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NEAX® 2000 IVS²
INTEGRATED VOICE SERVER
ISDN System Manual

FEBRUARY, 2000

NEC America, Inc.

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INTRODUCTION

PURPOSE

This manual describes the hardware installation and programming procedure for the ISDN service on the NEAX2000 IVS^2.

OUTLINE OF THIS MANUAL

This manual contains the following chapters:

CHAPTER 1 GENERAL INFORMATION
This chapter explains the ISDN system outline, the equipment name and function, system specifications, capacity, and conditions.

CHAPTER 2 INSTALLATION
This chapter explains the hardware installation procedure to provide ISDN interface to the PBX.

CHAPTER 3 SYSTEM DATA PROGRAMMING
This chapter explains the programming procedure to provide the ISDN feature to the PBX.

CHAPTER 4 CIRCUIT CARD INFORMATION
This chapter explains the mounting location, the meaning of lamp indications, and the method of switch settings of each circuit card for the ISDN system.

CHAPTER 5 OPERATION TEST
This chapter explains the operation test to be performed after completion of the ISDN installation. For fault diagnosis by MAT or CAT, refer to the Maintenance Manual.

REFERENCE MANUALS

Refer to the manuals during installation:

Command Manual	Describes Customer Administration Terminal (CAT) operation, command function, and setting data required for programming the system and Resident System Program.
Office Data Programming Manual	Contains the Customer Specification Sheets and Office Data Programming Sheets.
Maintenance Manual	Describes the maintenance service features and the recommended troubleshooting procedure.
Installation Procedure Manual	Describes the installation procedure for the PBX system.
CCIS System Manual	Describes the installation and programming procedure for the CCIS system.

CHAPTER 1

GENERAL INFORMATION

This chapter explains the ISDN system outline, the equipment name and function, system specifications, capacity, and conditions.

SYSTEM OUTLINE

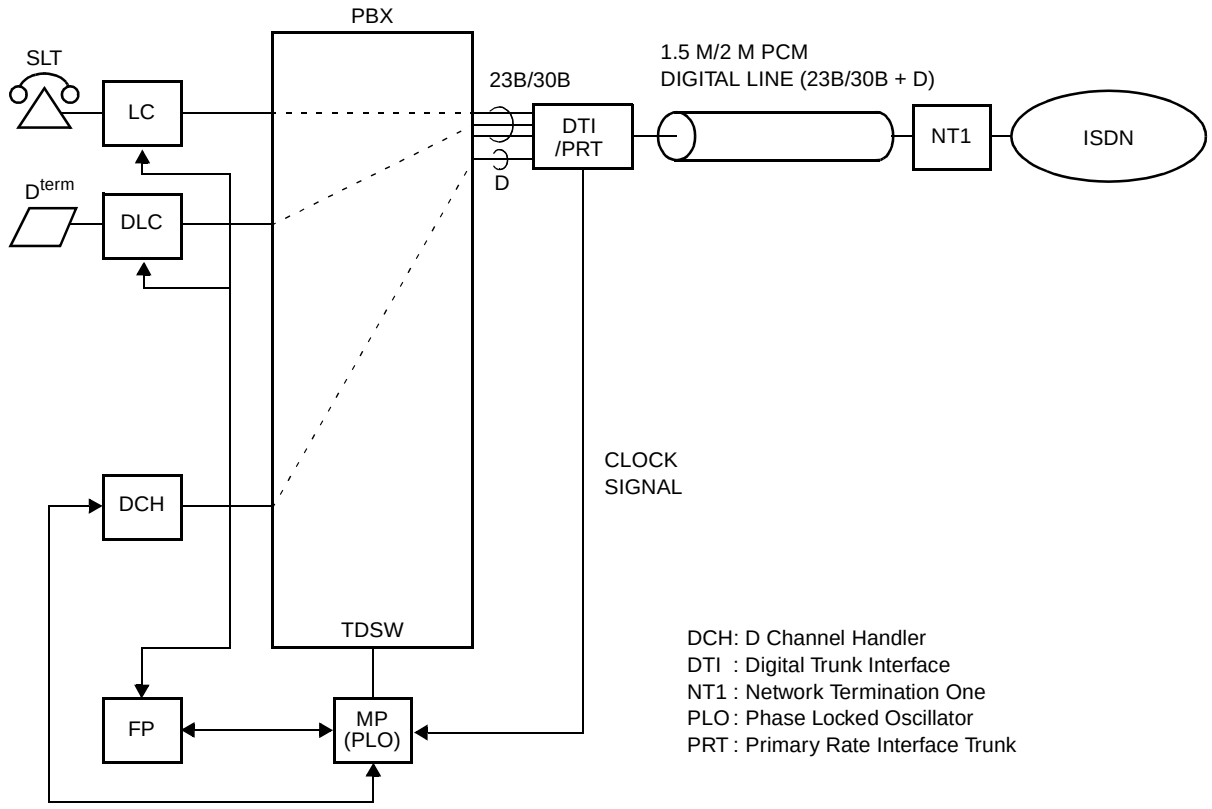
This system can be interfaced with an ISDN with the Primary Rate Interface or the Basic Rate Interface at the reference point S/T and ISDN Terminal.

System Outline of ISDN-PRI

The system is configured with a 24/30-channel Digital Trunk Interface (DTI) for digital network interface, D Channel Handler (DCH) for receiving/transmitting D channel signaling data from/to the ISDN exchange. Since the Main Processor (MP) contains Phase Locked Oscillator (PLO), the system can be synchronized to the ISDN as a clock receiver office.

Figure 1-1 shows the system outline of ISDN-PRI.

Figure 1-1 System Outline of ISDN-PRI



NOTE 1: NT1 equipment must be installed in the premise.

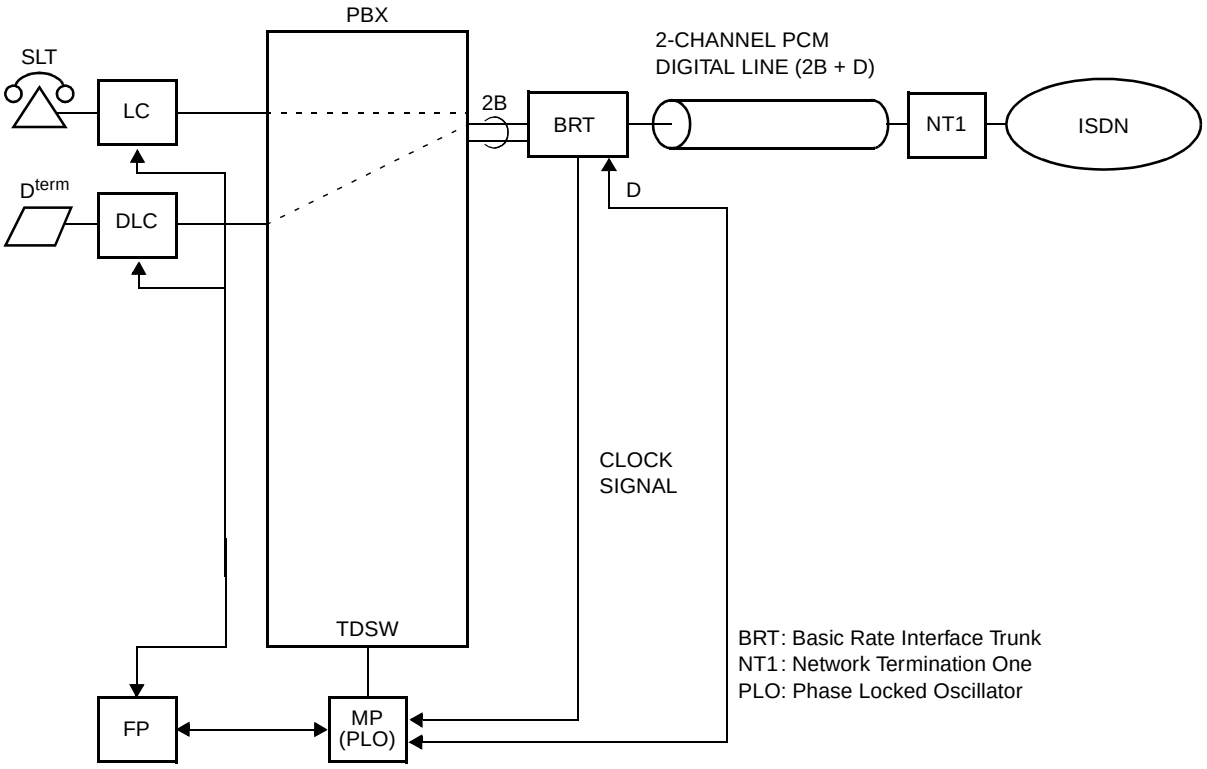
NOTE 2: The PRT provides a built-in DCH.

System Outline of ISDN-BRI

The system is configured with a Basic Rate Interface Trunk (BRT) for the digital network interface. Since the MP contains PLO, the system can be synchronized to the ISDN as a clock receiver office.

Figure 1-2 shows the system outline of ISDN-BRI.

Figure 1-2 System Outline of ISDN-BRI



NOTE: NT1 equipment must be installed in the premise.

System Outline of ISDN-VPN

The Virtual Private Network (VPN) is a service which provides an interoffice private line via an ISDN network.

When you dial a station number (Called Party Subaddress), the system sends a pre-assigned office number of a called party together with the Called Party Subaddress to an ISDN network. With this function, an interoffice call can be made by only dialing a station number (Called Party Subaddress).

Figure 1-3 shows an example of using the VPN.

Figure 1-3 Example of ISDN-VPN (1 of 2)

- When an opposite office can interface with the ISDN network

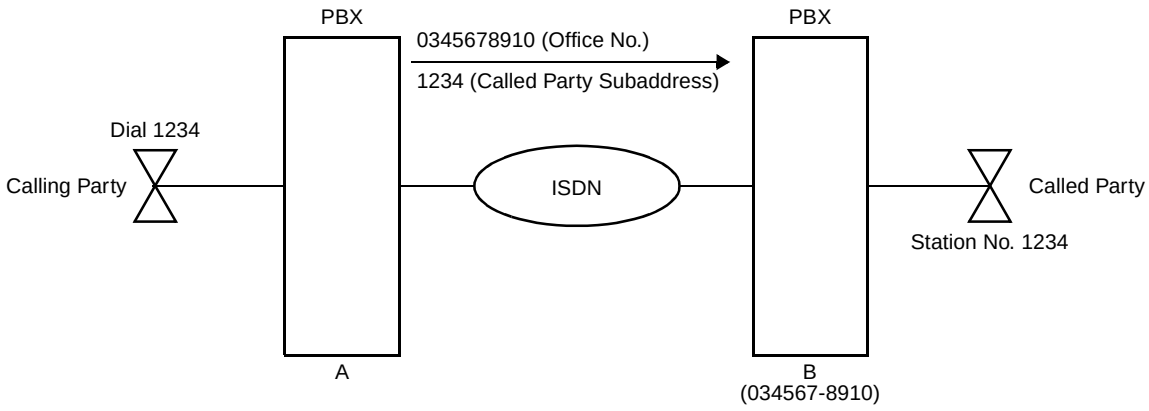
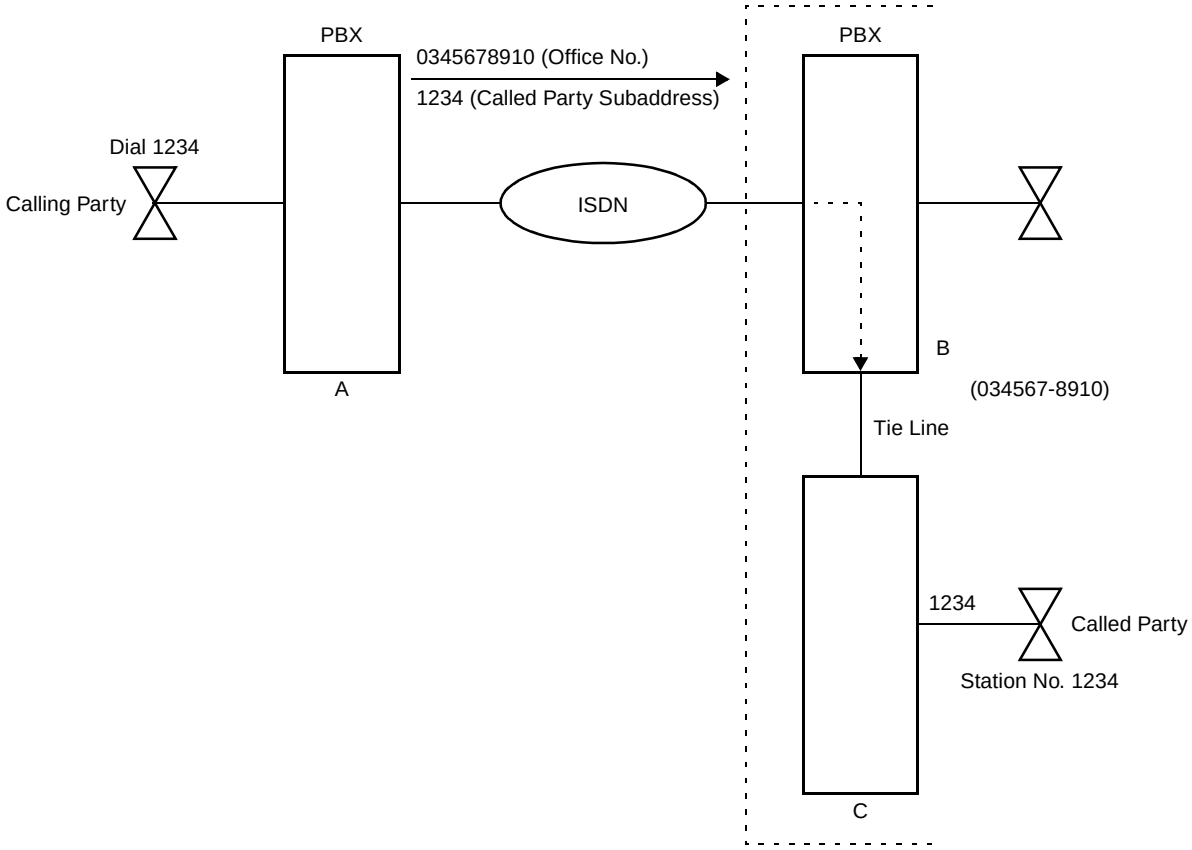


Figure 1-3 Example of ISDN-VPN (2 of 2)

- When an opposite office cannot interface with the ISDN network

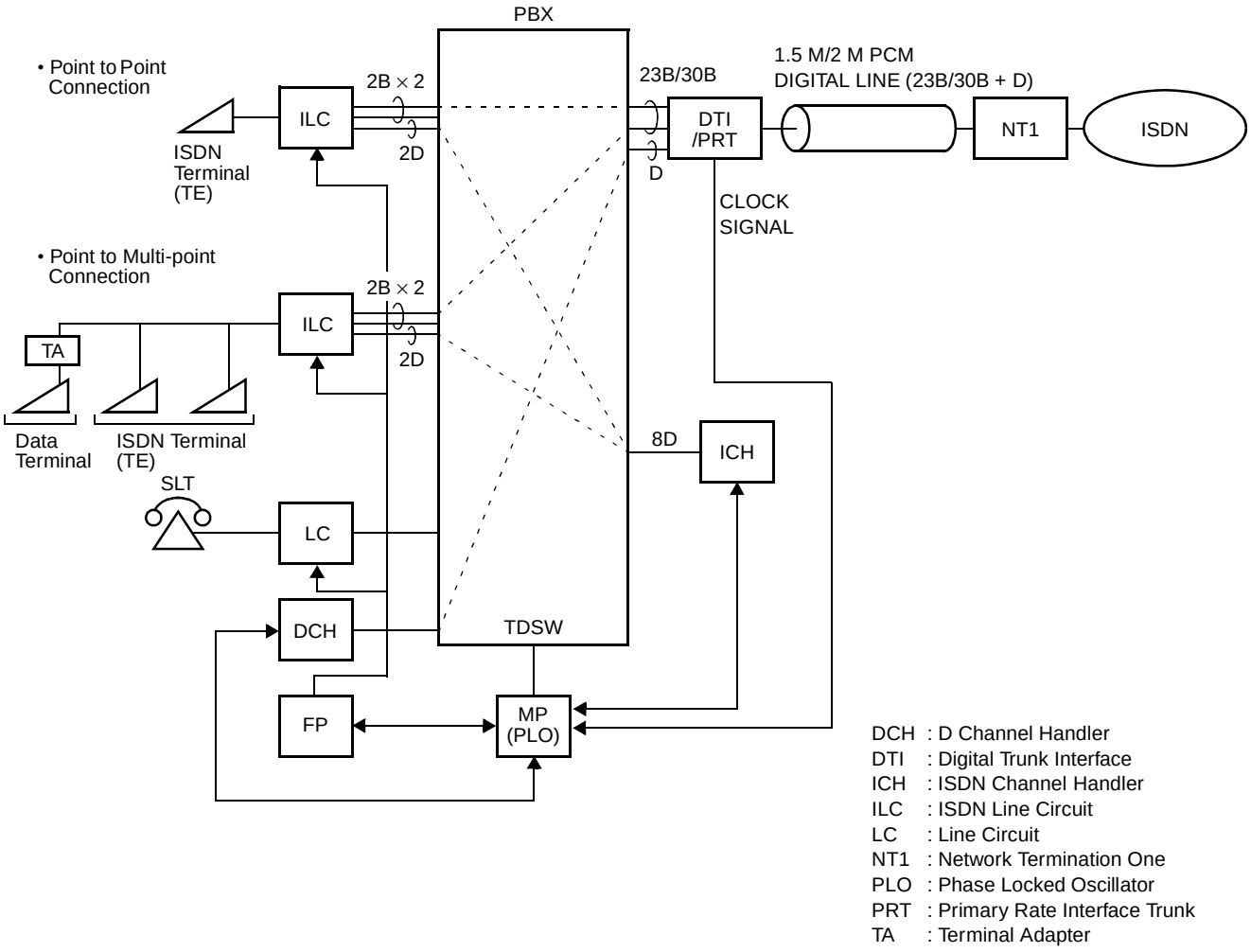


System Outline of ISDN Terminal

The system is configured with an ISDN Line Circuit (ILC) for the line interface of an ISDN Terminal and an ISDN Channel Handler (ICH) for Layer 2 protocol processing (LAP-D).

Figure 1-4 and Figure 1-5 show the system outline of the ISDN Terminal.

Figure 1-4 System Outline of ISDN Terminal (for ISDN-PRI)

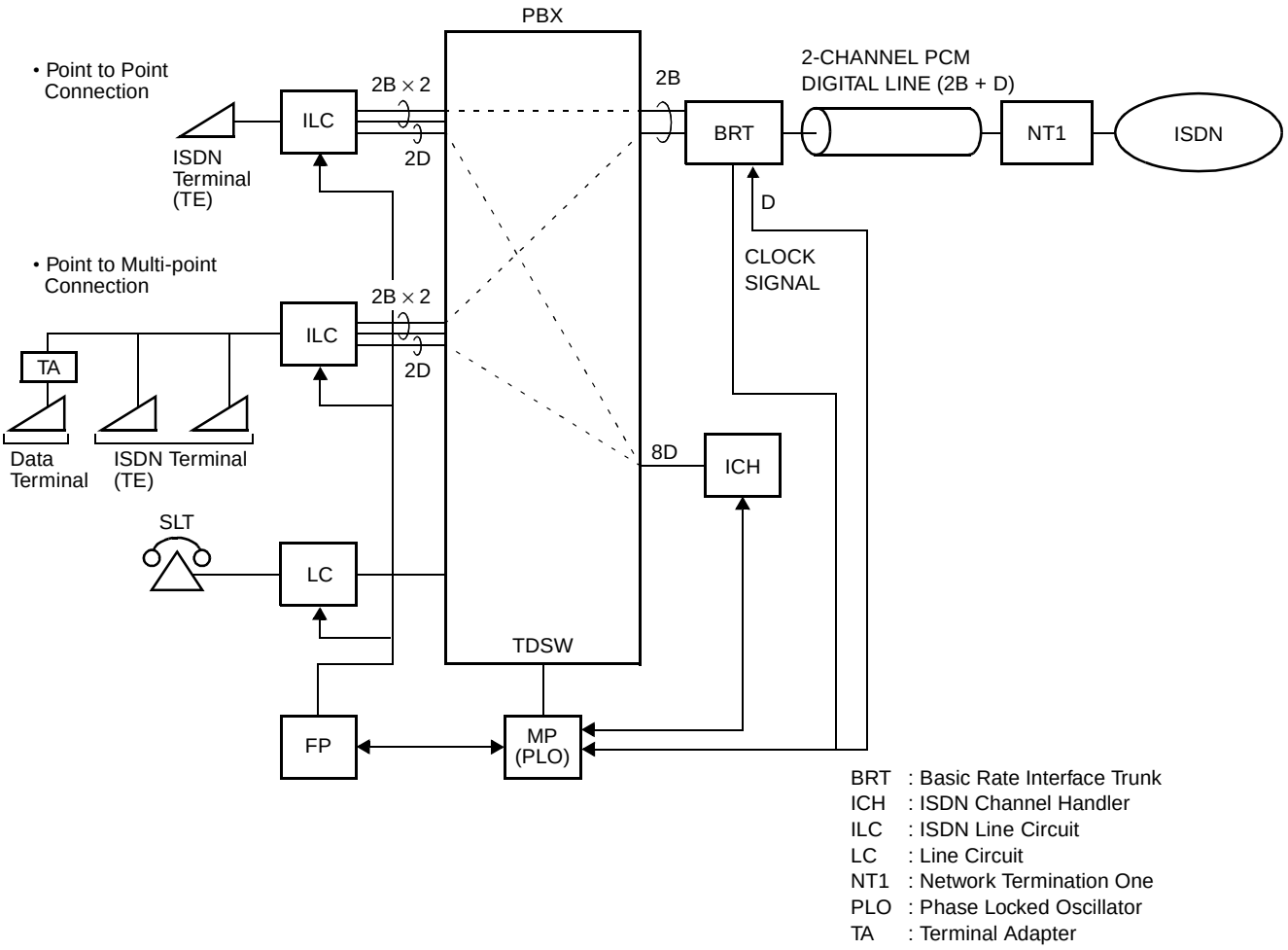


NOTE 1: The following connections are only available:

- ISDN Terminal to ISDN Terminal Connection
- ISDN Terminal to ISDN Trunk Connection
- ISDN Trunk to ISDN Terminal Connection
- ISDN Terminal to Single Line Telephone Connection

NOTE 2: NT1 equipment must be installed on the premises.

Figure 1-5 System Outline of ISDN Terminal (for ISDN-BRI)



NOTE 1: The following connections are only available:

- ISDN Terminal to ISDN Terminal Connection (S/T Interface)
- ISDN Terminal to ISDN Trunk Connection (S/T Interface)
- ISDN Trunk to ISDN Terminal Connection (S/T Interface)
- ISDN Terminal to Single Line Telephone Connection

NOTE 2: NT1 equipment must be installed on the premises.

DTI

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

For 24DTI:

- Unipolar/Bipolar Conversion (AMI Format/B8ZS 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 30DTI:

- Unipolar/Bipolar Conversion (HDB3 Format)
- Alarm Detection/Insertion
- Digital PAD on Voice Signal Transmission
- Cyclic Redundancy Checking (based on ITU-T Rec. G704)

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

DCH

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

PRT

The Primary Rate Interface Trunk (PRT) provides the ISDN Primary Rate Interface (1.5 Mbps PCM-23B + D) and a built-in DCH. The PRT has the following functions:

- Unipolar/Bipolar Conversion (AMI Format/B8ZS 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 connections of PRT and transmission line, twisted-pair cable can be used.

NOTE: ISDN requires B8ZS line coding with Extended Superframing (ESF) Format.

BRT

The Basic Rate Interface Trunk (BRT) provides one or two physical interface to the ISDN-Basic Rate Interface service (144 Kbps PCM-2B + D).

The BRT has the following functions:

- Unipolar/Bipolar Conversion (AMI Format) (S/T Interface) / B8ZS
- Signaling Insertion/Extraction
- Frame Synchronization
- Digital PAD on Voice Signal Transmission

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

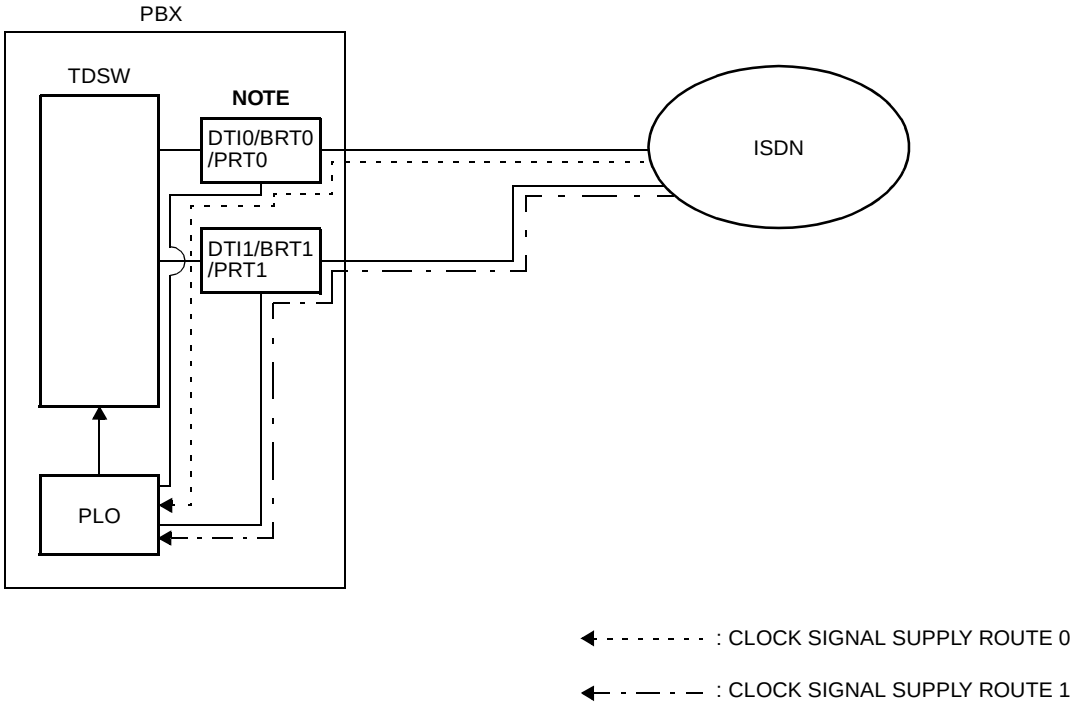
PLO

The Phase Locked Oscillator (PLO) equipped on the MP card synchronizes the system to an ISDN clock.

The PLO generates the clock signals according to the source clocks received from network. The source clock signals are extracted at DTI/BRT/PRT cards and supplied to the PLO. Two clock routes are available; one is Route 0 that receives clock signals from DTI0/BRT0/PRT0, and the other is a standby Route 1 (DTI1/BRT1/PRT1) that receives clock signals when no clock signals appear on Route 0. When no clock signals come from either Route 0 or Route 1, the PLO keeps generating the clock signals at the frequency of the last source clock. The PLO can receive different frequencies of source clocks from Route 0 and Route 1.

Figure 1-6 shows an example of clock supply route.

Figure 1-6 Clock Supply Route



NOTE: DTI0/BRT0/PRT0 and DTI1/BRT1/PRT1 must be mounted in PIM0.

ICH

The ISDN Channel Handler (ICH) provides the D channel signaling interface and controls an ILC (Layers 2 and 3).

ILC

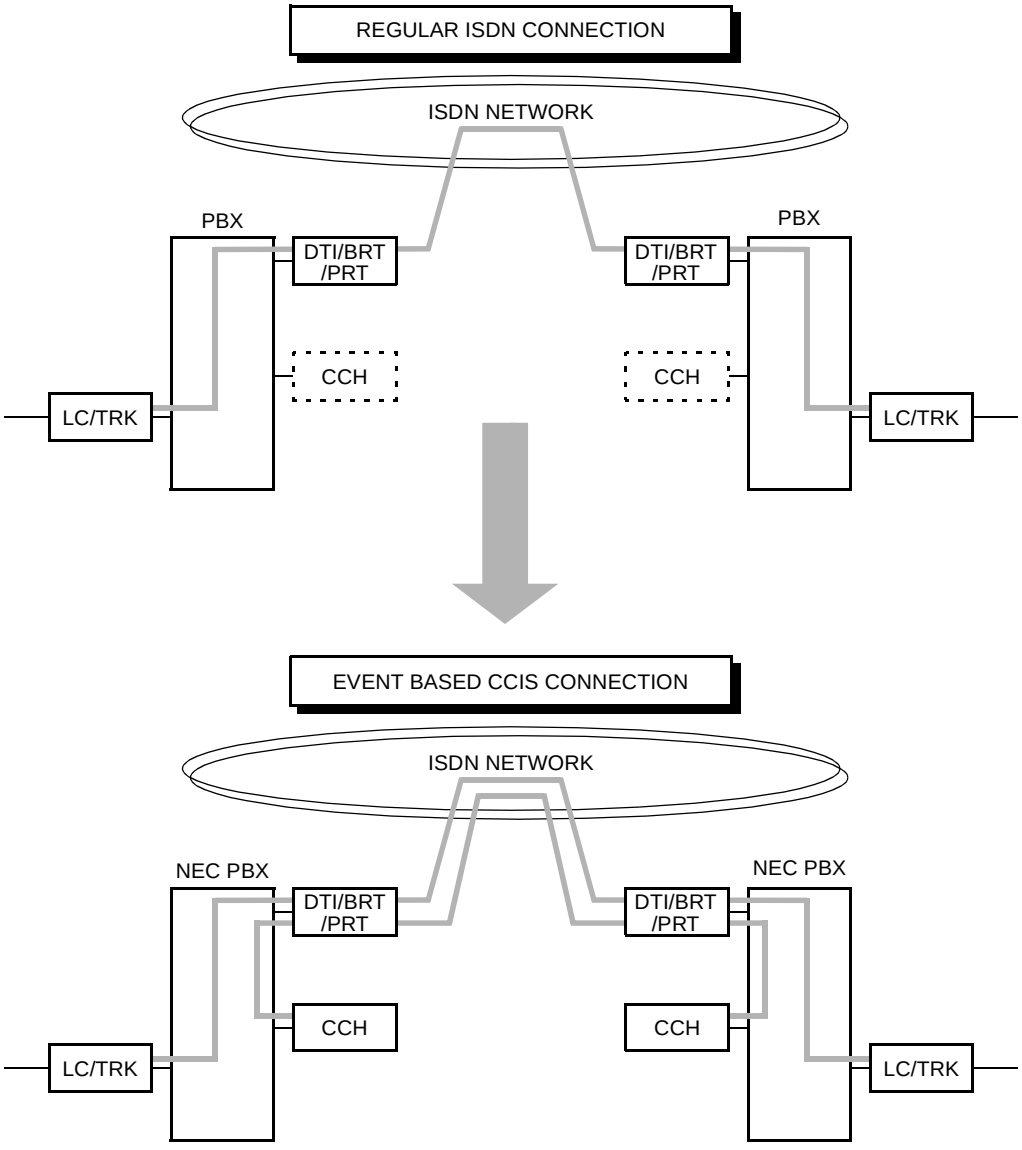
The ISDN Line Circuit (ILC) provides a physical interface to the ISDN Terminal. The interface provides for a maximum of two line circuits.

OUTLINE OF EVENT BASED CCIS

Event Based CCIS allows a PBX customer who does not have tie lines to use the various Common Channel Interoffice Signaling (CCIS) feature by using ISDN lines as CCIS virtual tie lines. For the PBX customer who usually has low traffic, Event Based CCIS is available between NEC NEAX PBXs.

Figure 1-7 shows the system outline of Event Based CCIS.

Figure 1-7 System Outline of Event Based CCIS

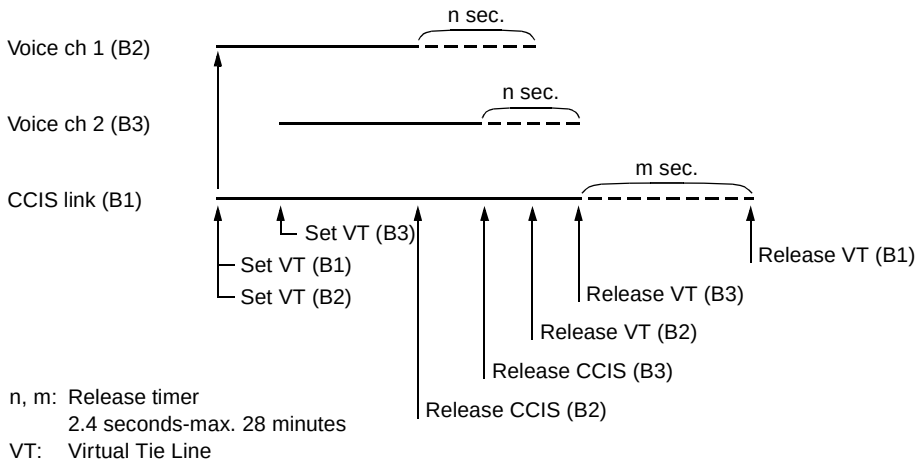


Common Channel and Voice Channel Link Control

When the call is a regular ISDN call or when there is no call on the PBX, the common signaling channel and the voice channel for the virtual tie lines are disconnected.
If the virtual tie lines are all busy or when the virtual tie lines cannot be connected 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 a predetermined time passes after all calls finish, the voice channels and common signaling channel are released and the CCIS link is disconnected. The release timer is set by system data programming for the common signaling channel and voice channels.

Figure 1-8 Release Timing of Virtual Tie Line and CCIS Link



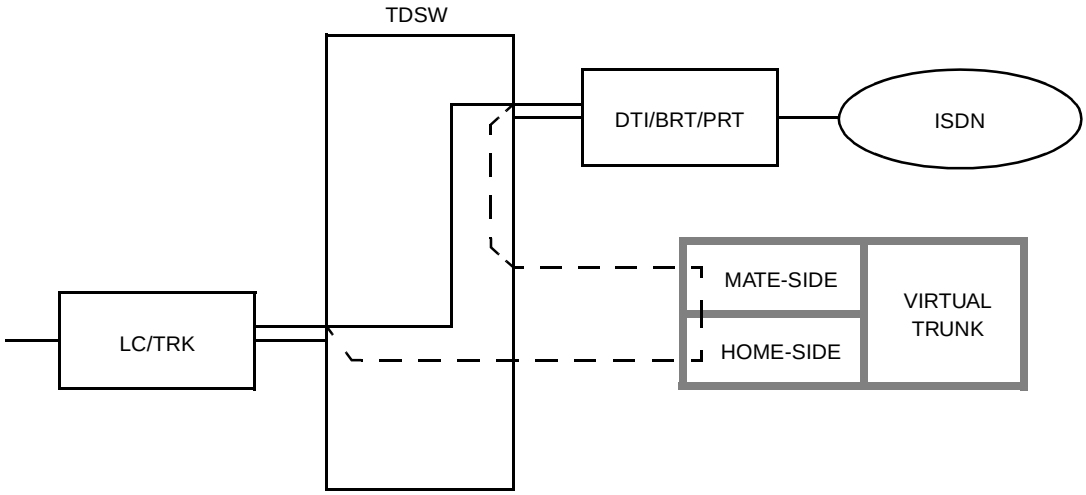
For Event Based CCIS, the virtual trunks are used as a No. 7 CCIS trunk.

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 the network side of the PBX virtually.

The virtual trunks do not exist actually, but are handled as a No. 7 CCIS trunk by the system, for system data. ISDN subaddress or ISDN indial number is used to notify the CCIS channel number for virtual tie line and establish a CCIS link and individual voice links between offices.

Figure 1-9 Virtual Trunk



CCH Card:

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

DTI/BRT/PRT Card:

The system uses the same interface trunk for regular ISDN connection and the virtual tie line connection on Event Based CCIS.

ISDN Protocol Analyzer:

For ISDN PRI, the protocol analyzer must be able to support ISDN exchange, such as AT&T, Nortel. For North America, it must support National ISDN 2 (NI-2) protocols.
For ISDN BRI, the protocol analyzer must be an **S/T interface**. For North America, it must support National ISDN 1 (NI-1) protocol.
Both analyzers must be capable of collecting Layer 2 and Layer 3 (Q921 & Q931) information.

Event Based CCIS Feature List

Table 1-1 Event Based CCIS Feature List

X : Available
– : Not available

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	

Table 1-1 Event Based CCIS Feature List (Continued)

X : Available
– : Not available

SERVICE FEATURE	AVAILABILITY	REMARKS
Hands-Free-Answer Back-CCIS	X	
House-Phone-CCIS	X	
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	

Table 1-1 Event Based CCIS Feature List (Continued)

X : Available
– : Not available

SERVICE FEATURE	AVAILABILITY	REMARKS
Uniformed Numbering Plan-CCIS	X	
Voice Call-CCIS	X	
Voice Mail Integration-CCIS	X	

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 up by the timer, the features are available.

NOTE 2: The billing information is sent while the CCH link is connected. If the sending of billing information has failed, it is sent again when a new CCH link is established by the next call.

NOTE 3: As a remote office, this feature is available on NEAX2000 IVS^2/7400ICS M100MX.

NOTE 4: An attendant/extension of the NEAX2000 IVS^2/7400ICS M100MX cannot be a conference leader.

NOTE 5: This service is available when the Attendant Console is provided at the IMX office on the network.

Event Based CCIS Service Conditions

- Event Based CCIS connection is available between NEC NEAX PBXs.
- The maximum number of the virtual tie lines is 16 channels per one system, including both common signaling channels and voice channels.
- This feature supports voice calls only. Supported objects at PBX transmission side: single line telephone, D^{term}, DID/E&M/Ring Down (analog/T1/E1) tandem calls.
- The data calls are transmitted via the regular ISDN network.
- The number of originating calls from the ISDN trunk is counted as Peg Count 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 after the call is finished.
  The common signaling channel of virtual tie line is released after all calls on voice channels are finished. The release timer is determined by system timer programming for the voice channels and the common signaling 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 LCR data in system programming.

CARD NAME AND FUNCTION

Table 1-2 shows the circuit card names and function for ISDN.

Table 1-2 ISDN Card Name and Function

CARD NAME	FUNCTIONAL NAME	FUNCTION
PN-BRTA	BRT	1-line Basic Rate (2B + D) Interface Trunk Card Accommodates one 2-channel PCM digital lines
PN-2BRTC	BRT	2-line Basic Rate (2B + D) Interface Trunk Card Accommodates two 2-channel PCM digital lines
PN-24DTA-C	DTI	Digital Trunk Interface (23B + D, 1.5 Mbps) Card Accommodates 24-channel PCM digital lines
PN-30DTC-A	DTI	Digital Trunk Interface (2 Mbps) Card Accommodates 30-channel PCM digital lines
PN-2ILCA	ILC	2-line ISDN Line Circuit Card Provides a physical interface to ISDN Terminals Occupies 8 time slots per one card
PN-24PRTA	PRT	ISDN Primary Rate (23B + D) Interface Card Provided a built-in D-channel Handler (DCH)
PN-SC00	CCH	Common Channel Handler Card Transmits/receives signals on the common signaling channel of No. 7 CCIS
PN-SC01	DCH	D-channel Handler Card Transmits/receives signals on the D-channel of ISDN Primary Rate (23B + D) interface or WCS Roaming interface
PN-SC03	ICH	ISDN-channel Handler Card Provides the D-channel signaling interface and controls max. four ILC cards (Layers 2 and 3)

SYSTEM CAPACITY

System Capacity for ISDN-PRI

Table 1-3 System Capacity for ISDN-PRI

DESCRIPTION	CAPACITY		
	24DTI	24PRT	30DTI
DTI Card	8	–	4
DCH Card	8	–	4
Trunks for DTI	192	–	124
PRT Card	–	8	–
Trunks for PRT	–	192	–
ISDN Routes	8	8	4
ICH Card	12	12	12
ILC Card	48	48	48
Port per DTI Card	24	–	32
Port per DCH Card	1	–	1
Port per PRT Card	–	24 + 1 (DCH)	–
Port per ICH Card	4	4	4
Port per ILC Card	8	8	8

System Capacity for ISDN-BRI

Table 1-4 System Capacity for ISDN-BRI

DESCRIPTION	CAPACITY
BRT Card (BRTA/2BRTC)	12/24
Trunks for BRT (BRTA/2BRTC)	24/96
ICH Card	12
ILC Card	48
Port per BRT Card (BRTA/2BRTC)	2/4
Port per ICH Card	4
Port per ILC Card	8

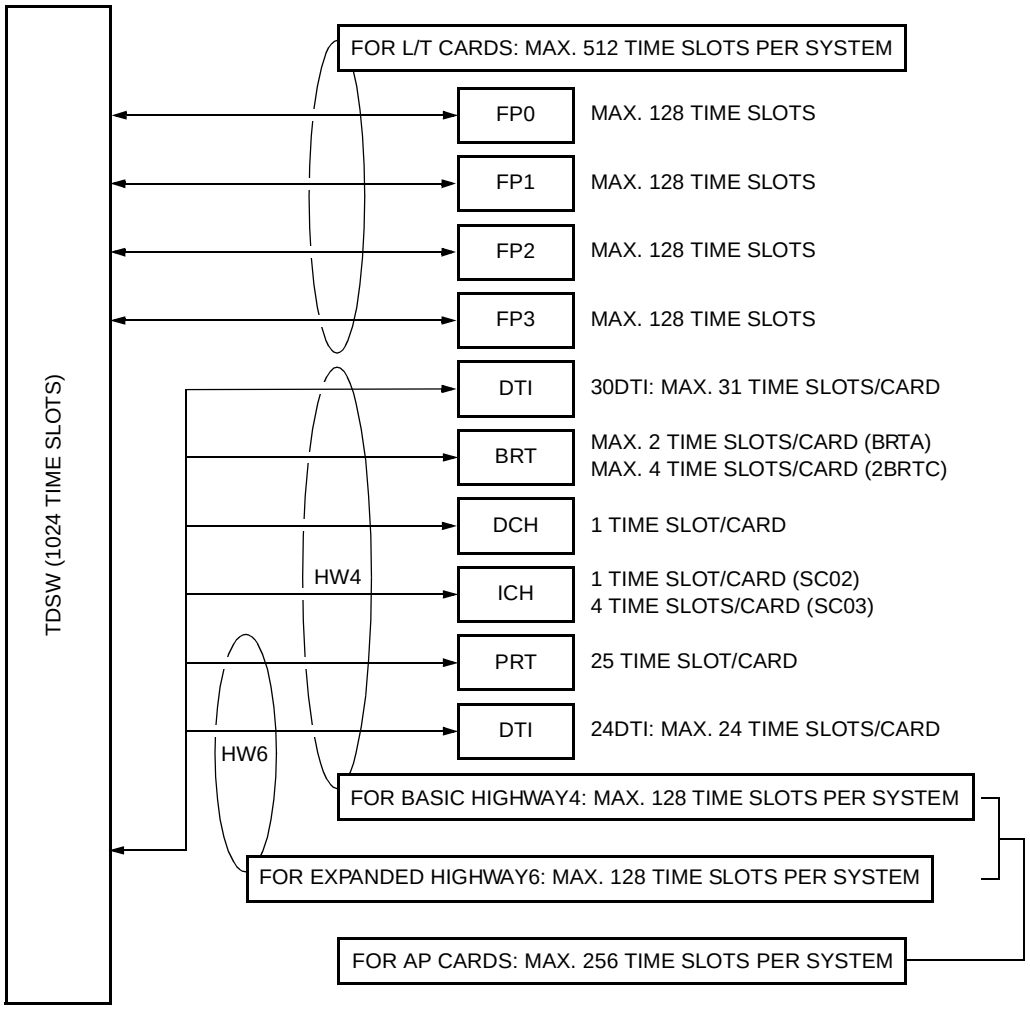
SYSTEM CONDITIONS

Time Slot Assignment Condition

As shown in Figure 1-10, the 30DTI/DCH/ICH/BRT card uses the time slot on the basic Highway 4. Therefore, the total number of time slots for all 30DTI/DCH/ICH/BRT cards must be 128 time slots or less including all other application processor cards, which use Highway 4.

The 24DTI/PRT card can use the time slot on both the basic and expanded Highway 4 and 6. Therefore, the total number of time slots for all 24DTI/PRT cards must be 256 time slots or less.

Figure 1-10 Accommodation of DTI/DCH/ICH/BRT/PRT into TDSW



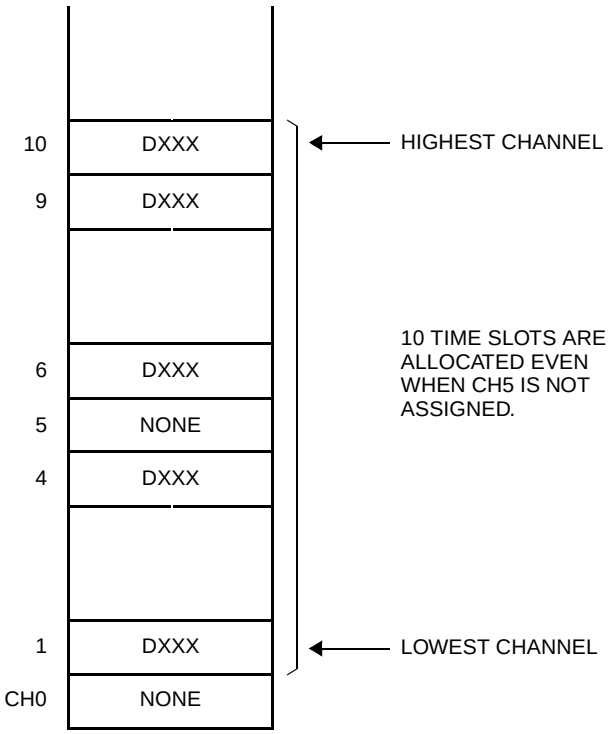
Time Slot Allocation for DTI/PRT/DCH Card

On each DTI/PRT 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, in Figure 1-11, even when Channel 1 through Channel 10 have been assigned by the system data programming (CM07 YY=01) except Channel 5, the system allocates a total of 10 time slots for all 10 channels. Therefore, to avoid allocation of unnecessary time slots, it is recommended that consecutive channels are assigned on each DTI/PRT 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 16 of the DTI as the D Channel.

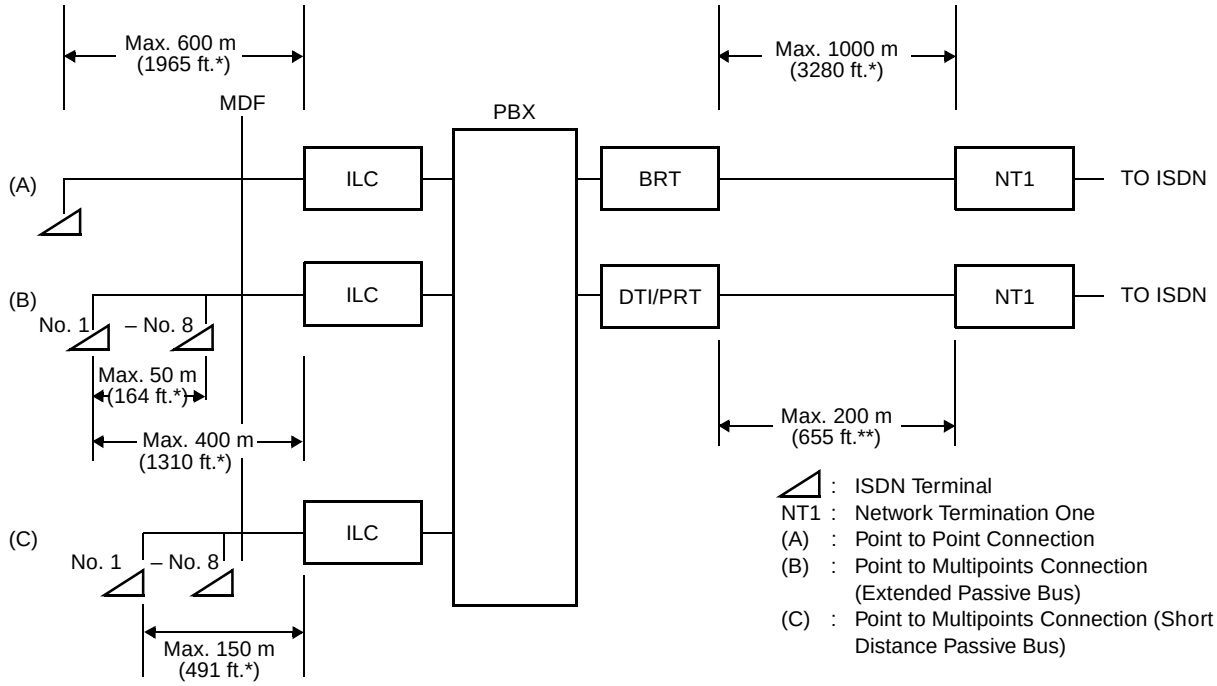
Figure 1-11 Time Slot Allocation for DTI



Line Distance Between PBX and NT1/ISDN Terminal

Figure 1-12 shows the line distance between PBX and NT1 and the line distance between PBX and ISDN Terminal.

Figure 1-12 Line Distance Between PBX and NT1/ISDN Terminal



NOTE 1: The line distance marked by * shows the value when the 0.5 ϕ twisted-pair cable is used.

NOTE 2: The line distance marked by ** shows the value when the 0.65ϕ twisted-pair cable is used.

DTI SPECIFICATIONS

Transmission Characteristics

Table 1-5 Transmission Characteristics

CHARACTERISTICS	24-CHANNEL	30-CHANNEL
(1) Output		
• Line Rate	1.544 Mbps ± 50 ppm	2.048 Mbps ± 50 ppm
• Line Code	AMI with ZCS/B8ZS*	HDB3 (High Density Bipolar 3)
• Line Impedance	100 ohms	75 ohms (Coaxial Cable) 120 ohms (Twisted-Pair Cable)
• Pulse Amplitude (Base to Peak)	3 volts ± 0.6 volts	2.37 volts nominal (Coaxial Cable) 3 volts nominal (Twisted-Pair Cable)
• Pulse Width	324 ns ± 30 ns	244 ns nominal

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

Table 1-5 Transmission Characteristics (Continued)

CHARACTERISTICS	24-CHANNEL	30-CHANNEL
(2) Input		
• Line Rate	1.544 Mbps ± 200 bps (130 ppm)	2.048 Mbps ± 50 ppm
• Pulse Amplitude (Base to Peak)	1.5 volts – 3 volts	1.5 volts – 2.7 volts (Coaxial Cable) 1.5 volts – 3.3 volts (Twisted-Pair Cable)
• Frame Synchronization Pattern	001011 (24MF)	
• Input Jitter	ITU-T Fig. 1/G743	ITU-T Fig. 1/G743
• Wander	+138U1, –193UI or –138UI, +193UI	ITU-T G823
• Cable Length from PBX to NT1	Max. 200 m (655 ft.) (with 0.65ϕ (22 ABAM) twisted-pair cable)	Max. 400 m (with 0.65ϕ twisted-pair cable)

Frame Configuration of 24DTI

According to the AT&T Specifications for 24-Channel transmission, there are two types of frame configurations: 12-Multi Frame and 24-Multi Frame.

(1) 12-Multi Frame

The frame has 12-Multi Frames, and each Multi frame has a 24-Channel PCM signal (8 bits/channel) and an S bit (Superframe Bit). Figure 1-13 shows the frame configuration, and Table 1-6 shows frame bit assignment.

Figure 1-13 DTI Frame Configuration (12-Multi Frame)

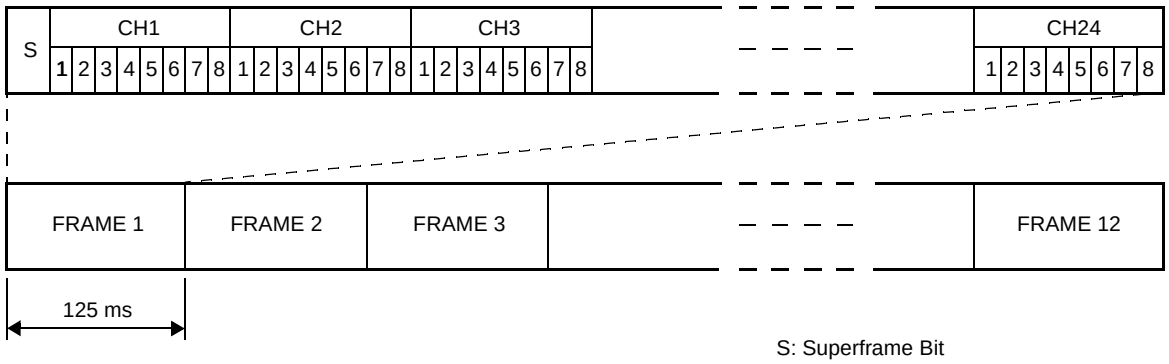


Table 1-6 12-Multi Frame Bit Assignment

FRAME No.	S BIT	
	TERMINAL SYNCHRONIZATION (FT)	SIGNAL SYNCHRONIZATION (FS)
1	1	
2		0
3	0	
4		0
5	1	
6		1
7	0	
8		1
9	1	
10		1
11	0	
12		0

* The S-bit is the first bit in each frame.
* Frames are repeated in the order shown above.
* Frames 6 and 12 become signal frames.

(2) 24-Multi Frame

This configuration has 24-Multi Frames and each Multi frame has a 24-Channel PCM signal (8 bits/channel) and an S bit (Superframe Bit). Figure 1-14 shows the frame configuration, and Table 1-7 shows frame bit assignment.

Figure 1-14 DTI Frame Configuration (24-Multi Frame)

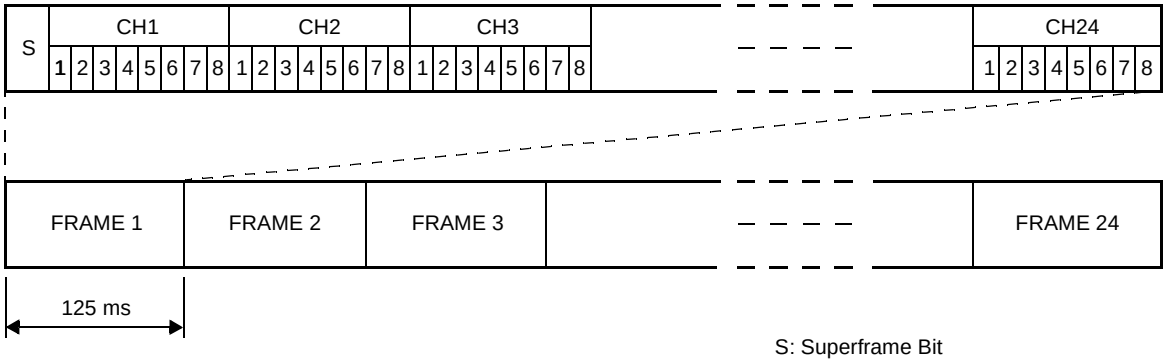


Table 1-7 24-Multi Frame Bit Assignment

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.

Frame Configuration of 30DTI

Based on 30-channel transmission method of ITU-T Specification, the frame configuration consists of 16-multi frame, each frame having 32 time slots.

Figure 1-15 shows the frame configuration, and Table 1-8 shows the details of time slot assignment.

Figure 1-15 Frame Configuration of 30DTI

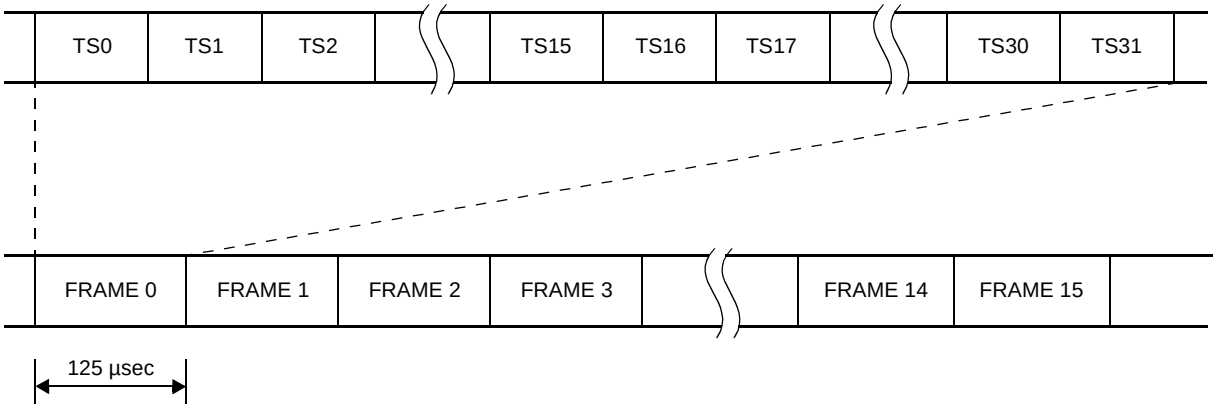
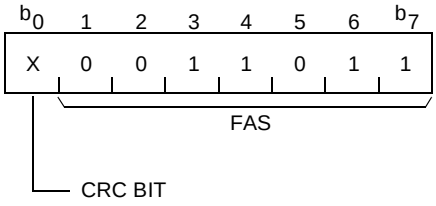
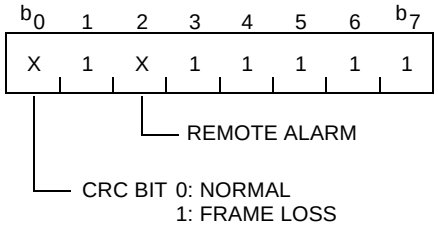


Table 1-8 Time Slot Assignment of 30DTI

TIME SLOT No.	EVEN No. FRAME	ODD No. FRAME
TS0	Frame Alignment Signal (FAS)  	
TS1 ≀ TS15	Voice Channel (B channel) CH1 ≀ CH15	
TS16	D Channel Signaling	
TS17 ≀ TS31	Voice Channel (B channel) CH17 ≀ CH31	

CHAPTER 2

INSTALLATION

This chapter explains the hardware installation procedure to provide ISDN interface to the PBX.

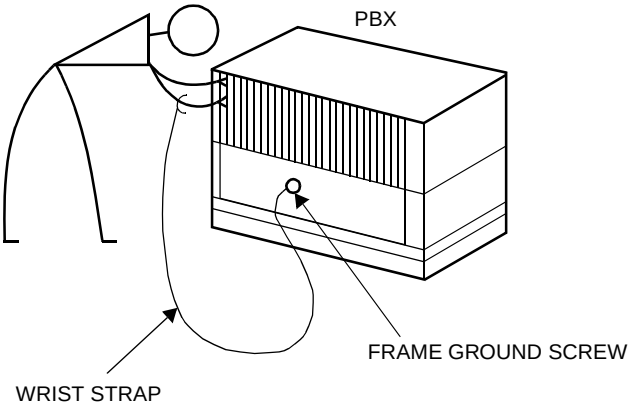
PRECAUTIONS

Static Electricity Guard

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

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

- WHEN PLUGGING/UNPLUGGING A CIRCUIT CARD



- WHEN HOLDING A CIRCUIT CARD

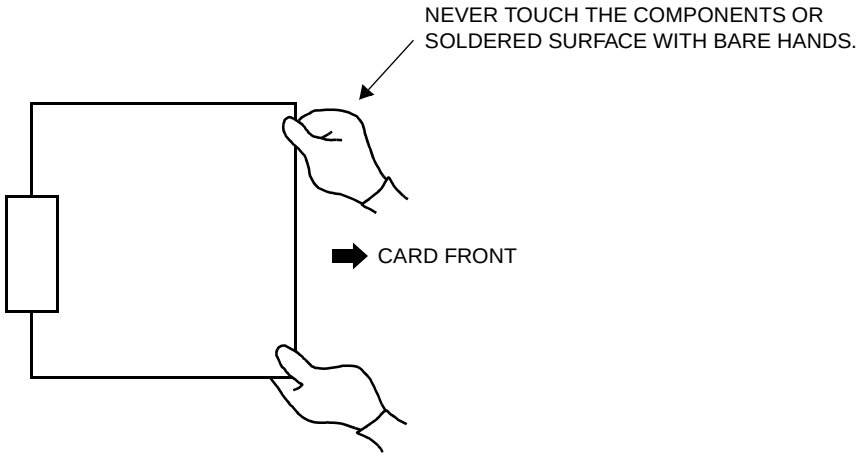
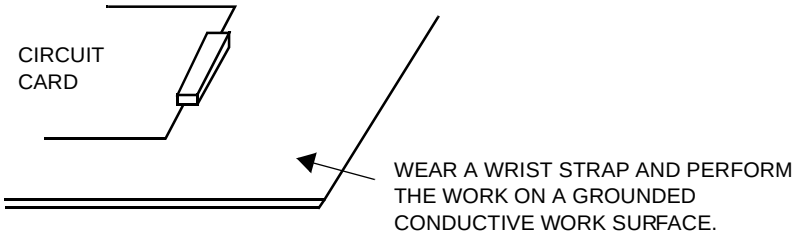
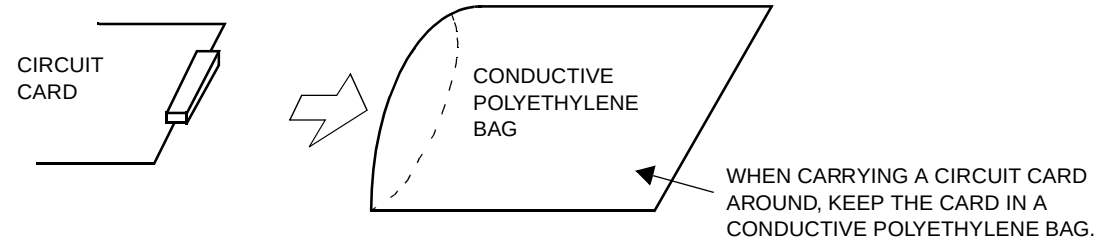


Figure 2-1 Static Electricity Guard (2 of 2)

- WHEN MAKING A SWITCH SETTING ON A CIRCUIT CARD



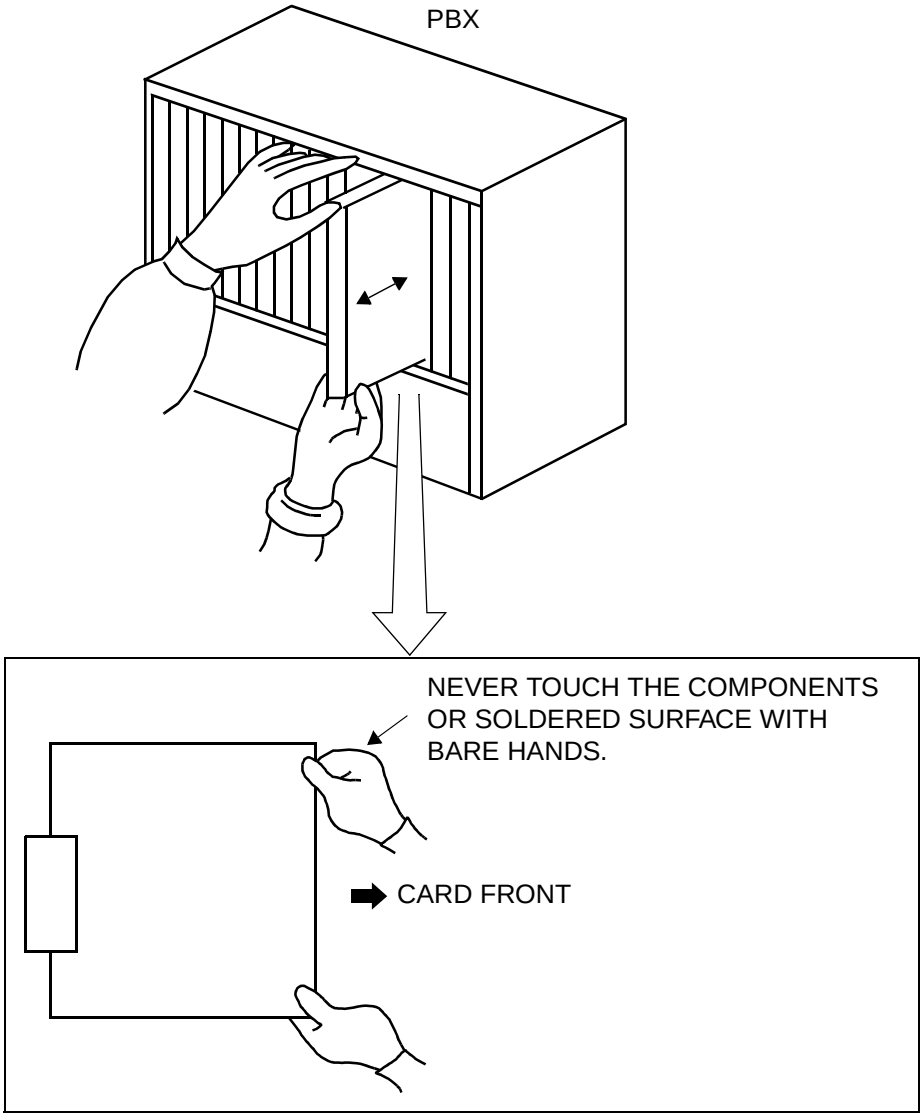
- WHEN CARRYING A CIRCUIT CARD



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

CAUTION

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



REQUIRED EQUIPMENT

ISDN-PRI Required Equipment

Table 2-1 shows the equipment required to provide ISDN with Primary Rate Interface to the system.

Table 2-1 ISDN-PRI Required Equipment

EQUIPMENT	DESCRIPTION	QUANTITY	REMARKS
PN-24DTA-C (24-DTI)	24-channel DTI Card	1-8	
PN-24PRTA (PRT)	24-channel PRT Card	1-8	
PN-30DTC-A (30-DTI)	30-channel DTI Card	1-4	
PN-SC01 (DCH)	D Channel Handler Card	1-8	1 DTI/card
PZ-M542/M557 (CONN)	Connection Card for Coaxial Cable	As required	1 DTI/card Max. 3 per PIM

ISDN-BRI Required Equipment

Table 2-2 shows the equipment required to provide ISDN with Basic Rate Interface to the system.

Table 2-2 ISDN-BRI Required Equipment

EQUIPMENT	DESCRIPTION	QUANTITY	REMARKS
PN-BRTA (BRT)	1-line BRT Card	1-12	
PN-2BRTC (BRT)	2-line BRT Card	1-24	

ISDN Terminal Required Equipment

Table 2-3 shows the equipment required to provide ISDN Terminal interface to the system, in addition to the required equipment for ISDN-PRI or ISDN-BRI.

Table 2-3 ISDN Terminal Required Equipment

EQUIPMENT	DESCRIPTION	QUANTITY	REMARKS
PN-SC03 (ICH)	ISDN Channel Handler Card	1-12	4 ILC/card
PN-2ILCA (ILC)	ISDN Line Circuit Card	1-48	2 terminal/card

Event Based CCIS Required Equipment

Table 2-4 shows the required equipment to provide Event Based CCIS to the system, in addition to the required equipment for ISDN-PRI or ISDN-BRI.

Table 2-4 Event Based CCIS Required Equipment

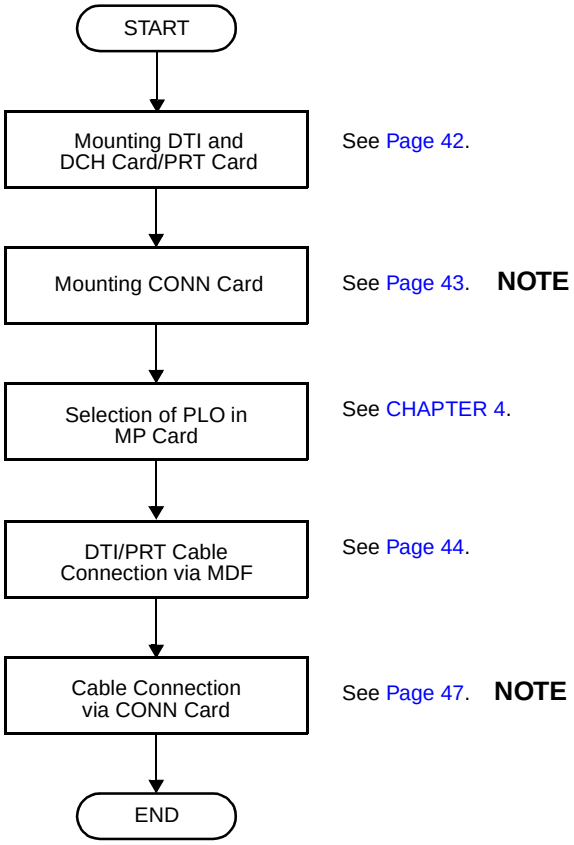
EQUIPMENT	DESCRIPTION	QUANTITY	REMARKS
PN-SC00 (CCH)	Common Channel Handler Card	1-8	1 DTI/card

INSTALLATION PROCEDURE FOR ISDN-PRI

Install the equipment for ISDN-PRI according to the procedure shown in Figure 2-2.

NOTE: For Call Recording of ISDN call, install the equipment for SMDR or CIS. For details, refer to the Installation Procedure Manual.

Figure 2-2 Installation Procedure for ISDN-PRI



NOTE: This procedure is required when using CONN card to connect a coaxial cable for DTI.

Mounting DTI and DCH Card/PRT Card

(1) Before mounting the 24DTI (PN-24DTA-C)/PRT (PN-24PRTA)/30DTI (PN-30DTC-A) card and DCH (PN-SC01) card, set the MB switch to UP position, and set the other switches to appropriate position.
See CHAPTER 4.

(2) Mount the 24DTI/30DTI/PRT card and the DCH card in the following AP slots on PIM0-PIM7:
PIM 0-7: AP00-AP11
The AP11 slot on PIM0 is available only when the FP card is not mounted in the FP11 slot on PIM0.

If you use the PRT card, the DCH card is not required because the PRT has a built-in DCH.

NOTE: The DTI/PRT card (DTI/PRT0, DTI/PRT1) which sends a clock signal to PLO of the MP card must be mounted in the AP slots on PIM0.

After mounting the card, set the MB switch to DOWN position to put the card in service.

Mounting CONN Card

When using the CONN (PZ-M542/PZ-M557) card to connect a coaxial cable for DTI, do the following installation:

(1) Confirm the correct switch settings of the CONN card. See CHAPTER 4.

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

DTI/PRT Cable Connection via MDF

When you use a twisted-pair cable, connect the cable to a NT1 equipment via the MDF as shown in Figure 2-3.

- Location of AP Slots and LTC Connectors for DTI/PRT (Figure 2-4)
- Example of MDF Cross Connection for DTI/PRT(Figure 2-5)

Figure 2-3 DTI/PRT Cable Connection via MDF

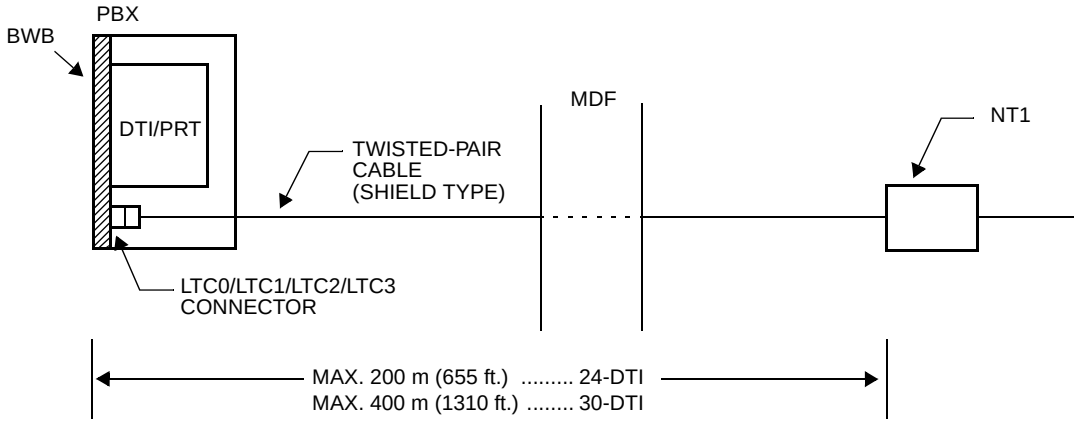


Figure 2-4 Location of AP Slots and LTC Connectors for DTI/PRT

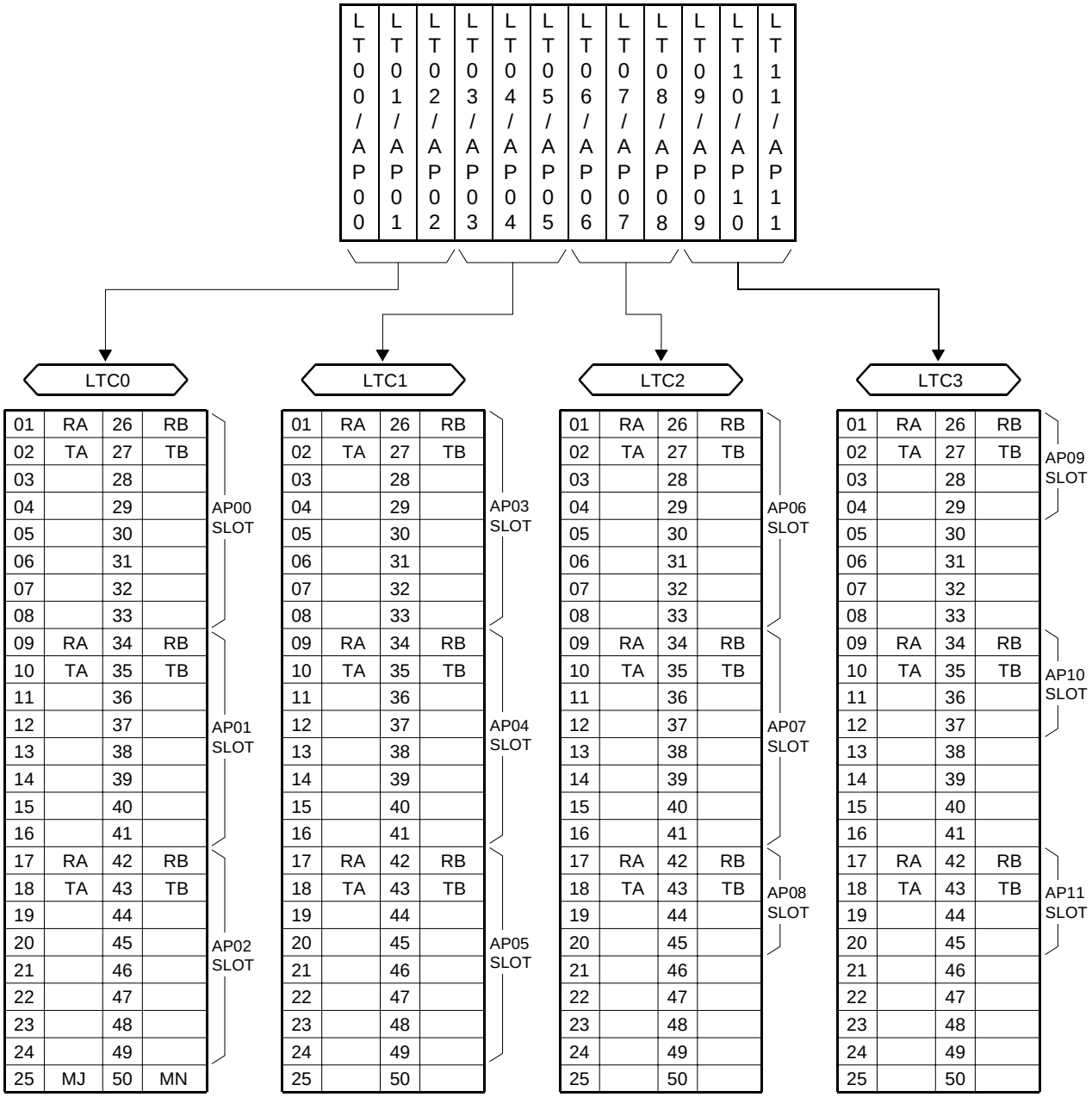
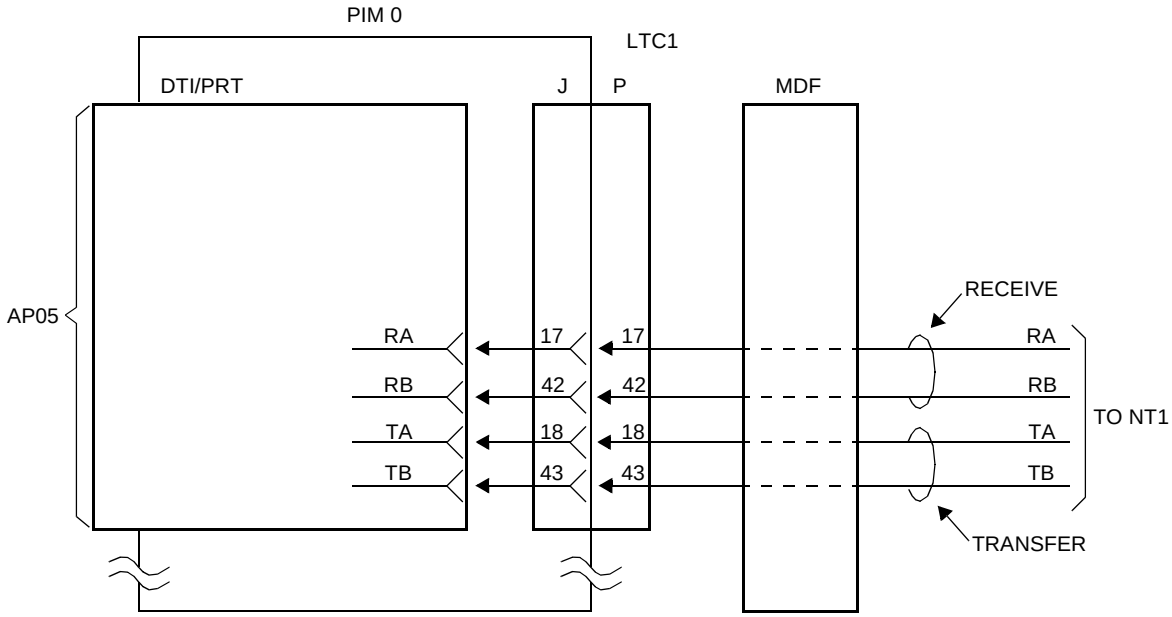


Figure 2-5 Example of MDF Cross Connection for DTI/PRT



LTC1 (J)

17	RA	42	RB
18	TA	43	TB
19		44	
20		45	

LTC1 (P)

42	RB	17	RA
43	TB	18	TA
44		19	
45		20	

Cable Connection via CONN Card

When you use a coaxial cable, connect the cable to a NT1 equipment via the CONN (PZ-M542/ PZ-M557) card as shown in Figure 2-6.
Figure 2-7 shows an example of the cable connection when the DTI/PRT card is mounted on the AP05 slot of PIM0.

Figure 2-6 Cable Connection via the CONN Card

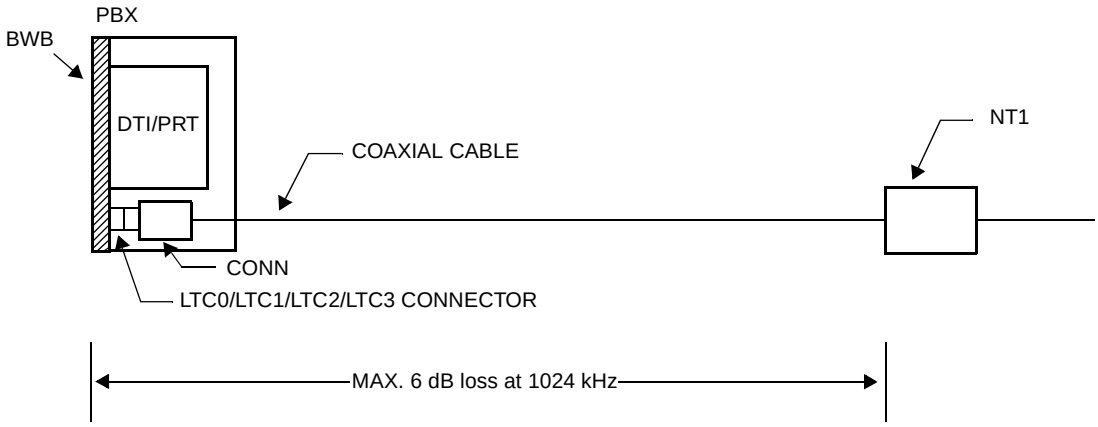
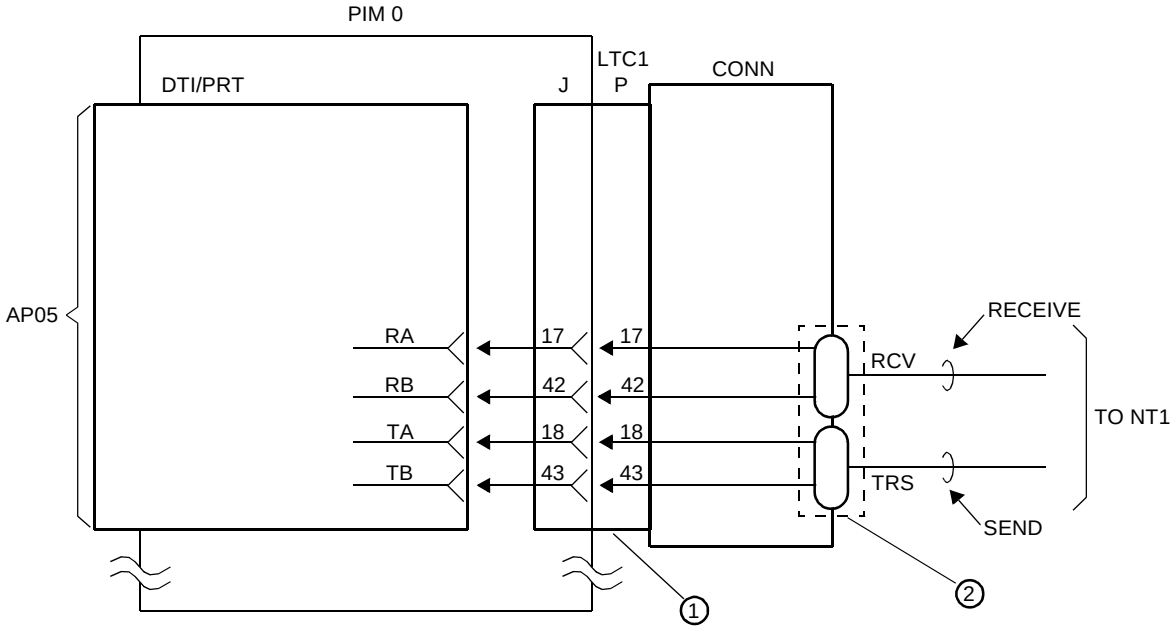


Figure 2-7 Example of Coaxial Cable Connection



1 LTC1 CONNECTOR

2 COAXIAL CONNECTOR

LTC1 (J)

17	RA	42	RB
18	TA	43	TB
19		44	
20		45	

LTC1 (P)

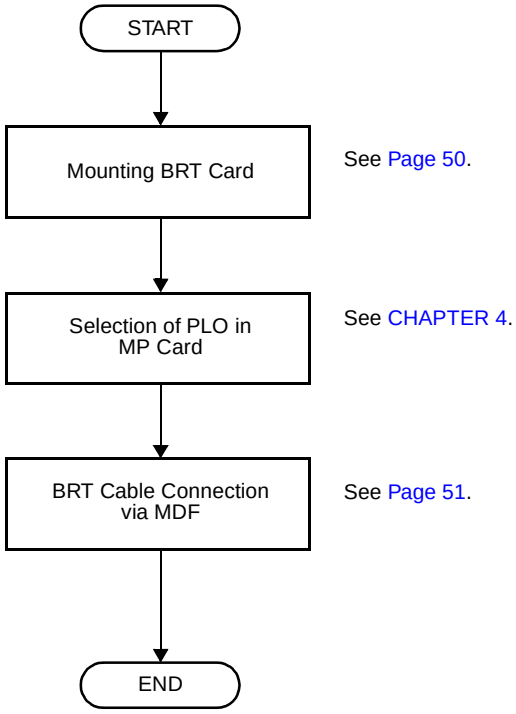
42	RB	17	RA
43	TB	18	TA
44		19	
45		20	

INSTALLATION PROCEDURE FOR ISDN-BRI

Install the equipment for ISDN-BRI according to the procedure shown in Figure 2-8.

NOTE: For Call Recording of ISDN call, install the equipment for SMDR or CIS. For details, refer to the Installation Procedure Manual.

Figure 2-8 Installation Procedure for ISDN-BRI



Mounting BRT Card

(1) Before mounting the BRT (PN-BRTA/2BRTC) card, set the MB switch to UP position, and set the other switches to appropriate position.
See CHAPTER 4.

(2) Mount the BRT card in the following AP slots on PIM0-PIM7:
PIM0-7: AP00-AP11
The AP11 slot on PIM0 is available only when the FP card is not mounted in the FP11 slot on PIM0.

NOTE: The BRT card (BRT0/BRT1), which sends a clock signal to PLO of the MP card, must be mounted in the AP slots on PIM0.

(3) After mounting the card, set the MB switch to DOWN position to put the card in service.

BRT Cable Connection via MDF

Connect the cable to a NT1 equipment via the MDF as shown in Figure 2-9.

- Location of AP Slots and LTC Connectors for BRT (Figure 2-10)
- Example of MDF Cross Connection for BRT (Figure 2-11)

Figure 2-9 BRT Cable Connection via MDF

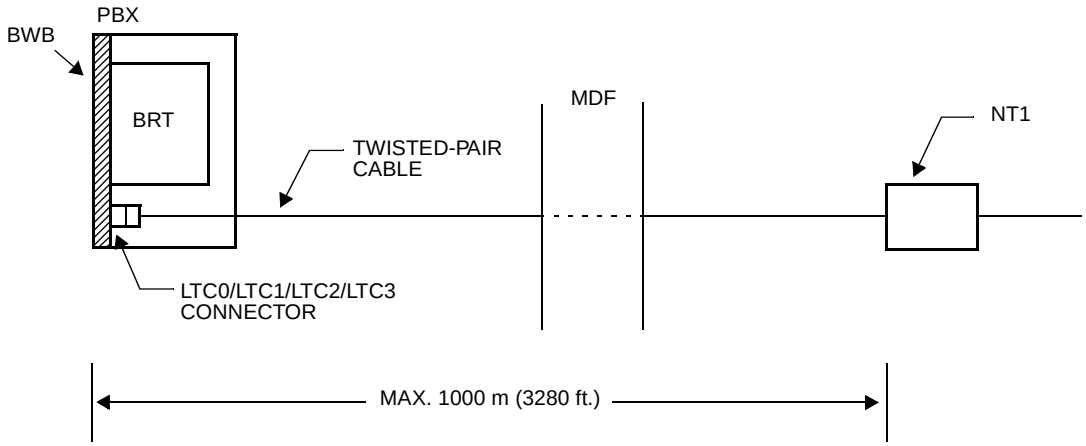


Figure 2-10 Location of AP Slots and LTC Connectors for BRT

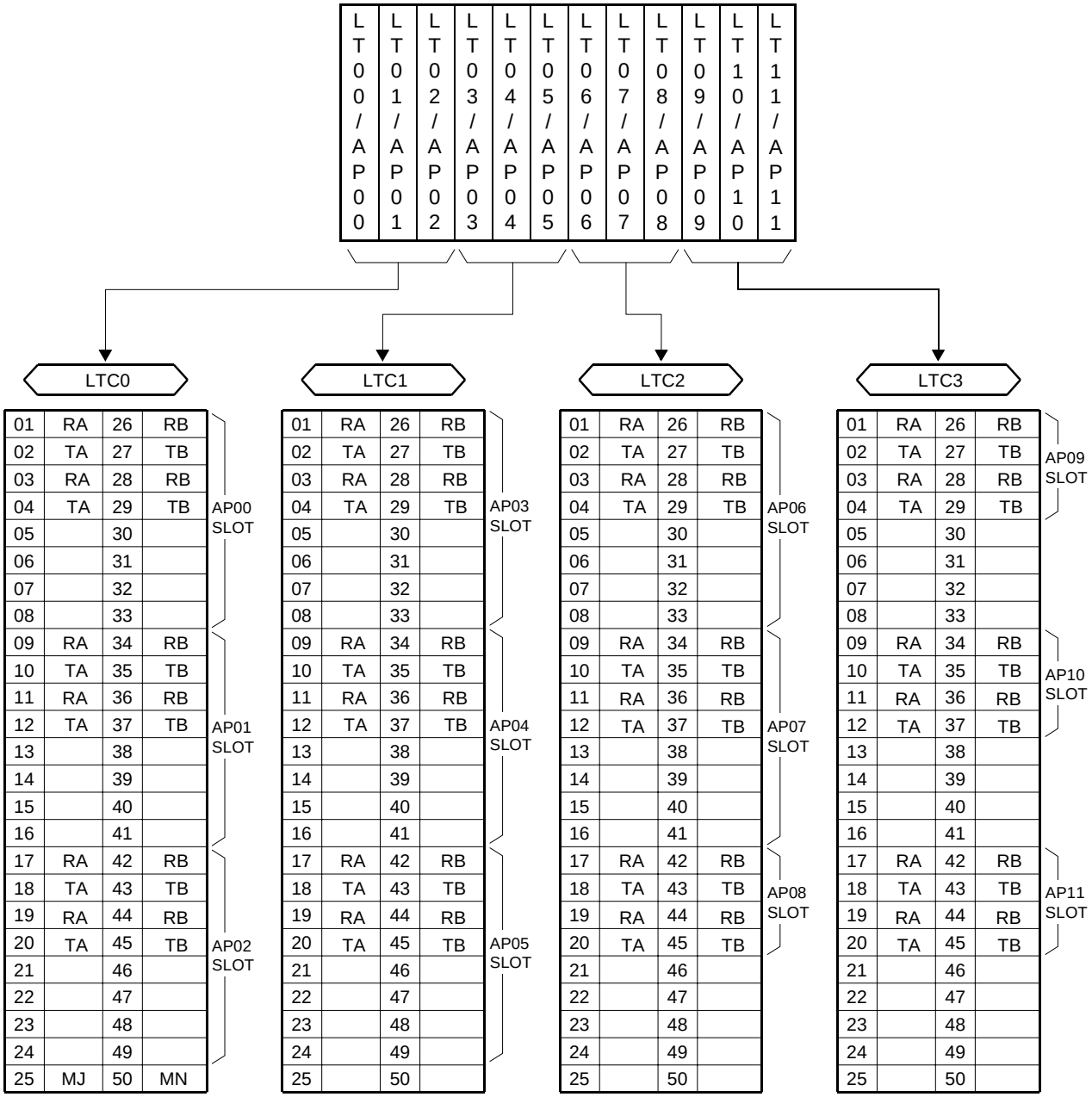
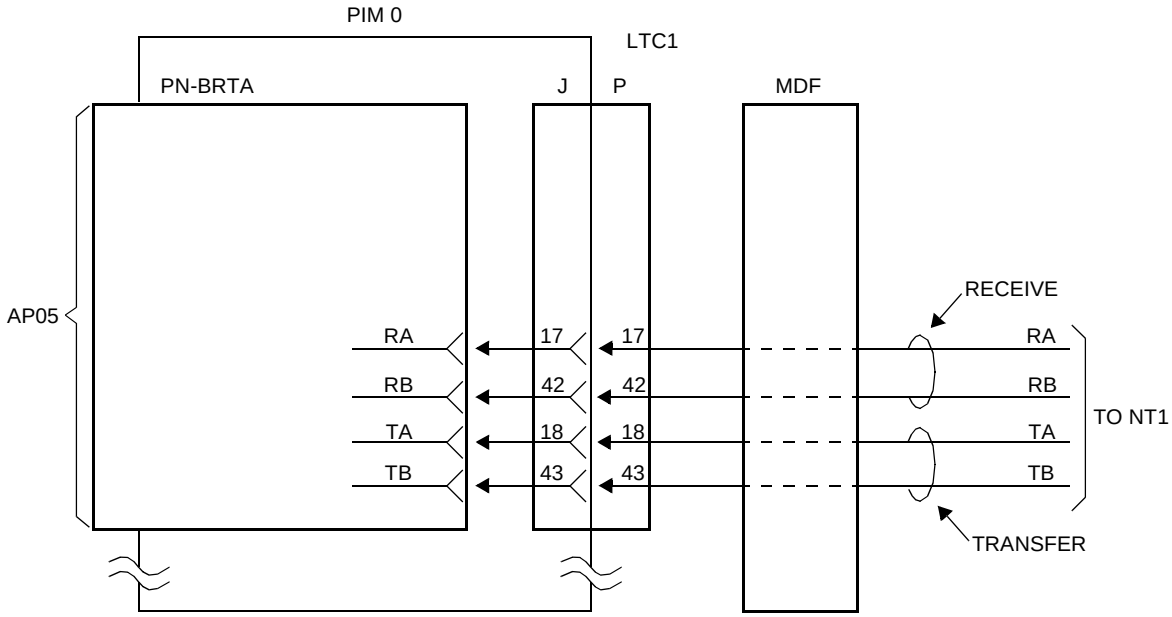


Figure 2-11 Example of MDF Cross Connection for BRT (1 of 2)



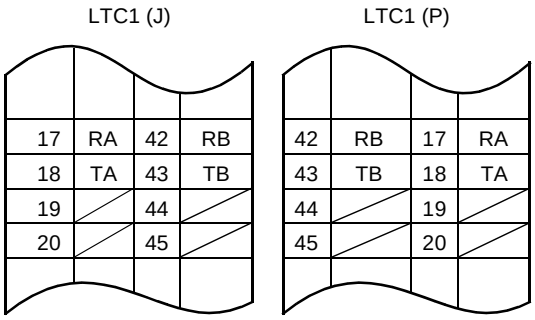
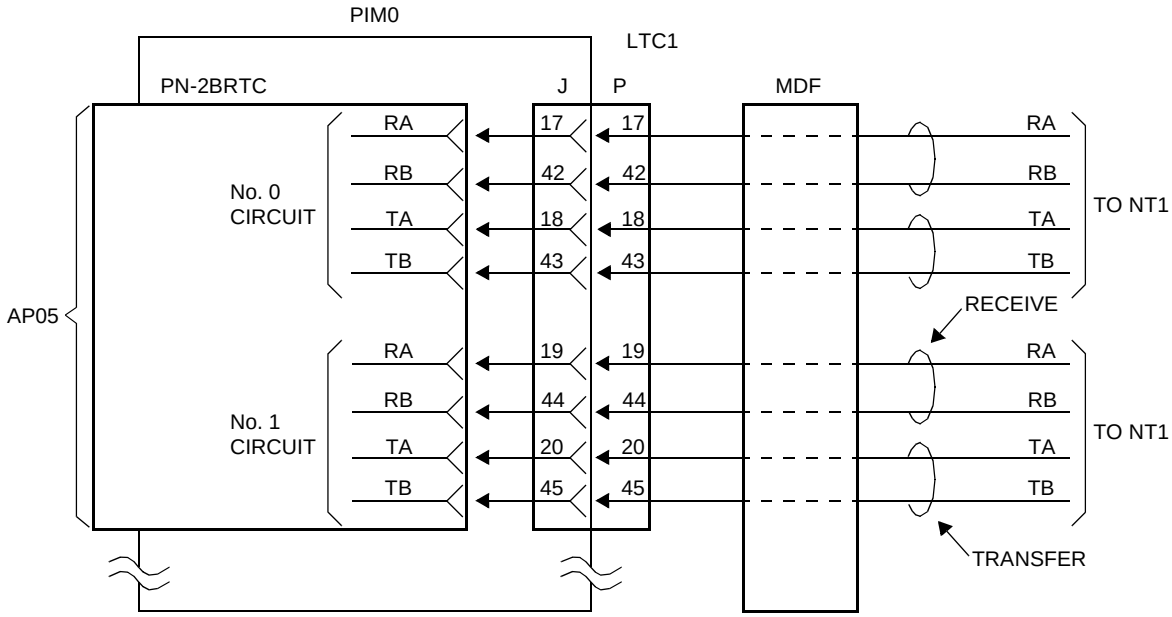


Figure 2-11 Example of MDF Cross Connection for BRT (2 of 2)



LTC1 (J)

17	RA	42	RB
18	TA	43	TB
19	RA	44	RB
20	TA	45	TB

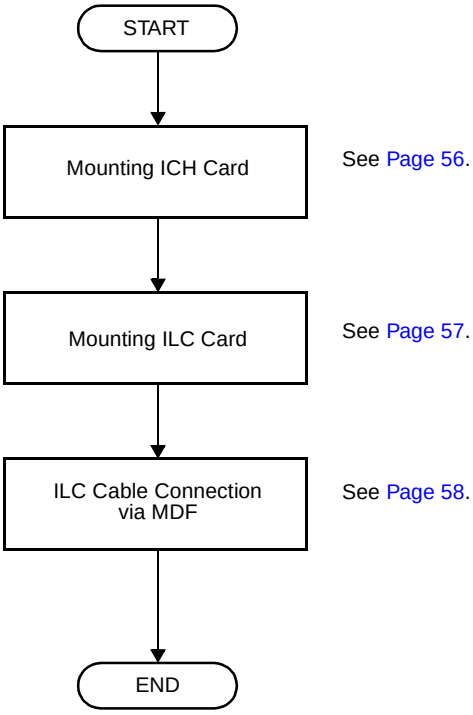
LTC1 (P)

42	RB	17	RA
43	TB	18	TA
44	RB	19	RA
45	TB	20	TA

INSTALLATION PROCEDURE FOR ISDN TERMINAL

Install the equipment for the ISDN Terminal according to the procedure shown in Figure 2-12.

Figure 2-12 Installation Procedure for ISDN Terminal



Mounting ICH Card

(1) Before mounting the ICH (PN-SC03) card, set the MB switch to UP position, and set the other switches to appropriate position.
See CHAPTER 4.

(2) Mount the ICH card in the following AP slots on PIM0-PIM7:
PIM0-7: AP00-AP11
The AP11 slot on PIM0 is available only when the FP card is not mounted in the FP11 slot on PIM0.

(3) After mounting the card, set the MB switch to DOWN position to put the card in service.

Mounting ILC Card

(1) Confirm the correct switch settings of the ILC (PN-2ILCA) card. See CHAPTER 4.

(2) Mount the ILC card in the following LT slots on PIM0-PIM7:
PIM0-PIM7: LT00-LT07

ILC Cable Connection via MDF

Connect the cable to an ISDN Terminal or a Terminal Adapter (TA) via the MDF as shown in Figure 2-13.

- Location of LT Slots and LTC Connectors for ILC (Figure 2-14)
- Example of MDF Cross Connection for ILC (Figure 2-15)

Figure 2-13 ILC Cable Connection via MDF

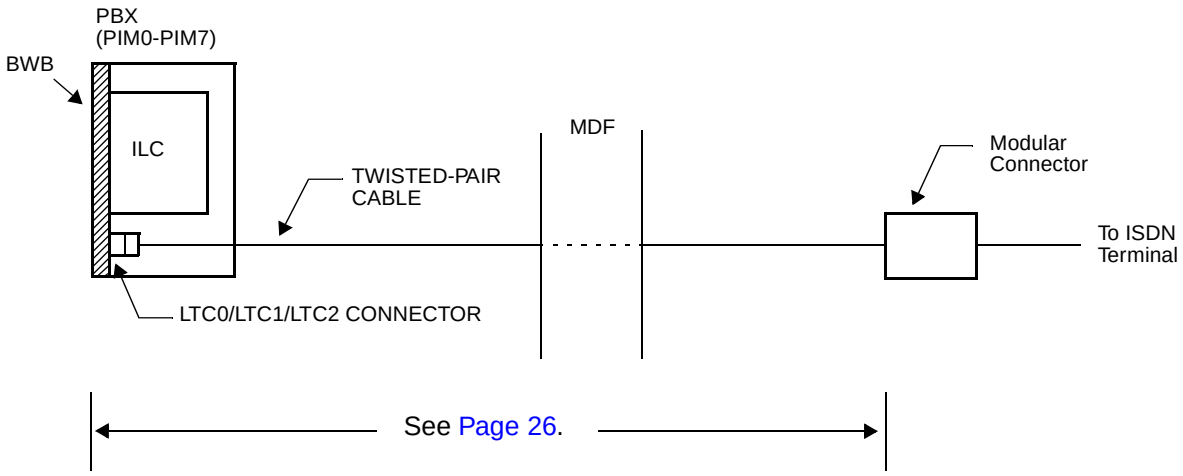
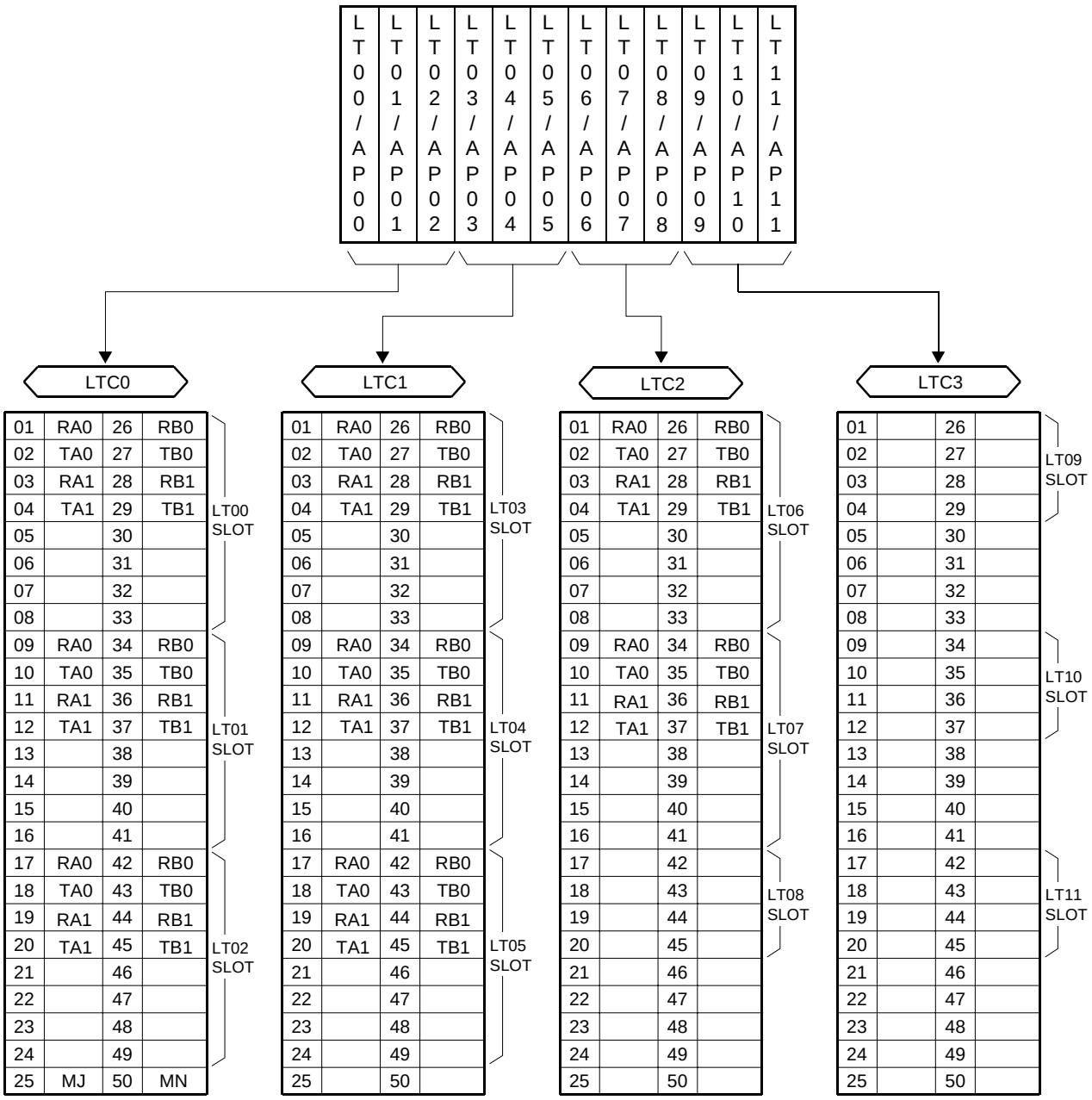
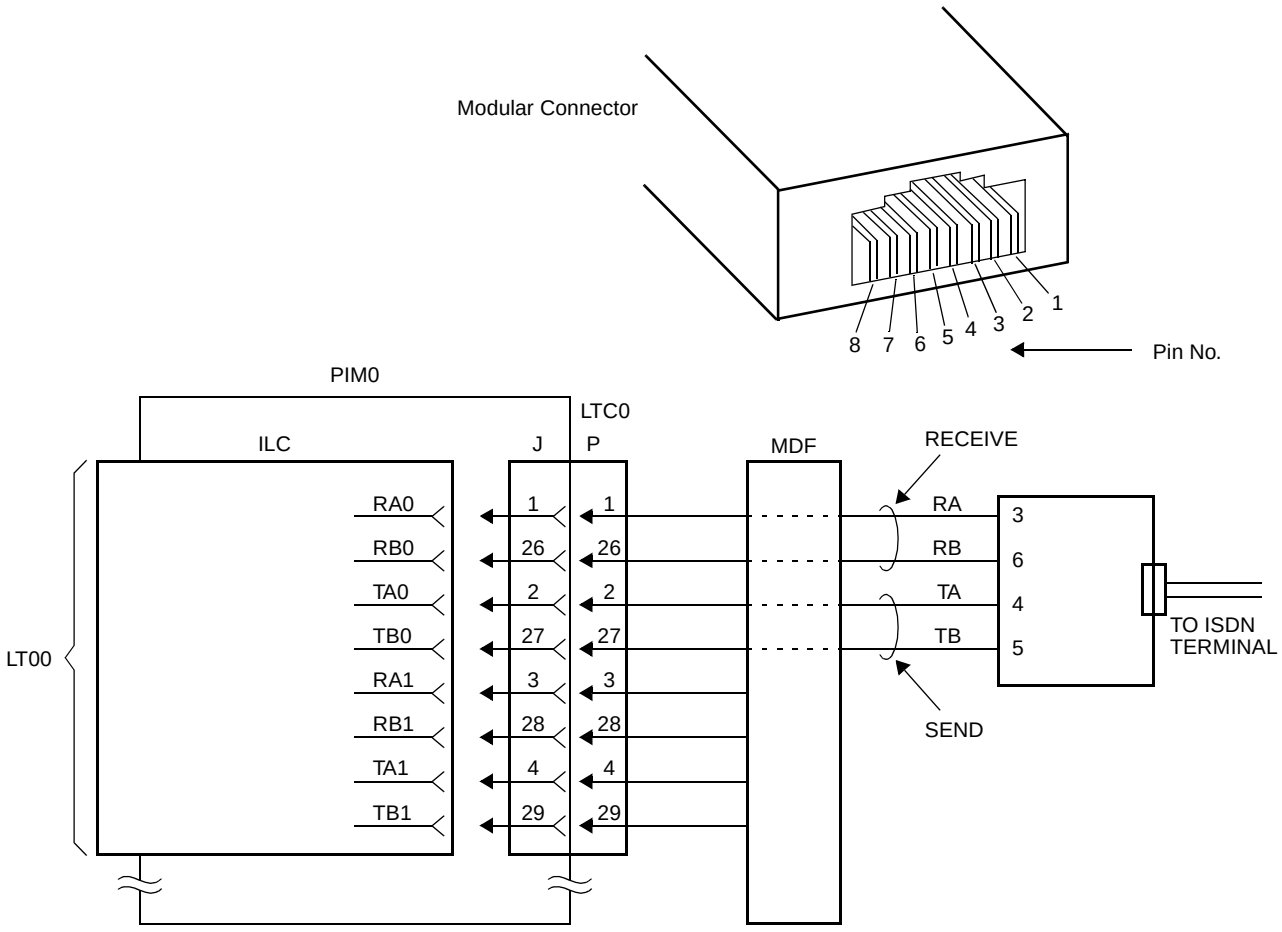


Figure 2-14 Location of LT Slots and LTC Connectors for ILC



NOTE: Be sure to mount an ILC card on the LTC connector separated from analog line/trunk cards.

Figure 2-15 Example of MDF Cross Connection for ILC



LTC (J)

1	RA	26	RB
2	TA	27	TB
3		28	
4		29	

LTC (P)

26	RB	1	RA
27	TB	2	TA
28		3	
29		4	

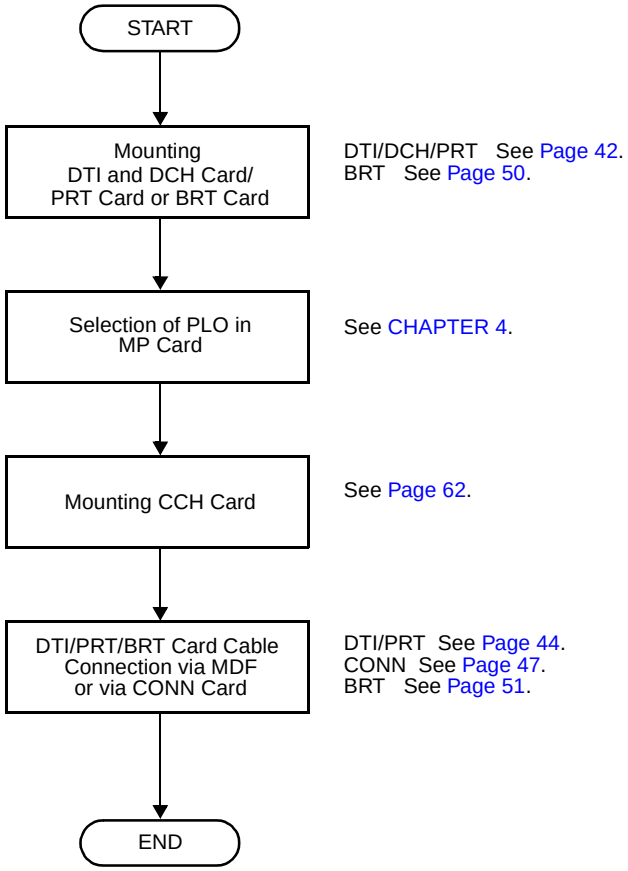
Pin No.	PBX	Direction of Signal	Terminal
1, 2	Not Used		
3	RA	←	TA
4	TA	→	RA
5	TB	→	RB
6	RB	←	TB
7, 8	Not Used		

INSTALLATION PROCEDURE FOR EVENT BASED CCIS

Install the equipment for Event Based CCIS according to the procedure shown in Figure 2-16.

NOTE: For Call Recording of ISDN call, install the equipment for SMDR/CIS. For details, refer to the Installation Procedure Manual.

Figure 2-16 Installation Procedure for Event Based CCIS



Mounting CCH Card

(1) Before mounting the CCH (PN-SC00) card, set the MB switch to UP position, and set the other switches to appropriate position.
See CHAPTER 4.

(2) Mount the CCH card in the following AP slots:
PIM0-7: AP00-AP11
The AP11 slot on PIM0 is available only when the FP card is not mounted in the FP11 slot on PIM0.

(3) After mounting the card, set the MB switch to DOWN position to put the card in service.

CHAPTER 3

SYSTEM DATA PROGRAMMING

This chapter explains the programming procedure to provide the ISDN feature to the PBX.

HOW TO READ THIS CHAPTER

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

(1) : 1st Data

(2) : 2nd Data

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

(INITIAL) : System Initialization
A reset of the MP card is required after data setting.
Press SW1 switch on the MP card.

(DTI INITIAL) : DTI Initialization
A reset of the DTI/PRT card is required after data setting.
Set the Make Busy switch to UP and then Down.

(DCH INITIAL) : DCH Initialization
A reset of the DCH card is required after data setting.
Set the Make Busy switch to UP and then Down.

ISDN-PRI PROGRAMMING

Digital Trunk Data Assignment

START	DESCRIPTION	DATA
CM05	Assign an AP number to the DTI/PRT card. The AP number must match the SENSE switch setting on the DTI/PRT card. (INITIAL)	• Y=0 (1) 04-15, 20-31: AP No. (2) 09: DTI card 12: PRT card
	Specify the AP highway channel for 24DTI/PRT card. (INITIAL)	• Y=1 (1) 04-15, 20-31: AP No. (2) 0 : Expanded Highway channel (128 time slots) 1◀: Basic Highway channel (128 time slots)
CM07	Assign trunk numbers to each channel number on the DTI/PRT card. (INITIAL)	• YY=01 (1) XX ZZ XX: 04-15, 20-31: AP No. assigned by CM05 ZZ: 00-23: Channel No. of 24DTI/PRT 01-15, 17-31: Channel No. of 30DTI (2) D000-D255: Trunk No. Any trunk No. already assigned by CM10 cannot be used.
	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.	
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
A		

A

	DESCRIPTION	DATA
CMAA	Assign the necessary functions to the DTI/PRT card. CMAA YY=00/01/02 assignment is required only for 24DTI/PRT. (DTI INITIAL) After entering the data, set the MB switch on the DTI/PRT card to UP, and then to DOWN, for DTI/PRT initialization. **NOTE:** The following table shows the relationship between CMAA YY=01 and YY=02.	• YY=00 Data Mode (1) 04-15, 20-31: AP No. assigned by CM05 (2) 0: Based on AT&T Spec. • YY=01 Frame Configuration (1) 04-15, 20-31: AP No. assigned by CM05 (2) 0 : 12-Multi Frame 1◀: 24-Multi Frame • YY=02 Zero Code Suppression (1) 04-15, 20-31: AP No. assigned by CM05 (2) 0 : Available 1◀: Not available • YY=03 (1) 04-15, 20-31: AP No. assigned by CM05 (2) 7◀: Associated Channel Interoffice Signaling
CM30	Assign a trunk route number to each ISDN trunk used for voice channel and also to signaling channel. The DTI route must be separated from any analog trunk route. Assign the trunk route data to each ISDN incoming trunk used for Voice channel only.	• YY=00 (1) 000-255: Trunk No. assigned by CM07 YY=01 (2) 00-63: Trunk Route No. • YY=02 Day Mode • YY=03 Night Mode • YY=40 Mode A • YY=41 Mode B (1) 000-255: Trunk No. assigned by CM07 YY=01 (2) 02: Trunk Line Appearance 03: Trunk Line Appearance + TAS 04: Direct-In Termination 09: Automated Attendant 14: Termination to Attendant console 16: Remote Access to System (DISA) 18: ISDN Indial

CMAA YY=01 (FRAME CONFIGURATION)	CMAA YY=02 (ZERO CODE SUPPRESSION)	SIGNALING
24-Multi Frame [1]		B8ZS
12-Multi Frame [0]	Not available [1]	Transparent
	Available [0]	B7

[ ]: Indicates 2nd data

B

	DESCRIPTION	DATA
B		
CM30	Assign Circuit Identification Code (CIC) number to each ISDN trunk used for voice channel only. **NOTE:** CIC No. must not be assigned to the trunk No. of D channel: TS16 (30DTI) or TS23 (24DTI/PRT).	• YY=07 (1) 000-255: Trunk No. assigned by CM07 YY=01 (2) 000-029: CIC No. EXAMPLE OF 30DTI B channel trunk No.: D100-D114, D116-D130 D channel trunk No.: D115 (1) 100-114, 116-130 (2) 000-014, 015-029 EXAMPLE OF 24DTI/PRT B channel trunk No.: D100-D122 D channel trunk No.: D123 (1) 100-122 (2) 000-022
CM35	Assign trunk route data to the route number assigned by CM30 YY=00.	• YY=00 Kind of Trunk Route (1) 00-63: B channel Trunk Route No. (2) 00: ISDN Trunk (1) 00-63: D channel Trunk Route No. (2) 15◀: Not used • YY=02 Call Direction (1) 00-63: B channel Trunk Route No. (2) 3◀: Bothway Trunk **NOTE 1** • YY=04 Answer Signal from distant office (1) 00-63: B channel Trunk Route No. (2) 2: Answer signal arrives (ISDN Trunk) (1) 00-63: D channel Trunk Route No. (2) 7◀: Not used
C		

C

CM35

D

DESCRIPTION	DATA
	• YY=05 Release Signal from distant office (1) 00-63: B channel/D channel Trunk Route No. (2) 1◀: Release signal arrives **NOTE 2** • YY=09 Incoming Connection Signaling (1) 00-63: B channel Trunk Route No. (2) 08: ISDN (1) 00-63: D channel Trunk Route No. (2) 15◀: Not used • YY=11 Toll Restriction (1) 00-63: B channel Trunk Route No. (2) 0 : Provided **NOTE 1** 3◀: Not provided • YY=12 Number of digits to be received on DID (1) 00-63: B channel Trunk Route No. (2) 0 : 1 digit 1 : 2 digits 2 : 3 digits 3◀: 4 digits **NOTE:** If CM35 YYY=143 is set to "1" for Event Based CCIS, the number of digits received on DID must be assigned. • YY=14 SMDR for outgoing call (1) 00-63: B channel Trunk Route No. (2) 0 : Not provided 1◀: Provided **NOTE 1** • YY=15 Kind of Call Termination Indicator Key/Lamp on ATT (1) 00-63: B channel Trunk Route No. (2) 00-07: C.O. Incoming 0-7 **NOTE 1**

D

CM35

E

DESCRIPTION	DATA
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=16 Hooking Signal Sending to outside (1) 00-63: B channel Trunk Route No. (2) 0: Not sending **NOTE 1** • YY=18 Digit conversion on DID call (1) 00-63: B channel Trunk Route No. (2) 0 : Provided 1◀: Not provided • YY=19 (1) 00-63: B channel Trunk Route No. (2) 0-3 : Programmable PAD (See CM42) 4-7◀: Fixed PAD **NOTE 1** **NOTE:** For details of PAD data, refer to Command Manual. • YY=28 Outgoing Trunk Queuing (1) 00-63: B channel Trunk Route No. (2) 0: Restricted **NOTE 1** • YY=39 Trunk release by detection of reversal of tip and ring (1) 00-63: B channel Trunk Route No. (2) 1◀: To release **NOTE 1** • YY=89 CRC error check (1) 00-63: B channel Trunk Route No. (2) 0: Provided **NOTE 1** • YY=90 Assignment of DTI route for ISDN (1) 00-63: B channel/D channel Trunk Route No. (2) 3: ISDN-Primary Rate Interface **NOTE 2**

- For originating calls to the ISDN, do the following programming:

E

	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-XXXX: Access code (2) 100-163: Trunk Route 00-63
CM08	Specify the timing start when making an ISDN call from an attendant.	(1) 403 (2) 0 : Not available 1◀: Available
CM41	Specify the timing start when making an ISDN call from a Single Line Telephone (PB/DP), D^{term} or Attendant Console, if required.	• Y=0 (1) 50 (2) 03-14: 3 sec.-14 sec. If no data is set, the timing start is not effective. 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 D^{term}. 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.

F

- When providing Tandem Connection (ODT/DTI to ISDN, ISDN to ODT/DTI), do the following programming:

F

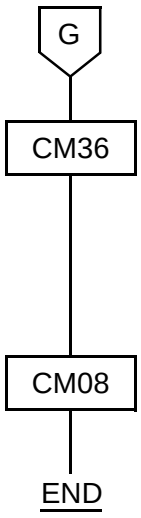
	DESCRIPTION	DATA
CM36	Specify the combination of trunk routes allowing the tandem connection.	• Y=0 (1) XX ZZ XX: 00-63: Incoming Trunk Route ZZ: 00-63: Outgoing Trunk Route (2) 0 : Allowed 1◀: Restricted
CM41	Specify the timing start when making an ISDN call from a station (PB/DP telephone/D^{term}) or Attendant Console for the Tandem Connection.	• Y=0 (1) 57 (2) 03-14: 3 sec.-14 sec. If no data is set, the timing start is not effective.

NOTE 1: By using CM41 Y=0>57, an ISDN call is available even if "#" is not dialed.

NOTE 2: CM41 Y=0>57 is effective for dialing a called number. When dialing a called party subaddress, this command is not effective.

G

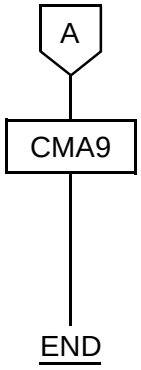
- When providing Tandem Connection (ISDN to CCIS, CCIS to ISDN), do the following programming:



DESCRIPTION	DATA
Specify the combination of trunk routes allowing the tandem connection.	• Y=0 (1) XX ZZ XX: 00-63: Incoming Trunk Route ZZ: 00-63: Outgoing Trunk Route (2) 0 : Allowed 1◀: Restricted
Allow tandem connection by station or attendant.	(1) 028 (2) 0: Available

D Channel Handler Assignment

START	DESCRIPTION	DATA
CM05	When you use the DCH card (PN-SC01), assign an AP number to the DCH card. The AP number must match the SENS switch settings on the DCH card. (INITIAL) When you use the PRT card, skip this assignment.	• Y=0 (1) 04-15, 20-31: AP No. (2) 12: DCH card
CMAA	Select DCH for ISDN-PRI.	• YY=14 (1) 04-15, 20-31: AP No. assigned by CM05 (2) 0 : PN-24PRTA (Built-in DCH) 1◀: PN-SC01 (DCH)
	Assign the ISDN Protocol Type for DCH/ PRT card. (DTI INITIAL)	• YY=06 (1) 04-15, 20-31: AP No. of DCH/PRT card assigned by CM05 (2) ISDN Protocol Type 17 : Australia 18 : New Zealand 19 : ITU-T (Hong Kong) 20 : AT&T (#4, #5 ESS) 21 : NTI (DMS 100, 250) 22 : Australia ETSI 23 : ETSI VN4 (Chile) 24 : ETSI Standard (Brazil, Chile, Columbia) 25 : ITU-T Standard (Thailand) 28 : USA NI-2 63◀: Not used
CM06	Assign the DCH number to the AP number of DCH/PRT card assigned by CM05. (INITIAL)	• YY=08 (1) 0-7: DCH No. (2) 04-15, 20-31: AP No. of DCH/PRT card assigned by CM05
CM35	Assign the DCH number to the each B channel trunk route assigned by CM30 YY=00.	• YY=93 Assignment of D Channel Handler (1) 00-63: B channel Trunk Route No. (2) 00-07: DCH No. assigned by CM06
A		



DESCRIPTION	DATA
Assign the DTI/PRT trunk number assigned by CM07 YY=01 to each DCH number for providing D channel path between DTI/PRT and DCH. (DCH INITIAL)	• YY=00 (1) 0-7: DCH No. assigned by CM06 (2) 000-255: DTI/PRT Trunk No. assigned by CM07 YY=01

ISDN-BRI PROGRAMMING

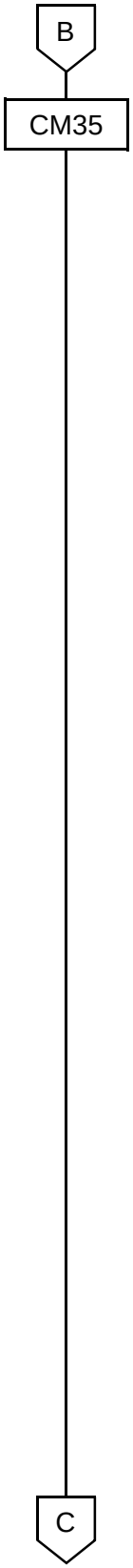
BRT Assignment

START	DESCRIPTION	DATA
CM05	Assign an AP number to the BRT card. The AP number must match the SENS switch setting on the BRT card. (INITIAL)	• Y=0 (1) 04-15, 20-31: AP No. (2) 10: BRT card
CMAA	Assign the ISDN Protocol Type for DCH circuit on the BRT card. (DTI INITIAL)	• YY=06 (1) 04-15, 20-31: AP No. of BRT assigned by CM05 (2) ISDN Protocol Type 17 : Australia 18 : New Zealand 20 : AT&T (#4, #5 ESS) 21 : NTI (DMS 100, 250) 22 : Australia ETSI 24 : ETSI Standard (Brazil, Columbia, Indonesia) 25 : ITU-T Standard (Thailand) 27 : USA NI-1 28 : USA NI-2 63◀: Not used
CM07	Assign ISDN trunk number to each channel number of BRT. (INITIAL) **NOTE:** Be sure to assign the trunk numbers to all circuits (00-03) of the 2BRTC card, even if only one PCM digital line is accommodated to the card. Set make-busy to the unused trunk numbers by CME5 Y=1, 2nd data=0.	• YY=02 (1) XX ZZ XX: AP No. assigned by CM05 ZZ : Channel No. (00/01: BRTA) (00-03: 2BRTC) (2) D000-D255: Trunk No. Trunk No. already assigned by CM10 cannot to be used.
A		

A

	DESCRIPTION	DATA
CM30	Assign trunk route to each ISDN trunk used for Voice channel (B channel). **NOTE:** BRT route must be separated from analog trunk routes.	• YY=00 (1) 000-255: Trunk No. assigned by CM07 YY=01 (2) 00-63: Trunk Route
	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 • YY=40 Mode A • YY=41 Mode B (1) 000-255: Trunk No. assigned by CM07 YY=01 (2) 04: Direct-In Termination 09: Automated Attendant 14: Termination to Attendant Console 16: Remote Access to System (DISA) 18: ISDN Indial
	Assign ISDN Local Office Code Table number to each ISDN trunk.	• YY=34 (1) 000-255: Trunk No. assigned by CM07 YY=02 (2) 00-14: Local Office Table No. 15◀ : Not assigned
CM35	Assign trunk route data to the route number assigned by CM30 YY=00.	• YY=00 Kind of Trunk Route (1) 00-63: B channel Trunk Route No. (2) 00: ISDN Trunk
		(1) 00-63: D channel Trunk Route No. (2) 15◀: Not used
		• YY=02 Call Direction (1) 00-63: B channel Trunk Route No. (2) 3◀: Bothway Trunk **NOTE 1**
		• YY=04 Answer Signal from distant office (1) 00-63: B channel Trunk Route No. (2) 2: Answer signal arrives (ISDN Trunk)
		(1) 00-63: D channel Trunk Route No. (2) 7◀: Not used

B



DESCRIPTION	DATA
	• YY=05 Release signal from distant office (1) 00-63: B channel/D channel Trunk Route No. (2) 1◀: Release signal arrives **NOTE 2**
	• YY=09 Incoming Connection Signaling (1) 00-63: Trunk Route No. (2) 08: ISDN Indial
	• YY=11 Toll Restriction (1) 00-63: B channel Trunk Route No. (2) 0 : Provided **NOTE 1** 3◀: Not provided
	• YY=12 Number of digit to be received on DID (1) 00-63: B channel Trunk Route No. (2) 0 : 1 digit **NOTE 1** 1 : 2 digits 2 : 3 digits 3◀: 4 digits
	• YY=14 SMDR for outgoing call (1) 00-63: B channel Trunk Route No. (2) 0 : Not provided 1◀: Provided **NOTE 1**
	• YY=15 Kind of Call Termination Indicator Key/Lamp on ATT (1) 00-63: B channel Trunk Route No. (2) 00-07: C.O. Incoming 0-7 **NOTE 1**
	• YY=16 Hooking Signal Sending to outside (1) 00-63: B channel Trunk Route No. (2) 0: Not sending **NOTE 1**
	• YY=18 Digit conversion on DID call (1) 00-63: B channel Trunk Route No. (2) 0 : Provided **NOTE 1** 1◀: Not provided

C

	DESCRIPTION	DATA
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=19 (1) 00-63: B channel Trunk Route No. (2) 0-3 : Programmable PAD (See CM42) 4-7◀: Fixed PAD **NOTE 1** **NOTE:** For details of PAD data, refer to Command Manual.
		• YY=28 Outgoing Trunk Queuing (1) 00-63: B channel Trunk Route No. (2) 0: Restricted **NOTE 1**
		• YY=39 Trunk release by detection of reversal of tip and ring (1) 00-63: B channel Trunk Route No. (2) 1◀: To release **NOTE 1**
		• YY=90 Assignment of BRT route for ISDN (1) 00-63: B channel/D channel Trunk Route No. (2) 2: ISDN-Basic Rate Interface **NOTE 2**
	Specify the method of Layer 1 activation.	• YYY=144 (1) 00-63: B channel/D channel Trunk Route No. (2) 0 : Activated by call event 1◀: Always activated
CM50	Assign ISDN Local Office Code.	• YY=05 (1) 00-14: Local Office Table No. assigned by CM30 YY=34 (2) X....X (Max. 12 digits)
CMAC	Assign Service Profile ID (SPID) to each B channel number. **[North America Only]**	• YY=30 (1) XX Z XX: 04-15: AP No. assigned by CM05 Z : 0-3: B ch No. (2) XXXX ZZZZ XXXX: ISDN Subscriber No. ZZZZ : SPID

D

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.	• YY=01 Day Mode • YY=02 Night Mode • YY=03 Mode A • YY=04 Mode B (1) 000-999: Number Conversion Block No. assigned by CM76 Y=00 (2) X-XXXXXXXX: Station No. to be terminated DXX: Change Terminating System to: D09: Automated Attendant D14: Attendant Console D16: Remote Access to System (DISA)

E

- For originating calls to the ISDN network, do the following programming:

E

	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-XXXX: Access code (2) 100-163: Trunk Route 00-63
CM08	Specify the timing start when making an ISDN call from an attendant.	(1) 403 (2) 0 : Not available 1◀: Available
CM41	Specify the timing start when making an ISDN call from a Single Line Telephone (PB/DP), D^{term} or Attendant Console, 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).

F

- When providing Tandem Connection (COT/ODT/LDT/DTI to ISDN, ISDN to COT/ODT/LDT/DTI), do the following programming:

F

	DESCRIPTION	DATA
CM08	Specify whether the busy tone is sent to a calling party of ISDN when a called party is busy in the tandem connection (ISDN to COT).	(1) 407 (2) 0 : Available (BT) 1◀: Not available (RBT)
CM36	Specify the combination of trunk routes allowing the tandem connection.	• Y=0 (1) XX ZZ XX: 00-63: Incoming Trunk Route ZZ: 00-63: Outgoing Trunk Route (2) 0 : Allowed 1◀: 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. If no data is set, the timing start is not effective.

NOTE 1: By using CM41 Y=0>57, an ISDN call is available even if "#" is not dialed.

NOTE 2: CM41 Y=0>57 is effective for dialing a called number. When dialing a called party subaddress, this command is not effective.

G

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

	DESCRIPTION	DATA
G		
CM36	Specify the combination of trunk routes allowing the tandem connection.	• Y=0 (1) XX ZZ XX: 00-63: Incoming Trunk Route ZZ: 00-63: Outgoing Trunk Route (2) 0 : Allowed 1◀: Restricted
CM08	Allow tandem connection by station or attendant.	(1) 028 (2) 0: Available
END		

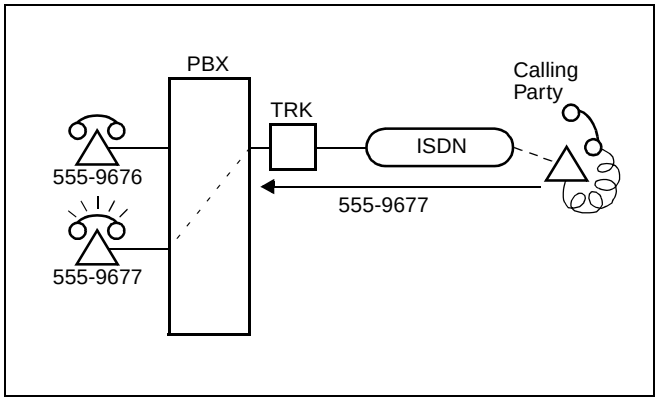
- Specify whether the Calling Party Number (CPN) sent from ISDN is sent to the CCIS network.

	DESCRIPTION	DATA
START		
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) 0-7: CCIS Channel No. (2) 0: Active
	Allow sending of CPN to CCIS network.	• YY=28 (1) 0-7: CCIS Channel No. (2) 0: Allowed
END		

ISDN FEATURE PROGRAMMING

- Calling Party Recognition Service (Direct-In Termination (DIT))
  Refer to “Direct Inward Termination (DIT)” in the Feature Programming Manual.
- DID Addressing (See Page 83.)
- MEGACOM® Access **[North America Only]** (See Page 85.)
- MEGACOM® 800 Service **[North America Only]**
  Refer to “DID Addressing” for programming instructions. (See Page 83.)
- SID to Network-Present **[Australia/Other Countries]** (See Page 86.)
- CPN to Network-Present **[North America]** (See Page 86.)
- SID to Terminating User-Display **[Australia/Other Countries]**
  No programming is required.
- CPN to Terminating User-Display **[North America]**
  No programming is required.
- Subaddress-Present (See Page 89.)
- Trunk Provisioning Service Selection (See Page 90.)
- ISDN PRI Call By Call Service Selection **[North America Only]** (See Page 91.)
- Advice of Charge (AOC) **[Australia/France Only]** (See Page 97.)
- Centrex SHF over ISDN **[N.Z. Only]** (See Page 98.)

DID Addressing



START

	DESCRIPTION	DATA
CM30	Assign the data for DID to the trunk numbers assigned by CM07.	• YY=02 Day Mode • YY=03 Night Mode • YY=40 Mode A • YY=41 Mode B (1) 000-255: Trunk No. 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) 00-63: Trunk Route No. (2) 00: DID • YY=02 OG/IC (1) 00-63: Trunk Route No. (2) 3◀: Bothway Trunk • YY=05 Release Signal Condition (1) 00-63: Trunk Route No. (2) 1◀: Release signal arrives • YY=09 Incoming Connection Signaling (1) 00-63: Trunk Route No. (2) 08: ISDN • YY=12 Number of digits to be received (1) 00-63: Trunk Route No. (2) 0 : 1 digit 1 : 2 digits 2 : 3 digits 3◀: 4 digits

A

	DESCRIPTION	DATA
A		
CM35		• YY=18 Received Digit Conversion (1) 00-63: Trunk Route No. (2) 0 : Provided 1◀: Not 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) 00-63: Tenant No. (2) Destination: X-XXXXXXXX: Station No. E000 : Attendant Console EBXXX: Announcement Service: Digital Announcement Trunk No. set by CM10
CM76	Assign the Number Conversion Block No.	• YY=00 (1) X-XXXX: DID No. (2) 000-999: Number Conversion Block No.
	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.	• YY=01 Day Mode • YY=02 Night Mode • YY=03 Mode A • YY=04 Mode B (1) 000-999: Number Conversion Block No. assigned by CM76 YY=00. (2) X-XXXXXXXX: Station/Data station/ ISDN line station No. to be terminated DXX: Change Terminating System to: D04: Direct-in Termination D14: Attendant Console
END		

MEGACOM® Access

[North America Only]

START	DESCRIPTION	DATA
CM12	Assign the Trunk Restriction Class to each station.	• YY=01 Trunk Restriction Class (1) X-XXXXXXXX: Station No. (2) X Z X: 1◀-8: Trunk Restriction Class in Day mode Z: 1◀-8: Trunk Restriction Class in Night mode 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)
	Set the outgoing/incoming Trunk Route Restriction data by Trunk Restriction Classes (RCA-RCH).	• YY=51-58 Outgoing Trunk Restriction • YY=61-68 Incoming Trunk Restriction (1) 00-63: Trunk Route No. (2) 0 : Restricted 1◀: Allowed
	NOTE: If Call-By-Call Service Selection is required, see Page 91 for additional programming.	
END		

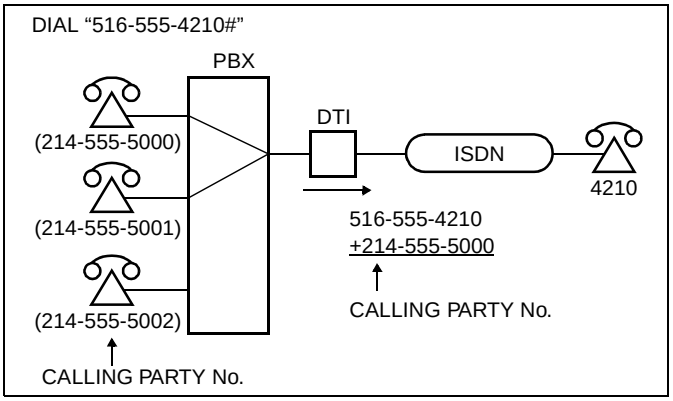
In addition to the programming of Direct Outward Dialing, assign WATS line to the required trunk route, as shown below:

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

SID to Network-Present/ CPN to Network-Present

For providing the Calling Party Number (CPN) to the network, do the following programming:

- When Dial-In service is provided:



START

	DESCRIPTION	DATA
CM12	Assign an ISDN Subscriber number and ISDN Local Office Code Table number to required stations. **NOTE 1**	• YY=12 (1) X-XXXXXXXX: Station No. (2) X-XXXX: ISDN Subscriber No. • YY=13 (1) X-XXXXXXXX: Station No. (2) 00-14: ISDN Local Office Code Table No. 00-14
CM13	Specify the facility control of CPN (Calling Party Number).	• YY=25 (1) X-XXXXXXXX: Station No. (2) 0 : To provide 1◀: Not provided **NOTE 2**
CM50	Assign ISDN Local Office Code to the Table number assigned by CM12 YY=13.	• YY=05 (1) 00-14: ISDN Local Office Code Table No. 00-14 (2) X...X: Local Office Code (Max. 12 digits)

END

- When ISDN (BRI) Terminals are used:

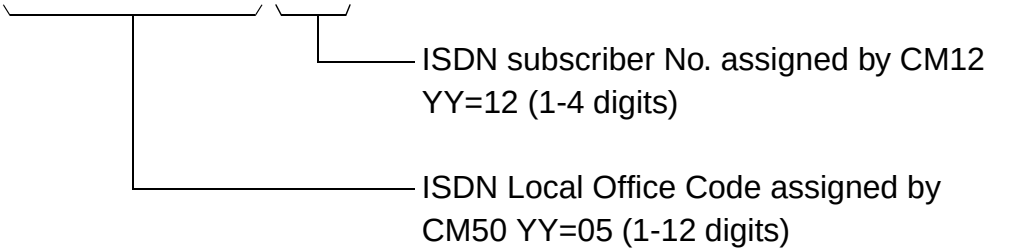
START

	DESCRIPTION	DATA
CM08	Allow the ISDN Terminal to send the CPN to network without using PBX programming.	(1) 434 (2) 0 : CPN set in ISDN Terminal 1◀: CPN assigned by CM12 YY=12, 13

END

NOTE 1: The ISDN number consists of the following numbers:

ISDN number: XXXXXXXXXXXX YYYY



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 by CM12 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, SID (CPN) to Network-Present is not available.

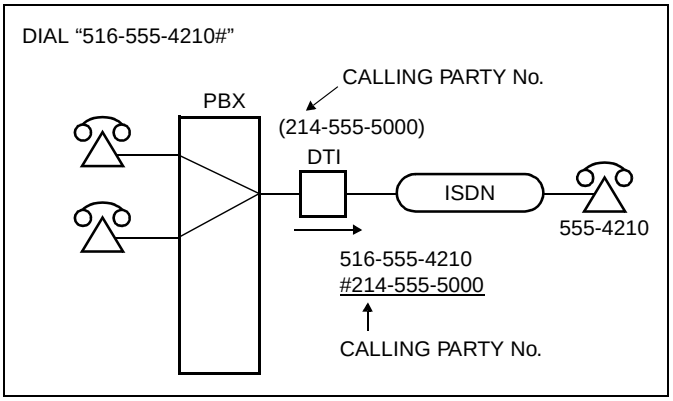
Example:

	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**) 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:



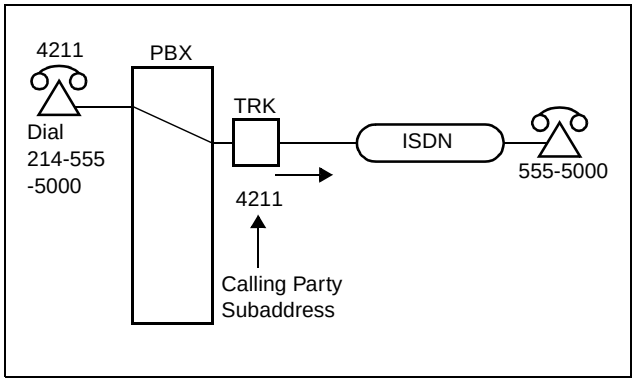
START

	DESCRIPTION	DATA
CM13	Specify the sending out of CPN (Calling Party Number).	• YY=25 (1) X-XXXXXXXX: Station No. (2) 0 : Sent 1◀: Not sent **NOTE 2** on previous page
CM30	Assign an ISDN subscriber number to each ISDN trunk. **NOTE 1** on previous page	• YY=19 (1) 000-255: Trunk No. assigned by CM07 YY=01 (2) XXXX: ISDN Subscriber No.
	Assign ISDN Local Office Code Table number to each ISDN trunk.	• YY=34 (1) 000-255: Trunk No. assigned by CM07 YY=01 (2) 00-14: Local Office Code Table No. 00-14
CM50	Assign ISDN Local Office Code to the Table number assigned by CM30 YY=34.	• YY=05 (1) 00-14: ISDN Local Office Code Table No. 00-14 (2) X...X: Local Office Code (Max. 12 digits)

END

Subaddress-Present

(1) Calling Party Subaddress
When a station has dialed an ISDN subscriber number, the station number is automatically sent as a Calling Party Subaddress.

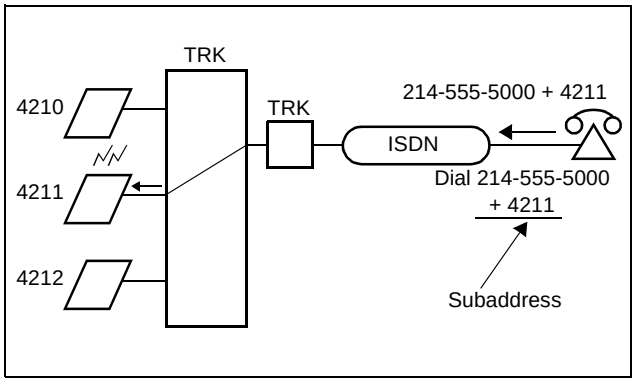


START

DESCRIPTION	DATA
CM08 Provide the system with Calling Party Subaddress to ISDN.	(1) 400 (2) 0: Sent

END

(2) Called Party Subaddress
When the system has received a Called Party Subaddress (Calling Station Number) from an ISDN subscriber, the system connects the call with the specified terminal.

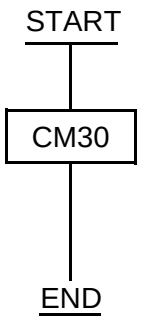


START

DESCRIPTION	DATA
CM08 Specify the terminating system for Called Party Subaddress. **NOTE:** If CM35 YYY=143 is set to "0" for Event Based CCIS, assign the second data to "0".	(1) 401 (2) 0 : Station Call 1◀: Terminating System assigned by CM30 YY=02/03/40/41

END

Trunk Provisioning Service Selection



DESCRIPTION	DATA
Assign the trunk route to the trunk number assigned by CM07.	• YY=00 Trunk Route Allocation (1) 000-255: Trunk No. assigned by CM07 YY=01. (2) 00-63: Route No.

ISDN PRI Call By Call Service Selection

[North America Only]

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.

CM8A4005>12 (dialed #)=0001 (go to route pattern 001)
CM8A0001>1 (1st choice)=00010 (use LCR pattern 000 + trk route 10)
CM855>12=11 (maximum number of digits dialed)

CM8A5000>157=02 (Kind of called party=National)
(dialed number is 10-digit NANP, select National)
CM8A5000>158=01 (Called party Number Plan ID=ISDN/Telephony Numbering Plan)
CM8A5000>159~161 are not used for this call.
CM8A5000>162=1 (Service)
CM8A5000>163=03 (Megacom)
CM8A5000>164 is not required for this call.

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

CM8A4005>2 (dialed number)=001 (go to route pattern 000)
CM8A0000>1 (1st choice)=00210 (use LCR pattern 002 + trk route 10)
CM855>2=7 (maximum number of digits dialed)

CM8A5002>157=04 (Kind of called party=Local) (dialed number is 7-digit NANP, select Local)
CM8A5002>158=01 (Called party Number Plan ID=ISDN/Telephony Numbering Plan)
CM8A5002>159~161 are not used for this call.
CM8A5002>162=1 (Service)
CM8A5002>163=NONE (not sending)
CM8A5002>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).

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

CM8A4005>10 (dialed number)=406 (go to table 406)
CM8A4006>288 (dialed number)=010 (use route pattern 010)
CM8A0010>1 (1st choice)=02010 (use LCR pattern 020 + trk route 10)

CM8A5020>157=02 (Kind of called party=National)
CM8A5020>158=01 (Called party Number Plan ID=ISDN/Telephony Numbering Plan)

CM8A5020>159=02 (Type of Network ID=National)
CM8A5020>160=01 (Network ID Plan Number=Interexchange Carrier)
CM8A5020>161=288 (CIC code for AT&T)
CM8A5020>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.

CM8A5020>151=0 (Allow digit deletion.)
CM8A5020>153=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 CM8A5XXX-Y=161 to send out the unique CIC number to the network.

START

DESCRIPTION	DATA
CM8A Assign the kind of the called party number.	• YYYY=5000-5255 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◀: No data
Assign the Called Party Numbering Plan Identifier.	• YYYY=5000-5255 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 : Not used 06 : Not used 07 : Not used 08 : National Numbering Plan 09 : Private Numbering Plan NONE◀: No data
Assign the Type of Network ID number.	• YYYY=5000-5255 LCR/TR Pattern No. 000-255 (1) 159: Type of Network ID (2) 00-07: Type of Network ID No. NONE◀: No data

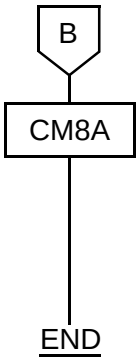
A

A

CM8A

DESCRIPTION	DATA
Assign the Network ID Plan number.	• YYYY=5000-5255 LCR/TR Pattern No. 000-255 (1) 160: Network ID Plan (2) 00-15 : Network ID Plan No. NONE◀: No data
Assign the Network ID character.	• YYYY=5000-5255 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.	• YYYY=5000-5255 LCR/TR Pattern No. 000-255 (1) 162: Feature/Service (2) 0 : Feature 1◀: Service
Assign the Binary Facility Coding Value.	• YYYY=5000-5255 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 : Not used 06 : ACCUNET 07 : Not used 08 : INTERNATIONAL800 16 : AT&T MULTIQUEST NONE◀: No data For Northern Telecom 01 : Private 02 : INWATS 03 : OUTWATS 04 : Foreign Exchange (FX) 05 : Tie Trunk (TIE) NONE◀: No data

B



DESCRIPTION	DATA
Assign the WATS Band number.	• YYYY=5000-5255 LCR/TR Pattern No. 000-255 (1) 164: WATS Band No. (2) 00-09 : WATS Band No. NONE◀: No data

Advice of Charge (AOC)

[Australia/France Only]

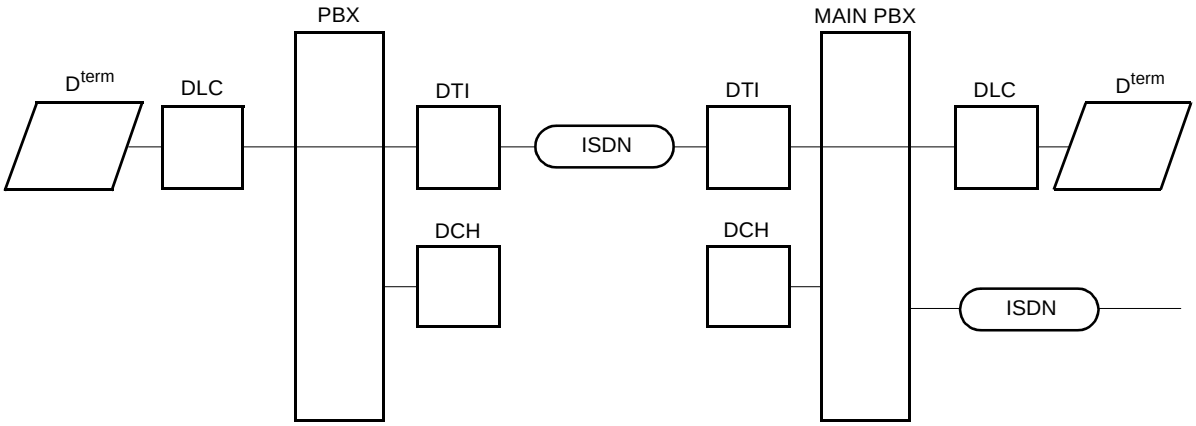
START	DESCRIPTION	DATA
CM08	Specify the Advice of Charge (AOC) display on D^{term} when the charge total is over $9999.99. (After 6 sec., the display goes off.)	(1) 402 (2) 0 : Flashing display 1◀: Fixed display
END		

NOTE: When you require Call Recording of ISDN call, do the data programming for SMDR or CIS. For details, refer to the Feature Programming Manual.

Centrex SHF Over ISDN

[N.Z. Only]

To send hooking signal from a D^{term} to a main PBX via ISDN, do the following programming:



START

DESCRIPTION	DATA
CM35 — Provide the voice channel trunk route for the main PBX with the Centrex function.	• YY=86 (1) 00-63: B channel Trunk Route No. (2) 0: To provide
CM90 — Assign the SHF Key on the D^{term}.	• YY=00 (1) My Line No. + [,] + Key No. (2) F1009: SHF (Hooking Signal sent to outside)

END

ISDN-VPN PROGRAMMING

START	DESCRIPTION	DATA
CM20	Assign the access code for LCR Group 0-3.	• Y=0-3 Number Plan Group 0-3 (1) X-XXXX: Access Code (2) A126: LCR Group 0 A127: LCR Group 1 A128: LCR Group 2 A129: LCR Group 3
CM90	Assign the LCR Group key on the D^{term}, if required.	• YY=00 (1) My Line No. + [,] + Key No. (2) F0A26: LCR Group 0 F0A27: LCR Group 1 F0A28: LCR Group 2
CM8A	Assign an Area Code Development Pattern number to each LCR Group.	• YYYY=A000 (1) 0-3: LCR Group 0-3 (2) 4000-4007: Area Code Development Pattern No. 0-7
	Assign a Route Pattern number to each area code for the Area Code Development Pattern number assigned by YYYY=A000.	• YYYY=4000-4007 Area Code Development Pattern No. 0-7 (1) X...X: Area Code, Max. 8 digits (2) 0000-0255: Route Pattern No. 000-255
	Specify the order of LCR selection for the Route Pattern number assigned by YYYY=4000-4007.	• YYYY=0000-0255 Route Pattern No. 000-255 (1) 1-4: Order of LCR Selection 1: 1st 2: 2nd 3: 3rd 4: 4th (2) XXX ZZ XXX: 000-255: LCR Pattern No. ZZ : 00-63: Trunk Route No.
	For area code addition, designate the digits to be added.	• YYYY=5000-5255 (1) 100: Designation of digit Addition Pattern No. (2) 9000-9255: Digit Addition Pattern No. 000-255 CCC: No digit addition
A		

	DESCRIPTION	DATA
A		
CM8A		• YYYY=9000-9025: Digit Addition Pattern No. 00-255 (1) 0 (2) X-X...X: Digits to be added (Max. 32 digits)
	To delete the designated digit of an area code assigned by YYYY=4000-4007.	• YYYY=5000-5255 (1) 153: Designation of digit to be deleted from area code assigned by YYYY=4000-4007 (2) 00 : No digit deletion 01-10: Leading 1-10 digits deletion CCC : No digit deletion
	Assign the sending an area code to ISDN as a Called Party Subaddress.	• YYYY=5000-5255 (1) 155: Designation of sending area code as a Called Party Subaddress (2) 0: Available
CM85	Specify the maximum number of digits to be Dialed by Calling Party. The maximum number of digits including the area codes should be assigned to each area code.	• Y=0-7 Area Code Development Pattern No. 0-7 assigned by CM8A Y=A000 (1) X-X...X: Area code dialed, Max. 8 digits (2) 01-79: 1 digit-79 digits 24◀ : 24 digits
CM35	Assign the Area Code Development Pattern number for Toll Restriction and maximum digit analysis to each trunk route.	• YY=76 (1) 00-63: Trunk Route No. (2) 00-07: Area Code Development Pattern No. 0-7
END		

ISDN TERMINAL DATA PROGRAMMING

ILC Assignment

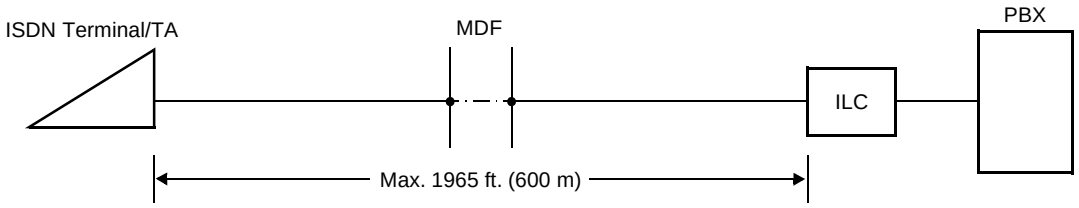
START	DESCRIPTION	DATA
CM10	Assign an ISDN line station number to the required LEN.	(1) 000-763: LEN (2) EFX-EFXXXXXXXX: ISDN Line Station No.
CM12	Assign a Tenant number to each ISDN line station number.	• YY=04 (1) X-XXXXXXXX: ISDN Line Station No. (2) 00-63: Tenant No. If no data is set, the default data is 01.
	Assign a Trunk Restriction Class to each ISDN line station number.	• YY=01 (1) X-XXXXXXXX: ISDN Line Station No. (2) X Z: Trunk Restriction Class X: 1◀-8: Trunk Restriction Class in Day Mode Z: 1◀-8: Trunk Restriction Class in Night Mode 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 an ISDN Indial number to the required ISDN line station number.	• YY=12 (1) X-XXXXXXXX: ISDN Line Station No. (2) X-XXXX: ISDN Indial No.
	Assign a Local Office Code Table number to the required ISDN line station number.	• YY=13 (1) X-XXXXXXXX: ISDN Line Station No. (2) 00-14: ISDN Local Office Code Table No. 00-14
A		

	DESCRIPTION	DATA
A		
CM13	Specify the facility control of CPN (Calling Party Number).	• YY=25 (1) X-XXXXXXXX: ISDN Line Station No. (2) 0 : Provided 1◀: Not provided
CM20	Assign the digit number of ISDN line station number.	• Y=0-3 (1) X-XXXX: Access Code (2) 801-808: 1 digit-8 digits
CM08	Specify whether the subaddress is sent to ISDN when making a call from ISDN Terminal, if required.	(1) 430 (2) 0 : Sent (As per CM08>431) 1◀: Not sent
	Specify the Calling Party Subaddress which is sent to ISDN when making a call from ISDN Terminal, if required.	(1) 431 (2) 0 : ISDN Line 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 CPN (Calling Party Number) which is sent to ISDN when making a call from ISDN Terminal, if required.	(1) 434 (2) 0 : CPN entered in ISDN Terminal 1◀: CPN assigned by CM12 Y=12/13
CME5	Specify the make busy of B channel (B1, B2) for ISDN Terminal, if required.	• Y=2 (1) XXXXXXXX , Z XXXXXXXX: ISDN Line Station No. Z: 0: B1 channel 1: B2 channel (2) 0 : Make busy 1◀: In service
END		

ICH Assignment

START	DESCRIPTION	DATA
CM05	Assign an AP number to each ICH card (PN-SC03). The AP number must match the SENS switch setting on the ICH card. (INITIAL)	• Y=0 (1) 04-15: AP No. (2) 13: ICH card
CM06	Assign the ICH number to the AP number of ICH assigned by CM05. (INITIAL)	• YY=09 (1) 00-15: ICH No. (2) 04-15: AP No. assigned by CM05
CMAC	Assign the ISDN line station number to the ISDN line number of ICH card. (INITIAL)	• YY=00 (1) XX Z XX: 00-15: ICH No. Z : 0-7: ISDN Line No. of ICH card (2) X-XXXXXXXX: ISDN Line Station No.
	Specify the method of TEI (Terminal End-point Identifier) assignment. (INITIAL) **NOTE:** CMAC YY=02 must be assigned to match the specification of ISDN Terminal.	• YY=02 (1) XX Z XX: 00-15: ICH No. Z : 0-7: ISDN Line No. of ICH card (2) 0 : Manual TEI Assignment 1◀: Automatic TEI Assignment
	Specify the method of Layer 1 activation. (INITIAL) **NOTE:** CMAC Y=04 must be assigned to match the specification of ISDN Terminal.	• YY=04 (1) XX Z XX: 00-15: ICH No. Z : 0-7: ISDN Line No. of ICH card (2) 0 : Always activated 1◀: Activated by call event
CMAA	Assign the ISDN Protocol Type to the AP number assigned by CM05. (INITIAL)	• YY=06 (1) 04-15: AP No. of ICH assigned by CM05 (2) 24 : ETSI Terminal 63◀: Not ETSI Terminal
END		

Point-to-Point Connection



START

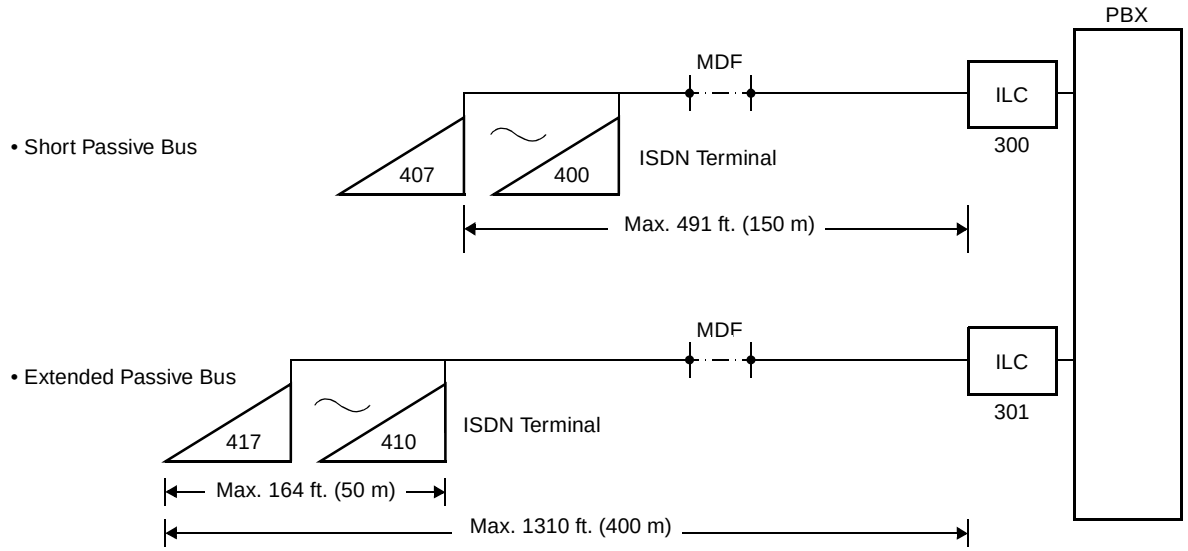
	DESCRIPTION	DATA
CMAC	Assign the point to point connection as the Layer 2 data link. INITIAL	• YY=01 (1) XX Z XX: 00-15: ICH No. Z : 0-7: ISDN Line No. of ICH card (2) 0: Point to Point Connection

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 CMAC YY=01 and CM1B to assign extension number for the BRI Terminal.

Assign the TEI Manual Assignment. INITIAL	• YY=02 (1) XX Z XX: 00-15: ICH No. Z : 0-7: ISDN Line No. of ICH card (2) 0: TEI Manual Assignment
Assign the Extended Passive Bus. INITIAL	• YY=03 (1) XX Z XX: 00-15: ICH No. Z : 0-7: ISDN Line No. of ICH card (2) 0: Extended Passive Bus
Assign the always activated as the method of Layer 1 activation. INITIAL	• YY=04 (1) XX Z XX: 00-15: ICH No. Z : 0-7: ISDN Line No. of ICH card (2) 0: Always activated

END

Point-to-Multipoint Connection



START

	DESCRIPTION	DATA
CMAC	Assign the point to multipoint connection as the Layer 2 data link. (INITIAL)	• YY=01 (1) XX Z XX: 00-15: ICH No. Z : 0-7: ISDN Line No. of ICH card (2) 1◀: Point-to-Multipoint Connection
	Specify the passive bus. (INITIAL)	• YY=03 (1) XX Z XX: 00-15: ICH No. Z : 0-7: ISDN Line No. of ICH card (2) 0 : Extended Passive Bus 1◀: Short Passive Bus
CM1B	Assign an ISDN Terminal Multipoint station number to the ISDN Line station number. The numbers assigned in this command are station numbers that are to be programmed in the BRI terminal. CM12 YY=12 will use the station assignment from CM10.	(1) XXXXXXXX , Z XXXXXXXX: ISDN Line Station No. assigned by CM10 Z: 0-7: ISDN Multipoint No. (2) X-XXXXXXXX: ISDN Terminal Multipoint Station No.

END

BRI Programming Example:

The following is an example of common BRI Station Programming.

CM10024>EF2125
025>EF2126

CMAC00>000-2125
001-2126

CMAC01>000-1
001-1

CMAC02>000-1
001-1

CMAC03>000-1
001-1

CMAC04>000-1
001-1

CMAC06>000-1
001-1

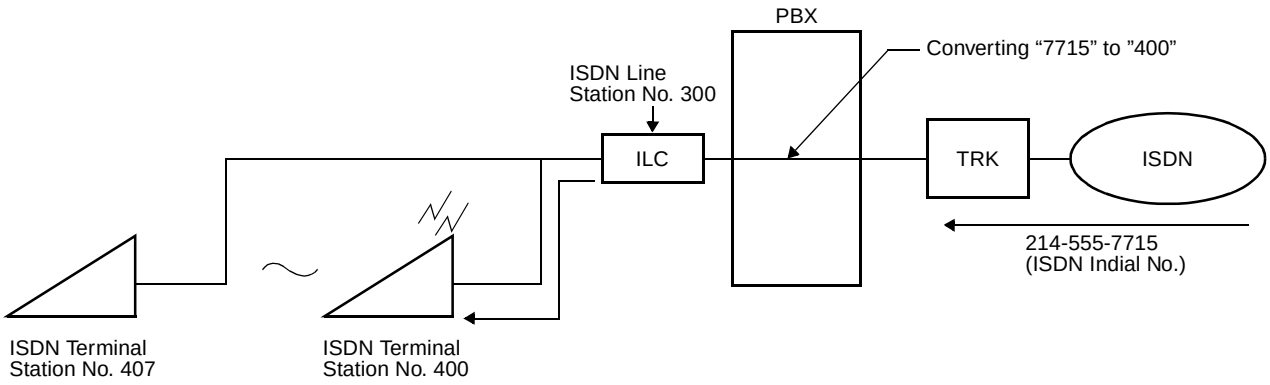
CM1B>2125, 0>2225*
2125, 1>2226
2
~ >None
7
2126, 0>2235*
2126, 1>2236*
2
~ >None
7

* 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.
If the BRI Terminals require a SPID **[North America Only]**, 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-to-Point do not use SPIDs.

Individual Terminal Call

(1) ISDN Indial

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



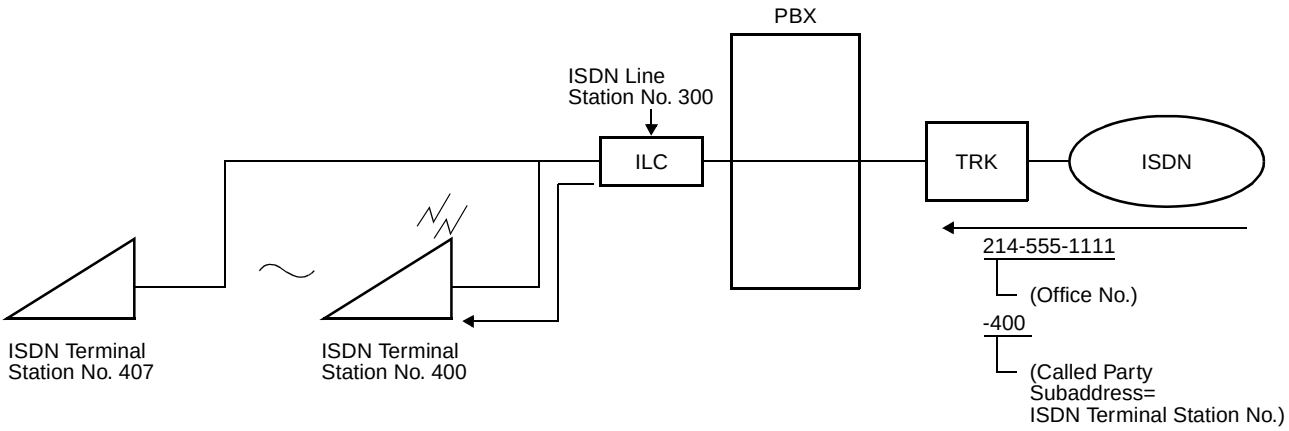
Do the following programming:

DID Addressing (See Page 83.)

Point-to-Multipoint Connection (See Page 105.)

(2) Called Party Subaddress

When the system has received a Called Party Subaddress (ISDN Terminal station number) from an ISDN Subscriber, the system connects the call with the specified ISDN Terminal or TA on the same bus (2B + D).



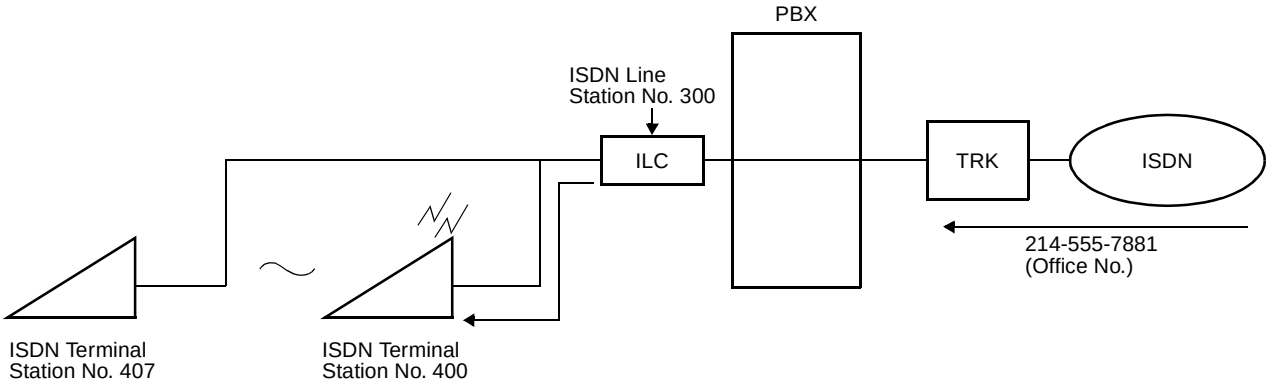
Do the following programming:

Subaddress-Present (See Page 89.)

Point-to-Multipoint Connection (See Page 105.)

(3) Direct In Termination (DIT)

When the ISDN Terminal station number is assigned as the destination of DIT, the system connects the call with the specified ISDN Terminal or TA on the same bus (2B + D).

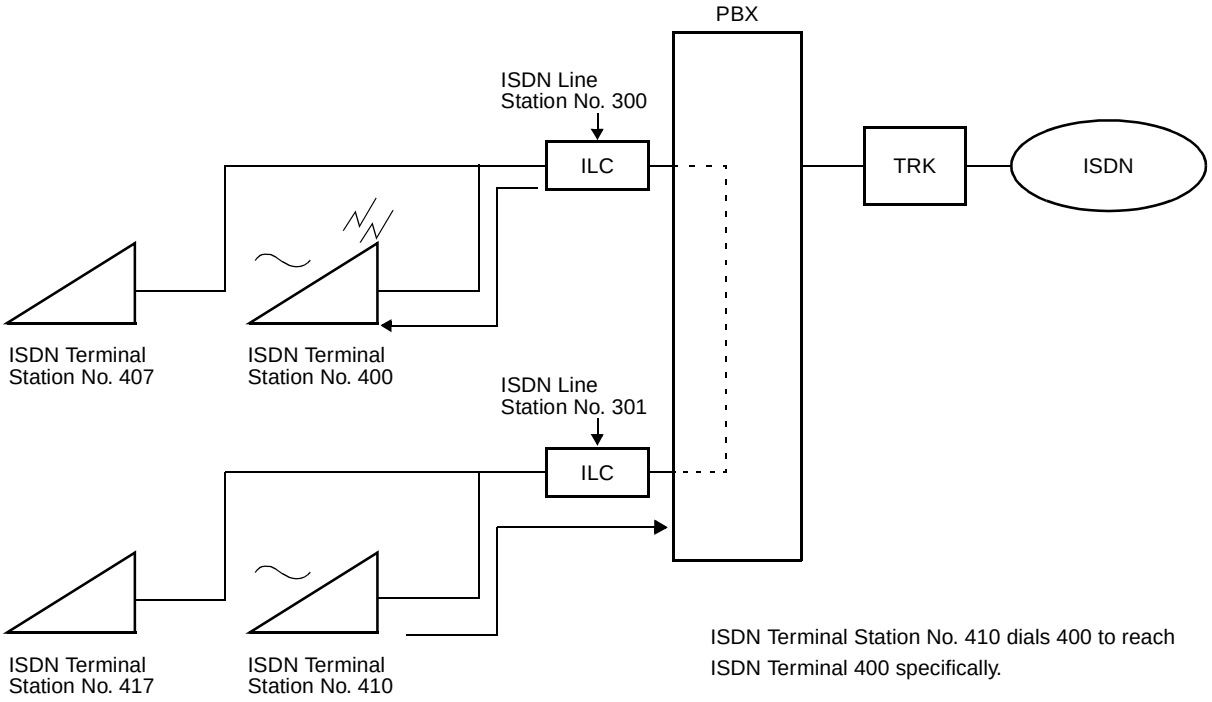


In addition to the programming of "Point-to-Multipoint Connection" on Page 105, do the following programming:

START	DESCRIPTION	DATA
CM30	Assign the data for DIT to the trunk numbers assigned by CM07.	• YY=02 Day Mode • YY=03 Night Mode • YY=40 Mode A • YY=41 Mode B (1) 000-255: Trunk No. assigned by CM07 YY=01 (2) 04: Direct-In Termination
	Assign the ISDN Terminal station number to be terminated by Direct In Termination.	• YY=04 Day Mode • YY=05 Night Mode • YY=42 Mode A • YY=43 Mode B (1) 000-255: Trunk No. assigned by CM07 YY=01 (2) X-XXXXXXXX: ISDN Terminal Station No.
END		

(4) Station to Station Calling

When an ISDN Terminal user dials an ISDN Terminal station number within the system, the system connects the call with the specified ISDN Terminal.

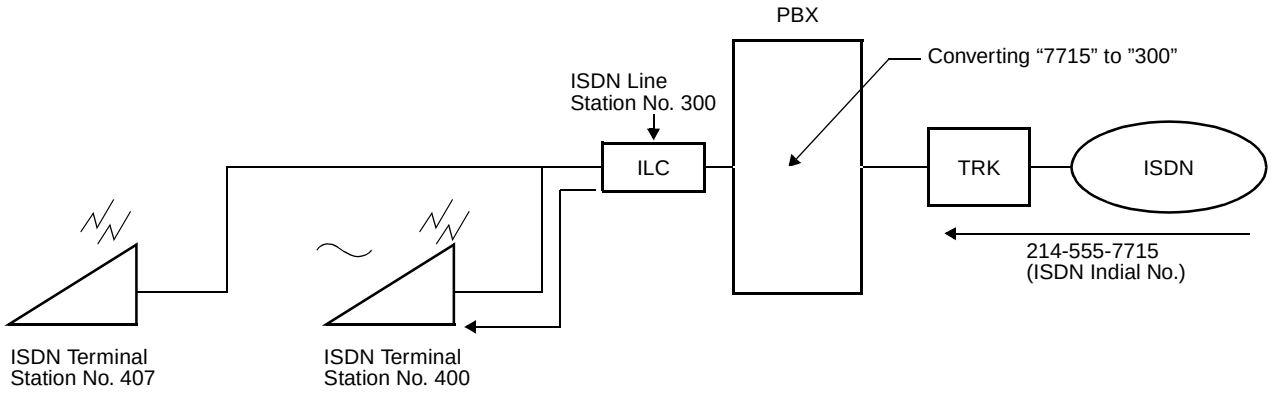


Do the programming of Point-to-Multipoint Connection. See Page 105.

Group Call

(1) ISDN Indial

When receiving an ISDN line station number as ISDN Indial number, or when converting an ISDN Indial number to an ISDN line station number by CM76, the system connects the call with all ISDN Terminals or Terminal Adapters (TA) on the same bus (2B + D).



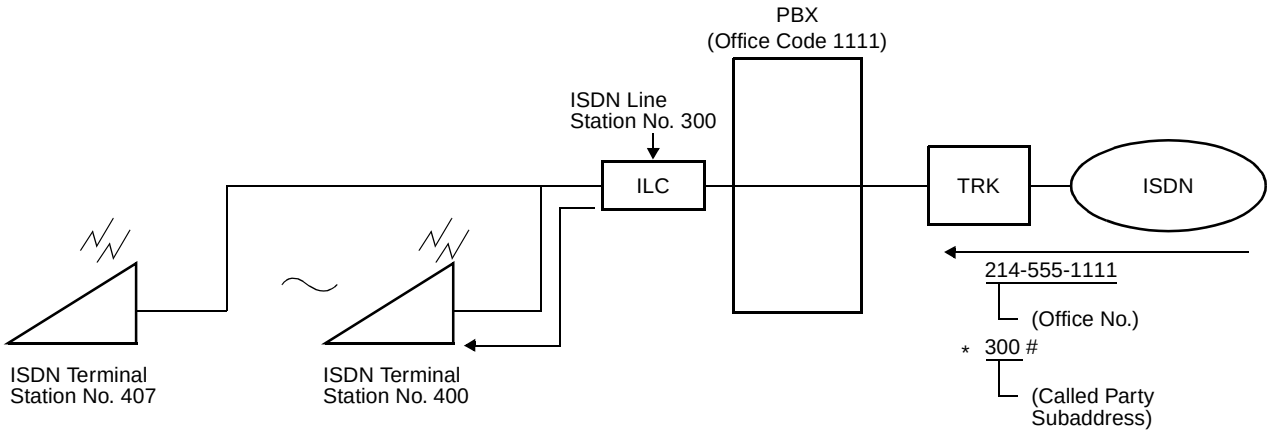
Do the following programming:

DID Addressing (See Page 83.)

Point-to-Multipoint Connection (See Page 105.)

(2) Called Party Subaddress

When receiving an ISDN line station number as the Called Party Subaddress, the system connects the call with all ISDN Terminals or Terminal Adapters (TA) on the same bus (2B + D).



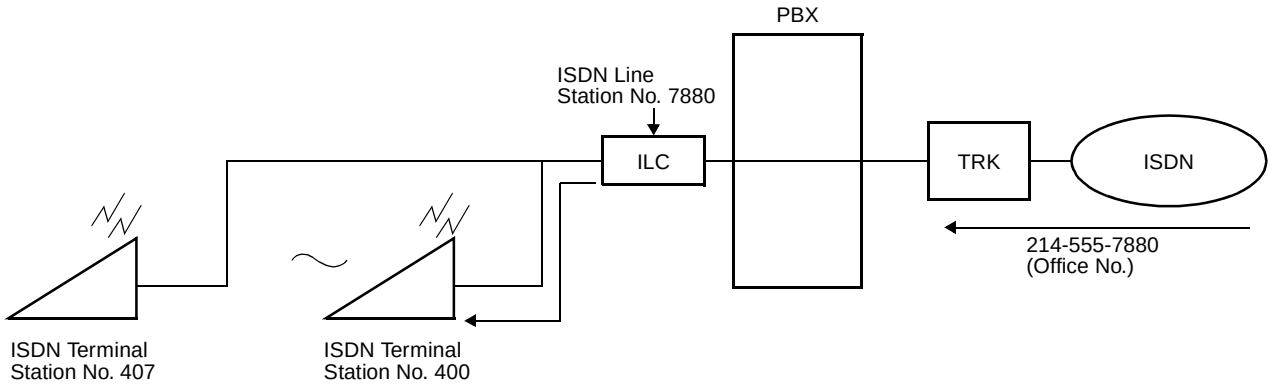
Do the following programming:

Subaddress-Present (See Page 89.)

Point-to-Multipoint Connection (See Page 105.)

(3) Direct In Termination (DIT)

When the ISDN line station number is assigned as the destination of DIT, the call from ISDN terminates all ISDN Terminals on the same bus (2B + D) simultaneously.



In addition to the programming of "Point-to-Multipoint Connection" on Page 105, do the following programming:

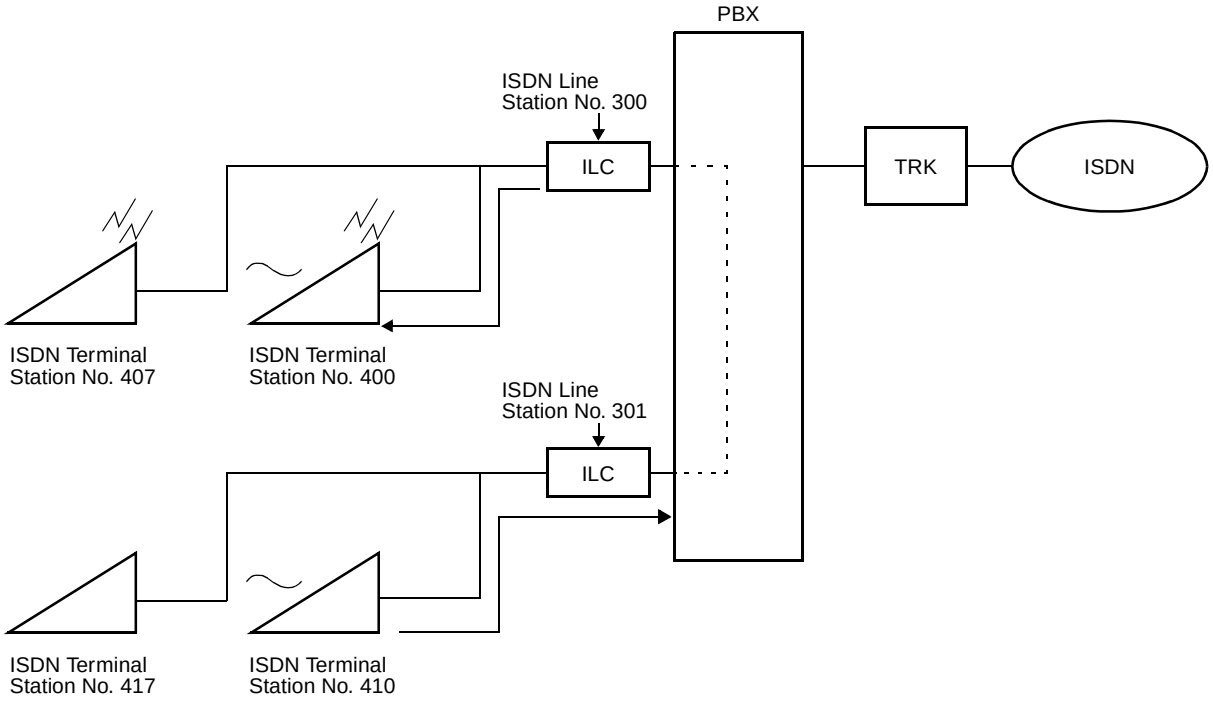
START

	DESCRIPTION	DATA
CM30	Assign the data for DIT to the trunk numbers assigned by CM07.	• YY=02 Day Mode • YY=03 Night Mode • YY=40 Mode A • YY=41 Mode B (1) 000-255: Trunk No. assigned by CM07 Y=01 (2) 04: Direct-In Termination
	Assign the ISDN Terminal station number to be terminated by Direct In Termination.	• YY=04 Day Mode • YY=05 Night Mode • YY=42 Mode A • YY=43 Mode B (1) 000-255: Trunk No. assigned by CM07 Y=01 (2) X-XXXXXXXX: ISDN Terminal Station No.

END

(4) Station to Station Calling

When an ISDN Terminal user dials an ISDN line station number within the system, the system connects the call with all ISDNTerminals.



Do the programming of Point-to-Multipoint Connection. See Page 105.

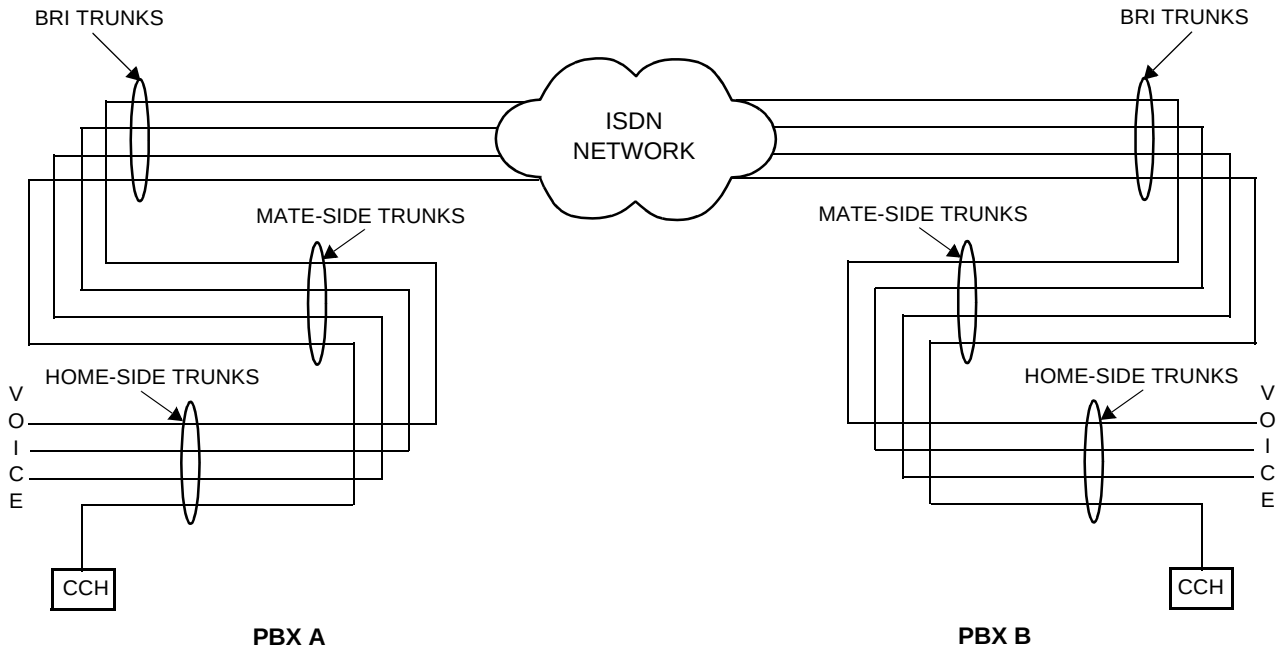
EVENT BASED CCIS PROGRAMMING

Programming Summary

Do the system data programming for Event Based CCIS according to the procedure shown in Figure 3-2. As for the CCIS feature programming, refer to the CCIS System Manual.

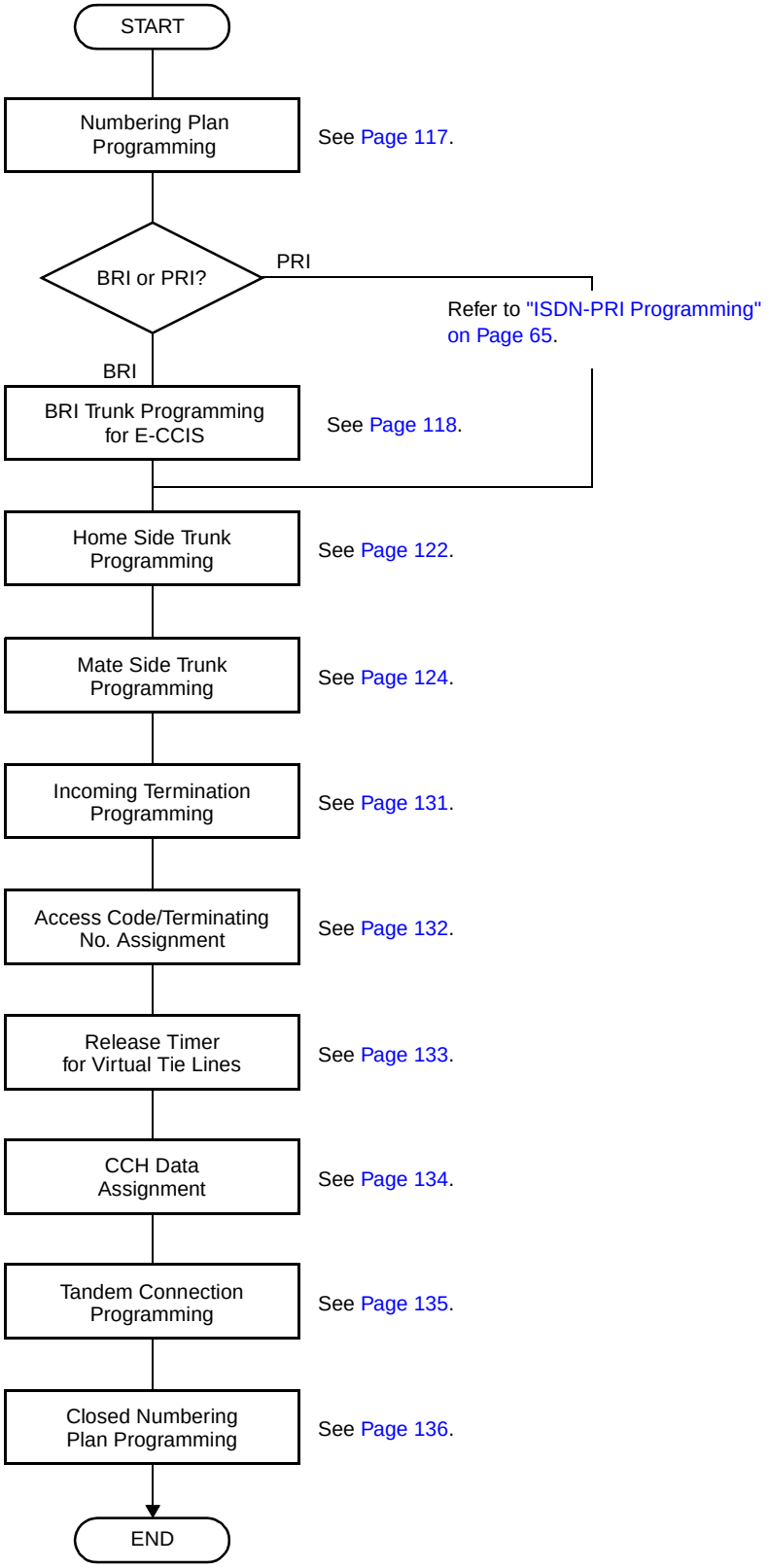
Figure 3-1 shows an outline of BRI to BRI connections.

Figure 3-1 Outline of BRI to BRI Connections



Programming for PBX A and PBX B is required on each programming procedure.

Figure 3-2 Event Based CCIS Programming Summary



Numbering Plan Programming

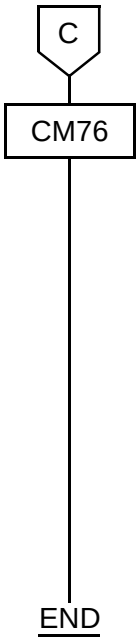
START	DESCRIPTION	DATA
CM20	Assign station number, LCR and trunk route access codes.	• Y=0-3 (1) X-XXXX: Access Code (2) 801-808 : 1 to 8 digits station A126-A129: LCR Group 0-3 100-163 : Trunk Route 00-63
END		

BRI Trunk Programming

START	DESCRIPTION	DATA
CM05	Assign an AP number to the BRT card. The AP number must match the SENS switch setting on the BRT card. (INITIAL)	• Y=0 (1) 04-15, 20-31: AP No. (2) 10: BRT card
CMAA	Assign the ISDN Protocol Type for DCH circuit on the BRT card. (DTI INITIAL)	• YY=06 (1) 04-15, 20-31: AP No. of BRT assigned by CM05 (2) ISDN Protocol Type 17 : Australia 18 : New Zealand 20 : AT&T (#4, #5 ESS) 21 : NTI (DMS 100, 250) 22 : Australia ETSI 24 : ETSI Standard (Brazil, Columbia, Indonesia) 25 : ITU-T Standard (Thailand) 27 : USA NI-1 28 : USA NI-2 63◀: Not used
CM07	Assign ISDN trunk number to each Channel number of BRT. (INITIAL) **NOTE:** Be sure to assign the trunk numbers to all circuits (00-03) of the 2BRTC card, even if only one PCM digital line is accommodated to the card. Set make-busy to the unused trunk numbers by CME5 Y=1, 2nd data=0.	• YY=02 (1) XX ZZ XX: AP No. assigned by CM05 ZZ : Channel No. (00/01: BRTA) (00-03: 2BRTC) (2) D000-D255: Trunk No. Trunk No. already assigned by CM10 cannot be used.
CM30	Assign trunk route to each ISDN trunk used for Voice channel (B channel). **NOTE:** BRT route must be separated from analog trunk routes.	• YY=00 (1) 000-255: Trunk No. assigned by CM07 YY=01 (2) 00-63: Trunk Route
A		

	DESCRIPTION	DATA
A		
CM30	Assign the trunk route data to each ISDN incoming trunk used for Voice channel only.	• YY=02 Day Mode • YY=03 Night Mode • YY=40 Mode A • YY=41 Mode B (1) 000-255: Trunk No. assigned by CM07 Y=01 (2) 18: ISDN Indial
	Assign an ISDN subscriber number (last 4 digits of telephone number) to each ISDN trunk.	• YY=19 (1) 000-255: Trunk No. assigned by CM07 Y=01 (2) XXXX: ISDN Subscriber No.
	Assign ISDN Local Office Code Table number to each ISDN trunk.	• YY=34 (1) 000-255: Trunk No. assigned by CM07 Y=01 (2) 00-14: Local Office Code Table No.
CM50	Assign ISDN Local Office Code.	• YY=05 (1) 00-14: Local Office Table No. assigned by CM30 Y=34 (2) X....X (Max. 12 digits)
CMAC	Assign the last 4 digits of telephone number + Service Profile ID (SPID) to each B channel number. **[North America Only]**	• YY=30 (1) XX Z XX: 04-15: AP No. assigned by CM05 Z : 0-3: B ch No. (2) XXXX ZZZZ (Last 4 digits of tel No. + SPID: 8 digits)
CM35	Assign trunk route data to the route number assigned by CM30 YY=00.	• YY=00 Kind ofTrunk Route (1) 00-63: B channel Trunk Route No. (2) 00: ISDN Trunk
		(1) 00-63: D channel Trunk Route No. (2) 15◀: Not used
		• YY=04 Answer signal from distant office (1) 00-63: B channel Trunk Route No. (2) 2: Answer signal arrives (ISDN Trunk)
B		(1) 00-63: D channel Trunk Route No. (2) 7◀: Not used

	DESCRIPTION	DATA
B		
CM35	Specify the number of digits to be received on DID.	• YY=09 Incoming Connection Signaling (1) 00-63: B channel Trunk Route No. (2) 08: ISDN Indial **NOTE 1**
	NOTE 1: This data should be assigned to the B channel trunk route. For D channel trunk route, no data setting is required.	• YY=16 Hooking Signal Sending to outside (1) 00-63: B channel Trunk Route No. (2) 0: Not sending **NOTE 1**
		• YY=18 Digit conversion on DID call (1) 00-63: B channel Trunk Route No. (2) 0 : To provide 1◀: Not provided **NOTE 1**
		• YY=28 Outgoing Trunk Queuing (1) 00-63: B channel Trunk Route No. (2) 0: Restricted **NOTE 1**
	Determine trunk seizure sequence.	• YY=83 (1) 00-63: B channel Trunk Route No. (2) 0: As per CM08>078 **NOTE 1**
	NOTE 2: This data should be assigned to both B channel trunk route and D channel trunk route.	• YY=90 Assignment of BRT route for ISDN (1) 00-63: B channel/D channel Trunk Route No. (2) 2: ISDN-Basic Rate Interface **NOTE 2**
CM08	Select trunk seizure sequence.	(1) 078 (2) 1◀: Lowest available trunk
CM76	Assign the Number Conversion Block number.	• YY=00 (1) X-XXXX: DID No. (2) 000-999: Number Conversion Block No.
C		



DESCRIPTION	DATA
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. Terminate BRI trunks to a station for testing.	• YY=01 Day Mode • YY=02 Night Mode • YY=03 Mode A • YY=04 Mode B (1) 000-999: Number Conversion Block No. assigned by CM76 Y=00 (2) X-XXXXXXXX: Station No. to be terminated

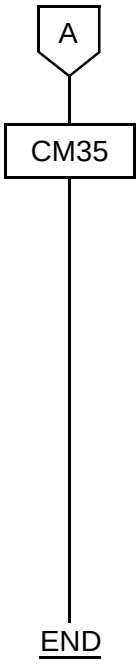
Home-Side Trunk Programming

START	DESCRIPTION	DATA
CM07	Assign a trunk number to each channels 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) 3200-3230: Virtual channel No. 00-30 (Even No.) of the Home-Side Trunk (2) D000-D255: Trunk No. Trunk No. already assignment by CM10 should not be used.
CM30	Assign a trunk route number to each trunk.	• YY=00 (1) 000-255: Trunk No. (2) 00-63: Trunk Route No.
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) 00-63: Trunk Route No. (2) 04: Tie Line
		• YY=01 (1) 00-63: Trunk Route No. (2) 2: DP
		• YY=04 (1) 00-63: Trunk Route No. (2) 2: Answer signal arrives
		• YY=09 (1) 00-63: Trunk Route No. (2) 06: 2nd DT/Timing Start
	Determine trunk seizure sequence.	• YY=83 (1) 00-63: B channel Trunk Route No. (2) 0: As per CM08>078
	Provide the common signaling channel and voice channel route with No. 7 CCIS facilities.	• YY=90 (1) 00-63: Trunk Route No. (2) 0: No. 7 CCIS
A		

	DESCRIPTION	DATA
A		
CM35	Assign a CCIS channel number to each common signaling channel and voice channel route.	• YY=91 (1) 00-63: Trunk Route No. (2) 0-7: CCIS Channel No.
	Specify the voice channel and common signaling channel route as the Event Based CCIS route.	• YYY=135 (1) 00-63: Trunk Route No. (2) 0: Event Based CCIS Route
CM08	Select trunk seizure sequence.	(1) 078 (2) 1◀: Lowest available trunk
CM30	Assign a Circuit Identification Code (CIC) number to each trunk used for voice channel.	• YY=35 (1) 000-255: Trunk No. (2) 001-254: CIC No.
	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.	
END		

Mate-Side Trunk Programming

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) 3201-3231: Virtual channel No. 01-31 (Odd No.) of the Mate-Side Trunk (2) D000-D255: Trunk No.
CM30	Assign a trunk route number to each trunk.	• YY=00 (1) 000-255: Trunk No. (2) 00-63: Trunk Route No.
	Assign a trunk number, of the opposite office, sent to the network on Event Based CCIS connection. The trunk number is sent by the subaddress to activate the relation between the trunks used for Event Based CCIS. **NOTE 1:** CM30 YY=19 is not required when the trunk number is sent by ISDN Indial dialed-in digits. (CM35 YYY=143>1) **NOTE 2:** CM30 YY=19 must be an unique combination between the offices.	• YY=19 (1) 000-255: Trunk No. (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) 00-63: Trunk Route No. (2) 04: Tie Line
	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) 00-63: Trunk Route No. (2) 00-31: Abbreviated Codes
A		



DESCRIPTION	DATA
Specify the voice channel and common signaling channel route as the Event Based CCIS route.	• YYY=135 (1) 00-63: Trunk Route No. (2) 0: Event Based CCIS Route
Specify which number is adopted for sending CCIS channel number of virtual trunks between the offices, either subaddress number or ISDN Indial dialed-in digits.	• YYY=143 (1) 00-63: Trunk Route No. (2) 0: By Subaddress 1: By dialed-in digits
Specify the Information Transfer Capability of the ISDN line used for Event Based CCIS.	• YYY=154 (1) 00-63: Trunk Route No. (2) 5 : 3.1 kHz audio 6 : Speech 7◀: Unrestricted digital information **NOTE:** Can't be used if opposite PBX is a NEAX2400.

- To provide Verification of Connection for Event Based CCIS, do the following programming. The following data must be set on the opposite PBX identically.
  See also the data setting example on the following pages.

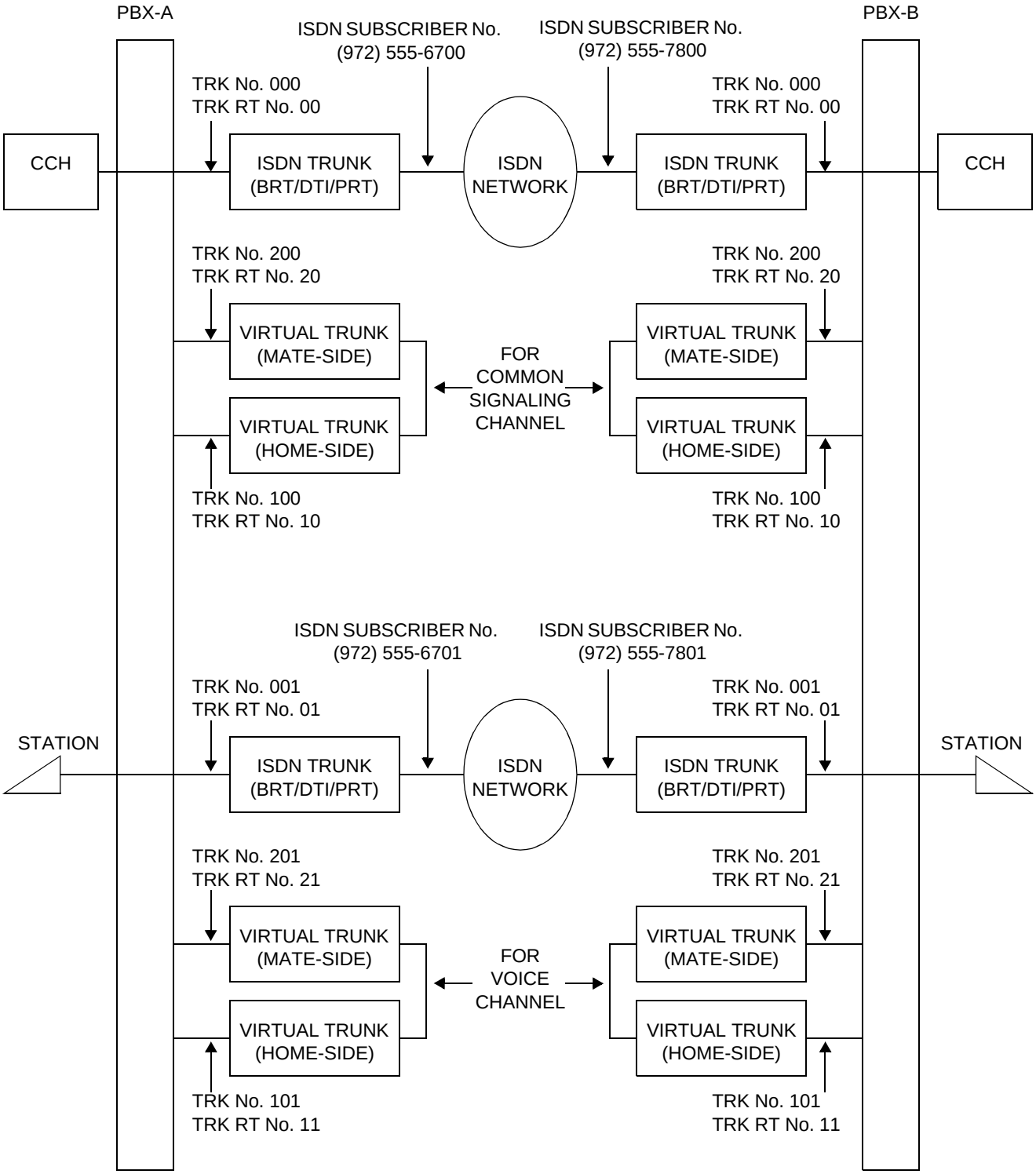
NOTE 1: This feature is available only for the connection between the NEAX2000 IVS^2/7400ICS M100MX's. The same programming must be set on the opposite office.

NOTE 2: This feature is available for installations consisting of PRI to PRI or PRI to BRI. Do not use for BRI to BRI.

START	DESCRIPTION	DATA
CM35	Provide Verification of Connection to the Mate-Side trunk route for the voice channels and the common signaling channel.	• YYY=152 (1) 00-63: Trunk Route No. of Mate-Side Trunk for voice channels and common signaling channel (2) 0: To provide
CM50	Assign the ISDN subscriber number of own office for the voice channel route and the common signaling channel route. This number is sent and verified with the number which is set by CM72 on the opposite office.	• YY=06 (1) 000-255: Trunk No. of Mate-Side Trunk for voice channels and common signaling channel (2) X...XXX: Subscriber No. of ISDN line for voice channels and common signaling channel (Max. 16 digits)
CM35	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) 00-63: Trunk Route No. of Mate-Side Trunk for voice channels and common signaling channel (2) 00-31◀: Abbreviated Codes
CM71	Assign the memory allocation to store the terminating number of the opposite office.	(1) 66 (2) XXX YYY XXX: 000-299: First Memory Slot No. YYY: 001-016: Number of Memory Slot allocated
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. **NOTE:** The data set by CM35 YY=40, CM71>66, and CM72 is used to verify the terminating number sent from the opposite office.	• Y=0 (1) 000-299: Memory Slot No. (2) Stored No. XXXX + , + YYY... XXXX: Access Code for ISDN YYY...: ISDN Subscriber No. of opposite office (Max. 16 digits)
END		

Figure 3-3 shows an example of the programming for verification of connection.

Figure 3-3 Verification of Connection



Programming example for PBX A shown in Figure 3-3.

CM35 YYY=152 (1) 20: Mate-Side trunk route number for common signaling channel
(2) 0: Provide Verification of Connection.

(1) 21: Mate-Side trunk route number for voice channel
(2) 0: Provide Verification of Connection.

CM50 YY=06 (1) 200: Mate-Side trunk number for common signaling channel
(2) 9725556700: ISDN subscriber number of ISDN line used for common signaling channel

(1) 201: Mate-Side trunk number for voice channel
(2) 9725556701: ISDN subscriber number of ISDN line used for voice channel

CM35 YY=40 (1) 20: Mate-Side trunk route number for common signaling channel
(2) 00: Abbreviated Code for terminating number of the opposite office

(1) 21: Mate-Side trunk route number for voice channel
(2) 01: Abbreviated Code for terminating number of the opposite office

CM71 (1) 66: Memory slot allocation for terminating number of opposite office
(2) 000002: First memory slot number=000 + number of memory slot allocated=2

CM72 Y=0 (1) 000: Memory slot number
(2) 0,9725557800: ISDN access code=0 + opposite office's ISDN subscriber number used for common signaling channel=9725557800

(1) 001: Memory slot number
(2) 0,9725557801: ISDN access code=0 + opposite office's ISDN subscriber number used for voice channel=9725557801

Programming example for PBX B shown in Figure 3-3.

CM35 YYY=152 (1) 20: Mate-Side trunk route number for common signaling channel
(2) 0: Provide Verification of Connection.

(1) 21: Mate-Side trunk route number for voice channel
(2) 0: Provide Verification of Connection.

CM50 YY=06 (1) 200: Mate-Side trunk number for common signaling channel
(2) 9725557800: ISDN subscriber number of ISDN line used for common signaling channel

(1) 201: Mate-Side trunk number for voice channel
(2) 9725557801: ISDN subscriber number of ISDN line used for voice channel

CM35 YY=40 (1) 20: Mate-Side trunk route number for common signaling channel
(2) 00: Abbreviated Code for terminating number of the opposite office

(1) 21: Mate-Side trunk route number for voice channel
(2) 01: Abbreviated Code for terminating number of the opposite office

CM71 (1) 66: Memory slot allocation for terminating number of opposite office
(2) 000002: First memory slot number=000 + number of memory slot allocated=2

CM72 Y=0 (1) 000: Memory slot number
(2) 0,9725556700: ISDN access code=0 + opposite office's ISDN subscriber number used for common signaling channel=9725556700

(1) 001: Memory slot number
(2) 0,9725556701: ISDN access code=0 + opposite office's ISDN subscriber number used for voice channel=9725556701

- To connect the ISDN line for the voice channel after the called party answers, do the following programming.
  By the following programming, the ISDN line for the voice channel is not connected, until the called party answers, or when the called party does not answers the call.

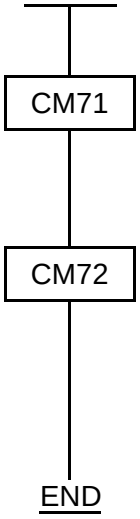
NOTE: This feature is available only for the connection between the NEAX2000 IVS^2/7400ICS M100MX's. The same programming must be set on the opposite office.

START	DESCRIPTION	DATA
CM35	Specify the ISDN answer signal sending timing as "when the called party answers".	• YYY=153 (1) 00-63: Trunk Route No. of Mate-Side Trunk for voice channels (2) 0: Send when the called party answers
	Specify the kind of the Information Transfer Capability of voice channel trunk route as "Speech".	• YYY=154 (1) 00-63: Trunk Route No. of Mate-Side Trunk for voice channels (2) 6: Speech
END		

Incoming Termination for Event Based CCIS Calls

START	DESCRIPTION	DATA
CM76	Assign the Number Conversion Block No.	• YY=00 (1) X-XXXX: DID No. (2) 000-999: Number Conversion Block No. 0-999
	Convert received digits to Mate-Side trunks.	• YY=01 Day Mode • YY=02 Night Mode • YY=03 Mode A • YY=04 Mode B (1) 000-999: Number Conversion Block No. assigned by CM76 Y=00 (2) BBBBB000-BBBBB255: Mate-Side Trunk No. of Virtual Trunk
END		

Access Code/Terminating Number Assignment for Outgoing Event Based Calls



DESCRIPTION	DATA
Allocate memory to store the terminating numbers to the opposite office.	(1) 66 (2) XXX YYY XXX: 000-299: First Memory Slot No. YYY: 001-016: Number of Memory Slot allocated
Assign terminating numbers of the opposite office (access code for ISDN line + ISDN subscriber number) to the Memory Slot number allocated by CM71.	• Y=0 (1) 000-299: Memory Slot No. (2) Stored No.: XX + , + ZZZ... XX : Access Code for ISDN ZZZ...: ISDN Subscriber No. of Opposite Office (Max. 26 digits)

Release Timer for Virtual Tie Lines (Home-Side and Mate-Side Trunks)

START	DESCRIPTION	DATA
CM41	Specify the release timer for 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 release timer for CCH channel of virtual tie line. If all the voice channels are released and there are no calls for predetermined time, the CCH 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		

CCH Data Assignment

START	DESCRIPTION	DATA
CM05	Assign an AP number to the CCH card (PN-SC00). The AP number must match the SENSE switch setting on the CCH card. (INITIAL)	• Y=0 (1) 04-15, 20-31: AP No. (2) 11: CCH Card
CM06	Assign a CCH channel number to each CCH card. (INITIAL)	• YY=07 (1) 0-7: CCH channel No. (2) 04-15, 20-31: AP No. of CCH Card
CMA7	Assign the trunk number used as the common signaling channel.	• YY=00 (1) 0-7: CCH channel No. (2) 000-255: Trunk No. assigned by CM07
	Assign an Originating Point Code (OPC) of own office and Destination Point Code (DPC) of opposite office, to each CCH channel.	• YY=01 (1) 0-7: CCH channel No. (2) 00001-16367: OPC
	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 CCH channels provided in the same system.	• YY=02 (1) 0-7: CCH channel No. (2) 00001-16367: DPC
	Assign ACM signal waiting timer.	• YY=10 (1) 0-7: CCH channel No. (2) 14: 28 sec.
CMA8	Assign CCH channel to which a signaling message is transferred according to the Destination Point Code (DPC) received.	(1) 00001-16367: DPC (2) 0-7: CCH channel No.
END		

Tandem Connection Programming

- 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.	• Y=0 (1) XX ZZ XX: 00-63: Incoming Trunk Route ZZ: 00-63: Outgoing Trunk Route (2) 0 : Allowed 1◀: Restricted
CM08	Tandem connection by station or attendant.	(1) 028 (2) 0 : Available 1◀: Not available
END		

Closed Numbering Plan Programming

START	DESCRIPTION	DATA
CM8A	Assign LCR Group number to Area Code Development Pattern.	• YYYY=A000 (1) 0-3: LCR Group No. (2) 4000-4007: Area Code Development Pattern No.
	Assign Area Code Development Pattern number.	• YYYY=4000-4007 (1) X...XXX: Area Code (Max. 8 digits) (2) 0000-0255: Route Pattern No.
	Assign Route Pattern.	• YYYY=0000-0255 (1) 1-4: 1st-4th Order (2) XXX ZZ XXX: 000-255: LCR/TR Pattern No. ZZ : 00-63: Trunk Route No.
CM85	Assign maximum number of sending digits.	• Y=0-7 Area Code Development Pattern No. 0-7 (1) X...XX: Area Code (Max. 8 digits) (2) 01-79: Max number of sending digits
END		

CHAPTER 4

CIRCUIT CARD INFORMATION

This chapter explains the mounting location, the meaning of lamp indications, and the method of switch settings of each circuit card for the ISDN system.

HOW TO READ THIS CHAPTER

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

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

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

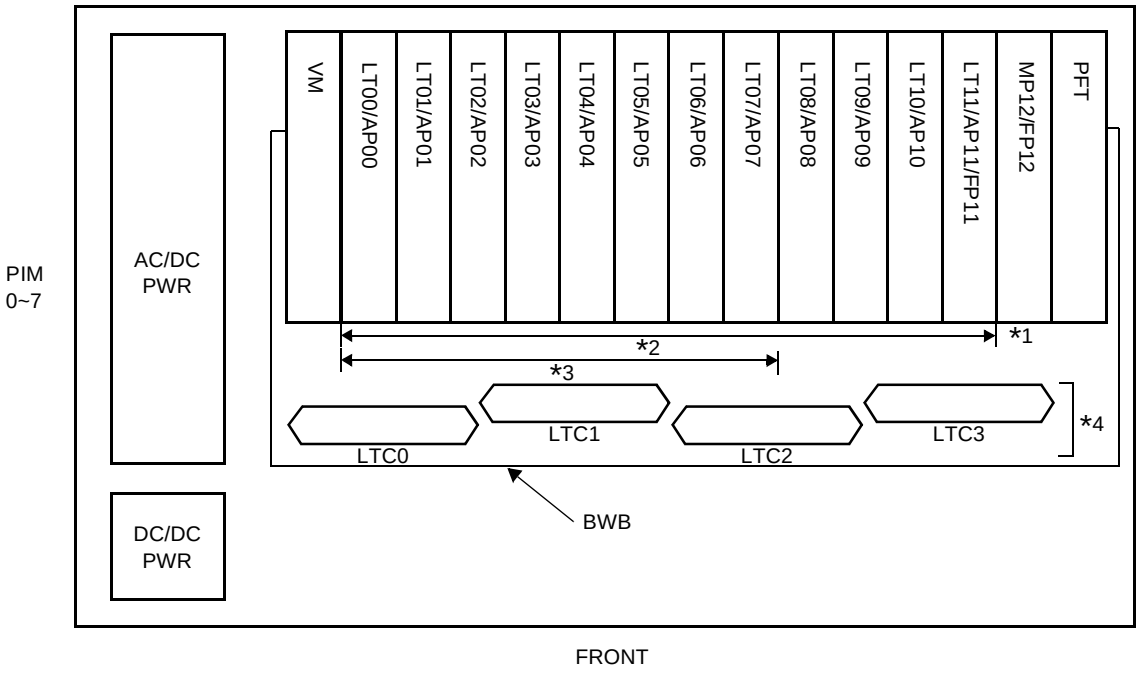
(3) Switch Settings
The name, settings, and functions of each switch equipped on each circuit card are described in a table.

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

MOUNTING LOCATION OF CIRCUIT CARD

This section explains the conditions for mounting circuit cards for the ISDN system. Figure 4-1 shows circuit card mounting slots allocated in the PIM.

Figure 4-1 Mounting Location of Circuit Card



*1: PN-CP14 (MP) card on the MP12 slot on PIM0.

*2: The following application processor cards can be mounted in the AP00-AP11 slots on PIM0-7.
- PN-BRTA (BRT)
- PN-2BRTC (BRT)
- PN-24DTA-C (DTI)
- PN-30DTC-A (DTI)
- PN-24PRTA (PRT)
- PN-SC00 (CCH)
- PN-SC01 (DCH)
- PN-SC03 (ICH)

*3: PN-ILCA (ILC) card on the LT00-LT07 slots on PIM0-7.

*4: PZ-M542/PZ-M557 (CONN) card on the LTC0-LTC3 connectors on the PIM which accommodates 30 DTI card.

LIST OF REQUIRED CIRCUIT CARDS

Table 4-1 shows the required circuit cards that are explained in this section.

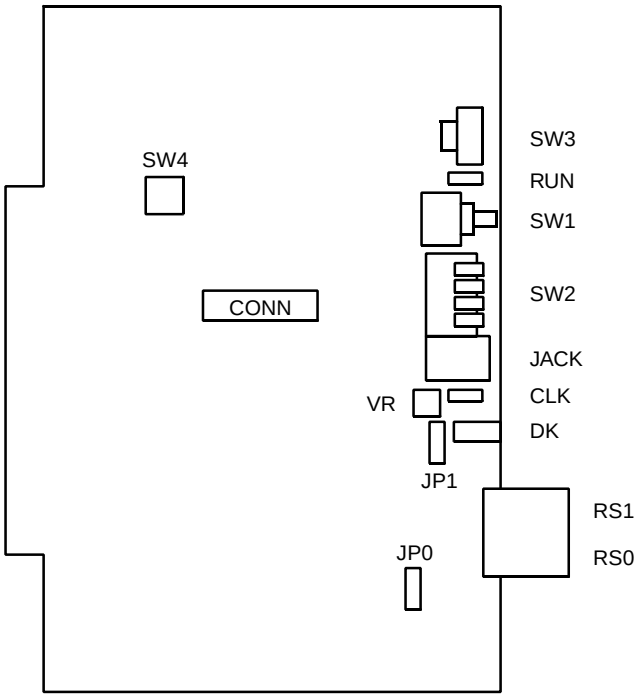
Table 4-1 List of Required Circuit Card

NAME (FUNCTIONAL NAME)	LAMP X: PROVIDED –: NOT PROVIDED	SWITCH X: PROVIDED –: NOT PROVIDED	EXTRACTION/ INSERTION WITH POWER ON X: ALLOWED Δ: ALLOWED AFTER MB* –: NOT ALLOWED	REFERENCE PAGE
PN-CP14 (MP)	X	X	–	Page 141
PN-BRTA (BRT)	X	X	Δ	Page 146
PN-2BRTC (BRT)	X	X	Δ	Page 151
PN-24DTA-C (DTI)	X	X	Δ	Page 156
PN-30DTC-A (DTI)	X	X	Δ	Page 162
PN-24PRTA (PRT)	X	X	Δ	Page 168
PN-SC00 (CCH)	X	X	Δ	Page 174
PN-SC01 (DCH)	X	X	Δ	Page 177
PN-SC03 (ICH)	X	X	Δ	Page 180
PZ-M542 (CONN)	–	X	X	Page 182
PZ-M557 (CONN)	–	X	X	Page 184
PN-2ILCA (ILC)	X	X	X	Page 186

* MB = Make Busy

PN-CP14 (MP)

Locations of Lamps, Switches, and Connectors



CONN: To CONNR connector on PZ-M537 (EXPMEM)

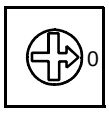
Lamp Indications

LAMP NAME	COLOR	FUNCTION
RUN	Green	Flashes at 120 IPM while this card is operating normally
CLK	Green	Remains lit while receiving clock signals to the PLO

Switch Settings

CAUTION

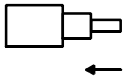
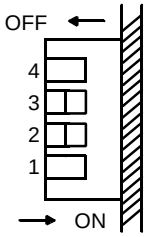
When the operating power is being supplied to this circuit card, do not plug/unplug this circuit card into/from its mounting slot.

SWITCH NAME	SWITCH NUMBER	SETTING POSITION	FUNCTION	CHECK
SW3 (Rotary SW)  **NOTE 1**	0-F	0	On Line (Call processing is in progress)	
		2	Off Line (Call processing is stopped) I/O port: As per CM40 YY=08	
		3	Off Line (Call processing is stopped) I/O port: 9600 bps (Fixed)	
		5 **NOTE 2**	Off Line (Call processing is stopped) I/O port: 9600 bps	
		6 **NOTE 2**	Off Line (Call processing is stopped) I/O port: 19200 bps	
		7 **NOTE 2**	Off Line (Call processing is stopped) I/O port: 38400 bps	
		8 **NOTE 2**	Off Line (Call processing is stopped) I/O port: 57600 bps	
		B	For clearing the office data	
		C	For setting the resident system program	
		1, 4, 9 A, D-F	Not used	

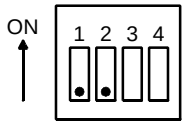
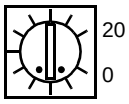
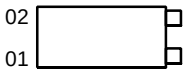
(Continued)

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

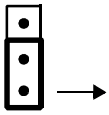
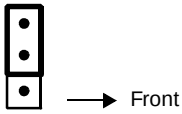
NOTE 2: Only when executing MP Program Download using the Software Activation Tool in MATWorX Studio, set the SW3 to 5-8.

<table>
<tr><th>SWITCH NAME</th><th>SWITCH NUMBER</th><th>SETTING POSITION</th><th>FUNCTION</th><th>CHECK</th></tr>
<tr><td>SW1 (Push SW)
  </td><td></td><td></td><td>For initializing CPU</td><td></td></tr>
<tr><td rowspan="4">SW2
(Piano Key SW)
  </td><td rowspan="2">1</td><td>ON</td><td>A-law (Australia)</td><td></td></tr>
<tr><td>OFF</td><td>μ-law (North America)</td><td></td></tr>
<tr><td>2, 3</td><td colspan="2">Selection of PLO0 input
(Phase Locked Oscillator)
• For clock receiver office:
<table><tr><th>SW2-2</th><th>SW2-3</th><th>FUNCTION</th></tr><tr><td>OFF</td><td>OFF</td><td>1.5 MHz clock
(For PN-24DTA-C/PN-24PRTA)</td></tr><tr><td>ON</td><td>OFF</td><td>192 kHz clock
(For PN-BRTA)</td></tr><tr><td>OFF</td><td>ON</td><td>2 MHz clock
(For PN-30DTC-A/PN-2BRTC)</td></tr><tr><td>ON</td><td>ON</td><td>Not used</td></tr></table>• For clock source office:
SW2-2 SW2-3
OFF OFF</td><td></td></tr>
<tr><td rowspan="2">4</td><td>ON</td><td>When using RS1 port for built-in MODEM</td><td></td></tr>
<tr><td>OFF</td><td>When using RS1 port for RS-232C</td><td></td></tr>
</table>

(Continued)

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

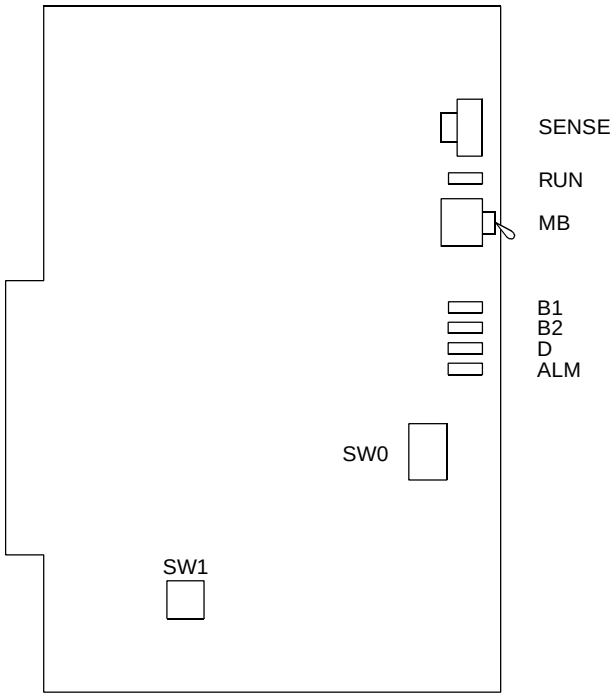
(Continued)

SWITCH NAME	SWITCH NUMBER	SETTING POSITION	FUNCTION	CHECK
JP0 (Jumper Pin) 		UP	Not used (Memory backup OFF)	
		DOWN	For normal operation (Memory backup ON)	
JP1 (Jumper Pin) 		UP	For using internal tone source	
		DOWN	For using external tone source	

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

PN-BRTA (BRT)

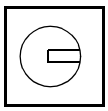
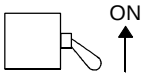
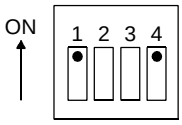
Locations of Lamps, Switches, and Connectors



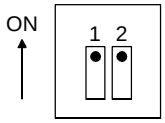
Lamp Indications

LAMP NAME	COLOR	FUNCTION
RUN	Green	Flashes at 120 IPM while this card is operating normally
B1	Green	B1 channel status ON: Busy OFF: Idle Flash (60 IPM): Make Busy
B2	Green	B2 channel status ON: Busy OFF: Idle Flash (60 IPM): Make Busy
D	Green	D channel status ON: Busy OFF: Idle
ALM	Red	Transmission line fault status ON: Line fault OFF: Normal operation

Switch Settings

<table>
<tr><th>SWITCH NAME</th><th>SWITCH NUMBER</th><th>SETTING POSITION</th><th>FUNCTION</th><th>CHECK</th></tr>
<tr><td rowspan="2">SENS
(Rotary SW)
 
NOTE 1</td><td>4-F</td><td colspan="2">Set the switch to match the AP Number (04-15) to be set by CM05.
<table><tr><td>AP No.</td><td>04</td><td>05</td><td>06</td><td>07</td><td>08</td><td>09</td><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td></tr><tr><td>SW No.</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>A</td><td>B</td><td>C</td><td>D</td><td>E</td><td>F</td></tr></table></td><td></td></tr>
<tr><td>0-3</td><td colspan="2">Not used</td><td></td></tr>
<tr><td rowspan="2">MB (Toggle SW)
 
NOTE 2</td><td rowspan="2"></td><td>UP</td><td>For make-busy</td><td></td></tr>
<tr><td>DOWN</td><td>For normal operation</td><td></td></tr>
<tr><td rowspan="8">SW0 (DIP SW)
  </td><td rowspan="2">1</td><td>ON</td><td>For normal operation</td><td></td></tr>
<tr><td>OFF</td><td>Not used</td><td></td></tr>
<tr><td rowspan="2">2
NOTE 3
NOTE 4</td><td>ON</td><td>Source clock signal from network is sent to the PLO of MP according to the switch setting of SW0-3.</td><td></td></tr>
<tr><td>OFF</td><td>Source clock signal from network is not sent to the PLO of MP card.</td><td></td></tr>
<tr><td rowspan="2">3
NOTE 3
NOTE 4</td><td>ON</td><td>Clock signal is sent to the PLO0 of MP.</td><td></td></tr>
<tr><td>OFF</td><td>Clock signal is sent to the PLO1 of MP.</td><td></td></tr>
<tr><td rowspan="2">4</td><td>ON</td><td>For normal operation</td><td></td></tr>
<tr><td>OFF</td><td>Not used</td><td></td></tr>
</table>

(Continued)

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	

(Continued)

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

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

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

NOTE 3: Set the SW0-2 and SW0-3 as follows:

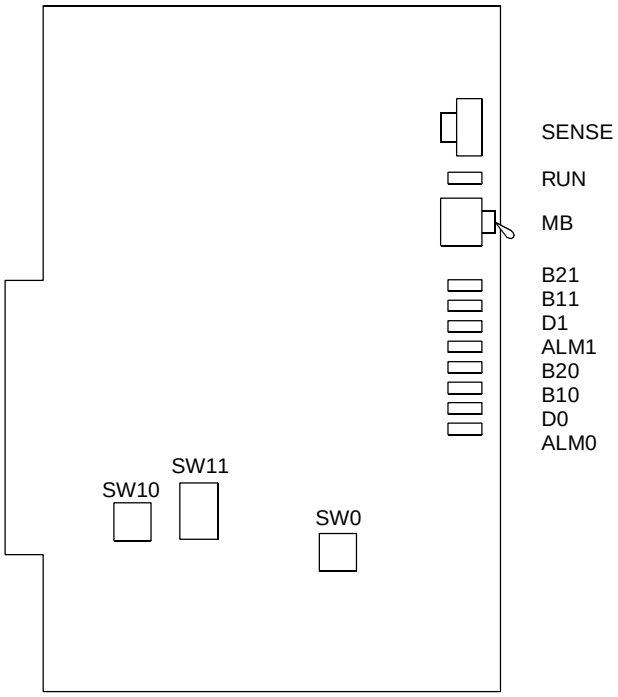
CONDITIONS	BRT0		BRT1		BRT2		----	BRT11		REMARKS
	SW 0-2	SW 0-3	SW 0-2	SW 0-3	SW 0-2	SW 0-3	----	SW 0-2	SW 0-3	
When one BRT is provided.	ON	ON								MP card will receive the clock signal from BRT0 at its PLO0 input.
When more than one BRT is provided.	ON	ON	ON	OFF	OFF	ON	----	OFF	ON	MP card will receive the clock signal from BRT0 at its PLO0 input, under normal conditions. If a clock failure occurs with BRT0, MP card switches to the PLO1 input which gets clock from BRT1.

NOTE 4: When the system is a clock source office, set the SW0-2 and SW0-3 on all the BRT cards mounted in PIM0 to OFF.

NOTE 5: Mount the BRT card which receives a source clock signals into PIM0.

PN-2BRTC (BRT)

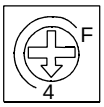
Locations of Lamps, Switches, and Connectors

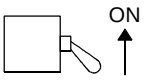


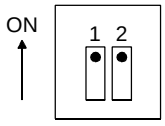
Lamp Indications

LAMP NAME	COLOR	FUNCTION	
RUN	Green	Flashes at 120 IPM while this card is operating normally	
B21	Red	No.1 Circuit	B2 channel status ON: Busy OFF: Idle Flash (60 IPM): Make Busy
B11	Red		B1 channel status ON: Busy OFF: Idle Flash (60 IPM): Make Busy
D1	Green		D channel status ON: Busy OFF: Idle
ALM1	Red		Transmission line fault status ON: Line fault OFF: Normal operation
B20	Red	No.0 Circuit	B2 channel status ON: Busy OFF: Idle Flash (60 IPM): Make Busy
B10	Red		B1 channel status ON: Busy OFF: Idle Flash (60 IPM): Make Busy
D0	Green		D channel status ON: Busy OFF: Idle
ALM0	Red		Transmission line fault status ON: Line fault OFF: Normal operation

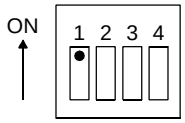
Switch Settings

<table>
<tr><th>SWITCH NAME</th><th>SWITCH NUMBER</th><th>SETTING POSITION</th><th>FUNCTION</th><th>CHECK</th></tr>
<tr><td rowspan="2">SENS
(Rotary SW)
 

NOTE 1</td><td>4-F</td><td colspan="2">Set the switch to match the AP Number (04-31) to be set by CM05.
<table><tr><td rowspan="2">AP No.</td><td>SW11-4: ON</td><td>04</td><td>05</td><td>06</td><td>07</td><td>08</td><td>09</td><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td></tr><tr><td>SW11-4: OFF</td><td>20</td><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td><td>27</td><td>28</td><td>29</td><td>30</td><td>31</td></tr><tr><td colspan="2">SW No.</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>A</td><td>B</td><td>C</td><td>D</td><td>E</td><td>F</td></tr></table></td><td></td></tr>
<tr><td>0-3</td><td colspan="2">Not used</td><td></td></tr>
<tr><td rowspan="2">MB (Toggle SW)
 

NOTE 2</td><td rowspan="2"></td><td>UP</td><td>For make-busy</td><td></td></tr>
<tr><td>DOWN</td><td>For normal operation</td><td></td></tr>
<tr><td rowspan="4">SW0, SW10
(DIP SW)
 
</td><td rowspan="2">1</td><td>ON</td><td>For terminating the transmitting side of channels B1 and B2 with 100 ohms</td><td></td></tr>
<tr><td>OFF</td><td>To remove the terminating resistor on the transmitting side of channels B1 and B2</td><td></td></tr>
<tr><td rowspan="2">2</td><td>ON</td><td>For terminating the receiving side of channels B1 and B2 with 100 ohms</td><td></td></tr>
<tr><td>OFF</td><td>To remove the terminating resistor on the receiving side of channels B1 and B2</td><td></td></tr>
</table>

(Continued)

SWITCH NAME	SWITCH NUMBER	SETTING POSITION	FUNCTION	CHECK
SW11 (DIP SW) 	1	ON	For normal operation	
		OFF	Not used	
	2 **NOTE 3** **NOTE 4**	ON	Output clock signals according to the switch setting of SW11-3	
		OFF	Do not output clock signals.	
	3 **NOTE 3** **NOTE 4**	ON	Output clock signals to PLO0 of MP	
		OFF	Output clock signals to PLO1 of MP	
	4	ON	AP No. 04-15	
		OFF	AP No. 20-31	

(Continued)

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

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

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

NOTE 3: The system can supply clock signals from two clock supply routes.
In normal condition, the system synchronizes to the clock signals supplied on the PLO0 of MP card via the Back Wiring Board, and if the clock signals fail, the clock supply route takes over to PLO1 automatically. Set SW11-2 and SW11-3 as follows:

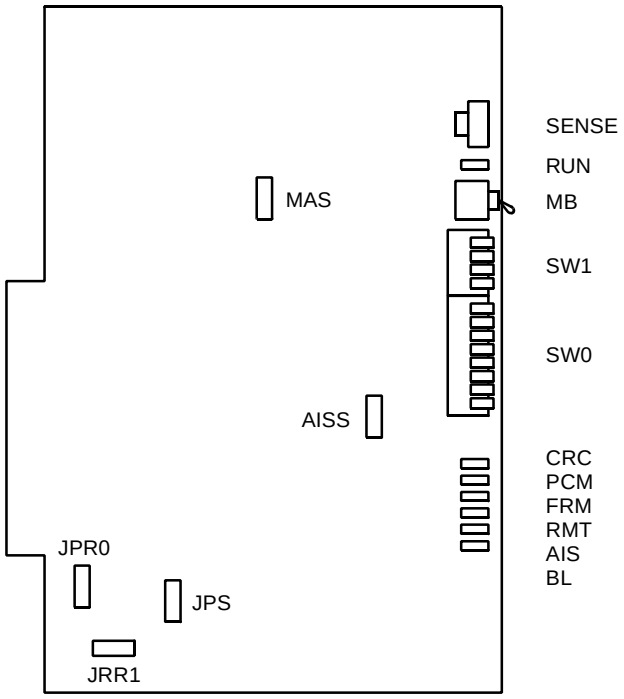
CONDITIONS	BRT0		BRT1		BRT2		----	BRT11		REMARKS
	SW 11-2	SW 11-3	SW 11-2	SW 11-3	SW 11-2	SW 11-3	----	SW 11-2	SW 11-3	
When one BRT is provided.	ON	ON								MP card will receive the clock signal from No.0 circuit of BRT0 at its PLO0 input. If a clock failure occurs with No. 0 circuit, MP card switches to No. 1 circuit of BRT0.
When more than one BRT is provided.	ON	ON	ON	OFF	OFF	ON	----	OFF	ON	MP card will receive the clock signal from BRT0 at its PLO0 input, under normal conditions. If a clock failure occurs with both No. 0 and No. 1 circuits of BRT0, MP card switches to the PLO1 input which gets clock from BRT1.

NOTE 4: When the system is a clock source office, set the SW11-2 and SW11-3 on all the BRT cards mounted in PIM0 to OFF.

NOTE 5: Mount the BRT card which receives a source clock signals into PIM0.

PN-24DTA-C (DTI)

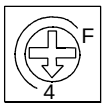
Locations of Lamps, Switches, and Connectors

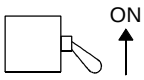


Lamp Indications

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

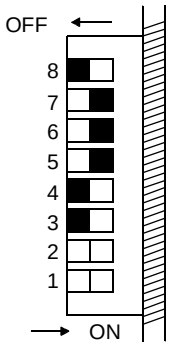
Switch Settings

<table>
<tr><th>SWITCH NAME</th><th>SWITCH NUMBER</th><th>SETTING POSITION</th><th>FUNCTION</th><th>CHECK</th></tr>
<tr><td rowspan="2">SENSE
(Rotary SW)
 

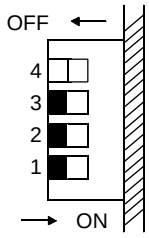
NOTE 1</td><td>0-3</td><td colspan="2">Not used</td><td></td></tr>
<tr><td>4-F</td><td colspan="2">Set the switch to match the AP Number (04-31) to be set by CM05.
<table><tr><td rowspan="2">AP No.</td><td>SW1-4: ON</td><td>04</td><td>05</td><td>06</td><td>07</td><td>08</td><td>09</td><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td></tr><tr><td>SW1-4: OFF</td><td>20</td><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td><td>27</td><td>28</td><td>29</td><td>30</td><td>31</td></tr><tr><td colspan="2">SW No.</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>A</td><td>B</td><td>C</td><td>D</td><td>E</td><td>F</td></tr></table></td><td></td></tr>
<tr><td rowspan="2">MB (Toggle SW)
 

NOTE 2</td><td rowspan="2"></td><td>UP</td><td>For make-busy</td><td></td></tr>
<tr><td>DOWN</td><td>For normal operation</td><td></td></tr>
</table>

(Continued)

<table>
<tr><th>SWITCH NAME</th><th>SWITCH NUMBER</th><th>SETTING POSITION</th><th>FUNCTION</th><th>CHECK</th></tr>
<tr><td rowspan="12">SW0
(Piano Key SW)
 
</td><td rowspan="2">1
NOTE 3
NOTE 4</td><td>ON</td><td>Source clock signal from network is sent to the PLO0 input on MP card.</td><td></td></tr>
<tr><td>OFF</td><td>Source clock signal from network is not sent to the PLO0 input on MP card.</td><td></td></tr>
<tr><td rowspan="2">2
NOTE 3
NOTE 4</td><td>ON</td><td>Source clock signal from network is sent to the PLO1 input on MP card.</td><td></td></tr>
<tr><td>OFF</td><td>Source clock signal from network is not sent to the PLO1 input on MP card.</td><td></td></tr>
<tr><td rowspan="2">3</td><td>ON</td><td>Remote loop-back</td><td></td></tr>
<tr><td>OFF</td><td>For normal operation</td><td></td></tr>
<tr><td rowspan="2">4</td><td>ON</td><td>Local loop-back (AIS send)</td><td></td></tr>
<tr><td>OFF</td><td>For normal operation</td><td></td></tr>
<tr><td rowspan="2">5</td><td>ON</td><td rowspan="6">Set equalizer according to the cable length between the PBX and the MDF.
<table><tr><th>SW0-5</th><th>SW0-6</th><th>SW0-7</th><th>CABLE LENGTH</th></tr><tr><td>ON</td><td>ON</td><td>ON</td><td>0-40 m (0-131.2 ft.)</td></tr><tr><td>ON</td><td>ON</td><td>OFF</td><td>40-80 m (131.2-262.5 ft.)</td></tr><tr><td>ON</td><td>OFF</td><td>ON</td><td>80-120 m (262.5-394 ft.)</td></tr><tr><td>ON</td><td>OFF</td><td>OFF</td><td>120-160 m (394-525 ft.)</td></tr><tr><td>OFF</td><td>ON</td><td>ON</td><td>160-200 m (525-656 ft.)</td></tr><tr><td>OFF</td><td>OFF</td><td>OFF</td><td>Signal is not sent</td></tr></table></td><td></td></tr>
<tr><td>OFF</td><td></td></tr>
<tr><td rowspan="2">6</td><td>ON</td><td></td></tr>
<tr><td>OFF</td><td></td></tr>
<tr><td rowspan="2">7</td><td>ON</td><td></td></tr>
<tr><td>OFF</td><td></td></tr>
<tr><td>8</td><td>OFF</td><td>Not used</td><td></td></tr>
</table>

(Continued)

SWITCH NAME	SWITCH NUMBER	SETTING POSITION	FUNCTION	CHECK
SW1 (Piano Key SW)  **NOTE 4**	1	OFF	Not used	
	2	OFF	Not used	
	3	OFF	Not used	
	4	ON	AP No. 04-15	
		OFF	AP No. 20-31	
JPR0 (Jumper Pin) 		UP	Neutral grounding on the receiving line is provided.	
		DOWN	Neutral grounding on the receiving line is not provided.	
JPR1 (Jumper Pin) 		Right	Line impedance: 100 ohms	
		Left	Line impedance: 110 ohms	
JPS (Jumper Pin) 		UP	Neutral grounding on the transmitting line is provided.	
		DOWN	Neutral grounding on the transmitting line is not provided.	
MAS (Jumper Pin) 		UP	Clock Source	
		DOWN	Clock Receiver	
AISS (Jumper Pin) 		UP	AIS signal is sent out when make-busy or power on.	
		DOWN	AIS signal is not sent out when make-busy or power on.	

(Continued)

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

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

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

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

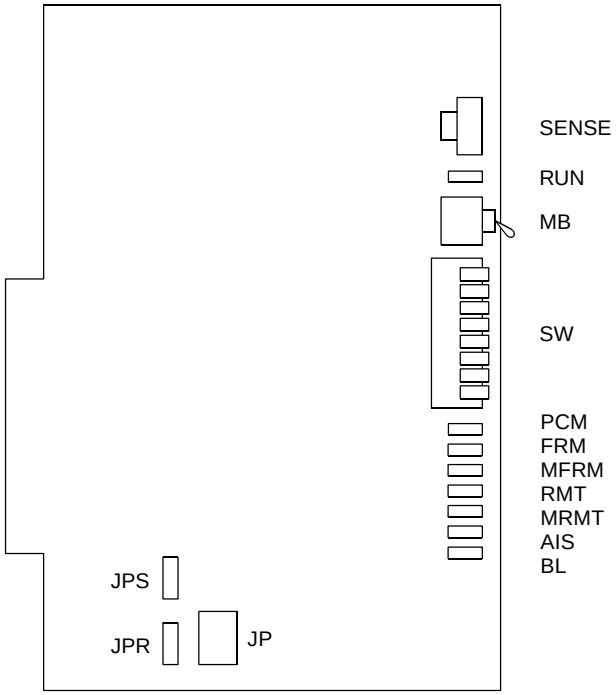
CONDITIONS	DTI0		DTI1		DTI2		DTI3		DTI4		REMARKS
	SW 0-1	SW 0-2	SW 0-1	SW 0-2	SW 0-1	SW 0-2	SW 0-1	SW 0-2	SW 0-1	SW 0-2	
When one DTI is provided.	ON	OFF	–	–	–	–	–	–	–	–	MP card will receive the clock signal from DTI0 at its PLO0 input.
When more than one DTI is provided.	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	MP card will receive the clock signal from DTI0 at its PLO0 input, under normal conditions. If a clock failure occurs with DTI0, MP card automatically switches to the PLO1 input which gets clock from DTI1.

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

NOTE 5: Mount the DTI card which receives a source clock signal into PIM0.

PN-30DTC-A (DTI)

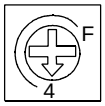
Locations of Lamps, Switches, and Connectors

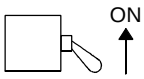


Lamp Indications

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

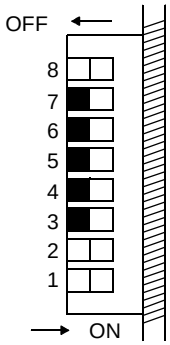
Switch Settings

<table>
<tr><th>SWITCH NAME</th><th>SWITCH NUMBER</th><th>SETTING POSITION</th><th>FUNCTION</th><th>CHECK</th></tr>
<tr><td rowspan="2">SENS
(Rotary SW)
 

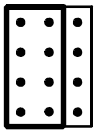
NOTE 1</td><td>4-F</td><td colspan="2">Set the switch to match the AP Number (04-31) to be set by CM05.
<table><tr><td rowspan="2">AP No.</td><td>SW-8: ON</td><td>04</td><td>05</td><td>06</td><td>07</td><td>08</td><td>09</td><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td></tr><tr><td>SW-8: OFF</td><td>20</td><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td><td>27</td><td>28</td><td>29</td><td>30</td><td>31</td></tr><tr><td colspan="2">SW No.</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>A</td><td>B</td><td>C</td><td>D</td><td>E</td><td>F</td></tr></table></td><td></td></tr>
<tr><td>0-3</td><td colspan="2">Not used</td><td></td></tr>
<tr><td>MB (Toggle SW)
 

NOTE 2</td><td rowspan="2"></td><td>UP</td><td>For make-busy</td><td></td></tr>
<tr><td>DOWN</td><td>For normal operation</td><td></td></tr>
</table>

(Continued)

SWITCH NAME	SWITCH NUMBER	SETTING POSITION	FUNCTION	CHECK
SW (Piano Key SW)  	1 **NOTE 3** **NOTE 4**	ON	Source clock signal from network is sent to the PLO0 input on MP card.	
		OFF	Source clock signal from network is not sent to the PLO0 input on MP card	
	2 **NOTE 3** **NOTE 4**	ON	Source clock signal from network is sent to the PLO1 input on MP card.	
		OFF	Source clock signal from network is not sent to the PLO1 input on MP card.	
	3	ON	Remote loop-back	
		OFF	For normal operation	
	4	ON	Local loop-back (AIS send)	
		OFF	For normal operation	
	5	ON	Transmission line cable: Coaxial cable (75 ohms)	
		OFF	Transmission line cable: Twisted-pair cable (120 ohms)	
	6	OFF	Always set to OFF	
	7	OFF		
	8	ON	AP No. 04-15	
		OFF	AP No. 20-31	

(Continued)

SWITCH NAME	SWITCH NUMBER	SETTING POSITION	FUNCTION	CHECK
JPS (Jumper Pin) 		UP	Balanced transmission (For twisted-pair cable)	
		DOWN	TA is grounded on the transmission line (For coaxial cable)	
JPR (Jumper Pin) 		UP	Balanced transmission (For twisted-pair cable)	
		DOWN	RA is grounded on the transmission line (For coaxial cable)	
JP (Jumper Pin) 		RIGHT	Line impedance: 75 ohms (For coaxial cable)	
		LEFT	Line impedance: 120 ohms (For twisted-pair cable)	

(Continued)

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

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

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

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

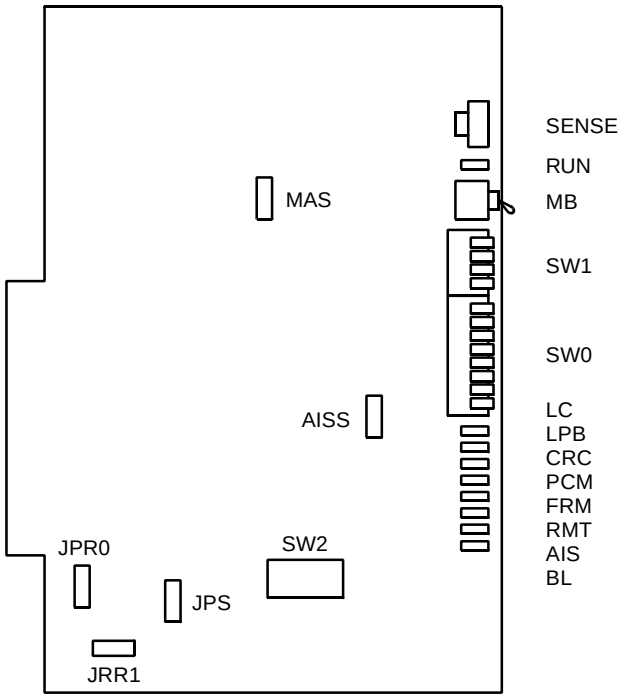
CONDITIONS	DTI0		DTI1		DTI2		DTI3		REMARKS
	SW-1	SW-2	SW-1	SW-2	SW-1	SW-2	SW-1	SW-2	
When one DTI is provided.	ON	OFF	–	–	–	–	–	–	MP card will receive the clock signal from DTI0 at its PLO0 input.
When more than one DTI is provided.	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	MP card will receive the clock signal from DTI0 at its PLO0 input, under normal conditions. If a clock failure occurs with DTI0, MP card automatically switches to the PLO1 input which gets from DTI1.

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

NOTE 5: Mount the DTI card which receives a source clock signal into PIM0.

PN-24PRTA (PRT)

Locations of Lamps, Switches, and Connectors



Lamp Indications

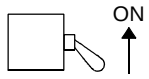
LAMP NAME	COLOR	FUNCTION
RUN	Green	Flashes at 120 IPM while this card is operating normally
LC	Green	Remains lit when communications are normally ongoing with the D channel data links connected
LPB	–	Not used
CRC	Red	Remains lit when detecting Cyclic Redundancy Checking (CRC) errors
PCM	Red	Remains lit when detecting PCM signal loss
FRM	Red	Remains lit when detecting Frame Alignment signal loss
RMT	Red	Remains lit when receiving Frame Alignment signal loss alarm from a distant office
AIS	Red	Remains lit when a pattern of consecutive “1” is received. The distant office transmits this signal for a loop-back test.
BL	Red	B channel status ON : More than 10 channels are busy. OFF : All channels are idle. Flash (60 IPM) : Only one channel is busy. Flash (120 IPM) : 2 through 10 channels are busy.

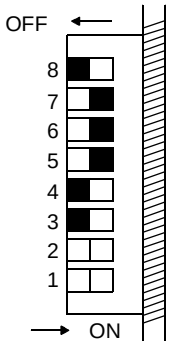
Switch Settings

<table>
<tr><th>SWITCH NAME</th><th>SWITCH NUMBER</th><th>SETTING POSITION</th><th>FUNCTION</th><th>CHECK</th></tr>
<tr><td rowspan="2">SENSE
(Rotary SW)
 

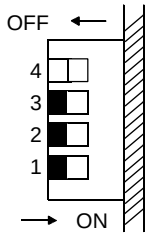
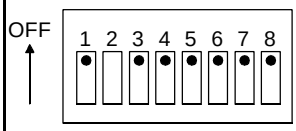
NOTE 1</td><td>0-3</td><td colspan="2">Not used</td><td></td></tr>
<tr><td>4-F</td><td colspan="2">Set the switch to match the AP Number (04-31) to be set by CM05.
<table><tr><td rowspan="2">AP No.</td><td>SW1-4: ON</td><td>04</td><td>05</td><td>06</td><td>07</td><td>08</td><td>09</td><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td></tr><tr><td>SW1-4: OFF</td><td>20</td><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td><td>27</td><td>28</td><td>29</td><td>30</td><td>31</td></tr><tr><td colspan="2">SW No.</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>A</td><td>B</td><td>C</td><td>D</td><td>E</td><td>F</td></tr></table></td><td></td></tr>
</table>

(Continued)

<table>
<tr><th>SWITCH NAME</th><th>SWITCH NUMBER</th><th>SETTING POSITION</th><th>FUNCTION</th><th>CHECK</th></tr>
<tr><td rowspan="2">MB (Toggle SW)
 

NOTE 2</td><td rowspan="2"></td><td>UP</td><td>For make-busy</td><td></td></tr>
<tr><td>DOWN</td><td>For normal operation</td><td></td></tr>
<tr><td rowspan="10">SW0
(Piano Key SW)
 
</td><td rowspan="2">1
NOTE 3
NOTE 4</td><td>ON</td><td>Source clock signal from network is sent to the PLO0 input on MP card.</td><td></td></tr>
<tr><td>OFF</td><td>Source clock signal from network is not sent to the PLO0 input on MP card.</td><td></td></tr>
<tr><td rowspan="2">2
NOTE 3
NOTE 4</td><td>ON</td><td>Source clock signal from network is sent to the PLO1 input on MP card.</td><td></td></tr>
<tr><td>OFF</td><td>Source clock signal from network is not sent to the PLO1 input on MP card.</td><td></td></tr>
<tr><td rowspan="2">3</td><td>ON</td><td>Remote loop-back</td><td></td></tr>
<tr><td>OFF</td><td>For normal operation</td><td></td></tr>
<tr><td rowspan="2">4</td><td>ON</td><td>Local loop-back (AIS send)</td><td></td></tr>
<tr><td>OFF</td><td>For normal operation</td><td></td></tr>
<tr><td rowspan="2">5</td><td>ON</td><td rowspan="4">Set equalizer according to the cable length between the PBX and the MDF.
<table><tr><th>SW0-5</th><th>SW0-6</th><th>SW0-7</th><th>CABLE LENGTH</th></tr><tr><td>ON</td><td>ON</td><td>ON</td><td>0-40 m (0-131.2 ft.)</td></tr><tr><td>ON</td><td>ON</td><td>OFF</td><td>40-80 m (131.2-262.5 ft.)</td></tr><tr><td>ON</td><td>OFF</td><td>ON</td><td>80-120 m (262.5-394 ft.)</td></tr><tr><td>ON</td><td>OFF</td><td>OFF</td><td>120-160 m (394-525 ft.)</td></tr><tr><td>OFF</td><td>ON</td><td>ON</td><td>160-200 m (525-656 ft.)</td></tr><tr><td>OFF</td><td>OFF</td><td>OFF</td><td>Signal is not sent</td></tr></table></td><td></td></tr>
<tr><td>OFF</td><td></td></tr>
<tr><td rowspan="2">6</td><td>ON</td><td></td></tr>
<tr><td>OFF</td><td></td></tr>
<tr><td rowspan="2">7</td><td>ON</td><td></td><td></td></tr>
<tr><td>OFF</td><td></td><td></td></tr>
<tr><td>8</td><td>OFF</td><td>Not used</td><td></td></tr>
</table>

(Continued)

SWITCH NAME	SWITCH NUMBER	SETTING POSITION	FUNCTION	CHECK
SW1 (Piano Key SW)  **NOTE 4**	1	OFF	Not used	
	2	OFF	Not used	
	3	OFF	Not used	
	4	ON	AP No. 04-15	
		OFF	AP No. 20-31	
SW2 (DIP SW)  	1	OFF	Always set to OFF.	
	2	[North America only for AT&T]		
		ON	Deletion of Area Code on International Outgoing call	
		OFF	No deletion of Area Code on International Outgoing call	
		[Australia/Other countries]		
		OFF	Always set to OFF.	
	3	OFF	Always set to OFF.	
	4	OFF	Always set to OFF.	
	5	OFF	Always set to OFF.	
	6	OFF	Always set to OFF.	
	7	OFF	Always set to OFF.	
	8	OFF	Always set to OFF.	

(Continued)

SWITCH NAME	SWITCH NUMBER	SETTING POSITION	FUNCTION	CHECK
JPR0 (Jumper Pin) 		UP	Neutral grounding on the receiving line is provided.	
		(DOWN)	Neutral grounding on the receiving line is not provided.	
JPR1 (Jumper Pin) 		(Right)	Line impedance: 100 ohms	
		Left	Line impedance: 110 ohms	
JPS (Jumper Pin) 		UP	Neutral grounding on the transmitting line is provided.	
		(DOWN)	Neutral grounding on the transmitting line is not provided.	
MAS (Jumper Pin) 		UP	Clock Source	
		(DOWN)	Clock Receiver	
AISS (Jumper Pin) 		(UP)	AIS signal is sent out when make-busy or power on.	
		DOWN	AIS signal is not sent out when make-busy or power on.	

(Continued)

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

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

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

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

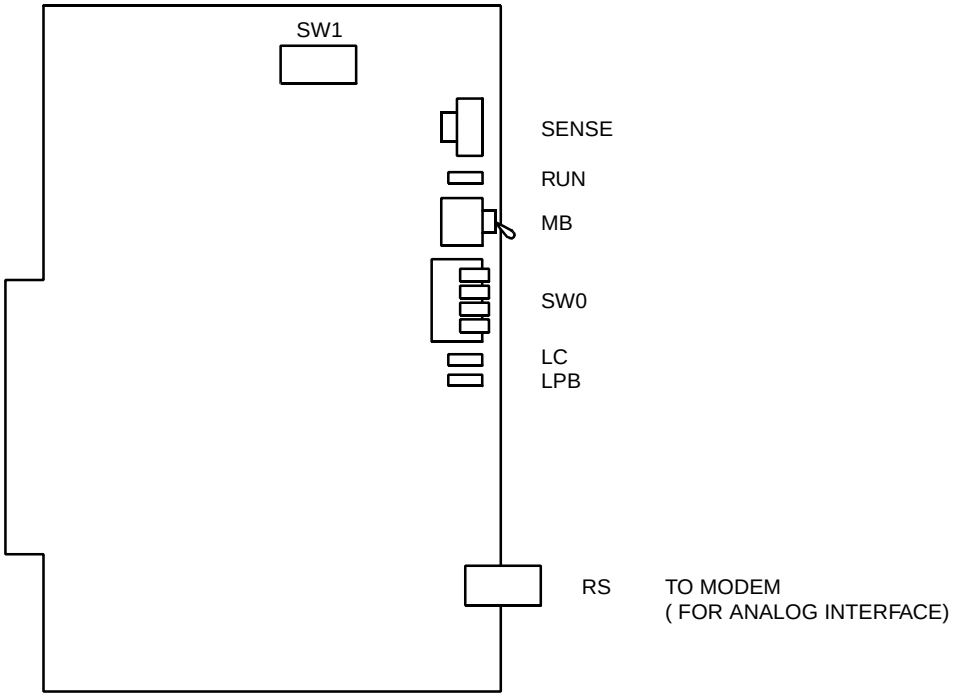
CONDITIONS	PRT0		PRT1		PRT2		PRT3		PRT4		REMARKS
	SW 0-1	SW 0-2	SW 0-1	SW 0-2	SW 0-1	SW 0-2	SW 0-1	SW 0-2	SW 0-1	SW 0-2	
When one PRT is provided.	ON	OFF	–	–	–	–	–	–	–	–	MP card will receive the clock signal from PRT0 at its PLO0 input.
When more than one PRT is provided.	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	MP card will receive the clock signal from PRT0 at its PLO0 input, under normal conditions. If a clock failure occurs with PRT0, MP card automatically switches to the PLO1 input which gets clock from PRT1.

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

NOTE 5: Mount the PRT card which receives a source clock signal into PIM 0.

PN-SC00 (CCH)

Locations of Lamps, Switches and Connectors

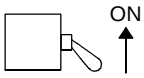


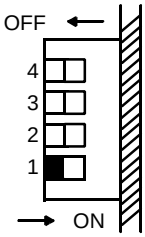
Lamp Indications

LAMP NAME	COLOR	FUNCTION
RUN	Green	Flashes at 120 IPM while this card is operating normally
LC	Green	Remains lit when communications are normally ongoing with the common signalling channel data links connected
LPB	Green	Remains lit when a loop-back test is in progress

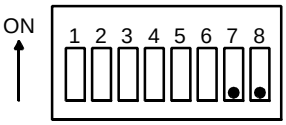
Switch Settings

<table>
<tr><th>SWITCH NAME</th><th>SWITCH NUMBER</th><th>SETTING POSITION</th><th>FUNCTION</th><th>CHECK</th></tr>
<tr><td rowspan="2">SENS
(Rotary SW)
 

NOTE 1</td><td>4-F</td><td colspan="2">Set the switch to match the AP Number (04-31) to be set by CM05.
<table><tr><td rowspan="2">AP No.</td><td>SW0-4: ON</td><td>04</td><td>05</td><td>06</td><td>07</td><td>08</td><td>09</td><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td></tr><tr><td>SW0-4: OFF</td><td>20</td><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td><td>27</td><td>28</td><td>29</td><td>30</td><td>31</td></tr><tr><td colspan="2">SW No.</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>A</td><td>B</td><td>C</td><td>D</td><td>E</td><td>F</td></tr></table></td><td></td></tr>
<tr><td>0-3</td><td colspan="2">Not used</td><td></td></tr>
<tr><td>MB (Toggle SW)
 

NOTE 2</td><td rowspan="2"></td><td>UP</td><td>For make-busy</td><td></td></tr>
<tr><td>DOWN</td><td>For normal operation</td><td></td></tr>
<tr><td rowspan="8">SW0
(Piano Key SW)
 
</td><td rowspan="2">1</td><td>ON</td><td>Loop-back test</td><td></td></tr>
<tr><td>OFF</td><td>For normal operation</td><td></td></tr>
<tr><td rowspan="2">2</td><td>ON</td><td>Analog interface</td><td></td></tr>
<tr><td>OFF</td><td>Digital interface</td><td></td></tr>
<tr><td rowspan="2">3</td><td>ON</td><td>RS-232C RTS signal (to MODEM) ON NOTE 3</td><td></td></tr>
<tr><td>OFF</td><td>RS-232C RTS signal (to MODEM) OFF</td><td></td></tr>
<tr><td rowspan="2">4</td><td>ON</td><td>AP No. 04-15</td><td></td></tr>
<tr><td>OFF</td><td>AP No. 20-31</td><td></td></tr>
</table>

(Continued)

<table>
<tr><th>SWITCH NAME</th><th>SWITCH NUMBER</th><th>SETTING POSITION</th><th>FUNCTION</th><th>CHECK</th></tr>
<tr><td rowspan="10">SW1(DIP SW)
  </td><td rowspan="2">1</td><td>ON</td><td rowspan="10">• Common channel signalling data transmission speed (For Digital Interface)
<table><tr><th>TRANSMISSION SPEED</th><th>SW 1-1</th><th>SW 1-2</th><th>SW 1-3</th><th>SW 1-4</th><th>SW 1-5</th></tr><tr><td>48 Kbps NOTE 4</td><td>ON</td><td>ON</td><td>OFF</td><td>OFF</td><td>ON</td></tr><tr><td>48 Kbps NOTE 4</td><td>ON</td><td>ON</td><td>ON</td><td>OFF</td><td>ON</td></tr><tr><td>56 Kbps</td><td>ON</td><td>ON</td><td>OFF</td><td>ON</td><td>ON</td></tr><tr><td>64 Kbps</td><td>ON</td><td>ON</td><td>ON</td><td>ON</td><td>ON</td></tr></table>
• Common channel signalling data transmission speed (For Analog Interface)

Set switches (SW1-1 - SW1-5) to OFF.</td><td></td></tr>
<tr><td>OFF</td><td></td></tr>
<tr><td rowspan="2">2</td><td>ON</td><td></td></tr>
<tr><td>OFF</td><td></td></tr>
<tr><td rowspan="2">3</td><td>ON</td><td></td></tr>
<tr><td>OFF</td><td></td></tr>
<tr><td rowspan="2">4</td><td>ON</td><td></td></tr>
<tr><td>OFF</td><td></td></tr>
<tr><td rowspan="2">5</td><td>ON</td><td></td></tr>
<tr><td>OFF</td><td></td></tr>
<tr><td rowspan="2">6</td><td>ON</td><td>A-law</td><td></td></tr>
<tr><td>OFF</td><td>μ-law</td><td></td></tr>
<tr><td>7</td><td>OFF</td><td>Always set to OFF.</td><td></td></tr>
<tr><td>8</td><td>OFF</td><td>Always set to OFF.</td><td></td></tr>
</table>

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

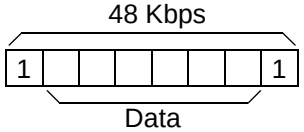
NOTE 1: Set the groove on the switch to the desired position.

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

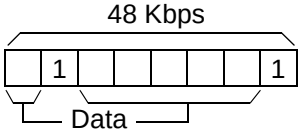
NOTE 3: This setting is available when SW0-2 is set to ON (Analog Interface).

NOTE 4: The following two kind of rate adaptation methods are available in 48 Kbps data transmission. The rate adaptation method must be set to match the rate adaptation of master office.

- SW1-3: OFF

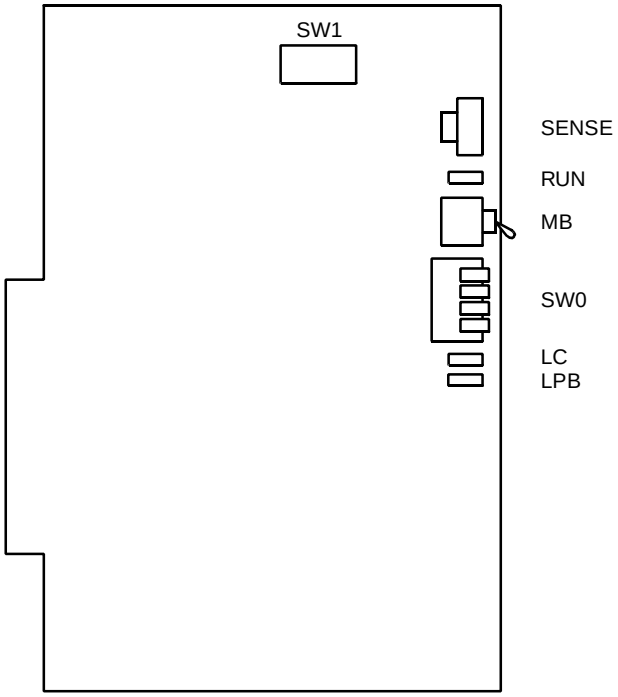


- SW1-3: ON



PN-SC01 (DCH)

Locations of Lamps, Switches, and Connectors

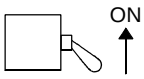


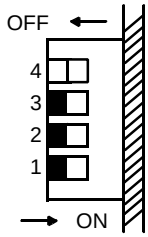
Lamp Indications

LAMP NAME	COLOR	FUNCTION
RUN	Green	Flashes at 120 IPM while this card is operating normally
LC	Green	Remains lit when communications are normally ongoing with the D channel data links connected
LPB	Green	Not used

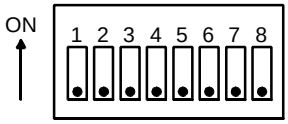
Switch Settings

<table>
<tr><th>SWITCH NAME</th><th>SWITCH NUMBER</th><th>SETTING POSITION</th><th>FUNCTION</th><th>CHECK</th></tr>
<tr><td rowspan="2">SENS
(Rotary SW)
 

NOTE 1</td><td>4-F</td><td colspan="2">Set the switch to match the AP Number (04-31) to be set by CM05.
<table><tr><td rowspan="2">AP No.</td><td>SW0-4: ON</td><td>04</td><td>05</td><td>06</td><td>07</td><td>08</td><td>09</td><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td></tr><tr><td>SW0-4: OFF</td><td>20</td><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td><td>27</td><td>28</td><td>29</td><td>30</td><td>31</td></tr><tr><td colspan="2">SW No.</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>A</td><td>B</td><td>C</td><td>D</td><td>E</td><td>F</td></tr></table></td><td></td></tr>
<tr><td>0-3</td><td colspan="2">Not used</td><td></td></tr>
<tr><td rowspan="2">MB (Toggle SW)
 

NOTE 2</td><td rowspan="2"></td><td>UP</td><td>For make-busy</td><td></td></tr>
<tr><td>DOWN</td><td>For normal operation</td><td></td></tr>
<tr><td rowspan="5">SW0
(Piano Key SW)
 
</td><td>1</td><td>OFF</td><td>Always set to OFF.</td><td></td></tr>
<tr><td>2</td><td>OFF</td><td>Always set to OFF.</td><td></td></tr>
<tr><td>3</td><td>OFF</td><td>Always set to OFF.</td><td></td></tr>
<tr><td rowspan="2">4</td><td>ON</td><td>AP No. 04-15</td><td></td></tr>
<tr><td>OFF</td><td>AP No. 20-31</td><td></td></tr>
</table>

(Continued)

SWITCH NAME	SWITCH NUMBER	SETTING POSITION	FUNCTION	CHECK
SW1 (DIP SW) 	1	OFF	Always set to OFF.	
	2	OFF	Always set to OFF.	
	3	OFF	Always set to OFF.	
	4	OFF	Always set to OFF.	
	5	OFF	Always set to OFF.	
	6	OFF	Always set to OFF.	
	7	OFF	Always set to OFF.	
	8	OFF	Always set to OFF.	

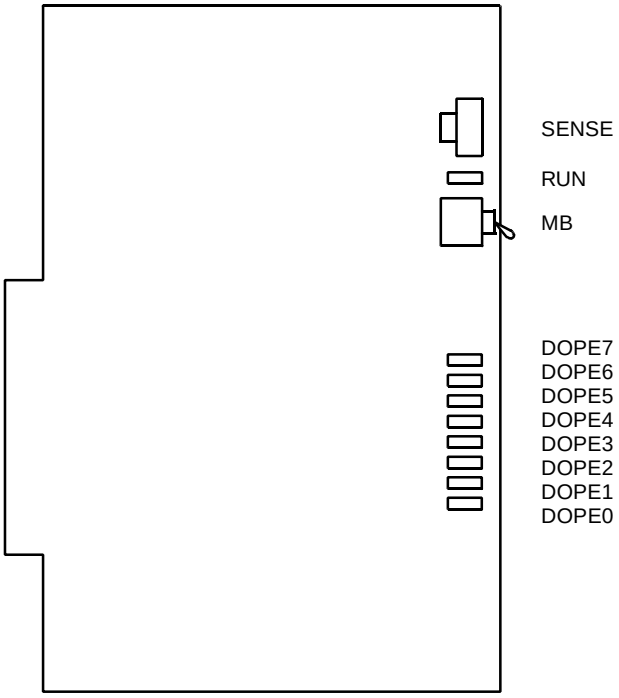
The figure in the SWITCH NAME column and the position in ( ) in the SETTING POSITION column indicate the standard setting of the switch. When the switch is not set as shown by the figure and ( ) , the setting of the switch varies with the system concerned.

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

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

PN-SC03 (ICH)

Locations of Lamps, Switches, and Connectors

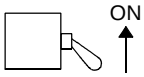


Lamp Indications

LAMP NAME	COLOR	FUNCTION
RUN	Green	Flashes at 120 IPM while this card is operating normally
DOPE7	Green	Remains lit when No. 7 circuit D channel link is connected
DOPE6	Green	Remains lit when No. 6 circuit D channel link is connected
DOPE5	Green	Remains lit when No. 5 circuit D channel link is connected
DOPE4	Green	Remains lit when No. 4 circuit D channel link is connected
DOPE3	Green	Remains lit when No. 3 circuit D channel link is connected
DOPE2	Green	Remains lit when No. 2 circuit D channel link is connected
DOPE1	Green	Remains lit when No. 1 circuit D channel link is connected
DOPE0	Green	Remains lit when No. 0 circuit D channel link is connected

Switch Settings

<table>
<tr><th>SWITCH NAME</th><th>SWITCH NUMBER</th><th>SETTING POSITION</th><th>FUNCTION</th><th>CHECK</th></tr>
<tr><td rowspan="2">SENSE
(Rotary SW)
 

NOTE 1</td><td>4-F</td><td colspan="3">Set the switch to match the AP Number (04-15) to be set by CM05.
<table><tr><td>AP No.</td><td>04</td><td>05</td><td>06</td><td>07</td><td>08</td><td>09</td><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td></tr><tr><td>SW No.</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>A</td><td>B</td><td>C</td><td>D</td><td>E</td><td>F</td></tr></table></td></tr>
<tr><td>0-3</td><td>Not used</td><td></td><td></td></tr>
<tr><td rowspan="2">MB (Toggle SW)
 

NOTE 2</td><td rowspan="2"></td><td>UP</td><td>For make-busy</td><td></td></tr>
<tr><td>DOWN</td><td>For normal operation</td><td></td></tr>
</table>

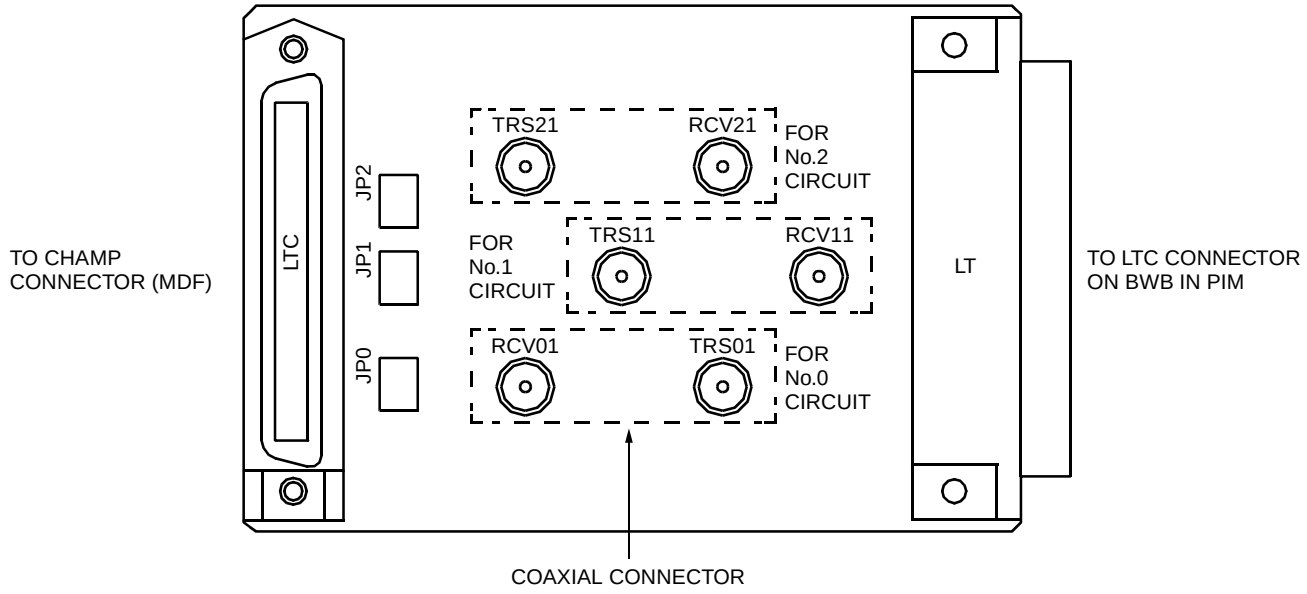
The figure in the SWITCH NAME column and the position in ( ) in the SETTING POSITION column indicate the standard setting of the switch. When the switch is not set as shown by the figure and ( ), the setting of the switch varies with the system concerned.

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

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

PZ-M542 (CONN)

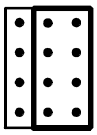
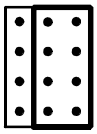
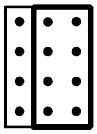
Locations of Lamps, Switches, and Connectors



Lamp Indications

This card has no lamps.

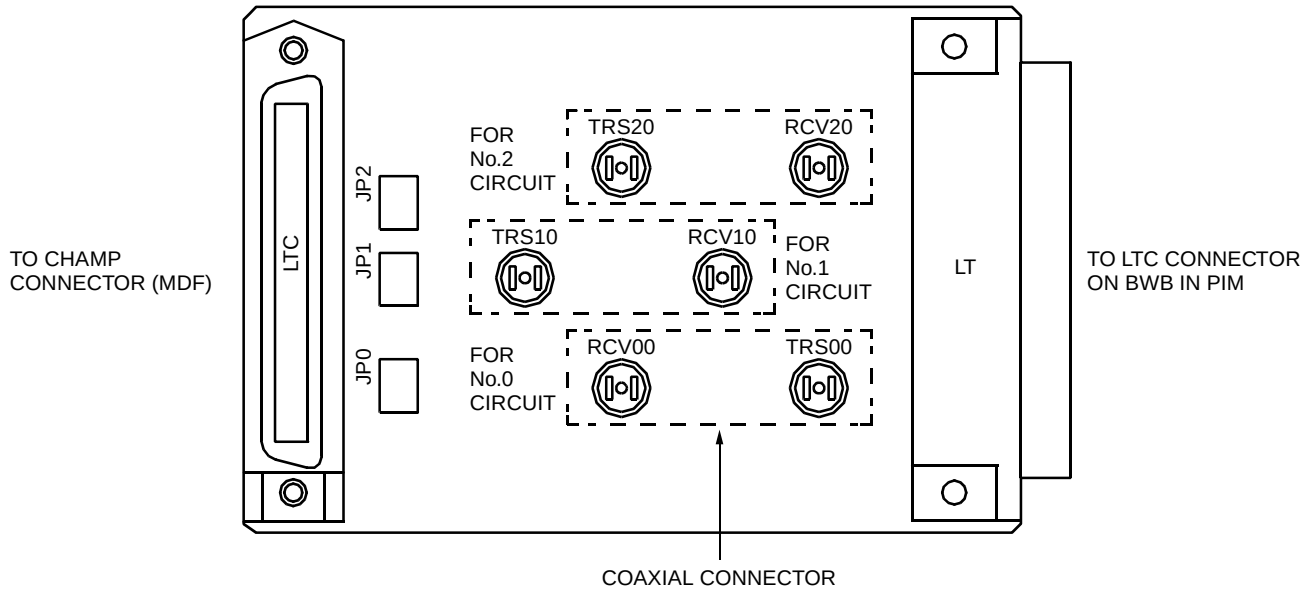
Switch Settings

SWITCH NAME	SWITCH NUMBER	SETTING POSITION	FUNCTION	CHECK
JP0 		RIGHT	For coaxial connectors (No. 0 circuit)	
		LEFT	For champ connector (LT connector) (No. 0 circuit)	
JP1 		RIGHT	For coaxial connectors (No. 1 circuit)	
		LEFT	For champ connector (LT connector) (No. 1 circuit)	
JP2 		RIGHT	For coaxial connectors (No. 2 circuit)	
		LEFT	For champ connector (LT connector) (No. 2 circuit)	

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

PZ-M557 (CONN)

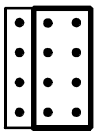
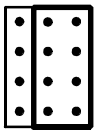
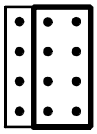
Locations of Lamps, Switches, and Connectors



Lamp Indications

This card has no lamps.

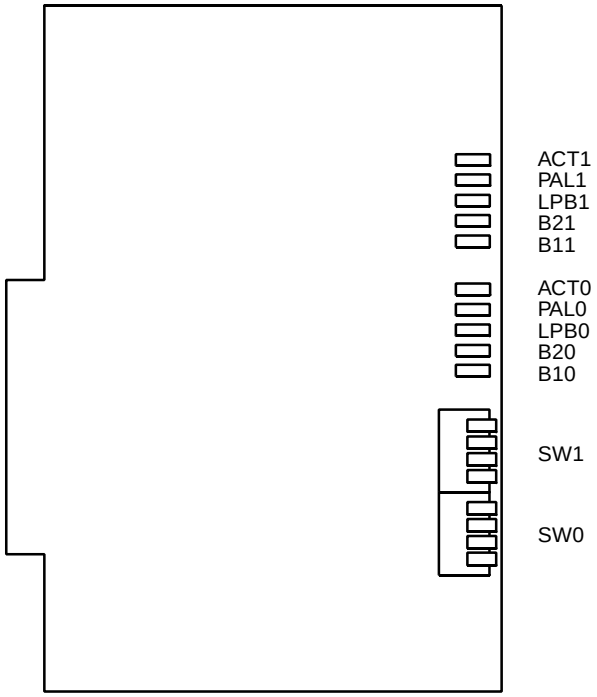
Switch Settings

SWITCH NAME	SWITCH NUMBER	SETTING POSITION	FUNCTION	CHECK
JP0 		RIGHT	For coaxial connectors (No. 0 circuit)	
		LEFT	For champ connector (LT connector) (No. 0 circuit)	
JP1 		RIGHT	For coaxial connectors (No. 1 circuit)	
		LEFT	For champ connector (LT connector) (No. 1 circuit)	
JP2 		RIGHT	For coaxial connectors (No. 2 circuit)	
		LEFT	For champ connector (LT connector) (No. 2 circuit)	

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

PN-2ILCA (ILC)

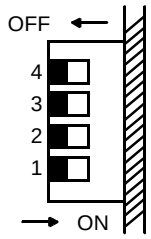
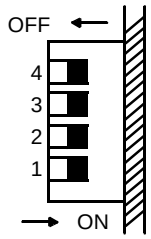
Locations of Lamps, Switches, and Connectors



Lamp Indications

LAMP NAME	COLOR	FUNCTION	
ACT1	Green	No. 1 Circuit	ON: Normally operating OFF: Not operating
PAL1	Red		ON: Line is short-circuiting. OFF: Normally operating
LPB1	Red		OFF: Not used
B21	Green		ON: B2 channel is in use. OFF: B2 channel is idle.
B11	Green		ON: B1 channel is in use. OFF: B1 channel is idle.
ACT0	Green	No. 0 Circuit	ON: Normally operating OFF: Not operating
PAL0	Red		ON: Line is short-circuiting. OFF: Normally operating
LPB0	Red		OFF: Not used
B20	Green		ON: B2 channel is in use. OFF: B2 channel is idle.
B10	Green		ON: B1 channel is in use. OFF: B1 channel is idle.

Switch Settings

SWITCH NAME	SWITCH NUMBER	SETTING POSITION	FUNCTION		CHECK
SW1 (Piano Key SW)  	1	OFF	Always set to OFF.		
	2	OFF	Always set to OFF.		
	3	OFF	Always set to OFF.		
	4	OFF	Always set to OFF.		
SW0 (Piano Key SW)  	1	ON	No. 0 Circuit (Receiving)	Terminating register is provided.	
		OFF		Terminating register is not provided.	
	2	ON	No. 0 Circuit (Sending)	Terminating register is provided.	
		OFF		Terminating register is not provided.	
	3	ON	No. 1 Circuit (Receiving)	Terminating register is provided.	
		OFF		Terminating register is not provided.	
	4	ON	No. 1 Circuit (Sending)	Terminating register is provided.	
		OFF		Terminating register is not provided.	

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.

CHAPTER 5

OPERATION TEST

This chapter explains the operation test to be performed after completion of the ISDN installation. For fault diagnosis by MAT or CAT, refer to the Maintenance Manual.

INTEROFFICE TRANSMISSION LINE TEST

To confirm inter-office synchronization and speech quality using “In-Service” transmission lines, do the following procedure:

STEP 1: Connect the transmission line to the MDF or CONN card.

STEP 2: Make busy the channels except the channel tested by CME5.

STEP 3: Confirm indication lamps on the DTI/PRT/BRT card, as per the following table.
- Alarm Indications on 24DTI (Table 5-1)
- Alarm Indications on 30DTI (Table 5-2)
- Alarm Indications on 24PRT (Table 5-3)
- Alarm Indications on BRT (Table 5-4)

STEP 4: Originate an outgoing call via trunk.

STEP 5: After an outgoing connection via trunks has been established, confirm inter-office synchronization as follows:
- On the DTMF telephone set, keep pressing any dial button.
- Check to see if there are noise or abnormal tones.
- Do the above test again in the opposite direction.

STEP 6: Repeat the test for all channels. When completed, make idle all channels by CME5.

Table 5-1 Alarm Indications on 24DTI

LED	LED INDICATION		FAULT	
	NORMAL	FAULT	CAUSE	ACTION
RUN	Flash (120 IPM)	On or Off	Abnormal operation of DTI card	① Confirm the programming data: CM05, CM07 YY=01. ② Check to see if the SENS switch is set as per the AP number (04-15, 20-31) assigned by CM05. ③ Reset the MB switch (Down→Up→Down) ④ If the fault cannot be cleared, replace the card.
CRC	Off	On	Bit Error Rate exceeds the predetermined value	① Check the receive line and external equipment. ② Replace the remote DTI card.
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 card. Repeat this two or three times.
FRM	Off	On	Frame Alignment signals from the distant office can-not be received	① Check the receive line and external equipment. ② Replace the remote DTI card.
RMT	Off	On	Frame Alignment signals cannot be sent to the remote PBX	① Check the transmission line and external equipment. ② Replace the DTI card.
AIS	Off	On	Remote PBX is in the loop-back test	① Check the switch settings of the remote DTI card.

Table 5-2 Alarm Indications on 30DTI

LED	LED INDICATION		FAULT	
	NORMAL	FAULT	CAUSE	ACTION
RUN	Flash (120 IPM)	On or Off	Abnormal operation of DTI card	① Confirm the programming data: CM05, CM07 YY=01. ② Check to see if the SENS switch is set as per the AP number (04-15, 20-31) assigned by CM05. ③ Reset the MB switch (Down→Up→Down) ④ If the fault cannot be cleared, replace the card.
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 card. Repeat this two or three times.
FRM	Off	On	Frame Alignment signals from the distant office cannot be received	① Check the receive line and external equipment. ② Replace the remote DTI card.
MFRM	Off	On	Multi Frame Alignment signals from the distant office cannot be received	① Check the receive line and external equipment. ② Replace the remote DTI card.
RMT	Off	On	Frame Alignment signals cannot be sent to the remote PBX	① Check the transmission line and external equipment. ② Replace the DTI card.
MRMT	Off	On	Frame Alignment signals from the distant office cannot be received	① Confirm the switch setting on the DTI card indicating an alarm. ② Replace the DTI card not indicating an alarm, with a spare.
AIS	Off	On	Remote PBX is in the loop-back test	① Check the switch settings of the remote DTI card.

Table 5-3 Alarm Indications on 24PRT

LED	LED INDICATION		FAULT	
	NORMAL	FAULT	CAUSE	ACTION
RUN	Flash (120 IPM)	On or Off	Abnormal operation of PRT card	① Confirm the programming data: CM05, CM07 YY=01. ② Check to see if the SENS switch is set as per the AP number (04-15, 20-31) assigned by CM05. ③ Reset the MB switch (Down→Up→Down) ④ If the fault cannot be cleared, replace the card.
LC	On	Off	ISDN primary rate D-channel data link connection failure	Check the status of the local-office side line or the public network side line.
CRC	Off	On	Bit Error Rate exceeds the predetermined value	① Check the receive line and external equipment. ② Replace the remote PRT card.
PCM	Off	On	No PCM signals arrive from the distant office	① Check to see if the PRT cable is correctly connected. ② Plug and unplug the PRT card. Repeat this two or three times.
FRM	Off	On	Frame Alignment signals from the distant office cannot be received	① Check the receive line and external equipment. ② Replace the remote PRT card.
RMT	Off	On	Frame Alignment signals cannot be sent to the remote PBX	① Check the transmission line and external equipment. ② Replace the PRT card.
AIS	Off	On	Remote PBX is in the loop-back test	① Check the switch settings of the remote PRT card.

Table 5-4 Alarm Indications on BRT

LED	LED INDICATION		FAULT	
	NORMAL	FAULT	CAUSE	ACTION
• BRT				
RUN	Flash (120 IPM)	On or Off	Abnormal operation of BRT card	① Confirm the programming data: CM05, CM07 YY=02. ② Check to see if the SENS switch is set as per the AP number (04-15) assigned by CM05. ③ Reset the MB switch (Down→Up→Down) ④ If the fault cannot be cleared, replace the card.
ALM	Off	On	Transmission line fault	① Confirm circuit line status. ② Confirm PSTN line status.
• 2BRT				
RUN	Flash (120 IPM)	On or Off	Abnormal operation of BRT card	① Confirm the programming data: CM05. ② Check to see if the SENSE switch is set as per the AP number (04-15, 20-31) assigned by CM05, CM07 YY=02. ③ Reset the MB switch (Down→Up→Down) ④ If the fault cannot be cleared, replace the card.
ALM0	Off	On	No. 0 circuit transmission line fault	① Confirm No. 0 circuit line status. ② Confirm PSTN line status.
ALM1	Off	On	No. 1 circuit transmission line fault	① Confirm No. 1 circuit line status. ② Confirm PSTN line status.

PLO OPERATION TEST

To confirm the PLO operation do the following tests:

- Clock Signal Generation Test
- Clock Signal Synchronization Test — To be tested when the PBX is a clock receiver office.
- Interoffice Synchronization Test
- Source Office Mode Test — To be tested when the PBX is a clock source office.

Clock Signal Generation Test

This test checks to see if the PLO keeps generating clock signals at the frequency of the previous source clock, when the source clock signal from network have stopped. Do the following procedure using “In Service” transmission lines.

STEP 1: On all the DTI/PRT/BRT cards mounted in PIM0, set the switches as follows to stop the external clock signal input:

- 30DTI card: SW-1 and SW-2 to OFF
- PRT/24DTI card: SW0-1 and SW0-2 to OFF
- BRT card: SW0-2 and SW0-3 to OFF
- 2BRT card: SW11-2 and SW11-3 to OFF

– The CLK lamp on the MP card goes out.

STEP 2: Originate an outgoing call via trunks.

STEP 3: After an outgoing connection via trunks has been established, confirm interoffice synchronization and speech quality as follows:

- On the DTMF telephone set, keep pressing any dial button.
- Check to see if noise periodically occurs on the DTMF signals coming from the calling station in the opposite office.
- Do the above test again in the opposite direction.

STEP 4: On all the DTI/PRT/BRT cards mounted in PIM0, restore the switches as the state before testing to input the external clock signals.

– The CLK lamp on the MP card lights.

NOTE: If noise periodically occurs, replace the MP card after checking the switch settings on the MP card, and do the above test again.

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 network has input again after it has stopped once. Do the following procedure using “In Service” transmission lines.

(1) When providing one clock supply route

STEP 1: On the DTI0/PRT0/BRT0 card extracting clock signals, set the switches as follows to stop the external clock signal input:
- 30DTI0 card: SW-1 and SW-2 to OFF
- PRT0/24DTI0 card: SW0-1 and SW0-2 to OFF
- BRT0 card: SW0-2 and SW0-3 to OFF
- 2BRT0 card: SW11-2 and SW11-3 to OFF

– The CLK lamp on the MP card goes out.

STEP 2: Originate an outgoing call via trunk.

STEP 3: After an outgoing connection via trunk has been established, confirm interoffice synchronization and speech quality as follows:
- On the DTMF telephone set, keep pressing any dial button.
- Check to see if noise periodically occurs on the DTMF signals coming from the calling station in the opposite office.
- Do the above test again in the opposite direction.

STEP 4: On the DTI0/PRT0/BRT0 card, restore the switches as the state before testing to input the external clock signals:
- 30DTI0 card: SW-1 to ON, SW-2 to OFF
- PRT0/24DTI0 card: SW0-1 to ON, SW0-2 to OFF
- BRT0 card: SW0-2 to ON, SW0-3 to ON
- 2BRT0 card: SW11-2 to ON, SW11-3 to ON

– The CLK lamp on the MP card lights.

STEP 5: Originate an outgoing call via trunks.

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

NOTE: If noise periodically occurs, replace the MP card after checking the switch settings on the MP card, and do the above test again.

(2) When providing two clock supply routes

STEP 1: On the DTI/PRT/BRT cards extracting clock signals, set the switches as follows to change the clock supply route from 0 to 1:

- 30DTI0 card: SW-1 to OFF, SW-2 to OFF
- 30DTI1 card: SW-1 to OFF, SW-2 to ON
- PRT0/24DTI0 card: SW0-1 to OFF, SW0-2 to OFF
- PRT1/24DTI1 card: SW0-1 to OFF, SW0-2 to ON
- BRT0 card: SW0-2 to OFF, SW0-3 to OFF
- BRT1 card: SW0-2 to ON, SW0-3 to OFF
- 2BRT0 card: SW11-2 to OFF, SW11-3 to OFF
- 2BRT1 card: SW11-2 to ON, SW11-3 to OFF

STEP 2: Originate an outgoing call via trunks.

STEP 3: After an outgoing connection via trunks has been established, confirm interoffice synchronization and speech quality as follows:

- On the DTMF telephone set, keep pressing any dial button.
- Check to see if noise periodically occurs on the DTMF signals coming from the calling station in the opposite office.
- Do the above test again in the opposite direction.

STEP 4: On the DTI/PRT/BRT cards, set the switches as follows to stop the external clock signal input:

- 30DTI0/1 card: SW-1 and SW-2 to OFF
- PRT0/1, 24DTI0/1 card: SW0-1 and SW0-2 to OFF
- BRT0/1 card: SW0-2 and SW0-3 to OFF
- 2BRT0/1 card: SW11-2 and SW11-3 to OFF

– The CLK lamp on the MP card goes out.

STEP 5: Repeat STEP 2 and STEP 3 of this procedure.

STEP 6: On the DTI0/1, PRT0/1, BRT0/1 cards, set the switches as shown in STEP 1 to input clock signals from the clock supply Route 1.

STEP 7: Repeat STEP 2 and STEP 3 of this procedure.

STEP 8: On the DTI/PRT/BRT cards, set the switches as follows to change the clock supply route from 1 to 0:

- 30DTI0 card: SW-1 to ON, SW-2 to OFF
- 30DTI1 card: SW-1 to OFF, SW-2 to ON
- PRT0/24DTI0 card: SW0-1 to ON SW0-2 to OFF
- PRT1/24DTI1 card: SW0-1 to OFF, SW0-2 to ON
- BRT0 card: SW0-2 to ON, SW0-3 to ON
- BRT1 card: SW0-2 to ON, SW0-3 to OFF
- 2BRT0 card: SW11-2 to ON, SW0-3 to ON
- 2BRT1 card: SW11-2 to ON, SW0-3 to OFF

– The CLK lamp on the MP card lights.

STEP 9: Repeat STEP 2 and STEP 3 of this procedure.

NOTE: If noise periodically occurs, replace the MP card after checking the switch settings on the MP card, and do the above test again.

Interoffice Synchronization Test

This test checks to see if noise occurs while calling with the opposite office, by difference of the clock signal frequency between the offices. Do the following procedure using “In Service” transmission lines.

STEP 1: Originate an outgoing call via trunks.

STEP 2: Check the speech quality (if noise, distortion or click occurs 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 periodically occurs on the DTMF signals coming from the calling station in the opposite office.

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

NOTE: If noise periodically occurs, replace the MP card after checking the switch settings on the MP card, and do the above test again.

Source Office Mode Test

When the PBX is operated as a clock source office, do the following procedure using “In Service” transmission lines.

STEP 1: Confirm that the following switches on all the DTI/PRT/BRT cards mounted in PIM0 are set to OFF:

- 30DTI card: SW-1 and SW-2 to OFF
- PRT/24DTI card: SW0-1 and SW0-2 to OFF
- BRT card: SW0-2 and SW0-3 to OFF
- 2BRT card: SW11-2 and SW11-3 to OFF

STEP 2: Confirm the following switches on the MP card are set to OFF:

- SW2-2 and SW2-3 to OFF
- SW4-2 and SW4-3 to OFF

STEP 3: Confirm indication lamps on the MP card.

NOTE: When the CLK lamp lights on the MP card, the clock signal is not generated from the MP card. Check the switch settings on the DTI, PRT, BRT and MP card. For details of the lamp indications, refer to CHAPTER 4.

STEP 4: Originate an outgoing call via trunks.

STEP 5: After an outgoing connection via trunk has been established, confirm interoffice synchronization and speech quality as follows:

- On the DTMF telephone set, keep pressing any dial button.
- Check to see if noise periodically occurs on the DTMF signals coming from the calling station in the opposite office.
- Do the above test again in the opposite direction.

NOTE: If noise periodically occurs, replace the MP card after checking the switch settings on the DTI/PRT/BRT and MP card, and do the above test again.

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