NEC

ND-43177-001 (E)
ISSUE 4

# NEAX® 1400 IMS

## General Information

NEC America, Inc.
OCTOBER, 1991

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8 | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | |
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| ISSUE No. | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 |
| | PAGE No. | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8 | | | | | | | | | | | | | | |
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| ISSUE No. | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 |
| | PAGE No. | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8 | | | | | | | | | | | | | | |
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| ISSUE No. | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 |
| | PAGE No. | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8 | | | | | | | | | | | | | | |
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| ISSUE No. | i | ii | iii | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| | PAGE No. | | | | | | | | | | | | | |

| ISSUE 1 | | ISSUE 2 | | ISSUE 3 | | ISSUE 4 | |
|---|---|---|---|---|---|---|---|
| DATE | FEBRUARY, 1989 | DATE | SEPTEMBER, 1989 | DATE | JUNE, 1990 | DATE | OCTOBER, 1991 |
| ISSUE 5 | | ISSUE 6 | | ISSUE 7 | | ISSUE 8 | |
| DATE | | DATE | | DATE | | DATE | |

**NEAX1400 IMS**
**General Information**

Revision Sheet 1/2

**ND- 43177-001 (E)**

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8 | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | | | |
| ISSUE No. | | | | | | | | | | | | | | |
| | PAGE No. | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | |
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| 1 | - | - | - | - | - | - | - | | | | | | | |
| ISSUE No. | 82 | 83 | 84 | 85 | 86 | 87 | 88 | | | | | | | |
| | PAGE No. | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | |
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| ISSUE No. | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 |
| | PAGE No. | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | |
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| ISSUE No. | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 |
| | PAGE No. | | | | | | | | | | | | | |

| ISSUE 1 | | ISSUE 2 | | ISSUE 3 | | ISSUE 4 | |
|---|---|---|---|---|---|---|---|
| DATE | FEBRUARY, 1989 | DATE | SEPTEMBER, 1989 | DATE | JUNE, 1990 | DATE | OCTOBER, 1991 |
| ISSUE 5 | | ISSUE 6 | | ISSUE 7 | | ISSUE 8 | |
| DATE | | DATE | | DATE | | DATE | |

# NEAX1400 IMS

## General Information

## TABLE OF CONTENTS

# LIST OF ILLUSTRATIONS

# LIST OF TABLES

## INTRODUCTION

This General Information explains the system configuration and the system specifications of the NEAX1400 IMS. The use of this manual, together with other manuals covering system installation and maintenance, will assure proper performance of the system.

# CHAPTER 1 MANUAL GUIDE

## 1. GENERAL

This Chapter outlines various manuals which should be used as a reference in relation to the installation and maintenance of the NEAX1400 IMS.

## 2. OUTLINE OF MANUALS

Table 1-1 lists the various manuals available.

Table 1-1 List of Manuals for NEAX1400 IMS

| MANUAL | DESCRIPTION |
|---|---|
| • Installation and Test Manual [ND-43177-002 (E)] | The installation procedures in this manual cover all details from unpacking to starting up the NEAX1400 IMS. This includes System Initialization, using the MAT (refer to the MAT Operations Manual) for system data entry and the methods of testing. |
| • System Programming Manual [ND- 43177-005 (E)] | This Manual contains command procedures, and initial data settings. It is also used for system data programming. The Numbering Plan, Station Data, Trunk Data, etc. created are to be recorded on the related sheets in the manual. |
| • Troubleshooting Guide [ND- 43177-003 (E)] | Used for troubleshooting when a fault has occured in the system. |
| • Feature Programming Manual [NDA-24081] | Used for programming the NEAX1400 IMS by features instead of command level programming. |
| • SMDR System Manual [(ND-43651 (E)] | Provides details of installation and data programming for Station Message Detail Recording. **Note** |
| • Data Communications Manual [ND-43652 (E)] | Describes details of the installation and operation of various data communication services. **Note** |
| • Hotel/Motel System Manual [ND-43653 (E)] | Describes the installation and system data programming for Hotel/Motel features. **Note** |
| • MAT Operation Guide (For MultiSpeed) [ND-43654 (E)] | Describes how to program the NEAX1400 IMS using the MultiSpeed, NEC's laptop personal computer. **Note** |
| • MAT Operation Guide (For APCIV/IBM PC - XT/AT) [ND-44248 (E)] | Describes how to program the NEAX1400 IMS using the desktop computer (APCIV or IBM PC-XT/AT). **Note** |
| • Direct Digital Interface (DDI) System Manual [ND-44083 (E)] | Describes details of the installation and data programming for the Direct Digital Interface (T1). **Note** |
| • No. 7 CCIS System Manual [ND-44359(E)] | Describes details of the installation and data programming for No. 7 CCIS. **Note** |
| • ACD-MIS System Manual [NDA-24127] | Describes details of the installation, operation and data programming for ACD-MIS. **Note** |

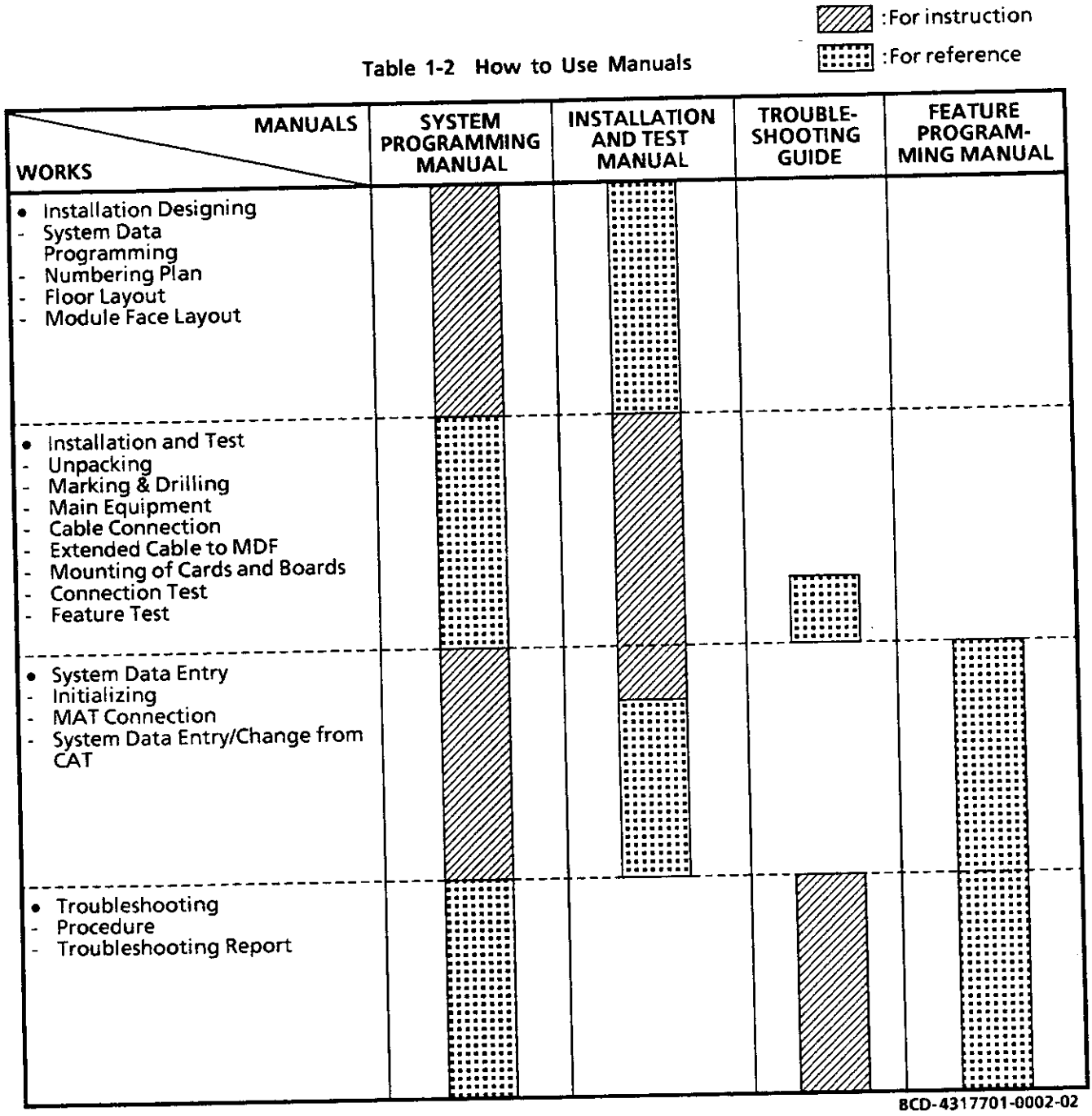
BCD-4317701-001-05

**Note**: *These are optional manuals.*

## 3. HOW TO USE MANUALS

Table 1-2 below shows how to use the manuals for various work items.

Table 1-2 How to Use Manuals



# CHAPTER 2 SYSTEM DESCRIPTION

## 1. GENERAL

This chapter describes the system configuration and the system specification of the NEAX1400 IMS.

Prior to engaging in installation and maintenance, the installer or maintenance personnel must become thoroughly familiar with the contents of this chapter.

## 2. SYSTEM CONFIGURATION

### 2.1 System Outer View

The NEAX1400 IMS is a Digital PABX System that provides conventional PBX functions. In addition to these functions, the NEAX1400 IMS provides key system functions, data communication functions and various kinds of networking functions.

The NEAX1400 IMS employs modular growth. The port capacity of a system is increased by adding Port Interface Modules (PIMs), each containing 128 ports. The NEAX1400 IMS can be configured to provide a maximum of 512 ports.

The boards constituting the control system are mounted on the left side shelf of the PIM. Interface cards (for accommodating Station Lines, C.O. Lines, Tie Lines, etc.) are mounted on the right side shelf of the PIM.

A 12-Line Power Failure Transfer (PFT) Panel can be mounted under each PIM.

The Power Unit is equipped with the Power Panel for power distribution, and a maximum of two Power Module units (AC-DC power converter).

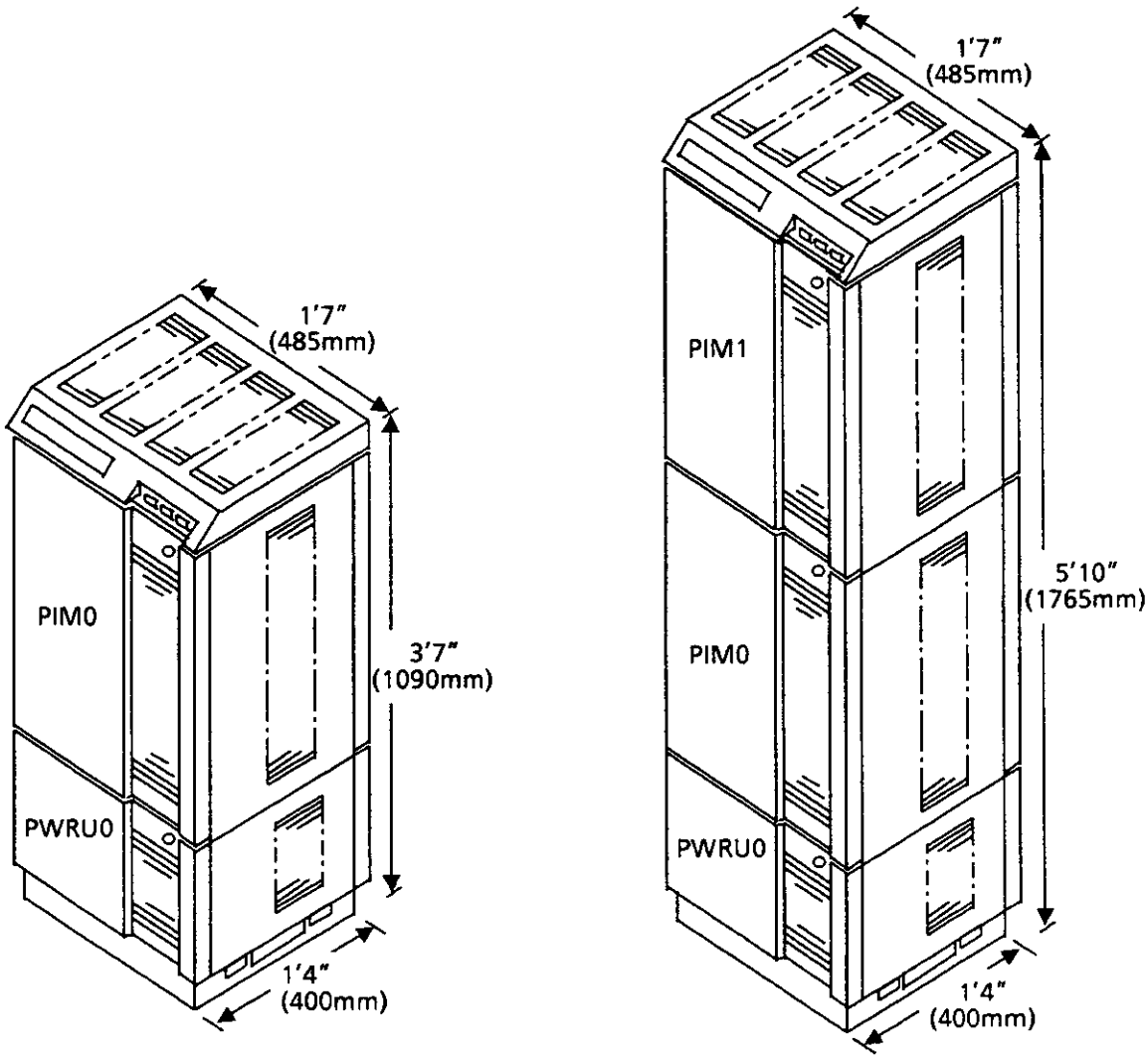



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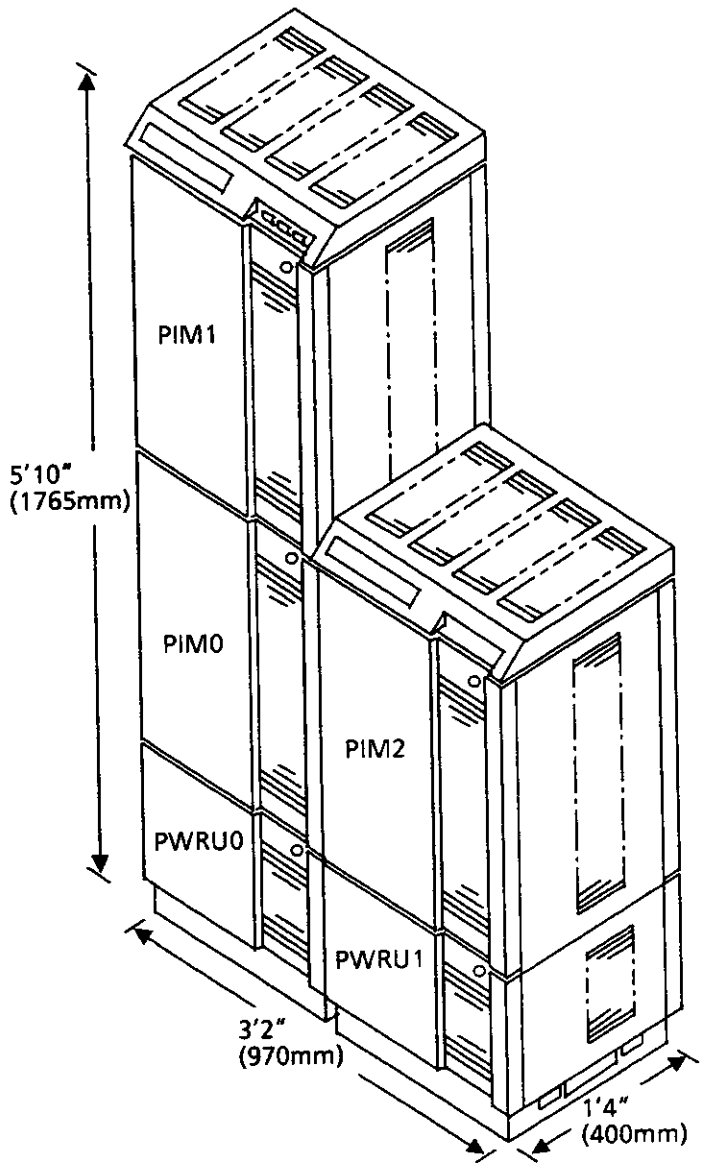
Figure 2-1 NEAX1400 IMS Outer View (1/4)




384-port System

Unit: inch

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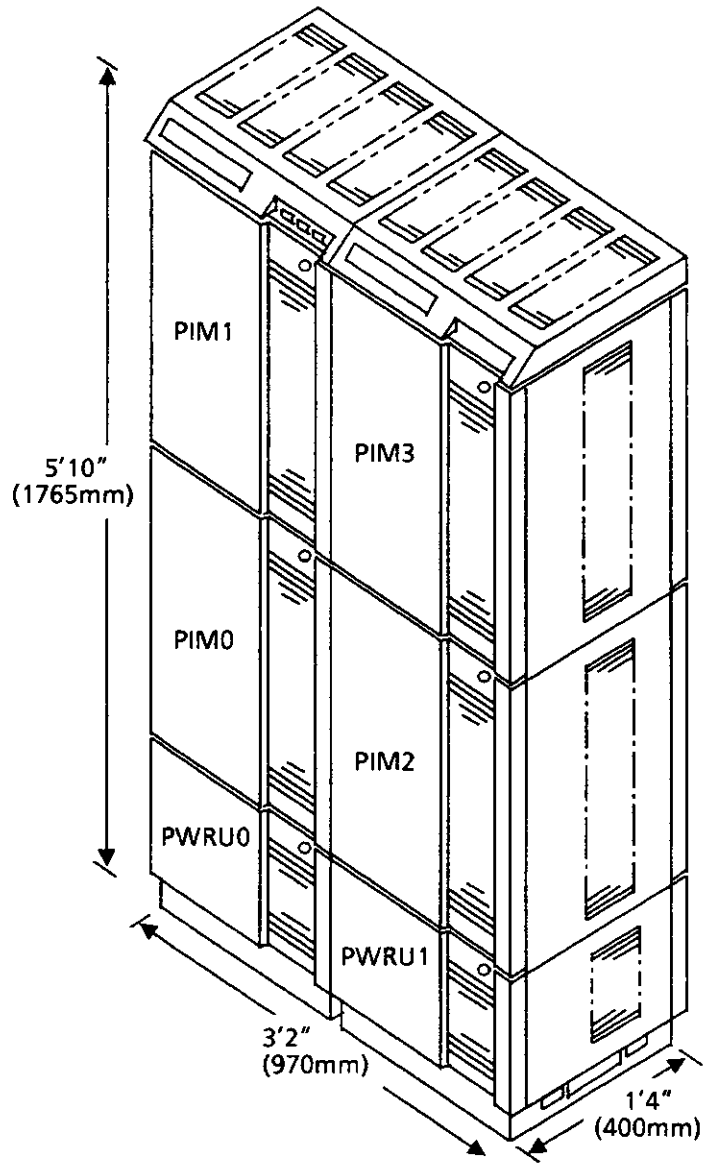
**Figure 2-1 NEAX1400 IMS Outer View (2/4)**




512-port System

Unit: inch

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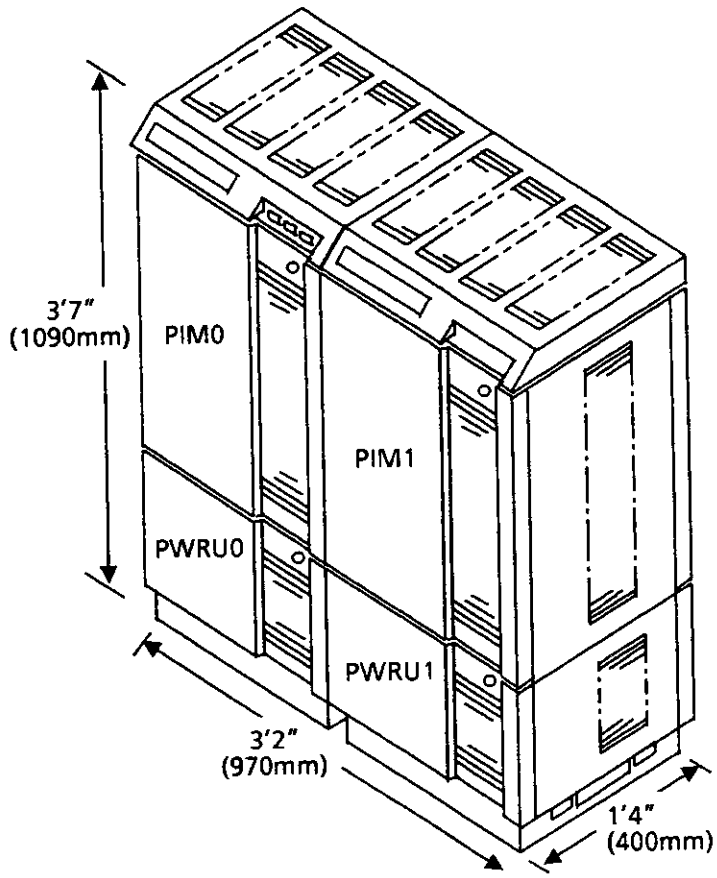
**Figure 2-1 NEAX1400 IMS Outer View (3/4)**




256-port System

Unit: inch

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Figure 2-1 NEAX1400 IMS Outer View (4/4)

Table 2-1 Modules, Units and Covers

| SYMBOL | DESCRIPTION | DESIGNATION |
|---|---|---|
| PIM 0 – 3 | Port Interface Module | SN1060 PIM-A |
| TOPU 0, 1 | Top Unit | SN1082 TOPU-A |
| PWRU 0, 1 | Power Unit | SN1062 PWRU-A |
| PWRM | Power Module | SN1071 PWRM-A<br>/SN1071 PWRM-B |
| BASEU 0, 1 | Base Unit | SN1083 BASEU-A |
| PFT 0 – 3 | Power Failure Transfer Panel | SN4005 PFT PANEL-A/<br>SN4017 PFT PANEL-A |
| | Connection Bracket PIM (0)-PIM (2)/<br>PIM (1)-PIM (3)<br>PWRU (0)-PWRU (1) | CONN BRACKET |
| | Side Cover for PIM | SIDE COVER (A) |
| | Side Cover for PWRU | SIDE COVER (B) |
| | Front Cover for PIM | FRONT COVER (A) |
| | Front Cover for PWRU | FRONT COVER (B) |
| | Rear Cover for PIM | REAR COVER (A) |
| | Rear Cover for PWRU | REAR COVER (B) |

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## 2.2 Equipment List

The Bay Face Layout of a 4-PIM system is shown below.

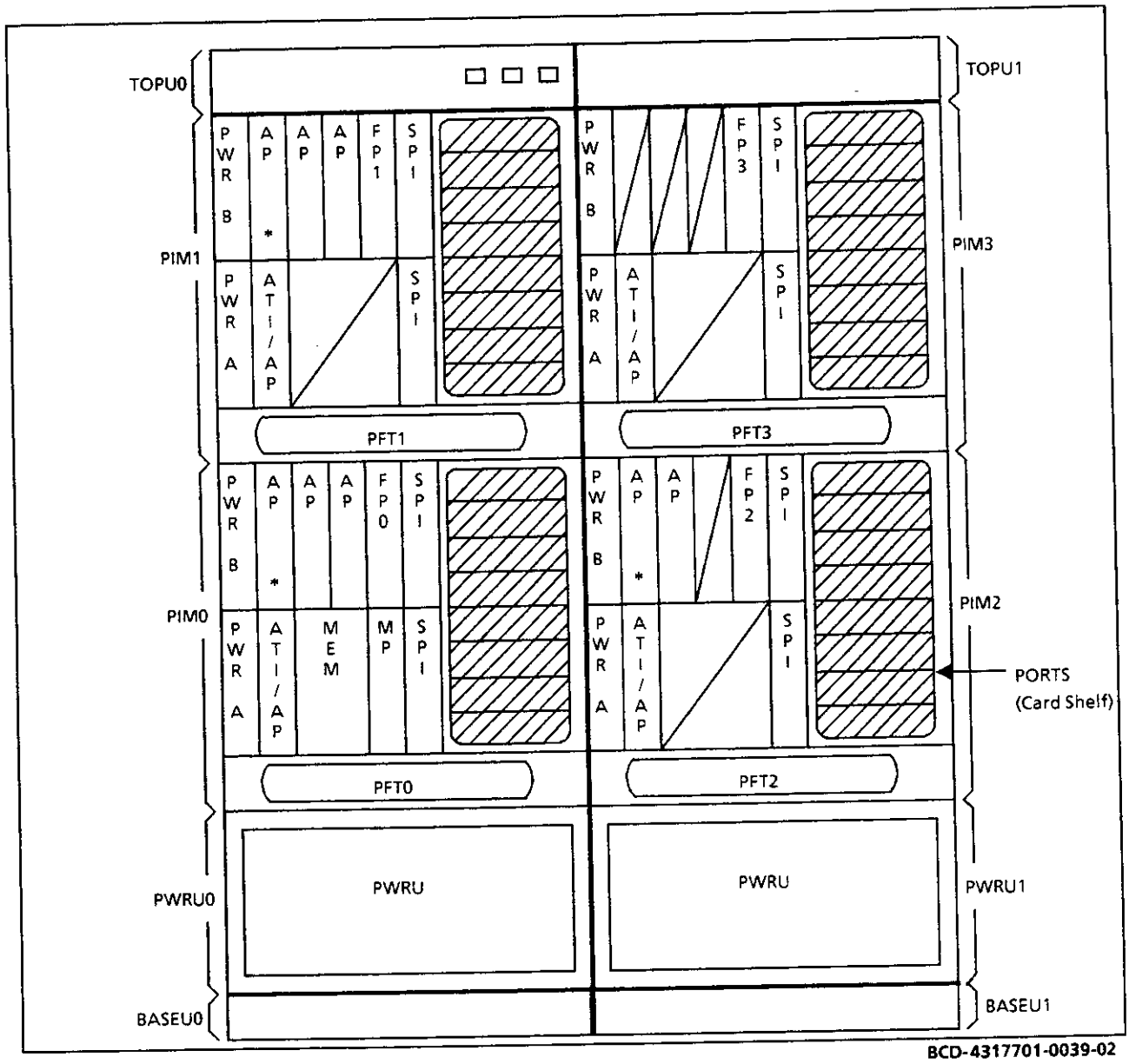


Figure 2-2 Bay Face Layout

Please refer to the notes on the following page.

**Note 1:** *The PJ-AP00 board is mounted in any one of the AP slots marked with an "*".*

**Note 2:** *A maximum of twelve (12) AP slots per system are available simultaneously.*

**Note 3:** *The PJ-4MDTA board is mounted in the AP slot of PIM0-3.*

**Note 4:** *The PJ-24DTB (DTI) Board is mounted in the AP or ATI/AP slots of PIM0-2.*

**Note 5:** *The PJ-CK01 (PLO) board is mounted in the AP slots of PIM0, except ATI/AP slots.*

**Note 6:** *The PJ-SC00 (CCH) board is mounted in the AP or ATI/AP slots of PIM0-2.*

**Note 7:** *The PJ-PW14 (PWRB) board must not be mounted together with the PJ-PW01 and PJ-PW04 in the same PIM.*

**Note 8:** *If the PJ-AP02 board is used for expanded Authorization/DISA Codes, then the board designation is PJ-AP02. If the board is used for ACD-MIS, then the board designation is AP-ACDB.*

Table 2-2 Boards and Cards

| SYMBOL | DESCRIPTION | DESIGNATION |
|---|---|---|
| PWRA | DC-DC PWR PKG (Input: −27 V; output: +5 V, 12 A; −5 V, 5 A) | PJ-PW01 |
| PWRB | DC-DC PWR PKG (Input: −27 V; output: −48 V, 3.5 A, CR 50 mA) | PJ-PW04 |
| | DC-DC PWR PKG (Input: −27 V; output: +5 V, 12 A, −5 V, 5 A, −48 V, 3.5 A, CR50 mA) | PJ-PW14 |
| MP | Main Processor | PJ-CP01 |
| MEM | Memory for MP | PJ-ME03 |
| FP 0−3 | Firmware Processors | PJ-CP02 |
| SPI | Speech Path Interface | PJ-64SPA |
| ATI 0−3 | Attendant Console Interfaces | PJ-CS00 |
| AP | Application Processors | PJ-AP00 |
| | | PJ-AP01 |
| | | PJ-AP02/AP-ACDB |
| MDT | 4L MODEM Trunk | PJ-4MDTA |
| DTI | 24-channel Digital Trunk Interface | PJ-24DTB |
| CCH | Common Channel Handler | PJ-SC00 |
| PLO | Phase Locked Oscillator | PJ-CK01 |
| LC | 2L Line Circuit | PK-2LCF |
| LC | 2L Line Circuit for Message Waiting | PK-2LCH |
| LC | 2L Line Circuit for Momentary Open | PK-2LCP-A |
| LLC | 2L Long Line Circuit | PK-2LLCC |
| LLC | 1L Long Line Circuit | PK-LLCG |
| DLC | 2L Digital LC for Multiline Terminal and DSS Console (Short Line) | PK-2DLCA |
| DLC | 2L Digital LC for Multiline Terminal and DSS Console (Long Line) | PK-2DLCC |
| DTLA | 1L Digital LC for DT-003 Data Module | PK-DTLA |
| COT | 2L Central Office Trunk | PK-2COTG/2COTN |
| ODT | 1L E&M Trunk (4W) | PK-ODTC/ODTE |
| EMT | 2L E&M Trunk (2W) | PK-2EMTB |
| DIT | 2L Direct Inward Dialing Trunk | PK-2DITD/2DITE |
| PBR | 4L DTMF Receiver | PK-4RSTA |
| HDT | Hold Tone Source / Music Source Interface | PK-TNTC |
| EXTI | 4L External Equipment Interface | PK-DK01 |
| KEYI | 8L External Key Interface | PK-DK02 |
| APMEM | Expansion Memory for Application Processor (PJ-AP00) | PK-ME00 |
| VRMEM | Memory for Voice Recording | PK-ME01 |

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Table 2-3 Cables

| DESCRIPTION | | DESIGNATION |
|---|---|---|
| Ground Cable PWRP 0-PWRP 1 | | PWR CA-G |
| DC PWR Cable PIM 0-PWRP 0, PIM 2-PWRP 1 | | PWR CA-J |
| DC PWR Cable PIM 1-PWRP 0, PIM 3-PWRP 1 | | PWR CA-K |
| DC PWR Multi-Cable PWRP 0-PWRP 1 | | PWR CA-L |
| ALM Cable PWRP 0-PWRP 1 | | PWR CA-M |
| BUS Cable PIM 0-PIM 1, PIM 2-PIM 3 | | BUSCA-A |
| BUS Cable PIM 1-PIM 2 | | BUSCA-B |
| PFT Cable PFT PANEL-PFT PANEL | | PFT CA-C |
| SMDR Cable (system side) | | AP CA-B |
| SMDR Cable (peripheral equipment side) | | SMDS CA-D |
| MAT Cable | For MultiSpeed/IBM PC-XT | MAT CA-D |
| | For APCIV/IBM PC-AT | MAT CA-F |
| | For Remote Maintenance (at remote PBX) | MAT CA-E |
| MODEM Cable (For 2 Modems) | | MODEM POOLING CABLE-G |
| PLO Cable (PLO - DTI installed in PIM 0) | | PLO CA-A |
| PLO Cable (PLO - DTI installed in PIM 1 - 2) | | PLO CA-C |
| ACD-MIS Interface Cable (Local/Remote) | | AP RS CA-A |
| ACD-MIS Interface Cable (Local) | | AP RVS CA-A |
| Direct Digital Interface Cable | | DTI-A CABLE F |

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Table 2-4 Peripheral Equipment

| DESCRIPTION | | DESIGNATION |
|---|---|---|
| Attendant Console | | HA-610Z ATTCON |
| | | SN610 ATTCON |
| Handset for operator | | F-HS-INI (CG) HANDSET |
| Multiline Terminal | With LCD | ETE-16D-2/ETE-6D-2 |
| | Without LCD | ETE-16-2/ETE-6-2 |
| Maintenance Administration Terminal (MAT) | | NEC MultiSpeed (PC-16-01)/Multi-Speed-EL(PC-16-02)/MultiSpeed-H0 (PC-16-03)/APCIV/IBM PC-AT/XT |
| DSS Console/Add-On Module | | EDE-30-2 |
| Data Adaptor for Asynchronous Data Switching (installed in Multiline Terminal) | | DTA-E |
| Data Adaptor for Asynchronous/Synchronous Data Switching and Keyboard Dialing | | DA-005A-2 |
| Interface Adaptor for DA-005A (installed in Multiline Terminal) | | INT-E |
| Standalone Synchronous Data Module | | DT-003 |
| Asynchronous/Synchronous Data Adaptor | | DA-013 |
| Synchronous Data Adaptor | | DA-008-2 |
| Synchronous Data Adaptor | | DA-007-2 |

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## 2.3 Equipment Description

(1) Port Interface Module (PIM)

The PIM consists of ports for Station Lines, C.O. Lines and Tie Lines, and the controllers for the ports and peripheral equipment.

The boards listed in Table 2-5 are mounted within the PIM.

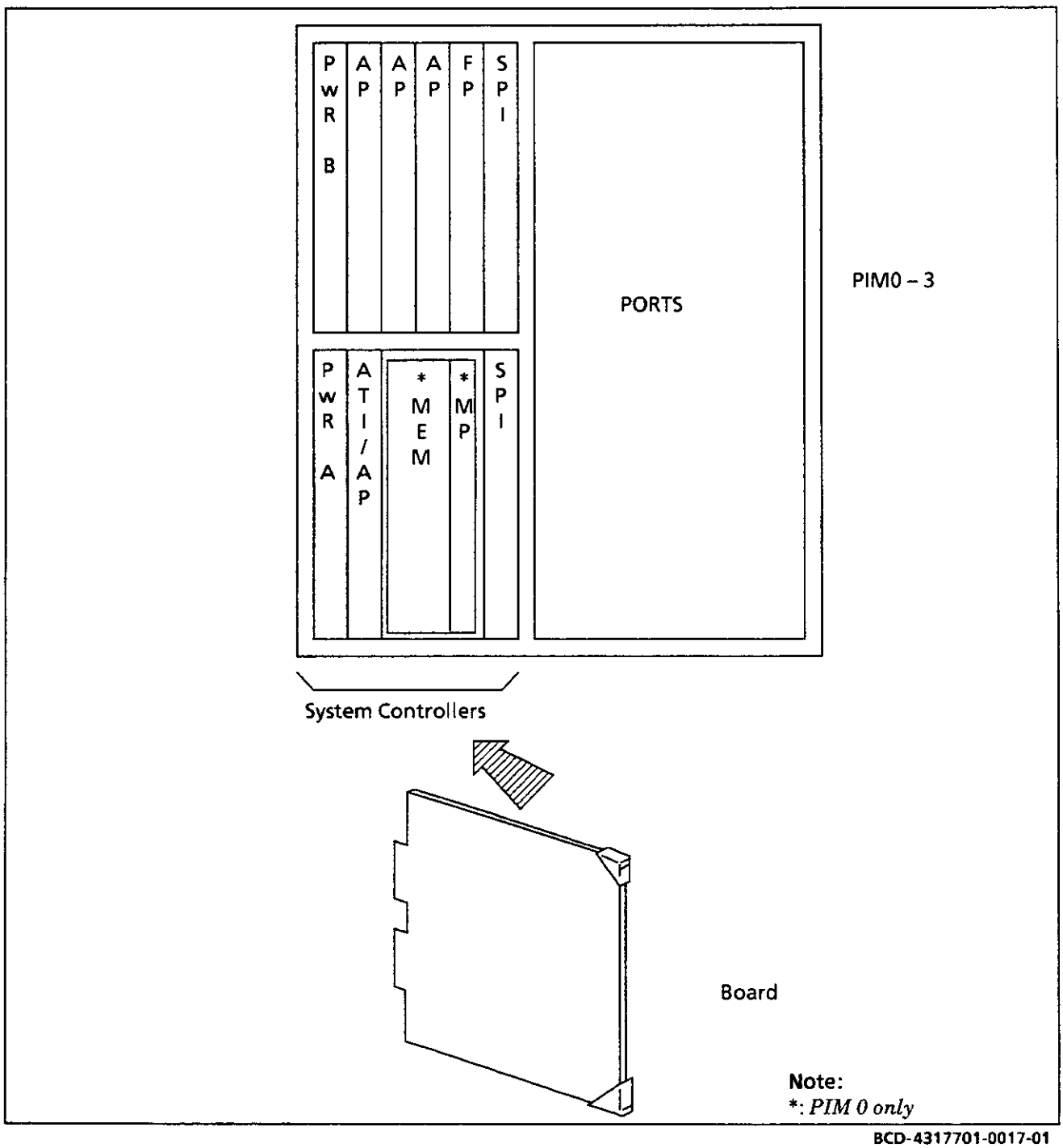


Figure 2-3 System Controllers Face Layout

Table 2-5 List of Boards

| BOARD NAME (SYMBOL) | FUNCTION | CONDITION |
|---|---|---|
| PJ-CP01 (MP) | This board is used as the Main Processor for the centralized control of the system, and is equipped with the following circuits in addition to the CPU (16-bit microprocessor):<br>• Time Division Switch<br>• Tone Generator including DTMF transmitter<br>• 3-Way Conference Trunks (8 circuits)<br>• RS-232C ports | Mounted in PIM0 |
| PJ-ME03 (MEM) | This board is equipped with memory devices (ROM: 864 KB, RAM: 384 KB) for the MP. | Mounted in PIM0 |
| PJ-CP02 (FP) | This board is used as the Firmware Processor (FP) for controlling 128 ports accommodated in a PIM.<br>The board is equipped with ROM (64 KB) and RAM (192 KB) for the FP. | One board mounted in each PIM (PIM0 – 3) |
| PJ-64SPA (SPI) | This board is the interface circuit between the FP and ports, and performs serial - parallel conversion of I/O Bus, and channel designation of PCM Highways. | Two boards mounted in each PIM (PIM0 – 3) |
| PJ-AP00 (AP) | This board is used as the Application Processor (AP) for SMDR H/M Printer and PMS functions.<br>The board is equipped with four RS-232C ports, and is also equipped with ROM (256 KB) and RAM (256 KB) for the AP. | Mounted in any one of the AP slots of PIM 0 – 3. (See Figure 2-2) |
| PJ-AP01 (AP) | This board is the Application Processor (AP) required for enabling synchronous data connection and keyboard dialing from a Data Terminal connection using a Multiline Terminal (ETE-16D-2 TEL/ETE-6D-2 TEL and DA-005A Data Adaptor). The board is equipped with ROM (128 KB) and RAM (64 KB) for the AP. | Mounted in the AP slot of PIM 0 – 3. |
| PJ-AP02 (AP) | This board is the Application Processor (AP) for expanded authorization code. | Mounted in the AP slot of PIM 0 – 3. |

BCD-4317701-0006-03

Table 2-5 List of Boards (continued)

| BOARD NAME (SYMBOL) | FUNCTION | CONDITION |
|---|---|---|
| AP-ACDB (AP) | This board is the ACD-MIS interface common control board. This board allows the system to interface with the personal computer that executes the ACD-MIS FD program. | One board per system, mounted in an AP slot of PIM 0-2. |
| PJ-CS00 (ATI) | This board is used to control the HA-610Z Attendant Consoles. One board can control a maximum of two Attendant Consoles. | One board is mounted in each PIM (PIM 0-3). |
| PJ-PW01 (PWRA) | This board is the DC-DC power converter for a PIM.<br>Rating : Input −27V<br>Output +5V, 12A<br>−5V, 5A | One board is mounted in each PIM (PIM 0 - 3). |
| PJ-PW04 (PWRB) | This board is the DC-DC power converter & ring generator for a PIM.<br>Rating : Input −27 V<br>Output −48 V, 3.5 A (DC-DC Power Converter)<br>Output 75 Vrms, 20 Hz (Ringing Generator) | One board is mounted in each PIM (PIM 0 − 3). |
| PJ-PW14 (PWRB) | This board is the DC-DC power converter & ring generator for a PIM.<br>Rating : Input −27 V<br>Output +5 V, 12 A, −5V, 5A, −48 V, 3.5 A (DC-DC Power Converter)<br>Output 75 Vrms, 20 Hz/90 Vrms, 25 Hz (Ringing Generator) | One board is mounted in each PIM (PIM 0 − 3). |
| PJ-4MDTA (MDT) | This board accommodates a maximum of four synchronous or asynchronous Modems for the modem pool function.<br>The modem pool function allows data terminals to share one set of Modems. This provides efficient use of the available Modems. | Mounted in the AP slot of PIM 0 − 3. |

BCD-4317701-0007-05

Table 2-5 List of Boards (continued)

| BOARD NAME (SYMBOL) | FUNCTION | CONDITION |
|---|---|---|
| PJ-24DTB (DTI) | This board is the Digital Trunk Interface (DTI) board. It accommodates 24-channel, PCM digital lines (T1 lines). | Mounted in the AP or ATI/AP slots of PIM 0-2. |
| PJ-CK01 (PLO) | This board is the Phase Locked Oscillator which generates clock signals used by the internal circuitry to synchronize with the clock signals received from the master office via DTI. | Mounted in the AP slots of PIM0, except ATI/AP slots. |
| PJ-SC00 (CCH) | This board is the Common Channel Handler (CCH) which transmits or receives signals on the common signaling channel of No. 7 CCIS. | Mounted in the AP or ATI/AP slots of PIM 0-2. |

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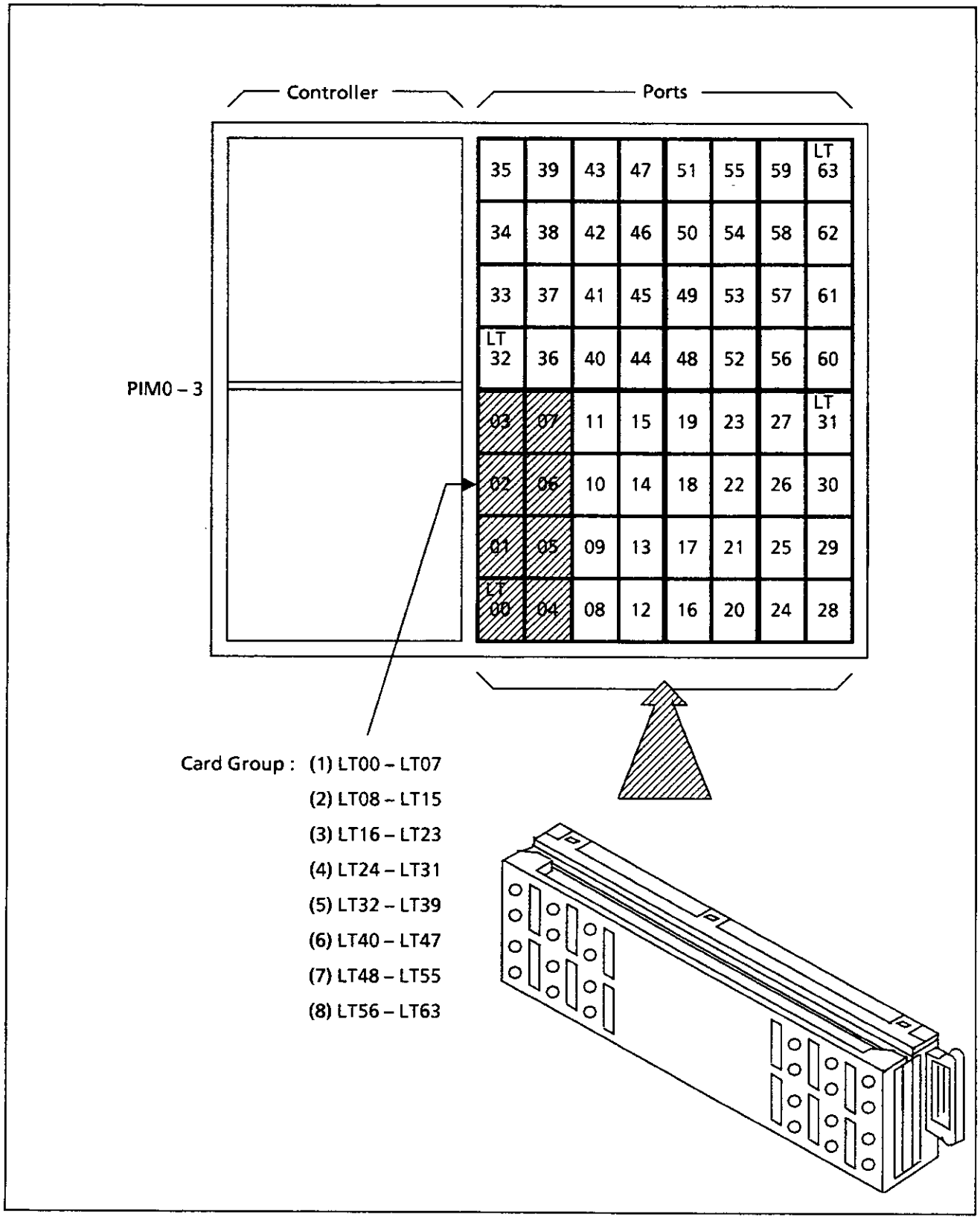


Figure 2-4 Ports Face Layout

There are 64 card slots per PIM, each of which provides from 1 to 4 ports. It should be noted that the overall maximum number of ports available, per PIM, is 128. Various kinds of interface cards can be mounted in any of these 64 card slots (LT00 – 63). The number of ports actually provided by each card slot is determined by the type of card. The total number of ports must not exceed the maximum number of ports specified in Table 2-6 below.

**Table 2-6 Maximum Number of Ports**

| ITEM | REMARKS |
|---|---|
| Number of ports within a Card Group → 32 ports | For the details of a Card Group, refer to Figure 2-4. |
| Number of ports within a PIM (0 – 3) → 128 ports | For the number of ports required for each card, refer to Table 2-7. |

BCD-4317701-0008-02

Table 2-7 below shows the function of each card mounted in a PIM, and the number of ports used by each card.

**Table 2-7 List of Cards**

| CARD | FUNCTION | NUMBER OF PORTS PER CARD |
|---|---|---|
| PK-2LCF | This card is the line circuit for single-line telephone stations, and one card can accommodate two (2) lines. | 2 ports |
| PK-2LCH | This card is the line circuit for single-line telephones with Message Waiting lamps, and one card can accommodate two (2) lines. | 2 ports |
| PK-2LCP-A | This card is the interface circuit for two single-line telephones with Message Waiting lamps and Momentary Open. One card can accommodate two (2) lines. | 2 ports |
| PK-2LLCC | This card is the line circuit for long-line single-line telephone stations, and one card can accommodate two (2) lines. | 2 ports |
| PK-LLCG | This card is the interface circuit for long-line single-line telephones, and one card accommodates one (1) line. | 1 port |
| PK-2DLCA | This card is the interface circuit for Multiline Terminal stations, SN610 ATTCONs, DSS Consoles and Add-On Modules (EDE-30-2). One card can accommodate two (2) lines. | • For voice communication only: 2 ports (1 port/CKT)<br>• For voice and data communication: 4 ports (2 ports/CKT)<br>• For voice Data and Keyboard Dialing: 6 ports (3 ports/CKT) |
| PK-2DLCC | This card is the interface circuit for long-line Multiline Terminal Stations, SN610 ATTCONs, DSS Consoles and Add-On Modules (EDE-30-2). One card can accommodate two (2) lines. | Same as above |
| PK-2COTG/N | This card is the interface circuit for C.O. Trunks, and one card can accommodate two (2) circuits. | 2 ports |
| PK-2DITD/E | This card is the interface circuit for DID Trunks, and one card can accommodate two (2) circuits. | 2 ports |
| PK-DTLA | This card is the interface circuit for DT-003 Data Modules, and one card can accommodate one (1) DT-003 Data Module. | 1 port for voice (not used)<br>1 port for data<br>1 port for AP01 (control) |

BCD-4317701-0009-04

Table 2-7 List of Cards (continued)

| CARD | FUNCTION | NUMBER OF PORTS PER CARD |
|---|---|---|
| PK-2EMTB | Interface circuit for 2-wire Tie Line Trunk E&M type; one card can accommodate two (2) circuits. | 2 ports |
| PK-ODTC/E | Interface circuit for 4-wire Tie Line trunk E&M type; one card can accommodate one (1) circuit. | 1 port |
| PK-4RSTA | This card is the DTMF signal receiver, and one card is equipped with four (4) circuits.<br><br>This card is required when the station telephone set is of the DTMF type, or DTMF signals from the Tie line or DID line are to be received. | 4 ports |
| PK-TNTC | This card is used for BGM or Music on Hold, and has the Tone (music) Generator which generates music (either one of two melodies can be selected) and two interfaces for an external music source. | 2 ports |
| PK-DK01 | This card is used for controlling external equipment. One card is equipped with four dry contacts. The rating of the contact is 125 mA.<br><br>This card is required when TAS (Trunk Answer Any Station) Indicators, etc. are provided. | No port is used. |
| PK-DK02 | This card provides an interface with external keys. The card detects key on/off information, and provides the FP with the detected information.<br>One card can be connected to a maximum of eight (8) external keys. | No port is used. |
| PK-ME00 | This card contains 256 KB of memory, and is internally equipped with an 8-bit microprocessor.<br><br>The card is used as an expansion memory for an AP (PJ-AP00). | 1 port |
| PK-ME01 | This card contains 256 KB of memory, and is internally equipped with an 8-bit microprocessor.<br><br>The card is used for voice recording. | 1 port |

BCD-42891-0015-04

(2) Power Unit (PWRU)

The Power Unit consists of a Power Panel and one or two Power Module units (AC-DC Power Converter), and supplies −27V DC to its associated PIM.

The Power Panel is equipped with an AC outlet for the Power Module, Power Switch, Fuse, DC Power Supply Connector, and terminals for supplying DC power.

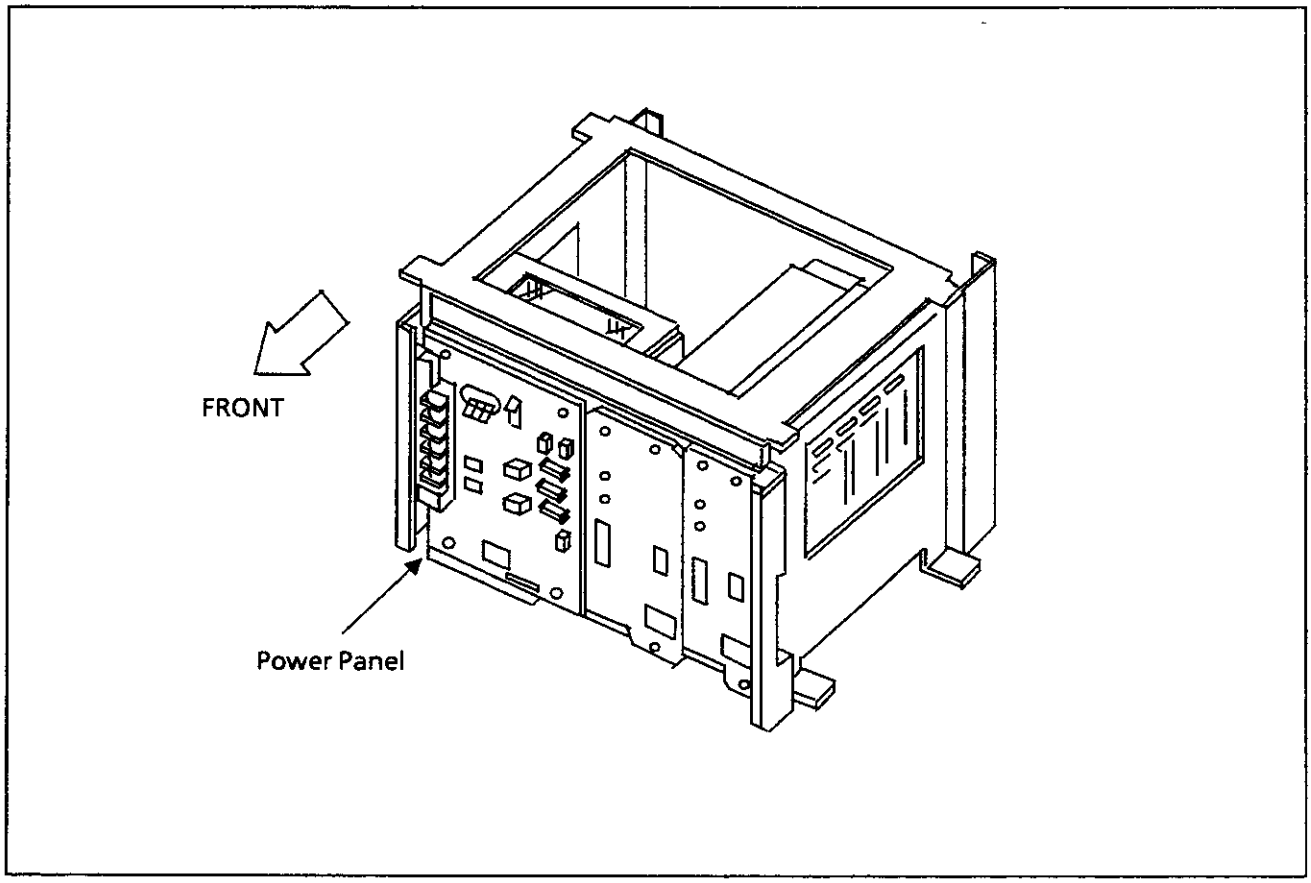


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**Figure 2-5 Power Unit (PWRU)**

The Power Module (SN1071 PWRM-A) is an AC-DC Converter which generates output power of −27V DC, 15 A from a commercial input source power of 117V AC.

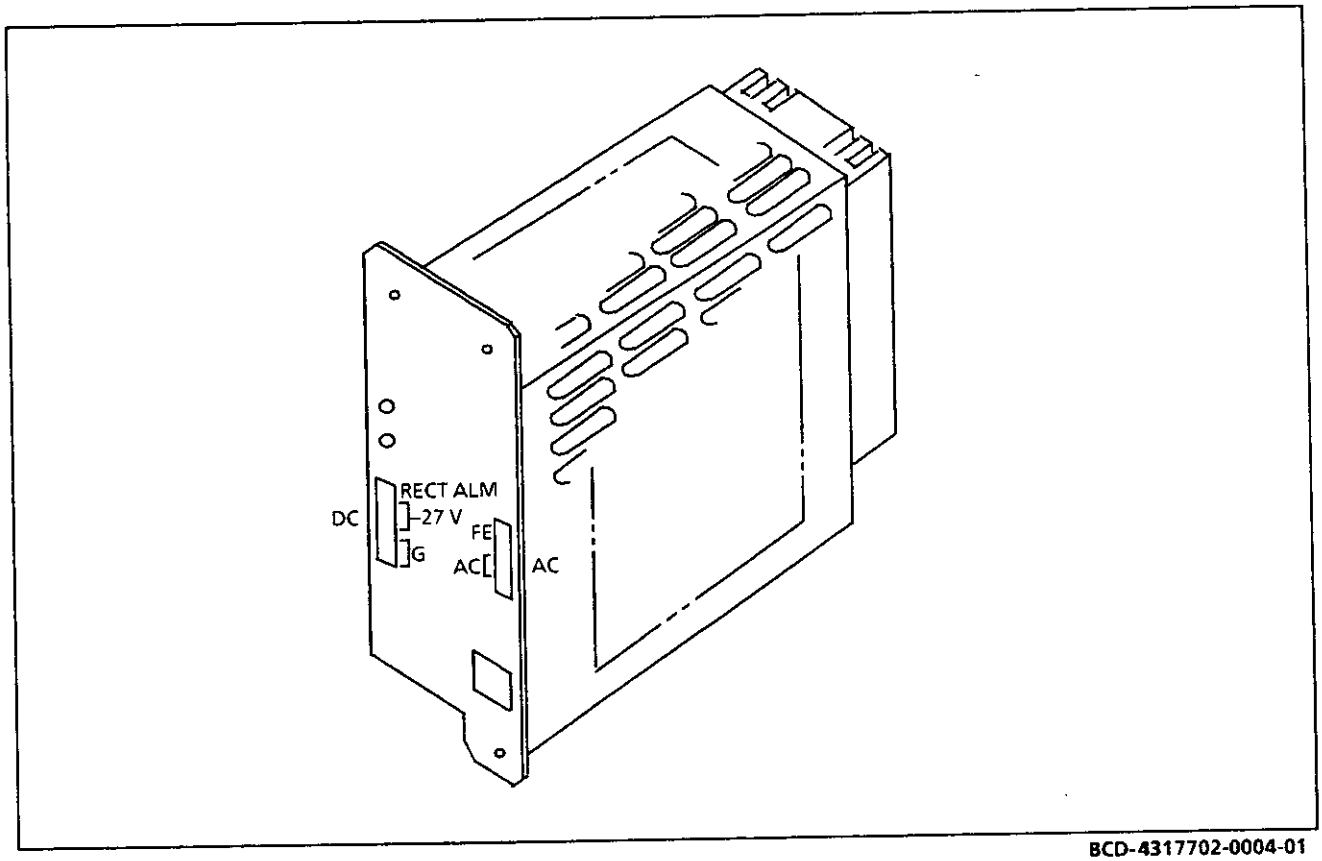


Figure 2-6 SN1071 PWRM-A (PWRM)

Mount the PWRM (Power Module) in the PWRU, and screw in.

- Set the AC INPUT switch to the commercial power voltage; down for 100 – 117 volts, or up for 200 – 240 volts.
- Set the EQUL/FLOAT switch according to the type of battery connected:
  - No Battery/Sealed Battery···"FLOAT"
  - Lead-Acid Battery··· "EQUL" (Equalizing Charge) "FLOAT" (Floating Charge)

When changing the EQUL/FLOAT mode in the case of plural PWRMs, the changes should be done as simultaneously as possible.

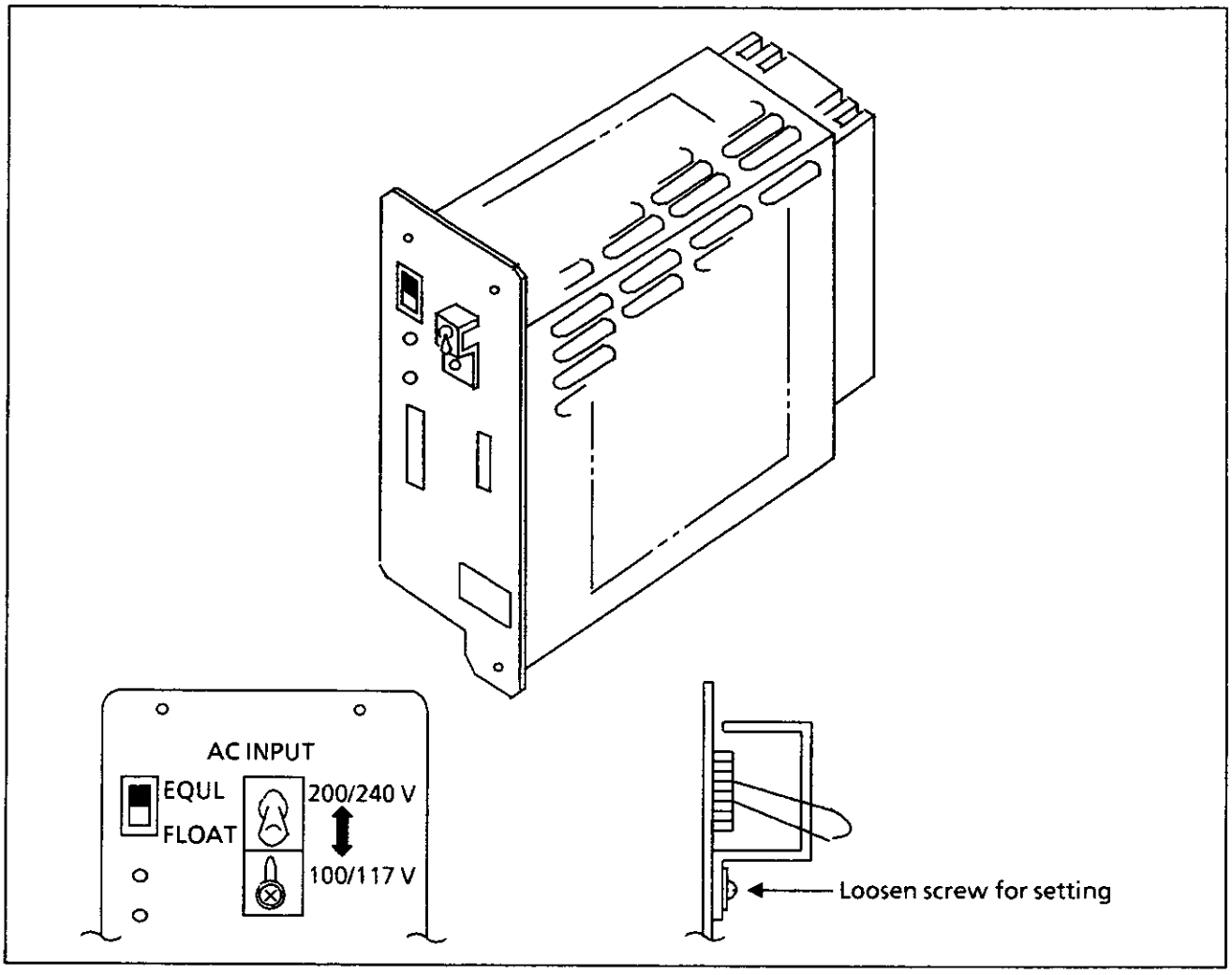


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Figure 2-7 SN1071 PWRM-B (PWRM)

A block diagram of the NEAX1400 IMS Power supply system follows .

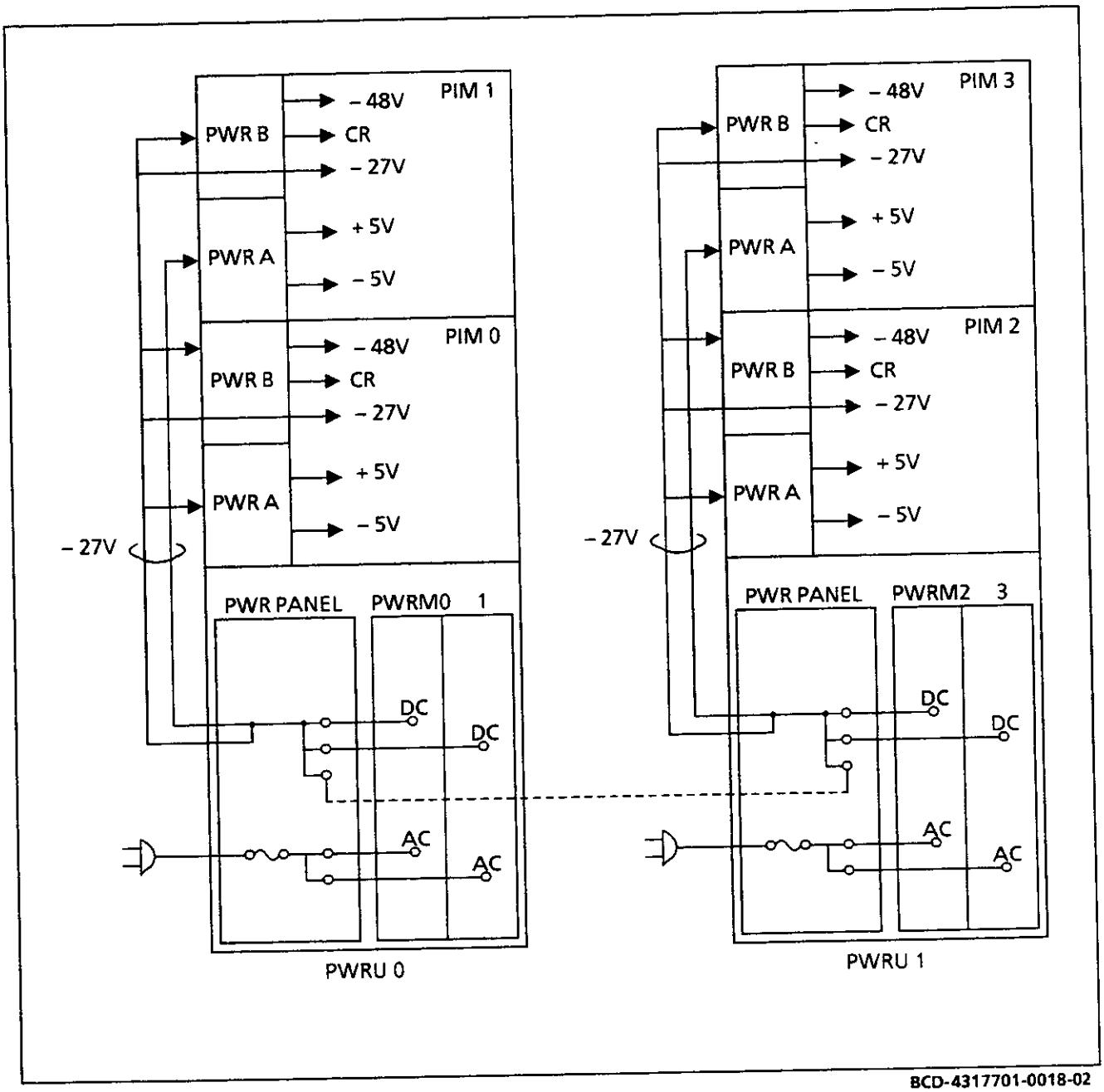


Figure 2-8 Power Supply System Block Diagram

Since the NEAX1400 IMS employs a modular Power Unit, power supply systems of various capacities can be used.

This is dependent upon the power consumption of the given system.

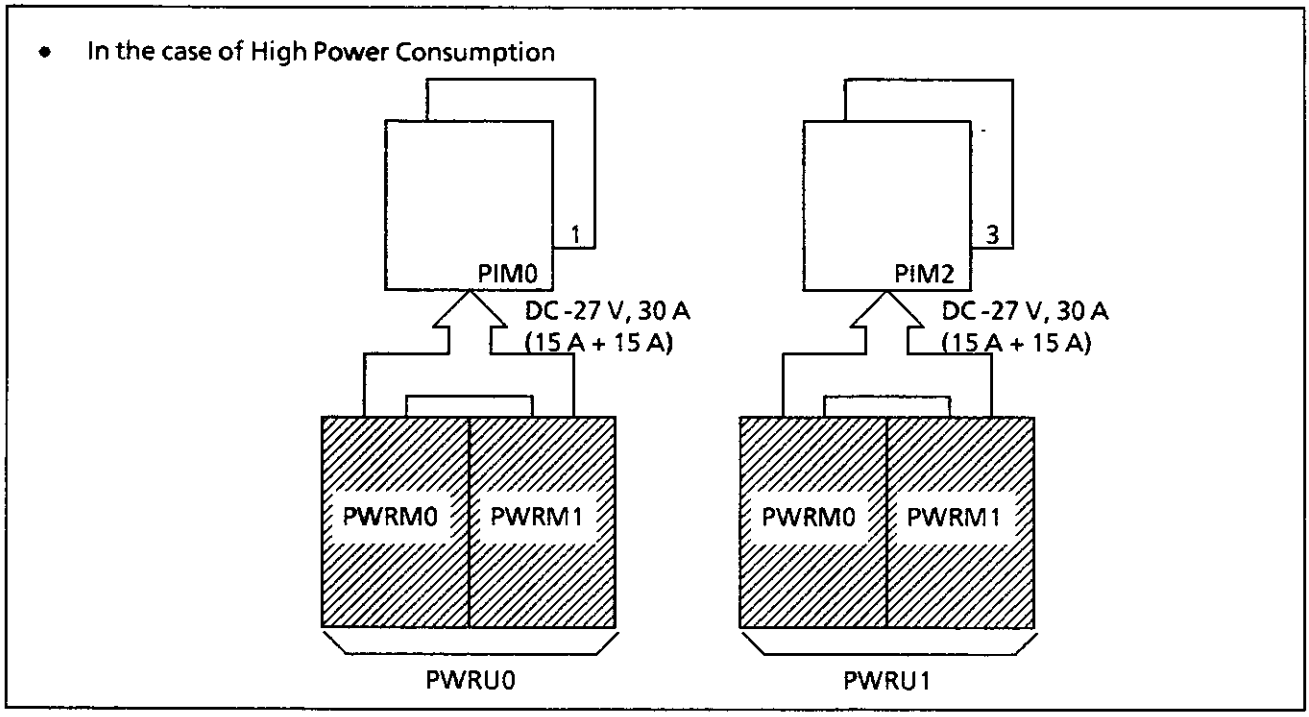


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**Figure 2-9 Load Sharing Operation**

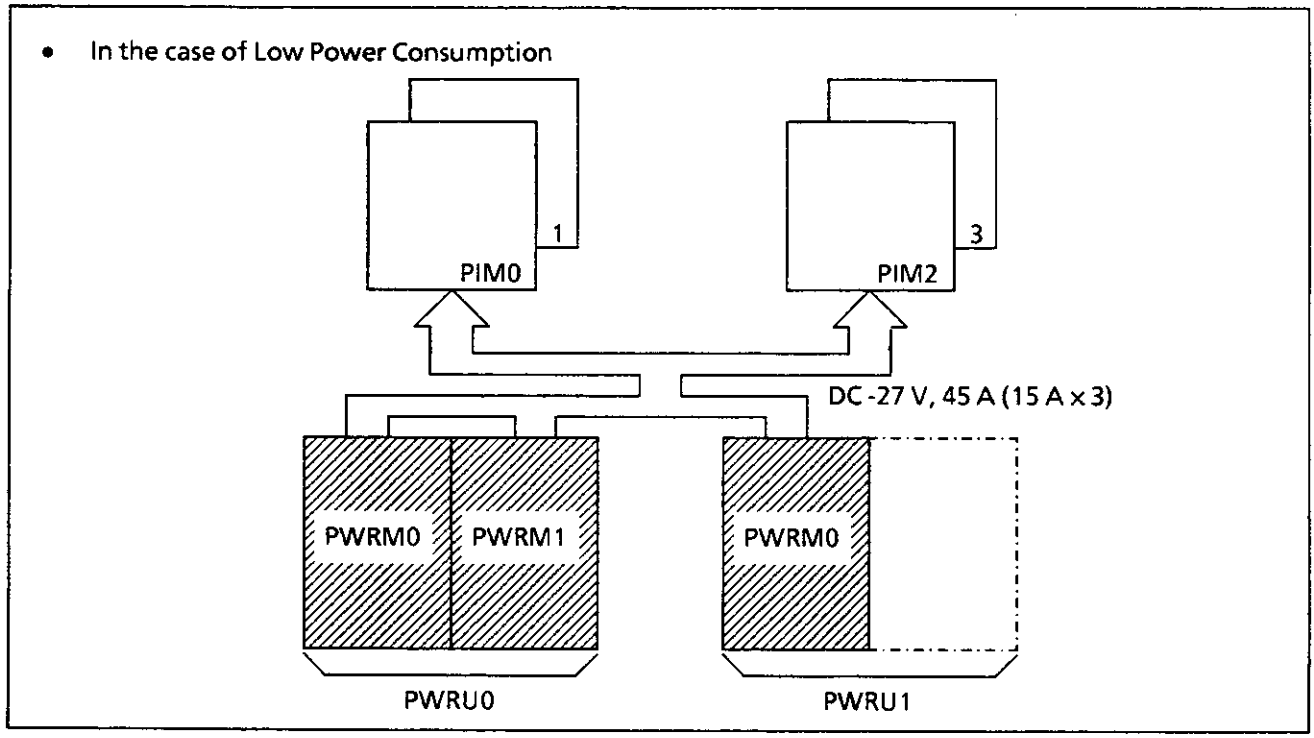


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**Figure 2-10 Parallel Operation**

(3) Peripheral Equipment

- Attendant Console

The NEAX1400 IMS can provide two types of Attendant Consoles (ATTCON): the HA-610Z ATTCON and the SN610 ATTCON. The HA-610Z ATTCON contains a clock display, station/trunk number display, 6 loop keys, 12 incoming call identification keys, 15 function keys, a busy lamp field and other system indication LEDs such as night mode and alarm. Operating power of −48 Vdc is supplied from the main equipment via 25-pair cable. The Attendant Console Controller Board (PJ-CS00) is required to use this console.

The SN610 ATTCON has a 4-line LCD display with 40 characters per line, and 24 programmable function keys for functions such as loop and incoming call identification. This console has the same hardware interface with the main equipment as the Multiline Terminal, DSS Console and Add-On Module. Therefore, either the PK-2DLCA card or the PK-2DLCC card are required to use this console. Operating power of −48 Vdc (using PK-2DLCC) or −24 Vdc (using PK-2DLCA) is supplied from the main equipment via 2-pair cable.

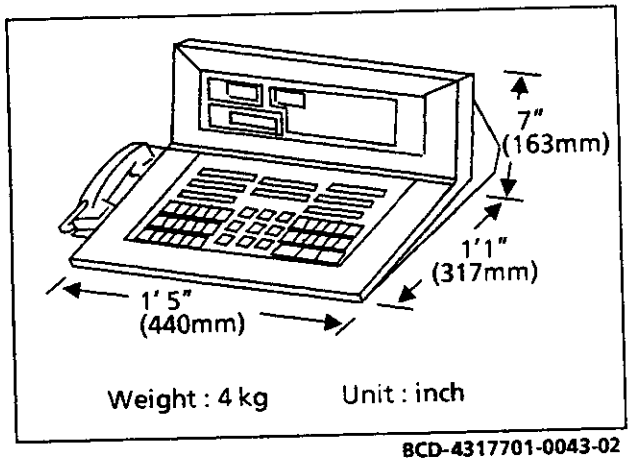


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**Figure 2-11 HA-610Z ATTCON**

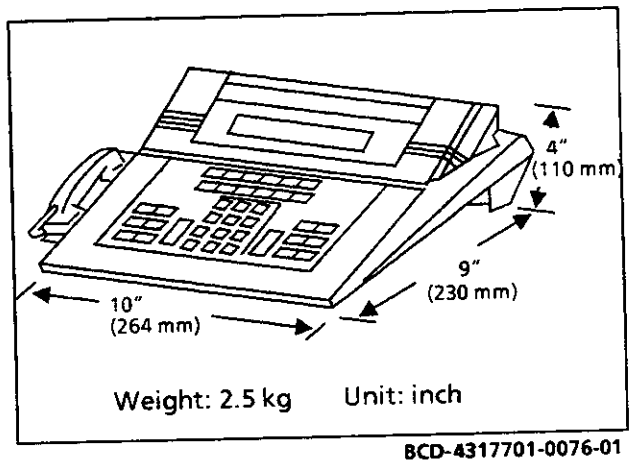


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**Figure 2-12 SN610 ATTCON**

- Multiline Terminals: ETE-16D-2 TEL
  ETE-6D-2 TEL
  ETE-16-2 TEL
  ETE-6-2 TEL

The Multiline Terminal is a digital, multi-function telephone that has line keys and dedicated function keys. Line keys are programmed as feature or line appearance keys and provide extension numbers and features such as camp-on, etc. Dedicated function keys are predefined and cannot be changed. These keys are used for Hold, Conference, etc.

The operating power for these Multiline Terminals is supplied from the main equipment through station cable wiring.

Table 2-8 compares the functions of the various Multiline Terminals.

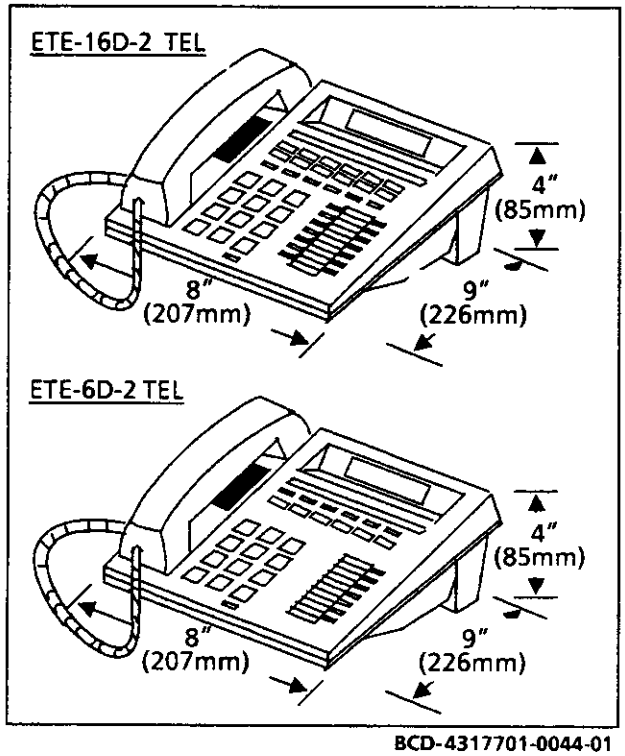


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**Figure 2-13 ETE-16D-2 TEL/ETE-6D-2 TEL**

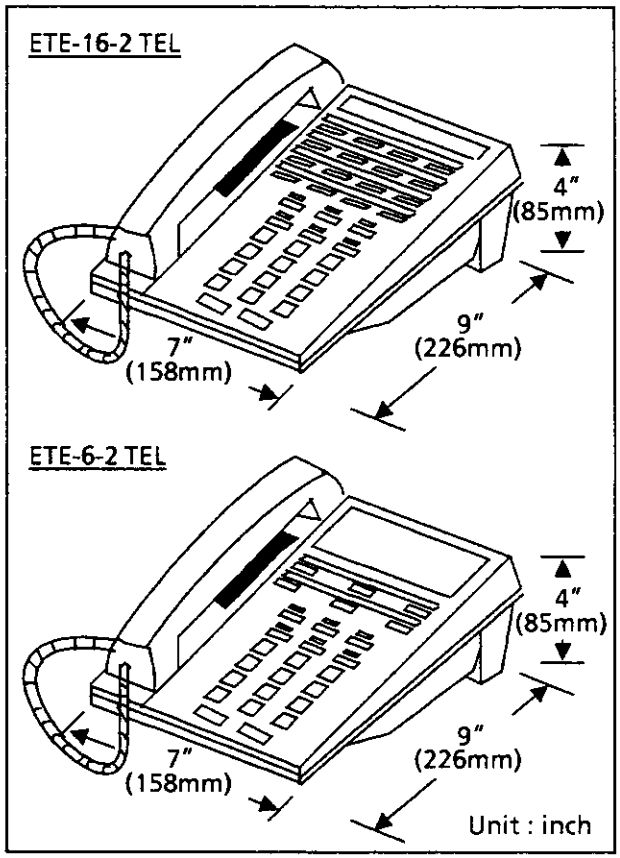


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**Figure 2-14 ETE-16-2 TEL/ETE-6-2 TEL**

Table 2-8 Function Comparison Between Multiline Terminals

| FUNCTION | TYPE OF MULTILINE TERMINAL | | | |
|---|---|---|---|---|
| | ETE-16D-2 TEL | ETE-6D-2 TEL | ETE-16-2 TEL | ETE-6-2 TEL |
| • Line Key | 16 Keys | 6 Keys | 16 Keys | 6 Keys |
| • Dedicated Function Key | 7 Keys | 7 Keys | 7 Keys | 7 Keys |
| • Feature Access Key (for Speed Dialing) | 20 Keys | 10 Keys | N/A | N/A |
| • Alphanumeric LCD (16-character × 2 lines) | A | A | N/A | N/A |
| • Asynchronous/Synchronous Data Switching | A | A | N/A | N/A |
| • Handsfree Unit | A | A | N/A | N/A |
| • Dedicated MW Lamp | N/A | N/A | A | A |
| • Multiline Terminal Attendant Position | A | N/A | N/A | N/A |
| • Front Desk Instrument | A | N/A | N/A | N/A |
| • Customer Administration Terminal (CAT) | A | A | N/A | N/A |

BCD-4317701-0048-01

A : Available
N/A : Not Available

- Maintenance Administration Terminal (MAT): NEC Multi-Speed (PC-16-01/PC-16-02/PC-16-03)/APCIV/IBM PC-XT/AT

  A personal computer (Multi-Speed, APCIV or IBM PC-XT/AT) is used as the Maintenance Administration Terminal (MAT), and has the following functional capabilities.

  - System data entry/change
  - System data load/save/verify
  - Instruction display of data entry procedures
  - Remote maintenance
  - System configuration report

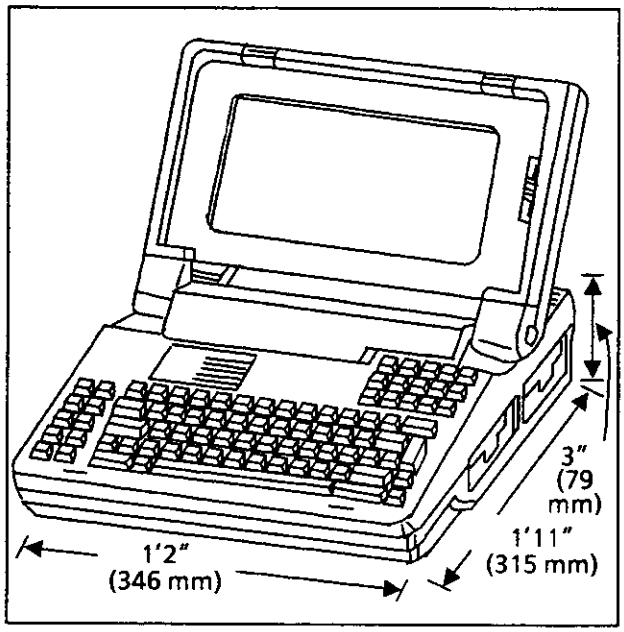


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Figure 2-15 MAT (Multi-Speed)

It is connected to the Main Processor (PJ-CP01) board, within the main equipment, by a dedicated cable.

The operating power for the MAT is supplied from the AC adaptor of the MAT.

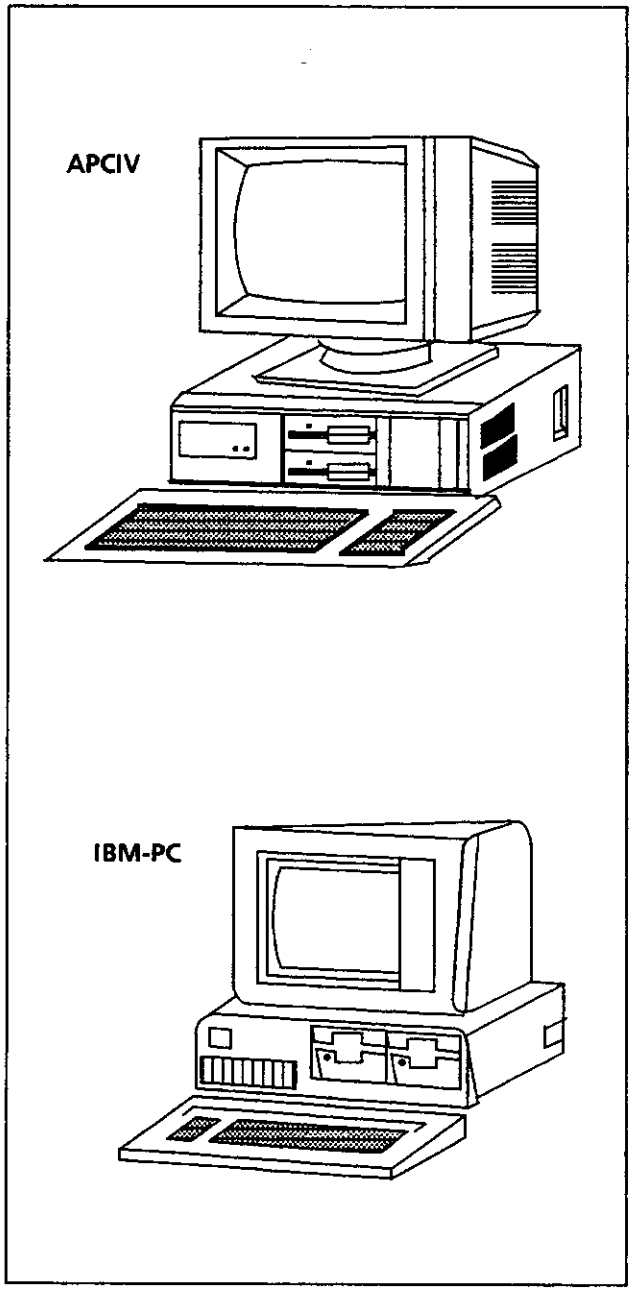


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Figure 2-16 MAT (APCIV/IBM PC)

- DSS/BLF Console/Add-On Module: (EDE-30-2)

  The EDE-30-2 provides a Direct Station Selection function and Busy Lamp Field, which when used in conjunction with a Multiline Terminal, can serve as an alternate Attendant position. Each DSS Console is equipped with thirty (30) Direct Station Selection buttons and three (3) Programmable Function Keys.

  The EDE-30-2, when used as an Add-On Module, provides the Multiline Terminal with an additional twenty five (25) line/trunk keys. This provides the station user with a total of forty one (41) line/trunk keys, if an ETE-16D-2/ETE-16-2 is used. This Add-On Module is also equipped with five (5) feature access keys for speed dialing and two (2) dedicated feature keys: a day/night mode change key and a release key.

  The operating power for the EDE-30-2 is supplied from the main equipment through the 2-pair connecting wire.

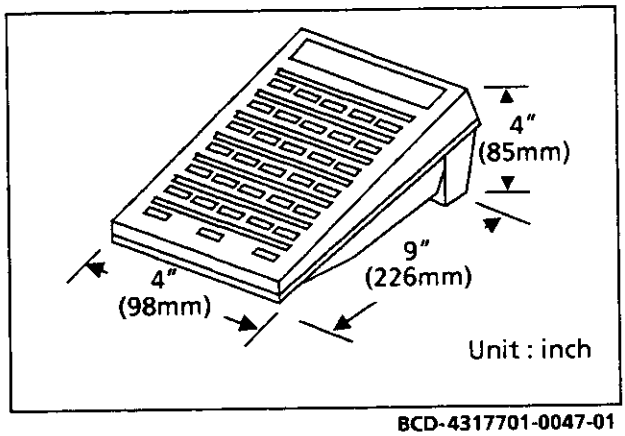


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**Figure 2-17 DSS/BLF Console / Add-On Module (EDE-30-2)**

## 2.4 Equipment Quantity Table

The total number of PIMs required is determined by the number of Station and C.O. lines.

An example of possible configurations is shown below. For detailed information on determining equipment quantity, refer to the NEAX1400 Configuration Guide.

**Table 2-9 Equipment Quantity Table (Typical)**

| TOTAL OF STATIONS | C.O. LINES | RST | ATT-CONS | PORTS | PIM | LC CARD | DLC CARD | COT CARD | RST CARD | ATT BOARD | MP BOARD | FP BOARD | SPI BOARD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 40 | 12 | 4 | 1 | 56 | 1 | 14 | 6 | 6 | 1 | 1 | 1 | 1 | 2 |
| 80 | 20 | 4 | 1 | 104 | 1 | 28 | 12 | 10 | 1 | 1 | 1 | 1 | 2 |
| 120 | 26 | 4 | 1 | 154 | 2 | 42 | 18 | 13 | 1 | 1 | 1 | 2 | 4 |
| 160 | 32 | 8 | 1 | 200 | 2 | 56 | 24 | 16 | 2 | 1 | 1 | 2 | 4 |
| 200 | 38 | 8 | 1 | 246 | 2 | 70 | 30 | 19 | 2 | 1 | 1 | 2 | 4 |
| 240 | 42 | 8 | 2 | 290 | 3 | 84 | 36 | 21 | 2 | 1 | 1 | 3 | 6 |
| 280 | 48 | 8 | 2 | 336 | 3 | 98 | 42 | 24 | 2 | 1 | 1 | 3 | 6 |
| 320 | 54 | 8 | 2 | 382 | 3 | 112 | 48 | 27 | 2 | 1 | 1 | 3 | 6 |
| 360 | 60 | 8 | 2 | 428 | 4 | 126 | 54 | 30 | 2 | 1 | 1 | 4 | 8 |

BCD-4317701-0026-01

**Note:** *The above quantities are based on the following conditions:*
*DTMF Telephone: 70 %*
*Multiline Terminal: 30 %*
*Total Traffic: 6 ccs/line*

A quick reference of the total number of C.O. and station lines per PIM is shown below.

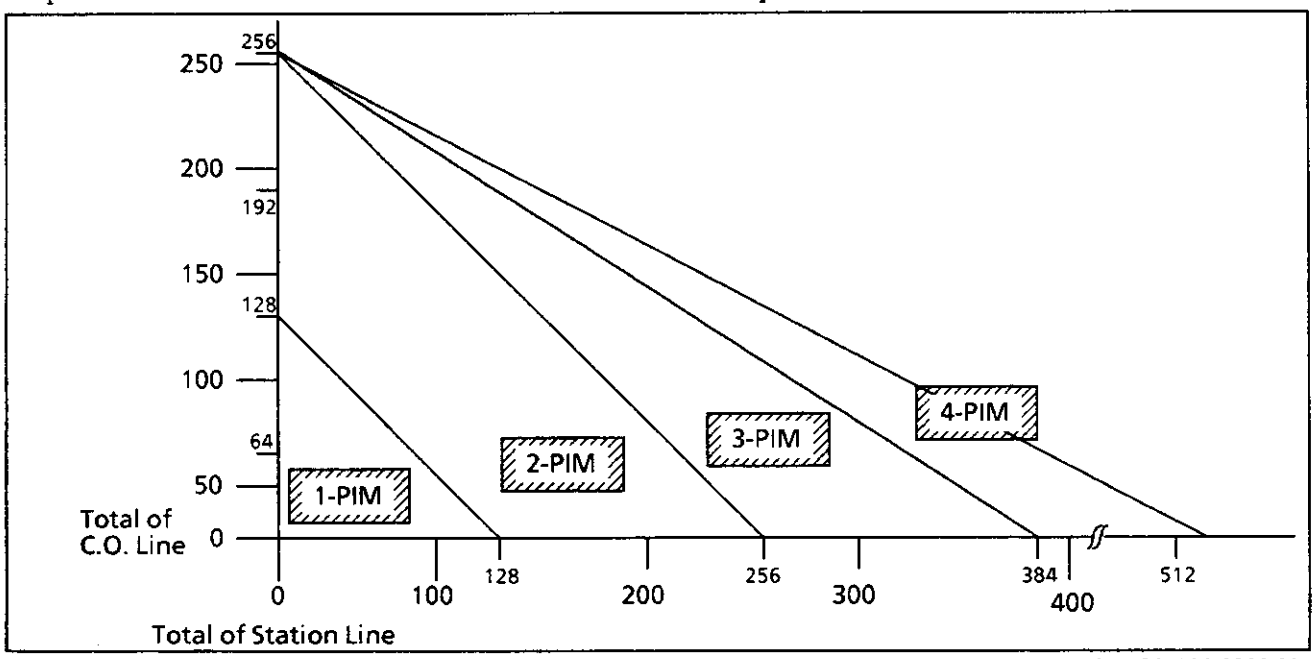


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**Figure 2-18 PIM Quantity Quick Reference**

## 2.5 Function of Switches and Lamps on Each Board

The following sections present the locations of the switches and lamps on each board. Also, the setting for each switch and the function of each lamp is provided.

- PJ-CP01 (MP) Board

The location of each switch and lamp on the PJ-CP01 board is shown in Figure 2-19. The setting for each switch and the function of each lamp is explained in Table 2-10.

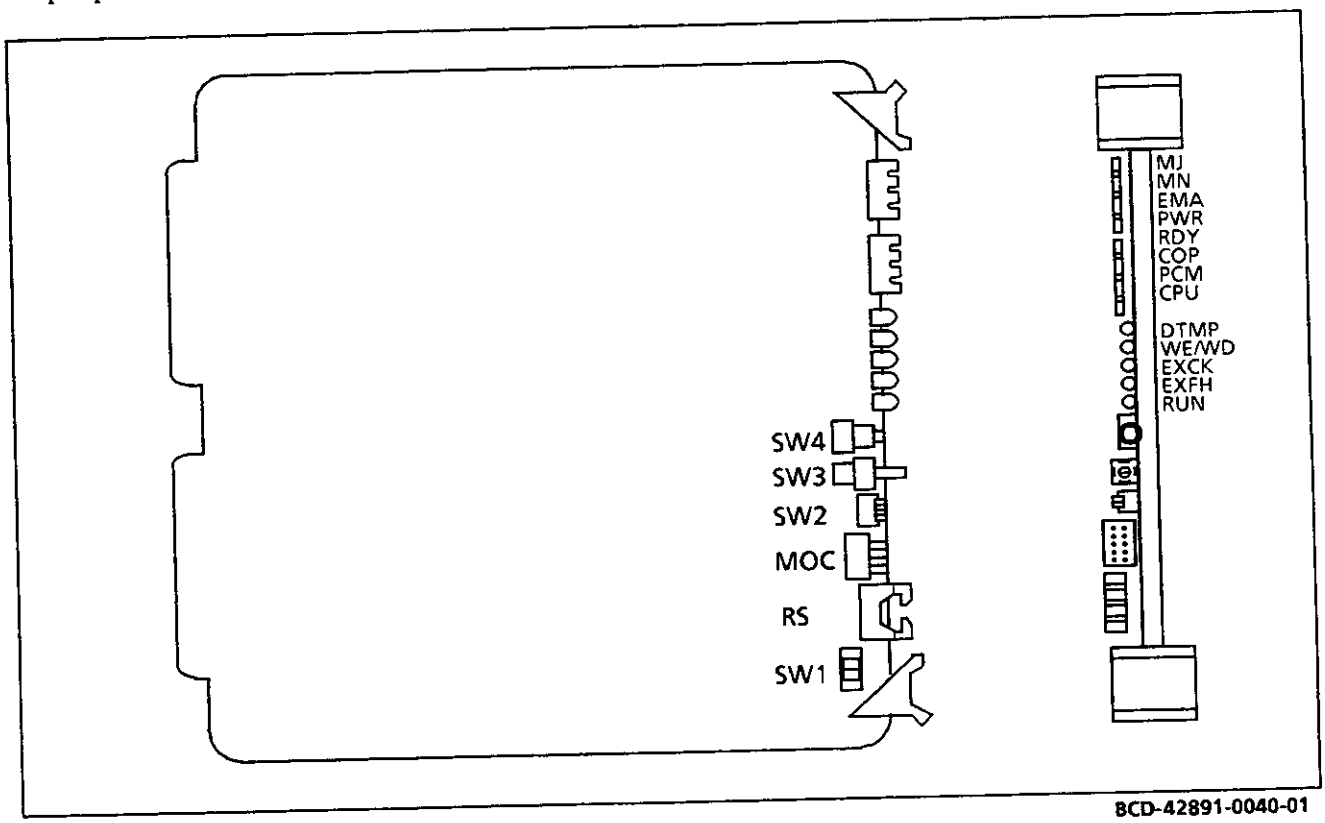


Figure 2-19 PJ-CP01 (MP) Board

Table 2-10 Switches and Lamps of PJ-CP01 (MP) Board

| SWITCH | LAMP | FUNCTION |
|---|---|---|
| SW1 | | Designation of terminal connected to "MOC" connector.<br>Down: MOC.<br>Up: RS-232C terminal. |
| SW2-1 | | Used for the protection of system data:<br>ON: For system data entry (WE mode).<br>OFF: For system operation (WD mode). |
| SW2-2 | | For factory testing. Should be "ON". |
| SW2-3 | | Designation of type of system ON: KF OFF: PF/MF |
| SW2-4 | | Not used. |
| SW3 | | Selection of CPU operation mode:<br>0: On-Line Mode (Normal Operation).<br>2: Off-Line Mode (Used for Factory Test).<br>A: For Resident System Program.<br>B: System Data All Clear for CAT.<br>1,3-9, C-F : Not used. |
| SW4 | | Switch is used for initialization of MP. |
| | MJ | Lights when a C-Level infinite loop, MP clock-down or PCM clock-down fault has occurred. |
| | MN | Lights when power fault has occurred, or the number of lockout station lines has exceeded the predetermined number. |
| | EMA | Lights when an emergency condition has occurred (PFT operation). |
| | PWR | Lights when a power fault has occurred. |
| | RDY | Lights when a "READY" signal from MEM Board is not returned. |
| | COP | Lights when a C-Level infinite loop has occurred. |
| | PCM | Lights when a PCM Clock fault has occurred. |
| | CPU | Lights when a MP Clock fault has occurred. |
| | DTMP | Momentarily lights when a Memory All Clear is performed. |
| | WE/WD | Lights when data can be written into the memory area (WE mode). |
| | EXCK | Lights when receiving the external clock signal. |
| | EXFH | Lights when receiving the external Frame Head signal. |
| | RUN | Normal on-line operation in progress (120 IPM-Flashing). |

BCD-4317701-0049-01

- PJ-CP02 (FP) Board
  Figure 2-20 shows the location of each switch and the lamp on a PJ-CP02 board.

Table 2-11 shows the setting of each switch and the function of the lamp.

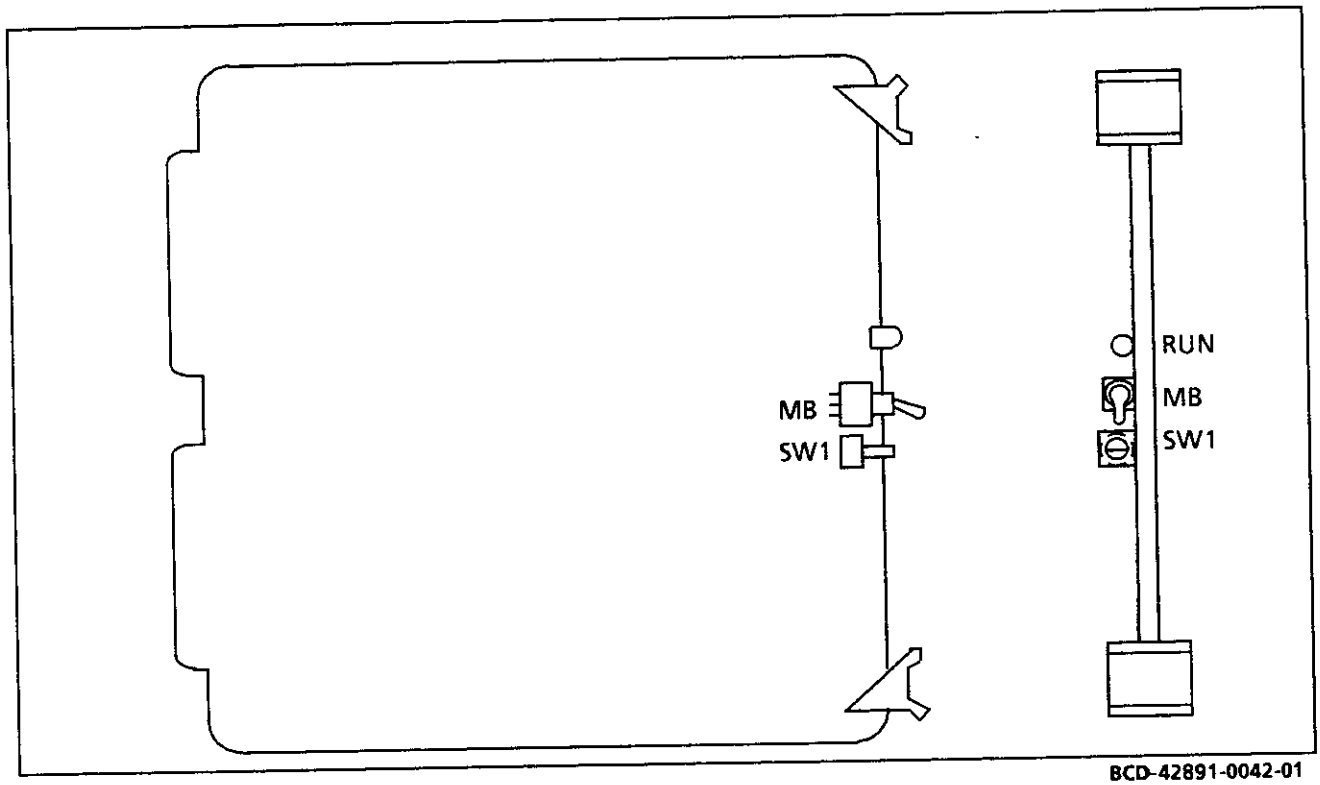


Figure 2-20 PJ-CP02 (FP) Board

Table 2-11 Switches and Lamp of PJ-CP02 (FP) Board

| SWITCH | LAMP | FUNCTION |
|---|---|---|
| SW1 | | Designation of Module location for this board:<br>0: For PIM 0 2: For PIM 2.<br>1: For PIM 1 3: For PIM 3. |
| MB | | Make Busy this board:<br>Down: In Service.<br>Up: Make Busy.<br>When this board is plugged/unplugged to/from the PIM, the MB switch should be set to the UP (Make Busy) position. |
| | RUN | Normal on-line operation in progress (120 IPM - flashing). |

BCD-4317701-0050-01

- PJ-CS00 (ATI) Board
  Figure 2-21 shows the location of each switch and lamp on the PJ-CS00 board.
  Table 2-12 shows the setting of each switch and the function of each lamp.

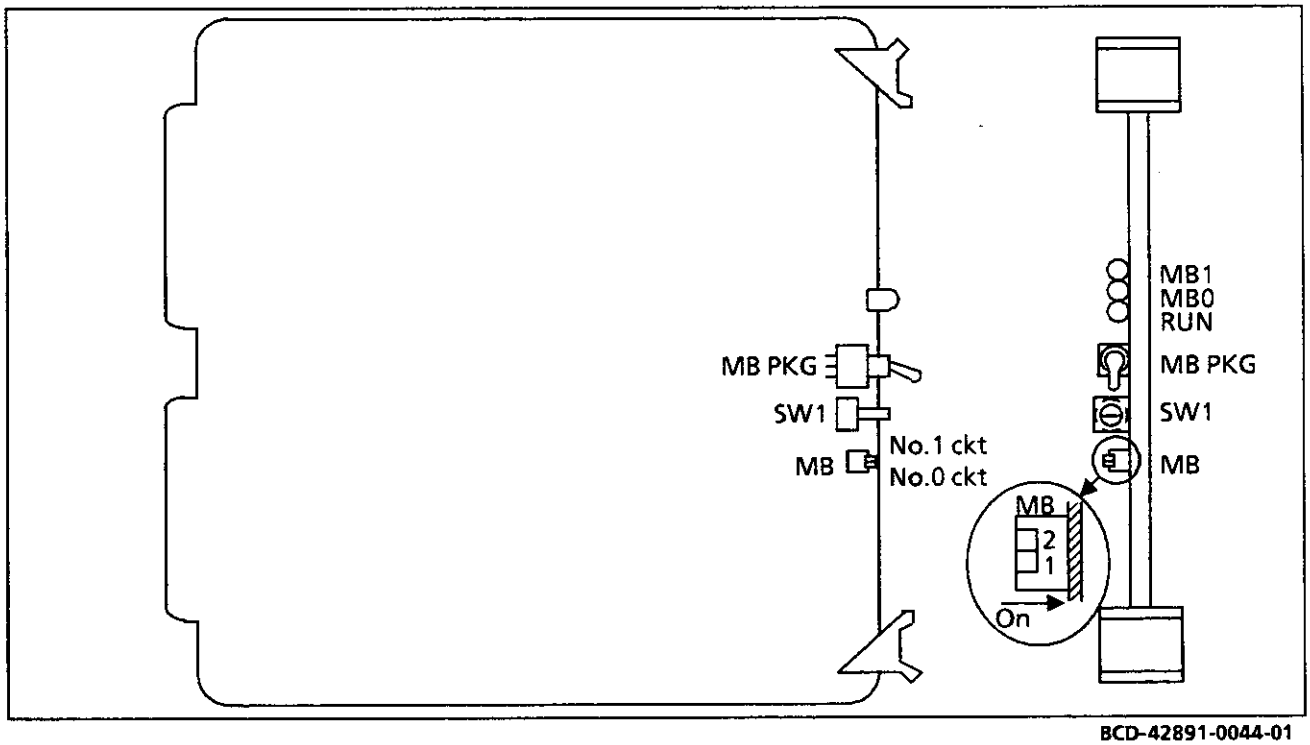


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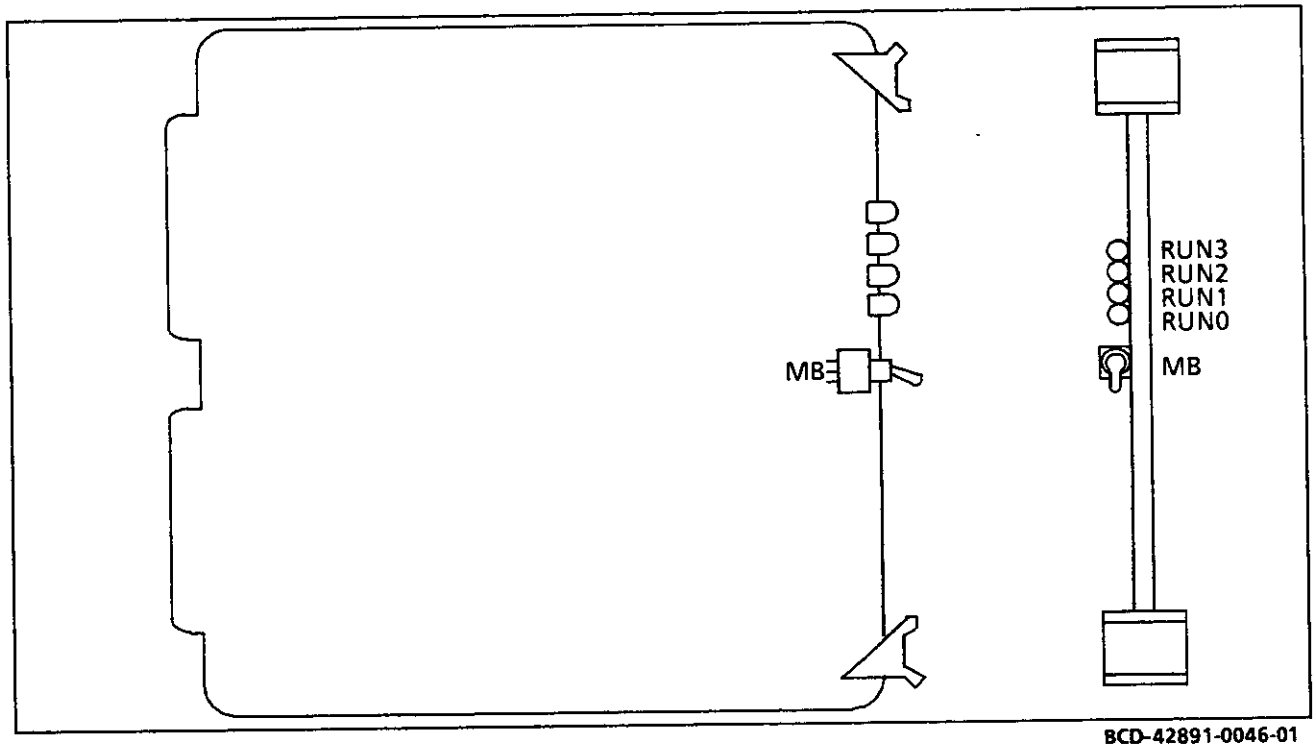
Figure 2-21 PJ-CS00 (ATI) Board

Table 2-12 Switches and Lamps of PJ-CS00 (ATI) Board

| SWITCH | LAMP | FUNCTION |
|---|---|---|
| MB-1 | | Make Busy the No.0 Attendant Console Interface circuit:<br>ON: Make Busy OFF: In Service |
| MB-2 | | Make Busy the No.1 Attendant Console Interface circuit:<br>ON: Make Busy OFF: In Service |
| SW1 | | Designation of Module location of this board:<br>4: For PIM 0 6: For PIM 2<br>5: For PIM 1 7: For PIM 3 |
| MB PKG | | Make Busy of this board:<br>Down: In Service.<br>Up: Make Busy.<br>When this board is plugged/unplugged to/from the PIM, the MB switch should be set to the UP (Make Busy) position. |
| | MB 0 | Lights when Circuit 0 is in the Make Busy state. |
| | MB 1 | Lights when Circuit 1 is in the Make Busy state. |
| | RUN | Normal on-line operation in progress (120 IPM - flashing). |

BCD-4317701-0051-01

- PJ-64SPA (64SPI) Board
  Figure 2-22 shows the location of the switch and lamps on the PJ-64SPA board. Table 2-13 shows the setting of the switch and the function of each lamp.




BCD-42891-0046-01

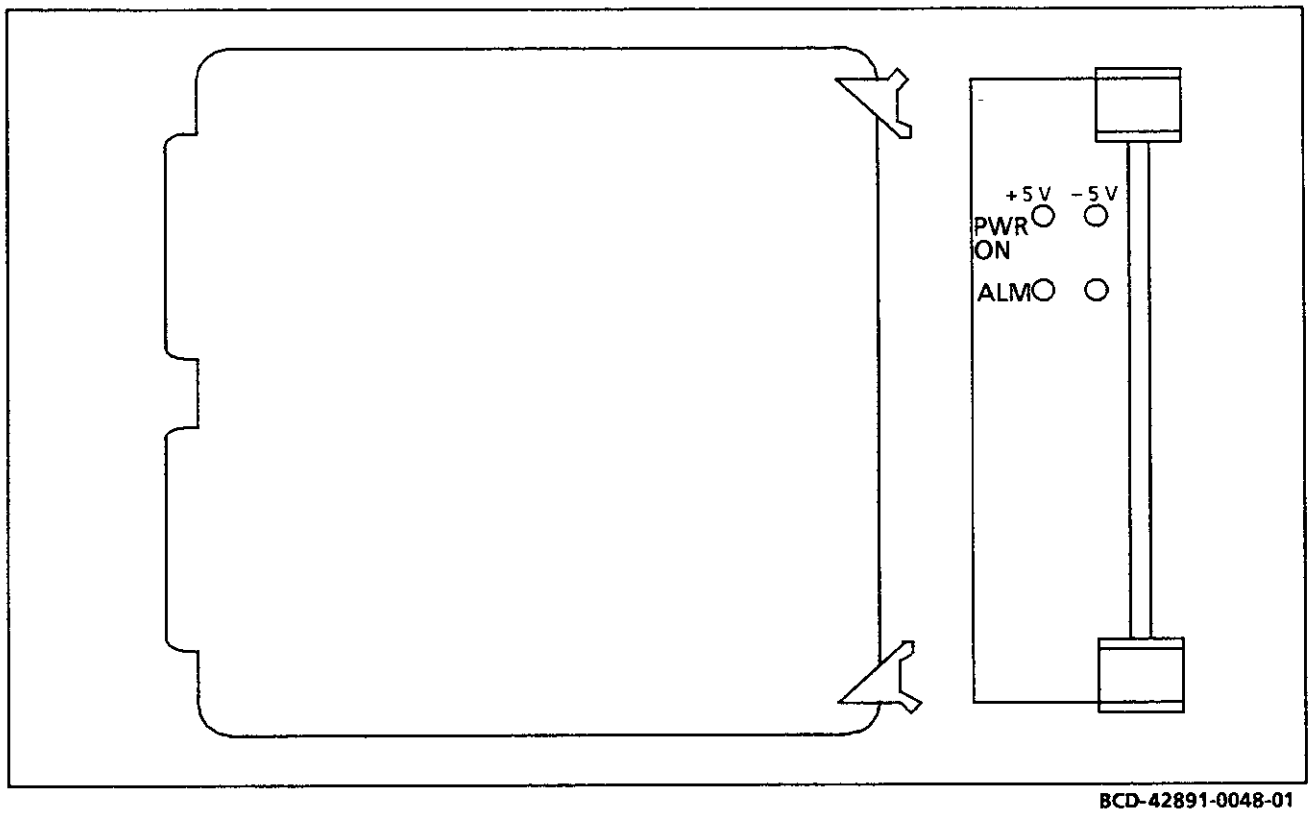
**Figure 2-22 PJ-64SPA (64SPI) Board**

**Table 2-13 Switch and Lamps of PJ-64SPA (64SPI) Board**

| SWITCH | LAMP | FUNCTION |
|---|---|---|
| MB | | Make Busy this board:<br>Down: In Service<br>Up: Make Busy<br>When this board is plugged/unplugged to/from the PIM, the MB switch should be set to the UP (Make Busy) position. |
| | RUN 0 | Status of Card Group 0 (LT00-LT07) or Card Group 4 (LT32-LT39)<br>Lights in on-line mode when at least one time slot is assigned to a card group. |
| | RUN 1 | Status of Card Group 1 (LT08-LT15) or Card Group 5 (LT40-LT47)<br>Lights in on-line mode when at least one time slot is assigned to a card group. |
| | RUN 2 | Status of Card Group 2 (LT16-LT23) or Card Group 6 (LT48-LT55)<br>Lights in on-line mode when at least one time slot is assigned to a card group. |
| | RUN 3 | Status of Card Group 3 (LT24-LT31) or Card Group 5 (LT56-LT63)<br>Lights in on-line mode when at least one time slot is assigned to a card group. |

BCD-4317701-0052-01

- PJ-PW01 (PWRA) Board
  Figure 2-23 shows the location of the lamps on the PJ-PW01 board. Table 2-14 shows the function of each lamp.




BCD-42891-0048-01

Figure 2-23 PJ-PW01 (PWRA) Board

Table 2-14 Lamps of PJ-PW01 (PWRA) Board

| LAMP | FUNCTION |
|---|---|
| +5 V PWR ON | Lights when +5 V output of this board is normal. |
| −5 V PWR ON | Lights when −5 V output of this board is normal. |
| +5 V ALM | Lights when +5 V output of this board is abnormal. |
| −5 V ALM | Lights when −5 V output of this board is abnormal. |

BCD-42891-049-01

- PJ-PW04 (PWRB) Board
  Figure 2-24 shows the location of the switch and lamps on a PJ-PW04 board. Table 2-15 provides the setting for the switch and the function of each lamp.

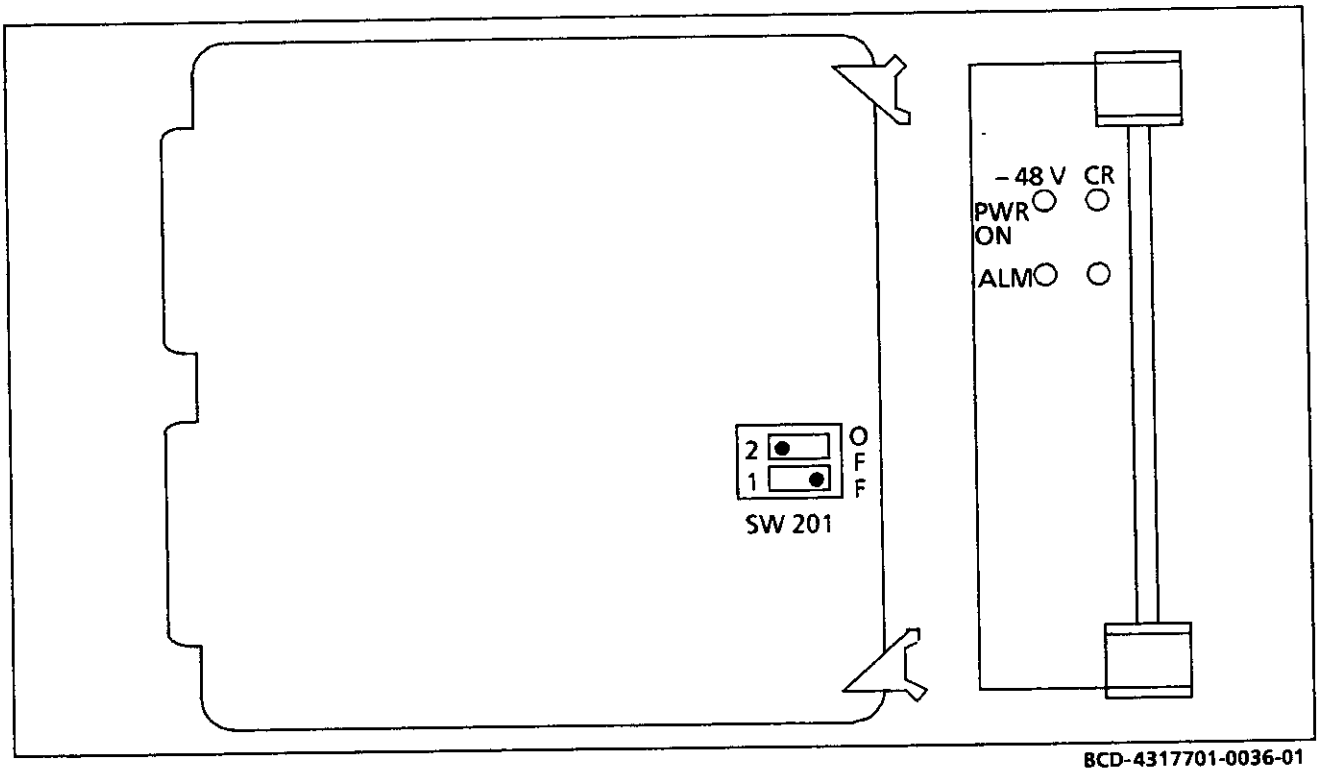


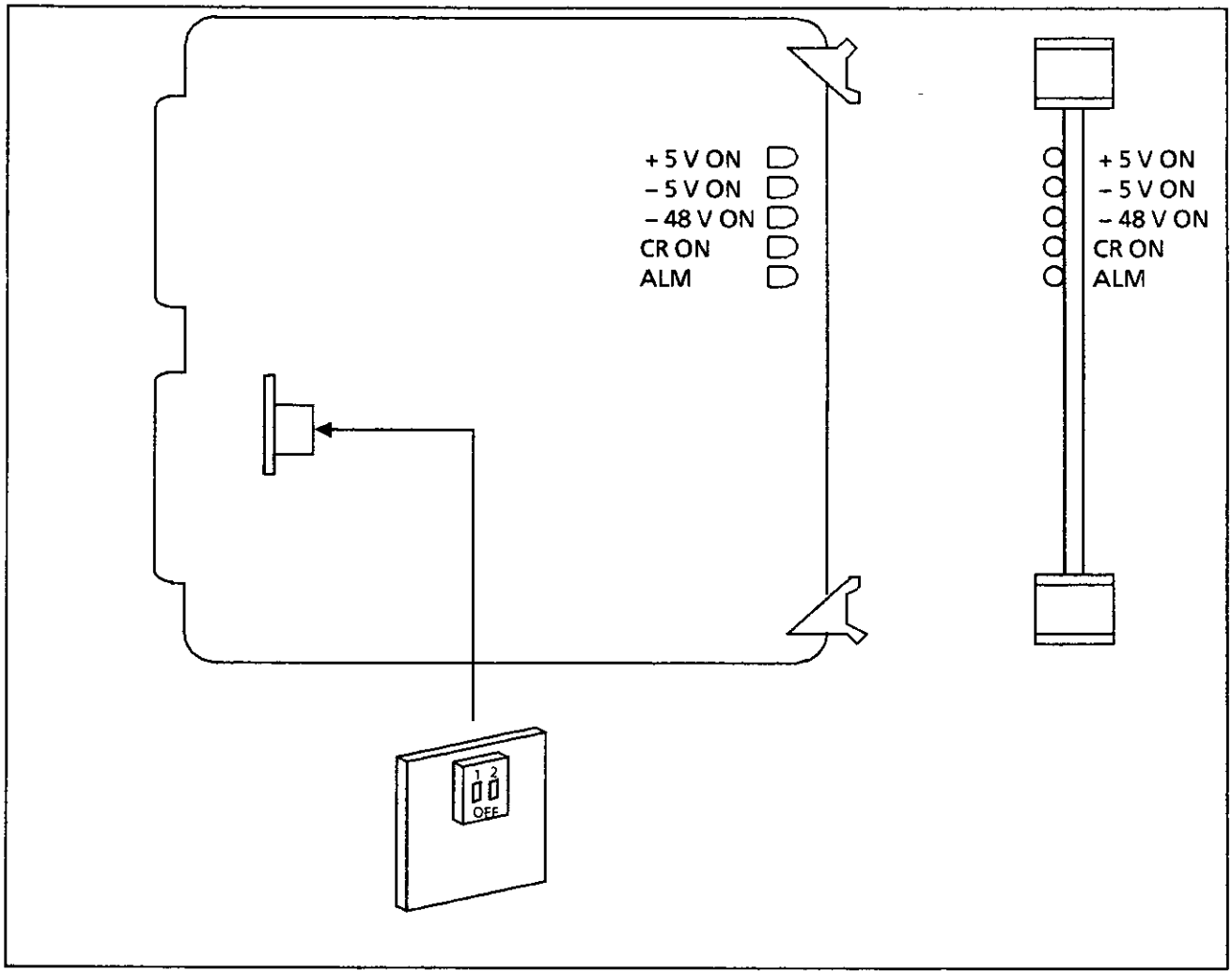

Figure 2-24 PJ-PW04 (PWRB) Board

Table 2-15 Switch and Lamps of PJ-PW04 (PWRB) Board

| SWITCH | LAMP | FUNCTION |
|---|---|---|
| | – 48 V PWR ON | Lights when – 48 V output of this board is normal. |
| | CR PWR ON | Lights when Continuous Ringing (CR) output of this board is normal. |
| | – 48 V ALM | Lights when – 48 V output of this board is abnormal. |
| | CR ALM | Lights when Continuous Ringing (CR) output of this board is abnormal. |
| SW 201 | | Set the switch for the voltage and frequency of the Ringing Signal as follows:<br>SW 201-1 OFF: 20 Hz<br>SW 201-2 ON: 75 Vrms |

BCD-4317701-0031-02

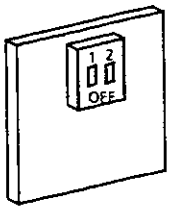
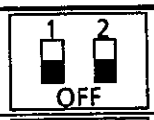
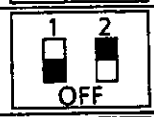
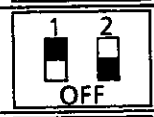
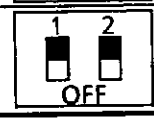
- PJ-PW14 (PWRB) Board
  Figure 2-25 shows the location of the switch and lamps on the PJ-PW14 board. Table 2-16 shows the function of the switch and lamps.




BCD-4317701-0195-01

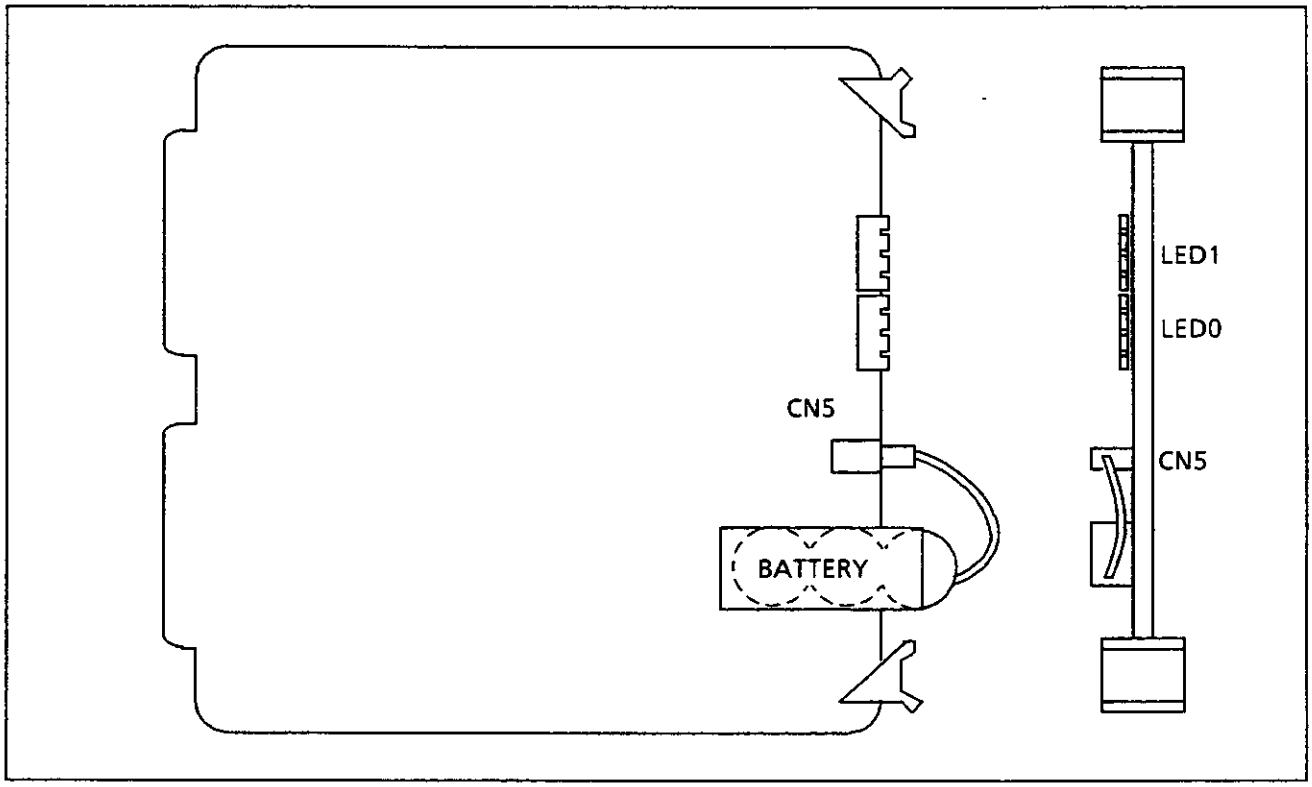
Figure 2-25 PJ-PW14 (PWRB) Board

Table 2-16 Switch and Lamps of PJ-PW14 (PWRB) Board

<table>
<tr><th>SWITCH</th><th>LAMP</th><th>FUNCTION</th></tr>
<tr><td>  </td><td></td><td>
<table>
<tr><th>SWITCH SETTING</th><th>FREQUENCY [Hz]</th><th>VOLTAGE [Vrms]</th></tr>
<tr><td>  </td><td>20</td><td>90</td></tr>
<tr><td>*  </td><td>20</td><td>75</td></tr>
<tr><td>  </td><td>25</td><td>90</td></tr>
<tr><td>  </td><td>25</td><td>75</td></tr>
</table>
Note: Switch setting marked by an "*" is default setting.
</td></tr>
<tr><td></td><td>+5 V ON</td><td>Lights when +5 V output of this board is normal.</td></tr>
<tr><td></td><td>−5 V ON</td><td>Lights when −5 V output of this board is normal.</td></tr>
<tr><td></td><td>−48 V ON</td><td>Lights when −48 V output of this board is normal.</td></tr>
<tr><td></td><td>CR ON</td><td>Lights when +5 V/−5 V/−48 V/CR output of this board is normal.</td></tr>
<tr><td></td><td>ALM</td><td>Lights when Continuous Ringing (CR) output of this board is abnormal.</td></tr>
</table>

BCD-4317701-0196-01

- PJ-ME03 (MEM) Board
  Figure 2-26 shows the location of the lamps on the PJ-ME03 board. Table 2-17 shows the function of each lamp.




BCD-42891-0052-02

Figure 2-26 PJ-ME03 (MEM) Board

Table 2-17 Lamps of PJ-ME03 (MEM) Board

| LAMP | FUNCTION |
|---|---|
| LED 0 | Quick flash indicates normal operation. |
| LED 1 | Quick flash indicates normal operation. |

BCD-42891-053-02

- PJ-AP00 Board
  Figure 2-27 shows the location of each switch and lamp on a PJ-AP00 board.

Table 2-18 provides the settings for each switch and the function of each lamp.

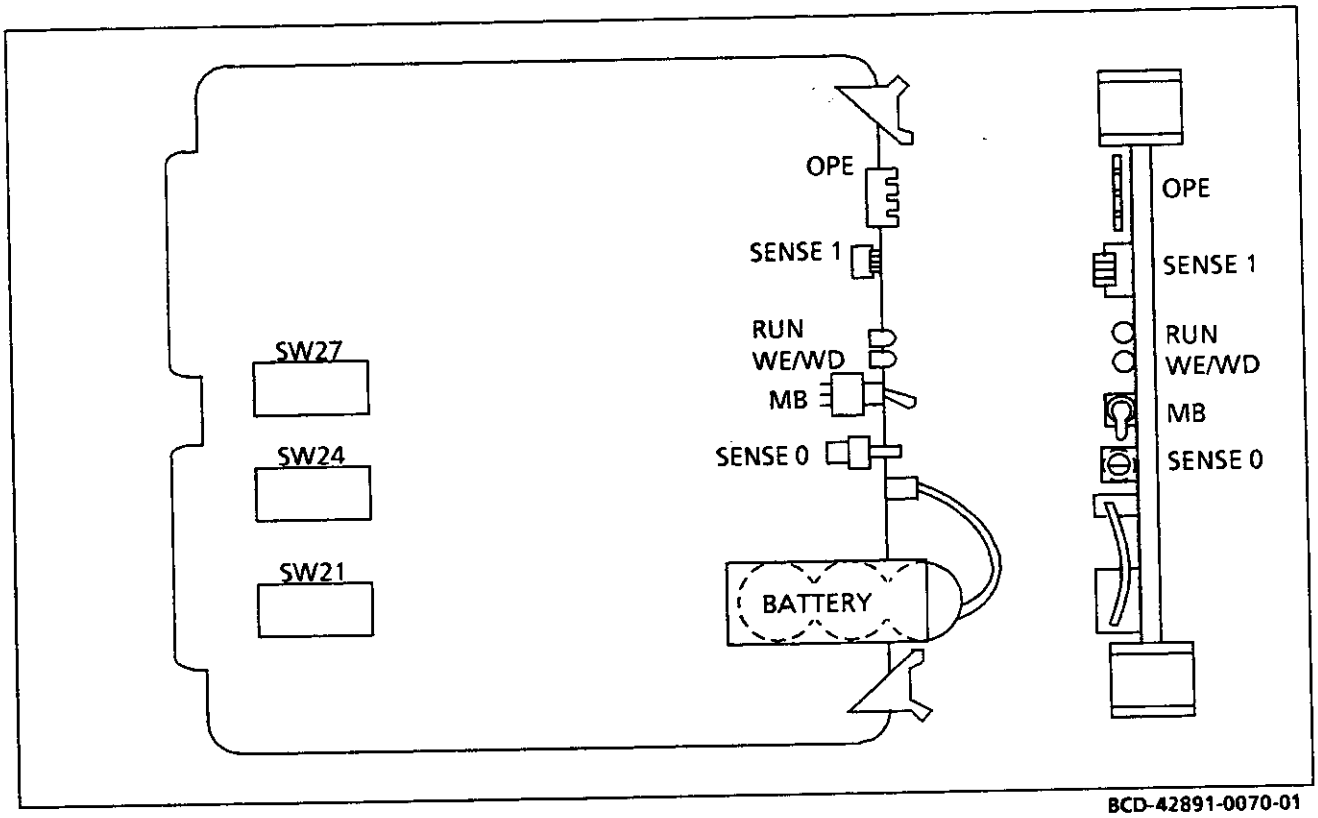



Figure 2-27 PJ-AP00 Board

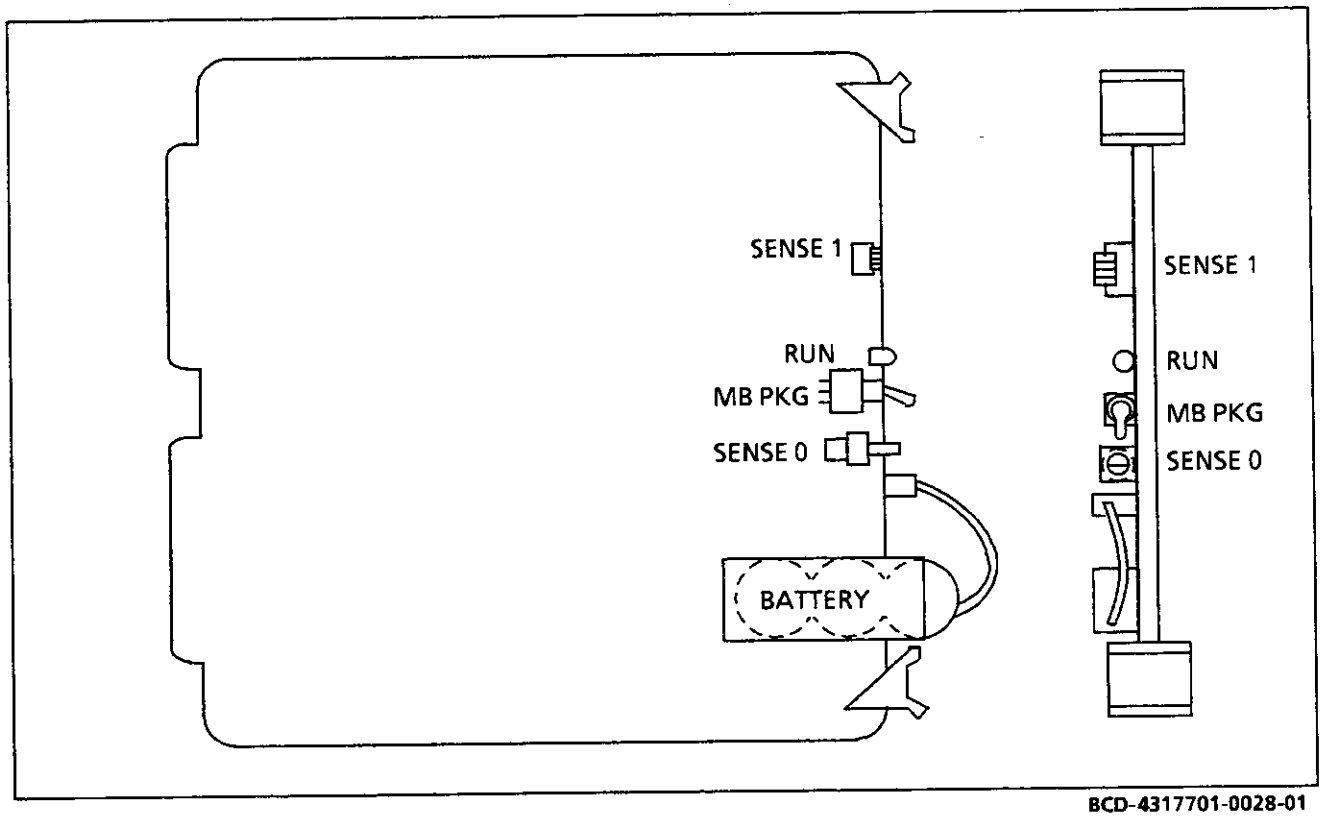
Table 2-18 Switches and Lamps of PJ-AP00 Board

| SWITCH | LAMP | FUNCTION |
|---|---|---|
| SENSE 1-1 | | Used for factory testing. Should be "ON". |
| SENSE 1-2 | | |
| SENSE 1-3 | | |
| SENSE 1-4 | | ON: Memory Write Enable OFF: Memory Write Disable |
| SENSE 0 | | Designation of location for this board.<br>This switch should be set to the Slot Number assigned with CM05. |
| MB | | Make Busy this board:<br>Down: In Service.<br>Up: Make Busy.<br>When this board is plugged/unplugged to/from the PIM, the MB switch should be set to the UP (Make Busy) position. |
| SW21 | | Designation of No.0 port. Interface Condition<br>SW21-1 ON: Synchronous Interface with RT Clock.<br>OFF: Synchronous Interface without RT Clock or Asynchronous Interface.<br>SW21-2 ON: Synchronous Interface with ST2 Clock.<br>OFF: Synchronous Interface without ST2 Clock or Asynchronous Interface.<br>SW21-3 ON: Synchronous Interface with ST1 Clock.<br>OFF: Synchronous Interface without ST1 Clock or Asynchronous Interface.<br>SW21-4 ON: Synchronous Interface.<br>OFF: Asynchronous Interface. |
| SW24 | | Designation of No.0 and No.1 ports Signaling Condition:<br>SW24-1 ON/OFF: CS Signal of No.0 port Ineffective/Effective.<br>SW24-2 ON/OFF: CD Signal of No.0 port Ineffective/Effective.<br>SW24-4 ON/OFF: CS Signal of No.1 port Ineffective/Effective.<br>SW24-5 ON/OFF: CD Signal of No.1 port Ineffective/Effective.<br>SW24-3, SW24-6, SW24-7, SW24-8: Not used. |
| SW2 | | Designation of No.2 and No.3 ports Signaling Condition:<br>SW27-1 ON/OFF: CS Signal of No.2 port Ineffective/Effective.<br>SW27-2 ON/OFF: CD Signal of No.2 port Ineffective/Effective.<br>SW27-4 ON/OFF: CS Signal of No.3 port Ineffective/Effective.<br>SW27-5 ON/OFF: CD Signal of No.3 port Ineffective/Effective.<br>SW27-3, SW27-6, SW27-7, SW27-8: Not used. |
| | OPE | Normal Operation |
| | RUN | Normal on-line operation in progress (120 IPM - Flashing) |
| | WE/WD | Lights when memory write is enabled. |

BCD-4317701-0053-01

- PJ-AP01 Board
  Figure 2-28 shows the location of each switch and lamp on a PJ-AP01 board.

Table 2-19 provides the setting for each switch and the function of the lamp.




BCD-4317701-0028-01

**Figure 2-28 PJ-AP01 Board**

**Table 2-19 Switches and Lamp of PJ-AP01 Board**

| SWITCH | LAMP | FUNCTION |
|---|---|---|
| | RUN | Normal on-line operation in progress (120 IPM - flashing). |
| SENSE 1-1 | | Not used |
| SENSE 1-2 | | |
| SENSE 1-3 | | |
| SENSE 1-4 | | |
| SENSE 0 | | Designation of location for this board. This switch should be set to the Slot Number assigned with CM05. |
| MB | | Down : In Service. |
| | | Up : Make Busy. |

BCD-4317701-0029-02

- PJ-AP02 Board
  Figure 2-29 shows the location of each switch and lamp on a PJ-AP02 board. Table 2-20 provides the setting for each switch and the function of each lamp.

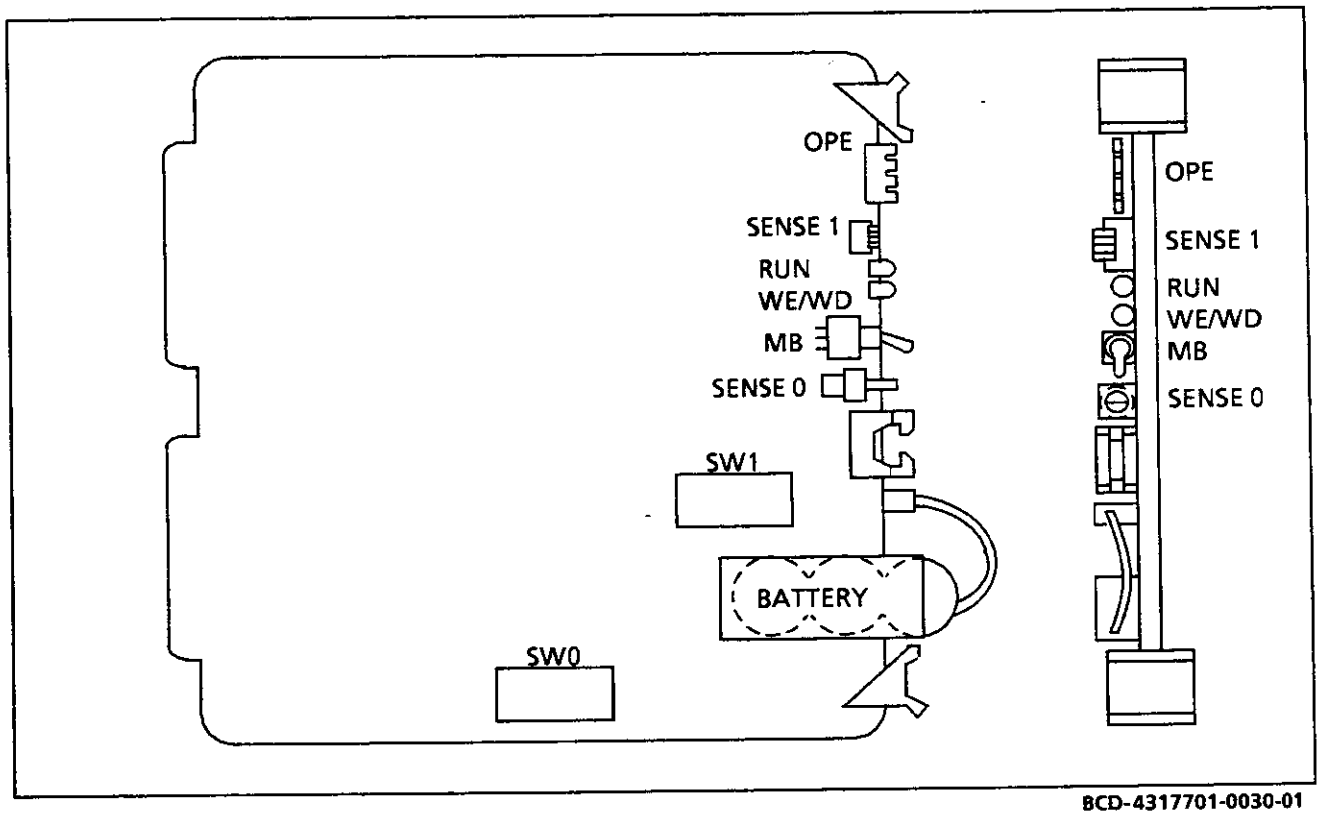


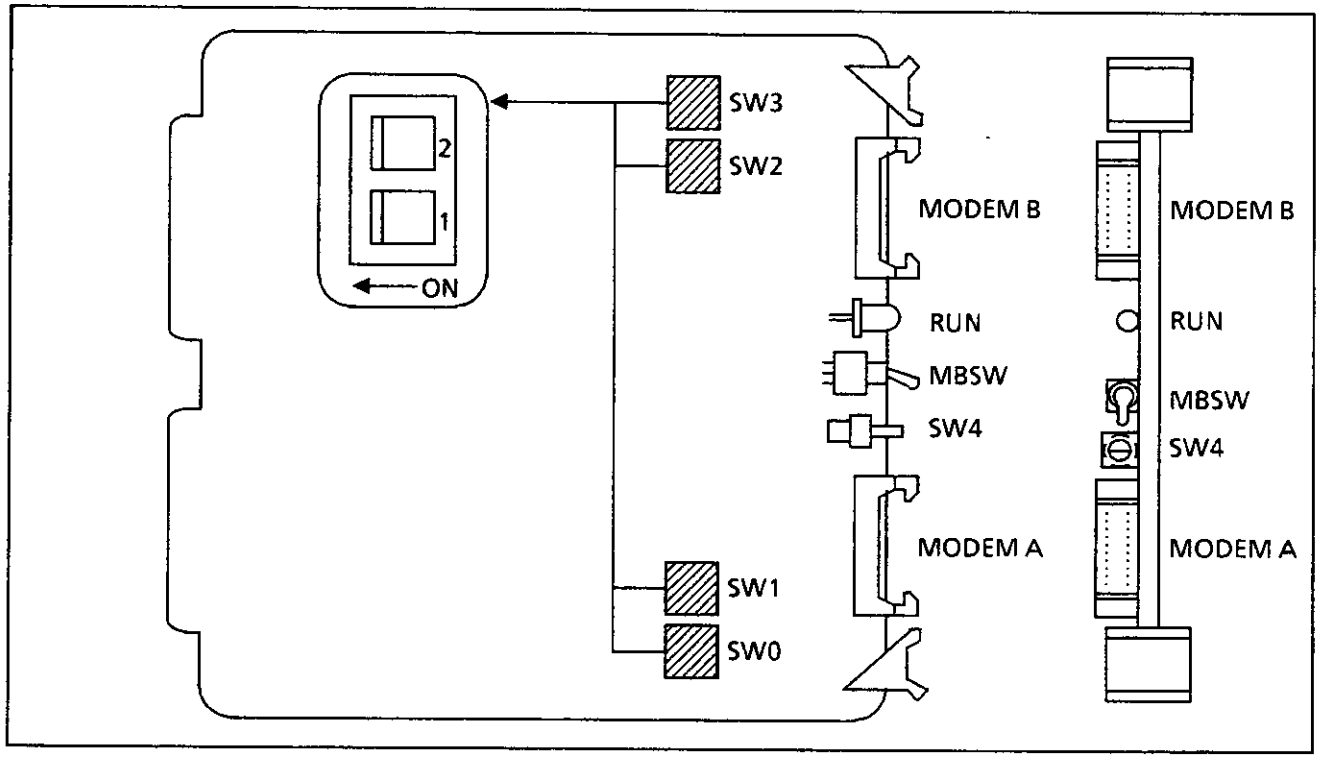

Figure 2-29 PJ-AP02 Board

Table 2-20 Switches and Lamps of PJ-AP02 Board

| SWITCH | LAMP | FUNCTION |
|---|---|---|
| | OPE | Normal Operation. |
| | RUN | On-line operation in progress (120 IPM). |
| | WE/WD | Lights when memory write is enabled. |
| SENSE 1-1 | | Used for factory testing. Should be "ON". |
| SENSE 1-2 | | |
| SENSE 1-3 | | |
| SENSE 1-4 | | ON: Memory Write Enable OFF: Memory Write Disable |
| SENSE 0 | | Designation of location for this board. This switch should be set to the Slot Number assigned by CM05. |
| MB | | Down: In Service. |
| | | Up: Make Busy. |
| SW 1 | | Designation of Signaling Condition with Modem:<br>SW 1-1 ON/OFF: CTS signal from Modem Ineffective/Effective.<br>SW 1-2 ON/OFF: DCD signal from Modem Ineffective/Effective.<br>SW 1-3 ON/OFF: DTR signal from Modem Ineffective/Effective.<br>SW 1-4 : Not Used. |
| SW 0 | | Designation of Synchronous Interface:<br>SW 0-1 ON: Synchronous Interface with RT Clock.<br>OFF: Synchronous Interface with internal Clock.<br>SW 0-2 ON: Synchronous Interface with ST1 Clock.<br>OFF: Synchronous Interface with internal Clock.<br>SW 0-3 ON: Synchronous Interface with ST2 Clock.<br>OFF: Synchronous Interface with internal Clock.<br>SW 0-4: Not Used.<br>**Note 1:** *For asynchronous interface, set SW 0-1 – 3 to "OFF".* |

BCD-4317701-0032-02

- PJ-4MDTA Board
  Figure 2-30 shows the location of each switch and lamp on a PJ-4MDTA board. Table 2-21 provides the setting for each switch and the function of the lamp.




BCD-4317701-0028-01

Figure 2-30 PJ-4MDTA Board

Table 2-21 Switches and Lamp of PJ-4MDTA Board

| SWITCH | LAMP | FUNCTION |
|---|---|---|
| MBSW | | Make Busy this board:<br>Down: In Service.<br>Up: Make Busy.<br>When this board is inserted/removed, the MB switch should be set to the UP (Make Busy) position. |
| SW0 and SW1 | | Type of No.0 and 1 circuit Modems:<br>SW0 – 1 ON/OFF: No.0 circuit Ring/Leased Modem.<br>SW0 – 2 ON/OFF: No.1 circuit Ring/Leased Modem.<br>SW1 – 1 ON/OFF: No.0 circuit 4-wire/2-wire Modem.<br>SW1 – 2 ON/OFF: No.1 circuit 4-wire/2-wire Modem. |
| SW2 and SW3 | | Type of No.2 and 3 circuit Modems:<br>SW2 – 1 ON/OFF: No.2 circuit Ring/Leased Modem.<br>SW2 – 2 ON/OFF: No.3 circuit Ring/Leased Modem.<br>SW3 – 1 ON/OFF: No.2 circuit 4-wire/2-wire Modem.<br>SW3 – 2 ON/OFF: No.3 circuit 4-wire/2-wire Modem. |

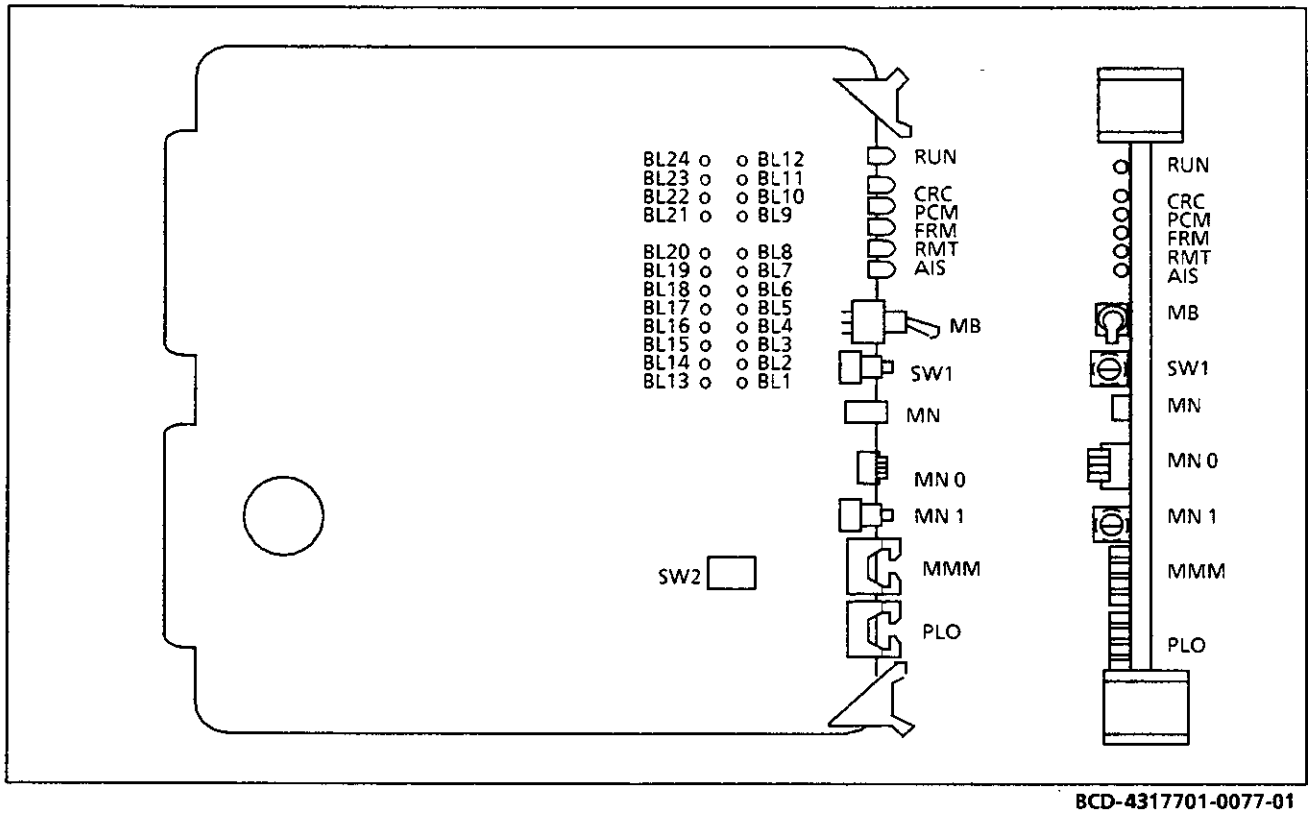
BCD-4317701-0054-01

Table 2-21 Switches and Lamp of PJ-4MDTA Board (continued)

| SWITCH | LAMP | FUNCTION |
|---|---|---|
| MBSW | | Make Busy this board:<br>Down: In Service.<br>Up: Make Busy.<br>When this board is inserted/removed, the MB switch should be set to the UP (Make Busy) position. |
| SW4 | | Designation of the location for this board.<br>This switch should be set to the Slot Number assigned with CM05. |
| | RUN | Normal on-line operation in progress (120 IPM - flashing). |

BCD-4317701-0054-01

- PJ-24DTB (DTI) Board
  Figure 2-31 shows the location of the lamps and switches on a PJ-24DTB board. Table 2-22 shows the function of each lamp and the setting of each switch.




BCD-4317701-0077-01

**Figure 2-31 PJ-24DTB Board**

Table 2-22 Switches and Lamps of PJ-24DTB Board

| SWITCH | LAMP | FUNCTION |
|---|---|---|
| MB | | Make Busy this board:<br>Down: In Service.<br>Up: Make Busy.<br>When this board is inserted/removed, the MB switch should be set to the UP (Make Busy) position. |
| SW0 | | SW0-1, SW0-2, SW0-3; Setting of Equalizer according to the cable length between DTI and external equipment.<br>CABLE LENGTH / SW0-1 / SW0-2 / SW0-3<br>0-133 / ON / ON / ON<br>134-267 / ON / ON / OFF<br>268-400 / ON / OFF / ON<br>401-533 / ON / OFF / OFF<br>534-650 / OFF / ON / ON |
| | | SW0-4, SW0-5; Setting of Balanced Line Interface.<br>SW0-4 ON/OFF: Neutral Grounding/No Neutral Grounding on transmitting line.<br>SW0-5 ON/OFF: Neutral Grounding/No Neutral Grounding on receiving line. |
| | | SW0-6; Setting of Line Impedance.<br>SW0-6: ON/OFF: 100 ohms/110 ohms |
| | | SW0-7; Not Used. |
| SW1 | | Designation of the location for this board.<br>This switch should be set to the Slot Number assigned with CM05. |
| MN0 | | MN0-1, MN0-2; Monitoring Channel Selection.<br>MN0-1 ON/OFF: Monitor on the receiving/transmitting side<br>MN0-2 ON/OFF: Monitoring Channels, CH16-CH23/CH0 - CH15 |
| | | MN0-3, MN0-4; Setting of Loop-Back Test.<br>MN0-3 ON/OFF: Operating Mode/Loop-Back Test Mode<br>MN0-4 ON/OFF: Local Loop-Back Test/Remote Loop-Back Test |

BCD-4317701-0078-01

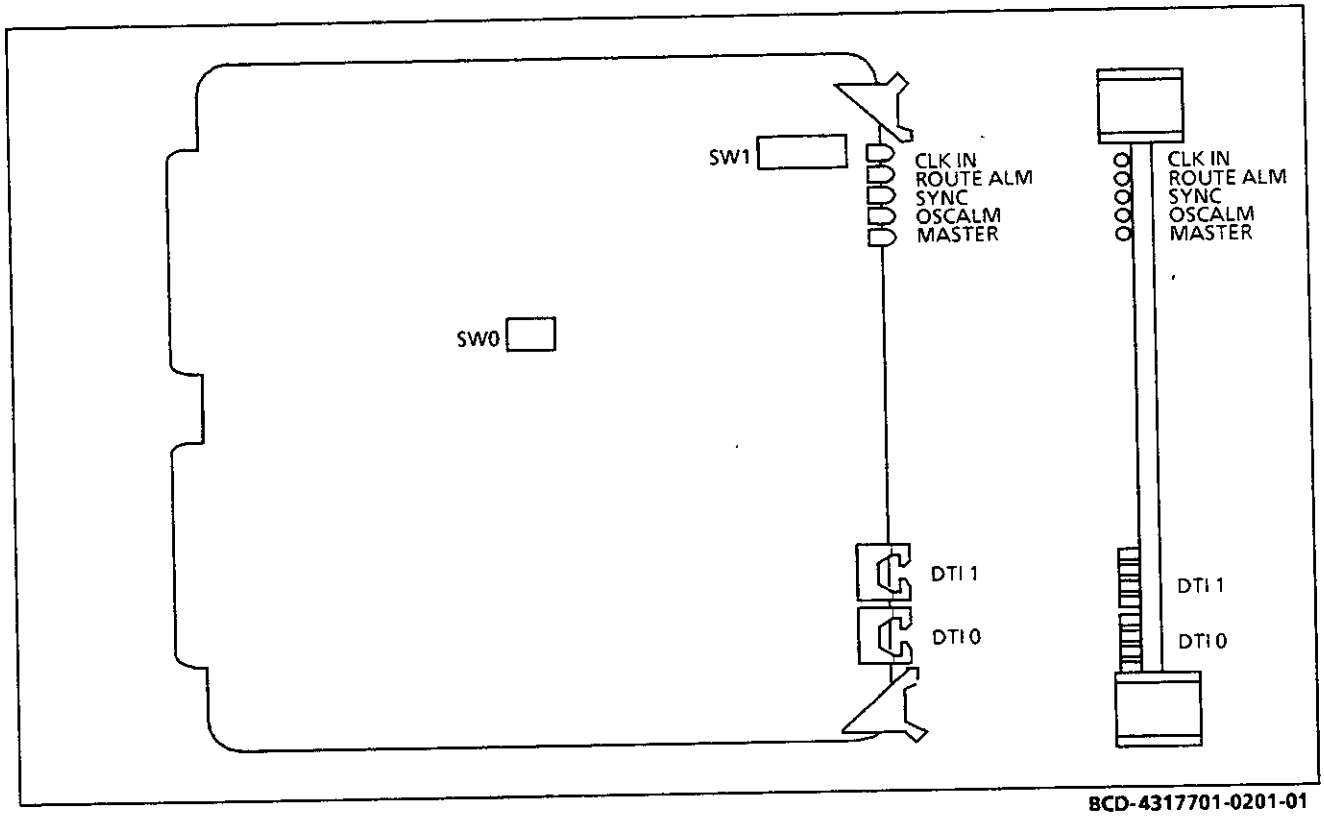
Table 2-22 Switches and Lamps of PJ-24DTB Board (continued)

<table>
<tr><th>SWITCH</th><th>LAMP</th><th>FUNCTION</th></tr>
<tr><td>MN1</td><td></td><td>Monitoring Channel Selection (designation of monitoring channels in combination with setting of MN0-1 and MN0-2).<br><br>MN1<br>0 1 2 3 4 5 6 7 8 9 A B C D E F<br>MN0-2 Channel #<br>ON 16 17 18 19 20 21 22 23 - - - - - - - -<br>OFF 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15</td></tr>
<tr><td></td><td>RUN</td><td>Normal on-line operation in progress (120 IPM - flashing).</td></tr>
<tr><td></td><td>CRC</td><td>Lights up on detecting CRC error.</td></tr>
<tr><td></td><td>PCM</td><td>Lights up when the distant office clock supply stops.</td></tr>
<tr><td></td><td>FRM</td><td>Lights up on detecting Frame Alignment Signal Loss.</td></tr>
<tr><td></td><td>RMT</td><td>Lights up when a Frame Alignment Signal Loss alarm has been detected at the distant office.</td></tr>
<tr><td></td><td>AIS</td><td>Lights up indicating that the pattern of consecutive "1"s is being received. The distant office transmits this signal due to a Loop-Back Test.</td></tr>
<tr><td></td><td>BL1-BL24</td><td>The function of BL-lamp varies with the state of the corresponding line, as follows:<br>Line Busy: ON<br>Line Idle: OFF<br>Line Make Busy: 60 IPM flashing</td></tr>
</table>

BCD-4317701-0079-01

- PJ-CK01 (PLO) Board
  Figure 2-32 shows the location of each switch and lamp on a PJ-CK01 board.

Table 2-23 provides the settings for each switch and the function of each lamp.




BCD-4317701-0201-01

Figure 2-32 PJ-CK01 (PLO) Board

Table 2-23 Switches and Lamps of PJ-CK01 (PLO) Board

| SWITCH | LAMP | FUNCTION |
|---|---|---|
| SW0 | | Clock Signal Supply Route Selection:<br>SW0-1 ON: When No. 0 circuit (DTI0 connector) is used to input a clock signal from the master office.<br>OFF: When No. 0 circuit is not used.<br>SW0-2 ON: When No. 1 circuit (DTI1 connector) is used to input a clock signal from the sub-master office.<br>OFF: When No. 1 circuit is not used.<br>When a PLO CA-A is not connected, set SW0-1 and SW0-2 to OFF |

BCD-4317701-0099-01

Table 2-23 Switches and Lamps of PJ-CK01 (PLO) Board (Continued)

| SWITCH | LAMP | FUNCTION |
|---|---|---|
| SW1 | | Setting of PLO functions:<br>SW1-1 ON: Clock Signal is supplied from the Master Oscillator via DTI (for a master office)<br>OFF: Clock Signal is supplied via DTI (for a slave office)<br>SW1-2 ON: BRI (For ISDN) } Type of trunks<br>OFF: DTI (For DDI/No.7 CCIS) } connected to PLO<br>SW1-3 ON: 2.048 MHz (30 channels) } Clock Signal<br>OFF: 1.544 MHz (24 channels) } Frequency<br>SW1-4 ON: Master Office<br>OFF: Slave Office |
| | CLK IN | Lights up when a clock signal is being supplied from DTI; off, when the NEAX1400 IMS is a master. |
| | ROUTE ALM | Lights up when the No. 0 Clock Signal and/or No. 1 Clock Signal has stopped when SW0-1 and SW0-2 are set to "Enable." |
| | SYNC | Lights up when the PLO is in synchronization with the master clock received; off, when the NEAX1400 IMS is a master. |
| | OSC ALM | Lights up when the PLO does not generate clock signal. |
| | MASTER | Lights up when the SW1-4 is set to "Master Office." |

BCD-4317701-0081-01

- PJ-SCOO (CCH) Board
  Figure 2-33 shows the location of each switch and lamp on a PJ-SC00 board.

Table 2-24 provides the setting for each switch and the function of each lamp.

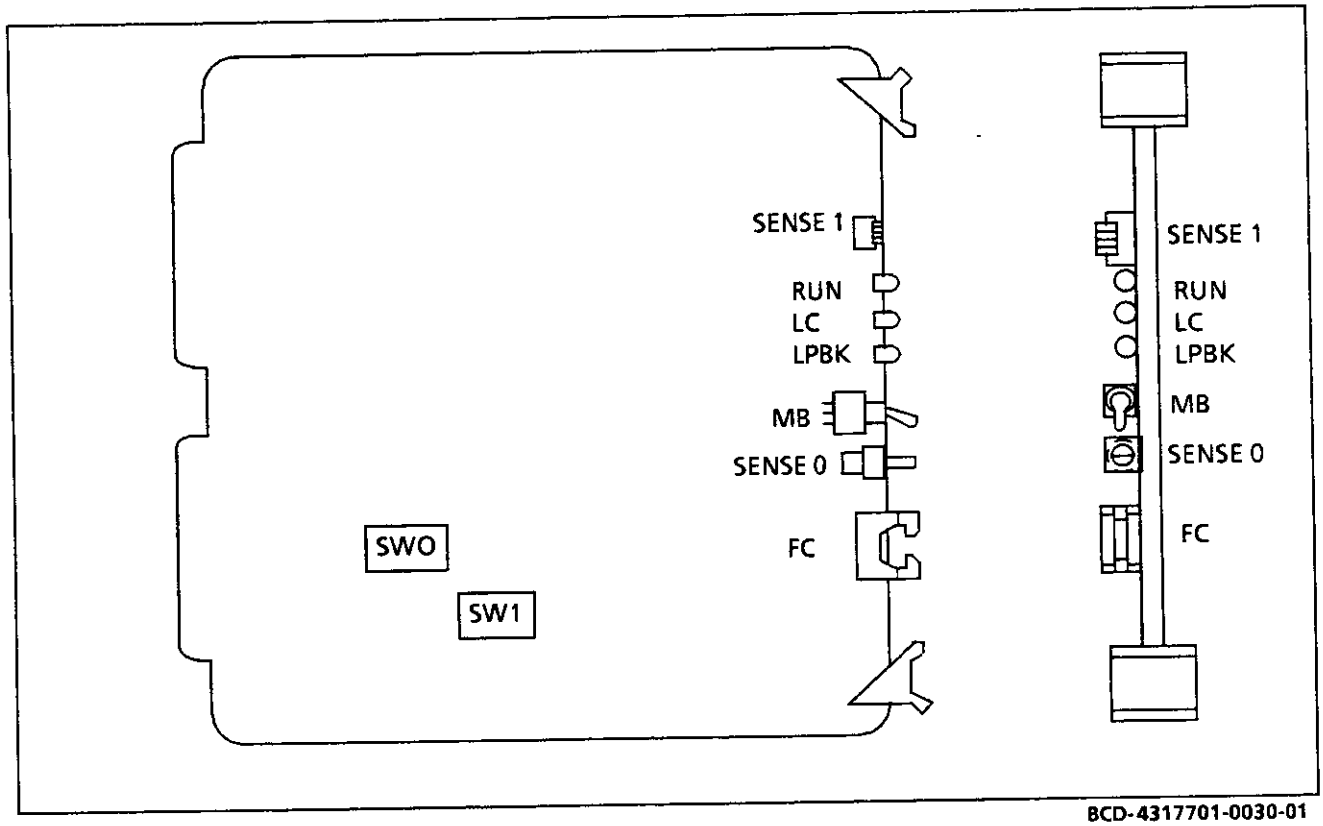



**Figure 2-33 PJ-SC00 (CCH) Board**

**Table 2-24 Switches and Lamps of PJ-SC00 (CCH) Board**

| SWITCH | LAMP | FUNCTION |
|---|---|---|
| MB | | Make Busy/Cancel of this this board:<br>Down: In Service.<br>Up: Make Busy. |
| SENSE 0 | | Designation of the location for this board.<br>4-F: Slot Number assigned with CM05. |
| SENSE 1 | | SENSE1-1 ON: Loop Back Test<br>OFF: Normal Usage<br>SENSE1-2 ON: Analog Interface<br>OFF: Digital Interface<br>SENSE1-3 ON: RS-232C RS Signal ( to Modem) ON **Note**<br>OFF: RS-232C RS Signal (to Modem) OFF<br>SENSE1-4 OFF Always set to OFF<br>**Note:** *Available when SENSE1-2 is set to ON (Analog Interface)* |

BCD-4317701-0103-01

Table 2-24 Switches and Lamps of PJ-SC00 (CCH) Board (continued)

<table>
<tr><th>SWITCH</th><th>LAMP</th><th>FUNCTION</th></tr>
<tr><td>SW0</td><td></td><td>• Common Channel Signaling Data Transmission Speed (for Digital Interface)<br><br>Transmission<br>
<table>
<tr><th>Speed</th><th>SW0-1</th><th>SW0-2</th><th>SW0-3</th><th>SW0-4</th><th>SW0-5</th><th>SW0-6</th><th>SW0-7</th><th>SW0-8</th><th>Remarks</th></tr>
<tr><td>48 Kbps</td><td>OFF</td><td>ON</td><td>ON</td><td>ON</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td><td rowspan="2">For 24DTI (1.5M system)</td></tr>
<tr><td>56 Kbps</td><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td></tr>
<tr><td>64 Kbps</td><td>OFF</td><td>OFF</td><td>OFF</td><td>ON</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td><td>For 30DTI (2M system)</td></tr>
</table>
• Common Channel Signaling Data Transmission Speed (for Analog Interface)<br><br>Transmission<br>
<table>
<tr><th>Speed</th><th>SW0-1</th><th>SW0-2</th><th>SW0-3</th><th>SW0-4</th><th>SW0-5</th><th>SW0-6</th><th>SW0-7</th><th>SW0-8</th></tr>
<tr><td>2.4 Kbps</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td><td>ON</td><td>OFF</td><td>OFF</td><td>ON</td></tr>
<tr><td>4.8Kbps</td><td>OFF</td><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td><td>OFF</td><td>OFF</td><td>ON</td></tr>
<tr><td>9.6 Kbps</td><td>OFF</td><td>OFF</td><td>OFF</td><td>ON</td><td>OF</td><td>ON</td><td>OFF</td><td>OFF</td></tr>
</table>
Note: The transmission speed must be set in accordance with the data speed of the Modem provided.</td></tr>
<tr><td>SW1</td><td></td><td>SW-1: Always set to OFF.<br>SW1-2:<br>SW1-3: } Always set to ON.<br>SW1-4:</td></tr>
<tr><td></td><td>RUN (Green)</td><td>Flashes (120 IPM) when the board is operating normally.</td></tr>
<tr><td></td><td>LC (Green)</td><td>Lights up when communications are ongoing normally with the common signaling channel Data links connected.</td></tr>
<tr><td></td><td>LPBK (Green)</td><td>Lights up when a loop-back test is in progress.</td></tr>
</table>

BCD-4317701-0194-02

- PK-ODTC/ODTE/2EMTB Card
  Figure 2-34 shows the location of each switch and lamp on a PK-ODTC/ODTE/2EMTB card. Table 2-25 provides the setting for the switch and the function of each lamp.

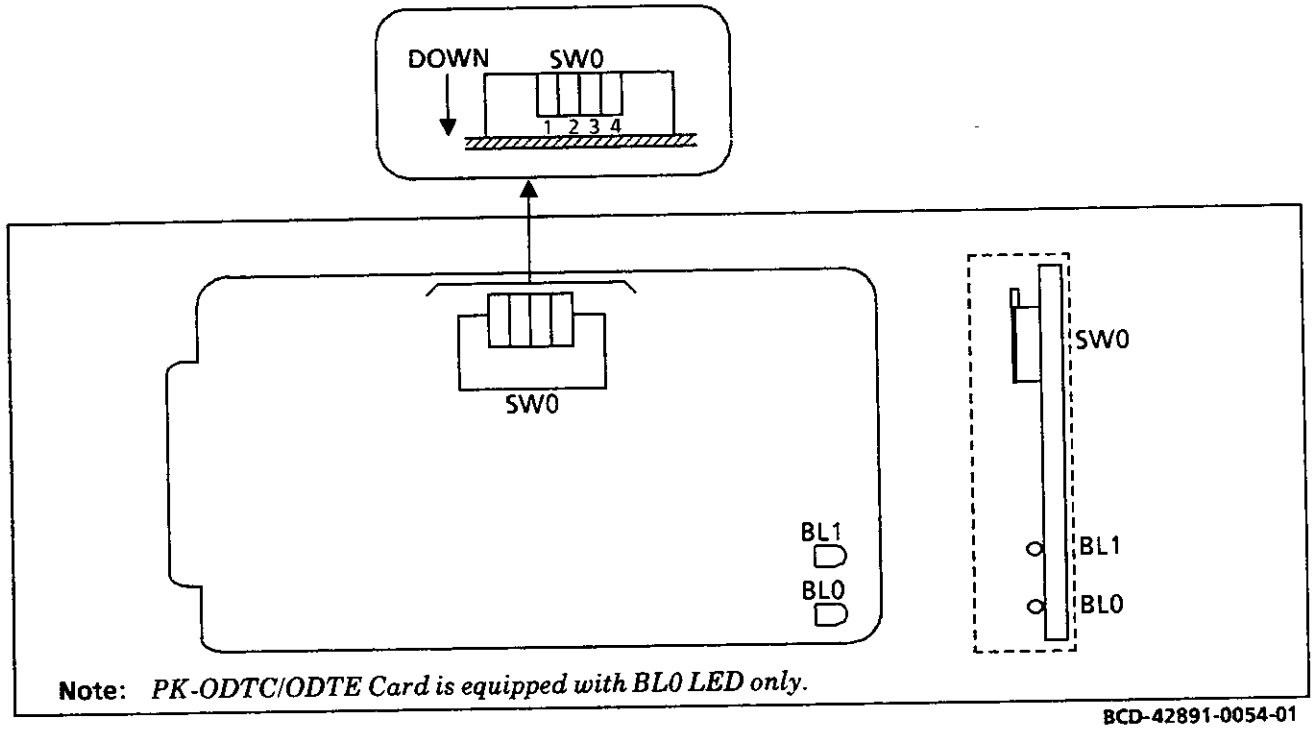


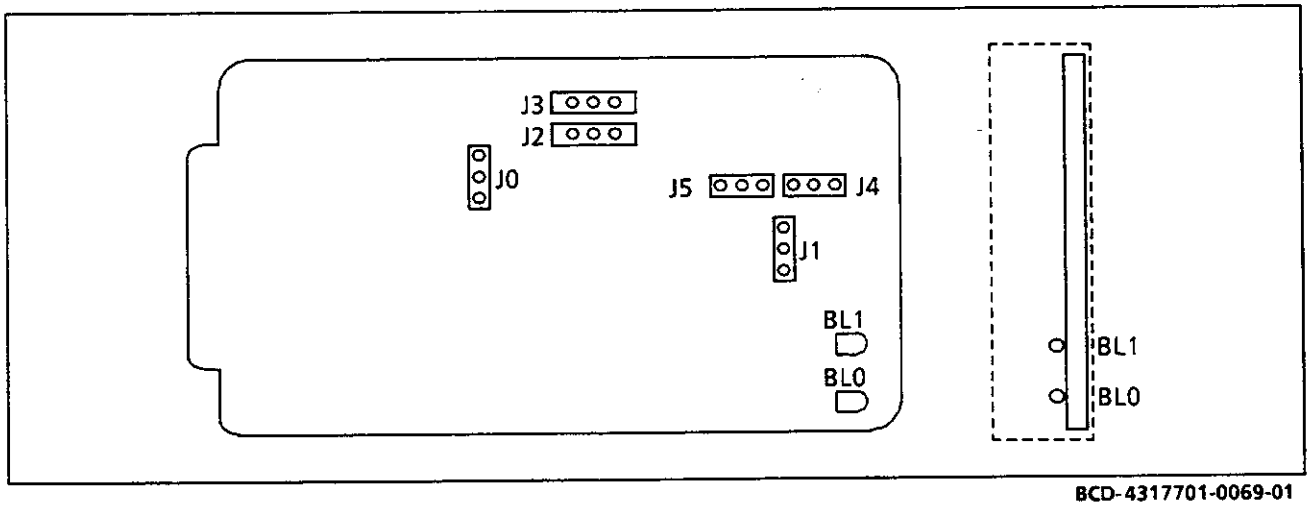

**Figure 2-34 PK-ODTC/ODTE/2EMTB Card**

**Table 2-25 Switch and Lamps of PK-ODTC/ODTE/2EMTB Card**

| SWITCH | LAMP | FUNCTION | | | |
|---|---|---|---|---|---|
| | | Signaling Condition on M-lead: | PK-ODTC/ODTE | PK-2EMTB | |
| | | | | No.0 CKT | No.1 CKT |
| SW 0 | | Busy Condition → Ground<br>Idle Condition → Open | Up: SW0-1 – 4 | Up:<br>SW0-1, 2 | Up:<br>SW0-3, 4 |
| | | Busy Condition → – 48 V<br>Idle Condition → Ground | Down: SW0-1, 2<br>Up: SW0-3, 4 | Down:<br>SW0-1, 2 | Down:<br>SW0-3, 4 |
| | BL0 | Lights when circuit is in use (PK-ODTC/ODTE)/Lights when No.0 circuit is in use (PK-2EMTB). | | | |
| | BL1 | Lights when No.1 circuit is in use (PK-2EMTB) | | | |

BCD-4317701-0198-01

- PK-2COTG Card
  Figure 2-35 shows the location of each switch and lamp on a PK-2COTG card. Table 2-26 provides the setting for each switch and the function of each lamp.




BCD-4317701-0069-01

Figure 2-35 PK-2COTG Card

Table 2-26 Switches and Lamps of PK-2COTG Card

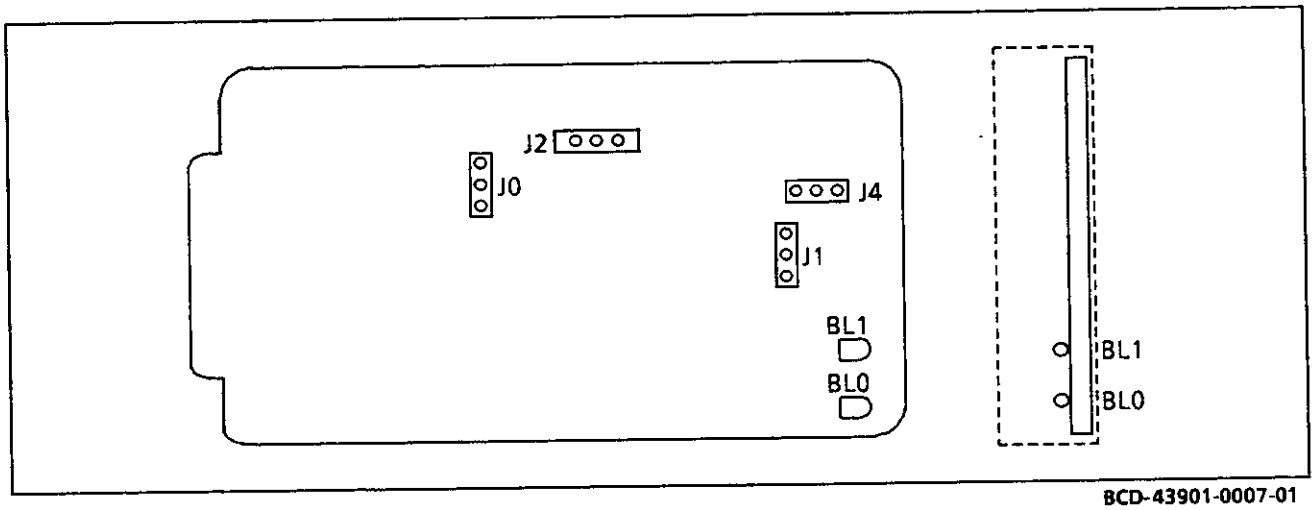
| SWITCH | LAMP | FUNCTION |
|---|---|---|
| J0 and J1 | | IMPEDANCE OF CENTRAL OFFICE / CKT0 J0 / CKT1 J1 / SETTING POSITION<br>600Ω: 600 / 600 / 600 900<br>900Ω: 900 / 900 / 600 900 |
| J2 through J5 | | TYPE OF CENTRAL OFFICE / CKT0 J2 J3 / CKT1 J4 J5 / SETTING POSITION<br>Loop Start: LP LP LP LP / GS LP<br>Ground Start: GS - GS - / GS LP<br>Ground Start: - LP - LP / GS LP |
| | BL0 | Lights when No. 0 circuit is in use. |
| | BL1 | Lights when No. 1 circuit is in use. |

BCD-4317701-0070-01

**Note:** *When using this card without setting the J3 and J5 switches, the switches are ineffective (there is no adverse effect on operation).*

- PK-2COTN Board
  Figure 2-36 shows the location of each switch and lamp on a PK-2COTN board.

Table 2-27 provides the setting for each switch and the function of each lamp.




BCD-43901-0007-01

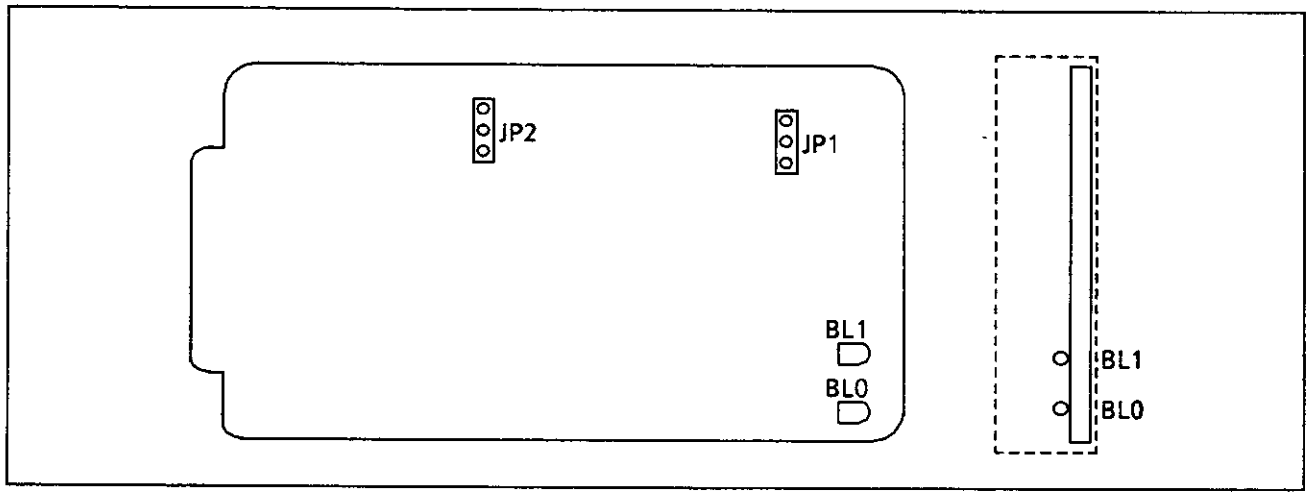
Figure 2-36 PK-2COTN Card

Table 2-27 Switches and Lamps of PK-2COTN Card

| SWITCH | LAMP | FUNCTION |
|---|---|---|
| J0 and J1 | | IMPEDANCE OF CENTRAL OFFICE / CKT0 J0 / CKT1 J1 / SETTING POSITION<br>600Ω: 600 / 600 / 600 900<br>900Ω: 900 / 900 / 600 900 |
| J2 and J4 | | TYPE OF CENTRAL OFFICE / CKT0 J2 / CKT1 J4 / SETTING POSITION<br>Loop Start: LP / LP / GS LP<br>Ground Start: GS / GS / GS LP |
| | BL0 | Lights when No. 0 circuit is in use. |
| | BL1 | Lights when No. 1 circuit is in use. |

BCD-43901-0008-01

- PK-2DITD/2DITE Card
  Figure 2-37 shows the location of each switch and lamp on a PK-2DITD/2DITE card. Table 2-28 provides the setting for each switch and the function of each lamp.




BCD-4317701-0071-01

Figure 2-37 PK-2DITD/2DITE Card

Table 2-28 Switches and Lamps of PK-2DITD/2DITE Card

| SWITCH | LAMP | FUNCTION |
|---|---|---|
| JP1 and JP2 | | IMPEDANCE OF CENTRAL OFFICE / CKT0 JP1 / CKT1 JP2 / SETTING POSITION<br>600Ω / 600 / 600 / 600 ○ ○ ○ 900<br>900Ω / 900 / 900 / 600 ○ ○ ○ 900 |
| | BL0 | Lights when No. 0 circuit is in use. |
| | BL1 | Lights when No. 1 circuit is in use. |

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- PK-DTLA Card
  Figure 2-38 shows the location of the switch and lamp on a PK-DTLA card. Table 2-29 provides the setting for the switch and the function of the lamp.

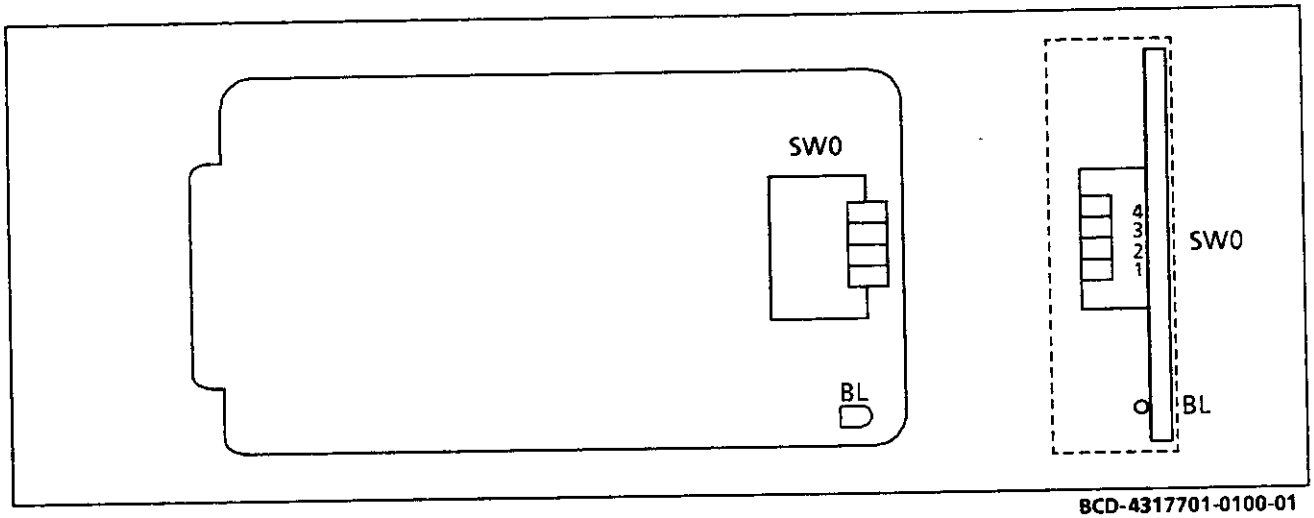


Figure 2-38 PK-DTLA Card

Table 2-29 Switch and Lamp of PK-DTLA Card

| SWITCH | LAMP | FUNCTION |
|---|---|---|
| SW0 | | Make Busy/Cancel<br>SW0-1 ON: Make Busy<br>OFF: Make Busy Cancel<br>SW0-2 OFF (always set to OFF; not used)<br>SW0-3 OFF (always set to OFF; not used)<br>SW0-4 OFF (always set to OFF; not used) |
| | BL | Steady ON The associated Data Module is in a communicating state.<br>20 IPM The associated Data Module is calling for an incoming call.<br>60 IPM This card is in Make Busy.<br>120 IPM The associated Data Module is in power off, the line is in fault or the System Data is not assigned. |

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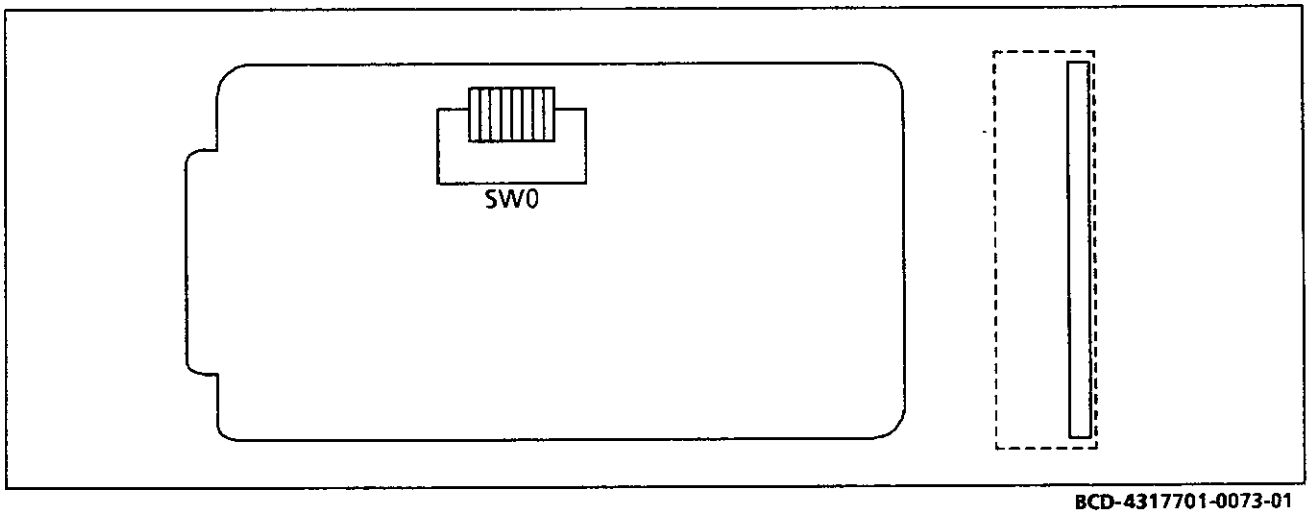
- PK-TNTC Card
  Figure 2-39 shows the location of the switch on a PK-TNTC card.
  Table 2-30 provides the setting for the switch and the function of the switch.



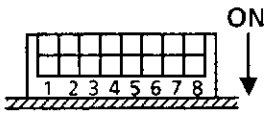

BCD-4317701-0073-01

Figure 2-39 PK-TNTC Card

Table 2-30 Switch of PK-TNTC Card

**SWITCH**

SW0



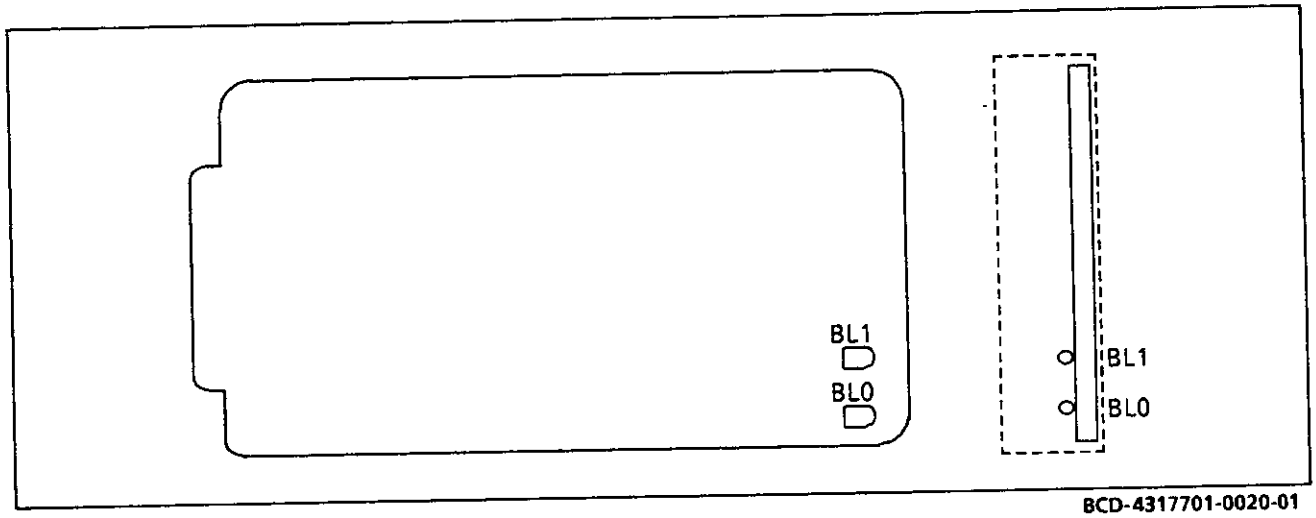

**FUNCTION**

| MUSIC SELECTION (ONLY FOR CKT0) | SW0 – 7 | SW0 – 8 |
|---|---|---|
| Internal Music Source | OFF | ON |
| External Music Source | ON | OFF |

| LEVEL CONTROL OF EXTERNAL TONE SOURCE | CKT0 | | | CKT1 | | |
|---|---|---|---|---|---|---|
| | SW0 – 1 | SW0 – 2 | SW0 – 3 | SW0 – 4 | SW0 – 5 | SW0 – 6 |
| – 10dB | ON | OFF | OFF | ON | OFF | OFF |
| – 7dB | OFF | ON | OFF | OFF | ON | OFF |
| – 4dB | OFF | OFF | ON | OFF | OFF | ON |
| – 1dB | OFF | OFF | OFF | OFF | OFF | OFF |

BCD-4317701-0074-01

- PK-2LCF/PK-2LCH/PK-2LCP-A/PK-2LLCC/PK-2DLCA/PK-2DLCC Card
  Figure 2-40 shows the location of each lamp on a PK-2LCF/PK-2LCH/PK-2LCP-A/PK-2LCC/PK-2DLCA/PK-2DLCC card. Table 2-31 describes the function of each lamp.




BCD-4317701-0020-01

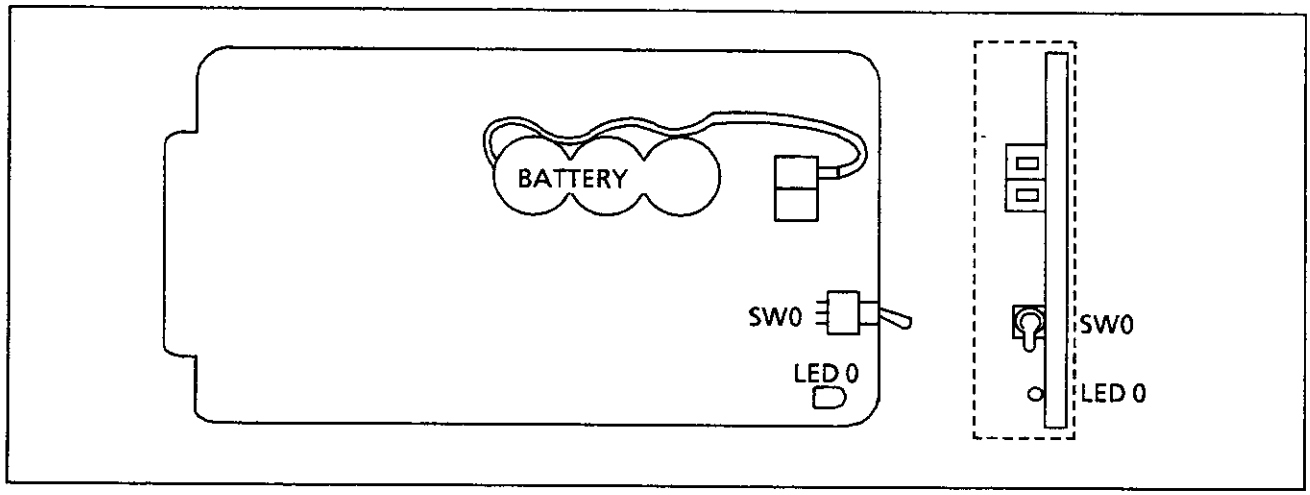
Figure 2-40 Other Cards

Table 2-31 Lamps of Other Cards

| LAMP | FUNCTION |
|---|---|
| BL0 | Lights when No. 0 circuit is in use. |
| BL1 | Lights when No. 1 circuit is in use. |

BCD-4317701-0019-01

- PK-ME00/ME01 Card
  Figure 2-41 shows the location of the switch and lamp on a PK-ME00/ME01 card. Table 2-32 provides the settings for the switch and the function of the lamp.




BCD-4317701-0040-01

Figure 2-41 PK-ME00/PK-ME01 Card

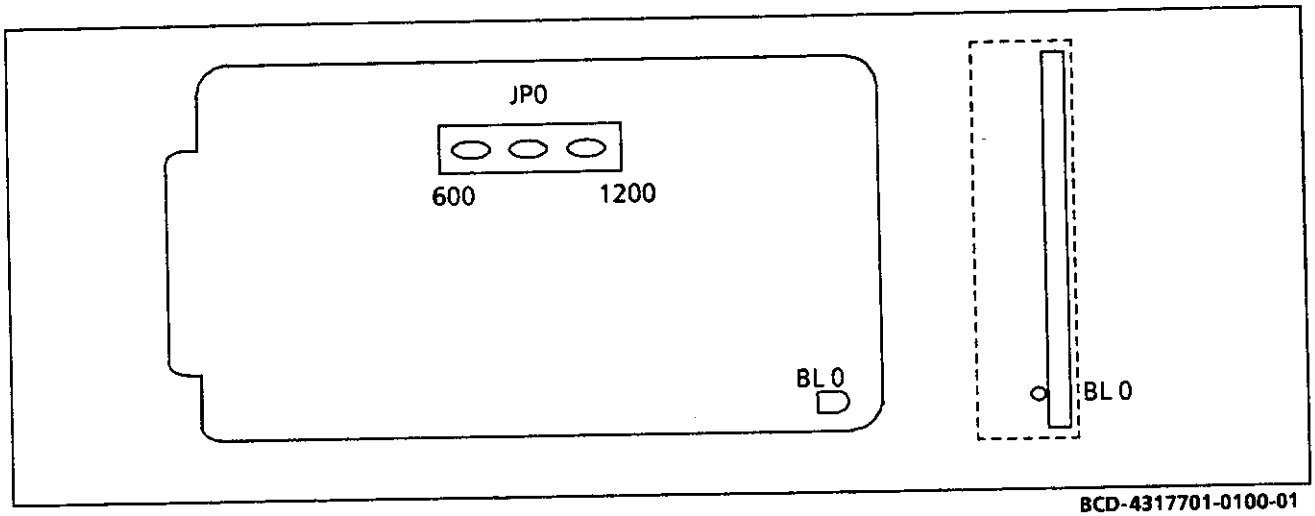
Table 2-32 Switch and Lamp of PK-ME00/PK-ME01 Card

| SWITCH | LAMP | FUNCTION |
|---|---|---|
| SW0 | | Make Busy this card:<br>Up: Make Busy.<br>Down: In Service.<br>When this card is plugged/unplugged to/from the PIM, the MB switch should be set to the UP position (Make Busy). |
| | LED0 | Lights when circuit is in use. |

BCD-42891-0074-02

- PK-LLCG CARD
  Figure 2-42 shows the location of each key and lamp on a PK-LLCG card.

Table 2-33 describes the setting for the switches and the function of the lamp.




BCD-4317701-0100-01

Figure 2-42 PK-LLCG Card

Table 2-33 Switches and Lamp of PK-LLCG Card

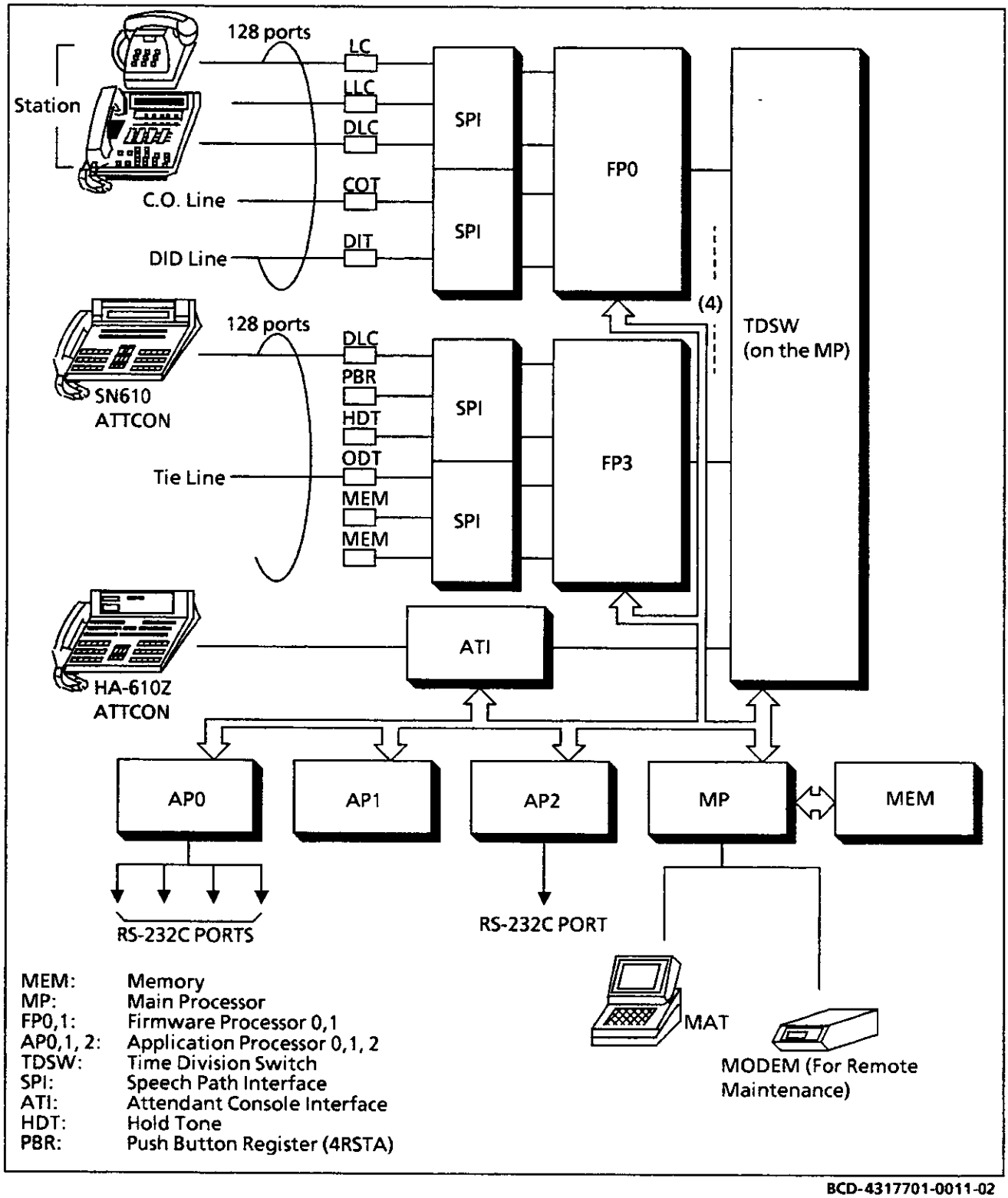
| SWITCH | LAMP | FUNCTION |
|---|---|---|
| JP0 600 1200 | | Far-End Balancing Network<br>Station Line Loop Resistance 600-1200 ohms |
| JP0 600 1200 | | Near-End Balancing Network<br>Station Line Loop Resistance 0-600 ohms |
| | BL0 | Lamp color: Red (Milky)<br>Station is Busy |

BCD-4317701-0101-01

# 3. TECHNICAL DESCRIPTION

The following is a block diagram of the NEAX1400 IMS.

## 3.1 System Block Diagram




BCD-4317701-0011-02

Figure 2-43 System Block Diagram

### 3.2 System Control

The control system of the NEAX1400 IMS consists of a Main Processor (MP), Firmware Processors (FPs), and Application Processors (APs). Each FP and AP executes its predetermined functions under the control of the MP.

The MP controls the entire system, including the switching control operations. It consists of a Central Processing Unit (CPU) board and Memory (MEM) board, and is mounted only within PIM 0.

One FP is provided for each PIM, and the FP performs the functions of supervision and status analysis of all interface cards, accommodated in the ports of the associated PIM, under the control of the MP.

The AP is used to provide special application features such as Keyboard Dialing, ACD-MIS, or interface with such peripheral equipment as SMDR (Station Message Detail Recording) and PMS (Property Management System).

### 3.3 System Speech Path

The speech path system utilizes a Time Division Switch (TDSW). Stations and trunks are connected to the TDSW via ports, Speech Path Interface (SPIs) and FPs.

Each SPI is allocated to one-half (first 4 Card Groups or last 4 Card Groups) of each PIM. For an explanation of a Card Group, see Figure 2-4 in Section 2. Each FP (0-3) is allocated 128 time slots (ports).

The TDSW also accommodates the Digital Conference Trunk (8CFT), Attendant Console Interface (ATI), Application Processor (AP), Digital Tone Generator) (DTG), and DTMF Transmitter (PBSD).

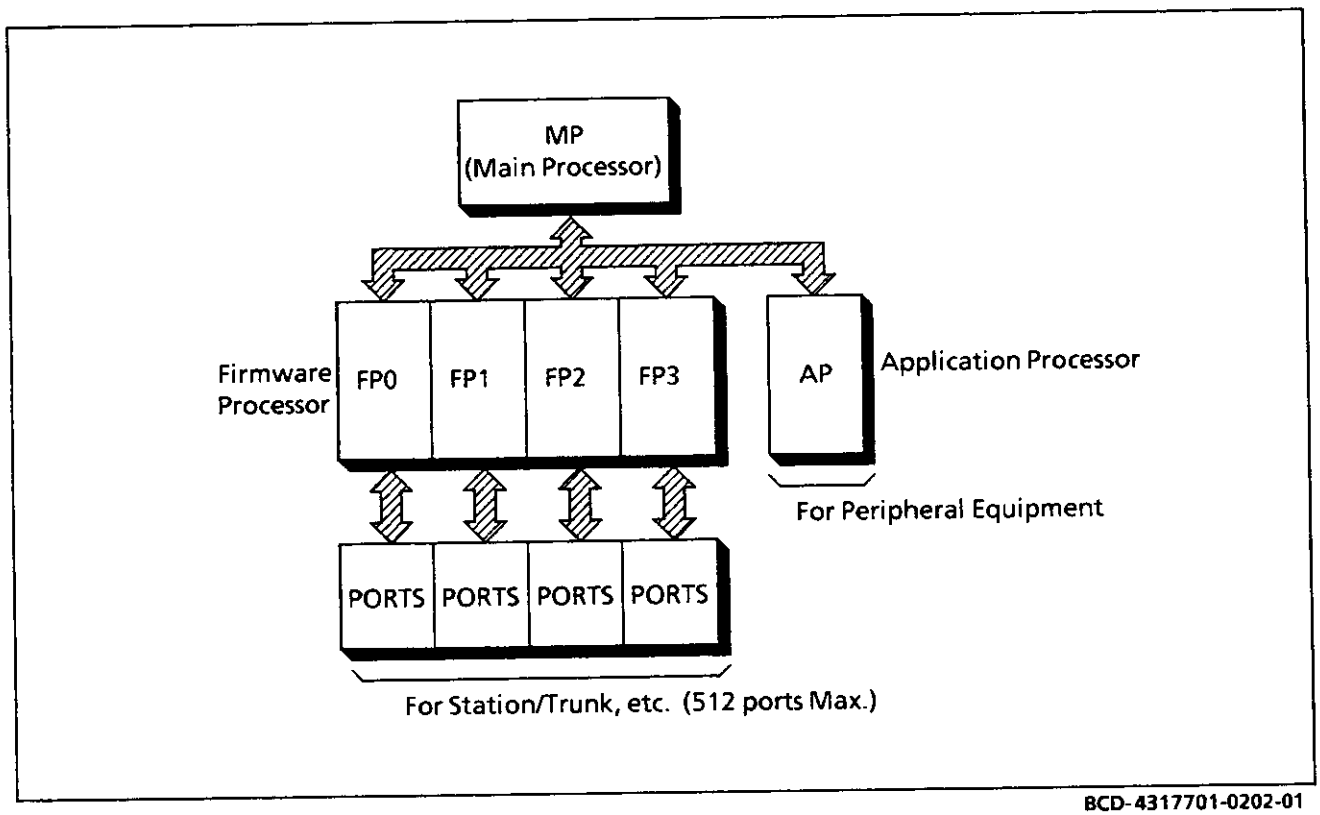



Figure 2-44 NEAX1400 IMS System Control

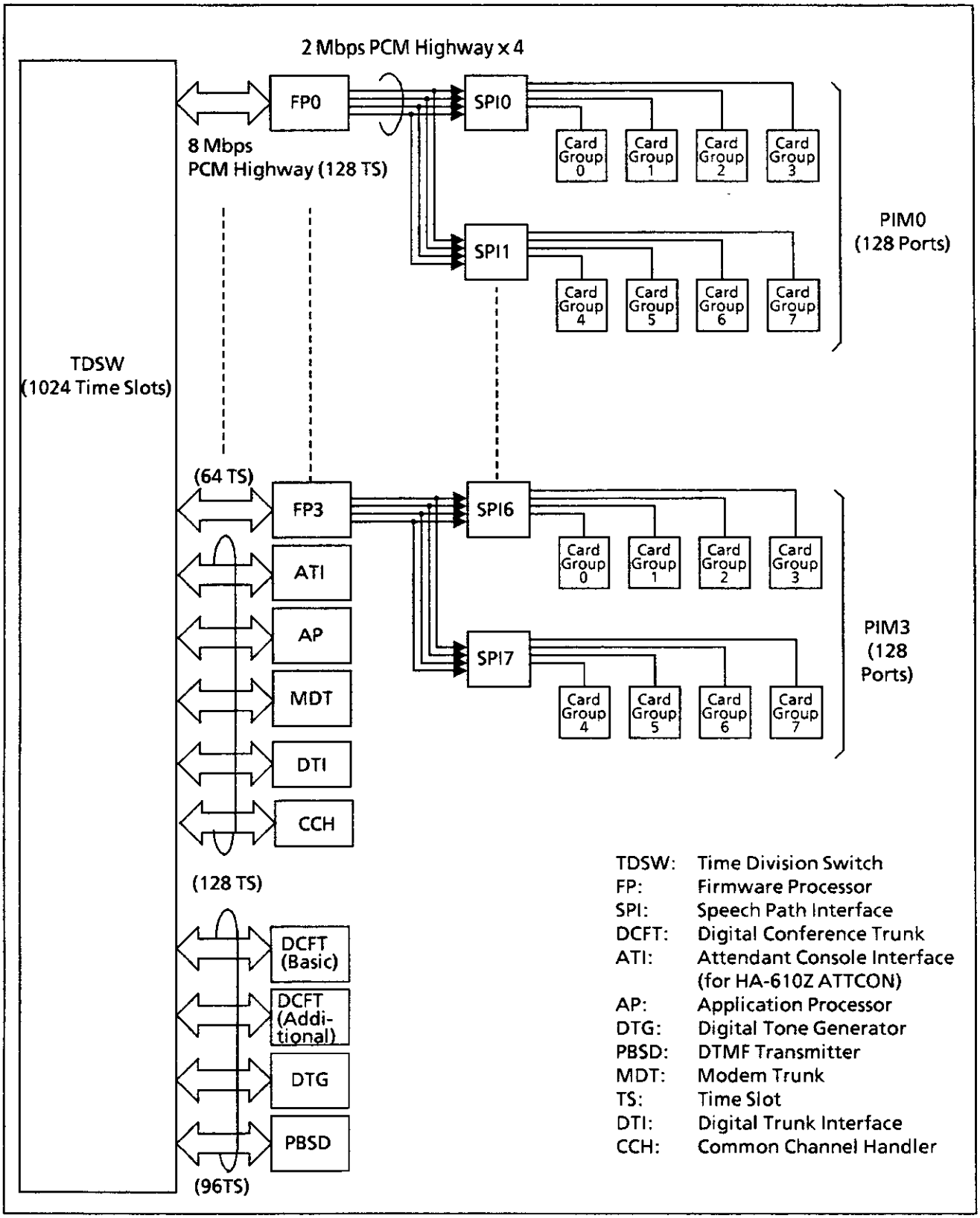



Figure 2-45 System Speech Path

## 3.4 System Specification

Table 2-34 Number of Lines

| DESCRIPTION | | | 1-PIM (128 ports) | 2-PIM (256 ports) | 3-PIM (384 ports) | 4-PIM (512 ports) |
|---|---|---|---|---|---|---|
| Station | Conventional Telephone (PB/DP) | Normal Line | 128 | 256 | 384 | 512 |
| | | Long Distance Line | 44 | 88 | 132 | 176 |
| | Conventional Telephone with Message Waiting Lamp | | 128 | 256 | 384 | 512 |
| | Multiline Terminal | Normal Line | 128 | 256 | | |
| | | Long Distance Line | 44 | 88 | 132 | 176 |
| Trunk | C.O. Trunk Including 2 EMT | | 128 | 256 | | |
| | Tie Line Trunk (ODT) | | 64 | 128 | 192 | 256 |
| | DID Trunk | | 44 | 88 | 132 | 176 |
| | Direct Digital Interface with T1 Lines | | 120 | | | |
| | No. 7 CCIS with Digital / Analog Interface | For Voice Channel | 92 | | | |
| | | For Common Signaling Channel | 4 | | | |
| | | For Data Nail Down | 99 | | | |

BCD-4317701-0056-04

(2) System Capacity

Table 2-35 System Capacities

| DESCRIPTION | | 1-PIM (128 ports) | 2-PIM (256 ports) | 3-PIM (384 ports) | 4-PIM (512 ports) |
|---|---|---|---|---|---|
| PB (DTMF) Receiver | | 16 | 32 | | |
| PB (DTMF) Transmitter | | 32 | | | |
| Power Failure Transfer | | 12 | 24 | 36 | 48 |
| Conference Trunk (3 or 4-party conference) | Std. | 8 | | | |
| | with option | 16 | | | |
| Music on Hold Tone Source (Internal/External) | | 1 | | | |
| Intra-Office Connection | | No Limit | | | |
| Trunk Route | | 64 | | | |
| Tenant | | 64 | | | |
| Attendant Console | HA-610Z ATTCON | 2 | 4 | 6 | 8 |
| | SN610 ATTCON | 8 | | | |
| DSS Console/Add-On Module | | 8 | 16 | 24 | 32 |
| Modem Pooling Trunk | | 16 | 32 | | |
| Multiline Terminal with Keyboard Dialing | | 32 | 64 | 96 | 128 |
| External Key Scanning | | 128 | 256 | 384 | 512 |
| External Equipment Drive Relay | | 32 | 64 | 96 | 128 |
| Voice Recording Memory Card | | 32 | 64 | 96 | 128 |
| Hot Line | | 50 pairs | | | |
| Station Speed Dialing | | 4500 codes | | | |
| System Speed Dialing | | 300 codes | | | |
| BGM Source | | 10 | | | |
| Automatic Wake Up Tone Source | | 1 | | | |
| Timed Reminder Tone Source | | 1 | | | |

BCD-4317701-0012-03

(3) Line Conditions

**Table 2-36 Line Conditions**

| ITEM | SPECIFICATION |
|---|---|
| • Station Line (Single-Line Telephone)<br>- Loop Resistance<br>- Long Line Loop Resistance<br><br><br><br><br>- Leakage Resistance | 800 ohms maximum (including instruments)<br>For DP telephone (10 pps)<br>Approx. 3,000 ohms maximum<br>(including instruments)<br>For PB telephone<br>Approx. 1,200 ohms<br>(including instruments)<br>More than 20,000 ohms |
| • Central Office Line<br>- Loop Resistance<br>- Leakage Resistance | 1,700 ohms maximum<br>More than 20,000 ohms |
| • DID Line<br>- Loop Resistance<br>- Leakage Resistance | 2,500 ohms maximum<br>More than 20,000 ohms |
| • Attendant Console (HA-610Z ATTCON)<br>- Cable length | 1,000 feet (300 meters) maximum |
| • Attendant Console (SN610 ATTCON)<br>- Cable length | For PK-2DLCA card:<br>1,000 feet (300 meters) Max. (24 AWG diameter cable)<br>For PK-2DLCC card:<br>4,000 feet (1,200 meters) Max. (24 AWG diameter cable) |
| • Multiline Terminal Station Line<br>- Cable length | |
| • DSS Console/Add-On Module<br>- Cable length | |
| • Hotel Printer/SMDR<br>- Cable length | 42 feet (13 meters) |
| • MAT<br>- Cable length | 13 feet (4 meters) |
| • MODEM Pooling<br>- Cable length | 19 feet (6 meters) |
| • DDI/No. 7 CCIS<br>- Cable length (between 1400 IMS and MDF) | 650 feet (200 meters) Max. (22 AWG diameter cable) |
| • DT-003 Data Module<br>- Cable length | 1000 feet (300 meters) Max. (24 AWG diameter cable) |

BCD-4317701-0057-02

(4) Signaling Conditions

Table 2-37 Signaling Conditions

<table>
<tr><th>ITEM</th><th>RECEIVING</th><th>SENDING</th><th>REMARKS</th></tr>
<tr><td>• Rotary Dial Pulse<br>- Dial Speed<br>- Break Ratio<br>- Inter-Digit Pause</td><td><br>9 — 11 pps<br>55 — 77 % (at 10 pps)<br>192 ms</td><td><br>10 pps ± 0.8 pps<br>67 ± 3% or 61 ± 3%<br>300 — 1,100 ms</td><td></td></tr>
<tr><td>• DTMF Signal<br>- Frequency Combination</td><td colspan="3"><table><tr><th>HIGH / LOW</th><th>1,209 Hz</th><th>1,336 Hz</th><th>1,477 Hz</th></tr><tr><td>697 Hz</td><td>1</td><td>2</td><td>3</td></tr><tr><td>770 Hz</td><td>4</td><td>5</td><td>6</td></tr><tr><td>852 Hz</td><td>7</td><td>8</td><td>9</td></tr><tr><td>941 Hz</td><td>*</td><td>0</td><td>#</td></tr></table></td></tr>
<tr><td>- Signal Duration<br>- Inter-Digit Pause<br>- Signal Level</td><td>More than 40 ms<br>More than 40 ms<br>−25 — 0 dBm</td><td>64 ms or 128 ms<br>32 — 240 ms<br>−10 dBm (Low), −9 dBm (High)</td><td></td></tr>
</table>

BCD-4317701-0058-01

(5) Audible Tones

**Table 2-38 Audible Tones**

| TONE | FREQUENCY (Hz) | INTERRUPTION RATE |
|---|---|---|
| • Dial Tone (DT) | 350 + 440 | Continuous |
| • 2nd Dial Tone (2DT) | 440 + 480 | 0.25s (ON)-0.25s (OFF)-0.25s (ON)-1.25s (OFF) |
| • Special Dial Tone (SPDT) | 350 + 440 | 0.125 s (ON)-0.125 s (OFF) |
| • Busy Tone (BT) | 480 + 620 | 0.5 s (ON)-0.5 s (OFF) |
| • Reorder Tone (ROT) | 480 + 620 | 0.25 s (ON)-0.25 s (OFF) |
| • Howler Tone (HWT) | 2400/16 | 0.5 s (ON)-0.5 s (OFF) |
| • Service Set Tone (SST) | 440 | Continuous |
| • Warning Tone (WT) | 440 | 3-burst tone followed by 1-burst every 4 seconds. |
| • Ring Back Tone (RBT) | 440 + 480 | 1 s (ON)-3 s (OFF) |
| • Call Waiting RBT | 440 + 480 | 1s (ON)-1s (OFF) |
| • Hold Tone (HDT) | 480 + 620 | 0.25 s (ON)-0.25 s (OFF)-0.25 s (ON)-1.25 s (OFF) |
| • Pulse Sender Transmitting Tone | 350 + 440 | Continuous |

BCD-4317701-0013-02

(6) Ringing Signal

Voltage: 75 Vrms

Frequency: 20 Hz

Interruption: 1 sec. (ON) – 2 sec. (OFF) for external call

2 sec. (ON) – 4 sec. (OFF) for internal call

### 3.5 Transmission Loss

Station-to-Station: – 6 dB/0 dB (For Long Line Station)

Station-to-Trunk:

Station-to-COT: 0 dB

Station-to-DIT: 0 dB

Station-to-ODT: 0 dB/2 dB/4 dB/12 dB (Receiver: 11 dB)

COT/DIT-to-ODT: 0 dB/2 dB/4 dB/12 dB (Receiver: 11 dB)

### 3.6 Power Requirements

(1) AC Input

- 117 VAC ± 10%, 60Hz ± 10% Single Phase
- A dedicated outlet, separately fused and grounded, is required

(2) Power Consumption

Table 2-39 Power Consumption

| No. of POWER MODULE | MAXIMUM CURRENT DRAW | POWER CONSUMPTION |
|---|---|---|
| 1 | 15 A | 3.1 KBTU |
| 2 | 30 A | 6.2 KBTU |
| 3 | 45 A | 9.2 KBTU |
| 4 | 60 A | 12.3 KBTU |

BCD-4317701-0027-02

## 4. SYSTEM FEATURE LIST

System Features

| FEATURE NAME | FEATURE NAME |
|---|---|
| BUSINESS FEATURES<br>• Account Code<br>• Add-On Module<br>• Alarm Indications<br>• Alphanumeric Display<br>• Announcement Service<br>• Answer Key<br>• Attendant Assisted Calling<br>• Attendant Camp On<br>• Attendant Console (HA-610Z ATTCON)<br>- Attendant Busy Lamp Field<br>- Attendant Called/Calling Number<br>- Attendant Call Selection<br>- Attendant Console Lockout<br>- Attendant Do Not Disturb Setup and Cancel<br>- Attendant Interposition Calling/Transfer<br>- Attendant Lamp Check<br>- Attendant Listed Directory Number<br>- Attendant Loop Release<br>- Attendant Training Jacks<br>- Audible Indication Control<br>- Call Processing Indication<br>- Call Queuing<br>- Call Splitting<br>- Call Waiting LED<br>- Common Route Indial<br>- Incoming Call Identification<br>- Individual Trunk Access<br>- Multiple Console Operation<br>- Pushbutton Calling-Attendant Only<br>- Serial Call<br>- Time Display<br>- Trunk Group Busy Display<br>- Unsupervised Trunk-to-Trunk Transfer By Attendant<br>• Attendant Console (SN610 ATTCON)<br>- Attendant Called/Calling Name Display<br>- Attendant Called/Calling Number<br>- Attendant Call Selection<br>- Attendant Console Lockout-Password<br>- Attendant Do Not Disturb Setup and Cancel<br>- Attendant Interposition Calling/Transfer<br>- Attendant Lamp Check<br>- Attendant Listed Directory Number<br>- Attendant Loop Release<br>- Attendant Programming<br>- Attendant Training Jacks<br>- Audible Indication Control<br>- Call Processing Indication<br>- Call Queuing<br>- Call Splitting<br>- Call Waiting Display<br>- Common Route Indial<br>- Incoming Call Identification<br>- Individual Trunk Access<br>- Multiple Console Operation<br>- Multi-Function Key<br>- Pushbutton Calling-Attendant Only<br>- Serial Call<br>- Time Display<br>- Trunk Group Busy Display<br>- Unsupervised Trunk-to-Trunk Transfer By Attendant | |

BCD-4317701-0059-03

| FEATURE NAME | FEATURE NAME |
|---|---|
| • Attendant Delay Announcement<br>• Attendant Lockout<br>• Attendant Overflow<br>• Attendant Override<br>• Authorization Code<br>• Automated Attendant<br>• Automatic Call Distribution - Management Information System (ACD-MIS)<br>• Automatic Camp-On<br>• Automatic Recall<br>• Background Music<br>• Boss/Secretary Calling<br>• Broker's Call<br>• Call Back<br>• Call Forwarding<br>  ├ Attendant Call Forwarding Setup and Cancel<br>  ├ Call Forwarding-All Calls<br>  ├ Call Forwarding-Busy Line<br>  ├ Call Forwarding-No Answer<br>  ├ Call Forwarding-Destination<br>  ├ Call Forwarding-Override<br>  ├ Group Diversion<br>  ├ Multiple Call Forwarding-All Calls<br>  ├ Multiple Call Forwarding-Busy Line<br>  ├ Multiple Call Forwarding-No Answer<br>  └ Split Call Forwarding-Busy Line<br>• Call Park<br>  ├ Call Park-Tenant<br>  └ Call Park-System<br>• Call Pickup<br>  ├ Call Pickup-Group<br>  ├ Call Pickup-Direct<br>  └ Call Pickup-Designated Group | • Call Transfer<br>  ├ Call Transfer-All Calls<br>  └ Call Transfer-Attendant<br>• Camp-On<br>• CCIS Compatibility<br>• CCSA Access<br>• Centrex Compatibility<br>• Class of Service<br>• Code Restriction<br>• Conference<br>• Consecutive Speed Dialing<br>• Consultation Hold<br>• Customer Administration Terminal (CAT)<br>• Data Line Security<br>• Delayed Ringing<br>• Diagnostics<br>• Dial Conversion<br>• Direct Digital Interface (DDI)<br>• Direct Inward Dialing (DID)<br>• Direct Inward System Access (DISA)<br>• Direct Inward Termination (DIT)<br>• Direct Outward Dialing (DOD)<br>• Direct Station Selection/Busy Lamp Field (DSS/BLF) Console<br>• Distinctive Ringing<br>• Do Not Disturb<br>• Dual Hold<br>• E&M Tie Line Access<br>• Elapsed Call Timer<br>• Executive Calling<br>• Executive Override<br>• External Paging With Meet-Me<br>• Feature Activation from Secondary Extension<br>• Flexible Line Key Assignment<br>• Flexible Numbering Plan |

BCD-4317701-0060-04

| FEATURE NAME | FEATURE NAME |
|---|---|
| • Flexible Ringing Assignment<br>• Forced Account Code<br>• Group Listening<br>• Handsfree Answer Back<br>• Handsfree Dialing and Monitoring<br>• Hold<br>  ├ Call Hold<br>  ├ Exclusive Hold<br>  └ Nonexclusive Hold<br>• Hotline<br>• Individual Attendant Access<br>• Intercept Announcement<br>• Intercom<br>  ├ Automatic Intercom<br>  ├ Dial Intercom<br>  └ Manual Intercom<br>• Internal Tone/Voice Signaling<br>• Internal Zone Paging with Meet-Me<br>• Last Number Redial<br>• Least Cost Routing-3/6 Digit<br>• Line Lockout<br>• Line Preselection<br>• Maintenance Administration Terminal (MAT)<br>  ├ Configuration Report<br>  ├ Maintenance Printout<br>  ├ Peg Count<br>  └ Remove and Restore Service<br>• Message Reminder<br>• Miscellaneous Trunk Access<br>  ├ Code Calling Equipment Access<br>  ├ Dictation Equipment Access<br>  ├ Foreign Exchange (FX) Access<br>  ├ Radio Paging Equipment Access<br>  └ Wide Area Telephone Service (WATS) Access<br>• Multiline Terminal Attendant Position | • Music On Hold<br>• Night Service<br>  ├ Attendant Night Transfer<br>  ├ Call Routing<br>  ├ Day/Night Mode Change by Attendant Console<br>  ├ Day Night Mode Change by Station Dialing<br>  ├ Night Connection-Fixed<br>  ├ Night Connection-Flexible<br>  └ Trunk Answer Any Station (TAS)<br>• Off-Hook Alarm<br>• Off-Premises Extension<br>• Periodic Time Indication Tone<br>• Pooled Lines Access<br>• Power Failure Transfer<br>• Priority Call<br>• Privacy/Privacy Release<br>• Private Lines<br>• Proprietary Multiline Terminal<br>  ├ Automatic Idle Return<br>  ├ Called Station Status Display<br>  ├ Calling Name and Number Display<br>  ├ Handsfree Unit<br>  ├ I-Hold/I-Use Indication<br>  ├ Microphone Control<br>  ├ Multiple Line Operation<br>  ├ Off-Hook Voice Announcement<br>  ├ Prime Line Pickup<br>  ├ Recall Key<br>  ├ Relay Control Function Key<br>  ├ Ring Frequency Control<br>  └ Volume Control<br>• Remote Maintenance<br>• Reserve Power<br>• Resident System Program |

BCD-4317701-0061-03

• Music On Hold

| FEATURE NAME | FEATURE NAME |
|---|---|
| • Return Message Schedule Display<br>• Ringing Line Pickup<br>• Route Advance<br>• Save and Repeat<br>• Security Alarm<br>• Software Line Appearance<br>• Station Hunting<br>  ├ Station Hunting-Circular<br>  ├ Station Hunting-Secretarial<br>  └ Station Hunting-Terminal<br>• Station Message Detail Recording (SMDR)<br>• Station Speed Dialing<br>• Step Call<br>• Supervisory Control of Peripheral Equipment<br>• System Speed Dialing<br>• Tie Line Tandem Switching<br>• Tenant Service<br>• Timed Queue<br>• Timed Reminder<br>• Trunk-Direct Appearances<br>• Trunk Queuing-Outgoing<br>• Trunk-to-Trunk Connection<br>• Uniform Call Distribution (UCD)<br>  ├ Uniform Call Distribution with Overflow to UCD Group/Station/Attendant Console<br>  └ UCD Monitor<br>• Uniform Numbering-Voice & Data<br>• Variable Timing Parameters<br>• Voice Mail Integration | <u>HOTEL/MOTEL FEATURES</u><br>• Automatic Wake Up<br>• Check In/Check Out<br>• Do Not Disturb<br>• Do Not Disturb-System<br>• Hotel/Motel Front Desk Instrument<br>• Hotel/Motel Attendant Console<br>• House Phone<br>• Message Waiting<br>• Message Registration<br>• Maid Status<br>• Property Management System Interface<br>• Room Cutoff<br>• Room Status<br>• Single Digit Dialing<br><br><u>DATA COMMUNICATION FEATURES</u><br>• Asynchronous Data Switching<br>• CCIS Data<br>• Do Not Disturb-Data Line Security<br>• Data Hunting<br>• Data Interface-Automatic Answer<br>• Data Hot Line<br>• Data Over T1 Interface - Nailed Down Connection<br>• Keyboard Dialing<br>• Modem Pooling<br>• Nailed Down Connection<br>• Simultaneous Voice and Data Transmission<br>• Synchronous Data Switching<br>• Terminal Attribute Data Assignment |

BCD-4317701-0062-01

# CHAPTER 3 SYSTEM PLANNING

This chapter provides the necessary information for planning the installation of the NEAX1400 IMS system.

## 1. INSTALLATION REQUIREMENTS

### 1.1 Environmental Condition (Operating)

| | |
|---|---|
| Ambient Temperature: | 32°F - 104°F<br>(0 °C - 40 °C) |
| Relative Humidity: | 90 % maximum |

### 1.2 Floor Space

It is recommended that a space of at least five (5) feet (1500 mm) be available in front of the cabinet; a space of at least two (2) feet (600 mm) be available in back of the cabinet; and, a space of at least two (2) feet (600 mm) be available on both sides of the cabinet.

### 1.3 Equipment Location

The system equipment should not be installed in any of the following places:

- A place where the ambient temperature and the relative humidity are higher than a predetermined level [Temperature: 104°F (40 °C), Relative Humidity: 90 %].
- A place exposed to moisture drops (under the air conditioner, etc.)
- A place that is dusty.
- A place that is exposed to direct sunlight.
- A place in the vicinity of any device which generates intense magnetic fields (a motor, etc.).

### 1.4 AC Power Supply

AC outlets for various equipment shown in the table below should be available in the vicinity of the main equipment.

Table 3-1 Number of Required AC Outlets

| FOR | NUMBER OF AC OUTLETS (117 V) |
|---|---|
| • Main equipment | 1 or 2-Power Module : 1<br>3 or 4-Power Module : 2 |
| • MAT | 1 |
| • Modems | n |
| • Installation Tools | 1 |

BCD-4317701-0014-02

### 1.5 Ground

A communication (Earth) ground specified as shown below is required for the system:

- Less than 10 ohms
- The communication ground should be supplied to the system through AC outlets or through a ground cable connected to the Power Unit.

### 1.6 Installation Materials

The materials required for installation are shown in Table 3-2. Unless required, these materials are not furnished in the equipment packing. The installer or the customer must make them available at the site.

Table 3-2 Materials for Installation

| MATERIALS | PURPOSE | REMARKS |
|---|---|---|
| • Print Cable (SWVP)<br>• CHAMP Connector (Amphenol)<br>• Jumper Wire<br>• Cable Band<br>• Insulated Vinyl Cable as ground Cable/Clamp Terminal<br>• Cable Duct | • Cables extended to MDF<br>• Ground Cable<br>• Battery connection cable | Note |
| • Anchor Bolt | • Floor mounting of Main Equipment and MDF | |

BCD-42891-0062-01

**Note:** *In order to comply with the requirements in Part 15 of FCC rules for a Class A computing device, shielded cable or zipper tube shield shall be prepared.*

## 1.7 Installation Tools

Various kinds of installation tools are shown in Table 3-3. To perform each installation work smoothly, the tools must be made available in advance.

Table 3-3 Installation Tools

| WORK | TOOLS | PURPOSE | REMARKS |
|---|---|---|---|
| Marking | • Steel Tape Measure<br>• Iron Level<br>• Center Punch | For Leveling and Marking Plumb Line | |
| Drilling | • Electric Vibration Drill<br>• Hammer<br>• Point Drill<br>• Drill Bit for Concrete<br>• Drill Bit for Metal | Drilling | |
| Module Group and Duct Installation | • Hacksaw Frame<br>• Hacksaw Blade<br>• Adjustable Angle Wrench<br>• Socket Wrench Set<br>• Phillips Screwdriver<br>• Screwdriver | Duct and Module Installation | |
| Cabling | • Circuit Tester<br>• Nipper<br>• Wire Stripper<br>• Telephone Set<br>• Connector Clamping Tool | Cabling | |

BCD-42891-0063-01

# 2. GENERAL INFORMATION ON THE CUSTOMIZING DATA

This section provides information for customizing the data in the System Programming Manual [ND-43177-005 (E)].

## 2.1 Numbering Plan

This table specifies the feature access codes, trunk access codes, station numbers, and other special access codes. A feature access code is assigned to each feature. A trunk access code is assigned to each trunk route. Feature access codes and trunk access codes contain a maximum of three (3) digits. Station numbers contain a maximum of four (4) digits.

For the system numbering plan, the following conditions should be considered:

(1) The same first digit code cannot be assigned to the other features within the Numbering Plan Group programmed. This condition is not applicable to a system providing Single Digit Timing Start Access.

(2) The feature access codes should be two or three digits because plural access codes for each feature are required.

(3) There are four types of station numbering (1 digit to 4 digits). Any combination of these types is available in one system.

(4) The same station number cannot be assigned, even if tenant service is applied.

## 2.2 Station Data

In this table, the following data is required.

- Station Number

  Station numbers up to four (4) digits specified in the Numbering Plan Table are assigned. Specify the Primary Extension for the Multiline Terminal station.

- Type of Telephone

  The type of station telephone set is specified as shown in the following chart:

| TYPE OF TEL | DESCRIPTION |
|---|---|
| DP | Dial Pulse Telephone set |
| PB | DTMF Telephone set |
| ETE-16D-2 TEL<br>ETE-6D-2 TEL<br>ETE-16-2 TEL<br>ETE-6-2 TEL | Multiline Terminal |

- SERVICE CLASS - A/B/C

  Specify the service class (1 — 15) programmed in the Service Restriction Data Table.

- RESTRICTION CLASS - DAY/NIGHT

  Specify the Trunk Restriction Class as shown below:

  1: Unrestricted
  2: Non-Restricted-1
  3: Non-Restricted-2
  4: Semi-Restricted 1
  5: Semi-Restricted 2
  6: Restricted 1
  7: Restricted 2
  8: Fully-Restricted

- DIT TRUNK NUMBER

  In the case of a DIT (Direct - Inward Termination) station, specify the number of the connected trunk.

## 2.3 Trunk Data

In this table, the following data is required:

- ACCESS NUMBER

  Specify the access code for the trunks.

- DESTINATION

  Specify the distant office such as the Central Office (Public Exchange), Tie Line, etc.

- NUMBER OF LINES

  Specify the number of trunks to be provided with each route (IC - Incoming, OG - Outgoing or BW - Bothway).

- DP/PB

  Specify the type of address signal from/to the distant office, as shown below:

| TYPE OF TEL | DESCRIPTION |
|---|---|
| DP | Dial Pulse |
| PB | DTMF Signal |

- KIND OF SIGNAL

  Specify the kind of signaling system, such as Ring Down, Loop, E & M, etc.

### 2.4 Station Hunting Group Data

This table requires the following data:

- KIND OF STATION HUNTING

  Specify the kind of Station Hunting System (Terminal/Circular/Secretarial). In the case of a Terminal System, specify the Terminal Station Number.

- SECRETARY STATION

  Specify the Secretary Station Number, if provided.

- STATION NUMBER

  Specify the station numbers to be assigned to the station hunting group with the following conditions:

  (1) Up to sixty (60) stations can be assigned per Station Hunting group.

  (2) There is no limitation to the number of Station Hunting groups.

  (3) An individual station cannot be assigned to multiple Hunting groups.

### 2.5 Call Pickup Group Data

Specify the station numbers to be assigned to a Call Pickup Group, with the following conditions:

(1) Up to sixty (60) stations can be assigned per Call Pickup group.

(2) There is no limitation to the number of Call Pickup groups.

(3) An individual station cannot be assigned to multiple Call Pickup groups.

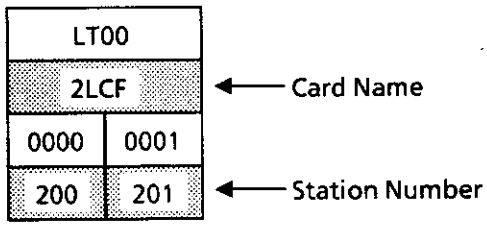
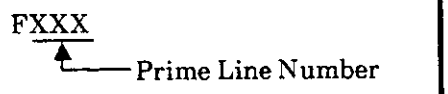
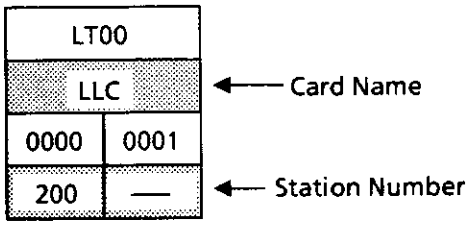
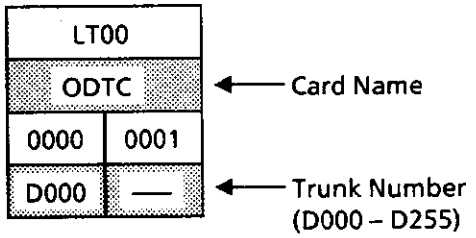
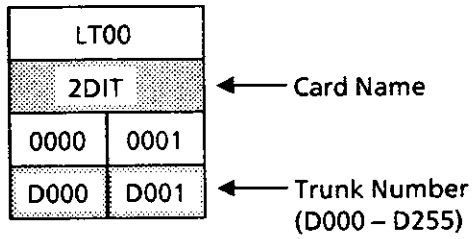
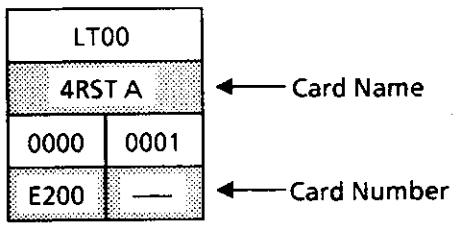
### 2.6 System Speed Dialing

This data table requires the abbreviated code and the stored number that is to be sent out. The stored number can contain a maximum of twenty eight (28) digits.

### 2.7 Port Assignment Table

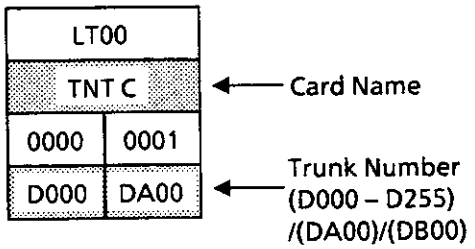
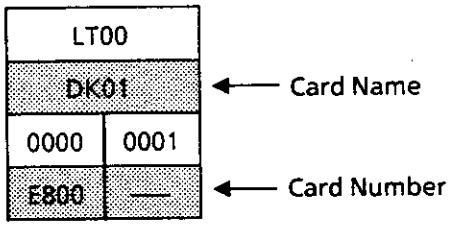
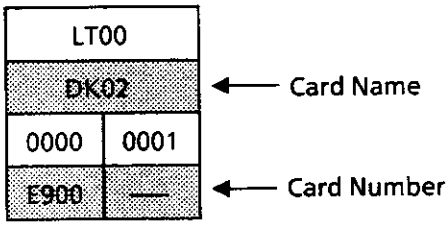
Specify the card name accommodated in the card slot, and the station number or trunk number corresponding to the LEN (Line Equipment Number), as shown in Table 3-4. The LEN represents the physical location within the PIM.

**Table 3-4 Port Assignment Method**

| CARD TO BE ASSIGNED | PORT ASSIGNMENT TABLE | REMARKS |
|---|---|---|
| • PK-2LCF<br>• PK-2LCH<br>• PK-2LCP-A<br>• PK-2LLCC<br>• PK-2DLCA<br>• PK-2DLCC |  | For the PK-2DLCA/2DLCC, specify the Prime Line Numbers of each Dterm connected, as shown below:<br>  |
| • PK-LLCG |  | |
| • PK-ODTC/ODTE |  | Trunk numbers should be assigned to even LENs. |
| • PK-2DITD/2DITE<br>• PK-2COTG/2COTN<br>• PK-2EMTB |  | |
| • PK-4RSTA |  | • The card numbers should be assigned to even LENs.<br>• The card numbers are allocated to each PIM as shown below:<br>Card Number — Accommodated in<br>E200 – E203 — PIM0<br>E204 – E207 — PIM1<br>E208 – E211 — PIM2<br>E212 – E215 — PIM3 |

BCD-4317701-0015-04

Table 3-4 Port Assignment Method (Continued)

| CARD TO BE ASSIGNED | PORT ASSIGNMENT TABLE | REMARKS |
|---|---|---|
| • PK-TNTC |  | BGM D000 – D255<br>Music on Hold DA00<br>Wake-Up Service DB00 |
| • PK-DK01 |  | • The card numbers should be assigned to even LENs.<br>• The card numbers are allocated to each PIM as shown below:<br>Card Number – Accommodated in<br>E800 – E807 PIM0<br>E808 – E815 PIM1<br>E816 – E823 PIM2<br>E824 – E831 PIM3 |
| • PK-DK02 |  | • The card numbers should be assigned to even LENs.<br>• The card numbers are allocated to each PIM as shown below:<br>Card Number – Accommodated in<br>E900 – E915 PIM0<br>E916 – E931 PIM1<br>E932 – E947 PIM2<br>E948 – E963 PIM3 |

BCD-42891-0065-02

## 2.8 Resident System Program

The NEAX1400 IMS generates System Data automatically, according to the system hardware configuration, thereby providing immediate operation and shorter programming time.

When activated, the system scans the hardware configuration (such as line/trunk card slot location) and assigns System Data (such as station numbers, trunk numbers, etc.) according to a predetermined generic program assignment. Refer to Chapter 3 of the System Programming Manual [ND- 43177-005 (E)] for detailed information.

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## CHAPTER 4 GLOSSARY OF TERMS

| ABBREVIATION | DESCRIPTION |
|---|---|
| AP | Application Processor<br>Provides a special function such as Keyboard Dialing, ACD/MIS, or interfaces with such peripheral equipment as SMDR or PMS under the control of the MP. |
| ATI | Attendant Console Interface (HA-610Z ATTCON)<br>Has two interface circuits to interface between the EPABX and ATTCONs. |
| ATTCON | Attendant Console<br>Operator's desktop console equipped with non-locking keys and lamps. |
| BASEU | Base Unit<br>Mounted at the lowest portion of a group of modules. |
| BUS | Bus<br>Communication link between processors and the functional blocks within a system. |
| CAT | Customer Administration Terminal (ETE-16D-2 TEL/ETE-6D-2 TEL) is used for system data entry/change. |
| C.O. Line | Central Office Line (Public Exchange Line) |
| CR | Continuous Ringing<br>A ringing signal sent to single-line telephones through a line circuit. |
| DCFT | Digital Conference Trunk<br>Used to make a connection between three or four parties. |
| DTG | Digital Tone Generator<br>Generates the PCM-coded audible signals sent to stations or trunks through the TDSW. DTG is provided on the MP board. |

| ABBREVIATION | DESCRIPTION |
|---|---|
| DTMF | Dual-Tone, Multi-Frequency signaling<br>A signaling method employing set combinations of two specific voice - band frequencies. |
| FP | Firmware Processor<br>Performs the functions of supervision and status analysis of Station Lines/Trunk Lines, under the control of the MP. |
| I/O BUS | Input/Output Bus<br>Communication link between processors, SMDR and the IOCs. |
| IOC | Input/Output Controller<br>Used to control external devices, such as a MAT. |
| LEN | Line Equipment Number<br>Represents the physical location of a peripheral interface card in a PIM. |
| MAT | Maintenance Administration Terminal<br>The personal computer (Multi-Speed/APCIV IBM PC-XT/AT) used for System Data entry/change, System Data load/save/ verify or remote data change. |
| MDF | Main Distribution Frame<br>A distribution frame at which the internal and external wires of a PABX terminate. |
| MEM | Memory<br>Stores Office Data and System Data. |
| MP | Main Processor<br>Controls the entire system, including the switching control operations. |

| ABBREVIATION | DESCRIPTION |
|---|---|
| PCM | Pulse Code Modulation<br>Method of transforming an analog signal into a digital signal using a specified sampling ratio. |
| PFT | Power Failure Transfer<br>Calls from a C.O. line are automatically connected to designated stations in the event of an A.C. failure. |
| PIM | Port Interface Module<br>Consists of ports for accommodating Stations/ Trunks and Controllers. |
| PMS | Property Management System<br>Customer-owned property management system which accommodates hotel management features such as Check In/Check Out, Message Waiting, etc. |
| PROM | Programmable Read Only Memory<br>IC chips which can be reprogrammed according to system design. The information contained in these chips is not affected by a power loss. |
| PWRM | Power Module (Rectifier)<br>Supplies each PIM with D.C.-27 volts. |
| PWRU | Power Unit<br>Equipped with a maximum of two Power Module units. |
| RAM | Random Access Memory<br>IC chips which store information. |
| RS-232C | RS-232C<br>A method of transmitting serial data information in half-duplex or full duplex mode. |
| SMDR | Station Message Detail Recording<br>Provides a detailed record of all outgoing station-to-trunk calls. |
| SPI | Speech Path Interface<br>Performs serial-to-parallel conversion of I/O Bus and channel designation of PCM Highways. |
| TDSW | Time Division Switch<br>A fully available, non-blocking communication path between ports. |
| TOPU | Top Unit<br>Mounted at the highest portion of a group of modules. |