NEAX® 2000 IVS

ISDN System Manual

NEAX2000 IVS
ISDN System Manual

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This page is for your notes.

CHAPTER 1   INTRODUCTION

1. PURPOSE

This manual provides the information needed for installing and programming the system data to provide the ISDN service on the NEAX2000 IVS (PBX).

2. OUTLINE OF THE MANUAL

This manual consists of five chapters. The contents of Chapters 2 through 5 are outlined as follows:

- CHAPTER 2 (SYSTEM DESCRIPTION):
  This chapter explains the system configuration and system specifications required to provide ISDN on the PBX.
- CHAPTER 3 (INSTALLATION):
  This chapter explains the procedure for hardware installation which is required to provide ISND on the PBX.
- CHAPTER 4 (SYSTEM DATA PROGRAMMING):
  This chapter explains the system data programming procedure required to assign ISDN.
- CHAPTER 5 (INSTALLATION TEST):
  This chapter explains the operation tests to be performed after completing the installation of ISDN on the PBX.

3. REFERENCE MANUALS

When installing ISDN and assigning the relevant system data, refer to the following manuals in addition to this manual:

- Installation Procedure Manual
- Command Manual
- Office Data Programming Manual
- SMDR System Manual
- Circuit Card Manual

When assigning the relevant system data for providing the CCIS service features, refer to the CCIS System Manual.

This page is for your notes.

CHAPTER 2   SYSTEM DESCRIPTION

1. GENERAL

This chapter explains the system configuration, additional hardware and system specifications pertaining to ISDN of the PBX.

2. SYSTEM CONFIGURATION

2.1 System Outline

The PBX can interface with an ISDN with Primary Rate Interface (1.5 Mbps PCM - 23B + D), Basic Rate Interface (144 kbps PCM - 2B + D) and ISDN Terminal.

2.1.1   System Outline of ISDN with PRI

When installing ISDN-PRI for a NEAX2000 IVS, two circuit cards are required. A PN-24DTA/24DTA-A 24-channel Digital Trunk Interface (DTI) card is used to interface to the digital network, and satisfies the requirements for ISDN Layer 1. A PN-SC01 D Channel Handler (DCH) card is used to transmit and receive D Channel signaling data to/from the network. A phase-locked oscillator (PLO) is required to synchronize the PBX with the network.

Figure 2-1 shows the connection diagram for PBX and ISDN Line with PRI.
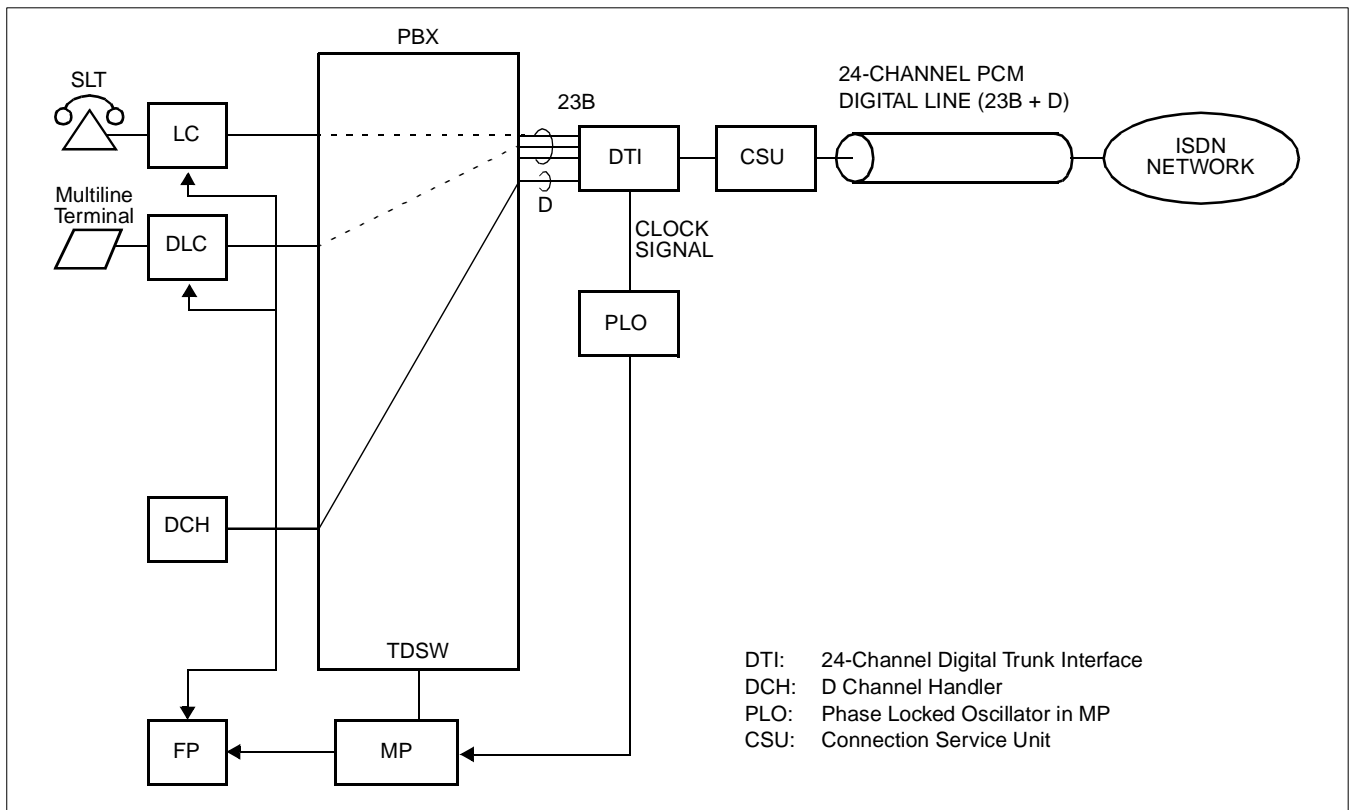
Figure 2-1   Connection Diagram for PBX and ISDN Line with PRI

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2.1.2 System Outline of ISDN with BRI

When the system is to be interfaced with a relevant ISDN exchange with the Basic Rate Interface (BRI), it is necessary to install a BRI card for the digital network interface. A Phase Locked Oscillator (PLO) is required to synchronize the PBX with the network.

Figure 2-2 shows the connection diagram of ISDN with BRI.
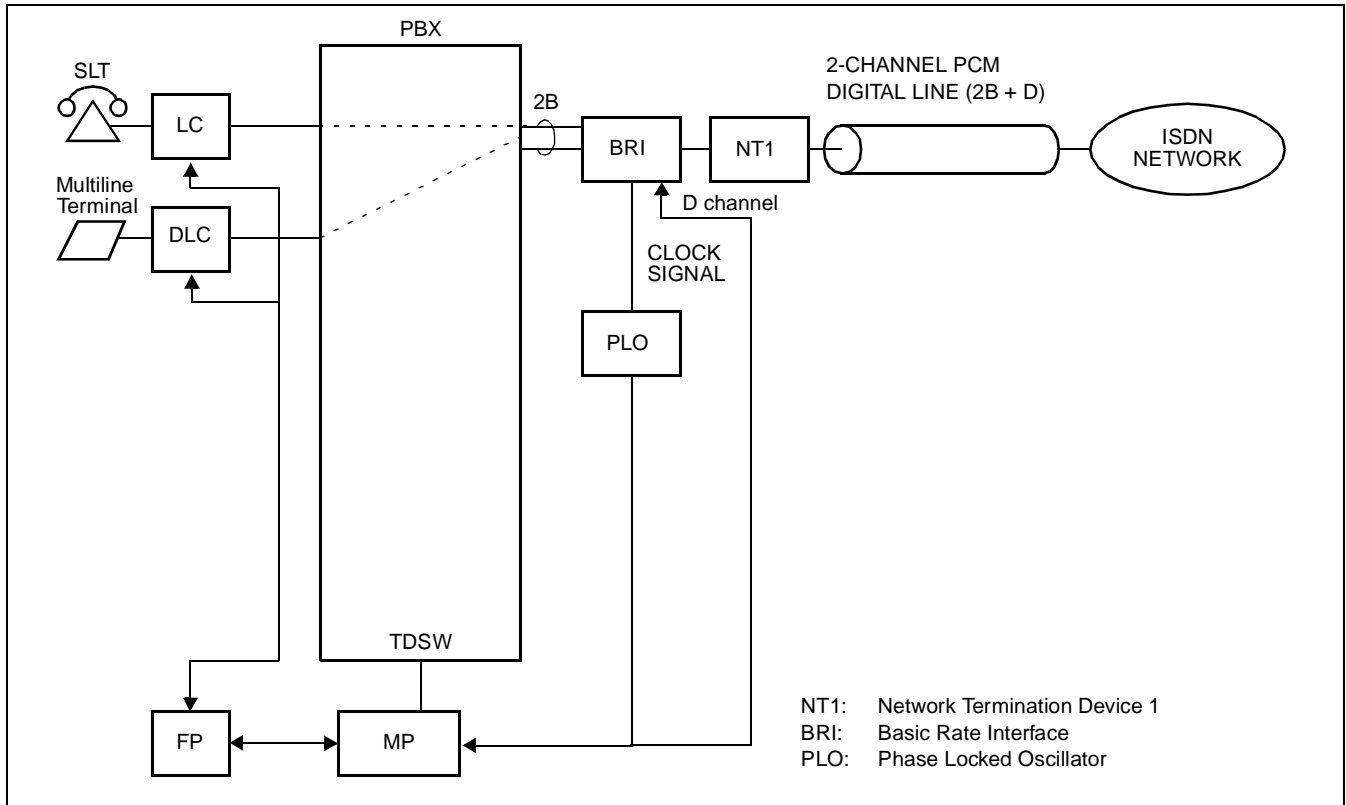
Figure 2-2   Connection Diagram for PBX and ISDN Line with BRI

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2.1.3 System Outline of ISDN Terminal

When providing the system with an ISDN Terminal, it is necessary to install an ISDN Line Circuit (ILC) card for the line interface of an ISDN Terminal and an ISDN Channel Handler (ICH) card for layer 2 protocol processing (LAP-D).

Figure 2-3 and Figure 2-4 show the connection diagram of ISDN Terminal.

Note 1: *When providing ISDN Terminal, the ILC and ICH are necessary.*

Note 2: *The following connections are only available.*

> • *ISDN Terminal to ISDN Terminal Connection*
> • *ISDN Terminal to ISDN Trunk (DTI) Connection*
> • *ISDN Trunk (DTI) to ISDN Terminal Connection*
> • *ISDN Terminal to Single Line Telephone Connection*
> • *ISDN Terminal to Multiline Terminal Connection*
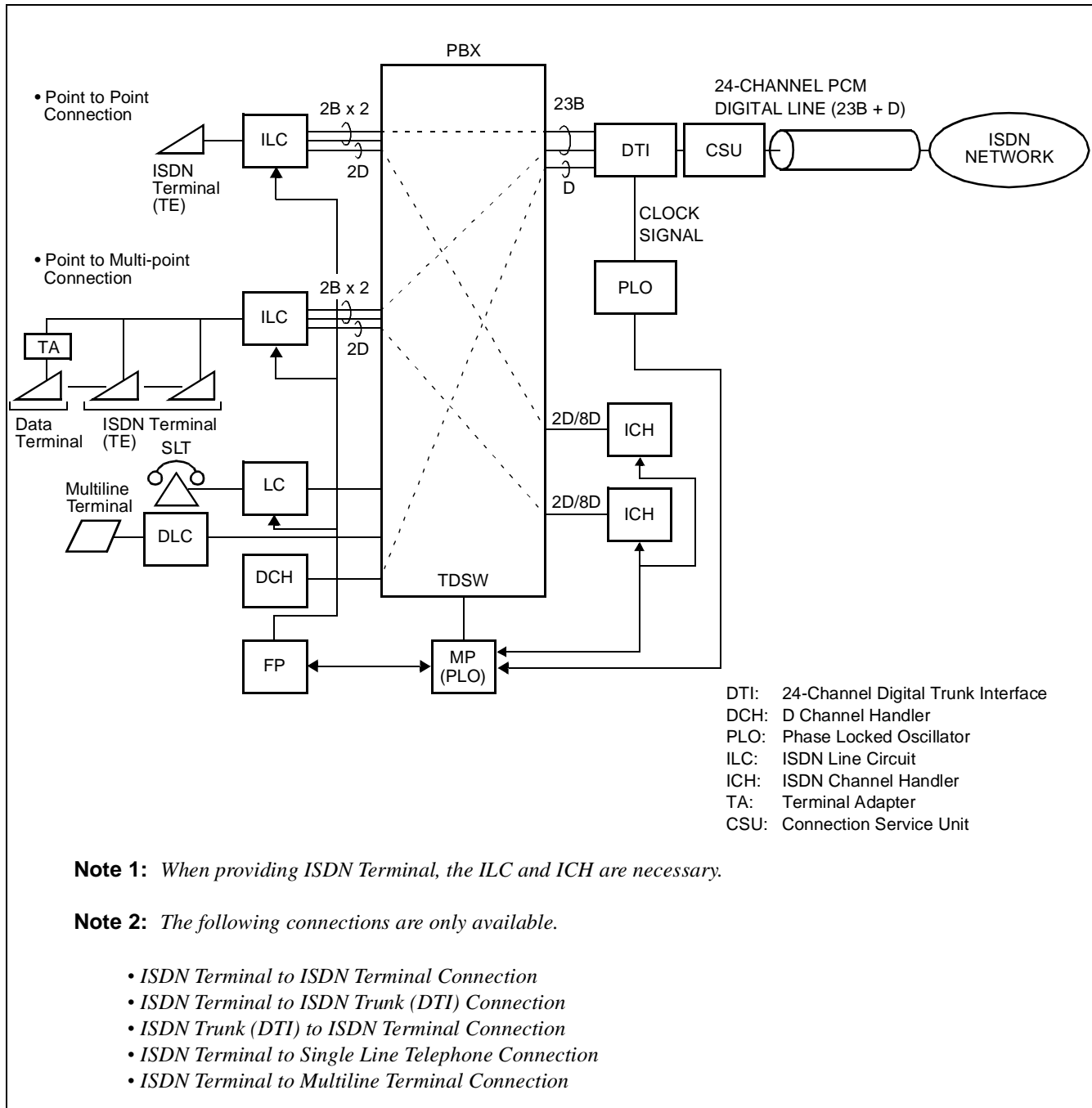
Figure 2-3   Connection Diagram of ISDN Terminal (for ISDN with PRI)

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NT1: Network Termination Device 1
BRI: Basic Rate Interface
PLO: Phase Locked Oscillator
ILC: ISDN Line Circuit
ICH: ISDN Channel Handler
TA: Terminal Adapter

Note 1: *When providing ISDN Terminal, the ILC and ICH are necessary.*

Note 2: *The following connections are only available.*

   • *ISDN Terminal to ISDN Terminal Connection (S/T Interface)*
   • *ISDN Terminal to ISDN Trunk (BRI) Connection (S/T Interface)*
   • *ISDN Trunk (BRI) to ISDN Terminal Connection (S/T Interface)*
   • *ISDN Terminal to Single Line Telephone Connection*
   • *ISDN Terminal to Multiline Terminal Connection*

Figure 2-4   Connection Diagram of ISDN Terminal (for ISDN with BRI)

2.1.4   System Outline of Event Based CCIS

Event Based CCIS allows a PBX customer who does not have a tie line (or when a customer can not use the tie line due to the busy or fault of the line), to use the various CCIS feature by using the ISDN line as a CCIS virtual tie line, on the 2400 ICS - 2000 IVS connection or the 2000 IVS - 2000 IVS connection. For the PBX customer who usually has low traffic, Event Based CCIS allows the CCIS feature by the virtual tie line, without adding a large scale system.

Figure 2-5 shows the outline of Event Based CCIS.
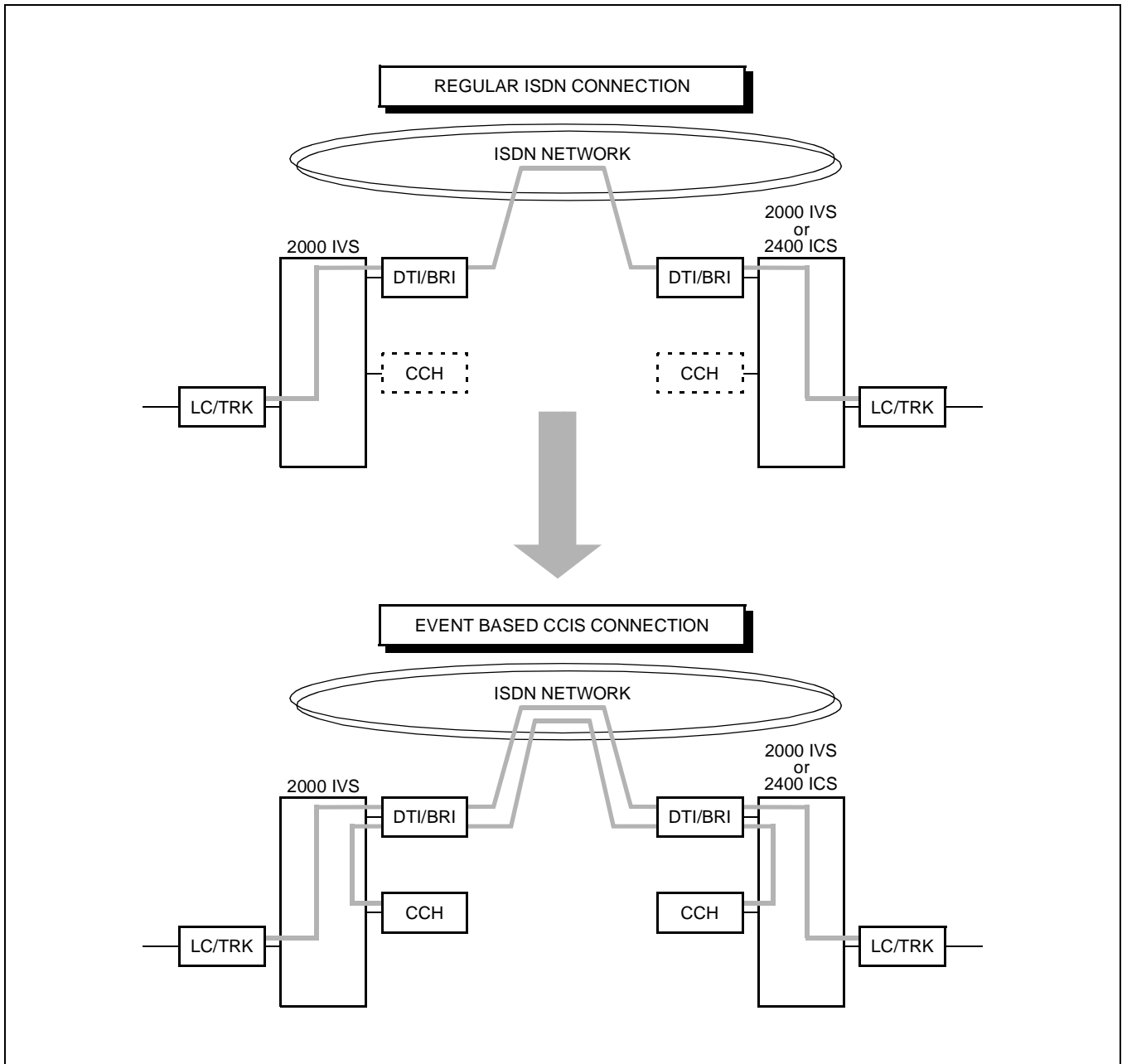
Figure 2-5   Outline of Event Based CCIS

- COMMON CHANNEL AND VOICE CHANNEL LINK CONTROL

When the call is a regular ISDN call, or when there is no call on the PBX, the common channel and the voice channel for virtual tie line is disconnected.

If the sub-address sent from an extension or a trunk informs the number to activate the CCIS link, the PBX performs making a CCIS link. When the opposite office sends the answering signal ("connect") to the ISDN network, a connection between ISDN line and the Common Channel Handler (CCH) card is made, then the virtual tie line (Event Based CCIS) is formed.
When receiving the signal from the opposite office, and the sub-address includes the trunk number of CCH card, the PBX performs making CCIS connection as the same method.

If the virtual tie lines are all busy, or when the virtual tie line connection can not be made due to a line fault, a call is transmitted to the opposite office via ISDN network as a regular ISDN call not as a CCIS call.

When certain time passes after all calls finish, the voice channel and common channel is released and CCIS link is disconnected. The release timer can be set by the system data programming for common channel and voice channels respectively.

2.2 DTI

The Digital Trunk Interface (DTI) interfaces the PBX to the ISDN Line and provides the following functions.

- Unipolar/Bipolar Conversion (AMI Format)
- Alarm Detection/Insertion
- Digital PAD on Voice Signal Transmission
- Loop-Back Test (Local/Remote Loop Back)
- Cyclic Redundancy Checking (based on ITU-T Rec. G704) for ESF Framing

For connections of DTI and transmission line, twisted-pair cable can be used.

2.3 DCH

The D Channel Handler (DCH) provides the D Channel signalling interface through the DTI to an ISDN line, and it is responsible for signalling between the PBX and the ISDN network under control of the system MP.

2.4 BRI

The Basic Rate Interface (BRI) provides one or two physical interfaces to the ISDN-Basic Rate Interface service (144 kbps PCM - 2B + D).

The BRI has the following functions.

- Unipolar/Bipolar Conversion (AMI Format)(S/T Interface)
- Signalling Insertion/Extraction
- Frame Synchronization
- Digital PAD on Voice Signal Transmission

For connections of BRI and transmission line, twisted-pair cables can be used.

2.5 PLO

The Phase Locked Oscillator (PLO) is responsible for providing synchronization between the TDSW and an ISDN exchange. In the PBX, the internal PLO equipped with the MP card or the PLO card (PN-CK00) is used.

When the PBX is a slave office, the PLO generates a synchronized clock signal according to the master clock signals supplied from the ISDN network, and supplies the generated clock signal to the TDSW. The PLO is supplied with clock signals extracted by DTI/BRI. The PLO can be equipped with two clock supply routes; one is the Route 0 to receive clock signals normally, and the other is a standby Route 1 to receive clock signals when no clock signals from the Route 0 due to the transmission line failure. If the PBX requires two clock supply routes and those frequency differ from each other, the PLO card is required. When no clock signals from the Route 0 and the Route 1, the PLO keeps to generating the clock signals with the frequency of previous master clock. When using the internal PLO equipped with the MP card, only slave synchronization is possible.

When the PBX is a master office, the PLO card is required. The PLO card generates the clock signals as master clock for providing synchronization between the TDSW and another office.

Figure 2-6 shows an example of clock supply route configuration.

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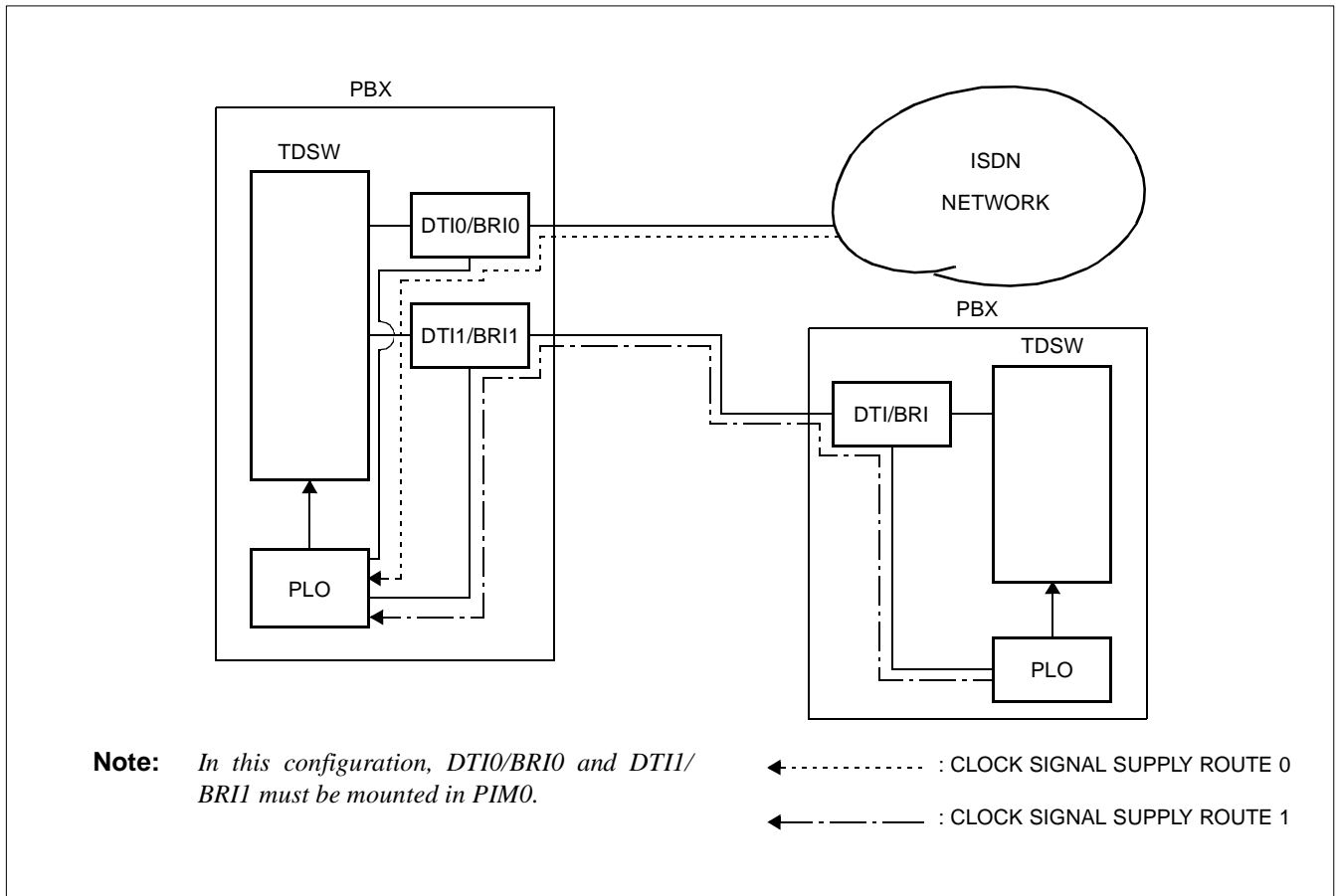
Figure 2-6   Clock Supply Route Configuration

2.6   ICH

The ISDN Channel Handler (ICH) provides the D channel signalling interface and controls an ILC (Layer 2 and 3). PN-SC02 is the 2channel ICH card and PN-SC03 is the 8channel ICH card.

2.7   ILC

The ISDN Line Circuit (ILC) provides a physical interfaces to the ISDN Terminal. The interface provides for a maximum of 2 line circuit.

2.8 Equipment for Event Based CCIS

For Event Based CCIS, the Virtual Trunks which are used as a No. 7 CCIS trunk, the existing CCH card and DTI/BRI card are required to activate No. 7 CCIS link (virtual tie line connection) on an ISDN network.

Virtual Trunk:

> The Virtual Trunk consists of a Home-Side Trunk and a Mate-Side Trunk. The Home-Side Trunk is connected to the station side, and the Mate-Side Trunk is connected to network side of the PBX virtually. (See Figure 2-7).

> The virtual trunks does not exist actually, but are handled as No. 7 CCIS trunk by the system, for system data. ISDN sub-address programmed to the virtual trunk is used to establish a CCIS link and individual voice link.
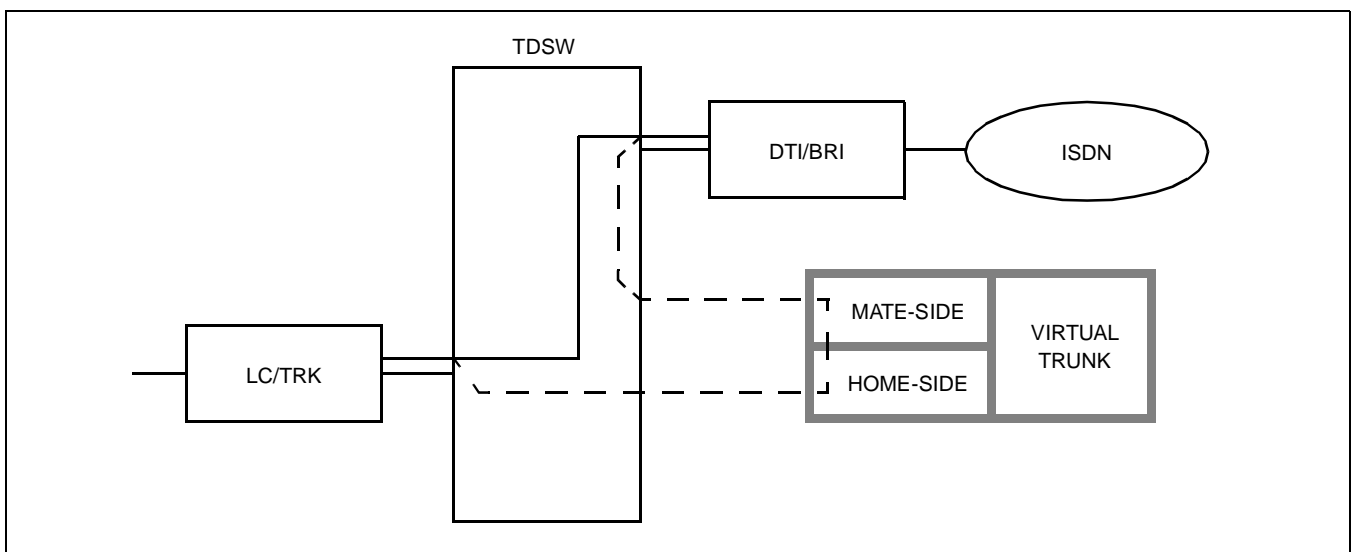
Figure 2-7   Virtual Trunk

CCH Card:

> The CCH card is used to handle the common channel signaling.

DTI/BRI Card:

> The system uses the same interface trunk (PRI/BRI card) for regular ISDN connection and the virtual tie line connection on Event Based CCIS.

3. SYSTEM SPECIFICATION

3.1 System Capacity

3.1.1 System Capacity for ISDN with PRI

Table 2-1 System Capacity for ISDN with PRI

DESCRIPTION	CAPACITY	REMARKS
Max. No. of DTI Card	5	Depending on the No. of DCH
Max. No. of DCH Card	5	
Max. No. of Trunks for DTI	115	115 B channels
Max. No. of ISDN Lines	5	1 Line/DTI
Max. No. of Trunks per ISDN Line	23	23 B channels per ISDN link
Max. No. of PLO Card	1	
Max. No. of Time Slot per DTI Card	24	
Max. No. of Time Slot per DCH Card	1	

3.1.2 System Capacity for ISDN with BRI

Table 2-2 System Capacity for ISDN with BRI

DESCRIPTION	CAPACITY	REMARKS
Max. No. of BRI Card	12	
Max. No. of Trunks for BRI	24	
Max. No. of PLO Card	1	
Max. No. of ICH Card	12	
Max. No. of ILC Card	12/48	Using SC02/SC03
Max. No. of Time Slot per BRI Card	2/4	Using BRTA/2BRTC
Max. No. of Time Slot per ICH Card	1/4	Using SC02/SC03
Max. No. of Time Slot per ILC Card	5	

3.2 System Conditions

3.2.1 Time Slot Assignment Condition

As shown in Figure 2-8, the DTI/DCH/ICH/BRI cards use the time slots on the same highway as the other application cards.
However, the following conditions are required on the time slot assignment.

- The total number of time slots for all DTI/DCH/ICH/BRI cards must be less than 128 time slots including all other AP cards.
- The total number of time slots for all DTI/BRI cards must be less than 512 time slots including all L/T cards.
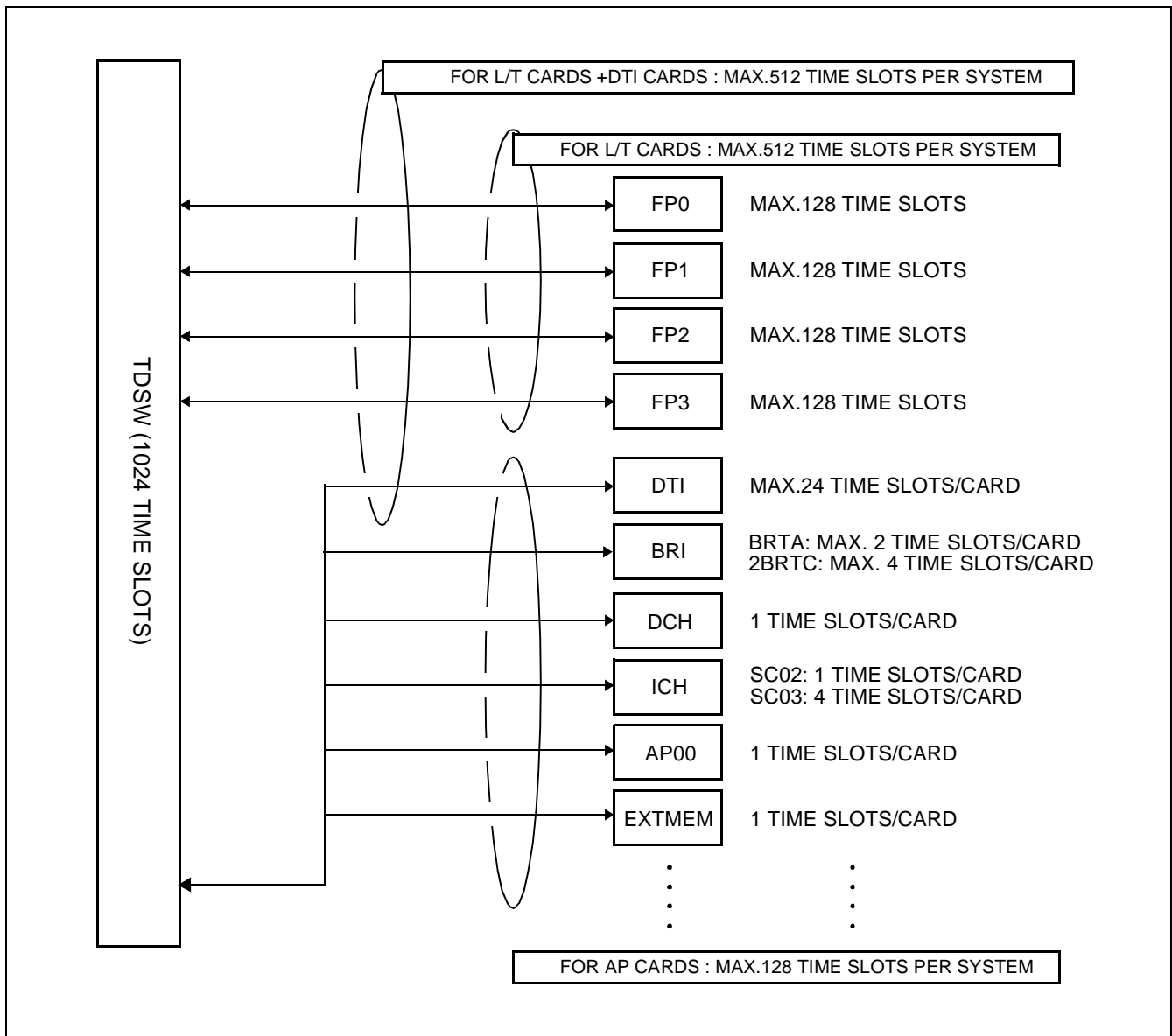
Figure 2-8   Accommodation of DTI/DCH/ICH into TDSW

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3.2.2 Time Slot Allocation for DTI/DCH 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 2-9, even when Channel 1 through Channel 10 have been assigned by the system data programming (CM07 YY = 01) excepting 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.

In the case of the DCH card, one time slot is allocated for setting up a fixed path between the DTI and the DCH by assigning Channel 23 of the DTI as the D Channel.
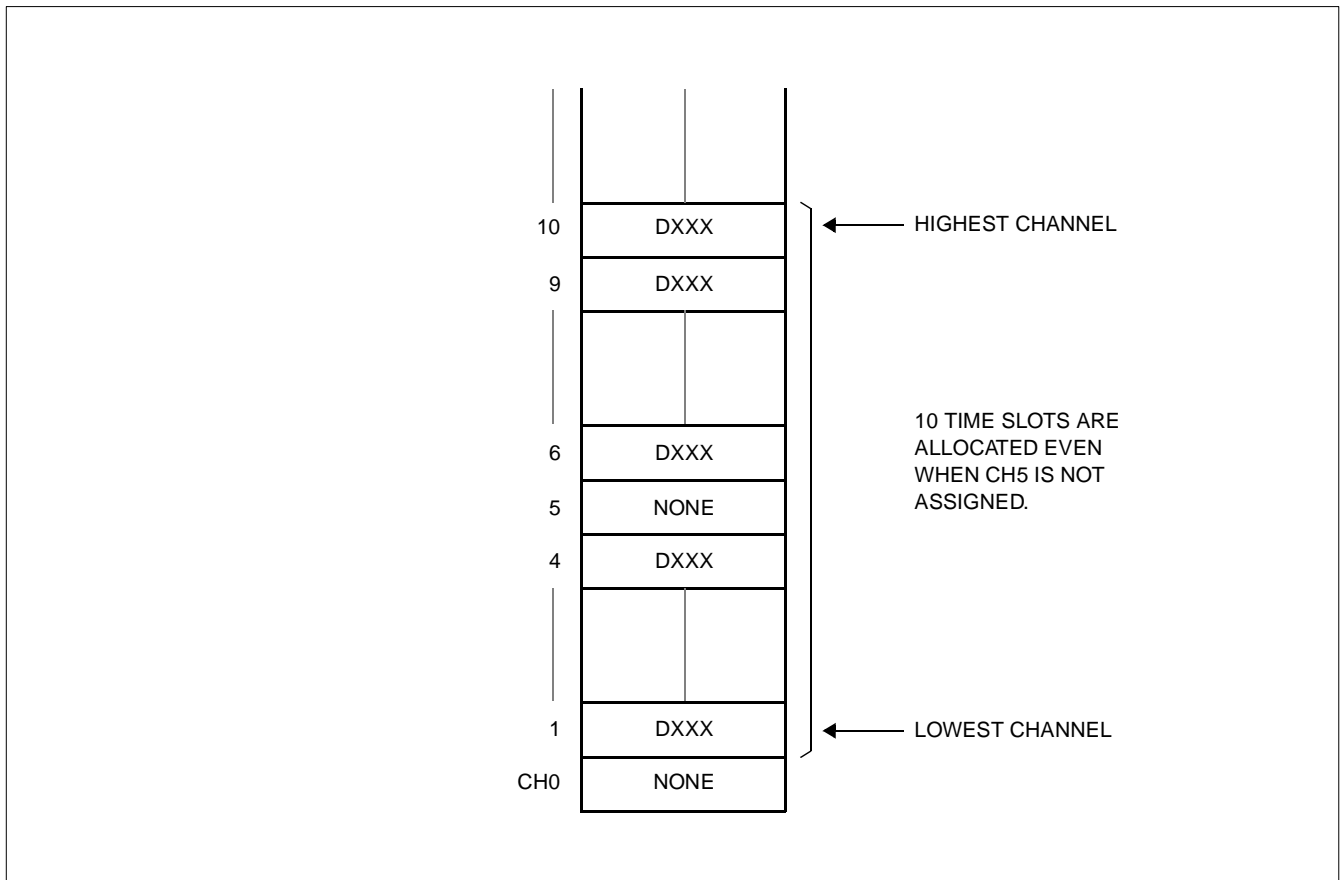
Figure 2-9   Time Slot Allocation for DTI

3.2.3 Line Distance between PBX and CSU/ISDN Terminal

Figure 2-10 shows the line distance between PBX and CSU and the line distance between PBX and ISDN Terminal.

Note 1: *The line distance marked by * shows the value when the 0.5ø (24 AWG) twisted-pair cable is used.*

Note 2: *The line distance marked by ** shows the value when the 0.65ø (22 AWG) twisted-pair cable is used.*
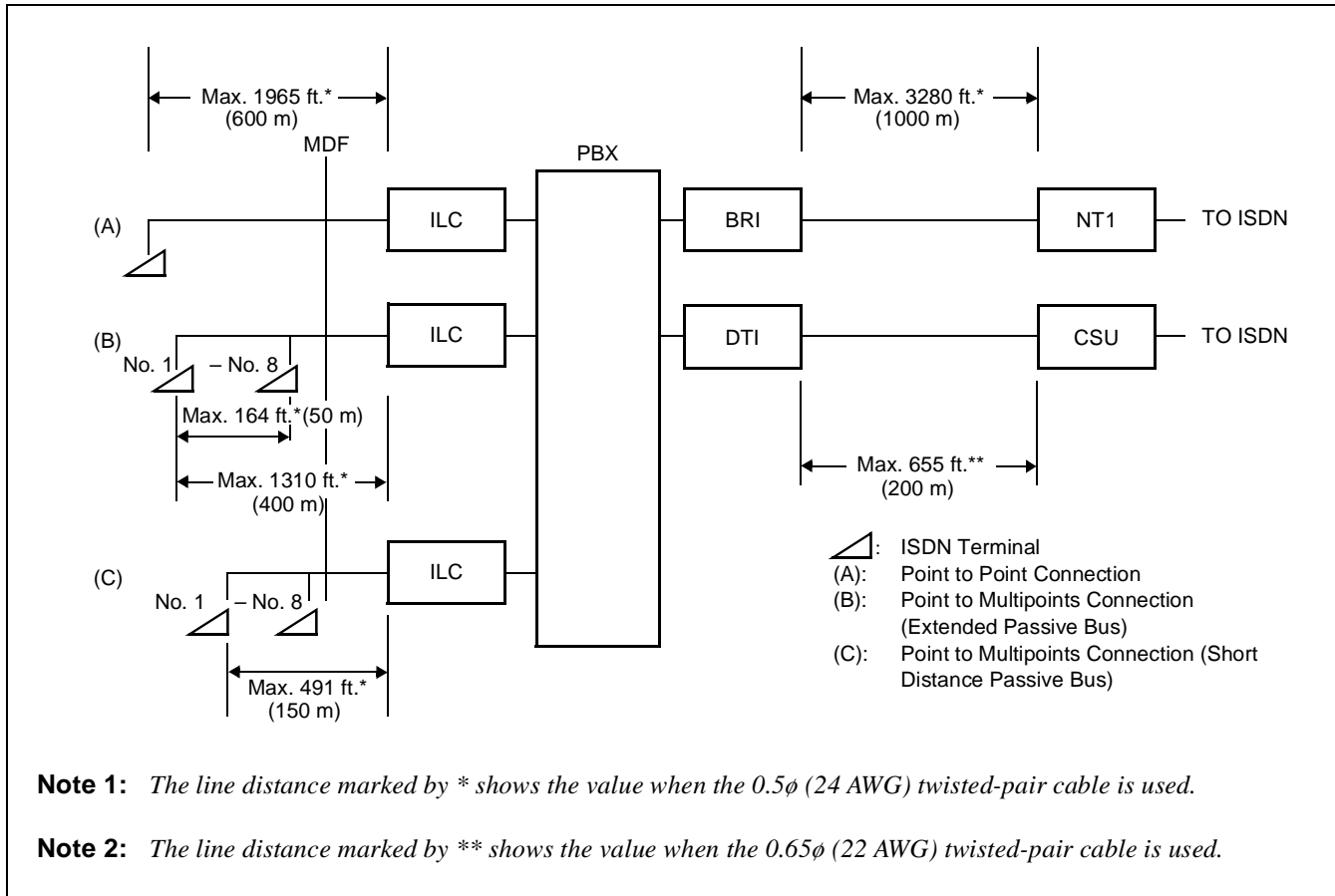
Figure 2-10   Line Distance between PBX and CSU/ISDN Terminal

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3.2.4 Service Conditions for Event Based CCIS

- Event Based CCIS is available in 2000 IVS to 2000 IVS or 2000 IVS to 2400 ICS.

- The maximum number of the virtual tie lines is 16 channels per one system, including both common signaling channels and voice channels.

- The ISDN line used for the virtual tie line can also be used as a regular ISDN line.
The trunk route used for the virtual tie line can be distinguished from the regular ISDN line by assigning different route data on system data programming.

- This feature supports voice calls only. (Supported object at PBX transmission side: single line telephone, Multiline Terminal, DID/E&M/Ring Down [analog/T1] tandem calls.)
The data calls are transmitted via the regular ISDN network.

- The Peg Count (the number of originating call from the ISDN trunk) is counted when using the ISDN line for the virtual tie line by route basis.

- Billing information of the virtual tie line using the ISDN line can be treated as regular tie line calls.

- Billing information of the virtual tie line using the ISDN line can be treated on tandem calls.

- The voice channel of the virtual tie line is released at a certain time after the call finishes.
The common signaling channel of virtual tie line is released at a certain time after all calls on voice channels finish. (The release timer is determined by the system data, toward the voice channel and the common signaling channel respectively).
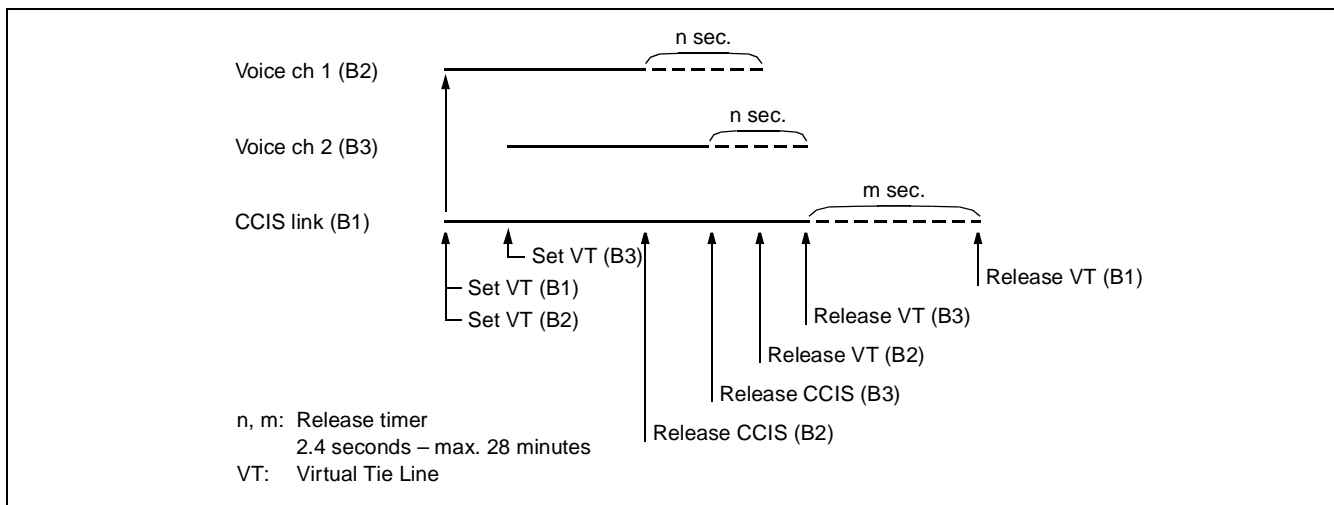
Figure 2-11   Release Timing of Virtual Tie Line and CCIS Link

• The availability of CCIS service features for Event Based CCIS are listed in the following table.

Table 2-3 Availability of CCIS Service Features for Event Based CCIS

SERVICE FEATURE	AVAILABILITY	REMARKS
Attendant Camp-On with Tone Indication-CCIS	X	
Attendant Controlled Conference-CCIS	X	**Note 4**
Brokerage-Hot-Line-CCIS	X	
Busy Verification-CCIS	X	
Call Back-CCIS	X	
Call Forwarding-All Calls-CCIS	X	
Call Forwarding-Busy Line-CCIS	X	
Call Forwarding-Don't Answer-CCIS	X	
Call Forwarding-Intercept-CCIS	X	
Call Forwarding-Override-CCIS	X	
Calling Name Display-CCIS	X	
Calling Number Display-CCIS	X	
Call Transfer-All Calls-CCIS	X	
Call Transfer-Attendant-CCIS	X	
Centralized Billing-CCIS	X	**Note 2**
Centralized Day/Night Mode Change-CCIS	–	
Consultation Hold-All Calls-CCIS	X	
Deluxe Traveling Class Mark-CCIS	X	
Dial Access to Attendant-CCIS	X	
Direct-in Termination-CCIS	X	
Distinctive Ringing-CCIS	X	
Do Not Disturb-CCIS	X	
Dual Hold-CCIS	X	
Elapsed Time Display-CCIS	X	
Flexible Numbering of Station-CCIS	X	
Hand-Free-Answer Back-CCIS	X	
House-Phone-CCIS	X	

LEGEND:

X   : Available

-    : Not Available

Table 2-3 Availability of CCIS Service Features for Event Based CCIS (Continued)

SERVICE FEATURE	AVAILABILITY	REMARKS
Hot Line-CCIS	X	
Incoming Call Identification-CCIS	X	
Individual Attendant Access-CCIS	X	**Note 5**
LDN Night Connection-CCIS	X	
Link Alarm Display-CCIS	–	
Message Waiting Lamp Setting-Attendant-CCIS	X	**Note 3**
Message Waiting Lamp Setting-Station-CCIS	X	**Note 3**
Miscellaneous Trunk Access-CCIS	X	
Miscellaneous Trunk Restriction-CCIS	X	
Multiple Call Forwarding-All Calls-CCIS	X	
Multiple Call Forwarding-Busy Line-CCIS	X	
Multiple Call Forwarding-Don't Answer-CCIS	X	
Night Connection Fixed-CCIS	X	
Night Connection Flexible-CCIS	X	
Outgoing Trunk Queuing-CCIS	–	
Paging Access-CCIS	X	
Restriction from Outgoing Calls-CCIS	X	
Single Digit Station Calling-CCIS	X	
Station Controlled Conference-CCIS	X	**Note 4**
Station to Station Calling-CCIS	X	
Station to Station Calling-Operator Assistance-CCIS	X	
Toll Restriction-3/6 Digit-CCIS	X	
Trunk Answer from Any Station-CCIS	X	
Trunk to Trunk Restriction-CCIS	X	
Uniformed Numbering Plan-CCIS	X	
Voice Call-CCIS	X	
Voice Mail Integration-CCIS	X	

LEGEND:

X : Available

-   : Not Available

Note 1: *The voice channel and the common signaling channel keep connecting after the calls finish according to the release timer data. Therefore, while the CCIS link is kept by the timer, the features are available.*

Note 2: *The billing information is sent while the CCH link keeps connecting. If the sending of billing information is failed, it is sent again when a new CCH link is established by next call.*

Note 3: *As a remote office, this feature is available on 2000 IVS.*

Note 4: *An extension of the 2000 IVS can not be a conference leader.*

Note 5: *This service is available when the Attendant Console is provided at a 2400 ICS office on the network.*

3.3 DTI Specifications

3.3.1 Transmission Characteristics

Table 2-4 Transmission Characteristics

CHARACTERISTICS	SPECIFICATION
(1) Output	
• Line Rate	1.544 Mbps ±50 ppm
• Line Code	AMI with ZCS/B8ZS*
• Line Impedance	100 ohms
• Pulse Amplitude (Base to Peak)	3 volts ± 0.6 volts
• Pulse Width	324 ns ± 30 ns
(2)Input	
• Line Rate	1.544 Mbps ± 200 bps (130 ppm)
• Pulse Amplitude (Base to Peak)	1.5 volts – 3 volts
• Frame Synchronization Pattern	001011(24MF)
• Input Jitter	ITU-T Fig. 1/G743
• Wander	+138U1, –193UI or –138UI, +193UI
• Cable Length from PBX to CSU	
• To Connect with CSU via BRI	Max. 1000 m (3280 ft.) (with 0.5ø twisted-pair cable)
• To Connect with CSU via DTI	Max. 200 m (655 ft.) (with 0.65ø twisted-pair cable)

```
* AMI  : Alternate Mark Inversion
  ZCS  : Zero Code Suppression
  B8ZS : Bipolar Eight Zero Substitution
```

3.3.2 Frame Configuration of 24-DTI

According to the AT&T Specifications for ISDN, the frame configuration is 24-Multiframe. This configuration has 24 multiframes and each multiframe has a 24-Channel PCM signal (8 bits/channel) and a S bit (superframe bit). Figure 2-12 shows the frame configuration, and Table 2-5 shows frame bit assignment.
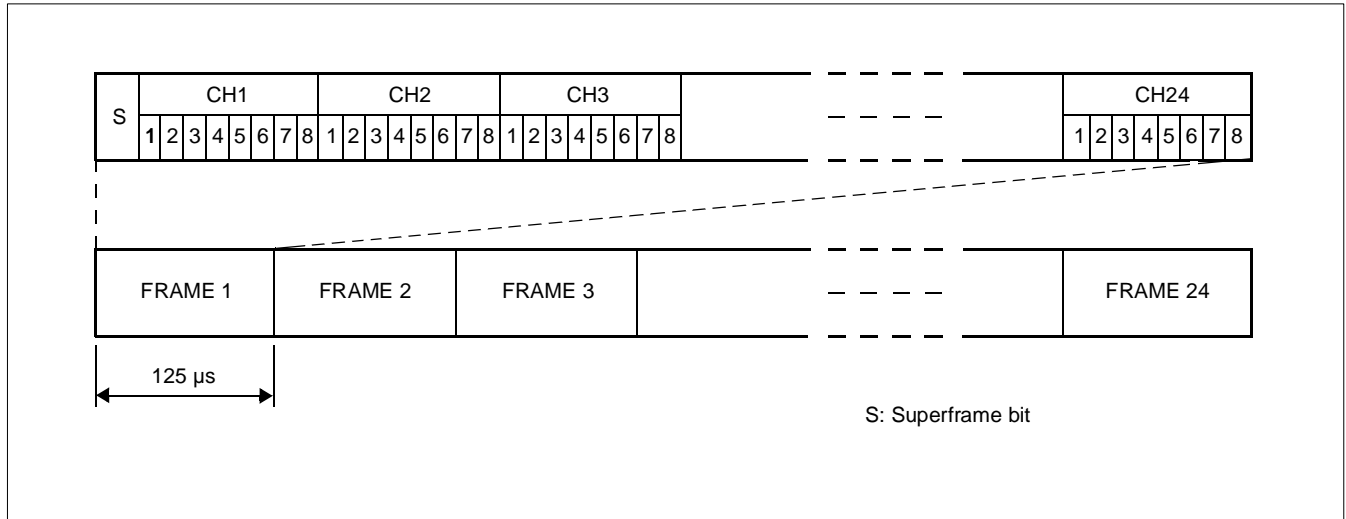
Figure 2-12 DTI Frame Configuration (24-Multiframe)

Table 2-5 24-Multi Frame Bit Assignment

FRAME No.	S BIT		
	FRAME SYNCHRONIZATION	4 Kbps DATA LINK	CRC
1		m	
2			CB1
3		m	
4	0		
5		m	
6			CB2
7		m	
8	0		
9		m	
10			CB3
11		m	
12	1		
13		m	
14			CB4
15		m	
16	0		
17		m	
18			CB5
19		m	
20	1		
21		m	
22			CB6
23		m	
24	1		

- The S-bit is the first bit in each frame.
- Frames are repeated in the order shown above.
- Frames 6, 12, and 24 become signal frames.
- "m" in the "4 kbps Data Link" column means that the frame is usually assigned to 1.

Note: *For ISDN the A B C D signal Bits are not used. ISDN uses channel 24 (D channel) for signalling.*

This page is for your notes.

CHAPTER 3   INSTALLATION

1.   GENERAL

This chapter details the installation procedure and work contents involved in providing ISDN to the PBX.

2.   PRECAUTION IN HANDLING

The installer must wear the grounded wrist strap to protect the circuit card from static electricity, when handling cards, and the installer must engage in the work on a grounded conductive work surface. (See Figure 3-1).

- WHEN PLUGGING/UNPLUGGING A CIRCUIT CARD

PBX

FRAME GROUND SCREW
CONNECT THE GROUND WIRE TO THE
FRAME EARTH OF THE EQUIPMENT.

WRIST STRAP

- WHEN HOLDING A CIRCUIT CARD

NEVER TOUCH THE COMPONENTS OR
SOLDERED SURFACE WITH BARE HANDS.

CARD FRONT
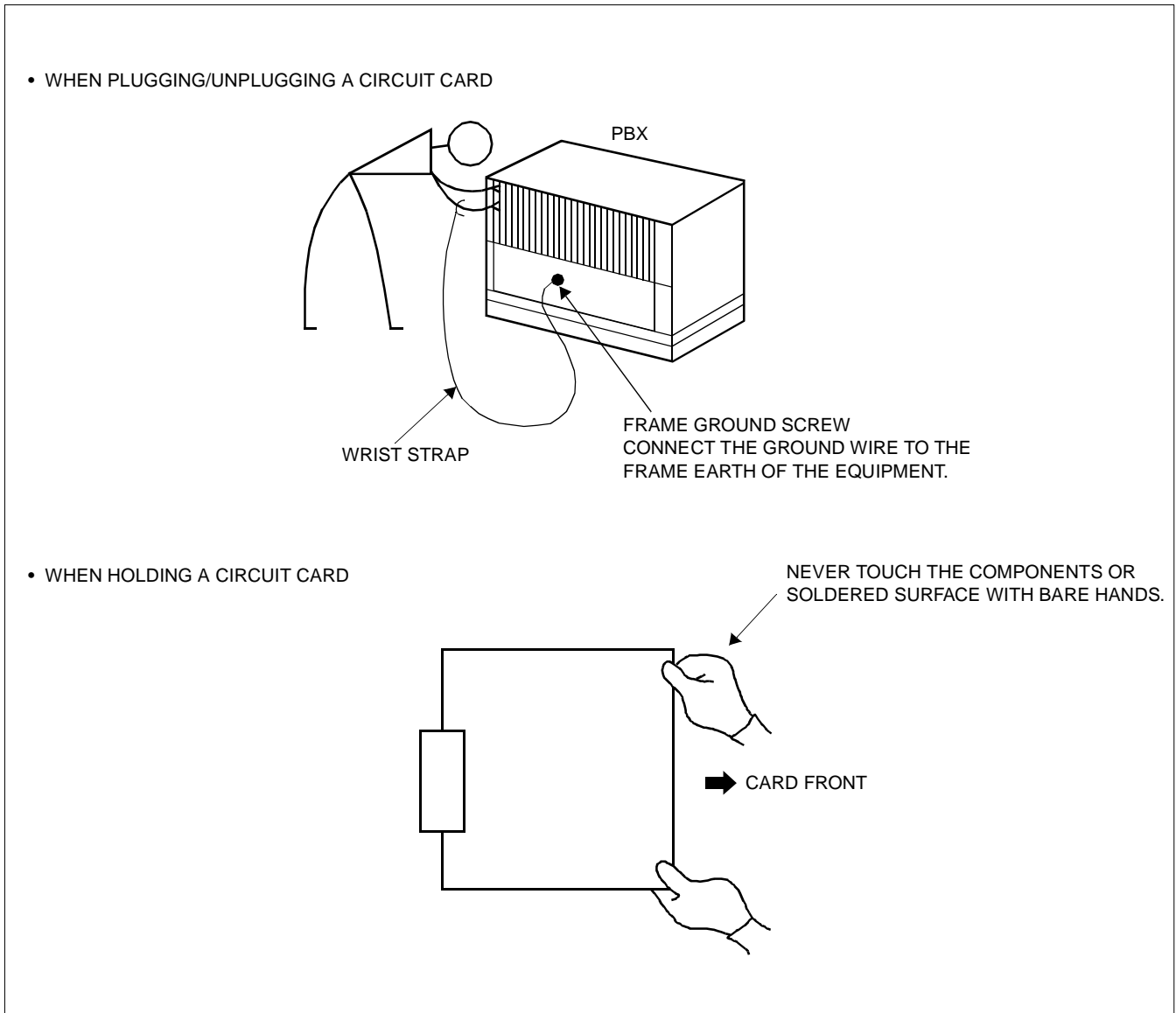
Figure 3-1   Static Electricity Precautions (1/2)

- WHEN SETTING SWITCHES ON A CIRCUIT CARD

CIRCUIT
CARD

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

- WHEN CARRYING A CIRCUIT CARD

CIRCUIT
CARD

CONDUCTIVE
POLYETHYLENE
BAG

WHEN CARRYING A CIRCUIT
CARD AROUND, KEEP THE
CARD IN THE CONDUCTIVE
POLYETHYLENE BAG.
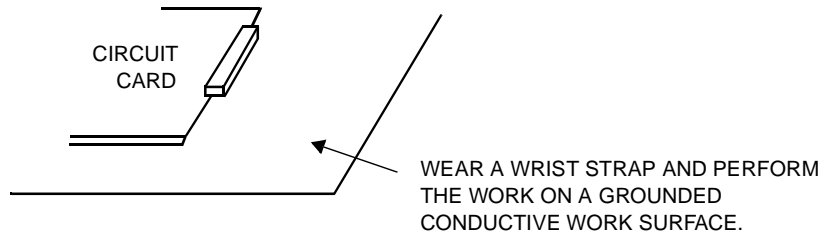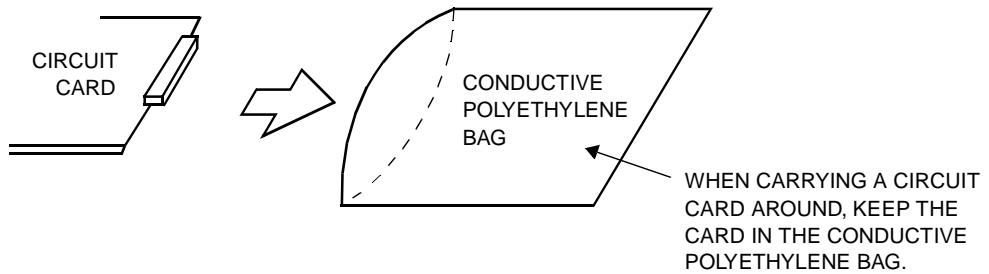
Figure 3-1 Static Electricity Precautions (2/2)

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.

ATTENTION
Contents
Static Sensitive
Handling
Precautions Required

CAUTION

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

PBX

NEVER TOUCH THE COMPONENTS
OR SOLDERED SURFACE WITH
BARE HANDS.

CARD FRONT
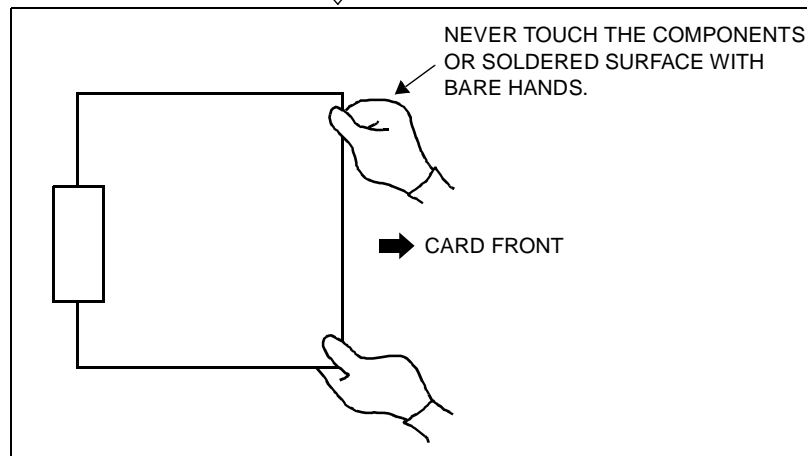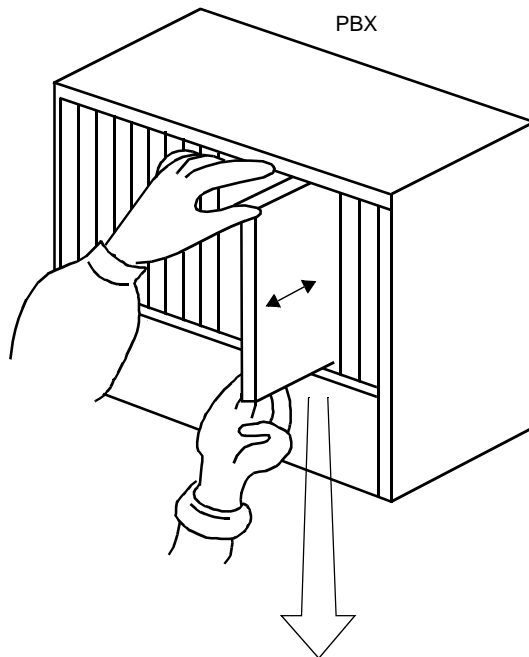
3. REQUIRED EQUIPMENT

3.1 Required Equipment for ISDN with PRI

Table 3-1 below shows the equipment required when providing ISDN with Primary Rate Interface to the system.

Table 3-1 Required Equipment for ISDN with PRI

EQUIPMENT	DESCRIPTION	QUANTITY	REMARKS
PN-24DTA/24DTA-A (DTI)	24-channel DTI card	N	N: 1 – 5
PN-SC01 (DCH)	D-channel handler card	N	N: 1 – 5
PN-CK00 (PLO)	PLO Card	1	**Note**

Note: *PLO card (PN-CK00) is required when the PBX needs to interface with two clock supply routes with different frequencies, e.g., DTI Trunk (1.544 MHz) and BRI Trunk (192 KHz or 2 MHz).*
For example: T1 at 1.544 MHz, and 192 KHz or 2 MHz for BRI Trunks: In this condition a PLO card is required.

3.2 Required Equipment for ISDN with BRI

Table 3-2 shows the equipment required when providing ISDN with Basic Rate Interface to the system.

Table 3-2 Required Equipment for ISDN with BRI

EQUIPMENT	DESCRIPTION	QUANTITY	REMARKS
PN-BRTA (BRI)	2-channel BRI card (1 BRI trunk)	N	N: 1 – 12
PN-2BRTC (BRI)	4-channel BRI card (2 BRI trunks)	N	N: 1 – 12
PN-CK00 (PLO)	PLO Card	1	**Note**
PN-SC02/SC03 (ICH)	ISDN Channel Handler Card	N	N: 1 – 12
PN-2ILCA (ILC)	ISDN Line Circuit Card	N	N: 1 – 12 (Using SC02) 1 – 48 (Using SC03)

Note: *PLO card (PN-CK00) is required when the PBX needs to interface with two clock supply routes with different frequencies, e.g., DTI Trunk (1.544 MHz) and BRI Trunk (192 KHz or 2 MHz).*
For example: T1 at 1.544 MHz, and 192 KHz or 2 MHz for BRI Trunks: In this condition a PLO card is required.

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3.3 Required Equipment for Event Based CCIS

When preparing Event Based CCIS to the system, the following equipment is required in addition to Table 3-1 or Table 3-3.

Table 3-3 Required Equipment for Event Based CCIS

EQUIPMENT	DESCRIPTION	QUANTITY	REMARKS
PN-SC00 (CCH)	Common Channel Handler Card	N	N: 1 – 4

4. INSTALLATION PROCEDURE

4.1 Installation Procedure for ISDN with PRI

Perform the installation procedure shown in Figure 3-2.

Note: *When requiring Call Recording of ISDN call, execute the installation procedure for SMDR. For details, refer to the SMDR System Manual.*

```
            ┌─────────────┐
            │    START    │
            └──────┬──────┘
                   │
      ┌────────────────────────┐
      │  MOUNTING DTI AND      │     SEE SECTION 4.1.1
      │     DCH CARD           │
      └────────────┬───────────┘
                   │
      ┌────────────────────────┐
      │  SELECTION OF PLO IN   │     SEE SECTION 4.1.2
      │       MP CARD          │
      └────────────┬───────────┘
                   │
      ┌────────────────────────┐
      │  MOUNTING PLO CARD     │     SEE SECTION 4.1.4
      │                        │     Note
      └────────────┬───────────┘
                   │
      ┌────────────────────────┐
      │  CABLE CONNECTION      │     SEE SECTION 4.1.3
      │      VIA MDF           │
      └────────────┬───────────┘
                   │
            ┌─────────────┐
            │     END     │
            └─────────────┘
```

Note: *PLO card (PN-CK00) is required when the PBX needs to interface with two clock supply routes with different frequencies, such as 1.544 MHz, and 192 KHz or 2 MHz.*
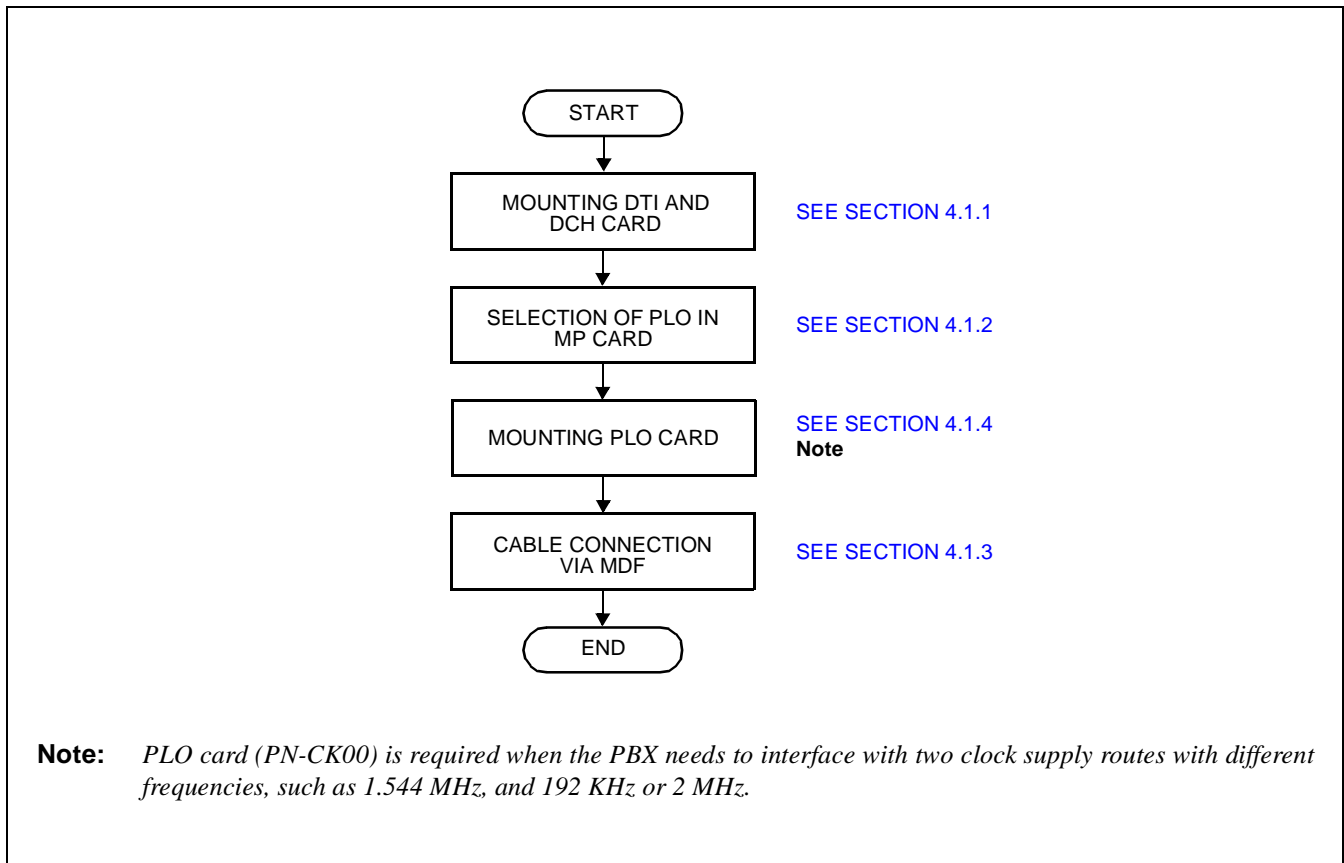
Figure 3-2   Installation Procedure for ISDN with PRI

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4.1.1 Mounting DTI and DCH Card

STEP 1: On the DTI (PN-24DTA/PN-24DTA-A) card and DCH (PN-SC01) card, set the switches as shown in Figure 3-3 and Figure 3-4.

• When providing DTI card.
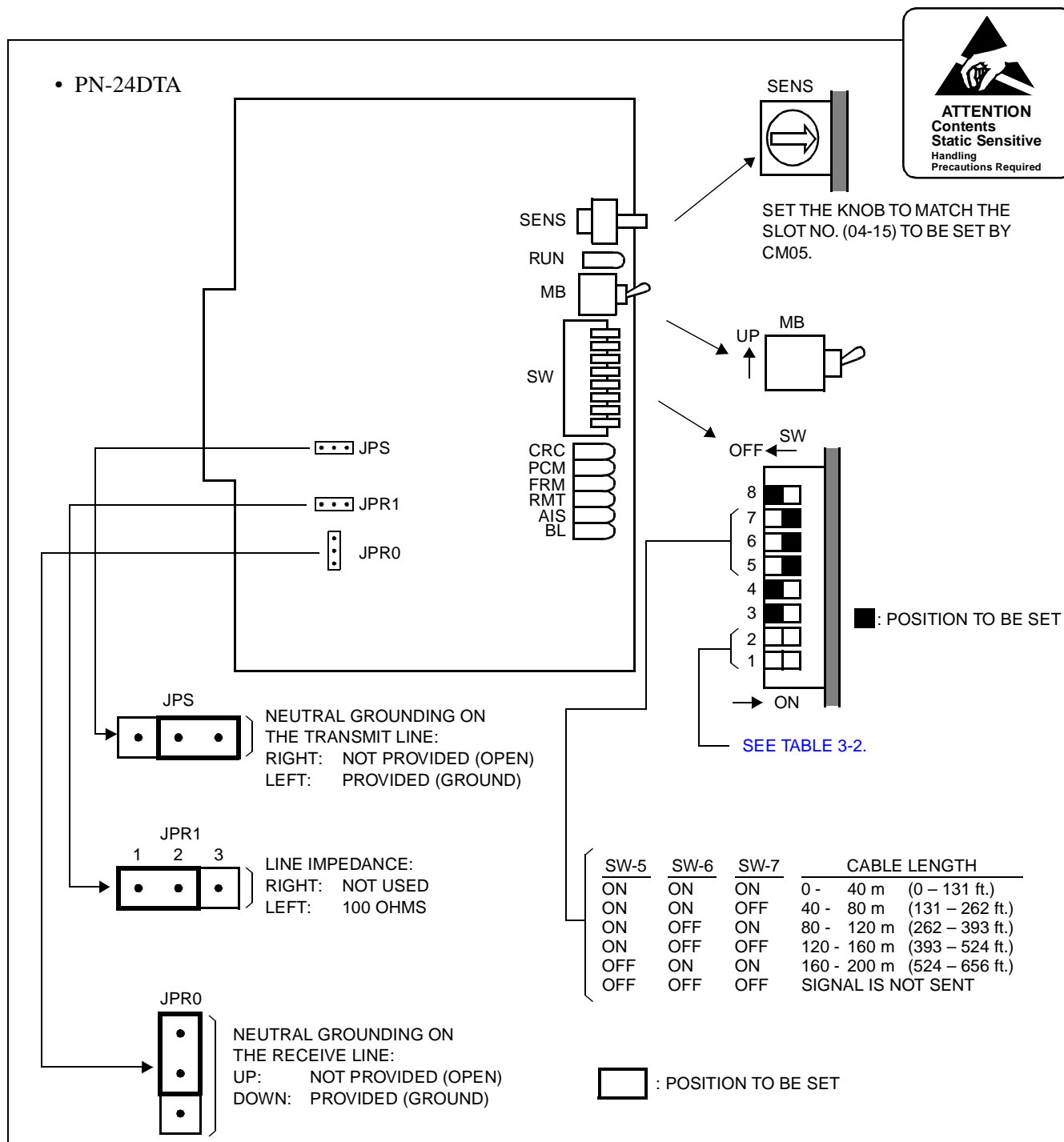
Figure 3-3   Switch Settings on the DTI Card (1/2)
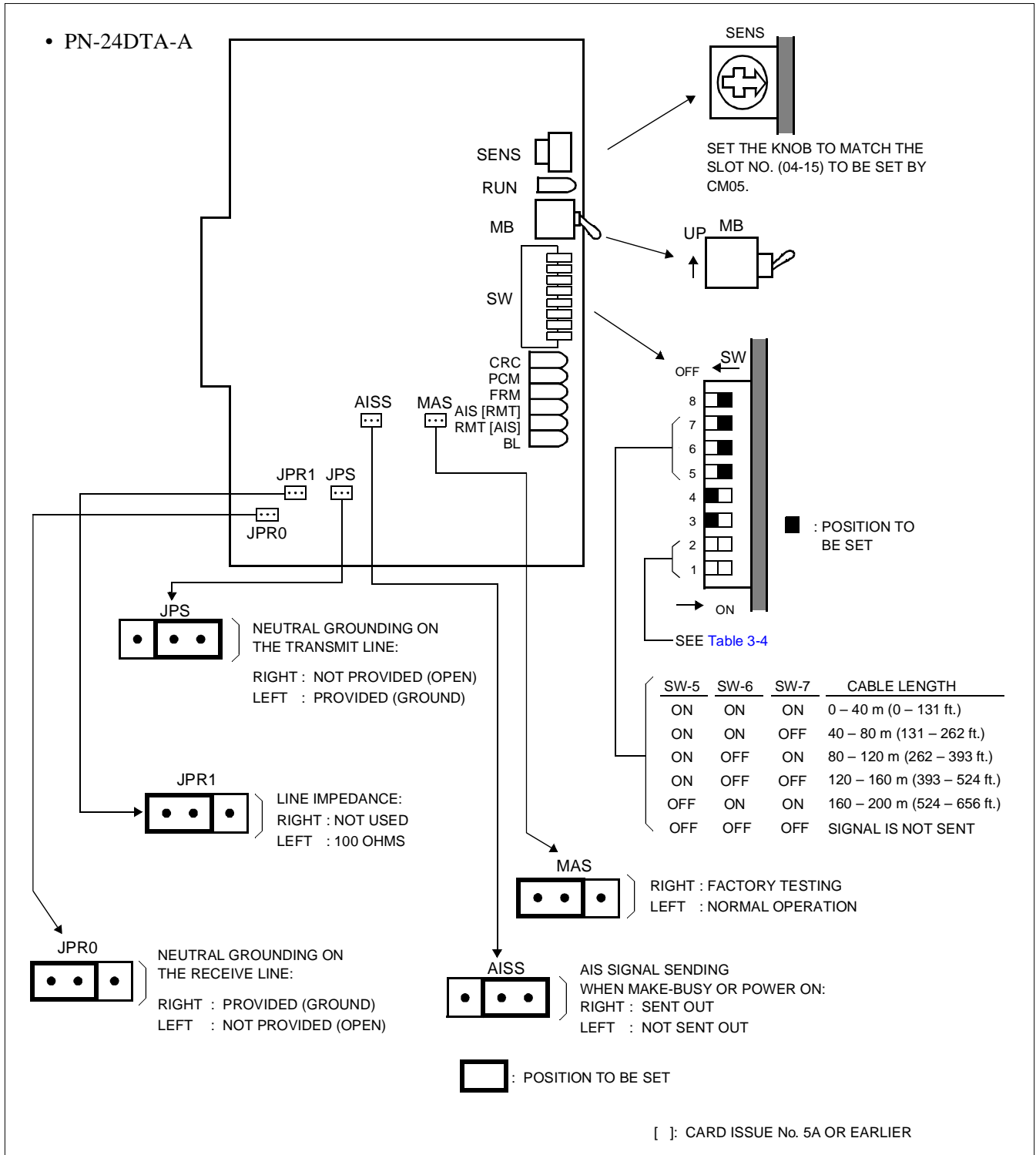
Figure 3-3 Switch Settings on the DTI Card (2/2)

Table 3-4 Switch Settings for SW-1 and SW-2 on the DTI Card

No. of DTI / CONDITIONS SW	DTI0		DTI1		DTI2		DTI3		DTI4		REMARKS
	SW-1	SW-2	SW-1	SW-2	SW-1	SW-2	SW-1	SW-2	SW-1	SW-2	
When only one DTI is provided	ON	OFF									To send a clock signal to PLO0 of the MP card.
When more than one DTI is provided	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	To send a clock signal via DTI1 to PLO1 of the MP/PLO card, when a clock signal via DTI0 is not supplied due to a transmission line failure. (The clock supply route 0 via DTI0 is automatically changed to the clock supply route 1 via DTI1.)

•   When providing the DCH card:

SENS

ATTENTION
Contents
Static Sensitive
Handling
Precautions Required

SW1

SENS

SET THE KNOB TO MATCH
THE AP NO. (04-15) TO BE SET
BY CM05.

RUN

MB

SW0

UP   MB

LC
LPB

SW0

OFF

4
3
2
1

■ : POSITION TO BE SET

ON

ON   : NORTHERN TELECOM INTERFACE
OFF : AT&T INTERFACE

ON   : DELETE FIRST THREE DIGITS
         (011) FROM INTERNATIONAL CALLS
OFF : NO DELETION

ON   1 2 3 4 5 6 7 8

● = POSITION TO BE SET.
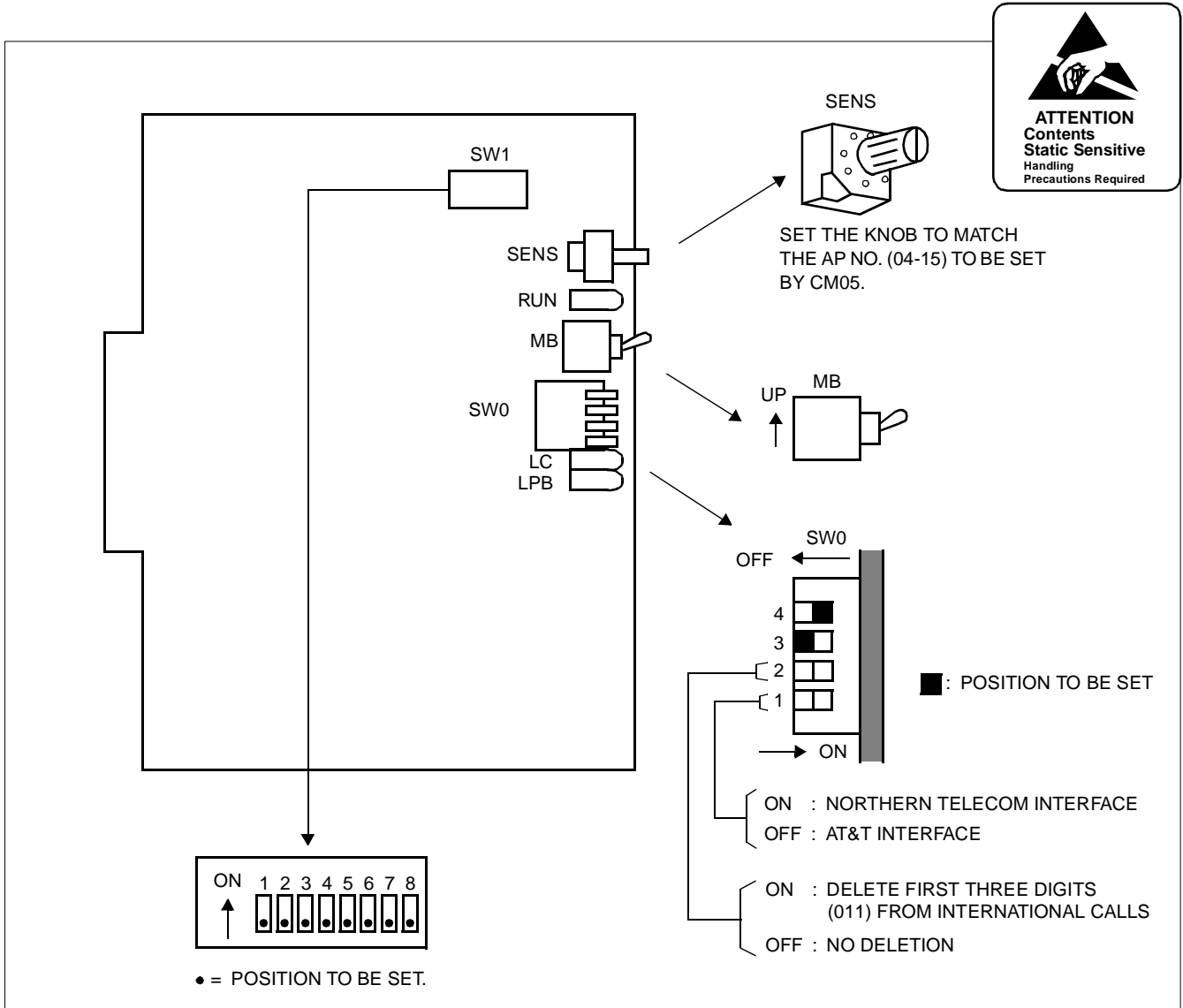
Figure 3-4   Switch Settings on the DCH Card

STEP 2: Mount the DTI card and the DCH card in AP slots on PIM0-PIM7.

After mounting the card, set the SENS switch to match an unequipped slot number in CM05. And set the MB switch to down position to put the card in service. For details on mounting locations, refer to the Circuit Card Manual.

- Mount DTI card in the AP slots (AP0-AP6).
- Mount DCH card in the AP slots (AP0-AP8).
- Set the SENS switch on the DTI card and DCH card to match an unequipped slot number in CM05 as shown below.

SLOT NUMBER	04	05	06	07	08	09	10	11	12	13	14	15
SWITCH SETTING VALUE	4	5	6	7	8	9	A	B	C	D	E	F

- Up to 12 slots are available in PIM0 through PIM7.

Note: *The DTI card (DTI0, DTI1), which sends a clock signal to PLO of the MP card, must be mounted in the AP slots on PIM0.*
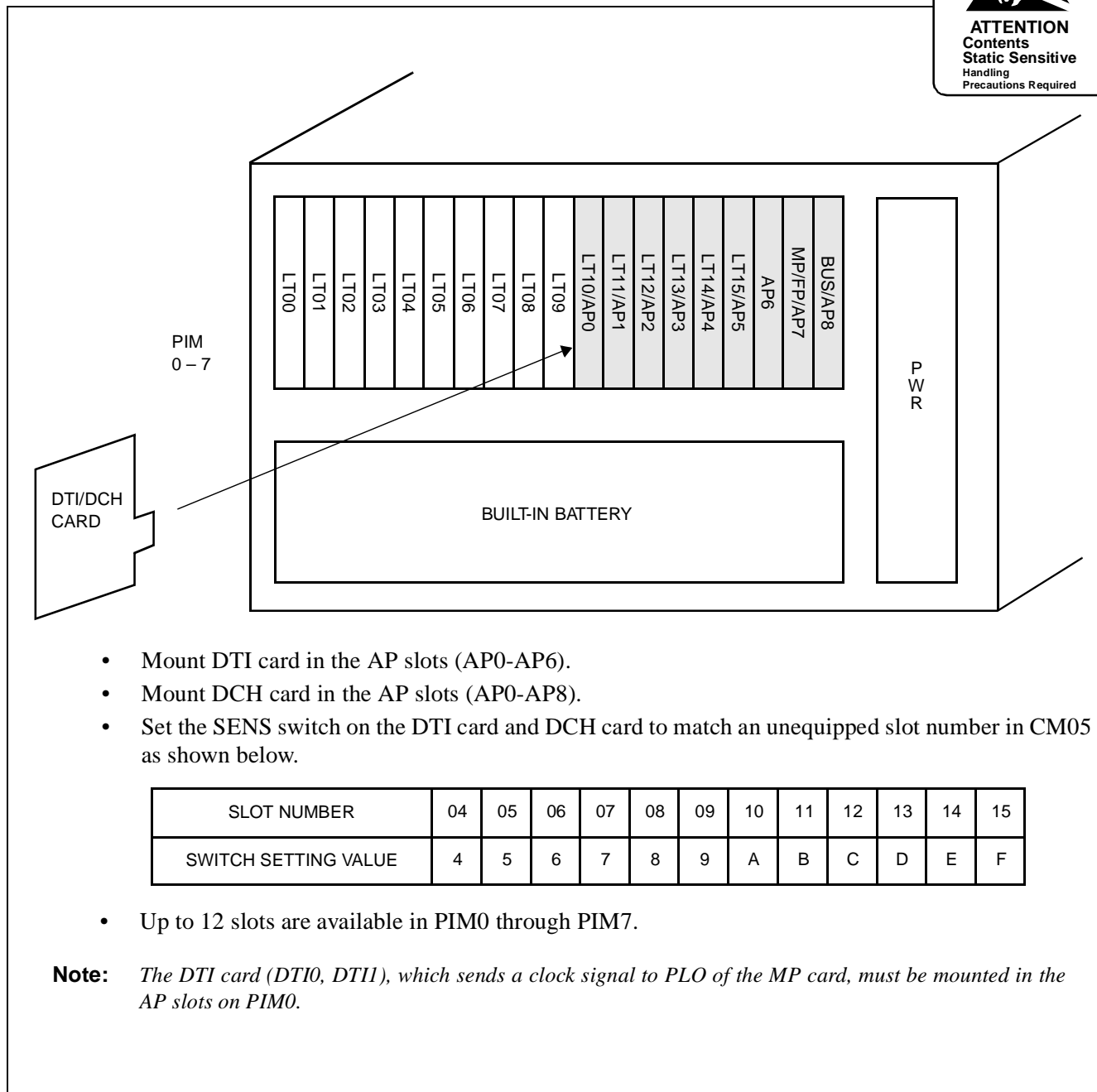
Figure 3-5   Mounting Location of DTI/DCH Card

4.1.2 Selection of PLO in MP Card

STEP 1: On the MP (PN-CP00/CP00-B/CP03) card, set the switches as shown in Figure 3-6.
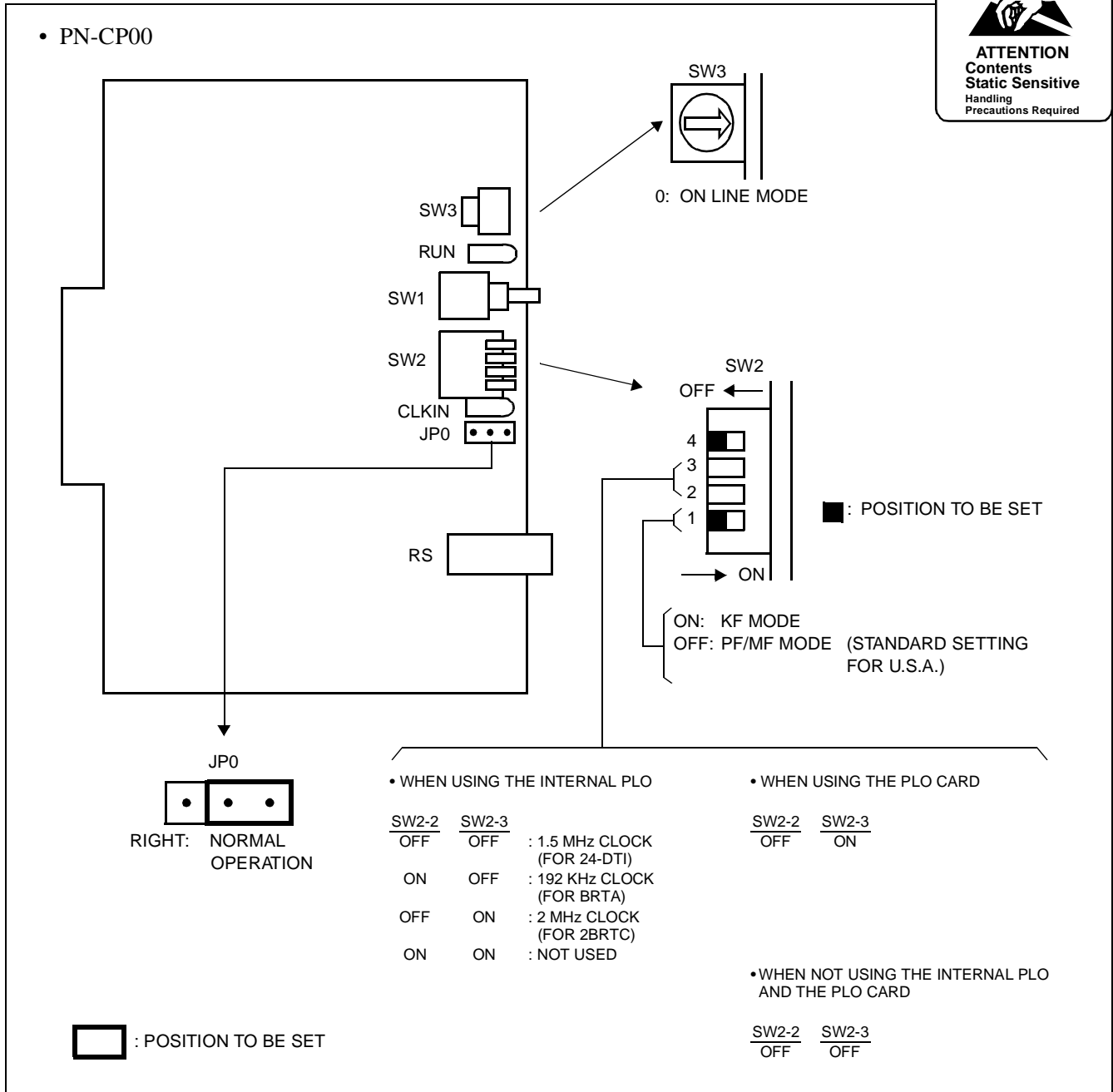
Figure 3-6   Switch Settings on the MP Card (1/3)

• PN-CP00-B

Figure 3-6 Switch Settings on the MP Card (2/3)

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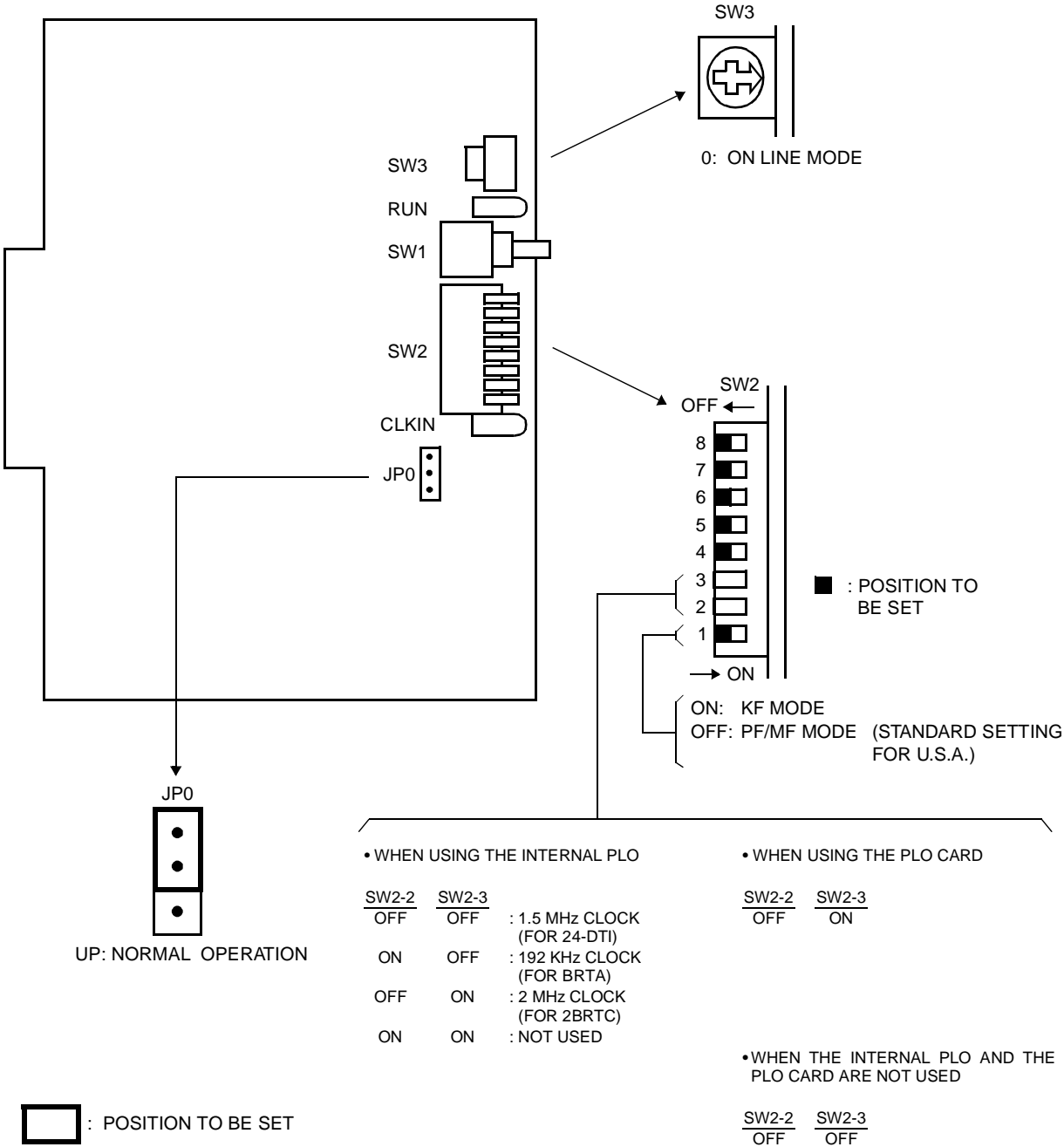
• PN-CP03
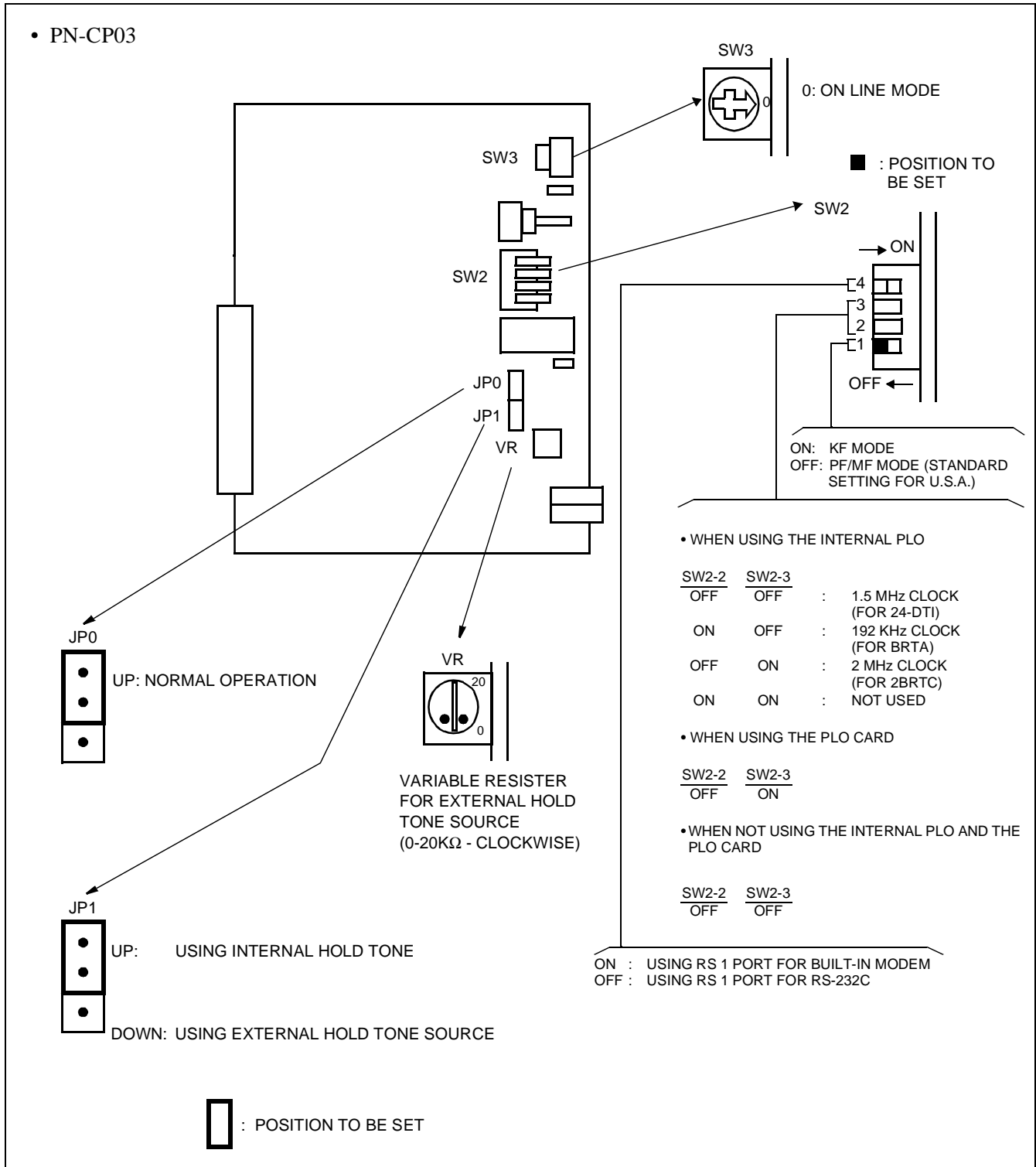
Figure 3-6 Switch Settings on the MP Card (3/3)

STEP 2: Mount the MP card on the MP slot of PIM0.

4.1.3 Cable Connection via the MDF for ISDN with PRI

When using a twisted-pair cable, connect the cable to a CSU via the MDF as shown in Figure 3-7.

Figure 3-8 shows LTC connector corresponds with the AP slots, and DTI pin assignment for each AP slot, and Figure 3-9 shows an example of the cable connection when the DTI card is mounted in the AP0 slot of PIM0.

Note: *The CSU must be installed to interface with the network, and must be installed on the premises where the PBX is located.*
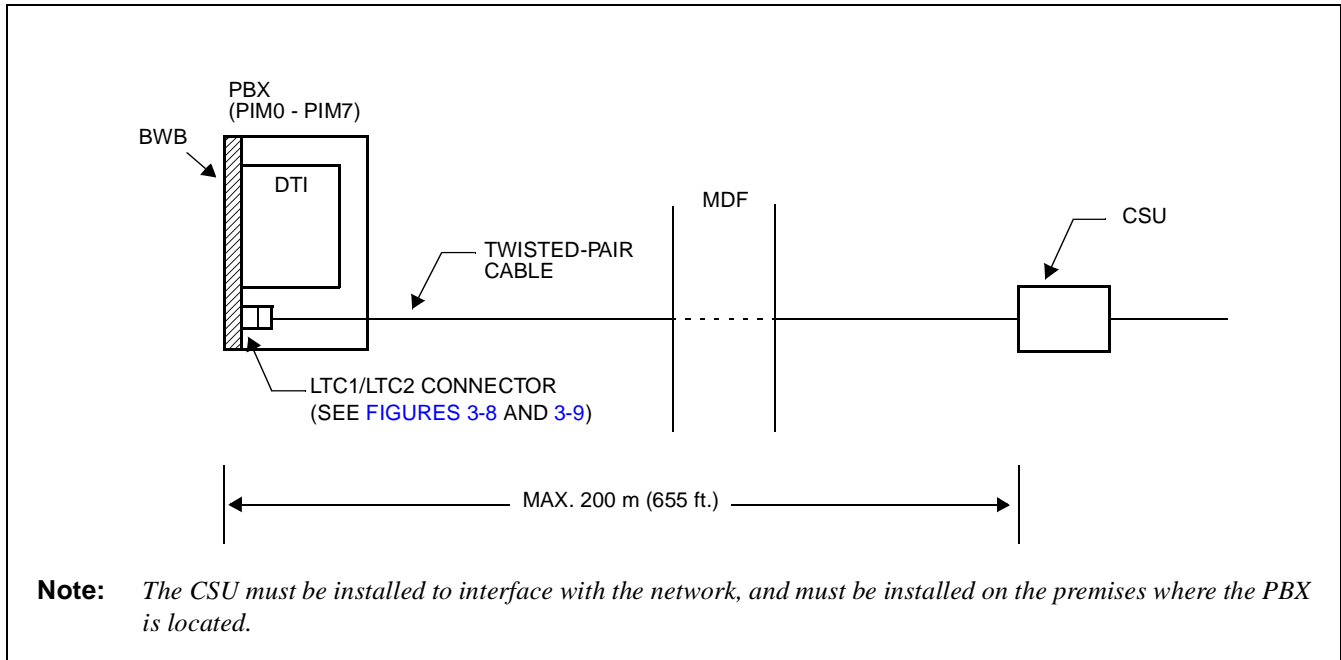
Figure 3-7   Cable Connection via the MDF for ISDN with PRI

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PIM
0 - 7

LT00 LT01 LT02 LT03 LT04 LT05 LT06 LT07 LT08 LT09 LT10/AP0 LT11/AP1 LT12/AP2 LT13/AP3 LT14/AP4 LT15/AP5 FP/AP6 MP/FP/AP7 BUS/AP8

P
W
R

LTC0   LTC1   LTC2

LTC1

1		26		
2		27		LT06
3		28		
4		29		
5		30		
6		31		LT07
7		32		
8		33		
9		34		
10		35		LT08
11		36		
12		37		
13		38		
14		39		LT09
15		40		
16		41		
17	RA	42	RB	
18	TA	43	TB	LT10/AP0
19		44		
20		45		
21	RA	46	RB	
22	TA	47	TB	LT11/AP1
23		48		
24		49		
25		50		

LTC2

1	RA	26	RB	
2	TA	27	TB	LT12/AP2
3		28		
4		29		
5	RA	30	RB	
6	TA	31	TB	LT13/AP3
7		32		
8		33		
9	RA	34	RB	
10	TA	35	TB	LT14/AP4
11		36		
12		37		
13	RA	38	RB	
14	TA	39	TB	LT15/AP5
15		40		
16		41		
17	RA	42	RB	
18	TA	43	TB	AP6
19		44		
20		45		
21		46		
22		47		
23		48		
24		49		
25		50		

Figure 3-8   Location of the AP Slots and the LTC Connectors for DTI

Figure 3-9   Example of Cable Connection via the MDF for DTI

4.1.4 Mounting PLO Card

STEP 1: On the PLO (PN-CK00) card, set the switches as shown in Figure 3-10.

Figure 3-10   Switch Settings on the PLO Card

STEP 2: On the MP card, set the SW2-2 to OFF and SW2-3 to ON.

STEP 3:   Mount the PLO (PN-CK00) card in an AP slot on PIM0

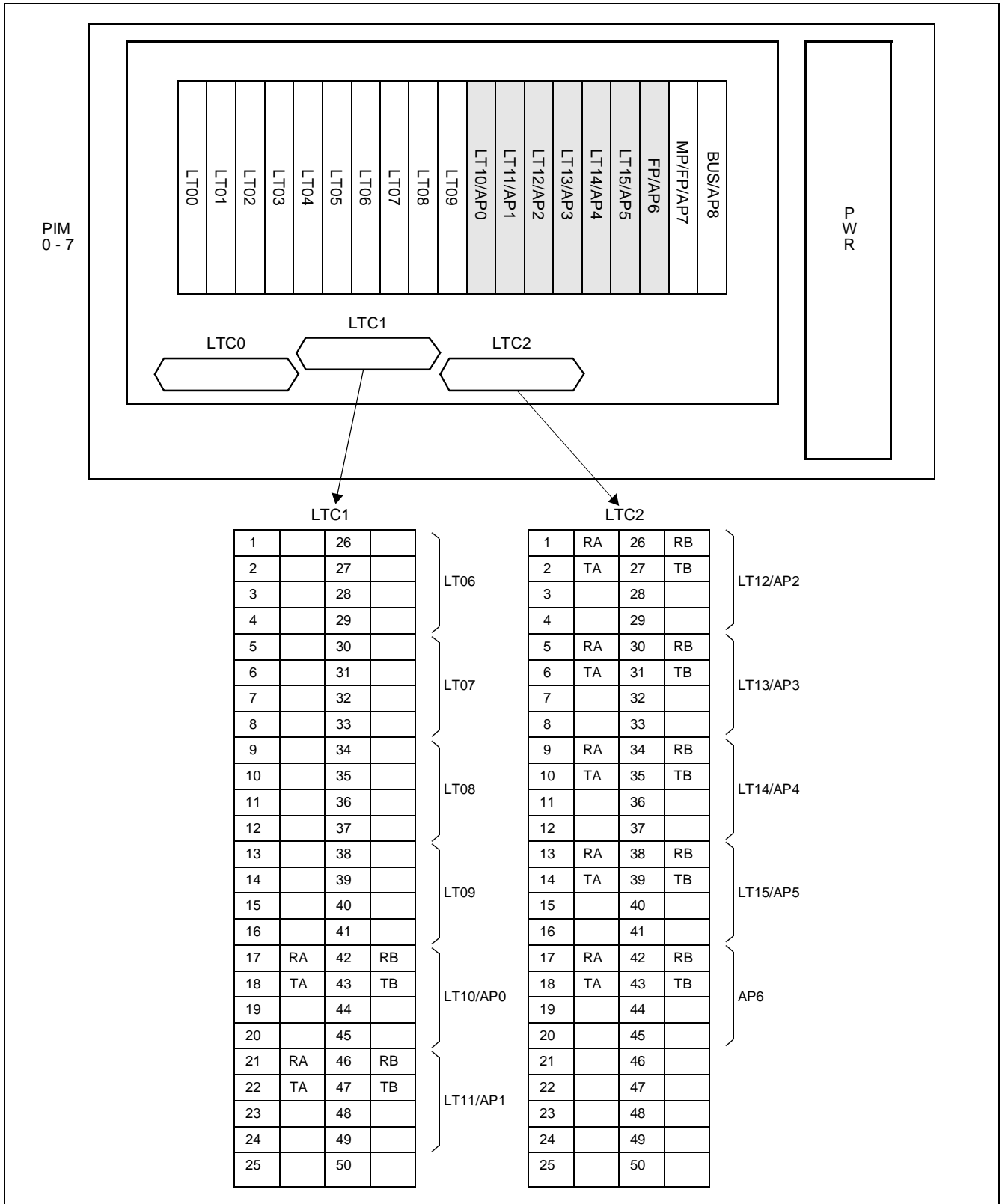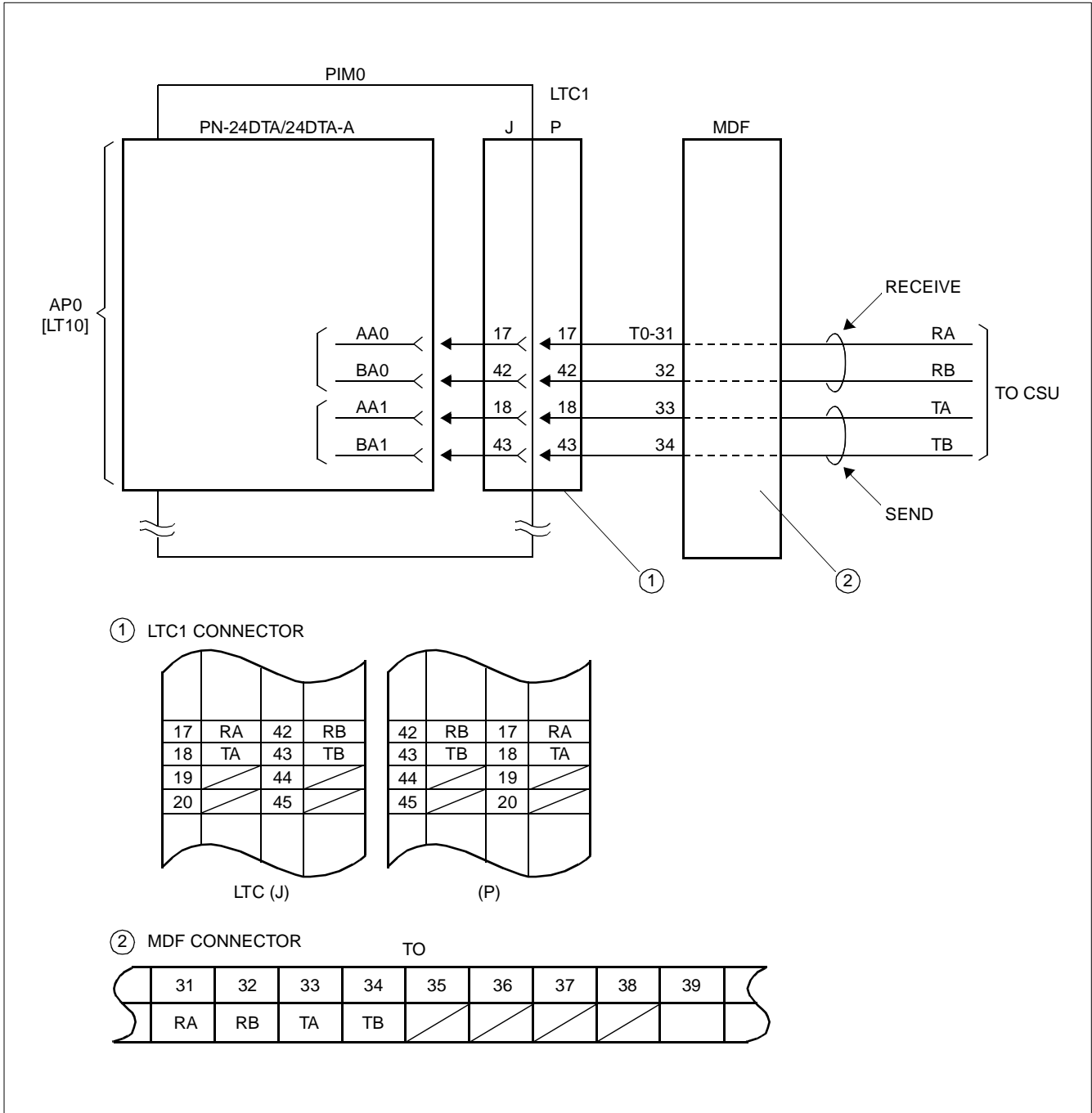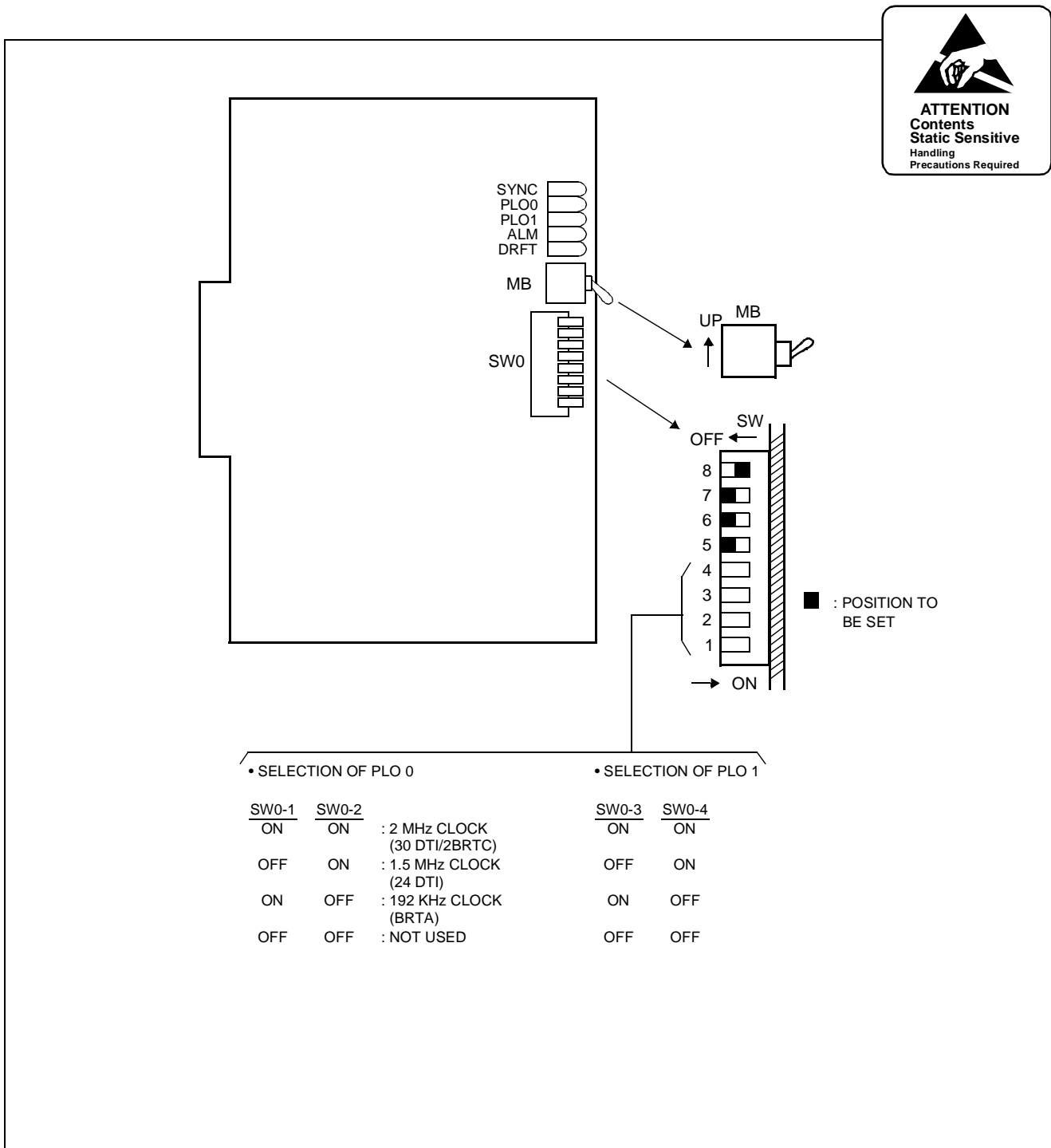After mounting the card, set the MB switch to down position to put the card in service. For details on mounting locations, refer to the Circuit Card Manual.

ATTENTION
Contents
Static Sensitive
Handling
Precautions Required

PIM0

LT00 LT01 LT02 LT03 LT04 LT05 LT06 LT07 LT08 LT09 LT10/AP0 LT11/AP1 LT12/AP2 LT13/AP3 LT14/AP4 LT15/AP5 AP6 MP/FP/AP7 BUS/AP8

PWR

PN-CK00
CARD

BUILT-IN BATTERY

• Mount the PN-CK00 card in an AP slot (AP0-AP6) on PIM0.

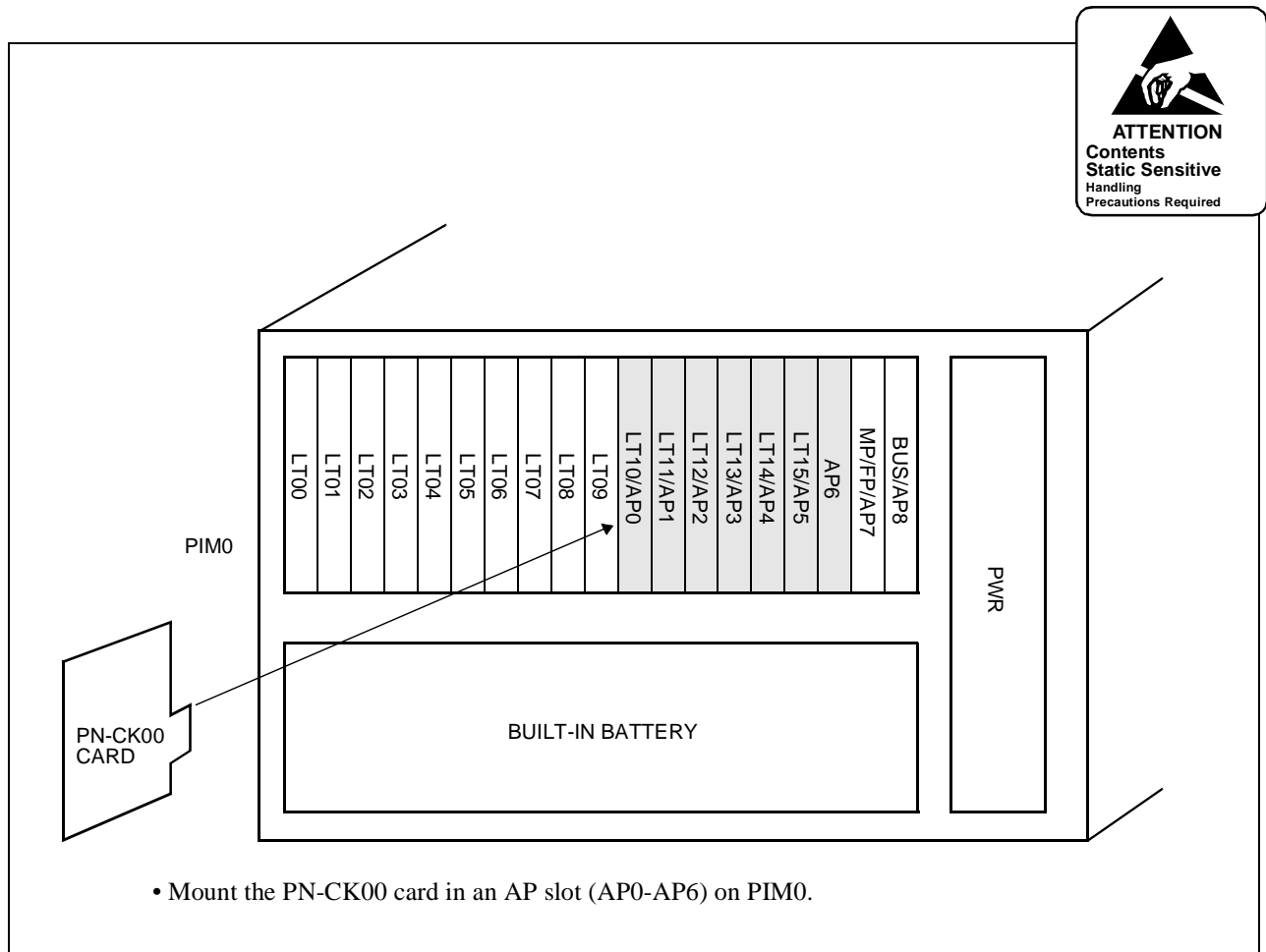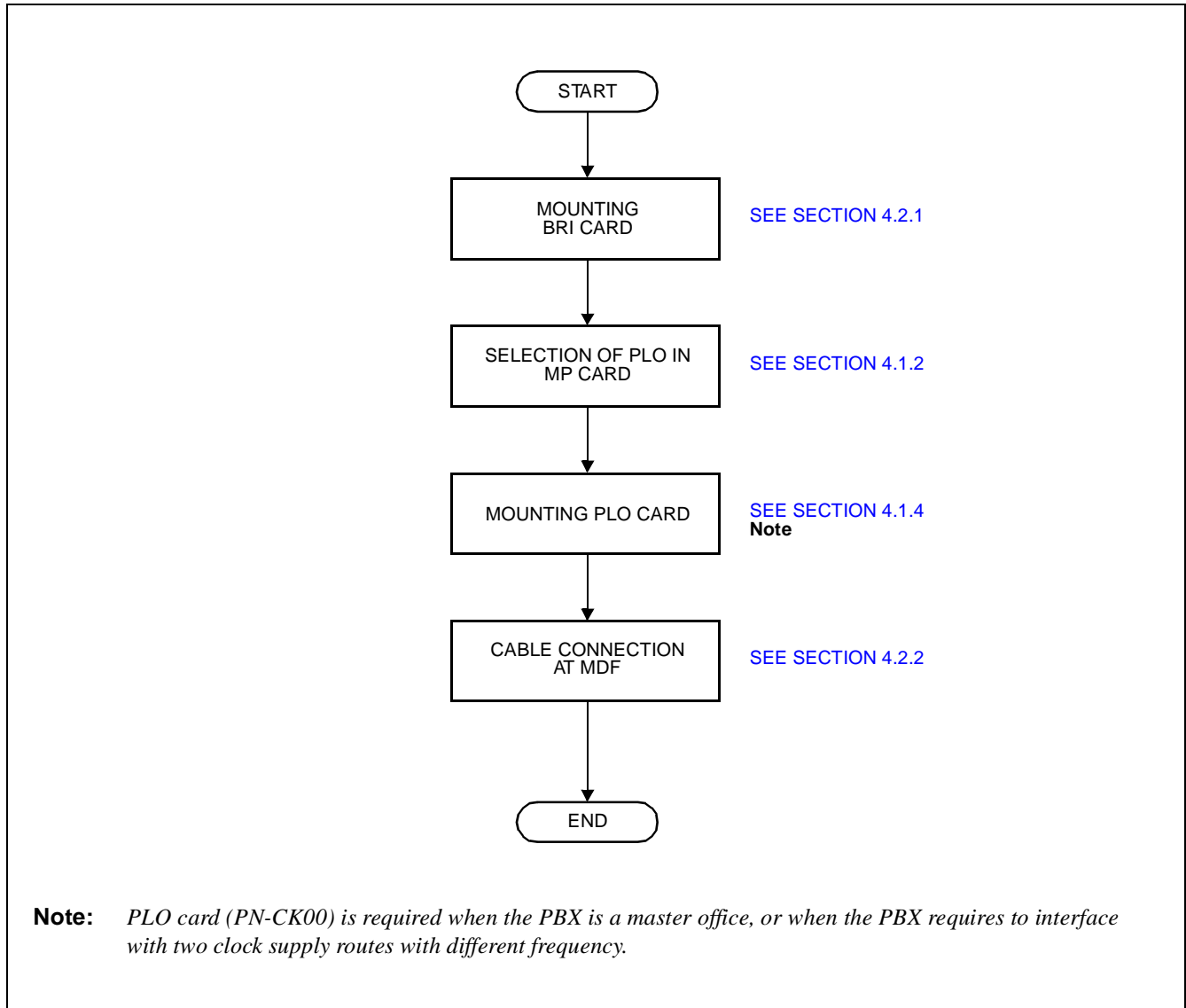**Figure 3-11   Mounting Location of the PLO Card**

4.2 Installation Procedure for ISDN with BRI

Perform necessary installation tasks according to the procedure shown in Figure 3-12.

Note: *When requiring Call Recording of ISDN call, execute the installation works of SMDR. For details, refer to the SMDR System Manual.*

Figure 3-12   Installation Procedure for ISDN with BRI

4.2.1 Mounting BRI Card

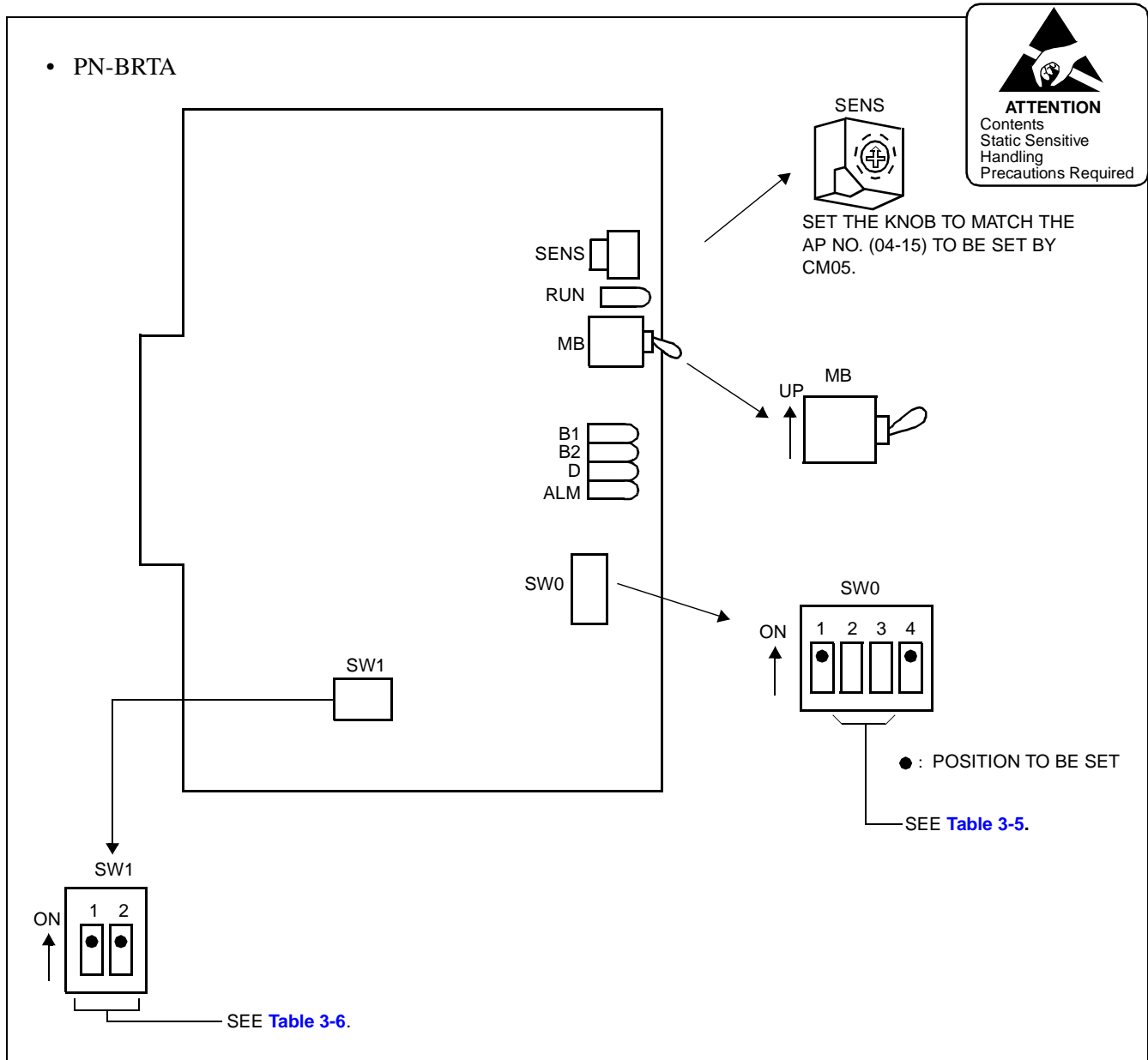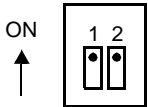STEP 1: On the BRI (PN-BRTA/2BRTC) card, set the switches as shown in Figure 3-13.
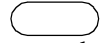

Figure 3-13   Switch Settings on the BRI Card (PN-BRTA)

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Table 3-5 Switch Settings for SW0-2 and SW0-3 on the BRI Card (PN-BRTA)

No. of BRI / SW CONDITIONS	BRI 0		BRI 1		BRI 2		・・・・・・	BRI 11		REMARKS
	SW0-2	SW0-3	SW0-2	SW0-3	SW0-2	SW0-3	・・・・・・	SW0-2	SW0-3	
When only one BRI is provided	ON	ON								To send a clock signal to PLO0 of the MP card.
When more than one BRI is provided	ON	ON	ON	OFF	OFF	ON	・・・・・・	OFF	ON	To send a clock signal via BRI1 to PLO1 of the MP/PLO card, when a clock signal via BRI0 is not supplied due to a transmission line failure. (The clock supply route 0 via BRI0 is automatically changed to the clock supply route 1 via BRI1.)

Table 3-6 Switch Settings for SW1 on the BRI Card (PN-BRTA)

SWITCH NAME	SWITCH NUMBER	SETTING POSITION	FUNCTION	CHECK
SW1 (Dip SW)	1	ON	For terminating the transmitting side of channels B1 and B2 with 100 ohms.	
		OFF	To remove the terminating resistor on the transmitting side of channels B1 and B2.	
	2	ON	For terminating the receiving side of channels B1 and B2 with 100 ohms.	
		OFF	To remove the terminating resistor on the receiving side of channels B1 and B2.	

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.

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Figure 3-13-1 Switch Settings on the BRI Card (PN-2BRTC)

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Table 3-6-1 Switch Settings for SW0 and SW10 on the BRI Card (PN-2BRTC)

SWITCH NAME	SWITCH NUMBER	SETTING POSITION	FUNCTION	CHECK
SW0, SW10 (Dip SW)	1	ON	For terminating the transmitting side of channels B1 and B2 with 100 ohms.	
		OFF	To remove the terminating resistor on the transmitting side of channels B1 and B2.	
	2	ON	For terminating the receiving side of channels B1 and B2 with 100 ohms.	
		OFF	To remove the terminating resistor on the receiving side of channels B1 and B2.	

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.
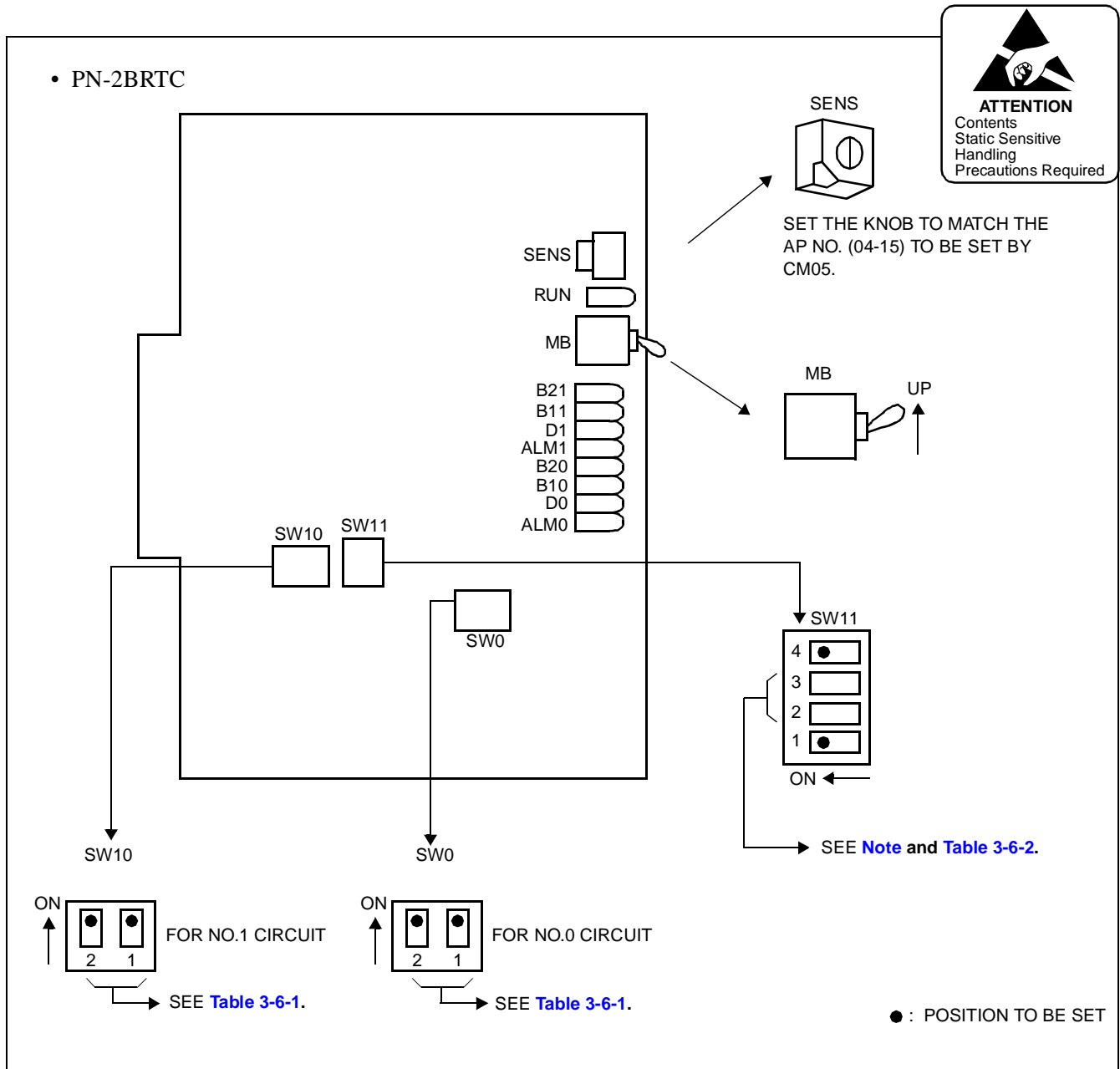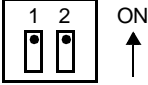
Note: *The system can supply clock signals from two clock supply routes.*
In normal condition, the system synchronizes to the clock signals supplied on the PLO 0 of MP card via the Back Wiring Board, and if the clock signals are failed, the clock supply route takes over to PLO1 automatically.

Table 3-6-2 Switch Setting for SW11-2 and SW11-3 on the BRI Card (PN-2BRTC)

No. of BRI / SW CONDITIONS	BRI 0		BRI 1		BRI 2		. . . .	BRI 11		REMARKS
	SW11 -2	SW11 -3	SW11 -2	SW11 -3	SW11 -2	SW11 -3	. . . .	SW11 -2	SW11 -3	
When one BRI is provided.	ON	ON								The clock signals are supplied to the PLO through No. 0 circuit of the BRI. If the clock supply route of No. 0 circuit is failed, the clock supply route of No. 1 circuit takes over automatically.
When more than one BRI is provided.	ON	ON	ON	OFF	OFF	ON	. . . .	OFF	ON	The system can supply the clock signals from BRI 0 or BRI 1. The system is synchronized to the BRI 0 clock signals normally, and if both No. 0 circuit clock supply route and No. 1 circuit clock supply route is failed, the BRI 1 takes over.

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STEP 2: Mount the BRI card in AP slots on PIM0-PIM7.

After mounting the card, set the SENS switch to match an unequipped slot number in CM05. Set the MB switch to down position to put the card in service. For details on mounting locations, refer to the Circuit Card Manual.
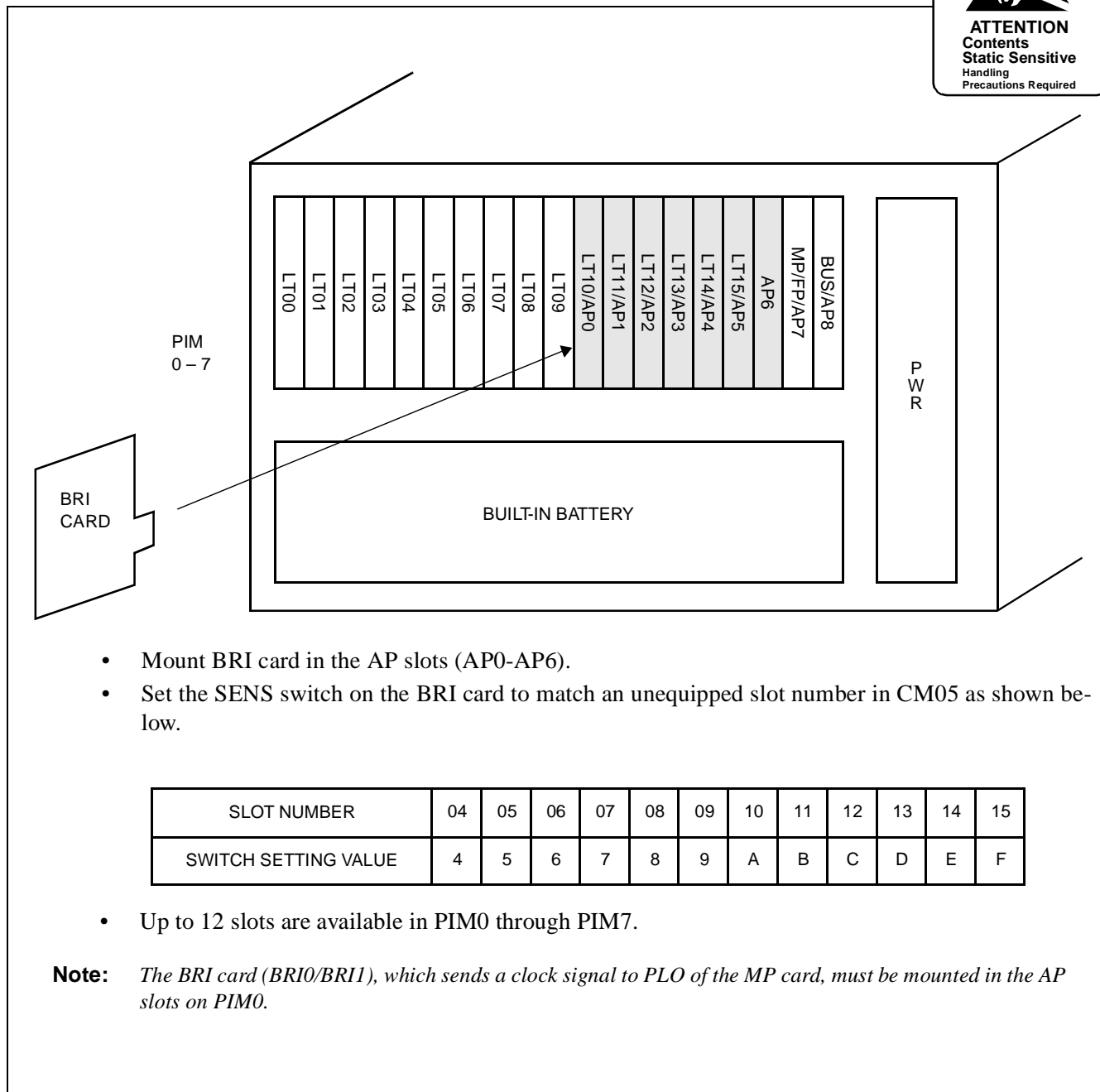
- Mount BRI card in the AP slots (AP0-AP6).
- Set the SENS switch on the BRI card to match an unequipped slot number in CM05 as shown below.

SLOT NUMBER	04	05	06	07	08	09	10	11	12	13	14	15
SWITCH SETTING VALUE	4	5	6	7	8	9	A	B	C	D	E	F

- Up to 12 slots are available in PIM0 through PIM7.

Note: *The BRI card (BRI0/BRI1), which sends a clock signal to PLO of the MP card, must be mounted in the AP slots on PIM0.*
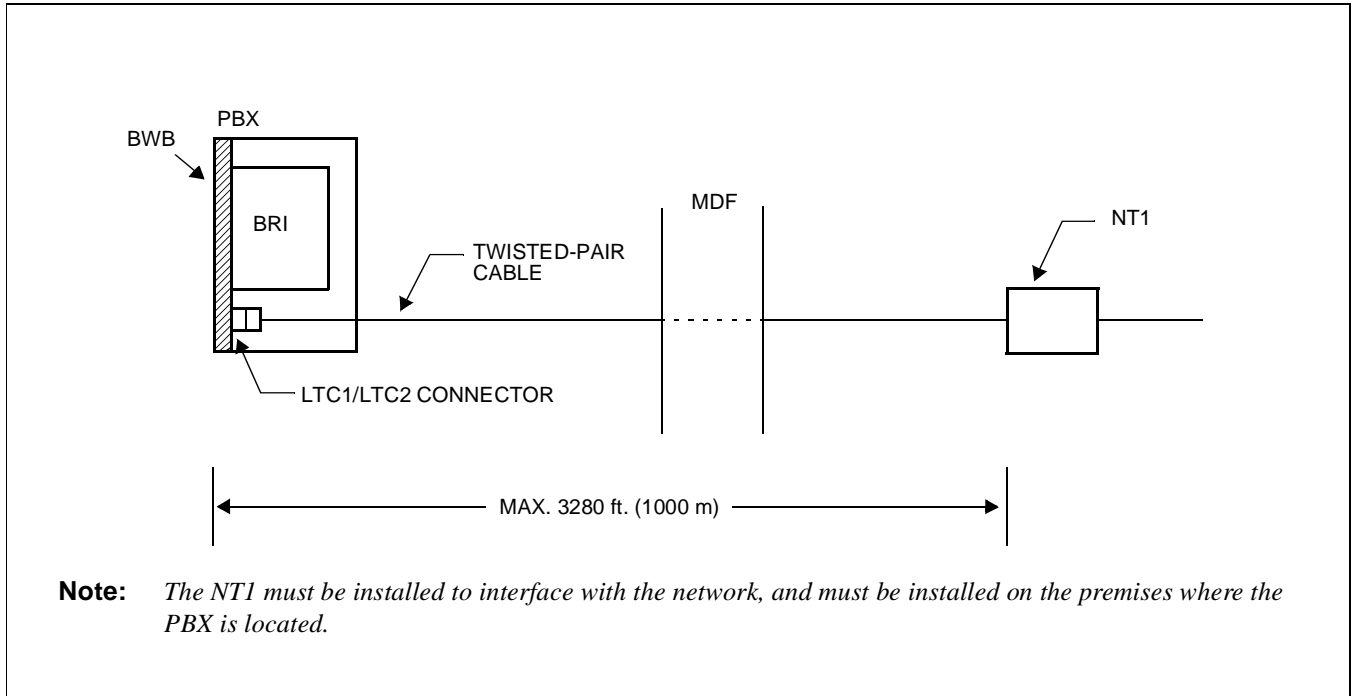
Figure 3-14   Mounting Location of BRI Card

4.2.2   Cable Connection via the MDF for ISDN with BRI

Connect the cable to a CSU via the MDF as shown in Figure 3-15.

Figure 3-16 shows LTC connector corresponds with the AP slots, and DTI pin assignment for each AP slot. Figure 3-17 shows an example of the cable connection when the BRI card is mounted in the AP0 slot of PIM0.

Note: *The NT1 must be installed to interface with the network, and must be installed on the premises where the PBX is located.*

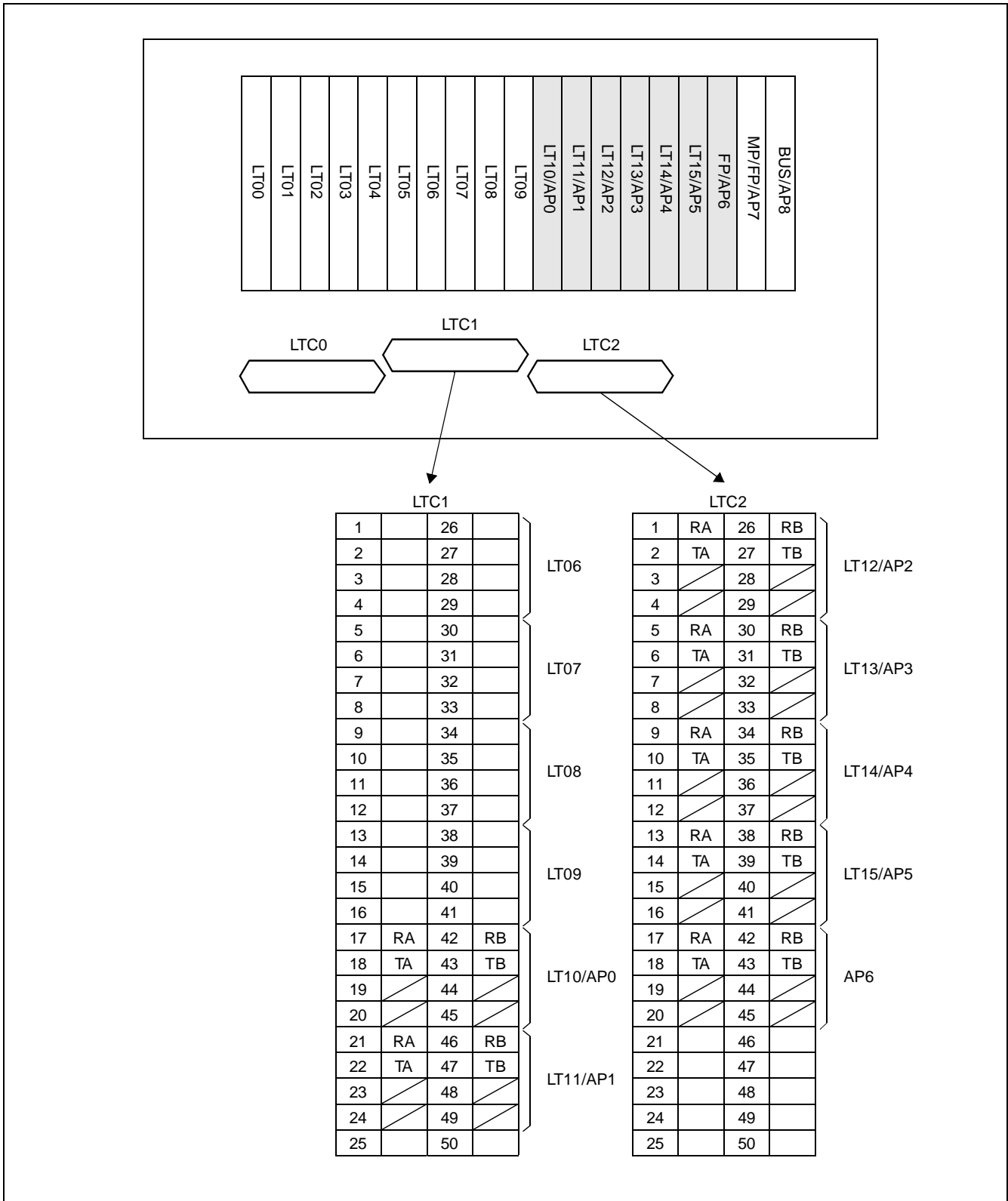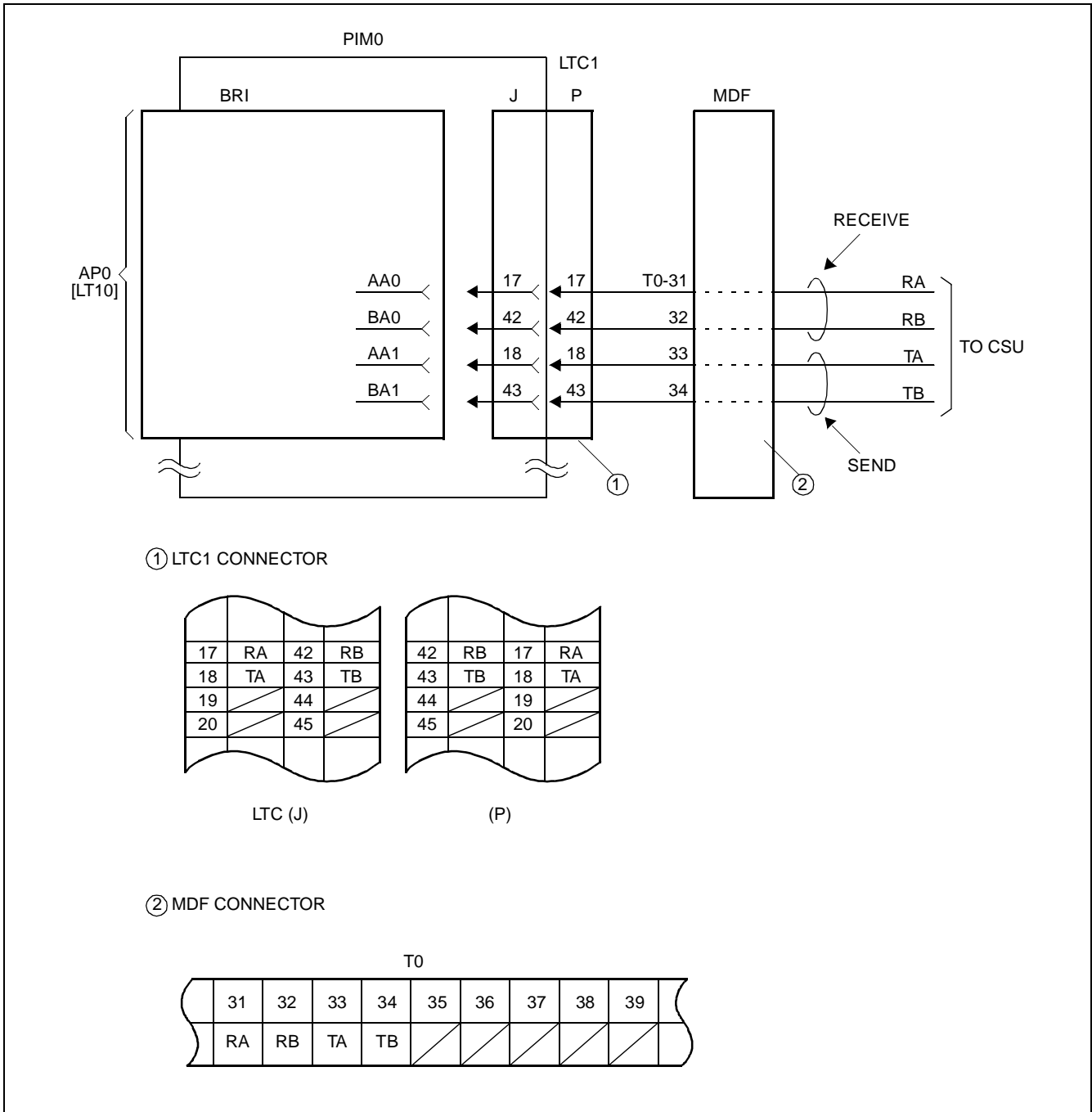**Figure 3-15   Cable Connection via the MDF for ISDN with BRI**

Figure 3-16   Location of the AP Slots and the LTC Connectors for BRI
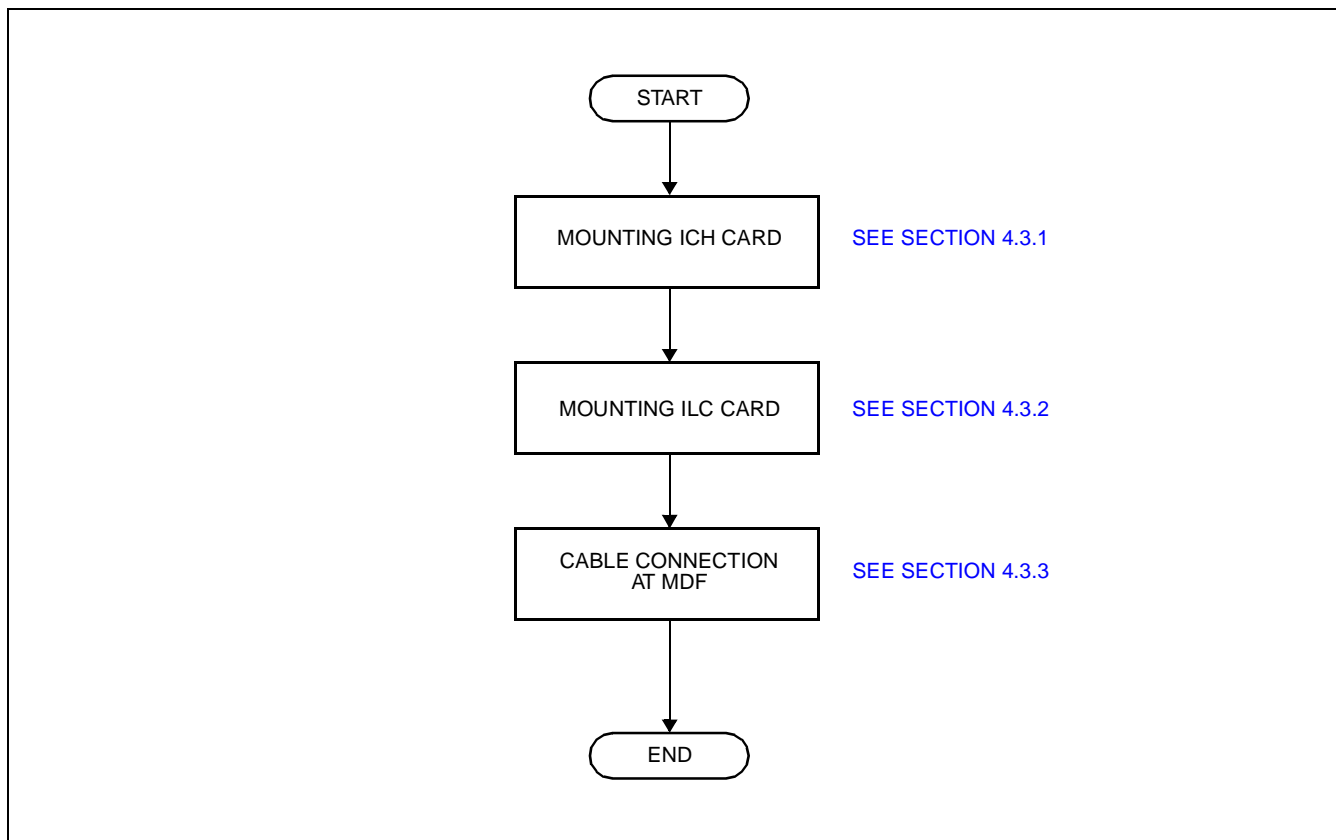
Figure 3-17   Example of Cable Connection via the MDF for BRI

4.3 Installation Procedure for ISDN Terminal

When providing the ISDN Terminal, perform necessary installation works of the equipment according to the procedure shown in Figure 3-18 in addition to the installation procedure of Section 4.1 or Section 4.2.

```
                          ┌─────────────┐
                          │    START    │
                          └─────────────┘
                                 │
                                 ▼
                    ┌──────────────────────┐
                    │  MOUNTING ICH CARD   │     SEE SECTION 4.3.1
                    └──────────────────────┘
                                 │
                                 ▼
                    ┌──────────────────────┐
                    │  MOUNTING ILC CARD   │     SEE SECTION 4.3.2
                    └──────────────────────┘
                                 │
                                 ▼
                    ┌──────────────────────┐
                    │  CABLE CONNECTION    │     SEE SECTION 4.3.3
                    │      AT MDF          │
                    └──────────────────────┘
                                 │
                                 ▼
                          ┌─────────────┐
                          │     END     │
                          └─────────────┘
```

Figure 3-18   Installation Procedure for ISDN Terminal

4.3.1 Mounting ICH Card

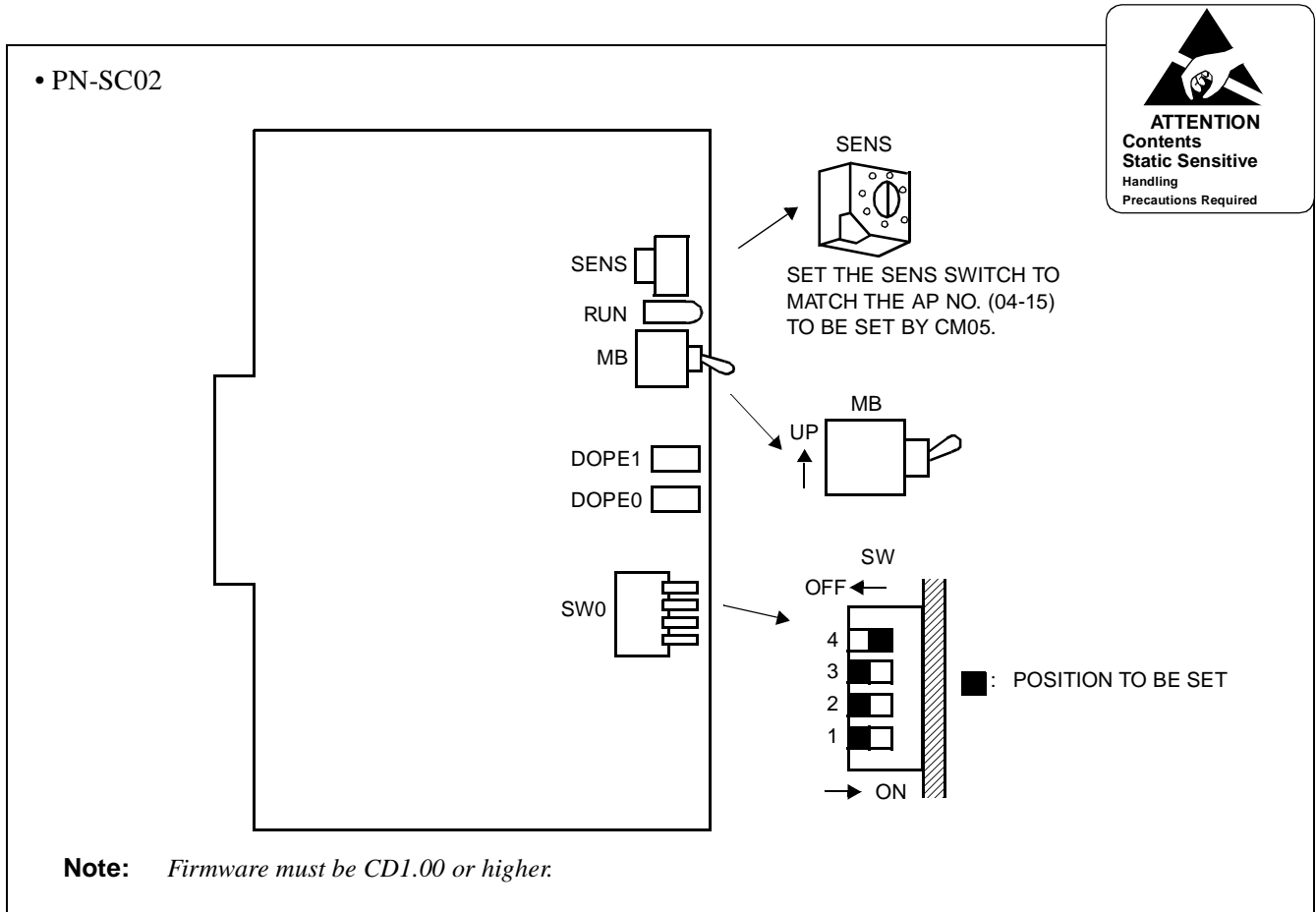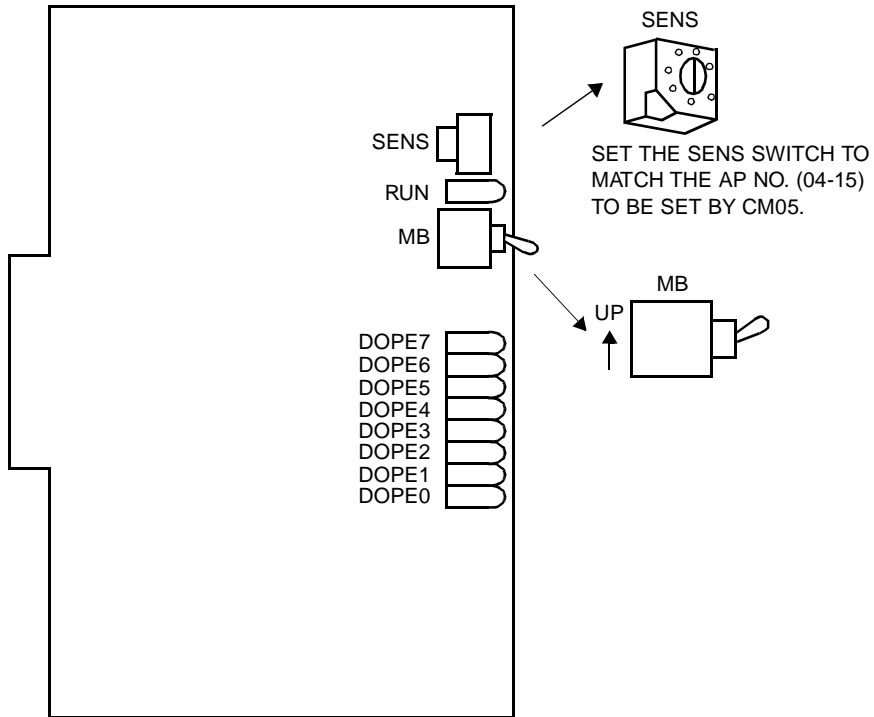STEP 1: On the ICH (PN-SC02/SC03) card, set the switches as shown in Figure 3-19.

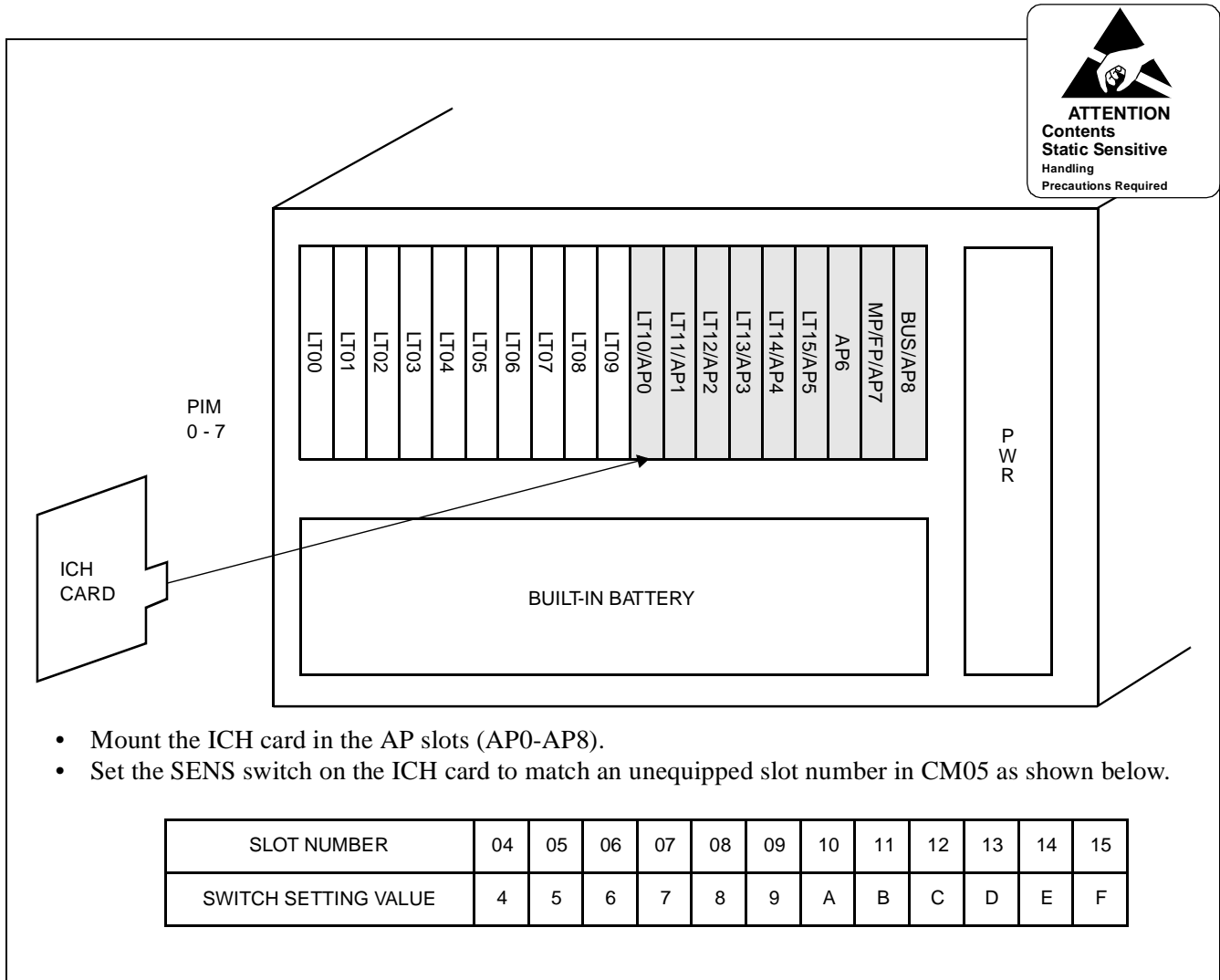**Figure 3-19   Switch Settings on the ICH Card (1/2)**

• PN-SC03

SENS

SET THE SENS SWITCH TO
MATCH THE AP NO. (04-15)
TO BE SET BY CM05.

ATTENTION
Contents
Static Sensitive
Handling
Precautions Required

SENS

RUN

MB

MB

UP

DOPE7
DOPE6
DOPE5
DOPE4
DOPE3
DOPE2
DOPE1
DOPE0

Note: *Firmware must be CE0.01.*

Figure 3-19 Switch Settings on the ICH Card (2/2)

STEP 2: Mount the ICH card in AP slots on PIM0-PIM7.

After mounting the card, set the SENS switch to match an unequipped slot number in CM05. And set the MB switch to down position to put the card in service. For details on mounting locations, refer to the Circuit Card Manual.

- Mount the ICH card in the AP slots (AP0-AP8).
- Set the SENS switch on the ICH card to match an unequipped slot number in CM05 as shown below.

SLOT NUMBER	04	05	06	07	08	09	10	11	12	13	14	15
SWITCH SETTING VALUE	4	5	6	7	8	9	A	B	C	D	E	F

Figure 3-20   Mounting Location of the ICH Card

4.3.2 Mounting ILC Card

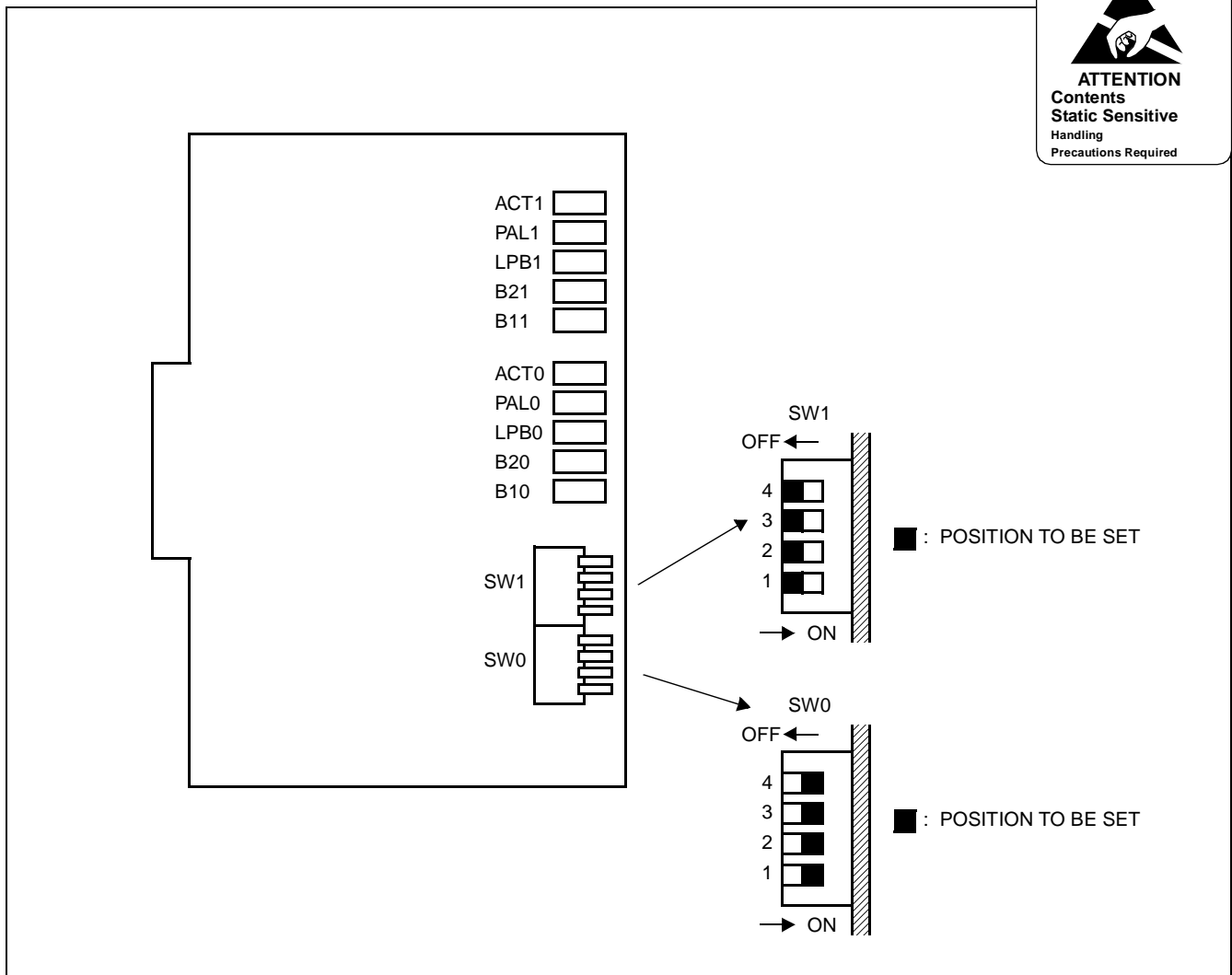STEP 1: On the ILC (PN-2ILCA) card, set the switches as shown in Figure 3-21.

Figure 3-21 Switch Settings on the ILC Card

STEP 2: Mount the ILC card in LT slots on PIM0-PIM7.

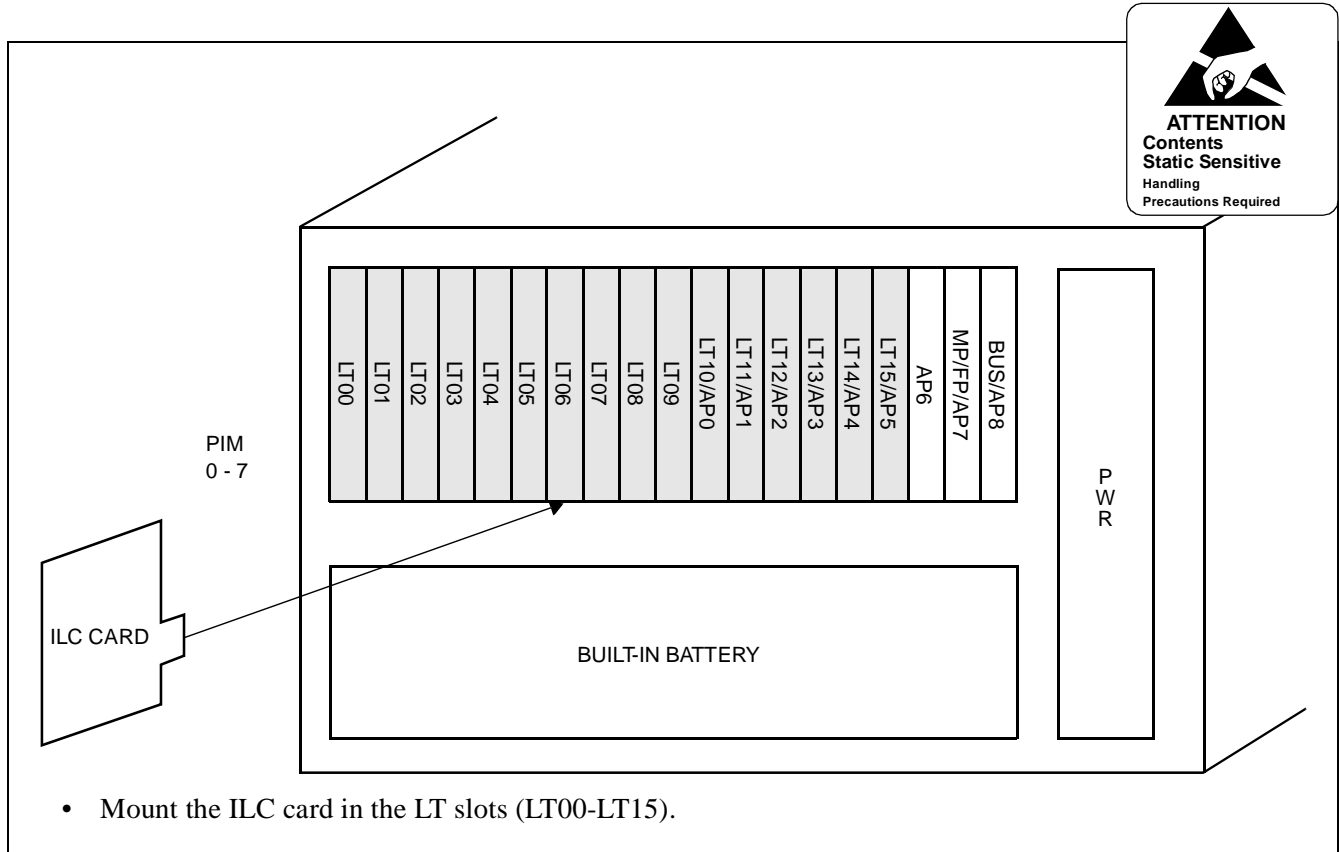• Mount the ILC card in the LT slots (LT00-LT15).

Figure 3-22   Mounting Location of the ILC Card

4.3.3 Cable Connection via the MDF (for ISDN Terminal)

Connect the cable to an ISDN Terminal or a Terminal Adapter (TA) via the MDF as shown in Figure 3-23.

Figure 3-24 shows LTC connector corresponds with the LT slots, and ILC pin assignment for each LT slot, and Figure 3-26 shows an example of the cable connection when the ILC card is mounted in the LT00 slot of PIM0.
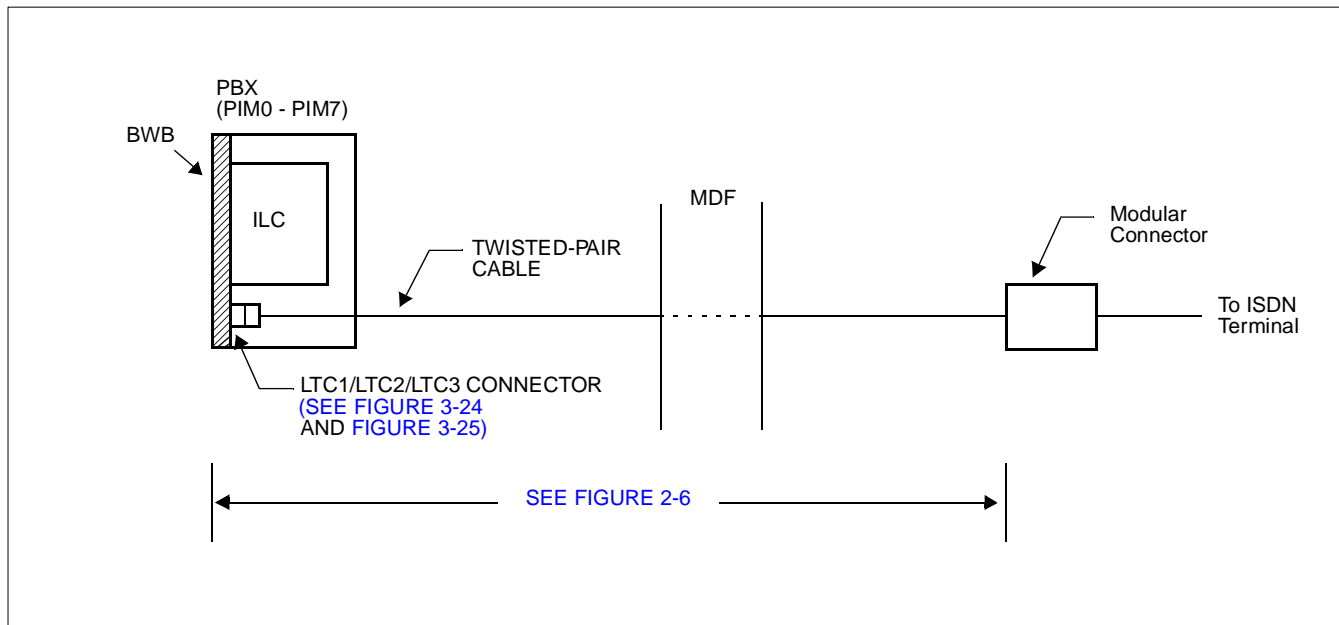

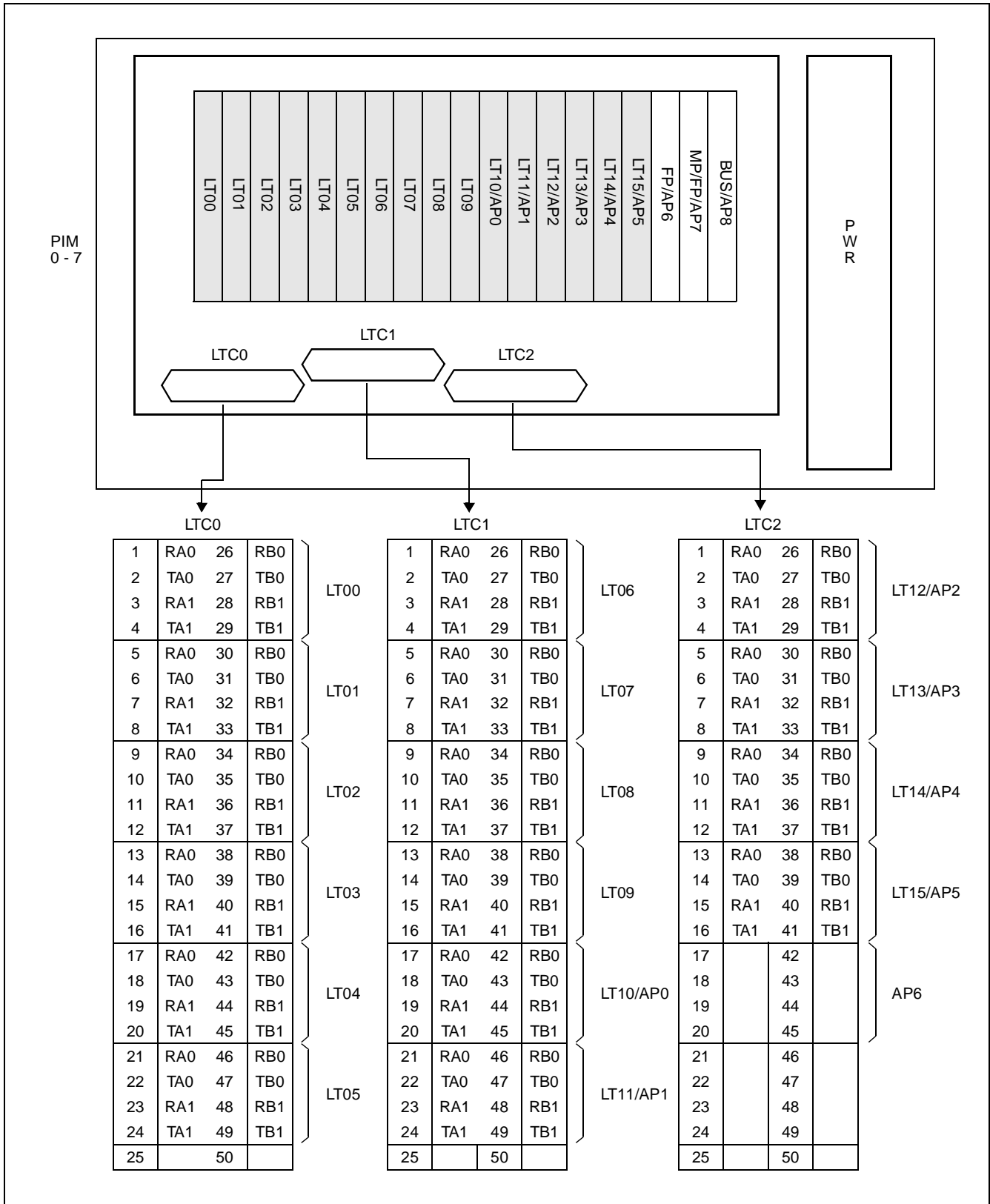**Figure 3-23   Cable Connection via the MDF for ISDN Terminal**

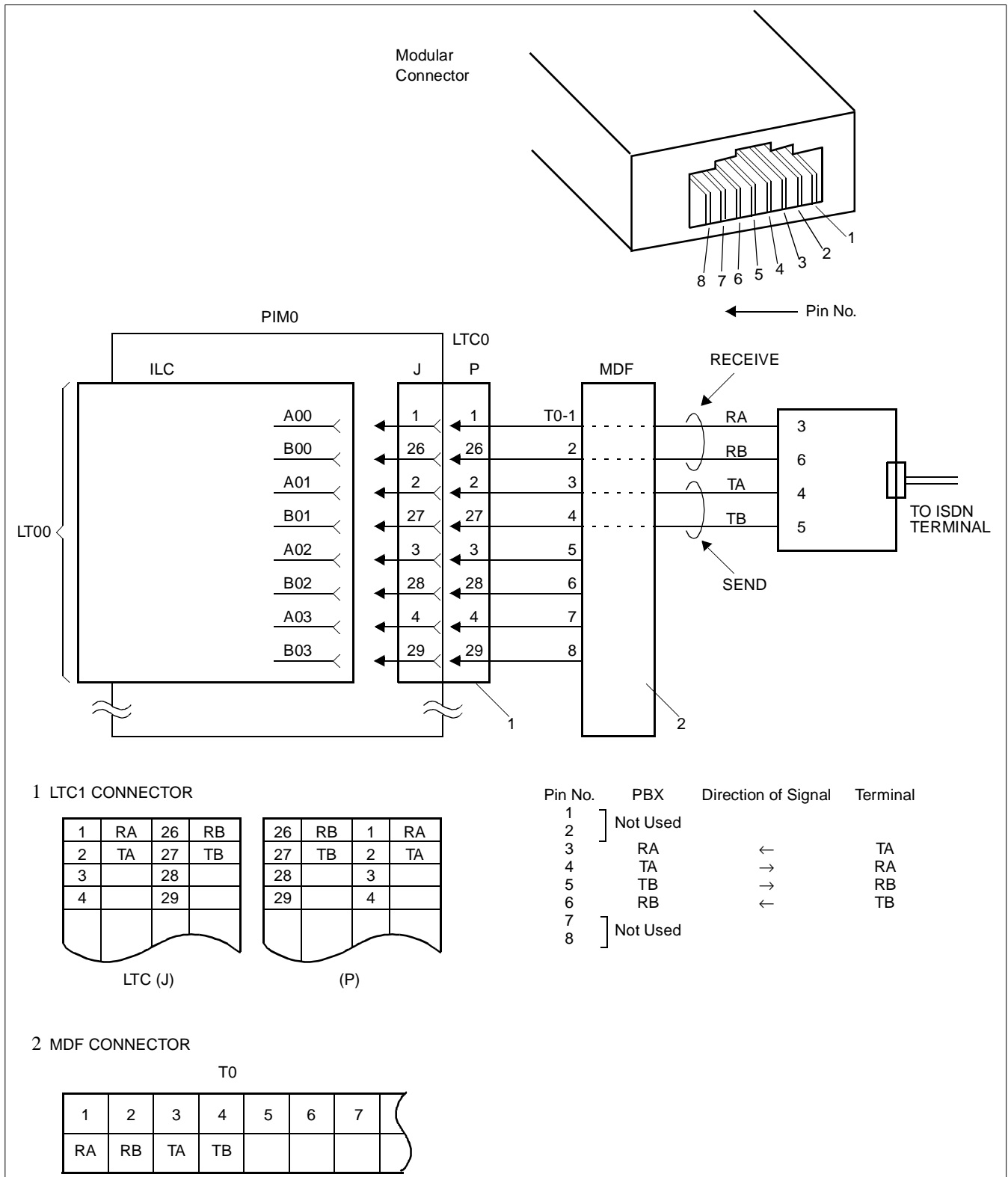**Figure 3-24   Location of the LT Slots and the LTC Connectors for ISDN Terminal**

Figure 3-25   Example of Cable Connection via the MDF for ISDN Terminal

4.4 Installation Procedure for Event Based CCIS

Perform necessary installation works of the equipment according to the procedure shown in Figure 3-26.

Note: *When requiring Call Recording of ISDN call, execute the installation works of SMDR.*
For details, refer to the SMDR System Manual.
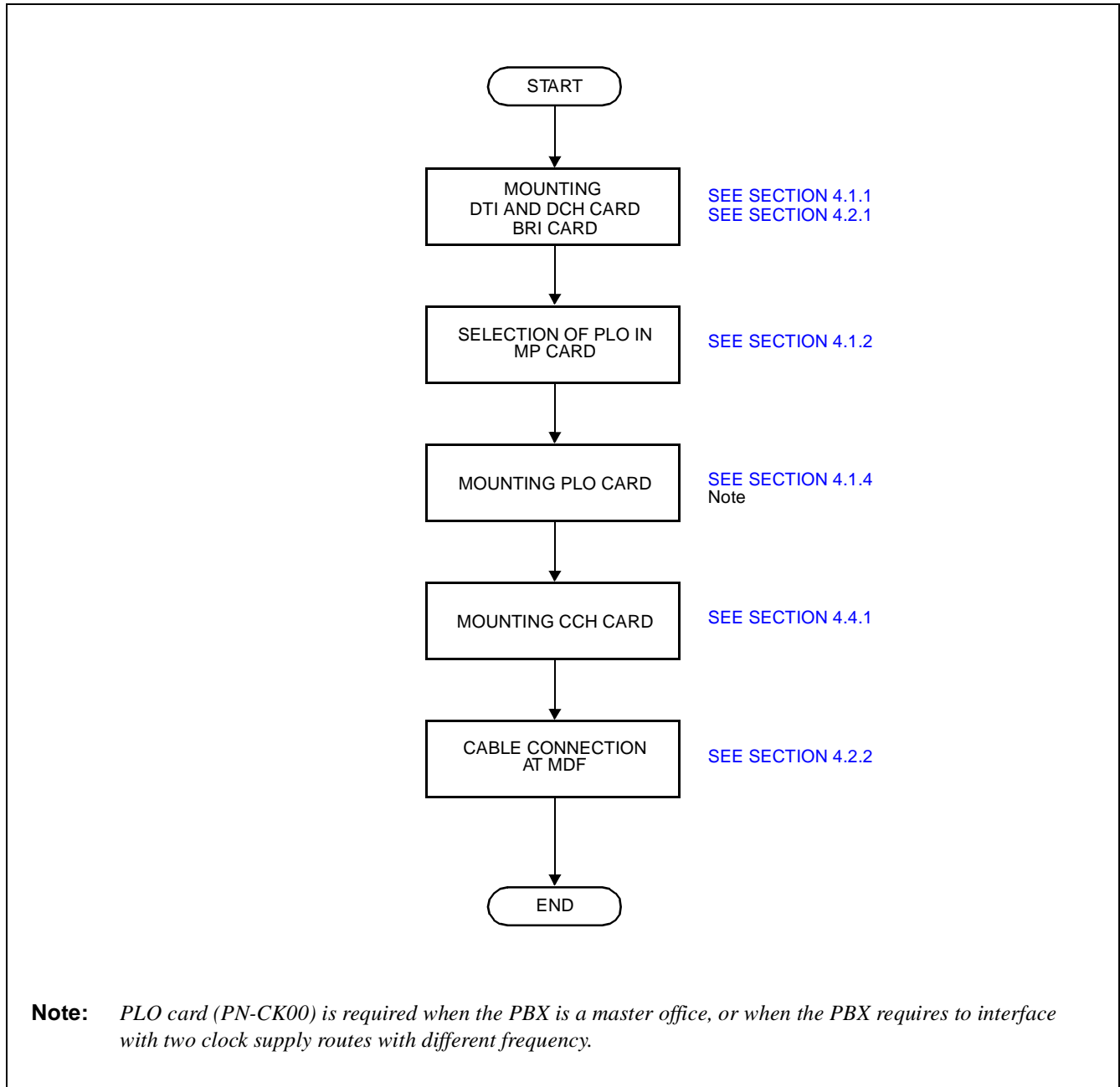
Figure 3-26   Installation Procedure for Event Based CCIS

4.4.1 Mounting CCH Card

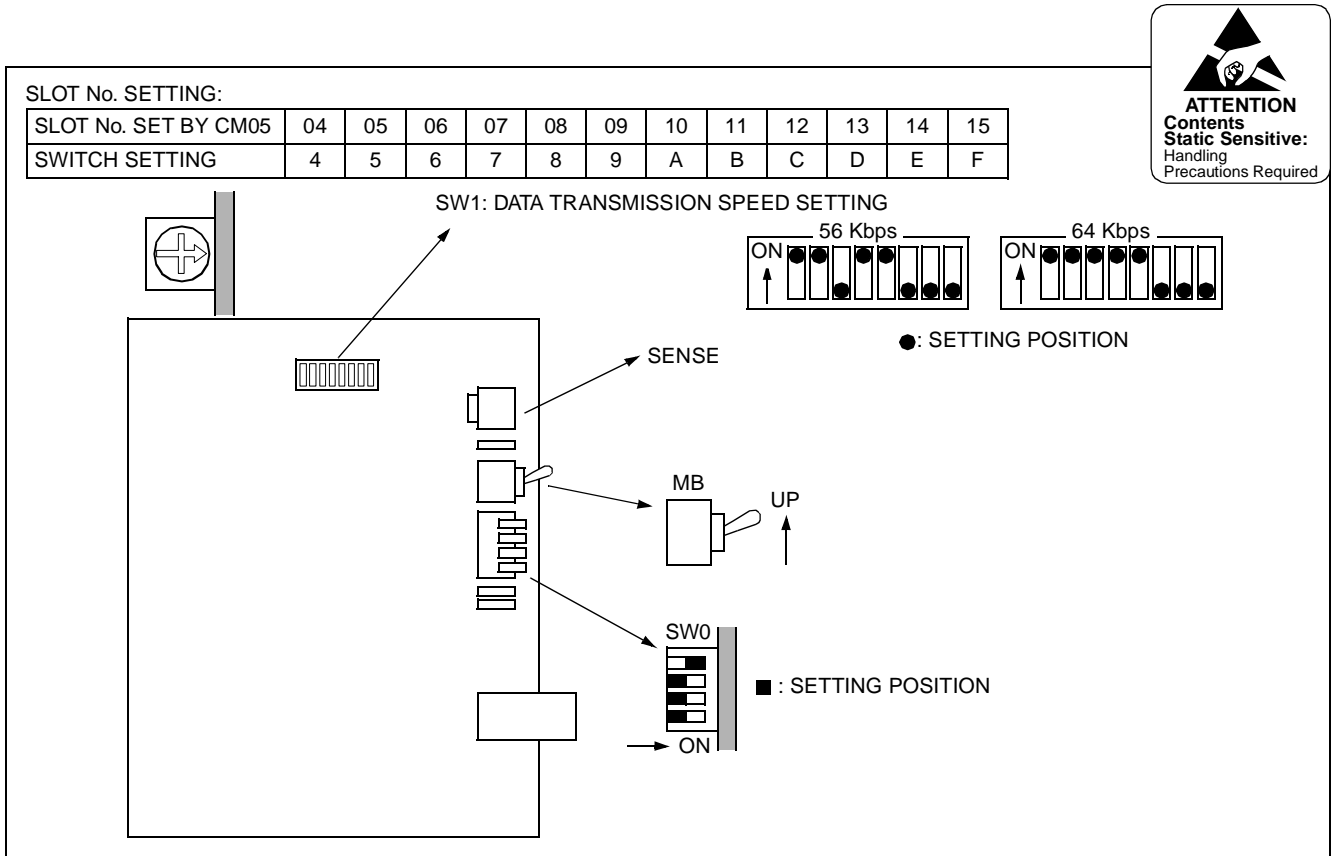STEP 1: On the CCH card, set the switches as shown below.

Figure 3-27   Switch Settings on the CCH Card

STEP 2: Mount the CCH card into one of the AP slots on PIM0-PIM7.
After mounting the card, set the MB switch to down position to put the card in service.
For details on switch settings and mounting location, refer to the Circuit Card Manual.
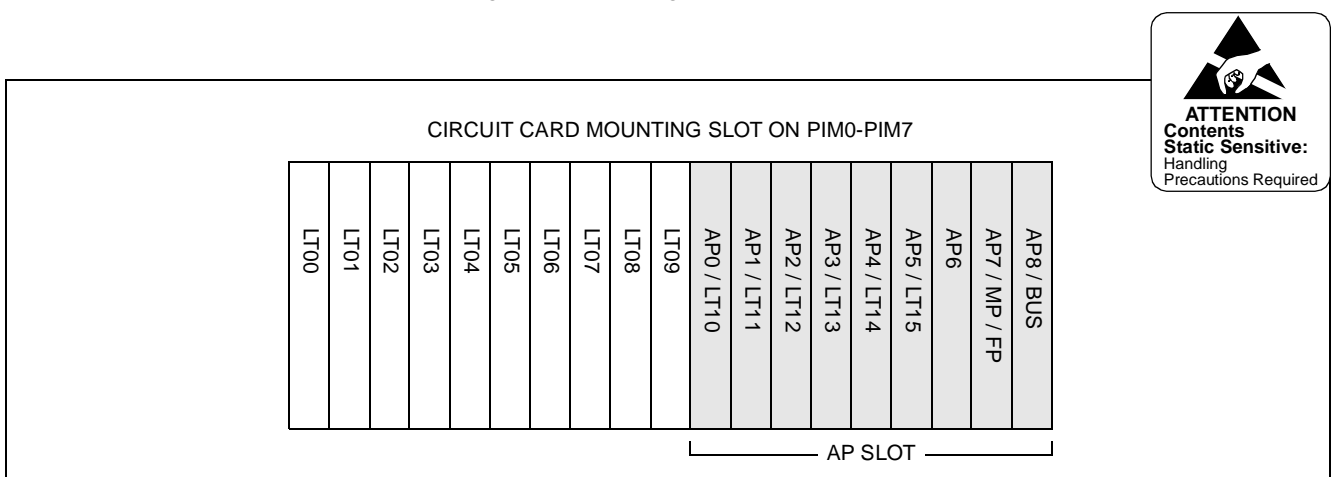

Figure 3-28   Mounting Location of the CCH Card

This page is for your notes.

CHAPTER 4   SYSTEM DATA PROGRAMMING

1. GENERAL

This chapter describes the programming procedure for providing ISDN to the PBX.

2. SYSTEM DATA PROGRAMMING INFORMATION

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 assigned for each command.
(INITIAL)	:	System Initialization After entering the data, system reset is required (press SW1 on the MP card).

3. PROGRAMMING PROCEDURE

Assign the system data related to ISDN, according to the following procedure.

For providing the system with a PLO card (PN-CK00), no programming is required.

For details on each command, refer to the Command Manual.
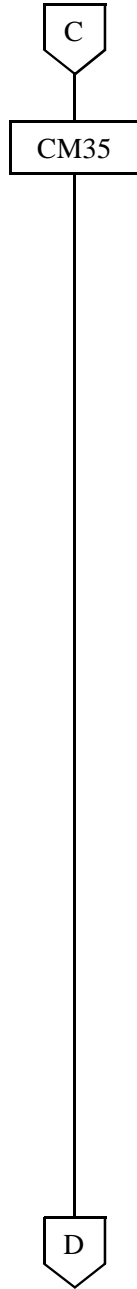
3.1 Basic Data Assignment for ISDN with PRI

3.1.1 DTI Assignment

START	DESCRIPTION	DATA
CM05	Assign a slot number to the DTI card. (PN-24DTA/24DTA-A). The slot number assigned must coincide with the value set by the SENS switch on the DTI card. (INITIAL)	(1) Slot No. (04-15) (2) 09: DTI card

CM07	Assign ISDN Trunk No. to each channel number on the DTI card.
	
	(INITIAL)
	
	Note: *The system allocates time slots to consecutive channels from lowest to highest channel number assigned. To minimize the number of time slots allocated, assign trunk numbers to the consecutive channels on each card. Never skip channels in CM07.*
		• YY = 01
		(1) <u>XX</u> <u>XX</u>
		   *a *b
		   *a: Slot No. assigned by CM05
		   *b: Channel No. of DTI 00-23
		(2) Trunk No. (D000-D255)
		   Trunk number already assigned by CM10 cannot be used.

CM48	Allow second Dial Tone when dialing access code assigned by CM20 for ISDN B channel route.	• Y=2 (1) 04 (2) 0: For ISDN Trunk Route, 2nd Dial Tone is provided. 1: No 2nd Dial Tone
CMAA	Assign the necessary functions to the DTI card. After entering the data, set the MB switch on the DTI card to UP, and then to DOWN, for DTI initialization.	• YY=00 (Data Mode) (1) Slot No. (04-15) assigned by CM05 (2) 0: Based on AT&T Spec. • YY=01 (Frame Configuration) (1) Slot No. (04-15) assigned by CM05 (2) 1◀ : 24-Multi Frame • YY=02 (Zero Code Suppression [B7]) (1) Slot No. (04-15) assigned by CM05 (2) 1◀ : Not Available (Transparent)(B8ZS) • YY=03 (1) Slot No. (04-15) assigned by CM05 (2) 7◀ : Common Channel Signaling
A		

A		
	DESCRIPTION	**DATA**

CM30	Assign a Trunk Route to each ISDN trunk used for Voice channel (B channel), and also to signaling channel (D channel). Make a separate route for B channels and D channels.	• YY=00 (1) Trunk No. (000-255) assigned by CM07 (2) YY=01 Trunk Route No. (00-63)
	Note: *DTI route must be separated from analog trunk routes.*	
	Assign the trunk route data to each ISDN incoming trunk used for Voice channel only.	• YY=02 (Day Mode) (1) YY=03 (Night Mode) Trunk No. (000-255) assigned by CM07 YY=01
	Note: *If CM35 YYY=143 is set to "1" for Event Based CCIS, this command must be set to "18" (ISDN Indial).*	(2) 04: Direct-In Termination 09: Automated Attendant 13: TAS 14: Termination to ATTCON 16: DISA 18: ISDN Indial
CM35	Assign trunk route data to the route number assigned by CM30 YY=00.	• YY=00 (Kind of Trunk Route) (1) B channel Route No. (00-63) (2) 00: ISDN Trunk
		(1) D channel Route No. (00-63) (2) 15◄ : Not used
	Note 1: *This data should be assigned to the B channel trunk route.*	• YY=02 (Call Direction) (1) B channel Route No. (00-63) (2) 3◄ : Bothway Trunk **Note 1**
		• YY=04 (Answer Signal from Distant Office) (1) B channel Route No. (00-63) (2) 2: Answer signal arrives (ISDN Trunk)
		(1) D channel Route No. (00-63) (2) 7◄ : Not used

B

	DESCRIPTION	DATA

B

CM35

Note 1: *This data should be assigned to the B channel trunk route.*

Note 2: *This data should be assigned to both B channel trunk route and D channel trunk route.*

- YY=05 (Release Signal from Distant Office)
- (1) B channel/D channel Route No. (00-63)
- (2) 1◄ : Release signal arrives
  Note 2
- YY=09 (Incoming Connection Signaling)
- (1) B channel Route No. (00-63)
- (2) 08: ISDN

- (1) D channel Route No. (00-63)
- (2) 15◄ : Not used

- YY=11 (Toll Restriction)
- (1) B channel Route No. (00-63)
- (2) 0/3◄ : To be provided/Not to be provided
  Note 1

Specify the number of digits to be received on DID.

Note: *If CM35 YYY=143 is set to "1" for Event Based CCIS, the number of digits received on DID must be assigned.*

- YY = 12
- (1) B channel Route No. (00-63)
- (2) 0 : 1 digit
  1 : 2 digits
  2 : 3 digits
  3◄ : 4 digits

- YY = 14 (SMDR for Outgoing Call)
- (1) B channel Route No. (00 – 63)
- (2) 0/1◄ : Not to be provided/To be provided
  Note 1

- YY = 15 (Kind of Call Termination Indicator Key/Lamp on ATT)
- (1) B channel Route No. (00 – 63)
- (2) 00 – 07 (C.O. Incoming 0 – 7)

- YY = 16 (Hooking Signal Sending to Outside)
- (1) B channel Route No. (00 – 63)
- (2) 0: Not sending

C

C

CM35

DESCRIPTION

CONNECTION PATTERNS	PAD DATA OF DTI [dB]			
	DATA =4 (T/R)	DATA =5 (T/R)	DATA =6 (T/R)	DATA =7 (T/R)
Station – DTI	3/8	3/3	3/3	3/8
Tone – DTI	0/0	0/0	0/0	0/0
COT/LDT – DTI	0/0	0/0	0/0	0/0
ODT – DTI	+3/3	0/0	0/0	+3/3
DTI –DTI	0/6	0/0	0/6	0/0

T/R: Transmitter PAD/Receiver PAD
+: Gain

Note: *This data should be assigned to the B channel trunk route.*

Specify which number is adopted for corresponding of virtual trunks between the offices, either sub-address number or ISDN Indial dialed-in digits.

DATA

- YY=18 (Digit conversion on DID call)
(1) Trunk Route No. (00-63)
(2) 0 : To provide
   1◀ : Not provided

- YY=19
(1) Trunk Route No. (00-63)
(2) 0:
   1:   Programmable PAD
   2:   (See CM42)
   3:
   4:
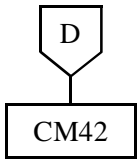   5:   Fixed PAD
   6:   (See left table)
   7◀ :
   Note

- YY=28 (Outgoing Trunk Queuing)
(1) Trunk Route No. (00-63)
(2) 0: Restricted
   For D channel trunk route, no data setting is required

- YY=39 (Trunk release by detection of reversal of tip and ring)
(1) Trunk Route No. (00-63)
(2) 1◀ : To be released
   Note

- YYY=143
(1) Trunk Route No. (00-63)
(2) 0 : By sub-address
   1 : By dialed in digits

D

D

	DESCRIPTION	**DATA**
CM42	When using the programmable PAD (CM35 YY = 19, 2nd Data = 0-3), assign the PAD data.	(1) 50-65 (2) 00-15

PATTERN 1ST DATA	PAD DATA PATTERNS				CONNECTING PATTERNS
	CM35 YY=19 2ND DATA=0	CM35 YY=19 2ND DATA=1	CM35 YY=19 2ND DATA=2	CM35 YY=19 2ND DATA=3	
50 ≀ 65	50	54	58	62	STA/TONE-DTI
	51	55	59	63	COT/LDT-DTI
	52	56	60	64	ODT-DTI
	53	57	61	65	DTI-DTI

2ND DATA	PATTERN	PAD DATA OF DTI (T/R) [dB]	REMARKS
00 ≀ 15	00	0/0	
	01	2/2	
	02	3/3	
	03	0/6	
	04	3/8	
	05	+3/3	
	06	6/6	
	07	8/8	
	08 ≀ 15	Not Used	

T/R: Transmitter PAD/Receiver PAD
+: Gain

END

• For originating calls to the ISDN network, assign the following data.

START	DESCRIPTION	DATA
CM20	Assign ISDN access code to each trunk route assigned by CM30 YY=00. **Note:** *LCR can be used with ISDN-PRI. Refer to Feature Programming Manual.*	• Y=0-3 (Numbering Plan Group 0-3) (1) X-XXX (Access code) (2) 100-163: Trunk Route No. (00-63)
CM08	Specify the timing start when making an ISDN call from SN610 ATTCON.	(1) 403 (2) 0/1◀ : Not Available/Available
CM41	Specify the timing start when making an ISDN call from a Single Line Telephone (PB/DP), Multiline Terminal or SN610 ATTCON, if required.	• Y=0 (1) 50 (2) 03-14: 3 sec.-14 sec. If no data is set, the timing start is not effective. (Dialing terminated by entering #.) Recommended setting is 05 (5 seconds).

Note: *A # or timing start is used for outgoing ISDN calls when LCR is not invoked.*
Example:1-214-555-1212 is dialed from a Multiline Terminal. The PBX will access a bearer channel and ship the digits only after the timing start timer has expired or # is dialed by the caller. The # sign tells the PBX that dialing is completed.

END

SYSTEM DATA PROGRAMMING

- When providing Tandem Connection (Tie Line (OD/DTI) to ISDN — ISDN to Tie Line (OD/DTI)), do the following programming.

START	**DESCRIPTION**	**DATA**
CM36	Specify the combination of Trunk Routes allowing the tandem connection.	(1) XX XX 　　　　 00-63 (Incoming Trunk Route) 　　　　 00-63 (Outgoing Trunk Route) (2) 0/1 ◄ : Allowed/Restricted
CM41	Specify the timing start when making an ISDN call from a station (PB/DP telephone D^{term}) or Attendant Console for the Tandem Connection.	• Y = 0 (1) 57 (2) 03 – 14: 3 sec. – 14 sec.

Note: *By using this command, an ISDN call is available even if "#" is not dialed.*

Note: *This command is effective for dialing a called number (When dialing a called party subaddress, this command is not effective).*

Note: *When the default setting is "NONE", the timing start is not effective.*

END

- When providing Tandem Connection (ISDN to CCIS — CCIS to ISDN), do the following programming.

START	**DESCRIPTION**	**DATA**
CM36	Specify the combination of Trunk Routes allowing the tandem connection.	(1) XX XX 　　　　 00-63 (Incoming Trunk Route) 　　　　 00-63 (Outgoing Trunk Route) (2) 0/1 ◄ : Allowed/Restricted
CM08	Specify whether the Calling Party Number (CPN) sent from ISDN is sent to the CCIS network.	(1) 374 (2) 0/1 ◄ : Available/Not Available

END

3.1.2 DCH Assignment

START	DESCRIPTION	DATA
CM05	Assign a slot number to the DCH card (PN-SC01). The slot number assigned must coincide with the value set by the SENS switch on the PN-SC01 card. (INITIAL)	(1) Slot No. (04 – 15) (2) 12: PN-SC01 card

CMAA	Assign the ISDN protocol type to a slot number assigned by CM05.	• YY=06
		(1) Slot No. of DCH (04-15) assigned by CM05
		(2) 20: AT&T (No. 4, No. 5 ESS)
		  21: NTI (DMS 100, 250)
		  28: National ISDN 2 (NI-2)

CM06	Assign the DCH Number to the Slot Number of DCH assigned by CM05. (INITIAL)	• YY = 08 (1) DCH No. 0 – 4: When using PN-24DTA/24DTA-A (2) XX: Slot No. assigned by CM05
CM35	Execute CM35 YY = 90 for Voice Route B channels and D channel Route.	• YY = 90 (Assignment of DTI route for ISDN) (1) Route No. (00 – 63) (2) 3: ISDN-Primary Rate Interface
	Assign the DCH No. to the ISDN trunk route assigned by CM30 YY = 00.	• YY = 93 (Assignment of D Channel Handler) (1) Route No. (00 – 63) (2) DCH No. assigned by CM06 00 – 04: for PN-24DTA/24DTA-A
CM30	Assign CIC (Circuit Identification Code) No. to each ISDN trunk used for voice channel only.	• YY = 07 (1) Trunk No. (000 – 255) assigned by CM07 YY = 01 (2) CIC No. (000 – 029)
CMA9	Assign the trunk number assigned by CM07 YY = 01 to each DCH Number for providing D Channel path between DTI and DCH. (INITIAL)	• YY = 00 (1) DCH No. assigned by CM06 0 – 4: for PN-24DTA/24DTA-A (2) Trunk No. (000 – 255) assigned by CM07 YY = 01
END		

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3.2 Basic Data Assignment for ISDN with BRI

3.2.1 BRI Assignment

START	DESCRIPTION	DATA

CM05

Assign a slot number to the BRI card.
The slot number assigned must coincide with the value set by the SENS switch on the BRI card.

(INITIAL)

- (1) Slot No. (04-15)
- (2) 10: BRI card

CMAA

Specify ISDN protocol type to a slot number assigned by CM05.

- • YY=06
- (1) Slot No. (04-15) assigned by CM05
- (2) 27: USA NI-1

CM07

Assign ISDN Trunk No. to each Channel No. of BRI Trunk.

(INITIAL)

- • YY=02
- (1) XX XX
       *a   *b
       *a: Slot No. assigned by CM05
       *b: Channel No. (00/01/02/03)
- (2) Trunk No. (D000-D255) Trunk No. already assigned by CM10 can not to be used.

CM30

Assign Trunk Route to each ISDN trunk used for Voice channel (B channel).

Note: *BRI route must be separated from analog trunk routes.*

- • YY=00
- (1) Trunk No. (000-255) assigned by CM07
       YY=01
- (2) Trunk Route No. (00-63)

Assign the trunk route data to each ISDN incoming trunk used for Voice channel only.

Note: *If CM35 YYY=143 is set to "1" for Event Based CCIS, this command must be set to "18" (ISDN Indial).*

- • YY=02 (Day Mode)
       YY=03 (Night Mode)
- (1) Trunk No. (000-255) assigned by CM07
       YY=01
- (2) 18: ISDN Indial

Note: *The programming example for BRI trunks is in Chapter 4 on Pages 128 and 129.*

A

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A	DESCRIPTION	DATA

CM30

Assign ISDN Local Office Code Table Number to each ISDN trunk.

- YY=34
- (1) Trunk No. (000-255) assigned by CM07 YY=02
- (2) Local Office Table No. (00-14)
  15◀ : Not assigned

CM35

Assign trunk route data to the route number assigned by CM30 YY=00.

Note 1: *This data should be assigned to the B channel trunk route. This data should be assigned to both B channel trunk route and D channel trunk route.*

- YY=00 (Kind of Trunk Route)
- (1) Trunk Route No. (00-63)
- (2) 00: ISDN Trunk
- (1) D channel Route No. (00-63)
- (2) 15◀ : Not used

- YY=02 (Call Direction)
- (1) Trunk Route No. (00-63)
- (2) 3◀ : Bothway Trunk
  Note 1

- YY=04 (Answer Signal From Distant Office)
- (1) Trunk Route No. (00-63)
- (2) 2: Answer signal arrives (ISDN Trunk)
- (1) D channel Route No. (00-63)
- (2) 7◀ : Not used

- YY=05 (Release Signal from Distant Office)
- (1) Trunk Route No. (00-63)
- (2) 1◀ : Release signal arrives
  Note 2

Specify the number of digits to be received on DID.

Note: *If CM35 YYY=143 is set to "1" for Event Based CCIS, the number of digits received on DID must be assigned.*

- YY=09 (Incoming Connection Signaling)
- (1) Trunk Route No. (00-63)
- (2) 08 : ISDN Indial

- YY=11 (Toll Restriction)
- (1) Trunk Route No. (00-63)
- (2) 0/3◀ : To be provided/Not to be provided
  Note 1

- YY=12
- (1) Trunk Route No. (00-63)
- (2) 0   : 1 digit
  1   : 2 digits
  2   : 3 digits
  3◀ : 4 digits
  Note 1

B

| B | **DESCRIPTION** | **DATA** |

CM35

Note 1: *This data should be assigned to the B channel trunk route. For D channel trunk rute, no data setting is required.*

Note: *If CM35 YYY=143, is set to "1" for Event Based CCIS, CM35 YY=18 must be set to "0".*

- YY=14 (SMDR for Outgoing Call)
(1) Trunk Route No. (00-63)
(2) 0/1◀ : Not to be provided/To be provided
Note 1

- YY=15 (Kind of Call Termination Indicator Key/Lamp on ATT)
(1) Trunk Route No. (00-63)
(2) 00-07 (C.O. Incoming 0-7)
Note 1

- YY=16 (Hooking Signal Sending to Outside)
(1) Trunk Route No. (00-63)
(2) 0: Not sending
Note 1

- YY=18 (Digit conversion on DID call)
(1) Trunk Route No. (00-63)
(2) 0 : To provide
1◀ : Not provided
Note 1

CONNECTION PATTERNS	PAD DATA OF DTI [dB]			
	DATA =4 (T/R)	DATA =5 (T/R)	DATA =6 (T/R)	DATA =7 (T/R)
Station – DTI	3/8	3/3	3/3	3/8
Tone – DTI	0/0	0/0	0/0	0/0
COT/LDT – DTI	0/0	0/0	0/0	0/0
ODT – DTI	+3/3	0/0	0/0	+3/3
DTI –DTI	0/6	0/0	0/6	0/0

T/R: Transmitter PAD/Receiver PAD
+: Gain

- YY=19
(1) Trunk Route No. (00-63)
(2) 0:
1: Programmable PAD
2: (See CM42)
3:
4:
5:
6:
7◀ :
Note 1

C

	DESCRIPTION	DATA

C

CM35

Note 1: *This data should be assigned to the B channel trunk route. For D channel trunk route, no data setting is required.*

Note 2: *This data should be assigned to both B channel trunk route and D channel trunk route.*

- YY=28 (Outgoing Trunk Queuing)
- (1) Trunk Route No. (00-63)
- (2) 0: Restricted
  For D channel trunk route, no data setting is required.

- YY=39 (Trunk release by detection of reversal of tip and ring)
- (1) Trunk Route No. (00-63)
- (2) 1◀ : To be released
  Note 1

- YY=90 (Assignment of BRI route for ISDN)
- (1) Trunk Route No. (00-63)
- (2) 2: ISDN-Basic Rate Interface
  Note 2

Specify which number is adopted for corresponding of virtual trunks between the offices, either sub-address number or ISDN Indial dialled-in digits.

- YYY=143
- (1) Trunk Route No. (00-63)
- (2) 0: By sub-address No.
  1: By dialled-in digits
  Note 1

CM50

Assign ISDN Local Office Code.

- YY=05
- (1) Local Office Table No. (00-14) assigned by CM30 YY=34
- (2) XXXXXX
  (Area Code + Local Office Code: 6 digits)

CMAC

Assign Service Profile ID (SPID) to each B channel No.

- YY=30
- (1) $\underline{XX}$ $\underline{X}$
  *a   *b
  *a: Slot No. (04-15) assigned by CM05.
  *b: BCH No. (0-3)
- (2) XXXXXXXX
  (Local Office Code + SPID: 8 digits)

D

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D	DESCRIPTION	DATA

CM76

When the data for CM35 YY = 18 is set to "0" (Received Digits Conversion is to be provided), assign the data for interpreting the digits received.

- • Y = 0 (Day Mode)
- • Y = 1 (Night Mode)
- (1) X-XXXX: Station Number received.
- (2) X-XXXX: Station Number to be terminated.
  - DXX: Change Terminating System to:
    - D09: AUTO ATT.
    - D13: TAS
    - D14: SN610 ATTCON
    - D16: DISA

END

HARDWARE REQUIRED

PN-AUCA card × n

This page is for your notes.

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• For originating calls to the ISDN network, assign the following data.

START	DESCRIPTION	DATA
CM20	Assign ISDN access code to each trunk route assigned by CM30 YY=00.	• Y=0-3 (Numbering Plan Group 0-3) (1) X-XXX (Access code) (2) 100-163: Trunk Route No. (00-63)
CM08	Specify the timing start when making an ISDN call from SN610 ATTCON.	(1) 403 (2) 0/1◀ : Not Available/Available
CM41	Specify the timing start when making an ISDN call from a Single Line Telephone (PB/DP), Multiline Terminal or SN610 ATTCON, if required.	• Y=0 (1) 50 (2) 03-14: 3 sec.-14 sec. If no data is set, the timing start is not effective. (Dialing terminated by entering #.) Recommended setting is 05 (5 seconds).

END

• When providing Tandem Connection (Tie Line (OD/DTI) to ISDN/ISDN to Tie Line (OD/DTI)), do the following programming.

START	DESCRIPTION	DATA

CM36	Specify the combination of Trunk Routes allowing the tandem connection.	(1) XX XX
		    00-63 (Incoming Trunk Route)
		    00-63 (Outgoing Trunk Route)
		(2) 0/1◀ : Allowed/Restricted

CM41	Specify the timing start when making an ISDN call from a station (PB/DP telephone Multiline Terminal) or Attendant Console for the Tandem Connection.	• Y=0 (1) 57 (2) 03-14: 3 sec.-14 sec.

Note 1: *By using this command, an ISDN call is available even if "#" is not dialed.*

Note 2: *This command is effective for dialing a called number (When dialing a called party subaddress, this command is not effective).*

Note 3: *When the default setting is "NONE", the timing start is not effective.*

END

• When providing Tandem Connection (ISDN to CCIS/CCIS to ISDN), do the following programming.

START	DESCRIPTION	DATA
CM36	Specify the combination of Trunk routes allowing the tandem connection.	(1) <u>XX</u> <u>XX</u> 00-63 (Incoming Trunk Route) 00-63 (Outgoing Trunk Route) (2) 0/1◄ : Allowed/Restricted
CM08	Tandem connection by station or attendant	(1) 028 (2) 0/1◄ : Available/Not Available
END		

• Specify whether the Calling Party Number (CPN) sent from ISDN is sent to the CCIS network.

START	DESCRIPTION	DATA
CM08	Maximum number of digits sent to CCIS network	(1) 379 (2) 0 : 24 digits
CMA7	Activate IAI2 message for sending ISDN CPN to CCIS network.	• YY=26 (1) CCIS Channel No. (0-3) (2) 0 : Active
	Allow sending of CPN to CCIS network.	• YY=28 (1) CCIS Channel No. (0-3) (2) 0 : Allowed
END		

ND-45857 (E)
Addendum-001
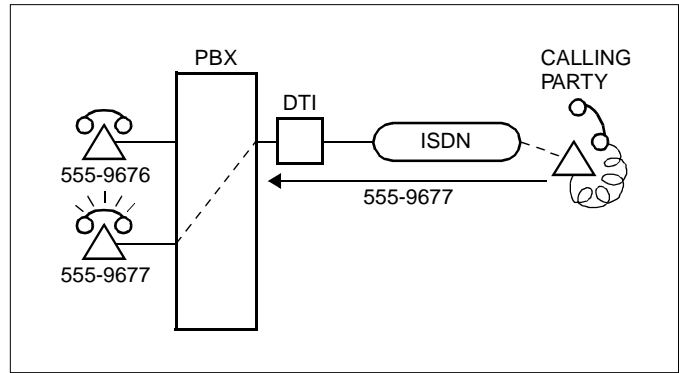**AUGUST, 1998**

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3.3 Service Data Assignment

3.3.1 Calling Party Recognition Service (Direct-In Termination (DIT)) Assignment

Refer to "Direct Inward Termination (DIT)" in the Feature Programming Manual.

3.3.2 DID Addressing Assignment

START	DESCRIPTION	DATA
CM30	Assign the data for DID to the Trunk Numbers assigned by CM07.	• YY = 02 (Terminating System in Day Mode) • YY = 03 (Terminating System in Night Mode) (1) Trunk No. (000 – 255) assigned by CM07 YY = 01 (2) 18: ISDN Indial

CM35	Assign the data for DID to the Trunk Routes assigned by CM30	• YY = 00 (Kind of Trunk)
		(1) Trunk Route No. (00 – 63)
		(2) 00: DDD
		
		• YY = 02 (OG/IC)
		(1) Trunk Route No. (00 – 63)
		(2) 3 ◀ : Bothway Trunk
		
		• YY = 05 (Release Signal Condition)
		(1) Trunk Route No. (00 – 63)
		(2) 1 ◀ : Release Signal arrives
		
		• YY = 09
		(1) Trunk Route No. (00 – 63)
		(2) 08: ISDN
		
		• YY = 12 (Number of digits to be received)
		(1) Trunk Route No. (00 – 63)
		(2) Number of Digits
		    0: 1 digit
		    1: 2 digits
		    2: 3 digits
		    3 ◀ : 4 digits

A		

A	DESCRIPTION	DATA

CM35

- • YY = 18 (Received Digit Conversion)
- (1) Trunk Route No. (00 – 63)
- (2) 0/1◄ : To be provided/Not to be provided

CM51

Assign the destination of DID Call transferred when the station is busy/unassigned/no answer.

- • YY = 00 (No Answer)
- • YY = 03 (Busy)
- • YY = 06 (Unassigned)
- (1) Tenant No. (00 – 63)
- (2) Destination:
  X-XXXX (Station No.)
  E000 (SN610 ATTCON)
  EBXXX (Announcement Service: Digital Announcement Trunk No.)

CM76

When the data for CM35 YY = 18 is set to "0" (Received Digit Conversion is to be provided), assign the data for interpreting the digits received.

Note: *If CM35 YYY=143 is set to "1" for Event Based CCIS, this command must be set.*

- • Y = 0 (Day Mode)
- • Y = 1 (Night Mode)
- (1) X-XXXX: Station No. received.
- (2) X-XXXX: Station/Data Station No. to be terminated.
  DXX: Change Terminating System to:
  D04: DIT
  D09: Automated Attendant
  D13: TAS
  D14: SN610 ATTCON
  D16: DISA

  BXXX: Mate-Side Trunk No. of Virtual Trunk
  (B000-B 255)
  Note

<u>END</u>

3.3.3 MEGACOM® Access Assignment

START	DESCRIPTION	DATA

CM12	Assign the Trunk Restriction Class to each station.	• YY = 01 (Trunk Restriction Class)
		(1) Station No. (X-XXXX)
		(2) <u>X</u> <u>X</u>
		   *a *b
		   *a: Trunk Rest. Class in Day mode.
		      (1◀ – 8)
		   *b: Trunk Rest. Class in Night mode.
		      (1◀ – 8)
		   1: Unrestricted (RCA)
		   2: Non-Restricted 1 (RCB)
		   3: Non-Restricted 2 (RCC)
		   4: Semi-Restricted 1 (RCD)
		   5: Semi-Restricted 2 (RCE)
		   6: Restricted 1 (RCF)
		   7: Restricted 2 (RCG)
		   8: Fully-Restricted (RCH)

CM35	Set the Outgoing/Incoming Trunk Route Restriction Data by Trunk Restriction Classes (RCA-RCH).	• YY = 51 – 58 (Outgoing Trunk Rest. Data) • YY = 61 – 68 (Incoming Trunk Rest. Data) (1) Trunk Route No. (00 – 63) (2) 0/1◀ : Restricted/Allowed.

Note: *If Call-By-Call Service Selection is required, see Section 3.4.1 for additional programming.*

END

In addition to the programming of Direct Outward Dialing, assign WATS line to the required trunk route, as shown below.

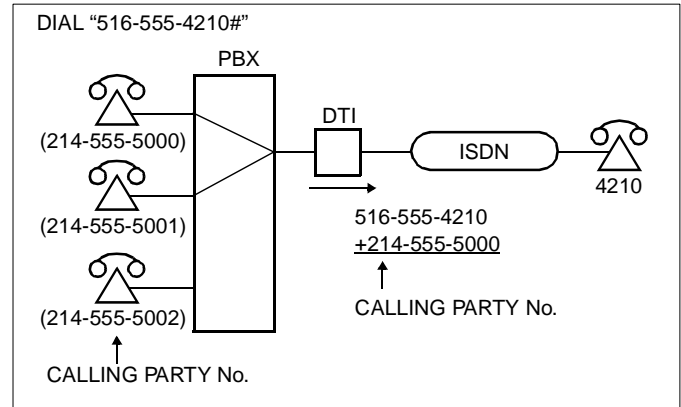| START	DESCRIPTION	DATA
CM35	Assign a WATS line to the required trunk route.	• YY = 00 (1) Trunk Route No. (00 – 63) (2) 02: WATS line

END

3.3.4   MEGACOM® 800 Service Assignment

Refer to DID Addressing Assignment for programming instructions.

3.3.5 CPN to Network – Presentation Assignment

For providing the calling party number (CPN) to the network, the data programming is shown below.

- When Dial-In service is provided:

DIAL "516-555-4210#"

PBX

DTI

ISDN

4210

(214-555-5000)

(214-555-5001)

(214-555-5002)

516-555-4210
+214-555-5000

CALLING PARTY No.

CALLING PARTY No.

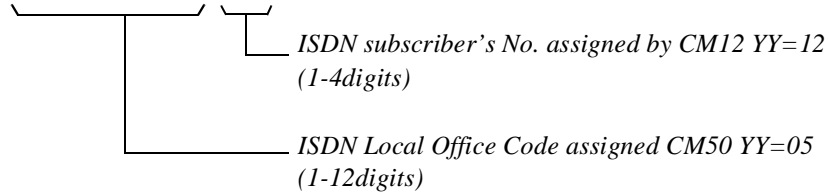| START	DESCRIPTION	DATA
CM12	Assign an ISDN Subscriber's Number of ISDN Number and ISDN Local Office Code Table Number to required station.	• YY = 12 (1) X-XXXX (Station No.) (2) X-XXXX (ISDN subscriber's No.) • YY = 13 (1) X-XXXX (Station No.) (2) 00: ISDN Local Office Code Table No. 00 ≀　　　　≀ 14: ISDN Local Office Code Table No. 1
CM13	Specify the facility control of CPN (Calling Party Number).	• YY = 25 (1) X-XXXX (Station No.) (2) 0/1◄ : To be provided　**Note 2** /Not to be provided
CM50	Assign Local Office Code of ISDN Number to the Table Number assigned by CM12 YY = 13.	• YY = 05 (1) 00: ISDN Local Office Code Table No. 00 ≀　　　　≀ 14: ISDN Local Office Code Table No. 14 (2) X...X:Local Office Code (Max. 12 digits)
END		

• When BRI Terminals are used:

START	DESCRIPTION	DATA

CM08

The BRI Terminal can send the CPN to Network without using PBX programming.

(1) 434

(2) 0: Use Calling Number Set in BRI Terminal.
1 ◀ : Use Programming in CM 12 YY=12, 13

START
│
CM08
│
END

Note 1: *The ISDN Number consists of the following numbers:*
ISDN Number: XXXXXXXXXXXX YYYY

ISDN subscriber's No. assigned by CM12 YY=12
(1-4digits)

ISDN Local Office Code assigned CM50 YY=05
(1-12digits)

This number must be in the indial range assigned by Telecom for the ISDN line.

For example:

National Destination Code for Dallas: 214
Local Code for a station: 518 - 5000
In this case, the ISDN Number is National Destination Code + Local Code = 214518 - 5000
That is:

ISDN Subscribers No. assigned byCM12 YY = 12 is 5000.
ISDN Local Office Code assigned by CM50 YY = 05 is 214518.

Note 2: *The following facility control services for CPN are available in accordance with the subscription category of distant ISDN exchange. In case of no subscription, CPN to Network – Present is not available.*

Example:

	1st Data	2nd Data	Meaning
CM13 YY = 25	5000	0	Restrict transfer
	5001	1	Permit transfer

Station 5000 places an outgoing call to an ISDN subscriber. Because CM13–25 is set to 0, the ISDN network is instructed to not send 214-518-5000 (see Note 1 above) to the distant ISDN subscriber.

Station 5001 places an outgoing call to an ISDN subscriber, and 214-518-5001 is sent to the called party.

• When Dial-In service is not provided:

DIAL "516-555-4210#"

CALLING PARTY No.

PBX

(214-555-5000)

DTI

ISDN

555-4210

516-555-4210
#214-555-5000
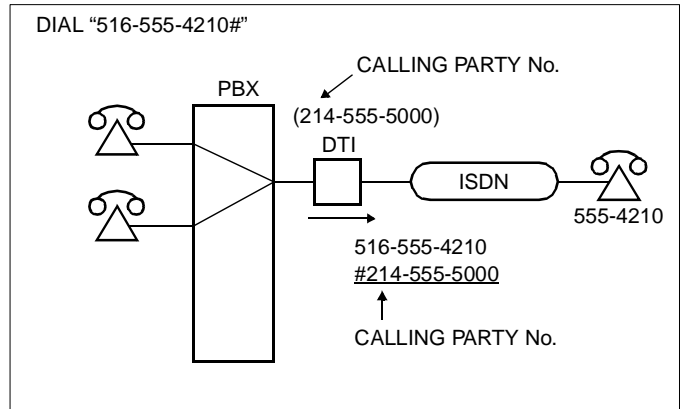
CALLING PARTY No.

START	DESCRIPTION	DATA
CM13	Specify the sending out of CPN (Calling Party Number).	• YY = 25 (1) X-XXXX: Station No. (2) 0/1◀ : To be sent out ⎤ **Note 2** /Not to be sent out ⎦
CM30	Assign an ISDN subscriber's Number of ISDN Number to each ISDN trunk.	• YY = 19 (1) Trunk No. (000 – 255) assigned by CM07 YY = 01 (2) XXXX: ISDN Subscriber's No.
	Assign ISDN Local Office Code Table Number to each ISDN trunk.	• YY = 34 (1) Trunk No. (000 – 255) assigned by CM07 YY = 01 (2) ⎡00: Local Office Code Table No. 00 ⎟ ⁓ ⁓ ⎣14: Local Office Code Table No. 14
CM50	Assign Local Office Code of ISDN Number Table Number assigned by CM30 YY = 34.	• YY = 05 (1) ⎡00: ISDN Local Office Code Table No. 00 ⎟ ⁓ ⁓ ⎣14: ISDN Local Office Code Table No. 14 (2) X...X: Local Office Code (Max. 12 digits)

END

Note 1: *The ISDN Number consists of the following number.*
ISDN Number: XXXXXXXXXXXX YYYY

ISDN subscriber's No. assigned by CM30 YY=19
(4digits)

ISDN Local Office Code assigned CM50 YY=05
(1-12digits)
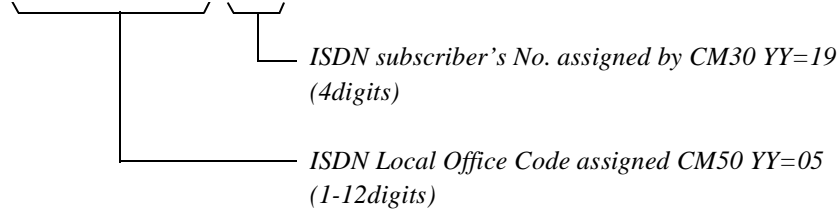
For example:

National Destination Code for Melbourne: 214
Local Code for the ISDN line: 518 - 5000
In this case, the ISDN Number is National Destination Code + Local Code = 214518 - 5000
That is:

ISDN Subscribers No. assigned by CM30 YY = 19 is 5000.
ISDN Local Office Code assigned by CM50 YY = 05 is 214518.

Note 2: *The following facility control services for CPN are available in accordance with the subscription category of distant ISDN exchange. If no subscription, CPN to Network – Present is not available.*

2nd Data of CM13 YY = 25	Subscription Category of Distant ISDN exchange	CPN to Remote Side
0: To be provided	Permit Transfer	Not Available
	Restrict Transfer	Available
1◄ : Not to be provided	Permit Transfer	Available
	Restrict Transfer	Not Available

3.3.6   CPN to Terminating User – Display Assignment

No programming is required.

3.3.7   Subaddress – Addressing Assignment

When the system has received a Called Party Sub-address (Calling Station Number) from an ISDN subscriber, the system makes the connection with the specified terminal.

START	**DESCRIPTION**	**DATA**

CM08	Specify the terminating system for Called Party Subaddress.	(1) 401
		(2) ⌈ 0: Station Call
		    1◄ : Terminating System assigned by
		           CM30 YY = 02/03

END		

3.3.8 Subaddress – Present Assignment

When a station has dialed an ISDN subscriber's number, the station number is automatically sent as a calling Party Subaddress.
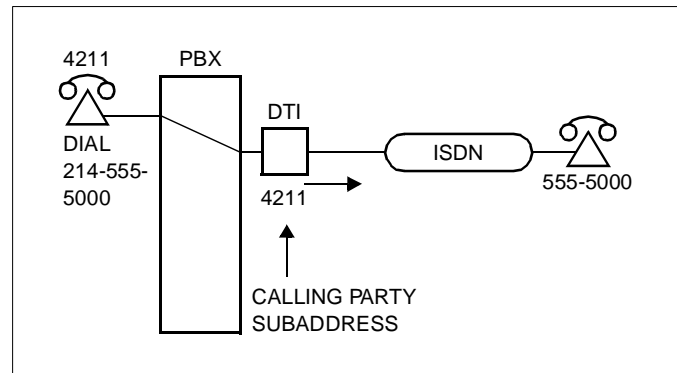
START	DESCRIPTION	DATA
CM08	Provide the system with Calling party Subaddress to an ISDN network.	(1) 400 (2) 0: To be sent out
END		

3.3.9 Trunk Provisioning Service Selection Assignment

START	DESCRIPTION	DATA
CM30	Assign the Trunk Route to the Trunk No. assigned by CM07.	• YY = 00 (Trunk Route Allocation) (1) Trunk No. (000 – 255) assigned by CM07 YY = 01. (2) Route No. (00 – 63)
END		

3.3.10 Automated Attendant Assignment

START	DESCRIPTION	DATA
CM30	Assign the Trunk Route.	• YY = 00 (1) Trunk No. (000 – 255) (2) Trunk Route (00 – 63)
	Assign the Trunk Tenant.	• YY = 01 (1) Trunk No. (000 – 255) (2) Trunk Tenant (00 – 63) If no data is set, the default setting is 01.
	Assign the data for Automated Attendant to required trunks.	• YY = 02 (Terminating System in Day mode) • YY = 03 (Terminating System in Night mode) (1) Trunk No. (000 – 255) (2) 18: ISDN Indial • YY = 30 (Handling of busy/not available Automated Attendant destination in Day mode) • YY = 31 (Handling of busy/not available Automated Attendant destination in Night mode) (1) Trunk No. (000 – 255) (2) ⌈00: C.O. Line Release 01: Forwarded to TAS 03: Forwarded to ATTCON 04: Forwarded to DIT Station 06: DT Connection for redial 08: 2nd Answering Message followed by DT Connection for redial ⌊15 ◀ : C.O. Line Release

A

A	DESCRIPTION	DATA

CM30

- YY = 32 (Handling of timed-out Automated Attendant in day mode)
- YY = 37 (Handling of time-out Automated Attendant in night mode)

(1) Trunk No. (000 – 255)

(2) ⌈ 00: C.O. Line Release
01: Forwarded to TAS
03: Forwarded to ATTCON
04: Forwarded to DIT Station
06: DT Connection for redial
⌊ 15 ◀ : C.O. Line Release

- YY = 33 (In case YY = 30, 31 is set to data 08, if all DTMF Receivers are busy.)

(1) Trunk No. (000 – 255)

(2) ⌈ 00: Disconnection
01: Forwarded to TAS Indicator
03: Forwarded to SN610 ATTCON
⌊ 15 ◀ : Disconnection

CM35 Assign the data for DID to the Trunk Routes.

- YY = 00 (Kind of Trunk)

(1) Trunk Route No. (00 – 63)

(2) 00: ISDN Trunk

- YY = 12 (Number of digits to be received)

(1) Trunk Route No. (00 – 63)

(2) ⌈ 0: 1 digit
1: 2 digits
2: 3 digits
⌊ 3 ◀ : 4 digits

- YY = 18 (Received Digit Conversion)

(1) Trunk Route No. (00 – 63)

(2) 0/1 ◀ : To be provided/Not to be provided

B

	DESCRIPTION	DATA
B		
CM35		• YY = 33 (Interval of ringing signal)
		(1) Trunk Route No. (00 – 63)
		(2) 0: 0.4s ON – 0.2s OFF – 0.4s ON–2s OFF
		1: 0.4s ON – 0.2s OFF – 0.4s ON–2s OFF
		2: 1s ON – 2s OFF
		3 ◀ : When CM08 – 392 = 0: 2s ON – 4s OFF
		◀ When CM08 – 392 = 1: 0.4s ON – 0.2s OFF – 0.4s ON – 2s OFF
CM76	When the data for CM35 YY = 18 is set to 0, assign the data for converting the received digit.	• Y = 0 (Day Mode)
		• Y = 1 (Night Mode)
		(1) X-XXXX: Station No. received
		(2) D09: Automated Attendant
CM45	Assign the DTMF Receiver for the Automated Attendant.	• Y = 2
		(1) XX X: DTMF Receiver No.
		*a *b
		*a: Card No. of PN-8RST (Last two digits of E200-E215 assigned by CM10)
		*b: Circuit No. (0–3)
		(2) 0: Only for Automated Attendant
		1◀ : Station and Tie Line/DID/ Automated Attendant
CM63	Specify whether the inter-tenant connection is allowed on an Automated Attendant incoming call.	• Y = 2
		(1) XX XX
		*a *b
		*a: Tenant No. (00-63) of called station
		*b: Tenant No. (00-63) of trunk
		(2) 0/1◀ : Restricted/Allowed
C		

	DESCRIPTION	DATA

CM64	Assign the answering method of the Automated Attendant to the required tenants.	• Y = 0
		(1) Tenant No. (00 – 63)
		(2) 00: DT Connection
		  02: 1st Answering Message
		    followed by DT Connection
		  03◄ : DT Connection

CM48	Assign the data of Hold Tone Sending.	• Y = 0 (1) 00:C.O. Line (2) 1400: Hold Tone Source on MP Card
	If no Dial tone connection is required for the answering system assigned by CM64 Y = 0, set data "0".	• Y = 2 (1) 06 (2) 0/1◄ : Without DT/With DT

CM08	Specify the ringing rate for an Automated Attendant Call.	(1) 180
		(2) 0/1: 0.2s ON – 0.2s OFF –
		    0.2s ON – 0.2s OFF –
		    0.2s ON – 2s OFF
		    /As per CM35 YY = 33

	Specify the process when a call is transferred by an Automated Attendant to a predetermined Station and time-out occurs.	(1) 359 (2) 0/1◄ : Disconnect the call/Continue to call
	Specify the process for an Automated Attendant call when a caller dials while receiving the message.	(1) 363 (2) 0/1◄ : Not allowed (Allowed after receiving the message)/Allowed

C

D

D	DESCRIPTION	DATA
CM08	Specify the Terminating System for called Party Subaddress.	(1) 401 (2) 0: Station Call 1◄ : Terminating System assigned by CM30 YY = 02, 03
CM41	Specify the time before an Automated Attendant call is redirected because no digits are received from the calling party.	• Y = 0 (1) 34 (2) 01 – 30: 0 – 120 sec. If no data is set, the default setting is 32 – 36 seconds.
	Specify the timing of unanswered call after forwarding to predetermined station in Automated Attendant.	• Y = 0 (1) 39 (2) 01 – 30: 0 – 120 sec. If no data is set, the default setting is 32 – 36 seconds.
	Specify the time before Dial Tone timeout in Automated Attendant.	• Y = 0 (1) 43 (2) 01 – 14: 1 – 14 sec. If no data is set the default setting is 14 seconds.

END

When the 1st and/or 2nd answering message is required: CM30 YY=30, 31, Data=08/CM64 Y=0, Data=02, do the following programming.

START	DESCRIPTION	DATA
CM10	Assign a Digital Announcement Trunk Circuit No. to the required LEN. **Note:** *The Digital Announcement Trunk Circuit No. must be assigned to the 1st LEN (Level 0) and/or 3rd LEN (Level 2) of each LT slot.*	(1) LEN (0000 – 0511) (2) EB000 – EB127: Digital Announcement Trunk Circuit No. EB000 – EB031: For PIM0/1 EB032 – EB063: For PIM2/3 EB064 – EB095: For PIM4/5 EB096 – EB127: For PIM6/7

CM49	Assign the function of the Digital Announcement Trunk.	• YY = 00
		(1) XXX: Digital Announcement Trunk Circuit No.
		(000 – 127) assigned by CM10.
		(2) XX XX
		  *a *b
		*a: 01: 1st Answering Message
		  02: 2nd Answering Message
		*b:Message No. (00-63)

	Assign the Message No. to the required tenants.	• YY = 01 (For 1st Answering Message) • YY = 02 (For 2nd Answering Message) (1) XX: Tenant No. (00 – 63) (2) XX: Message No. (00 – 63) assigned by YY = 00.

CM20	To record, replay, or delete a message, assign the respective Digital Announcement Trunk access codes.	• Y = 0 – 3 (Numbering Plan Group 0 – 3)
		(1) X-XXX: (Access Code)
		(2) ⌈A00: Record
		  A01: Replay
		  ⌊A02: Delete

CM41	Specify the message replay timer for Automated Attendant.	• Y = 0 (1) 51 (2) 01-15: 4-60 sec. If no data is set, the default setting is 40 sec.

END

3.3.11 Direct Inward System Access (DISA) Assignment

To provide the DISA without Application Processor (PN-AP01):

START	DESCRIPTION	DATA
CM08	Designate the processor checking the ID code on DISA.	(1) 217 (2) 0: MP (PN-CP00)
	Designate the Terminating System for Called Party Subaddress.	(1) 401 (2) 0/1◄ : Station Call/Terminating System assigned by CM30 YY = 02/03
	Assign the ring rate on a DISA call.	(1) 180 (2) 0/1◄ : 0.2s ON – 0.2s OFF – 0.2s ON – 0.2s OFF – 0.2s ON – 2s OFF /As per CM35 YY = 33
CM30	Assign the Trunk Route.	• YY = 00 (1) Trunk No. (000 – 255) (2) Trunk Route (00 – 63)
	Assign the Trunk Tenant.	• YY = 01 (1) Trunk No. (000 – 255) (2) Trunk tenant (00 – 63) If no data is set, the default setting is 01.
	Assign the Terminating System in Day/Night Mode for incoming C.O. Calls.	• YY = 02 (Day Mode) • YY = 03 (Night Mode) (1) Trunk No. (000 – 255) (2) 18: ISDN Indial
A		

	DESCRIPTION	DATA

A

CM30

Assign the handling of busy/not available/unanswered Automated Attendant, DISA destination in Day/Night Mode.

- YY = 30 (Day mode)
- YY = 31 (Night mode)
- (1) Trunk No. (000 – 255)
- (2) 00: C.O. Line Release
  01: Forwarded to TAS
  03: Forwarded to ATTCON
  04: Forwarded to DIT Station assigned by CM30 Y = 04, 05.
  06: DT Connection for redial
  08: C.O. Line Release
  15◄ : C.O. Line Release

Assign the handling of timed-out Automated Attendant call.

- YY = 32 (Handling of time-out Automated Attendant in day mode)
- YY = 37 (Handling of time-out Automated Attendant in night mode)
- (1) Trunk No. (000 – 255)
- (2) 00: C.O. Line Release
  01: Forwarded to TAS Indicator
  03: Forwarded to SN610 ATTCON
  04: Forwarded to DIT Station
  06: DT Connection for Redial
  15 ◄ : C.O. Line Release

CM36

Assign the restriction data for the tandem connection within a system to each combination of incoming trunk route and outgoing trunk route.

- (1) XXXX
  *a *b
  *a: Incoming trunk route (00-63)
  *b: Outgoing trunk route (00-63)
- (2) 0/1◄ : Allowed/Restricted

CM35

Assign the number of digits to be received on DID.

- YY = 12
- (1) Trunk Route No. (00 – 63)
- (2) 0: 1 digit
  1: 2 digits
  2: 3 digits
  3◄ : 4 digits

B

B	DESCRIPTION	DATA

CM35

Assign the data for digit conversion on DID call to the Route No. assigned by CM30 YY = 00 when providing DISA to the DID call.

- YY = 18
- (1) Trunk Route No. (00 – 63)
- (2) 0/1◀ : To be provided/Not to be provided

CM76

When the data for CM35 YY = 18 is set to 0, assign the data for converting the received digit(s) to DISA.

- Y = 0 (Day Mode)
- Y = 1 (Night Mode)
- (1) X-XXXX:Station No. received
- (2) D16: DISA

CM2A

Assign the ID code for DISA. The maximum number of digits for an ID code is specified by CM42 – 13.

- Y = 5
- (1) XX: 00 – 07
       (ID code serial number)
- (2) X – X...X:ID code (Max. 16 digits)

Assign required Trunk Restriction Class to each ID code.

- Y = 6
- (1) XX: 00 – 07
       (ID code serial number)
- (2) 1◀ : Unrestricted (RCA)
      2: Non-Restricted-1 (RCB)
      3: Non-Restricted-2 (RCC)
      4: Semi-Restricted-1 (RCD)
      5: Semi-Restricted-2 (RCE)
      6: Restricted-1 (RCF)
      7: Restricted-2 (RCG)
      8: Fully-Restricted (RCH)

Assign the required Service Class A/B to each ID code. The features available in each class are assigned by CM15.

- Y = 7
- (1) XX: 00 – 07
       (ID code serial number)
- (2) XXXX
       *a   *b
      *a: Service Feature Class (A) (00–15◀)
      *b: Service Feature Class (B) (00–15◀)

Assign required Service Class C to each ID code. The features available in each class are assigned by CM15.

- Y = 8
- (1) XX: 00 – 07
       (ID code serial number)
- (2) XX: 00 – 15◀ (Service Restriction Class (C))
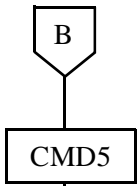
C

C	**DESCRIPTION**	**DATA**
CM42	Specify the maximum number of digits for ID Code on DISA.	(1) 13 (2) 01 – 16 (Number of digits) If no data is set, 10 digits of ID Code are available.

END

To provide the DISA with AP (PN-AP01):

START	DESCRIPTION	DATA
CM05	Assign the slot number to the PN-AP01 card. The SENSE Switch on the PN-AP01 card should be set to the slot number assigned by this command. (INITIAL)	(1) Slot No. (04 – 15) (2) 07
CM08	Designate the processor checking the DISA ID Codes.	(1) 217 (2) 1◄ : AP (PN-AP01)
	Designate the Terminating System for Called Party Subaddress.	(1) 401 (2) 0/1◄ : Station Call/Terminating System assigned by CM30 YY = 02/03
	Assign the ring rate on a DISA call.	(1) 180 (2) 0/1: 0.2s ON – 0.2s OFF – 0.2s ON – 0.2s OFF – 0.2s ON – 2s OFF /As per CM35 YY = 33
CM30	Assign the Trunk Route.	• YY = 00 (1) Trunk No. (000 – 255) (2) Trunk Route (00 – 63)

A

A	DESCRIPTION	DATA

CM30 — Assign the Trunk Tenant.

- YY = 01
- (1) Trunk No. (000 – 255)
- (2) Trunk Tenant (00 – 63)

If no data is set, the default setting is 01.

Assign the Terminating System in Day/Night Mode for incoming C.O. Calls.

- YY = 02 (Day Mode)
- YY = 03 (Night Mode)
- (1) Trunk No. (000 – 255)
- (2) 18:ISDN Indial

Assign the handling of busy/not available/unanswered Automated Attendant, DISA destination in Day/Night Mode.

- YY = 30 (Day mode)
- YY = 31 (Night mode)
- (1) Trunk No. (000 – 255)
- (2) 00: C.O. Line Release
  - 01: Forwarded to TAS
  - 03: Forwarded to ATTCON
  - 04: Forwarded to DIT Station assigned by CM30 YY = 0.
  - 06: DT Connection for redial
  - 08: C.O. Line Release
  - 15◄ : C.O. Line Release

Assign the handling of timed-out Automated Attendant call.

- YY = 32 (Handling of time-out Automated Attendant in day mode)
- YY = 37 (Handling of time-out Automated Attendant in night mode)
- (1) Trunk No. (000 – 255)
- (2) 00: C.O. Line Release
  - 01: Forwarded to TAS Indicator
  - 03: Forward to SN610 ATTCON
  - 04: Forward to DIT Station
  - 06: DT Connection for Redial
  - 15◄ : C.O. Line Release

CM36 — Assign the restriction data for the tandem connection within a system to each combination of incoming trunk route and outgoing trunk route.

- (1) XXXX
  - *a   *b
  - *a: Incoming trunk route (00 – 63)
  - *b: Outgoing trunk route (00 – 63)
- (2) 0/1 ◄ : Allowed/Restricted

B

B

CMD5

DESCRIPTION

Specify the conditions for adding a Check Code to each Authorization Code.
Check Code consists of 2 digits:
1st and 2nd Check Code are generated by the AP according to the conditions specified by $Y = 0$ and $Y = 1$.
Authorization Code:
$X_1 X_2 X_3 X_4 X_5 X_6 X_7 X_8 C_1 C_2$

ID Code programmed Check Code

DIGIT	X_1	X_2	X_3	X_4
DATA	X_5	X_6	X_7	X_8
0	No Check Code			
1	X			
2		X		
3	X	X		
4			X	
5	X		X	
6		X	X	–
7	X	X	X	
8				X
9	X			X
A		X		X
B	X	X		X
C			X	X
D	X		X	X
E		X	X	X
F	X	X	X	X

X: Significant Digit for Check Code

DATA

• $Y = 0$ (Designation of Significant digit for Check Code)

(1) ⌈ 0: For 1st Check Code
    ⌊ 1: For 2nd Check Code

(2) 00 $\underline{X}\ \underline{X}$: Significant digit designation
       *a *b
    *a: 1st – 4th digit (0 – F)
    *b: 5th – 8th digit (0 – F)
    (See left column)

If no Check Code is required, set data = 0000 for both 1st and 2nd Check Code.

• $Y = 1$ (Setting of Check Sum Data for generating Check Code)

(1) ⌈ 0: For 1st Check Code
    ⌊ 1: For 2nd Check Code

(2) 0 – 9: Check Sum Data (Enter desired value)

C

	DESCRIPTION	DATA
C		

CMD5

Set the Authorization Code and its temporary Class of Service.

By entering the Authorization Code, the Check Code will be display on the MAT or CAT.

- Temporary Class of Service
  - A: Type of Temporary Class of Service
    - 0: Unrestricted
    - 1: Fully Restricted
    - 2: As per BBCCDDEE
    - 9: Delete of the ID Code
  - BB: Trunk Restriction Class
    - (01 – 08) specified by CM35
    - YY = 51 – 68.
  - CC: Service Restriction
    - Class (A) (01 – 15)
  - DD: Service Restriction
    - Class (B) (01 – 15)
  - EE: Service Restriction
    - Class(C) (01 – 15)

  As per CM15

- Y = 3
(1) X – X...X: Authorization Code (Max. number of digits specified by CM42-11.)
(2) A (Single Digit): In case of A = 0, 1 or 9
    ABBCCDDEE (9 digits): In case of A = 2

(See left column)

CM35

Assign the number of digits to be received on DID.

- YY = 12
(1) Trunk Route No. (00 – 63)
(2) 0: 1 digit
    1: 2 digits
    2: 3 digits
    3◄ : 4 digits

Assign the data for digit conversion on DID calls to the Route No. assigned by CM30
YY = 00 when providing DISA to the DID call.

- YY = 18
(1) Trunk Route No. (00 – 63)
(2) 0/1◄ : To be provided/Not to be provided

D

D	**DESCRIPTION**	**DATA**

CM76

When the data for CM35 YY = 18 is set to 0, assign the data for converting the received digit(s) to DISA.

- • Y = 0 (Day Mode)
- • Y = 1 (Night Mode)
- (1) X-XXXX:Station No. received
- (2) D16:DISA

CM42

Specify the maximum number of digits for ID Codes on DISA.

Note: *The same number of digits must be assigned by CM42-11 and CM42-13.*

- (1) 11, 13
- (2) 01 – 10 (Maximum Number of Digits).If Check Code is provided, the maximum number of digits is limited to eight (8).If no data is set, 10 digits will be applied.

END

To access the Digital Announcement Trunk (PN-2DATA) via DISA, add the following programming.

START	DESCRIPTION	DATA
CM10	Assign a Digital Announcement Trunk Circuit No. to the required LEN. **Note:** *The Digital Announcement Trunk Circuit No. must be assigned to the first LEN (Level 0) and/or the third LEN (Level 2) of each LT slot.*	(1) LEN (0000-0511) (2) EB000 – EB127: Digital Announcement Trunk Circuit No. For PIM0/1: EB000 – EB031 For PIM2/3: EB032 – EB063 For PIM4/5: EB064 – EB095 For PIM6/7: EB096 – EB127
CM2A **CM15**	Assign the Class of Service for Digital Announcement Trunk access to the required ID Code Serial No., when providing DISA without an Application Processor (PN-AP01).	• CM2A Y = 7 (1) XX: ID Code Serial No. (00 – 07) assigned by CM2A Y = 5 (2) XX XX *a *b *a: Service Rest. Class (A) (00 – 15) *b: Service Rest. Class (B) (00 – 15) • CM15 YY = 33 (1) Service Rest. Class (A) (00 – 15) assigned by CM2A Y = 7 (2) 1 ◄ : Allowed
CMD5 **CM15**	Assign the Class of Service for Digital Announcement Trunk access to the required ID Code Serial No., when providing DISA with an Application Processor (PN-AP01).	• CMD5 Y = 3 (1) X-X---X: ID Code (Max. Number of digits specified by CM42-13) (2) 201 XX 0000 *a *a: Service Rest. Class (A) (00 – 15) • CM15 YY = 33 (1) Service Rest. Class (A) (00 – 15) assigned by CMD5 Y = 3 (2) 1◄ : Allowed
CM20	To record and replay a message from an outside user, assign the Digital Announcement Trunk access code, respectively.	• Y = 0 – 3 (Numbering plan Group 0 – 3) (1) X-XXX: Access Code (2) A00: Record 01: Replay

END

3.4 ISDN PRI Call By Call Service Selection

General

1500 Series Software enhanced ISDN PRI by providing Call By Call Services Selection. the Call By Call enhancements require two new components for implementation:

- D Channel Handler (DCH) firmware upgrade to revision CB1.15
- 1500 Series CD 2.05 or higher including proper Serial ID key software

The separate sections have been implemented in LCR programming for the CBC enhancement.

- Called Number Type
- Network ID Type
- Binary Facility Codes
- Feature/Service

Available Services

The following Binary Facility Code can be sent to the ISDN network when the called party number is flagged as a Service. Services and features are selected by the ISDN subscriber at the time the ISDN is ordered. The PBX must be programmed to match the services and features provided by the ISDN provider.

AT&T	Northern Telecom
SDN	Private
Megacom	InWATS
Megacom 800	OutWATS
Accunet	Foreign Exchange
International 800	Tie Trunk
AT&T MultiQuest	

Call By Call LCR Programming

The following programming steps is an example of a long-distance call placed to any area code that begins with a 2 and that call is flagged as AT&T Megacom.

CM8A405 - 12(dialed #) = 001 (go to route pattern 001)
CM8A001 - 1 (1st choice)=00010 (use LCR pattern 000 + trk route 10)
CM 855 - 12 = 11 (maximum number of digits dialed)

CM 8A500 - 157 = 02 (Kind of called party = National) (dialed number is 10-digit NANP, select National)
CM 8A500 - 158 = 01 (Called party Number Plan ID = ISDN / Telephony Numbering Plan
CM 8A500 - 159 ~ 161 are not used for this call.
CM 8A500 - 162 = 1 (Service)
CM 8A500 - 163 = 03 (Megacom)
CM 8A500 - 164 is not required for this call.

The next example details a local 7 digit call and will not used a Binary Facility Code.

CM8A405 - 2 (dialed number) = 001 (go to route pattern 000)
CM8A000 - 1 (1st choice)=00210 (use LCR pattern 002 + trk route 10)
CM 855 - 2 = 7 (maximum number of digits dialed)

CM 8A502 - 157 = 04 (Kind of called party = Local) (dialed number is 7-digit NANP, select Local)
CM 8A502 - 158 = 01 (Called party Number Plan ID = ISDN / Telephony Numbering Plan
CM 8A502 - 159 ~ 161 are not used for this call.
CM 8A502 - 162 = 1 (Service)
CM 8A502 - 163 = NONE (not sending)
CM 8A502 - 164 is not required for this call.

Note: *These examples are provided to demonstrate the required programming. Always verify with the ISDN provider as to how local calls should be handled.*

Features

Carrier Identification Codes (CIC)

In ISDN terms placing a long-distance call using the equal access carrier code is a feature. There are times when, depending upon the type of service provider (LEC or IEX), the PBX must contain the following programming to complete a long-distance call by using CIC numbers.

Currently all CIC numbers are three digits in length preceded by a 10. Example: To dial AT&T a user dials 10288 + the long-distance number. The PBX must route the call based on 10288 or a portion of that number. ISDN complicates this process by identifying each CIC at the PBX level.

For example: Without ISDN the PBX is able to simply outpulse 10288 and the public network would provide connection to AT&T. With ISDN used for routing equal access calls, the PBX must translate the 10288 in its entirety and provide the network with four pieces of information as described below. The implementation of this feature is further complicated by the fact that this is only required by some ISDN providers and not others.

Required Network Information

Four components are required by the network when sending CIC information. This information can be found in the SETUP message.

(1) FEATURE (A statement advising the network that this is a feature based call, as opposed to a Service based call).
(2) TYPE OF NETWORK ID (The PBX should send out NATIONAL for this information).
(3) NETWORK ID PLAN NUMBER (The Interchange Carrier should be sent).
(4) NETWORK ID CHARACTER (XXX) (For AT&T the PBX sends out 288).

NEAX2000 IVS Programming

Use the following programming to assign the ISDN PRI Call By Call Identification Codes.

CMA405 - 10 (dialed number) = 406 (go to table 406)
CMA406 - 288 (dialed number) = 010 (use route pattern 010)
CMA010 - 1 (1st choice) = 02010 (use LCR pattern 020 + trk route 10)

CM8A520 - 157 = 02 (Kind of called party = National)
CM8A520 - 158 = 01 (Called party Number Plan ID = ISDN / Telephony Numbering Plan)

CM8A520 - 159 = 02 (Type of Network ID = National)
CM8A520 - 160 = 01 (Network ID Plan Number = Interexchange Carrier)
CM8A520 - 161 = 288 (CIC code for AT&T)
CM8A520 - 162 = 0 (Feature)

The above programming will allow the 10288 to be sent out with the proper Setup message to the network. However, further LCR programming is required because the network will not understand what 10288 is as a dialed number. Use the following LCR programming to delete the 10288 digits from being sent to the ISDN Network.

CM8A520 - 151 = 0 Allow digit deletion.
CM8A520 - 152 = 05 Delete the first five digits of the dialed number.

Note: *This programming example only details the required steps for the 288 CIC. Each CIC must be programmed in different tables to allow CM8A5XX - YYY = 161 to send out the unique CIC number to the network.*

3.4.1 Call By Call Service Selection Assignment

START	DESCRIPTION	DATA

CM8A	Assign the kind of the called party number.	• YYY=500-755 (LCR/TR Pattern No. 000-255) (1) 157 (Kind of Called Party No.) (2) 01 : International 02 : National 03 : Network 04 : Local 05 : Not used 06 : Speed Dial NONE ◄ :Not Sending
	Assign the Called Party Numbering Plan Identifier.	• YYY=500-755 (LCR/TR Pattern No. 000-255) (1) 158 (Called Party Numbering Plan Identifier) (2) 01 : ISDN/Telephone Numbering Plan 02 : Not used 03 : Data Numbering Plan 04 : Telex Numbering Plan 05 : ⎤ 06 : Not used 07 : ⎦ 08 : National Numbering Plan 09 : Private Numbering Plan NONE ◄ : Not Sending
	Assign the Type of Network ID Number.	• YYY=500-755 (LCR/TR Pattern No. 000-255) (1) 159 (Type of Network ID No.) (2) 00 : ⎤ ⸝ Type of Network ID No. 07 : ⎦ NONE◄ : Not Sending

A

A	**DESCRIPTION**	**DATA**

CM8A   Assign the Network ID Plan Number.

- YYY=500-755
  (LCR/TR Pattern No. 000-255)
- (1) 160 (Network ID Plan No.)
- (2) 00 :
  ⁀
  15 : } Network ID No.
  NONE◀ : Not Sending

Assign the Network ID Character.

- YYY=500-755
  (LCR/TR Pattern No. 000-255)
- (1) 161 (Network ID Character)
- (2) X :
  ⁀
  XXX : } X=0-9, A(*), B(#)

Specify whether Call By Call is Feature or Service.

- YYY=500-755
  (LCR/TR Pattern No. 000-255)
- (1) 162 (Feature/Service)
- (2) 0 : Feature
  1◀ : Service

Assign the Binary Facility Coding Value.

- YYY=500-755
  (LCR/TR Pattern No. 000-255)
- (1) 163 (Binary Facility Coding Value)
- (2) For AT&T
  01 : SDN
  02 : MEGACOM800
  03 : MEGACOM
  04 : Not used
  05 : ACCUNET
  06 : Not used
  07 : Not used
  08 : INTERNATIONAL800
  16 : AT&T MULTIQUEST
  NONE◀ : Not Sending

  For Nothern Telecom
  01 : PRIVATE
  02 : INWATS
  03 : OUTWATS
  04 : FOREIGN EXCHANGE (FX)
  05 : TIE TRUNK (TIE)
  NONE◀ : Not Sending

B

	DESCRIPTION	**DATA**

B

CM8A   Assign the WATS Band Number.

- YYY=500-755
  (LCR/TR Pattern No. 000-255)
- (1) 164 (WATS Band No.)
- (2) 00   :⎤
       ⁀   ⎬ WATS Band No.
     09   :⎦
     NONE◄ : Not Sending

END

3.5 Basic Data Assignment for ISDN Terminal

3.5.1 ILC Assignment

START	DESCRIPTION	DATA

CM10

Assign an ISDN Circuit Station Number to the required LEN.

(INITIAL)

(1) LEN (0000-0511)
(2) EFX-EFXXXX: ISDN Circuit Station No.

CM12

Assign a Tenant No. to each ISDN Circuit Station Number.

- YY=04
(1) X-XXXX (ISDN Circuit Station No.)
(2) 00-63 (Tenant No.)
If no data is set, the default data is 01.

Assign a Trunk Restriction Class to each ISDN Circuit Station Number.

- YY=01
(1) X-XXXX (ISDN Circuit Station No.)
(2) X X (Trunk Restriction Class)
   *a *b
   *a: Trunk Rest. Class in Day Mode
   (1◄ -8)
   *b: Trunk Rest. Class in Night Mode
   (1◄ -8)
   1: Unrestricted (RCA)
   2: Non-Restricted 1 (RCB)
   3: Non-Restricted 2 (RCC)
   4: Semi-Restricted 1 (RCD)
   5: Semi-Restricted 2 (RCE)

Assign an ISDN Indial Number to the required ISDN Circuit Station Number.

- YY=12
(1) X-XXXX (ISDN Circuit Station No.)
(2) X-XXXX (ISDN Indial No.)

Assign a Local Office Code Table Number to the required ISDN Circuit Station Number.

- YY=13
(1) X-XXXX (ISDN Circuit Station No.)
(2) 00: ISDN Local Office Code Table No. 00
       ≀   ≀
   14: ISDN Local Office Code Table No. 14

A

A	DESCRIPTION	DATA

CM13

Specify the facility control of CPN (Calling Party Number).

- YY=25
(1) X-XXXX: ISDN Circuit Station No.
(2) 0/1◀ : To be provided/Not to be provided

CM20

Assign the digit number of ISDN Circuit Station Number.

- Y=0-3
(1) X-XXXX: ISDN Circuit Station No.
(2) 801: 1 digit
802: 2 digits
803: 3 digits
804: 4 digits

CM08

Specify whether the subaddress is sent to an ISDN network when making a call from ISDN Terminal, if required.

(1) 430
(2) 0: To be sent (depends on CM08-431)
1◀ : Not to be sent

Specify the calling party subaddress which is sent to an ISDN network when making a call from ISDN Terminal, if required.

(1) 431
(2) 0: ISDN Circuit Station No. assigned by CM10
1◀ : ISDN Terminal No.

Specify the forced release when a called ISDN Terminal does not answer during 3 minutes, if required.

(1) 432
(2) 0: Not Available
1◀ : Available

Assign the calling party number which is sent to an ISDN network when making a call from ISDN Terminal, if required.

(1) 434
(2) 0: Calling Party No. entered in ISDN Terminal
1◀ : Calling Party No. assigned by CM12 YY=12/13

CME5

Specify the make busy of B channel (B1, B2) for ISDN Terminal, if required.

- Y=2
(1) <u>XXXX</u> , <u>X</u>
     *a   *b
*a: ISDN Circuit Station No.
*b: 0/1 (B1 channel/B2 channel)
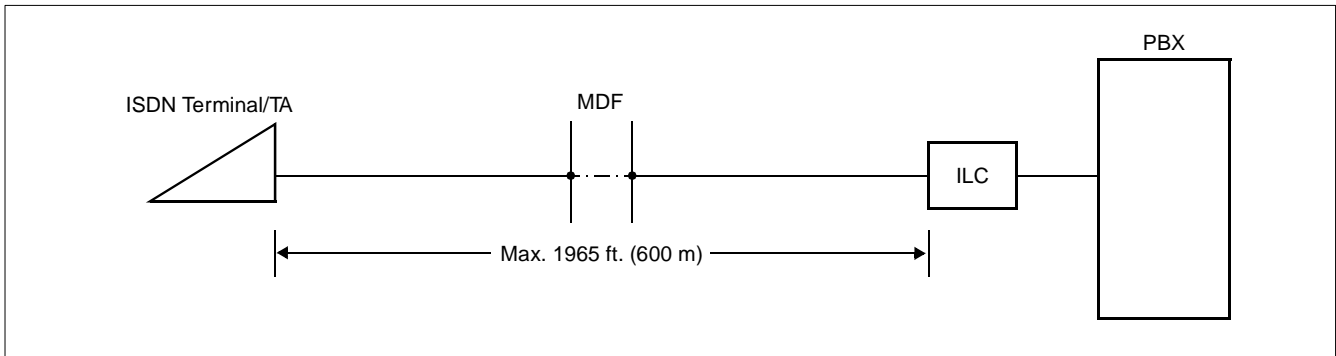(2) 0/1◀ : Make busy set/In service

END

3.5.2 ICH Assignment

START	**DESCRIPTION**	**DATA**

CM05

Assign slot number to each ICH card (PN-SC02/SC03). The slot number to be assigned must coincide with the value set by the SENS switch on the ICH card.

(INITIAL)

(1) Slot No. (04-15)
(2) 13: ICH card

CM06

Assign the ICH Number to the Slot Number of ICH assigned by CM05.

(INITIAL)

- YY=09
(1) ICH No. (00-11)
(2) <u>XX</u>
   *a
   *a: Slot No. assigned by CM05

CMAC

Assign the ISDN Circuit Station Number to the ISDN Circuit Number of ICH card.

(INITIAL)

- YY=00
(1) <u>XX</u> <u>X</u>
   *a *b
   *a: ICH No. (00-11)
   *b: ISDN Circuit No. of ICH card (0-7)
(2) X-XXXX: ISDN Circuit Station No.

Specify the method of TEI (Terminal Endpoint Identifier) assignment.

(INITIAL)

Note: *This data must be assigned to match the specification of ISDN Terminal.*

- YY=02
(1) <u>XX</u> <u>X</u>
   *a *b
   *a: ICH No. (00-11)
   *b: ISDN Circuit No. of ICH card (0-7)
(2) 0: Manual TEI Assignment
   1◄ : Automatic TEI Assignment

Specify the method of Layer 1 activation.

(INITIAL)

Note: *This data must be assigned to match the specification of ISDN Terminal.*

- YY=04
(1) <u>XX</u> <u>X</u>
   *a *b
   *a: ICH No. (00-11)
   *b: ISDN Circuit No. of ICH card (0-7)
(2) 0: Always activated
   1 ◄ : Activated by call event

END

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3.6 Service Data Assignment for ISDN Terminal

3.6.1   Point to Point Connection Assignment

START	**DESCRIPTION**	**DATA**

CMAC

Assign the point to point connection as the Layer 2 data link.

(INITIAL)

Note: *When Point-to-Point Connection is selected, the PBX will address the BRI Terminal with channel select (B1/B2) message. Some BRI Terminals cannot answer the call with this type of signaling. Some of the BRI Terminals require a Calling Party Number sent from the PBX. In this case, use Point-to-Multipoint for CM AC01 and command 1B to assign extensioin number for the BRI Terminal.*

- YY=01
(1) XX X
   *a *b
   *a: ICH No. (00-11)
   *b: ISDN Circuit No. of ICH card (0-7)
(2) 0: Point to Point Connection

Assign the TEI Manual Assignment.

(INITIAL)

- YY=02
(1) XX X
   *a *b
   *a: ICH No. (00-11)
   *b: ISDN Circuit No. of ICH card (0-7)
(2) 1◄ : Automatic TEI Assignment

Assign the Long Passive Bus.

(INITIAL)

- YY=03
(1) XX X
   *a *b
   *a: ICH No. (00-11)
   *b: ISDN Circuit No. of ICH card (0-7)
(2) 1◄ : Short Distance Passive Bus

Assign the always activated as the method of Layer 1 activation.

(INITIAL)

- YY=04
(1) XX X
   *a *b
   *a: ICH No. (00-11)
   *b: ISDN Circuit No. of ICH card (0-7)
(2) 1◄ : Activated by call event.

END

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3.6.2 Point to Multipoints Connection Assignment

START	DESCRIPTION	DATA
CMAC	Assign the point to multipoints connection as the Layer 2 data link. (INITIAL)	• YY=01 (1) <u>XX</u> <u>X</u> *a *b *a: ICH No. (00-11) *b: ISDN Circuit No. of ICH card (0-7) (2) 1◄ : Point to Multipoints Connection
	Specify the passive bus. (INITIAL)	• YY=03 (1) <u>XX</u> <u>X</u> *a *b *a: ICH No. (00-11) *b: ISDN Circuit No. of ICH card (0-7) (2) 0: Extended Passive Bus 1◄ : Short Distance Passive Bus

A

A	**DESCRIPTION**	**DATA**

| CM1B | Assign an ISDN Terminal Multipoints Station Number to the ISDN Circuit Station Number.

The numbers assigned in this command are station numbers that are to be programmed in the BRI terminal. CM 12 YY=12 will use the station assignments from CM 10. | (1) XXXX , X
   *a   *b
*a: ISDN Circuit Station No. assigned by CM10
*b: ISDN Multipoints Station No. (0-7)
(2) X-XXXX:ISDN Terminal Multipoints Station No. |

END

BRI Programming Example:

The following is an example of common BRI Station Programming.

CM 10 0024 = EF 2125
     0025 EF2126

CM AC 00 - 000 - 2125
         001 - 2126

CM AC 01 - 000 - 1
         001 - 1

AC02 - 000 - 1
     001 - 1

AC03 - 000 - 1
     001 - 1

AC04 - 000 - 1
     001 - 1

AC05 - 000 - 1
     001 - 1

AC06 - 000 - 1
     001 - 1

CM 1B - 2125, 0 = 2225 *
2125. 1 = 2226
2
ι = None
7
2126. 0 = 2235*
2126. 1 = 2236*
2
ι = None
7

* Ext. 2225 and others assigned in CM1B are the Extension Numbers that should be entered into the BRI Terminal(s). Most BRI Terminals require a 10-digit number. Use NPA NNX 2225. If the BRI Terminal requires a SPID, it is common to add a 3-digit number to the main number. For example:
Main Number (1)214-555-2225
Main Number (2)214-555-2226
SPID (1)214-555-2225123
SPID (2)214-555-2226123
SPIDs are required for NI-1 protocol and AT&T Point-to-Multipoint.
Devices that are set as AT&T Point-Point do not use SPIDs.

3.6.3 National ISDN 1 BRI Terminal Assignment

START	DESCRIPTION	DATA

CMAC

Assign the point to multipoints connection as the Layer 2 data link.

(INITIAL)

- YY=01
- (1) <u>XX</u> <u>X</u>
     *a *b
  *a: ICH No. (00-11)
  *b: ISDN Circuit No. of ICH card (0-7)
- (2) 1◀ : Point to Multipoints Connection

Specify the passive bus.

(INITIAL)

- YY=03
- (1) <u>XX</u> <u>X</u>
     *a *b
  *a: ICH No. (00-11)
  *b: ISDN Circuit No. of ICH card (0-7)
- (2) 1◀ : Short Distance Passive Bus

Assign protocol as National ISDN 1.

- YY=10
- (1) <u>XX</u> <u>X</u>
     *a *b
  *a: ICH No. (00-11)
  *b: ISDN Circuit No. of ICH card (0-7)
- (2) 0: National ISDN 1 (NI-1)

CM1B

Assign an ISDN Terminal Multipoints Station Number to the ISDN Circuit Station Number.

The numbers assigned in this command are station numbers that are to be programmed in the BRI terminal. CM 12 YY=12 will use the station assignments from CM 10.

- (1) <u>XXXX</u> , <u>X</u>
    *a   *b
  *a: ISDN Circuit Station No. assigned by CM10
  *b: ISDN Multipoints Station No. (0-7)
- (2) X-XXXX:ISDN Terminal Multipoints Station No.
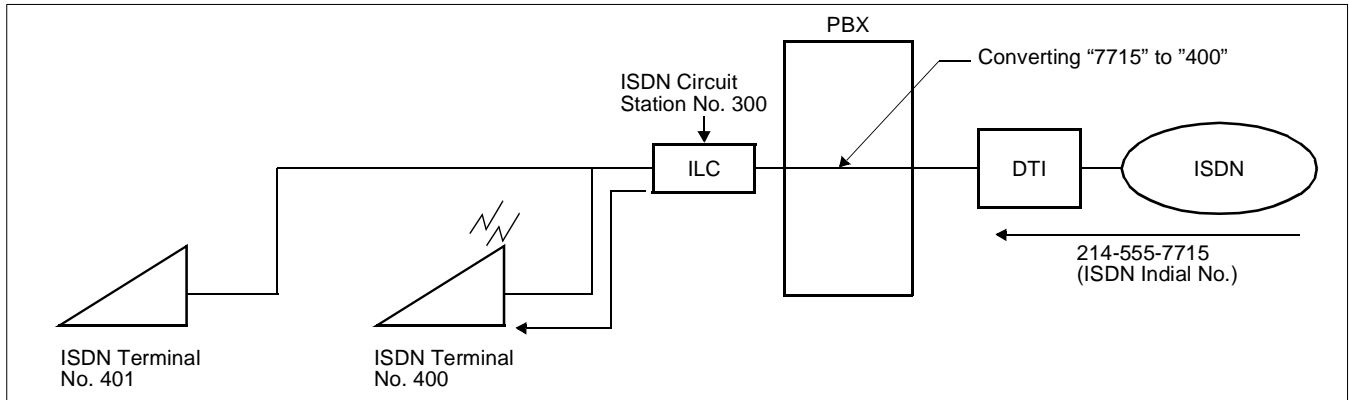
END

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This page is for your notes.

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3.6.4 Individual Terminal Call Assignment

(1) ISDN Indial

When receiving an ISDN Terminal Number as the ISDN Indial Number or when converting an ISDN Indial Number to an ISDN Terminal Number by CM76, the system makes the connection with the specified ISDN Terminal or Terminal Adapter (TA) on the same bus (2B + D).

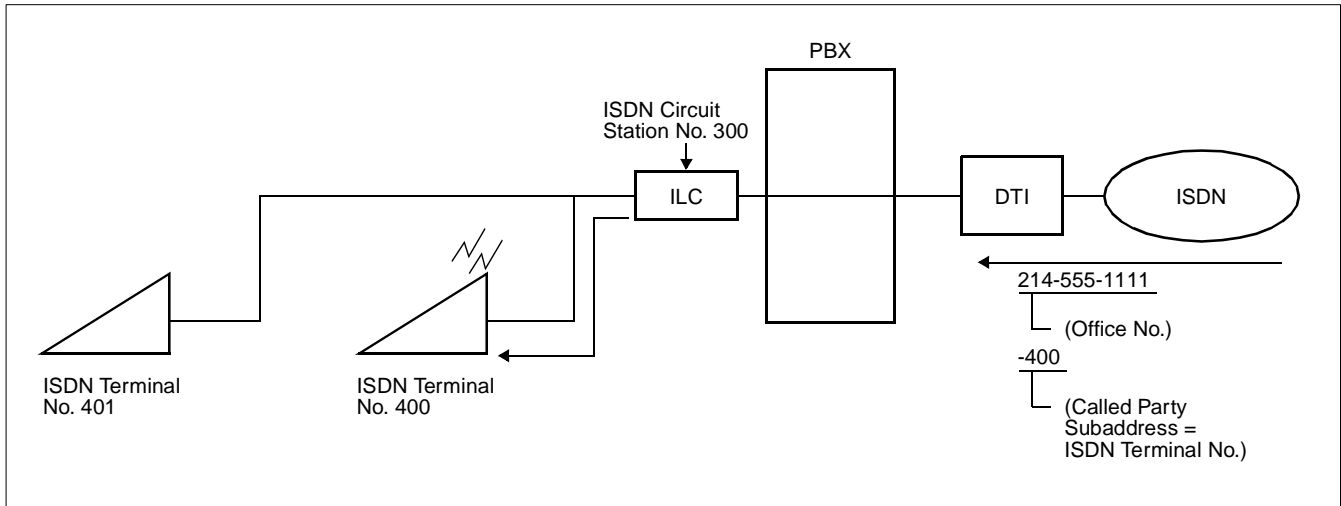In addition to the programming of Section 3.5, do the following programming.

START	DESCRIPTION	DATA
CM30	Assign the data for DID to the Trunk Numbers assigned by CM07.	• YY=02 (Terminating System in Day Mode) • YY=03 (Terminating System in Night Mode) (1) Trunk No. (000-255) assigned by CM07 YY=01 (2) 18: ISDN Indial
CM35	Assign the data for DID to the Trunk Routes assigned by CM30.	• YY=00 (Kind of Trunk) (1) Trunk Route No. (00-63) (2) 00: DID • YY=02 (OG/IC) (1) Trunk Route No. (00-63) (2) 3◀ : Bothway Trunk • YY=05 (Release Signal Condition) (1) Trunk Route No. (00-63) (2) 1◀ : Release Signal arrives • YY=09 (1) Trunk Route No. (00-63) (2) 08: ISDN
A		

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A	DESCRIPTION	DATA

CM35

- YY=12 (Number of digits to be received)
- (1) Trunk Route No. (00-63)
- (2) Number of Digits
    - 0: 1 digit
    - 1: 2 digits
    - 2: 3 digits
    - 3◄ : 4 digits

- YY=18 (Received Digit Conversion)
- (1) Trunk Route No. (00-63)
- (2) 0/1◄ : To be provided/Not to be provided

CM51

Assign the destination of DID Call transferred when the station is busy/unassigned/not answer.

- YY=00 (No Answer)
- YY=03 (Busy)
- YY=06 (Unassigned)
- (1) Tenant No. (00-63)
- (2) Destination:
    - X-XXXX(Station No.)
    - E000   (SN610 ATTCON)
    - EBXXX (Announcement Service: Digital Announcement Trunk Circuit No.)

CM76

When the data for CM35 YY=18 is set to "0" (Received Digit Conversion is to be provided), assign the data for interpreting the digits received.

- Y=0 (Day Mode)
- Y=1 (Night Mode)
- (1) X-XXXX: Station Number received
- (2) X-XXXX: ISDN Terminal No.

END

(2) Called Party Subaddress

When the system has received a Called Party Subaddress (ISDN Terminal Number) from an ISDN Sub-scriber, the system makes the connection with the specified ISDN Terminal or TA on the same bus (2B + D).

In addition to the programming of Section 3.5, do the following programming.

START	DESCRIPTION	DATA
CM08	Specify the terminating system for Called Party Subaddress.	(1) 401 (2) 0: Station Call 　　1◄ : Terminating System assigned by CM30 YY=02/03
END		

(3) Direct In Termination (DIT)

When the ISDN Terminal Number is assigned as the destination of DIT, the system makes the connection with the specified ISDN Terminal or TA on the same bus (2B + D).

In addition to the programming of Section 3.5, do the following programming.

START	DESCRIPTION	DATA
CM30	Assign the data for DIT to the Trunk Numbers assigned by CM07.	• YY=02 (Day Mode) • YY=03 (Night Mode) (1) Trunk No. (000-255) assigned by CM07 YY=01 (2) 04: DIT
	Assign the ISDN Terminal Station Number to be terminated by Direct In Termination.	• YY=04 (Day Mode) • YY=05 (Night Mode) (1) Trunk No. (000-255) assigned by CM07 YY=01 (2) X-XXXX: ISDN Terminal Station No.
END		

(4)   Station to Station Calling

When an ISDN Terminal user dials an ISDN Terminal Number within the system, the system makes the connection with the specified ISDN Terminal.
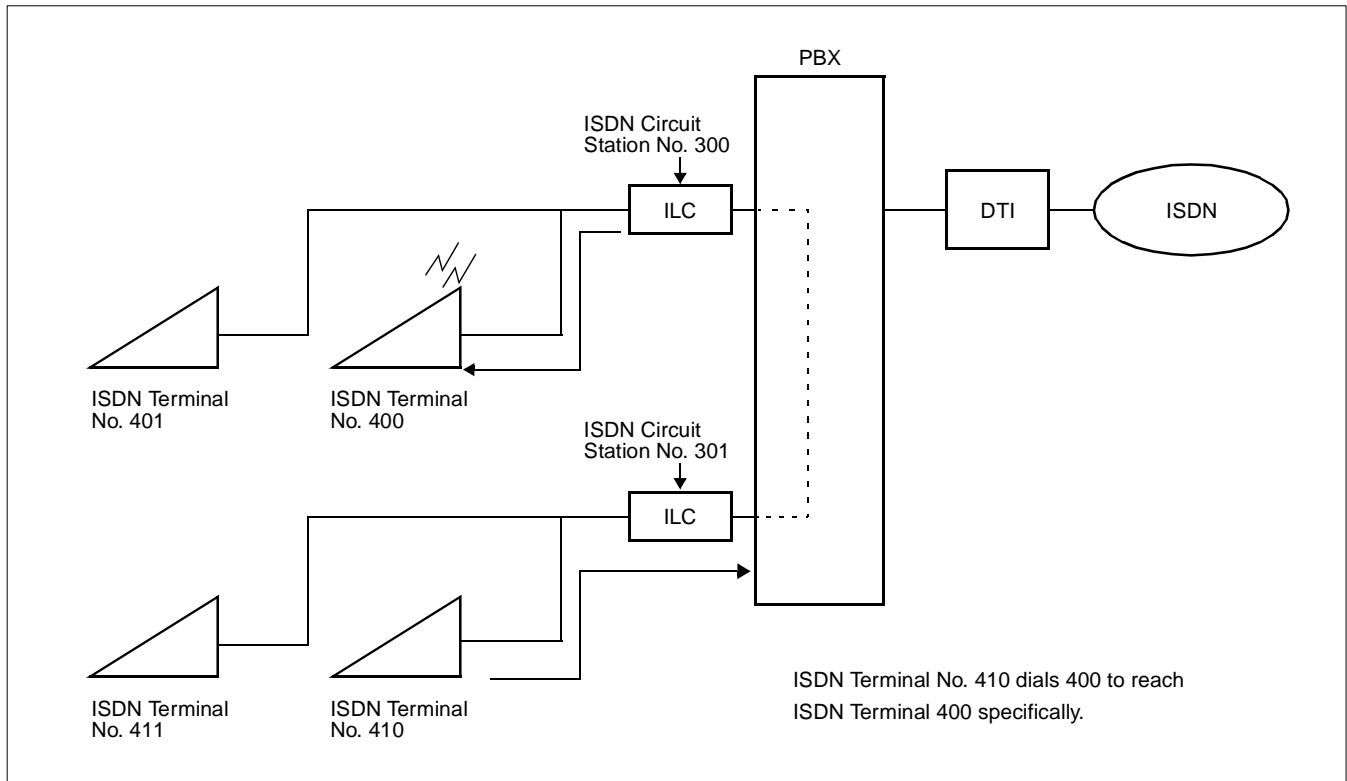
Do the programming of Section 3.5.

3.6.5 Group Call Assignment

(1) ISDN Indial

When receiving an ISDN Circuit Number as the ISDN Indial Number or when converting an ISDN Indial Number to an ISDN Circuit Number by CM76, the system makes the connection with all ISDN Terminals or Terminal Adapters (TA) on the same bus (2B + D).

In addition to the programming of Section 3.5, do the following programming.

START	DESCRIPTION	DATA
CM30	Assign the data for DID to the Trunk Numbers assigned by CM07.	• YY=02 (Terminating System in Day Mode) • YY=03 (Terminating System in Night Mode) (1) Trunk No. (000-255) assigned by CM07 YY=01 (2) 18: ISDN Indial
CM35	Assign the data for DID to the Trunk Routes assigned by CM30.	• YY=00 (Kind of Trunk) (1) Trunk Route No. (00-63) (2) 00:DID • YY=02 (OG/IC) (1) Trunk Route No. (00-63) (2) 3◄ : Bothway Trunk • YY=05 (Release Signal Condition) (1) Trunk Route No. (00-63) (2) 1◄ : Release Signal arrives • YY=09 (1) Trunk Route No. (00-63) (2) 08: ISDN
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	DESCRIPTION	DATA
A		
CM35		• YY=12 (Number of digits to be received)
		(1) Trunk Route No. (00-63)
		(2) Number of Digits
		0: 1 digit
		1: 2 digits
		2: 3 digits
		3◀ : 4 digits
		• YY=18 (Received Digit Conversion)
		(1) Trunk Route No. (00-63)
		(2) 0/1◀ : To be provided/Not to be provided
CM51	Assign the destination of DID Call transferred when the station is busy/unassigned/not answer.	• YY=00 (No Answer)
		• YY=03 (Busy)
		• YY=06 (Unassigned)
		(1) Tenant No. (00-63)
		(2) Destination:
		X-XXXX (Station No.)
		E000 (SN610 ATTCON)
		EBXXX (Announcement Service: Digital Announcement Trunk Circuit No.)
CM76	When the data for CM35 YY=18 is set to "0" (Received Digit Conversion is to be provided), assign the data for interpreting the digits received.	• Y=0 (Day Mode)
		• Y=1 (Night Mode)
		(1) X-XXXX: Station Number received.
		(2) X-XXXX: ISDN Circuit Station No.

END

(2) Called Party Subaddress

When receiving an ISDN Circuit Station Number as the Called Party Subaddress, the system makes the connection with all ISDN Terminals or Terminal Adapters (TA) on the same bus (2B + D).

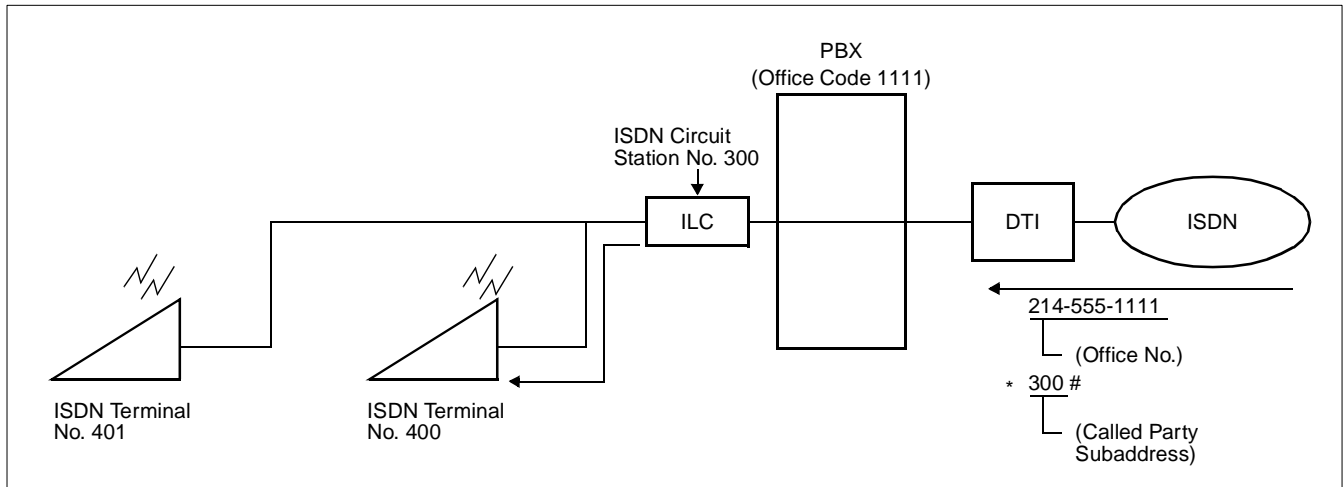In addition to the programming of Section 3.5, do the following programming.

START	**DESCRIPTION**	**DATA**
CM08	Specify the terminating system for Called Party Subaddress.	(1) 401 (2) 0: Station Call 1◀ : Terminating System assigned by CM30 YY=02/03
END		

(3) Direct In Termination (DIT)

When the ISDN Circuit Station Number is assigned as the destination of DIT, the call from ISDN network terminates all ISDN Terminals on the same bus (2B + D) simultaneously.

In addition to the programming of Section 3.5, do the following programming.

START	**DESCRIPTION**	**DATA**
CM30	Assign the data for DIT to the Trunk Numbers assigned by CM07.	• YY=02 (Day Mode) • YY=03 (Night Mode) (1) Trunk No. (000-255) assigned by CM07 YY=01 (2) 04: DIT
	Assign the ISDN Terminal Station Number to be terminated by Direct In Termination.	• YY=04 (Day Mode) • YY=05 (Night Mode) (1) Trunk No. (000-255) assigned by CM07 YY=01 (2) X-XXXX: ISDN Terminal Station No.
END		

(4)   Station to Station Calling

When an ISDN Terminal user dials an ISDN Circuit Station Number within the system, the system makes the connection with all ISDN Terminals.
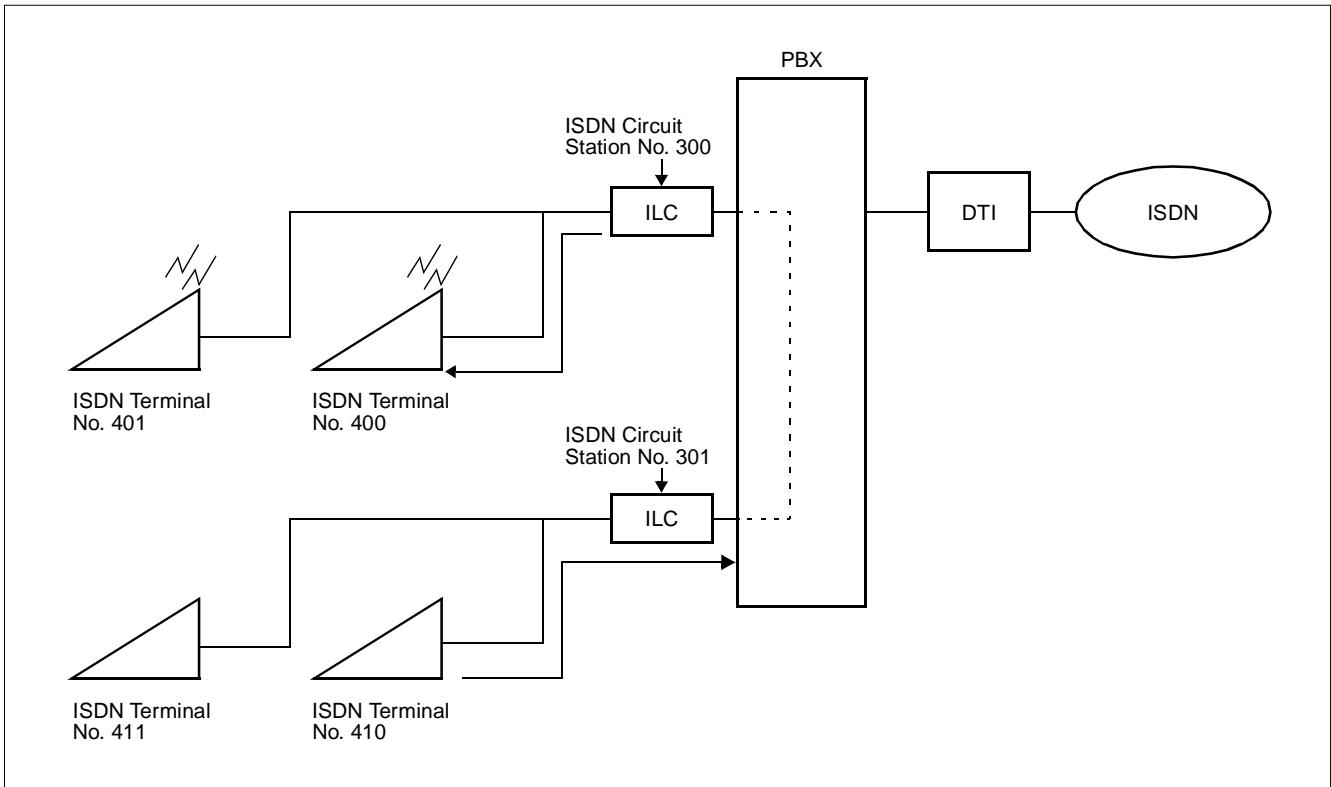
Do the programming of Section 3.5.

3.7 Data Assignment for Event Based CCIS

This section describes the programming procedure to provide the system with Event Based CCIS.
As for the voice communication service feature programming on No. 7 CCIS, refer to the No. 7 CCIS System Manual.

3.7.1 Outline of Data Programming for Event Based CCIS

For the Event Based CCIS, the Virtual Trunks which are used as No. 7 CCIS trunks, and the existing CCH card must be assigned by system data programming to activate No. 7 CCIS link (virtual tie line connection) on an ISDN network.

Virtual Trunk:

> The Virtual Trunk consists of a Home-Side Trunk and a Mate-Side Trunk. The Home-Side Trunk is connected to the station side, and the Mate-Side Trunk is connected to network side of the PBX virtually.
> The virtual trunks do not exist actually, but are handled as No. 7 CCIS trunk by the system, for system data.
> ISDN sub-address programmed to the virtual trunk is used to establish a CCIS link and individual voice link.

CCH Card:

> The CCH card is used to handle the common channel signaling.
> For Event Based CCIS, the system data for CCH card should be programmed according to the same method for regular No. 7 CCIS programming.

DTI/BRI Card:

> The system uses the same interface trunk (DTI/BRI card) for regular ISDN connection and for the virtual tie line connection on the Event Based CCIS.
> For the DTI/BRI card, regular programming as the interface trunk for ISDN network should be assigned.

3.7.2 Virtual Trunk Data Assignment

• Home-Side Trunk Data Assignment

START	DESCRIPTION	DATA

CM07	Assign a trunk number to each channel on the Home-Side Trunk. **Note:** *The Virtual Channel number on the Home-Side Trunk must be an even number (00, 02, 04, ... 30).* (INITIAL)	• YY=05 (1) 32XX: Virtual Channel No. 00-30 (Even No.) of the Home-Side Trunk (2) Trunk No. (D000-D255)
CM30	Assign a trunk route number to each trunk.	• YY=00 (1) Trunk No. (000-255) (2) Trunk Route No. (00-63)
	Assign a Circuit Identification Code (CIC) number to each trunk used for voice channel. **Note:** *CIC number represents a Circuit number to designate a trunk (of each trunk route) used as a Voice channel in the No. 7 CCIS network. Do not assign a CIC number to a trunk used as Common Signaling channel.*	• YY=35 (1) Trunk No. (000-255) (2) CIC No. (001-127)
CM35	Assign trunk route data to the Voice channels and Common Signaling channel of the Event Based CCIS route as Tie lines.	• YY=00 (1) Trunk Route No. (00-63) (2) 04: Tie Line • YY=01 (1) Trunk Route No. (00-63) (2) 2: DP • YY=04 (1) Trunk Route No. (00-63) (2) 2: Answer Signal arrives
A		

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	DESCRIPTION	DATA

A

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- YY=05
(1) Trunk Route No. (00-63)
(2) 1◄ : Release Signal arrives

- YY=09
(1) Trunk Route No. (00-63)
(2) 06: 2nd DT/Timing Start

Specify the PAD patterns on Event Based CCIS connection to the voice channel route.

- YY=19
(1) Trunk Route No. (00-63)
(2) PAD Pattern No. (0-7)
See CM35 in the Command Manual

Specify trunk seizure sequence.

- YY=83
(1) Trunk Route No. (00-63)
(2) 0: By lowest numbered trunk

Provide the common signaling channel and voice channel route with No. 7 CCIS facilities.

- YY=90
(1) Trunk Route No. (00-63)
(2) 0: No. 7 CCIS

Assign a CCIS channel number to each common signaling channel and voice channel route.

- YY=91
(1) Trunk Route No. (00-63)
(2) CCIS Channel No. (0-3)

Specify the voice channel and common signaling channel route as the Event Based CCIS route.

- YYY=135
(1) Trunk Route No. (00-63)
(2) 0: Event Based CCIS Route

END

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- Mate-Side Trunk Data Assignment

START	DESCRIPTION	DATA

CM07

Assign a trunk number to each channel on the Mate-Side trunk.

Note: *The Virtual Channel number on the Mate-Side Trunk must be an odd number (01, 03, 05, ... 31).*

(INITIAL)

- YY=05
- (1) 32XX: Virtual Channel No. 00-30 (Even No.) of the Home-Side Trunk
- (2) Trunk No. (D000-D255)

CM30

Assign a trunk route number to each trunk.

- YY=00
- (1) Trunk No. (000-255)
- (2) Trunk Route No. (00-63)

Assign a trunk number, of the opposite office, sent to the network on Event Based CCIS connection. The trunk number is sent as the sub-address to activate the relation between the trunks used for Event Based CCIS.

Note: *This data must be an unique combination between the offices.*

- YY=19
- (1) Trunk No. (000-255)
- (2) X-XXXX: Trunk No. of the opposite office

CM35

Assign trunk route data to the voice channels and common signaling channel of the Event Based CCIS route as Tie Lines.

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

- YY=05
- (1) Trunk Route No. (00-63)
- (2) 1◄ : Release signal arrives

Assign the abbreviated codes for terminating number of the opposite office.
The terminating number and its memory allocation should be assigned by CM71, CM72.

- YY=40
- (1) Trunk Route No. (00-63)
- (2) Abbreviated Codes (00-31)

A

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	DESCRIPTION	DATA

A

CM35

Specify whether the virtual tie line is released when there are no calls for predetermined time. If the second data is set to "1", the virtual tie line keeps connecting even if all calls finished.

- YYY=127
(1) Trunk Route No. (00-63)
(2) 0:   Released
    1◀ : Not Released

Specify the voice channel and common signaling channel route as the Event Based CCIS route.

- YYY=135
(1) Trunk Route No. (00-63)
(2) 0:   Event Based CCIS Route
    1◀ : Other Trunk Route

Specify which number is adopted for corresponding of virtual trunks between the offices, either sub-address number, or ISDN Indial dialed-in digits.

- YYY=143
(1) Trunk Route No. (00-63)
(2) 0: By sub-address number
    1: By dialed-in digits

END

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3.7.3 Access Code/Terminating Number Assignment

START	**DESCRIPTION**	**DATA**

CM71 — Assign the memory allocation to store the terminating number of the opposite office on Event Based CCIS connection.

(1) 66
(2) <u>XXX</u> <u>XXX</u>
   *a   *b
*a: First Memory Slot No. (000-299)
*b: Number of Memory Slot allocated (001-032)

CM72 — Set the stored number (terminating number of the opposite office: access code for ISDN line + ISDN subscriber number) to the Memory Slot Number allocated by CM71.

(1) Memory Slot No. (000-299)
(2) Stored No. <u>XX</u>, <u>YYY...</u>
           *a   *b
*a: Access Code for ISDN
*b: ISDN Subscriber No. of Opposite Office (Max. 26 digits)

CM76 — E-CCIS Incoming Call Assignment

• Y=0 (Day)
  Y=1 (Night)
(1) XXX-XXXX (Last three or four digits of ISDN Called Party No.)
(2) Mate-Side Trunk (B000-B255)

END

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3.7.4   Channel Release Timer Assignment This page is for your notes.

	DESCRIPTION	DATA
START		

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CM41

Specify the timer data to release the voice channels of virtual tie line. If there are no calls for predetermined time, the voice channels used for Event Based CCIS is released.

- Y=0
- (1) 87: Virtual Tie Line Release Timer
        (For Voice channels)
- (2) 02: 2.4-4.8 sec. (2.4 sec. increments)
     ≀   ≀
     30: 69.6-72.0 sec.
     32: 24 sec. (24 sec. increments)
     ≀   ≀
     70: 936 sec.
     72: 1 min. (1 min. increments)
     ≀   ≀
     99: 28 min.
     NONE ◀ : 3 min.
     (Error span: 2.4 sec.)

Specify the timer data to release the common signaling channel of virtual tie line. If all the voice channels are release and there are no calls for predetermined time, the common signaling channel used for Event Based CCIS is released.

- Y=0
- (1) 89: Virtual Tie Line Release Timer
        (For Common Signaling Channel)
- (2) 02: 2.4-4.8 sec. (2.4 sec. increments)
     ≀   ≀
     30: 69.6-72.0 sec.
     32: 24 sec. (24 sec. increments)
     ≀   ≀
     70: 936 sec.
     72: 1 min. (1 min. increments)
     ≀   ≀
     99: 28 min.
     NONE ◀ : 3 min.
     (Error span: 2.4 sec.)

END

3.7.5 CCH Data Assignment

START	DESCRIPTION	DATA

CM05

Assign a slot number to the CCH card. The slot number must correspond to the SENSE switch setting on the card.

(INITIAL)

(1) Slot No. (04-15)
(2) 11: CCH Card

CM06

Assign a CCIS channel number to each CCH card.

(INITIAL)

- YY=07
(1) CCIS Channel No. (0-3)
(2) Slot No. of CCH Card (04-15)

CM09

Provide the system with No. 7 CCIS facilities.

(INITIAL)

(1) 53: No. 7 CCIS
(2) 0: Provided

CMA7

Assign the trunk number used as the common signaling channel.

- YY=00
(1) CCIS Channel No. (0-3)
(2) Trunk No. (000-255) assigned by CM07

Assign an Originating Point Code (OPC) of own office and Destination Point Code (DPC) of
opposite office, to each CCIS channel.

Note: *The OPC is used to designate an originating office in the No. 7 CCIS network. A single OPC of own office should be assigned to all CCIS channels provided in the same system.*

- YY=01
(1) CCIS Channel No. (0-3)
(2) OPC (00001-16367)

- YY=02
(1) CCIS Channel No. (0-3)
(2) DPC (00001-16367)

Specify whether the distant end is the centralized office or a local office.

- YY=03
(1) CCIS Channel No. (0-3)
(2) 0: Distant End is a Centralized Office
    1: Distant End is a Local Office
    3◄ : Not provided

Assign Point Code of the Centralized Billing office to each CCIS channel, if required.

- YY=04
(1) CCIS Channel No. (0-3)
(2) Point Code of Centralized Office (00001-16367)

A

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A	**DESCRIPTION**	**DATA**

CMA7 — Assign Point Code of the Centralized Fault Report office to each CCIS channel, if required.

- YY=05
- (1) CCIS Channel No. (0-3)
- (2) Point Code of Centralized Office (00001-16367)

Assign ACM Signal Waiting Timer.

- YY=10
- (1) CCIS Channel No. (0-3)
- (2) 14 : 28 seconds

Specify the CCH for Event Based CCIS.

- YY=27
- (1) CCIS Channel No. (0-3)
- (2) 0: CCH for Event Based CCIS
  - 1◄ : CCH for normal CCIS

CMA8 — Assign CCIS channel to which a signaling message is transferred according to the Destination Point Code (DPC) received.

- (1) DPC (00001-16367)
- (2) CCIS Channel No. (0-3)

END

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3.7.6 E-CCIS Tandem Connection Assignment

• When providing Tandem Connection (ISDN to CCIS/CCIS to ISDN), do the following programming.

START	DESCRIPTION	DATA

CM36

Specify the combination of Trunk Routes allowing the tandem connection.

Note: *The Home-Side Virtual Tie line routes must be included for all Tandem combinations.*

(1) XX XX

         00-63 (Incoming Trunk Route)
         00-63 (Outgoing Trunk Route)

(2) 0/1◀ : Allowed/Restricted

CM08

Tandem connection by station or attendant

(1) 028
(2) 0/1◀ : Available/Not Available

END

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3.8 Event Based CCIS Programming Example

BRTA TRUNKS

D100 Rt. 10   (972) 555-6868
D101 Rt. 10   (972) 555-6869
D102 Rt. 10   (972) 555-6870
D103 Rt. 11   (972) 555-6871

TELCO

D040 Rt. 40   MATE SIDE TRUNKS
D041 Rt. 41
D042 Rt. 42
D043 Rt. 43

VOICE

D030 Rt. 30
D031 Rt. 30
D032 Rt. 30
D033 Rt. 31

CCH

HOME SIDE TRUNKS
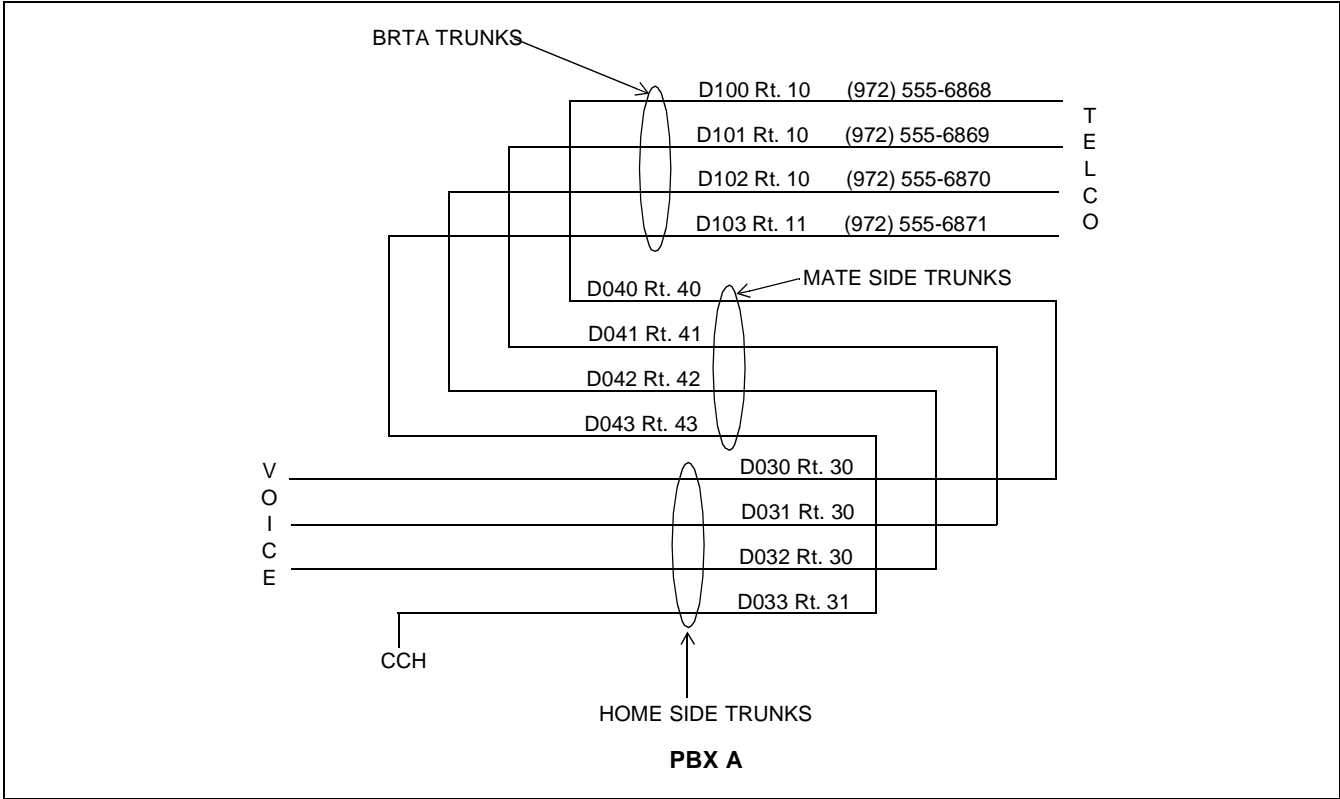
PBX A

3.9 Numbering Plan Programming in PBX A:

Station numbers in PBX A are 2000~2999.
Station numbers in PBX B are 3000~3999.
Digit conversion must be done for 6868~6871.

	DESCRIPTION	DATA
START		
CM20		• YY=0~3
		2 > 804
		3 > A29
		68 > 804
	Access code for trunk route 10.	80 > 110
	Access code for trunk route 11.	81 > 111
END		

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3.9.1   Telco BRI Trunk Programming

BRI Trunks in PBX A are (Example for using BRTA cards):
Circuit 1: B1 (972) 555-6868
        B2   (972) 555-6869
Circuit 2: B1 (972) 555-6870
        B2 (972) 555-6871

Note: *Sense Wheel on BRI cards are set to 04 and 05 respectively.*

START	DESCRIPTION	DATA
CM05	Assign BRI cards.	04 > 10 05 > 10
CMAA	Set protocol as NI-1.	• YY=06 04 > 27 05 > 27
CM07	Assign trunks to BRI.	• YY=02 0400 > D100 0401 > D101 0500 > D102 0501 > D103
CM30	Assign trunks to trunk routes.	• YY=00 100 > 10 101 > 10 102 > 10 103 > 11
	Assign Day & Night incoming termination.	• YY=02 & YY=03 100 > 18 101 > 18 102 > 18 103 > 18
	Last 4 digits of telephone no.	• YY=19 100 > 6868 101 > 6869 102 > 6870 103 > 6871
	ISDN Local Office Code Table	• YY=34 100 > 00 101 > 00 102 > 00 103 > 00
A		

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A	DESCRIPTION	DATA

CM50 — Area Code + Local Office Code

- YY=05
  00 > 972555

CMAC — Last 4 digits of telephone no. + 4 digit SPID

- YY=30
  040 > 68680101
  041 > 68690101
  050 > 68700101
  051 > 68710101

CM35 — Set as ISDN trunk route.

- YY=00
  10 > 00
  11 > 00

Answer signal arrives.

- YY=04
  10 > 2
  11 > 2

Incoming connection signaling.

- YY=09
  10 > 08
  11 > 08

Hooking signal sending to outside not provided.

- YY=16
  10 > 0
  11 > 0

Enable digit conversion.

- YY=18
  10 > 0
  11 > 0

Disable trunk queuing outgoing.

- YY=28
  10 > 0
  11 > 0

Assign as BRI trunk route.

- YY=90
  10 > 2
  11 > 2

CM76 — Terminate BRI trunks to station for testing.

- Y=0 & Y=1
  6868 > Sta. no.
  6869 > Sta. no.
  6870 > Sta. no.
  6871 > Sta. no.

END

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BRI Trunks in PBX B are:
Circuit 1: B1 (214) 555-6204
         B2   (214) 555-6205
Circuit 2: B1 (214) 555-6206
         B2   (214) 555-6207

Note: *You __must__ have this information prior to programming E-CCIS.*

- Home-Side Trunk Programming

	DESCRIPTION	DATA
START		
CM07	Assign Home-Side trunks to even numbered addresses.	• YY=05 3200 > D030 3202 > D031 3204 > D032 3206 > D033
CM30	Assign trunks to trunk routes.	• YY=00 030 > 30 031 > 30 032 > 30 033 > 31
CM35	Assign as Tie Line routes.	• YY=00 30 > 04 31 > 04
	Set route as Dial Pulse.	• YY=01 30 > 2 31 > 2
	Answer signal arrives.	• YY=04 30 > 2 31 > 2
	Incoming connection signaling.	• YY=09 30 > 06 31 > 06
	Seize trunks by lowest numbered trunk.	• YY=83 30 > 0
	Assign as CCIS.	• YY=90 0 > 0 31 > 0
A		

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	DESCRIPTION	DATA
A		
CM35	Assign CCH Channel No.	• YY=90 30 > 0 31 > 0
	Assign as E-CCIS route.	• YYY=135 30 > 0 31 > 0
CM30	Assign CIC no.	• YY=35 030 > 001 031 > 002 032 > 003
END		

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- Mate-Side Trunk Programming

	DESCRIPTION	DATA
START		
CM07	Assign Mate-Side trunks to odd numbered addresses.	• YY=05 3201 > D040 3203 > D041 3205 > D042 3207 > D043
CM30	Assign trunks to trunk routes.	• YY=00 040 > 40 041 > 41 042 > 42 043 > 43
	Assign last 4 digits of telephone number in PBX B.	• YY=19 040 > 6204 041 > 6205 042 > 6206 043 > 6207
CM35	Assign as Tie Line routes.	• YY=00 40 > 04 41 > 04 42 > 04 43 > 04
	Assign abbreviated codes to terminate call to PBX B. **Note:** *Terminating number and its memory allocation are assigned by CM 71 and CM 72.*	• YY=40 40 > 00 41 > 01 42 > 02 43 > 03
	Release virtual tie line if there are no calls for a predetermined time.	• YYY=127 40 > 0 41 > 0 42 > 0 43 > 0
	Assign as E-CCIS route.	• YYY=135 40 > 0 41 > 0 42 > 0 43 > 0
END		

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3.9.2   Program Termination for Incoming E-CCIS Calls

	DESCRIPTION	DATA
START		
CM76	Convert received digits to Mate-Side trunks.	• Y=0 & Y=1 6868 > B040 6869 > B041 6870 > B042 6871 > B043
END		

3.9.3   Program Access Code/Terminating Number Assignment for Outgoing E-CCIS Calls

	DESCRIPTION	DATA
START		
CM71	Allocate memory to store the terminating numbers of PBX B.	• 66 > 100004
CM72	**Note:** *In the stored number a trunk route access code must be used. E-CCIS will not work if an LCR access code is used.*	• 100 > 80,2145556204 101 > 80,2145556205 102 > 80,2145556206 103 > 81,2145556207
END		

3.9.4   Program Release Timer for Virtual Tie Lines (Home-Side & Mate-Side Trunks)

	DESCRIPTION	DATA
START		
CM41	Release timer for voice channels	• Y=0 87 > 04
	Release timer for CCH channel.	• Y=0 89 > 08
END		

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3.9.5   CCH Data Assignment:

Sense Wheel for PN-SC00 is set to 06.
Originating Point Code for PBX A is 00001.

START	DESCRIPTION	DATA
CM05	Assign CCH card.	• 06 > 11
CM06	Assign CCH channel no. to CCH card.	• YY=07 0 > 06
CM09	Provide the PBX with CCIS.	• 53 > 0
CMA7	Assign trunk to be used as CCH channel.	• YY=00 0 > 043
	Assign Originating Point Code.	• YY=01 0 > 00001
	Assign Destination Point Code.	• YY=02 0 > 00002
	Assign ACM Signal Waiting Timer.	• YY=10 0 > 14
	E-CCIS for the CCH channel.	• YY=27 0 > 0
CMA8	Assign CCH channel to which a signaling message is transferred according to the Destination Point Code received.)	• 0 > 00002

END

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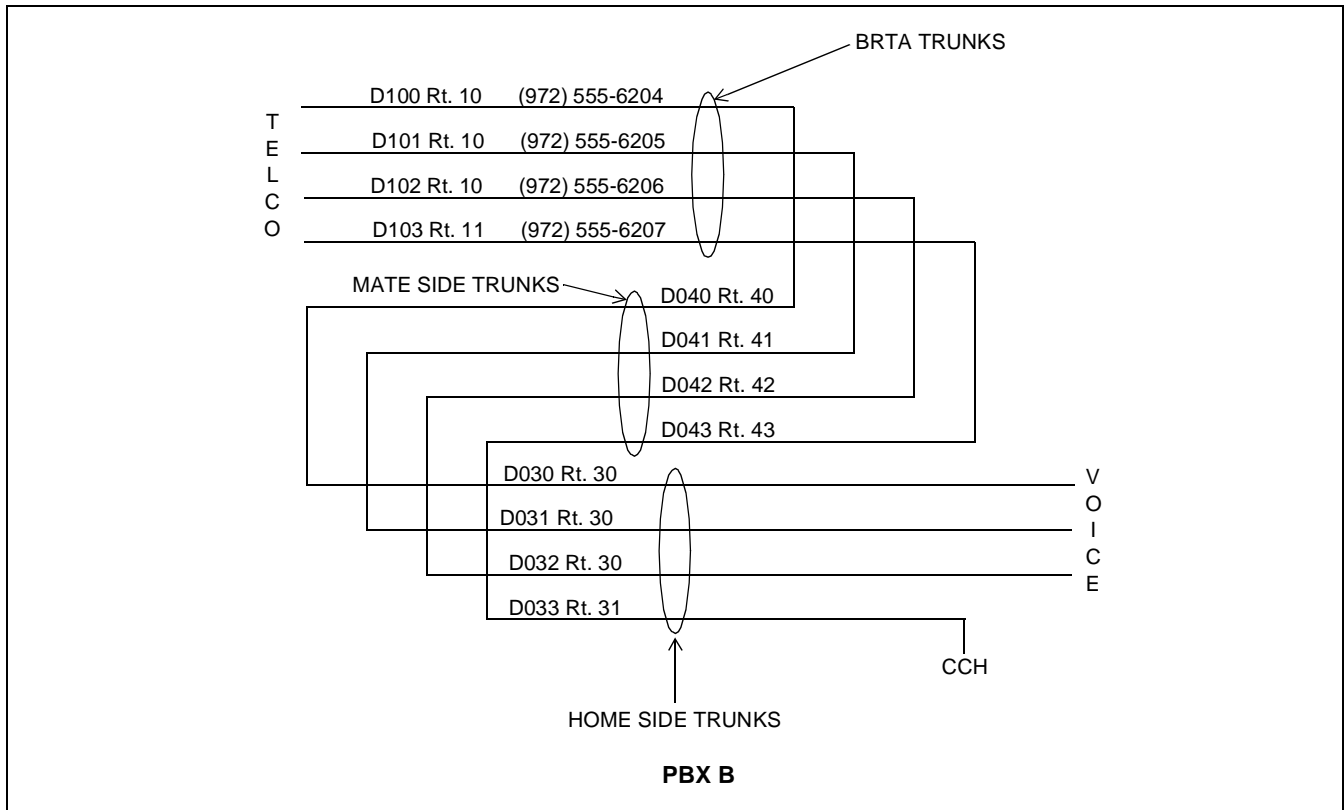
PBX B

3.10 Numbering Plan Programming in PBX B:

Station numbers in PBX A are 2000~2999.
Station numbers in PBX B are 3000~3999.
Digit conversion must be done for 6204~6207.

	DESCRIPTION	DATA
START		• YY=0~3
CM20		2 > A29
		3 > 804
		62 > 804
	Access code for trunk route 10.	80 > 110
	Access code for trunk route 11.	81 > 111
END		

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3.10.1 Telco BRI Trunk Programming

BRI Trunks in PBX B are (Example for using BRTA cards):
Circuit 1: B1 (972) 555-6204
    B2 (972) 555-6205
Circuit 2: B1 (972) 555-6206
    B2 (972) 555-6207

Note: *Sense Wheel on BRI cards are set to 04 and 05 respectively.*

START	DESCRIPTION	DATA
CM05	Assign BRI cards.	04 > 10 05 > 10
CMAA	Set protocol as NI-1.	• YY=06 04 > 27 05 > 27
CM07	Assign trunks to BRI.	• YY=02 0400 > D100 0401 > D101 0500 > D102 0501 > D103
CM30	Assign trunks to trunk routes.	• YY=00 100 > 10 101 > 10 102 > 10 103 > 11
	Assign Day & Night incoming termination.	• YY=02 & YY=03 100 > 18 101 > 18 102 > 18 103 > 18
	Last 4 digits of telephone no.	• YY=19 100 > 6204 101 > 6205 102 > 6206 103 > 6207
	ISDN Local Office Code Table	• YY=34 100 > 00 101 > 00 102 > 00 103 > 00
A		

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	DESCRIPTION	DATA
A		
CM50	Area Code + Local Office Code	• YY=05 00 > 214555
CMAC	Last 4 digits of telephone no. + 4 digit SPID	• YY=30 040 > 62040101 041 > 62050101 050 > 62060101 051 > 62070101
CM35	Set as ISDN trunk route.	• YY=00 10 > 00 11 > 00
	Answer signal arrives.	• YY=04 10 > 2 11 > 2
	Incoming connection signaling.	• YY=09 10 > 08 11 > 08
	Hooking signal sending to outside not provided.	• YY=16 10 > 0 11 > 0
	Enable digit conversion.	• YY=18 10 > 0 11 > 0
	Disable trunk queuing outgoing.	• YY=28 10 > 0 11 > 0
	Assign as BRI trunk route.	• YY=90 10 > 2 11 > 2
CM76	Terminate BRI trunks to station for testing.	• Y=0 & Y=1 6204 > Sta. no. 6205 > Sta. no. 6206 > Sta. no. 6207 > Sta. no.

END

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BRI Trunks in PBX A are:
Circuit 1: B1 (214) 555-6868
         B2 (214) 555-6869
Circuit 2: B1 (214) 555-6870
         B2 (214) 555-6871

Note: *You <u>must</u> have this information prior to programming E-CCIS.*

- Home-Side Trunk Programming

	DESCRIPTION	DATA
START		
CM07	Assign Home-Side trunks to even numbered addresses.	• YY=05 3200 > D030 3202 > D031 3204 > D032 3206 > D033
CM30	Assign trunks to trunk routes.	• YY=00 030 > 30 031 > 30 032 > 30 033 > 31
CM35	Assign as Tie Line routes.	• YY=00 30 > 04 31 > 04
	Set route as Dial Pulse.	• YY=01 30 > 2 31 > 2
	Answer signal arrives.	• YY=04 30 > 2 31 > 2
	Incoming connection signaling.	• YY=09 30 > 06 31 > 06
	Seize trunks by lowest numbered trunk.	• YY=83 30 > 0
	Assign as CCIS.	• YY=90 0 > 0 31 > 0
A		

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A	DESCRIPTION	DATA

CM35 — Assign CCH Channel No.
- YY=91
  30 > 0
  31 > 0

Assign as E-CCIS route.
- YYY=135
  30 > 0
  31 > 0

CM30 — Assign CIC no.
- YY=35
  030 > 001
  031 > 002
  032 > 003

END

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- Mate-Side Trunk Programming

	DESCRIPTION	DATA
START		
CM07	Assign Mate-Side trunks to odd numbered addresses.	• YY=05 3201 > D040 3203 > D041 3205 > D042 3207 > D043
CM30	Assign trunks to trunk routes.	• YY=00 040 > 40 041 > 41 042 > 42 043 > 43
	Assign last 4 digits of telephone number in PBX A.	• YY=19 040 > 6868 041 > 6869 042 > 6870 043 > 6871
CM35	Assign as Tie Line routes.	• YY=00 40 > 04 41 > 04 42 > 04 43 > 04
	Assign abbreviated codes to terminate call to PBX A. **Note:** *Terminating number and its memory allocation are assigned by CM 71 and CM 72.*	• YY=40 40 > 00 41 > 01 42 > 02 43 > 03
	Release virtual tie line if there are no calls for a predetermined time.	• YYY=127 40 > 0 41 > 0 42 > 0 43 > 0
	Assign as E-CCIS route.	• YYY=135 40 > 0 41 > 0 42 > 0 43 > 0
END		

3.10.2 Program Termination for Incoming E-CCIS Calls

	DESCRIPTION	DATA
START		
CM76	Convert received digits to Mate-Side trunks.	• Y=0 & Y=1 6204 > B040 6205 > B041 6206 > B042 6207 > B043
END		

3.10.3 Program Access Code/Terminating Number Assignment for Outgoing E-CCIS Calls

	DESCRIPTION	DATA
START		
CM71	Allocate memory to store the terminating numbers of PBX B	• 66 > 100004
CM72	**Note:** *In the stored number a trunk route access code must be used. E-CCIS will not work if an LCR access code is used.*	• 100 > 80,2145556868 101 > 80,2145556869 102 > 80,2145556870 103 > 81,2145556871
END		

3.10.4 Program Release Timer for Virtual Tie Lines (Home-Side & Mate-Side Trunks)

	DESCRIPTION	DATA
START		
CM41	Release timer for voice channels	• Y=0 87 > 04
	Release timer for CCH channel	• Y=0 89 > 08
END		

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3.10.5 CCH Data Assignment:

Sense Wheel for PN-SC00 is set to 06.
Originating Point Code for PBX B is 00002.

START	DESCRIPTION	DATA
CM05	Assign CCH card.	• 06 > 11
CM06	Assign CCH channel no. to CCH card.	• YY=07 0 > 06
CM09	Provide the PBX with CCIS.	• 53 > 0
CMA7	Assign trunk to be used as CCH channel.	• YY=00 0 > 043
	Assign Originating Point Code.	• YY=01 0 > 00002
	Assign Destination Point Code.	• YY=02 0 > 00001
	Assign ACM Signal Waiting Timer.	• YY=10 0 > 14
	Assign E-CCIS for the CCH channel.	• YY=27 0 > 0
CMA8	Assign CCH channel to which a signaling message is transferred according to the Destination Point Code received.)	• 0 > 00001
END		

3.10.6 Alternative ISDN Route Assignment

To provide an ISDN line as an alternative route when the call can not be connected through the virtual tie line, do the programming for Least Cost Routing. Refer to the NEAX2000 IVS Feature Programming Manual.
For the call through the alternative ISDN route, the called number which is dialed by the caller is set to the sub-address.

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CHAPTER 5   INSTALLATION TEST

1. GENERAL

This chapter describes the test procedure and the troubleshooting procedure after providing ISDN to the PBX.

2. OUTLINE OF INSTALLATION TEST

The test item described in this chapter is to be performed after the installation of ISDN has been completed. Since the explanation is given about interoffice test procedure mainly with respect to the basic functions of DTI, connection tests and service feature tests via the relevant network must be performed according to the related manuals separately from the explanation given in this chapter. When reading out the record of faults occur in each DTI, refer to the Maintenance Manual.

The test item covered in this chapter is as follows:

- Transmission Line Test
- PLO Operation Test

3. INSTALLATION TEST PROCEDURES

3.1 Transmission Line Test

Transmission line test is for confirming interoffice synchronization and speech quality using an "In-Service" transmission line.

(1) Connect the transmission line to the MDF.
(2) Confirm indication lamps on the DTI card, as per Table 5-1.
(3) Originate a station-to-station call and "an outgoing call via DTI".
(4) After an outgoing connection via DTI has been established, confirm interoffice synchronization by the following procedure.
- On the DTMF telephone set, keep pressing any dial button.
- Check to see if noise is periodically occurring with the DTMF signals coming from the calling station in the opposite office.
- Perform the above test again set in the opposite office.

If noise is periodically generating, check the transmission line and the external equipment.

Table 5-1 Alarm Indications on the PN-24DTA Card

LED	LED INDICATION		FAULT	
	NORMAL	FAULT	CAUSE	ACTION
RUN	Flash (120IPM)	Off	DTI Trunk data is not correctly assigned.	1.Reset the MB switch. (Down→UP→Down) 2.Confirm the program data (CM05, CM07 YY = 01)
CRC	Off	On	Bit Error Rate exceeds the predetermined value.	Check the transmission line and external equipment.
PCM	Off	On	No PCM signals arrive from the distant office.	1.Check to see if the DTI cable is correctly connected. 2.Plug and unplug the DTI cards. Repeat this two or three times.
FRM	Off	On	Frame Alignment signals from the distant office cannot be received.	Check the transmission line and external equipment.
RMT	Off	On	Frame Alignment signals cannot be sent to the opposite PBX.	Replace the DTI card.
AIS	Off	On	Opposite PBX is in the loopback test.	Check the opposite DTI card.

3.2 PLO Operation Test

The following tests should be performed to confirm the PLO operation's normality.

- Clock Signal Generation Test
- Clock Signal Synchronization Test ─── To be performed when the PBX is a slave office.
- Interoffice Synchronization Test

3.2.1 Clock Signal Generation Test

This test checks to see if the PLO keeps generating clock signals at the frequency of the previous master clock, when the external clock signal from the master office and sub-master office have stopped.

To perform this test, an "In Service" transmission line is required.

STEP 1: On all the DTI cards mounted in the PIM0, set the SW-1 and SW-2 to "OFF" to stop the external clock signal input.

- The CLKIN lamp on the MP card goes out.

STEP 2: Originate an outgoing call via DTI.

STEP 3: After an outgoing connection via DTI has been established, confirm interoffice synchronization and speech quality with the following procedure.

① On the DTMF telephone set, keep pressing any dial button.

② Check to see if noise is periodically occurring with the DTMF signals coming from the calling station in the opposite office.

③ Perform the above test again in the opposite direction.

STEP 4: On all the DTI cards mounted in the PIM0, restore the SW-1 and SW-2 as the state before testing to input the external clock signals.

- The CLKIN lamp on the MP card lights.

If noise is periodically occurring, replace the MP card after checking the switch settings on the MP card, and perform the above test again.

3.2.2 Clock Signal Synchronization Test

This test checks to see if the PLO keeps synchronizing with the external clock signals, when the external clock signals from the master/sub-master office has input again after it has stopped once.

To perform this test, an "In Service" transmission line is required.

(1) When providing one clock supply route (from a master office)

STEP 1: On the DTI card extracting clock signals (DTI0), set the SW-1 and SW-2 to "OFF" to stop the external clock signal input.

–   The CLKIN lamp on the MP card goes out.

STEP 2: Originate an outgoing call via DTI.

STEP 3: After an outgoing connection via DTI has been established, confirm interoffice synchronization and speech quality with the following procedure.

① On the DTMF telephone set, keep pressing any dial button.

② Check to see if noise is periodically occurring with the DTMF signals coming from the calling station in the opposite office.

③ Perform the above test again in the opposite direction.

STEP 4: On the DTI card (DTI0), restore the SW-1 and SW-2 as the state before testing to input the external clock signals.

–   The CLKIN lamp on the MP card lights.

STEP 5: Originate an outgoing call via DTI.

STEP 6: After an outgoing connection via DTI has been established, confirm interoffice synchronization and speech quality with the procedure ① – ③ shown in STEP 3.

If noise is periodically occurring, replace the MP card after checking the switch settings on the MP card, and perform the above test again.

---

(2)   When providing two clock supply routes (from a master office and a sub-master office)

STEP 7:   On the DTI cards extracting clock signals (DTI0, DTI1), set the SW-1 and SW-2 as follows to change the clock supply route from 0 (from a master office) to 1 (from a sub-master office).

DTI0 card: SW-1 to OFF, SW-2 to OFF

DTI1 card: SW-1 to OFF, SW-2 to ON

STEP 8:   Originate an outgoing call via DTI.

STEP 9:   After an outgoing connection via DTI has been established, confirm interoffice synchronization and speech quality with the following procedure.

①   On the DTMF telephone set, keep pressing any dial button.

②   Check to see if noise is periodically occurring with the DTMF signals coming from the calling station in the opposite office.

③   Perform the above test again in the opposite direction.

STEP 10: On the DTI cards (DTI0, DTI1), set the SW-1 and SW-2 to "OFF" to stop the external clock signal input.

–   The CLKIN lamp on the MP card goes out.

STEP 11: Perform the procedure shown in STEP 2 and STEP 3 again.

STEP 12: On the DTI cards (DTI0, DTI1), set the SW-1 and SW-2 as shown in STEP 1 to input clock signals from the clock supply route 1.

STEP 13: Perform the procedure shown in STEP 2 and STEP 3 again.

STEP 14: On the DTI cards (DTI0, DTI1), set the SW-1 and SW-2 as follows to change the clock supply route from 1 to 0.

DTI0 card: SW-1 to ON, SW-2 to OFF

DTI1 card: SW-1 to OFF, SW-2 to ON

–   The CLKIN lamp on the MP card lights.

STEP 15: Perform the procedure shown in STEP 2 and STEP 3 again.

If noise is periodically occurring, replace the MP card after checking the switch settings on the MP card, and perform the above test again.

3.2.3 Interoffice Synchronization Test

This test checks to see if noise is occurring while calling with the opposite office, by difference of the clock signal frequency between the offices.

To perform this test, an "In Service" transmission line is required.

STEP 1: Originate an outgoing call via DTI.

STEP 2: Check the speech quality (if noise, distortion or click is occurring during a few minutes) with the opposite office mutually.

STEP 3: On the DTMF telephone set, keep pressing any dial button, and check to see if noise is periodically occurring with the DTMF signals coming from the calling station in the opposite office.

STEP 4: Perform the above test again in the opposite direction.

If noise is periodically occurring, replace the MP card after checking the switch settings on the MP card, and perform the above test again.

3.2.4   Master Office Mode Test

When the PBX is operated as a master office using the PN-CK00, perform this test.

To perform this test, an "In Service" transmission line is required.

STEP 1:   Confirm that the SW-1 and SW-2 on all the DTI cards mounted in PIM0 are set to "OFF".

STEP 2:   Confirm indication lamps on the PN-CK00 card.

STEP 3:   Originate an outgoing call via DTI.

> When the SYNC lamp lights, the clock signal is not generated from the PN-CK00 card. Check the switch settings on the DTI, PN-CK00 and MP card.
>
> For details of the lamp indications, refer to the Circuit Card Manual.

STEP 4:   After an outgoing connection via DTI has been established, confirm interoffice synchronization and speech quality with the following procedure.

①   On the DTMF telephone set, keep pressing any dial button.

②   Check to see if noise is periodically occurring with the DTMF signals coming from the calling station in the opposite office.

③   Perform the above test again in the opposite direction.

> If noise is periodically occurring, replace the PN-CK00 card after checking the switch settings on the PN-CK00, DTI and MP card. If noise have not been cleared, replace the MP card and perform the above test again.

This page is for your notes.