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INTRODUCTION

PURPOSE

This manual explains the installation, programming and operation test procedure for the Data Interface system on the NEAX2000 IVS².

OUTLINE OF THIS MANUAL

This manual contains the following chapters:

CHAPTER 1 GENERAL INFORMATION
This chapter explains the system outline, the name and functions of circuit cards required, system capacity, system specifications and system conditions of Data Interface system.

CHAPTER 2 INSTALLATION
This chapter explains the hardware installation procedure to provide Data Interface on the PBX.

CHAPTER 3 SYSTEM DATA PROGRAMMING
This chapter explains the programming procedure to provide the Data Interface on the PBX.

CHAPTER 4 OPERATION TEST
This chapter explains the operation tests to be performed after completing the installation of the Data Interface on the PBX.

CHAPTER 5 CIRCUIT CARD INFORMATION
This chapter explains the mounting location, the meaning of lamp indications, and the method of switch settings of each circuit card for the Data Interface.
REFERENCE MANUAL

During installation, refer also to the manuals below:

Command Manual: Describes Customer Administration Terminal (CAT) operation, command function and setting data required for programming the system, and Resident System Program.


Maintenance Manual: Describes the maintenance service features and the recommended troubleshooting procedure.

Installation Procedure Manual: Explains the installation procedure for the PBX system.
CHAPTER 1

GENERAL INFORMATION

This chapter explains the Data Interface system outline, the name and functions of circuit cards required, system capacity, specifications, and conditions.
SYSTEM OUTLINE

The Data Interface can provide the intra- or inter-office digital data transmission on fixed path (Nailed-Down) connection. The Data Interface equips the V.11 (X.21) and the V.24/V.28 (RS-232C) interface. When you use the V.11 (X.21) interface, a maximum of 64 kbps digital data transmission is available. When you use the V.24/V.28 (RS-232C) interface, a maximum of 19.2 kbps digital data transmission is available.

To add the V.11 (X.21) or V.24/V.28 (RS-232C) Data Interface to the system, it is necessary to install the Data Port Controller (DPC) card. You can provide the V.35 interface DTE by the M03 card installed in addition to the DPC card. The M03 card converts the V.11 (X.21) interface to a V.35 interface. When you provide the inter-office digital data transmission, it is necessary to install the 24/30-channel Digital Trunk Interface (DTI) card in addition to the DPC card.

Figure 1-1 and Figure 1-2 show the outline of the Data Interface intra-office/inter-office connection.

NOTE: The DPC card can only operate as DCE. If the DPC card is to be connected to a modem or other DCE, a null modem adapter is required.
When the PBX is an end office in the Inter-Office Digital Data Transmission through Nailed-Down Connection, the digital signal is transmitted directly. A maximum of 64 kbps digital data transmission is available for the direct digital transmission.

When the PBX is a tandem office in the Inter-Office Digital Data Transmission through Nailed-Down Connection, data transparency is provided, and a maximum of 64 kbps digital data transmission is available.

Table 1-1 shows the connecting pattern of the Inter-Office Data Transmission through Nailed-Down Connection.

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<td>—</td>
<td>—</td>
<td>○</td>
</tr>
<tr>
<td>LDT/ODT</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>DTI (Digital Signal)</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>●</td>
</tr>
</tbody>
</table>

○ : Direct Connection  
● : Tandem Connection  
— : Not available
CHAPTER 1 GENERAL INFORMATION

System Outline

Figure 1-2 System Outline of Inter-Office Data Connection

(1) PBX IS AN END OFFICE:

NAILED-DOWN CONNECTION

PBX

DTE

DPC

DTE

DPC

TO DTE

M

M

DTE

DPC

TDSW

MP

PLO

24/30 CHANNEL PCM DIGITAL LINE

DIGITAL PBX

CLOCK SIGNAL

DPC: DATA PORT CONTROLLER
DTE: DATA TERMINAL EQUIPMENT
DTI: 24/30 CHANNEL DIGITAL TRUNK INTERFACE
M: MODEM
PLO: PHASE LOCKED OSCILLATOR

(2) PBX IS A NTANDEM OFFICE:

PBX

DTI

DTI

TDSW

CLOCK SIGNAL

MP

PLO
DPC
The Data Port Controller (DPC) can accommodate a maximum of two DTE per cards with V.11 (X.21) or V.24/V.28 (RS-232C) interface, and can provide the intra-office or inter-office digital data transmission on Nailed-Down connection.

DTI
The Digital Trunk Interface (DTI) interfaces the PBX directly to a 24/30-channel PCM transmission line. The DTI has the following functions.

For 24DTI:
- Unipolar/Bipolar Conversion (AMI Format)
- Signaling Insertion/Extraction
- Alarm Detection/Insertion
- Digital PAD on Voice Signal Transmission
- Loopback Test (Local/Remote Loopback)
- Cyclic Redundancy Checking (based on ITU-T Rec. G704)

For 30DTI:
- Unipolar/Bipolar Conversion (HDB3 Format)
- Signaling Insertion/Extraction
- Alarm Detection/Insertion
- Digital PAD on Voice Signal Transmission
- Cyclic Redundancy Checking (based on ITU-T Rec. G704)
- Channel Associated Signaling (based on ITU-T Rec. 0421 Digital R2 Signaling Code)

For connection of a 24DTI and transmission line, twisted-pair cables can be used. For connection of a 30DTI and transmission line, either coaxial cable or twisted pair cable can be used.

M03
The M03 provides V.35 Data Terminal Equipment interface. M03 is connected to the DPC and converts V.11 (X.21) interface to V.35 interface.
PLO
The Phase Locked Oscillator (PLO) equipped on the MP card synchronizes the system to the digital network clock.

When the PBX is a clock receiver office, the PLO generates the clock signals according to the source clocks received from the source office within the network. The source clock signals are extracted at DTI cards and supplied to the PLO. Two clock routes are available; one is the Route 0 from the source office, and the other is a standby Route 1 from a sub-source office. When no clock signals arrive from the source and sub-source office, due to a transmission line failure, the PLO keeps generating the clock signals at the frequency of the previous source clock. The PLO can receive different frequency of source clocks from the Route 0 and Route 1.

Figure 1-3 shows an example of the clock supply route when the system is a receiver office.

**Figure 1-3  Clock Supply Route**

![Diagram of clock supply route](image)

**NOTE:** DTI 0 and DTI 1 must be mounted in PIM0.
## CARD NAME AND FUNCTION

Table 1-2 shows the circuit card name and function for Data Interface.

<table>
<thead>
<tr>
<th>EQUIPMENT NAME</th>
<th>FUNCTIONAL NAME</th>
<th>FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>PN-CP14</td>
<td>MP</td>
<td>Main Processor Card Provides Memory, TDSW (1024CH × 1024CH), 16-line CFT, PB sender, Clock, PLO 2 ports (receiver mode/source mode), two RS-232C ports, 2-line DAT (Recording duration: Max. 128 sec.), DK, 4-line PB receiver, Modem for remote maintenance (19.2 kbps), internal Music-on-Hold tone source and BUS interface. BUS interface functions as a driver/receiver of various signals, adjusts gate delay timing and cable delay timing, monitors I/O Bus and PCM BUS. One card is required per system.</td>
</tr>
<tr>
<td>PN-24DTA-C</td>
<td>DTI</td>
<td>Digital Trunk Interface (23B + D, 1.5 Mbps) Card Accommodates 24-channel PCM digital lines.</td>
</tr>
<tr>
<td>PN-30DTC-A</td>
<td>DTI</td>
<td>Digital Trunk Interface (2 Mbps) Card Accommodates 30-channel PCM digital lines.</td>
</tr>
<tr>
<td>PZ-M542</td>
<td>CONN</td>
<td>Coaxial Cable Connection Card Used to connect a coaxial cable for the Digital Trunk Interface. Two cards maximum can be connected to LTC connector of each PIM.</td>
</tr>
<tr>
<td>PZ-M557</td>
<td>CONN</td>
<td>Coaxial Cable Connection Card Used to connect a coaxial cable for the Digital Trunk Interface. Two cards maximum can be connected to LTC connector of each PIM.</td>
</tr>
</tbody>
</table>
## Table 1-2  Card Name and Function (Continued)

<table>
<thead>
<tr>
<th>EQUIPMENT NAME</th>
<th>FUNCTIONAL NAME</th>
<th>FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>PN-2DPCB</td>
<td>DPC</td>
<td>2-line Data Port Controller Card Used for the intra-office or inter-office digital data transmission on nailed down connection. Accommodates max. two DTEs with V.11 (X.21) interface or V.24/V.28 (RS-232C) interface.</td>
</tr>
<tr>
<td>PN-M03</td>
<td>M03</td>
<td>V.35 Data Terminal Equipment Interface Card Used together with the PN-2DPCB card to provide the V.35 interface.</td>
</tr>
</tbody>
</table>
SYSTEM CAPACITY

System Capacity for Data Interface

Table 1-3  System Capacity for Data Interface

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>CAPACITY</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>DPC Card</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Circuits per DPC Card</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Fixed Path Connection</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

System Capacity for Digital Trunk Interface

Table 1-4  System Capacity for Digital Trunk Interface

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>24DTI</th>
<th>30DTI</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>DTI Card</td>
<td>8</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>DTI Trunk</td>
<td>192</td>
<td>124</td>
<td></td>
</tr>
<tr>
<td>DTI Trunk Route</td>
<td>64</td>
<td>64</td>
<td>1 Route/DTI</td>
</tr>
<tr>
<td>Ports per DTI Card</td>
<td>24</td>
<td>31</td>
<td></td>
</tr>
</tbody>
</table>
SYSTEM SPECIFICATIONS

DPC Specifications

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>SPECIFICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Synchronization</td>
<td>Synchronous</td>
</tr>
<tr>
<td>Transmission Rate</td>
<td>2.4, 4.8, 9.6, 14.4, 19.2, 48, 56, 64 kbps</td>
</tr>
<tr>
<td>Transmission Mode</td>
<td>Full/Half Duplex</td>
</tr>
<tr>
<td>Rate Adaptation</td>
<td>ITU-T V.110</td>
</tr>
</tbody>
</table>

NOTE 1: When the transmission rate is 56 or 64 kbps, only full duplex is available.

NOTE 2: For the transmission rate after Rate Adaptation, see Table 1-6.

Table 1-5 DPC Specifications

Table 1-6 Rate Adaptation

<table>
<thead>
<tr>
<th>TRANSMISSION RATE BEFORE RATE ADAPTATION</th>
<th>TRANSMISSION RATE AFTER RATE ADAPTATION</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.4-4.8 kbps</td>
<td>8 kbps</td>
<td></td>
</tr>
<tr>
<td>9.6 kbps</td>
<td>16 kbps</td>
<td></td>
</tr>
<tr>
<td>14.4 kbps</td>
<td>32 kbps</td>
<td></td>
</tr>
<tr>
<td>19.2 kbps</td>
<td>32 kbps</td>
<td></td>
</tr>
<tr>
<td>48-64 kbps</td>
<td>64 kbps</td>
<td></td>
</tr>
</tbody>
</table>

Modem Specifications

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>SPECIFICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Synchronization</td>
<td>Synchronous</td>
</tr>
<tr>
<td>Transmission Rate</td>
<td>2.4, 4.8, 9.6, 14.4, 19.2, 48, 56, 64 kbps</td>
</tr>
<tr>
<td>Transmission Mode</td>
<td>Full/Half Duplex</td>
</tr>
<tr>
<td>Line</td>
<td>4 wire</td>
</tr>
<tr>
<td>Connecting Type</td>
<td>Leased</td>
</tr>
</tbody>
</table>

NOTE: When the transmission rate is 56 or 64 kbps, only full duplex is available.
SYSTEM CONDITIONS

Time Slot Assignment Condition
As shown in Figure 1-4, the 30DTI card uses the time slot on the basic Highway 4. Therefore, the total number of time slots for all 30DTI card must be 128 time slots or less including all other application processor cards which use the Highway 4. The 24DTI card can use the time slot on both the basic and expanded Highway 4 and 6. Therefore, the total number of time slots for all 24DTI card must be 256 time slots or less.

Figure 1-4 Accommodation of DTI into TDSW
**Time Slot Allocation for DTI Card**

On each DTI card, the system recognizes the lowest and highest channel numbers to which trunk numbers have been assigned, and allocates time slots to all the channels within them. If trunk numbers are assigned to discontinuous channels in this case, the system also allocates time slots to channels not assigned.

For example, as shown in Figure 1-5, even when Channel 1 through Channel 10 have been assigned by the system data programming (CM07 YY=01) except Channel 5, the system allocates a total of 10 time slots for all the ten channels. Therefore, to avoid allocation of unnecessary time slots, it is recommended that consecutive channels are assigned on each DTI card.

![Figure 1-5 Time Slot Allocation for DTI](image)
CHAPTER 2

INSTALLATION

This chapter explains the hardware installation procedure to provide Data Interface to the PBX.
PRECAUTIONS

Static Electricity Guard
You must wear a grounded wrist strap to protect circuit cards from static electricity.

Figure 2-1 Static Electricity Guard (1 of 2)

- WHEN PLUGGING/UNPLUGGING A CIRCUIT CARD

- WHEN HOLDING A CIRCUIT CARD

NEVER TOUCH THE COMPONENTS OR SOLDERED SURFACE WITH BARE HANDS.
Figure 2-1 Static Electricity Guard (2 of 2)

- WHEN MAKING A SWITCH SETTING ON A CIRCUIT CARD

![Diagram](image)

WEAR A WRIST STRAP AND PERFORM THE WORK ON A GROUNDED CONDUCTIVE WORK SURFACE.

- WHEN CARRYING A CIRCUIT CARD

![Diagram](image)

WHEN CARRYING A CIRCUIT CARD AROUND, KEEP THE CARD IN A CONDUCTIVE POLYETHYLENE BAG.

The mark shown below is attached to the sheet for the work in which circuit cards are handled. When engaging in such work, the installer must be careful not to cause damage by static electricity.
Caution

You must hold the edge of a circuit card when plugging or unplugging the circuit card. If you touch another area, you may be exposed to hazardous voltages.
REQUIRED EQUIPMENT

Table 2-1 shows the equipment required to provide the Data Interface on the system.

<table>
<thead>
<tr>
<th>EQUIPMENT/CABLE</th>
<th>DESCRIPTION</th>
<th>QTY</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>PN-2DPCB</td>
<td>Data Port Controller Card</td>
<td>1-50</td>
<td></td>
</tr>
<tr>
<td>PN-24DTA-C</td>
<td>24 channel DTI Card</td>
<td>1-8</td>
<td>For Inter-office</td>
</tr>
<tr>
<td>PN-30DTC-A</td>
<td>30 channel DTI Card</td>
<td>1-4</td>
<td>For Inter-office</td>
</tr>
<tr>
<td>PN-M03</td>
<td>V.35 DTE Interface Card</td>
<td>1-50</td>
<td></td>
</tr>
<tr>
<td>PZ-M542/M557</td>
<td>Coaxial Cable Connection Card</td>
<td>1-4</td>
<td>2 cards/PIM</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 card/DTI</td>
</tr>
<tr>
<td>DPC V11 CABLE</td>
<td>Connection Cable between PN-2DPCB and V.11</td>
<td>N</td>
<td>N: Number of V.11 (X.21) DTE</td>
</tr>
<tr>
<td></td>
<td>(X.21) DTE</td>
<td></td>
<td>4 m (13.1 ft.)</td>
</tr>
<tr>
<td>17-TW-0.3 CONN CABLE-A</td>
<td>Connection Cable between PN-2DPCB and PN-M03</td>
<td>N</td>
<td>N: Number of V.35 DTE</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.3 m (1 ft.)</td>
</tr>
<tr>
<td>DPC V35 CABLE</td>
<td>Connection Cable between PN-M03 and V.35 DTE</td>
<td>N</td>
<td>N: Number of V.35 DTE</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4 m (13.1 ft.)</td>
</tr>
<tr>
<td>DPC RS CABLE</td>
<td>Connection Cable between PN-2DPCB and V.24/V.28</td>
<td>N</td>
<td>N: Number of V.24/V.28 DTE</td>
</tr>
<tr>
<td></td>
<td>DTE</td>
<td></td>
<td>4 m (13.1 ft.)</td>
</tr>
<tr>
<td>MODEM</td>
<td>Refer to “Modem Specifications”. Page 12</td>
<td>2 × N</td>
<td>N: Number of DTE (As required)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(Should be provided by customer.)</td>
</tr>
<tr>
<td>Straight Cable</td>
<td>Connection Cable between DPC V11 CABLE/DPC RS</td>
<td>N</td>
<td>N: Number of DTE (When connecting DTE</td>
</tr>
<tr>
<td></td>
<td>CABLE and DTE</td>
<td></td>
<td>directly)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(Should be provided by customer.)</td>
</tr>
<tr>
<td>Reverse Cable</td>
<td>Connection Cable between DPC V11 CABLE/DPC RS</td>
<td>N</td>
<td>N: Number of DTE (When using modem)</td>
</tr>
<tr>
<td></td>
<td>CABLE and Modem</td>
<td></td>
<td>(Should be provided by customer.)</td>
</tr>
</tbody>
</table>
INSTALLATION PROCEDURE FOR DATA INTERFACE

Installation Summary for Data Interface
Install the equipment according to the procedure shown in Figure 2-2.

Figure 2-2  Installation Procedure for Data Interface

START

Mounting DPC Card  Page 21

Which type of DTE?

X.21  Page 23
Connecting X.21 DTE

V.24/V.28  Page 28
Connecting V.24/V.28 DTE

RS-449  Page 31
Connecting RS-449 DTE

V.35  Page 21
Mounting M03 Card

Connecting V.35 DTE  Page 33

END
Mounting DPC Card

(1) Confirm the correct switch settings of the DPC card. See CHAPTER 5. Page 63.

(2) Mount the DPC cards in LT00 through LT11 slots of PIM0 through PIM7.

Mounting M03 Card

(1) Confirm the correct switch settings of the M03 card. See CHAPTER 5. Page 63.

(2) Mount the M03 cards in LT00 through LT11 slots of PIM0 through PIM7.
CHAPTER 2 INSTALLATION
Installation Procedure for Data Interface

Conditions on Connecting DTE

Forcible ON control of DTR, RTS/C signal:
When connecting the DTE which does not support the DTR signal and RTS/C signal, these signals can be turned to ON forcibly by switch setting on the DPC card.

Condition of CTS signal ON control:
The CTS signal is turned to ON after 60 ms from the time when receiving the RTS/C signal. And the CTS signal is turned to ON under the following conditions.

1. The DTR signal is ON.
2. The received X signal is ON (The synchronization of the opposite office is established).
3. The sending X signal is ON (The synchronization of the PBX is established).

Limitation on using modem:
When using modem, the DTR signal from the DTE can not be transmitted to the PBX (DPC card). Therefore, the DTE starting by the DTR signal can not be used.

Figure 2-3 Limitation on Using Modem
Connecting X.21 DTE

Connect the X.21 DTE/modem to the DPC card as shown in Figure 2-4.

Figure 2-4 Cable Connection between DPC Card and X.21 DTE/Modem

(1) Direct Connection

NOTE 1

NOTE 2

(Continued)
NOTE 1: When providing X.21 DTE with TXC(1) signal, this connection is required.

NOTE 2: The distance between the DPC card and X.21 DTE is as follows.

When providing X.21 DTE with TXC(1) signal: L=Max. 1000 m (3281 ft.)
When providing X.21 DTE without TXC(1) signal, the distance depends on the data speed.

<table>
<thead>
<tr>
<th>Distance (L)</th>
<th>Data Speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. 1000 m (3281 ft.)</td>
<td>Less than 9.6 kbps</td>
</tr>
<tr>
<td>Max. 800 m (2625 ft.)</td>
<td>19.2 kbps</td>
</tr>
<tr>
<td>Max. 350 m (1148 ft.)</td>
<td>48 kbps</td>
</tr>
<tr>
<td>Max. 300 m (984 ft.)</td>
<td>56 kbps</td>
</tr>
<tr>
<td>Max. 250 m (820 ft.)</td>
<td>64 kbps</td>
</tr>
</tbody>
</table>

(Continued)
### Figure 2-5  Cable Connection between DPC Card and X.21 DTE/Modem

#### (2) Modem Connection

When using a modem that can provide TXC(1) signal:

|   | T  | 2A | 2B | C  | 3A | 3B | R  | 4A | 4B | I  | 5A | 5B | S  | 6A | 6B | TXC(1) | 3C | 4D | GND | 6D |
|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|--------|----|----|----|----|
|   | 2A | 9  | 3  | 10 | 4  | 11 | 5  | 12 | 13 | 7  | 14 | GND | T  | TXD | TXC | TXC | GND |     |
|   | 2B |    |    |    |    |    |    |    |    |    |    |     |    |    | (1)  |    |    |     |    |
|   | C  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |      |    |    |     |    |
|   | 3A |    |    |    |    |    |    |    |    |    |    |    |    |    |    |      |    |    |     |    |
|   | 3B |    |    |    |    |    |    |    |    |    |    |    |    |    |    |      |    |    |     |    |
|   | R  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |      |    |    |     |    |
|   | 4A |    |    |    |    |    |    |    |    |    |    |    |    |    |    |      |    |    |     |    |
|   | 4B |    |    |    |    |    |    |    |    |    |    |    |    |    |    |      |    |    |     |    |
|   | I  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |      |    |    |     |    |
|   | 5A |    |    |    |    |    |    |    |    |    |    |    |    |    |    |      |    |    |     |    |
|   | 5B |    |    |    |    |    |    |    |    |    |    |    |    |    |    |      |    |    |     |    |
|   | S  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |      |    |    |     |    |
|   | 6A |    |    |    |    |    |    |    |    |    |    |    |    |    |    |      |    |    |     |    |
|   | 6B |    |    |    |    |    |    |    |    |    |    |    |    |    |    |      |    |    |     |    |
|   | TXC(1) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |      |    |    |     |    |
|   | 3C |    |    |    |    |    |    |    |    |    |    |    |    |    |    |      |    |    |     |    |
|   | 4D |    |    |    |    |    |    |    |    |    |    |    |    |    |    |      |    |    |     |    |
|   | GND |    |    |    |    |    |    |    |    |    |    |    |    |    |    |      |    |    |     |    |
|   | 6D |    |    |    |    |    |    |    |    |    |    |    |    |    |    |      |    |    |     |    |

When using a modem that has not TXC(1) terminal:

|   | T  | 2A | 2B | C  | 3A | 3B | R  | 4A | 4B | I  | 5A | 5B | S  | 6A | 6B | TXC(1) | 3C | 4D | GND | 6D |
|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|--------|----|----|----|----|
|   | 2A | 9  | 3  | 10 | 4  | 11 | 5  | 12 | 13 | 7  | 14 | GND | T  | TXD | TXC | TXC | GND |     |
|   | 2B |    |    |    |    |    |    |    |    |    |    |     |    |    | (1)  |    |    |     |    |
|   | C  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |      |    |    |     |    |
|   | 3A |    |    |    |    |    |    |    |    |    |    |    |    |    |    |      |    |    |     |    |
|   | 3B |    |    |    |    |    |    |    |    |    |    |    |    |    |    |      |    |    |     |    |
|   | R  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |      |    |    |     |    |
|   | 4A |    |    |    |    |    |    |    |    |    |    |    |    |    |    |      |    |    |     |    |
|   | 4B |    |    |    |    |    |    |    |    |    |    |    |    |    |    |      |    |    |     |    |
|   | I  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |      |    |    |     |    |
|   | 5A |    |    |    |    |    |    |    |    |    |    |    |    |    |    |      |    |    |     |    |
|   | 5B |    |    |    |    |    |    |    |    |    |    |    |    |    |    |      |    |    |     |    |
|   | S  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |      |    |    |     |    |
|   | 6A |    |    |    |    |    |    |    |    |    |    |    |    |    |    |      |    |    |     |    |
|   | 6B |    |    |    |    |    |    |    |    |    |    |    |    |    |    |      |    |    |     |    |
|   | TXC(1) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |      |    |    |     |    |
|   | 3C |    |    |    |    |    |    |    |    |    |    |    |    |    |    |      |    |    |     |    |
|   | 4D |    |    |    |    |    |    |    |    |    |    |    |    |    |    |      |    |    |     |    |
|   | GND |    |    |    |    |    |    |    |    |    |    |    |    |    |    |      |    |    |     |    |
|   | 6D |    |    |    |    |    |    |    |    |    |    |    |    |    |    |      |    |    |     |    |

**NOTE 1**

**NOTE 2**

---

4 m (13.1 ft.)

---

(Continued)
NOTE 1: When providing X.21 modem with TXC(1) signal, this connection is required.

NOTE 2: The distance between the DPC card and X.21 modem is as follows.

When providing X.21 modem with TXC(1) signal: L=Max. 1000 m (3281 ft.)
When providing X.21 modem without TXC(1) signal, the distance depends on the data speed.

<table>
<thead>
<tr>
<th>Distance (L)</th>
<th>Data Speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. 1000 m (3281 ft.) . . . . . .</td>
<td>Less than 9.6 kbps</td>
</tr>
<tr>
<td>Max. 800 m (2625 ft.) . . . . . .</td>
<td>19.2 kbps</td>
</tr>
<tr>
<td>Max. 350 m (1148 ft.) . . . . . .</td>
<td>48 kbps</td>
</tr>
<tr>
<td>Max. 300 m (984 ft.) . . . . . .</td>
<td>56 kbps</td>
</tr>
<tr>
<td>Max. 250 m (820 ft.) . . . . . .</td>
<td>64 kbps</td>
</tr>
</tbody>
</table>
Figure 2-6  DPC V11 Cable

<table>
<thead>
<tr>
<th>D</th>
<th>C</th>
<th>B</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>GND</td>
<td>SB</td>
<td>SA</td>
</tr>
<tr>
<td>5</td>
<td>X</td>
<td>IB</td>
<td>IA</td>
</tr>
<tr>
<td>4</td>
<td>TXC(1)</td>
<td>RB</td>
<td>RA</td>
</tr>
<tr>
<td>3</td>
<td>TXC(1)</td>
<td>CB</td>
<td>CA</td>
</tr>
<tr>
<td>2</td>
<td>X</td>
<td>TB</td>
<td>TA</td>
</tr>
<tr>
<td>1</td>
<td>X</td>
<td>G</td>
<td></td>
</tr>
</tbody>
</table>

X: NOT CONNECTED
G: GROUND
Connecting V.24/V.28 DTE

Connect the V.24/V.28 DTE/modem to the DPC card as shown in Figure 2-7.

**Figure 2-7  Cable Connection between DPC Card and V.24/V.28 DTE/Modem**

(1) Direct Connection
Figure 2-8 Cable Connection between DPC Card and V.24/V.28 DTE/Modem

(2) Modem Connection
Figure 2-9 DPC RS Cable

<table>
<thead>
<tr>
<th>D</th>
<th>C</th>
<th>B</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>06</td>
<td>X</td>
<td>RXC</td>
<td>TXC(2)</td>
</tr>
<tr>
<td>05</td>
<td>DTR</td>
<td>GND</td>
<td>TXD</td>
</tr>
<tr>
<td>04</td>
<td>TXC(1)</td>
<td>RXD</td>
<td>RTS</td>
</tr>
<tr>
<td>03</td>
<td>X</td>
<td>CTS</td>
<td>DSR</td>
</tr>
<tr>
<td>02</td>
<td>X</td>
<td>GND</td>
<td>DCD</td>
</tr>
<tr>
<td>01</td>
<td>RI</td>
<td>G</td>
<td></td>
</tr>
</tbody>
</table>

X: NOT CONNECTED
G: GROUND

05B-GND 1-GND
02B-GND 7-GND
05A-TXD 2-TXD
04B-RXD 3-RXD
04A-RTS 4-RTS
03B-CTS 5-CTS
03A-DSR 6-DSR
02A-DCD 8-DCD
05C-DTR 20-DTR
04D-TXC(1) 24-TXC(1)
06A-TXC(2) 15-TXC(2)
06B-RXC 17-RXC
01C-RI 22-RI
01A-GND
Connecting RS-449 DTE
RS-449 DTE requires a locally provided conversion cable, as shown in Figure 2-10. This cable must be equipped with a 15-pin male D-type connector and a 37-pin D-type connector (male or female as required by DTE.) A modification is required to be installed in the 37-pin connector, as shown in the Table 2-2, Figure 2-11 and Figure 2-12.

Figure 2-10  Cable Connection between DPC Card and RS-449 DTE

Table 2-2  X.21 to RS-449 Adapter Cable Connections

<table>
<thead>
<tr>
<th>Name</th>
<th>Function</th>
<th>Pin</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>TA</td>
<td>Transmit data A</td>
<td>2</td>
<td>TXD +</td>
</tr>
<tr>
<td>TB</td>
<td>Transmit data B</td>
<td>9</td>
<td>TXD –</td>
</tr>
<tr>
<td>RA</td>
<td>Receive data A</td>
<td>4</td>
<td>RXD +</td>
</tr>
<tr>
<td>RB</td>
<td>Receive data B</td>
<td>11</td>
<td>RXD –</td>
</tr>
<tr>
<td>SA</td>
<td>Clock A</td>
<td>6</td>
<td>SCT +</td>
</tr>
<tr>
<td>SB</td>
<td>Clock B</td>
<td>13</td>
<td>SCT –</td>
</tr>
<tr>
<td>CA</td>
<td>Control A</td>
<td>3</td>
<td>RTS +</td>
</tr>
<tr>
<td>CB</td>
<td>Control B</td>
<td>10</td>
<td>RTS –</td>
</tr>
<tr>
<td>IA</td>
<td>Indicate A</td>
<td>5</td>
<td>DCD +</td>
</tr>
<tr>
<td>IB</td>
<td>Indicate B</td>
<td>12</td>
<td>DCD –</td>
</tr>
<tr>
<td>SG</td>
<td>Signal ground</td>
<td>8</td>
<td>Signal ground</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Name</th>
<th>Function</th>
<th>Pin</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>4</td>
<td>DTE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>22</td>
<td>DTE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6</td>
<td>DCE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>24</td>
<td>DCE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5</td>
<td>DCE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8</td>
<td>DCE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>23</td>
<td>DCE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>26</td>
<td>DCE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7</td>
<td>DTE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>25</td>
<td>DTE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>13</td>
<td>DCE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>11</td>
<td>DCE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>9</td>
<td>DCE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>31</td>
<td>DCE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>29</td>
<td>DCE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>27</td>
<td>DCE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>19</td>
<td>Common</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20</td>
<td>Common</td>
</tr>
<tr>
<td></td>
<td></td>
<td>37</td>
<td>Common</td>
</tr>
</tbody>
</table>
**Figure 2-11 RS-449 Connector Pin Assignments**

<table>
<thead>
<tr>
<th>Source</th>
<th>Signal</th>
<th>Signal</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common</td>
<td>Send Common</td>
<td>37</td>
<td>Signal Ground</td>
</tr>
<tr>
<td>DCE</td>
<td>Standby Indicator</td>
<td>36</td>
<td>Test Mode (A)</td>
</tr>
<tr>
<td>Return</td>
<td>Terminal Timing (B)</td>
<td>35</td>
<td>Terminal Timing (A)</td>
</tr>
<tr>
<td>DTE</td>
<td>New Signal</td>
<td>34</td>
<td>Select Frequency</td>
</tr>
<tr>
<td>DCE</td>
<td>Signal Quality</td>
<td>33</td>
<td>Incoming Call</td>
</tr>
<tr>
<td>DTE</td>
<td>Select Standby</td>
<td>32</td>
<td>Remote Loopback</td>
</tr>
<tr>
<td>Return</td>
<td>Receiver Ready (B)</td>
<td>31</td>
<td>Receiver Ready (A)</td>
</tr>
<tr>
<td>Return</td>
<td>Terminal Ready (B)</td>
<td>30</td>
<td>Terminal Ready (A)</td>
</tr>
<tr>
<td>Return</td>
<td>Data Mode (B)</td>
<td>29</td>
<td>Data Mode (A)</td>
</tr>
<tr>
<td>DTE</td>
<td>Terminal in Service</td>
<td>28</td>
<td>Local Loopback</td>
</tr>
<tr>
<td>Return</td>
<td>Clear To Send (B)</td>
<td>27</td>
<td>Clear To Send (A)</td>
</tr>
<tr>
<td>Return</td>
<td>Receive Timing (B)</td>
<td>26</td>
<td>Receive Timing (A)</td>
</tr>
<tr>
<td>Return</td>
<td>Request To Send (B)</td>
<td>25</td>
<td>Request To Send (A)</td>
</tr>
<tr>
<td>Return</td>
<td>Receive Data (B)</td>
<td>24</td>
<td>Receive Data (A)</td>
</tr>
<tr>
<td>D</td>
<td>Send Timing (B)</td>
<td>23</td>
<td>Send Timing (A)</td>
</tr>
<tr>
<td>DTE</td>
<td>Send Data (B)</td>
<td>22</td>
<td>Send Data (A)</td>
</tr>
<tr>
<td>Common</td>
<td>Unassigned</td>
<td>21</td>
<td>Unassigned</td>
</tr>
<tr>
<td>Common</td>
<td>Receive Common</td>
<td>20</td>
<td>Signal Rate Indicator</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1</td>
<td>Shield</td>
</tr>
</tbody>
</table>

**Figure 2-12 X.21 Connector Pin Assignments**

<table>
<thead>
<tr>
<th>Source</th>
<th>Signal</th>
<th>Signal</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>Unassigned</td>
<td>15</td>
<td>Signal Ground</td>
</tr>
<tr>
<td>DCE</td>
<td>Byte Timing (B)</td>
<td>14</td>
<td>Byte Timing (A)</td>
</tr>
<tr>
<td>DCE</td>
<td>Signal Element Timing (B)</td>
<td>13</td>
<td>Signal Element Timing (A)</td>
</tr>
<tr>
<td>DCE</td>
<td>Indication (B)</td>
<td>12</td>
<td>Indication (A)</td>
</tr>
<tr>
<td>DCE</td>
<td>Received Data (B)</td>
<td>11</td>
<td>Received Data (A)</td>
</tr>
<tr>
<td>DTE</td>
<td>Control (B)</td>
<td>10</td>
<td>Control (A)</td>
</tr>
<tr>
<td>DTE</td>
<td>Transmitted Data (B)</td>
<td>9</td>
<td>Transmitted Data (A)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8</td>
<td>Shield</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7</td>
<td>Common</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6</td>
<td>DCE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5</td>
<td>DTE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
<td>DTE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
<td>DTE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2</td>
<td>DTE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1</td>
<td>Common</td>
</tr>
</tbody>
</table>
Connecting V.35 DTE

(1) Connect the M03 card and the DPC card as shown in Figure 2-13.

(2) Connect the V.35 DTE/modem to the M03 card in the following pages.

Figure 2-13 Outline of V.35 Cable Connection
Figure 2-14 Cable Connection between M03 Card and V.35 DTE/Modem

![Diagram of cable connection between M03 Card and V.35 DTE/Modem]

NOTE: When you provide V.35 DTE using TXC(1) signal, this connection is required.

(Continued)
Figure 2-15 Cable Connection between M03 Card and V.35 DTE/Modem

(2) Modem Connection

V35 CONNECTOR

DPC V35 CABLE
Page 36

REVERSE CABLE (LOCALLY PROVIDED)

M03

V.35 MODEM

TXD 4A
4B
RXD 2A
2B
RTS 6A
CTS 6B
DSR 5A
GND 6D
DCD 5B
TXC(2) 3A
3B
RXC 1C
2D
DTR 5C
TXC(1) 3C
4D

TXD P
RXD S
RTS R
CTS T
DSR U
GND V
DCD W
TXC(2) X
RXC Y
DTR Z
TXC(1) AA

4 m (13.1 ft.)

MAX 15 m (49.2 ft.)
CHAPTER 2 INSTALLATION
Installation Procedure for Data Interface

Figure 2-16 DPC V35 Cable

<table>
<thead>
<tr>
<th></th>
<th>D</th>
<th>C</th>
<th>B</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>GND</td>
<td>CTS</td>
<td>RTS</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>DTR</td>
<td>DCD</td>
<td>DSR</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>TXC(1)B</td>
<td>TXDB</td>
<td>TXDA</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>TXC(1)A</td>
<td>TXC(2)B</td>
<td>TXC(2)A</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>RXCB</td>
<td>RXDB</td>
<td>RXDA</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>RXCA</td>
<td></td>
<td>G</td>
<td></td>
</tr>
</tbody>
</table>

X: NOT CONNECTED
G: GROUND
### Table 2-3  V.35 Interface Cable Connector Pin Assignments

<table>
<thead>
<tr>
<th>Pin</th>
<th>Name</th>
<th>Function</th>
<th>Specification</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>GND</td>
<td>Frame Ground</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>B</td>
<td>GND</td>
<td>Signal Ground</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>C</td>
<td>RTS</td>
<td>Request To Send</td>
<td>RS-232</td>
<td>DTE</td>
</tr>
<tr>
<td>D</td>
<td>CTS</td>
<td>Clear To Send</td>
<td>RS-232</td>
<td>DCE</td>
</tr>
<tr>
<td>E</td>
<td>DSR</td>
<td>Data Set Ready</td>
<td>RS-232</td>
<td>DCE</td>
</tr>
<tr>
<td>F</td>
<td>RLSD</td>
<td>Received Line Signal Detector</td>
<td>RS-232</td>
<td>DCE</td>
</tr>
<tr>
<td>H</td>
<td>DTR</td>
<td>Data Terminal Ready</td>
<td>RS-232</td>
<td>DTE</td>
</tr>
<tr>
<td>P</td>
<td>TXD</td>
<td>Send Data</td>
<td>V.35</td>
<td>DTE</td>
</tr>
<tr>
<td>R</td>
<td>RXD</td>
<td>Receive Data</td>
<td>V.35</td>
<td>DCE</td>
</tr>
<tr>
<td>U</td>
<td>SCTE</td>
<td>Serial Clock Transmit External (A)</td>
<td>V.35</td>
<td>DTE</td>
</tr>
<tr>
<td>W</td>
<td></td>
<td>Serial Clock Transmit External (B)</td>
<td>V.35</td>
<td>DCE</td>
</tr>
<tr>
<td>V</td>
<td>SCR</td>
<td>Serial Clock Receive (A)</td>
<td>V.35</td>
<td>DCE</td>
</tr>
<tr>
<td>X</td>
<td></td>
<td>Serial Clock Receive (B)</td>
<td>V.35</td>
<td>DCE</td>
</tr>
<tr>
<td>Y</td>
<td>SCT</td>
<td>Serial Clock Transmit (A)</td>
<td>V.35</td>
<td>DCE</td>
</tr>
<tr>
<td></td>
<td>AA (or aa)</td>
<td>Serial Clock Transmit (B)</td>
<td>V.35</td>
<td>DCE</td>
</tr>
<tr>
<td>L, M, N, Z, BB, CC, DD, EE, HH, JJ, KK, LL, MM, NN</td>
<td>Reserved for future V.35 use</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Figure 2-17  V.35 Connector Pin Assignment

<table>
<thead>
<tr>
<th>Signal</th>
<th>Pin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chassis Ground</td>
<td>A</td>
</tr>
<tr>
<td>Request To Send</td>
<td>C</td>
</tr>
<tr>
<td>Data Set Ready</td>
<td>E</td>
</tr>
<tr>
<td>Data Terminal Ready</td>
<td>H</td>
</tr>
<tr>
<td>Transmitted Data</td>
<td>P</td>
</tr>
<tr>
<td>Transmitted Data</td>
<td>S</td>
</tr>
<tr>
<td>Transmit Timing</td>
<td>U</td>
</tr>
<tr>
<td>Transmit Timing</td>
<td>W</td>
</tr>
<tr>
<td>Transmit Timing</td>
<td>Y</td>
</tr>
<tr>
<td>Transmit Timing</td>
<td>AA</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pin</th>
<th>Signal</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>Signal Ground</td>
</tr>
<tr>
<td>D</td>
<td>Clear To Send</td>
</tr>
<tr>
<td>F</td>
<td>Receive Line Signal Detect</td>
</tr>
<tr>
<td>R</td>
<td>Received Data</td>
</tr>
<tr>
<td>T</td>
<td>Received Data</td>
</tr>
<tr>
<td>V</td>
<td>Receive Timing</td>
</tr>
<tr>
<td>X</td>
<td>Receive Timing</td>
</tr>
</tbody>
</table>
CHAPTER 2 INSTALLATION
Installation Procedure for Data Interface

INSTALLATION PROCEDURE FOR DIGITAL TRUNK INTERFACE

Installation Summary for Digital Trunk Interface
Install the equipment according to the procedure shown in Figure 2-18.

Figure 2-18  Installation Procedure for DTI

NOTE: This procedure is required when you provide CONN card to connect a coaxial cable for 30DTI.
Mounting DTI Card

(1) Before mounting the DTI (PN-24DTA-C/PN-30DTC-A) card, set the MB switch to UP position, and set the other switches to appropriate position. See CHAPTER 5. Page 63

(2) Mount the DTI card in the following AP slots on PIM0-PIM7.
   PIM0: AP00-AP10 slots
   PIM1-7: AP00-AP11 slots
   After mounting the card, set the MB to DOWN position to put the card in service.

NOTE: The DTI card (DTI 0, DTI 1) which sends a clock signal to PLO of the MP card must be mounted in the AP slots on PIM0.

Mounting CONN Card

When you provide CONN (PZ-M542/M557) card to connect a coaxial cable for 30DTI, do the following installation.

(1) Confirm the correct switch settings of the CONN card. See CHAPTER 5. Page 63

(2) Mount the CONN card on LTC connector on BWB in the PIM which accommodates the DTI cards.
   For details, refer to the Installation Procedure Manual.
DTI Cable Connection via MDF

When you use a twisted-pair cable, connect the cable to a CSU via the MDF as shown below.

- Location of AP Slots and LTC Connectors for DTI - Page 41
- Example of MDF Cross Connection for DTI - Page 42

*Figure 2-19  DTI Cable Connection via MDF*
Figure 2-20 Location of the AP Slots and the LTC Connectors for DTI
Figure 2-21 Example of MDF Cross Connection for DTI
DTI Cable Connection via CONN Card

When you use an coaxial cable, connect the cable to a CSU via the CONN (PZ-M542/M557) card as shown in Figure 2-22. Figure 2-23 shows an example of the cable connection when the 30DTI card is mounted in the AP05 slot of PIM0.

![Figure 2-22 DTI Cable Connection via CONN Card](image-url)
Figure 2-23 Example of Coaxial Cable Connection

① LTC1 CONNECTOR

② COAXIAL CONNECTOR
CHAPTER 3

SYSTEM DATA PROGRAMMING

This chapter explains the programming procedure to provide the Data Interface to the PBX.
HOW TO READ THIS CHAPTER

In the programming procedure, the meaning of (1), (2) and markings are as follows.

(1) : 1st Data

(2) : 2nd Data

: Initial Data; With the system data clear command (CM00, CM01), the data with this marking is automatically set for each command.

: A reset of the MP card is required after data setting. Press SW1 switch on the MP card.

: A reset of the DTI card is required after data setting. Set the Make Busy switch to UP and then DOWN.
DATA INTERFACE ASSIGNMENT

**DESCRIPTION**

To assign data station number by CM1A, assign a station number (dummy number) to each port (LEN) on the DPC card.

**NOTE 1:** The station number must be assigned to the first LEN (level 0) and the third LEN (level 2) of each LT slot. The station number must be also assigned to the unused port on the DPC card.

**NOTE 2:** The "*" and "#" can not be used as a station number.

Assign a data station number to the station number assigned by CM10.

**NOTE:** The data station number must be also assigned to the unused port on the DPC card.

Assign an access code for data station.

Assign the type of data terminal interface to the data station number.

**NOTE:** This data must be also assigned to the unused port on the DPC card.

**DATA**

(1) 000-763: LEN
(2) FX-FXXXXXXXX: Station No.
   X: 0-9

(1) X-XXXXXXXX: Station No. assigned by CM10
(2) X-XXXXXXXX: Data Station No.

• Y=0-3 Numbering Plan Group 0-3
(1) X-XXXX: Access Code
(2) 801: 1 digit station
    802: 2 digits station
    803: 3 digits station
    804: 4 digits station
    805: 5 digits station
    806: 6 digits station
    807: 7 digits station
    808: 8 digits station

(1) X-XXXXXXXX: Data Station No.
(2) 04: DPC
Assign the attribute data for data station (assigned by CM1A) in accordance with the specification of the DTE connected.

<table>
<thead>
<tr>
<th>YY</th>
<th>Description</th>
<th>DATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>04</td>
<td>Data speed</td>
<td>(1) X-XXXXXXX: Data Station No.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(2) 0-05 : 1200 bps</td>
</tr>
<tr>
<td></td>
<td></td>
<td>06 : 600 bps</td>
</tr>
<tr>
<td></td>
<td></td>
<td>07 : 1200 bps</td>
</tr>
<tr>
<td></td>
<td></td>
<td>08 : 2400 bps</td>
</tr>
<tr>
<td></td>
<td></td>
<td>09 : 4800 bps</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10 : 9600 bps</td>
</tr>
<tr>
<td></td>
<td></td>
<td>11 : 19.2 kbps</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12 : 48 kbps</td>
</tr>
<tr>
<td></td>
<td></td>
<td>13 : 56 kbps</td>
</tr>
<tr>
<td></td>
<td></td>
<td>14 : 64 kbps</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15 : 7200 bps</td>
</tr>
<tr>
<td></td>
<td></td>
<td>16 : 14.4 kbps</td>
</tr>
<tr>
<td></td>
<td></td>
<td>17-31 : 1200 bps</td>
</tr>
<tr>
<td>05</td>
<td>Parity Check</td>
<td>(1) X-XXXXXXX: Data Station No.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(2) 0 : Effective</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 : Ineffective</td>
</tr>
<tr>
<td>06</td>
<td>Synchronous/Asynchronous</td>
<td>(1) X-XXXXXXX: Data Station No.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(2) 0 : Synchronous</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7 : Asynchronous</td>
</tr>
<tr>
<td>07</td>
<td>Transmission Mode</td>
<td>(1) X-XXXXXXX: Data Station No.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(2) 0 : Half Duplex</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 : Full Duplex</td>
</tr>
</tbody>
</table>
**DESCRIPTION**

Provide the Nailed-Down Connection with the connecting patterns.

**DATA**

- **YY=08 Stop Bit**
  1. X-XXXXXXXX: Data Station No.
  2. 0 : 2-Stop Bit
    1: 1-Stop Bit

- **YY=09 Type of Code**
  1. X-XXXXXXXX: Data Station No.
  2. 00 : ASCII (7-bit) + even parity
    01 : ASCII (7-bit) + odd parity
    02 : ASCII (7-bit) + parity (0)
    03 : ASCII (7-bit) + parity (1)
    04 : JIS (7-bit) + even parity
    05 : JIS (7-bit) + odd parity
    06 : JIS (8-bit)
    07 : EBCDIC (8-bit)
    15: Non character (Binary Data)

- **YY=19 S Buffer**
  1. X-XXXXXXXX: Data Station No.
  2. 0 : Effective
    1: Ineffective

- **YYY=00-99, 000-199**
  Memory Block 00-99, 000-199
  1. X-XXXXXXXX: Data station No. assigned by CM1A
  2. DXXX : Trunk No. assigned by CM07

  **1ST AND 2ND DATA CONNECTING PATTERN**

<table>
<thead>
<tr>
<th>CONNECTING PATTERN</th>
<th>1ST DATA (1)</th>
<th>2ND DATA (2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data station to Data station</td>
<td>X-XXXX XXXX</td>
<td>X-XXXX XXXX</td>
</tr>
<tr>
<td>Data station to trunk</td>
<td>X-XXXX XXXX</td>
<td>DXXX</td>
</tr>
<tr>
<td>Trunk to trunk (Tandem Connection)</td>
<td>DXXX</td>
<td>DXXX</td>
</tr>
</tbody>
</table>

See left table
**DIGITAL TRUNK INTERFACE ASSIGNMENT**

<table>
<thead>
<tr>
<th>START</th>
<th>DESCRIPTION</th>
<th>DATA</th>
</tr>
</thead>
</table>
|       | Assign an AP number to the DTI card. The AP number must match the SENSE switch setting on the DTI card. | • Y=0  
  (1) 04-15, 20-31: AP No.  
  (2) 09: DTI |
| CM05  | Specify the AP highway channel for 24DTI card. | • Y=1  
  (1) 04-15, 20-31: AP No.  
  (2) 0 : Expanded Highway channel (128 time slots)  
    1 : Basic Highway channel (128 time slots) |
| CM07  | Assign trunk numbers to each channel number on the DTI card. | • YY=01  
  (1) XX ZZ  
    XX: 04-15, 20-31: AP No. assigned by CM05 Y=0  
    ZZ: 00-23: Channel No. of 24DTI  
      01-15, 17-31: Channel No. of 30DTI  
  (2) D000-D255: Trunk No. Any trunk number already assigned by CM10 cannot be used. |
|       | The system allocates time slots to consecutive channels from the lowest to the highest channel number assigned. To minimize the number of time slots allocated, assign trunk numbers to consecutive channels on each card. Never skip channels in CM07. | |
Assign the necessary functions to the 24DTI card.

After entering the data, set the MB switch on the DTI card to UP, and then to DOWN, for DTI initialization.

**NOTE:** The DTI route must be separated from any analog trunk route.

Assign a trunk route number for tie line interface to each DTI.

Assign trunk route data to each DTI route.

**DESCRIPTION**

**DATA**

- **YY=00 Data Mode**
  
  (1) 04-15, 20-31: AP No. assigned by CM05 Y=0
  
  (2) 0: Based on AT&T Spec.

- **YY=01 Frame Configuration**
  
  (1) 04-15, 20-31: AP No. assigned by CM05 Y=0
  
  (2) 0 : 12-Multi Frame

  1 : 24-Multi Frame

- **YY=02 Zero Code Suppression**
  
  (1) 04-15, 20-31: AP No. assigned by CM05 Y=0
  
  (2) 1 : Not available (Transparent)

- **YY=03**
  
  (1) 04-15, 20-31: AP No. assigned by CM05 Y=0
  
  (2) 7 : Associated Channel Interoffice Signaling

- **YY=00 Kind of Trunk Route**
  
  (1) 00-63: Trunk Route No.
  
  (2) 04: Tie Line trunk

- **YY=01 Dialing Signal Type**
  
  (1) 00-63: Trunk Route No.
  
  (2) 7 : DP/DTMF (Incoming)

  DTMF (Outgoing)
### DESCRIPTION

**CM35 Y=19 DTI PAD**  
[For Australia]

<table>
<thead>
<tr>
<th>CONNECTION PATTERNS</th>
<th>DATA OF DTI [dB]</th>
<th>DATA</th>
<th>DATA</th>
<th>DATA</th>
<th>DATA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DATA =4 (T/R)</td>
<td>DATA =5 (T/R)</td>
<td>DATA =6 (T/R)</td>
<td>DATA =7 (T/R)</td>
<td></td>
</tr>
<tr>
<td>Station-DTI</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0/0</td>
</tr>
<tr>
<td>Tone-DTI</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0/0</td>
</tr>
<tr>
<td>COT/DID/LDT-DTI</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0/0</td>
</tr>
<tr>
<td>ODT-DTI</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0/0</td>
</tr>
<tr>
<td>DTI-DTI</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0/0</td>
</tr>
</tbody>
</table>

**Data**: T/R: Transmitter PAD/Receiver PAD  
[For North America/Other Countries]

<table>
<thead>
<tr>
<th>CONNECTION PATTERNS</th>
<th>DATA OF DTI [dB]</th>
<th>DATA =4 (T/R)</th>
<th>DATA =5 (T/R)</th>
<th>DATA =6 (T/R)</th>
<th>DATA =7 (T/R)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Station-DTI</td>
<td></td>
<td>-3/-8</td>
<td>-3/-3</td>
<td>-3/-3</td>
<td>-3/-8</td>
</tr>
<tr>
<td>Tone-DTI</td>
<td></td>
<td>0/0</td>
<td>0/0</td>
<td>0/0</td>
<td>0/0</td>
</tr>
<tr>
<td>COT/DID/LDT/ODT (2W E&amp;M)-DTI</td>
<td></td>
<td>0/0</td>
<td>0/0</td>
<td>0/0</td>
<td>0/0</td>
</tr>
<tr>
<td>ODT (4W E&amp;M)-DTI</td>
<td></td>
<td>+3/-3</td>
<td>0/0</td>
<td>0/0</td>
<td>+3/-3</td>
</tr>
<tr>
<td>DTI-DTI</td>
<td></td>
<td>0/-6</td>
<td>0/0</td>
<td>0/-6</td>
<td>0/0</td>
</tr>
</tbody>
</table>

**Data**: T/R: Transmitter PAD/Receiver PAD  

+ : Gain  
− : Loss  

### DATA

- **YY=04**  
  Answer Signal from distant office  
  (1) 00-63: Trunk Route No.  
  (2) 2: Answer signal arrives

- **YY=05**  
  Release Signal from distant office  
  (1) 00-63: Trunk Route No.  
  (2) 1: Release signal arrives

- **YY=09**  
  Incoming Connection Signaling  
  (1) 00-63: Trunk Route No.  
  (2) 03: Wink Start  
    04: Delay Dial  
    05: Immediate Start  
    06: 2nd DT/Timing Start-Tie Line

- **YY=19**  
  DTI Pad  
  (1) 00-63: Trunk Route No.  
  (2) 0-3: Programmable PAD by CM42  
    4-7: Fixed PAD (See left table)

- **YY=20**  
  Sender start condition  
  (1) 00-63: Trunk Route No.  
  (2) 0: Wink Start  
    01: Delay Dial  
    02: Ground Start  
    15: Timing Start

- **YY=89**  
  Cyclic Redundancy Checking  
  for Bit Error Detection  
  (1) 00-63: Trunk Route No.  
  (2) 0: To provide
REFERENCE DATA

Specify the kind of digital data transmission.

CM35

END

<table>
<thead>
<tr>
<th>CM35</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
</tr>
</tbody>
</table>

**DESCRIPTION**

- YY=92
- (1) 00-63: Trunk Route No.
- (2)
  - 0 : Digital Data Transmission (48 kbps)
  - 1 : Digital Data Transmission (56 kbps)
  - 2 : Digital Data Transmission (Transparent)
  - 3 : Reversal of F&S Bits
  - 7: Data Transmission via Modem

**DATA**
CHAPTER 4

OPERATION TEST

This chapter explains the operation tests to be performed after you have completed the installation of the Data Interface to the PBX.
DPC LOOPBACK TEST

This test is the intra-office loopback test on the DPC card using a modem tester. There are two kinds of loopback (Loopback 1, Loopback 2) as shown in Figure 4-1. Either the Loopback 1 or the Loopback 2 can be selected by switch settings on the DPC card.

Figure 4-1  DPC Loopback Tests

NOTE: The modem tester is locally provided.
DPC Loopback 1 Test

(1) Set the SW1 on the DPC card as shown below.

![Switch Configuration Diagram]

(2) Confirm whether the LB01 lamp (for No. 0 circuit) or the LB11 lamp (for No. 1 circuit) on the DPC card lights.

- If the LB01 lamp or the LB11 lamp does not light, check the switch settings on the DPC card and the system data assignment.

(3) Connect a modem tester to the DPC card as shown in Figure 4-2.

**Figure 4-2 Connection of Modem Tester**

(a) When you use V. 11 (X.21) interface

![Connection Diagram (V.11 Interface)]

(b) When you use V. 24/V. 28 (RS-232C) interface

![Connection Diagram (V.24/V.28 Interface)]
(4) Set the attributes of modem tester (transmission rate, etc.).

(5) To confirm whether the data is transmitted correctly, send the PN Pattern 9 (511 Pattern) from the modem tester.

(6) Count bit errors on the modem tester for 1 minute.

- If bit errors do not occur, the cable connection between DPC card and modem tester is normal.

(7) If bit errors occur, check the cable connection, and replace the DPC card.

(8) After this test, set all the SW1-1 through SW1-4 on the DPC card to OFF.
DPC Loopback 2 Test

After you complete the DPC Loopback 1 Test, do the following steps.

(1) Set the SW1 on the DPC card as shown below.

![Diagram of SW1 settings for No. 0 and No. 1 Circuits]

(2) Confirm whether the LB02 lamp (for No. 0 circuit) or the LB12 lamp (for No. 1 circuit) on the DPC card lights.

- If the LB02 lamp or the LB12 lamp does not light, check the switch settings on the DPC card and the system data assignment.

(3) Connect a modem tester to the DPC card as shown in Figure 4-2 “Connection of Modem Tester.”

(4) Set the attributes of modem tester (transmission rate, etc.).

(5) To confirm whether the data is transmitted correctly, send the PN Pattern 9 (511 Pattern) from the modem tester.

(6) Count bit errors on the modem tester for 1 minute.

- If bit errors do not occur, the DPC card is normal.

(7) If bit errors occur, check the system data assignment, and replace the DPC card.

(8) After this test, set all the SW1-1 through SW1-4 on DPC card to OFF.
OTHER LOOPBACK TESTS

Two additional forms of loopback test are shown in Figure 4-3.

Figure 4-3  Other Loopback Tests

- **DTI local loopback**
  - MODEM TESTER
  - PBX
  - Set DTI in local loopback.

- **DTI hard-wired loopback**
  - MODEM TESTER
  - PBX
  - On the MDF, connect transmit leads to the Receive leads to test all portions of the DTI.
INTER-OFFICE DIGITAL DATA TRANSMISSION TEST

This test is the inter-office digital data transmission test using modem testers. After you complete the loopback tests, do the following steps.

(1) Connect modem testers to the both PBXs as shown in Figure 4-4.

Figure 4-4  Inter-Office Digital Data Transmission Test

NOTE 1: For details of cable connection between the DPC card and the modem tester, see Figure 4-2 “Connection of Modem Tester.”

NOTE 2: The modem tester is locally provided.

(2) Set the attributes of both modem testers (transmission rate, etc.).

NOTE: If both the attributes do not match, this test is not available.

(3) To confirm whether the data is transmitted correctly, send the PN Pattern 9 (511 Pattern) from the modem testers.

(4) Count bit errors on the modem testers for 1 minute.
   • If bit errors do not occur, the inter-office digital data transmission is normal.

(5) If bit errors occur, check the following items.
   • System data assignment
   • DTI card
   • PCM digital line
   • Opposite PBX
CHAPTER 5

CIRCUIT CARD INFORMATION

This chapter explains the mounting location, the meaning of lamp indications, and the method of switch settings of each circuit card for the Data Interface system.
CHAPTER 5 CIRCUIT CARD INFORMATION

How to Read This Chapter

HOW TO READ THIS CHAPTER

This chapter explains each circuit card used in this system for the following items. Explanations are given in the alphabetical order of the circuit card names within each circuit card category (Control, Application Processor, and Line/Trunk).

(1) Locations of Lamps, Switches, and Connectors
   The locations of lamps, switches, and connectors of each circuit card are shown by a face layout.

(2) Lamp Indications
   The name, color, and functions of each indicator lamp equipped on each circuit card are described in a table.

(3) Switch Settings
   The name, settings, and functions of each switch equipped on each circuit card are described in a table.

Each switch setting table has a “CHECK” column. Make necessary entries in the CHECK column during and/or after the system installation and maintenance, and use each table as a reference for subsequent system maintenance and operations.
MOUNTING LOCATION OF CIRCUIT CARD

This section explains the conditions for mounting circuit cards for the Data Interface. Figure 5-1 shows circuit card mounting slots allocated in the PIM.

Figure 5-1  Mounting Location of Circuit Card

*1 PN-CP14 (MP) card on the MP12 slot on PIM0.
*2 PN-24DTA-C/PN-30DTC-A (DTI) card on the AP00-AP11 slots on PIM0-PIM7.
*3 PN-2DPCB (DPC) and PN-M03 (M03) card on the LT00-LT11 slots on PIM0-PIM7.
*4 PZ-M542/PZ-M557 (CONN) card on the LTC0-LTC3 connectors on the PIM which accommodates 30DTI card.
### LIST OF REQUIRED CIRCUIT CARDS

Table 5-1 shows the required circuit cards to be explained in this section.

#### Table 5-1 List of Required Circuit Cards

<table>
<thead>
<tr>
<th>NAME (FUNCTIONAL NAME)</th>
<th>LAMP X: PROVIDED ←: NOT PROVIDED</th>
<th>SWITCH X: PROVIDED ←: NOT PROVIDED</th>
<th>EXTRACTION/INSERTION WITH POWER ON X: ALLOWED Δ: ALLOWED AFTER MB* ←: NOT ALLOWED</th>
<th>REFERENCE PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>PN-CP14 (MP)</td>
<td>X</td>
<td>X</td>
<td>–</td>
<td>Page 67</td>
</tr>
<tr>
<td>PN-24DTA-C (DTI)</td>
<td>X</td>
<td>X</td>
<td>Δ</td>
<td>Page 72</td>
</tr>
<tr>
<td>PN-30DTC-A (DTI)</td>
<td>X</td>
<td>X</td>
<td>Δ</td>
<td>Page 78</td>
</tr>
<tr>
<td>PZ-M542 (CONN)</td>
<td>–</td>
<td>X</td>
<td>X</td>
<td>Page 84</td>
</tr>
<tr>
<td>PZ-M557 (CONN)</td>
<td>–</td>
<td>X</td>
<td>X</td>
<td>Page 86</td>
</tr>
<tr>
<td>PN-2DPCB (DPC)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Page 88</td>
</tr>
<tr>
<td>PN-M03 (M03)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Page 92</td>
</tr>
</tbody>
</table>

*MB = Make Busy
PN-CP14 (MP)

Locations of Lamps, Switches, and Connectors

<table>
<thead>
<tr>
<th>LAMP NAME</th>
<th>COLOR</th>
<th>FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>RUN</td>
<td>Green</td>
<td>Flashes at 120 IPM while this card is operating normally.</td>
</tr>
<tr>
<td>CLK</td>
<td>Green</td>
<td>Remains lit while receiving clock signals to the PLO.</td>
</tr>
</tbody>
</table>
## Switch Settings

### CAUTION
When the operating power is being supplied to this circuit card, do not plug/unplug this circuit card into/from its mounting slot.

### Switch Settings Table

<table>
<thead>
<tr>
<th>SWITCH NAME</th>
<th>SWITCH NUMBER</th>
<th>SETTING POSITION</th>
<th>FUNCTION</th>
<th>CHECK</th>
</tr>
</thead>
<tbody>
<tr>
<td>SW3 (Rotary SW)</td>
<td></td>
<td>0-F</td>
<td>On Line (Call processing is in progress)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2</td>
<td>Off Line (Call processing is stopped)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• I/O port: As per CM40 YY=08</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
<td>Off Line (Call processing is stopped)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• I/O port: 9600bps (Fixed)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>5</td>
<td>Off Line (Call processing is stopped)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• I/O port: 9600bps</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>6</td>
<td>Off Line (Call processing is stopped)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• I/O port: 19200bps</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>7</td>
<td>Off Line (Call processing is stopped)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• I/O port: 384000bps</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>8</td>
<td>Off Line (Call processing is stopped)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• I/O port: 57600bps</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>B For clearing the office data</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>C For setting the resident system program</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1, 4, 9</td>
<td>Not used</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>A, D-F</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**NOTE 1:** Set the groove on the switch to the desired position.

**NOTE 2:** Only when executing “MP Program Download” in MATWorX, set the SW3 to 5-8.
<table>
<thead>
<tr>
<th>SWITCH NAME</th>
<th>SWITCH NUMBER</th>
<th>SETTING POSITION</th>
<th>FUNCTION</th>
<th>CHECK</th>
</tr>
</thead>
<tbody>
<tr>
<td>SW1 (Push SW)</td>
<td></td>
<td></td>
<td>For initializing CPU</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SW2 (Piano Key SW)</td>
<td>1</td>
<td>ON</td>
<td>A-law (Australia)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
<td>µ-law (North America)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2, 3</td>
<td></td>
<td>Selection of PLO0 input</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(Phase Locked Oscillator)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• For clock receiver office:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SW2-2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SW2-3</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>FUNCTION</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
<td>OFF</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
<td>OFF</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>ON</td>
<td>OFF</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
<td>OFF</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.5 MHz clock</td>
<td>1.5 MHz clock</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>192 kHz clock</td>
<td>192 kHz clock</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 MHz clock</td>
<td>2 MHz clock</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>[For PN-24DTA-C/PN-24PRTA]</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>[For PN-BRTA]</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>[For PN-30DTC-A/PN-2BRTC]</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>ON</td>
<td>Not used</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• For clock source office:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>ON</td>
<td>When using RS1 port for built-in MODEM</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
<td>When using RS1 port for RS-232C</td>
<td></td>
</tr>
</tbody>
</table>

(Continued)
### List of Required Circuit Cards

<table>
<thead>
<tr>
<th>SWITCH NAME</th>
<th>SWITCH NUMBER</th>
<th>SETTING POSITION</th>
<th>FUNCTION</th>
<th>CHECK</th>
</tr>
</thead>
<tbody>
<tr>
<td>SW4 (Dip SW)</td>
<td>1</td>
<td>OFF</td>
<td>Not used</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>OFF</td>
<td>Not used</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3, 4</td>
<td></td>
<td>Selection of PLO1 input (Phase Locked Oscillator)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• For clock receiver office:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>SW4-3 SW4-4 FUNCTION</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>OFF</td>
<td>OFF</td>
<td>1.5 MHz clock</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>[For PN-24DTA-C/PN-24PRTA]</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ON</td>
<td>OFF</td>
<td>192 kHz clock</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>[For PN-BRTA]</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OFF</td>
<td>ON</td>
<td>2 MHz clock</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>[For PN-30DTC-A/PN-2BRTC]</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ON</td>
<td>ON</td>
<td>Not used</td>
<td></td>
</tr>
<tr>
<td>VR (Rotary SW)</td>
<td>OFF</td>
<td></td>
<td>Variable Resister for External Hold Tone Source (0 - 20 Kohms : Clockwise)</td>
<td></td>
</tr>
<tr>
<td>DK (Connector)</td>
<td>02</td>
<td></td>
<td>Ground detection</td>
<td></td>
</tr>
<tr>
<td></td>
<td>01</td>
<td></td>
<td>Ground sending</td>
<td></td>
</tr>
</tbody>
</table>

(Continued)
### List of Required Circuit Cards

The figure in the SWITCH NAME column and the position in ☐ in the SETTING POSITION column indicate the standard setting of the switch. When the switch is not set as shown by the figure and ☐, the setting of the switch varies with the system concerned.

<table>
<thead>
<tr>
<th>SWITCH NAME</th>
<th>SWITCH NUMBER</th>
<th>SETTING POSITION</th>
<th>FUNCTION</th>
<th>CHECK</th>
</tr>
</thead>
<tbody>
<tr>
<td>JP0 (Jumper pin)</td>
<td></td>
<td>UP</td>
<td>Not used (Memory backup OFF)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>DOWN</td>
<td>For normal operation (Memory backup ON)</td>
<td></td>
</tr>
<tr>
<td>JP1 (Jumper pin)</td>
<td></td>
<td>UP</td>
<td>For using internal tone source</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>DOWN</td>
<td>For using external tone source</td>
<td></td>
</tr>
</tbody>
</table>
PN-24DTA-C (DTI)

Locations of Lamps, Switches and Connectors
Lamp Indications

<table>
<thead>
<tr>
<th>LAMP NAME</th>
<th>COLOR</th>
<th>FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>RUN</td>
<td>Green</td>
<td>Flashes at 120 IPM while this card is operating normally.</td>
</tr>
<tr>
<td>CRC</td>
<td>Red</td>
<td>Remains lit when detecting Cyclic Redundancy Checking (CRC) errors.</td>
</tr>
<tr>
<td>PCM</td>
<td>Red</td>
<td>Remains lit when detecting PCM signal loss.</td>
</tr>
<tr>
<td>FRM</td>
<td>Red</td>
<td>Remains lit when detecting Frame Alignment signal loss.</td>
</tr>
<tr>
<td>RMT</td>
<td>Red</td>
<td>Remains lit when receiving Frame Alignment signal loss alarm from a distant office.</td>
</tr>
<tr>
<td>AIS</td>
<td>Red</td>
<td>Remains lit when a pattern of consecutive “1” is received. The distant office transmits this signal for a loop-back test.</td>
</tr>
</tbody>
</table>
| BL        | Red   | B channel status  
  ON : More than 10 channels are busy  
  OFF : All channels are idle  
  Flash (60 IPM) : Only one channel is busy  
  Flash (120 IPM) : 2 through 10 channels are busy |
### Switch Settings

<table>
<thead>
<tr>
<th>SWITCH NAME</th>
<th>SWITCH NUMBER</th>
<th>SETTING POSITION</th>
<th>FUNCTION</th>
<th>CHECK</th>
</tr>
</thead>
<tbody>
<tr>
<td>SENSE (Rotary SW)</td>
<td>0-3</td>
<td>Not used</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4-F</td>
<td>Set the switch to match the AP Number (04-31) to be set by CM05.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**NOTE 1**

<table>
<thead>
<tr>
<th>AP No.</th>
<th>SW1-4: ON</th>
<th>SW1-4: OFF</th>
</tr>
</thead>
<tbody>
<tr>
<td>04</td>
<td>05</td>
<td>06</td>
</tr>
<tr>
<td>07</td>
<td>08</td>
<td>09</td>
</tr>
<tr>
<td>10</td>
<td>11</td>
<td>12</td>
</tr>
<tr>
<td>13</td>
<td>14</td>
<td>15</td>
</tr>
<tr>
<td>20</td>
<td>21</td>
<td>22</td>
</tr>
<tr>
<td>23</td>
<td>24</td>
<td>25</td>
</tr>
<tr>
<td>26</td>
<td>27</td>
<td>28</td>
</tr>
<tr>
<td>29</td>
<td>30</td>
<td>31</td>
</tr>
<tr>
<td>SW No.</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>D</td>
</tr>
<tr>
<td></td>
<td>E</td>
<td>F</td>
</tr>
</tbody>
</table>

**NOTE 2**

<table>
<thead>
<tr>
<th>MB (Toggle SW)</th>
<th>SETTING POSITION</th>
<th>FUNCTION</th>
<th>CHECK</th>
</tr>
</thead>
<tbody>
<tr>
<td>ON</td>
<td>UP</td>
<td>For make-busy</td>
<td></td>
</tr>
<tr>
<td></td>
<td>DOWN</td>
<td>For normal operation</td>
<td></td>
</tr>
</tbody>
</table>
### List of Required Circuit Cards

<table>
<thead>
<tr>
<th>SWITCH NAME</th>
<th>SWITCH NUMBER</th>
<th>SETTING POSITION</th>
<th>FUNCTION</th>
<th>CHECK</th>
</tr>
</thead>
<tbody>
<tr>
<td>SW0 (Piano Key SW)</td>
<td>1</td>
<td>ON</td>
<td>Source clock signal from network is sent to the PLO 0 input on MP card.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
<td>Source clock signal from network is not sent to the PLO 0 input on MP card.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>ON</td>
<td>Source clock signal from network is sent to the PLO 1 input on MP card.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
<td>Source clock signal from network is not sent to the PLO 1 input on MP card.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>ON</td>
<td>Remote loop-back</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
<td>For normal operation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>ON</td>
<td>Local loop-back (AIS send)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
<td>For normal operation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>ON</td>
<td>Set equalizer according to the cable length between the PBX and the MDF.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>ON</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>ON</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>OFF</td>
<td>Not used</td>
<td></td>
</tr>
</tbody>
</table>

(Continued)
The figure in the SWITCH NAME column and the position in the SETTING POSITION column indicate the standard setting of the switch. When the switch is not set as shown by the figure and , the setting of the switch varies with the system concerned.
**NOTE 1:** Set the groove on the switch to the desired position.

**NOTE 2:** When the power is on, flip the MB switch to ON (UP position) before plugging/unplugging the circuit card.

**NOTE 3:** Set SW0-1 and SW0-2 as follows:

<table>
<thead>
<tr>
<th>CONDITIONS</th>
<th>DTI0 SW 0-1</th>
<th>DTI1 SW 0-2</th>
<th>DTI2 SW 0-1</th>
<th>DTI2 SW 0-2</th>
<th>DTI3 SW 0-1</th>
<th>DTI3 SW 0-2</th>
<th>DTI4 SW 0-1</th>
<th>DTI4 SW 0-2</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>When one DTI is provided.</td>
<td>ON</td>
<td>OFF</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>MP card will receive the clock signal from DTI0 at its PLO0 input.</td>
</tr>
<tr>
<td>When more than one DTI is provided.</td>
<td>ON</td>
<td>OFF</td>
<td>OFF</td>
<td>ON</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>MP card will receive the clock signal from DTI0 at its PLO0 input, under normal conditions. Should a clock failure occur with DTI0, MP card will automatically switch to the PLO1 input which gets clock from DTI1.</td>
</tr>
</tbody>
</table>

**NOTE 4:** When the PBX is a clock source office, set the SW0-1 and SW0-2 on all the DTI cards mounted in PIM0 to “OFF”.

**NOTE 5:** Mount the DTI card which receives a source clock signal into PIM0.
PN-30DTC-A (DTI)

Locations of Lamps, Switches and Connectors
Lamp Indications

<table>
<thead>
<tr>
<th>LAMP NAME</th>
<th>COLOR</th>
<th>FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>RUN</td>
<td>Green</td>
<td>Flashes at 120 IPM when this card is normally operating.</td>
</tr>
<tr>
<td>PCM</td>
<td>Red</td>
<td>Remains lit when detecting PCM signal loss.</td>
</tr>
<tr>
<td>FRM</td>
<td>Red</td>
<td>Remains lit when detecting Frame Alignment signal loss.</td>
</tr>
<tr>
<td>MFRM</td>
<td>Red</td>
<td>Remains lit when detecting Multi-Frame Alignment signal loss on time Slot 16.</td>
</tr>
<tr>
<td>RMT</td>
<td>Red</td>
<td>Remains lit when receiving the alarm from a distant office because Frame Alignment signal loss has been detected at the distant office.</td>
</tr>
<tr>
<td>MRMT</td>
<td>Red</td>
<td>Remains lit when receiving the alarm from a distant office because Multi-Frame Alignment signal loss has been detected at the distant office.</td>
</tr>
<tr>
<td>AIS</td>
<td>Red</td>
<td>Remains lit when indicating that the pattern of consecutive “1” is being received. The distant office transmits this signal for a loop-back test distant.</td>
</tr>
<tr>
<td>BL</td>
<td>Red</td>
<td>B channel status</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ON : More than 10 channels are busy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF : All channels are idle</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Flash (60 IPM) : Only one channel is busy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Flash (120 IPM) : 2 to 10 channels are busy</td>
</tr>
</tbody>
</table>
## Switch Settings

<table>
<thead>
<tr>
<th>SWITCH NAME</th>
<th>SWITCH NUMBER</th>
<th>SETTING POSITION</th>
<th>FUNCTION</th>
<th>CHECK</th>
</tr>
</thead>
<tbody>
<tr>
<td>SENS (Rotary SW)</td>
<td>4-F</td>
<td>Set the switch to match the AP Number (04-31) to be set by CM05.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Note 1

- 0-3 Not used

<table>
<thead>
<tr>
<th>MB (Toggle SW)</th>
<th>UP</th>
<th>For make-busy</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DOWN</td>
<td>For normal operation</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Note 2

See table below for specific settings:

<table>
<thead>
<tr>
<th>AP No.</th>
<th>SW-8: ON</th>
<th>SW-8: OFF</th>
<th>SW No.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>04 05 06 07 08 09 10 11 12 13 14 15</td>
<td>20 21 22 23 24 25 26 27 28 29 30 31</td>
<td>4 5 6 7 8 9 A B C D E F</td>
</tr>
</tbody>
</table>

(Continued)
<table>
<thead>
<tr>
<th>SWITCH NAME</th>
<th>SWITCH NUMBER</th>
<th>SETTING POSITION</th>
<th>FUNCTION</th>
<th>CHECK</th>
</tr>
</thead>
<tbody>
<tr>
<td>SW (Piano Key SW)</td>
<td>1</td>
<td>ON</td>
<td>Source clock signal from network is sent to the PLO 0 input on MP card.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
<td>Source clock signal from network is not sent to the PLO 0 input on MP card</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>ON</td>
<td>Source clock signal from network is sent to the PLO 0 input on MP card.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
<td>Source clock signal from network is not sent to the PLO 0 input on MP card</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>ON</td>
<td>Remote loop-back</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
<td>For normal operation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>ON</td>
<td>Local loop-back (AIS send)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
<td>For normal operation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>ON</td>
<td>Transmission line cable: Coaxial cable (75 ohms)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
<td>Transmission line cable: Twisted-pair cable (120 ohms)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>OFF</td>
<td>Always set to OFF</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>OFF</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>ON</td>
<td>AP No. 04-15</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
<td>AP No. 20-31</td>
<td></td>
</tr>
</tbody>
</table>

(Continued)
### List of Required Circuit Cards

The figure in the SWITCH NAME column and the position in □ in the SETTING POSITION column indicate the standard setting of the switch. When the switch is not set as shown by the figure and □, the setting of the switch varies with the system concerned.

**NOTE 1:** Set the groove on the switch to the desired position.

**NOTE 2:** When the power is on, flip the MB switch to ON (UP position) before plugging/unplugging the circuit card.

<table>
<thead>
<tr>
<th>SWITCH NAME</th>
<th>SWITCH NUMBER</th>
<th>SETTING POSITION</th>
<th>FUNCTION</th>
<th>CHECK</th>
</tr>
</thead>
<tbody>
<tr>
<td>JPS (Jumper pin)</td>
<td></td>
<td>UP</td>
<td>Balanced transmission (For twisted-pair cable)</td>
<td></td>
</tr>
<tr>
<td>DOWN</td>
<td>TA is grounded on the transmission line (For coaxial cable)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>JPR (Jumper pin)</td>
<td></td>
<td>UP</td>
<td>Balanced transmission (For twisted-pair cable)</td>
<td></td>
</tr>
<tr>
<td>DOWN</td>
<td>RA is grounded on the transmission line (For coaxial cable)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>JP (Jumper pin)</td>
<td>RIGHT</td>
<td>Line impedance: 75 ohms (For coaxial cable)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LEFT</td>
<td>Line impedance: 120 ohms (For twisted-pair cable)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(Continued)
NOTE 3: Set the SW-1 and SW-2 as follows:

<table>
<thead>
<tr>
<th>CONDITIONS</th>
<th>DT10</th>
<th>DT11</th>
<th>DT12</th>
<th>DT13</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>When one DTI is provided.</td>
<td>ON</td>
<td>OFF</td>
<td>–</td>
<td>–</td>
<td>MP card will receive the clock signal from DT10 at its PLO0 input.</td>
</tr>
<tr>
<td>When more than one DTI is provided.</td>
<td>ON</td>
<td>OFF</td>
<td>OFF</td>
<td>ON</td>
<td>MP card will receive the clock signal from DT10 at its PLO0 input, under normal conditions. Should a clock failure occur with DT10, MP card will automatically switch to the PLO1 input which gets from DT11.</td>
</tr>
</tbody>
</table>

NOTE 4: When the PBX is a clock source office, set the SW-1 and SW-2 on all the DTI cards mounted in PIM0 to “OFF”.

NOTE 5: Mount the DTI card which receives a source clock signal into PIM0.
PZ-M542 (CONN)

Locations of Lamps, Switches and Connectors

Lamp Indications

This card has no lamps.
## Switch Settings

<table>
<thead>
<tr>
<th>SWITCH NAME</th>
<th>SWITCH NUMBER</th>
<th>SETTING POSITION</th>
<th>FUNCTION</th>
<th>CHECK</th>
</tr>
</thead>
<tbody>
<tr>
<td>JP0</td>
<td></td>
<td>RIGHT</td>
<td>For coaxial connectors (No.0 circuit)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>LEFT</td>
<td>For champ connector (LT connector) (No.0 circuit)</td>
<td></td>
</tr>
<tr>
<td>JP1</td>
<td></td>
<td>RIGHT</td>
<td>For coaxial connectors (No.1 circuit)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>LEFT</td>
<td>For champ connector (LT connector) (No.1 circuit)</td>
<td></td>
</tr>
<tr>
<td>JP2</td>
<td></td>
<td>RIGHT</td>
<td>For coaxial connectors (No.2 circuit)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>LEFT</td>
<td>For champ connector (LT connector) (No.2 circuit)</td>
<td></td>
</tr>
</tbody>
</table>

The figure in the SWITCH NAME column and the position in □□□□ in the SETTING POSITION column indicate the standard setting of the switch. When the switch is not set as shown by the figure and □□□□, the setting of the switch varies with the system concerned.
PZ-M557 (CONN)

Locations of Lamps, Switches and Connectors

Lamp Indications

This card has no lamps.
Switch Settings

<table>
<thead>
<tr>
<th>SWITCH NAME</th>
<th>SWITCH NUMBER</th>
<th>SETTING POSITION</th>
<th>FUNCTION</th>
<th>CHECK</th>
</tr>
</thead>
<tbody>
<tr>
<td>JP0</td>
<td></td>
<td>RIGHT</td>
<td>For coaxial connectors (No. 0 circuit)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>LEFT</td>
<td>For champ connector (LT connector) (No. 0 circuit)</td>
<td></td>
</tr>
<tr>
<td>JP1</td>
<td></td>
<td>RIGHT</td>
<td>For coaxial connectors (No. 1 circuit)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>LEFT</td>
<td>For champ connector (LT connector) (No. 1 circuit)</td>
<td></td>
</tr>
<tr>
<td>JP2</td>
<td></td>
<td>RIGHT</td>
<td>For coaxial connectors (No. 2 circuit)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>LEFT</td>
<td>For champ connector (LT connector) (No. 2 circuit)</td>
<td></td>
</tr>
</tbody>
</table>

The figure in the SWITCH NAME column and the position in ( ) in the SETTING POSITION column indicate the standard setting of the switch. When the switch is not set as shown by the figure and ( ), the setting of the switch varies with the system concerned.
PN-2DPCB (DPC)

Location of Lamps, Switches and Connectors

![Diagram showing the location of lamps, switches, and connectors for PN-2DPCB (DPC)]
## Lamp Indications

<table>
<thead>
<tr>
<th>LAMP NAME</th>
<th>COLOR</th>
<th>FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>BL0</td>
<td>Red</td>
<td>No. 0 Circuit: ON: Ready for digital data transmission or the circuit is busy. OFF: Fixed path is not connected. Flash (60IPM): Make-busy state or the system data for this card is not assigned. Flash (120IPM): Fixed path is connected.</td>
</tr>
<tr>
<td>LB01</td>
<td>Red</td>
<td>ON: Loop Back 1 is set. OFF: Normally operating.</td>
</tr>
<tr>
<td>LB02</td>
<td>Red</td>
<td>ON: Loop Back 2 is set. OFF: Normally operating.</td>
</tr>
<tr>
<td>RSC0</td>
<td>Green</td>
<td>ON: RTS/C signal ON OFF: RTS/C signal OFF</td>
</tr>
<tr>
<td>SDT0</td>
<td>Green</td>
<td>ON: TXD/T signal is “0”. OFF: TXD/T signal is “1”.</td>
</tr>
<tr>
<td>RDR0</td>
<td>Green</td>
<td>ON: RXD/R signal is “0”. OFF: RXD/R signal is “1”.</td>
</tr>
<tr>
<td>CDI0</td>
<td>Green</td>
<td>ON: DCD/I signal ON OFF: DCD/I signal OFF</td>
</tr>
</tbody>
</table>

(Continued)
### List of Required Circuit Cards

<table>
<thead>
<tr>
<th>LAMP NAME</th>
<th>COLOR</th>
<th>FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>BL1</td>
<td>Red</td>
<td>ON: Ready for digital data transmission or the circuit is busy. OFF: Fixed path is not connected. Flash (60IPM): Make-busy state or the system data for this card is not assigned. Flash (120IPM): Fixed path is connected.</td>
</tr>
<tr>
<td>LB11</td>
<td>Red</td>
<td>ON: Loop Back 1 is set. OFF: Normally operating.</td>
</tr>
<tr>
<td>LB12</td>
<td>Red</td>
<td>ON: Loop Back 2 is set. OFF: Normally operating.</td>
</tr>
<tr>
<td>RSC1</td>
<td>Green</td>
<td>ON: RTS/C signal ON OFF: RTS/C signal OFF</td>
</tr>
<tr>
<td>SDT1</td>
<td>Green</td>
<td>ON: TXD/T signal is “0”. OFF: TXD/T signal is “1”.</td>
</tr>
<tr>
<td>RDR1</td>
<td>Green</td>
<td>ON: RXD/R signal is “0”. OFF: RXD/R signal is “1”.</td>
</tr>
<tr>
<td>CDI1</td>
<td>Green</td>
<td>ON: DCD/I signal ON OFF: DCD/I signal OFF</td>
</tr>
</tbody>
</table>

#### Switch Settings

<table>
<thead>
<tr>
<th>SWITCH NAME</th>
<th>SWITCH NUMBER</th>
<th>SETTING POSITION</th>
<th>FUNCTION</th>
<th>CHECK</th>
</tr>
</thead>
<tbody>
<tr>
<td>SW1 (Piano Key SW)</td>
<td>1</td>
<td>ON</td>
<td>No. 0 Circuit Loop Back 1 ON</td>
<td>Loop Back 1 OFF</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>ON</td>
<td></td>
<td>Loop Back 2 ON</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>ON</td>
<td></td>
<td>Loop Back 2 OFF</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>ON</td>
<td>No. 1 Circuit Loop Back 1 ON</td>
<td>Loop Back 1 OFF</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
<td></td>
<td>Loop Back 2 ON</td>
</tr>
</tbody>
</table>

(Continued)
<table>
<thead>
<tr>
<th>SWITCH NAME</th>
<th>SWITCH NUMBER</th>
<th>SETTING POSITION</th>
<th>FUNCTION</th>
<th>CHECK</th>
</tr>
</thead>
<tbody>
<tr>
<td>SW0 (Dip SW)</td>
<td>1</td>
<td>ON</td>
<td>No. 0 Circuit</td>
<td>Forcibly turning the DTR signal to ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
<td></td>
<td>The DTR signal from DTE goes through the card</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>ON</td>
<td></td>
<td>Forcibly turning the RTS/C signal to ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
<td></td>
<td>The RTS/C signal from DTE goes through the card</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>OFF</td>
<td>Not used</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>ON</td>
<td></td>
<td>V.11 (X.21) interface</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
<td></td>
<td>V.24/V.28 (RS-232C) interface</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>ON</td>
<td>No. 1 Circuit</td>
<td>Forcibly turning the DTR signal to ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
<td></td>
<td>The DTR signal from DTE goes through the card</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>ON</td>
<td></td>
<td>Forcibly turning the RTS/C signal to ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
<td></td>
<td>The RTS/C signal from DTE goes through the card</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>OFF</td>
<td>Not used</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>ON</td>
<td></td>
<td>V.11 (X.21) interface</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
<td></td>
<td>V.24/V.28 (RS-232C) interface</td>
</tr>
</tbody>
</table>

The figure in the SWITCH NAME column and the position in ( ) in the SETTING POSITION column indicate the standard setting of the switch. When the switch is not set as shown by the figure and ( ), the setting of the switch varies with the system concerned.

**NOTE:** When the power is on, disconnect the cables before unplugging the circuit card, and connect the cables after plugging the circuit card.
PN-M03 (M03)

Location of Lamps, Switches and Connectors
## Lamp Indications

<table>
<thead>
<tr>
<th>LAMP NAME</th>
<th>COLOR</th>
<th>FUNCTION</th>
</tr>
</thead>
</table>
| OPE       | Green | ON: This card is normally connected to the PN-2DPCB.  
           |       | OFF: This card is abnormally connected to the PN-2DPCB. |
| RS        | Green | ON: RTS signal is ON. 
           |       | OFF: RTS signal is OFF. |
| SD        | Green | ON: TXD signal is “0” (Space condition).  
           |       | OFF: TXD signal is “1” (Mark condition). |
| RD        | Green | ON: RXD signal is “0” (Space condition).  
           |       | OFF: RXD signal is “1” (Mark condition). |
| CD        | Green | ON: DCD signal is ON.  
           |       | OFF: DCD signal is OFF. |
| ER        | Green | ON: DTR signal is ON.  
           |       | OFF: DTR signal is OFF. |
| DR        | Green | ON: DSR signal is ON.  
           |       | OFF: DSR signal is OFF. |
| CS        | Green | ON: CTS signal is ON.  
           |       | OFF: CTS signal is OFF. |
| SELX21    | Green | ON: Connecting to the PN-2DPCB is available.  
           |       | OFF: Connecting to the PN-2DPCB is not available. |
| SELCN0    | Green | Not used |
### Switch Settings

<table>
<thead>
<tr>
<th>SWITCH NAME</th>
<th>SWITCH NUMBER</th>
<th>SETTING POSITION</th>
<th>FUNCTION</th>
<th>CHECK</th>
</tr>
</thead>
<tbody>
<tr>
<td>SW0 (Dip SW)</td>
<td>1</td>
<td>OFF</td>
<td>Always set to OFF</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>OFF</td>
<td>Not used</td>
<td></td>
</tr>
<tr>
<td>JP1A (Jumper pin)</td>
<td></td>
<td>Right</td>
<td>TXC(2) signal is sent out.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Left</td>
<td>TXC(2) signal is inputted.</td>
<td></td>
</tr>
<tr>
<td>NOTE</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>JP1B (Jumper pin)</td>
<td></td>
<td>Right</td>
<td>TXC(2) signal is sent out.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Left</td>
<td>TXC(2) signal is inputted.</td>
<td></td>
</tr>
<tr>
<td>NOTE</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OPSD (Jumper pin)</td>
<td></td>
<td>Right</td>
<td>Set the function of extending distance for TXD signal.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Left</td>
<td>Cancel the function of extending distance for TXD signal.</td>
<td></td>
</tr>
<tr>
<td>OPRS (Jumper pin)</td>
<td></td>
<td>Right</td>
<td>Set the function of extending distance for RTS signal.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Left</td>
<td>Cancel the function of extending distance for RTS signal.</td>
<td></td>
</tr>
<tr>
<td>OPER (Jumper pin)</td>
<td></td>
<td>Right</td>
<td>Set the function of extending distance for DTR signal.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Left</td>
<td>Cancel the function of extending distance for DTR signal.</td>
<td></td>
</tr>
</tbody>
</table>

The figure in the SWITCH NAME column and the position in the SETTING POSITION column indicate the standard setting of the switch. When the switch is not set as shown by the figure and , the setting of the switch varies with the system concerned.

**NOTE:** The JP1A and JP1B must be set to the same position each other.