SX-200" DIGITAL
PRIVATE AUTOMATIC BRANCH EXCHANGE (PABX)

CONTROL SHEET - VOLUME 4 (PN 9109-094-004-NA)
PERIPHERALS INFORMATION
CONTENTS - THIS VOLUME

CONTENTS - OTHER VOLUMES

SX-200" DIGITAL

PRIVATE AUTOMATIC BRANCH EXCHANGE

SUPERSET 3™ TELEPHONE DESCRIPTION

NOTICE

CONTENTS   PAGE

LIST OF ILLUSTRATIONS

FIGURE   **TITLE**   **PAGE**

1. INTRODUCTION

General

1.01 This Section describes the physical and electrical characteristics of the *SUPERSET* 3™ electronic telephone set. An outline of installation procedures, set operation and maintenance is also included.

Reason for Issue

1.02 This Section is issued to provide information about the *SUPERSET* 3 telephone.

2. DESCRIPTION

General

2.01   The SUPERSEJ 3 telephone is a microprocessor-controlled electronic telephone set employing integrated circuitry. Operational features include, single key activation, handsfree operation, 12 user-programmed Speed dial keys and automatic selection of the Prime Line. Up to three lines can appear on the SUPERSEJ 3 telephone. Line appearances can be lines, trunks, or multiple appearances of the same line.

2.02   The SUPERSEJ 3 telephone is connected to local area wiring by a modular jack. Power, signal, and voice are carried over a single pair of wires.

Physical

2.03   The SUPERSEJ 3 telephone consists of the main assembly, the handset cord, the handset, and the line cord.

2.04   The microphone (for handsfree operation), is located behind an aperture on the front of the main assembly.

2.05   The speaker is located between the handset recesses. The speaker volume control is mounted on the left side of the cover assembly.

3. FUNCTIONAL DESCRIPTION

General

3.01   Figure 3-1 shows the *SUPERSET* 3 Electronic Telephone Set; the face layout is shown in Figure 3-2. A description of the function of each key and display follows. All keys are noninterlocking.

Line Select Keys

3.02 During CDE, the three Line Select keys are programmed to access lines and/or trunks. The leftmost key will access the set's Prime Line. The remaining two keys are available for use as Speed Dial keys, if they have not been assigned as line appearances.

Line Status LEDs

3.03   Above each Line Select key there is an associated Line Status LED. The LED lights continuously to indicate the line is in use; it flashes to indicate a call is on hold at that line.

Speed Dial Keys

3.04   There are 12 Speed Dial keys located on the upper right portion of the set. The user can program these keys with frequently-dialed numbers.

Hold Key

3.05   The red Hold key allows the user to place any call at the set on hold. The Line Status LED associated with the held line, flashes to remind the user that a call is on hold. The call is retrieved by pressing the Line Select key.

Feature Keys

3.06   Each of the seven Feature keys are associated with a specific feature. They are as follows:

SWAP ▪ The SWAP key allows the user to alternate between two established calls (a Broker's Call).

TRANS/CONF ▪ This key allows the user to put a call on hold, dial a new number and conference the call or transfer the held call (with privacy) to the new number.

REDIAL ▪ This key causes the last number dialed to be automatically redialed when the key is pressed.

CANCEL ▪ This key cancels any dialing which had been performed.

PROGRAM/SAVE ▪ This key allows the user to program and save

speed dial numbers on selected speed dial keys.

SPEAKER ON/OFF - This key allows the set user to receive or originate calls without using the handset. Each time this key is pressed the set is switched between handset and Handsfree operation.

MIC/MUTE - While pressed, the MIC/MUTE key disables the microphone during Handsfree operation, either to prevent transmission of local sound or to improve reception when the set is installed in a noisy environment.

Speaker Volume

3.07   A sliding lever is provided on the left side of the SUPERSEJ 3 telephone to control speaker volume. Volume is greatest when the lever is in the up position, and lowest when it is in the down position.

Ringer Volume and Ringer Pitch

3.08   Ringer volume and pitch controls are located under the line identification card and are adjustable by hand. Refer to Figure 3-2, SUPERSEJ 3 Telephone Face Layout.

79 mm
(3.11 in.)

161 mm
(6.31 in.)

220 mm
(8.66 in.)

WEIGHT: 1 kg.
(2.2 lb)

6492E1R1
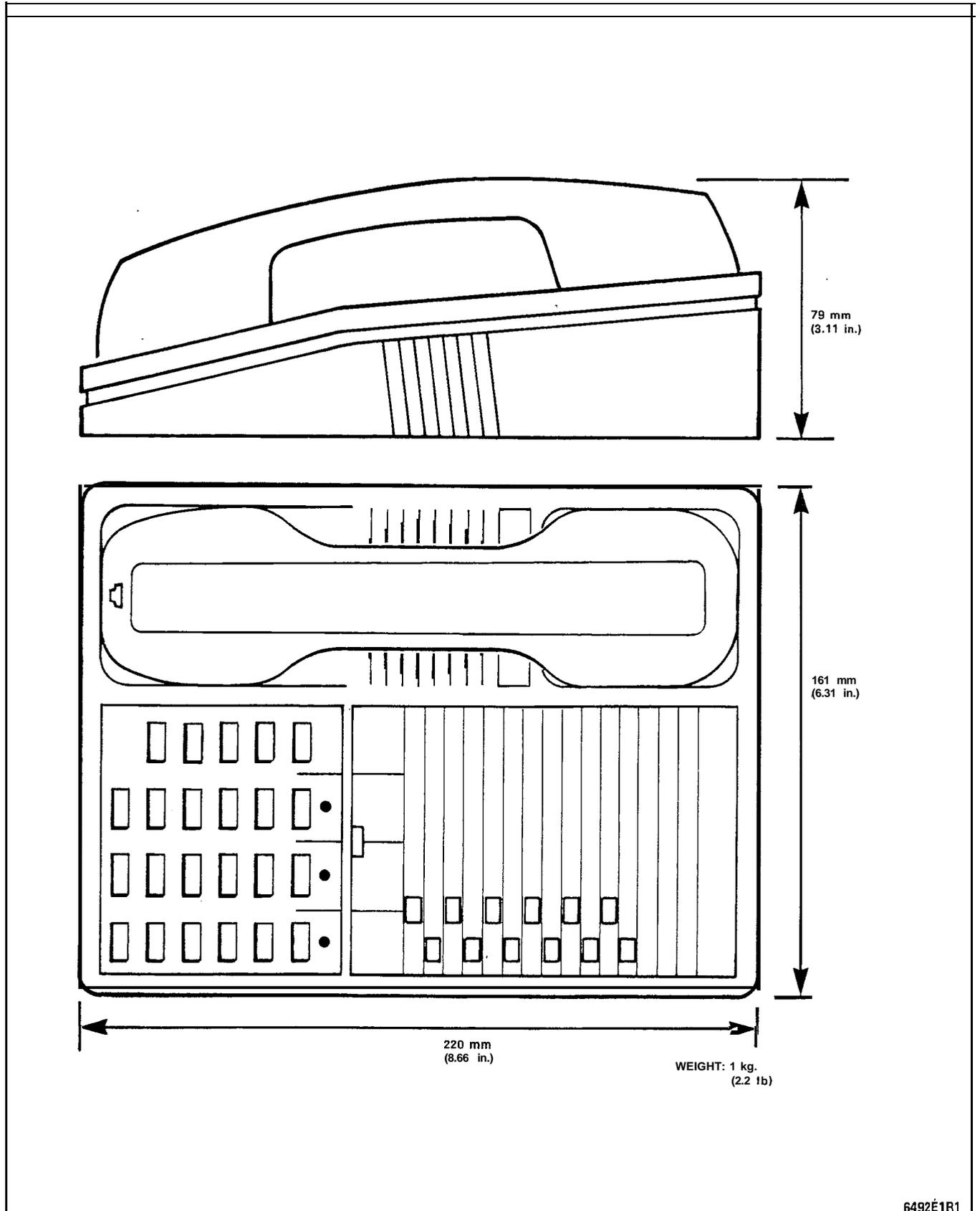
Figure 3-I *SUPERSET* **3 Electronic Telephone Set**
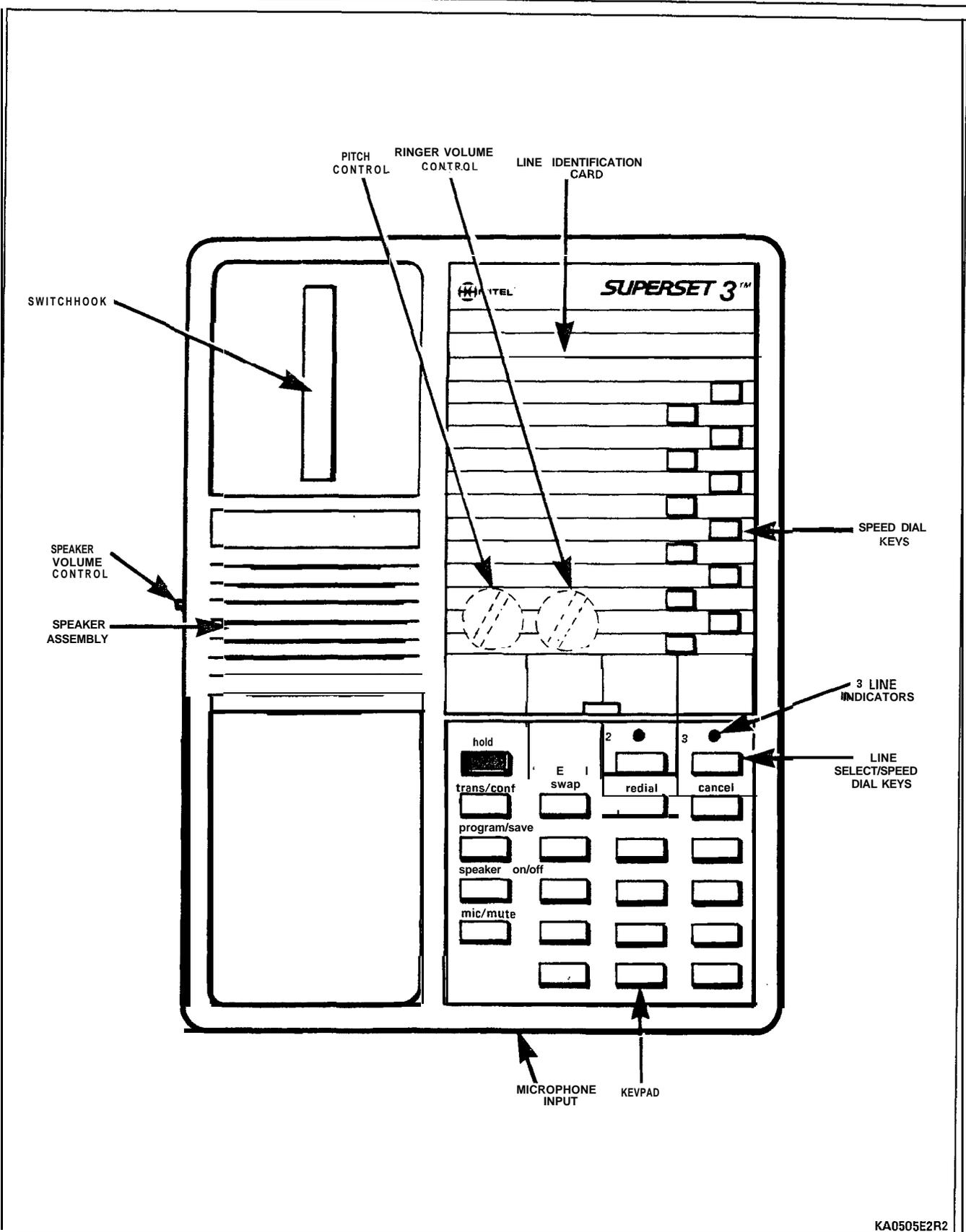
Figure 3-2 *SUPERSET* 3 Telephone Face Layout

4. SHIPPING AND RECEIVING

General

4.01   The *SUPERSET* 3 telephone is shipped in a single carton.

4.02   The *SUPERSET* 3 telephone is disassembled into main assembly, handset, handset cord, and line cord. Additionai items include identification cards (for telephone numbers and lines), clear plastic lens for these cards, reference guide, installation guide, and warranty tag.

Delivery Check

4.03   On delivery at the destination, check that all items are present and undamaged. Retain one or two sets of packaging material for reshipment of any damaged or defective items.

5. INSTALLATION

WARNING

ANY CONNECTION OF THIS SET TO AN OFF PREMISE APPLICATION, AN OUT OF PLANT APPLICATION, OR TO ANY OTHER EXPOSED PLANT APPLICATION MAY RESULT IN A SAFETY HAZARD, AND/OR DEFECTIVE OPERATION, AND/OR EQUIPMENT DAMAGE.

General

5.01 Installers should not use a hand test telephone (butt-in) to check a *SUPERSET* 3 telephone line. The interface card for *SUPERSET* 3 telephones has no loop detector; set on-hook/off-hook status is signaled by data transmission.

5.02 Do NOT connect *SUPERSET* 3 telephones to standard lines, in parallel, or as Power Fail Transfer extensions.

Installation

Note: Before a *SUPERSET* 3 telephone can be connected to a PABX, the PABX must be programmed and equipped to interface with a *SUPERSET* 3 telephone.

5.03 Install a *SUPERSET* 3 telephone as follows:

* Connect the handset cord to the handset and the main assembly.

* Identify the user's Prime Line number and other lines appearing at the *SUPERSET* 3 telephone on the Line Identification Card.

* Install the Line Identification Card and protective cover onto the main assembly.

* Connect the line cord to the telephone jack.

6. TEST PROCEDURES

General

6.01 Perform these test procedures as operational tests when installing a SUPERSEJ 3 telephone after initial installation of a system.

6.02 Whenever a *SUPERSET* 3 telephone is connected to an 'operating system, or the system has just been powered up, the test is run automatically and the following results appear. If any test fails, verify that the system is installed correctly and is powered up.

SUPERSET 3 TELEPHONE, POWER-ON TEST

TEST	LED1	LED2	LED3	TIMING
1	on	on	on	1 second
2	flashing	off	off	IO-15 seconds
3	off	off	off	steady, if set is on-hook
or	on	off	off	steady, if set is off-hook

If all LEDs turn on steady for more than a few seconds there is an error. Check wiring, then try a known good spare.

6.03 If the system is programmed to detect a missing SUPERSEJ 3 telephone, perform the following to verify this feature:

- Disconnect the SUPERSEJ 3 modular plug.

- Verify that the appropriate alarm has been raised.

- Reconnect the modular cord to the SUPERSEJ 3 telephone.

- Clear the alarm.

SX-200" DIGITAL

PRIVATE AUTOMATIC BRANCH EXCHANGE (PABX)

SUPERSET 4" TELEPHONE INFORMATION

NOTICE

CONTENTS   PAGE

LIST OF TABLES

TABLE   TITLE   PAGE

LIST OF ILLUSTRATIONS

FIGURE   TITLE   PAGE

LIST OF ILLUSTRATIONS (CONT'D)

1. INTRODUCTION

General

1.01 This Section describes in general, the physical and electrical characteristics of the *SUPERSET 4*® electronic telephone set. It also outlines major features, installation, operation, and maintenance information.

Reason for Issue

1.02 This Section is issued to describe the *SUPERSET* 4 telephone.

2. GENERAL DESCRIPTION

General

2.01 The *SUPERSET* 4 telephone is an advanced microprocessor-controlled telephone set, employing digitally-controlled integrated circuitry and liquid crystal displays (LCD).

2.02 The *SUPERSET* 4 telephone provides visual features such as line status indication, time and date display, caller identification and word prompts to facilitate call handling. Operational features include, single key feature activation, handsfree operation, and user selection of pre-programmed status messages. `

3. PHYSICAL DESCRIPTION

General

3.01 The *SUPERSET* 4 telephone body and handset are of plastic construction. The dimensions of the *SUPERSET* 4 telephone, with handset on-hook, are given in Figure 3-l.

3.02 The body and handset are connected together with a modular detachable handset cord, plugged into the side of the body. Line connection to the set is by means of a modular detachable line cord, plugged into the rear of the set.

3.03 An optional rear support can be clipped in position beneath the set. This would be used when the set is likely to be placed some distance from the user (Figure 3-3).

Body

3.04 The body of the *SUPERSET* 4 telephone comprises two parts: a base assembly and a cover assembly (Figure 3-2).

Base Assembly

3.05 The base assembly contains a microphone (for handsfree operation), modular jacks for the handset and line cords, the main circuit card, and a speaker assembly (for handsfree operation and tone ringer output). The microphone is mounted in a position which permits it to receive sound passing through an aperture in the front of the base assembly.

3.06 A screwdriver slotted control for adjusting ringer pitch is user-accessible from the underside of the base assembly.

Cover Assembly

3.07 The cover assembly houses a volume control assembly, a keypad module, and a line selection/repertory dial module. The speaker is located between the handset recesses, and projects sound upwards through a grill beneath the handset.

Volume Control Assembly

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

Keypad Module

3.09 The keypad module contains a standard 12-key keypad, six softkeys, and four feature keys.

Line Selection/Repertory Dial Module

3.10 The line selection/repertory dial module contains 15 line select/speed dialing keys, a HOLD key, an LCD line status display, and an LCD feature display.

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

95. 25 mm
(3. 75 in.)

203. 2 mm
(8. 0 in.)

264. 16 mm
(10. 4 in.)

WEIGHT 1.36 kg
(3 lb.)

KA0702E0R0
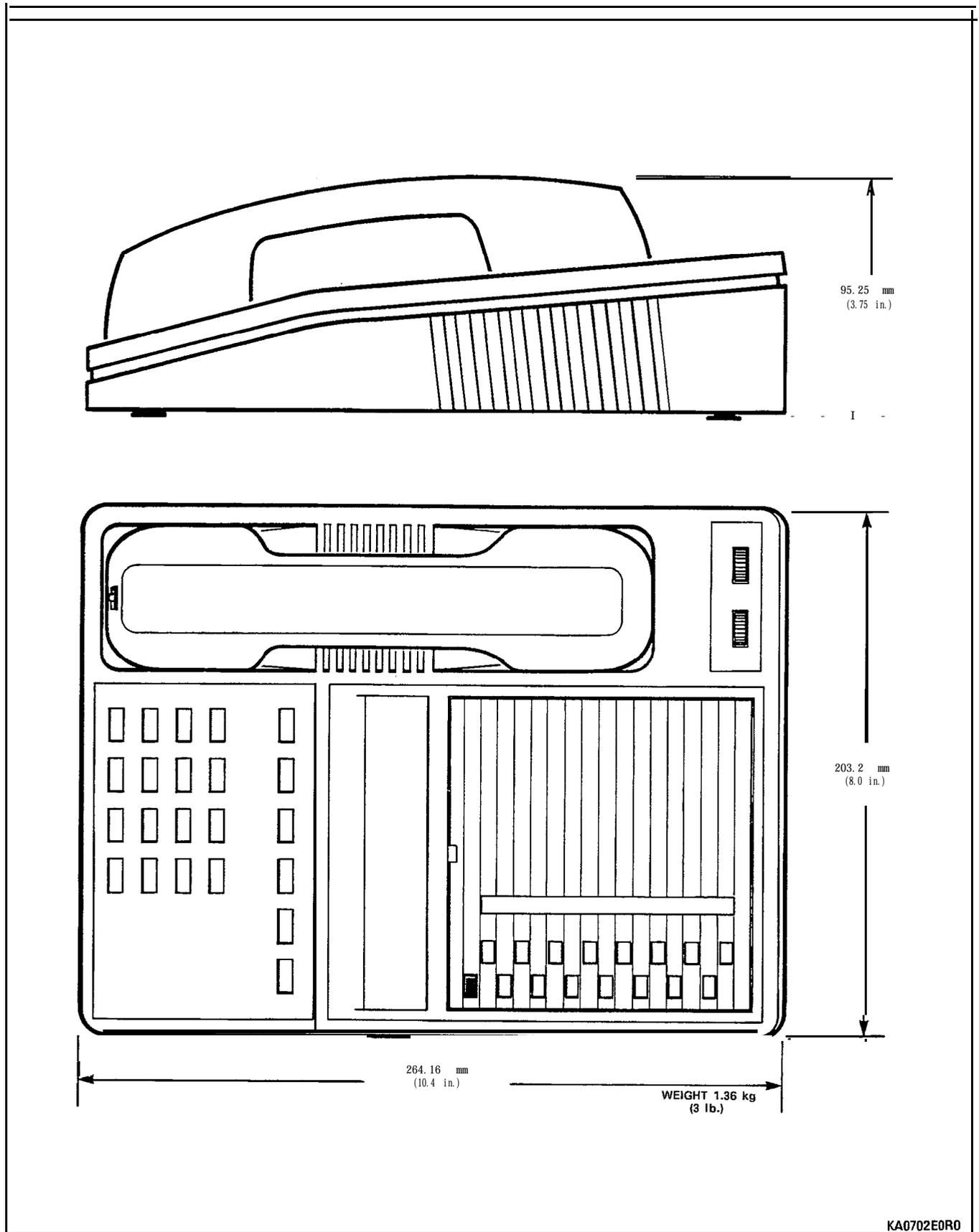
Figure 3-l *SUPERSET* **4 Telephone Dimensions**

SWITCHHOOK

SPEAKER
ASSEMBLY

LOUDSPEAKER VOLUME CONTROL

RINGER VOLUME CONTROL

LINE IDENTIFICATION CARD,

COVER ASSEMBLY

LINE STATUS
DISPLAY

HANDSET

LINE
SELECT/SPEED
CALL BUTTONS

BASE
ASSEMBLY

"hold' BUTTON

KEYPAD

'LINE SELECTION/
REPERTORY
DIAL MODULE

MAIN DISPLAY

FEATURE
BUTTONS

'display'
'select features' BUTTON
BUTTON

RINGER
PITCH CONTROL
(UNDERNEATH BASE ASSEMBLY)

'speaker on/off'
BUTTON

'mic. on/off
BUTTON

MICROPHONE

7131E3R3

Figure 3-2 *SUPERSET* 4 Telephone

REAR
SUPPORT
(OPTIONAL)

6398E2R2

Figure 3-3 *SUPERSET* 4 Telephone and Optional Support

4. FUNCTIONAL DESCRIPTION

General

4.01   The SUPERSEJ 4 telephone face layout is shown in Figure 4-l. The following describes the function of each key and display; all keys are noninterlocking.

Line Select/Speed Dial Keys

4.02   There are a total of 15 line select/speed call keys. During CDE 14 of these can be programmed as line select keys, (one key is designated as the Prime line). Lines can be a combination of line types such as Key, DTS, Private etc. Unassigned keys are available for use as speed dial numbers.

Hold Key

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

Softkeys

4.04   There are six softkeys. Each key is associated with a specific group of word prompts on the features display.

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

Supplementary Feature Keys

4.06   **DISPLAY:** This key displays the following:

- user name, if programmed
- identification of lines at the set
- saved numbers for speed dialing ("speed call")
- number saved for redial
- identification of source of incoming calls
- identification of caller camping on
- timed-reminder setting
- call forward destination

4.07 After the DISPLAY key is pressed, the actual feature to be displayed is selected by:

Pressing a line select/speed dial key − for line or caller identification, or speed dial number

OR

Pressing a softkey under the prompt associated with the feature. (To clear the display, press the EXIT softkey).

4.08   SELECT FEATURES. Features which may be activated at any time, as opposed to those which may be selected only at fixed times, are displayed on the features display when the SELECT FEATURES key is pressed.

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

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

4.11   MIC ON/OFF. This key is used to switch the microphone OFF during handsfree operation, in order to either prevent transmission of local sound, or improve reception when the set is installed in a noisy environment. While the microphone is ON, a visual reminder (MIC ON) is displayed on the features display.

Line Status Display

4.12 This is a liquid crystal display mounted adjacent to the line select keys. The display contains 15 identical symbol groups; the symbols are aligned with the line select/speed dial keys.

4.13   The different states of a symbol group, and the meaning of each state, are shown in Figure 4-2.

Features   Display

4.14   This is a liquid crystal display mounted adjacent to the feature keys. The features display is divided into three functional areas, as shown in Figure 4-3.

4.15 **FEATURES DISPLAY AREA.** The words displayed in this area indicate the features that may be selected at any time. Those features which are not in the Class of Service are not displayed. Display of the words is initiated by pressing the DISPLAY FEATURES key.

4.16 The meaning of each feature name is as follows:

1:FWD Call Forward.

This feature is automatically invoked after setting up type and destination. To cancel the feature, the user must press the SELECT FEATURES key, dial '1', and then press the OFF feature key. To reactivate the feature, the user must press the SELECT FEATURES key, dial '1', and then press the ON feature key. When active, the word FWD is displayed as a reminder.

2:N0 DIST'B Do Not Disturb.

This feature prevents an incoming call from ringing the user's set. To activate, the user must press the SELECT FEATURES key, dial '2', and then press the ON feature key. To cancel this feature, the user must press the SELECT FEATURES key, dial '2', and then press the OFF feature key. When active, the words NO DIST'B are displayed as a reminder.

3:AUT0 ANS Automatic Answer.

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

4:MSG Messaging.

This feature is used to read system messages' during an established call. The word MSG flashing in the display notifies a user that there is a message waiting to be read. To read the message during an established call, the user must press the SELECT FEATURES key and dial '4'. The prompt READ MSG is now displayed, and pressing this feature key brings the message into view in the alphanumeric display. When the message has been read, the user has three choices: CANCEL, NEXT or EXIT. The CANCEL feature key cancels the current message and brings the next message into view. Both NEXT and EXIT leave the current message active. NEXT brings the next message into view. The EXIT feature key exits from the feature and clears the display.

5:ACC CODE Account Code.

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

4.17   The words MIC ON have an advisory function and, when displayed, remind the user that the microphone is on.

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

4.19   Each character is formed from a 5X7 dot matrix.

Softkey Prompt Display Area

4.20   There are 35 word prompts organized into six groups. Each group relates to one of the six feature select keys. The prompts act as a guide to the set user, and indicate to the user what can be done, and when. To select a function or feature indicated, the user only has to press the softkey below the prompt.

4.21   The prompts are organized such that only one word above any feature key is displayed at any time (except for SWAP CAMP ON feature). Whenever a feature is not in the Class of Service of a particular set, or if the choices of actions are less than six, the area above some feature keys is left blank. Pressing keys under these conditions is ineffective.

Error Messages

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

Message: NO   COMMUNICATION

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

Message: CONSECUTIVE ERRS

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

LINE STATUS DISPLAY

LINE SELECT/
SPEED DIAL KEYS

HOLD KEY

12:35   19-FEB-87

PROGRAM   MSG

FEATURES
DISPLAY

SOFTKEYS

	abc	def	display
1	2	3	
ghi	jkl	mno	select -features
4	5	6	
prs	tuv	wxy	speaker on/off
7	8	9	
qz	oper.		mic. on/off
*	0	#	

FEATURE KEYS
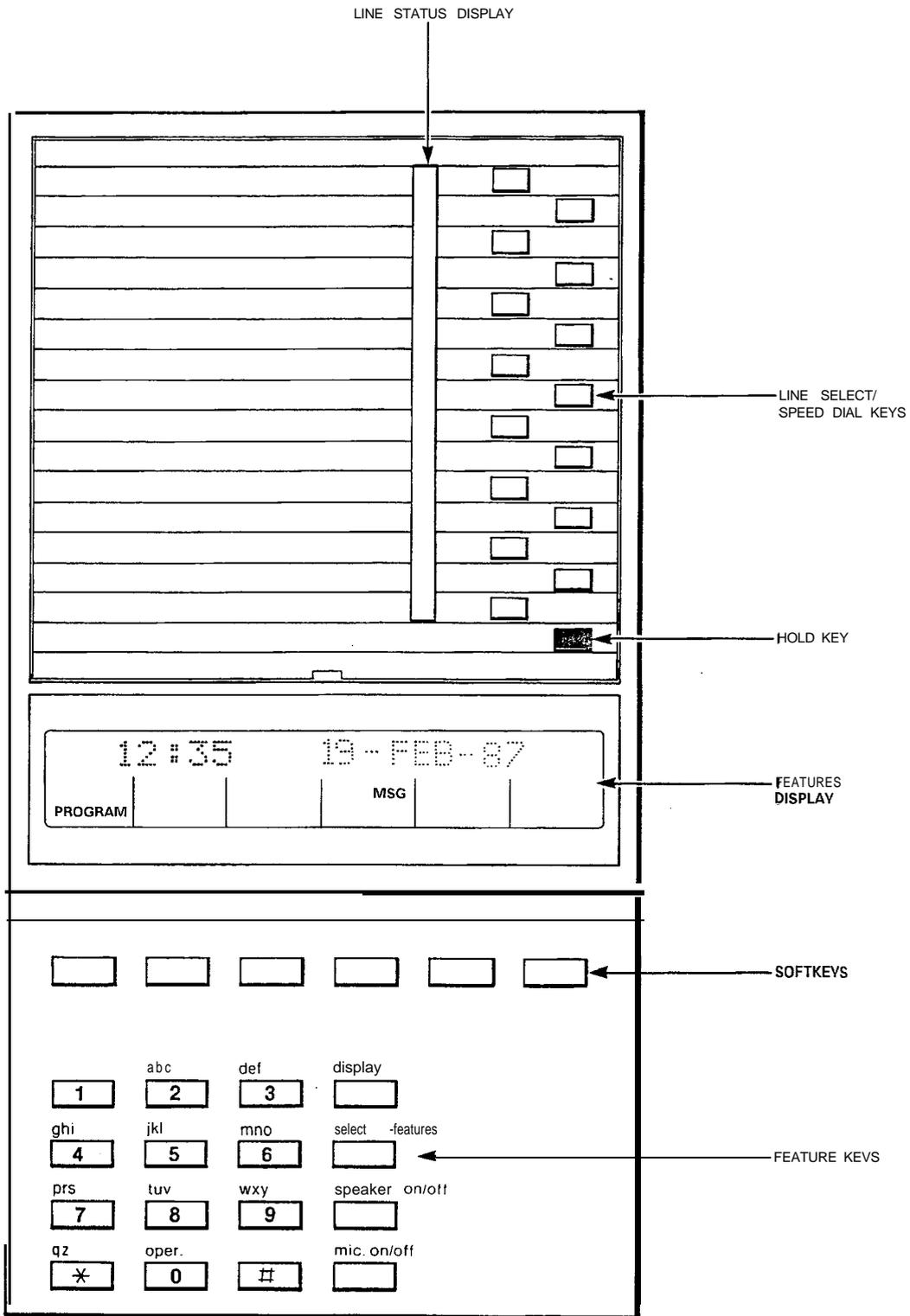
KA0701R0E0

Figure 4-1 SUPERSET 4 Telephone Keys and Displays

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

5634E1R1

Figure 4-2 SUPERSET 4 Telephone Line Status Display Symbols

FEATURES DISPLAY
AREA

ALPHANUMERIC DISPLAY
AREA

FEATURES
DISPLAY AREA

1:FWD
2:NO DIST'B
3:AUTO ANS

4:MSG
5:ACC
→ MIC ON

PAGEEXIT
SWAPSPLIT
CAMP ON
PROGRAM

NAME SAVE
ONOFF
CALLBACK
NIGHT ANS

CALL FWD
TRANS/CONF
OVERRIDE
PICKUP

REMINDER
ADD HELD
SEND MSG
HELP CALL

READ MSG
PRIVACY REL
CANCEL NO
REDIAL ←

SPEED CALL
NEXT YES
HANG-UP
RELEASE →

PROMPT DISPLAY AREA

7726R0A157E0

Figure 4-3 *SUPERSET* 4 Telephone Features Display Layout

Line   Appearances

4.23   A line is said to "appear" at a *SUPERSET* 4 telephone if the line has been assigned to one of the available positions on the line status display and can therefore be selected or accessed by the set user. A line can be programmed to appear at one set, at more than one set, or more than once at a particular set. Although a line can appear more than once throughout the system, it is always identified by its unique   directory   number.

4.24   The appearances of a line do not have to be identical – the line type and its variants can both differ; for example, a line can appear as a prime line at one set and as a key line (with delayed ring) at another set.

4.25   Although a *SUPERSET* 4 telephone can access up to 15 lines, it only requires one pair of wires to connect the set to its equipment number position. The SUPERSEJ 4 telephone sends signals to the system which makes the appropriate line connection. A second pair is required if the Call Announce feature is to be used.

5. **PACKAGING**

General

5.01 The *SUPERSET* 4 telephone is shipped in a single carton, as shown in Figure 5-1.

5.02 On delivery at the destination, carefully unpack the *SUPERSET* 4 telephone carton and check that all items are present and undamaged. Retain some sets of packaging material for reshipment of any damaged items.

5.03 The *SUPERSET* 4 telephone consists of a main assembly, handset, and handset cord. Additional items include identification cards (for telephone numbers and lines), protective lens for these cards, reference guide, installation guide, elevation stand, and warranty tag.

LINE CORD

REAR
SUPPORT

HANDSET·

HANDSET
CORD

MAIN
ASSEMBLY

DOCUMENTATION

6081E3R3
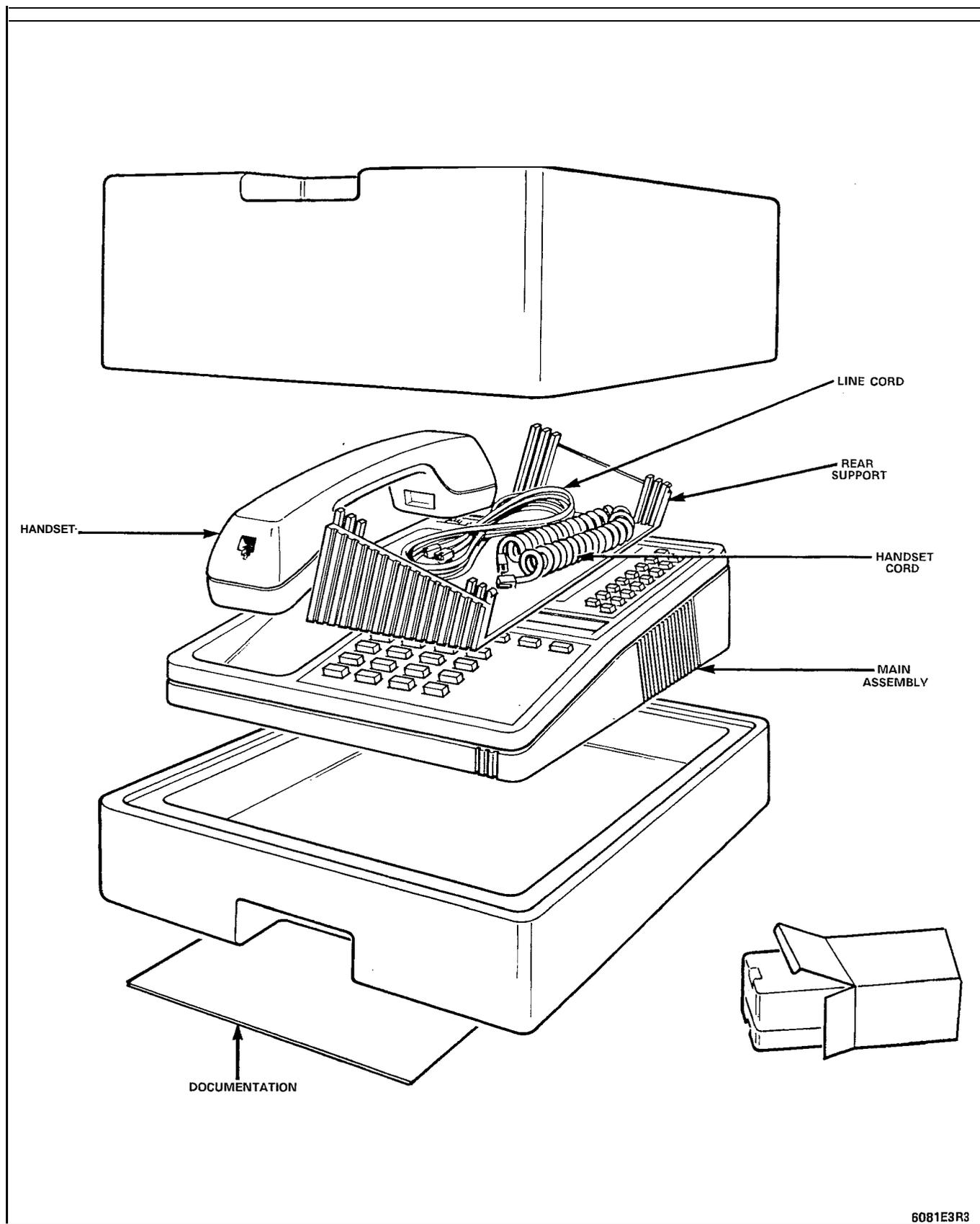
Figure 5-1 *SUPERSET* 4 Telephone and Packaging

6. INSTALLATION AND MAINTENANCE

WARNING

ANY CONNECTION OF THIS SET TO AN OFF PREMISE APPLICATION, AN OUT OF PLANT APPLICATION, OR TO ANY OTHER EXPOSED PLANT APPLICATION MAY RESULT IN A SAFETY HAZARD, AND/OR DEFECTIVE OPERATION, AND/OR EQUIPMENT DAMAGE.

Note: Do not attempt to use a hand test telephone (butt in) to check *SUPERSET* 4 telephone lines. There is no loop detector installed in the PABX *SUPERSET*® line card/interface; set on-/off-hook status is signaled using data transmission. *SUPER-*SET 4 telephones must not be connected to any of the following:

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

Installation

6.01 The following conditions simplify the installation of a *SUPERSET* telephone:

● Handset and line cords are modular-connector-ended.

● No local power supply is required; the system provides power through the line.

● Only nonessential user programming is performed at the set; i.e., speed dial ("speed call") entry, call forward destination, name, and timed reminder.

● Installer can use set display feature to identify lines programmed to appear at the set.

● Initialization of the *SUPERSET* 4 telephone occurs automatically when the set is connected to the system.

6.02 Before a *SUPERSET* 4 telephone can be connected to a PABX system, the PABX must be programmed and equipped to interface with a SUPERSEJ 4 telephone.

6.03 Figure 6-l shows a *SUPERSET* 4 telephone assembly. Install a SUPERSEJ 4 telephone as follows:

● Connect the handset cord to the handset and the main assembly.

● identify the user's extension number and other lines appearing at the *SUPERSET* 4 telephone on the line identification card.

Page 23

- Install the line identification card and protective lens onto the main assembly.

- Connect the line cord to the telephone jack.

6.04   Installation of a *SUPERSET* 4 telephone into a powered-up system consists of:

- Ensuring the local modular telephone outlet is connected to a *SUPERSET* or COV line card or interface.

- Connection of the line cord to the main body of the *SUPERSET* 4 telephone.

- Connection of the line cord to local modular jack.

- Verifying that automatic initialization procedures have been executed; this should take 10 to 20 seconds. Then, time and date are displayed.

- Identification of customer telephone number and lines appearing at the set.

- Performance of installer loop test procedures as specified in Part 9 of this Practice. This verifies transmission and reception paths, key operation, and display operation.

Maintenance

6.05   No regular or scheduled maintenance is required. The installer loop test procedure can be performed at any time to check set operation. The installer loop test procedure, performed at the *SUPER-SET* 4 telephone after dialing the loop test access code, confirms correct key operation, liquid crystal display activation, hookswitch functioning, and ringer (speaker) output. Refer to Table 7-l for the detailed procedure.

EXAMPLE OF TELEPHONE NUMBER
IDENTIFIED ON TELEPHONE NUMBER
IDENTIFICATION CARD

EXAMPLE OF LINES IDENTIFIED
ON LINE IDENTIFICATION CARD

PROTECTIVE LENS

TELEPHONE NUMBER
IDENTIFICATION CARD

PROTECTIVE
LENS

HANDSET

LINE
IDENTIFICATION
CARD

LINE
CORD

HANDSET CORD   MAIN ASSEMBLY   REAR SUPPORT
(OPTIONAL)
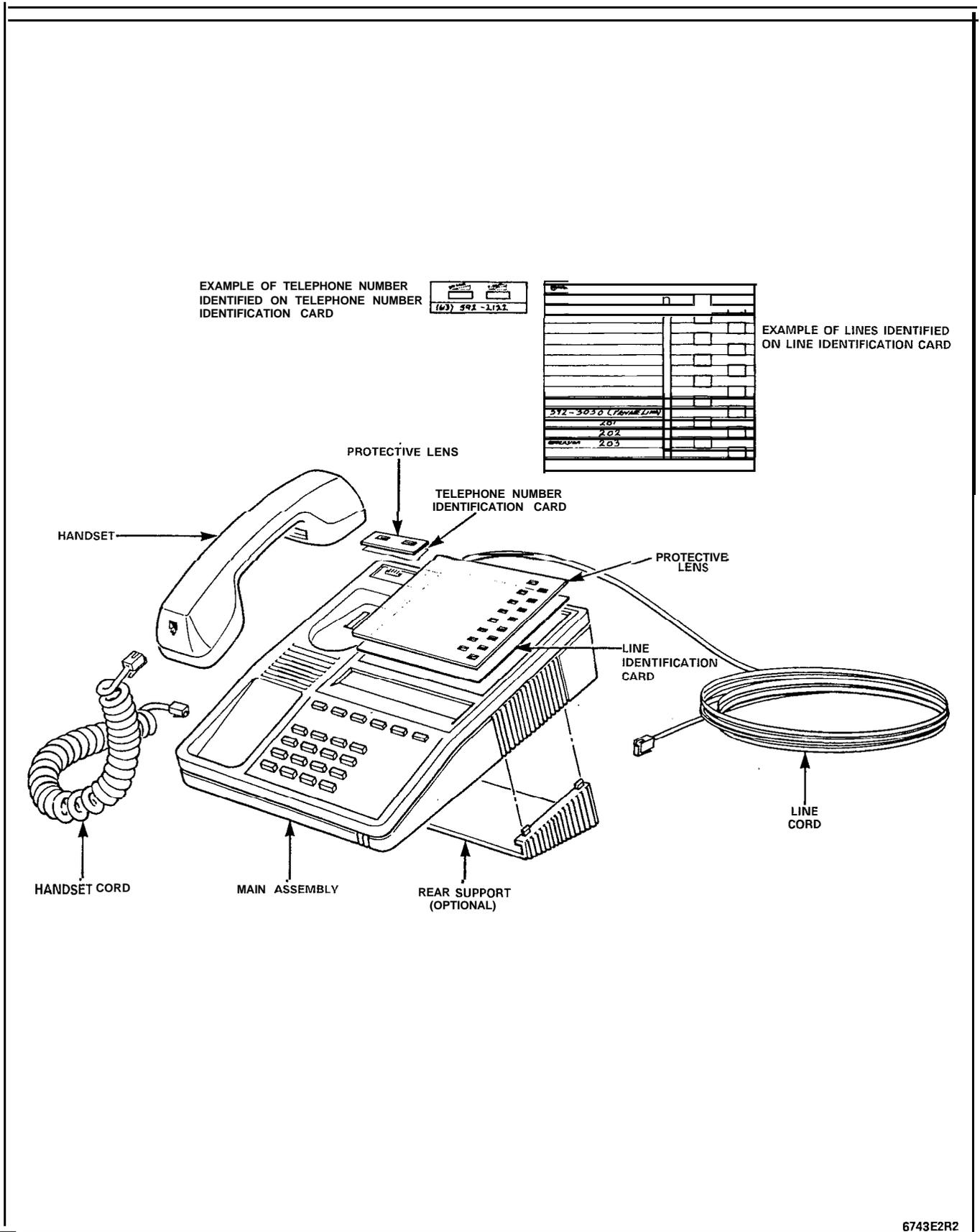
6743E2R2

Figure 6-I *SUPERSET* 4 **Telephone Assembly**

7. *SUPERSET* 4 **TELEPHONE TEST PROCEDURES**

General

7.01   Perform these SUPERSEJ *4 test* procedures as operational tests after initial installation of a system.

7.02   Whenever a SUPERSEJ 4 telephone is connected to an operating system, or the system has just been powered up, this test is run automatically. A message in the following format appears on the SUPERSEJ 4 telephone LCD: *":SS4* VXX.XX.XX:", for approximately 30 seconds. Time and date are then displayed. If the test fails, verify that the system is installed correctly and is powered up. Refer to the appropriate MITEL practices for system installation instructions.

7.03   Satisfactory completion of the test procedures listed in Table 7-I confirms correct key operation, liquid crystal display activation, hookswitch functioning, and speaker output, and checks that the set has been installed correctly.

7.04   Perform the tests listed in Table 7-I at each SUPERSEJ 4 telephone. If any test fails, verify that the system is installed correctly and is powered up.

TABLE 7-1
INSTALLER LOOP TEST ROUTINES

Step	Action	Verification	Notes
Accessing Test Routines			
1.	Go off-hook (handset or handsfree).	Dial tone returned. Line status display indicates line busy at this set.	1
2.	Dial Loop Test Access Code.	"TEST! PRESS KEYS" displayed.	2, 3
Keypad Test			
3.	Press keys I-9, *, 0, and # in turn.	DTMF tones are heard through handset or speaker. A 2-digit number is displayed as follows: Key Number Pressed Displayed 1 01 2 02 3 03 4 04 5 05 6 06 7 07 8 08 9 09 * 10 0 00 # 11	
Supplementary Feature Keys Test			
4.	Press the "display", "select features", "speaker on/off", and "mic. on/off" keys in turn.	A 2-digit number is displayed as follows: Key Number Pressed Displayed display 12 select features 13 speaker on/off 14 mic. on/off 15	
INSTALLER LOOP TEST ROUTINES			
Step	**Action**	**Verification**	**Notes**
Feature Select Keys and Features Display Test			
5.	Press each of the softkeys in turn.	The prompts above each key are activated, and a 2-digit number is displayed (see Figure 7-l).	7
6.	Press the "select features" key.	Supplementary feature names are activated (see Figure 7-l).	

**TABLE 7-I (CONT'D)
INSTALLER LOOP TEST ROUTINES**

Step	Action	Verification	Notes
Line Select Keys, Hold Key, Line Status Display, and Tone Ringer Test			
7.	Press the red hold key and each line select key in turn.	The line status display next to each key (except hold) is activated to indicate an incoming call (alternating square/circle format). A 2-digit number is displayed, as follows: hold key = 30 to upper line select key = 45 The tone ringer sounds when the top line select key is pressed.	
Hookswitch Test			
8.	(a) If the tests are run with the handset on-hook, lift the handset. (b) Press "speaker on/off" key, and replace the handset.	"HANDSET UP" displayed. Number 14 displayed, then "HANDSET DOWN" displayed.	
9.	(a) If the tests are run with the handset off-hook, press the "speaker on/off" key. Replace the handset. (b) Lift handset.	"HANDSET DOWN" displayed. "HANDSET UP" displayed.	
Terminating Test Routines			
10.	If the tests are run with the handset on-hook, press the "speaker on/off" key, or if the tests are run with the handset off-hook, replace the handset.	Set becomes idle; time and date are displayed.	

Notes:
1. If test is run in handsfree mode, 'MIC ON' is displayed.
2. Access code is found in the CDE Form: Feature Access Codes.
3. All prompts and line status displays are cleared. 'MIC ON' remains if test is run in the handsfree mode.
4. Supplementary feature names are also displayed.
5. Do not press this key if test is run in handsfree mode, as it will cause the test to be terminated.
6. If test is run in handsfree mode, "MIC ON" prompt is turned on or off each time this key is pressed.
7. Prompts remain displayed after key is released to allow error patterns to be detected.
8. Supplementary feature names remain displayed until another key is pressed.

FEATURES
DISPLAY

```
1:FWD                                                    4:MSG
2:NO DIST'B                                         5:ACC CODE
3:AUTO ANS                                          → MIC ON


    PAGEEXIT    NAME SAVE  CALL FWD    REMINDER  READ MSG  SPEED CALL
    SWAPSPLIT    ON OFF    TRANS/CONF  ADD HELD  PRIVACY REL NEXT YES
    CAMP ON     CALLBACK   OVERRIDE   SEND MSG  CANCEL NO   HANG-UP
    PROGRAM     NIGHT ANS   PICKUP    HELP CALL  REDIAL ←   RELEASE →
```

```
 ⌐20⌐   ⌐21⌐   ⌐22⌐   ⌐23⌐   ⌐24⌐   ⌐25⌐
```

SOFTKEYS
WITH RELATED
LOOP TEST
NUMBERS
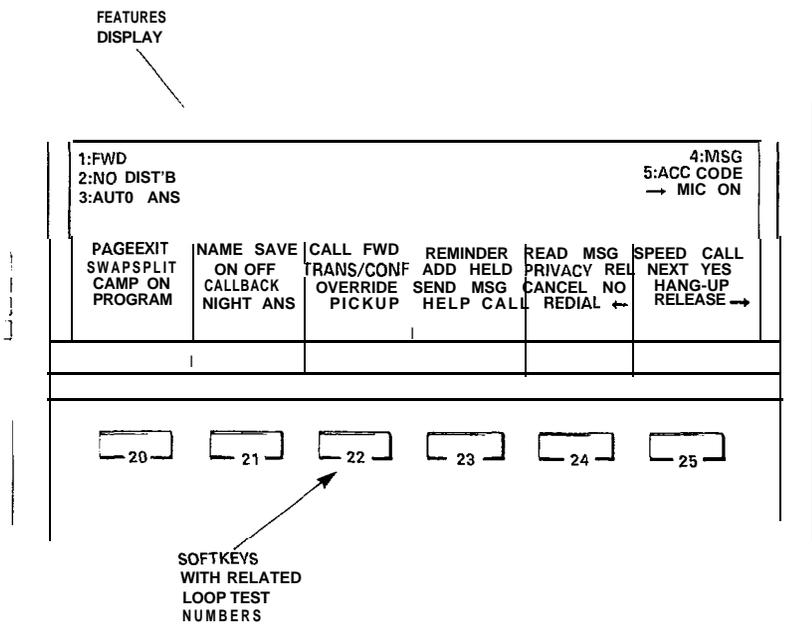
5949R0A033E0

Figure 7-I Feature Select Keys and Feature Display Test

SX-200" DIGITAL

PRIVATE AUTOMATIC BRANCH EXCHANGE

SUPERSET 3™DN SET INFORMATION

NOTICE

CONTENTS   **PAGE**

LIST OF ILLUSTRATIONS

FIGURE   **TITLE**   **PAGE**

1. INTRODUCTION

General

1.01 This Section describes the general, physical, and electrical characteristics of the *SUPERSET* 3™DN electronic telephone set when used as part of an *SX-200*® DIGITAL PABX. It also includes a brief description of major features, operation and installation.

Reason for Issue

1.02 This Section is issued to describe the *SUPERSET* 3DN telephone.

2. GENERAL DESCRIPTION

General

2.01 The SUPERSET 3DN telephone is a desk-top electronic tele-
phone with many features that enhance communications in a
modern business environment. It sits on a desk or workstation, and
may be used with its handset or in handsfree mode. Figure 2-l shows
a SUPERSET 3DN telephone while Figure 2-2 shows the layout of its
faceplate.

2.02 The SUPERSET 3DN telephone has the following features:

- single key feature activation
- up to 12 line appearances
- automatic selection of primary line
- key selection of non-primary line
- handsfree and auto-answer with microphone control
- speed dial
- automatic selection of ringing line
- hold function for any call at the set
- user programming of Call Forwarding destination and Speed
  Dial numbers
- speaker, handset and ringer volume control
- ringer pitch control
- digital communication with the host PABX

2.03 The SUPERSET 3DN telephone is designed for fast, simple in-
stallation; it connects to local area wiring by a modular jack,
and to the PABX by a single twisted pair. Power, signaling, and voice
are carried over this pair; additional wiring is not required.
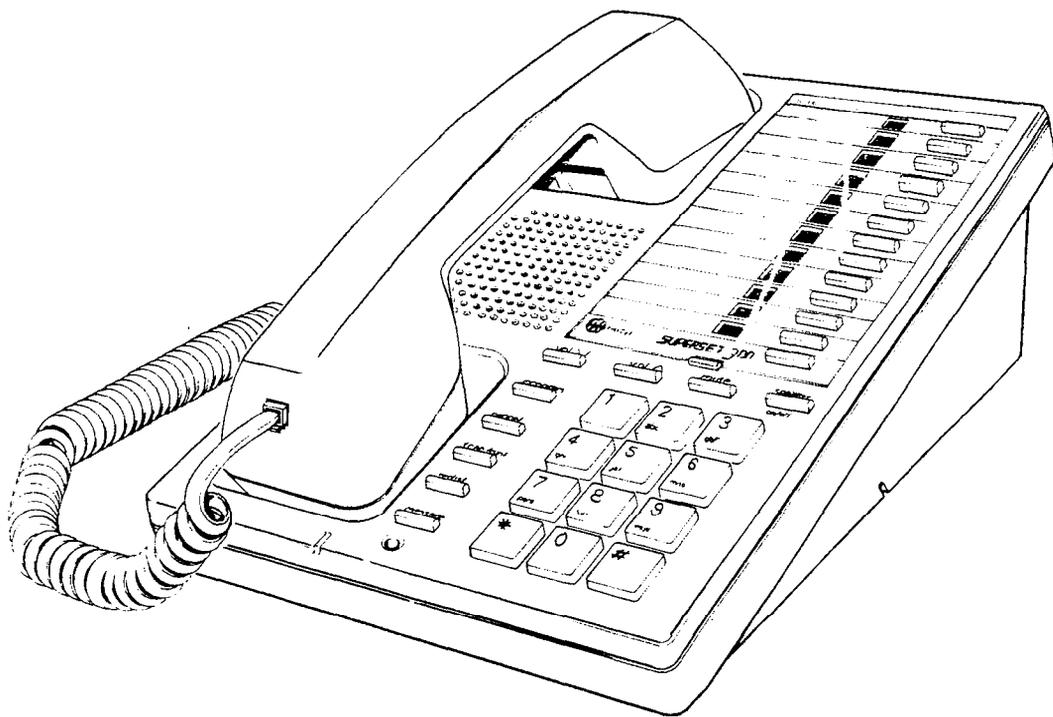
KA0227R0

Figuie 2-I *SUPERSET* **3DN Telephone**
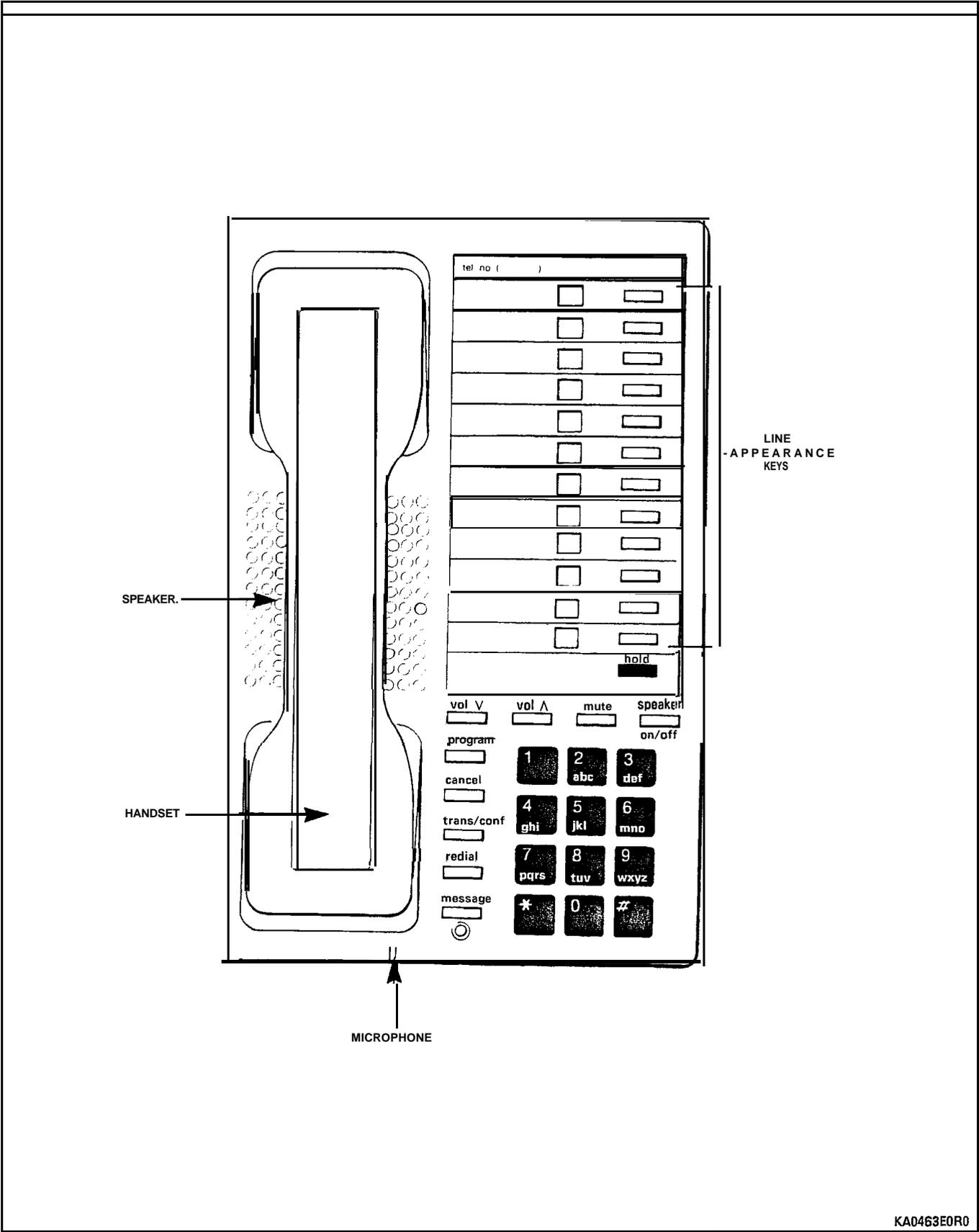
KA0463E0R0

Figure 2-2 *SUPERSET* 3DN Faceplate Layout

3. PHYSICAL DESCRIPTION

General

3.01 The *SUPERSET* 3DN telephone dimensions are:

length 240 mm (9.45 in.)
width 155 mm (6.10 in.)
height 106 mm (4.17 in.).

3.02 The faceplate of the set is divided into four functional areas:

- handset, speaker and microphone
- line appearance keys, each with a status indicator
- fixed function keys
- telephone keypad

Handset, Speaker and Microphone

3.03 The handset mounts in a cradle on the left side of the set; the speaker is located beneath a grille between the cradle depressions. The microphone is located in the bottom edge of the set, below the depression where the handset mouthpiece rests.

Line Appearance Keys

3.04 There is a column of 12 keys in the upper right part of the set's faceplate. To the left of each key is a liquid crystal display (LCD) with a circle within a square symbol. The outer square or the inner circle may be illuminated separately. Refer to Figure 7-l.

Fixed Function Keys

3.05 The fixed function keys are arranged around the telephone keypad, except for the red Hold key which is at the bottom of the column of line appearance keys.

Telephone Keypad

3.06 The telephone keypad has 12 keys arranged in the standard pattern. The number keys have associated letters with a slight deviation from the standard: the letter "q" appears with "p", "r" and "s" on the 7 key; "z" appears with "w", "x" and "y" on the 9 key. This allows entry of alphabetic information from the keypad.

Message Waiting Lamp

3.07 The message waiting lamp is a LED immediately below the Message function key at the bottom of the faceplate.

4. FUNCTIONAL DESCRIPTION

Fixed Function Keys

4.01 Surrounding the dial pad are ten fixed function keys; their functions are as follows:

HOLD Key: Pressing the red HOLD key places the current call on **hard** hold. The call may be retrieved by pressing the appropriate line select key.

VOLUME UP and DOWN Keys: These keys are used to set levels for: ringing volume, ringing pitch, handsfree volume, and background music volume. Each key depression changes the volume level or pitch by one step. The level for each function is stored in the PABX; changing one function setting does not affect the others. On system or set resets, the levels are restored. Default levels are applied when the set is first programmed.

When the set is ringing, these keys control the ringing volume level.

When the set is in handsfree mode, these keys control the speaker volume level.

When ringing from the tone demonstration package has been accessed, these keys control the ringer pitch.

When background music is connected, these keys control the music volume level.

SPEAKER Key: The SPEAKER key controls Handsfree operation of the set. Pressing the SPEAKER key in handset mode puts the set **into** Handsfree mode. The current call is now conducted via the microphone and speaker. If the handset was on-hook the set goes off-hook Handsfree. Pressing the SPEAKER key in Handsfree mode returns the set to handset mode. If the handset is on-hook the current call is terminated.

MUTE Key: The MUTE key, to the right of the volume keys, is used to disable the microphone (when in Handsfree mode) so that conversation near the set is not picked up and heard by the distant party. The microphone is disabled only while the key is pressed.

PROGRAM Key: The PROGRAM key is used to program speed dial numbers for line keys not used for line appearances or features. When programming is finished, this key is pressed to save the entered number.

CANCEL Key: This key is used to cancel a dialing sequence, to terminate a call in progress, to terminate (without saving) a programming function, or to return to a party held on soft hold.

TRANS/CONF Key: Pressing this key places the current call on hold

and returns dial tone. The user dials another number. Hanging up at this point transfers the held party to the dialed number. Pressing the TRANS/CONF key again when the called party answers reconnects the held party, forming a conference.

REDIAL Key: This key allows single keystroke redialing of the last correct internal or external number entered from this set. This key can be used only if manual dialing has not been initiated.

MESSAGE Key and LED: The MESSAGE LED flashes whenever a message is waiting for this set. Pressing this key calls the set that left the message.

When the SUPERSET 3DN telephone reaches a busy or unanswered party capable of receiving a message, the MESSAGE LED lights. Pressing the MESSAGE Key sends a message to the called set. The LED goes out and the call is terminated.

Feature Access Keys

4.02   During CDE, some of the set's line appearance keys can be programmed as feature access keys, eliminating the need for the user to dial feature access codes. For CDE purposes the keys are numbered 1 to 12 from bottom to top. These keys cannot be programmed from the set.

4.03   When a programmed feature is activated its LCD indicator shows a solid square; (if the feature provides status indication) otherwise, the LCD indicator is clear. This indicates the on/off status of the feature, not the validity of using the feature.

4.04   If the Attendant activates a feature on a set's feature access keys, the corresponding LCD indicator darkens.

4.05   Dialing the access code of a feature available on a feature key has the same effect as pressing the feature key. If the feature provides status indication, the corresponding LCD indicator will indicate whether the feature is ON or OFF.

4.06   The CDE-programmable feature keys which **do not** provide LCD indication include:

Call Pickup ▬ the user can answer a call ringing at another telephone in the set's pickup group without having to dial the pickup code.

Night Answer ▬ the user can answer a call ringing the night bell without having to dial the night answer access code.

Callback ▬ a busy or unanswered number can be automatically retried later. If the number was busy, it is called when it becomes idle; if it was unanswered, it is called when its set becomes idle again after being used.

Trade Calls (Swap) - the user can alternate between two calls, having one on hold and being in conversation with the other.

4.07   The CDE-programmable feature keys which provide LCD indication include:

Auto Answer - the set rings once and then automatically answers the call by switching into handsfree mode.

Call/Attn - used to originate a data call (connects the user to the DTRX). Refer to Section MITL91 09-094- 105-NA, Features Description for more information.

Data Disc - used to terminate the call. Refer to Section MITL9109-094-105-NA, Features Description for more information.

Do Not Disturb - incoming calls receive busy tone and the set doesn't ring; outgoing calls and other features operate normally.

Privacy Release - other sets with an appearance of the line in use may join the conversation by pressing the appropriate Line Select key.

Intrude (Override) - a set receiving busy tone can press this key to enter the conversation.

Paging - while the key is held down, the set is connected to the paging system. This feature does not operate in handsfree mode.

I Will Wait (Campon) - when a set user camps on to a busy extension, the called party receives a tone to indicate that another caller is waiting.

Music - music on hold (if provided by the PABX) can be heard through the set's speaker when the set is idle.

Call Forward - calls are forwarded according to the call forwarding the user has programmed.

Speed Dial

4.08   Any key not assigned as a line appearance or feature access key may be programmed as a Speed Dial key from the set. Refer to Section MITL91 09-094-I 05-NA, Features Description.

5. TELEPHONE OPERATION

General

5.01   This Part describes basic telephone call handling. Part 6 describes additional features available with the SUPERSEJ 3DN telephone.

Originating Calls

5.02   To originate a call:

Pick up the handset,

or,

Press the SPEAKER key. The set selects the prime line. If the prime line is busy, the set selects the first available outgoing line, starting from the lowest line appearance key. If no line is available, the set remains silent.

or

Proceed to the next step if Immediate Line Selection is enabled and a Handsfree call is desired.

If other than the set's prime line is desired, press the appropriate Line Appearance key.

Dial the number, press Redial or press the appropriate Speed Dial key, if programmed.

Answering Calls

5.03   To answer a call:

Lift the handset or press the SPEAKER key. The set automatically selects the ringing line. If more than one line is ringing, the set selects the lowest ringing line appearance key.

or

Press the Line Appearance key to be answered. The call is answered Handsfree. If desired, lift and use the handset.

Terminating A Call

5.04   To terminate a call:

Hang up. If in Handsfree mode, press the SPEAKER key. If there is a call on consultation hold, the call will ring the set.

or

Press the CANCEL key. If the set is in handsfree mode, it returns to the idle state; if the handset is in use, the set returns dial tone. If the set has a call on consultation hold, this call is reconnected.

5.05 When one party hangs up, the remaining party returns to the idle state if in handsfree mode; if off-hook, the party returns to silence or dial tone, depending on system options.

Call Transfer/Conferencing

5.06 Press the TRANSKONF key. This places the current call on soft hold and returns transfer dial tone to the user. Dial another call.

5.07 To abandon the transfer and return to the held party, press the CANCEL key.

5.08 To transfer the call, hang up. This can be done before or after the called party answers. If the called party is busy, the held party camps on.

5.09 To set up a conference, press the TRANS/CONF key after the called party answers. This connects the three parties together.

5.10 If a user hangs up with a party on soft hold, and there is no call to a third party (ringing, busy, or answered), then the user is rung back and reconnected to the party on hold.

Ringer Pitch Adjustment

5.11 The SX-200 DIGITAL System must have an access code assigned to the Tone Demonstration Package. Dial the access code followed by 33. The set will ring. Press the Volume Up or Volume Down key to raise or lower the ringer pitch. Each depression of the key changes the pitch one step. When the ringer sounds as desired, go on-hook or press the SPEAKER key.

6. DATA CARTRIDGE OPERATION

General

6.01 This is only a brief description of data call operations possible with the *SUPERSET* 3DN telephone data cartridge and feature keys. For more information on data calls, refer to Section MITL9 109-094-105-NA.

To originate a data transceiver (DTRX) call from the *SUPERSET* 3DN telepone:

Press the CALL/ATTN key.

Enter the number destination from the data terminal keyboard.

The LCD beside the CALL/ATTN key provides call status indication as follows:

blank – no connection
circle – DTR (device is ready but not connected)
circle and flashing square – connected to DTRX or queued at destination
solid – connected to called distination

To disconnect a DTRX call from the set:

Press the DATA DISC key.

7. LINE APPEARANCES

General

7.01 A line is said to "appear" at a SUPERSEJ 3DN telephone if the line has been assigned to one of the twelve available positions on the Line Status Display and can be selected or accessed by the set user. A line can be programmed to appear at one set, or at more than one set, or more than once at a particular set. Although a line can appear more than once throughout the system, it is always identified by its unique directory number.

7.02 The appearances of a line do not have to be identical - the line type and its variants can both differ; for example, a line can appear as a Prime Line at one set and as a Key Line (with delayed ring) at another set. However, an ONS line or *SUPERSET*® prime line cannot have both key line and Multicall line appearances.

7.03 Although a SUPERSEJ 3DN telephone can have up to 12 line appearances, it requires only only one pair of wires to connect the set to its equipment number position. The SUPERSEJ 3DN telephone sends signals to the PABX which makes the appropriate line connection.

7.04 The liquid crystal display beside the line appearance keys indicates the status of each line appearance as shown in Figure 7-I.

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

5634E1R1

Figure 7-I Line Status Display Symbols

8. SHIPPING AND RECEIVING

General

8.01 The SUPERSEJ 3DN telephone is shipped in a single carton.

8.02 The SUPERSEJ 3DN telephone disassembles into main assembly, handset, and handset cord. Additional items include identification cards (for telephone numbers and lines), protective covers for these cards, reference guide, installation guide, and warranty tag.

Delivery Check

8.03 On delivery at the destination, check that all items are present and undamaged. Retain some sets of packaging material for reshipment of any damaged or defective items.

9.   **INSTALLATION**

WARNING

ANY CONNECTION OF THIS SET TO AN OFF PREMISE APPLICATION, AN OUT OF PLANT APPLICATION, OR TO ANY OTHER EXPOSED PLANT APPLICATION MAY RESULT IN A SAFETY HAZARD, AND/OR DEFECTIVE OPERATION, AND/OR EQUIPMENT DAMAGE.

9.01   Do NOT connect *SUPERSET* 3DN telephones in parallel, to standard lines, or as Power Fail Transfer extensions. Do not **use** a hand test telephone (butt-in) to check a *SUPERSET* 3DN telephone line, because its Digital Line Card has no loop detector; set on-hook/off-hook status is signaled by data transmission.

Before a *SUPERSET* 3DN telephone can be connected to a PABX, the PABX must be programmed and equipped with Digital Line Cards to interface with its *SUPERSET* 3DN telephones.

Installation

9.02   Install a *SUPERSET* 3DN telephone as follows:

Connect the handset cord to the handset and the main assembly.

Identify the *SUPERSET* 3DN telephone set's number, prime line number, and other lines appearances on the telephone number identification card.

Install the identification card and protective cover onto the main assembly.

Connect the line cord to the telephone jack which connects to its assigned Digital Line Card in the PABX.

Environmental   Specifications

Operating   Environment:

Ambient Temperature: 4 to 49°C (39.2 to 120°F).
Ambient Humidity: 10 to 90% RH, noncondensing.

Storage/Shipping Environment:

Ambient Temperature: -40 to 60°C (-40 to 150°F).
Ambient Humidity: 10 to 90% RH, noncondensing.

SX-200" DIGITAL

PRIVATE AUTOMATIC BRANCH EXCHANGE

SUPERSET 4™DN TELEPHONE INFORMATION

NOTICE

CONTENTS   **PAGE**

LIST OF ILLUSTRATIONS

1. INTRODUCTION

General

1.01 This Section describes the general, physical, and electrical characteristics of the *SUPERSET* 4^{TM}DN electronic telephone set when used as part of an *SX-200*® DIGITAL PABX. It also includes a brief description of major features, operation, and installation.

Reason for Issue

1.02 This Section is issued to describe the *SUPERSET* 4DN telephone.

2. GENERAL DESCRIPTION

General

2.01   The SUPERSEJ 4DN telephone is an advanced microprocessor-controlled electronic telephone set, containing digital electronic circuitry and liquid crystal displays (LCD).

2.02   The SUPERSEJ 4DN telephone can be used only with MITEL PABXs equipped with proprietary Digital Line Cards.

2.03   The SUPERSEJ 4DN telephone provides the following features:

- single key feature activation
- up to 12 line appearances
- automatic selection of primary line
- key selection of non-primary line
- handsfree and auto-answer with microphone control
- speed dial
- automatic selection of ringing line
- hold function for any call at the set
- user programming of Call Forwarding destination and Speed Dial numbers
- speaker and ringer volume control
- ringer pitch control
- digital communication with the host PABX
- visual line or trunk status indication
- 4-line by 40-character alphanumeric display
- softkey prompts signifying all valid call-handling operations at any given time.

3. PHYSICAL DESCRIPTION

3.01   The *SUPERSET* 4DN telephone dimensions are:

length 240 mm (9.45 in.)

width 155 mm (9.35 in.)

height 106 mm (4.17 in.).

3.02   Figure 3-l shows a *SUPERSET* 4DN telephone, while Figure 3-2 shows the *SUPERSET* 4DN telephone faceplate. At the left side of the set is the handset and its cradle, with the speaker grill in the faceplate between the handset depressions. At the center is a column of 13 keys; the top 12 are line appearance keys, and the red bottom key is the HOLD key. At the top is the Liquid Crystal Display (LCD) with a 4-line by 40-character display. The contrast adjustment is to the right of the LCD. Below the LCD are six softkeys and a SUPERKEY, associated with the LCD. The 12-key dialpad is located at the lower right of the faceplate; above it are four feature keys, Volume up, Volume down, Mute, and Speaker on/off. A Message LED is at the left of the dialpad.

Liquid Crystal Display

3.03   At the top of the set is a Liquid Crystal Display (LCD) containing 4 lines of 40 characters each. The top two lines contain system messages; the bottom two lines contain the current softkey definitions. At the right of the LCD is a contrast control for varying the intensity of the display.

Handset

3.04   The set handset is located in its cradle at the left side of the faceplate. It is connected by a modular line cord to the set.

Telephone Keypad

3.05 The telephone keypad has 12 keys arranged in the standard pattern. The number keys have associated letters with a slight deviation from the standard: the letter "q" appears with "p", "r" and "s" on the 7 key; "z" appears with "w", "x" and "y" on the 9 key. This allows entry of alphabetic information from the keypad.

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Figure 3-l *SUPERSET* **4DN Telephone**

LIQUID CRVSTAL
DISPLAY

CONTRAST
CONTROL

SOFTKEVS

SuperKey

SPEAKER

vol V   vol Λ   mute   speaker

on/off

HANDSET

message

MICROPHONE   LINE
APPEARANCE
KEYS

KA0462E0R0
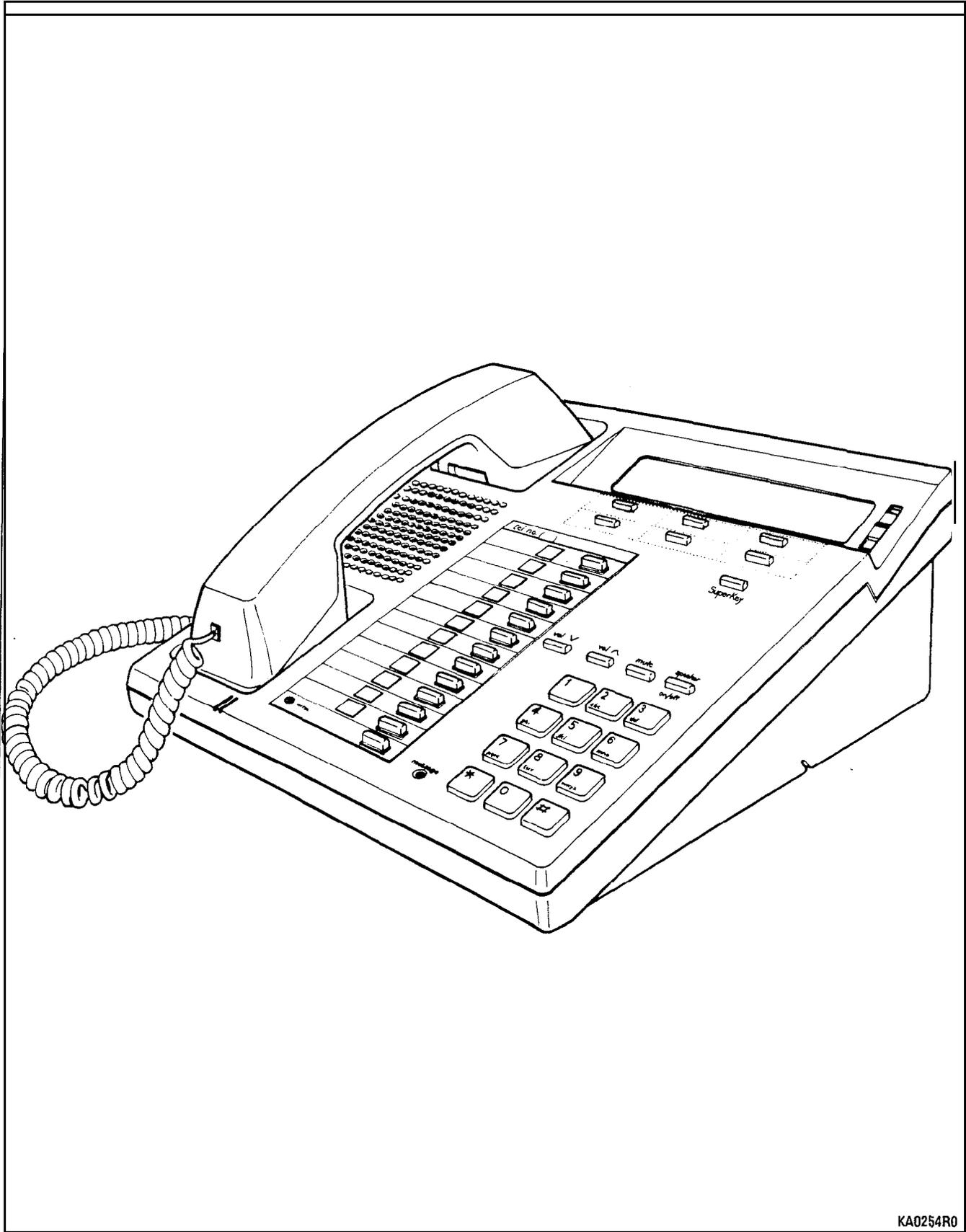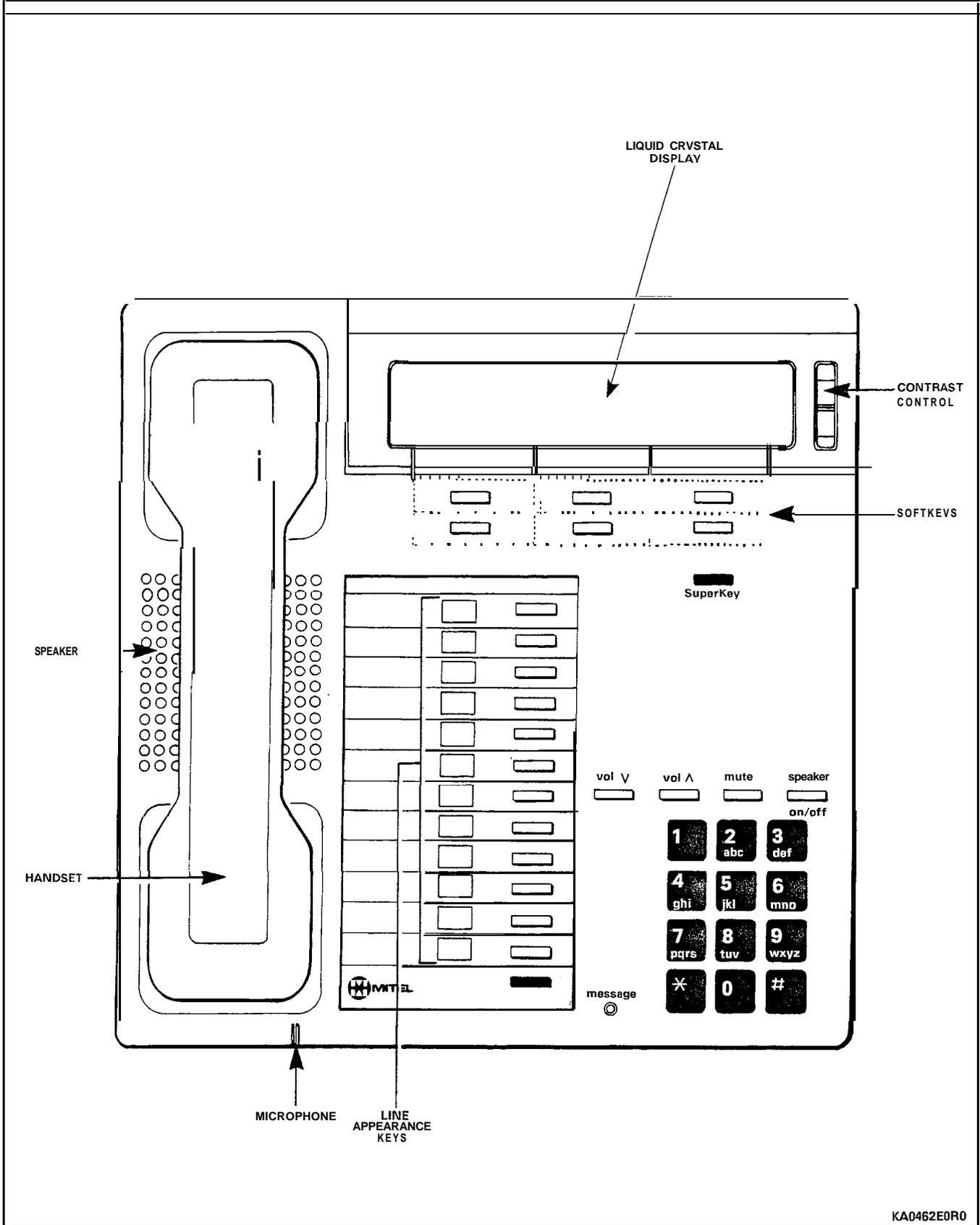
Figure 3-2 *SUPERSET* 4DN Telephone Faceplate

4. FUNCTIONAL DESCRIPTION

4.01 The *SUPERSET* 4DN telephone face layout is shown in Figure 3-2. The following describes the function of each key and display; all keys are noninterlocking.

Softkeys and SUPERKEY

4.02 Immediately below the LCD are six unlabelled keys (softkeys); their functions are defined by corresponding prompts displayed on the LCD. The softkeys are used during telephone operations to perform functions or to access features. The keys' functions vary with the activities of the set. The SUPERKEY is located just below the softkeys on the right. When the SUPERKEY is pressed, the softkeys take on new meanings associated with user programming functions.

HOLD Key

4.03 The red key on the lower left of the faceplate (at bottom of Line Appearance keys) is the Hold key which is used to place a call on hard hold.

VOLUME UP and DOWN Keys: These keys are used to set levels for: ringing volume, ringing pitch, handsfree volume, and background music volume. Each key depression changes the volume level or pitch by one step. The level for each function is stored in the PABX; changing one function setting does not affect the others. On system or set resets, the levels are restored. Default levels are applied when the set is first programmed.

When the set is ringing, these keys control the ringing volume level.

When the set is in handsfree mode, these keys control the speaker volume level.

When used with the SUPERKEY ringer pitch adjustment function, these keys control the ringer pitch.

When background music is connected, these keys control the music volume level.

SPEAKER Key

4.04 The SPEAKER key controls Handsfree operation of the set. Pressing the SPEAKER key in handset mode puts the set into Handsfree mode. The current call is now conducted via the microphone and speaker. If the handset was on-hook the set goes off-hook Handsfree. Pressing the SPEAKER key in Handsfree mode returns the set to handset mode. If the handset is on-hook the current call is terminated.

MUTE Key.

> 4.05   The MUTE key, to the right of the volume keys, is used to disable the microphone (when in Handsfree mode) so that conversation near the set is not picked up and heard by the distant party. The microphone is disabled only while the key is pressed.

Message LED

> 4.06   The Message LED flashes if the set has received a message waiting indication; the LCD shows the number of messages waiting.

> 4.07   When the *SUPERSET* 4DN telephone reaches a busy or unanswered party capable of receiving a message, the MESSAGE LED lights. Pressing the MESSAGE Key sends a message to the called set. The LED goes out and the call is terminated.

Line Appearance Keys

> **4.08**   On the left side of the set are twelve line appearance keys, each with an associated LCD indicator. These keys may be programmed as Speed Dial numbers, to access specific lines, or to access specific   features.

> 4.09   The LCD indicator beside each line appearance key defines the status of each line appearance as shown in Figure 4-1.

Feature Access Keys

> **4.10**   During CDE, the installer can program the set's line appearance keys as feature access keys, eliminating the need for the user to dial feature access codes. For CDE purposes the keys are numbered 1 to 12 from bottom to top. These keys cannot be programmed from the set.

> **4.11**   When a programmed feature which provides status indication is activated, its LCD indicator shows a solid square; otherwise, the LCD indicator is clear. This indicates the on/off status of the feature, not the validity of using the feature.

> **4.12**   If the Attendant activates on a set a feature available on one of its feature access keys, the corresponding LCD indicator darkens.

> **4.13**   Dialing the access code of a feature available on a feature key toggles that feature and its corresponding LCD indicator.

> **4.14**   Some CDE-programmable feature keys are not valid on the *SUPERSET* 4DN telephone; these features are provided via the SUPERKEY. If an invalid feature key is programmed, it will not work. The DISPLAY KEYS function operated on the key will show "INVALID FEATURE KEY FOR THIS TELEPHONE".

SYMBOL	DESCRIPTION	MEANING
c l	NO SYMBOL IN DISPLAY	LINE IDLE
	DISPLAY ALTERNATES BETWEEN THESE TWO SYMBOLS	INCOMING CALL
	DISPLAV SOLID SQUARE	LINE BUSY AT THIS SET
	DISPLAY SOLID CIRCLE	LINE BUSY AT ANOTHER SET
	DISPLAY ALTERNATES BETWEEN SOLID AND CLEAR	CALL ON HOLD AT THIS SET
	DISPLAY CIRCLE FLASHES ON AND OFF	CALL ON HOLD AT ANOTHER SET
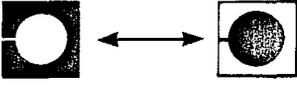
5634E1R1

Figure 4-1 Line Status Display Symbols

4.15   The CDE-programmable feature keys which are valid for the
SUPERSET 4DN telephone include:

Auto Answer - the set rings once and then automatically answers the
call by switching into handsfree mode.

Call/Attn - used to originate a data call (connects the user to the
DTRX). Refer to Section MITL9109-095-105-NA, Features Description
for more information.

Data Disc - used to terminate the call. Refer to Section
MITL9109-095-105-NA, Features Description for more information.

Do Not Disturb - incoming calls receive busy tone and the set does
not ring; outgoing calls and other features operate normally.

5. TELEPHONE OPERATION

General

5.01 This Part describes basic telephone call handling with the *SUPERSET* 4DN telephone. Part 6 describes the features available at the set.

Originating Calls

5.02 To originate a call:

- Pick up the handset, or press the SPEAKER key for Handsfree operation. This step can be omitted if Immediate Line Selection is enabled. The set selects the prime line. If the prime line is busy, the set selects the first available outgoing line, starting from the lowest line appearance key. If no line is available, the set remains silent.

- If other than the set's prime line is desired, press the appropriate Line Appearance key.

- Dial the number or press the appropriate Speed Dial key, if programmed.

Answering Calls

5.03. To answer a call:

- Lift the handset or press the SPEAKER key. The set automatically selects the ringing line. If more than one line is ringing, the set selects the lowest ringing line appearance.

    or.

- Press the Line Appearance key to be answered. The call is answered Handsfree. If desired, lift and use the handset.

5.04 The first line of the display gives the extension number and user name of the calling party. If the call is being forwarded from the calling party, the extension number and user name of the forwarding party is given on the second line of the display.

Terminating A Call

5.05 To terminate a call:

- Hang up. If in Handsfree mode, press the SPEAKER key. If there is a call on consultation hold; the call will ring the set.

    or,

● Press the New Call softkey. If the set is in handsfree mode, it returns to the idle state; if the handset is in use, the set returns dial tone. If the set has a call on consultation hold, this call is reconnected.

5.06 When one party hangs up, the remaining party returns to the idle state if in handsfree mode; if off-hook, the party returns to silence or dial tone, (according to system options).

Call Transfer/Conferencing

5.07 To Transfer a call:

● Press the TRANS/CONF softkey. This places the current call on soft hold and returns transfer dial tone to the user. Dial another call.

● Hang up. This can be done before or after the called party answers. If the called party is busy, the held party camps on.

● To abandon the transfer/conference and return to the held party, press the BACK TO HELD softkey.

● To abandon the call without returning to the held party (to try another number), press the NEW CALL softkey.

5.08 To set up a conference:

● Press the TRANS/CONF softkey. This places the current call on soft hold and returns transfer dial tone to the user. Dial another call.

● Press the CONF softkey after the called party answers. This connects the three parties together.

5.09 If a user hangs up with a party on soft hold, and there is no call to a third party (ringing, busy, or answered), then the user is rung back and reconnected to the party on hold.

Ringer Pitch Adjustment

5.10 Ringer Pitch Adjustment is one of the *SUPERSET* 4DN telephone's built-in functions. Perform the adjustment as follows:

● Press the SUPERKEY.

● Press the More... softkey.

● Press the Ring Adjust softkey.

● Press the Ririger Pitch softkey.

● The set will start ringing

- Adjust the ringer pitch. The Volume UP key increases the pitch; the Volume DOWN key decreases the pitch.

- Press the SUPERKEY. This saves the pitch setting, stops the ringer and returns the set to its normal state.

6. DATA CARTRIDGE OPERATION

General

6.01 This is only a brief description of data call operations possible with the *SUPERSET* 4DN telephone data cartridge and feature keys. For more information on data calls, refer to Section MITL9109-095-105-NA.

To originate a data transceiver (DTRX) call from the SUPERSEJ 4DN telephone:

● Press the CALL/ATTN key.

● Enter the number of the destination from the data terminal keyboard.

The LCD beside the CALL/ATTN key provides call status indication as follows:

blank ▪ no connection
circle ▪ DTR (device is ready but not connected)
circle and flashing square ▪ connected to DTRX or queued
solid ▪ connected to called destination.

To disconnect a DTRX call from the set:

● Press the DATA DISC key.

7. LINE APPEARANCES

General

7.01 A line is said to "appear" at a *SUPERSET* 4DN telephone if the line has been assigned to one of the line appearance keys and can be selected or accessed by the set user. A line can be programmed to appear at one set, at more than one set, or more than once at a particular set. Although a line can appear more than once throughout the system, it is always identified by its unique directory number.

7.02 The appearances of a line do not have to be identical ▪ the line type and its variants can both differ; for example, a line can appear as a prime line at one set and as a key line (with delayed ring) at another set.

7.03 Although a *SUPERSET* 4DN telephone can access up to 12 lines, it requires only one pair of wires to connect the set to its equipment number position. The *SUPERSET* 4DN telephone sends signals to the system which makes the appropriate line connection.

8. **PACKAGING**

General

8.01 The SUPERSEJ 4DN telephone is shipped in a single carton.

8.02 On delivery at the destination, carefully unpack the SUPERSEJ 4DN telephone carton and check that all items are present and undamaged.' Retain some packaging for reshipment of any damaged items.

8.03 The SUPERSEJ 4DN telephone consists of a main assembly, handset, and handset cord. Additional items include identification cards (for telephone numbers and lines), protective covers for these cards, reference guide, installation guide, and warranty tag.

9. INSTALLATION AND MAINTENANCE

WARNING

ANY CONNECTION OF THIS SET TO AN OFF PREMISE APPLICATION, AN OUT OF PLANT APPLICATION, OR TO ANY OTHER EXPOSED PLANT APPLICATION MAY RESULT IN A SAFETY HAZARD, AND/OR DEFECTIVE OPERATION, AND/OR EQUIPMENT DAMAGE.

9.01   Installers should not attempt to use a hand test telephone (butt in) to check *SUPERSET* 4DN telephone lines, because there **is** no loop detector installed in the PABX Digital Line Card: set on-/off-hook status is signaled using data transmission. *SUPERSET* 4DN telephones must not be connected to standard lines, in parallel, or as Power Fail Transfer extensions.

Installation

9.02   Installation of a *SUPERSET* 4DN telephone is simplified because of the following:

- Handset and line cords are modular-connector-ended.

- No local power supply is required; the system provides power through the line.

- Only nonessential user programming is performed at the set; speed dial entry, call forward destination, name, and timed reminder.

- Installer can use set display feature to identify lines programmed to appear at the set.

- Initialization of the *SUPERSET* 4DN telephone occurs automatically when the set is connected to the system and programmed. It takes 20-30 seconds; during part of the initialization procedure, WAITING FOR COMMUNICATION is displayed. Upon completion, time and date are displayed.

9.03   Install a *SUPERSET* 4DN telephone as follows:

- Before a *SUPERSET* 4DN telephone can be connected to a PABX system, the PABX must be programmed and equipped with a Digital Line Card to interface with it.

- Connect the handset cord to the handset and the main assembly.

- Install the card and protective lens onto the main assembly.

- Identify the user's telephone number, extension number, and other line appearances at the *SUPERSET* 4DN telephone on the line identification card.

● install the line identification card and protective cover onto the main assembly.

● Connect the line cord to the telephone jack (which has been connected to the Digital Line Card within the PABX).

Environmental Specifications

Operating Environment:

Ambient Temperature: 4 to 49°C (39.2 to 120°F).
Ambient Humidity: 10 to 90% RH, noncondensing.

Storage/Shipping Environment:

Ambient Temperature: -40 to 60°C (-40 to 150°F).
Ambient Humidity: 10 to 90% RH, noncondensing.

SX-200" DIGITAL

PRIVATE AUTOMATIC BRANCH EXCHANGE (PABX)

CIRCUIT CARD DESCRIPTIONS

NOTICE

<div style="text-align:center">**CONTENTS**   **PAGE**</div>

CONTENTS   (CONT'D)   PAGE

CONTENTS   (CONT'D)   **PAGE**

LIST OF TABLES

TABLE   **TITLE**   **PAGE**

LIST OF ILLUSTRATIONS

FIGURE   **TITLE**   **PAGE**

1. INTRODUCTION

General

1.01 This Section describes the digital cards in the *SX-200*® DIGITAL PABX. Figure 1-1 shows the front faces of some of these digital cards.

Reason for Issue

1.02 This Section is issued to provide a general description of the digital circuit cards in the SX-200 DIGITAL PABX.
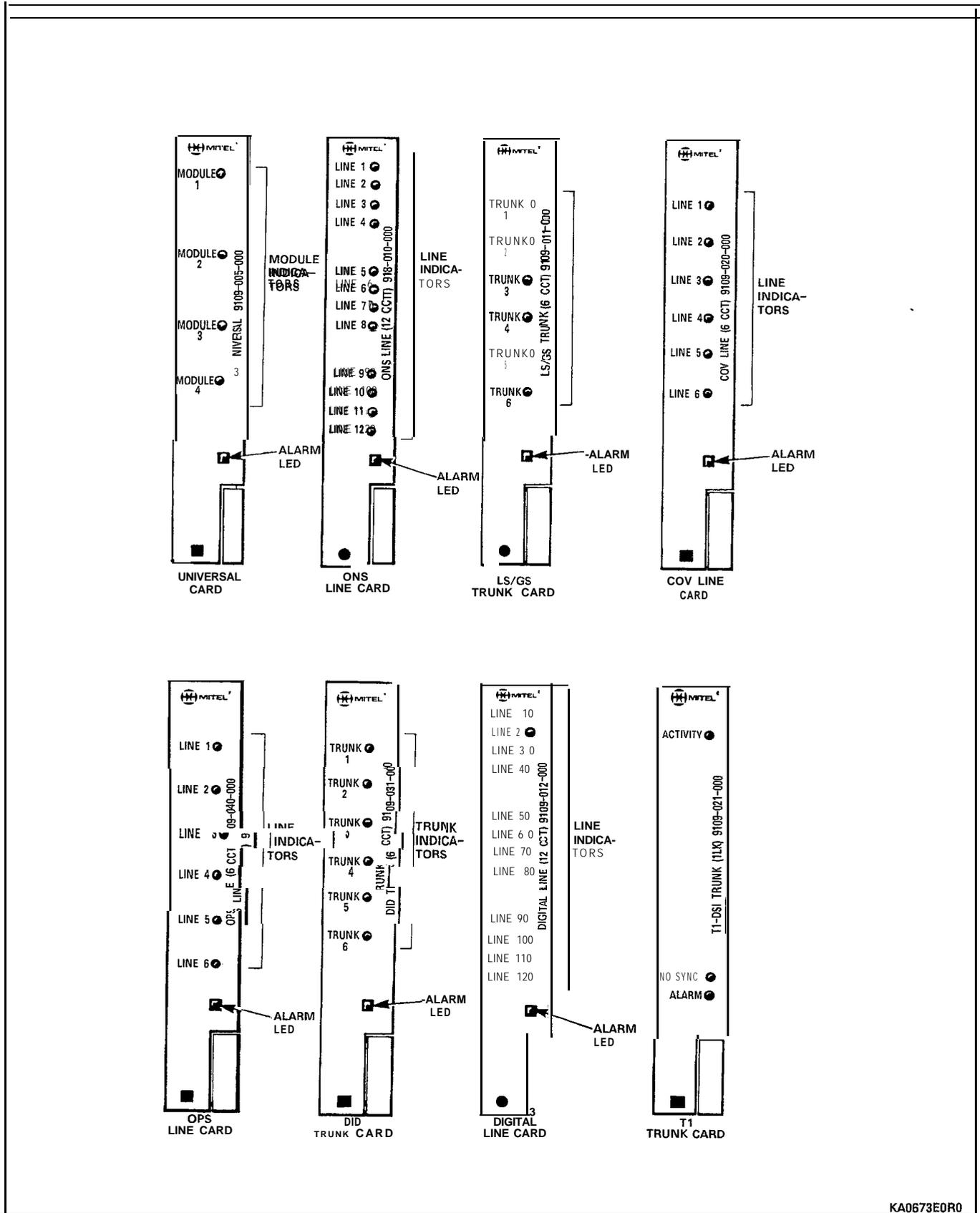
Figure I-I Digital Card Faces

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2. MAIN CONTROL CARD

Description

2.01 The Main Control card performs all call processing for the entire system, and peripheral control operations for Bays 1 **and** 2. It maintains overall control through communication with the Bay Control card or Peripheral Control Card in each bay.

Facilities

2.02 Facilities on the Main Control Card are:

- HDLC link for high speed message communication and bulk data transfers to peripheral processors or Bay Control cards and Digital line cards

- Two RS-232 communication ports (one printer port, one maintenance port)

- Floppy Disk Control including data separation and write precompensation

- DMA controller for dynamic RAM refresh, data transfer to floppy disk and HDLC communication system

- Real Time Clock for time of day and interrupt generation, with 3-day non-volatile backup

- System PCM Clock Generation

- Memory: Dynamic RAM (on RAM Module) with parity detection, 3-day non-volatile CMOS RAM, EPROM

- Digital signal processor to generate and detect progress and ringing tones and to provide conferencing

- RAM Module for program storage and process work areas

- DX Module (digital time/space crosspoint switch) for circuit and message switching

- Decryption Module to enable use of protected software

- Fault detection hardware to monitor PCM clock and processor sanity (watchdog)

- System Reset switch (front panel).

Operation

2.03   The Main Control Card (MCC) must not be inserted or removed with the power on. Damage to onboard circuits may result.

2.04 The correct Decryption Module must be installed, or the disk software will not run.

2.05   At power-up the Main Control Card is held reset for about 1 second after the power supply voltages reach their normal levels. After reset, the processor first runs the software contained in its EPROM. This consists of tests for the RAM memory, the CPU and the DMA controller. A routine to load the system software into RAM from disk is run only after all preliminary tests have been passed.

2.06   The Main Control Card may also be reset via the pushbutton switch behind the front panel of the card near the top. Reset invokes Power Fail Transfer, which remains in effect until the system software has been loaded from disk.

2.07   Parts 3, 4 and 5 describe the modules that plug into the MCC.

STATUS

ACTIVE

MINOR
ALARM

MAJOR
ALARM

CRITICAL
ALARM

MAIN CONTROL

★
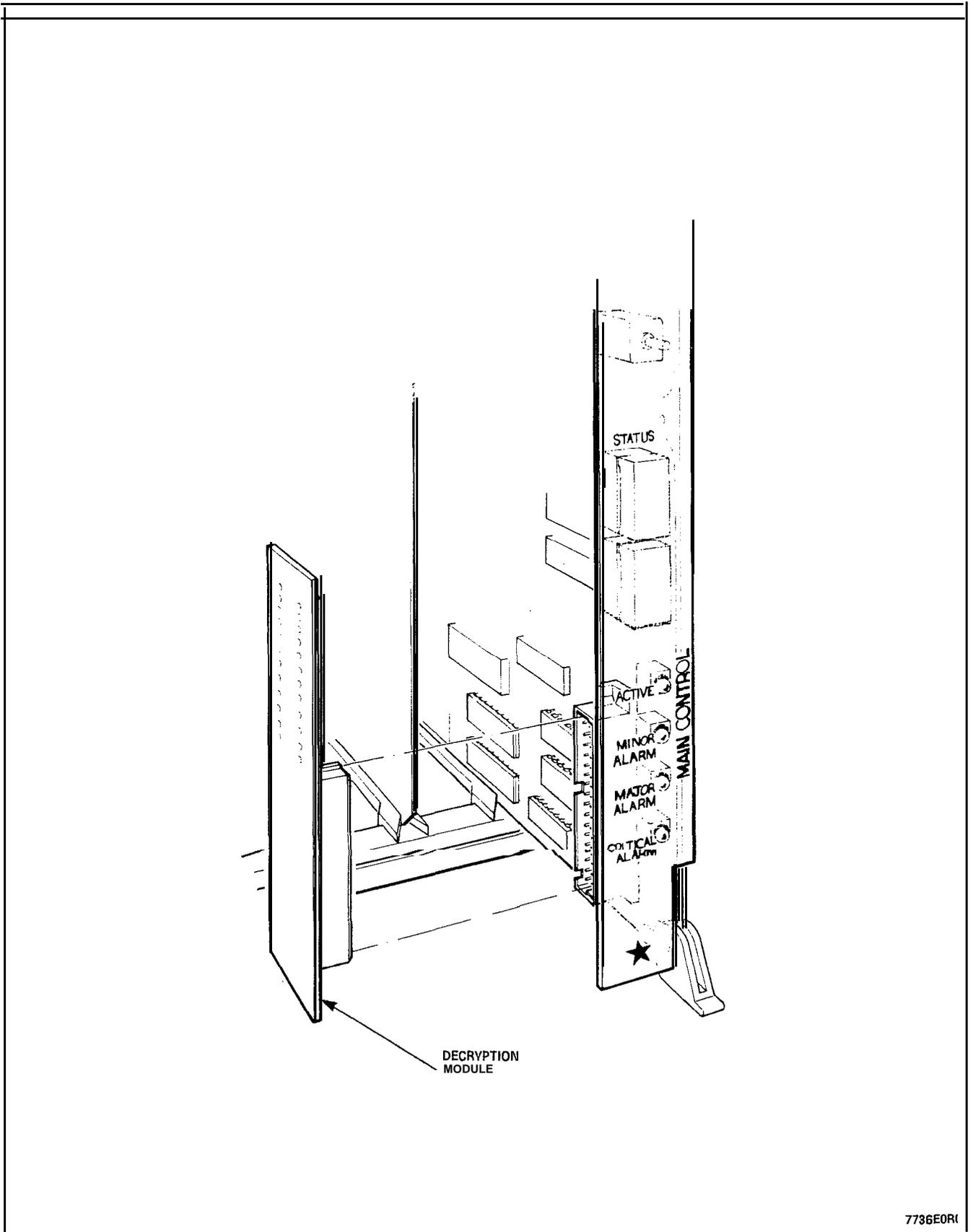
DECRYPTION
MODULE

7736E0R(

Figure 2-1 Main Control Card and Decryption Module

3. DECRYPTION MODULE

Brief Description

3.01 The Decryption Module plugs into the lower front corner of the Main Control Card. The Decryption Module must be present during power-up and system operation. Figure 2-1 shows the location of the Decryption Module on the Main Control Card. There are 3 Decryption Modules for Generic 1003, as follows:

- FK3 – Basic System
- FK4 – ACD
- FK5 – ACD + Reports

Operation

3.02 The Decryption Module is written to and read from constantly by the system software. If there is a mismatch between the module and the software, the software will not run.

4. RAM MODULE

Brief Description

4.01 The RAM Module carries the dynamic memory required for program storage and call processing work areas. It plugs into a 96-pin DIN connector on the lower part of the Main Control **Card.** Mechanical support is provided by standoffs. The board measures 25.9 mm x 14.5 mm high (10.6 in. x 5.7 in.).

4.02 Parity is checked on all read and refresh cycles by circuitry on the Main Control Card. If the parity logic detects an error, it logs it in CMOS RAM and invokes a system reset via software.

5. DX MODULE

Brief Description

5.01 The DX Module plugs into the upper back corner of the Main Control Card, using the two 96-pin DIN connectors.

Facilities

5.02 Facilities on the DX Module include:

- Main DX Matrix

- Peripheral DX Matrix

- Dial Tone filter

- Bay 1 and 2 access logic.

Electrical Description

5.03 The Main DX Matrix consists of four Mitel 8980 DX chips arranged in a non-blocking 16 x 16 links. The matrix is capable of connecting any one of the 32 channels on any one of the 16 incoming 2.048 MHz links to any one of the 32 channels on any of the 16 outgoing links.

5.04 The Peripheral DX Array consists of three Mitel 8980 DX chips. It forms 8 x 24 concentrating/expanding links between the Main DX matrix and the 14 peripheral cards. Eighteen links go to and from the combo backplane.

5.05 The Ringing Generator receives PCM data for the ringing signal from a 7720 Signal Processor on the Main Control Card. It is converted to an analog signal by a Mitel 8960 Codec. This signal is filtered to remove fast rise time transients and passed through the backplane connector to the ringing power amplifier in the power supply.

5.06 The Dial Tone Filter consists of a codec and an analog filter circuit. The PCM dial tone is converted to an analog signal, filtered, and reconverted to PCM.

6. T1 CLOCK MODULE

Brief   Description

6.01   The T1 Clock Module is a digitally controlled oscillator which synchronizes the system clock to an incoming T1 frame rate clock signal.The T1 Clock Module plugs into the SX-200 DIGITAL Main Control Card.

Electrical   Description

6.02   Every 100 ms the T1 Trunk card sends a counter value representing the phase difference between the incoming T1 clock and the SX-200 DIGITAL system clock. On the T1 Clock Module a Digital to Analogue converter generates a corresponding voltage to control the clock oscillator. This forms a phase-locked loop which keeps the clocks in phase.

Physical   Description

6.03   The card measures approximately 8 cm x 11 cm (3.2" x 4.3"). It connects to the Main Control Card via a 30-pin connector.

7. BAY CONTROL CARD

General

7.01 The Bay Control Card is required in the lower rightmost slot of all digital bays, except Bays 1 and 2. On 672-port systems, a Bay Control card is required in every bay. This card must NOT **be** inserted or removed with the power on. The card measures 158 mm x 368 mm (6.2 in. x 14.5 in.).

Functions

7.02 The Bay Control card provides:

- Control of operations within the Bay

- Monitoring of lines, trunks and other circuits within the bay; reports are sent to the Main Control Card via HDLC message links

- Ringing signal conversion. (The waveform comes from the Main Control Card as a PCM signal).

indicators

7.03 The Bay Control Card has Alarm LED Tx (transmit) and Rx (receive) indicators for HDLC message link.

Electrical Description

7.04 Electrical connection between the Bay Control and the circuit cards is through the peripheral backplane. Connection to the Main Control Card is via PCM cables. The PCM cable connector is on the rear of the backplane, behind the Bay Control location. There is room for two more cables for future applications.

7.05 There are two pairs of switches on the card. See Figure 7-1. All four switches must be closed for normal operation.
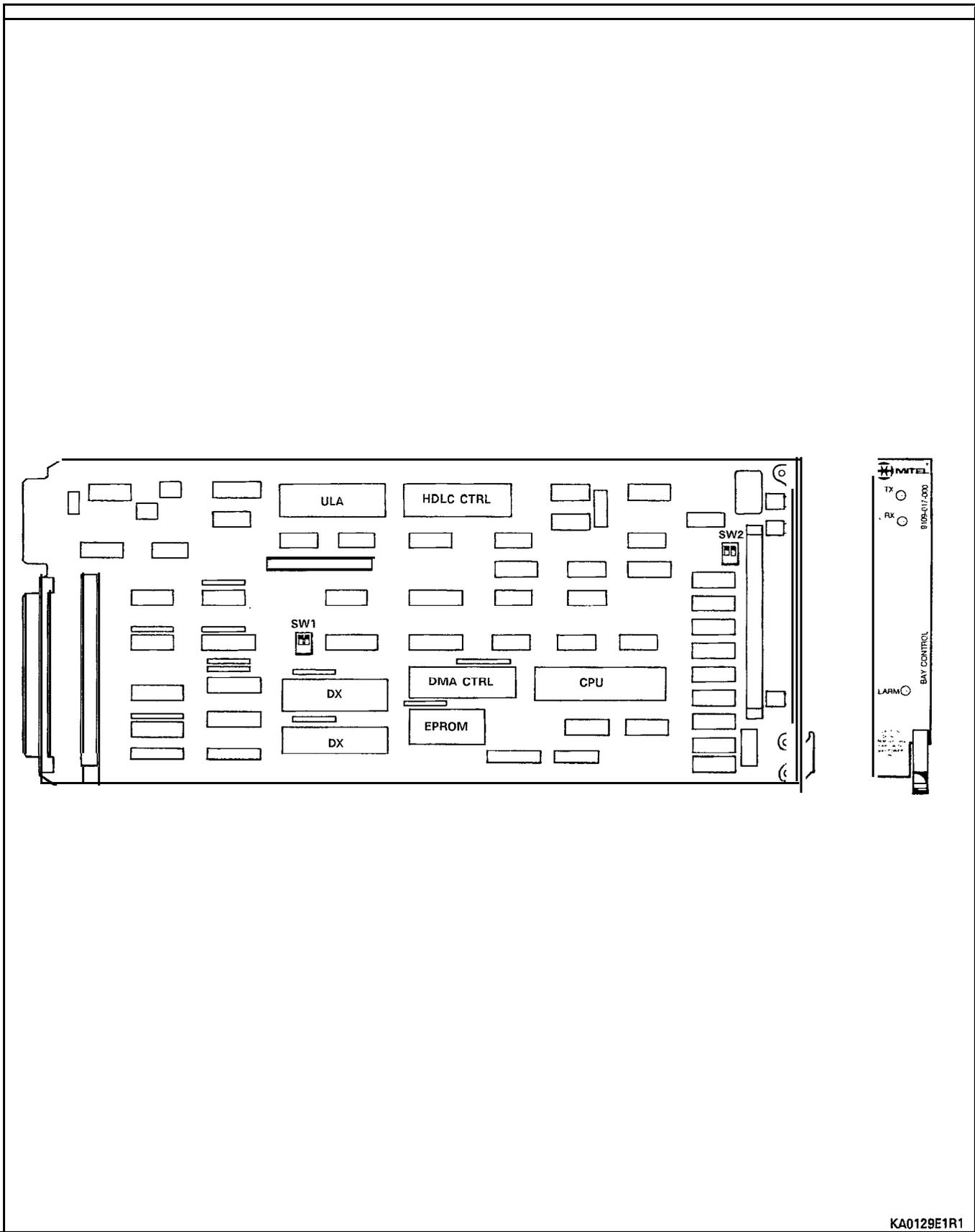
Figure 7-I Bay Control Card

8. PERIPHERAL CONTROL CARD

Brief Description

8.01 The Peripheral Control card is located in slot 20 of an analog peripheral shelf. It controls the analog cards on instructions from the Main Control Card. Figure 8-l shows the front faces of the Peripheral Control Card, the Scanner and Digital Interface cards and the Main Control Card.

Major Components

8.02 Major components provided by the Peripheral Control Card include:

- 6809 microprocessor running at 1.33 MHz

- Memory: 8K EPROM, 32K RAM

- Peripheral Clock Oscillator.

Facilities

8.03 Facilities for the Peripheral Control Card include:

- Peripheral I/O Timing Generator for the bays it controls

- Peripheral Address Decoder

- FIRQ Interrupt Timer/Generator

- Power Fail Monitor: a local bay reset is generated if any power rail drops below 95%. of its nominal level.

- Status Flag Buffer.
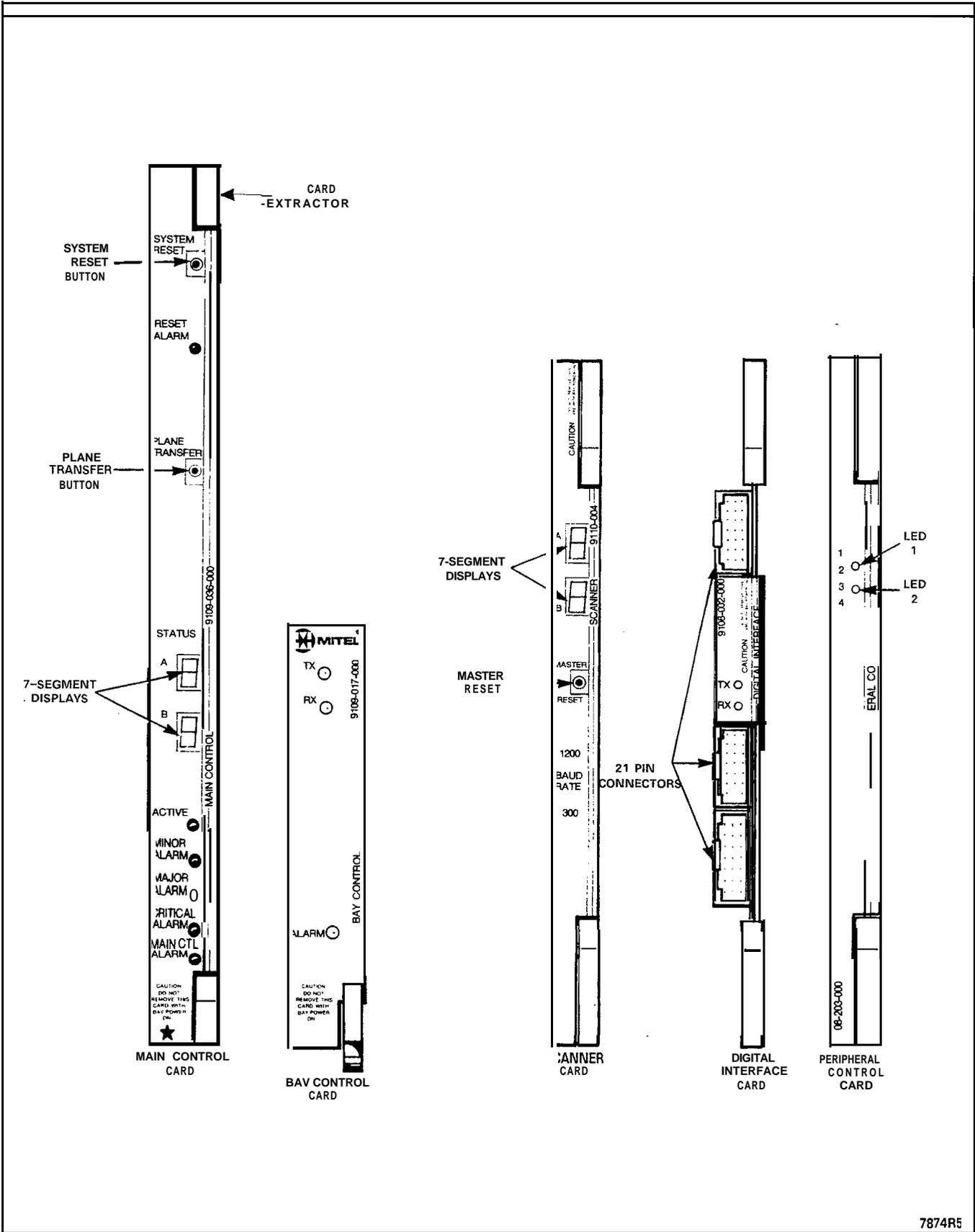
Figure 8-l Main Control Card and Interface Cards for Analog Shelf

9. DIGITAL INTERFACE CARD

Brief Description

9.01   The Digital Interface card is installed in slot 18 of an analog peripheral shelf. It interfaces the analog shelf to the Main Control card. The card is illustrated in Figure 9-l.

Facilities

9.02   Facilities for the Digital Interface card include:

- analog/digital and digital/analog conversions between the analog junctors and the Master Control card via the PCM cable.

- enables dial pulse detection by the Peripheral Control card. Dial pulses cannot be encoded in PCM.

- provides a message channel between the Main Control card and the Peripheral Control card via the PCM cable.

Connections

9.03   The Digital Interface card is installed in slot 18 of an analog peripheral shelf. It must not be inserted or removed from the system with the power on. The card front panel contains three 21-pin male DIN connectors and two LEDs. A PCM cable from the Main Control is plugged into J2.

9.04   A 2-shelf peripheral cabinet may have a Digital Interface card installed in both the top and bottom shelves. In this case, the cable from the Main Control card plugs into J2 of the lower DIC. An intershelf jumper cable connects J1 of the lower DIC to J3 of the upper shelf DIC. The upper shelf card performs only the analog/digital interface and dial pulse detection functions. When connected this way, the cards automatically identify their location to the main processor.
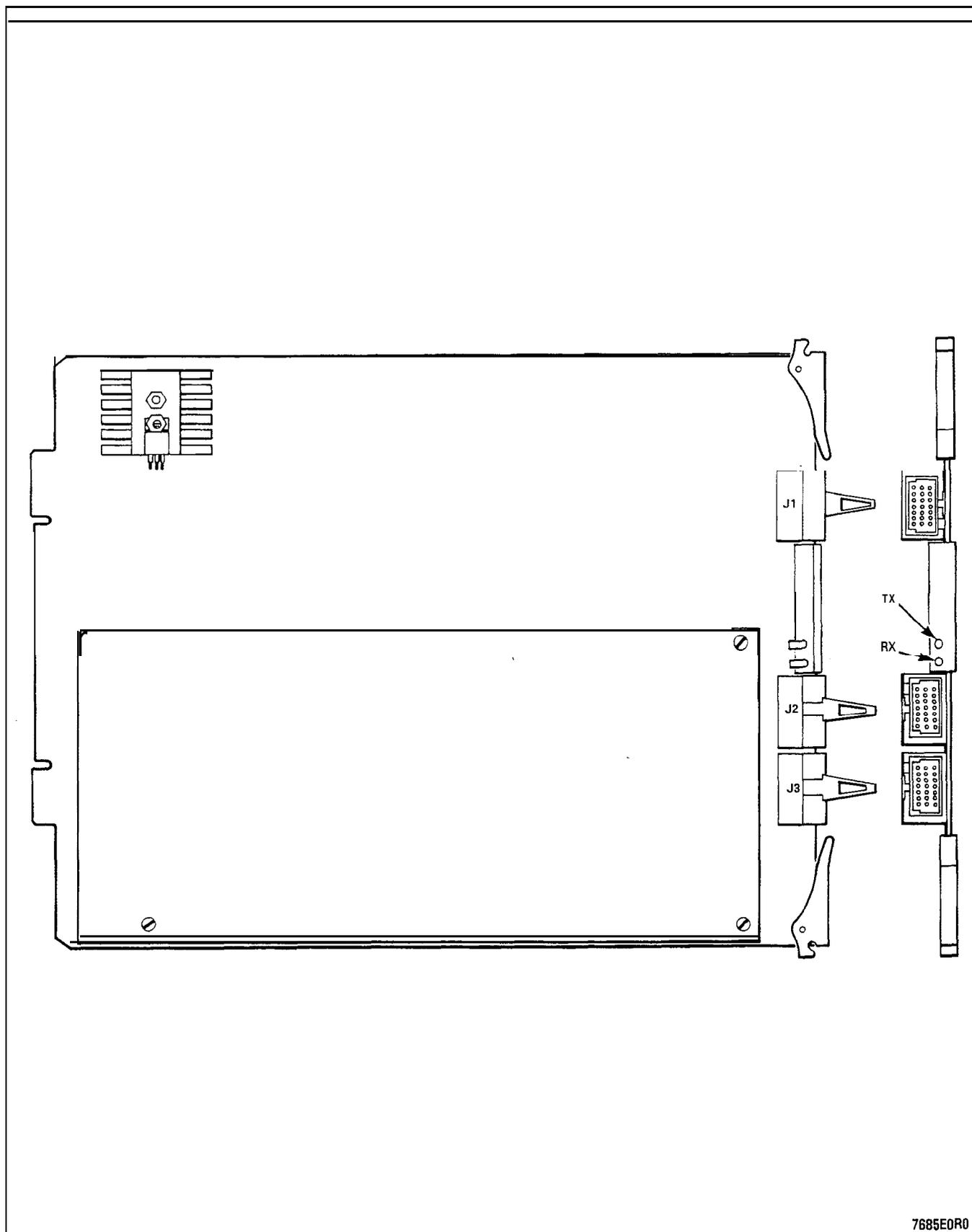
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Figure 9-I Digital Interface Card

10. UNIVERSAL CARD

Brief Description

10.01 The Universal card interfaces up to four modules to the backplane in any of the digital peripheral bays. The card and three of the available modules are illustrated in Figure IO-I. Parts 15 through 18 describe the available modules.

Facilities

10.02 Facilities provided by the Universal Card include:

- module mounting positions (four)

- module activity LEDs (four)

- software-controlled failure alarm LED.

Physical Description

10.03 Each module has two vertical 32-pin female DIN connectors which mate to male connectors on the Universal card. Mechanical connection to the Universal card is assisted by a standoff.

10.04 Up to four modules may be mounted on a Universal Card, subject to electrical power limitations. See the Electrical Description paragraph.

10.05 Module size is 145 mm x 83 mm (5.7 in. x 3.25 in.).

Electrical Description

10.06 The combination of modules on a Universal card is limited by the power available from the card. Each module has a power rating number. The total of these numbers must not exceed 10. The Universal card can be mounted only in a high power (upper) card slot of a digital bay.

10.07 The Module power ratings are as follows:

Module Type	Power Rating
Empty module position	0
DTMF REC/Relay	2
Music on Hold/Paging	1
Console Interface Module	5
E&M Trunk	3

10.08 Each of the four module positions are assigned Universal card tip and ring connections as shown below.

Module Position	Module Tip/Ring		
	T1/R1		T2/R2 T3/R3
1	T1/R1	T2/R2	T3/R3
2	T4/R4	T5/R5	T6/R6
3	T7/R7	T8/R8	T9/R9
4	T10/R10	T11/R11	T12/R12

MUSIC ON
HOLD/PAGER
MODULE

RECEIVER/RELAY
MODULE

CONSOLE
MODULE

E&M TRUNK

-SWITCH

UNIVERSAL CARD

MODULE
4

MODULE
3

MODULE
2

MODULE
1

LED's

MODULE 1

MODULE 2

MODULE 3

MODULE 4

ALARM
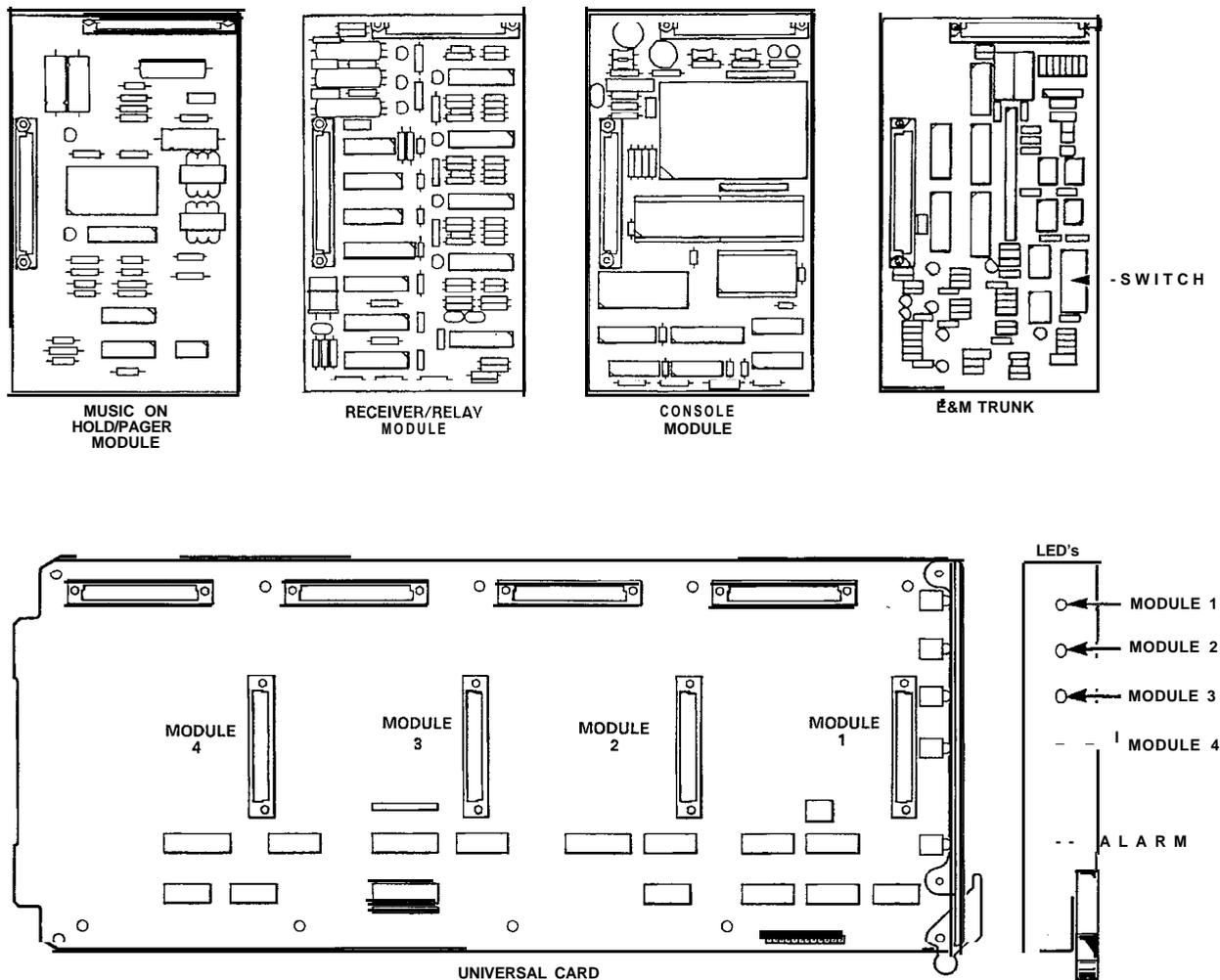
KA0021 EORO

Figure 10-I Universal Card and Modules

11. CONSOLE MODULE

Brief Description

11.01 The Console Module plugs into the Universal Card and provides the interface between the console and the main and bay processors.

Electrical Description

11.02 There are four channels of data to the console, multiplexed into a 256 kb/s PCM line. One channel is for voice data and one is for communication of operations information between the console, processor and the bay processor via the console module processor. The remaining two channels are reserved for future use.

11.03 The Console Interface Module feeds -48 Vdc to the console. Current is limited to about 120 mA.

11.04 The Console Interface Module has a power rating of 5.

12. DTMF RECEIVER/RELAY MODULE

Brief Description

12.01 The DTMF Receiver/Relay Module facilitates the reception and decoding of DTMF dialing.

Main Components

12.02 Major components of the DTMF Receiver/Relay Module are:

- Mitel filter/codec (four)
- Mitel 8870 DTMF receiver (four)
- Parallel bus interface
- Guard time circuit (four)
- General Purpose relays (two).

Facilities

12.03 Facilities provided by the DTMF Receiver/Relay Module include:

- Early line split
- Guard time circuit
- Presents digits on parallel bus with Data Valid signal
- Two general purpose relays.

Circuit Description

12.04 There are four receivers on the DTMF module. Each receiver takes its input from the incoming serial PCM audio stream and repeats this data to the outgoing serial PCM stream approximately 125 μsec later. A filter/codec converts the data to analog audio which is monitored by a DTMF Receiver chip. When DTMF tones are detected, the loopback of the data to the PCM output stream is disabled. (Early Line Split). The DTMF Receiver/Relay Module has a power rating of 2.

12.05 Two relays are on the module; each is software controlled to provide a contact closure across one tip-ring pair.

TABLE 12-1
DTMF CODES

DTMF DIGIT	Data Output DS3 DS2 D1 DO
1	**1 1 1 0**
2	1 1 0 1
3	1 0 0
4	1 0 1 1
5	1 0 1 0
6	1 0 0 1
7	1 0 0 0
8	0 1 1 1
9	0 1 1 0
0	0 1 0 1
✶	0 1 0 0
#	0 0 1 1

Relays

12.06 There are two general purpose relays. When each relay closes, it connects a tip and ring pair as follows:

Relay	Connection
RLY1	T2 to R2
RLY2	T3 to R3

The relay contacts are rated as follows:

maximum switching voltage: 90 V
maximum carrying current: 0.5 A

Note: This relay contact may be connected only to a secondary circuit that has no direct connection to a primary circuit, and receives its power from a transformer, converter, or equivalent isolation device situated within the equipment.

13. E&M TRUNK MODULE

Brief Description

13.01 The E&M Trunk Module plugs into the Universal Card. It provides interface to Type 1 or Type 5 E&M trunks.

13.02 The module has a power rating of 3. Because of this, a maximum of three of these modules can be used per Universal Card.

Facilities

13.03 Facilities provided by the E&M Trunk Module include:

- Type 1 or Type 5 signaling
- selectable gain/loss plan for normal or satellite working trunks
- selectable 600 ohm or AT&T Complex Balance Network (350 ohms + 1000 ohms in parallel with 0.21 μF)
- selectable 2- or 4-wire transmission
- on board filter/codec for analog/digital and digital/analog conversions (μlaw).

Operation

13.04 The E&M Trunk Module is set for the type of trunk in use by a set of eight DIL switches. The settings are as follows:

Function	Switches 1 2 3 4 5 6 7 8
PABX to Line Gain 3 dB -13 dB	o x x x x x x x 1 x x x x x x x
Line to PABX Gain -4 dB -11 dB	x o x x x x x x x l x x x x x x
Balance 600 ohm Complex	x x 1 0 x x x x x x 0 1 x x x x
Transmission 2-wire 4-wire	x x x x o x x x x x x x o x x x
Signaling Type 1 Type 5	x x x x x l x x x x x x x o x x

0= open, 1= closed, x= not applicable
Default setting for North America is 00101100.

Trunk Types

13.05 The E&M trunk module applies signals to the M lead and monitors the E lead. In the on-hook condition, the Type 1 interface grounds the M lead; an open presented to the E lead indicates idle, a grounded E lead indicates an incoming call. In the off-hook condition, the Type 1 interface applies -48 volts to the M lead; a ground sent to the E lead indicates an incoming seizure.

Note: As of the date of issue of this Practice, Type 5 E&M signaling is not approved for connection to the public network or for use as an On-Premise Tie Trunk between systems.

14. MUSIC ON HOLD/PAGING MODULE

Brief Description

14.01 The Music on Hold/Paging module provides an input for music on hold, a paging output and a relay to switch an external paging amplifier. The module plugs into the Universal card. The Music on Hold/Paging module has a power rating of 1.

Major Components

14.02 Major components of the Music on Hold/Paging Module include:

- audio filter/amplitude limiter

- Mitel 8961 filter/codec

- paging driver amplifier

- paging control relay.

Electrical Description

14.03 The music input is isolated by a transformer and has an impedance of 600 ohms. The signal should be between 50 and 500 mVrms. High frequencies are attenuated and amplitude limiting is applied as required by FCC rules part 68. Amplitude limiting is applied when the signal exceeds approximately 390 mV rms.

14.04 The paging output is isolated by a transformer and has an impedance of less than 200 ohms. The output level into a 600 ohm load is typically -6 dBm (388 mV rms).

14.05 The control relay contacts are rated as follows:

maximum switching voltage 90 Vrms
maximum carrying current 0.4 Arms

Note: This relay contact may be connected only to a secondary circuit that has no direct connection to a primary circuit, and receives its power from a transformer, converter, or equivalent isolation device situated within the equipment.

15. DID TRUNK CARD

Brief   Description

15.01 The DID trunk card contains six l-way Direct Inward Dial cir-
cuits. It plugs into the digital peripheral bay. One-Way Direct
inward Dialing (DID) provides for direct access to PABX subscriber
lines from the public telephone network.

15.02 DID trunk cards can be used in any digital peripheral bay high
power (upper) slot. The maximum number of these cards is four
per bay. This provides a maximum of 24 ports per peripheral bay.

15.03 The card is 157.5 mm (6.2 in.) high and 366.4 mm (14.4 in.) long.

Major Components

15.04 Major components in the DID Trunk Card are:

- Mitel 8962 Filter/Codec (one per trunk circuit)

- Feed Reversal relay (one per trunk circuit) Alarm LED.

Facilities

15.05 The facilities provided by each trunk circuit are:

- Trunk activity LED

- Line   protection

- 2-wire / 4-wire conversion (external to internal)

- Analog-to-Digital / Digital-to-Analog conversion (μlaw)

- Immediate, Delay Dial or Wink Start supervision

- Direct Inward Dialing access to PABX subscriber lines

- Conformity with the EIA loss level plan for μlaw-compatible
PABXs in North America.

Operation

15.06 A trunk is idle if the resistance across Tip and Ring is 4000
ohms or more. In idle condition the PABX provides forward
battery feed to the line. The Tip is grounded and the Ring is at -48
Volts.

15.07 The CO initiates a call to the PABX by terminating Tip and Ring.
The supervision circuitry. detects the flow of loop current and
alerts the system software. The PABX signals it is ready to receive
dialing by briefly applying a battery reversal to the line. Ring is

grounded and Tip is at -48 Volts. There are two types of controlled address signaling: Delay Dial and Wink Start.

15.08 A Delay Dial signal must start no later than 150 ms after trunk seizure. It is held until the PABX is ready to receive dialing. The minimum hold time is 140 ms.

15.09 A Wink Start signal must start at least 100 ms after trunk seizure. It is sent when the PABX is ready to receive dialing and, can be held a maximum of 290 ms.

15.10 Where the CO does not provide controlled address signaling, the PABX must be prepared to receive dialing 65 ms after trunk seizure.

15.11 When called station or PABX attendant answers, the PABX places battery reversal on the line for the duration of the call. The trunk then returns to the idle state.

15.12 A trunk may be busied out by the system software. This presents an open circuit to the Tip and Ring of both the trunk and trunk card circuit. The trunks default to the busy-out state if system power fails.

15.13 Each circuit has a LED on the front panel which lights to indicate the trunk is in use. A seventh LED at the bottom of the panel lights to indicate a failure on the card.

Electrical   Description

15.14 Line protection comprises high voltage varistors to energy dump ground from Tip and Ring and fusible links incorporated in the battery feed resistors. EMI is controlled by inductors in series with Tip and Ring.

15.15 The maximum loop resistance is 1800 ohms. The maximum loop length is 5850 m (19,200 ft) when using 26 AWG wire, 15,240 m (50,000 ft) when using 22 AWG wire.

15.16 The card circuitry performs 2-wire to 4-wire conversion, splitting the signal on the trunk into outgoing and incoming speech paths. The analog signal coming from the trunk is converted to Pulse Code Modulation (PCM); the signal to be sent to the trunk is converted from PCM to analog audio. These conversions are performed by a Mitel Codec chip.

Battery Feed Reversal and Busy-out for each trunk are controlled by relays, as shown below.

Condition	Relay 1	Relay 2
Forward Feed (Idle)	ON	OFF
Reverse Feed (Talk)	ON	ON

16. LS/GS TRUNK CARD

Brief   Description

16.01 The Loop Start/Ground Start trunk card mounts in any digital bay and interfaces six trunk circuits to the system. The card is 158 mm high x 368 mm long (6.2 in. x 14.5 in.). Figure 16-1 illustrates the card and the LS/GS jumper.

Facilities

16.02 Facilities provided by the LS/GS Trunk Card include:

- Loop Start or Ground Start selectable by jumper

- M and MM signaling leads available

- Trunk activity indicated by LED (one per trunk)

- Transient suppression on Tip, Ring, and signaling leads Alarm LED.

Electrical   Description

16.03 The Loop Start/Ground Start trunk card mounts in any digital bay and interfaces six trunk circuits to the system. Each trunk circuit is programmed as loop start or ground start by a jumper clip prior to installation.

16.04 Each trunk has Tip and Ring leads and M and MM leads for additional signaling, if required. All leads are protected by varistors against transients between line and ground. There are also varistors between Tip and Ring and between M and MM. Each lead is in series with an inductor near the edge connector to reduce electromagnetic interference (EMI).

16.05 Each trunk has an LED on the front faceplate of the card that lights to indicate the circuit is busy. An LED at the bottom of the faceplate lights to indicate a failure on the card.

Operation – Loop Start

16.06 To place an outgoing call, the trunk card places a termination across tip and ring. The CO detects the current flow and responds with dial tone. Now the user may begin to dial.

16.07 The Trunk card recognizes an incoming call when it receives ringing voltage or battery reversal from the CO. The Trunk card will respond by placing a termination across Tip and Ring. The trunk is released when the loop current is broken. This happens when the near party goes on-hook or the line is physically broken.

MARKED END
SHOWN FOR
LOOP START TRUNK

G
W1

TRUNK
4

TRUNK
5

TRUNK
6

k m

TRUNK
1

TRUNK
2

TRUNK
3

LEDs

TRUNK 1
TRUNK 2
TRUNK 3
TRUNK 4
TRUNK 5
TRUNK 6

ALARM
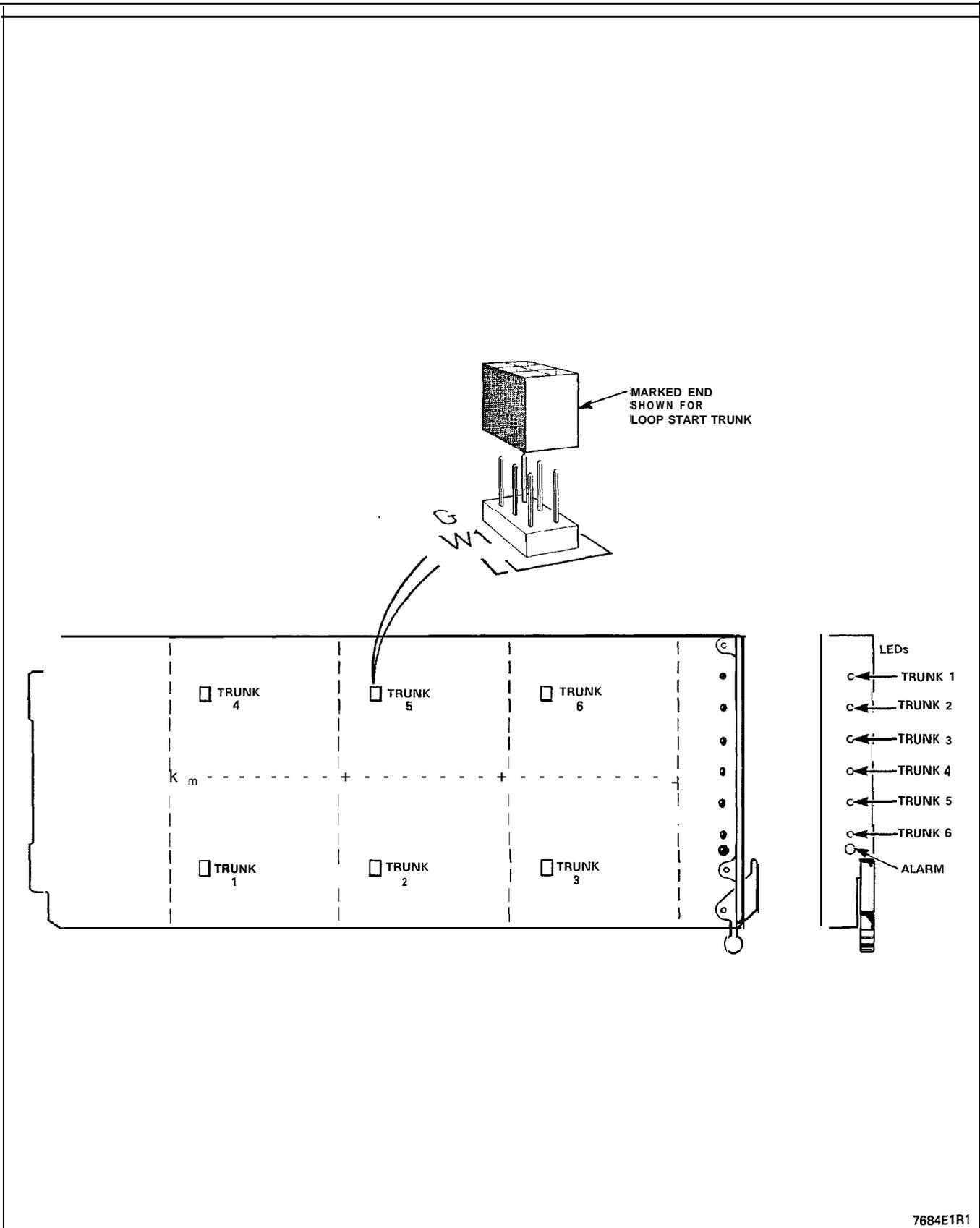
7684E1R1

Figure 16-1 Loop Start/Ground Start Card and Jumper Location

Operation   -   Ground   Start

16.08 To place an outgoing call, the Trunk card grounds the Ring lead. The CO responds by grounding the Tip lead. The Trunk then places a termination across Tip and Ring and ungrounds the Ring lead. The CO then sends dial tone, indicating that it is ready to receive dialing.

16.09 The Trunk card recognizes an incoming call when the CO grounds the Tip lead. The CO may also send ringing voltage. The Trunk card will respond by placing a termination across Tip and Ring. The trunk is released when the loop current is broken. This happens when either party goes on-hook or the line is physically broken.

17. ONS LINE CARD

WARNING

ANY CONNECTION OF THIS CARD TO AN OFF PREMISE APPLICA-TION, AN OUT OF PLANT APPLICATION, OR TO ANY OTHER EXPOSED PLANT APPLICATION MAY RESULT IN A SAFETY HAZARD, AND/OR DEFECTIVE OPERATION, AND/OR EQUIPMENT DAMAGE.

General Description

17.01 The On-Premises (ONS) Line card interfaces standard subscriber telephone sets to a PABX in the same building. It contains 12 line circuits and plugs into any digital bay.

17.02 The card is 158 mm high x 368 mm long (6.2 in. x 14.5 in.).

17.03 There are 13 LEDs on the front face of the card. The top 12 are each connected to a line circuit and light to show that the circuit is in use., The LED at the bottom of the panel lights to indicate an alarm (failure) condition.

Facilities

17.04 Each line circuit provides the following facilities:

- Line protection

- Analog-to-Digital / Digital-to-Analog conversion (μlaw)

- Line circuit status monitoring

- Signaling (ringing, message waiting).

Electrical Description

17.05 The following description applies to each line circuit.

17.06 Tip and Ring are each protected against transients by a 200 volt varistor to ground. A bridge rectifier provides four protection diodes for the line circuit transistors. The -28 volt line is protected by a 35 volt transzorb.

17.07 The line circuit performs 2-wire to 4-wire conversion, splitting the signal on the line into outgoing and incoming speech paths. The analog signal coming from the telephone is converted to Pulse Code Modulation (PCM); the signal to be sent to the telephone is converted from PCM to analog audio. These conversions are performed by a Mitel Codec chip.

17.08 When the telephone is off-hook, the line circuit status LED on the front panel lights. The line circuit maintains a constant 26 mA current to the telephone while the set is off-hook. Loop length is maximum 600 ohms including the telephone set.

17.09 The ONS line card supports the Message Waiting feature. A high voltage (-140 Vdc) is applied to the Ring terminal of the line, lighting a neon lamp on the subscriber's set.

Operation

17.10 When a telephone goes off-hook, the line circuit detects the flow of loop current and signals the Main Processor. The processor responds by connecting a DTMF receiver to the line and sending dial tone to the set. (If the telephone uses pulse dialing the processor detects the pulses by monitoring the loop current). The user can then dial the desired number.

17.11 When a call is directed to an extension, the system applies ringing voltage to the appropriate line and monitors the loop current for an off-hook condition. When the telephone is answered, the ringing voltage is removed.

17.12 When a call is ended by one of the sets going on-hook, the call is disconnected and the line returns to its idle state.

18. OPS LINE CARD

Brief Description

18.01 The OPS Line Card contains six Off-Premises line circuits. An Off-Premises (OPS) Line circuit is used where the line goes outside the building housing the PABX and may be exposed to extraneous high voltages or induced currents (e.g., lightning).

18.02 The OPS Line card can be used in any digital peripheral bay high power (upper) slot. The maximum number of these cards is four per bay. This provides a maximum of 24 ports per peripheral bay.

18.03 The card is 157.5 mm high x 366.4 mm long (6.2 in. x 14.4 in.).

Major Components

18.04 Major components for the OPS Line Card are:

- Mitel 8962 Filter/Codec (six)

- 2-wire / 4-wire converter (six)

- Ringing relay (one per circuit).

Facilities

18.05 Each line circuit provides the following facilities:

- Line activity LED

- Alarm LED

- Line protection

- Analog-to-Digital / Digital-to-Analog conversion (Jaw)

- Signaling (ringing).

Operation

18.06 Each circuit has a LED on the front panel which lights to indicate the line is in use. A seventh LED at the bottom of the panel lights to indicate a failure on the card.

18.07 The line circuit applies Forward Battery Feed to the line. The Tip is grounded and the Ring is at -48 volts. When the set goes off-hook to place a call, the PABX detects the loop current and responds with dial tone. Dialing may be DTMF or pulses. Dial pulses are debounced by software to assure reliable performance.

18.08 When a call is directed to the set, a relay closes, sending ringing voltage to the set. The ringing relay drops out when loop current flow indicates that the telephone has been answered. (Off-hook condition).

Electrical Description

18.09 Line protection comprises high voltage varistors to energy dump ground from Tip and Ring and fusible links incorporated in the battery feed resistors. EMI is controlled by inductors in series with Tip and Ring.

18.10 The maximum loop resistance is 1800 ohms. The maximum loop length is 5850 m (19,200 ft) when using 26 AWG wire, 15,240 m (50,000 ft) when using 22 AWG wire.

18.11 The card circuitry performs 2-wire to 4-wire conversion, splitting the signal on the line into outgoing and incoming speech paths. The analog signal coming from the line is converted to Pulse Code Modulation (PCM); the signal to be sent to the line is converted from PCM to analog audio. These conversions are performed by a Mitel Codec chip.

18.12 The line circuit applies ringing voltage to the appropriate line through a relay and removes it when the telephone is answered. This is determined by monitoring the loop current.

18.13 Loop current is provided through a pair of 200 ohm resistors. Below 900 ohms loop resistance, active current limiting circuitry limits line power to less than 1.5 watts.

18.14 Ringing for each line is controlled by relay 2.

Condition	Relay 1	Relay 2
Idle or Talk	OFF	OFF
Ringing	OFF	ON

19. COV LINE CARD

WARNING

ANY CONNECTION OF THIS CARD TO AN OFF PREMISE APPLICA-
TION, AN OUT OF PLANT APPLICATION, OR TO ANY OTHER EXPOSED
PLANT APPLICATION MAY RESULT IN A SAFETY HAZARD, AND/OR
DEFECTIVE OPERATION, AND/OR EQUIPMENT DAMAGE.

General

19.01 The COV Card is installed in a digital peripheral bay to interface
up to six SUPERSEJ 3^{TM} or SUPERSEJ $4^{®}$ telephones to the bay
processor. The card measures 158 mm x 368 mm (6.2 in. x 14.5 in.). It
has a profiled edge connector that allows it to be safely inserted or
removed from the system with the power on.

19.02 The COV Card can be mounted only in a high power (upper)
card slot of a digital bay.

Major Components

19.03 The major components of the COV line card are:

- Subscriber line interface circuit (SLIC) hybrid (one per line)

- Backplane interface

- PCM Timer

- 6402 UART

- 8840 Modem

- Line protection circuits

- Line status LEDs (one per line)

- Card status LED (one).

Facilities

19.04 Facilities provided by the COV line card include:

- Amplitude Shift Keyed communication with SUPERSEJ 3 or
SUPERSEJ 4 telephones

- Analog/Digital and Digital/Analog conversions (μlaw)

- Battery Feed to power sets.

Electrical Description

19.05 Control information from the backplane is converted to a 32 kHz amplitude shift-keyed (ASK) data stream. The audio information is taken from the 2 Mb/s data link, converted to analog audio and combined with the control information for transmission to the set. Conversely, the audio and ASK data signals from the set are separated and converted. The ASK data is demodulated and sent to the bay processor. The audio is digitized and transmitted on the data link.

19.06 There is only one UART and one modem on the card. The six lines are time-division-multiplexed to the communication circuit. Transmission and reception are simultaneous, but the card receives data from the set to which it last transmitted. For example, if the card is transmitting to set 2, it is receiving from set 1. In the next time slot, it will transmit to set 3 and receive from set 2.

19.07 The COV card has seven indicators on the front panel. There is an activity LED for each subscriber line. The LED at the bottom of the panel is an alarm indicator for the entire card.

19.08 The maximum loop lengths for COV circuits are:

Wire Gauge (AWG)	Loop length
26	1000 m (3300 ft)
24	1500 m (5000 ft)
22	2000 m (6600 ft)

20. DIGITAL LINE CARD

WARNING

ANY CONNECTION OF THIS CARD TO AN OFF PREMISE APPLICA-TION, AN OUT OF PLANT APPLICATION, OR TO ANY OTHER EXPOSED PLANT APPLICATION MAY RESULT IN A SAFETY HAZARD, AND/OR DEFECTIVE OPERATION, AND/OR EQUIPMENT DAMAGE.

General Description

20.01 The Digital Line Card (DLC) interfaces asynchronous DATASETs, the Superconsole 1 000™ attendant console, SUPERSET 3™DN and SUPERSET 4™DN telephones to the SX-200 DIGITAL PABX. It contains 12 asynchronous line circuits (MITEL Digital Network Interface Circuit), and is a low power digital card which can plug into any slot within a digital bay.

20.02 The card is 158 mm high x 368 mm long (6.2 in. x 14.5 in.).

20.03 There are 13 LEDs on the face of the card. The top 12, one for each line circuit, light when the circuit is in use. The bottom LED on the panel lights to indicate an alarm condition within the card.

Facilities

20.04 Each Digital Network Interface Circuit (DNIC) provides the following facilities:

- line protection

- full duplex simultaneous data end voice digital transmission over a single pair of wire

- line circuit status monitoring

- signaling and HDLC protocol to its associated DATASET.

Electrical Description

20.05 Each Digital Network Interface Circuit (DNIC) connects a DATASET, Superconsole 1000 attendant console, SUPERSET 3DN or a SUPERSET 4DN telephone to the common circuitry on the DLC card (and then to the PABX). The common circuitry will be described first, followed by a description of one DNIC.

20.06 The common circuitry contains a High-level Data Link Controller (HDLC) which controls the D channel communication between each DNIC and the Main Control Card (MCC) within the PABX. This data is passed over one-half of a link to the MCC. The B1 and B2 channels from the DNICs are multiplexed onto one link between the DLC and the MCC. The common circuitry includes phase-lock loop circuitry to keep the DNICs in synchronization with the system clock,

as well as circuits which prevent the DLC from disrupting the back-plane when a card is inserted or removed. The DLC line circuits are arranged in three groups of four; at power-up, each group can be separately sequenced. There are 12 Digital Network interface Circuits (DNIC) on the DLC card, each connected to a separate tip-ring pair.

DNIC   Description

20.07   Each DNIC connects via its tip-ring pair to a proprietary tele-phone set, or a proprietary telephone set with a data cartridge, or a DATASET which also contains a DNIC. The DNICs communicate with each other over the twisted pair at 160 Kbit/s (which includes two 64 Kb/s B1 and B2 channels and a D channel). Since the DNIC is a proprietary integrated circuit, each device connected to a Digital Line Card DNIC tip-ring pair must also contain a DNIC. The two DNICs communicate data plus voice simultaneously in full duplex over the single twisted pair between them. The twisted pair also carries the power required by the SUPERSET 3DN or the SUPERSET 4DN telephone from the DNIC on the DLC. The DATASET is powered from a separate AC power supply.

Operation

20.08   The Digital Line Card communicates with a DNIC-equipped de-vice using digital transmission techniques; a voice channel, a data channel, and a control channel. It allows simultaneous transmis-sion of voice and data over a single twisted pair of wires. When the DLC is connected to SUPERSET 3DN or SUPERSET 4DN telephones, each set may be equipped with a Data Cartridge which can be con-nected to a personal computer, or similar data device. The set's voice operation and the data device's data operation can both function con-currently.

LOOP LENGTH SPECIFICATIONS FOR CONNECTIONS TO A DIGITAL LINE CARD '

Application: This interface is not intended or approved for off premises applications.

Maximum   Any combination of 22, 24 or 26 AWG wire with
Loop Length: a total length of up to 1000 meters.

Bridge Taps: One bridge tap of any length and located at any point on the main loop will not significantly degrade the error performance. A second bridge tap, depending on its length and location may significantly degrade the error perfor-mance.

Note: The main loop and the bridge tap must NOT have any devices connected to them other than the SX-200 Digital Line Card and one Digital set or console; the third tip and ring pair must be unterminated.

21. POWER FAIL TRANSFER CARD (6 CIRCUIT)

Brief   Description

21.01 The Power Fail Transfer card allows six telephones, defined by the customer, to place and receive outside calls while the system is inoperative due to a power failure or other major fault. The sets must be industry standard, rotary dial or DTMF, according to trunk type.

21.02 Power Fail Transfer cards mount on the right wall of the cabinet, as seen from the rear door. Each card contains six circuits. There can be up to three cards per system, allowing a maximum of 18 PFT circuits. The card is 165 mm high x 267 mm long (6.5 in. x 10.5 in.). See Figure 21-1.

Connections

21.03 The connections to the Power Fail Transfer card are made through a 25-pair connector, two 9 pin DSUB connectors, a 14-pin strip connector and a four terminal barrier strip.

21.04 The amphenol connector provides all the tip and ring connections from the cross-connect field. The two DSUB connectors provide control signals, power supply and ground connections. They are in parallel. One is connected by cable to the Common Control Shelf; the other cable goes to the next Power Fail Transfer card. The berg strip connector is, for the optional Loop-to-Ground Start Converter module. The terminal strip is for an external alarm connection.

Electrical   Description

21.05 The Power Fail Transfer card connects six extension lines to the PABX. Under System Fail condition it connects each of these extensions to a CO trunk, as defined by the customer. This allows these extensions to place and receive outside calls. When the system is restored, the extensions revert to their normal connection. If a call is in progress at this time, the affected extension's return to normal service is delayed until the call is completed.

21.06 If the CO Trunks to be used for PFT service are of the ground start type, a Loop-to-Ground Start Converter must be connected to the PFT card.

21.07 Extensions to be used for PFT service cannot be SUPERSET® telephones. They can be pulse dialing or DTMF sets, depending on which types of dialing the CO trunks accept.

Operation

21.08 Power Fail Transfer occurs under any of the following conditions:

- failure of the commercial AC power supply

- operation of the force transfer switch

- failure of the -28 V power supply to the Main Control Card

- loss of sanity (malfunction) in the Main Control Card.

21.09 Normal operation is restored when the condition that caused it is rectified: power is restored, controller sanity is re-established, transfer switch is set to Normal.

21.10 If a call is in progress under system fail operation, the transfer to normal operation for that circuit is delayed until the call is completed (CO trunk on-hook for at least 1.8 seconds). This prevents the call from being dropped during return to normal operation.

21.11 Power Fail Transfer Plug and Jack Connections

	Ring		Tip	
Circuit	Pin	Colour	Pin	Colour
TRUNK 1	26	W-BL	1	BL-W
TRUNK 2	27	w - o	2	o - w
TRUNK 3	28	W-G	3	G-W
TRUNK 4	29	W-BR	4	BR-W
TRUNK 5	30	w - s	5	s - w
TRUNK 6	31	R-BL	6	BL-R
TRUNK CARD 1	32	R-O	7	O-R
TRUNK CARD 2	33	R-G	8	G-R
TRUNK CARD 3	34	R-BR	9	BR-R
TRUNK CARD 4	35	R-S	10	S-R
TRUNK CARD 5	36	BK-BL	11	BL-BK
TRUNK CARD 6	37	BK-0	12	0-BK
Empty	38	BK-G	13	G-BK
LINE CARD 1	39	BK-BR	14	BR-BK
LINE CARD 2	40	BK-S	15	S-BK
LINE CARD 3	41	Y-BL	16	BL-Y
LINE CARD 4	42	Y-O	17	O-Y
LINE CARD 5	43	Y-G	18	G-Y
LINE CARD 6	44	Y-BR	19	BR-Y
PHONE 1	45	Y-S	20	S-Y
PHONE 2	46	V-BL	21	BL-V
PHONE 3	47	v - o	22	o - v
PHONE 4	48	V-G	23	G-V
PHONE 5	49	V-BR	24	BR-V
PHONE 6	50	v - s	25	s - v

POWER FAIL TRANSFER CARD

OPTIONAL LS/GS CONVERSION MODULE FOR PFT CARD

8538E2R2
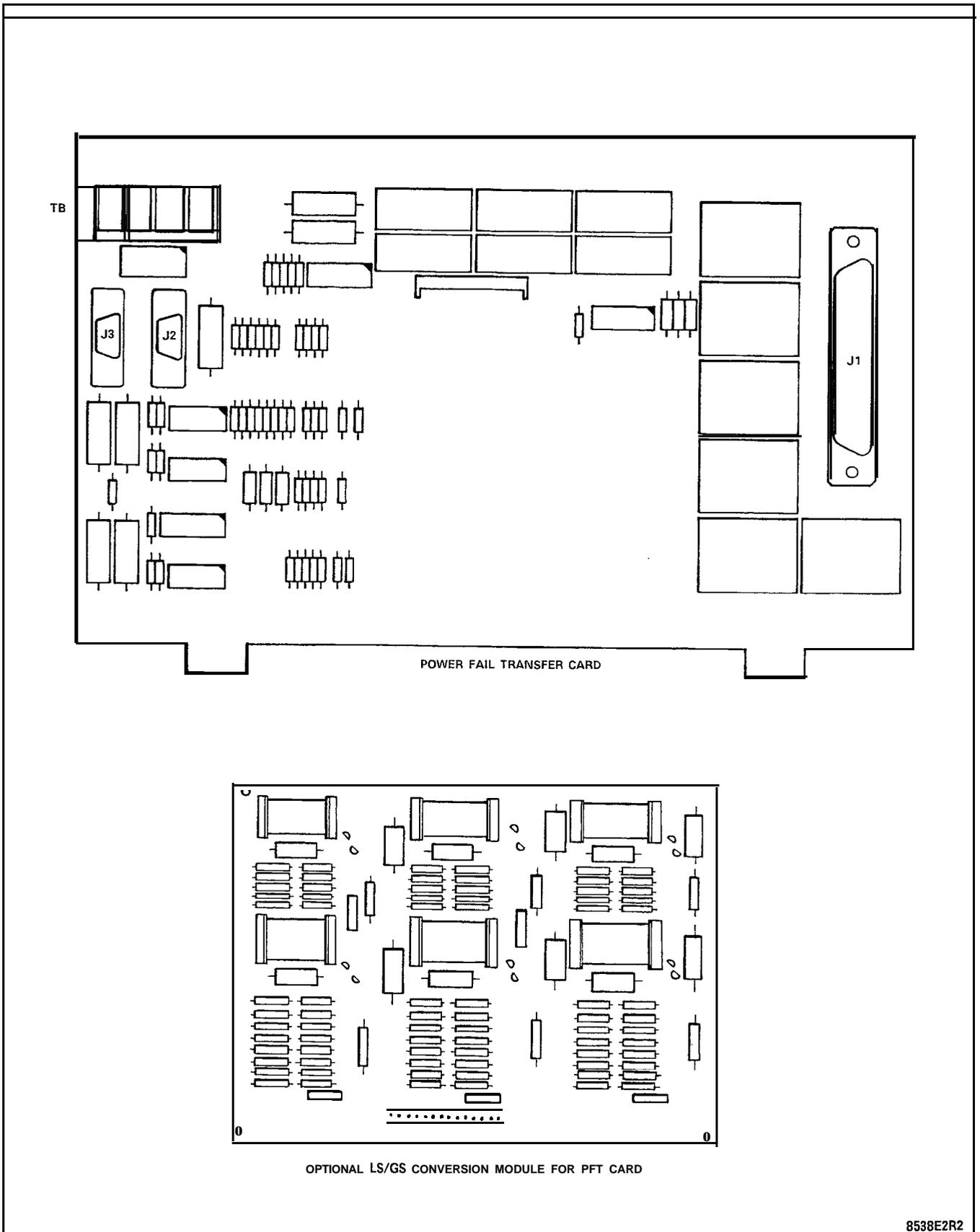
Figure 21-1 Power Fail Transfer Card

22. SWITCH MATRIX CARD

22.01 The Switch Matrix Card resides in a dedicated card slot directly to the right of the MCC in the control bay of the 672-port SX-200 DIGITAL PABX. It expands the DX switching matrix, the static non-volatile RAM, and the resources of the 7720 Digital Signal Processor. The card measures approximately 325 mm x 366 mm (12.8" x 14.4").

Facilities

22.02 The Switch Matrix card provides:

- 24 x 24 link DX array

- Digital Signal Processor

- Dial Tone Filter

- Ringing Reference Generator

- 8 Kbytes Non-volatile Static RAM

DX Array

22.03 The DX Array on the Switch Matrix Card consists of a 24 x 24 link switching array provided by 9 Mitel DX chips with balanced drivers and receivers.

Ringing Reference Generator

22.04 The Digital Signal Processor generates PCM data corresponding to a 20Hz sine wave, which is passed through the DX array. A codec then converts the PCM to analog. This 20 hz signal is then filtered and distributed via the backplane to the Bay PSU, which contains a ringing amplifier.

Non-volatile Static RAM

22.05 Any time the user enables a function the changed data (extension number, type of forwarding) must be saved in a non-volatile memory so that it is not lost on power down or system failure. The Static RAM acts as a buffer for this sort of data. As the data accumulates, finally filling up the buffer, it is then transferred to disk. This reduces disk running time, increasing the disk drive's life-span. During power-off periods, the static RAM is powered from a large capacitor, providing 72-hour holdover time.

WARNING

THE SWITCH MATRIX CARD MUST NOT BE INSERTED OR REMOVED WITH THE POWER ON. DAMAGE TO ONBOARD CIRCUITS MAY RESULT.

23. T1 DIGITAL TRUNK CARD

Brief Description

23.01 The T1 Trunk card interfaces a single T1 trunk circuit to the SX-200 DIGITAL PABX. The T1 protocol is used primarily in North America.

Facilities

23.02 The T1 Trunk Card provides the following facilities:

- T1 Clock - System Clock Phase Comparator

- Bidirectional T1 to ST-BUS@ data rate and format conversion

- Line Equalization

General Description

23.03 The T1 interface will transmit and receive 24 8-bit voice/data channels on a 4-wire digital trunk operating at 1.544 Mb/s. The Bay Controller performs all control functions.

23.04 To provide signaling information on the T1 line, data bits are "stolen" from each channel to provide channel associated signaling.

23.05 The T1 Trunk Card includes a phase comparator which, through the T1 Clock Module on the Main Control Card, keeps the system clock in phase with the incoming frame rate clock. This prevents data losses due to clock rate differences. (Refer to the Part on T1 Clock Module in this Section).

23.06 The SX-200 DIGITAL system supports a maximum of two T1 Trunk Cards per digital bay. In 336, 456 or 480-port systems Bay 2 supports only one T1 Trunk Card.

23.07 One incoming T1 trunk is selected as the primary timing source; the system locks its PCM clock and all other T1 trunk cards in the system to this incoming data stream.

23.08 The telephone company provides on-site T1 termination equipment, the Channel Service Unit (CSU). Shielded twisted pair cables are run from the CSU to the SX-200 DIGITAL backplane. The T1 Trunk card includes switches to set appropriate line equalization for cable lengths up to 200 metres (655 feet) from the CSU.

23.09 The T1 Trunk card can be installed in any even-numbered, high-power (upper) digital card slot. An adapter fitted to the backplane connector provides a 15-pin D-Sub connector for the T1 facility and a 25-pair connector to maintain access to the adjacent odd-numbered card slot. Only 1 T1 Trunk card can be installed in each digital bay.

Electrical   Description

23.10   in the transmit direction, the data from the system PCM link must be converted from the Mitel ST-BUS format of 32 channels at 2.048 MBit/sec to the T1 format of 24 channels at 1.544 MBit/sec. To match the number of data channels, the TI card skips every fourth channel on the ST-BUS links. The T1 interface circuits retime the output data to I.544 Mbits/sec and add the framing bits.

23.11   In the receive direction, the framing bits are removed, the data is retimed to 2.048 MBit/sec and the channels are mapped onto the system PCM link in the same manner as above, with every fourth channel left empty.

23.12   The system runs a loopback test during power-up or reset. A relay is operated to loop the card's transmit line back to its receive line, removing the transmit data from the output line. A 6db attenuation is automatically added to the signal during loopback, to simulate actual transmission. The card remains in loopback until the test is passed.

23.13   The relative phase of the T1 and system clocks is determined as follows: An 8 KHz clock output derived from the incoming frame rate is divided by two. This 4KHz signal gates a counter, which counts the number of cycles of the system 2.048 MHz clock occuring during one cycle of the 4 KHz signal. This phase count is sampled every 100 ms. The oscillator on the T1 Clock Module on the Main' Control Card is adjusted to keep the phase count value constant over a longer term (16 seconds). The T1 circuit data buffer accommodates short-term phase variation (jitter).

Indicators

23.14   If any of the data channels on the T1 link are active, the upper front panel LED lights, giving visual indication of channel activity.

23.15   If the SX-200 DIGITAL cannot phase-lock to the incoming signal, the yellow (NO SYNC) LED lights.

23.16   The lower red LED is the Card Alarm. It flashes when the card is busied out or if the system diagnostics finds a malfunction on the card.

Physical   Description

23.17   The card measures approximately 158 X 368 mm (6.2" X 14.5"). It connects to the backplane via an 88-pin edge connector.

SX-200” DIGITAL

PRIVATE AUTOMATIC BRANCH EXCHANGE (PABX)

ATTENDANT CONSOLE DESCRIPTION

NOTICE

CONTENTS   **PAGE**

CONTENTS (CONT'D)   **PAGE**

LIST OF ILLUSTRATIONS

FIGURE   **TITLE**   **PAGE**

LIST OF ILLUSTRATIONS (CONT'D)

LIST OF ILLUSTRATIONS (CONT'D)

LIST OF TABLES

1.   INTRODUCTION

General

1.01   Two types of Attendant consoles are available with the *SX-200*® DIGITAL PABX supporting G1003 software. The existing LCD console, uses four wires and interfaces with the universal card (console module). The Superconsole *1000*™ attendant console uses one twisted pair of wires, and interfaces to a Digital line card. The Superconsole 7000 attendant console has a RS-232 printer port, an optional tilt display and is designed to work with any of the Mitel digital systems. Otherwise both consoles are similar in appearance and functionally   identical.

1.02   This Section describes the Attendant call handling functions of the SX-200 DIGITAL PABX consoles. It contains a brief description of each fixed key and softkey function. The SX-200 DIGITAL PABX Console incorporates those features described in Section MITL9109-094-105-NA and uses an alphanumeric Liquid Crystal Display (LCD) which simplifies Call Handling, Customer Data Entry (refer to Section MITL9109-094-210-NA) and Maintenance (refer to Section MITL9109-094-353-NA).

Reason for Issue

1.03   This Section has been issued to describe the Attendant Consoles used with an SX-200 DIGITAL Private Automatic Branch Exchange (PABX), 336-port, *480-port,* 456-port and 672-port configurations. Unless, otherwise stated, descriptions and call handling functions apply to both consoles.

2. PHYSICAL DESCRIPTION

2.01   The Attendant Console housing 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 is shown in Figure 2-l: SX-200 DIGITAL PABX Attendant Console. The weight of the console is 2.27 kg (5.0 lb) and consists of two major assemblies: an upper and lower assembly.

Upper   Assembly

2.02   The upper assembly consists of the following parts:

Keyboard Printed Circuit Assembly: A printed circuit board assembly with 32 keys, a dial pad (12 keys) and a cable harness. The cable harness plugs into the Console Printed Circuit Assembly.

Housing Top: The plastic moulded top of the Attendant Console housing which encloses and protects the console circuitry.

Alphanumeric Liquid Crystal Display: A 4-line x 80-character LCD which facilitates Attendant Console operation. Each character consists of a 5 X 7 dot matrix display.

Keyboard Designation Cover: A transparent cover with silkscreened key designations.

Keyboard   Layout

2.03   The console keyboard consists of a standard 12 key keypad, 10 Display Associative Keys (softkeys), 4 cursor control keys, 2 volume control keys, 2 contrast control keys, and 14 fixed keys, seven of which have associated LED indicators. The status of the indicator displays the condition of the key:

- Indicator flashing − the system expects a response from the associated key.
- Indicator solid − the feature associated with the key is active.
- Indicator off − the feature is not active.

Lower   Assembly

2.04   The lower assembly consists of the following parts:

Console Printed Circuit Assembly: A printed circuit board (PCB), which holds the main console circuits, power supply circuitry and processor. Slots are provided into which the keyboard assembly, speaker and handset jack leads are plugged.

Housing Bottom: The moulded plastic bottom of the Attendant Console housing.

LCD Adjustment: The contrast is controlled repeatedly pressing either CONTRAST key, until the desired level is achieved.

Hand/Headset: The removable hand/headset may be connected to either jack on the left side of the Attendant Console.

RS-232C Port: A printer or terminal/CRT can be attached to the Superconsole 1000 attendant console via an RS-232C port, connector. This allows direct connection to most printers or terminal/CRTs. The RS-232C interface is programmable from 50 to 2400 baud. Refer to Appendix A for RS-232C interface specifications.

7101R2

Figure   2-l   SX-200   DIGITAL   PABX   Attendant   Console

HANDSET

LIQUID
CRYSTAL
DISPLAY

10 DISPLAY ASSOCIATIVE
KEYS (SOFTKEYS)

F1▷ F2▷ F3▷ F4▷ F5▷
F6▷ F7▷ F8▷ F9▷ F0▷

Volume Volume Contrast Contrast
  ∨   ∧   ∨   ∧

Telephone Number

Function Trunk Grp   Cancel Release

0   0   0   0   0   0   0
Page   Block Hold 4+ Hold 3 Hold 2 Hold 1 Answer

        abc   def
1   2   3   ↑
ghi   jkl   mno
4   5   6   ↓
pqrs   tuv   wxyz
7   8   9   →
         0   ←

7 LED
INDICATORS

14 ATTENDANT CONSOLE
KEYS (FIXED KEYS)

12 DIAL KEYS
2 VOLUME CONTROL KEYS
2 CONTRAST CONTROL KEYS
4 CURSOR CONTROL KEYS
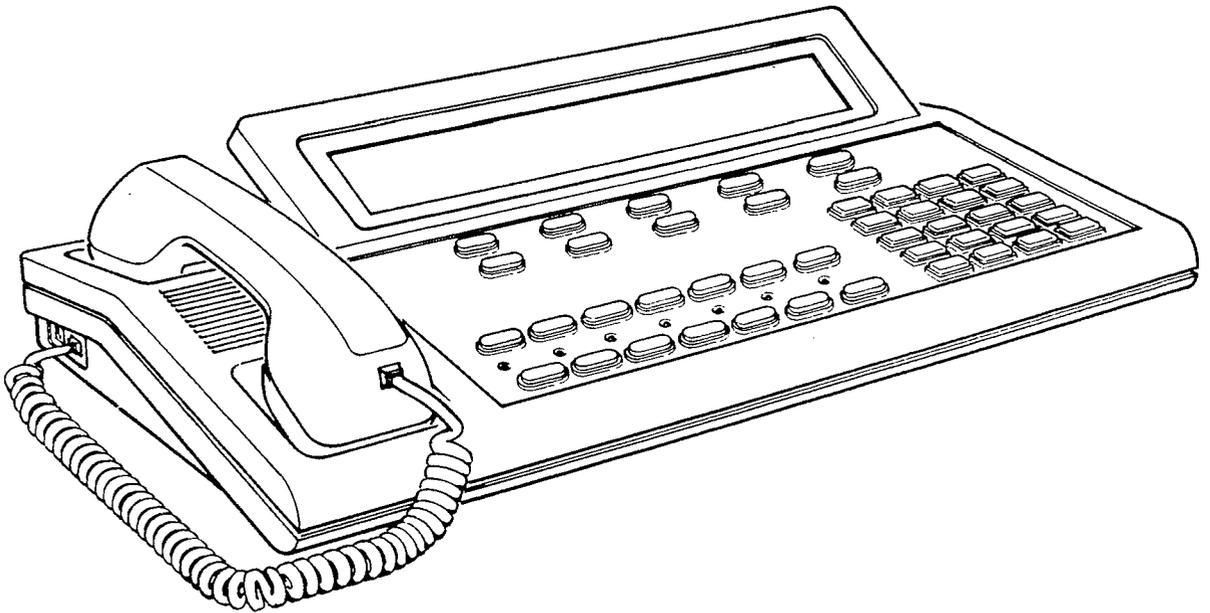
6763R4E

Figure 2-2 Attendant Console Keyboard Layout

3. FUNCTIONAL   DESCRIPTION

General

3.01   The Attendant Console Keyboard layout (refer to Figure 2-2),
provides the standard Call Handling keys.

Attendant Function Keys (Fixed Keys)

3.02   The following paragraphs describe the operation of the 14 fixed
keys in Call Processing mode.

FUNCTION   KEY: This key enables the attendant to access the follow-
ing softkey functions:

- ATT   FUNCTION
- DAY NIGHT 1 OR 2
- GUEST ROOM FUNCTIONS (if enabled)
- FRANCAIS
- APPLICATION
- ALARM (if enabled)
- BELL OFF or BELL ON (if enabled)
- SYSTEM   IDENTITY

TRUNK   GRP   STATUS: This key permits the Attendant to display the
status of Trunk Groups. It may be used when the console is idle, or
when a call is being handled. For more information, refer to the feature
description, Trunk Group Busy Indication, in this Part.

CANCEL   KEY: This key is used to cancel a misdialed call or a call
directed to a busy number. The console display reverts to the previous
display when this key is pressed.

RELEASE   KEY: This key releases source to destination calls from the
console. The call may be released in the busy state, ringing state or
after a connection has been made. This key also functions as a CAN-
CEL key if both a source and a destination are not present.

PAGE   KEY: The Attendant can access up to nine paging zones. If the
PAGE key is used, the programmed default zones will be accessed. To
access a given zone or all nine zones, the Attendant must dial the
appropriate access code.

BLOCK   KEY: This key is used in hotel/motel applications and permits
the Attendant to bar extensions from calling one another. Pressing
BLOCK activates the feature, and causes the LED above the key to light.
Pressing the key again removes call block.

HOLD 1, 2, 3 **AND** 4 **KEYS:** These keys allow the Attendant to hold up
to eight independent calls at the Attendant Console. When a call is
placed on hold the associated LED of the pressed key will be ON. HOLD
key 4 is an overflow key. When this key is activated softkey displays F6
to FO will give the status of HOLD slots 4 through 8.

ANSWER KEY: When an incoming call is routed to the Attendant Console the ANSWER LED is flashing and the appropriate softkey display is ON. The ANSWER key is used to answer calls in the order in which they arrived at the Attendant Console. At this time the ANSWER LED is ON continuously. To answer a specific call the Attendant must press the appropriate softkey.

Display Associative Keys (Softkeys)

3.03   The 10 Display Associative Keys (F1 to FO) are located directly below the alphanumeric LCD. Each key is assigned 12 character positions on the third row (F1 to F5) and fourth row (F6 to FO) of the LCD. Softkey prompts indicate the function of these keys on the alphanumeric LCD. The function of these keys varies according to system status at a given time. Figure 3-l gives the list of characters used on the LCD. The paragraphs that follow describe the appearance of the Liquid Crystal Display and the operational aspects of the Attendant Console for the following conditions:

- Idle Console

- Incoming Calls

- Placing a Call on Hold

- Dialing a Destination

- Busy/No Answer Recall

- Attendant Intercept

- Set up and cancel Do Not Disturb

- Set up and cancel Message Waiting

- Paging

- Customer Data Entry/Maintenance Application

- Additional Attendant Functions.

```
0123456789:;<>?ABCDEFGHIJKLMNOPQRSTUVW
XYZ/,.-_'abcdefghijklmnopqrstuvwxyz
```

Figure 3-1 Alphanumeric LCD Characters

Idle   Console

3.04   When the console is in the idle condition the LCD is as shown
in Figure 3-2. The first line displays the date, time and number
of calls waiting (C/W). Line 2 is blank and lines 3 and 4 display the
softkey numbers (F1 to FO). Softkey F9 will display REDIAL; this enables
the Attendant to automatically redial the last external/internal number
manually dialed from the Attendant Console by pressing softkey F9. All
other softkeys; i.e., F1 to F8 and FO are disabled in the idle condition.

TUE. AUG. 7, 1984				10:26
❑ 𝑥☞◑❀	❑ F2>	❑ F3>	❑ F4>	❑ F5>
❑ F6>	❑ F7>	▨F8>	❑F9>REDIAL	▨FO>
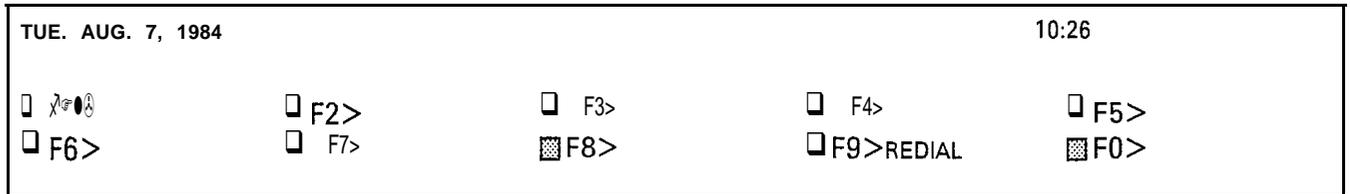
Figure   3-2   Attendant   Console   Display   in   the   Idle   Condition

Incoming   Calls

3.05   When a call is routed to the Attendant Console, line 1 of the
display will indicate the date, time and total number of calls
waiting. Line 2 is blank and lines 3 and 4 display the available softkey
functions. Refer to Figure 3-3.

TUE. AUG. 7, 1984			10:26 8 **C/W**	
❑F 1>RECALL	❑ ☞❀❀◑●◢❀ 0	❑ F3>PRIORITY0	❑ ☞♁❀❀◊❧ 1	❑ ☞◢❀❀◊❧ 2
❑ F6>LDN 3	❑ F7>LDN 4	▨F8>	❑F9>REDIAL	▨ FO>NIGHT BELL
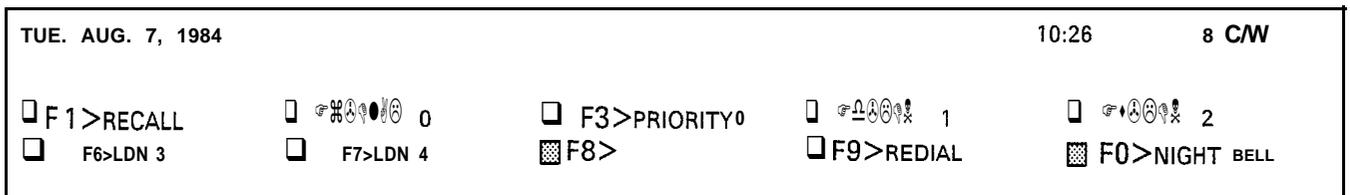
Figure   3-3   Example   of   Display   Associative   Keys   for   Incoming   Calls

3.06   The console alerts the Attendant of an incoming call in three
ways: ANSWER key LED is flashing, the appropriate softkey
display is ON, and the tone warbler (if enabled) is active. To answer the
calls in the order in which they arrived at the console, the Attendant
simply presses the ANSWER key.

3.07   To answer a specific call, the Attendant must activate the ap-
propriate softkey. In the above example of Figure 3-3 a total of
eight calls are waiting; One RECALL, one DIAL '0', one PRIORITY DIAL
'0', four LDN (Listed Directory Number) and one NIGHT ANS call. The
following paragraphs describe the softkey functions for incoming calls.

RECALL: When a call is not answered within the time-out period, it is
returned to the console; the RECALL prompt lights on the Alphanu-
meric LCD. The RECALL prompt cues the Attendant for the proper
response. Pressing this key connects the Attendant to the recalled call.

DIAL '0' and PRIORITY DIAL '0': Internal calls or Intercepts directed to the Attendant or intercepts will appear at the Attendant Console as DIAL '0' calls. Priority Dial '0' calls will only be available for extensions with the appropriate Class-Of-Service (COS) option enabled in their COS. The DIAL '0' and PRIORITY DIAL '0' labels must be programmed in CDE (refer to Section MITL9109-094-210-NA, Customer Data Entry).

LDN 1, LDN 2, **LDN** 3, **LDN** 4: When an outside call arrives at the Attendant Console, the prompt associated with the LDN 1, LDN 2, LDN 3 or LDN 4 key on the alphanumeric LCD is ON. Pressing the LDN 1 (F4), LDN 2 (F5), LDN 3 (F6) or LDN 4 (F7) softkey answers the incoming call to the customer's Listed Directory Number.

NIGHT BELL: If the Attendant has access to any calls which are currently routed to night bells, softkey FO (NIGHT BELL) will be active. The Attendant may answer the call by pressing softkey FO.

3.08 When a given call is answered the ANSWER LED will stop flashing and will be ON continuously. The display will change to provide the Attendant with information about the source (line 1) and the available functions which may be selected (softkeys). Figure 3-4 gives an example of an answered DIAL '0' call. The COS may also have a name (as programmed in Form 9) which will also be displayed on the console.

```
>>>SRC 1108      J BARKER      COS 49 COR 15                <<<    10:26        7 c/w
      DST
❑  ☞●🖐                ❑ F2>              ❑  F3>           ❑ F4>              ❑  F5>
▨ F6>NO DISTB      ❑  F7>MSG WAITING ❑  F8>MESSAGE REG  ▨ F9>             ❑ FO>
```
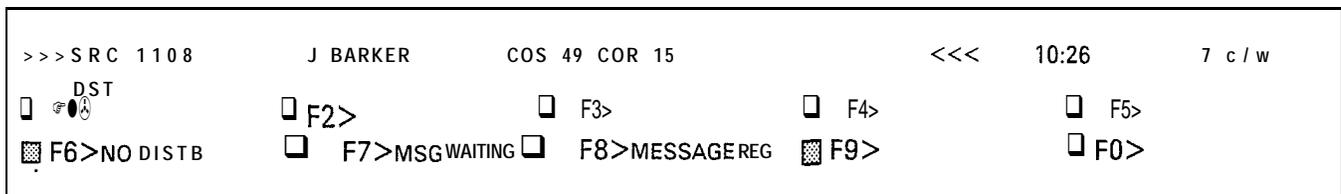
Figure 3-4 Answering a DIAL '0' Call

Internal Call

3.09 Line 1 of the display (Figure 3-4) gives a description of the caller. SRC (source) indicates that the call is incoming, 1108 is the extension number, J. BARKER is the caller's name, COS 49 is the Class Of Service of the caller and COR 15 is his Class Of Restriction. The delimiters (>>><<<) point to the actual caller the Attendant is on-line with (SRC or DST).

3.10 Line 2 in this case is reserved for a destination (DST) party (not used in this example). Lines 3 and 4 are used for softkey definitions; in this case softkeys F6, F7 and F8 are enabled. The Attendant may set up Do Not Disturb (NO DISTB) for the extension by pressing the F6 (NO DISTB) softkey. If the extension user has a message waiting the MSW display will be on. The Attendant simply presses the MSG WAITING softkey (F7) to cancel the Message Wait for the extension and gives the message to the user.

External Call

3.11 Figure 3-5 gives an example of an answered trunk call. Line 1 displays' SRC (source) since it is an incoming call, TRUNK indicates that it is a trunk call, 76 is the. number of the trunk, COS 15 is the Class Of Service of the trunk and COR 5 is the Class Of Restriction of the Trunk. Line 2 in this example is not used and is reserved for a destination (DST) party if required. Softkeys 4 (FLASH) and 5 (SERIAL CALL) are enabled. If a trunk name is programmed in Form 14 for this trunk group, the trunk name will appear on the console display instead of TRUNK XX.

```
>>>SRC TRUNK 76              COS 15 COR 5                <<<    10:27      6 C/W
   DST
 ❑ ⚆⚇       ❑ F2>       ❑ F3>       ❑ F4>FLASH     ❑ F5>SERIAL CALL
 ▦F6>       ❑ F7>       ▦F8>       ❑ ⚆⚇          ▦F0>
```

Figure 3-5 Answering a Trunk Call

FLASH: This softkey function enables the Attendant to generate a "Flash" back to the CO to signal the long distance operator.

SERIAL CALL: The Attendant may force the trunk call to automatically return to the console after the call is routed to a station, and the call is completed.

Placing a Call on HOLD

3.12 An incoming call may be placed in one of eight hold slots. Hold slots 1, 2 and 3 are provided via fixed keys on the Attendant Console. When a call is placed on hold using hold slots 1, 2 or 3 the Attendant must press one of the three hold keys. The associated LED will be ON. If the three first hold slots are being used, the attendant must press the HOLD 4 (overflow) fixed key. The LCD will display the remaining five hold slots as softkeys F6 to FO as shown in Figure 3-6. The status of the slots will also be shown. If a party has been on HOLD for a period exceeding the programmed time-out it will RECALL back to the Attendant Console, the hold slot LED will flash and the warbler will sound. The warbler will periodically sound once for a recall on HOLD 1, twice for a recall on HOLD 2, three times for a recall on HOLD 3 and four times for a recall on one or more of HOLD slots 4, 5, 6, 7 and 8.

```
>>>SRC  1108      J BARKER      COS 49 COR 15            <<<   10:45      3 c/w
   DST
❑ F1>EXIT     ⚆F2>       ❑ F3>       ❑ F4>       ❑ F5>
❑ F6>HOLD 8 FREE   ❑ F7>HOLD 7 FREE   ❑ F8>HOLD 6 FREE   ❑ F$I>HOLD 5 FREE   ▦F0>HOLD 4*RCL
```

Figure 3-6 Placing a Call on Hold (Overflow)

3.13 The EXIT softkey function enables the Attendant to exit from the overflow hold status (HOLD 4 to 8) and return to the previous display (pressing any console fixed key allows the Attendant to exit from overflow held status).

Dialing a Destination

3.14 In order to call a party the Attendant must dial the number from the dial keypad. Figure 3-7 gives an example of the appearance of the display while the Attendant is dialing a destination. Line 1 is reserved for the source. Line 2 is reserved for the destination and will contain information pertaining to the destination when the complete number has been dialed; refer to Figure 3-8. The Attendant may cancel the call at any time by pressing the CANCEL fixed key. The Attendant Console will then revert to the previous state. The Attendant may use the back arrow key to correct or change an entry.

```
    SRC                                                          11:12        2 c/w
>>>DST 115_                                             <<<
 ▢  ☞●۞          ▢ F2>           ▢  F3>          ▢ F4>                ▩F5>
▩F6>             ▢  F7>          ▢ F8>           ▢  ☞⅄۞              ▢  ☞ｊ۞
```
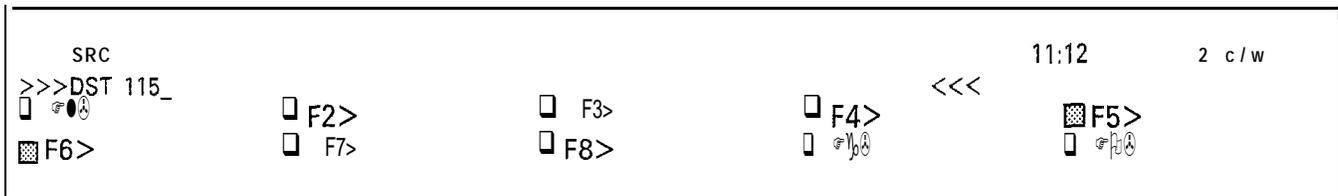
Figure 3-7 Dialing a Destination

```
    SRC                                                          11:12        2 c/w
>>>DST   1155        S KRITSCH   COS 50 COR 23   RINGING <<<
 ▢  ☞●۞          ▢ F2>              ▢  F3>          ▩F4>CALLBACK    ▢  F5>
▢ F6>            ▢  F7>MSGWAITING ▢ F8>            ▢  ☞⅄۞           ▩F0>
```
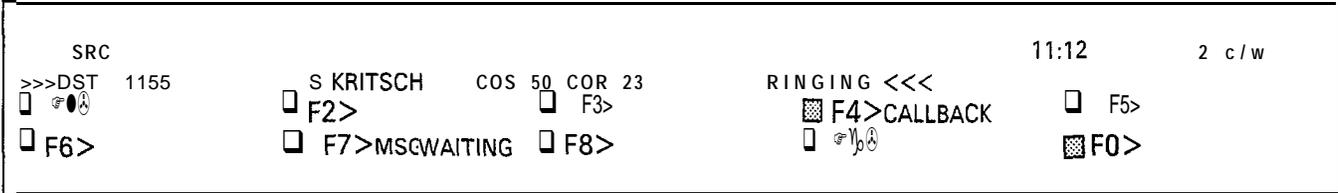
Figure 3-8 Calling a Destination

3.15 The Attendant will receive ringback tone if the extension is idle and line 2 of the LCD will display RINGING. The available softkey functions are CALLBACK and MSG WAITING.

CALLBACK: If the extension user does not answer, the Attendant may press the CALLBACK key and have the extension call back the Attendant Console. For a No Answer Callback the extension will call back to the Attendant Console after going off- and on-hook once. For a Busy Callback the Attendant Console will be called back once the extension goes on-hook.

When a CALLBACK placed by the Attendant is answered at the console, the call is identified as a CALLBACK.- Refer to Figure 3-9, CALLBACK from an Internal Call. If the Attendant receives an 'All Trunks Busy' indication, and presses CALLBACK, the Console is queued to access a trunk when one becomes idle. Figure 3-10 shows the display that is received when an idle trunk is assigned to the Console.

```
   SRC                                                                    11:50 AM
>>>DST   3401           FRED              cos_1 COR 1      CALLBACK    <<<
❑ ☞☏●◔                ❑ F2>                 ❑ F3>             ❑F4>CALLBACK      ❑ F5>
❑ F6>              ❑  F7>MSG WAITING ❑  F8>        ❑ ☞◑◐◔          ❑ F0>
```
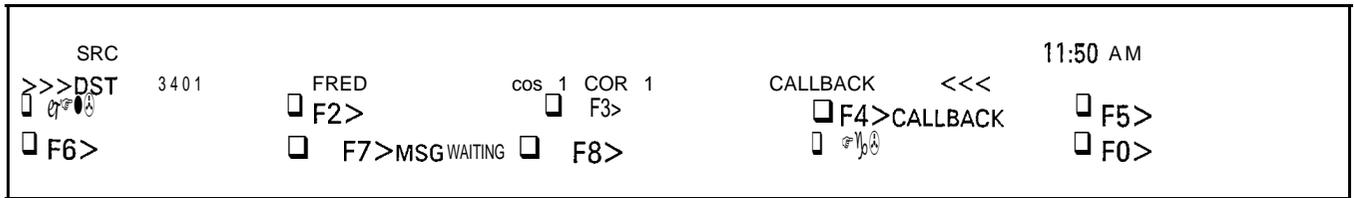
Figure   3-9   Internal   CALLBACK

```
   SRC                                                                    11:50 AM
>>>DST TRUNK 12                       COS 1 COR 1      CALLBACK    < < <
❑ ☞●◔                 ❑ F2>              ❑ F3>          ❑ F4>          ❑ F5>
▓F6>               ❑  F7>              ▓ F8>          ❑ ☞◑◐◔        ❑ ☞◑◐◔
```
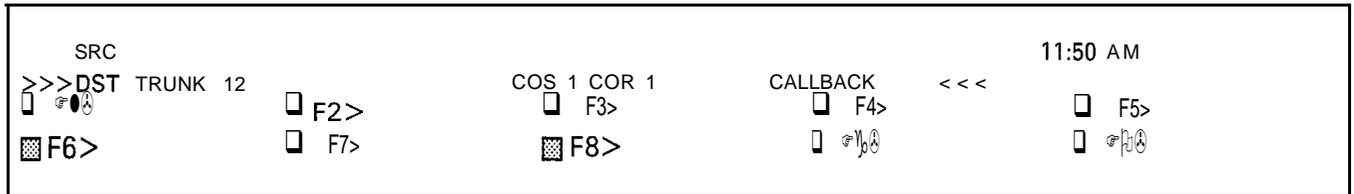
Figure   3-I 0   External   CALLBACK

MSG   WAITING: The Attendant may send a message to an extension user. For DTMF and rotary sets the message waiting indication can be provided by ringing the extension at regular time intervals or by setting the message waiting lamp (if equipped) ON.

3.16   If the user has a *SUPERSET* 4 telephone, the set may respond back to the Console with a systemwide message such as "IN A MEETING" when called. Refer to Figure 3-I 1.

```
   SRC                                                         11:12       2 c/w
>>>DST 1383        M WARREN        IN A MEETING   RINGING <<<
▓F1>               ❑ F2>              ❑ F3>          ❑F4>CALLBACK   ❑ F5>
▓F6>            ❑  F7>MSG WAITING ❑ F8>          ❑ F9>          ▓F0>
```
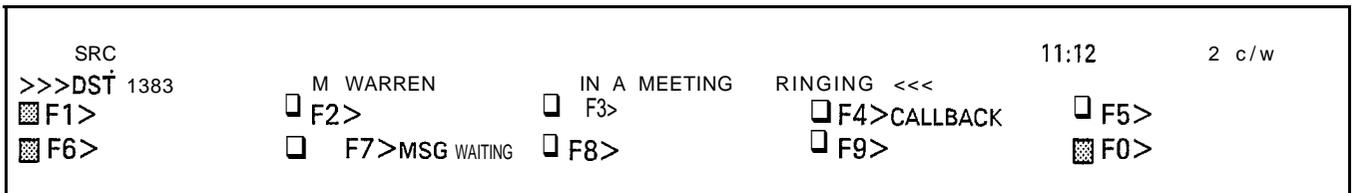
Figure   3-I 1   Calling   a   *SUPERSET*   4   Telephone

3.17   When a console calls or answers a call from another console, the LCD displays ATT followed by the console's access code. Refer to Figure 3-12 and Figure 3-13.

3.18   The *SUPERSET* 4™DN displays ATT XXXX CALLING or RINGING ATT XXXX. Due to space limitation on the *SUPERSET* 4 LCD, the display shows ATT XXXX while the user is taking to the Attendant.

```
>>>SRC ATT 1821              COS 1 COR 1              < < <   11:50 AM
   DST
❑ ☞●◔             ❑ F2>           ❑ F3;        ❑ F4>          ❑ F5>
❑ F6>          ❑  F7>           ❑ F8>        ❑ ☞◑◐◔        ❑ F0>
```
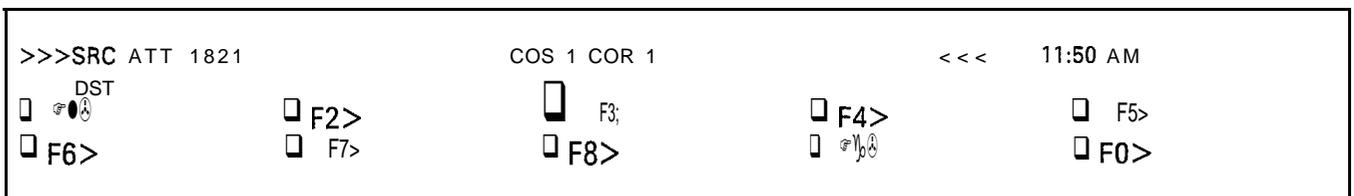
Figure   3-12 Answering   a   Call   from   Another   Attendant

```
    SRC                                                                    1 1:50 AM
>>>DST ATT 1821                    cos 1  COR 1          RINGING    <<<
▨F1>              ❏ F2>              ❏ F3>              ▨F4>           ❏ F5>
▨F6>              •j F7>             ▨F8>              ❏ ⫙⫯⫶⫶⫯⫯        ❏ F0>
```
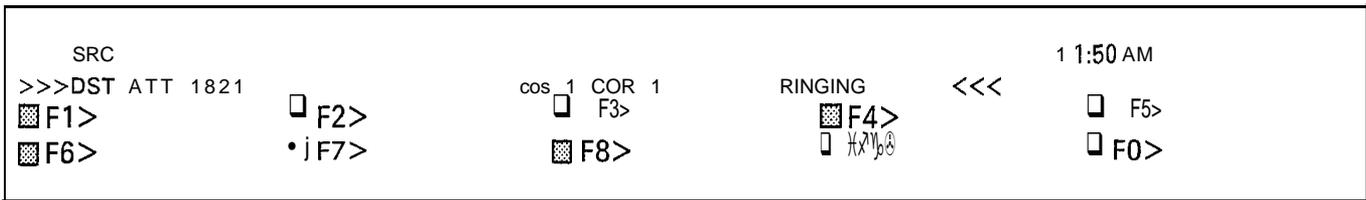
Figure   3-13   Calling   Another   Console

3.19   When the Attendant reaches a busy extension the softkey op-
tions are: return to the SOURCE if one exists, set up a CALL-
BACK, send a message (MSG WAITING) or OVERRIDE. Refer to Figure
3-14.

```
    SRC  TRUNK        5 5         COS 15 COR 4                      11:12       6 c/w
>>>DST 1155         S KRITSCH   COS 50 COR 15          BUSY <<<
❏ F'>SOURCE        ▨F2>           ❏ F3>              ❏F4>CALLBACK   ❏ F5>
❏ F6>              ❏  F7>MSG WAITING ❏F8>OVERRIDE    ▨F9>          ❏ ⫯⫶⫯⫯⫯
```
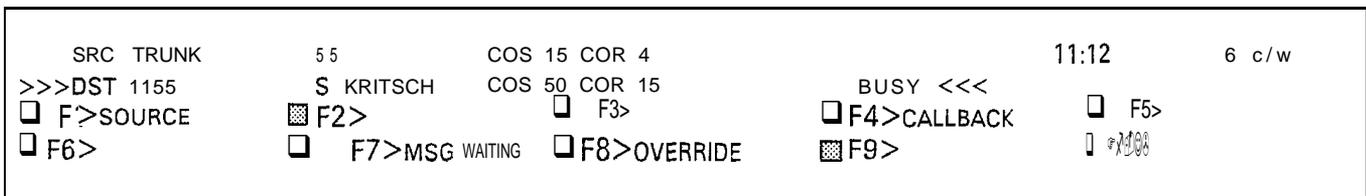
Figure   3-14   Reaching   a   Busy   Destination

SOURCE: The Attendant may return to the source by pressing the
SOURCE softkey (Figure 3-15). At this point in time the Attendant may
camp the source onto the busy extension (destination) by pressing the
fixed RELEASE key.

```
>>>SRC  TRUNK        5 5         COS 15 COR 4               <<<    11:12       6 C/W
    DST 1155        S KRITSCH   COS 50 COR 15          BUSY
❏ ⫯●⫶⫯⫯            ▨F2>           ❏F3>DEST            ❏F4>           ❏ F5>
▨F6>               ❏  F7>          ▨F8>              ❏ ⫯⫯⫶⫶⫯        ▨F0>
```
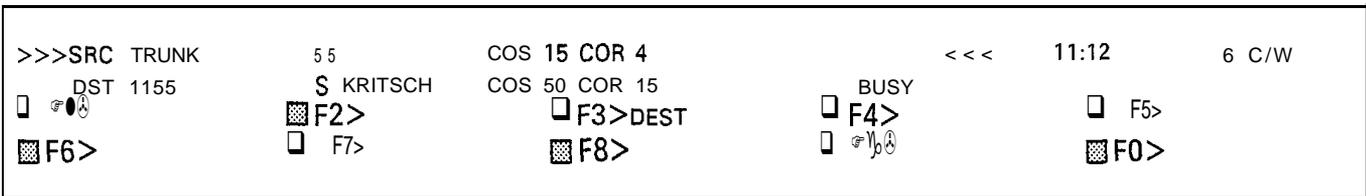
Figure   3-15   Returning   to   the   Source

OVERRIDE: The Attendant may override the extension by pressing AND
HOLDING DOWN the OVERRIDE softkey. The Attendant will barge in the
conversation. Busy tone will be returned when the OVERRIDE softkey is
released.

3.20   If the Attendant reaches a party with Do Not Disturb (DND), line
2 (DST) will display DND (Do Not Disturb); refer to Figure 3-16.
The Attendant may switch back to the source (SOURCE), send a mes-
sage (MSG WAITING) or override the DND (OVERRIDE).

```
    SRC  TRUNK  34                    COS  15  COR  5                              11:40          1  c/w
>>>DST 1108            J BARKER       COS  49  COR  15  DND                 <<<
  F1>SOURCE           F2>               F3>                     F4>CALLBACK      F5>
  F6>                 F7>MSG WAITING  F8>OVERRIDE                                F0>
```
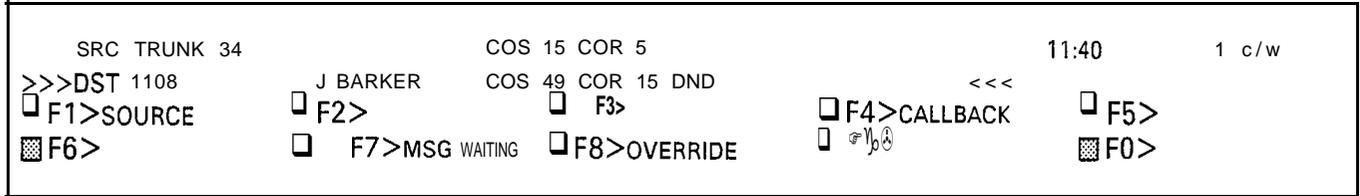
Figure 3-16 Calling an Extension with Do Not Disturb (DND)

3.21   To return to the source the Attendant can either press the SOURCE softkey or the fixed CANCEL key.

3.22   If the Attendant has a source party and reaches a destination party, the Attendant may return to the source (SOURCE), con- nect the source party with the destination party (fixed RELEASE key), or form a 3-way conference (CONF). Refer to Figures 3-17 and 3-17a. The fixed CANCEL key may be used to return to the source party.

```
    SRC  TRUNK  36                    COS  15  COR  5                              11:50          1  c/w
>>>DST  1151          B. TRAUB        COS  49  COR  15              <<<
  F1>SOURCE           F2>CONF           F3>                   F4>              F5>
  F6>                 F7>             F8>                    F9>
```
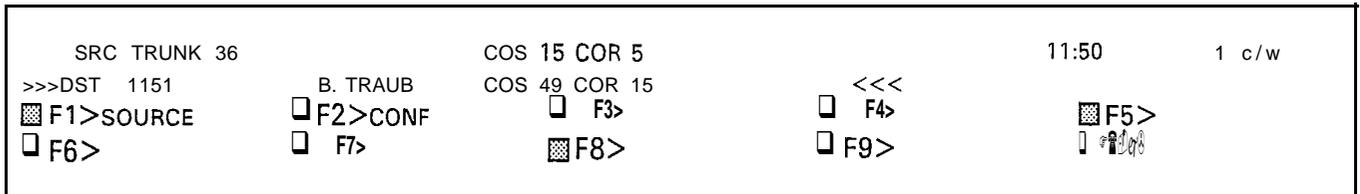
Figure 3-17 Connecting a Source and Destination or Forming a 3-Way Conference

```
>>>SRC  TRUNK  34                      COS  15  COR  5              <<<          11:53
        DST  1108      J BARKER        COS  49  COR  15
                       F2>CONF           F3>DEST              F4>              F5>
  F6>                 F7>             F8>
```
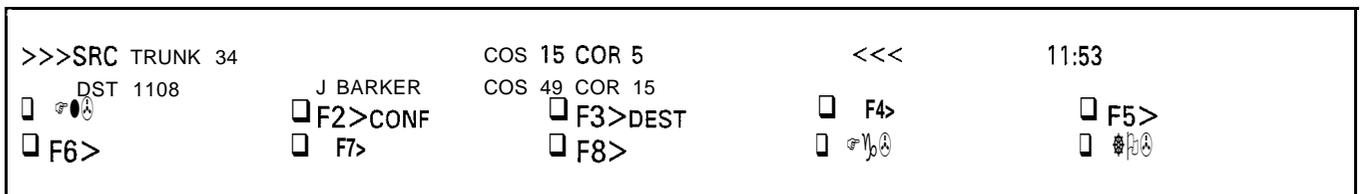
Figure 17a Connecting a Destination and a Source or Forming a 3-Way Conference

3.23   If the Attendant selected the conference option the LCD will appear as in Figure 3-18. The Attendant has the option of call splitting; i.e., talk to the source party alone or talk to the destination party alone.

3.24 The Conference Disable feature, disables the Attendant from conferencing the source and destination. The Attendant can talk to one or the other but not simultaneously. When this COS option is enabled the CONF softkey does not appear in the display.

```
>>>SRC  TRUNK  34                      COS  15  COR  5                     <<<  11:54
>>>DST  1108          J BARKER        COS  49  COR  15                     <<<
  F1>SOURCE           F2>               F3>DEST               F4>              F5>
  F6>                 F7>             F8>                                      F0>
```
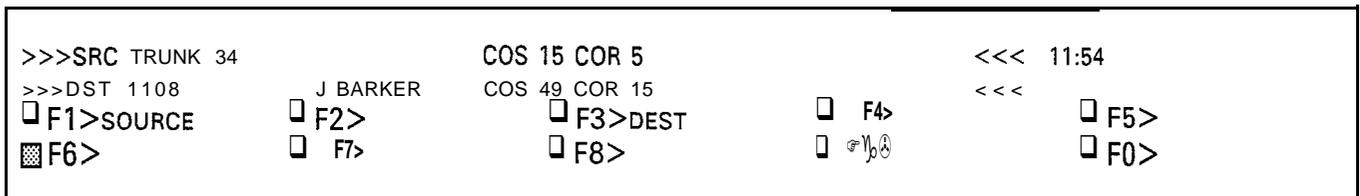
Figure 3-18 In a Conference

Busy/No Answer Recall

3.25 If the Attendant has released a source call to a destination and the destination party does not answer within the programmed time-out the source call will recall to the Attendant Console. When the Attendant answers the recall the LCD will be as in Figure 3-19. Line 2 will indicate that the destination party did not answer (NO ANSR) and the RING AGAIN prompt will be ON.

```
>>>SRC TRUNK 34          cos 15 COR 5                    <<<  12:00       1 c/w
    DST 1108      J BARKER    COS 49 COR 15   NO ANSR
  ☐ ⅄☞●⍟      ▨F2>          ☐  F3>        ▨F4>          ☐ F5>
  ☐ F6>        ☐ F7>         ☐   F8>RINGAGAIN  ☐ ☞⍗⍙⍟    ☐ ☞⍙⍟
```
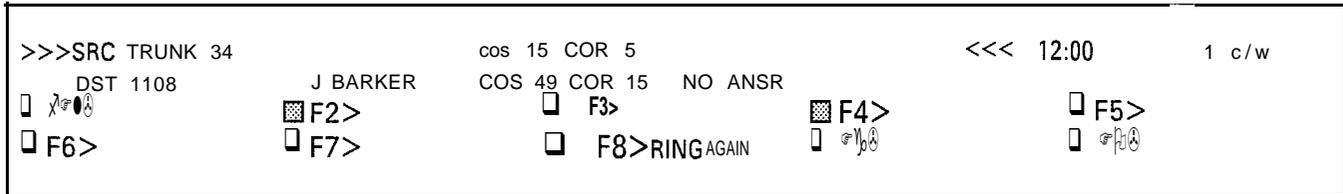
Figure 3-19 Answering a No Answer Recall

3.26 The Attendant may ring the destination party again by pressing softkey F8 (RING AGAIN). If at that time the extension is busy then the LCD will display the available functions for a busy destination (SOURCE, CALLBACK, MSG WAITING AND OVERRIDE). The Attendant may also camp the source onto the destination by releasing the call. If the extension does not answer the camp-on then the source party will recall to the Attendant Console; refer to Figure 3-20. The Attendant at this point may switch back to the destination and override the call.

```
>>>SRC TRUNK 34          COS 15 COR 5                    <<<  12:oo       1 c/w
    DST 1108      J BARKER    COS 49 COR 15  BUSY
  ▨F1>          ☐ F2>        ☐ F3>DEST      ▨F4>          ☐ F5>
  ☐ F6>         ▨F7>         ☐ F8>          ▨F9>          ☐ F0>
```
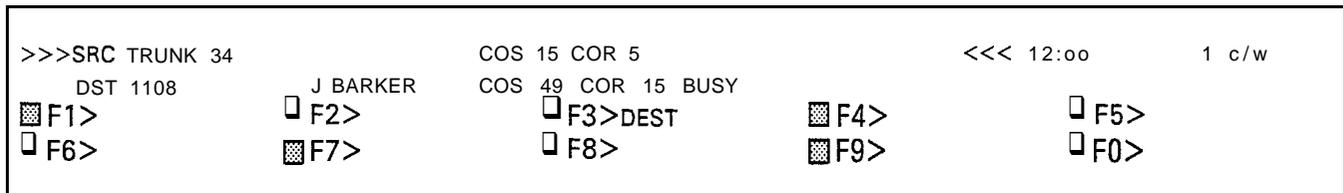
Figure 3-20 Answering a Busy Recall

Attendant Intercept

3.27 An intercept to the Attendant is displayed as INT; refer to Figure 3-21. The delimiter (>>><<<) display also indicates that the Attendant is presently connected to the source.

```
>>>SRC 1108      T. KITTLE   COS 19 COR 14  INT          <<<  12:00       4 c/w
     DST
  ☐ ☞●⍟           ☐ F2>        ☐  F3>        ☐ F4>         ☐  F5>
  ☐ F6>NO DISTB   ☐   F7>MSG WAITING  ▨F8>   ☐ F9>         ☐ ⍶☞⍙⍟
```
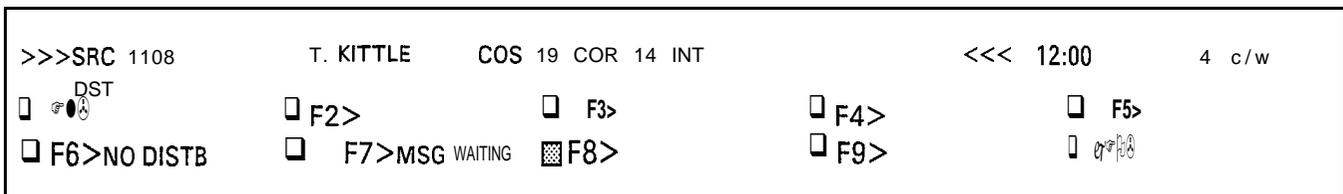
Figure 3-21 Answering an Attendant Intercept

3.28 If the console has a trunk as a source or a destination the FLASH prompt will appear at softkey position 4 as shown in Figure 3-22.

```
>>>SRC   4612        R. MILNE     COS 48 COR 12                    <<< 12:oo        4 c/w
    DST  TRUNK        7 6         COS 16 COR 3
❑ ☞●⊛              ❑F2>CONF       ❑F3>DEST        ❑F4>FLASH         ❑ F5>
❑ F6>              ❑  F7>          ▦F8>           ❑ ☞⍟⊛              ❑ ☞⍟⊛
```
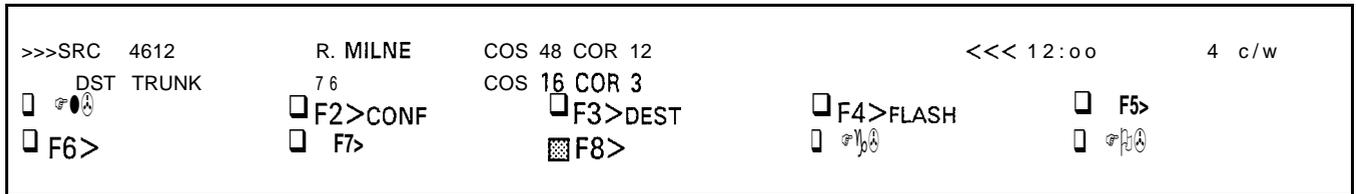
Figure 3-22 Flashing on a Trunk Call

Do Not Disturb - Setup and Cancel

3.29 When the Attendant Console is connected to an extension the displayed prompts are as shown in Figure 3-23. To set up Do Not Disturb (DND) the Attendant must press softkey F6 (NO DISTB). Line 2 of the display will indicate that the feature is active with the DND prompt after the COS and COR numbers. To cancel Do Not Disturb the Attendant simply presses softkey F6 again. The DND status flag on line 2 will disappear.

```
    SRC                                                  15:38        6 C/W
>>>DST  1108        J BARKER     COS 49 COR 15 DND        <<<
❑ ☞●⊛              ❑ F2>          ❑ F3>          ❑ F4>            ❑ F5>
❑  F6>NO DISTB     ❑  F7>MSG WAITING ❑  F8>        ❑ ☞⍟⊛            ❑ ☞⍟⊛
```
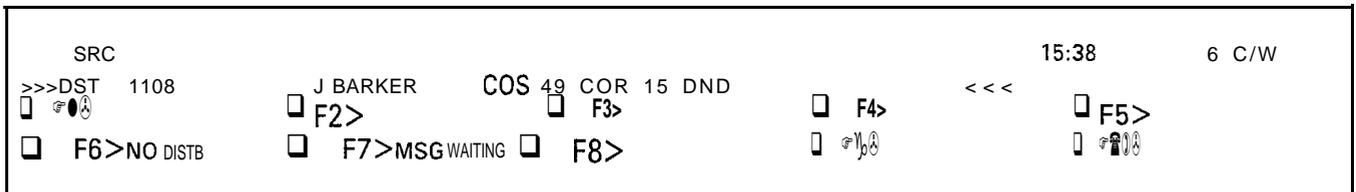
Figure 3-23 Do Not Disturb (DND)

Message Waiting - Setup and Cancel

3.30 The Attendant may set up or cancel the Message Waiting (MSW) feature for the extension. Softkey 7 is used to set up and cancel MSW. In Figure 3-24 the Attendant Console display indicates at line 2 that the Attendant is connected to an extension user with Do Not Disturb (DND) and Message Waiting (MSW) set up. To cancel MSG WAITING the Attendant must press softkey 7 (MSG WAITING). This will clear the MSW prompt on line 2.

```
    SRC                                                  10:34        6 C/W
>>>DST  1108        J BARKER     COS 49 COR 15 DND MSW     <<<
❑ ☞●⊛              ❑ F2>          ❑ F3>          ❑ F4>            ❑ F5>
❑  F6>NO DISTB     ❑  F7>MSG WAITING ❑ F8>         ❑ F9>            ❑ ☞⍟⊛
```
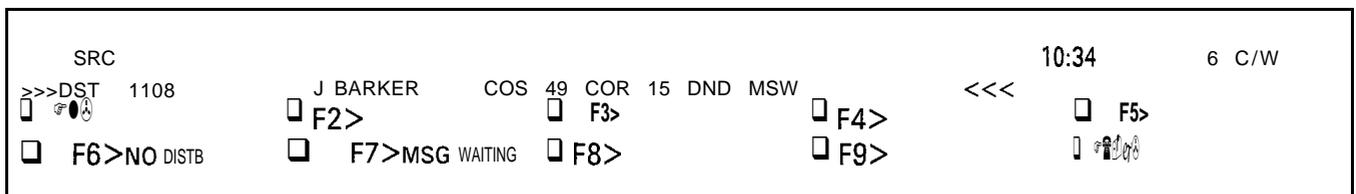
Figure 3-24 Message Waiting

Paging

3.31   The Attendant can access paging equipment using the PAGE
          fixed key on the Attendant Console. By using this key the
Attendant can access a default paging zone(s) which has been pro-
grammed in Customer Data Entry (CDE). To access a given paging
zone or all paging zones the Attendant must dial the appropriate
access code. If the Attendant has a call on hold for an extension user,
the hold pickup access code must be given to enable the extension
user to pick up the call. The hold slot access code has three fields as
shown in this example: the feature access code (66), the Attendant
Console number (05) and the hold slot number (1 to 8); refer to Figure
3-25.

For Hold Pickup Dial: 6605n   (n = HOLD SLOT NUMBER 1 - 8)
❑ ☞●🖐   ❑ F2>   ❑ F3>   ❑ F4>   ❑ F5>
▨F6>   ▨F7>   ▨F8>   ▨F9>   ❑ 🖐🖐🖐
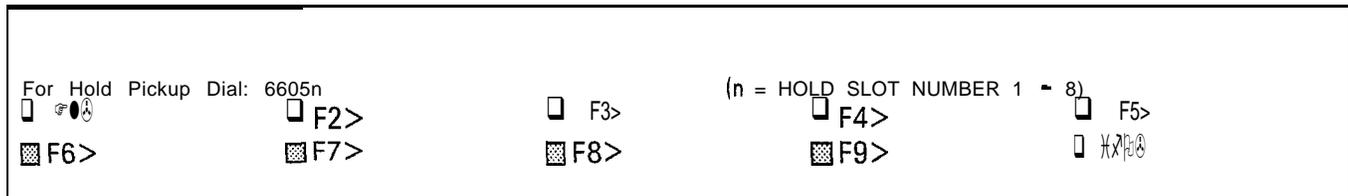
Figure 3-25 Station Hold Slot Access

Lockout Alarm

3.32   .When a station or set remains off-hook and idle for 45 seconds
          (locked out), all consoles will start to warble with a long-
short-long cadence. This cadence overrides all other cadences that
might be active. When a console is warbling with the long-short-long
lockout alarm cadence, the attendant can display the identity of the
locked out device by pressing the FUNCTION hardkey, the APPLICA-
TION softkey, and the SHOW LOCKOUT softkey, in this sequence; the
display then shows the time and date the lockout alarm occurred, the
extension number of the device, and a message stating that the device
has been off-hook too long.

Customer Data Entry/Maintenance Application

3.33   By selecting FUNCTION and the APPLICATION softkey the Atten-
          dant Console may be used as a Customer Data Entry or Main-
tenance Terminal. The display will prompt for the application desired,
and the access level and password. The password may only consist of
numeric characters. If a password has been programmed from the
Maintenance Terminal which contains alphabetic characters, Customer
Data Entry and Maintenance applications will not be accessible from
the Attendant Console. A new, numeric password must be set from the
Maintenance Terminal before these Applications become accessible
from the Attendant Console. At any time during Customer Data Entry
or Maintenance, pressing any hard key will return the Attendant Con-
sole to the call handling mode and display. To resume CDE or Main-
tenance, press:

FUNCTION + APPLICATION

The display will return to the format it had before leaving the CDE or
Maintenance   levels.   For further information, refer to Section
MITL9109-094-351-NA, RS-232 Maintenance Terminal.

Tone Signaling

3.34   This feature allows the Attendant to send DTMF tones during a
call. COS Option 119 ~ Attendant Tone Signaling must be en-
abled. When enabled, this option results in the TONES ON softkey
being displayed whenever the Attendant is talking on an internal **or**
external call. Pressing TONES ON enables the tones generated by the
dial keypad. Pressing TONES ON also causes the softkey label to
toggle to TONES OFF. Tones dialed using this feature are ignored by
the PABX, and are transmitted out onto the line or trunk. Pressing
TONES OFF disables Tone Signaling.

Trunk Group Busy indication

3.35   This feature is used to display the status of Trunk Groups.
Trunk Group Status may be displayed when the console is idle,
or when a call is in progress. If used when the console is idle, the
display is updated every 5 seconds. To use the feature press the
TRUNK STAT fixed key. The first 19 Trunk Groups will be displayed.
Press the MORE softkey to see the next 20 Trunk Groups, and press it
once more to see the last 11 Trunk Groups. After the last 11 groups
are displayed, pressing MORE will re-display the first 19 groups. The
solid block beneath the Trunk Group number indicates that group is
busy. To exit the feature, press the EXIT softkey.

Figure 3-26 Trunk Group Busy indication

Additional   Attendant   Functions

3.36   Additional Attendant functions are accessed by the use of fixed
key and softkey functions. The fixed FUNCTION key must be
pressed to access the softkey functions. Figure 3-27 gives the appear-
ance of the Attendant Console display after the fixed FUNCTION key
has been pressed.

```
                                                    11:52        3  c/w

❏ F1>EXIT      ▨ F2>ATT FUNCTION ❏   F3>NIGHT 1      ❏ F4>NIGHT 2      ▨ F5>GUEST ROOM
❏ F6>APPLICATION  ❏ F7>ALARM       ❏  F8>BELL OFF     ❏ FS>FRANCAIS     ▨ F0>IDENTITY
```
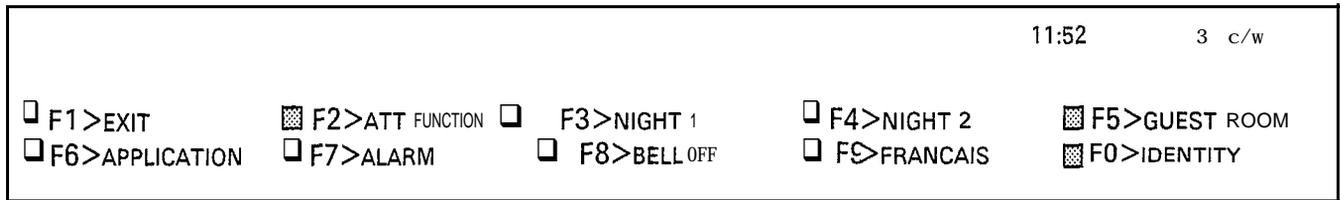
Figure   3-27   Additional   Functions

EXIT: Softkey F1 (EXIT) allows the Attendant to return to the previous display; i.e., to exit the function mode.

ATT FUNCTION: Softkey F2 (ATT FUNCTION) when pressed will display prompts as shown in Figure 3-28. These functions allow the Attendant to do the following:

```
                                                    11:52        3  c/w

❏ F1>EXIT      ❏  F2>SET TIME    ❏   F3>SET DATE    ❏ F4>STATIONS    ❏ F5>TRUNKS
❏  F6>ABBR DIAL   ❏ F7>           ❏  F8>SYSTEMDENT ❏ F9>             ▨ F0>MORE...
```
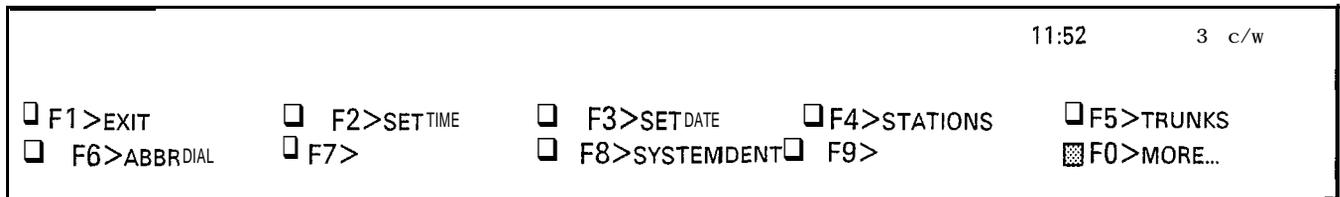
Figure   3-28   Additional   Attendant   Functions

MORE: Pressing this softkey displays more additional Attendant Functions as shown in Figure 3-29.

```
                                                    11:52        3  c/w

❏ F1>EXIT      ❏ ☞⌘☉❄♪☒ ALL FWD ❏ ☞♦☉❄♪☒ ALL CBK  ❏ ☞▤☉         ❏  F5>
❏  F6>DISA CODE   ▨ F7>FLEX NIGHT   ▨F8>              ❏ ☞❧☉         ❏  F0>MORE...
```
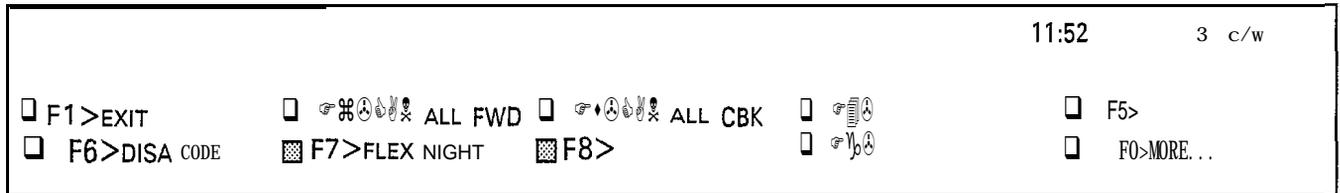
Figure   3-29   More   Additional   Attendant   Functions

EXIT: Softkey F1 (EXIT) allows the Attendant to return to the previous display; i.e., to exit the FUNCTION mode.

MORE: Pressing the MORE softkey returns the display to the previous functions (Figure 3-28).

SET TIME: Softkey F2 (SET TIME) when pressed will display prompts as shown in Figure 3-30. The Attendant must dial in the time in a 4-digit string, 2-digit hours (HH) and 2-digit minutes (MM). If the entry is correct (refer to Figure 3-30a) the display area for softkey F3 will show 'PM'. The Attendant may select AM by pressing softkey F2 (SET) or select PM by pressing softkey F3 (PM). The 12- or 24-hour clock mode is preselected during CDE. If the entry is incorrect the Attendant Console will not display SET. The "←" key can be used to back up and

clear the incorrect entry, or the EXIT softkey can be pressed to exit the
SET TIME function.

```
                                                        08:34          6  C/W

Enter  Time  (HH:MM) =_
❏ F1>EXIT          ❏ F2>          ❏  F3>          ❏ F4>          ❏   f5>
❏ F6>              ❏  F7>         ▥F8>            ❏  ☞⅄ⓞⓞ        ❏  ☞▯ⓞ
```

Figure   3-30   Setting   Time   of   Day

```
                                                        08:34          6  C/W

Enter  Time  (HH:MM) = 09:34
❏ F1>EXIT          ❏F2>SET        ❏F3>PM          ❏  F4>          ▥F5>
▥F6>               ❏  F7>         ❏ F8>           ❏ F9>           ❏  ☞▯ⓞ
```
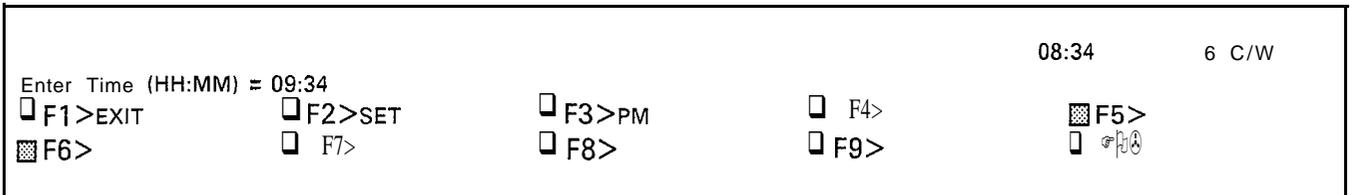
Figure   3-30a   Setting   Time   of   Day

SET DATE: Softkey F3 when pressed will display prompts as shown in
Figure 3-31. The Attendant must dial in the 6-digit string representing
the date; i.e., 2-digit day (DD), 2-digit month (MM) and 2-digit year
(YY). If the entry is correct the prompts will be as in Figure 3−31a. If
softkey F2 (SET) is pressed the date will be entered; if softkey F1 is
pressed the Attendant Console will revert to the previous state and the
entered date will not register.

```
                                                        09:34          6  C/W

Enter  Date  (DD/MM/YY) = _
❏  ☞●ⓞ            ▥F2>           ❏  F3>          ❏ F4>           ❏ F5>
❏ F6>             ❏ F7>          ▥F8>            ❏  ☞⅄ⓞⓞ         ❏  ☞▮ⓞⓞ
```
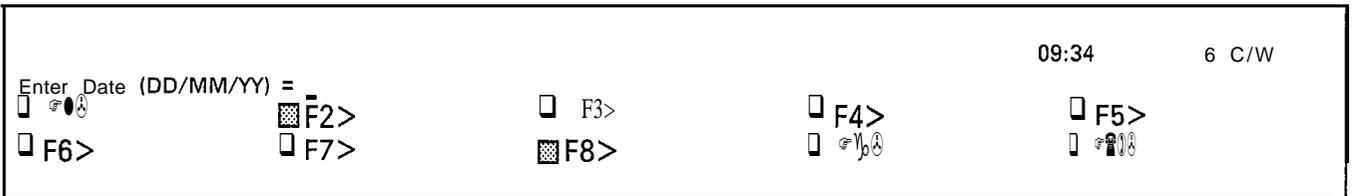
Figure   3-31   Setting   the   Date

```
                                                        09:34          6  C/W

Enter  Date  (DD/MM/YY) = 30/08/84
❏ F1>EXIT          ❏ F2>SET        ❏  F3>          ❏ F4>           ❏  F5>
❏ F6>              ❏  F7>          ❏ F8>           ❏  ☞⅄ⓞⓞ         ❏  ☞▯ⓞ
```
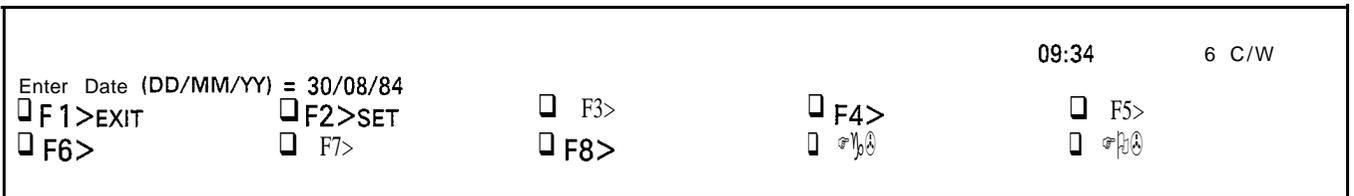
Figure   3-31a   Setting   the   Date

STATIONS: This key enables the Attendant to enter an extension number in order to set up Call Forwarding, busy out the station or set up Message Waiting without calling the extension user. As shown in Figure 3-32 the Attendant simply has to enter the extension number. The CALL FWD and BUSY OUT prompts will appear as shown in Figure 3-32a; SET UP MSG prompt appears for a *SUPERSET* 4 telephone or a *SUPERSET* 4DN telephone. The ⊷ key on the keypad may be used to change the extension number and enter another without having to EXIT and reenter ATT.FUNCTION each time.

```
                                                    09:34          4  c/w

Enter  Extension  Number:_
❏ F1 >EXIT        ❏ F2>         ❏ F3>        ▦F4>        ❏ F5>
❏ F6>             ❏ F7>         ▦F8>         ❏  ☞ⁿⅉ∂      ❏  ☞ⅉ∂
```

Figure   3-32   Setting   Extension   Features

```
   1108              J. BARKER    COS 49 COR 15              10:34        4  c/w

Enter  Extension  Number: 1108
❏ F1 >EXIT        ❏ F2>CALLFWD    ❏ F3>BUSYOUT    ❏ ☞⎁⑥◖☜✳ UP MSG   ❏ F5>
❏ F6>NODISTB      ❏   F7>MSG WAITING ▦F8>         ❏ ⫙ⁿⅉ∂             ▦F0>
```
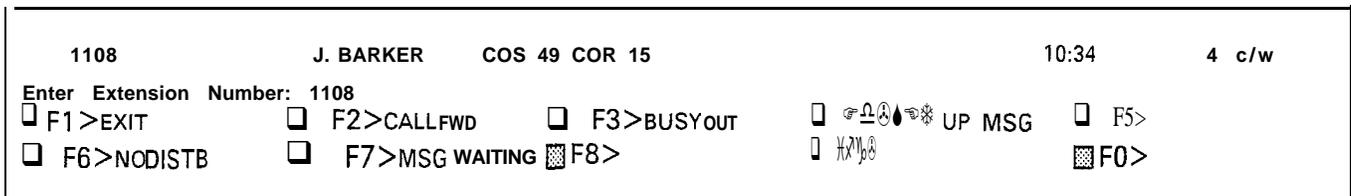
Figure   3-32a   Setting   Extension   Features

EXIT: The Attendant may return to the previous state by pressing softkey F1 (EXIT).

CALL   FWD: To view. or to set up Call Forwarding for the extension , press softkey F2 (CALL FWD). Line 1 will redisplay information pertinent to the dialed extension number. Line 2 will provide the Call Forwarding status for the extension as shown in Figure 3-33.

```
   1291              R. BUDD    COS 49 COR 15                10:35

Currently to  1132  Always                  Forward  to:_
❏ F 1 >EXIT       ❏F2>CANCEL      ❏  F3>        ❏ F4>        ❏ F5>
▦ F6>             ❏   J7>         ▦F8>          ❏  ☞ⅉ∂       ❏ ☞⎃∂
```
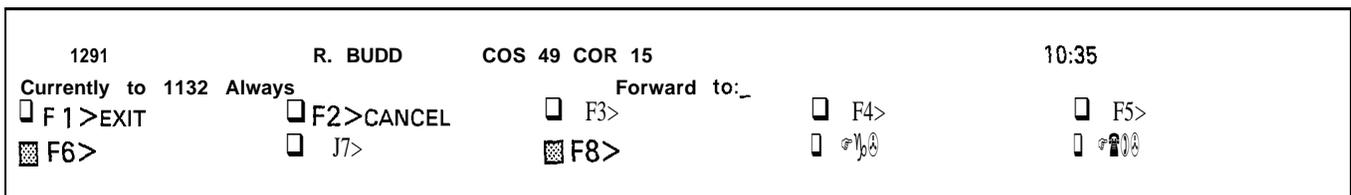
Figure   3-33 Setting   Call   Forwarding

To forward the calls to another destination the Attendant must enter a valid extension number, Hunt Group Access Code, or Abbreviated Dial number. The display will change to provide the options shown in Figure 3-33a. Line 2 will now display pertinent information about the forwarded extension user. The softkey options are: Always Forward (F2), Forward when there is No Answer (F3), Forward when Busy (F4) or

Forward   when   Busy   or   when   there   is   No   Answer   (F5).

CANCEL: The   Attendant   may   cancel   Call   Forwarding   for   the   extension
by   pressing   this   key.

When   a   call   has   been   forwarded   to   an   Attendant,   the   console   replaces
the   COS   and   COR   fields   of   the   source   display   with   the   extension
number   of   the   party   whose   telephone   has   been   forwarded.   (Refer   to
Figure   3-33b).

```
    1291                R. BUDD        COS 49 COR 15                                        10:35
Currently to 1132 Always                          Forward to: 1151
▨F1>EXIT        .        ▨F2>ALWAYS        ▨F3>NO ANSWER     ❏F4>ON BUSY        ❏  F5>BUSY/NOANS
❏F6>                    ▨F7>            ❏F8>              ▨F9>               ▨F0>
```
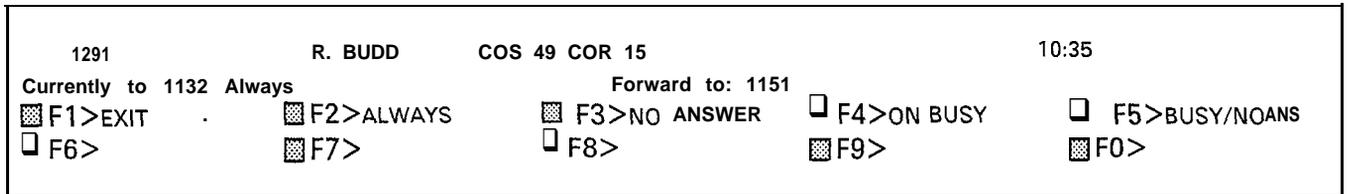
Figure   3-33a   Setting   Call   Forwarding

```
>>>SRC 3401                        Fwd From 4942                  <<< 1 1:50 AM        1  c/w
     DST
❏  ☞●Ⓐ                    ❏F2>             ❏ F3>            ❏ F4>             ❏F5>
❏ F6>NODISTB            ❏ F7>MSGWAITING❏ F8>              ❏ ☞Ⓨ₀Ⓐ            ❏ ☞Ⓗ₀Ⓐ
```
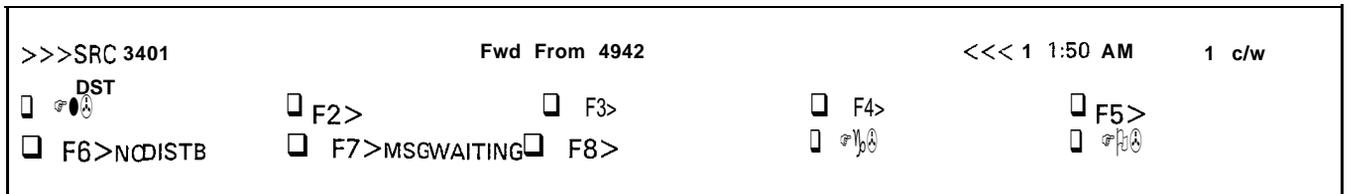
Figure   3-33b   Forwarding   Indication

BUSY   OUT: This   feature   enables   the   Attendant   to   busy   out   a   station
or   *SUPERSET*   telephone.   The   BUSY   OUT   prompt   will   appear   after   the
Attendant   has   entered   the   following   key   sequence:

FUNCTION   +   ATT.   FUNCTION   +   STATIONS   +   EXTENSION   NUMBER   +
BUSY   OUT

The   display   will   be   as   shown   in   Figure   3-34.   Line   1   will   display   per-
tinent   information   about   the   entered   extension   number;   i.e.,   extension
number,   user   name,   COS   and   extension   status   (BUSY   or   IDLE).

```
    1291                R. BUDD        COS 49 COR 15              IDLE              10:35
Enter Extension Number:_1291
❏ F1>EXIT              ❏F2>SET            ▨F3>              ▨F4>              ▨F5>
❏ F6>                  ▨F7>               ▨F8>              ▨F9>              ▨F0>
```
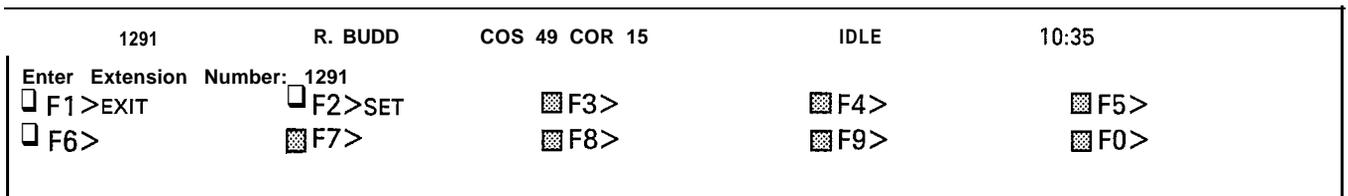
Figure   3-34   Setting   Busy-Out

The   Attendant   may   busy   out   the   extension   by   pressing   the   SET   key
(F2).   If   the   extension   is   idle   as   in   Figure   3-34,   the   extension   will
immediately   be   busied-out   and   the   display   will   change   from   IDLE   to
BSY   OUT   (Busied-Out).   If   the   extension   is   busy   the   Attendant   may   still
set   the   busy-out   condition.   The   extension   will   only   become   busied-out

when the extension becomes idle.

When an Attendant calls an extension which has been busied-out, the BSY OUT prompt will appear and the Attendant may cancel the busied-out condition by pressing softkey F2 (CLEAR).

SET UP MSG: This feature enables the Attendant to set up system-wide *SUPERSET* telephone messages by the following key sequence:

FUNCTION + ATT. FUNCTION + STATIONS + EXTENSION NUMBER + SET UP MSG

After the above key sequence has been entered the display will be as shown in Figure 3-35. The Attendant may EXIT (F1), view the next available message by pressing the NEXT softkey (F2) or set up the message displayed on line 2 for the *SUPERSET* telephone. When the message is set up, softkey F3 will display OFF to enable the Attendant to disable the systemwide message for that set.

1108	**J. BARKER**	**COS 49 COR 15**	**IDLE**	**10:35**
1 IN A MEETING				
❑ F1>EXIT	❑ F2>NEXT	❑ F3>ON	❑ F4>	❑ F5>
❑ F6>	▨ F7>	❑ F8>	❑ F9>	❑ F0>
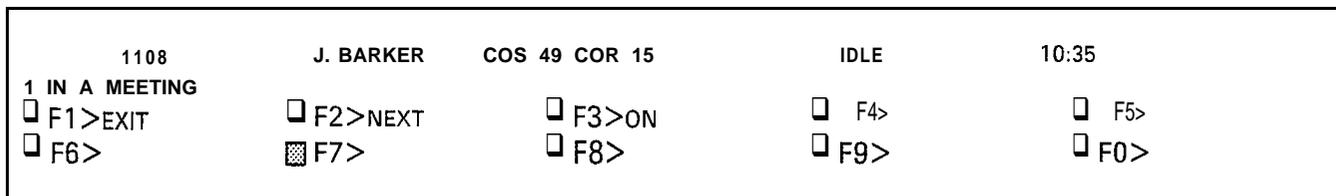
Figure   3-35   Setting   Systemwide   Messaging   for   *SUPERSET*   Telephone

TRUNKS: This feature enables the Attendant to access trunk hardware control functions by entering the following key sequence:

FUNCTION + ATT. FUNCTION + TRUNKS

The Attendant Console display will be as shown in Figure 3-36. The Attendant must enter a trunk number. The display will change as shown in Figure 3-36a. The Attendant may request trunk status, restrict trunk access or busy out the trunk.

				10:35
Enter Trunk Number:-				
❑ F1>EXIT	❑ F2>	❑ F3>	❑ F4>	❑ F5>
❑ F6>	❑ F7>	❑ F8>	❑ ☞◌◌	❑ ☞◌◌
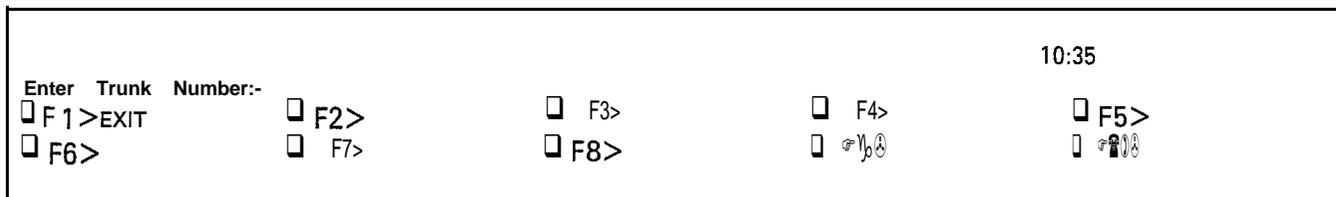
Figure   3-36   Setting   Trunk   Functions

```
                                                                    10:35
Enter  Trunk  Number: 72_
   ❏ F1>EXIT           ❏ F2>STATUS        ❏  F3>ATT ACCESS      ▨ F4>BUSY OUT       ❏  F5>
   ▨F6>                ❏ F7>              ❏ F8>                 ❏ F9>               ▨F0>
```
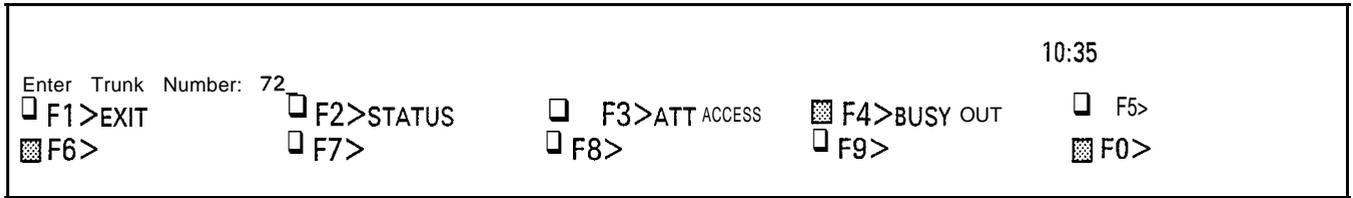
Figure 3-36a Setting Trunk Functions

```
      SRC                                                               11:50 AM
   >>>DST   TRUNK  12                   COS 1 COR 1      BUSY         <<<
   ▨F1>                ❏ F2>FORCED RLS  ❏ F3>           ❏  F4>                ❏  F5>
   ▨F6>                ❏  F7>           ❏ F8>OVERRIDE   ❏  ✑🐾𝄐               ▨F0>
```
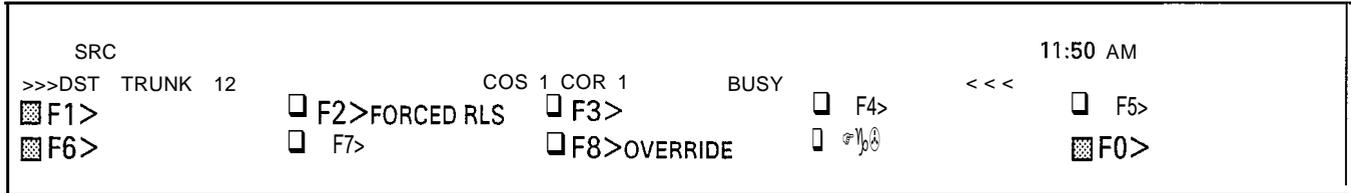
Figure 3-36b Override a Busy Trunk

STATUS: The Attendant may view trunk status by pressing this key. The display will have the format shown in Figure 3-37.

```
         TRUNK  72                       COS 15 COR 5      BSY OUT     10:35
   Enter  Trunk  Number: 72_
   ▨F1>EXIT            ▨F2>             ▨F3>            ▨F4>           ❏ F5>
   ❏ F6>               ❏  F7>           ▨F8>            ❏ ✑𝄐𝄐𝄐         ❏ ✑🐾𝄐
```
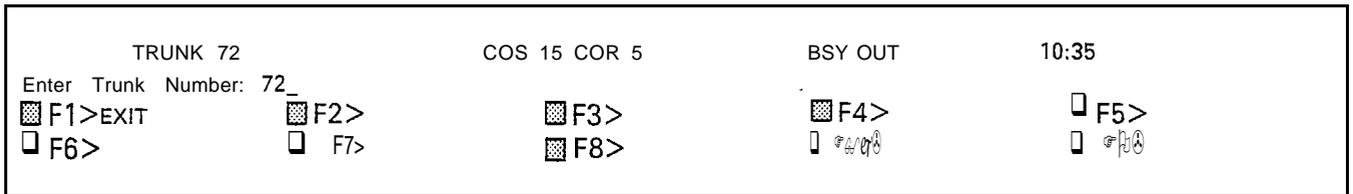
Figure 3-37 Trunk Status Display

ATT. ACCESS: This feature permits the Attendant to select a specific trunk. After a trunk number has been entered (see Figure 3-36) the LCD will change as shown in Figure 3-36a. Pressing ATT. ACCESS results in the trunk being seized by the attendant. If the trunk is busy the attendant can override it by pressing the OVERRIDE softkey. Refer to Figure 3-36b.

FORCED TRUNK RELEASE: To force release a locked-up trunk, press the following softkeys:

MORE-KEYS
DISC-TRUNK
BAY/S LOT/CCT
(enter the required bay, slot, and circuit numbers, pressing the RETURN key after each one)
ENTER

BUSY OUT: Pressing this key results in information concerning the trunk being displayed. Two softkey options are presented: EXIT and SET (if the selected trunk is idle) or CLEAR (if the trunk is busied out). Pressing SET causes the trunk to be busied out and causes the display to revert to call processing mode. Pressing CLEAR returns the trunk to

idle and causes the display to revert to call processing mode.

NIGHT SWITCHING: The NIGHT1 and NIGHT2 keys are used to place the areas of the system controlled by a given Attendant Console into night service. In multi-tenant applications, each tenant may locally switch into night service without affecting any other tenant, unless programmed to do so. Pressing the NIGHT1 or NIGHT2 softkey results in the night service status being displayed on the Attendant Consoles affected. If night service is in effect, the display will show the softkey DAY SERVICE. Pressing this key will result in a return to day service.

```
                                              10:35         .

❏ F1>EXIT        ❏  F2>ATT FUNCTION ❏  F3>NIGHT1      ❏ F4>NIGHT 2      ❏  F5>
❏ F6>APPLICATION ❏ F7>ALARM         ❏ F8>BELL  OFF    ❏ F9>FRANCAIS     ▦ F0>IDENTITY
```
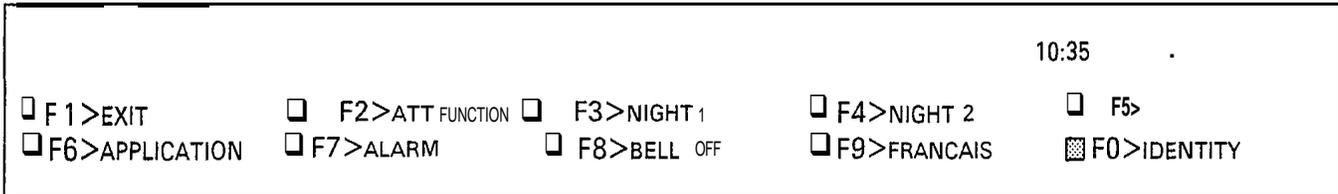
Figure 3-38 Night Switching and Language Option Display

```
                                              10:35
                                                              NIGHT 2
❏ ☞●⏅         ❏ F2>          ❏  F3>        ❏  F4>         ❏  F5>
▦ F6>         ❏  F7>         ▦ F8>         ❏ F9>REDIAL    ▦ F0>
```
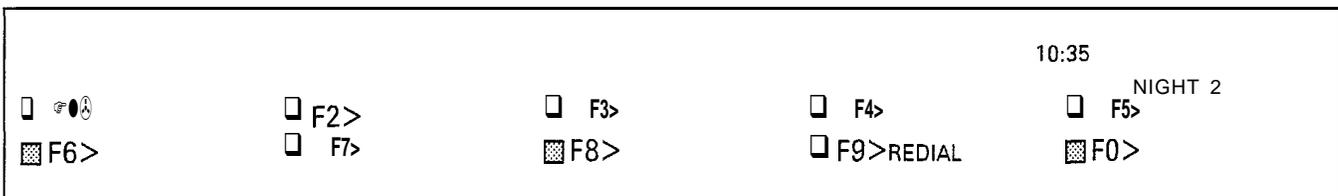
Figure 3-39 Night Service 2 in Effect

ALARM RESET: When the system generates a minor alarm due to a detected fault by the system's diagnostics routines, a new alarm flag will automatically be displayed on Attendant Consoles programmed to receive minor alarms. This will appear on the destination line as shown in Figure 3-40. The alarm may be reset, and the cause of the alarm displayed, by pressing:

<p align="center">FUNCTION + ALARM:</p>

Pressing the CANCEL softkey will clear the alarm message currently being read and return the console to call processing mode. Pressing MORE permits reading additional alarm messages. The flashing ALARM message will continue until all alarm messages have been read. Alarms cannot be read while:

- the console is performing Maintenance or CDE functions
- the maintenance terminal is performing Maintenance or CDE functions
- another console is reading alarm messages or performing Maintenance or CDE functions.

```
 WED  MARCH  2,  1988                    Minor  Alarm                                10:35

❏ F1>EXIT          ❏ F2>              ❏  F3>            ❏ F4>              ❏ F5>
▨ F6>NO DISTB      ❏   F7>MSG WAITING ▨ f--8>          ❏  ☞⑂◔         ❏  ☞⑂◔
```

Figure   3-40   Alarm   Display

FRANCAIS/ENGLISH: When the FRANCAIS softkey is pressed all soft-key labels and Call Processing messages are displayed in French; the softkey prompt toggles to ENGLISH. Pressing the ENGLISH softkey causes all softkey labels and Call Processing messages to be displayed in English; the softkey prompt toggles to FRANCAIS.

IDENTITY: When the IDENTITY softkey is pressed the display shows the Attendant Console's identity, as well as the software release and revision number in which the system is currently operating.

ABBR.   DIAL: Attendant Abbreviated Dial functions are accessed via the key sequence:

FUNCTION + ATT. FUNCTION + ABBR DIAL

The Abbreviated Dial digits to be dialed are prompted for by the words "ENTER INDEX NUMBER". A number of up to three digits can **then** be entered. Pressing the ENTER key results in the display changing to that shown in Figure 3-41. The number the system is to dial when this index number is selected is then entered. If a digit string is already assigned to that index number, the digit string will be displayed against the index number. A new number can then be entered against this index number, replacing the previous one, if desired, or the Abbreviated Dial function can be exited, or the current index number entry sequence canceled. Once a digit string has been entered, the SET softkey is displayed. Pressing SET will result in the digit string being saved in the system memory. Each time that index number is keyed, the system will then dial the entered digit string.

```
 37  =  96135922122                                                   10:35
 Dial    Number:-
❏ F1>EXIT          ❏ F2>            ❏ F3>PRIVATE      ❏ F4>CANCEL       ▨ F5>
❏ F6>              ❏ F7>            ❏ F8>             ❏  ☞⑂◔        ❏  ☞⑂◔
```

Figure   3-41   Abbreviated   Dialing   Functions

SYSTEM IDENTIFIER: When this softkey is pressed the display shows the current system identifier, and prompts for the desired identifier. A number consisting of from one to three digits can be entered.

CANCEL ALL CALL FORWARDING/CALLBACK: The CANCEL ALL CALL FORWARDING and CANCEL ALL CALLBACK functions are accessed by the following key sequence:

FUNCTION + ATT. FUNCTION + MORE + CAN. ALL FWD (or CAN. ALL CBK)

Pressing CAN. ALL FWD will clear all call forwarding; pressing CAN. ALL CBK will clear all callbacks.

DISA CODE: The DISA CODE softkey allows the Attendant to redefine the Access Code required for a call originating outside the PABX to access the PABX's features (Direct Inward System Access). The DISA code is set up by the following sequence:

FUNCTION + ATT. FUNCTION + MORE + DISA CODE

The display then prompts for the DISA Access Code, and the softkeys SET and EXIT are displayed. Pressing SET enters the new Access Code into the system. Pressing EXIT returns the display to its normal call handling mode.

FLEXIBLE NIGHT SERVICE: Flexible night service allows the Attendant to redefine the inward routing of non-dial-in trunks. This permits the routing for NIGHT1 and NIGHT2 to be changed. Access to this function is gained by the following sequence:

FUNCTION + ATT. FUNCTION + MORE + FLEX NIGHT

The display then prompts for trunk number. The trunk number is keyed in, followed by selecting NIGHT1 or NIGHT2, and the new destination. Pressing the SET key will cause the routing to be changed. The routing destination may be a *SUPERSET* telephone, a *SUPERSET* line, an Attendant Console LDN or an LDN appearance on an Attendant Console. It may also be a night bell directory number.

```
        TRUNK 72              COS 49 COR 15                       10:35
Currently to 1251                        Forward to:1 108_
 ❑ F1>EXIT          ❑ F2>SET        ❑ F3>            ❑  F4>            ❑  F5>
▨ F6>              ❑  F7>          ▨ F8>           ▨ F9>            ▨ F0>
```
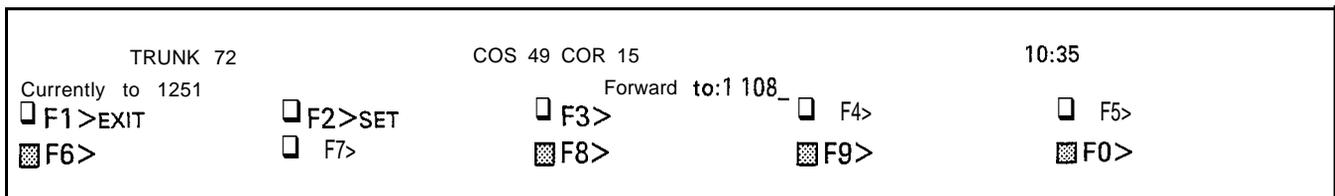
Figure 3-42 Flexible Night Service Setup

4. HOTEL/MOTEL FEATURES

General

4.01   The standard Attendant Console features described in Part 3 may be supplemented by additional features related specifically to hotel/motel PABX installations. When enabled, most of these features are accessed from the Call Processing mode of the Attendant Console by pressing the FUNCTION key and the GUEST ROOM softkey (F5). The exception to this is the Call Block feature, which is accessed by pressing the BLOCK fixed key (next to the PAGE key). The following paragraphs describe the way these features are accessed from the Attendant   Console.

Call   Block/Room-to-room   Restriction

4.02   This feature permits the Attendant to prevent extensions from calling one another. (Refer to Section MITL9109-094-105-NA, Features Description, for a description of the operation of this feature.) Call Block is implemented by pressing the BLOCK key. The LED associated with this key lights when Call Block is active. Pressing the key a second time removes Call Block.

Guest Room

4.03   Pressing FUNCTION, then the GUEST ROOM softkey gives the Attendant the ability to do any of the following:

- Display the Message Register
- Clear the Message Register
- Set up and cancel an Automatic Wake-up Call
- Change the status of a room
- Set up and cancel Do Not Disturb for a room
- Set up and cancel Message Waiting for a room
- Set up and cancel Outgoing Call Restriction
- Generate printouts of Room Status, Wake-Up calls and Message Registers
- Display of all rooms with maids in them
- Display all vacant and clean rooms

The GUEST ROOM function can be accessed regardless of whether the Attendant Console is idle or in the process of handling a call. When handling a call, after the FUNCTION, GUEST ROOM keys and extension number are pressed the Attendant Console display will show information regarding the source on the top line of the display, room functions on the second line, and the softkeys on the remaining two lines. Refer to Figure 4-l.

```
    4951        J. LAKS      COS 12 COR 01 DND MSW                 11:12 AM      6 C/W
   Reg = 00001      Wake-Up = 12:34P        Status = Vac/Clean/LD
❏ F1>EXIT          ❏  F2>CLRREG       ❏ F3>SET WAKE-UP  ❏ F4>CLR WAKE-UP  ❏ F5>STATUS
❏  F6>NODISTB      ❏   F7>MSG WAITING  ▨F8>            ❏ F9>              ❏   F0>ROOM NUMBER
```
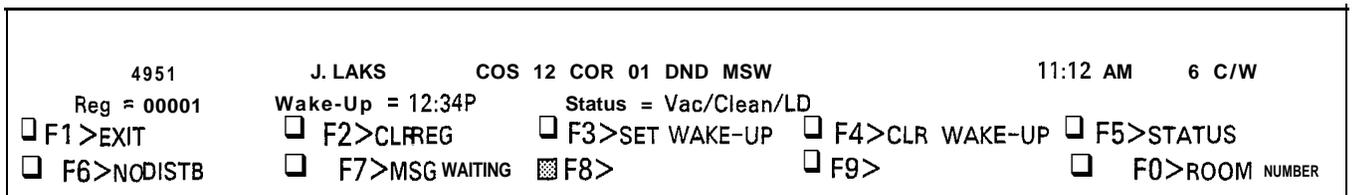
Figure 4-1 GUEST ROOM Display During a Call

Pressing GUEST ROOM while the Attendant Console is not engaged in a call will produce the display shown in Figure 4-2.

```
                                                              11:12 AM     6 C/W
Enter  Room   Number:-
❑ F1>EXIT          ❑ F2>MAID          ❑ F3>VAC/CLEANRM❑ F4>AUDITS        ▨F5>
❑  ☞🕮🔔            ❑ F7>RES/CLEAN RM ❑ F8>                ❑ ☞🕮🔔🎵♦❄ OF SERV. ▨F0>
```
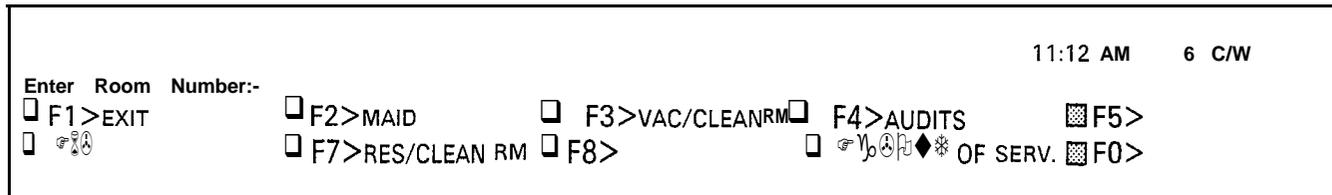
Figure 4-2 GUEST ROOM Display with Idle Console

Once a room number (extension number) has been entered, the display will change to the format shown in Figure 4-l with a ROOM NUMBER softkey displayed in the FO position. Pressing EXIT at any time returns the Attendant Console to its prior state (e.g., idle or busy call processing). The functions of the various softkeys shown above are as follows:

CLR REG: The CLR REG softkey (Clear Register) is used to reset the Message Register to zero. Pressing this key will clear the register, and return the Attendant Console to Call Processing mode. Clearing the register may result in a l-line report being printed.

SET WAKE-UP and CLR WAKE-UP: The SET WAKE-UP softkey is used by an Attendant to set or change, a wake-up call for a room. SET WAKE-UP appears after the FUNCTION key, the GUEST ROOM softkeys and extension number are pressed. This softkey is also displayed while talking to a source. This enables the Attendant to enter a wake-up call while it is being requested. If a wake-up time is set against a room, pressing CLR WAKE-UP will cancel the wake-up, then return the Attendant Console display to its previous Call Processing display. Figure 4-3 shows the Attendant Console display after the SET WAKE-UP softkey is pressed. To set a wake-up time, the Attendant enters a room number after GUEST ROOM is pressed (if the console is idle); if the console is engaged in a call to a room, the room information is displayed.

```
        100      J. SMITH         COS 12 COR 01 DND MSW           11:12 AM    6 C/W
Enter  Wake-Up ( HH:MM ) =
▨F1>EXIT              ❑ F2>          ❑  F3>          ❑ F4>          ❑ F5>
❑ F6>                ❑  F7>         ▨F8>           ❑  ☞🕮🔔         ▨F0>MORE…
```
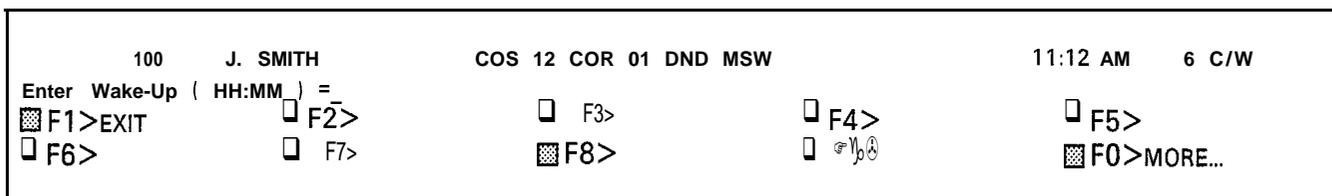
Figure 4-3 Setting Automatic Wake-Up

Dialing a valid 4-digit time will result in the display changing to that shown in Figure 4-4. Three options are presented in addition to EXIT: SET, PM and MORE. Pressing either SET or PM will result in the wake-up becoming activated. The display **reverts** to its previous form (Figure 4-l). Pressing the more softkey also returns the display to the previous form without changing the wakeup time.

```
      100      J. SMITH          COS  12  COR  01  DND  MSW              1 1:12 AM    6  C/W
Enter  Wake-Up  (  HH:MM  )  =12:35
  ❑ F1>EXIT          ❑ F2>SET          ❑ F3>PM          ❑  F4>          ❑ ☞❄☜☋
  ❑ F6>             ❑  F7>            • ｊF8>           ❑  ☞❄☍         ▦ F0>MORE...
```

Figure   4-4   Automatic   Wake-Up

Setting, changing, cancelling, and honoring an Automatic Wake-Up will result in a printed record of the event, if the System Option "Automatic Wake-up Print" is enabled. Wake-ups may also be set up without involving the Attendant, from a room extension. In this case, an access code is dialed from the extension, and the time entered in 24-hour format. Dialing the Access Code and "9999" will clear the Automatic Wake-Up from the station.

STATUS: The STATUS softkey permits the Attendant to display and change the status of a room. The Attendant presses FUNCTION, GUEST ROOM, and the room number (if not engaged in a call), then presses the STATUS softkey. All occupied/vacant rooms have default call restriction, programmed via CDE, System Option Timers form. The display changes to that shown in Figure 4-5.

```
      1352    N. MCMILLAN        COS  03  COR  01  DND  MSW             11:12 AM    6  C/W
Status = Vac/Dirty/Int/Maid
  ▦ F1>EXIT         ❑ F2>OCCUPIED     ❑ F3>RESERVED     ❑ F4>CLEAN       ❑  F5>TO INSPECT
  ▦ F6>            ❑ F7>LOCAL        ❑ F8>LONG DIST    •ｌ F9>OUT OF SERV.  ▦ F0>MORE...
```

Figure   4-5   Room   Status   Display

When the status of a room is changed from occupied to vacant, any wakeup calls or message waiting still in effect are cancelled.

Pressing the OCCUPIED softkey toggles the status display from "Vac" (vacant) to "Occ" (occupied), and the OCCUPIED softkey changes to VACANT. Similarly, pressing the CLEAN softkey toggles the status from "Dirty" to "Clean", and changes the CLEAN softkey to DIRTY. Pressing the LOCAL softkey will toggle the status from "Int" to "Loc", and change the softkey from LOCAL to INTERNAL. Pressing the LONG DIST softkey changes the status to "LD" and toggles the LONG DIST key to LOCAL. The "Maid" portion of the status display is activated from the room by dialing a "MAID IN ROOM" access code plus a single digit (1, 2, or 3). "1" indicates a maid is in the room; "2" indicates there **is no** maid in the room; "3" indicates the room is clean, and the maid is not in the room. Pressing the RESERVED softkey changes the status of the room from Vacant or Occupied, and the softkey toggles to the previous room status. Pressing the TO INSPECT softkey changes the room status to INSPECT and the softkey toggles to the previous room status. Pressing the OUT OF SERV. softkey changes the room status to SERV.

and the softkey toggles to the previous room status. When a room status is changed, the default call restriction (as programmed in CDE for that room status) is also assigned for that room, if the current restriction was different.

MORE: Pressing the MORE softkey returns the screen to the previous display (Refer to Figure 4-l).

Room status can also be converted automatically if System Options "Auto Room Status Conversion/Auto Wake-Up Print" and "Auto Room Status Conversion/Auto Wake-Up Print Timer" are enabled. Once the timer is programmed, the system will automatically change the status of all occupied and clean rooms to occupied and dirty. At this programmable time, an audit is also performed on all automatic wake-up calls.

NO DISTB and MSG WAITING: These softkeys operate as they do' in the commercial application of the Attendant Console.

ROOM NUMBER: This key will prompt the user to enter a room number as shown in Figure 4-2.

Guest Room Functions

4.04   When the FUNCTION and GUEST ROOM keys are pressed, the display changes to that shown in Figure 4-2. Pressing EXIT returns the Attendant Console to its previous display. The functions of the remaining softkeys are described below:

MAID: Pressing this softkey changes the display to that shown in Figure 4-6. The MORE softkey will be displayed if more than 10 rooms' have the status of "Maid in Room".

```
11111          11112              11113    11114              11115              11:12 A M    6 C / W
12345          12346              12347    12348              12349
▨F1>EXIT          •TJF2>              ▨F3>              ❏ F4>              ❏  F5>
• JF6>            • JF7>              ❏ F8>            ❏  ☞⅓⑧              ▨F0>MORE...
```
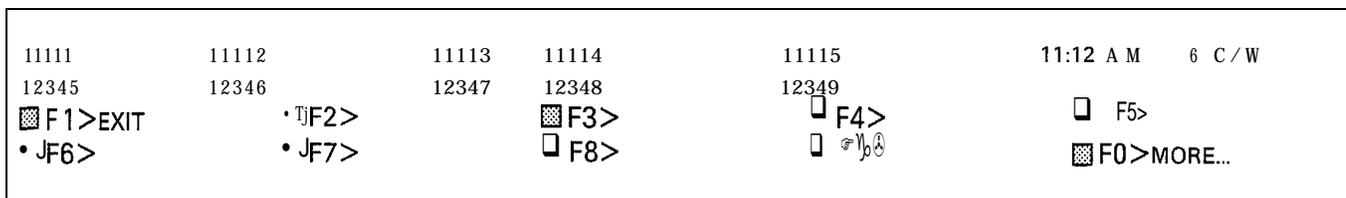
Figure 4-6 Maid In Room Display

VAC/CLEAN RM: This softkey displays all room numbers which have a status of "Vac/Clean Room". Pressing this softkey changes the display to that shown in Figure 4-7. The MORE softkey will be displayed if more than 10 rooms have the "Vac/Clean Room" status.

```
10204          13595          14883   15321          16992          11:12 A M   6 C/W
20501          20502          21348   21499          22001
   ❏ F1 >EXIT        ❏ F2 >ROOM NUMBER ❏ F3 >         ❏ F4 >           ❏ F5 >
   ❏ F6 >            ❏ F7 >            ❏ F8 >      ❏  ☞🎵☊         ▦ F0 >MORE...
```
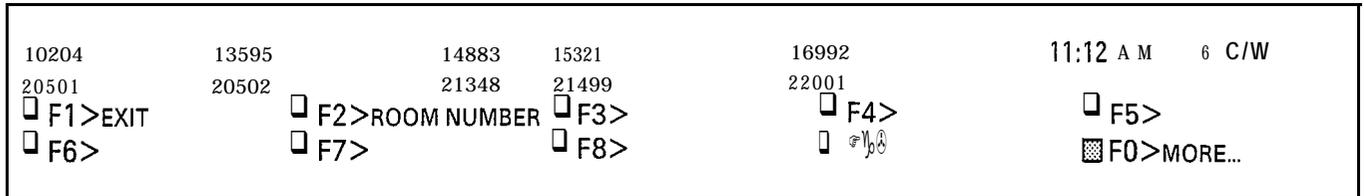
Figure 4-7 Room Status Display

If the ROOM NUMBER softkey is pressed, the display changes to that shown in Figure 4-8. Entering a valid room number results in the 10 rooms following the' entered number to be displayed. The display of the "Vac/Clean Room" status thus starts at the entered room number.

```
                                              11:12 AM      6 C/W

Enter Room Number: -
   ❏ F1 >EXIT        ❏ F2 >          ▦ F3 >       ❏  F4 >        ❏  F5 >
▦ F6 >               ❏  F7 >         ❏ F8 >       ▦ F9 >         ▦ F0 >
```
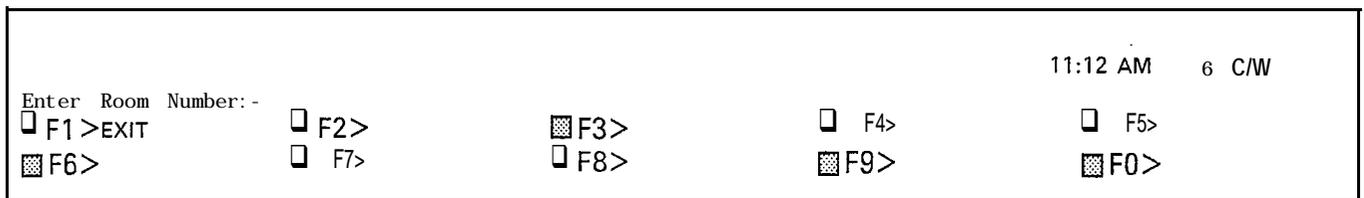
Figure 4-8 Enter Room Number Display

RES/CLEAN RM: This softkey displays all room numbers which have a status of "Reserved/Clean Room". Pressing the softkey changes the display to that shown in Figure 4-7. If the ROOM NUMBER softkey is pressed, the display changes to that shown in Figure 4-8. Entering a valid room number results in the next ten rooms with this status, starting with the entered number, to be displayed.

OUT OF SERV.: This softkey displays all room numbers which have a status of "Out of Service". Pressing the softkey changes the display to that shown in Figure 4-7. If the ROOM NUMBER softkey is pressed, the display changes to that shown in Figure 4-8. Entering a valid room number results in the next ten rooms with this status, starting with the entered number, to be displayed.

AUDITS: This softkey permits the Attendant to perform three types of room audits: Message Register Audits, Room Status Audits, and Automatic Wake-Up Audits. Each is described below.

1. Message Register Audits: When selected, this type of audit results in a printout being made of all message registers which do not have a value of zero. When System Option "Zero Message Register After Audit" is enabled, all message registers will be cleared once the printout is completed.

2. Room Status Audits: When selected, this type of audit results in a printout which shows the status of all extensions which have the COS Option "Room Status" enabled. The report generates three sections, one for Vacant rooms, one for Occupied rooms, and one for Reserved

room.

3. Automatic Wake-Up Audits: When selected, this type of audit pro-
duces a printout showing the wake-up times for all extensions with
active wake-up calls. This audit can also be done automatically at a
pre-set time (determined by a System Timer).

In order to perform audits, the Attendant Console must not be active
on a call. Audits are performed by pressing the following keys in
sequence:

FUNCTION + GUEST ROOM + AUDITS + (audit type)

The display changes to that shown in Figure 4-9. After selecting the
desired audit type, the Attendant Console will return to its idle mode
display. The printout is routed to the default printer.

```
                                                    1 1:12 AM     6  C/W

Select the Printout Required
❏ F1 >EXIT          ❏ F2>MSGREGISTER❏  F3>WAKE-UP       ❏ F4>              ❏  F5>ROOM STATUS
❏ F6>               ❏  F7>            ▨F8>              ❏  ☞🖐👁           ❏  ☞🖐👁
```

Figure 4-9 Audits

The formats of the printouts of the various types of audits are shown
in Table 4-l. Examples of audit printouts are shown in Figure 4-10.

TABLE 4-I
AUDIT PRINTOUTS

AUDIT TYPE	PRINT LINE	FORMAT	DEFINITIONS & NOTES
Message Register	1	nm/dd hh:mmP Message Register Audit	mm/dd = month/day hh/mm = hour/minute P = PM indicator, if 12-hour clock is used
	4	Room - Reg	Repeated 5 times across printout
	6 and subsequent	XXXXX - YYYYY	xxxxx = extension number yyyyy = message register count (zero filled) Extension numbers are printed in numerical order. One blank line is printed between each xxxxx - yyyyy line whenever the first digit of xxxxx changes.

TABLE 4-I (CONT'D)
AUDIT PRINTOUTS

AUDIT TYPE	PRINT LINE	FORMAT	DEFINITIONS & NOTES
Room Status	1	mm/dd hh:mmP Room Status Audit aaaa	mm/dd hh:mmP = date and time as above aaaa = "Vacant Rooms" or "Occupied Rooms" or "Reserved Rooms"
	3	"Clean Rooms","Dirty Rooms", "To Be Inspected", or "Out of Service".	
	4	Room - Status	Repeated 5 times across page
	6 and subsequent	xxxxx - ccc/M	Repeated 5 times. xxxxx = extension number ccc = Int, Loc or LD /M = indicates Maid in Room. Rooms are printed in numerical order, with a blank line inserted whenever the first digit of xxxxx changes
Automatic Wake-Up	1	mm/dd hh:mmP Automatic Wake-Up Audit	mm/dd hh:mmP = date and time, as above
	3	Room - Time	Repeated 5 times.
	5	xxxxx - hh:mmP	Repeated 5 times. xxxxx = extension number. hh:mmP = hours and minutes, with PM indicator if 12-hour clock is used. Rooms are printed in numerical order, with a blank line inserted whenever the first digit of xxxxx changes

01/16 12:34P Message Register Audit

Room - Reg	Room - Reg	Room - Reg	Room - Reg	Room - Reg
12345 - 00001	12346 - 00001	12347 - 00001	12348 - 00001	12349 - 00001
12355 - 00001	12356 - 00001	22357 - 00001	22358 - 00001	12359 - 00001
22345 - 00001	22346 - 00001	22347 - 00001	22348 - 00001	22349 - 00001
32345. - 0000 1	32346 - 00001	32347 - 00001	32348 - 00001	32349 - 00001

Example 1: Message Register Audit Printout

01/16 12:35P Room Status Audit - Vacant Rooms

Clean Rooms

Room - Status	Room - Status	Room - Status	Room - Status	Room - Status
12345 - LD /M	12346 - Int	12347 - Int/M	12348 - LD	12349 - LD /M
12355 - LD /M	12356 - Int	12357 - Int/M	12358 - LD	12359 - LD /M
22345 - LD	22346 - LD /M	22347 - Int/M	22348 - LD	22349 - LD

Dirty Rooms

Room - Status	Room - Status	Room - Status	Room - Status	Room - Status
32345 - LD /M	32346 - Int	32347 - Int/M	32348 - LD	32349 - LD /M
32355 - LD /M	32356 - Int	32357 - Int/M	32358 - LD	32359 - LD /M
42345 - LD	42346 - LD /M	42347 - LD /M	42348 - Int/M	42349 - LD

To Be Inspected Rooms

Room - Status	Room - Status	Room - Status	Room - Status	Room - Status
32302 - LD	32303 - Int	32304 - Int	32305 - LD	32306 - LD
32307 - LD	32308 - Int	32309 - Int	32310 - LD	32311 - LD

Out of Service Rooms

Room - Status	Room' - Status	Room - Status	Room - Status	Room - Status
32377 - LD	32211 - Int			

Example 2: Room Status Audit Printout for Vacant Rooms

01/16 12:35P Room Status Audit - Occupied Rooms

Clean Rooms

Room - Status	Room - Status	Room - Status	Room - Status	Room - Status
42345 - LD /M	42346 - Int	42347 - Int/M	42348 - LD	42349 - LD /M
42355 - Loc/M	42356 - Int	42357 - Int/M	42358 - LD	42359 - LD /M
52345 - LD	52346 - LD /M	52347 - Int/M	52348 - LD	52349 - LD

Dirty Rooms

Room - Status	Room - Status	Room - Status	Room - Status	Room - Status
62345 - LD /M	62346 - Int	62347 - Int/M	62348 - LD	62349 - LD /M
62355 - Loc/M	62356 - Int	62357 - Int/M	62358 - LD	62359 - LD /M
72345 - LD	72346 - LD /M	72347 - LD /M	72348 - Int/M	72349 - LD

Figure 4-10 Audit Printouts

To Be Inspected Rooms

Room - Status	Room - Status	Room - Status	Room - Status	Room - Status
72845 - LD	72846 - Int	72847 - Int	72848 - LD	72849 - LD
72855 - Loc	72856 - Int	72857 - Int	72858 - LD	72859 - LD
82345 - LD	82346 - LD	82348 - LD	82348 - Int	82349 - LD

Out of Service Rooms

Room - Status	Room - Status	Room - Status	Room - Status	Room - Status
42377 - LD				

Example 3: Room Status Audit Printout for Occupied Rooms

01/16 12:34P **Room Status Audit - Reserved Rooms**

Room - Status	Room - Status	Room - Status	Room - Status	Room - Status
48345 - LD /M	48346 - Int	48347 - Int/M	48348 - LD	48349 - LD /M
48355 - Loc/W	48356 - Int	48357 - Int/M	48358 - LD	48359 - LD/M
58345 - LD	58346 - LD /M	58347 - LD /M	58348 - Int/M	58349 - LD

Dirty Rooms

Room - Status	Room - Status	Room - Status	Room - Status	Room - Status
68845 - LD /M	68846 - Int	68847 - Int/M	68848 - LD	68849 - LD/ M
68855 - Loc/M	68856 - Int	68857 - Int/M	68858 - LD	68859 - LD /M
78845 - LD	78846 - LD /M	78847 - LD /M	78848 - Int/M	78849 - LD

To Be Inspected Rooms

Room - Status	Room - Status	Room - Status	Room - Status	Room - Status
76645 - LD	76646 - Int	76647 - Int	76648 - LD	76649 - LD
76655 - Loc	76656 - Int	76657 - Int	76658 - LD	76659 - LD
86695 - LD	82696 - LD	82698 - LD	82698 - Int	82699 - LD

Out of Service Rooms

Room - Status	Room - Status	Room - Status	Room - Status	Room - Status
62377 - LD	62211 - Int			

Example 4: Room Status Audit Printout for Reserved Rooms

01/16 12:36P **Automatic Wake-Up Audit**

Room - Time	Room - Time	Room - Time	Room - Time	Room - Time
12345 - 07:33P	12346 - 07:34	12347 - 07:35	12348 - 07:36	12349 - 07:38
12355 - 08:00	12356 - 09:00	12357 - 10:00	12358 - 11:00	12359 - 12:00P
22345 - 01:00P	22346 - 02:00P	22347 - 03:00P	22348 - 04:00P	22349 - 05:00P

Example 5: Automatic Wake-Up Audit Printout

Figure 4-10 Audit Printouts (Cont'd)

Room Call Restriction

4.05 The Room Call Restriction feature permits the Attendant to prevent an extension from making outgoing calls. This feature is enabled by enabling System Option "Outgoing Call Restriction", and Attendant COS Option "Attendant Outgoing Call Restriction/Room Status Setup". When these features are enabled, pressing FUNCTION, GUEST ROOM and extension number will result in the display shown in Figure 4-11. Pressing the RESTRICT O/G softkey will toggle the RS flag which appears on the first line of the display.

```
   4951      J. LAKS              COS 12 COR 01 DND MSW      R S              11:12 AM      6 C/W
Reg = 00123 Wake-Up = 12:34P
❏ F1>EXIT            ❏ F2>CLR REG         ▨ F3>SET WAKE-UP   ❏  F4>CLR WAKE-UP ▨ F5>
❏ F6>NO DISTB        ❏   F7>MSG WAITING ❏   F8>RESTRICT O/G  ❏ F9>             ❏ F0>
```

Figure 4-11 Call Restriction Display

Single-line   Reports

4.06 Single-line Reports are types of audits. They are used to record changes in status for an individual room. These reports are generated automatically (under control of System Options), and provide hard-copy evidence that a change occurred. The printouts produced by single-line reports are limited to 40 characters in length. The report printouts begin with a standard prefix, containing extension number, date and time. This prefix occupies 19 columns on a print line, and is in the following format:

xxxxx mm/dd hh:mmP.

The xxxxx field refers to a (maximum) 5-digit extension number. The mm/dd field refers to a 2-digit month and a 2-digit day. The hh:mmP field refers to a 2-digit hour, and 2-digit minute, with the P representing a PM indicator when a 12-hour clock is used.

4.07 There are three categories of single-line reports:

- Automatic   Wake-Up
- Message   Registration
- Message   Waiting.

A number of printout suffixes are available to these, and are described below.

AUTOMATIC   WAKE-UP: 13 types of suffixes are available for automatic wake-up single-line reports. Three of these apply to Attendant Console operations, three to station operations, and seven to wake-up attempts. All contain the programmed wake-up time. The suffixes are summarized in Table 4-2. A sample

automatic   wake-up   report   is   given   below:

12345 01/23 11:20P WU 7:00 SET BY ROOM

MESSAGE   REGISTRATION: Message   registration   single-line   re-
ports   have   only   one   type   of   printout   suffix.   This   suffix   is   gen-
erated   whenever   a   room's   message   register   is   cleared   from   the
Attendant   Console.   The   register   count   field   is   five   digits   in
length,   and   all   leading   zeros   are   displayed.   The   format   of   the
suffix   is:

REG. CLEARED AT nnnnn.

nnnnn   represents   the   register   contents   prior   to   being   cleared.   A
sample   message   registration   report   is   given   below:

12345 01/23 11:40P REG. CLEARED AT 00012

MESSAGE   WAITING: Two   types   of   suffixes   are   available   for
Message   Waiting   single-line   report   printouts.   One   is   generated
when   Message   Waiting   is   turned   on   for   an   extension;   the   other
is   generated   when   it   is   turned   off.   The   format   of   the   suffixes   is:

MESSAGE WAITING ON

or

MESSAGE WAITING OFF

A   sample   message   waiting   report   is   given   below:
12345 01/23 11:45P MESSAGE WAITING ON

TABLE   4-2
AUTOMATIC   WAKE-UP   SINGLE-LINE   REPORT   SUFFIXES

OPERATION TYPE	SUFFIX	DEFINITIONS & NOTES
Console Operations	WU hh:mmP SET BY CONS	WU = Wake-Up hh:mmP = time and PM indicator SET BY CONS = Set by Attendant Console
	WU hh:mmP CHG BY CONS	CHG BY CONS = Changed by Attendant Console
	WU hh:mmP CAN BY CONS	CAN BY CONS = Canceled by Attendant Console
Room Operations	WU hh:mmP aaa BY ROOM	aaa = either : SET, CHG, or CAN
Wake-Up Attempts	WU hh:mmP aaaaaaa	aaaaaaa = either: ANSWERED, NO ANS 1, NO ANS 2, NO ANS 3 **, BUSY 1, BUSY 2, BUSY 3 **. Note: Third attempt failures for NO ANS and BUSY generate 3 CTRL G characters separated by seven nulls, along with the asterisks. A CTRL G character rings bell.

APPENDIX A

Superconsole   1000   Attendant   Console   RS-232C   Interface   Specifications

General

AI.01 This appendix provides the information necessary to identify all the pins on the RS-232C connector of the Superconsole *1000* attendant console. The printer port on the Superconsole 1000 attendant console acts like a DATASET 1101 cartridge with the following exceptions:

- no autobaud
- baud rate limited to 2400
- device ID different from that of data cartridge
- no data loopback test

The RS-232C connector (J3) is configured such that the console is the data communications equipment (DCE). This allows direct connection to most serial printers or terminal/crts. The following table lists the RS-232C pins recognized by the console's printer port.

TABLE AI-I
RS-232C   PORT   PIN   CONFIGURATION - DCE

Pin	Designation	Status	Console Printer Port
1	Frame Ground	- -	Connected
2	Tx Data	Input	Supported
3	Rx Data	output	Supported
4	RTS (Request to Send)	Input	Supported
5	CTS (Clear to Send)	output	Supported
6	DSR (Data Set Ready)	output	*
7	Digital Ground	- -	Connected
8	DCD (Data Carrier Detect)	output	*
20	DTR (Data Terminal Ready)	Input	Supported

Notes: * DSR and DCD signals are wired together, driven from a single RS-232C output.

Other   Differences

AI.02 The printer does not incorporate the following user interface features:

- ATTN key
- DISC key
- READY LED
- DEVICE LED

The Attendant does not have an indication of printer status.

SX-200" DIGITAL

PRIVATE AUTOMATIC BRANCH EXCHANGE

DATASET 1100 SERIES

WARNING:

1. IF ANY OF THE WARRANTY SEALS ON ANY MITEL EQUIPMENT ARE BROKEN, MITEL RESERVES THE RIGHT TO REFUSE TO SERVICE THE EQUIPMENT OR TO VOID ANY REMAINING WARRANTY ON THE EQUIPMENT.

2. IF ANY MITEL EQUIPMENT HAS BEEN MODIFIED SO THAT IT IS NOT WITHIN MANUFAC- TURERS SPECIFICATIONS (INCLUDING, BUT NOT LIMITED TO, THE INSTALLATION OF ANY NON-MITEL PARTS, COMPONENTS, OR REPLACEMENT BOARDS), THEN MITEL RE- SERVES THE RIGHT TO: REFUSE TO SERVICE THE EQUIPMENT; VOID ANY REMAINING WARRANTY; REMOVE AND REPLACE ANY NON-MITEL PARTS FOUND IN THE EQUIP- MENT; AND PERFORM WHATEVER MODIFICATIONS ARE NECESSARY TO RETURN THE EQUIPMENT TO ORIGINAL MANUFACTURER'S SPECIFICATIONS.

3. THE COST FOR THE LABOR AND PARTS REQUIRED TO RETURN THE MITEL EQUIPMENT TO THE ORIGINAL MANUFACTURER'S SPECIFICATIONS WILL BE CHARGED TO THE CUS- TOMER IN ADDITION TO THE NORMAL REPAIR CHARGE.

WARNING:

THIS EQUIPMENT GENERATES, USES, AND CAN RADIATE RADIO FREQUENCY ENERGY AND IF NOT INSTALLED AND USED IN ACCORDANCE WITH THE INSTRUCTION MANUAL, MAY CAUSE INTERFERENCE TO RADIO COMMUNICATIONS. IT HAS BEEN TESTED AND FOUND TO COMPLY WITH THE LIMITS FOR CLASS A COMPUTING DEVICE PURSUANT TO SUBPART J OF PART 15 OF FCC RULES, WHICH ARE DESIGNED TO PROVIDE REASONABLE PROTECTION AGAINST SUCH INTERFERENCE WHEN OPERATED IN A COMMERCIAL ENVIRONMENT. OPERATION OF THIS EQUIPMENT IN A RESIDENTIAL AREA IS LIKELY TO CAUSE INTERFERENCE IN WHICH CASE THE USER AT HIS OWN EXPENSE WILL BE REQUIRED TO TAKE WHATEVER MEASURES MAY BE REQUIRED TO CORRECT THE INTERFERENCE.

CONTENTS | PAGE

LIST OF ILLUSTRATIONS

1. INTRODUCTION

1.01   This Section describes three DATASET 1100 series asynchronous data sets; a DATASET 1101 Cartridge, a DATASET 1102 Dual Rack Mounted card, and a Standalone DATASET 1103.

Reason for Issue

1.02 This Section is issued to describe the DATASET 1100 series data sets used with the *SX-200*® DIGITAL PABX.

2. GENERAL DESCRIPTION

2.01   The DATASET 1100 series asynchronous data sets are composed of three variants; a DATASET 1101 Cartridge, a DATASET 1102 Dual Rack Mounted card, and a Standalone DATASET 1103 unit. The DATASET 1100 series support asynchronous data communications at rates up to 19.2 kilobits per second, and interface with an SX-200 DIGITAL PABX through a Digital Line Card within the PABX.

2.02   These DATASETs operate with the Mitel Digital Network Interface Circuit (DNIC) digital link technology which is composed of three channels: a 64 kbps data channel, a 64 kbps voice or data channel, and a 16 kbps (D) channel for control communications between the set and the PABX.

2.03   The DATASET 1101 Cartridges and Standalone DATASET 1103 interface peripheral devices to the PABX, while the DATASET 1102 Dual Rack Mounted cards usually interface a host computer to the PABX.

Baud Rates

2.04   The DATASET 1100 series operate at the following baud rates:

110
150
200
300
600
1200
2400
4800
9600
19200

Connector Pin Assignment Tables

2.05   The RS-232 connectors used on the DATASET 1100 series have
the following pin assignments when operating in Data Commu-
nications Equipment (DCE) mode:

Signal	Designation	Pin	Direction
	frame ground	1	
TXD	transmit data	2	to DATASET
RXD	receive data	3	from DATASET
RTS	ready to send	4	to DATASET
CTS	clear to send	5	from DATASET
DSR	data set ready	6	from DATASET
	signal ground	7	
DCD	data carrier detect	8	from DATASET
DTR	data terminal ready	20	to DATASET
RI	ring indicator	22	from DATASET
	reserved input	25	

3. DATASET 1101

Description

3.01 A DATASET 1101 is mounted within a *SUPERSET* 3™DN or a *SUPERSET* 4™DN telephone. It is 13 x 13 cm (5 x 5 inch) and connects via an internal cable to the telephone set circuit board; it interfaces to the PABX Digital Line Card through the same pair of wires that the telephone set voice circuit uses. Although the DATASET 1101 Cartridge has LEDs near its connectors, its primary interface to the user is through two programmable line appearance keys and an associated LCD on the telephone set. Figure 3-I shows a DATASET 1101 Cartridge mounted in a set; note that in this example two keys and an LCD immediately above the prime line key of the set are assigned to control operation of the DATASET 1101 Cartridge. These are programmed in Form 9 during Customer Data Entry.

3.02 The DATASET 1101 Cartridge usually interfaces a terminal, a personal computer, a printer, a file disk, or another peripheral device to the PABX, for connection to a host computer or to another peripheral device. Figure 3-2 shows a typical application of a *SUPER-SET* 4DN set with a DATASET 1101 Cartridge connecting a personal computer and the telephone set to the PABX over a single pair of wires.

3.03 The DATASET 1101 Cartridge is not field replaceable; it is an integral part of a *SUPERSET* 3DN or a *SUPERSET* 4DN telephone.

Controls, Indicators, and Connectors

3.04 Its controls and indicators are:

- TxD LED   on back of set
- RxD LED   on back of set
- -DATA LCD   line appearance LCD on set adjacent to ATTN key
  - solid circle indicates DTR connection
  - flashing square indicates connection to DTRX or queued to the called DATASET
  - solid square indicates connection to other DATASET

- DISC KEY   line appearance key on set

- ATTN KEY   line appearance key on set

3.05 The DATASET 1101 Cartridge has the following connectors at the back of the set:

- RS-232 connector
- power connector

It also has an internal ribbon cable connecting it to the telephone set; its connection to the PABX is through the set's twisted pair.

Installation

3.06   The DATASET 1101 Cartridge is internal to the telephone set; only two connections (power and RS-232) are required, in addition to the set's connection to the PABX.

3.07 Complete Customer Data Entry for the system to allow the DATASET 1101 Cartridge to operate with the PABX.

3.08   Connect an RS-232 cable between the RS-232 connector at the back of the set and the peripheral device.

3.09   Plug the power supply into an ac outlet and plug its cord into the power socket on the DATASET 1101 Cartridge. Both LEDs should be ON.

3.10   Plug the telephone set's cord into its jack, which connects to the Digital Line Card at the PABX; the telephone set should be operational   now.

All LEDs should flash 5 times, indicating that the DATASET has passed its self-test. If this does not happen, the DATASET is faulty and must be   replaced.

After the self-test, the TxD LED should be on, unless the device is an auto-answer device, and defined as such in CDE (usually only destination devices such as host computers are auto-answer). If the device is not auto-answer, and the TxD LED does not come on, do the following:

   1)   Make sure the device is powered on

   2)   Use an RS-232 break-out box to verify that the device attached to the dataset provides DTR. If the device does not provide DTR, select CDE option "RS-232 Force High" for that device.

NOTE:
THE DATASET 1101 CARTRIDGE IS AN INTEGRAL INTERNAL PART OF THE TELEPHONE SET. IT IS NOT FIELD ACCESSIBLE.

DATA LCD

ATTN KEY

DISC KEY

TYPICAL LINE APPEARANCE KEY ASSIGNMENT ON A SUPERSET 4™DN TELEPHONE

RxD

TxD

RS-232 CONNECTOR

POWER
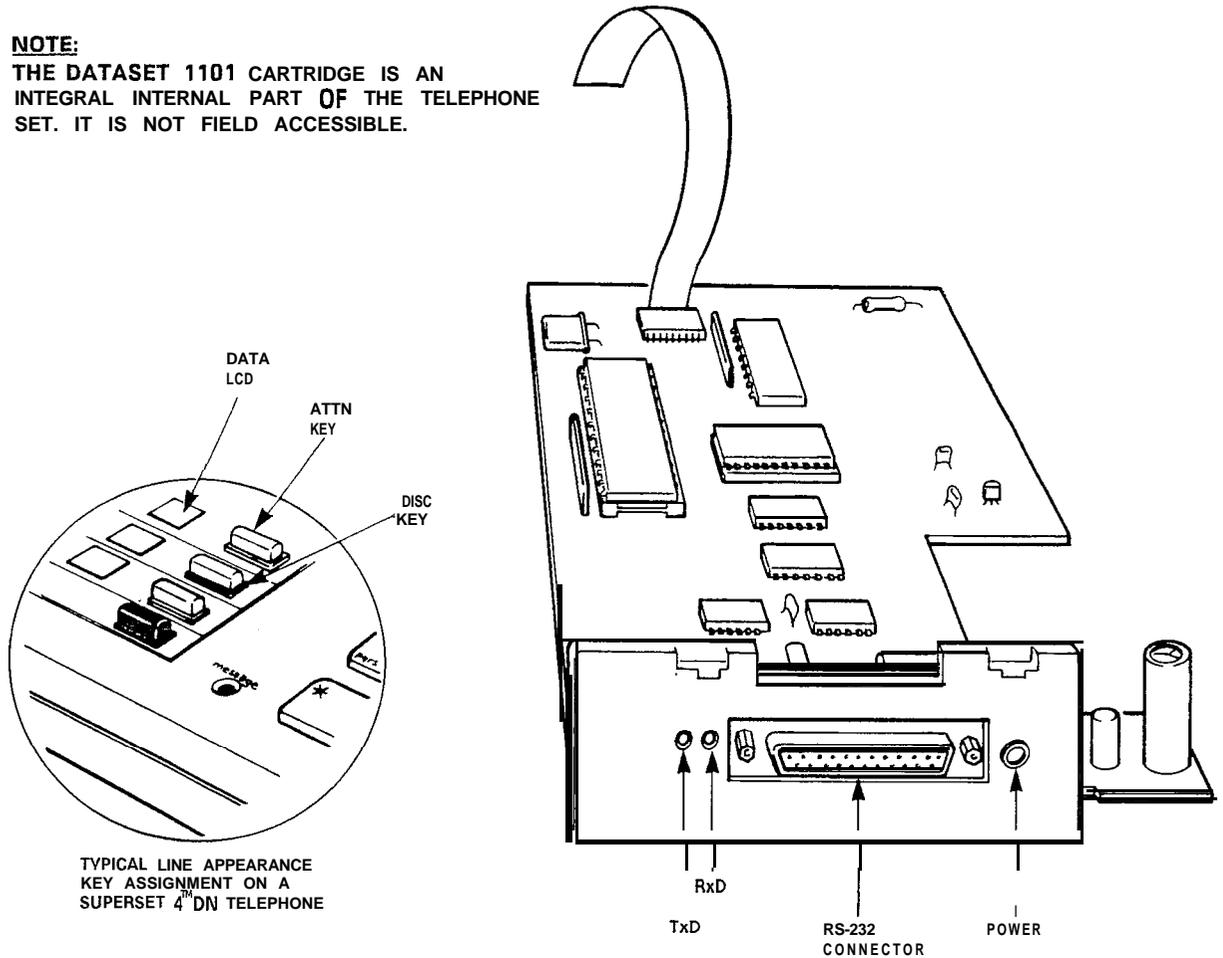
KA0486R3E5

Figure 3-I DATASET 1101 Cartridge, Showing Connectors and indicators

**SX-200®
DIGITAL PABX**

SINGLE
PHYSICAL PORT

DIGITAL
LINE
CARD

SINGLE
TWISTED PAIR

DNIC LINE CARD
12 PORTS/CARD

RS-232C OR v.24

SUPERSET 4™DN OR SUPERSET 3™DN
TELEPHONES WITH DATASET 1101 CARTRIDGE

TERMINAL OR PC
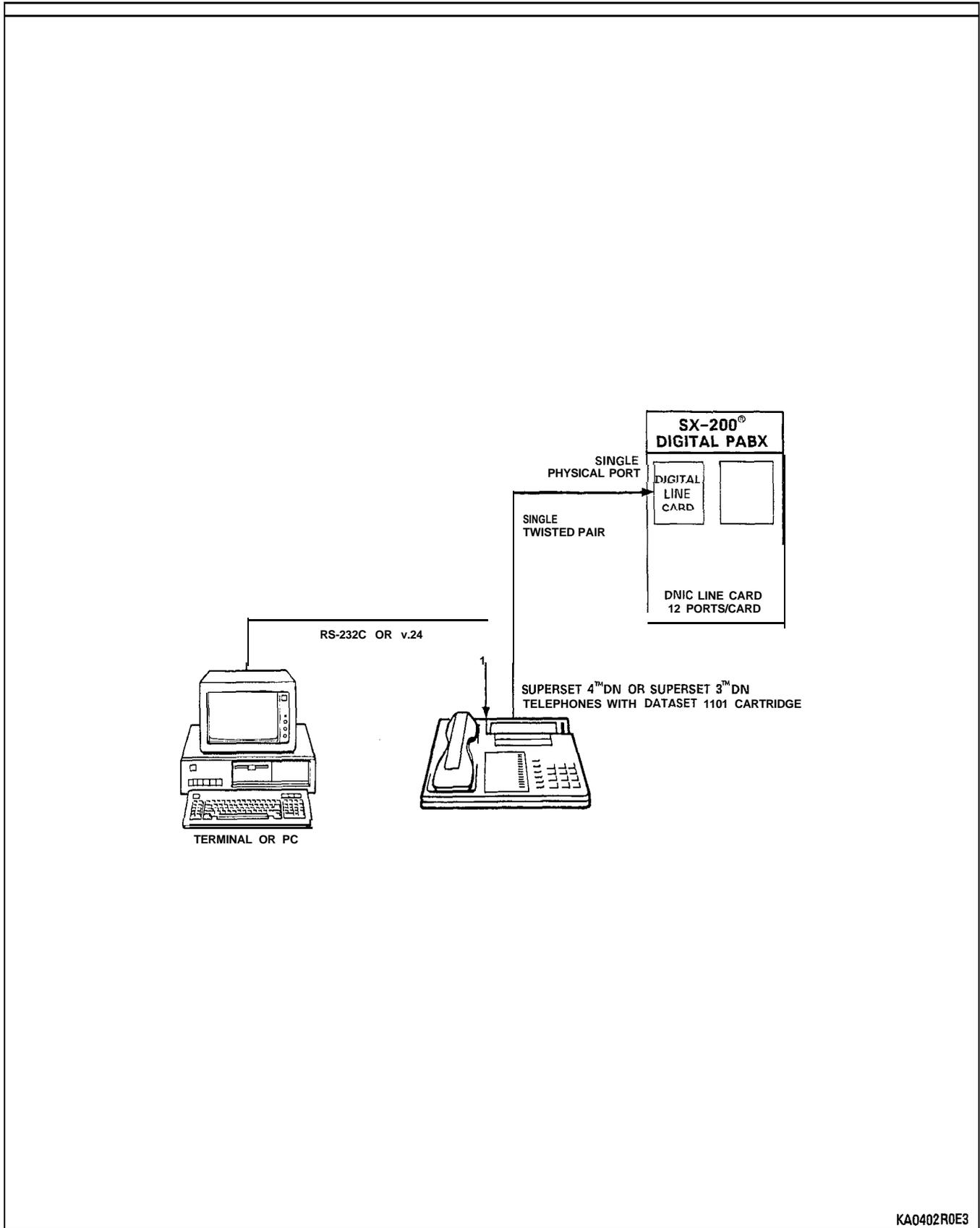
KA0402R0E3

Figure 3-2 Typical DATASET 1101 Cartridge Application

4. DATASET 1102 DUAL RACK MOUNTED CARD

Description

4.01 A DATASET 1102 Dual Rack Mounted card contains two DATA-SETs mounted on a common pcb; it has LEDs on its front panel, but no switches or keys for manual operation. Each DATASET 1102 Dual Rack Mounted card, which is installed within a data cabinet, interfaces to a a PABX Digital Line Card circuit through a single pair. The DATASHELF 9100 connects to the PABX through a 25-pair cable; each card slot is assigned one of these pairs. Figure 4-1 shows a DATASET 1102 Dual Rack Mounted card.

4.02 Its primary function is to interface between a host computer and the PABX; DATASET 1101 Cartridges or Standalone DATASET 1103 sets distributed throughout the complex access the DATASET 1102 Dual Rack Mounted cards through the PABX. The DATACABINET 9000, in which the DATASET 1102 Dual Rack Mounted cards are mounted, is usually located within a computer room.

Indicators and Connectors

4.03 There are six LEDs on the front of the DATASET 1102 Dual Rack Mounted card:

- DEVICE 1 (DTR) - DC1 in CDE
- READY 1 - DC1 in CDE
- DEVICE 2 A (DTR) - DC2 in CDE
- READY 2 - DC2 in CDE
- POWER 1 - (CARD FUSE O.K. INDICATION)
         2 - DC2 (CARD SYNC WITH PABX INDICATION)

The connectors on the back of a DATASET 1102 Dual Rack Mounted card are:

- RS-232 connector (1)
- RS-232 connector (2)
- shelf backplane connector (power and tip-ring pairs)

4.04 The pinout of the card edge connector is as follows:

Pin	Signal
1	data ring
2	no connection
3	frame ground
4	signal ground
5	T1 (ac input)
6	T2 (ac input)
7	T2 (ac input)
8	T1 (ac input)
9	signal ground
10	frame ground
11	no connection
12	data tip

installation

4.05 Complete system cabling and Customer Data Entry for the slot into which the DATASET is being installed; cabling is defined in DATASHELF 9100 installation procedures.

4.06 Install a DATASET 1102 Dual Rack Mounted card by plugging it into its assigned slot in the DATASHELF 9100. All LEDs (except POWER 1) should flash 5 times, indicating that the DATASET has passed its self-test. If this does not happen, the DATASET is faulty and must be replaced.

4.07 The POWER 2 LED should be on continuously, indicating connection to the Digital Line Card. If the POWER 2 LED is flashing, check the wiring between the DATASET and the PABX, and Customer Data Entry (CDE) for the device.

4.08 Plug the RS-232 interconnecting cables into the RS-232 connector at the back of the DATASET 1102 Rack Mounted cards and connect them to the host device. When the RS-232 connector is attached, the DEVICE LED should be on, unless the device is an auto-answer device, and defined as such in CDE (usually only destination devices such as host computers are auto-answer). If the device is not auto-answer, and the DEVICE LED does not come on, do the following:

1) Make sure the device is powered on

2) Use an RS-232 break-out box to verify that the device provides DTR. If the device does not provide DTR, select CDE option "RS-232 Force High" for that device.
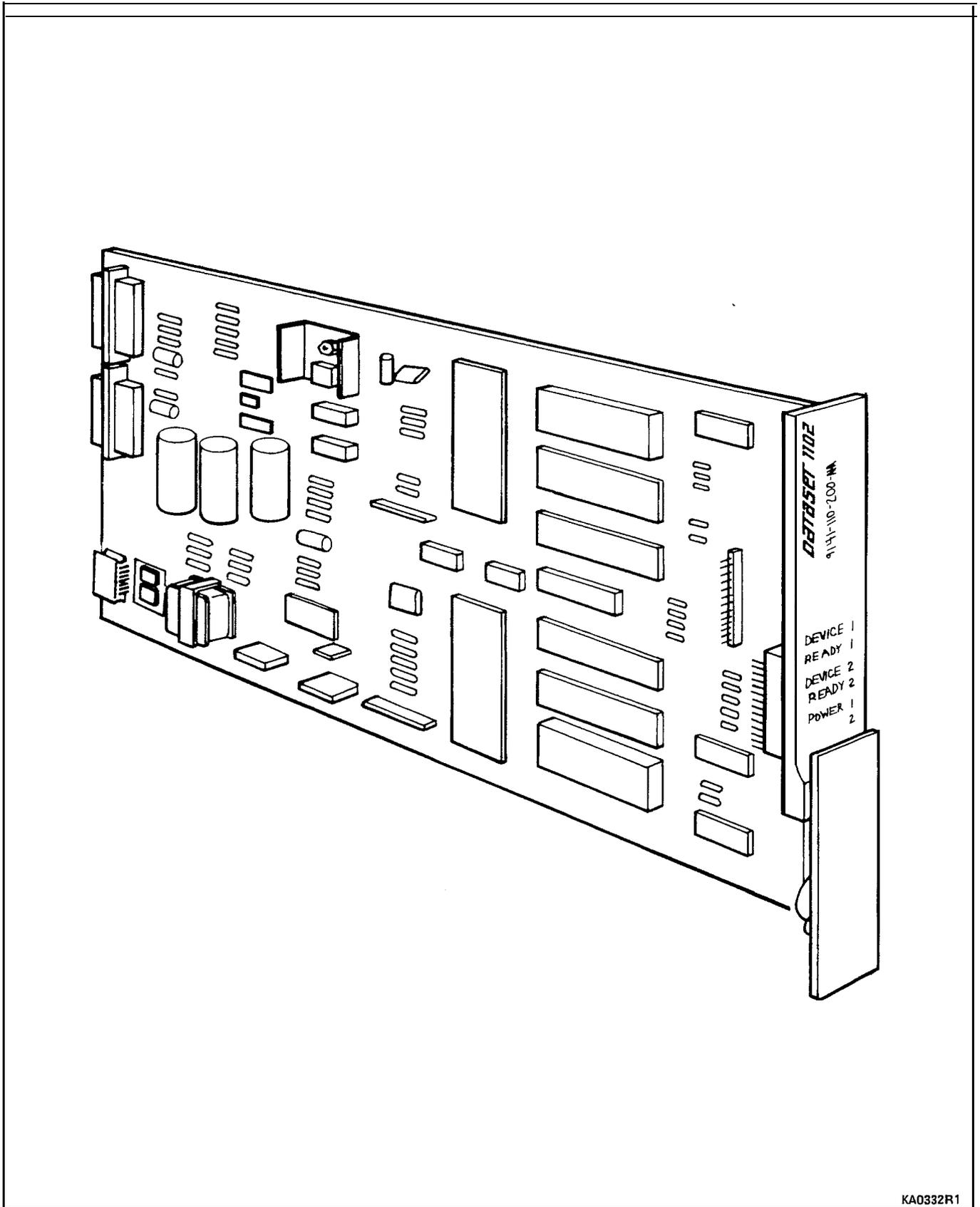
KA0332R1

Figure 4-1 DATASET 1102 Dual Rack Mounted card

5. STANDALONE DATASET 1103

Description

5.01   A Standalone DATASET 1103 is packaged in a flat case which can be placed under a standard desk telephone set. It is functionally the same as the DATASET 1101 Cartridge or one-half of the DATASET 1102 Dual Rack Mounted card (it shares the same base pcb as the DATASET 1102 Dual Rack Mounted card). The Standalone DATASET 1103 can be connected to the PABX using a four-wire connection; two wires connect the DATASET to the Digital Line Card, and two different wires connect the telephone set tip-ring pair to an ONS or COV line card; it may also be connected to a Digital Line Card within the PABX by a single twisted pair (the telephone set is connected independently). Figure 5-I shows a Standalone DATASET 1103, while Figure 5-2 shows typical applications of a Standalone DATASET 1103 connected to a telephone set and a personal computer or terminal.

Controls, indicators, and Connectors

5.02   Its keys and LEDs are:

- ATTN key
- DISC key
- POWER LED (includes SYNC to PABX information)
- READY LED (includes RxD traffic information)
- DEVICE (DTR) LED (includes TxD traffic information)

Standalone DATASET 1103 (NA Teleadapt socket) connector pins are:

Line

Pin	Signal
1	no connection
2	data tip
3	voice tip
4	voice ring
5	data ring
6	no connection

Telephone

Pin	Signal
1	no connection
2	no connection
3	voice tip
4	voice ring
5	no connection
6	no connection

Installation

5.03   Install a Standalone DATASET 1103 by placing it near its asso-
        ciated telephone set and data peripheral (its case is designed to
lie flat on the desk under a standard telephone set).

5.04   Complete Customer Data Entry for the system to allow the
        Standalone DATASET 1103 cartridge to operate with the PABX.

5.05   Connect the telephone set cord to the jack marked PHONE;
        connect the modular telephone line cord to the jack marked
LINE and to the wall or floor jack which connects to the PABX main
distributing frame (MDF). The connection to the MDF is a four-wire
circuit; the voice tip and ring (red and green) connect to an ONS or
COV line card (depending on the type of set being used), and the
DATASET tip and ring (yellow and black) connect to a Digital Line Card.

Note: An alternative tip and ring wiring arrangement is: connect the
        telephone set through a two-wire connection to its ONS or
        COV line card; connect the modular telephone line cord (data
        tip and ring) to the jack of the Standalone DATASET 1103
        marked LINE, through the MDF to its Digital Line Card in the
        PABX.

5.06   Plug the power supply into an ac outlet and its cord into the
        power socket on the Standalone DATASET 1103. All LEDs
(except POWER) should flash 5 times, indicating that the DATASET has
passed its self-test. If this does not happen, the DATASET is faulty and
must be replaced.

5.07   The POWER LED should be on continuously, indicating connec-
        tion to the Digital Line Card. If the POWER LED is flashing, check
the wiring between the ˙DATASET and the PABX, and Customer Data
Entry (CDE) for the device.

5.08   Plug the RS-232 interconnecting cable into the RS-232 connec-
        tor at the back of the Standalone DATASET 1103 and connect
its other end to the peripheral device. When the RS-232 connector is
attached, the DEVICE LED should be on, unless the device is an auto-
answer device, and defined as such in CDE (usually only destination
devices such as host computers are auto-answer). If the device is not
auto-answer, and the DEVICE LED does not come on, do the following:

1)   Make sure the device is powered on

2)   Use an RS-232 break-out box to verify that the device provides
      DTR. If the device does not provide DTR, select CDE option
      "RS-232 Force High" for that device.

COVER
(NOT TO BE REMOVED)

DEVICE   DISCONNECT
READY   (TxD)   KEY
(RxD)   ATTENTION
KEY
POWER

PRINTED
CIRCUIT BOARD

PHONE   RS-232   POWER LINE
CONNECTOR
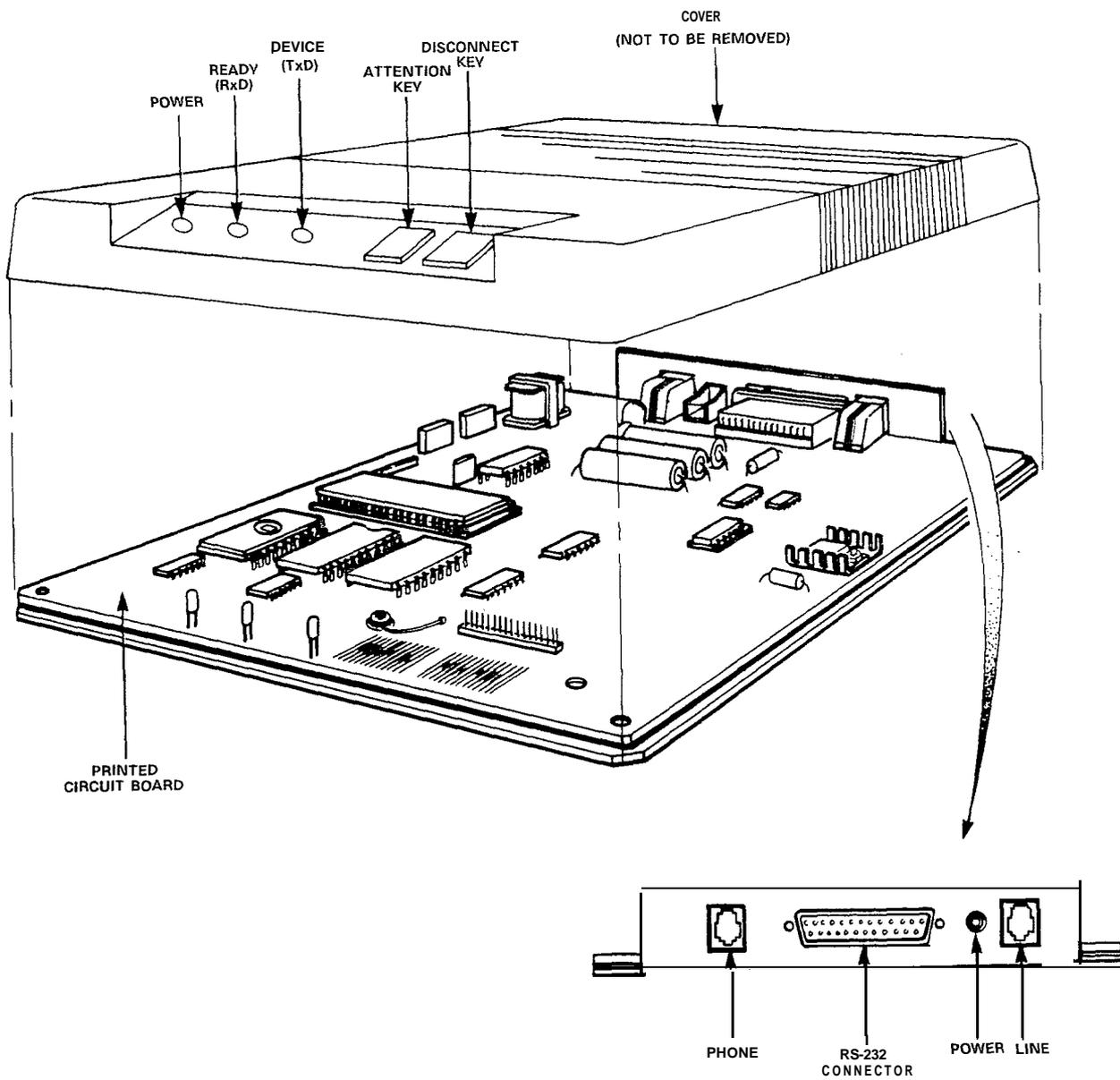
KA0485R0E0

Figure 5-I Standalone DATASET 1103, Showing Connectors and Indicators
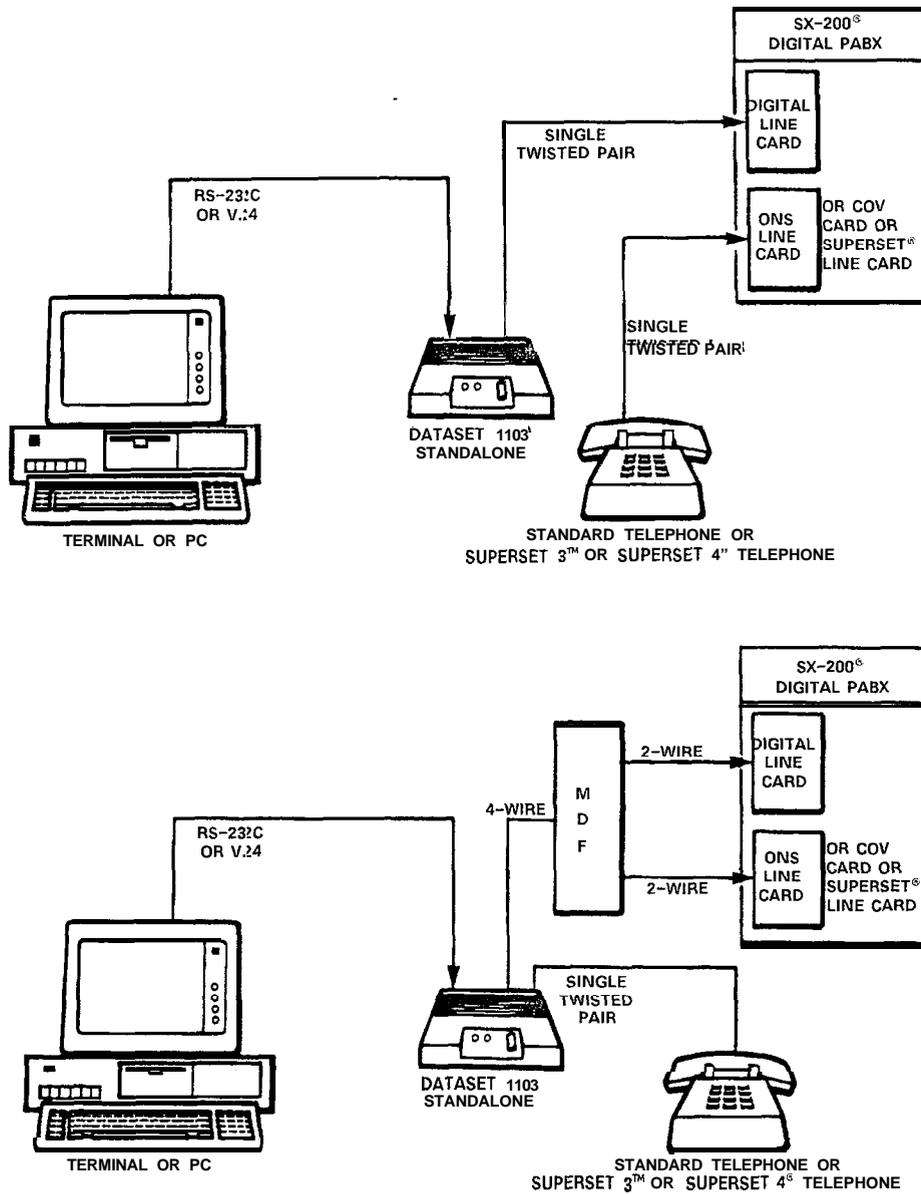
Figure 5-2 Typical Standalone DATASET 1103 Applications

6. CIRCUIT DESCRIPTION

General

6.01   The microprocessor controls the operations within the DATASET. It adds High-level Data Link Control (HDLC) control bytes to incoming data received through its RS-232 port, before the data is passed to the HDLC Controller to be packetized and sent out via the DNIC to the PABX. Similarly data received through the PABX has its address and HDLC control bytes stripped off before it is sent out on the RS-232 port. Once a call is established by the use of D-channel signals to the PABX, data communication occurs on the B-channel, and passes straight through the PABX to its destination. Figure 6-l is a block diagram of the DATASET 1100 series.

6.02   The LEDs and keys, which interface the DATASET 1100 series to the user, connect to the microprocessor.

6.03   The external random access memory (RAM) provides buffering for error correction and speed conversion, as well as improving flow control through the DATASET 1100 series.

6.04   The HDLC controller is a single channel interface between the microprocessor and the DNIC; control signals are sent on the D-channel, while data is sent on the B2-channel. Each section of the DATASET 1102 Dual Rack Mounted card has its own B-channel, but shares the D-channel for control.
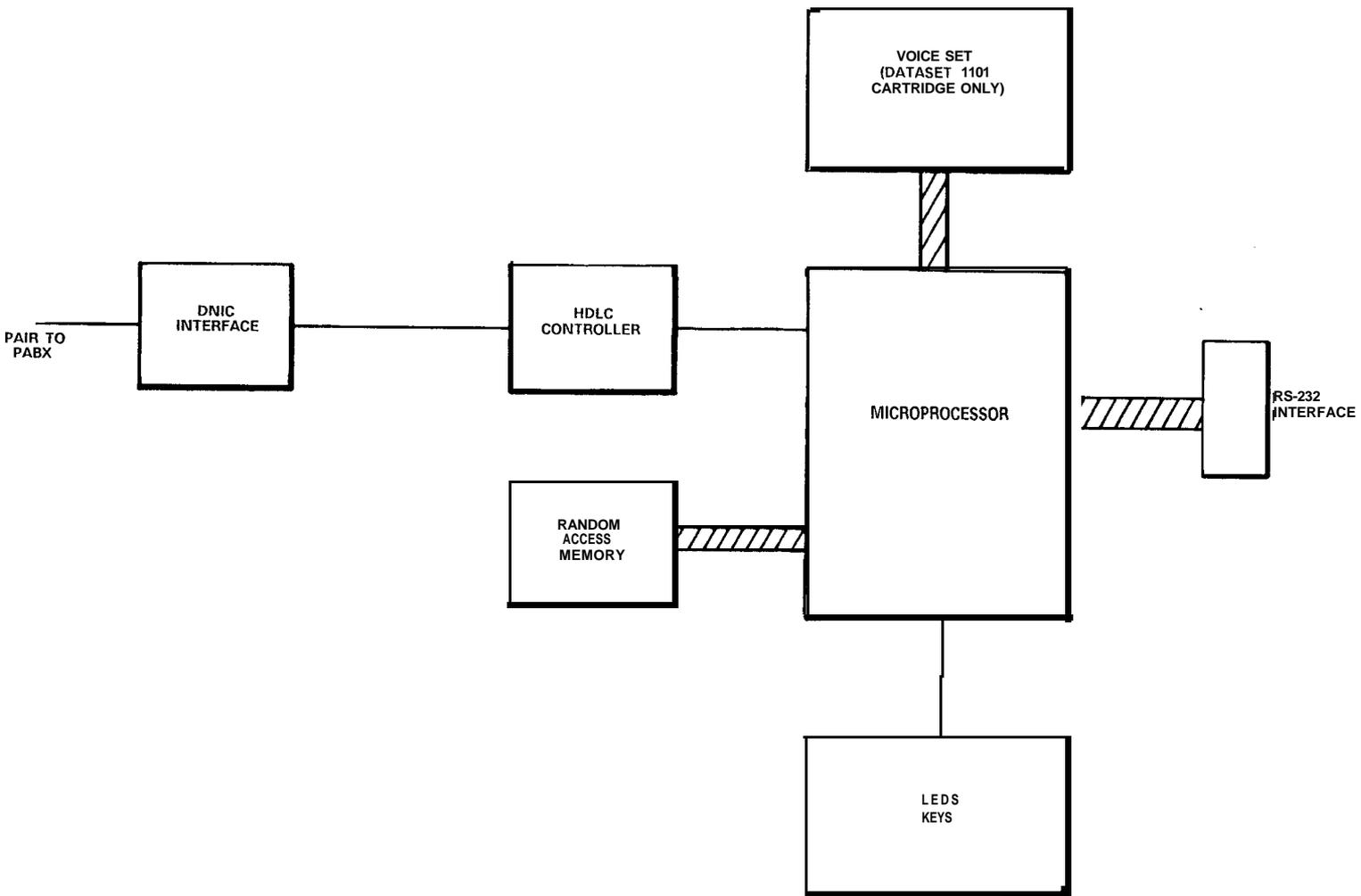
Figure 6–1 Typical DATASET 1100 Series Data Set Block Diagram

7. POWER SUPPLIES

General

7.01   The DATASET 1101 Cartridge and the Standalone DATASET 1103 receive their power from a plug-in transformer which supplies 9 vac to a power connector on the back of the set. Circuitry within the data set converts this to the required dc voltages. The digital telephone set voice operation receives its power from the PABX, whether or not the DATASET 1101 Cartridge power supply is plugged in. Only DATASET 1101 Cartridge operation requires that the power supply be plugged in.

7.02   The DATASET 1102 Dual Rack Mounted card receives its power from a power supply which is an integral part of the DATASHELF 9100. Refer to Section MITL9141-753-525-NA, Data Cabinet and MITL9141-753-526-NA, Datashelf for further information.

DATASET 2100 SERIES

NOTICE

CONTENTS PAGE

LIST OF TABLES

LIST OF CHARTS

LIST OF ILLUSTRATIONS

1. INTRODUCTION

General

1.01 This Section describes the Rack Mounted DATASET 2102 and the Standalone DATASET 2 103. These products are Synchronous/Asynchronous data sets which are used with Mitel digital private automatic branch exchanges (PABX).

Reason for Issue

1.02 This Section is issued to describe the DATASET 2100 Series used with Mitel PABXs.

2. GENERAL DESCRIPTION

2.01 The DATASET 2100 Series is composed of two North American variants; a Rack Mounted DATASET 2102 and a Standalone DATASET 2103. The DATASET 2100 Series supports synchronous and asynchronous data communications at rates up to 19.2 kilobits per second, and interface with a Mitel Digital Network Interface Circuit (DNIC) line card within the PABX.

2.02 These DATASETs operate with DNIC digital link technology which is composed of three channels: a 64 kbps data channel, a 64 kbps voice or data channel (B), and a 16 kbps (D) channel for control communications between the set and the PABX. Only one B channel is used with the DATASET 2100 Series.

2.03 The Standalone DATASET 2103 interfaces peripheral devices to the PABX, while the Rack Mounted DATASET 2102 usually interfaces a host computer to the PABX.

Environmental Specifications

Operating Environment:

Ambient Temperature: 4 to 49°C (39.2 to 120°F).
Ambient Humidity: IO to 90% RH, noncondensing.

Storage/Shipping Environment:

Ambient Temperature: -40 to 60°C (-40 to 150°F).
Ambient Humidity: IO to 90% RH, noncondensing.

Baud Rates

2.04 The DATASET 2100 Series operates at the following baud rates:

Asynchronous	Synchronous
110	1200
150	2400
200	4800
300	9600
600	19200
1200	
2400	
4800	
9600	
19200	

Connector Pin Assignment Tables

2.05 The RS-232 connector on the DATASET 2100 Series has the following pin assignments when operating in Data Communications Equipment (DCE) mode:

Pin	Signal	Designation	Direction
1		frame ground	
2	TXD	transmit data	to DATASET
3	RXD	receive data	from DATASET
4	RTS	ready to send	to DATASET
5	CTS	clear to send	from DATASET
6	DSR	data set ready	from DATASET
7		signal ground	
8	DCD	data carrier detect	from DATASET
20	DTR	data terminal ready	to DATASET
22	RI	ring indicator	from DATASET
25		reserved input	

2.06 The RS-232 connector on the DATASET 2100 Series has the following pin assignments when operating in Data Terminal Equipment (DTE) mode with an attached Modem Adapter:

Pin	Signal	Designation	Direction
1		frame ground	
2	TXD	transmit data	from DATASET
3	RXD	receive data	to DATASET
4	RTS	ready to send	from DATASET
5	CTS	clear to send	to DATASET
6	DSR	data set ready	to DATASET
7		signal ground	
8	DCD	data carrier detect	to DATASET
15	DB	SCT	to DATASET
17	DD	SCR	to DATASET
19	n/a	remote digital loopback	from DATASET
20	DTR	data terminal ready	from DATASET
22	RI	ring indicator	to DATASET
23	CH	data signal rate selector	from DATASET
24	DA	XCLK	from DATASET
25	CN	analog loopback	from DATASET

Synchronous Operation

2.07 Transparent – The DATASET 2100 Series can operate in transparent synchronous mode. Because the connections are usually established for a long time (compared to asynchronous connections) and are important parts of a large data communications network, the D channel connection is held up while the connection is established. The network management process can obtain statistics on traffic and error rates while a call is in progress from this D channel. When one DATASET 2100 drops its connection, it cannot signal to the other; the PABX must drop this connection with a Terminate B channel command, which it can do because the D channel is active while the B channel session is in progress.

2.08 Data is clocked to and from the shift registers at a constant rate by the synchronous clocks on the RS-232 interface. The data set firmware converts this data into packets which are passed through the PABX in UI frames. No error detection or correction is

performed on this data; synchronous data usually includes its own error detection and correction protocol, and it is more important to maintain the synchronization between the two endpoints. The synchronization is done by a software Phase Locked Loop algorithm, which actually becomes a frequency locking loop.

2.09 x.31 ▪ It is a protocol for adapting a data rate from a synchronous interface to a 64 kbps channel, such as is used by Mitel PABXs. This mode will allow Mitel equipment to be connected to another manufacturer's equipment without having protocol conversion in between. The synchronous data being received must be HDLC based, with a maximum frame size of 512 bytes.

2.10 The DATASET 2100 decodes the received HDLC frames and reformats them into new HDLC frames using the X.31 protocol on the B channel. The rate conversion is done by transmitting HDLC flags during B channel idle time. Received frames are depacketized and transmitted to the attached device in HDLC format at the RS-232 interface synchronous clock rate.

Asynchronous   Operation

2.11   The DATASET 2100 Series can operate in asynchronous mode in simplex, half duplex, or full duplex modes. Once the communications are established between data sets in asynchronous mode, the D channel connection is dropped, and only the B channel connection remains. The B channel passes through the PABX, without supervision by the PABX, connected only to the two endpoints.

Back-to-Back   Operation

2.12   Two DATASET 2100 Series may be connected back to back to communicate directly with each other (typically to bypass a failed PABX). At least one of the data sets must be in hunt mode; the data set then alternates between master and slave timing until synchronization is achieved. If both data sets are in hunt mode, it can take up to one minute to achieve synchronization.

2.13 A back to back connection may be established as above in either synchronous mode or in asynchronous mode between two DATASET 2100 series. If the DATASET 2100 Series is in master mode and asynchronous mode, the back to back connection can also be made with a DATASET 1100 series. The data set that is operating in master mode scans its DIP switches on power up, and sets its operating parameters according to the settings of the switches.

Timing   Modes

2.14   There are four modes of timing available with a DATASET 2100 series that are used according to the current mode of operation.

2.15 **internal** – The Internal clock is used when the DATASET 2100 Series is operating in Data Communication Equipment (DCE) mode. The transmit clock (SCT) to the Data Terminal Equipment (DTE) is generated within the DATASET's baud rate generator and is not synchronized with PABX timing. The DATASET's receive clock (SCR) to the DTE is extracted from the data received from the far end DATASET by the Phase Locked Loop (PLL) circuit within the DATASET.

2.16 **System** – The System clock is used when the DATASET 2100 Series is operating in Data Communication Equipment (DCE) mode. The DATASET's transmit clock (SCT) and receive clock (SCR) to the DTE are extracted from the data received from the far end devices by the Phase Locked Loop (PLL) circuit within the DATASET.

2.17 **Transmit External** – The DATASET 2100 Series uses the Transmit External clock in either DTE or DCE mode; it is received from an external clock signal from the attached device. From a DTE device, the clock is received on RS-232 pin 24; from a DCE device, the clock is derived from the DCE device's SCR. The DATASET's receive clock (SCR) to the DTE is extracted from the data received from the far end device by the Phase Locked Loop (PLL) circuit within the DATASET.

2.18 **Transmit and Receive External** – When the DATASET 2100 Series is operating in DTE mode, the Transmit -and Receive External clocks are derived from the attached DCE device. The external transmit clock is received from the modem's SCR (pin 17) and transferred to pin 24 by the DCE adapter; the external receive clock is received from the modem's SCT (pin 15) and transferred to pin 18 by the DCE adapter.

Modem Adapter

2.19 DATASET 2100 Series are DCE devices, as are modems. To connect a DATASET 2100 Series to a modem requires that a Modem Adapter (pn 9141-100-100-NA) be connected to the RS-232 connector on the data set. The Modem Adapter makes the DATASET 2100 Series appear as a DTE device to the modem. This is used primarily in Modem Pooling applications.

2.20 There is an 8-position DIP switch on the back of a Rack Mounted DATASET 2102 and a Standalone DATASET 2103. It is read once immediately after DNIC Sync is achieved and the operating parameters are set according to the settings. When viewed from the rear the DIP switches are labelled as follows:

01	02	03	04	05	06	07	08

User accessible switches

TABLE 2-1
DATASET 2100 DIP SWITCH SETTINGS

SWITCH 1	DATASET OPERATING MODE
DOWN UP	SET - PBX OPERATION HUNT - BACK TO BACK MODE
SWITCH 2	
DOWN UP	ASYNCHRONOUS SYNCHRONOUS

ASYNCHRONOUS MODE				
SWITCHES				ASYNC FLOW CONTROL
3	4			
DOWN	DOWN			FLOW CONTROL DISABLED
UP	DOWN'			XON/XOFF FLOW CONTROL ENABLED
DOWN	UP			CTS FLOW CONTROL ENABLED
UP	UP			FLOW CONTROL DISABLED
SWITCHES				ASYNC SPEED
5	6	7	8	
DOWN	DOWN	DOWN	DOWN	AUTOBAUD
UP	DOWN	DOWN	DOWN	110
DOWN	UP	DOWN	DOWN	150
UP	UP	DOWN	DOWN	200
DOWN	DOWN	UP	DOWN	300
UP	DOWN	UP	DOWN	-600
DOWN	UP	UP	DOWN	1200
UP	UP	UP	DOWN	2400
DOWN	DOWN	DOWN	UP	4800
UP	DOWN	DOWN	UP	9600
DOWN	UP	DOWN	UP	19200

TABLE 2-I (CONT'D)
DATASET 2100 DIP SWITCH SETTINGS

SYNCHRONOUS MODE				
SWITCHES			SYNC OPERATING MODE	
3	4			
DOWN	DOWN		INTERNAL CLOCK	
DOWN	UP		SYSTEM CLOCK	
UP	DOWN		TX EXTERNAL CLOCK	
UP	UP		TX AND RX EXTERNAL CLOCK	
SWITCH 5			SYNCHRONOUS MODE ONLY	
DOWN			TRANSPARENT MODE	
UP			X.31 MODE	
SWITCHES			SYNC SPEED	
6	7	8		
DOWN	DOWN	DOWN	1200	
UP	DOWN	DOWN	2400	
DOWN	UP	DOWN	4800	
UP	UP	DOWN	9600	
X	X	UP	19200 (x = don't care)	

NOTES:
(1) PARAMETER CHANGES MUST BE FOLLOWED BY A POWER
     RESET.
(2) ALL SWITCH PARAMETERS, EXCEPT SWITCH 1 CAN BE
     OVERIDDEN BY THE PBX CDE PARAMETERS.

3. RACK MOUNTED DATASET 2102

Description

3.01   A Rack Mounted DATASET 2102 has LEDs on its front panel, but no switches or keys for manual operation. Each Rack Mounted DATASET 2102 interfaces to a PABX Digital Line Card circuit through a single pair. The DATASHELF 9100 connects to the PABX through a 25-pair cable; each card slot is assigned one of these pairs. Figure 3-l shows a Rack Mounted DATASET 2102.

3.02   Its primary function is to interface between a host computer and the PABX; Standalone DATASET 2103s distributed throughout the building access the Rack Mounted DATASET 2102s through the PABX. The DATACABINET 9000, in which the Rack Mounted DATASET 2102 is mounted, is usually located within a computer room.

indicators and Connectors

3.03   There are five LEDs on the front of the Rack Mounted DATASET 2102:

- DEVICE TxD
- READY RxD
- ASYNC
- POWER
- CARD FUSE O.K. INDICATION

The connectors on the back of a Rack Mounted DATASET 2102 are:

- RS-232 connector (1)
- shelf backplane connector (power and tip-ring pair)
- MI/MIC connector

The backplane connector pinout is as follows:

Pin	Signal
1	data tip
2	no connection
3	frame ground
4	signal ground
5	T1 (ac input)
6	T2 (ac input)
7	T2 (ac input)
8	T1 (ac input)
9	signal ground
10	frame ground
11	no connection
12	data ring

The MI/MIC Teledapt connector pinout is as follows:

Pin	Signal
1	no connection
2	modem MI
3	no connection
4	no connection
5	modem MIC
6	no connection

Installation

WARNING

ANY CONNECTION OF THIS SET TO AN OFF PREMISE APPLICATION, AN OUT OF PLANT APPLICATION, OR TO ANY OTHER EXPOSED PLANT APPLICATION MAY RESULT IN A SAFETY HAZARD, AND/OR DEFECTIVE OPERATION, AND/OR EQUIPMENT DAMAGE.

CHART 3-l
INSTALLATION OF A RACK MOUNTED DATASET 2102

Step	Action
1.	Complete system cabling and Customer Data Entry for the slot into which the DATASET is being installed; cabling is defined in DATASHELF 9100 installation procedures.
2.	Set the eight DIP switches as required for this installation. Refer to Table 2-l.
3.	install a Rack Mounted DATASET 2102 by plugging it into its assigned slot in the DATASHELF 9100; these assignments are done when the system is configured. All LEDs should flash 5 times, indicating that the DATASET has passed its self-test. If this does not happen, the DATASET is faulty and must be replaced.
4.	Ensure the POWER 1 LED is on continuously, indicating no open fuse within the data set; if off, a fuse is open or there is a fault in the wiring connection,
5.	Plug the RS-232 interconnecting cable into the RS-232 connector at the back of the Rack Mounted DATASET 2102 and connect it to the host device. When the RS-232 connector is attached, the DEVICE LED should be on, unless the device is an auto-answer device, and defined as such in CDE (usually only destination devices such as host computers are auto-answer). If the device is not auto-answer, and the DEVICE LED does not come on, make sure the device is powered on, and then use an RS-232 break-out box to verify that the device provides DTR. If the device does not provide DTR, select CDE option "RS-232 Force High" for that device.
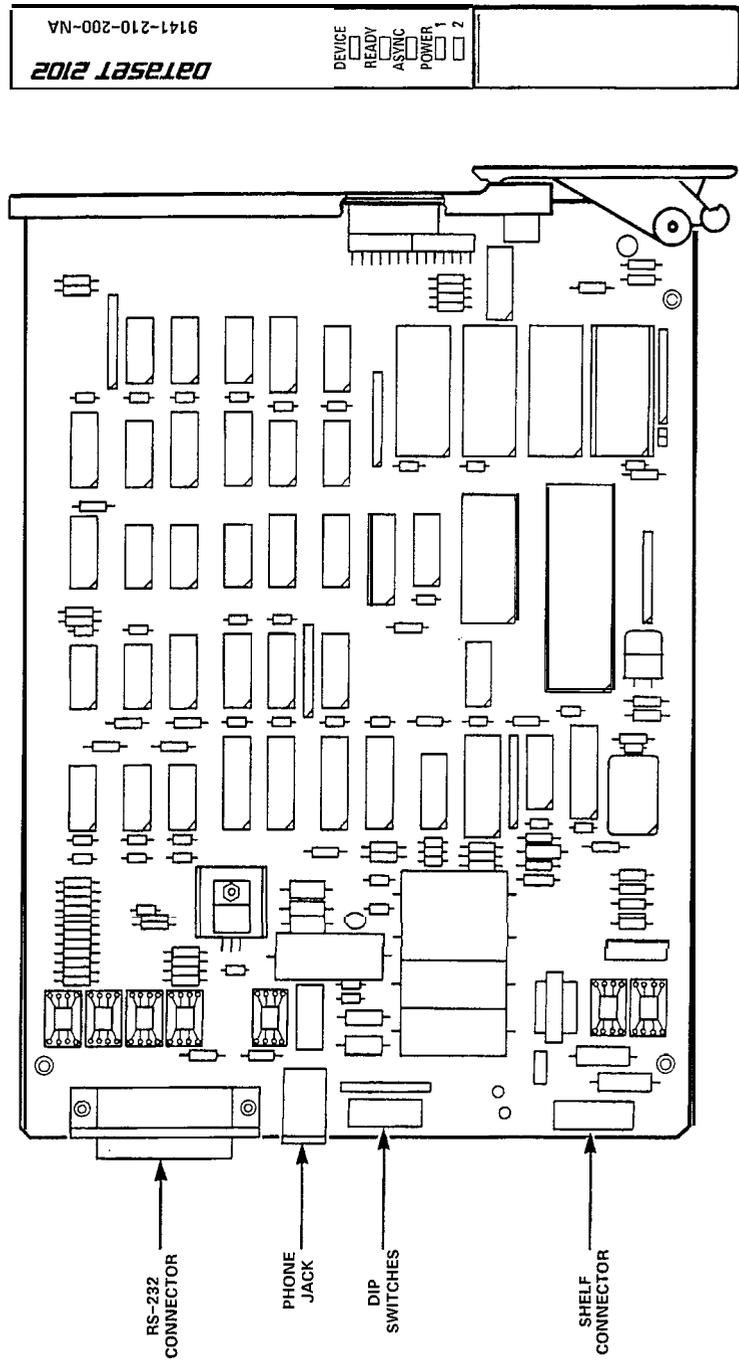
Figure 3-I Rack Mounted DATASET 2102

KA0649E0R0

4. STANDALONE DATASET 2103

Description

4.01　　A Standalone DATASET 2103 is packaged in a flat case which can be placed under a standard desk telephone set. It is functionally the same as the Rack Mounted DATASET 2102 (they share the same base pcb). The Standalone DATASET 2103 can be connected to the PABX using a four-wire connection; two wires connect the DATASET to the Digital Line Card, and two different wires connect the telephone set tip-ring pair to an ONS or COV line card; it may also be connected to a Digital Line Card within the PABX by a single twisted pair (the telephone set is connected independently). Figure 4-1 shows a Standalone DATASET 2103, while Figure 4-2 shows typical applications of a Standalone DATASET 2103 connected to a telephone set and a personal computer or terminal.

Controls, Indicators, and Connectors

4.02　　Its keys and LEDs are:

- ATTN key
- DISC key
- POWER LED
- READY RxD LED
- DEVICE TxD LED
- ASYNC

Standalone DATASET 2103 (NA Teledapt socket) connector pins are:

	Line		Telephone
Pin	Signal	Pin	Signal
1	no connection	1	no connection
2	data tip	2	modem MI
3	voice tip	3	voice tip
4	voice ring	4	voice ring
5	data ring	5	modem MIC
6	no connection	6	no connection

Installation

WARNING

ANY CONNECTION OF THIS SET TO AN OFF PREMISE APPLICATION, AN OUT OF PLANT APPLICATION, OR TO ANY OTHER EXPOSED PLANT APPLICATION MAY RESULT IN A SAFETY HAZARD, AND/OR DEFECTIVE OPERATION, AND/OR EQUIPMENT DAMAGE.

CHART 4-I
INSTALLATION OF A STANDALONE DATASET 2103

Step	Action
1.	Install a Standalone DATASET 2103 by placing it near its associated telephone set and data peripheral (its case is designed to lie flat on the desk under a standard telephone set).
2.	Complete Customer Data Entry for the system to allow the Standalone DATASET 2103 to operate with the PABX.
3.	Set the eight DIP switches as required for this installation. Refer to Table 2-I.
4.	Connect the telephone set cord to the jack marked PHONE; connect the modular telephone line cord to the jack marked LINE and to the wall or floor jack which connects to the PABX main distributing frame (MDF). The connection to the MDF is a four-wire circuit; the voice tip and ring (red and green) connect to an ONS or COV line card (depending on the type of set being used), and the DATASET tip and ring (yellow and black) connect to a Digital Line Card.
5.	An alternative tip and ring wiring arrangement is: connect the telephone set through a two-wire connection via the MDF to its ONS or COV line card; connect the modular line cord (data tip and ring) to the jack of the Standalone DATASET 2103 marked LINE, through the MDF to its Digital Line Card in the PABX.
6.	Plug the power supply into an ac outlet and its cord into the power socket on the Standalone DATASET 2103. All LEDs should flash 5 times, indicating that the DATASET has passed its self-test. If this does not happen, the DATASET is faulty and must be replaced. Then the POWER LED comes on, to indicate that the data set is communicating with the PABX. If the POWER LED flashes, check the wiring.
7.	Plug the RS-232 interconnecting cable into the RS-232 connector at the back of the Standalone DATASET 2103 and connect its other end to the peripheral device. When the RS-232 connector is attached, the DEVICE LED should be on, unless the device is an auto-answer device, and defined as such in CDE (usually only destination devices such as host computers are auto-answer). If the device is not auto-answer, and the DEVICE LED does not come on, make sure the device is powered on, and then use an RS-232 break-out box to verify that the device provides DTR. If the device does not provide DTR, select CDE option "RS-232 Force High" for that device.

CAUTION: **If ATTN and DISC keys are both pressed at the same time, the DATASET 2103 goes into a special test sequence, generating many error conditions which are displayed on the terminal that is connected to the DATASET 2103. To exit from this sequence, disconnect and reconnect the data set power cord. These keys should NEVER be pressed concurrently.**

RS-232
CONNECTOR · · · · · PHONE JACK · · · · · MODE SWITCHES · · · · · POWER · · · · · LINE JACK

MITEL®   DATASET 2103

POWER   ASYNC   READY   DEVICE   ATTENTION   DISCONNECT
                        (RxD)   (TxD)

POWER   ASYNC   READY   DEVICE   ATTENTION   DISCONNECT
LED   LED   LED   LED   KEY   KEY
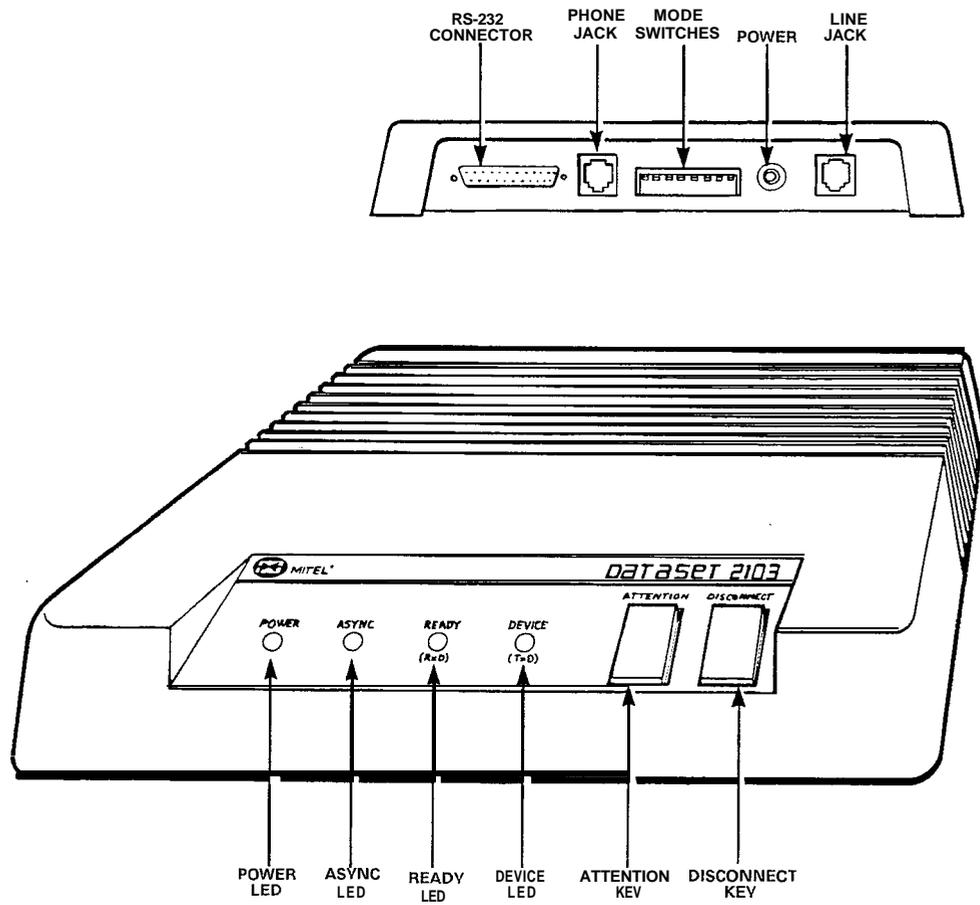
KA0648E0R0

Figure 4-I Standalone DATASET 2103, Showing Connectors and Indicators
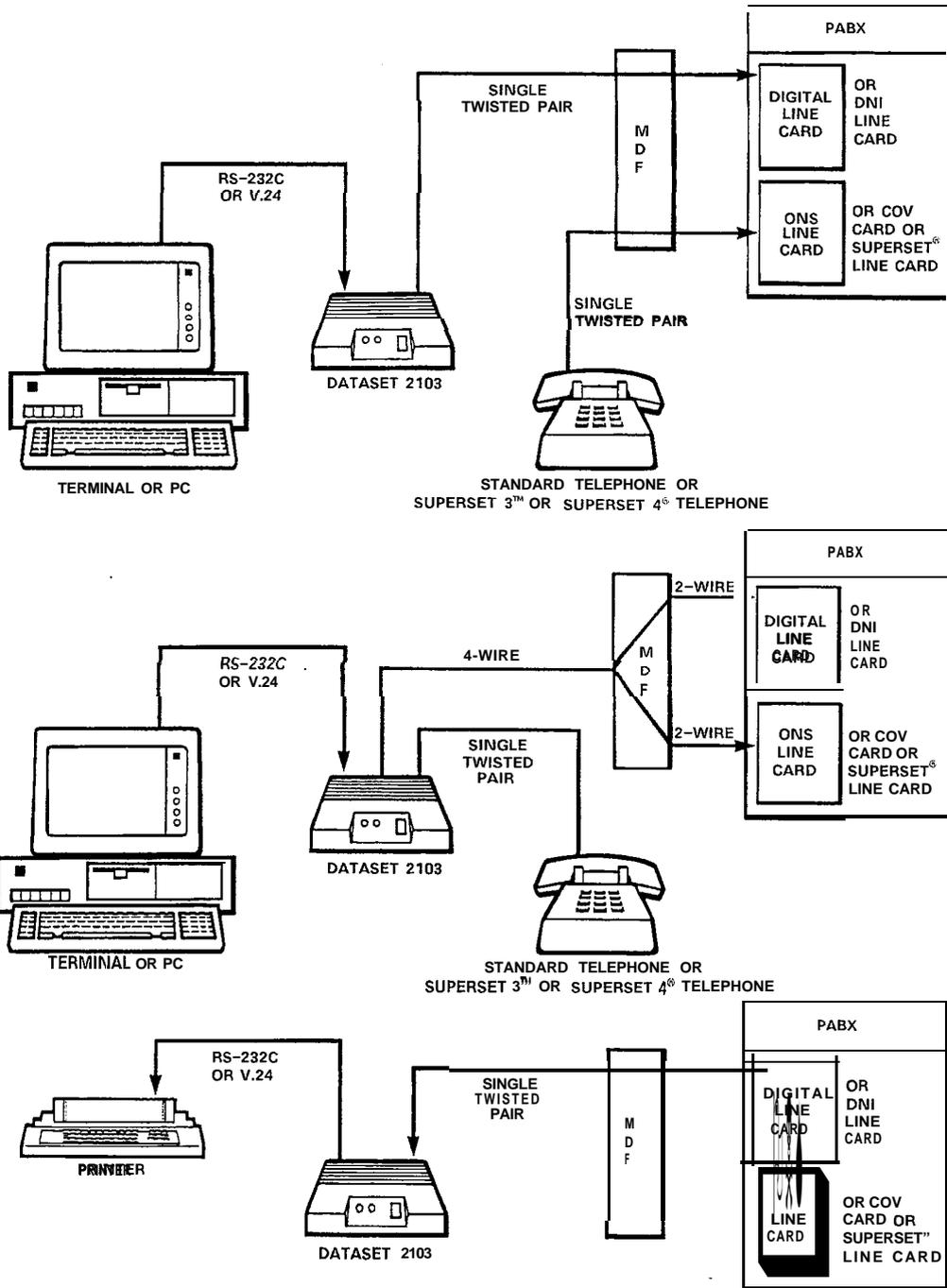
Figure 4-2 Typical Standalone DATASET 2103 Applications

5. CIRCUIT DESCRIPTION

General

5.01   The DATASET 2100 Series circuit contains six basic blocks, as shown in Figure 5-l. The microcontroller is the central processor for the data set; it contains two timers, the BAUD rate generator, and the Universal Asynchronous Receiver Transmitter (UART) and the system High-level Data Link Control (HDLC). The switches on the data set interface directly to the microcontroller; this way, the firmware can override the switch settings.

5.02   The serial/parallel converter converts serial data from the RS-232 port to parallel for the processor, and parallel data from the processor to serial for the RS-232 port. In asynchronous mode, the microprocessor does the conversion; in synchronous mode, shift registers and latches interface the TxD and RxD lines with the databus to the processor.

5.03   The Phase Lock Loop and Clock circuits synchronize the receive data rate of the data set to the rate of the received data from the other device.

5.04   The DNIC Interface Circuit provides the interface to the PABX; its clock signals operate the data set in either set or system mode.

5.05   The RS-232 Interface contains the drivers and receivers that buffer the signal lines. It also contains a loopback circuit which can connect together transmit data from the microcontroller to receive data to the microcontroller (RxD to TxD) for self-testing functions.

5.06   The Power Supply receives unregulated ac voltage and rectifies it to become +12 vdc unregulated, -12 vdc unregulated, and regulated +5 vdc for logic circuits.

RS-232 CONTROL LEADS

ADDRESS

DATA

M I C R O C O N T R O L L E R

SERIAL/ PARALLEL CONVERTER

R x D

T x D

RS-232 INTERFACE

DNIC INTERFACE

PHASE LOCK, LOOP AND CLOCK

MASTER CLOCK

SWITCHES

+12
-12
+5
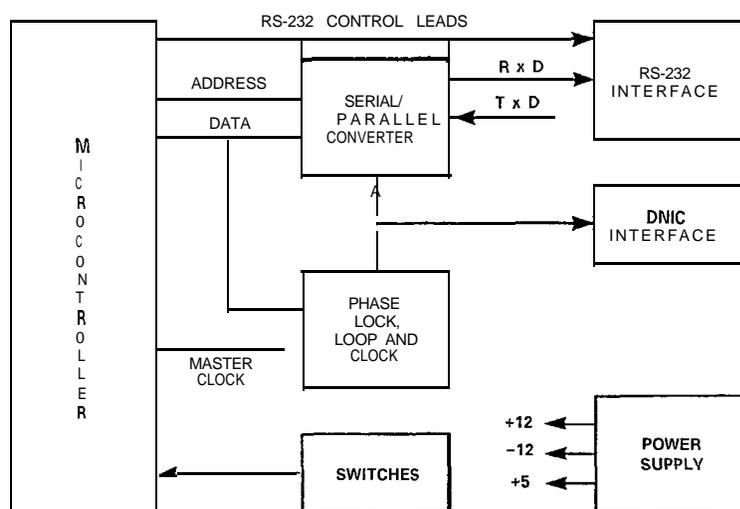
POWER SUPPLY

KA0650E0R0

Figure 5-I Typical DATASET 2100 Series Block Diagram

6. POWER SUPPLIES

General

6.01   The Standalone DATASET 2103 receives its power from a plug-in transformer which supplies 9 vac to a power connector on the back of the set. Circuitry within the data set converts this to the required dc voltages.

6.02 The Rack Mounted DATASET 2102 receives 9 vac from the power supply of the DATASHELF 9100. Circuitry on the card converts this to the required dc voltages. Refer to Section MITL9141-753-526-NA, DATASHELF 9100, for further information.

DATACABINET 9000

WARNING

THIS EQUIPMENT GENERATES, USES, AND CAN RADIATE RADIO FREQUENCY ENERGY AND IF NOT INSTALLED AND USED IN ACCORDANCE WITH THE INSTRUCTION MANUAL, MAY CAUSE INTERFERENCE TO RADIO COMMUNICATIONS. IT HAS BEEN TESTED AND FOUND TO COMPLY WITH THE LIMITS FOR CLASS A COMPUTING DEVICE PURSUANT TO SUBPART J OF PART 15 OF FCC RULES, WHICH ARE DESIGNED TO PROVIDE REASONABLE PROTECTION AGAINST SUCH INTERFERENCE WHEN OPERATED IN A COMMERCIAL ENVIRONMENT. OPERATION OF THIS EQUIPMENT IN A RESIDENTIAL AREA IS LIKELY TO CAUSE INTERFERENCE IN WHICH CASE THE USER AT HIS OWN EXPENSE WILL BE REQUIRED TO TAKE WHATEVER MEASURES MAY BE NECESSARY TO CORRECT THE INTERFERENCE.

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WARNING

THE DATASHELF 9100 DEVICE IS MARKETED AND SOLD BY MITEL AS AN INTEGRAL PART OF ITS DATACABINET 9000 SYSTEM AND IS NOT INTENDED BY MITEL TO BE USED AT ANY TIME BY ANY CUSTOMER, IN WHOLE OR IN PART, IN ANY APPLICATION OTHER THAN IN AN APPRO-PRIATE DATACABINET 9000 SYSTEM. IN THE EVENT A DATASHELF 9100 DEVICE IS INSTALLED AND/OR OPERATED OTHER THAN IN AN APPROPRIATE DATACABINET 9000 SYSTEM, MITEL SHALL NOT BE RESPONSIBLE FOR ANY FINES, PENALTIES, CLAIMS, DAMAGES, LOSSES OR OTHER LIABILITIES WHICH MAY ARISE DIRECTLY OR INDIRECTLY AS A RESULT OF SUCH UN-AUTHORIZED AND UNINTENDED USE, INCLUDING WITHOUT LIMITATION FINES OR PENALTIES FOR VIOLATION OR CONTRAVENTION OF ANY DECISIONS, ORDERS, RULES, REGULATIONS, STANDARDS OR OTHER REQUIREMENTS OF THE UNITED STATES FEDERAL COMMUNICATIONS COMMISSION, UNDERWRITERS' LABORATORIES INC. AND THE CANADIAN STANDARDS ASSOCI-ATION AS MAY BE IN EFFECT FROM TIME TO TIME.

<div align="center">

CONTENTS **PAGE**

</div>

<div align="center">

LIST OF ILLUSTRATIONS

</div>

<div align="center">

LIST OF TABLES

</div>

<div align="center">

LIST OF CHARTS

</div>

1. INTRODUCTION

General

1.01   This Section describes the MITEL DATACABINET 9000, part number 9141-900-100-NA. The data shelves and DATASETs which mount in these shelves are described in separate practices.

Reason for Issue

1.02   This Section is issued to describe the cabinet in which MITEL rack mounted DATASETs are installed.

1.03   Only MITEL designed and approved equipment is to be installed in the DATACABINET 9000.

2. DESCRIPTION

General

2.01   The DATACABINET 9000 is a free-standing metal cabinet approximately 60 cm x 60 cm x 98 cm high (24 inches by 24 inches by 39 inches high). It has locking doors at the front and the rear, and contains rails inside for mounting data shelves and other equipment.

2.02   Figure 2-l shows the front view of the cabinet, with the door open, and a configuration of three DATASHELF 9100 assemblies and a Modem interconnect Panel. Figure 2-2 shows a rear view of the cabinet interior with cables installed. Each shelf also has a 25-pair connectorized cable which connects to the PABX MDF, and one ac power   cord.

2.03   The cabinet is mounted on four casters. The Power Distribution Unit rear panel, shown in Figure 2-2, contains entrances for power and communication cables. Inside, on the left, is a power distribution panel for distributing power to equipment within the cabinet.
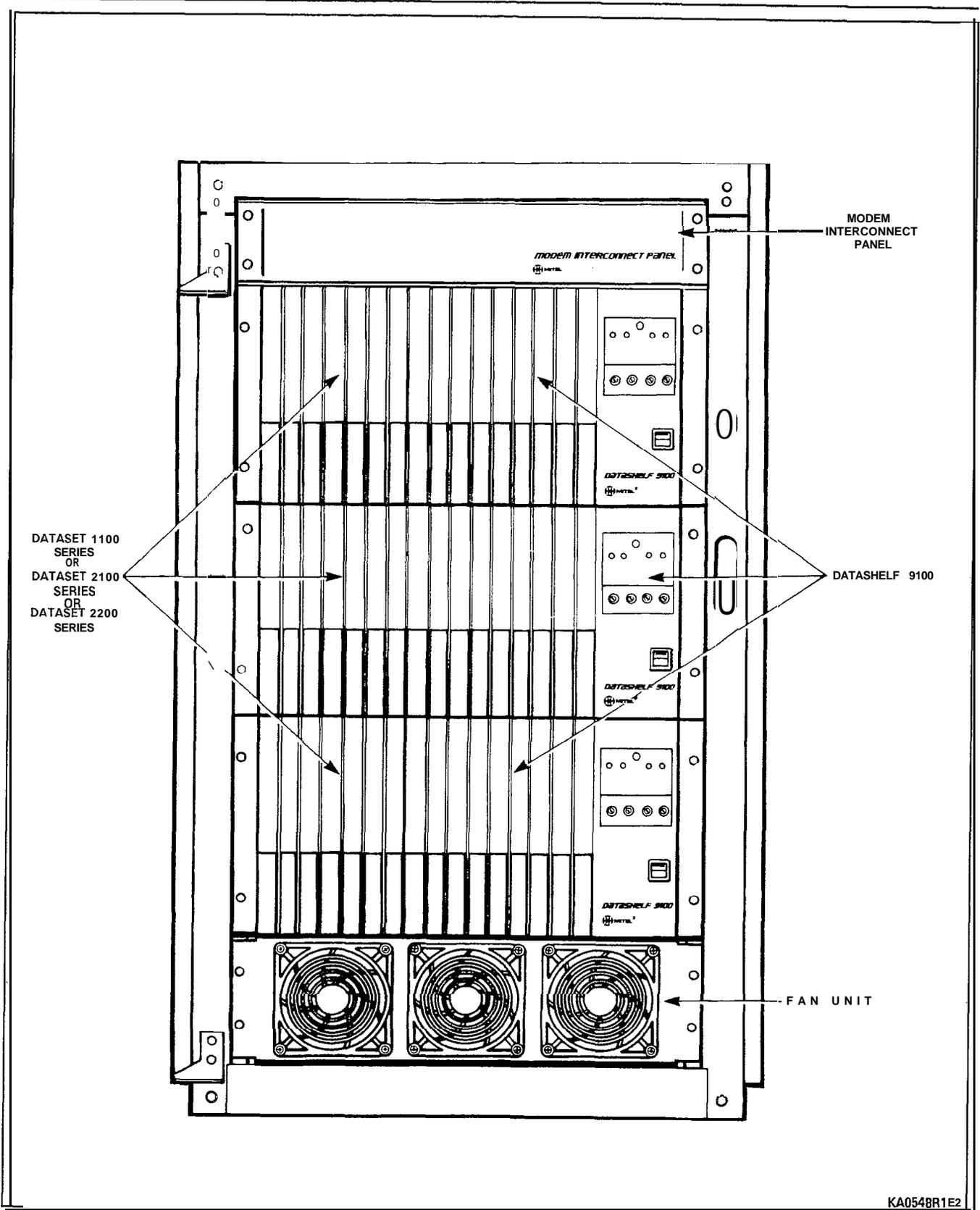
Figure 2-1 DATACABINET 9000, Front View, with Three DATASHELF 9100 Assemblies and a Modem Interconnect Panel
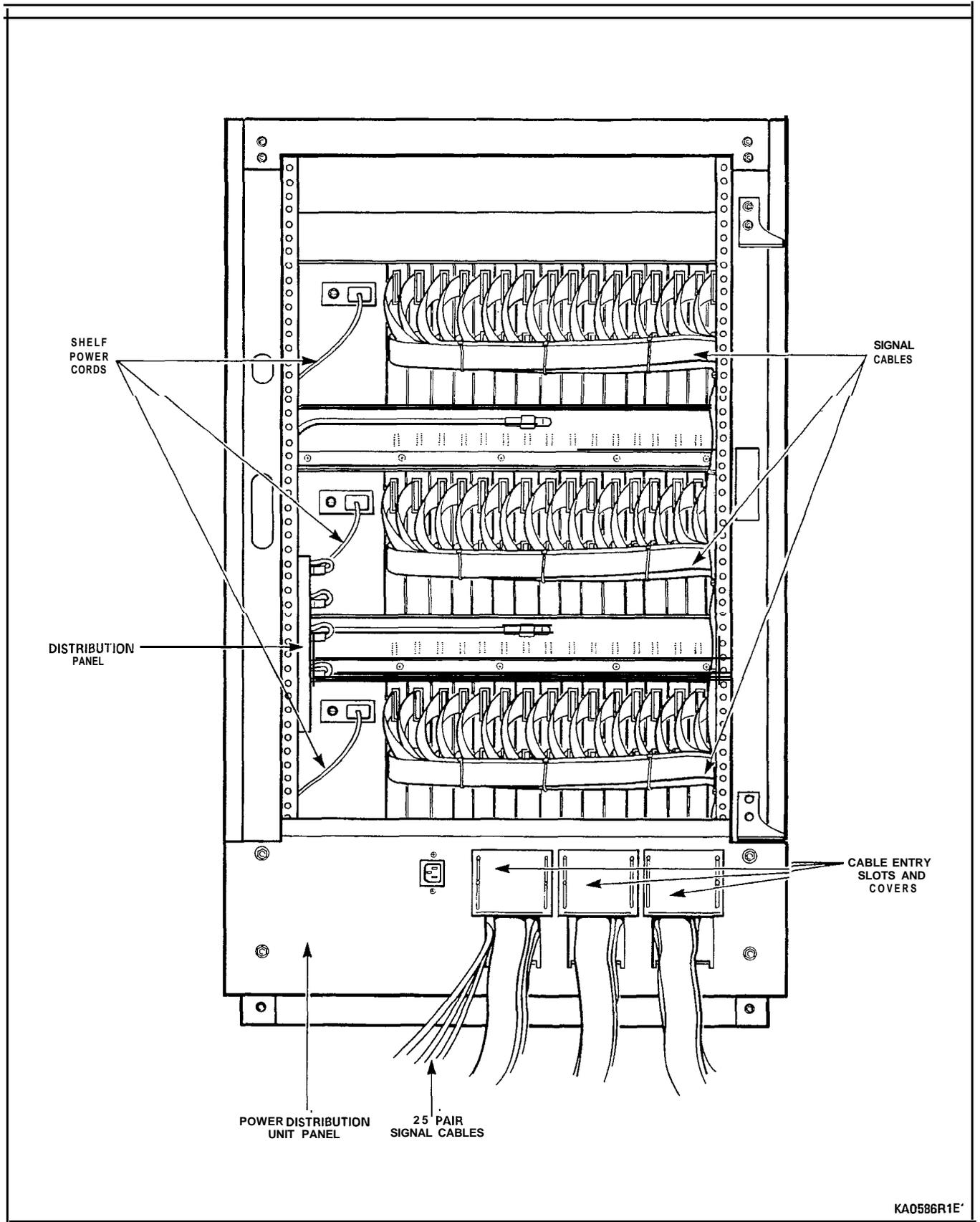
Figure 2-2 DATACABINET 9000, Rear View

SHELF POWER CORDS

SIGNAL CABLES

DISTRIBUTION PANEL

CABLE ENTRY SLOTS AND COVERS

POWER DISTRIBUTION UNIT PANEL

25 PAIR SIGNAL CABLES

KA0586R1E'

3. CONFIGURATIONS

General

3.01 A DATASHELF 9100 and a Modem Interconnnect Panel are available for mounting within the DATACABINET 9000. This Part describes different configurations that can be set up within the cabinet. Configurations are restricted only by the 35 inch height limit of the 19 inch rack and the total heights of the equipment being installed on it. The DATASHELF 9100 is 8.75 inches high, and the Modem Interconnect Panel is 3.5 inches high. Part 4 contains instructions for installing the DATACABINET 9000; instructions for installing each shelf are in Chart 4-I.

3.02 The DATACABINET 9000, configured with three DATASHELF 9100 assemblies and one Modem Interconnect Panel, is shown in Figure 2-1.

3.03 Equipment within the DATACABINET 9000 is to be powered only from the internal ac distribution panel. No external ac line cards are to be brought into the cabinet.

3.04 The DATACABINET 9000 must always have the fan unit installed in the bottom of the cabinet.

3.05 Table 3-1 lists the possible configurations which will be available for a DATACABINET 9000.

TABLE 3-I
CONFIGURATIONS AVAILABLE IN A DATACABINET 9000

Equipment Configuration	DATASHELF 9100	Modem Interconnect Panel
1	1	–
2	2	–
3	2	1
4	2	2
5	3	–
6	3	1

4. DATACABINET 9000 INSTALLATION AND WIRING

General

4.01 Unpack the DATACABINET 9000 and check it for damage or missing items. Position the cabinet where it is to be installed and equipped. install the shelves and cables within the cabinet according to Chart 4-1.

Notes: 1. Each card slot not equipped with a DATASET set must be equipped with a filler plate to maintain correct flow of cooling air within the shelves; this does not apply to the top shelf of any configuration.

2. Only MITEL designed and approved equipment may be installed within a DATACABINET 9000.

CHART 4-I
INSTALL SHELVES, CABLES, AND OTHER ASSEMBLIES INTO A DATACABINET 9000

Step	Action
1	Unpack and inspect the shelf for damage or missing items.
2	Turn off the power switch and remove the line cord from its outlet. Open the doors of the cabinet.
3	Install the cardfile rails in the bottom of the cabinet, above the fan unit, as shown in Figure 4-1, for the first shelf being installed in the cabinet, or immediately above an existing shelf.
4	Place the shelf onto the cardfile rails and fasten to the front cabinet side rails with the screws provided.
5	Connect the frame ground wire from the shelf ground stud to the left side rail (as viewed from rear) within the cabinet, as shown in Figure 4-2. The Modem Interconnect Panel does not require a ground wire.
6	install remaining shelves (or Modem Interconnect Panel) similarly; each requires tha a pair of cardfile rails be installed first.
7	Connect ac cords from distribution panel to each shelf and attach to left side rail within cabinet.
8	At the front of cabinet, unpack and install the DATASETs into their assigned slots.
9	Install remaining signal cables to each shelf; run the cable group for the bottom shelf through the right hand cable entry slot, run the cables for the middle shelf through the middle slot, and run the cables for the top shelf through the left slot.

CHART 4-I (CONT'D)
INSTALL SHELVES, CABLES, AND OTHER ASSEMBLIES INTO A DATACABINET 9000

Step	Action
10	Form each cable bundle neatly up the right side rail, as shown in Figure 2-2, and attach securely to the brackets on the side rails.
11	Install 25-pair cables in through one of the three cable entry slots on the rear PDU panel and route up the left side of the cabinet to the associated shelves; attach to side rail brackets separately from ac cords.
12	Close up the covers of the cable access slots, close and lock rear door.
13	Connect the power cord from the DATACABINET 9000 to its ac outlet.
14	Connect the 25-pair cables to their associated MDF, and cross connect the MDF blocks as required.
15	Connect the remaining signal cables to their associated equipment.
16	Customer Data Entry for the DATASETs must be completed at the PABX before the DATASETs will operate, (refer to Section MITL9109-095-210-NA, Customer Data Entry).
17	Turn on the power switch on the PDU panel at the rear of the cabinet,
18	Turn on shelf power supply, and close and lock door.

CABINET
SIDE RAIL

CARDFILE RAIL

FAN UNIT
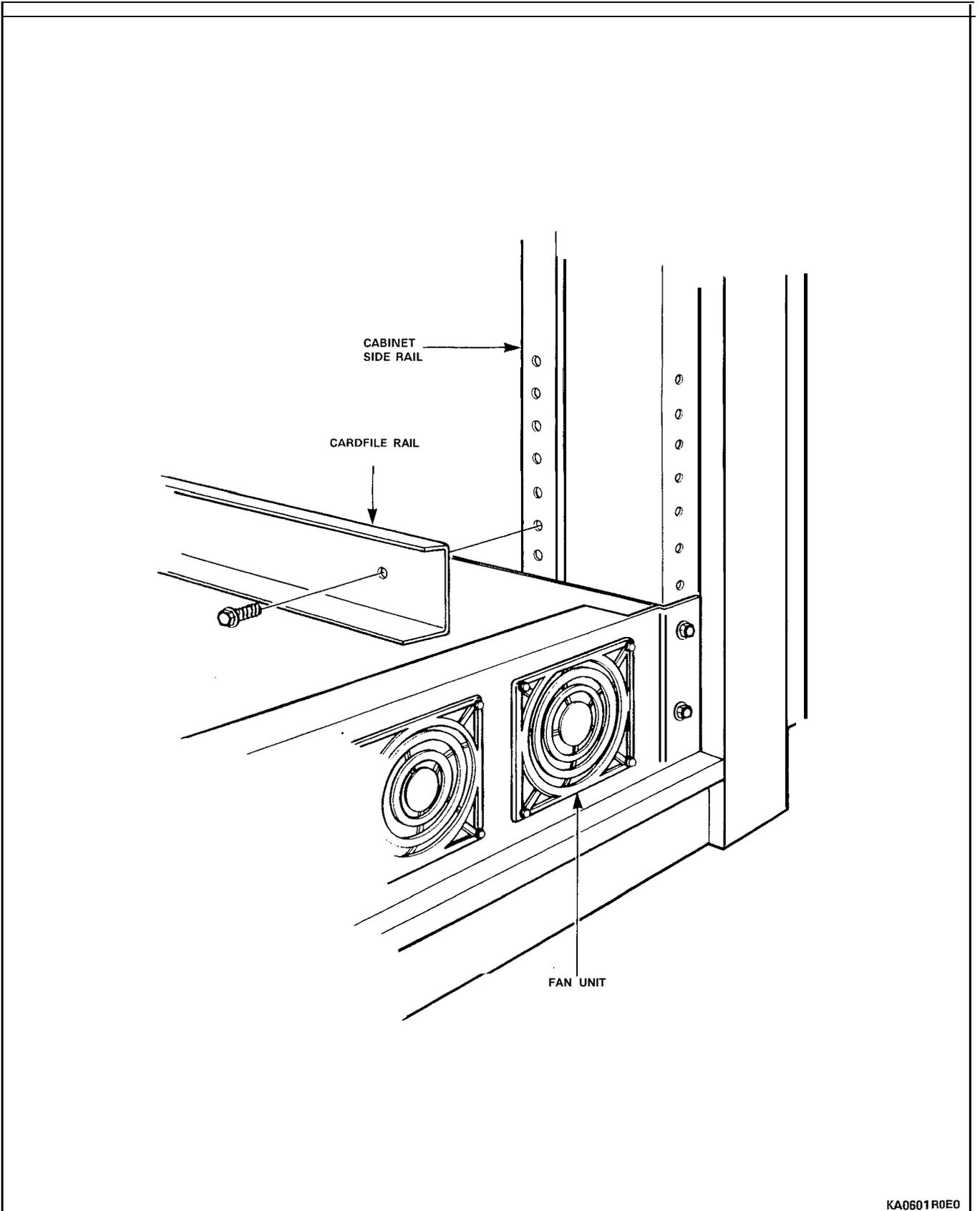
KA0601R0E0

Figure 4-l Installation of Cardfile Rail
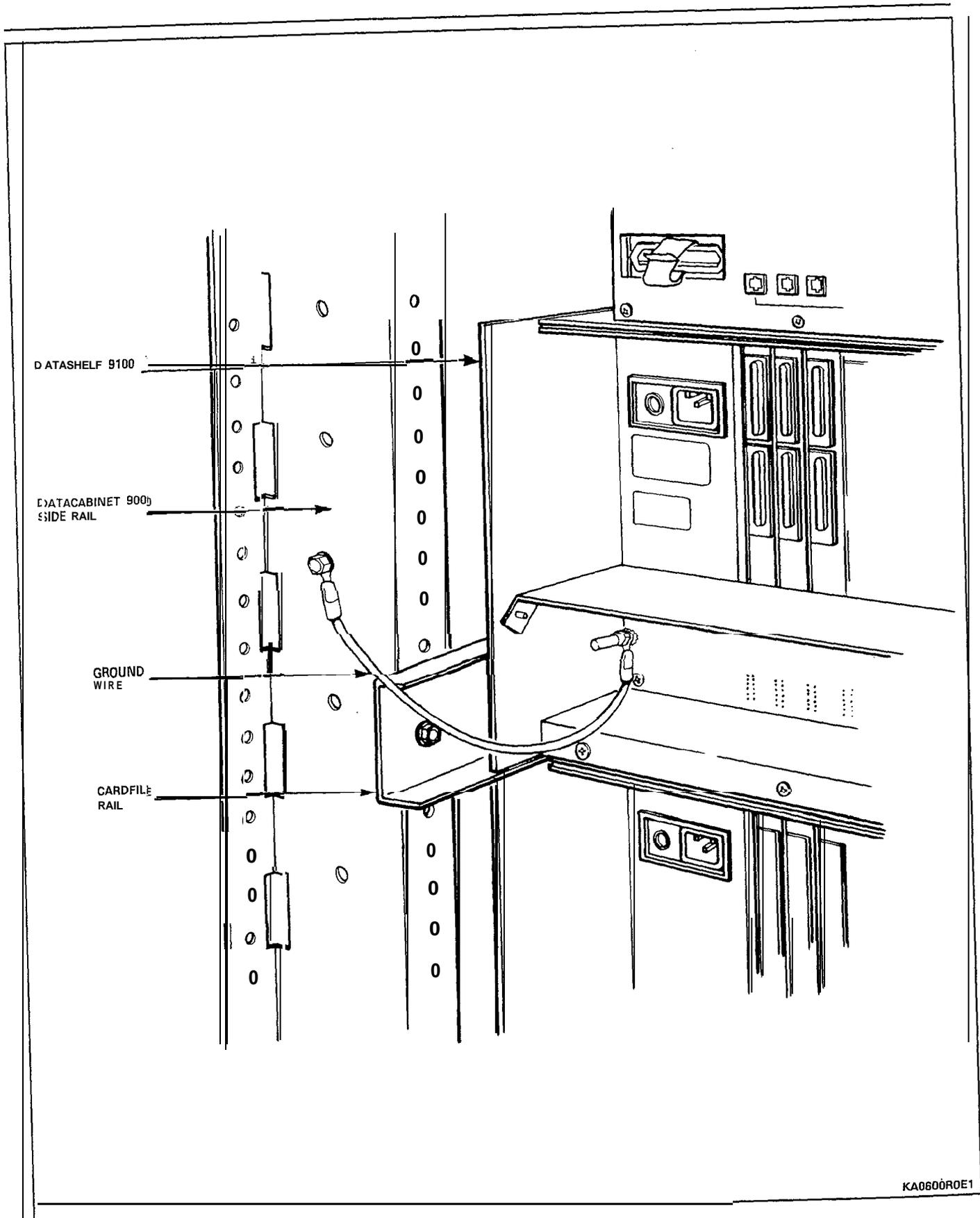
Figure 4-2 Connection of Shelf Ground Wire

KA0600R0E1

DATASHELF 9 100

WARNING

THIS EQUIPMENT GENERATES, USES, AND CAN RADIATE RADIO FREQUENCY ENERGY AND, IF NOT INSTALLED AND USED IN ACCORDANCE WITH THE INSTRUCTIONS MANUAL, MAY CAUSE INTERFERENCE TO RADIO COMMUNICATIONS. IT HAS BEEN TESTED AND FOUND TO COMPLY WITH THE LIMITS FOR A CLASS A COMPUTING DEVICE PURSUANT TO SUBPART J OF PART 15 OF FCC RULES, WHICH ARE DESIGNED TO PROVIDE REASONABLE PROTECTION AGAINST SUCH INTERFERENCE WHEN OPERATED IN A COMMERCIAL ENVIRONMENT. OPERATION OF THIS EQUIPMENT IN A RESIDENTIAL AREA IS LIKELY TO CAUSE INTERFERENCE, IN WHICH CASE THE USER, AT HIS OWN EXPENSE, WILL BE REQUIRED TO TAKE WHATEVER MEASURES MAY BE REQUIRED TO CORRECT THE INTERFERENCE.

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WARNING

THE DATASHELF 9100 IS MARKETED AND SOLD BY MITEL AS AN INTEGRAL PART OF ITS DATACABINET 9000 SYSTEM AND IS NOT INTENDED BY MITEL TO BE USED AT ANY TIME BY ANY CUSTOMER, IN WHOLE OR IN PART, IN ANY APPLICATION OTHER THAN IN AN APPRO-PRIATE DATACABINET 9000 SYSTEM. IN THE EVENT A DATASHELF 9100 DEVICE IS INSTALLED AND/OR OPERATED OTHER THAN IN AN APPROPRIATE DATACABINET 9000 SYSTEM, MITEL SHALL NOT BE RESPONSIBLE FOR ANY FINES, PENALTIES, CLAIMS, DAMAGES, LOSSES OR OTHER LIABILITIES WHICH MAY ARISE DIRECTLY OR INDIRECTLY AS A RESULT OF SUCH UNAUTHORIZED AND UNINTENDED USE, INCLUDING WITHOUT LIMITATION FINES OR PENAL-TIES FOR VIOLATION OR CONTRAVENTION OF ANY DECISIONS, ORDERS, RULES, REGULA-TIONS, STANDARDS OR OTHER REQUIREMENTS OF THE UNITED STATES FEDERAL COMMU-NICATIONS COMMISSION, UNDERWRITERS' LABORATORIES INC. AND THE CANADIAN STAN-DARDS ASSOCIATION AS MAY BE IN EFFECT FROM TIME TO TIME.

CONTENTS   PAGE

LIST OF ILLUSTRATIONS

FIGURE	TITLE	PAGE

LIST OF TABLES

TABLE	TITLE	PAGE

LIST OF CHARTS

CHART	TITLE	PAGE

1. INTRODUCTION

General

1.01   This Section describes the MITEL DATASHELF 9100, part number 9141-901-100-NA. The DATASETs which mount in this shelf are described in separate practices.

Reason for Issue

1.02 This Section is issued to describe the DATASHELF 9100 in which MITEL rack mounted DATASETs are installed.

2. DATASHELF 9100

General

2.01 The DATASHELF 9100 is 8.75 in. high. The left side of the shelf holds up to 16 DATASETs, while the right side contains an integral shelf power supply. All connections to the DATASHELF 9100 are made at the back of the shelf. Each card has connectors which are connected directly to the device with which the DATASET is to communicate. Each DATASET also has an edge connector which plugs into the shelf backplane; this connector provides power to the card, and connects to the backplane connector which connects tip-ring pair to the PABX. Figure 2-l shows a front view of the DATASHELF 9100.

2.02 The shelf power supply, the shelf, and the backplane are one integral unit. The power supply provides 9 vac to each card connector. A 25-pair connector on the backplane connects the tip-ring pairs from the DATASETs to the PABX. The power cord from the ac distribution panel plugs into the back of the shelf, directly behind the power supply. Figure 2-2 shows the backplane and connectors of the DATASHELF 9100.

2.03 The DATASET edge connectors which plug into the shelf connect the tip and ring to the 25-pair connector which is cabled to the PABX MDF. The pair assigned to each DATASET is listed in Table 2-1.

TABLE 2-I
DATASHELF 9100 TIP AND RING PIN ASSIGNMENTS

| DATASET | | | J17 connector | |
slot	tip	ring	tip	ring
J1	1	12	26	1
J2	1	12	27	2
J3	1	12	28	3
J4	1	12	29	4
J5	1	12	30	5
J6	1	12	31	6
J7	1	12	32	7
J8	1	12	33	8
J9	1	12	9	34
J10	1	12	10	35
J11	1	12	11	36
J12	1	12	12	37
J13	1	12	13	38
J14	1	12	14	39
J15	1	12	15	40
J16	1	12	16	41

RACK-MOUNTED
DATASET CARD

ON/OFF
SWITCH

POWER
SUPPLY

KA0317R2E1

Figure 2-I Front View of the DATASHELF 9100

POWER CORD
CONNECTOR

PRIMARY
INPUT FUSE

GROUND/
STUD

25 PAIR CONNECTOR
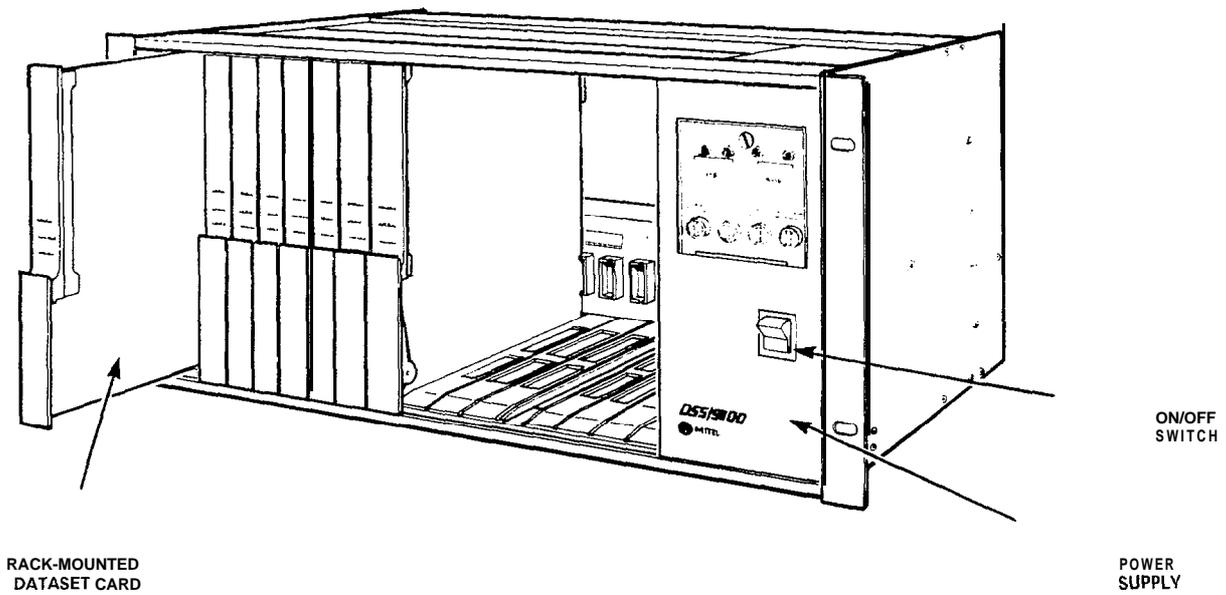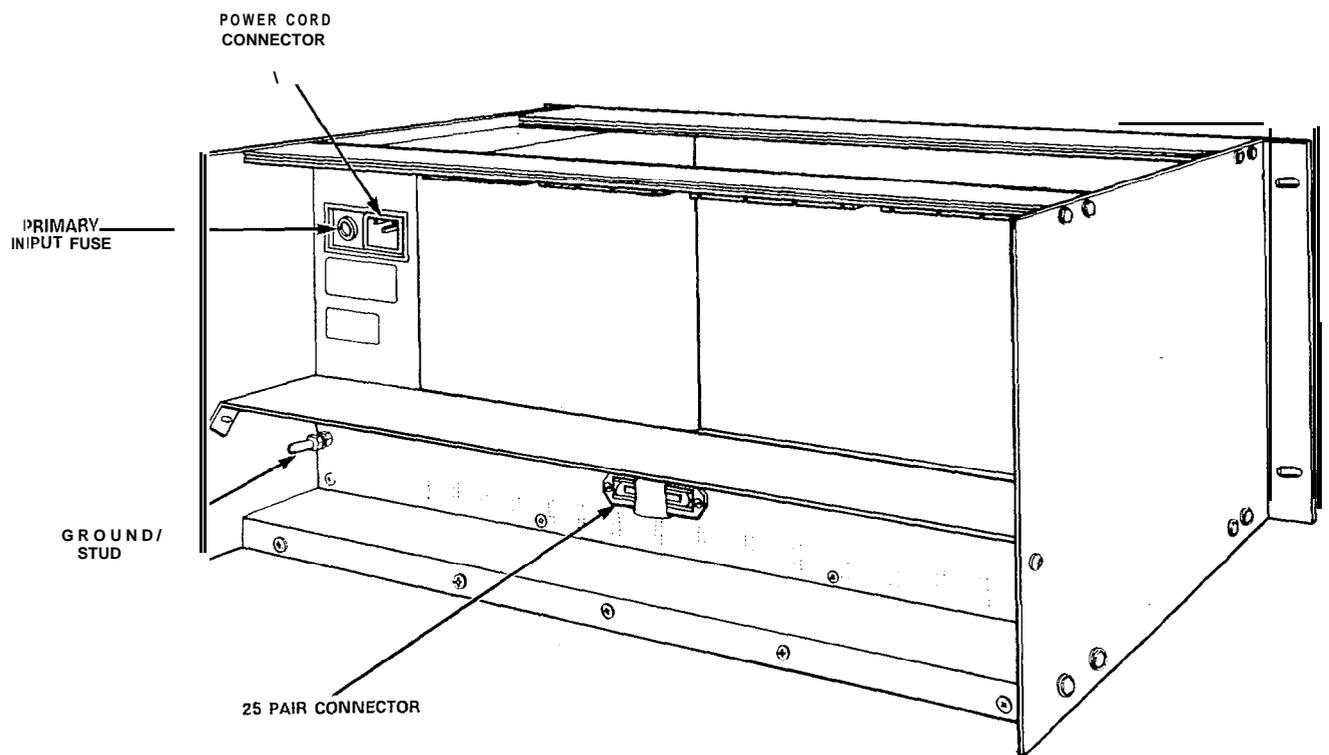
KA0344R2E

Figure 2-2 Backplane and Connectors of the DATASHELF 9100

3. DATASHELF 9100 INSTALLATION AND WIRING

Note: Each card slot not equipped with a DATASET set must be equipped with a filler plate to maintain correct flow of cooling air within the shelves; this does not apply to the top shelf of any configuration.

CHART 3-1
INSTALL DATASHELF 9100 INTO A DATACABINET 9000

Step	Action
1	Unpack and inspect the shelf for damage or missing items.
2	Turn off the DATACABINET 9000 power switch and remove the line cord from its outlet. Open the doors of the cabinet.
3	Install the cardfile rails in the bottom of the cabinet, above the fan unit, as shown in Figure 3-1, for the first shelf being installed in the cabinet, or immediately above an existing shelf.
4	Place the shelf onto the cardfile rails and fasten to the front cabinet side rails with the screws provided.
5	Connect the frame ground wire from the shelf ground stud to the left side rail (as viewed from rear) within the cabinet, as shown in Figure 3-2.
6	Connect ac cords from distribution panel to the shelf and attach to left side rail within cabinet.
7	Unpack and install DATASETs into their assigned slots.
8	Install signal cables to each shelf, and connect the signal cables to their associated equipment.
9	Form a cable bundle neatly up the right side rail, and attach securely to the brackets on the side rails.
10	Install 25-pair cable to the shelf; attach to side rail brackets separately from ac cords. Connect the 25-pair cable to its associated MDF, and cross connect the MDF blocks as required.
11	Close up the covers of the cable access slots, close and lock rear door.
12	Connect the power cord from the DATACABINET 9000 to its ac outlet.
13	Customer Data Entry for the DATASETs must be completed at the PABX before the DATASETs will operate (refer to PABX Customer Data Entry Practice).
14	Turn on the power switch on the PDU panel at the rear of the cabinet.
15	Turn on shelf power supply, and close and lock door.

CABINET
SIDE RAIL

CARDFILE RAIL

FAN UNIT
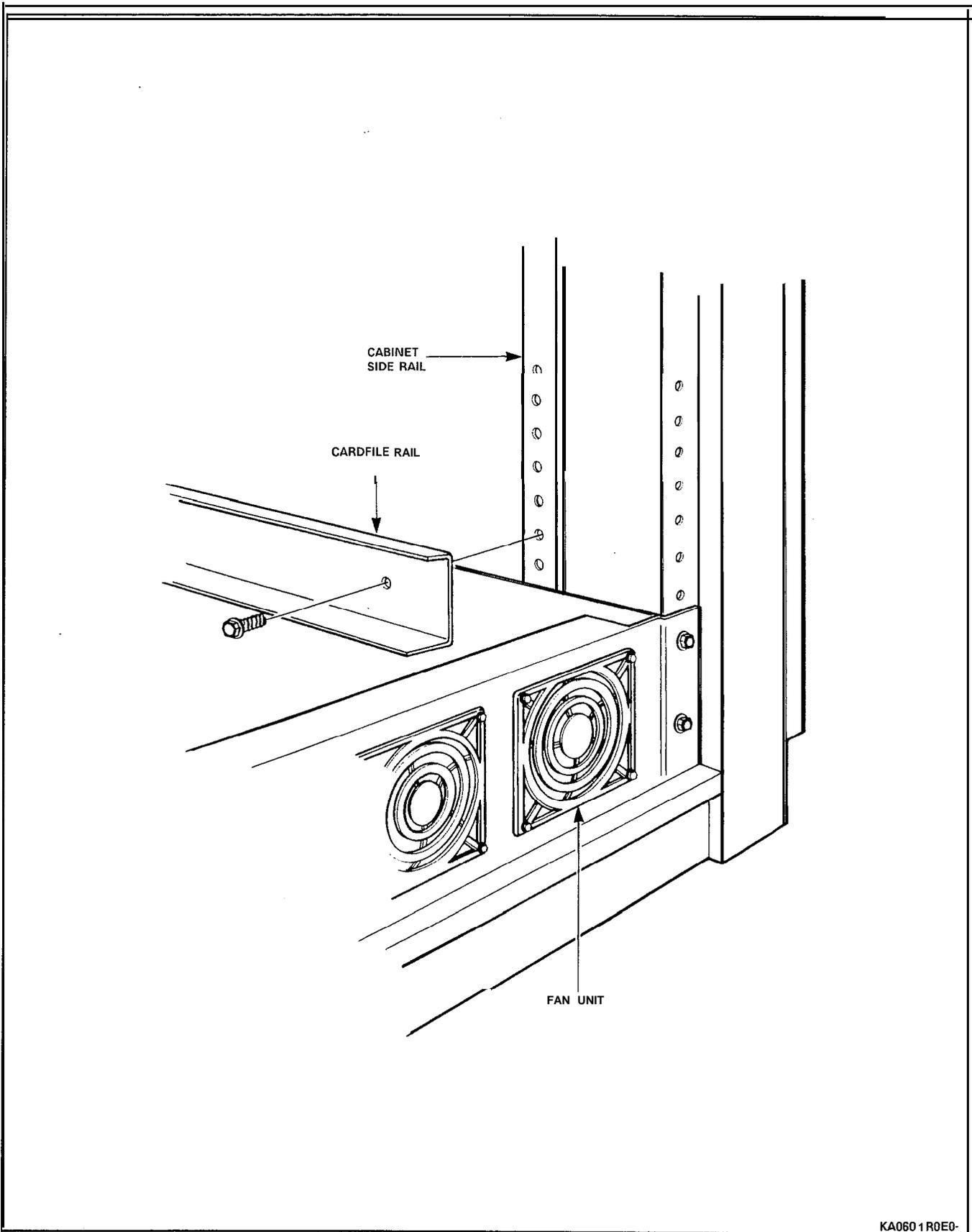
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Figure 3-I Installation of Cardfile Rail

DATASHELF 9100

DATACABINET 9000
SIDE RAIL

GROUND
WIRE

CARDFILE
RAIL

KA0600R0E1
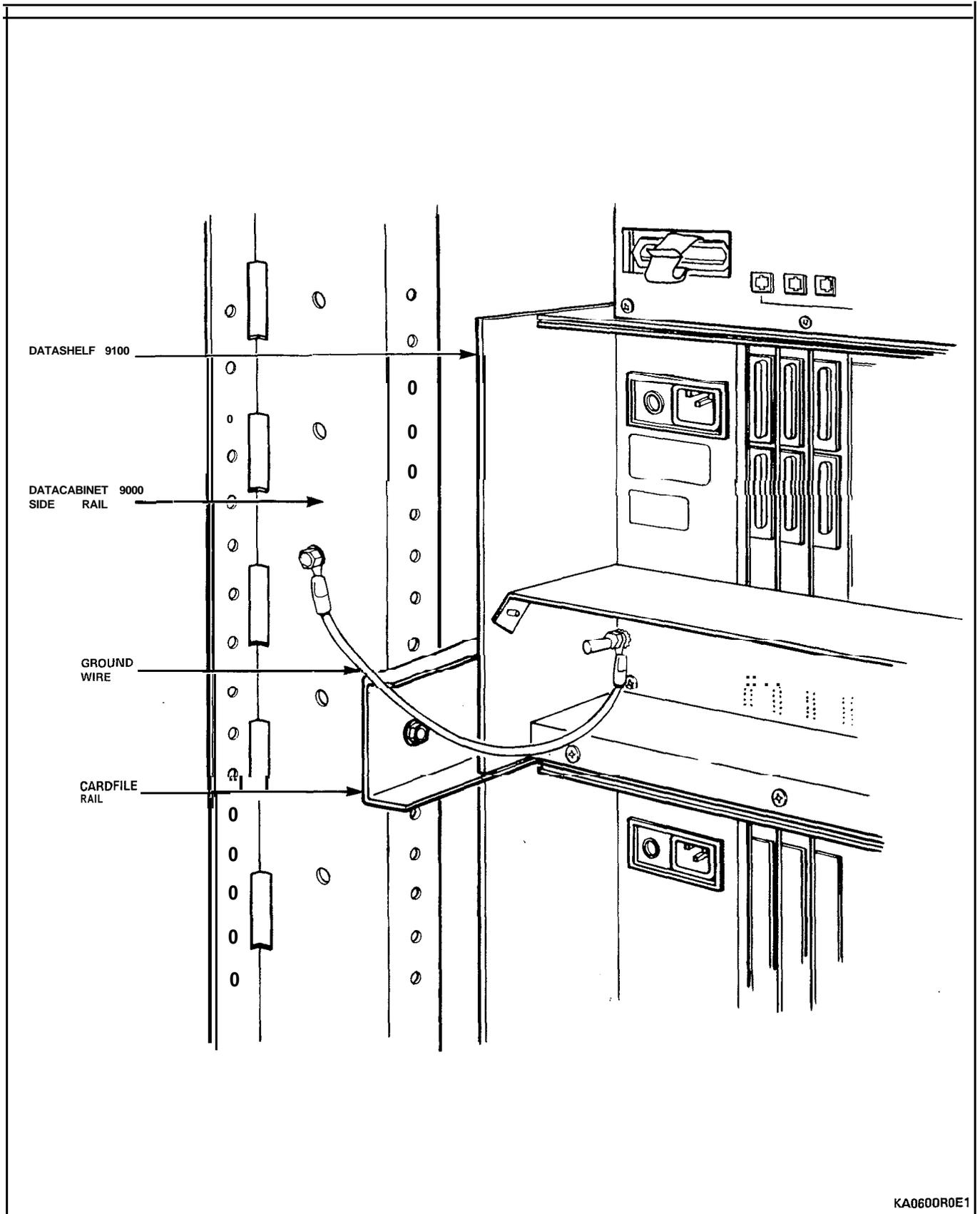
Figure 3-2 Connection of Shelf Ground Wire

MODEM INTERCONNECT PANEL

i

NOTICE

CONTENTS   **PAGE**

LIST OF TABLES

TABLE   **TITLE**   **PAGE**

LIST OF CHARTS

CHART   **TITLE**   **PAGE**

LIST OF ILLUSTRATIONS

FIGURE   **TITLE**   **PAGE**

1. INTRODUCTION

General

1.01 This Section describes the MITEL Modem Interconnect Panel, part number 9141-940-100-NA. THE MITEL Modem Interconnect Panel is designed and approved only for installation in the Mitel DATACABINET 9000.

Reason for Issue

1.02 This Section is issued to describe the Modem Interconnect Panel.

2. MODEM INTERCONNECT PANEL

General

2.01   The Modem Interconnect Panel provides a method to connect a voice tip-ring pair from the PABX to a modem, and to connect the MI/MIC leads from the data set to the modem. Sixteen circuits are provided; each is the same, except for the tip-ring connection to the 25-pair cable. Figure 2-1 shows the connections to a Modem Interconnect Panel.

Connections

2.02   The Teledapt jacks (FROM MODEM and TO DATASET) are connected together in pairs (pin 2 to pin 2 and pin 5 to pin 5). The FROM MODEM Teledapt connector voice tip (pin 3) and voice ring (pin 4) are connected to the 25-pair cable connector pins as listed in Table 2-1. These cable pairs are then connected to ONS ports on the PABX.

TABLE 2-1
MODEM INTERCONNECT PANEL CONNECTIONS

DATASET Jack/ Modem Jack pair	25-pair tip	Connector ring
16	16	41
15	15	40
14	14	39
13	13	38
12	· 12	37
11	11	36
10	IO	35
9	9	34
8	8	33
7	7	32
6	6	31
5	5	30
4	4	29
3	3	28
2	2	27
1	1	26
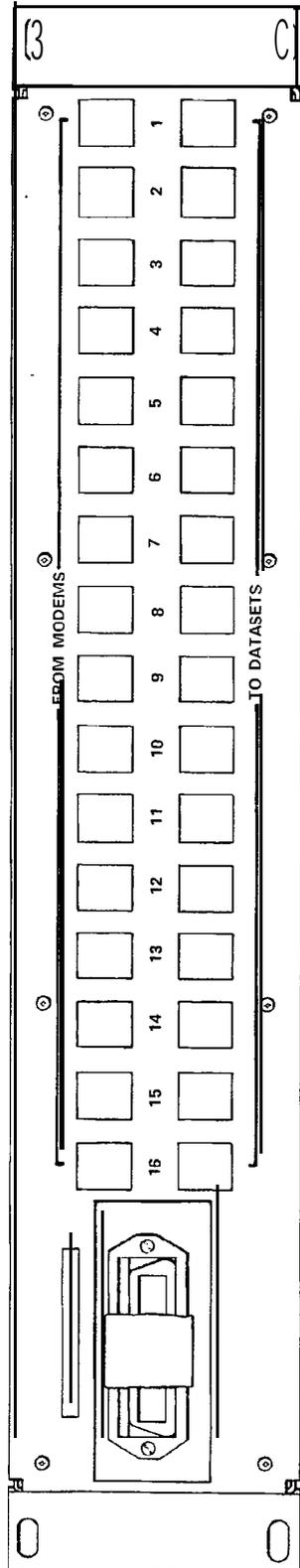
Figure 2-l Modem Interconnect Panel Connectors

CHART 2-I
INSTALL A MODEM INTERCONNECT PANEL INTO A DATACABINET 9000

CAUTION: Only MITEL designed and approved equipment may be installed within a DATACABINET 9000.

Step	Action
1.	Unpack and inspect the Modem Interconnect Panel for damage or missing items.
2.	**Turn off the power switch and remove the line cord from its outlet.** Open the doors of the cabinet.
3.	install the cardfile rails for the Modem Interconnect Panel immediately above an existing DATASHELF 9100 or Modem Interconnect Panel. Refer to Figure 2-2. The Modem Interconnect Panel(s) must always be installed immediately above the DATASHELF 9100 to maintain correct cooling air flow.
4.	Place the Modem Interconnect Panel onto the cardfile rails and fasten to the front cabinet side rails with the screws provided.
5.	Run the cable groups through the cable entry slots. Form each cable bundle neatly up the right side rail, and attach securely to the brackets on the side rails; also attach to the strain reliefs at the back of the Modem Interconnect Panel.
6.	Install 25-pair cables in through one of the cable entry slots on the rear PDU panel and route up the left side of the cabinet and attach to side rail brackets separately from ac cords.
7.	Close up the covers of the cable access slots.
8.	Connect the 25-pair cables to their associated MDF, and cross-connect the MDF blocks as required.
9.	Attach one end of a 4-wire line cord to the jack usually labeled "TELCO" on the rear of the modem. Attach the other end of the line cord to the Teledapt jack labeled "FROM MODEM" on the Modem Interconnect Panel.
10.	Attach one end of a 4-wire line cord to the "PHONE" jack of the Rack Mounted DATASET. Attach the other end of the line cord to the Teledapt jack labeled "TO DATASET" on the Modem Interconnect Panel.
11.	Complete the PABX Customer Data Entry for the Modem Interconnect Panel.
12.	Close and lock Cabinet doors.
13.	Connect the power cord from the DATACABINET 9000 to its ac outlet.

CABINET
SIDE RAIL

CARDFILE RAIL

FAN UNIT
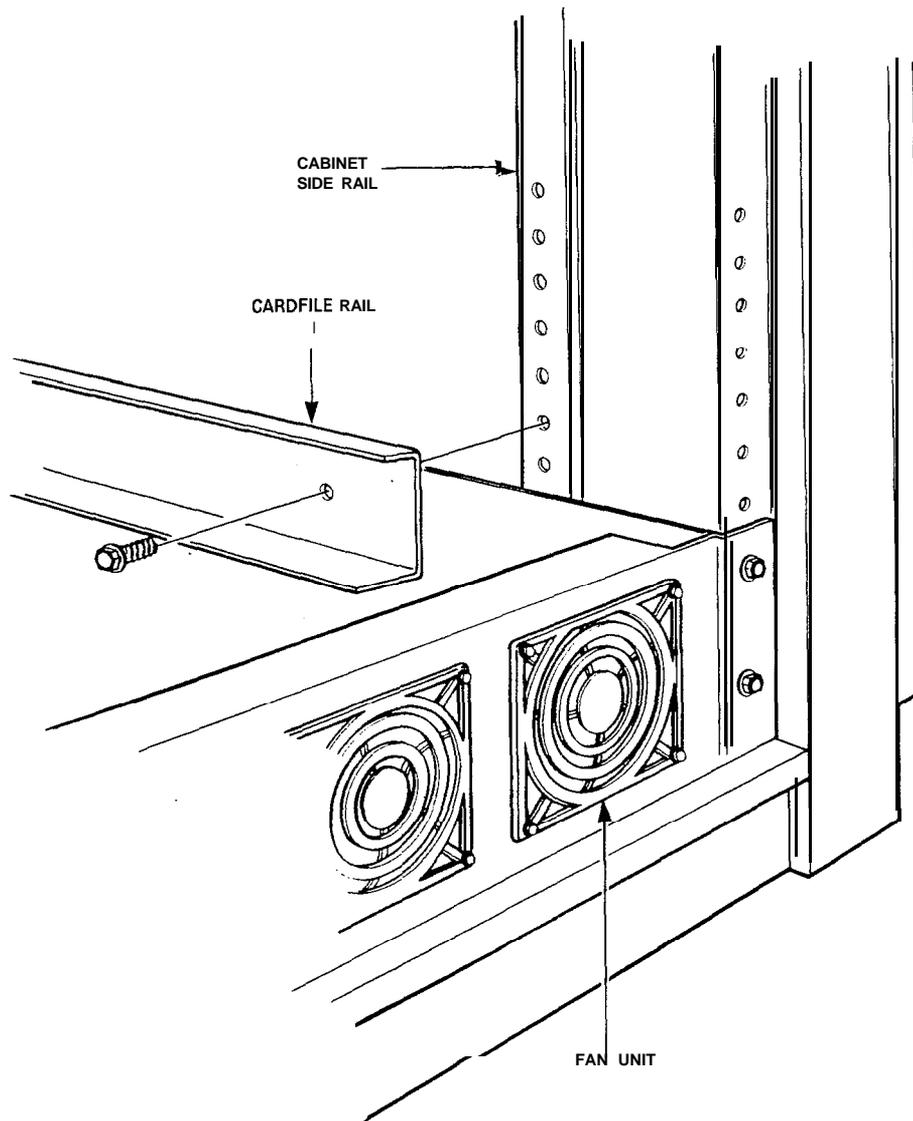
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Figure 2-2 Installation of Cardfile Rail