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NEAX[®] 2400 IMX

Fusion Network System Manual

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NEC America, Inc.

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This page is for your notes.

CHAPTER 1 INTRODUCTION

1. General

This manual covers the installation of the Fusion system.

2. How to Follow This Manual

This manual consists of the following chapters.

- CHAPTER 1 (INTRODUCTION)
Explains how to use this manual.
- CHAPTER 2 (GENERAL)
Outlines the Fusion system configuration and lists available service features.
- CHAPTER 3 (SYSTEM CONFIGURATION)
Explains the hardware configuration of the Fusion system.
- CHAPTER 4 (INSTALLATION)
Consists of the following topics:
 - Static Cautions
 - Switch Settings (PA-M96, PA-FCHA, PA-24DTR)
- CHAPTER 5 (DATA PROGRAMMING)
Provides basic data assignment procedures using the following examples.
 - Installing a new Fusion network
 - Upgrading a CCIS network
- CHAPTER 6 (POST INSTALLATION TEST)
Explains how to perform installation tests, focusing on the Fusion link connection test.
- CHAPTER 7 (TROUBLESHOOTING)
Explains Fusion-related system messages and the repair procedures.
- CHAPTER 8 (EX-FCCS)
Consists of the following EX-FCCS topics:
 - Network Configuration
 - Feature Descriptions
 - Data Programming

INTRODUCTION

Related Manuals

3. Related Manuals

To complete the installation of the Fusion system, the following manuals are required:

- NEAX2400 IMX Circuit Card Manual
- NEAX2400 IMX Installation Manual
- NEAX2400 IMX Office Data Specification

This manual assumes that the reader has sufficient knowledge of the installation of both the CCIS No. 7 and the ACIS systems. For more information on these systems, refer to the related manuals.

CHAPTER 2 GENERAL

1. What is Fusion and its Advantages

The main advantages of the Fusion network are as follows:

1.1 Improved Inter-Office Service Features

The Fusion system can eliminate the constraints normally associated with network services that are offered using Common Channel Inter-Office Signaling (CCIS).

1.2 Use of Telephone Numbers

A Fusion system allows you to use Telephone Numbers in addition to the existing station numbers. (In the remainder of this manual, the existing station numbers are referred to as Physical Station Numbers.) Fusion service features are activated when a Telephone Number is dialed. The Telephone Number, which can be assigned on a station basis, is a unique number on a Fusion network. If required, numbering plan data, which is identical to that of an existing station number, can be used to maintain consistency of the numbering plan. When this plan is adopted, you can use the same numbering plan data after introducing the Fusion system.

Note: *A maximum of 16 digits can be used as a Telephone Number.*

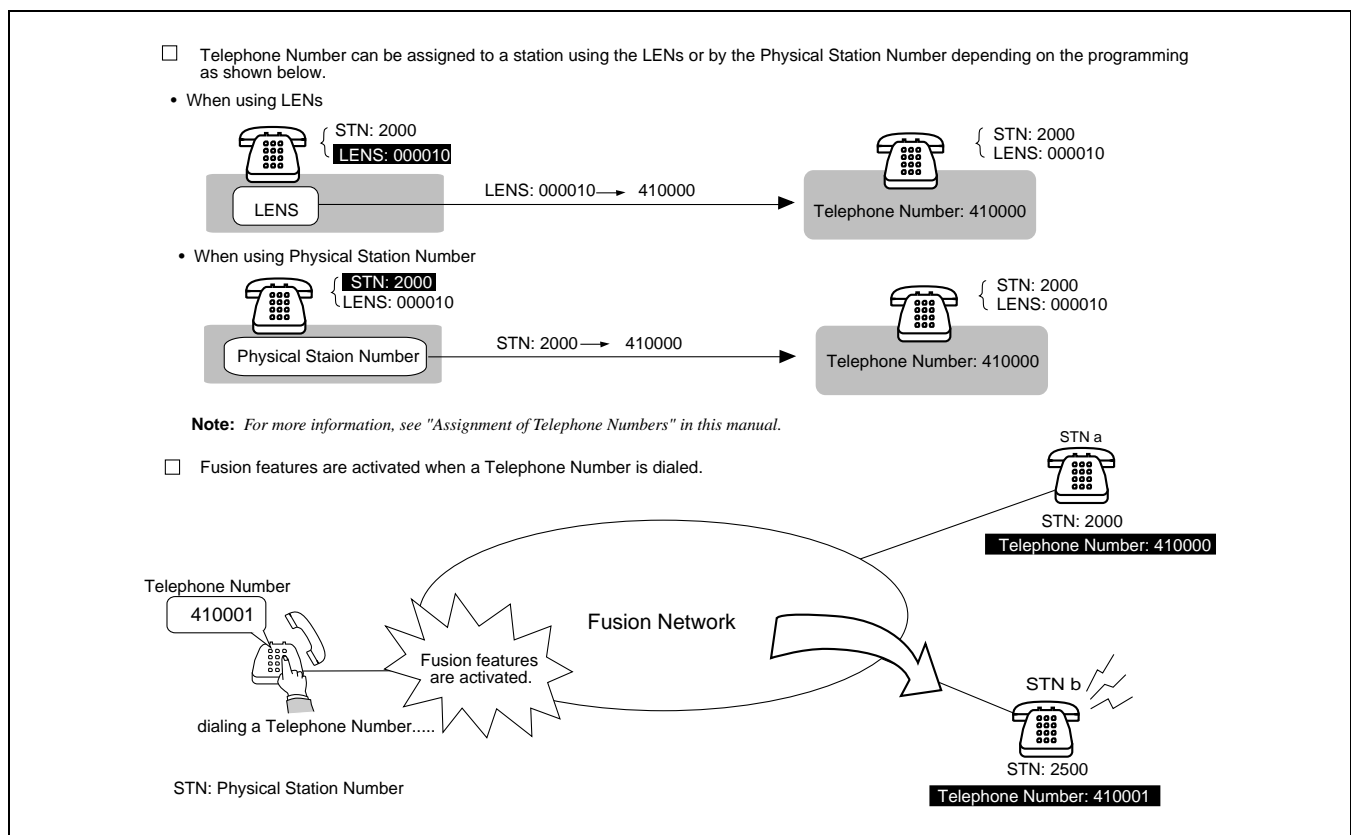


Figure 2-1 Telephone Number

GENERAL

Free Numbering

2. Free Numbering

A Telephone Number can be assigned to a desired station on the Fusion network using the simple command operation shown below.

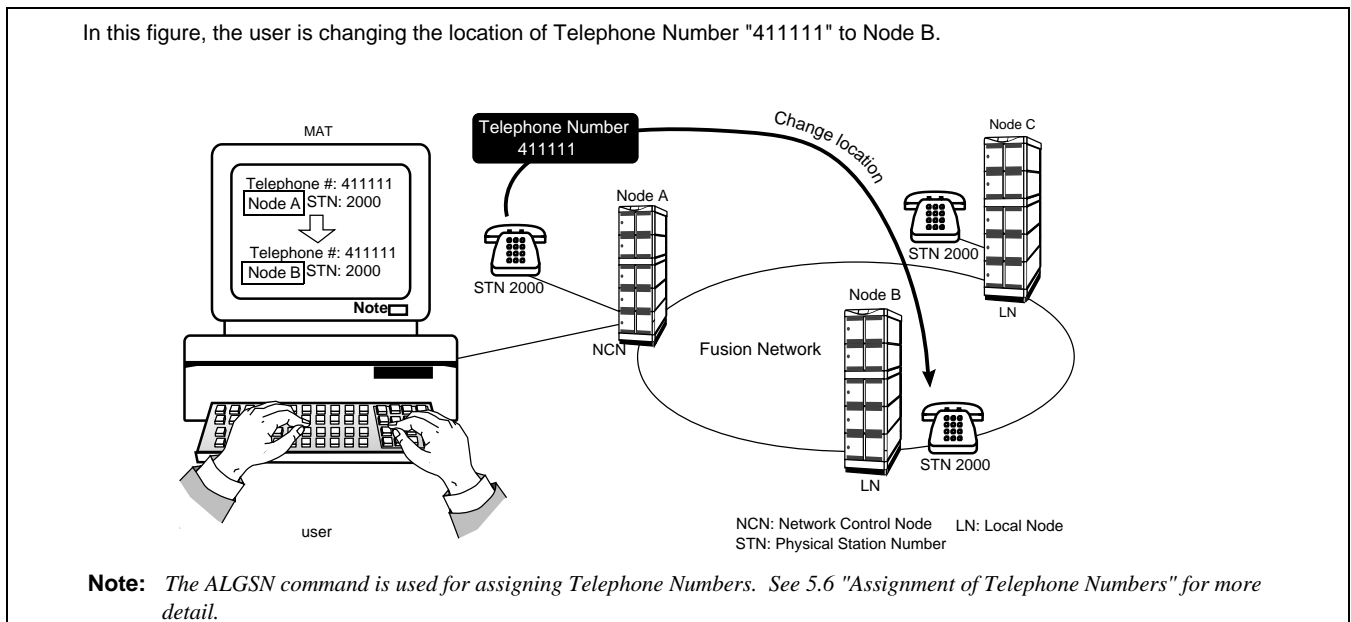


Figure 2-2 Free Location

2.1 Centralized Maintenance Administration Terminal (MAT)

A Fusion network has one Network Control Node (NCN) and Local Nodes (LNs). The NCN has the Centralized-MAT, which runs on Windows 95/NT. The MAT can collect fault information from all nodes on the network. The NCN has Network Data Memory, which stores the data related to network level. The Telephone Numbers, for example, can be changed using the Centralized-MAT at the NCN. The MAT also allows the user to manage network-level office data.

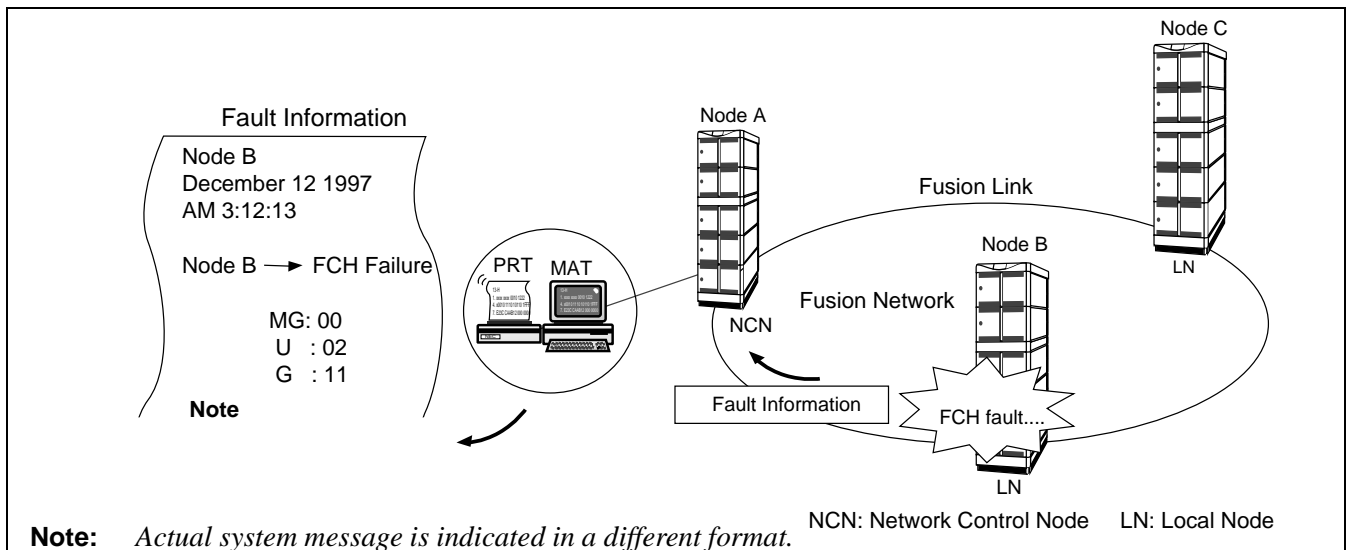


Figure 2-3 Centralized MAT on Fusion Network

3. Fusion System Configuration

The Fusion system can be divided into the following two types. [Figure 2-4](#) shows a Fusion system with Fusion Call Control Handler (FCH) cards.

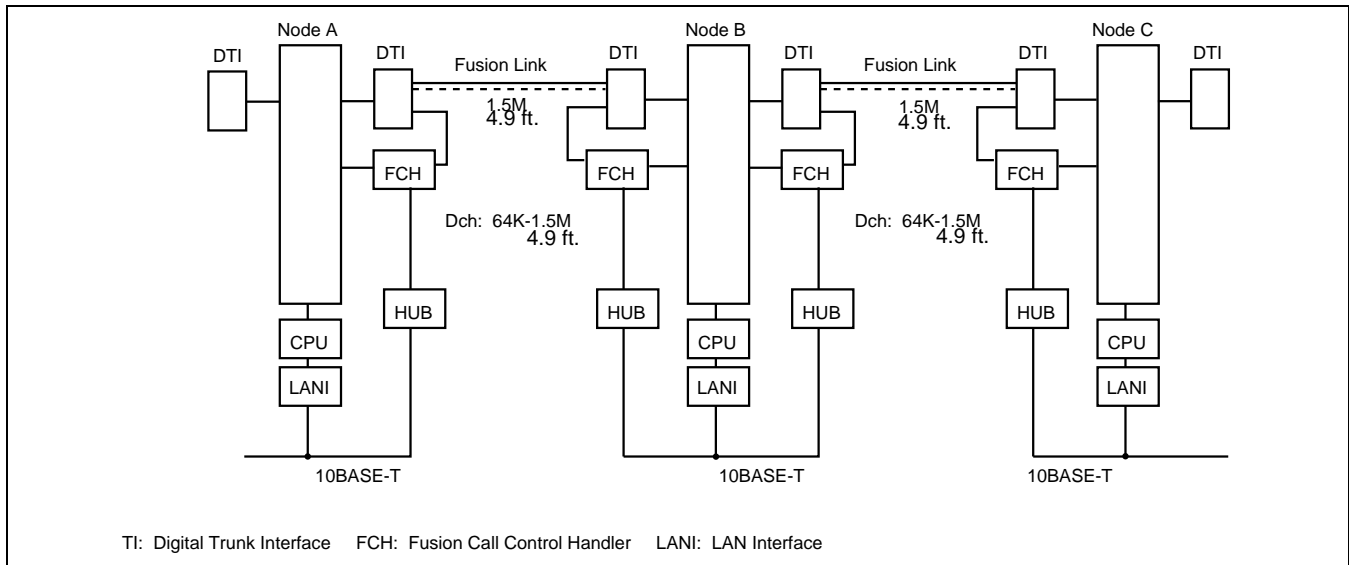


Figure 2-4 Fusion System Configuration (with FCH)

[Figure 2-5](#) shows a Fusion system without Fusion Call Control Handler (FCH) cards.

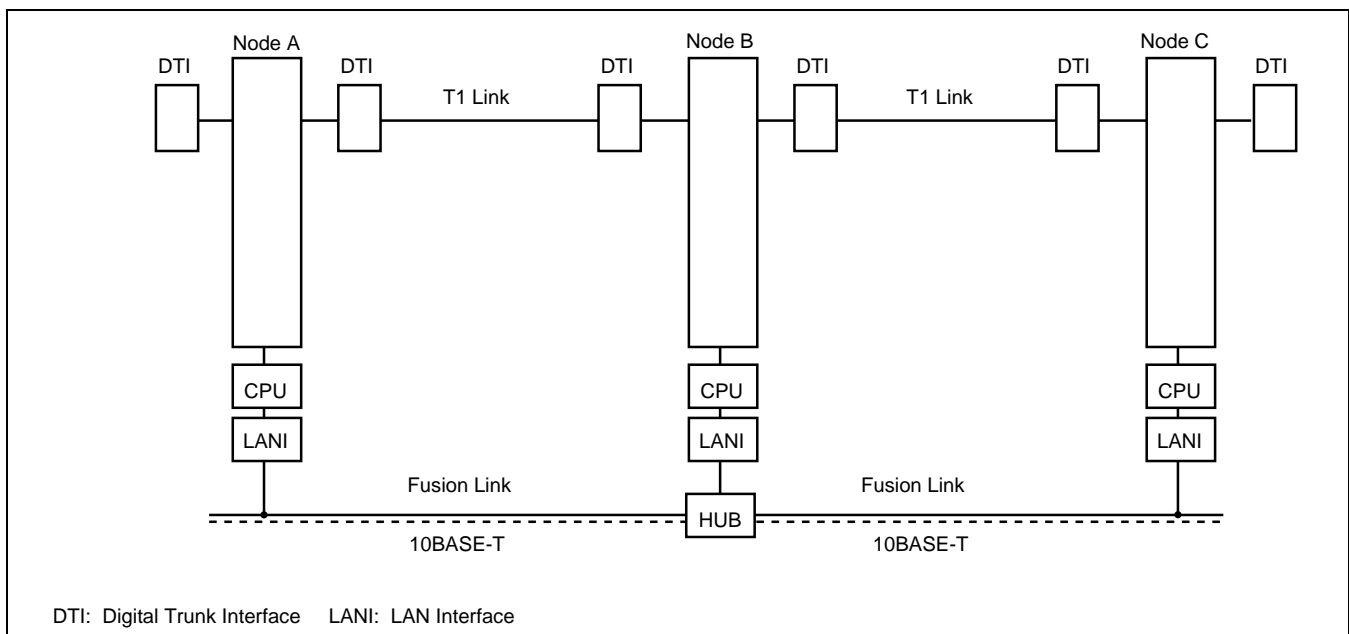


Figure 2-5 Fusion System Configuration (without FCH)

GENERAL

Node

4. Node

A Fusion network consists of the following types of nodes:

- Network Control Node

Network Control Node, which must be assigned on a Fusion network, manages other nodes on the network. This node has the Centralized-MAT to collect fault information from other nodes on the network. Multiple nodes cannot be assigned as a Network Control Node.

- Local Node

All nodes other than Network Control Node are called Local Node. Fault information generated at a Local Node is sent to the Network Control Node via a Fusion Link, allowing the Network Control Node to collect the fault information. A Fusion network can have a maximum of 16 nodes on the network. (See [Figure 2-6.](#))

Note: *The actual number of nodes varies with system configurations.*

- Center Node (for Centralized Billing - Fusion)

This node collects the billing information from other nodes as well as the self-node. For this reason, the node is called Center Node for Centralized Billing - Fusion. Multiple Center Nodes can be assigned on the network by specifying the polling destinations, which can be set by the ASYDL command - SYS 1 Indexes 608 through 639. At the Center Node, the user can select “polling destinations” by setting 1 to the FPC of the corresponding nodes. For more information, see the NEAX2400 IMX Office Data Specification.

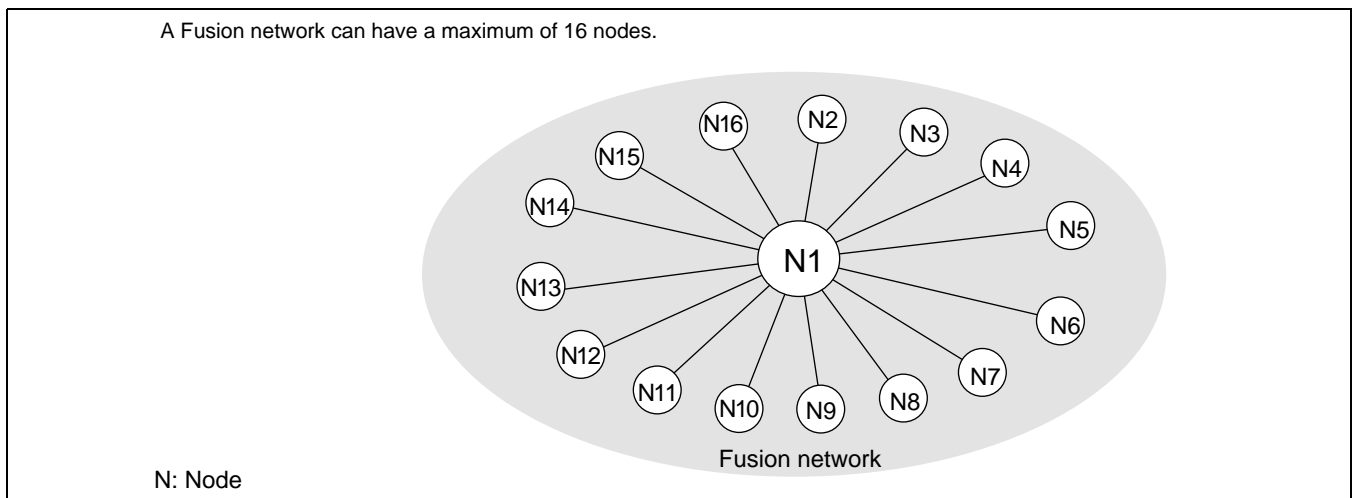


Figure 2-6 Maximum System Configuration

5. Data Memory Configuration

Each node on a Fusion network has the following three kinds of Data Memory:

- Data Memory (DM)
- Local Data Memory (LDM)
- Network Data Memory (NDM) - Programmable only by the NCN.

When the contents of the NDM are changed at NCN, the new data is automatically copied to the NDM of each node. The NDM of the NCN functions as master memory. Figure 2-7 shows how a Telephone Number change is performed in a Fusion network.

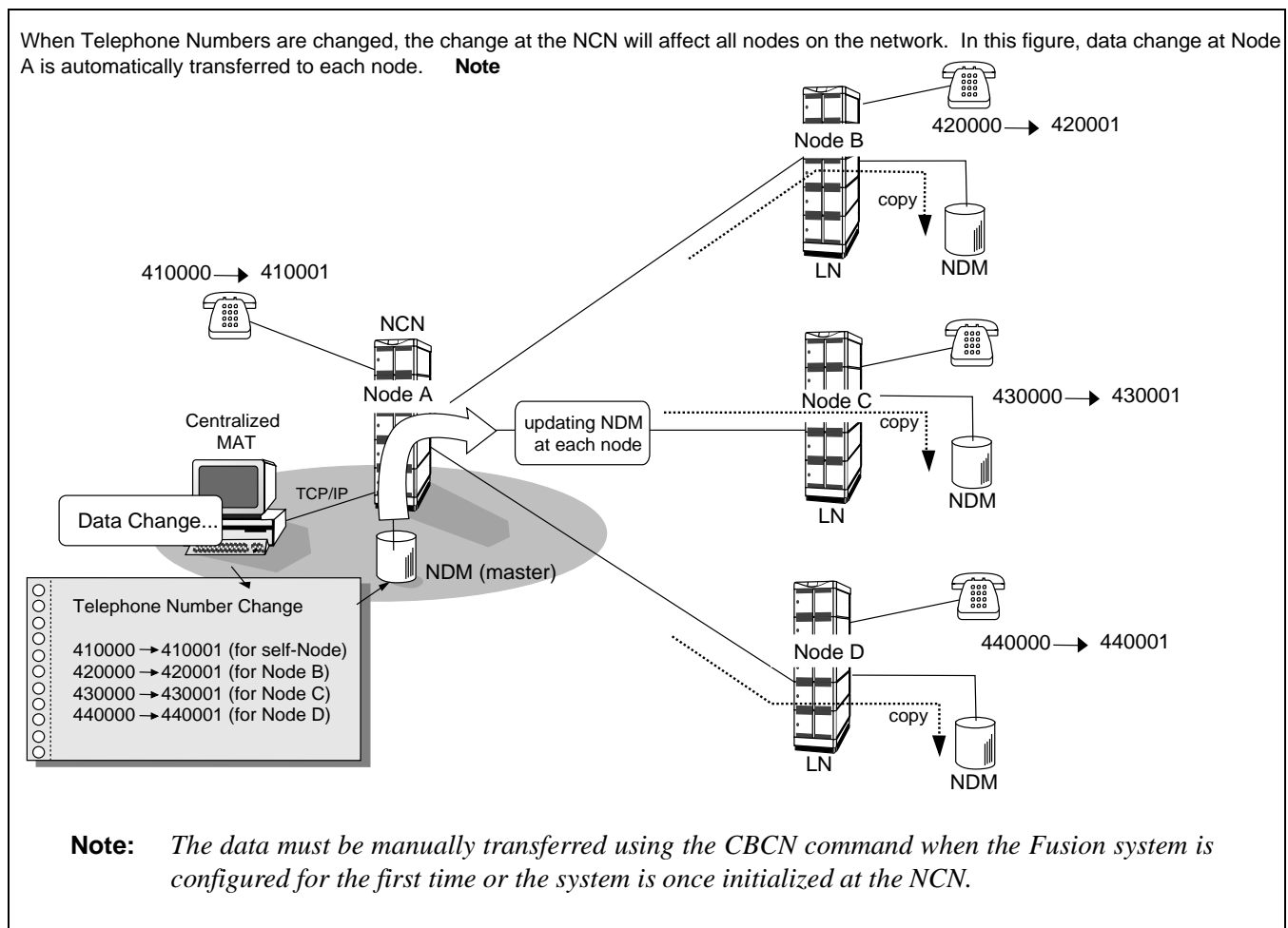


Figure 2-7 Network Data Memory

GENERAL

Fusion Network Examples

When the NDM (master) is modified, the new data is automatically copied.

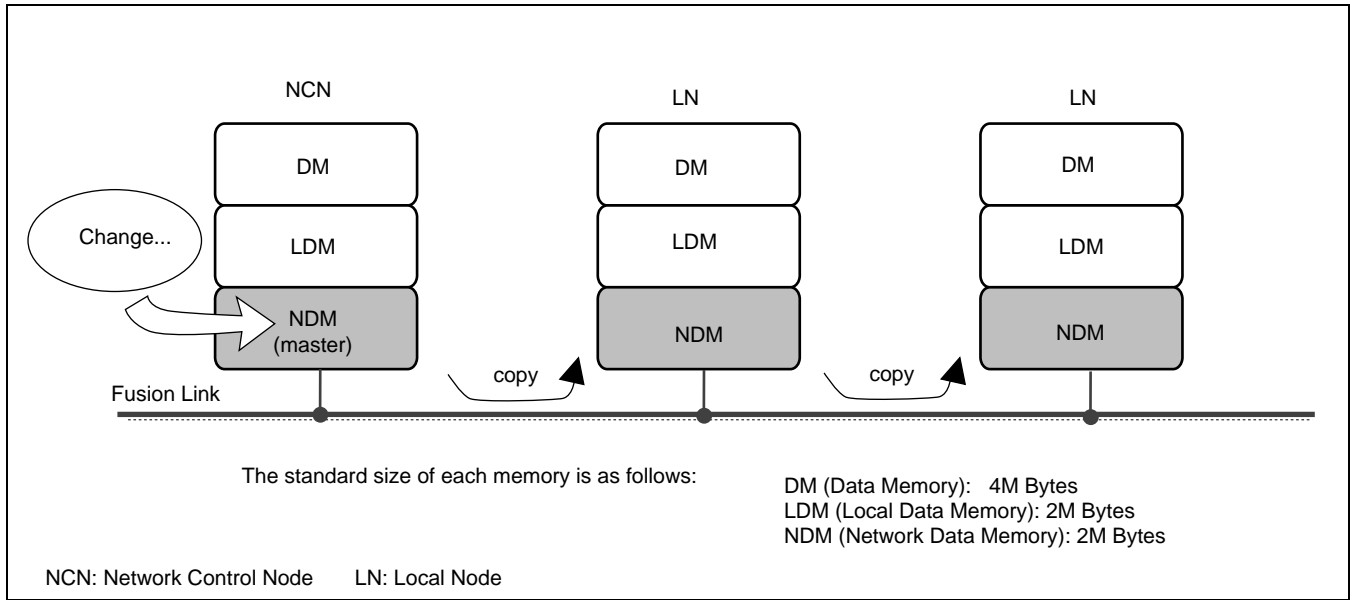


Figure 2-8 Network Data Memory Copy

6. Fusion Network Examples

Figure 2-9 and Figure 2-10 show examples of Fusion networks. When incorporating the Fusion system with the existing CCIS network, all nodes must be connected via CCIS links.

Note: To connect a CCIS network and Fusion network, use STNs and TELNs respectively.

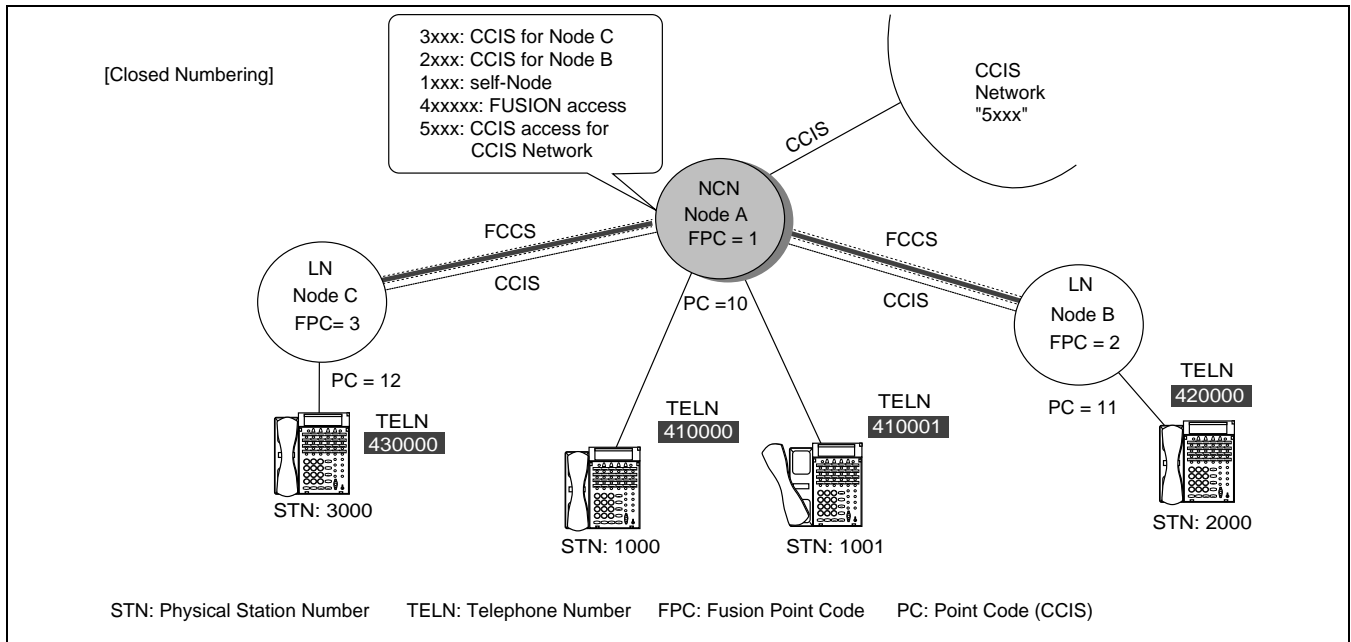


Figure 2-9 Closed Numbering Fusion-CCIS Network

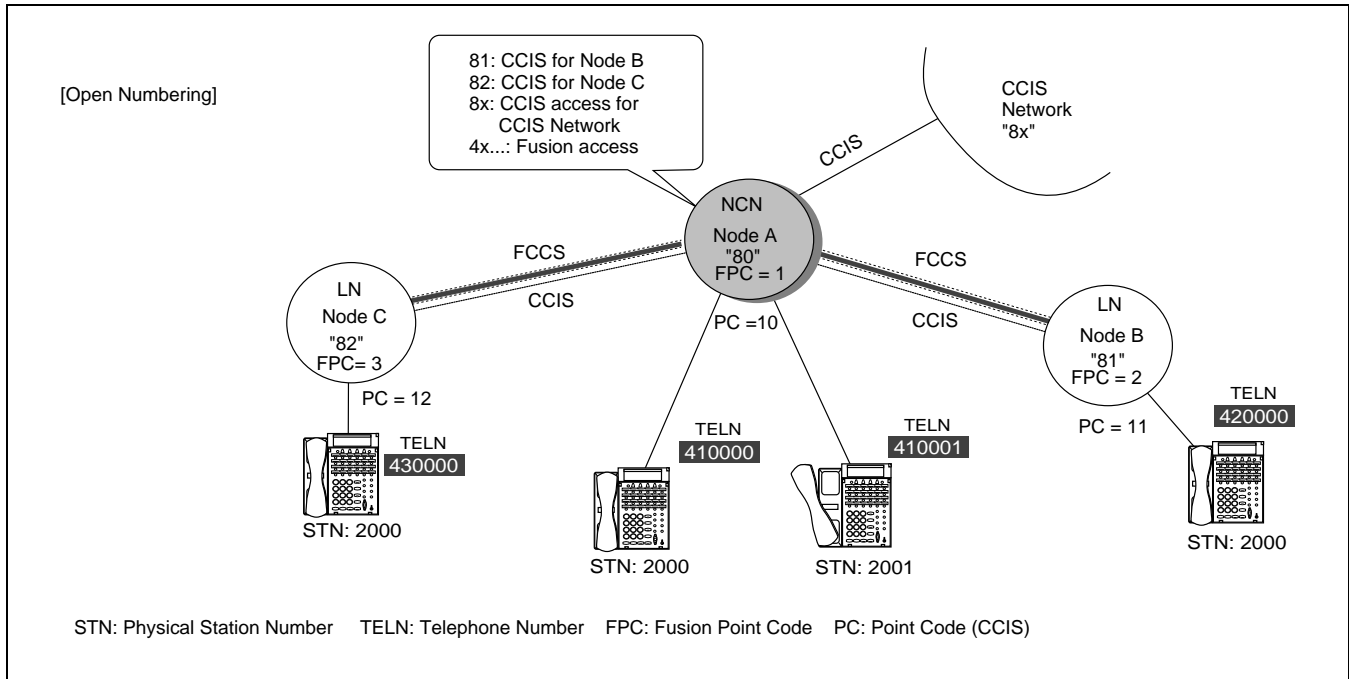


Figure 2-10 Open Numbering Fusion-CCIS Network

[conditions for Telephone Number Digits]

When incorporating the Fusion system with the CCIS network, consider the following conditions as to the available Telephone Number digits:

Telephone Number Composition	Display		Inter-Office Service	MCI	SMDR	
	D ^{term}	ATTCON/ DESKCON			CCIS	Fusion
4 digits or less Note	×	×	×	×	×	×
4~8digits Note	×	-	×	-	×	×
9 digits or more Note	-	-	-	-	-	×

×: Available -: Not available

Note: When the network is Open Numbering, the "digits" in the table above must be the number of "Office Code digits + Telephone Number digits".

GENERAL

Tandem Connections via Fusion Link

7. Tandem Connections via Fusion Link

Tandem connections via FCCS-ACIS can be established. In Figure 2-11, STN (A) can place a tandem call via FCCS-ACIS.

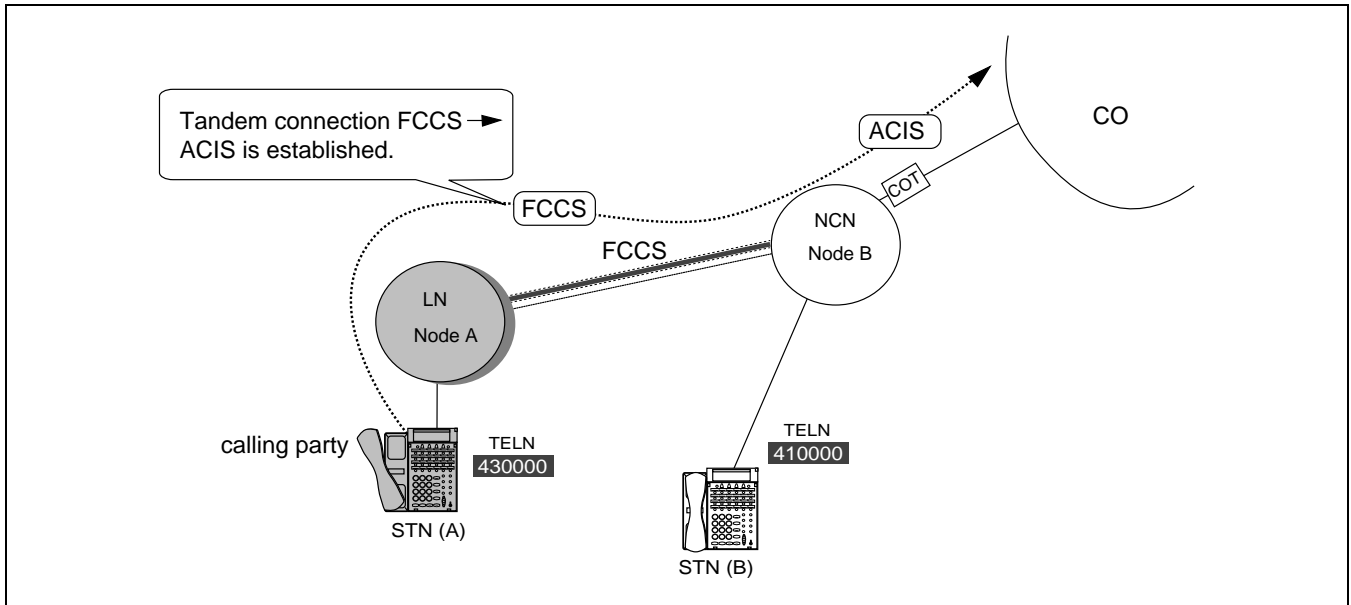


Figure 2-11 Tandem Connections via Fusion Link

CHAPTER 3 SYSTEM CONFIGURATION

Fusion systems can be divided into the following two types:

- Fusion system with FCH
- Fusion system without FCH

Note: Fusion Call Control Handler (FCH): PA-FCHA

This chapter explains the system configuration of each Fusion system.

1. Fusion System without FCH

A sample Fusion system configuration that does not use a DTI to carry D-channel is shown below. In this configuration, the Fusion link is established between nodes using Ethernet. The DTI card carries B-channels only in this example. Figure 3-1 shows a Fusion System Configuration without FCH.

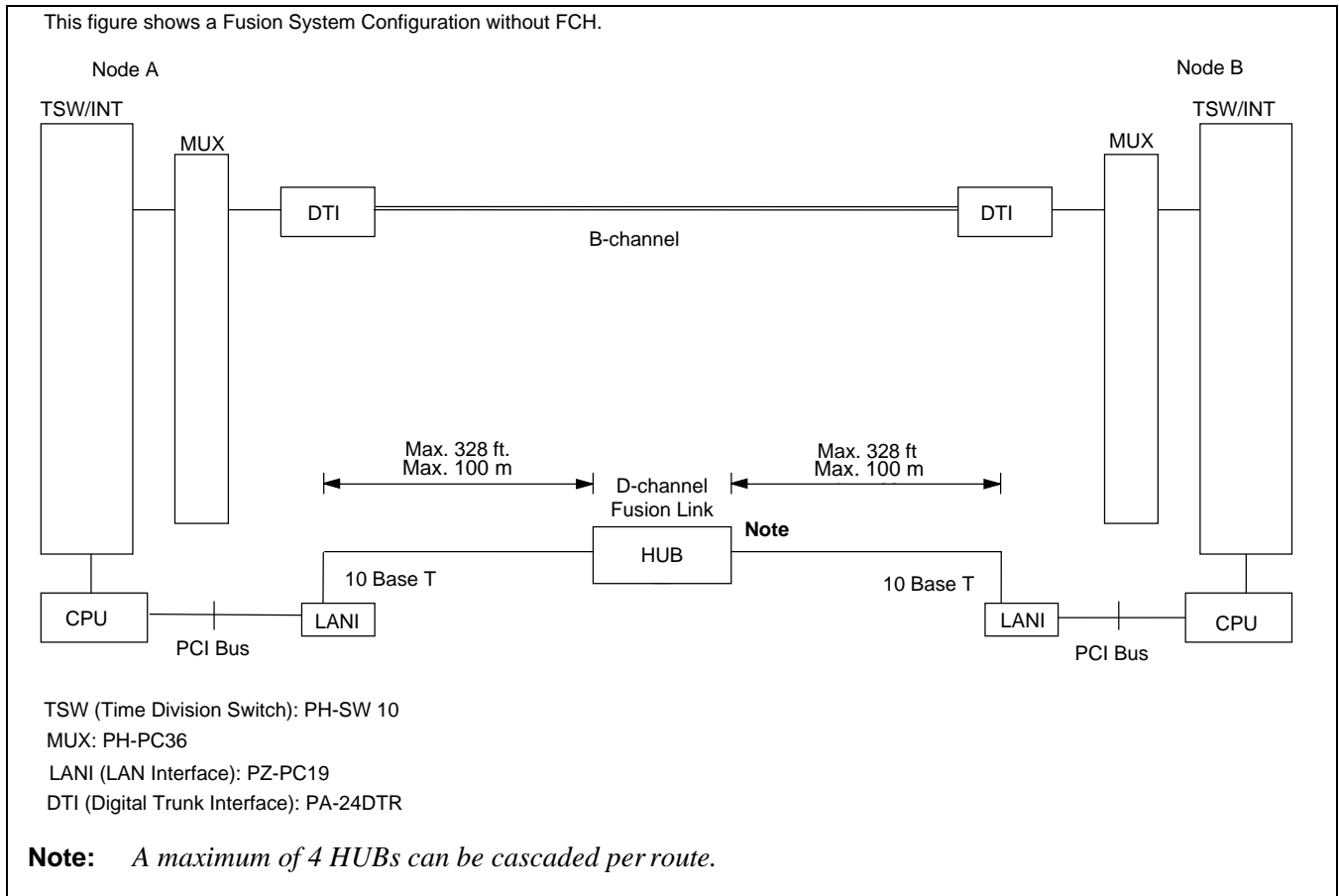


Figure 3-1 Fusion System Configuration without FCH

SYSTEM CONFIGURATION

Fusion System with FCH

2. Fusion System with FCH

2.1 System Configuration

A sample Fusion system configuration that uses a DTI to carry D-channel is shown below. In this configuration, the Fusion link is established between nodes via the T1 link. Figure 3-2 shows a Fusion system configuration with FCH.

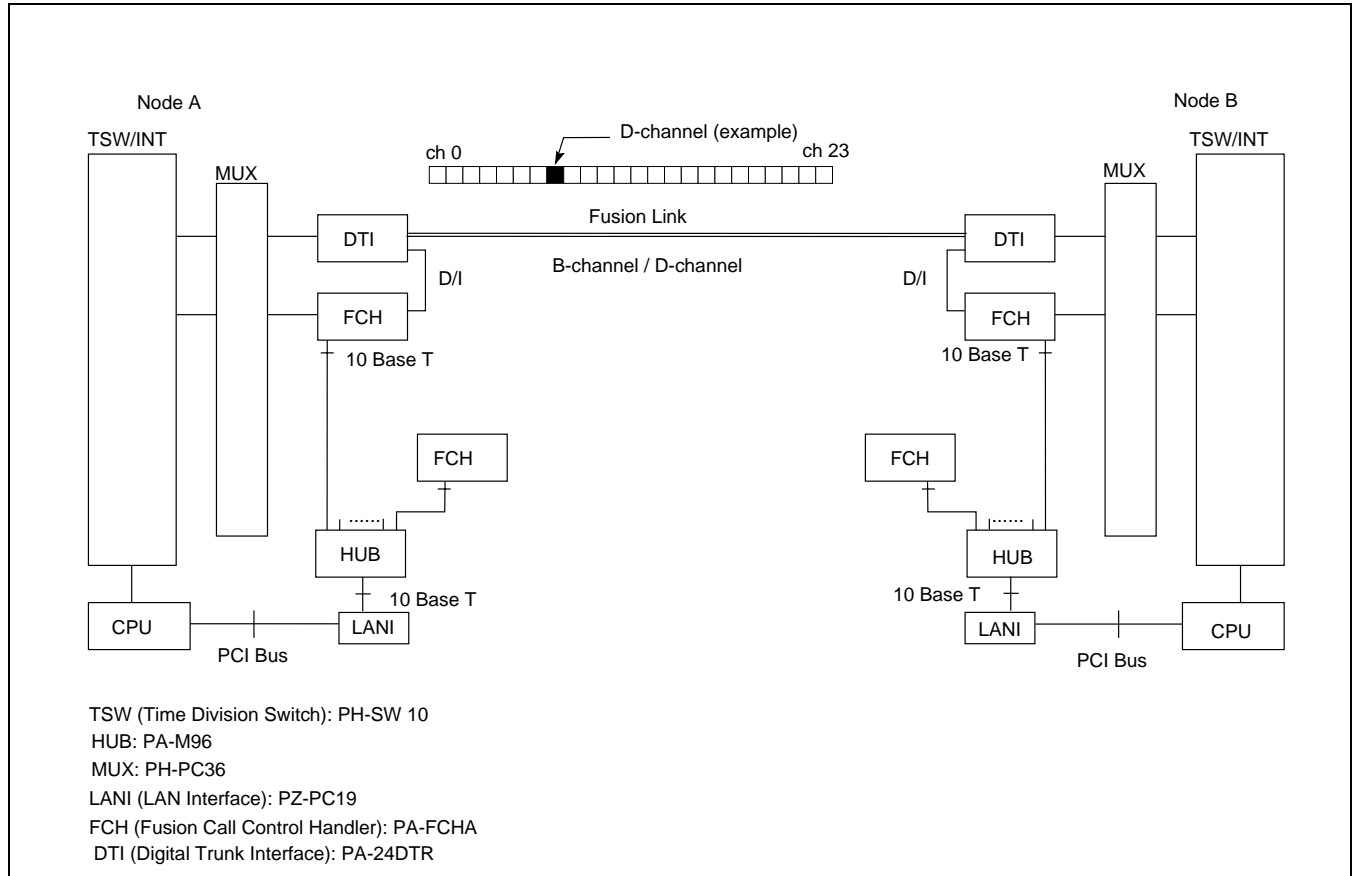


Figure 3-2 Fusion System Configuration with FCH

2.2 Redundancy of Fusion Link

The FCH (PA-FCHA) card handles a Fusion link, occupying one time slot of a frame by D/I function located on the DTI card. In terms of redundancy, the Fusion system (with FCH) can have one of the following configurations.

- Redundant Configuration (LANI, HUB, FCH, and DTI)
- Redundant Configuration (HUB, FCH, and DTI)
- Redundant Configuration (FCH and DTI)
- Non-Redundant Configuration

In [Figure 3-3](#) LANI, HUB, FCH, and DTI are shown in a fully redundant configuration. This configuration is available for Release 3 or later software.

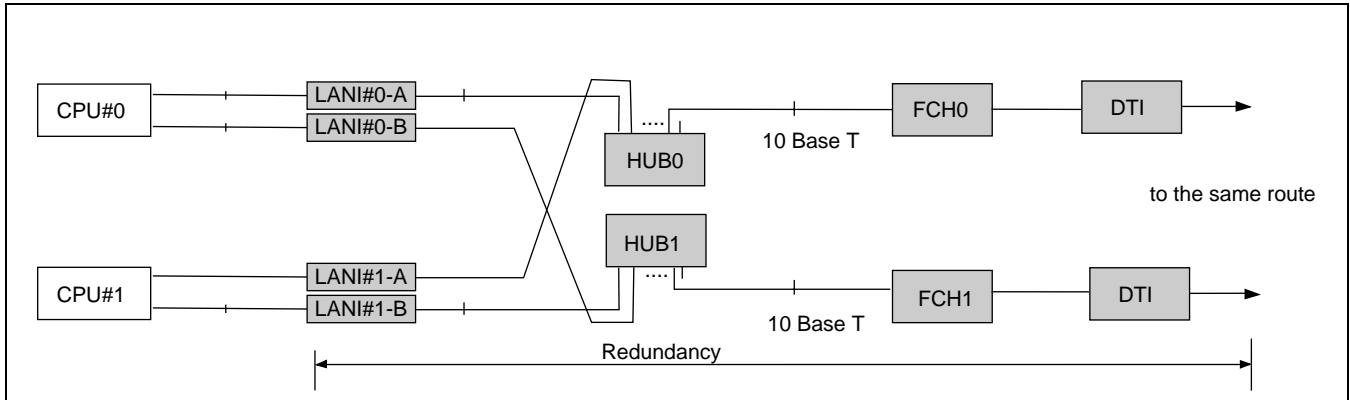


Figure 3-3 Redundant Configuration (LANI, HUB, FCH, and DTI)

In [Figure 3-4](#) HUB, FCH, and DTI are shown in a redundant configuration.

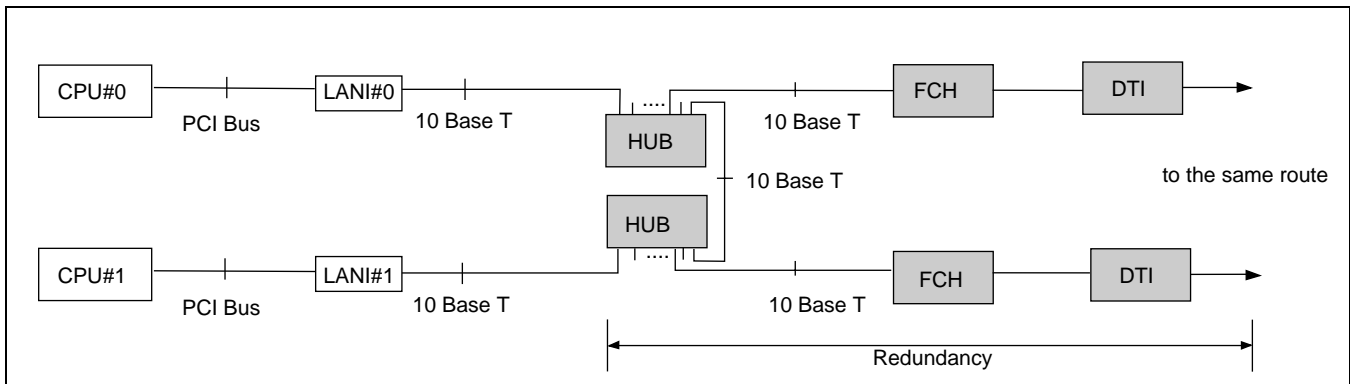


Figure 3-4 Redundant Configuration (HUB, FCH, and DTI)

In [Figure 3-5](#) FCH and DTI are shown in a redundant configuration.

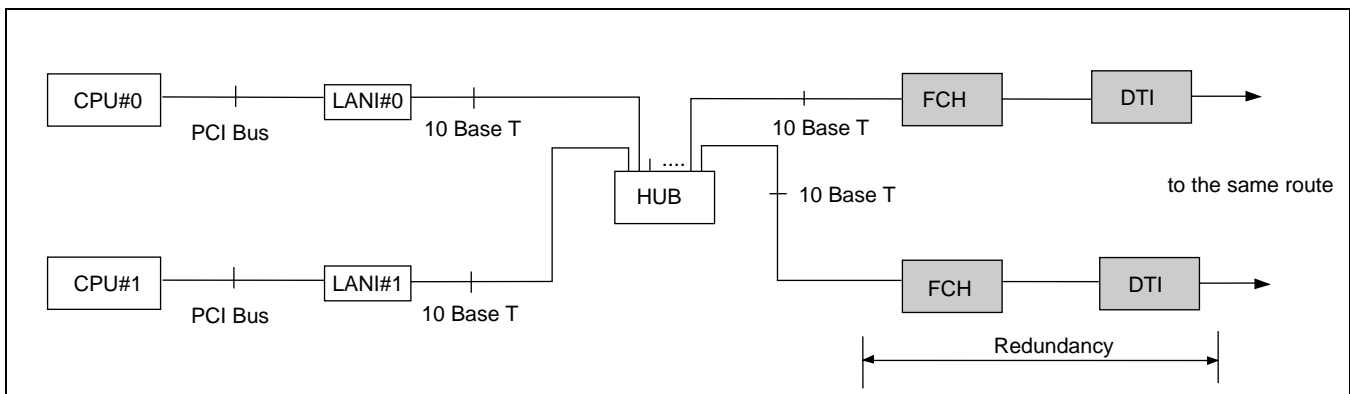


Figure 3-5 Redundant Configuration (FCH and DTI)

SYSTEM CONFIGURATION

System Considerations

In [Figure 3-6](#), no redundancy is shown in the Fusion link.

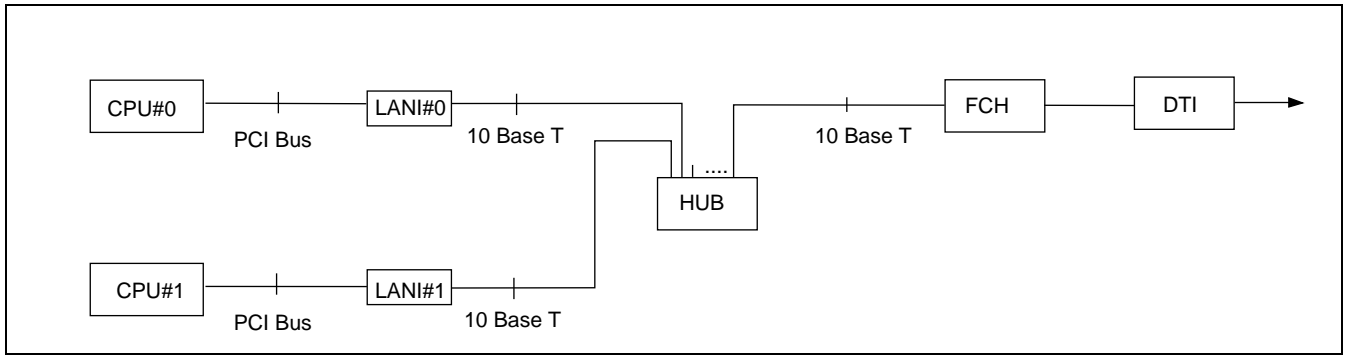


Figure 3-6 Non-Redundant Configuration

3. System Considerations

3.1 Fusion Network Conditions

This section explains how to design a Fusion network. In the following diagram, a Fusion Link is printed in a thick line while a CCIS link is printed in a dotted line.

Condition 1: The maximum number of nodes on a Fusion network is sixteen (16) nodes.

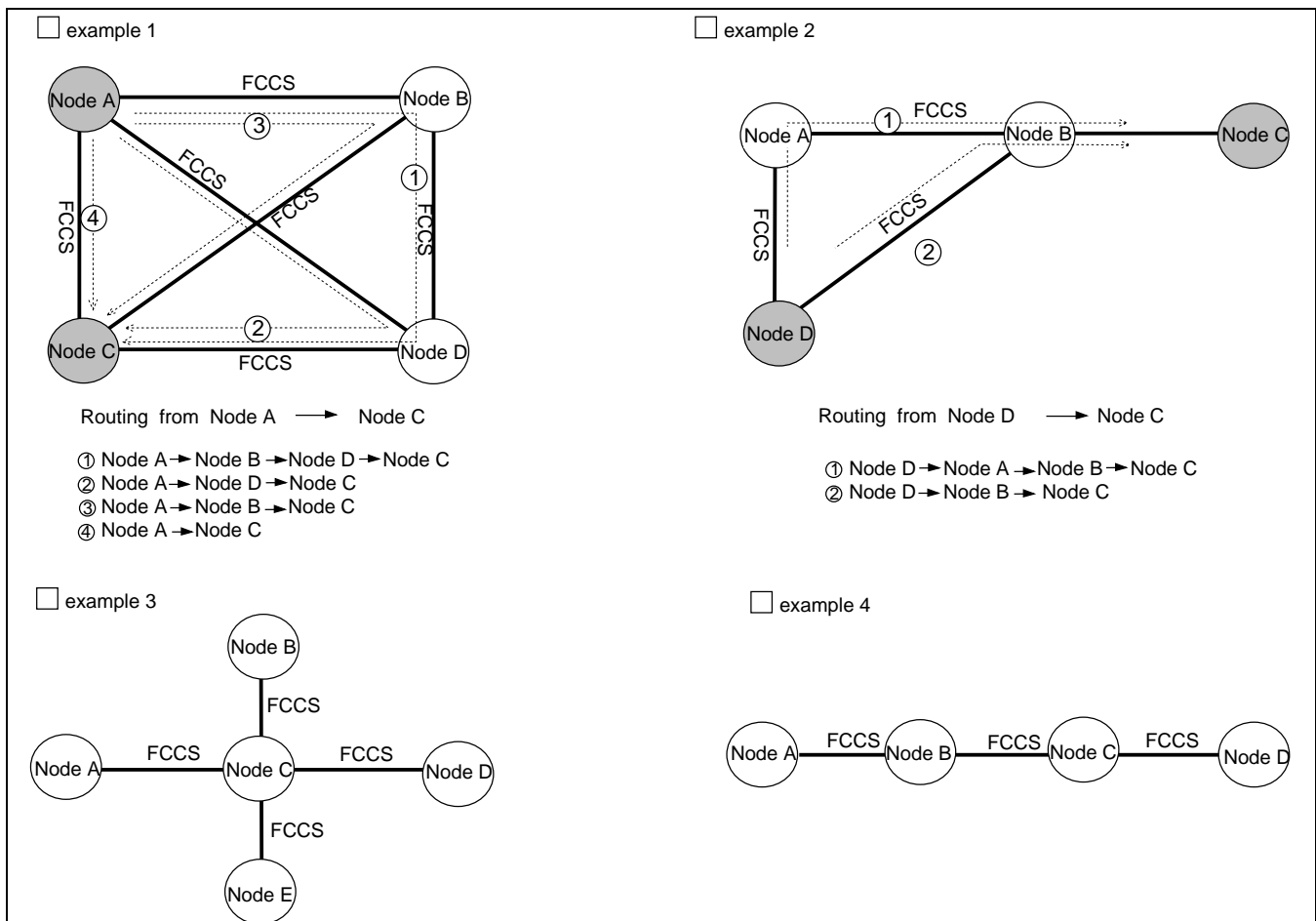


Figure 3-7 Fusion Network Topologies

Condition 2: A maximum of four (4) nodes can be connected as tandem nodes.

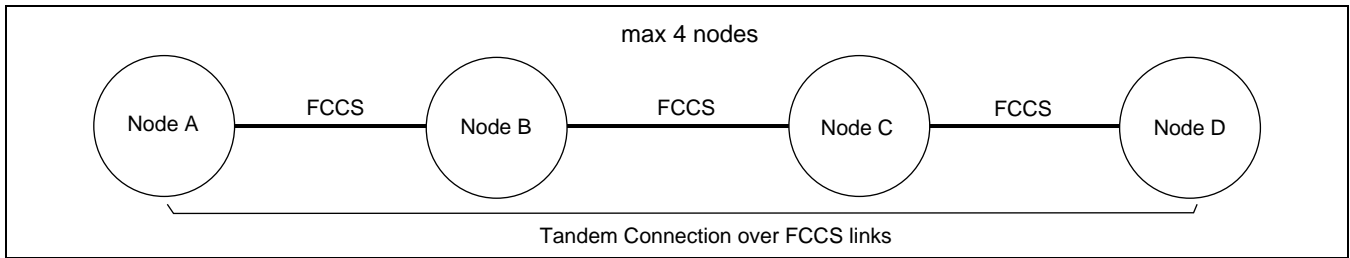


Figure 3-8 Fusion Tandem Connections

Condition 3: The available connection-route number ranges from 1 to 1023.

Condition 4: The available connection-trunk number of each route ranges from 1 to 4095.

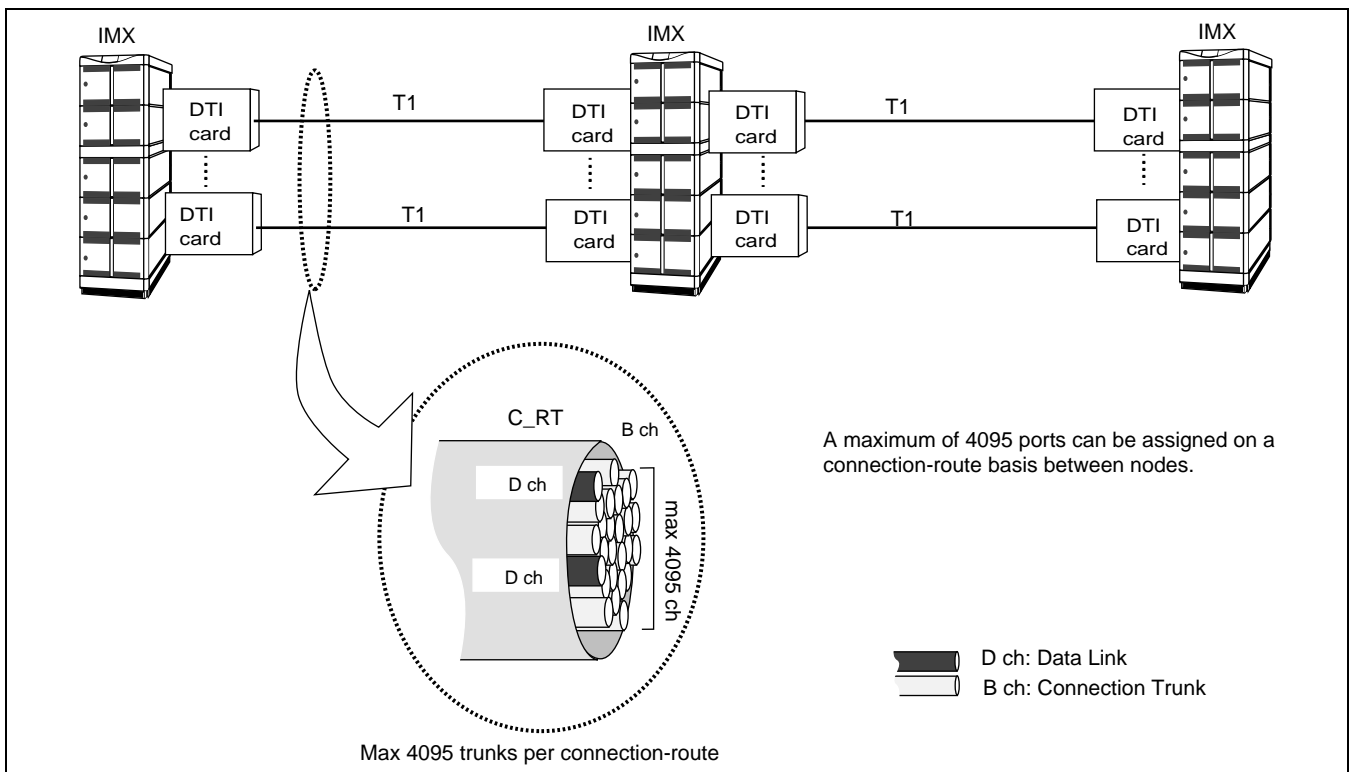


Figure 3-9 Maximum Number of Ports between Nodes

SYSTEM CONFIGURATION

System Considerations

Condition 5: Up to eight (8) routes can be assigned as alternate routes for a connection trunk.

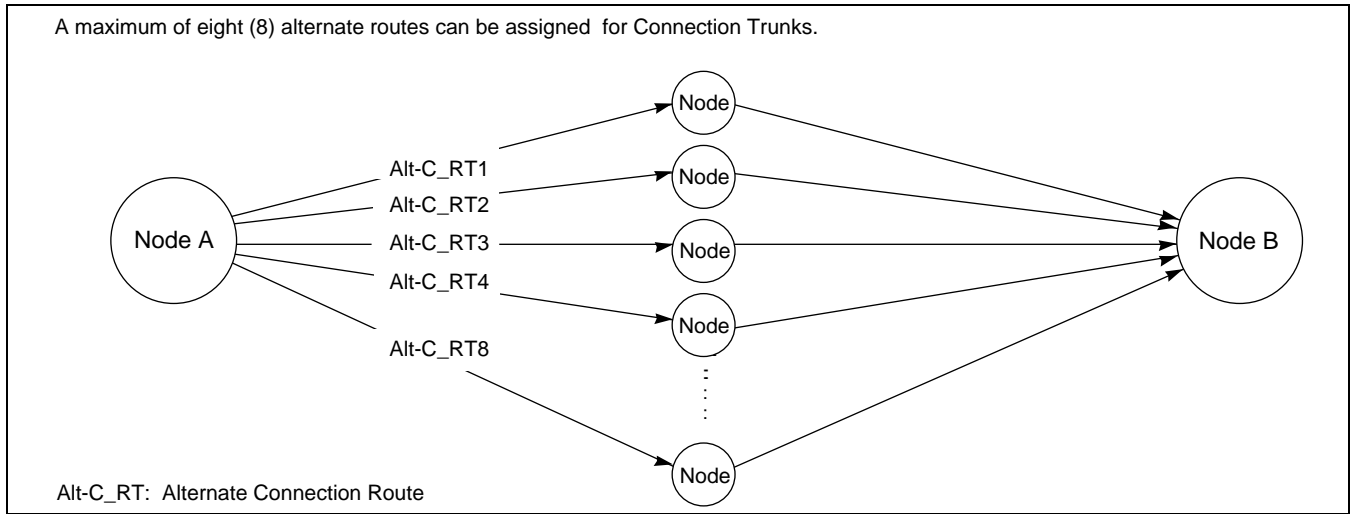


Figure 3-10 Connection Trunk Alternate Routing

Condition 6: Connection trunks and the Fusion data link must be assigned on an "associated" basis.

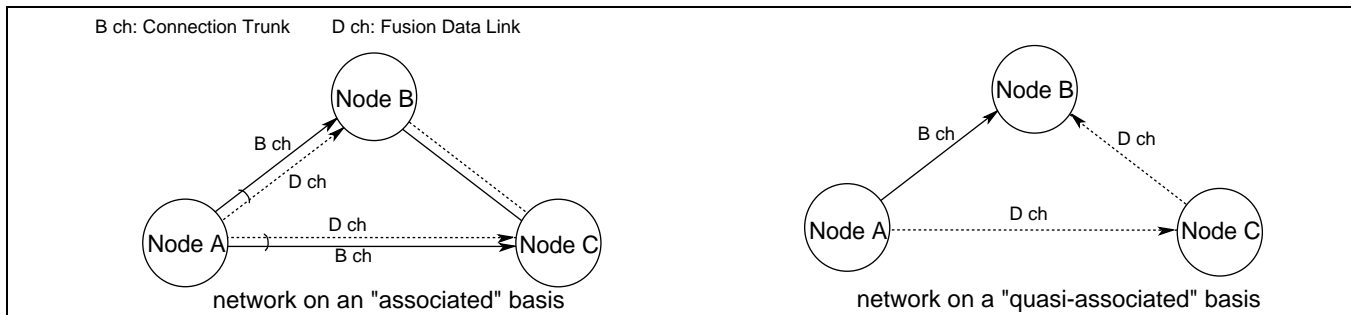


Figure 3-11 Fusion Network on an Associated Basis

Condition 7: One fusion data link must be assigned on each T1 link.

Condition 8: A maximum of eight (8) data links can be used for a connection trunk for redundancy.

Condition 9: The maximum of data link speed is “1.5 Mbps.”

Condition 10: Connection Trunks (B ch) conform to the following specifications:

- Existing external trunk cannot be used as alternate routes for connection trunks.
- Billing information on connection trunks cannot be output.
- Under the following conditions, “connection trunk seizure NG” will occur:

Data Link Failure

Connection Trunk all busy

LANI (built-in) - FCH failure

- Connection test for connection trunks is not provided.
- Nailed Down connection is not provided for connection trunks.

Specifications on Release 2 or earlier software:

- PAD value for connection trunks is fixed to 0 db.
- Echo canceller (EC) / MPC control is not provided.
- Nailed Down connection is not provided for connection trunks.

Condition 11: If a “layer 2 failure” occurs, the connections are released.

Condition 12: When fusion links and CCIS links coexist on a Fusion network, the following conditions should be considered:

A Fusion link may be used as a CCIS link through data programming. In this instance, if the other node accommodates a dedicated CCIS card, CCIS will not work even if the self-node accommodates a Fusion-Link-Card. Therefore, the same Fusion-Link-Card must be accommodated at both nodes. [Figure 3-13](#) shows an example of CCIS-FUSION networks.

SYSTEM CONFIGURATION

System Considerations

3.2 Centralized Billing - Fusion (Polling Method)

This section explains the conditions of Centralized Billing - Fusion, focusing on when CCIS links are involved. To use this feature, select Center Node(s) on the Fusion network.

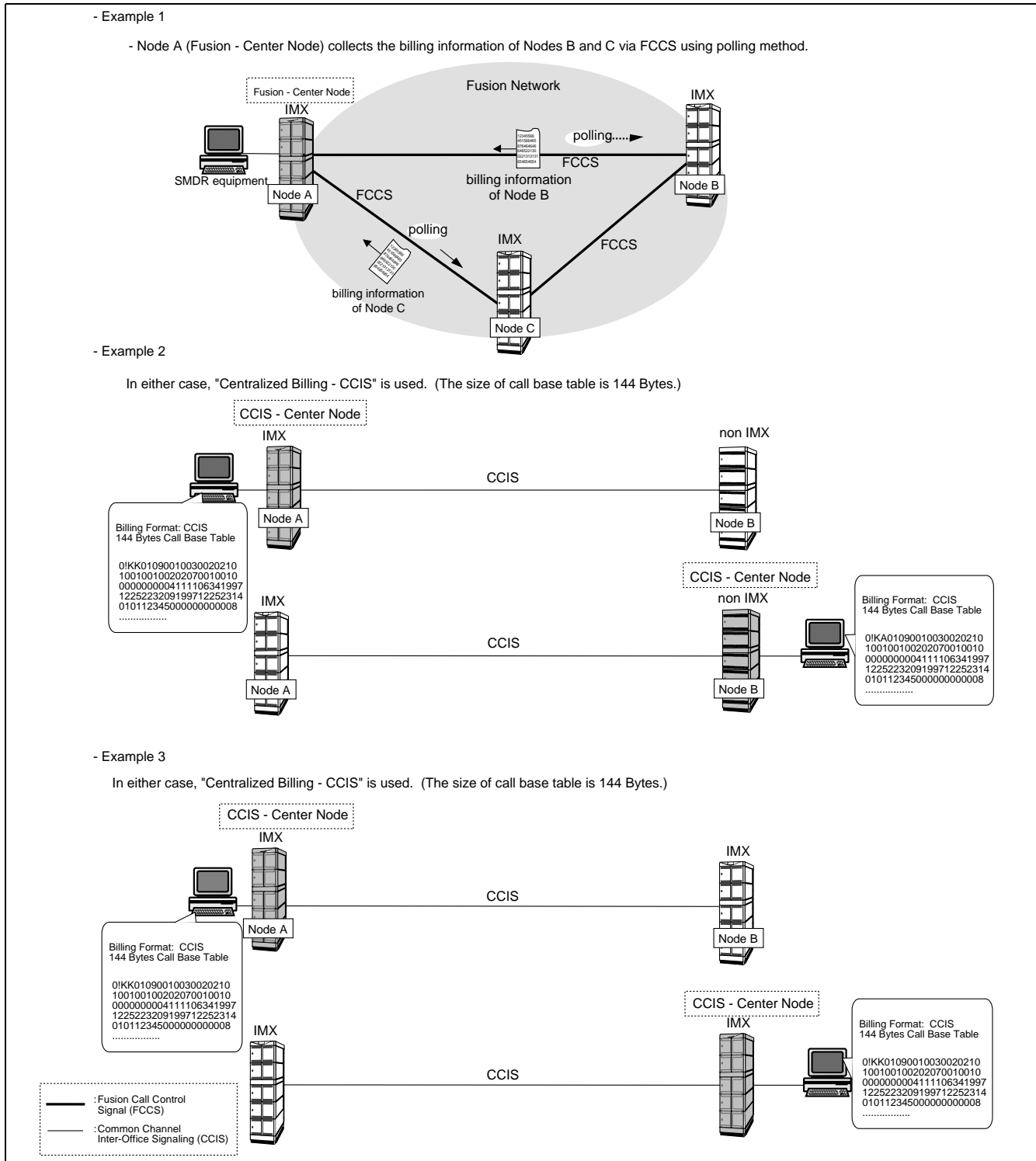
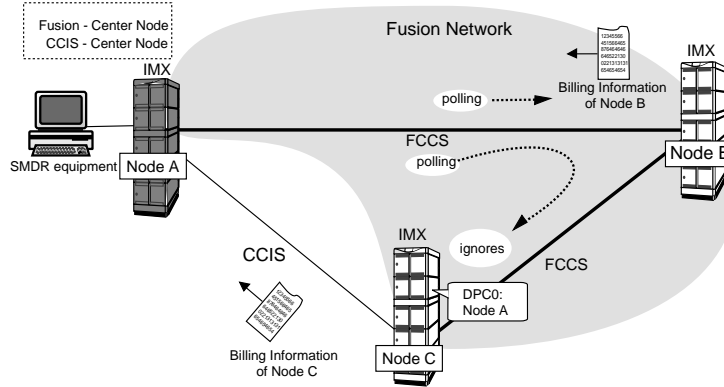


Figure 3-12 Centralized Billing - Fusion (1/3)

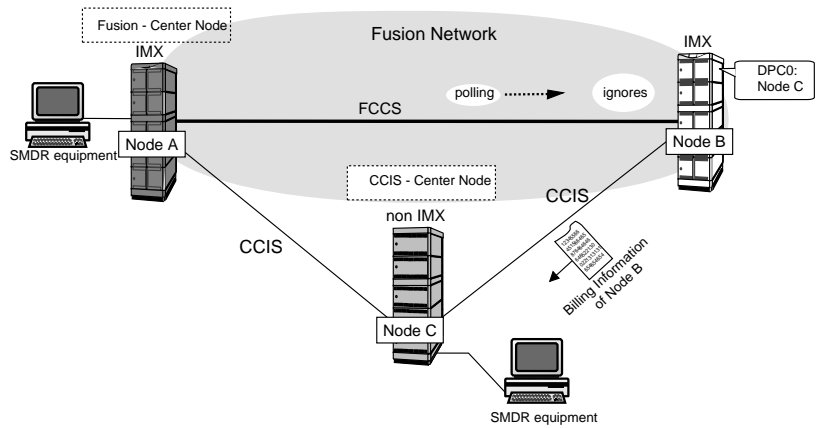
- Example 4

- Node A tries to collect the billing information of Node B, and Node C via FCCS using polling method. (Node A cannot collect the billing information of Node C via FCCS.)
- Node C sends the billing information via CCIS, ignoring polling from Node A.
- Node C deletes the self-Point Code (CCIS) when requiring to send billing information for polling from Node A.



- Example 5

- Node A tries to collect the billing information of Node B via FCCS using polling method. (Node A cannot collect the billing information of Node B via FCCS.)
- Node B sends the billing information to Node C via CCIS, ignoring polling from Node A.
- Node B deletes the self-Point Code (CCIS) when requiring to send billing information for polling from Node A.



- Example 6

- Node A collects the billing information of Node B and Node C via FCCS using polling method.
- Node A sends the billing information of Node A, Node B, and Node C to Node D.

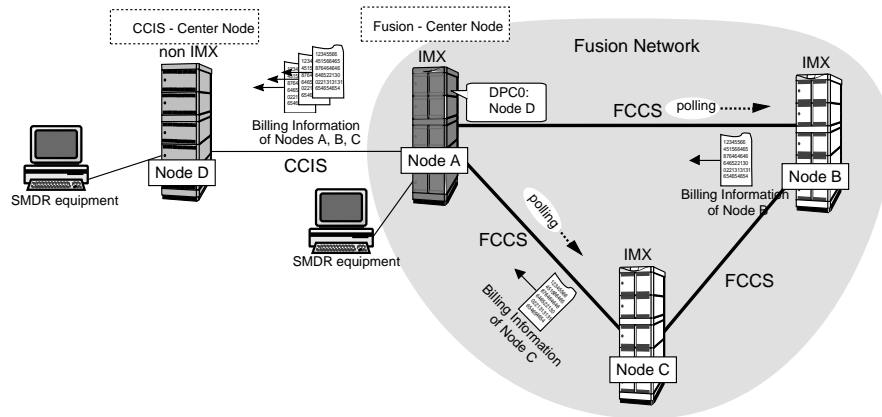


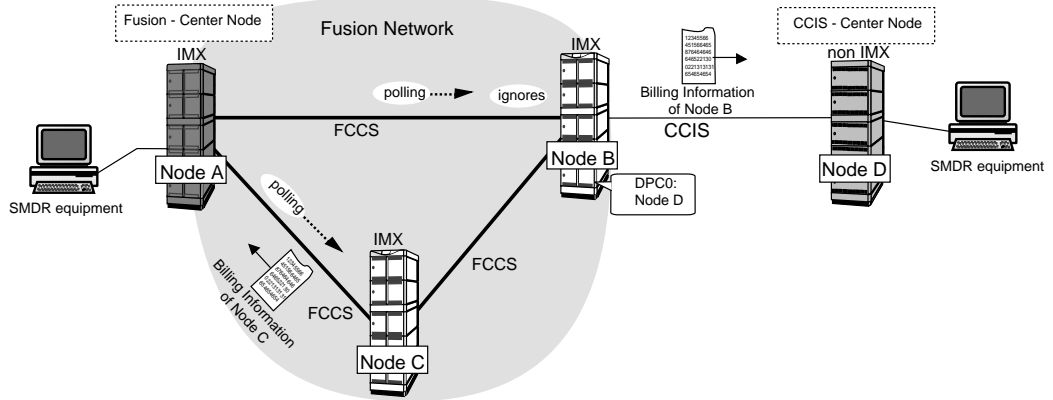
Figure 3-12 Centralized Billing - Fusion (2/3)

SYSTEM CONFIGURATION

System Considerations

- Example 7

- Node A collects billing information of Node B and Node C via FCCS by polling method.
(Billing information of Node B cannot be collected.)
- Node B sends billing information to Node D via CCIS, ignoring polling from Node A.
- Node B deletes the self-Node Point Code (CCIS) when Node B wants to send billing information.



- Example 8

- Node A collects the billing information of Node B, Node C, and Node D which are stored in Node B and Node C by polling method.
- Node D sends billing information to Node B.

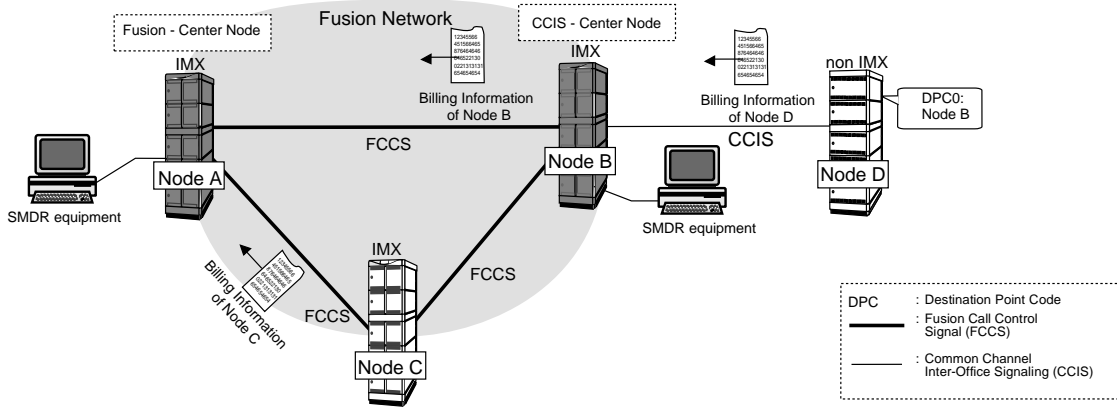


Figure 3-12 Centralized Billing - Fusion (3/3)

3.3 Centralized Management Report-Fusion

To collect fault information in a Fusion network, the Centralized Management Report-Fusion is used. This feature provides automatic reporting of fault occurrence from Local Nodes to Center Node. Service conditions for this feature are shown below.

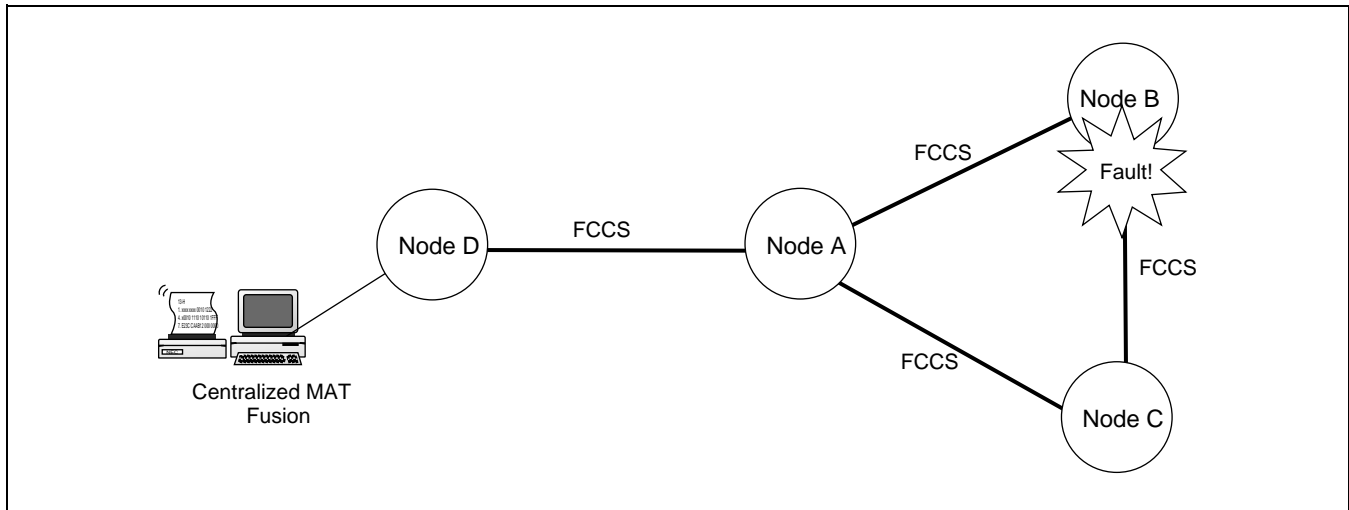


Figure 3-13 Centralized Management Report-Fusion

- Center Node for Centralized Management Report-Fusion is specified in the following system data: ASYDL, SYS1, Index 532 (FPC of Center Node for Centralized Management Report-Fusion).
- At Center Node, system messages received from the other nodes are stored in the buffer memory for Centralized Management Report-Fusion.
- The MAT connected to Center Node polls only the self-node.
- Office Name (ASYD, Index 96 through 115) is used for identification of each node.
- When a system message printer is connected to a node other than Center Node, system messages sent to Center Node are also output to the system message printer.
- When a system message has been sent to Center Node, the message is regarded as an old message.
- When the system fails transmission of a system message to Center Node, retry operation is executed. When the retry operation also fails, transmission is aborted and the message is to be sent together with the next system message.

SYSTEM CONFIGURATION

System Considerations

The following explains service conditions for the network including both FCCS and CCIS links.

Example: 1 When the network comprises FCCS and CCIS links

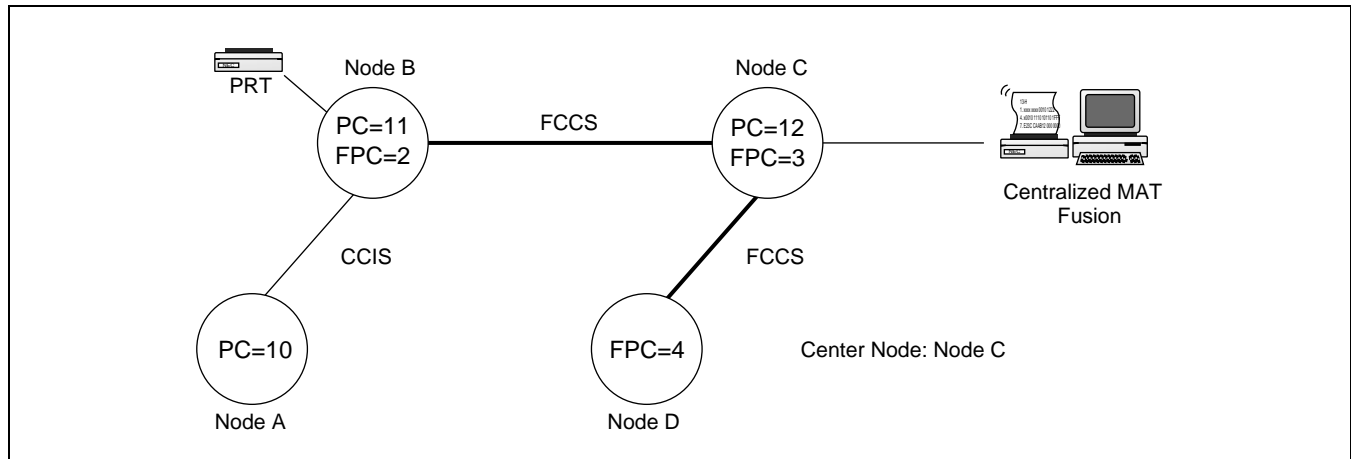


Figure 3-14 Centralized Management Report-Fusion (Example 1)

Node A: To send system messages to Node C via Office B, assign Point Code of Node C (12) to ASYD, SYS 1, Indexes 184 and 185.

Node B: To send system messages to Node C, assign Fusion Point Code of Node C (3) to ASYDL, SYS1, Index 532. When this system data is assigned, system messages received from Node A are also transferred to Node C. However, when data is not assigned (0), system messages received from Node A are ignored and not transferred to Node C.

System messages received from Node A are not output to the system message printer connected to Node B.

Node C: Received system messages are stored in the memory area for Centralized Management Report-Fusion.

Node D: To send system messages to Node C, assign Fusion Point Code of Node C (3) to ASYDL, SYS1, Index 532.

Example: 2 When both FCCS and CCIS links are established between two nodes

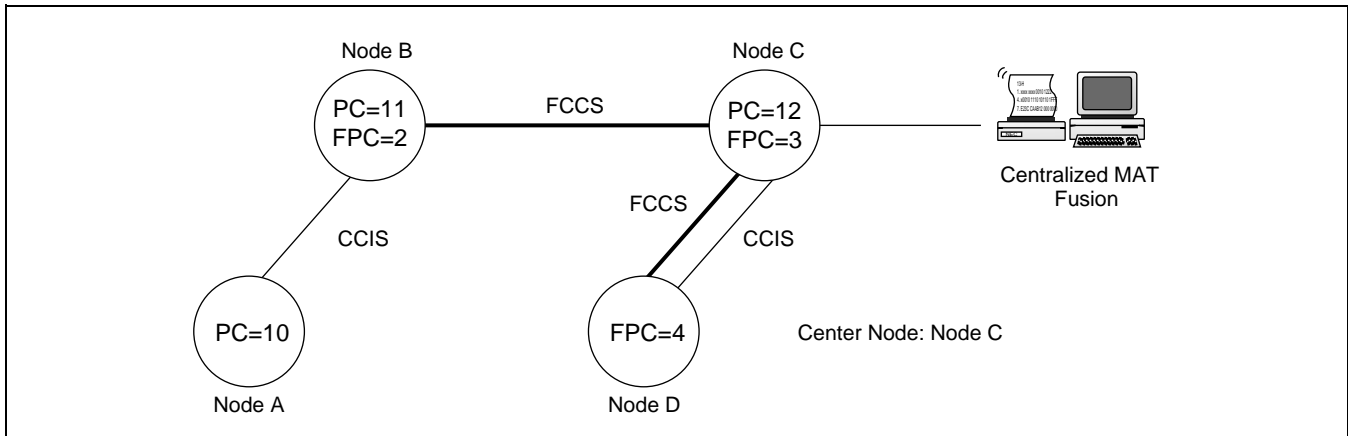


Figure 3-15 Centralized Management Report-Fusion (Example 2)

Node A/B/C: Refer to Example 1 on the previous page.

Node D: When Point Code of Node C (12) is assigned to ASYD, SYS 1, Indexes 184 and 185, System messages are sent to Node C using CCIS. When this system data is not assigned (0) and Fusion Point Code of Node C (3) is assigned to ASYDL, SYS 1, Index 532, system messages are sent to Node C using FCCS.

SYSTEM CONFIGURATION

System Considerations

Example: 3 When a node is linked with LAN interface

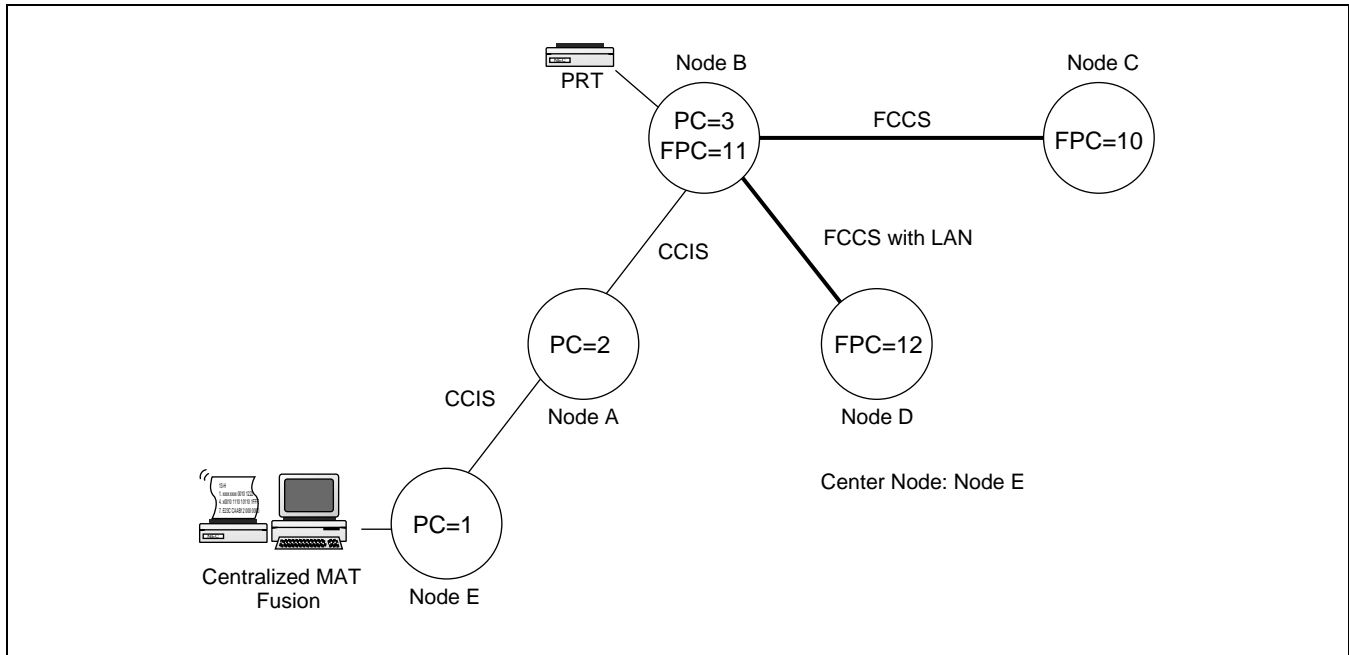


Figure 3-16 Centralized Management Report-Fusion (Example 3)

Node A: To send system messages to Node E, assign Point Code of Node C (1) to ASYD, SYS 1, Indexes 184 and 185.

Node B: To send system messages to Node E, assign Point Code of Node C (1) to ASYD, SYS1, Indexes 184 and 185. When this system data is assigned, system messages received from Nodes C and D are also transferred to Node E. However, when this data is not assigned (0), system messages received from Nodes C and D are ignored and not transferred to Node E.

System messages received from Nodes C and D are not output to the system message printer connected to Node B.

Node C/D: To send system messages to Node E via Node B and Node A, assign Fusion Point Code of Node B (11) to ASYDL, SYS 1, Index 532.

Node E: Received system messages are stored in the memory area for Centralized Management Report-Fusion.

3.4 Fusion Attendant/Desk Console

3.4.1 Operator Call

An operator call can be placed from each node by assigning the access code using the ASPAL/ASPAN command, which allows the user to specify an appropriate node on the Fusion network by entering the FPC. In this example, a station user at Node B can call up an operator at Node C or Node E by dialing "90" or "91."

Note 1: As regards the following data (Waiting Call Display data), be sure to develop the unified data at each node:
ASYD, SYS2, INDEX 8
ASYD, SYS2, INDEX 9

Note 2: When the connection routes (C_RT) are all busy, the operator call becomes in Night ATT mode.

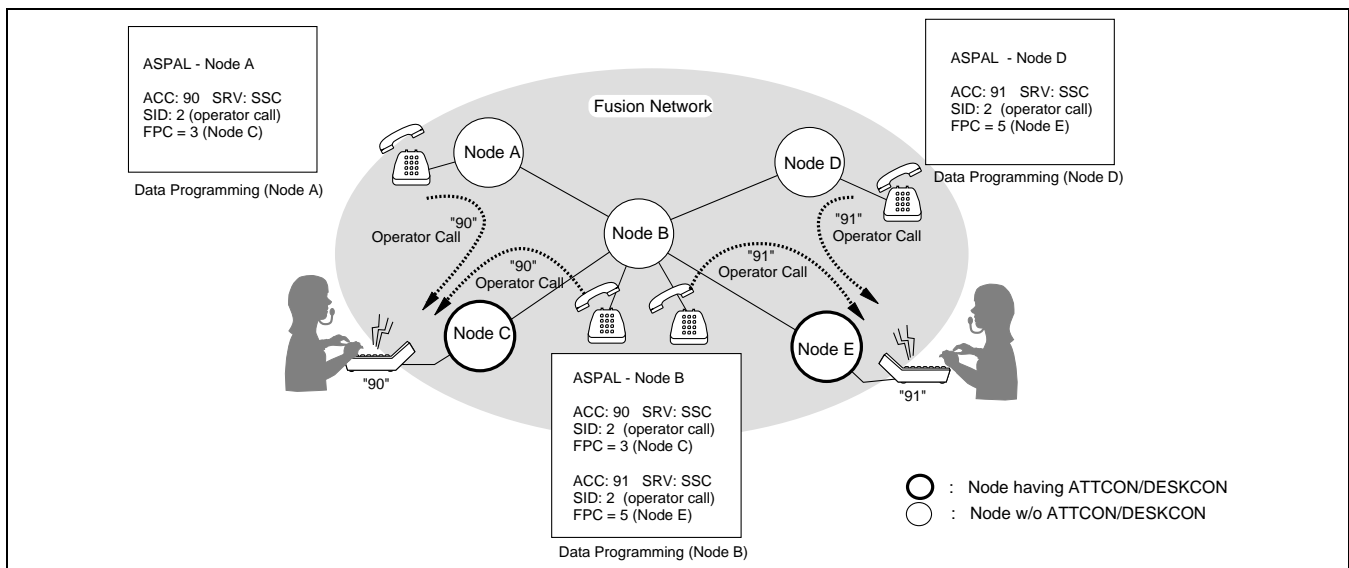


Figure 3-17 Operator Calls on a Fusion Network

SYSTEM CONFIGURATION

System Considerations

3.4.2 Central Office Incoming Call (Ring Down)

Each node can specify a terminating node for Ring Down calls using the system data. In this example, Node A and Node D specify Node C and Node E as the terminating node respectively. The terminating node is assigned using the ASYDL command (SYS 1, Index 640). Note that self-FPC is assigned at the terminating node.

Note 1: When assigning the data regarding the call termination to ATT, be sure to develop the unified data at each node.

Note 2: Terminating node cannot be assigned differently at each tenant (TN).

Note 3: When the connection routes (C_RT) are all busy, any attempted call via C.O. Line is not connected to the ATT. As a result, the calling party is provided with the Ring Back Tone (RBT), and even when a C_RT later becomes idle, the RBT connection is still maintained and the C.O. call does not terminate to the ATT.

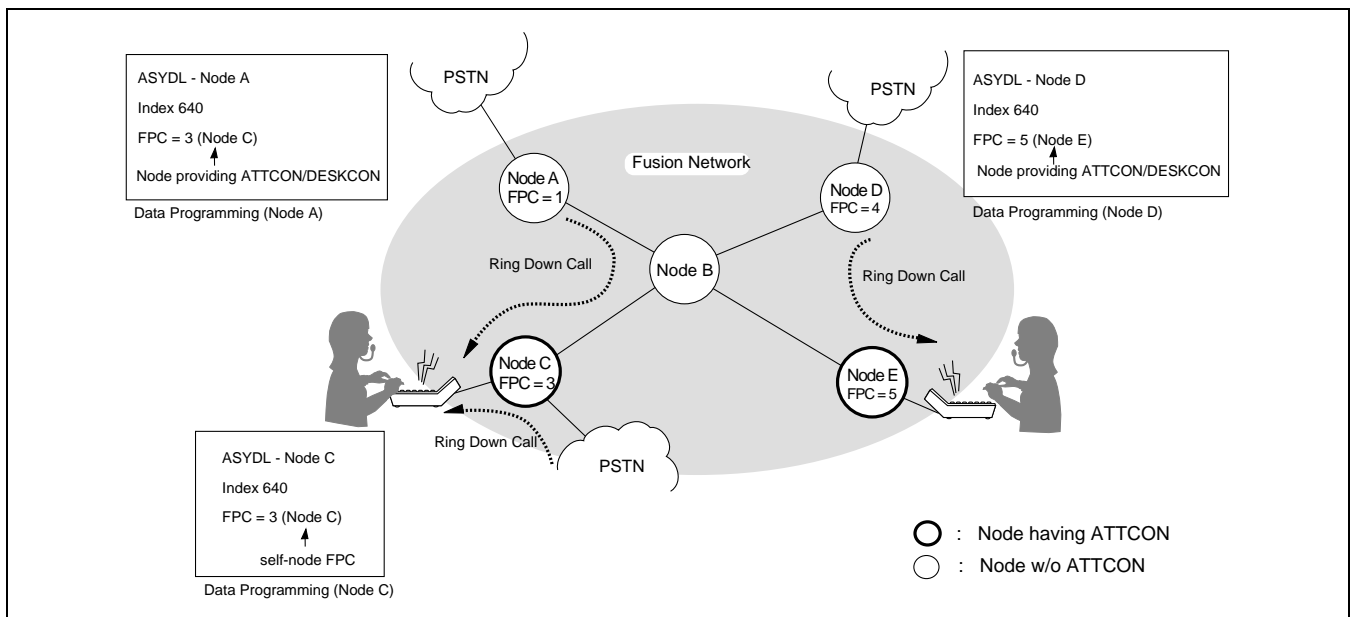


Figure 3-18 Ring Down Calls on a Fusion Network

3.4.3 Day/Night Change

Day/Night information is transferred from an ATTCON/DESKCON to predetermined nodes. In this example, Node C specifies Node A and Node B as destination nodes by assigning FPCs 1 and 2 in Indexes 704-735. Node A and Node B specifies Node C as a terminating node for Ring Down calls from PSTN by assigning FPC 3 in Index 640. Node E specifies Node D as a destination.

Note 1: When assigning ATTCON/DESKCON on the Fusion network, be sure to develop the unified System Data at each node.

Note 2: Terminating node cannot be assigned differently at each tenant (TN).

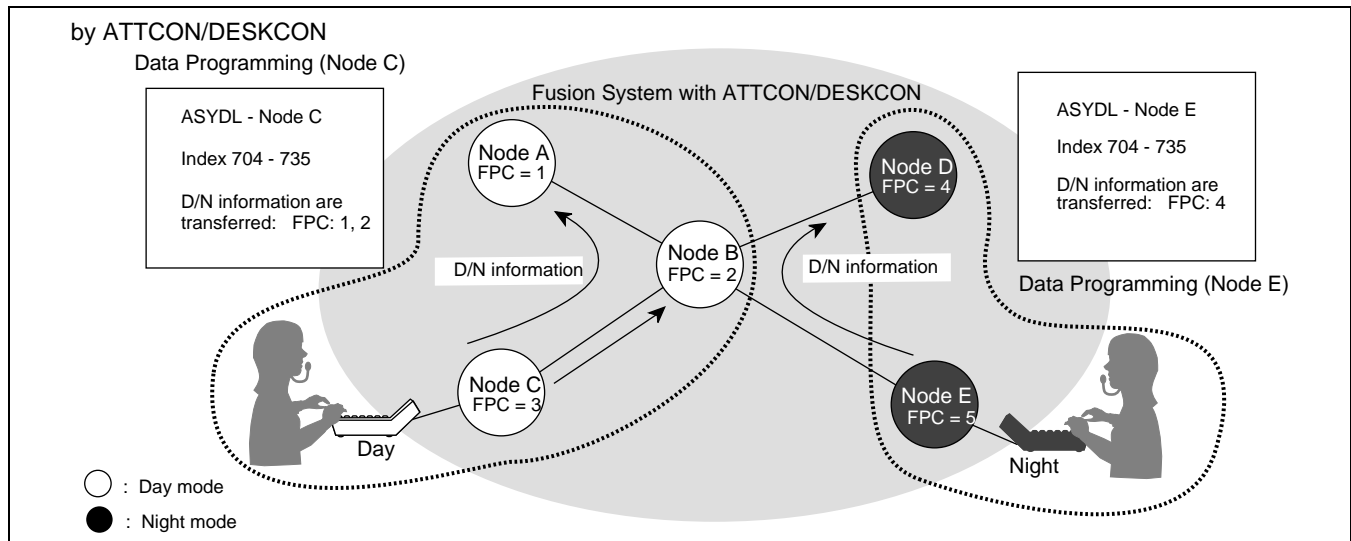


Figure 3-19 Day/Night Information Transfer by ATTCON/DESKCON

When an ATTCON/DESKCON is not provided on the Fusion network, Day/Night information is effective for node accommodating an external key box.

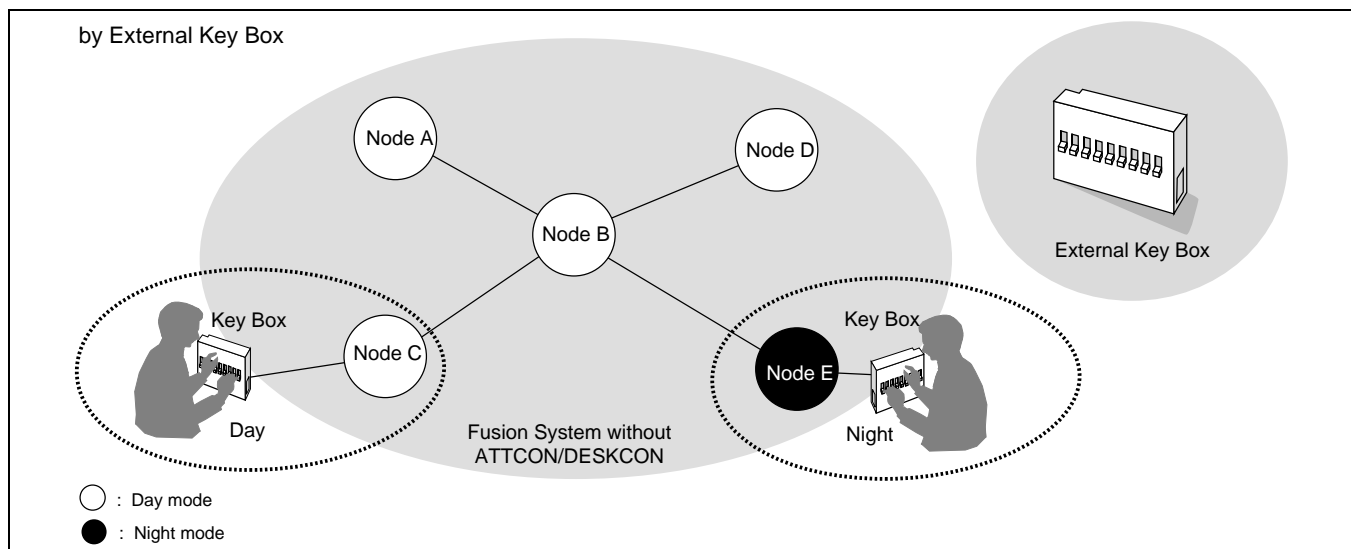


Figure 3-20 Day/Night Information Transfer

This page is for your notes.

CHAPTER 4 INSTALLATION

This chapter covers the installation of the Fusion system. The following topics are covered:

- How to set switches on the following circuit cards:
 - PA-M96 (HUB)
 - PA-FCHA (FCH)
 - PA-24DTR (DTI)
- How to mount the circuit cards
- How to run the 10 BASE-T cables

1. Anti-Static Caution

This manual provides Static Caution indicators on pages where work involving static-sensitive components is described. When performing work accompanied by this mark, be sure to use the anti-static kit. [Figure 4-1](#) shows the Static Caution indicator.



Figure 4-1 Static Caution Indicator

INSTALLATION
Anti-Static Caution

Figure 4-2 shows the anti-static kit that is provided. Use the kit as shown below when handling static-sensitive components such as circuit cards and cables.

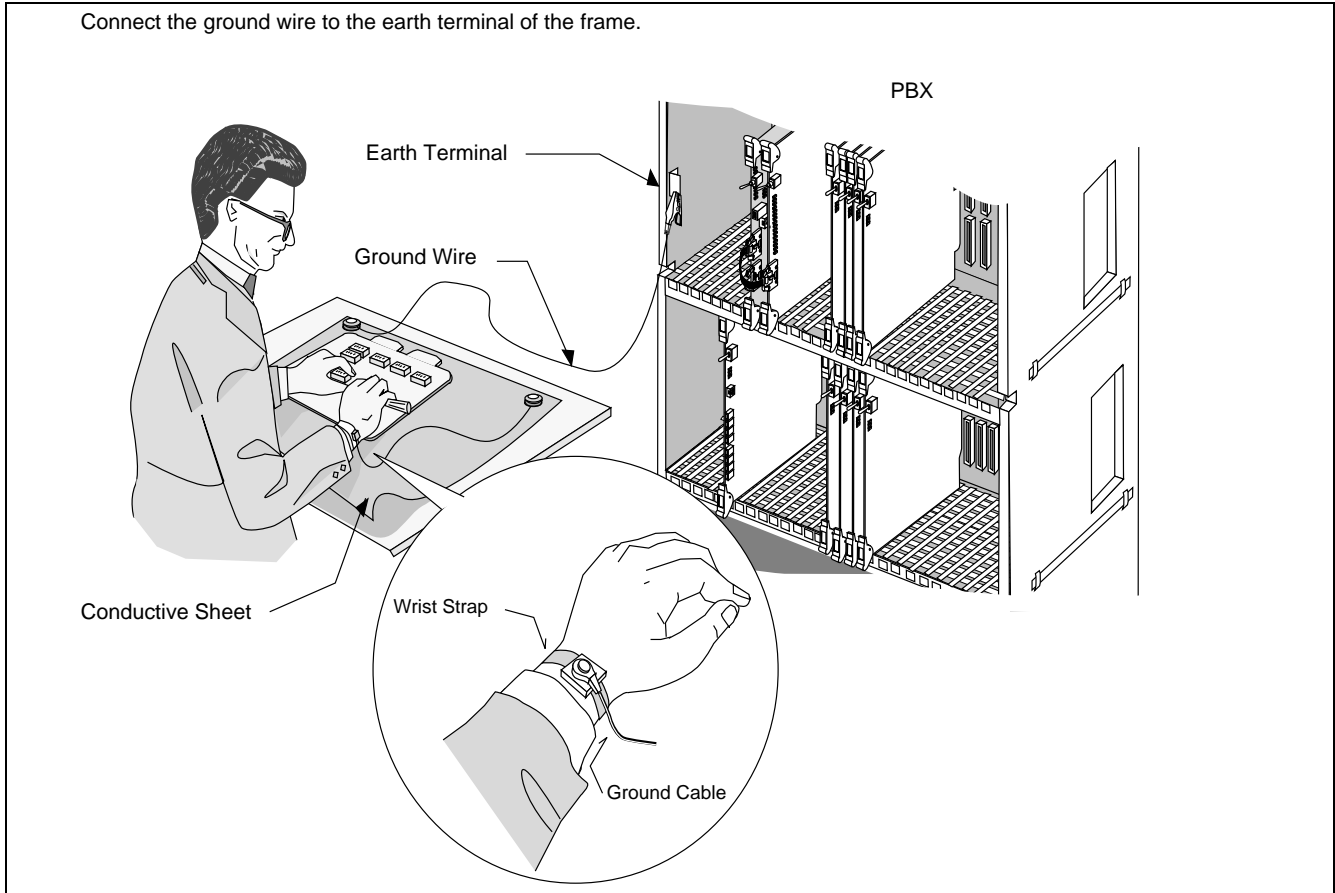


Figure 4-2 How to Use the Anti-static Kit

1.1 Circuit Cards Required

Depending on the system type, the following circuit cards are required to install the Fusion system:

- Fusion with FCH
HUB (PA-M96)
FCH (PA-FCHA)
DTI (PA-24DTR)
- Fusion without FCH
DTI (PA-24DTR)
HUB (PA-M96)

Before starting installation, make sure that all necessary cards are at your site.

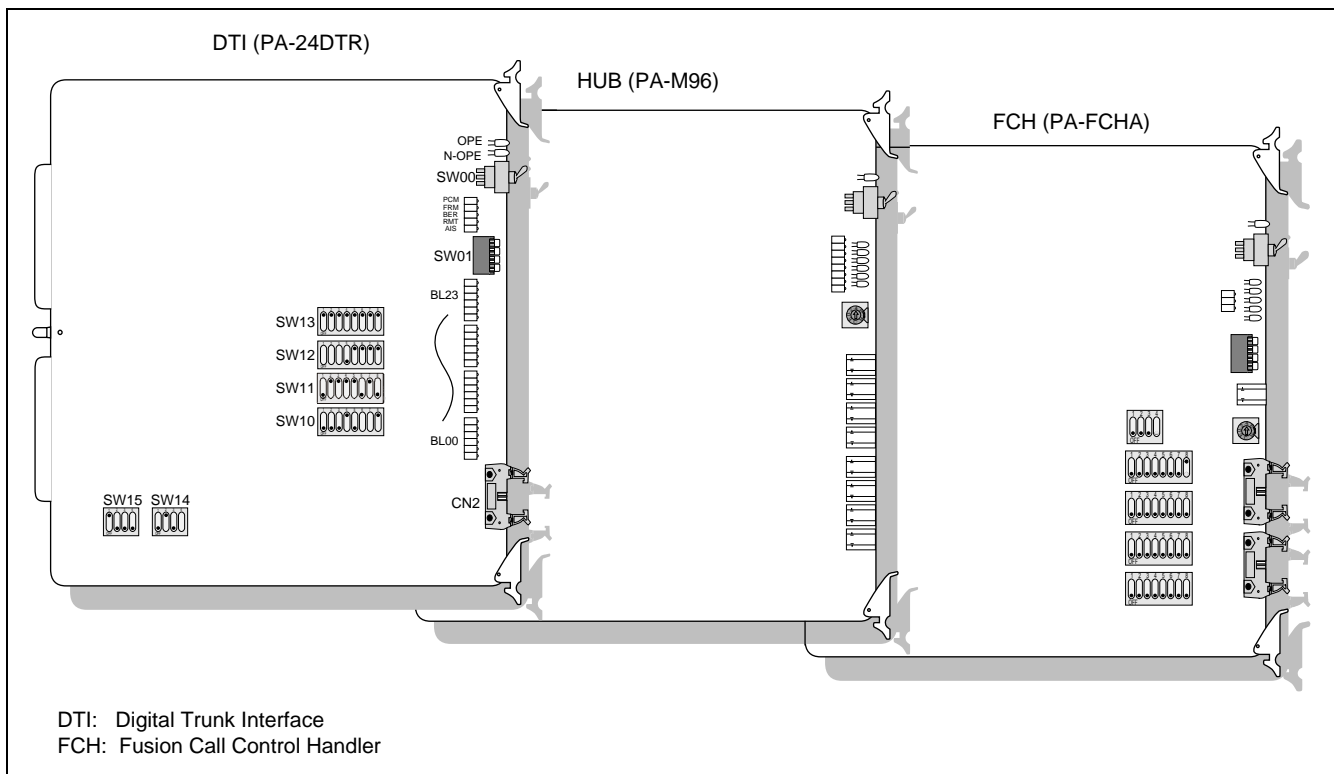


Figure 4-3 Circuit Cards for Fusion

INSTALLATION

Key Setting on Circuit Cards

2. Key Setting on Circuit Cards

2.1 PA-M96 (HUB)

Set the SEL switch on the HUB (PA-M96) card(s), after referring to [Figure 4-4](#) and [Table 4-1](#).

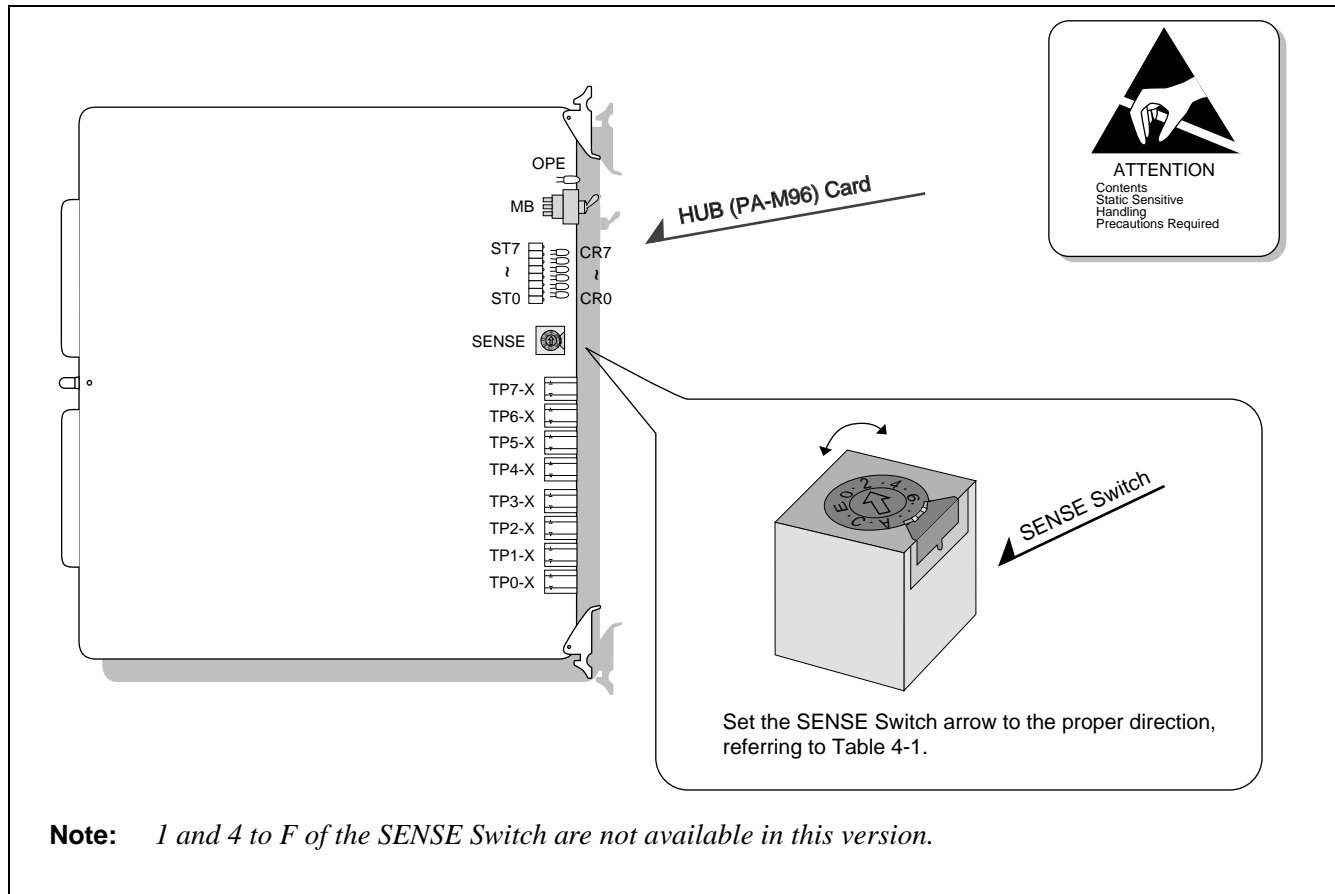



Figure 4-4 Switch Setting on HUB (PA-M96) Card

Table 4-1 SENSE Switch Setting

SWITCH NAME	SETTING	STANDARD SETTING	DESCRIPTION
 SENSE	0		Polarity indication on the STn lamps for TPn-Xports.
	1		Not used.
	2	×	TPn-X ports operate as a repeater HUB. (Standard setting)
	3		Data-Packet-Collision indication on the STn lamps for TPn-X ports.
	4-F		Not used.

2.2 PA-FCHA (FCH)

Set the switches on the FCH (PA-FCHA) card(s) as shown below. This card has DIP switches, whose key settings determine the time slots of the Fusion link. In Figure 4-5, CH3 is designated as the D/I channel in an example.

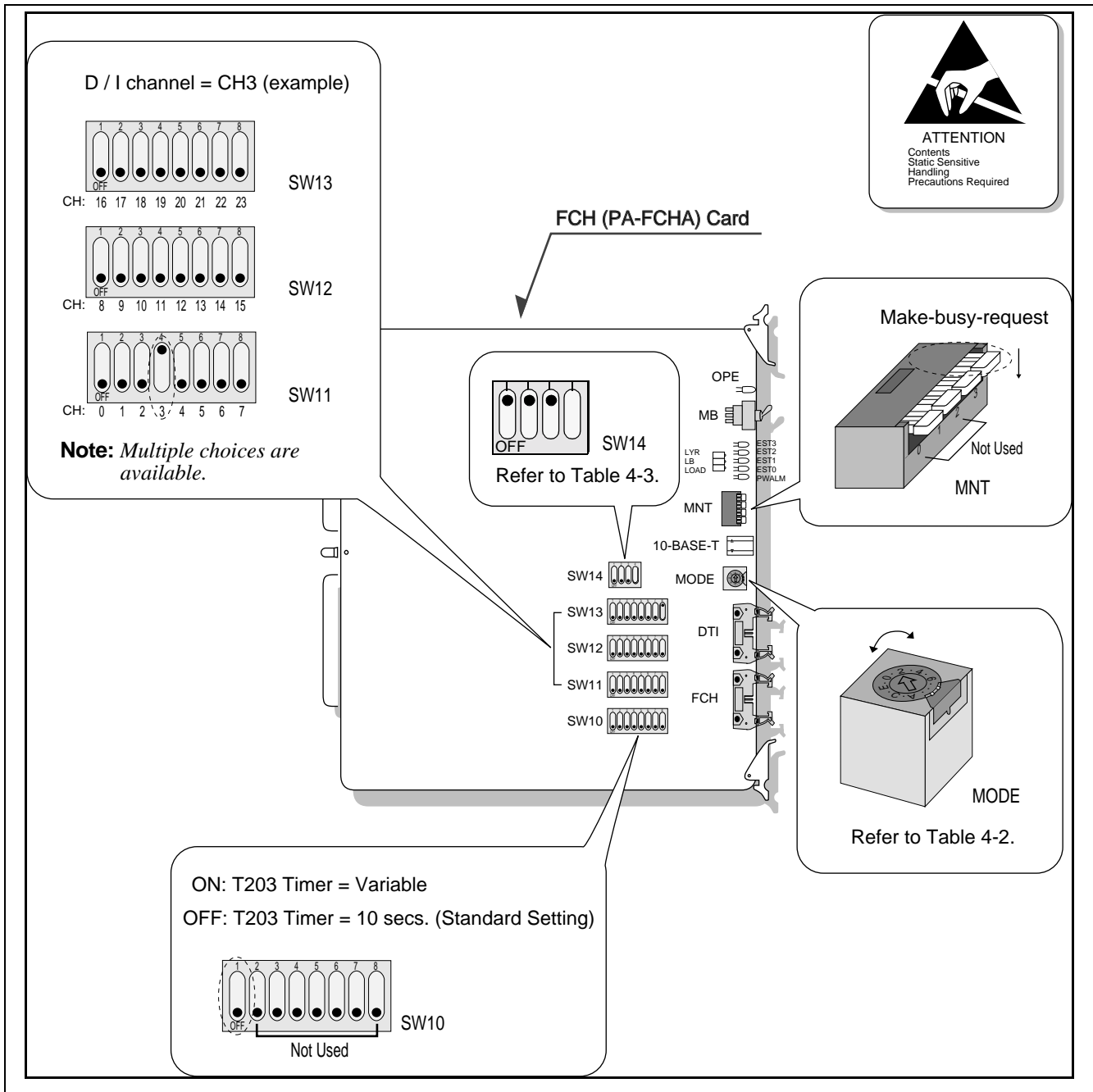


Figure 4-5 Switch Setting on FCH (PA-FCHA) Card

INSTALLATION
Key Setting on Circuit Cards

Table 4-2 MODE Switch Setting


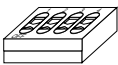
SWITCH NAME	SETTING	STANDARD SETTING	DESCRIPTION
	0-7		Not used
	8	×	Standard setting (When the DTI is connected with the card's front cable)
	9		Fusion link test mode (When the DTI is connected with the card's front cable)
	A-F		Not used

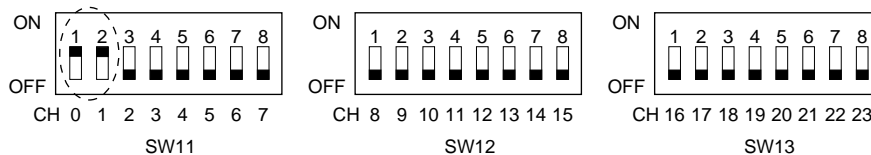
Table 4-3 DIP Switch (SW14) Setting

SWITCH NAME	SWITCH NUMBER	SETTING	STANDARD SETTING	DESCRIPTION															
	1	ON	×	Positive logic for the D/I CONT															
		OFF		Negative logic for the D/I CONT															
	2 Note 1	ON	×	The fusion data link speed inserted onto the T1 interface Note 3 <table border="1" data-bbox="938 949 1448 1163"> <thead> <tr> <th>SW14-2</th> <th>SW14-3</th> <th>SPEED (Note 2)</th> </tr> </thead> <tbody> <tr> <td>ON</td> <td>ON</td> <td>64Kbps × n (1~24)</td> </tr> <tr> <td>ON</td> <td>OFF</td> <td>48Kbps × n (1~24)</td> </tr> <tr> <td>OFF</td> <td>ON</td> <td>56Kbps × n (1~24)</td> </tr> <tr> <td>OFF</td> <td>OFF</td> <td>Not used</td> </tr> </tbody> </table>	SW14-2	SW14-3	SPEED (Note 2)	ON	ON	64Kbps × n (1~24)	ON	OFF	48Kbps × n (1~24)	OFF	ON	56Kbps × n (1~24)	OFF	OFF	Not used
		SW14-2	SW14-3		SPEED (Note 2)														
	ON	ON	64Kbps × n (1~24)																
	ON	OFF	48Kbps × n (1~24)																
	OFF	ON	56Kbps × n (1~24)																
	OFF	OFF	Not used																
	3 Note 1	ON	×																
		OFF																	
	4	ON		LAPD signal link performs as "network."															
		OFF		LAPD signal link performs as "user."															

Note 1: 64Kbps is used for T1 or E1 interface.
56Kbps is used for T1 interface with bit stealing.
48Kbps is used for T1 interface with both bit stealing and Zero Code Suppression (or Bit 7 Stuffing).

Note 2: When n is bigger than 1, Time Slot Sequence Integrity (TSSI) must be guaranteed at the network side.

Note 3: The following is an example key setting when n = 2.
SW11-1 = ON
SW11-2 = ON



2.3 PA-24DTR (DTI)

There are two types of the PA-24DTR (DTI) card as shown below. Refer to [Figure 4-6](#) and [Table 4-4](#) to set each switch to the proper positions.

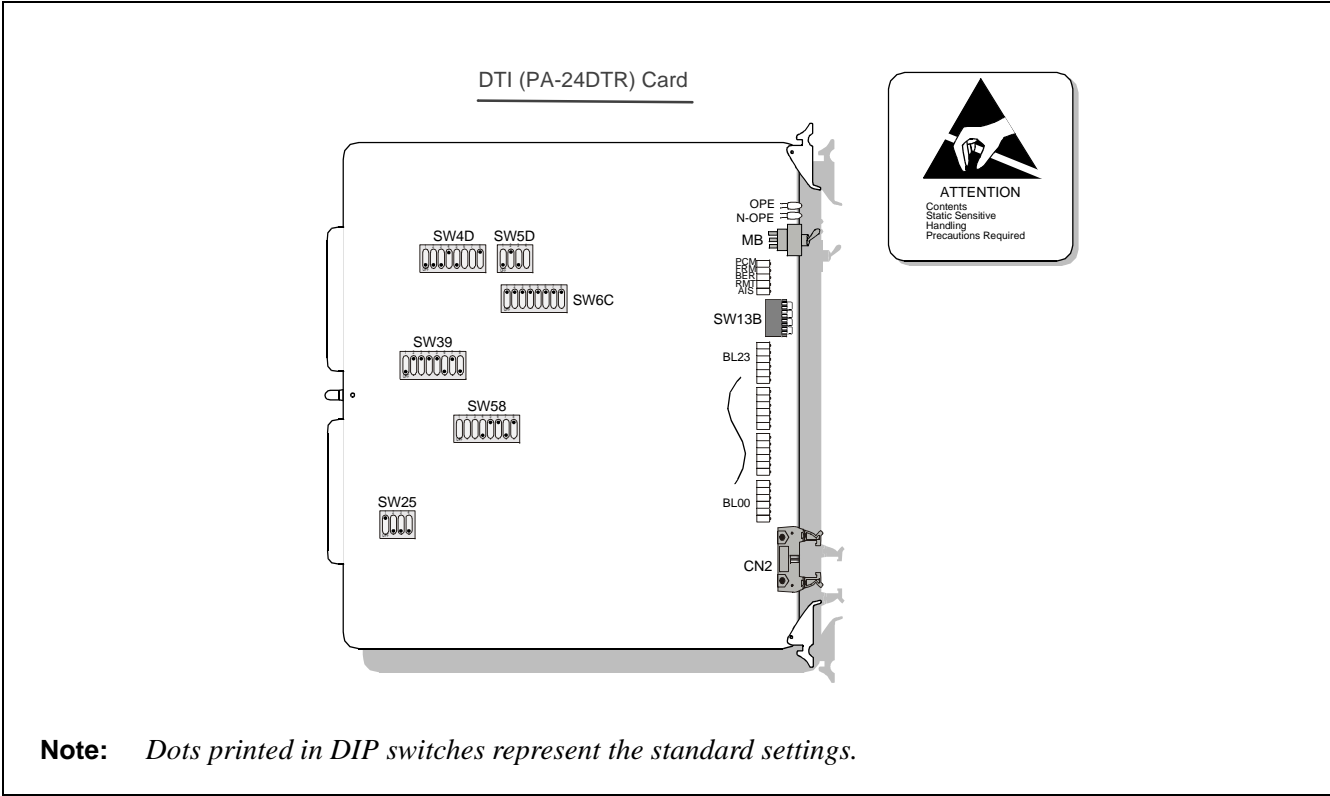
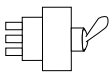
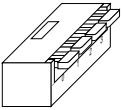


Figure 4-6 Switch Locations on DTI (PA-24DTR) Card

Table 4-4 Switch Setting Patterns for the DTI Card

SWITCH NAME	SWITCH NUMBER	SETTING	STANDARD SETTING	MEANING
		UP		Circuit card make busy
		DOWN	×	Circuit card make busy cancel
	0	ON		Internal Loopback: Set
		OFF	×	Internal Loopback: Cancel
	1	ON		External Loopback: Set
		OFF	×	External Loopback: Cancel
	2	ON		Payload Loopback: Set
		OFF	×	Payload Loopback: Cancel
3	ON		All Channel Make Busy: Set Note	
	OFF	×	All Channel Make Busy: Cancel	

INSTALLATION
Key Setting on Circuit Cards

Table 4-4 Switch Setting Patterns for the DTI Card (Continued)


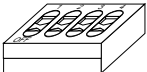

SWITCH NAME	SWITCH NUMBER	SETTING	STANDARD SETTING	MEANING
SW4D 	1	ON		Transmission Signal A Logic: Negative
		OFF	×	Transmission Signal A Logic: Positive
	2	ON		Receiving Signal A Logic: Negative
		OFF	×	Receiving Signal A Logic: Positive
	3	ON		RMT Alarm Sending: Not to be sent out
		OFF	×	RMT Alarm Sending: To be sent out
	4	ON	×	Simultaneous Seizure Supervision: Not to be controlled
		OFF		Simultaneous Seizure Supervision: To be controlled
	5	ON		Data Link Control: MOS
		OFF	×	Data Link Control: BOS
6	ON		Multiframe Selection: 12-Multiframe	
	OFF		Multiframe Selection: 24-Multiframe	
7	ON		Signal Selection: AMI (Alternate Mark Inversion)	
	OFF		Signal Selection: B8ZS (Bipolar with 8 Zeros Substitution)	
8	ON	×	Fixed	
SW25 	1	ON	×	Impedance setting: 100 Ω
		OFF		Impedance setting: 110 Ω
	2	ON		Transformer at Middle Point – Transmission: Ground
		OFF	×	Transformer at Middle Point – Transmission: Open
	3	ON		Transformer at Middle Point Receive: Ground
		OFF	×	Transformer at Middle Point Receive: Open
	4	ON		Idle Code: To be sent out
		OFF	×	Idle Code: Not to be sent out

Table 4-4 Switch Setting Patterns for the DTI Card (Continued)

SWITCH NAME	SWITCH NUMBER	SETTING	STANDARD SETTING	MEANING			
SW39 	1	ON					
		OFF	×	SW39-1	SW39-2	PAD CONTROL	
	2	ON	×	ON	ON	Both directions	
		OFF		OFF	ON	Receiving only	
					ON	OFF	Sending only
					OFF	OFF	ARTD is fixed
	3	ON	×				
		OFF					
	4	ON	×	SW39-3	SW39-4	DATA PAD	
		OFF		ON	ON	64K	
					OFF	ON	56K
					ON	OFF	48K
				OFF	OFF	64K INV.	
	5	ON	×				
		OFF					
	6	ON		SW39-5	SW39-6	T SIG CONTROL	
		OFF		ON	ON	ABCD	
					OFF	ON	ABAB
				×	ON	OFF	Bit steal is inhibited
				OFF	OFF	AAAA	
	7	ON	×				
		OFF					
	8	ON		SW39-7	SW39-8	R SIG CONTROL	
		OFF		ON	ON	ABCD	
				OFF	ON	ABAB	
			×	ON	OFF	Bit steal is inhibited	
			OFF	OFF	AAAA		

INSTALLATION
Key Setting on Circuit Cards

Table 4-4 Switch Setting Patterns for the DTI Card (Continued)



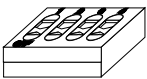
SWITCH NAME	SWITCH NUMBER	SETTING	STANDARD SETTING	MEANING																																		
SW6C 	1	ON	×	Fixed																																		
	2	ON	×	Fixed																																		
	3	ON	×	Fixed																																		
	4	ON	×	Fixed																																		
	5	ON	×	Fixed																																		
	6	ON	×	Fixed																																		
	7	ON	×	Fixed																																		
	8	ON	×	Fixed																																		
SW58 	1	ON		Equalizer Setting																																		
		OFF		<table border="1"> <thead> <tr> <th>SW 58-1</th> <th>SW 58-2</th> <th>SW 58-3</th> <th>DISTANCE</th> </tr> </thead> <tbody> <tr> <td>ON</td> <td>ON</td> <td>ON</td> <td>0 - 131 ft (0 - 040 m)</td> </tr> <tr> <td>ON</td> <td>ON</td> <td>OFF</td> <td>131 - 262 ft (40 - 080 m)</td> </tr> <tr> <td>ON</td> <td>OFF</td> <td>ON</td> <td>262 - 393 ft (80 - 120 m)</td> </tr> <tr> <td>ON</td> <td>OFF</td> <td>OFF</td> <td>393 - 524 ft (120 - 160 m)</td> </tr> <tr> <td>OFF</td> <td>ON</td> <td>ON</td> <td>524 - 656 ft (160 - 200 m)</td> </tr> <tr> <td colspan="3">Other Combinations</td> <td>Not Allowed</td> </tr> </tbody> </table>				SW 58-1	SW 58-2	SW 58-3	DISTANCE	ON	ON	ON	0 - 131 ft (0 - 040 m)	ON	ON	OFF	131 - 262 ft (40 - 080 m)	ON	OFF	ON	262 - 393 ft (80 - 120 m)	ON	OFF	OFF	393 - 524 ft (120 - 160 m)	OFF	ON	ON	524 - 656 ft (160 - 200 m)	Other Combinations			Not Allowed			
	SW 58-1	SW 58-2	SW 58-3	DISTANCE																																		
	ON	ON	ON	0 - 131 ft (0 - 040 m)																																		
	ON	ON	OFF	131 - 262 ft (40 - 080 m)																																		
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	OFF	ON	ON	524 - 656 ft (160 - 200 m)																																		
	Other Combinations			Not Allowed																																		
	2	ON																																				
		OFF																																				
	3	ON																																				
		OFF																																				
	4	ON		PAD Pattern Selection																																		
		OFF	×	<table border="1"> <thead> <tr> <th>SW 58-4</th> <th>SW 58-5</th> <th>SW 58-6</th> <th>PAD PATTERN</th> </tr> </thead> <tbody> <tr> <td>OFF</td> <td>ON</td> <td>ON</td> <td>PAD Pattern 1</td> </tr> <tr> <td>OFF</td> <td>ON</td> <td>OFF</td> <td>PAD Pattern 2</td> </tr> <tr> <td>ON</td> <td>OFF</td> <td>ON</td> <td>A→μ Loss (Bothway)</td> </tr> <tr> <td>ON</td> <td>OFF</td> <td>OFF</td> <td>A→μ Loss (Receive)</td> </tr> <tr> <td>OFF</td> <td>OFF</td> <td>ON</td> <td>μ→A Loss (Bothway)</td> </tr> <tr> <td>OFF</td> <td>OFF</td> <td>OFF</td> <td>μ→A Loss (Receive)</td> </tr> <tr> <td colspan="3">Other Combinations</td> <td>Not Allowed</td> </tr> </tbody> </table>				SW 58-4	SW 58-5	SW 58-6	PAD PATTERN	OFF	ON	ON	PAD Pattern 1	OFF	ON	OFF	PAD Pattern 2	ON	OFF	ON	A→μ Loss (Bothway)	ON	OFF	OFF	A→μ Loss (Receive)	OFF	OFF	ON	μ→A Loss (Bothway)	OFF	OFF	OFF	μ→A Loss (Receive)	Other Combinations		
	SW 58-4	SW 58-5	SW 58-6	PAD PATTERN																																		
	OFF	ON	ON	PAD Pattern 1																																		
	OFF	ON	OFF	PAD Pattern 2																																		
	ON	OFF	ON	A→μ Loss (Bothway)																																		
	ON	OFF	OFF	A→μ Loss (Receive)																																		
OFF	OFF	ON	μ→A Loss (Bothway)																																			
OFF	OFF	OFF	μ→A Loss (Receive)																																			
Other Combinations			Not Allowed																																			
5	ON	×																																				
	OFF																																					
6	ON	×																																				
	OFF																																					
7	ON																																					
	OFF	×																																				
8	ON	×																																				
	OFF		Alarm Sending when this circuit card is in N-OPE state.																																			

Table 4-4 Switch Setting Patterns for the DTI Card (Continued)

SWITCH NAME	SWITCH NUMBER	SETTING	STANDARD SETTING	MEANING
SW5D 	1	ON		Digital PAD ROM selection: Special specification
		OFF	×	Digital PAD ROM selection: Standard specification
	2	ON	×	LAYER2 signal logic: Positive
		OFF		LAYER2 signal logic: Negative
	3	ON		Line fault is not notified to the upper CPU
		OFF	×	Line fault is notified to the upper CPU
	4	ON		Zero Code Suppression is not provided

Note: This switch setting is applicable for a system which adopts Associated Channel Interoffice Signalling (ACIS).

2.4 Digital PAD Setting

The PA-24DTR card is equipped with a mask ROM in which the following typical PAD patterns have been already written. PAD value is determined by selecting a desired PAD pattern, which can be done by key setting of the SW 58 (elements 4, 5, 6) on the card, and programming of the PAD data by the ARTD command - CDN = 30 (PAD). The PAD patterns and ARTD data correspond as follows.

Table 4-5 Digital Pad Setting

PAD DATA ARTD CDN= 30	PAD Pattern [dB] (Selected by key setting)												
	PAD Pattern 1		PAD Pattern 2		A→μ Loss (Bothway)		A→μ Loss (Receive)		μ→A Loss (Bothway)		μ→A Loss (Receive)		
	SEND	RECEIVE	SEND	RECEIVE	SEND	RECEIVE	SEND	RECEIVE	SEND	RECEIVE	SEND	RECEIVE	
1	2	2	-3 Note	3	0	0	0	0	0	0	0	0	0
2	4	4	3	3	4	4	0	4	4	4	0	4	
3	6	6	0	6	6	6	0	12	6	6	0	12	
4	8	8	3	9	8	8	0	8	8	8	0	8	
5	Key setting of SW 39-3,4 correspond to PAD values. (Regardless of PAD patterns)												
7	0	0	0	0	Through	Through	Through	Through	Through	Through	Through	Through	Through

Note: Stands for 3[dB] GAIN.

INSTALLATION

Mounting Circuit Cards in PIM

3. Mounting Circuit Cards in PIM

3.1 Mounting HUB (PA-M96) in a PIM

Mount the HUB (PA-M96) card in an appropriate slot of a PIM as shown below. When the MAT is connected via a HUB card, be sure to use a dedicated HUB for the Fusion link.

Note: *HUB (PA-M96) can be mounted wherever in a PIM of any IMG stack. However, if your system is 1-IMG type, mount the HUB in PIM0.*

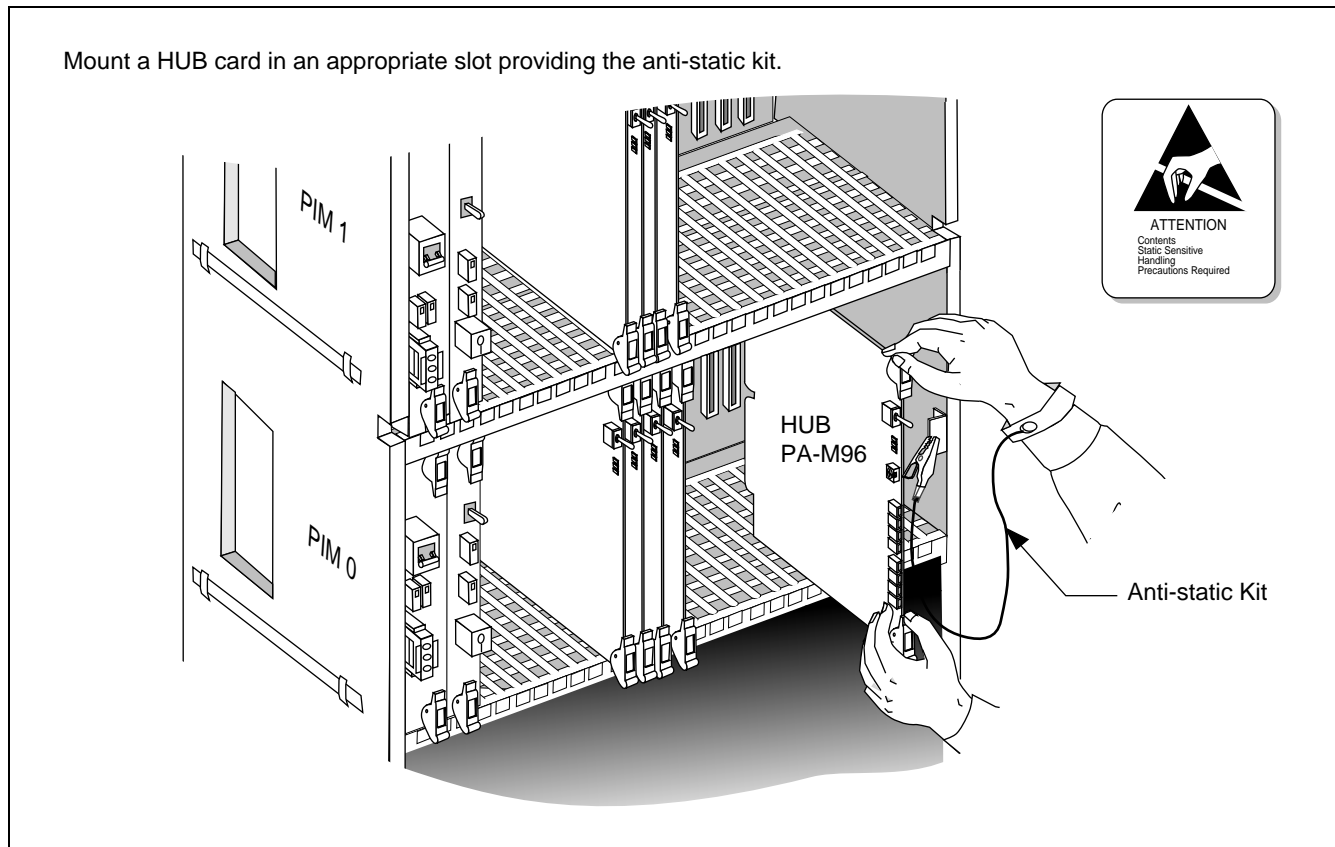


Figure 4-7 Mounting HUB Card in PIM 0

3.2 Mounting FCH (PA-FCHA) and DTI (PA-24DTR) Cards

Mount the FCH (PA-FCHA) and the DTI (PA-24DTR) card in appropriate slots in a PIM. Mount the two cards in adjacent slots since these cards must be connected on the front connectors. [Figure 4-8](#) shows an example with the FCH and DTI cards mounted in PIM 1.

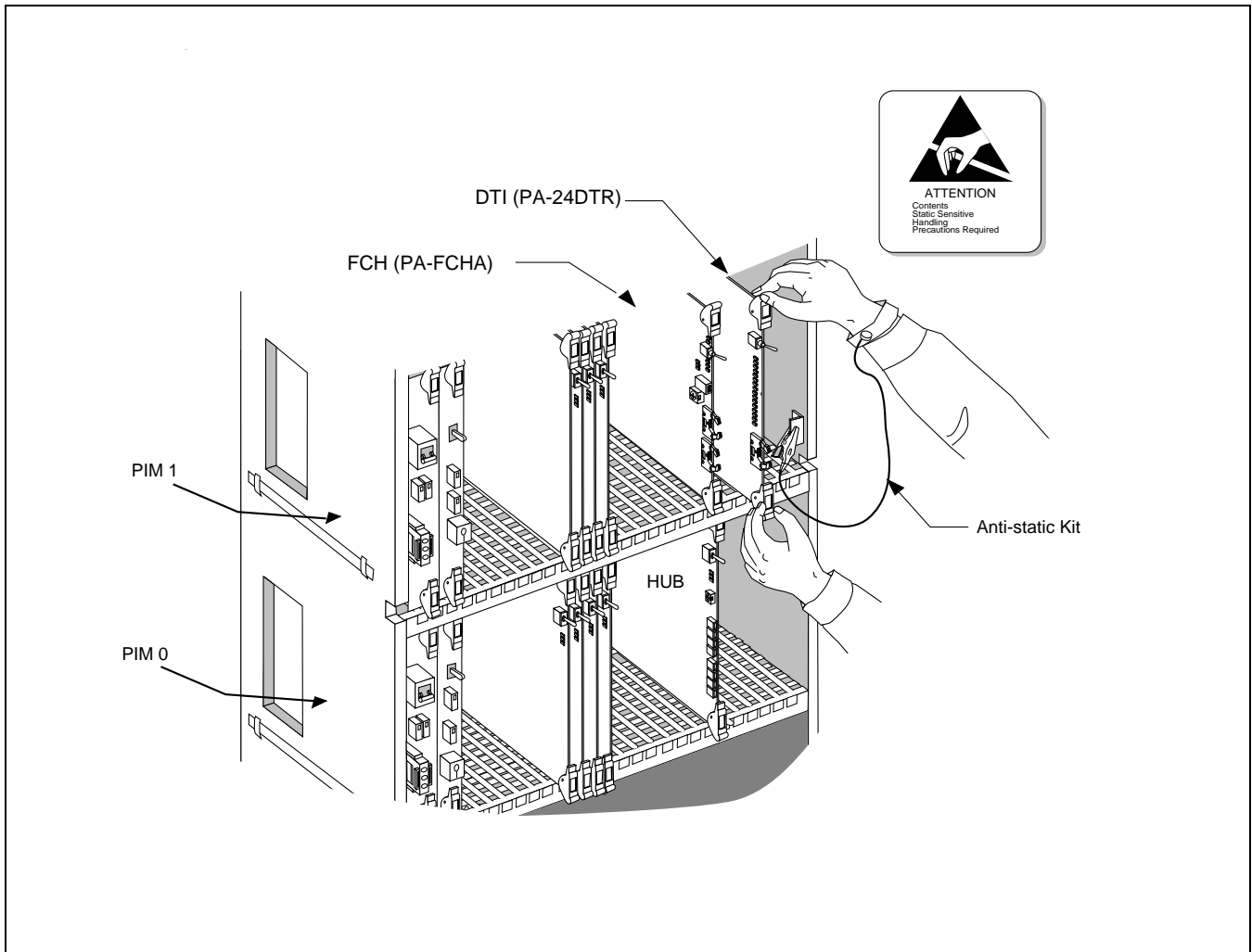


Figure 4-8 Mounting FCH and DTI Cards

INSTALLATION
Connecting Cables

4. Connecting Cables

4.1 Connecting DTI-FCH Front Cables

Connect the furnished front cable to the connectors on the DTI and FCH cards. Use DTI and CN2 connectors on the FCH and DTI cards respectively. Since an FCH card is equipped with one Handler circuit, a maximum of five FCH cards can be connected to a DTI card. (See [Figure 4-10](#).) However, if a DCH card is also cascaded, a maximum of three FCH cards can be added to the DTI card. (DCH is equipped with two Handler circuits per card.)

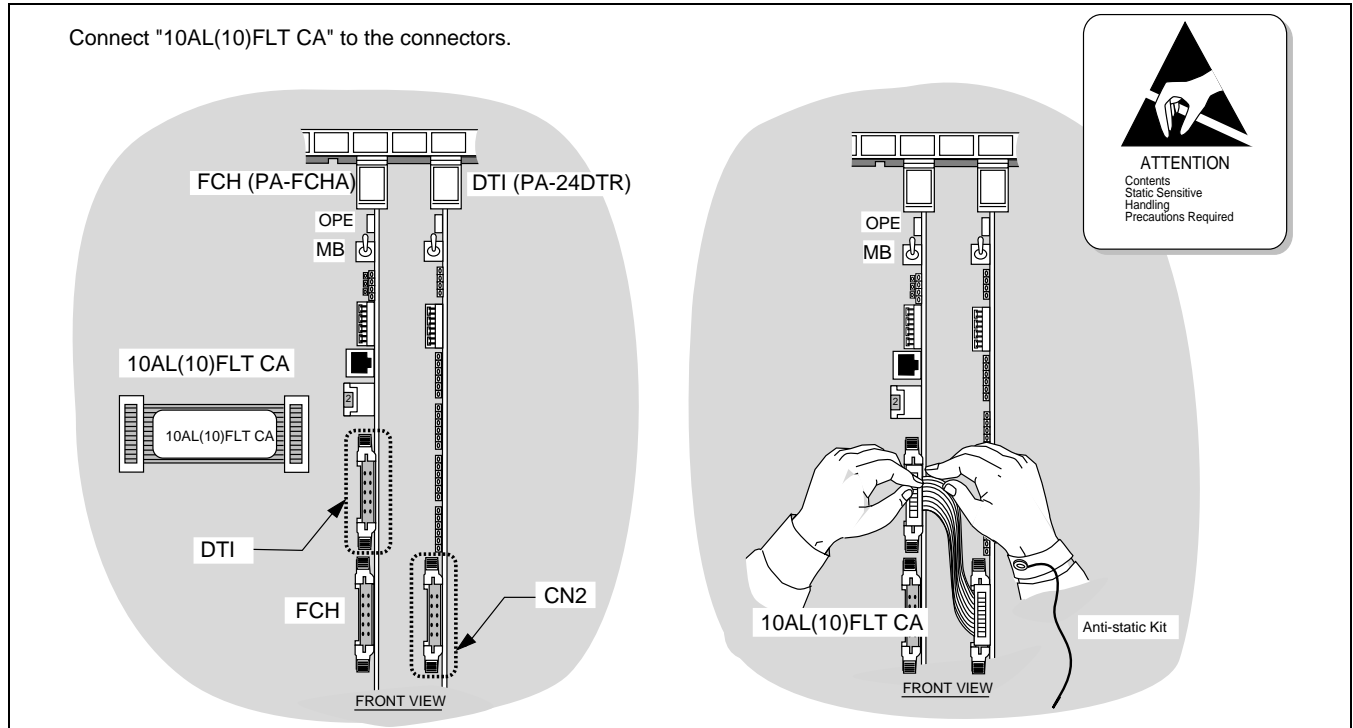


Figure 4-9 Connecting Front Cables

Since a maximum of five Handler circuits can be used, five FCH cards can be cascaded. Figure 4-10 shows an example where three FCH cards are cascaded.

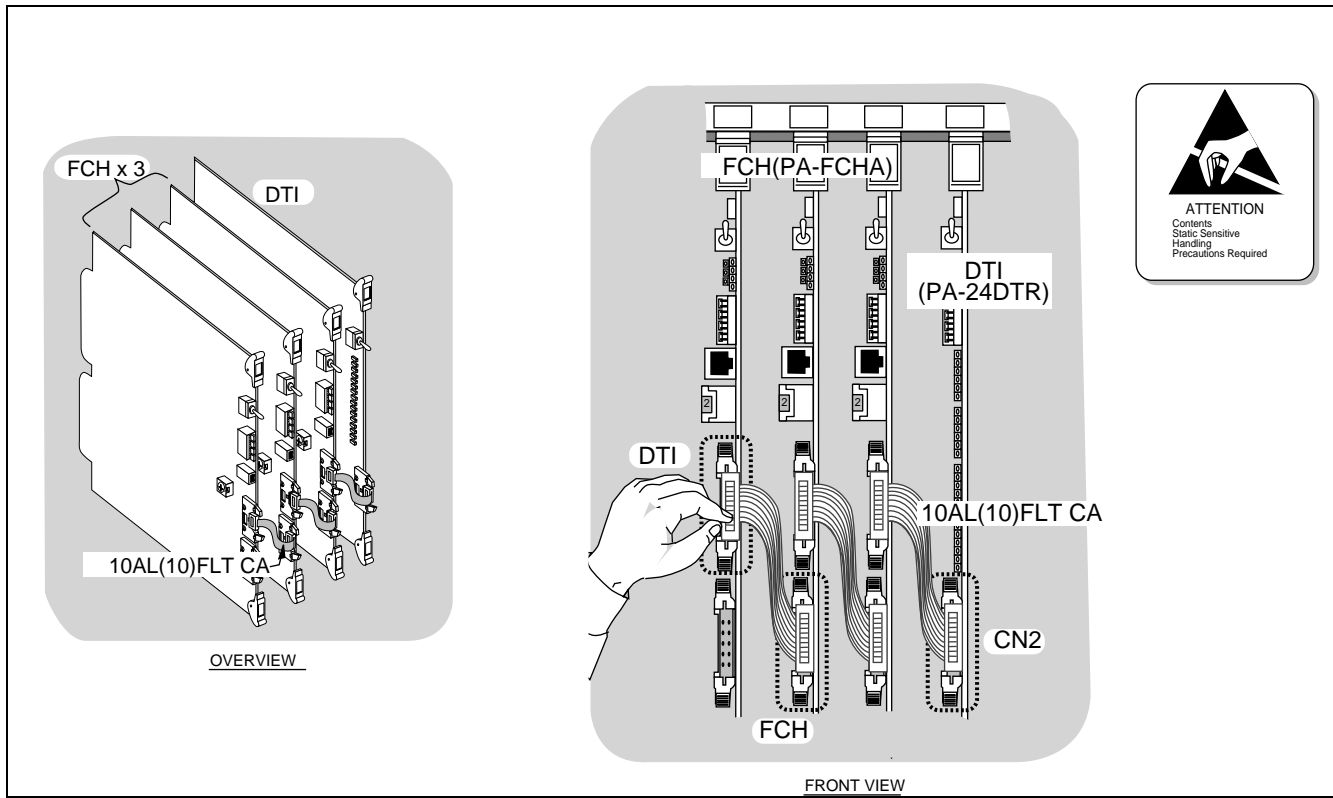


Figure 4-10 FCH Cascade Connections

INSTALLATION
Connecting Cables

4.2 Connecting 10 BASE-T Cables

Figure 4-11 shows sample cable connections, where HUB (PA-M96) cards are provided in a dual configuration and the FCH (PA-FCHA) card is located in PIM 1 (1-IMG system/IMG0). When HUB cards are provided in a dual configuration, the two HUB cards must be connected on each front edge connector using a 10 BASE-T cross cable. However, when dual LANIs (LANI-A and LANI-B) are used for each CPU, the cross cable connection between HUBs for FCH#0 and #1 is not necessary.

Note: *The Ethernet cables shown in the examples in this section are NOT available from NEC. These cables must be provided by the customer, depending on the system configuration. See “Chapter 6 Connecting 10 BASE-T Cables.”*

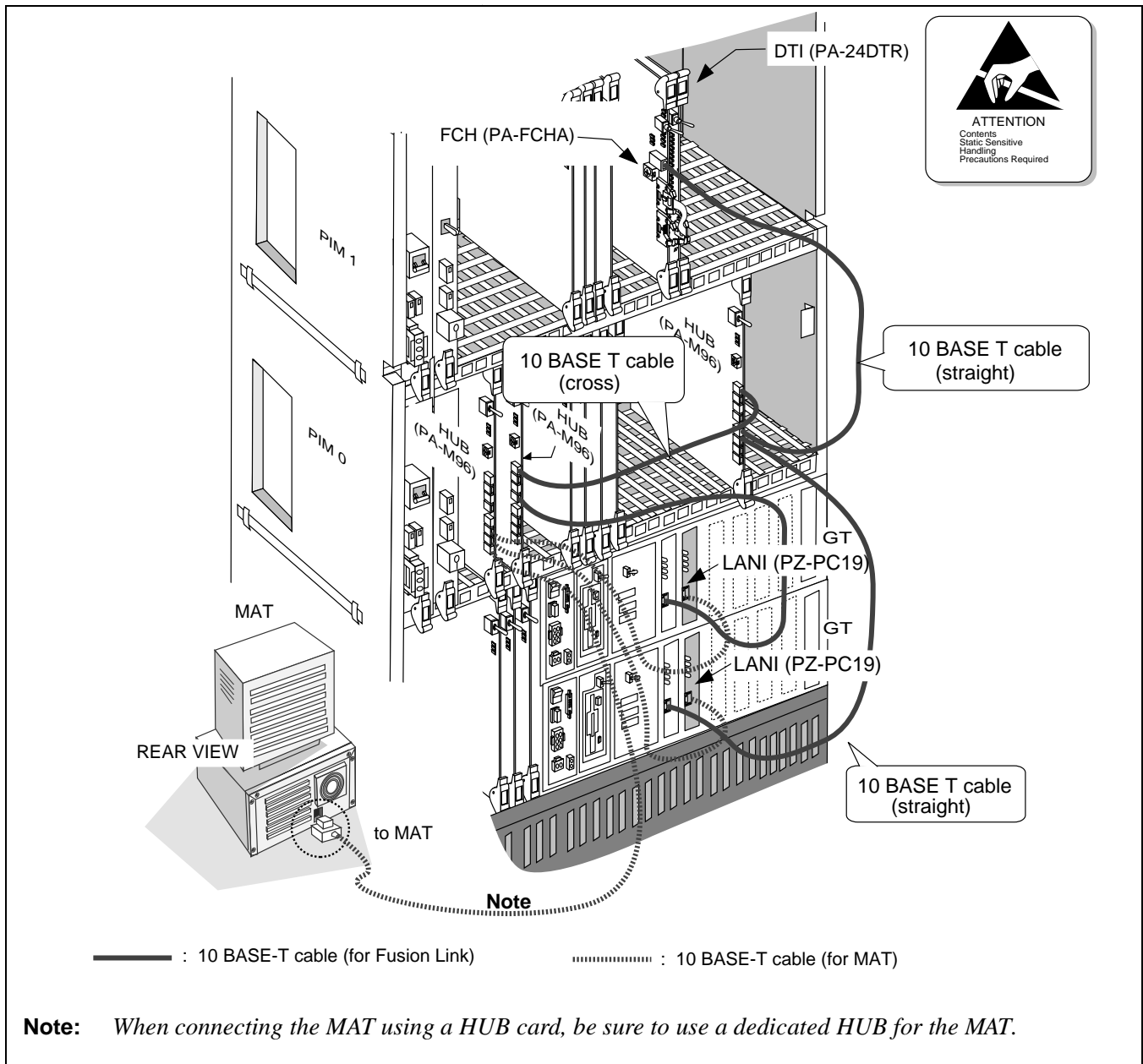


Figure 4-11 Overall 10 BASE-T Connections

4.3 10 BASE-T Connection Procedure

The pattern for 10 BASE-T cable connections may vary, depending on the system configuration (such as number of IMG stacks or the mounting location/number of the FCH/HUB cards, etc.). According to your system configuration, connect necessary Ethernet cables:

4.3.1 Procedure for 1-IMG System

If your system is 1-IMG type, the 10 BASE-T connection should use either of the following cables:

1. Cable unit specified as SR1201 ETIF CAU-n
2. Cables, other than those of SR1201 ETIF CAU-n, that are provided by the user

Based on the cable type, perform the following:

4.3.2 When using cable unit SR1201 ETIF CAU-n

1. Referring to any of [Figure 4-13](#) through [Figure 4-15](#), connect the 10 BASE-T straight cables, between the LANI (PZ-PC19) and HUB (PA-M96) cards, and between the HUB and FCH (PA-FCHA) cards. If the HUB is in a dual configuration, also connect the 10 BASE-T cross cable between HUB#0 and HUB#1.

When dual LANIs are used in both Slot 00 and 03 of CPR#0/CPR#1, be sure to use at least two HUB cards. Use one HUB for the internal LANI (in Slot 00) and use the other HUB for external LANI (in Slot 03, available for Series 7300 Release 3 software or later). If FCH is also in a dual configuration, the 10 BASE-T cross connection between the two HUBs is not required.

2. If your system needs more FCH (PA-FCHA) and/or HUB (PA-M96) cards, provide the required Ethernet connection(s) for the added card(s) using the following cables:
 - When adding FCH card in PIM0: UTP CTG5 ST CA-D
 - When adding HUB card in PIM0: UTP CTG5 CRS CA-D
 - When adding FCH card in PIM1: UTP CTG5 ST CA-K
 - When adding HUB card in PIM1: UTP CTG5 CRS CA-K
 - When adding FCH card in PIM2: UTP CTG5 ST CA-M
 - When adding HUB card in PIM2: UTP CTG5 CRS CA-M
 - When adding FCH card in PIM3: UTP CTG5 ST CA-N
 - When adding HUB card in PIM3: UTP CTG5 CRS CA-N

Note: *The cables, cited above and used in [Figure 4-13](#) through [Figure 4-15](#), are for the 1-IMG system only (not available in the 4-IMG/IMX-U system).*

INSTALLATION

Connecting Cables

4.3.3 When not using the cable unit SR1201 ETIF CAU-n

When your system doesn't use the cable unit classified as SR1201 ETIF CAU-n, perform the 10 BASE-T connections as instructed below:

1. Depending on your system configuration, connect the 10 BASE-T straight cable(s) between the HUB (PA-M96) and LANI (PZ-PC19) cards. Use the cable UTP CTG5 ST CA-O, which must be provided by the user.

When a single LANI is used for each CPR (Slot 00 only) and the HUB is in a dual configuration, connect HUB#0 to LANI#0 and HUB#1 to LANI#1, using two 10 BASE-T cables.

When dual LANIs are used in both Slot 00 and 03 of CPR#0/CPR#1, use at least two HUB cards as separate 10 BASE-T connection terminals: One HUB for the internal LANI (LANI-A in Slot 00 Of each CPR) and the other for the external LANI (LANI-B: in Slot 03 of each CPR) The external LANI is available for Series 7300 Release 3 software or later.

2. When HUB is in a dual configuration, connect the 10 BASE-T cross cable between the HUB cards. Use the cable UTP CTG5 CRS CA-F, which must be provided by the user.

When using more than two HUB cards, connect the cross cable(s) for the remaining HUB cards, except the HUB card used for the MAT connection.

3. Connect the 10 BASE-T straight cable(s) between the HUB and FCH (PA-FCHA) cards. Use the following cables, which must be provided by the user.

UTP CTG5 ST CA-F: When the HUB and FCH are in the same PIM (PIM0)

UTP CTG5 ST CA-O: When the HUB and FCH are in different PIMs

When FCH is in a dual configuration, connect FCH#0 to the HUB#0 side, and FCH#1 to the HUB#1 side.

4.3.4 Procedure for 4-IMG System

When your system is 4-IMG type, the procedure for 10 BASE-T connection is as follows. Because the HUB (PA-M96) can be mounted anywhere in a PIM of any IMG, the Ethernet cables must be arranged by the user, depending on the system configuration.

1. Depending on your system configuration, connect the 10 BASE-T straight cable(s) between the HUB (PA-M96) and LANI (PZ-PC19) cards. Use the following cable, prepared by the user.

UTP CTG5 ST CA-O: When the HUB and LANI are in the same IMG (IMG0)

UTP CTG5 ST CA-X: When the HUB and LANI are in different IMGs

When a single LANI is used for each CPR (Slot 00 only) and the HUB is in a dual configuration, connect HUB#0 and HUB#1 to LANI#1 using two 10 BASE-T cables.

When dual LANIs are used in both Slot 00 and 03 of CPR#0/CPR#1, be sure to use at least two HUB cards as separate 10 BASE-T connection terminals. Use one HUB for the internal LANI (LANI-A: in Slot 00 of each CPR) and use the other for the external LANI (LANI-B in Slot 03 of each CPR).

2. When the HUB is in a dual configuration, connect the 10 BASE-T cross cable between the HUB cards. Use the following cables, which are provided by the user.

UTP CTG5 CRS CA-F: When the HUB and HUB are in the same PIM

UTP CTG5 CRS CA-O: When the HUB and HUB are in different PIMs but in the same IMG

UTP CTG5 CRS CA-X: When the HUB and HUB are in different IMG stacks

When using more than two HUB cards, also connect the cross cable(s) for the remaining HUB card(s), except the HUB for the MAT connection.

This step is not necessary when your system uses dual LANIs for CPU#0/CPU#1 and FCH is also in a dual configuration.

3. Connect the 10 BASE-T straight cable(s) between the HUB and FCH (PA-FCHA) cards. Use the following cable, which must be provided by the user.

UTP CTG5 ST CA-F: When the HUB and FCH are in the same PIM

UTP CTG5 ST CA-O: When the HUB and FCH are in different PIMs but in the same IMG

UTP CTG5 ST CA-X: When the HUB and FCH are in different IMG stacks

When FCH is in a dual configuration, connect FCH#0 to the HUB#0 side, and FCH#1 to the HUB#1 side.

4.3.5 Procedure for IMX-U System

When your system is the IMX-U type (configured to a maximum of 4 Local Nodes + 1ISW), the procedure for the 10 BASE-T connection is as follows. Because this system already has a Fusion Link via the HUB (PA-M96) cards, this section gives details related only to the connection between the HUB and FCH (PA-FCHA) cards.

1. Refer to the NEAX2400 IMX Installation Manual (IMX-U Type) to make sure that the necessary 10 BASE-T (both straight and cross) connections between the ISW and each LN (Local Node) are all securely provided.
2. Connect the 10 BASE-T straight cable(s) between the HUB (PA-M96) and FCH (PA-FCHA) cards. Use the following cable, which must be provided by the user.

UTP CTG5 ST CA-F: When the HUB and FCH are in the same PIM

UTP CTG5 ST CA-O: When the HUB and FCH are in different PIMs but in the same IMG

UTP CTG5 ST CA-X: When the HUB and FCH are in different IMG stacks but in the same LN

UTP CTG5 ST CA-A0: When the HUB and FCH are in different LNs

INSTALLATION

Connecting Cables

When dual FCH is provided for the HUB dedicated to each internal LANI card (LANI-A: in Slot 00 of each CPR), connect FCH#0 to HUB#0 and FCH#1 to HUB#1.

When your system also uses the external LANI cards (LANI-B in Slot 03 of each CPR), prepare another set of FCH cards for the HUB dedicated to the external LANI cards. Then, if the FCH is in dual configuration, connect one FCH to the HUB for No. 0 system of the external LANI, and the other to the HUB for the No. 1 system of the external LANI.

Figure 4-12 shows an example of a HUB in a dual configuration and the FCH card mounted in PIM 1 of the 1 IMG system.

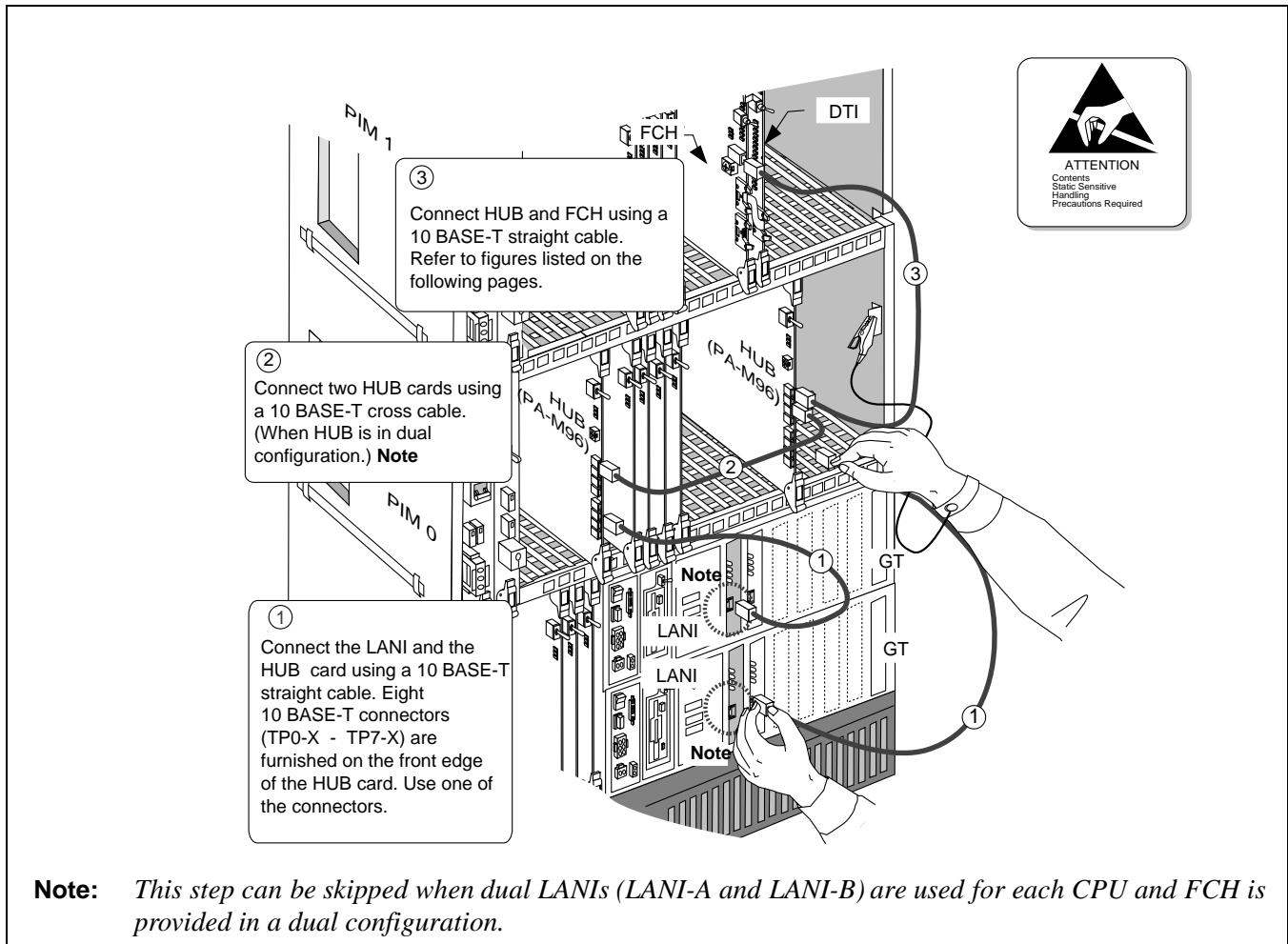


Figure 4-12 Connecting 10 BASE-T Cables (example)

Figure 4-13 shows some typical examples, where 10 BASE-T cables are connected to the FCH card(s) mounted in PIM0 of 1-IMG system, under the following conditions:

	Configuration of CPU	Configuration of LAN	Used Cable Unit (Note 1, Note 2)	Number of HUB/FCH
Pattern 1	Single	Single	SR1201 ETIF CAU-A × 1	HUB× 1, FCH× 1
Pattern 2	Dual	Single	SR1201 ETIF CAU-A × 1 SR1201 ETIF CAU-DA × 1	HUB× 2, FCH× 2
Pattern 3	Single	Dual	SR1201 ETIF CAU-A × 2	HUB× 2, FCH× 2
Pattern 4	Dual	Dual	SR1201 ETIF CAU-A × 2 SR1201 ETIF CAU-DA × 2	HUB× 2, FCH× 2

Note 1: Cables Contained in each cable unit are as follows.

SR1201 ETIF CAU-A: UTP CTG5 ST CA-D, UTP CTG5 ST CA-J

SR1201 ETIF CAU-DA: UTP CTG5 ST CA-D, UTP CTG5 ST CA-J, UTP CTG5 CRS CA-F

Note 2: The cables cited in Figure 4-13 can be used in the 1-IMG system only. Refer to Page 45 through Page 48 for more details.

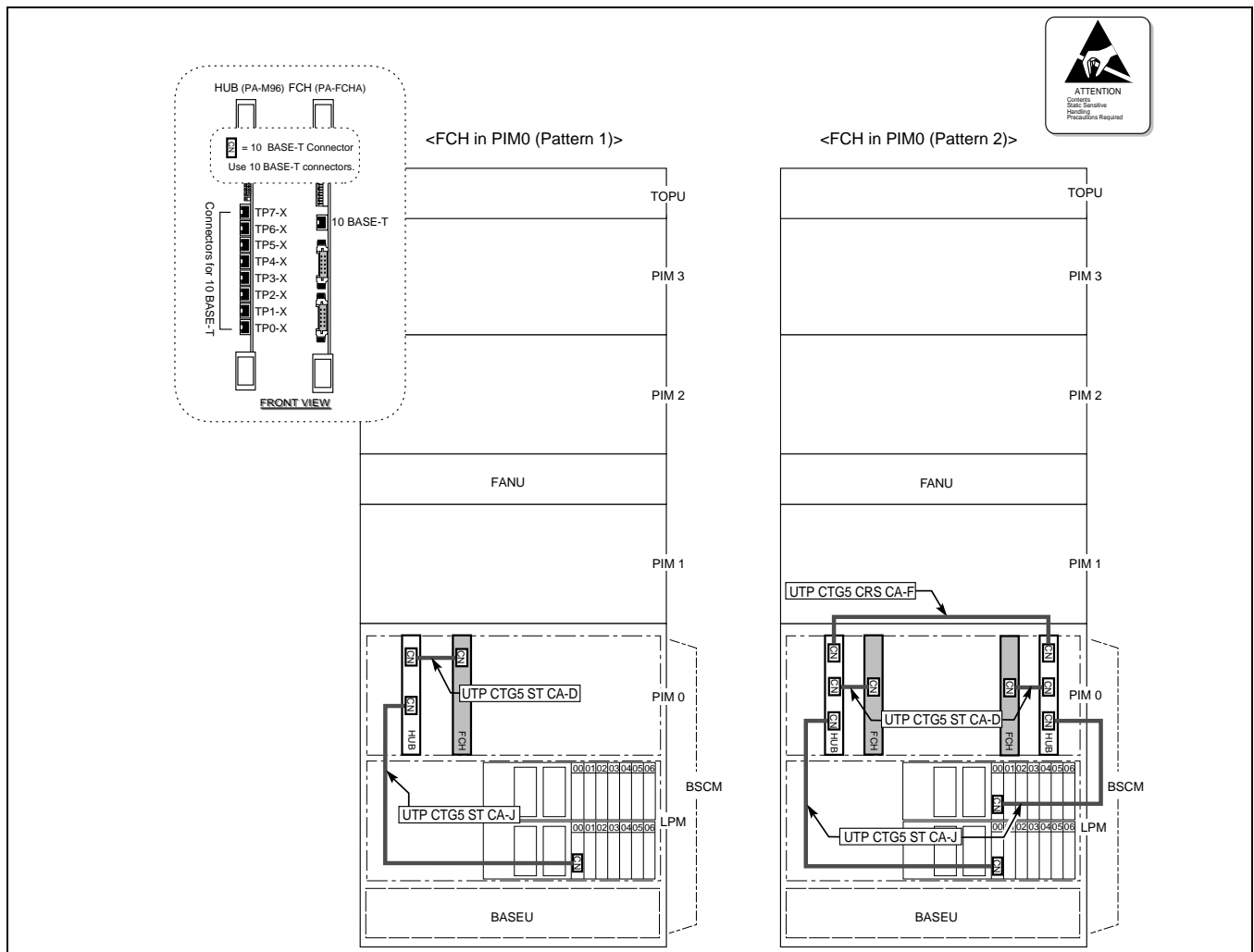
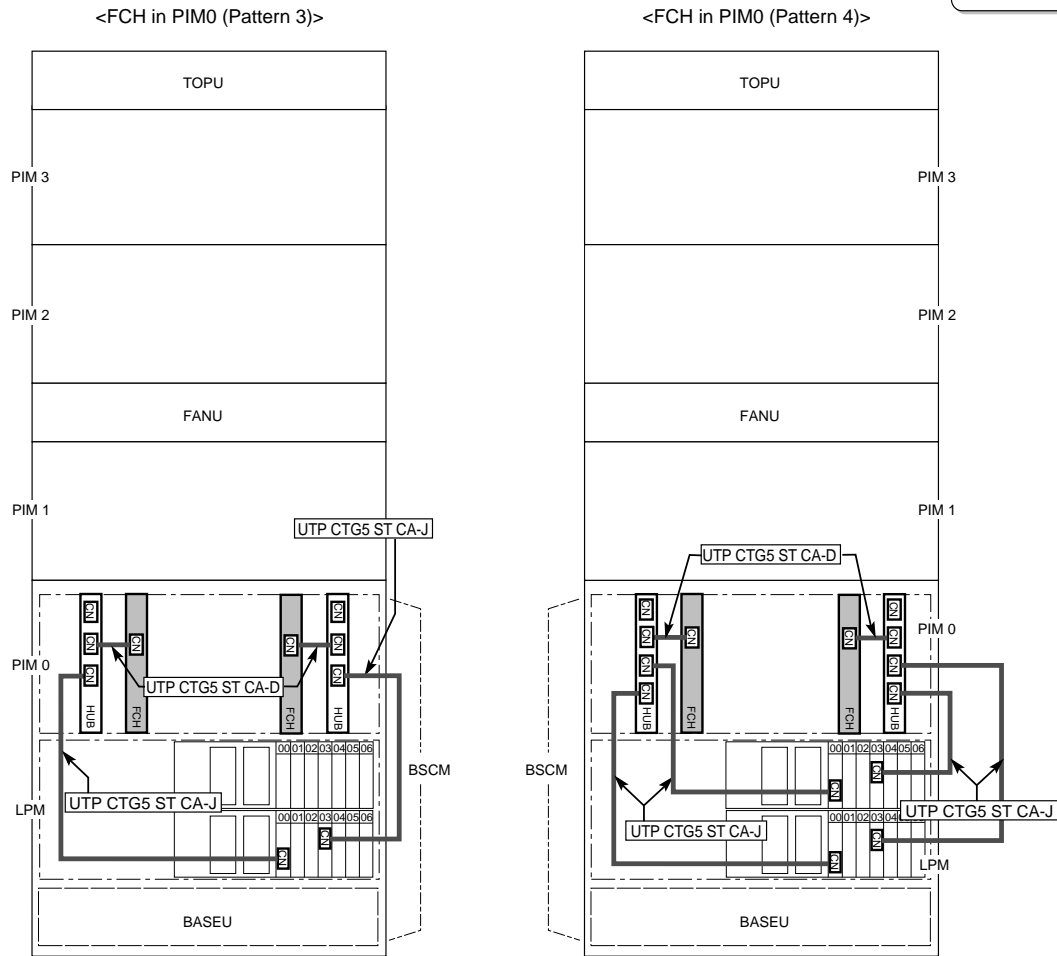


Figure 4-13 Examples of Ethernet Cable Connection-FCH in PIM0 (1-IMG System) (1/2)

INSTALLATION
Connecting Cables



Note: When dual LANIs are used in both slot 00 and 03 of CPR (Pattern 3 or 4), be sure to use at least two HUB cards: One HUB for internal LANI (in slot 00) and the other for external LANI (in slot 03: available for Release 3 or later software). However, if this is the case and FCH is also in a dual configuration, the 10 BASE-T “cross” connection between the HUBs is not required.

Figure 4-13 Examples of Ethernet Cable Connection-FCH in PIM0 (1-IMG System) (2/2)

Figure 4-14 shows some typical examples, where 10 BASE-T cables are connected to the FCH card(s) mounted in PIM1 of 1-IMG system, under the following conditions:

	Configuration of CPU	Configuration of LAN	Used Cable Unit (Note 1, Note 2)	Number of HUB/FCH
Pattern 1	Single	Single	SR1201 ETIF CAU-B × 1	HUB× 1, FCH× 1
Pattern 2	Dual	Single	SR1201 ETIF CAU-B × 1 SR1201 ETIF CAU-DB × 1	HUB× 2, FCH× 2
Pattern 3	Single	Dual	SR1201 ETIF CAU-B × 2	HUB× 2, FCH× 2
Pattern 4	Dual	Dual	SR1201 ETIF CAU-B × 2 SR1201 ETIF CAU-DB × 2	HUB× 2, FCH× 2

Note 1: Cables contained in each cable unit are as follows.

SR1201 ETIF CAU-B: UTP CTG5 ST CA-K, UTP CTG5 ST CA-J

SR1201 ETIF CAU-DB: UTP CTG5 ST CA-I, UTP CTG5 ST CA-J, UTP CTG5 CRS CA-F

Note 2: The cables cited in Figure 4-14 can be used in the 1-IMG system only. Refer to Page 45 through Page 48 for more details.

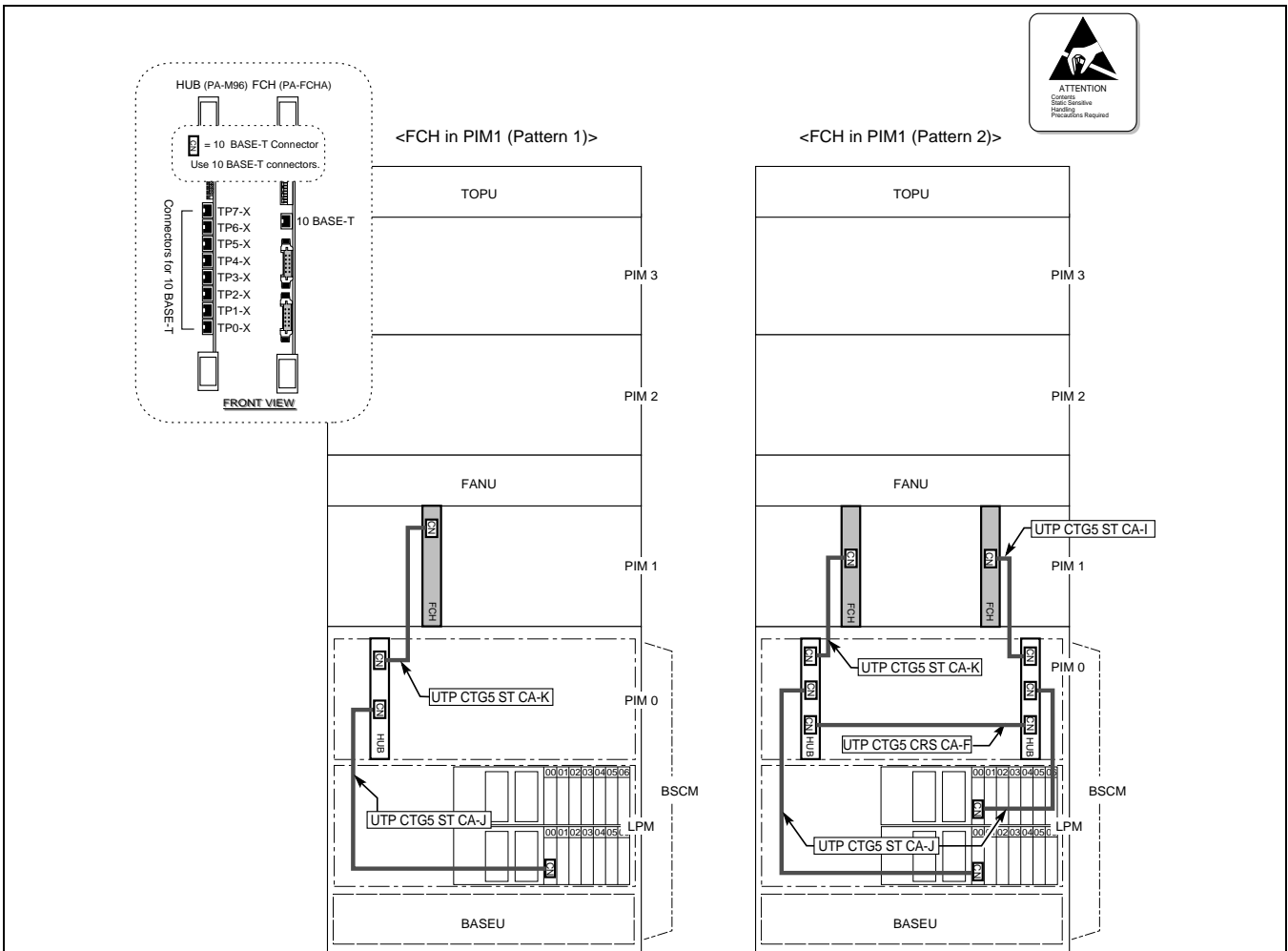


Figure 4-14 Examples of Ethernet Cable Connection-FCH in PIM1 (1-IMG System)

INSTALLATION
Connecting Cables

Figure 4-15 shows some typical examples, where 10 BASE-T cables are connected to the FCH card(s) mounted in PIM2 of 1-IMG system, under the following conditions:

	Configuration of CPU	Configuration of LAN	Used Cable Unit (Note 1, Note 2)	Number of HUB/FCH
Pattern 1	Single	Single	SR1201 ETIF CAU-C × 1	HUB× 1, FCH× 1
Pattern 2	Dual	Single	SR1201 ETIF CAU-C × 1 SR1201 ETIF CAU-DC × 1	HUB× 2, FCH× 2
Pattern 3	Single	Dual	SR1201 ETIF CAU-C × 2	HUB× 2, FCH× 2
Pattern 4	Dual	Dual	SR1201 ETIF CAU-C × 2 SR1201 ETIF CAU-DC × 2	HUB× 2, FCH× 2

Note 1: Cables contained in each cable unit are as follows.

SR1201 ETIF CAU-C: UTP CTG5 ST CA-M, UTP CTG5 ST CA-J

SR1201 ETIF CAU-DC: UTP CTG5 ST CA-K, UTP CTG5 ST CA-J, UTP CTG5 CRS CA-F

Note 2: The cables cited in Figure 4-15 can be used in the 1-IMG system only. Refer to Page 45 through Page 48 for more details.

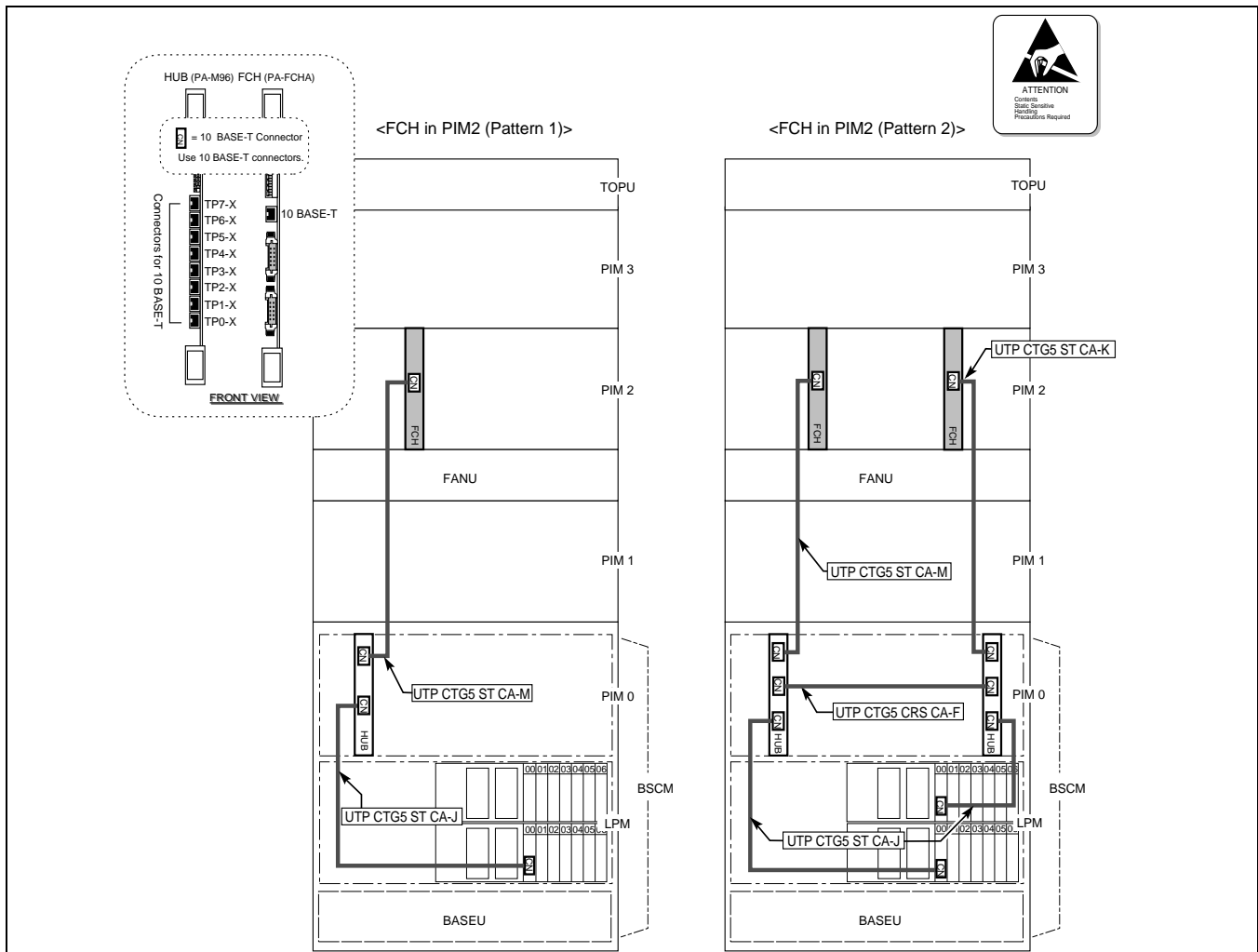
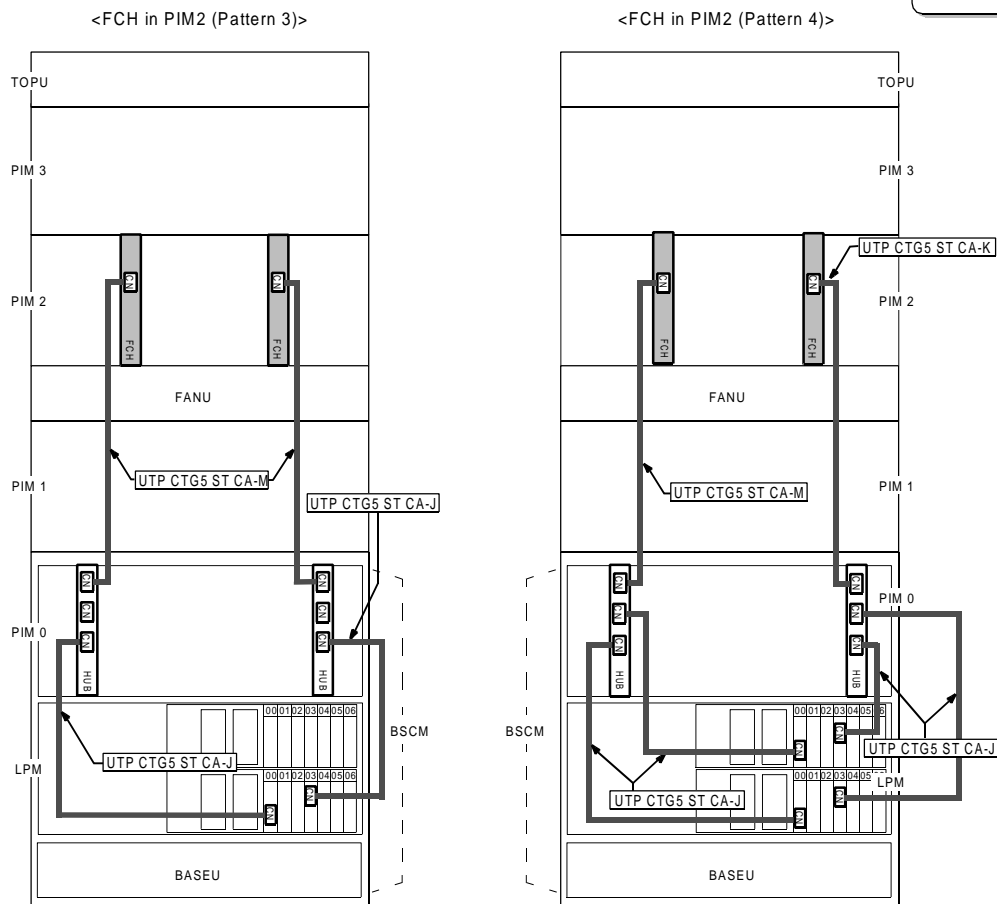


Figure 4-15 Examples of Ethernet Cable Connection-FCH in PIM2 (1-IMG System) (1/2)



Note: When dual LANIs are used in both Slot 00 and 03 of CPR (Pattern 3 or 4), be sure to use at least two HUB cards: One HUB for internal LANI (in Slot 00) and the other for external LANI (in Slot 03). However, if this is the case and FCH is also in a dual configuration, the 10 BASE-T “cross” connection between the HUBs is not required.

Figure 4-15 Examples of Ethernet Cable Connection-FCH in PIM2 (1-IMG System) (2/2)

INSTALLATION
Connecting Cables

Figure 4-16 shows some typical examples, where 10 BASE-T cables are connected to the FCH card(s) mounted in PIM3 of 1-IMG system, under the following conditions:

	Configuration of CPU	Configuration of LAN	Used Cable Unit (Note 1, Note 2)	Number of HUB/FCH
Pattern 1	Single	Single	SR1201 ETIF CAU-D × 1	HUB× 1, FCH× 1
Pattern 2	Dual	Single	SR1201 ETIF CAU-D × 1 SR1201 ETIF CAU-DD × 1	HUB× 2, FCH× 2
Pattern 3	Single	Dual	SR1201 ETIF CAU-D × 2	HUB× 2, FCH× 2
Pattern 4	Dual	Dual	SR1201 ETIF CAU-D × 2 SR1201 ETIF CAU-DD × 2	HUB× 2, FCH× 2

Note 1: Cables contained in each cable unit are as follows.

SR1201 ETIF CAU-D: UTP CTG5 ST CA-N, UTP CTG5 ST CA-J

SR1201 ETIF CAU-DD: UTP CTG5 ST CA-L, UTP CTG5 ST CA-J, UTP CTG5 CRS CA-F

Note 2: The cables cited in Figure 4-16 can be used in the 1-IMG system only. Refer to Page 45 through Page 48 for more details.

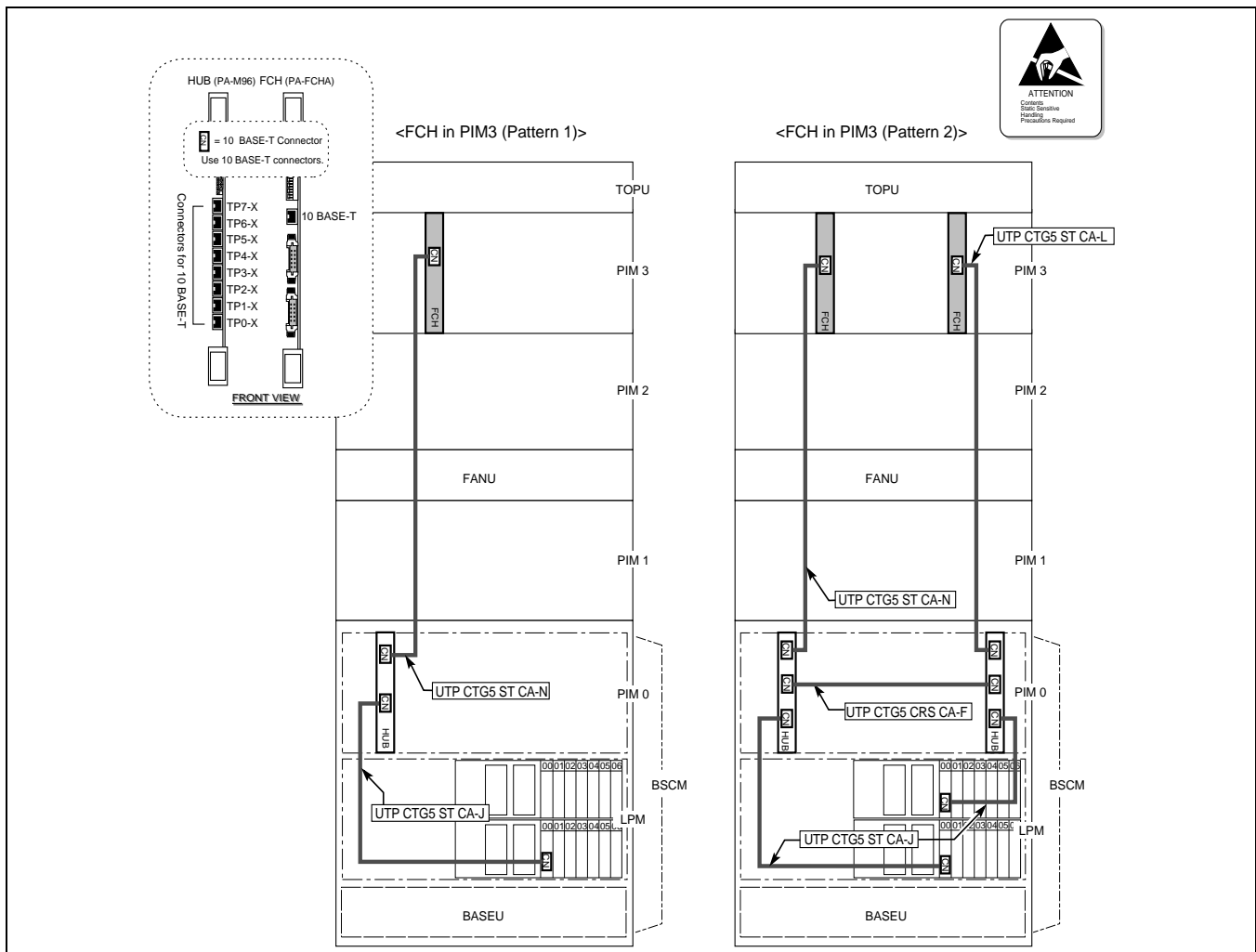
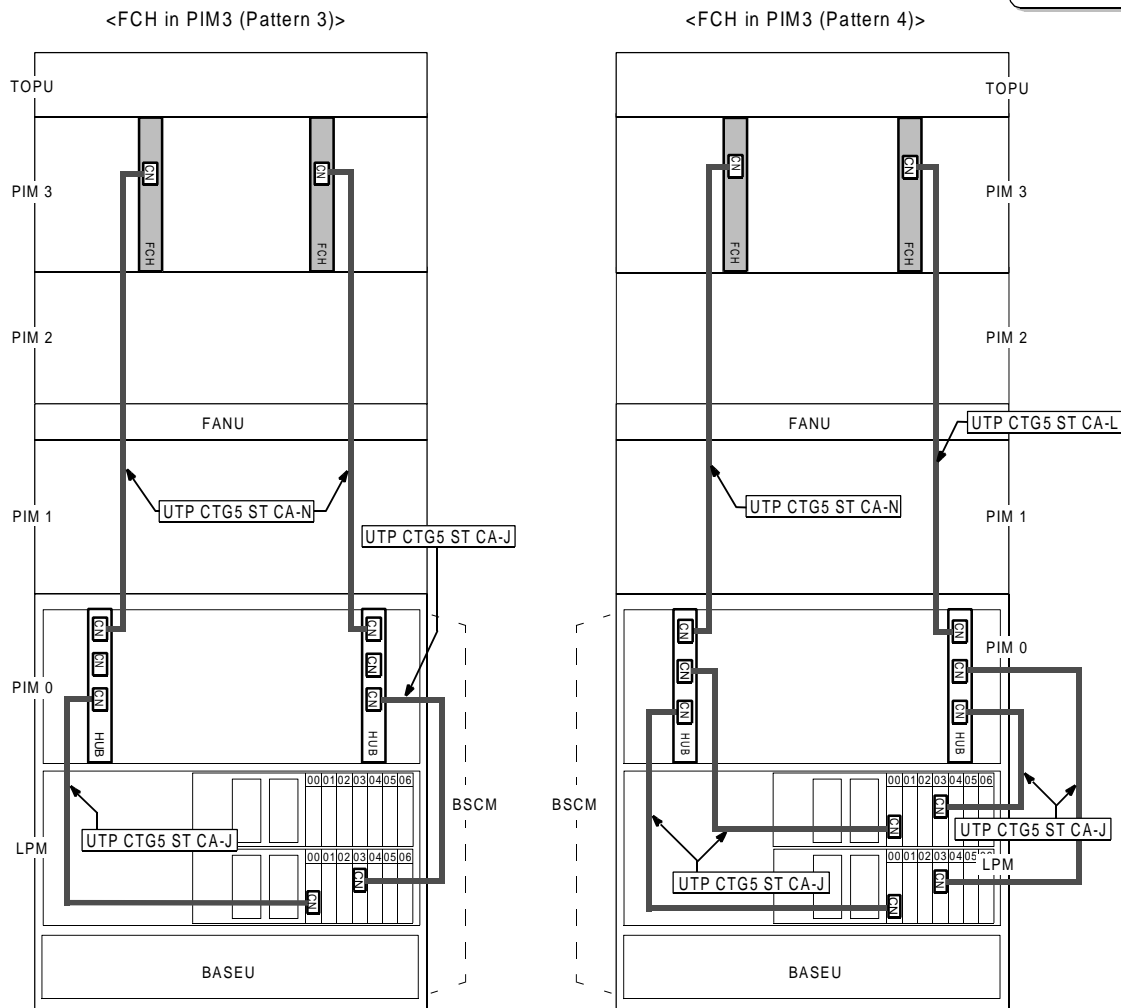


Figure 4-16 Examples of Ethernet Cable Connection-FCH in PIM3 (1-IMG System) (1/2)



Note: When dual LANIs are used in both Slot 00 and 03 of CPR (Pattern 3 or 4), be sure to use at least two HUB cards: One HUB for internal LANI (in Slot 00) and the other for external LANI (in Slot 03). However, if this is the case and FCH is also in a dual configuration, the 10 BASE-T "cross" connection between the HUBs is not required.

Figure 4-16 Examples of Ethernet Cable Connection-FCH in PIM3 (1-IMG System) (2/2)

This page is for your notes.

CHAPTER 5 DATA PROGRAMMING

This chapter explains how to set Fusion Network data, using the following data categories:

- System Data
- Numbering Plan Data
- Station Data
- Fusion Link Data

Figure 5-1 shows the overall data programming procedure:

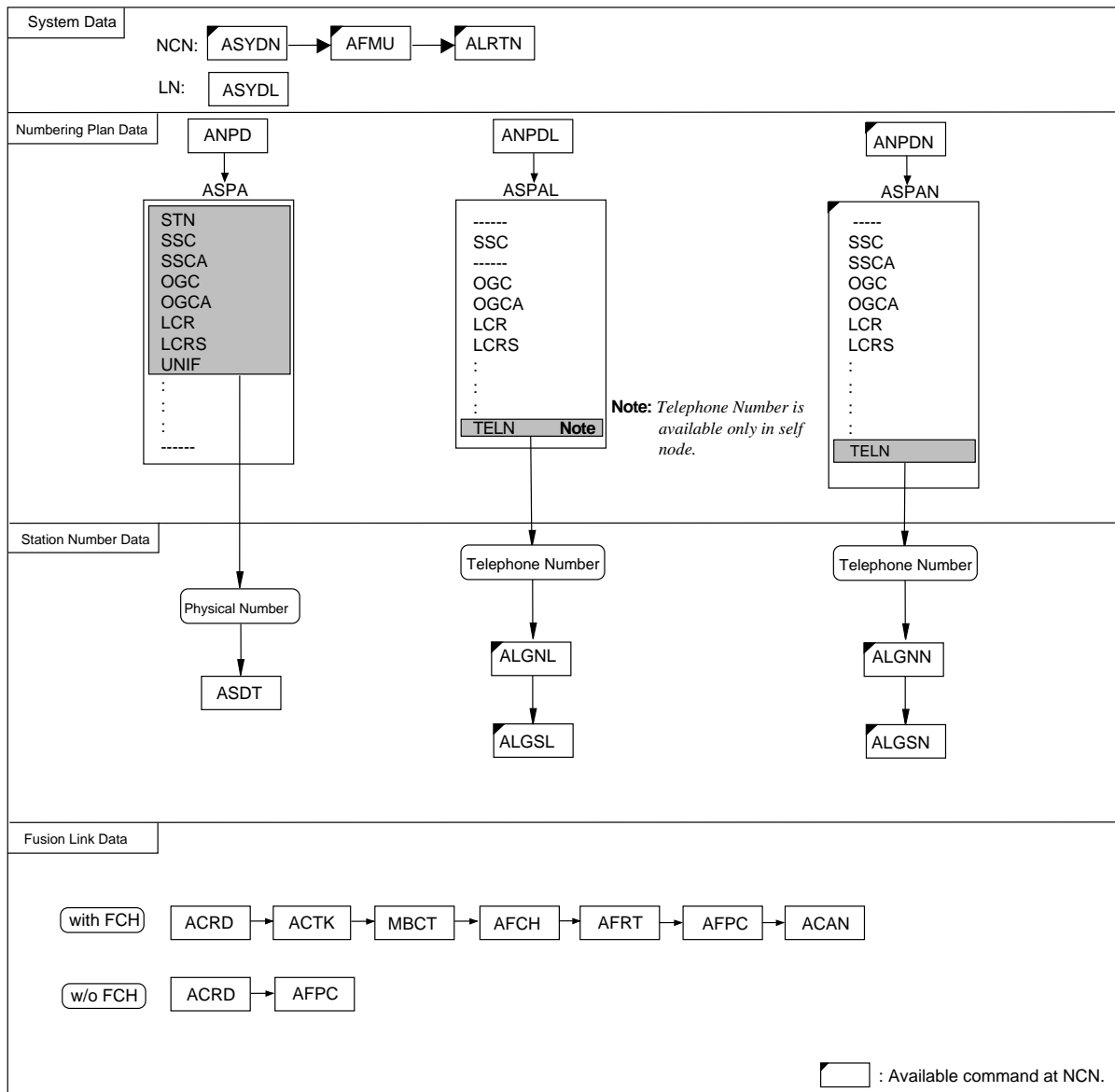


Figure 5-1 Data Programming Flow Chart

DATA PROGRAMMING

Network Data Programming Summary

1. Network Data Programming Summary

This section explains a summary of the data programming of Fusion systems.

1.1 Brand-new Fusion Network

To install the Fusion network as a brand-new system, the overall data programming procedure is as follows.

1.1.1 System Data

- Decide an NCN, and LN on the network.
- Assign System Data for each node. Use the ASYDN command for the NCN and the ASYDL command for all nodes. The system data includes the size of LDM, NDM, Fusion Point Code (FPC), etc.

Note: *The data becomes effective by executing “Non-Load Initial” after setting the FPC.*

- Assign unit data using the AFMU command for each node which exists on the network. Note that the AFMU command is available at NCN only.
- Assign Logical Route Numbers for all routes (external trunk) on the network using the ALRTN command. Note that the ALRTN command is available at NCN only.

1.1.2 Numbering Plan Data

- ANPDN → ASPAN (for NCN only): Assign numbering plan data for Telephone Number.
- ANPDL → ASPAL (for NCN and LN): Assign numbering plan data for Service Codes, Trunk Access Codes, etc. other than STN (physical station) and TELN.
- ANPD → ASPA (for NCN and LN): Assign numbering plan data for Physical Station Number using STN.

Note: *The Numbering Plan data for the LDM and/or NDM cannot use separate Tenant Numbers (TN). Therefore, be sure to assign the following data on the ASYDL command.*

- *ASYDL command, SYS1, INDEX 800*
b1 = 1 (ASPAL command tenant data table development on LDM = Common)
b2 = 1 (ANPDL command tenant data table development on LDM = Common)

1.1.3 Station Numbering

- Assign Telephone and/or Physical Station Numbers using the following command:
ALGNN → ALGSN: Assign Telephone Number on the network. (NCN only)
ASDT: Assign Physical Number for each node as required. (available for NCN and LN)

1.1.4 Fusion Link Data

- Assign the Fusion Link data using the following commands:
Fusion with FCH:ACRD → ACTK → ACAN → MBCT → AFCH → AFPC → AFRT
Fusion w/o FCH:ACRD → ACTK → ACAN → MBCT → AFPC

1.2 Upgrading a CCIS Network

To install the Fusion system to an existing CCIS network, the overall programming procedure is as follows:

1.2.1 System Data

- Decide an NCN and LN on the network.
- Assign System Data for each node. Use the ASYDN command for NCN and the ASYDL command for LN. The system data includes the size of LDM, NDM, Fusion Point Code (FPC), etc.

Note: *The data becomes effective by executing “Non-Load Initial” after setting the FPC.*

- Assign unit data using the AFMU command for each node which exists on the network. Note the AFMU command is available at NCN only.
- Assign Logical Route Numbers of all routes (external trunk) on the network using the ALRTN command. Note that the ALRTN command is available at NCN only.

1.2.2 Numbering Plan Data

- ANPDN → ASPAN (for NCN only): Assign numbering plan data for Telephone Number.
- When “Operator Call” or “Priority Call (ATT)” is used on the Fusion network, replace the existing numbering plan data for these features using the ANPDL and ASPAL commands.

Note: *The Numbering Plan data for the LDM and/or NDM cannot use separate Tenant Numbers (TN). Therefore, be sure to assign the following data on the ASYDL command.*

- *ASYDL command, SYS1, INDEX 800*
b1 = 1 (ASPAL command tenant data table development on LDM = Common)
b2 = 1 (ANPDL command tenant data table development on LDM = Common)

1.2.3 Station Numbering

- Assign Telephone Numbers using the following commands:
ALGNN → ALGSN: Assign Telephone Number at network level. (NCN only)

1.2.4 Fusion Link Data

- Assign the Fusion Link data using the following commands:
Fusion with FCH: ACRD → ACTK → ACAN → MBCT → AFCH → AFPC → AFRT
Fusion w/o FCH: ACRD → ACTK → ACAN → MBCT → AFPC

Note: *When the Fusion system is incorporated in an existing CCIS network, all nodes must be linked via CCIS on the network.*

If there are any nodes linked via ACIS alone, add the CCIS link before the installation of the Fusion link (See [Figure 5-2](#).) Please refer to CCIS-related manuals for more detailed information.

DATA PROGRAMMING

Network Data Programming Summary

1.3 Fusion Link Data

- Assign the Fusion Link data using the following commands:

Fusion with FCH: ACRD → ACTK → MBCT → AFCH → AFRT → AFPC → ACAN

Fusion w/o FCH: ACRD → AFPC

Note: When the Fusion system is incorporated in an existing CCIS network, all nodes must be linked via CCIS on the network.

If there are any nodes linked via ACIS alone, add the CCIS link before the installation of the Fusion link (See [Figure 5-2](#) below.) Please refer to CCIS-related manuals for more detailed information.

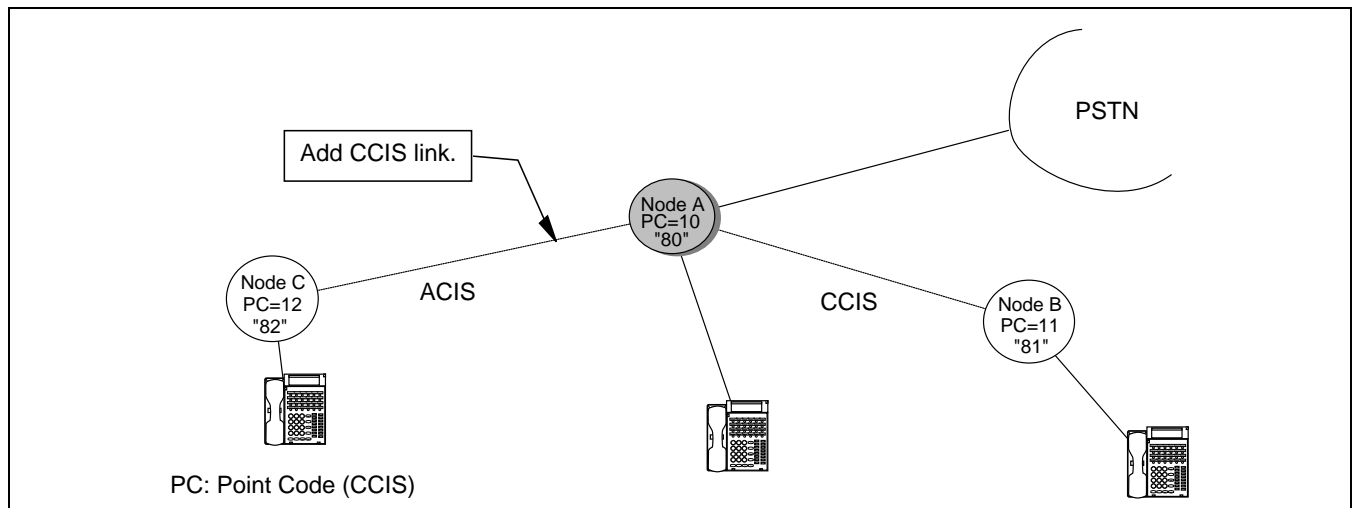


Figure 5-2 Fusion-CCIS Network

Figure 5-3 shows how to upgrade an existing CCIS network, focusing on the Numbering Plan. The example data setting assumes the existing network uses this particular numbering. For more detailed information on how to assign Telephone Numbers, please see [Assignment of Telephone Numbers](#).

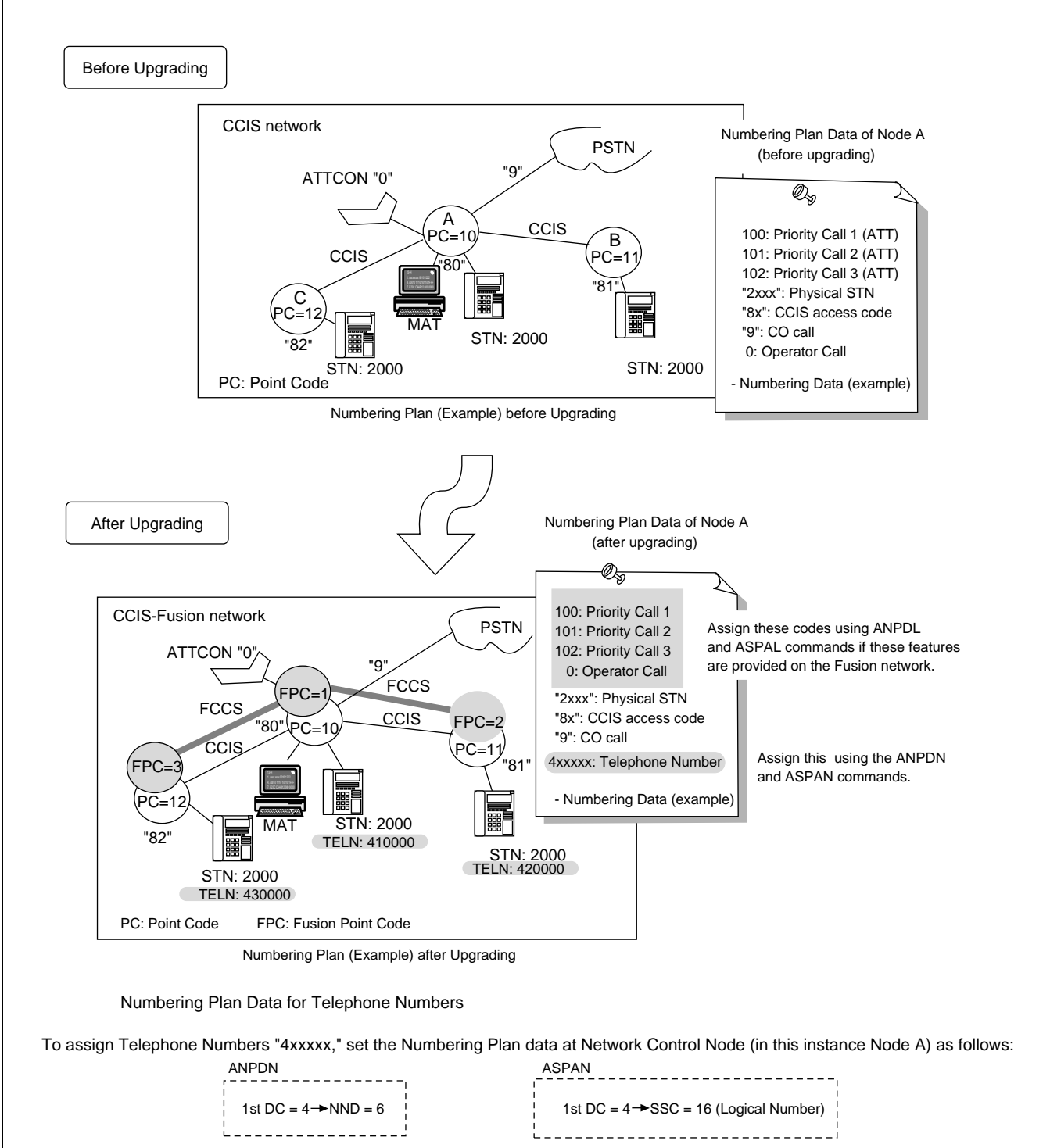


Figure 5-3 How to Upgrade the Numbering Plan Data of an Existing CCIS Network

DATA PROGRAMMING

Assignment of System Data

2. Assignment of System Data

STEP 1: ASYDL and ASYDN

Assign the number of data memory blocks for the Network Data Memory (NDM) and the Local Data Memory (LDM). Use the ASYDN command for the NCN. Use the ASYDL command for all nodes. Figure 5-4 shows ASYDL Indexes 513 and 514 as an example.

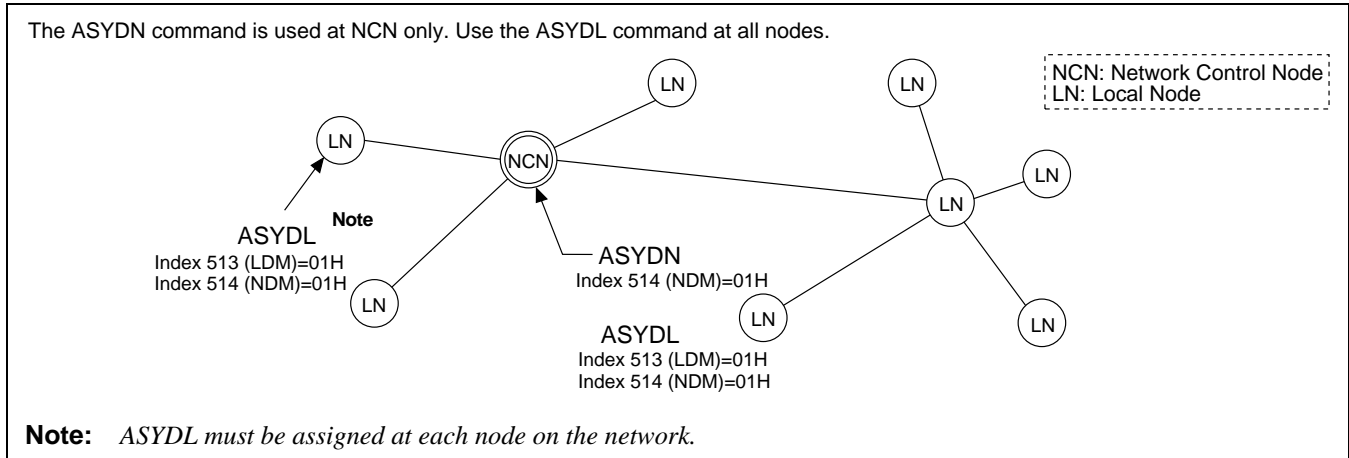


Figure 5-4 Assignment of Memory Block

- (1) Assign the following data to all nodes.
 - ASYDL, Index 513 Local Data Memory (LDM) usage
Assign 1 for bit(s) corresponding to the data memory block to be used as Local Data Memory (LDM).
Assign 01H for systems having 2M-LDM.
 - ASYDL, Index 514 Network Data Memory (NDM) usage
Assign 1 for bit(s) corresponding to the data memory block to be used as Network Data Memory (NDM).
Assign 01H for systems having 2M-NDM.
Allowable memory block of LDM and NDM assigned by ASYD are shown in Figure 5-5.

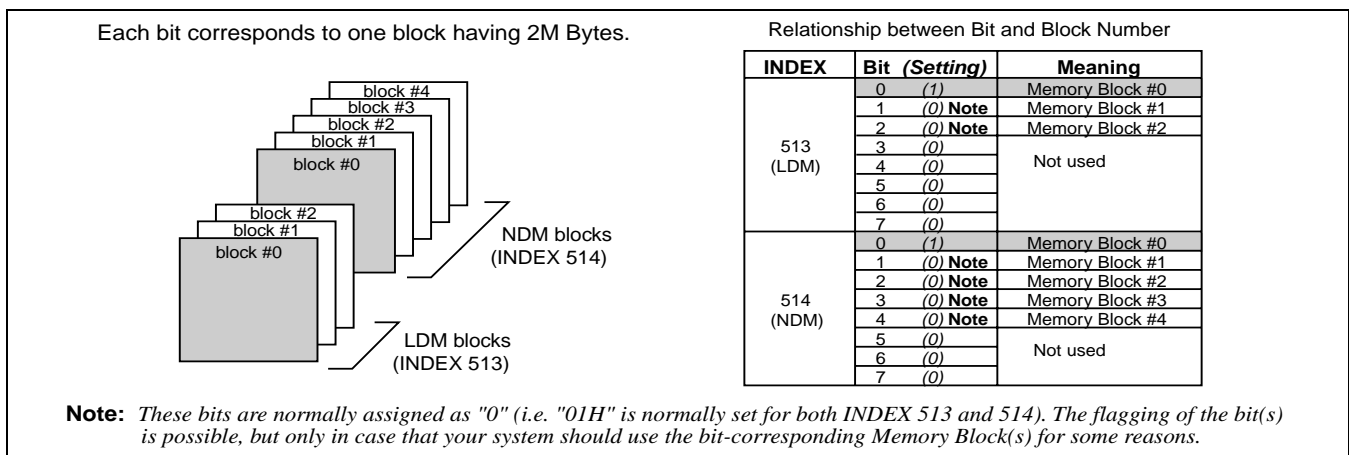


Figure 5-5 LDM and NDM Allocation (ASYDL)

- (2) Assign the data to NCN only.
 - ASYDN, Index 514 Network Data Memory (NDM) usage
Assign 1 for bit(s) corresponding to the data memory block to be used as Network Data Memory (NDM).
Assign 01H for systems having 2M-DM.

STEP 2: ASYDL

Assign the self-Fusion Point Code (self-FPC) at each node. FPC ranges from 1 to 253. Use the ASY-DL command. (Index 512 b0-b7)

- Index 512 self-Fusion Point Code
Assign a unique FPC for each node.

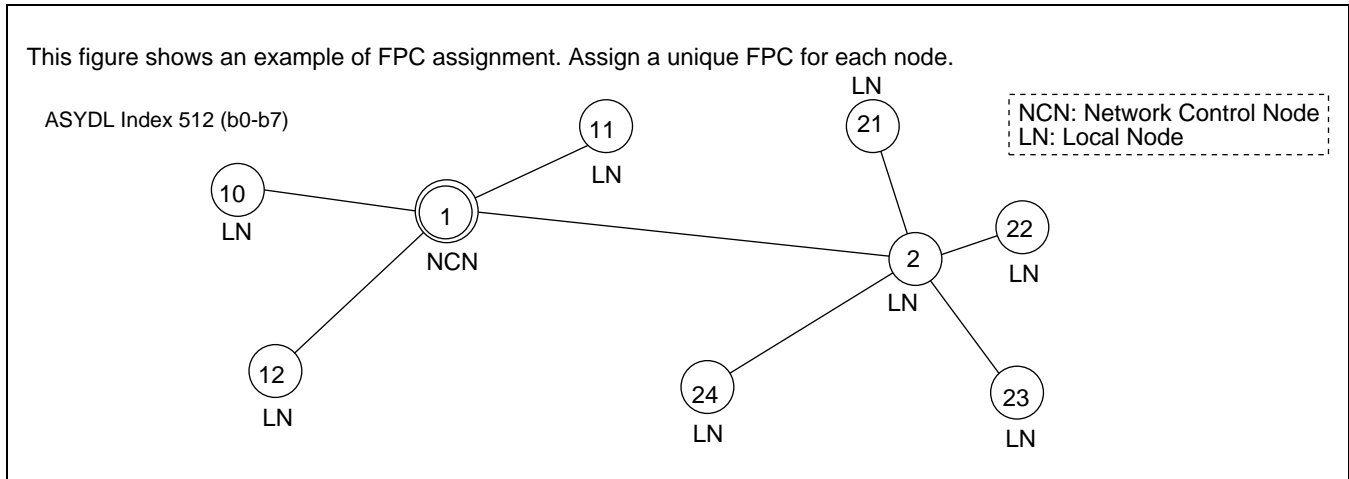


Figure 5-6 Self-FPC Assignment

STEP 3: ASYDL and ASYDN

Assign other system data using the ASYDL/ASYDN command.

When Timing Start is used, assign the following data.

- | | |
|---------------|--|
| Index 161 | b6 : 0/1=-/Timing Start using “#” code |
| | b7 : 0/1=-/Timing Start using “*” code |
| Index 170 | b4 : 0/1=Timing Start out of Service/Timing Start in Service Note 1 |
| Index 640 | Fusion Point Code (FPC) of node providing ATTCON Note 2 |
| Index 704~735 | (ASYDL)
FPC of the node to which ATTCON transfers the Day/Night changeover information. Note 3 |

Assign FPC of a terminating node for House Phone, Off-Hook Alarm and Ring Down (IC) calls from PSTN. Day/Night information is transferred from the terminating node.

Note 1: When Timing Start is in service, Called Sub Address for ISDN Network cannot be dialed.

Note 2: This data is necessary at each node. Assign the self-FPC at the terminating node.

Note 3: This data is necessary at the node providing ATTCON.

DATA PROGRAMMING
Assignment of System Data

Index 800

For ASYDL

- b0 : 0/1 = ALGNL, ALGSL on a UGN (TN) basis/-
- b1 : 0/1 = ASPAL on a TN basis/-
- b2 : 0/1 = ANPDL on a TN basis/-
- b4 : 0/1 = AFRSL, ASTPL, AUNEL on a TN basis/-
- b5 : 0/1 = ASTPL on a TN basis/-
- b7 : 0/1 = AAEDL on a TN basis/-

For ASYDN

- b0 : 0/1 = ALGNN, ALGSN on a UGN (TN) basis/-
- b1 : 0/1 = ASPAN on a TN basis/-
- b2 : 0/1 = ANPDN on a TN basis/-
- b4 : 0/1 = AFRSN, ASTPN on a TN basis/-
- b5 : 0/1 = ASTPN on a TN basis/-
- b6 : 0/1 = ARSCN on a TN basis/-
- b7 : 0/1 = AAEDN on a TN basis/-

When “different numbering development on a TN basis ” is not required, set the above bits.

This figure shows the display of the ASYDN command Index 514 as an example.

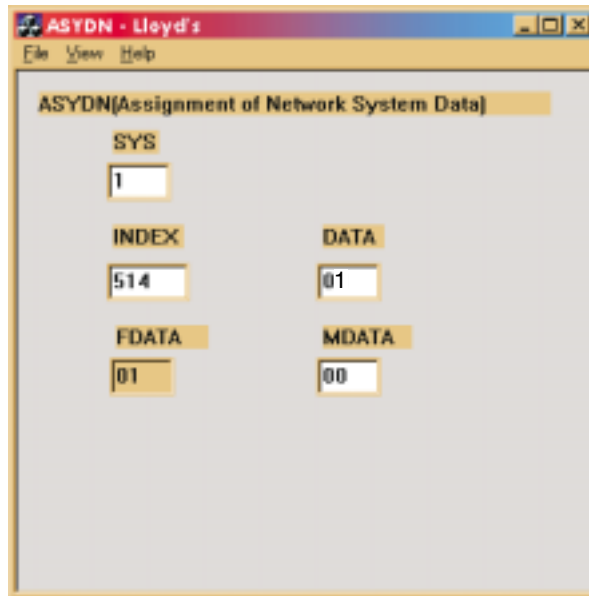


Figure 5-7 ASYDN Command Display (example)

Note 4: *Be sure to execute “Non-Load Initial” after setting the FPC data. The assigned FPC becomes effective by this operation.*

3. Assignment of FPC and MG and UNIT into Network

3.1 AFMU

Assign the module accommodation data by giving Module Group Number and Unit Number on an FPC basis. This data is necessary to allocate unique Network ID (NID) to each MG/UNIT of the whole Fusion network nodes. **Note** This data can be set at the NCN only.

Note: A unique NID is assigned to each MG/UNIT, automatically by entering the AFMU data.

- When the Fusion network is configured for the first time :
Enter the AFMU command data for all the Fusion network nodes (FPCs). Then, a unique NID is assigned automatically to each MG/UNIT in the assigned order.
- When the Fusion network is already configured and a module/unit is to be expanded:
Enter the AFMU command data related to the expanded module/unit. Then, a unique NID number, just next to the last existing NID number, is automatically assigned to the expanded module/unit.

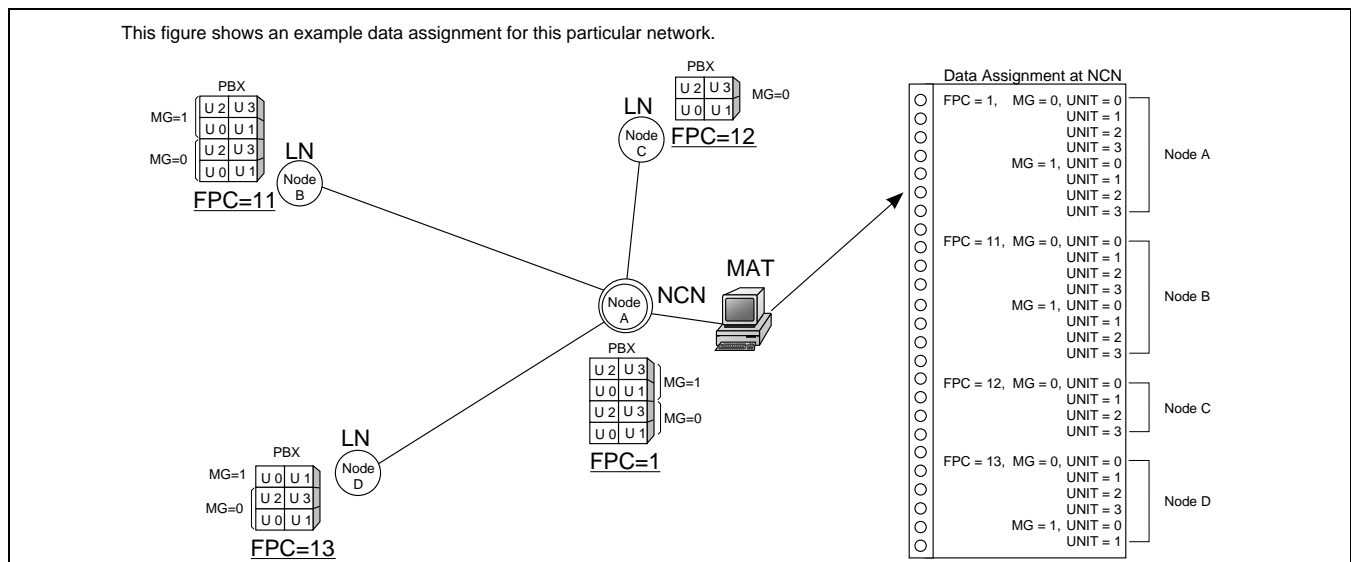


Figure 5-8 Assignment of Module Accommodation Data

The AFMU command display should look similar to the following.

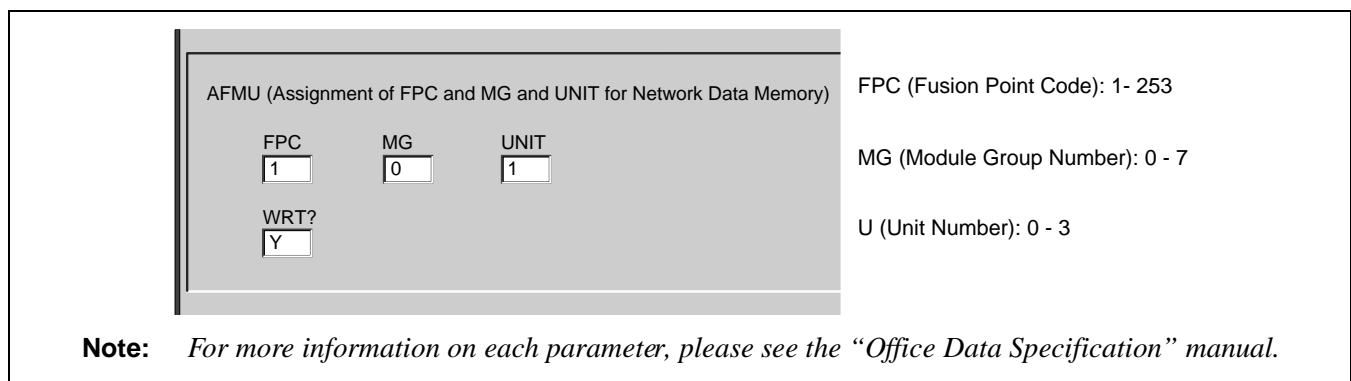


Figure 5-9 AFMU Command Display

DATA PROGRAMMING

Assignment of Logical RT in Network DM (NDM)

4. Assignment of Logical RT in Network DM (NDM)

4.1 ALRTN/ARTKN

This command is used to assign Logical Route Numbers to all external trunks used on a Fusion network. Assign unique Telephone Numbers to the whole route for external trunks on the network (including COT, DAT, Dummy Route, etc.) using this command. The data can be set at the NCN only and should be set for every external route in every node.

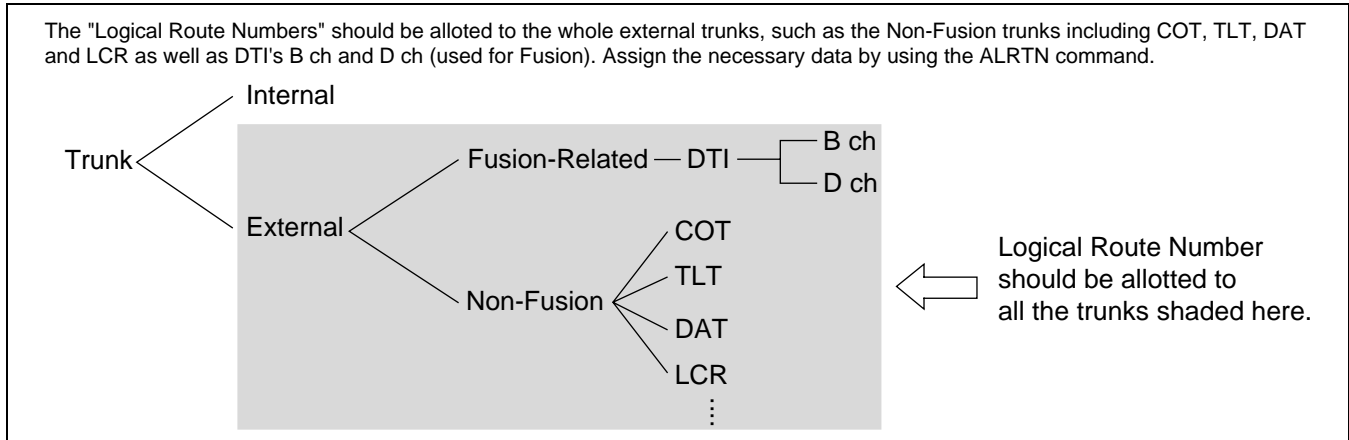


Figure 5-10 Telephone Number Required

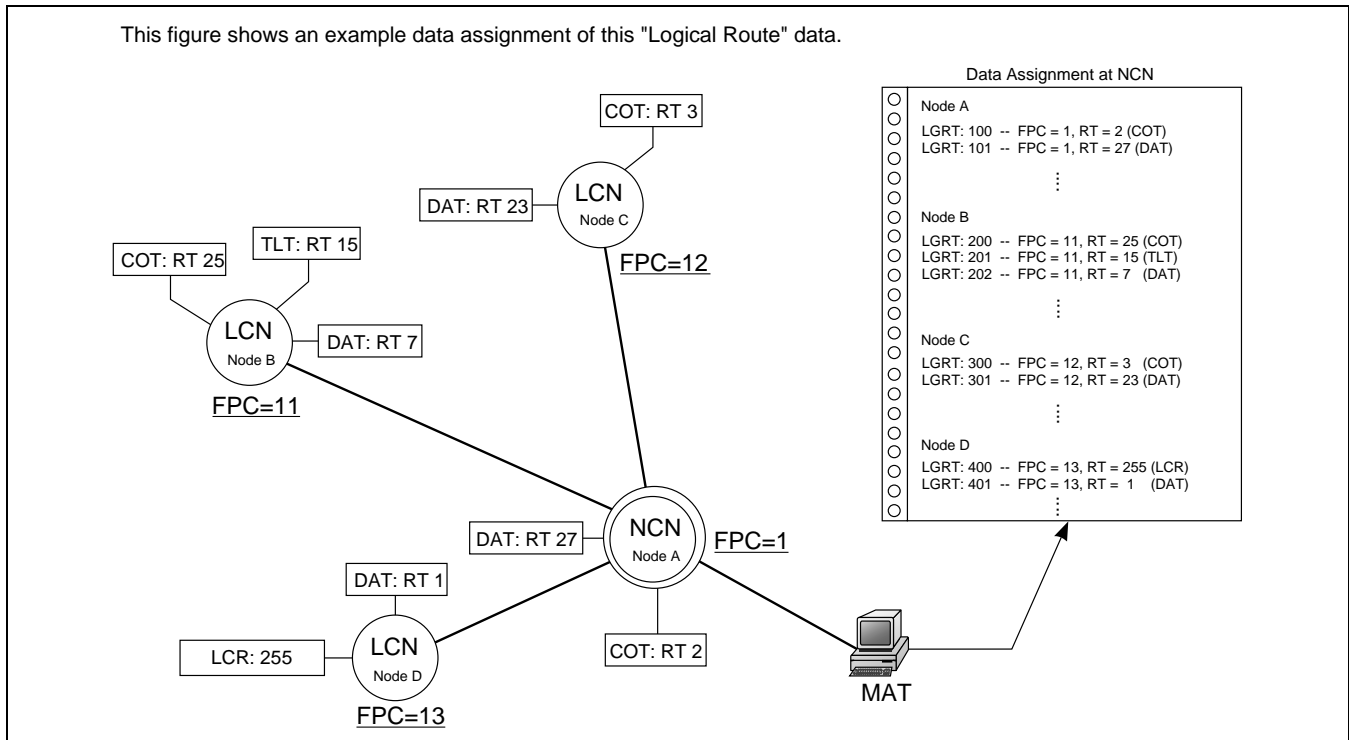


Figure 5-11 Assignment of Logical Route Number

The ALRTN command display should look similar to the following:

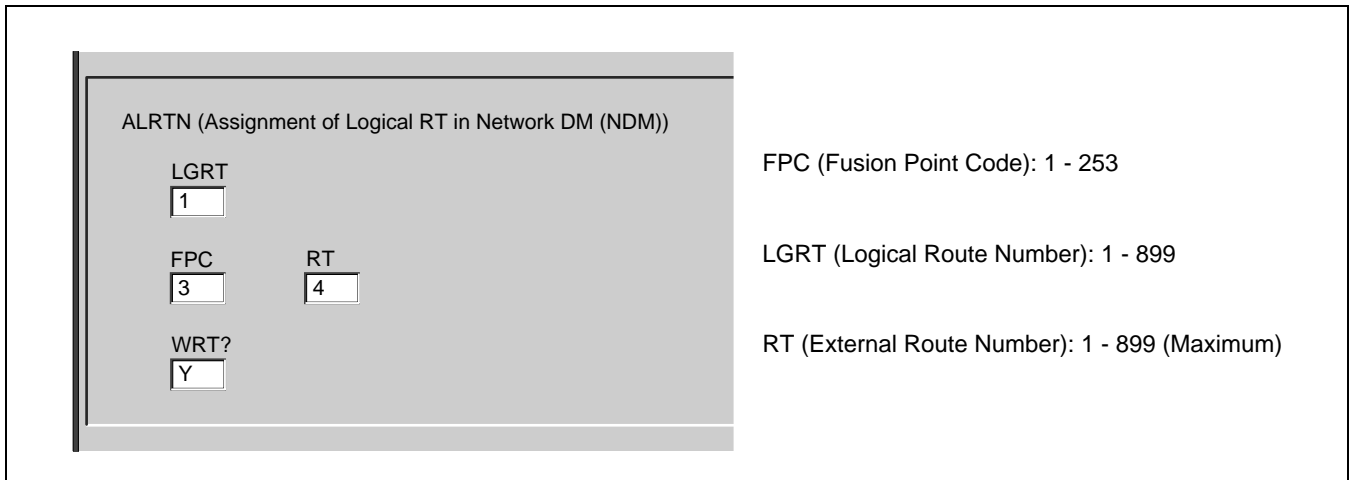


Figure 5-12 ALRTN Command Display

5. Assignment of Numbering Data for Telephone Numbers

STEP 1: ANPDN

Make a Telephone Numbering plan on the network. The explanation is given here on the assumption that the network adopts the numbering plan shown below. Therefore, make modifications to the data assignment explained here when you assign the data on your network.

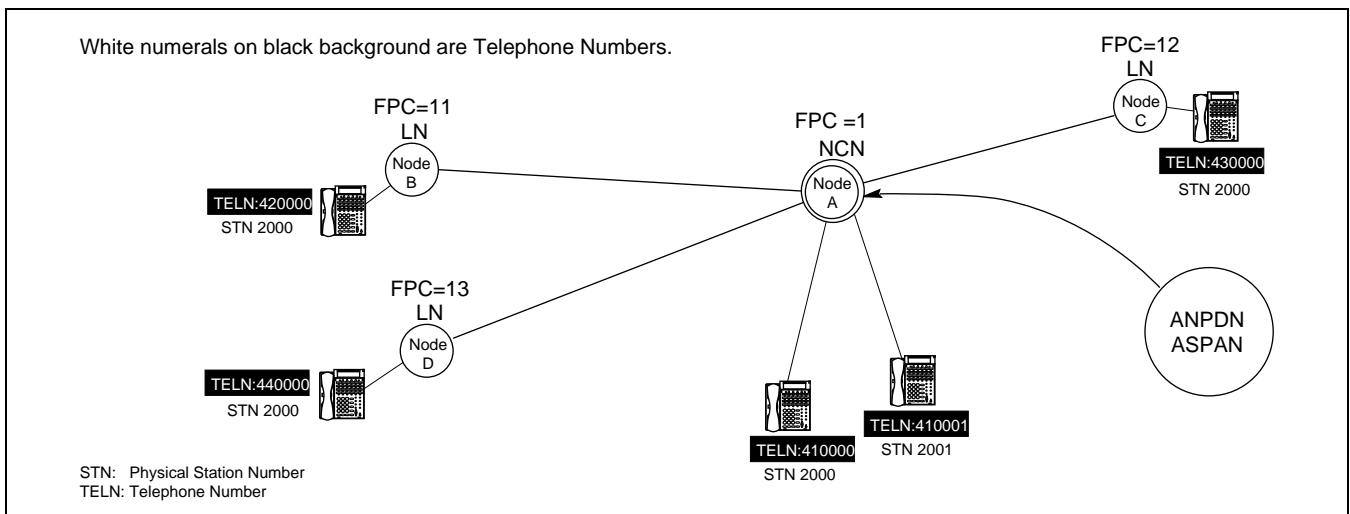


Figure 5-13 Telephone Number Allocation

DATA PROGRAMMING

Assignment of Numbering Data for Telephone Numbers

STEP 2: ANPDN

Assign Pre-translation Data for the Telephone Numbers planned in Step 1 using the ANPDN command at NCN. In [Figure 5-14](#), the data setting should be as follows:

○ ○ ○ ○ ○ ○ ○ ○ ○ ○	- ANPDN Data Sheet (example)				Telephone Number 4 x x x x x 6 digits
	- NCN (Node A)				
	TN = 1	1st DC = 4	CI = N (Normal)	NND = 6	BLF = 0
	TN = 1	1st DC = 4	CI = H (Hooking)	NND = 6	BLF = 0

Figure 5-14 ANPDN Sample Data Sheet

The ANPDN command display should look similar to the following:

ANPDN (Assignment of Numbering Plan for Network Data Memory)			1stDC (1st Digit Code): ASCII 0 - 9, *, #
TN	1stDC	CI	CI (Connection Index)
1	4	N	N: Normal
			H: Hooking
			B: Busy
NND	BLF		NND (Necessary Digit): 1 - 16 digits
6	1		BLF (Busy Lamp Field):
			0: Out of Service
			1: In Service

Figure 5-15 ANPDN Command Display

Note: Perform the Numbering Plan data setting by using ANPD command in the same way as assigned by ANPDN command.

STEP 3: ASPAN

Assign special access code data for the Telephone Numbers using the ASPAN command. SRV=TELN is the data for Telephone Numbers.

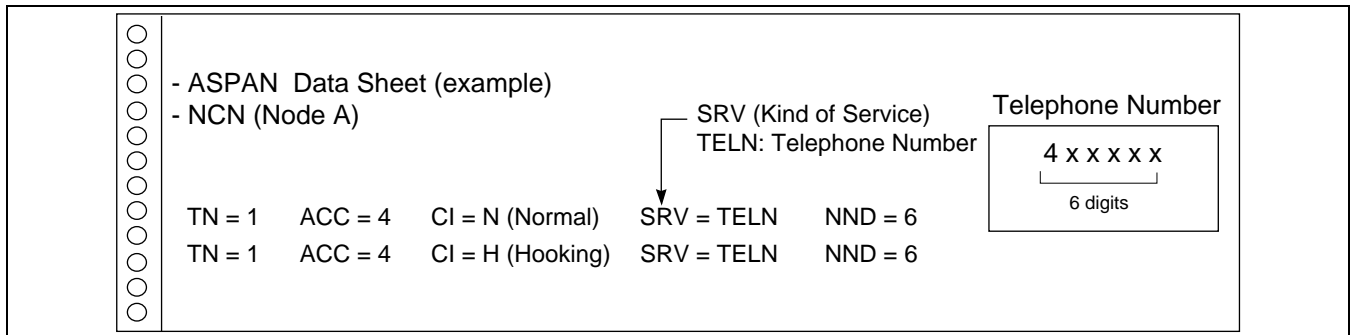


Figure 5-16 ASPAN Sample Data Sheet

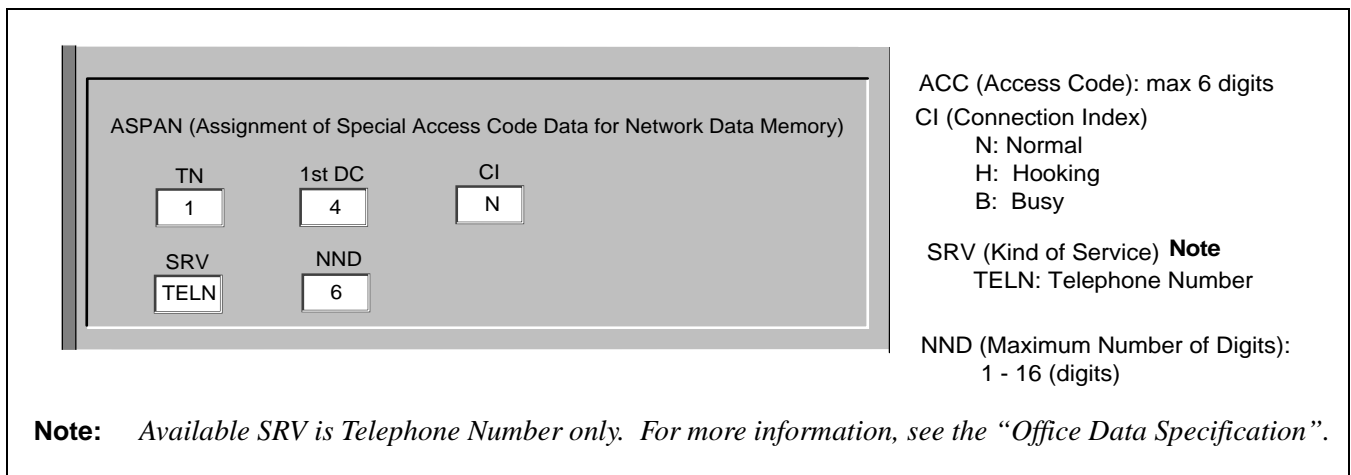


Figure 5-17 ASPAN Command Display

Note: The Numbering Plan data for the LDM and/or NDM cannot use separate Tenant Numbers (TN). Therefore, be sure to assign the following data on the ASYDL command.

- ASYDL command, SYS1, INDEX 800
 b1 = 1 (ASPAL command tenant data table development on LDM = Common)
 b2 = 1 (ANPDL command tenant data table development on LDM = Common)

DATA PROGRAMMING

Assignment of Telephone Numbers

6. Assignment of Telephone Numbers

This section explains how to program Telephone Numbers. To program Telephone Numbers, use ALGSN command. Telephone Number can be assigned to a station using the LENS or the Physical Station Number depending on programming.

Note: *The Fusion Link must be operational before programming telephone numbers in the Fusion Network.*

COMMAND: ALGSN/ATSTN

Assign Telephone Numbers to Physical Station Number (Type 2) or to physical LENS (Type 1) using the ALGSN/ATSTN command. An example data sheet-Type 2 follows.

○	- ALGSN Data Sheet (example)						
○	- NCN (Node A)						
○	Type = 2	UGN = 1	TELN = 410000	FPC = 1	TN = 1	STN = 2000	
○	Type = 2	UGN = 1	TELN = 410001	FPC = 1	TN = 1	STN = 2000	Node A
○	Type = 2	UGN = 1	TELN = 420000	FPC = 11	TN = 1	STN = 2000	← Node B
○	Type = 2	UGN = 1	TELN = 430000	FPC = 12	TN = 1	STN = 2000	← Node C
○	Type = 2	UGN = 1	TELN = 440000	FPC = 13	TN = 1	STN = 2000	← Node D
○		:	:				
○		:	:				
○		:	:				
○		:	:				
○		:	:				

Note: *This data is a sample when the Telephone Number is assigned by the ALGSN command.*

Figure 5-18 ALGSN Sample Data Sheet

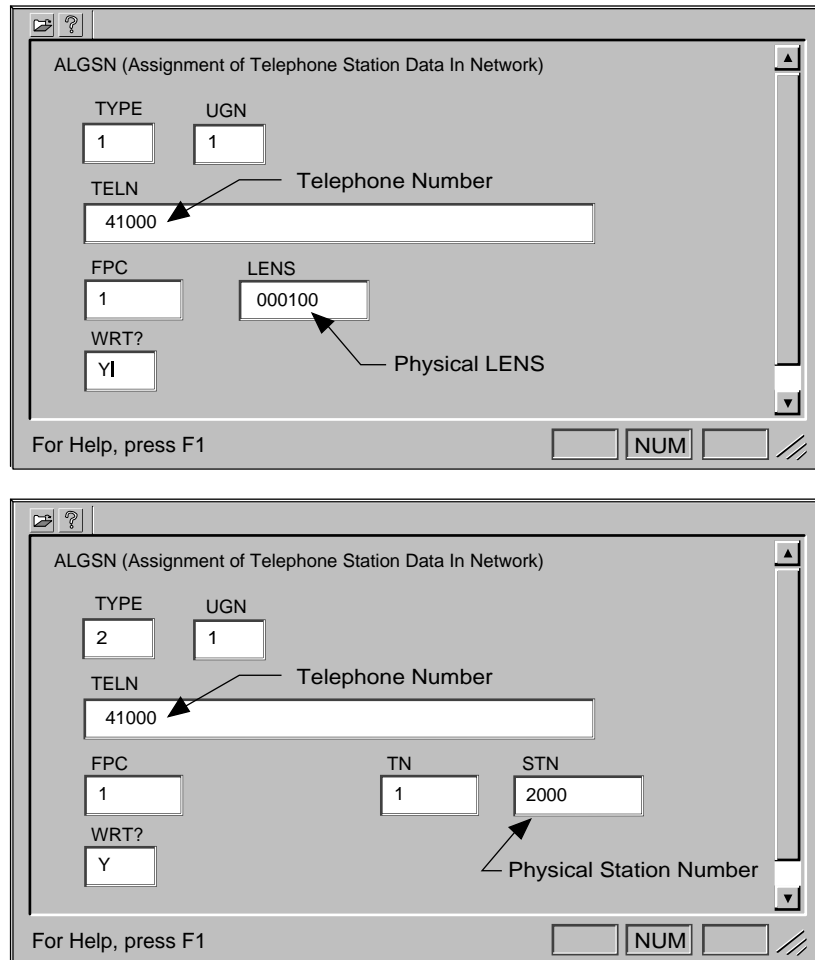


Figure 5-19 ALGSN Command Display (example)

DATA PROGRAMMING

Assignment of Telephone Numbers

6.1 Assignment of Connection Route/Trunk Data

STEP 1: ACRD

Using the ACRD command, assign the connection route data of Fusion link. The data must be assigned for both B-channel and D-channel. Assign appropriate data referring to the [Table 5-1](#).

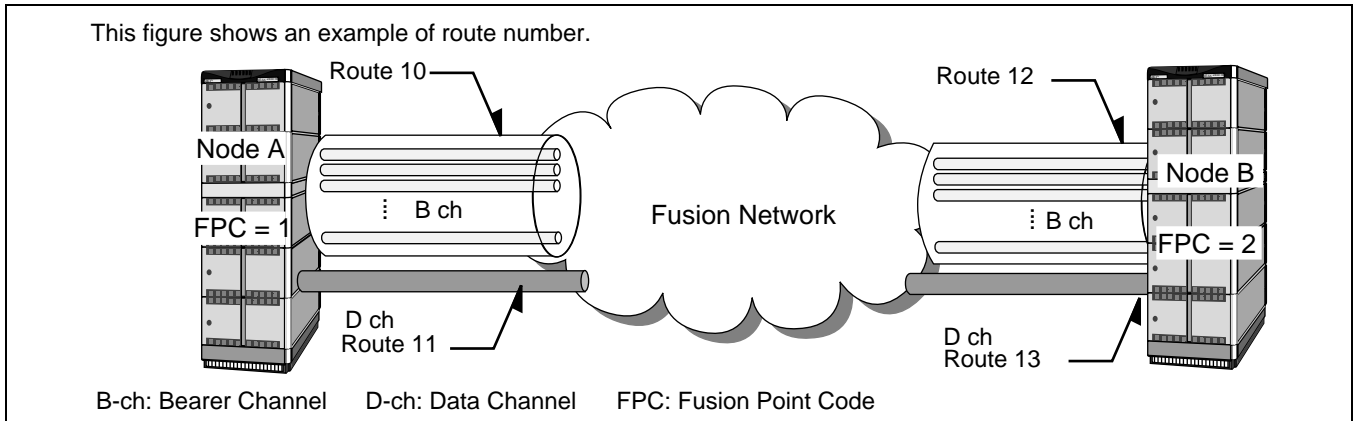


Figure 5-20 B-ch and D-ch

The ACRD command should look similar to the following.

This figure shows an example of data setting for a B-ch route.

The screenshot shows the ACRD (Assignment of Connection Route Class Data) command display. The C_RT is set to 10. The table below shows the data settings for a B-ch route.

CDN	FUNC	DT	CDN	FUNC	DT	CDN	FUNC	DT
1	TF	3	7	TRKS	0	13	STSEQ	0
2	TCL	4	8	TC/EC	0	14	FGH	0
3	RLP	2	9	FINT	0	15	MMN	0
4	SMDR	0	10	FPEG	0	16	LKIND	0
5	LSG	12	11	TC	0	17	IPLYR	0
6	PAD	7	12	MTC	0			

For Help, press F1

Figure 5-21 ACRD Command Display (example)

Table 5-1 Route Class Data Assignment

CDN		Node A		Node B		Description
		B-channel	D-channel	B-channel	D-channel	
type		C_RT: 10	C_RT: 11	C_RT: 12	C_RT: 13	
RT						
1	TF	3	3	3	3	Trunk Kind 3: Bothway (fixed)
2	TCL	4	4	4	4	Trunk Class: 4 (fixed)
3	RLP	2	2	2	2	Release Method : Assign 2-First Party Release.
4	SMDR	0	0	0	0	Assign 0.
5	LSG	12	13	12	13	B-ch: 12, D-ch: 13
6	PAD					
7	TRKS	0 (1)	0	0 (1)	0	0: FIFO (1: LIFO)
8	TC/EC					
9	FINT	0	0	0	0	Fusion Interface Kind: Assign 0.
10	FPEG	0	0	0	0	Fusion Trunk Peg Count: Assign 0.
11	TC	0	0	0	0	Timer Class
12	MTC	0	0	0	0	Timer Counter:
13	STSEQ	0	0	0	0	Status Enquiry: 0 0/1=-/cancel
14	FGH	0	0	0	0	Assign 0.
15	MMN					

DATA PROGRAMMING

Assignment of Telephone Numbers

- CDN 1: Trunk Kind
0-2: -
3: Bothway Trunk
- CDN 2: TCL (Trunk Class)
0-3: -
4: Fusion Trunk
5-31: -
- CDN 3: RLP (Release Pattern)
0: Calling Party Release
1: -
2: First Party Release
3: -
- CDN 4: SMDR (SMDR for station-to-station call)
Assign 0.
- CDN 5: LSG (Line Signal)
12: B channel for No.7 CCIS/ISDN
13: D channel for No.7 CCIS/ISDN
- CDN 6: PAD **Note**
0: Depending Key Setting of Circuit Card
1: Send 8 dB, Receive 0 dB
2: Send 4 dB, Receive 4 dB
3: Send 8 dB, Receive 12 dB
4: Send 8 dB, Receive 8 dB
5-6: -
7: 0 dB

Note: When PAD data is assigned by AFPD command, AFPD data takes precedence over this data. For more information on AFPD command, see the "Office Data Specification."

- CDN 7: TRKS (Trunk Select)
0: FIFO
1: LIFO
- CDN 8: TC/EC
0: No MPC/EC
1: EC
2: MPC
3: -
- CDN 9: FINT (Fusion Interface Kind)
0: Fusion
1-15: Not used

- CDN 10: FPEG (Fusion Trunk Peg Count)
Assign 0.
- CDN 11: TC (Timer Class)
0: -
1: 1 sec
2: 2 sec
3: 8 sec
4: 20 sec
5-7: -
- CDN 12: MTC (Miscellaneous Timer Counter)
- CDN 13: STSEQ (Status Enquiry)
0: -
1: cancel
- CDN 14: FGH (Fusion Gateway Handler)
Assign 0.
- CDN 15: MMN (Kind of Multiple Equipment)
0: TDM
1: MM-Node
2-3: -
- CDN 16: Fusion Link
0: via DTI
1: via ISW
2: Fusion over IP (Router)
3-15: Not used
- CDN 17: IPLYR (Voice over IP)
0: DTI interface 1.5 Mbps
1: DTI interface 2.0 Mbps

DATA PROGRAMMING

Assignment of Telephone Numbers

STEP 2: ACTK

Assign the connection trunk data of both B-channel and D-channel using the ACTK command. Assign the Connection Equipment Number (C_LENS) referring to [Figure 5-22](#) through [Figure 5-25](#). The ACTK command display should look similar to the following.

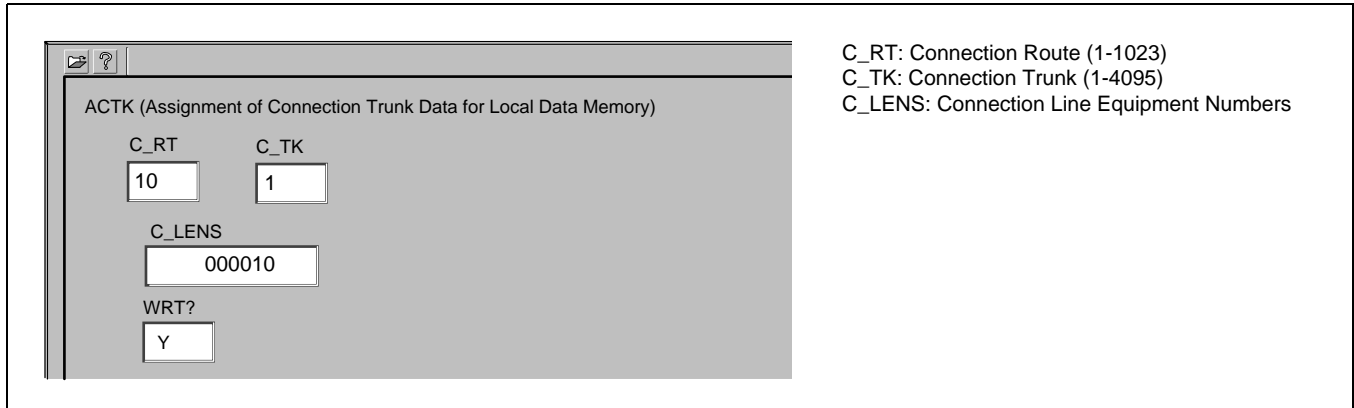


Figure 5-22 ACTK Command Display (example)

The mounting location of the FCH, DTI cards can be classified into the following two types.

Regular Density Slot (16-port slot) -See [Figure 5-23](#).

High Density Slot (32-port slot) -See [Figure 5-24](#) and [Figure 5-25](#).

6.1.1 When FCH is mounted in a Extended Density Slot

If the FCH is to be mounted in the Extended Density Slot, the connection trunk should be assigned as shown in the figures below. If the card's mounting location is in any of the Slot Nos. 04, 06, 08, or 15, 17, 19, the following extended Group should be used for the Dch trunk: G27, 29, or 31. [Figure 5-23](#) shows an example where the cards are mounted in density Slots 04 or 05.

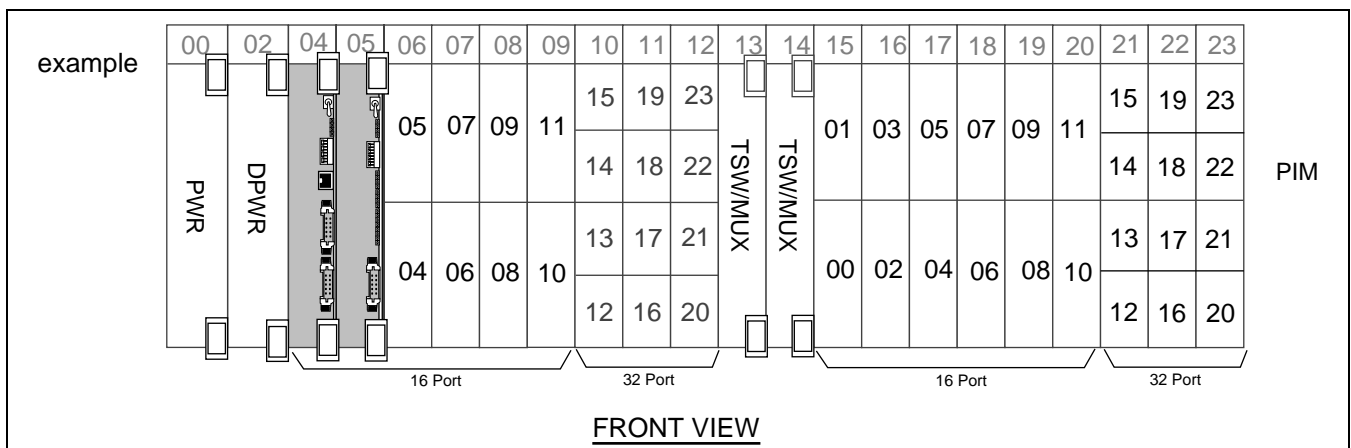


Figure 5-23 Mounting FCH and DTI Cards in Regular Density Slots

Table 5-2 Data Programming Sheet for Regular Density Slot

C_RT (1-1023)	C_TK(1-4095)	C_LENS				Time Slot Allocation		
		MG	U	G	LV			
10 (B-ch)	1	0	0	0	0	1	0	<div style="text-align: right; margin-bottom: 10px;">Example</div> <p style="margin-top: 20px;">Specify Dch -TS by setting switch on FCH.</p>
	2	0	0	0	0	1	1	
	3	0	0	0	0	1	2	
	4	0	0	0	0	1	3	
	5	0	0	0	0	1	4	
	6	0	0	0	0	1	5	
	7	0	0	0	0	1	6	
	8	0	0	0	0	1	7	
	9	0	0	0	0	2	0	
	10	0	0	0	0	2	1	
	11	0	0	0	0	2	2	
	12	0	0	0	0	2	3	
	13	0	0	0	0	2	4	
	14	0	0	0	0	2	5	
	15	0	0	0	0	2	6	
	16	0	0	0	0	2	7	
	17	0	0	0	0	3	0	
	18	0	0	0	0	3	1	
	19	0	0	0	0	3	2	
	20	0	0	0	0	3	3	
	21	0	0	0	0	3	4	
	22	0	0	0	0	3	5	
	23	0	0	0	0	3	6	
11 (D-ch)	1	0	0	0	0	3	7	
	2	0	0	0	2	7	0	

DATA PROGRAMMING

Assignment of Telephone Numbers

6.1.2 When FCH is Mounted in a High Density Slot

If the FCH is to be mounted in the High Density Slot, the connection trunk data should be assigned as shown in the figures below. Figure 5-24 shows an example where these cards are mounted in Slots 11 and 12.

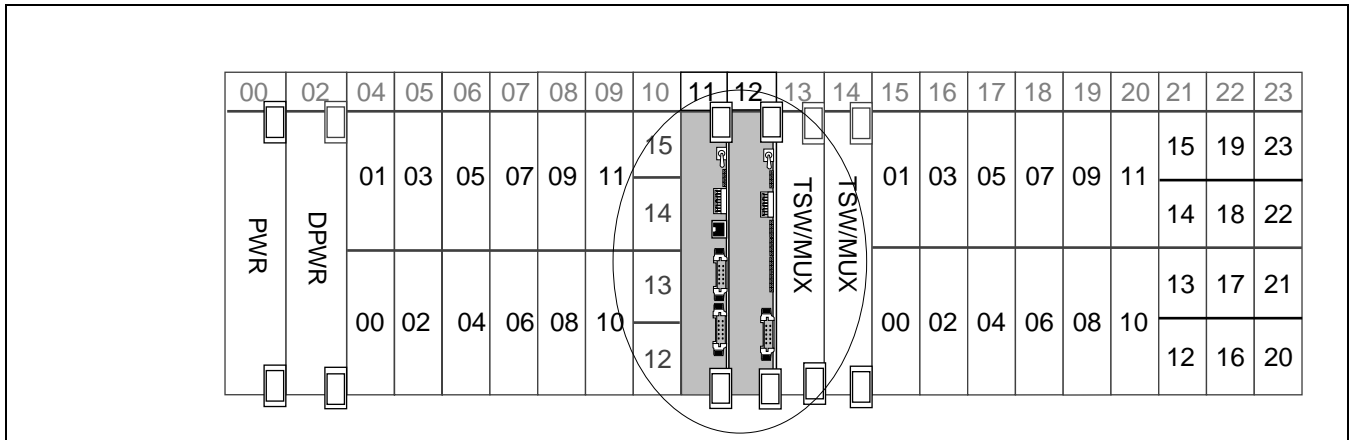


Figure 5-24 Mounting FCH and DTI Cards in High-Density Slots

When the DTI cards is mounted in a double density slot, the C_LEN data for the FCH and DTI cards are as follows.

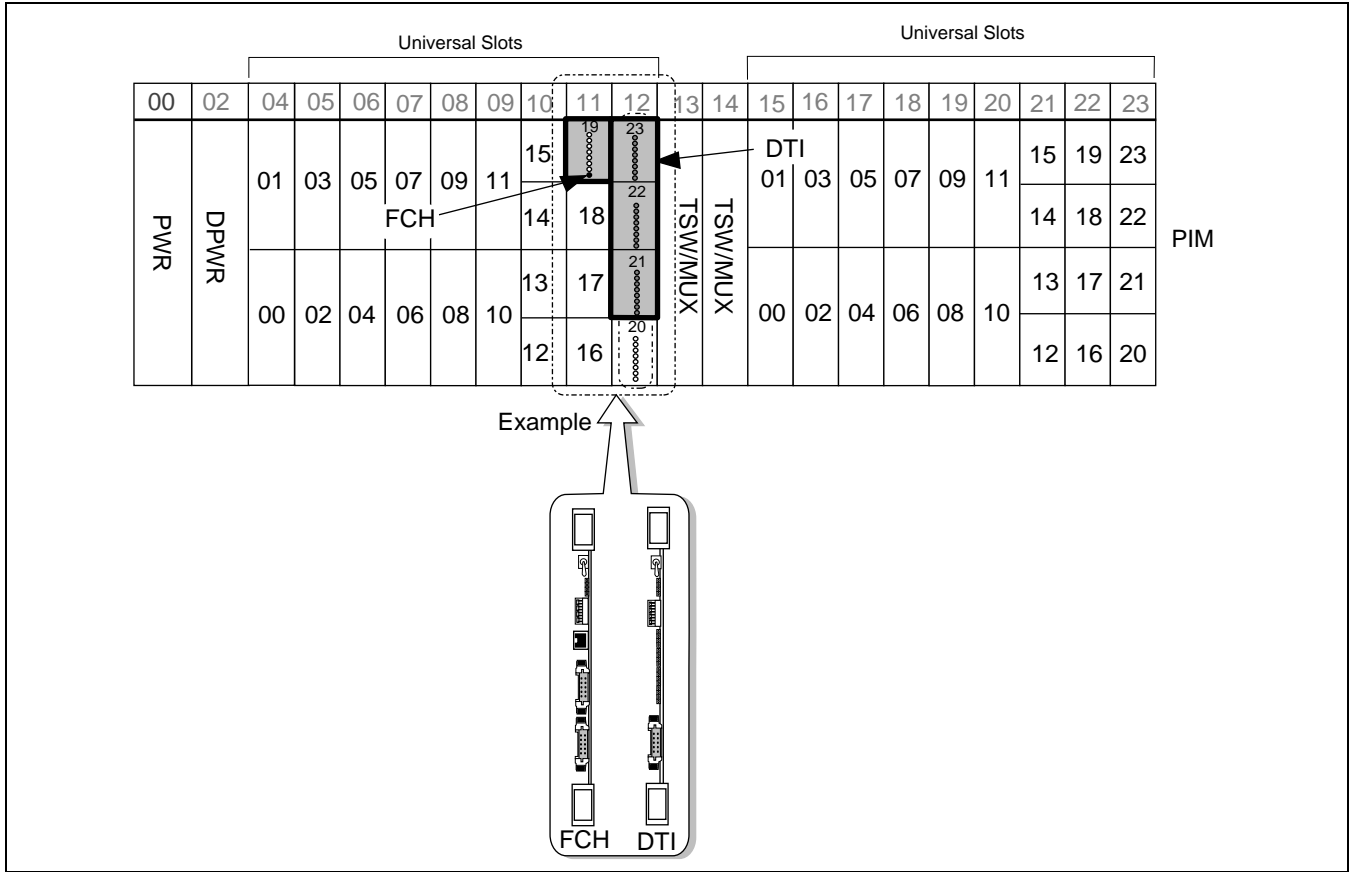


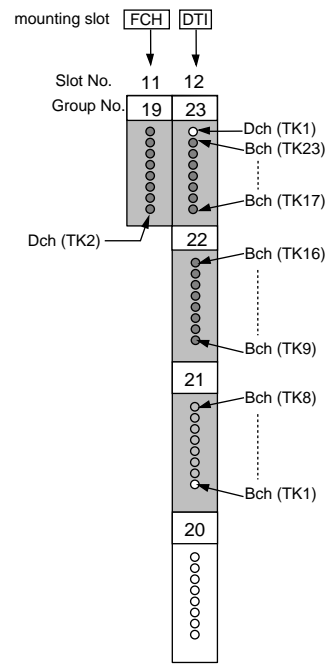
Figure 5-25 How to Assign C_LEN Data (Type 2)

DATA PROGRAMMING

Assignment of Telephone Numbers

Table 5-3 Data Programming Sheet for High Density Slot

C_RT (1-1023)	C_TK (1-4095)	C_LENS				Time Slot Allocation	
		MG	U	G	LV		
10 (B-ch)	1	0	0	0	2	1	0
	2	0	0	0	2	1	1
	3	0	0	0	2	1	2
	4	0	0	0	2	1	3
	5	0	0	0	2	1	4
	6	0	0	0	2	1	5
	7	0	0	0	2	1	6
	8	0	0	0	2	1	7
	9	0	0	0	2	2	0
	10	0	0	0	2	2	1
	11	0	0	0	2	2	2
	12	0	0	0	2	2	3
	13	0	0	0	2	2	4
	14	0	0	0	2	2	5
	15	0	0	0	2	2	6
	16	0	0	0	2	2	7
	17	0	0	0	2	3	0
	18	0	0	0	2	3	1
	19	0	0	0	2	3	2
	20	0	0	0	2	3	3
	21	0	0	0	2	3	4
	22	0	0	0	2	3	5
	23	0	0	0	2	3	6
11 (D-ch)	1	0	0	0	2	3	7
	2	0	0	0	1	9	0



STEP 4: MBCT

Unbusy the connection trunk data assigned in the previous step using MBCT (Make Busy of Connection Trunk) command. This step is required for both B-channel and D-channel trunk. The MBCT command should look similar to the following.

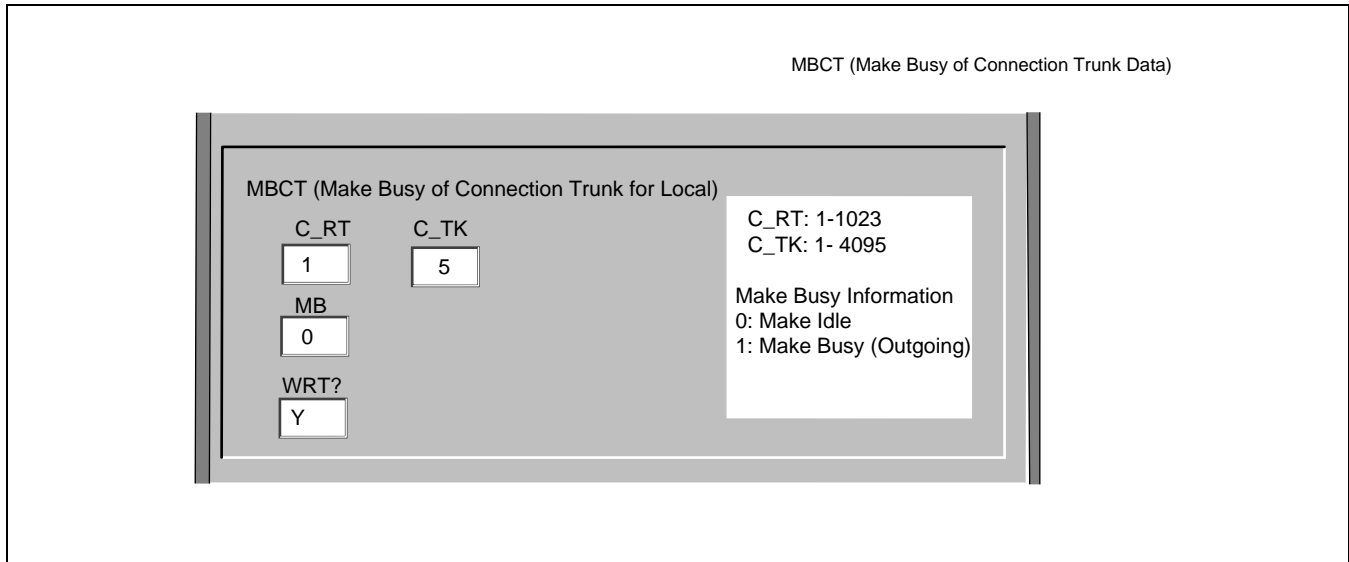


Figure 5-26 MBCT Command Display

7. Assignment of FCH Related Data

STEP 1: For Fusion with FCH only:

- Assign FCH Number on an FCH (PA-FCHA) circuit card basis.
- The FCH Number must conform to the following conditions:
 - FCH Number range must be between 1 and 255.
 - At the network level, the same FCH Numbers can be assigned. However, they must be unique at the node level.
 - Use sequential numbers starting from 1 as FCH Numbers.

DATA PROGRAMMING

Assignment of FCH Related Data

Figure 5-29 shows a sample data assignment when FCH cards are located in the PIM 0 slot 4 and PIM 2 slot 11.

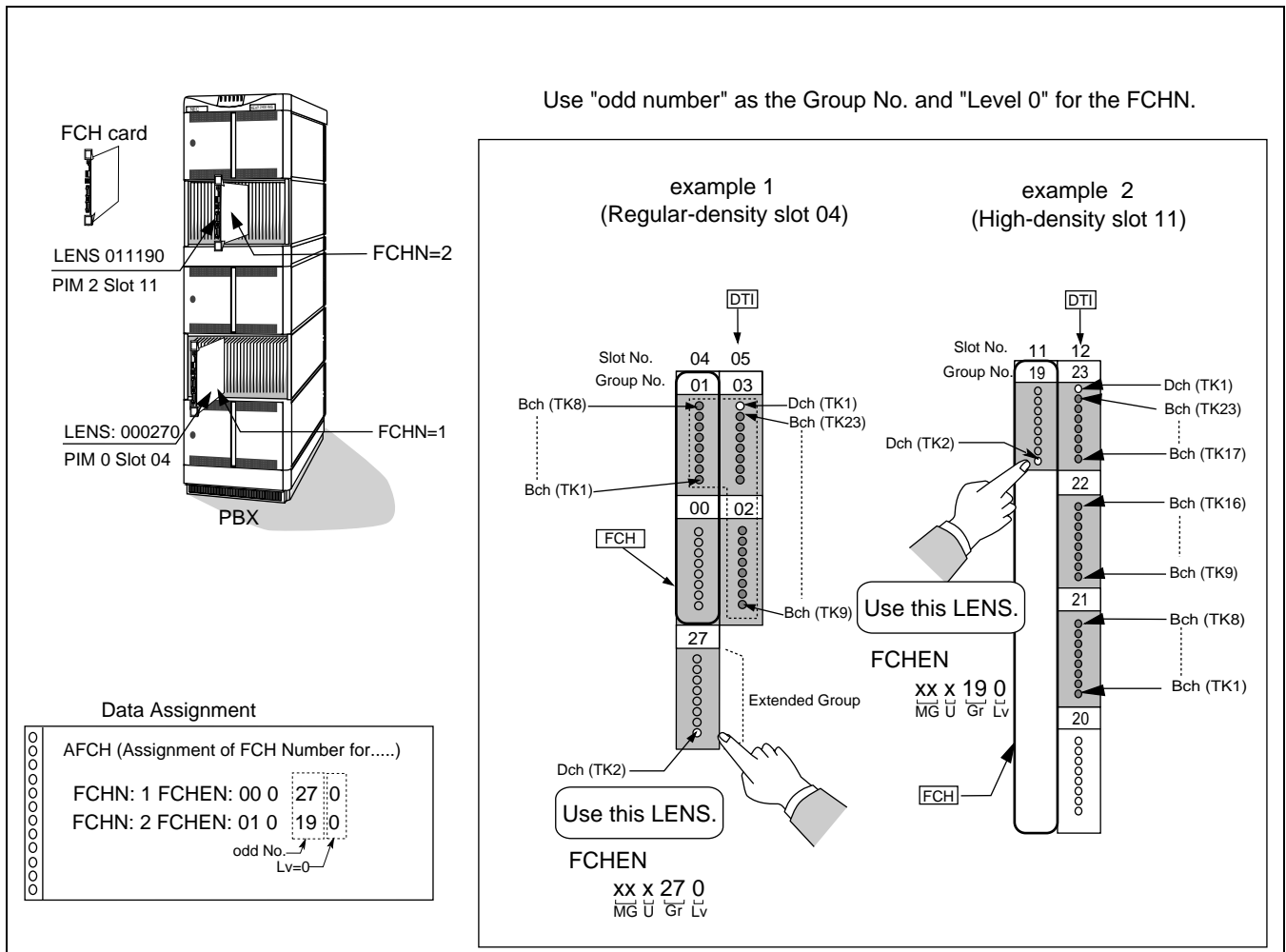


Figure 5-27 Assignment of FCH Number

The AFCH command display should look similar to the following:

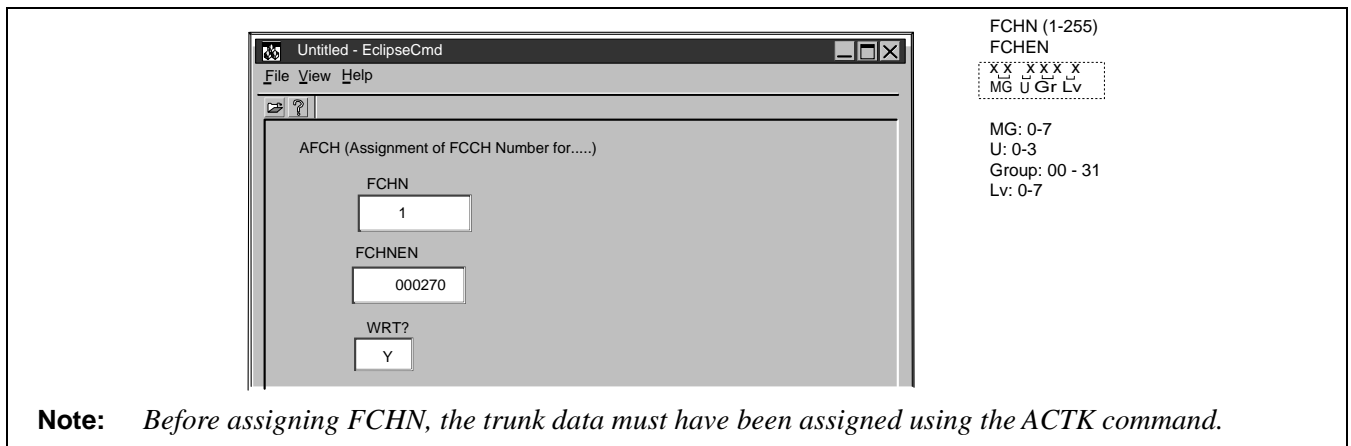


Figure 5-28 AFCH Command Display (example)

STEP 2: AFRT (Fusion with FCH only)

Assign connection route numbers as shown below using the AFRT command.

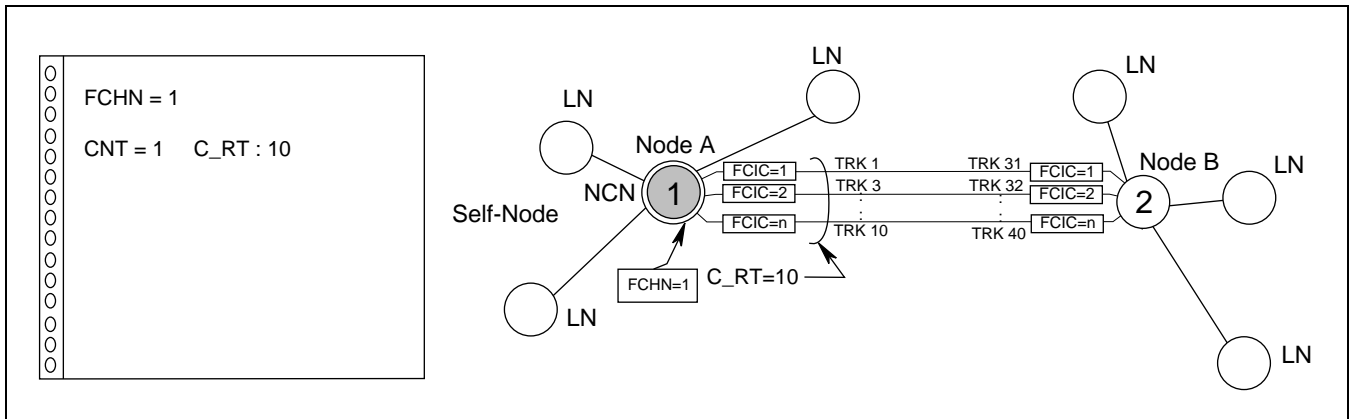


Figure 5-29 AFRT Sample Data Sheet

The AFRT command display should look similar to [Figure 5-30](#).

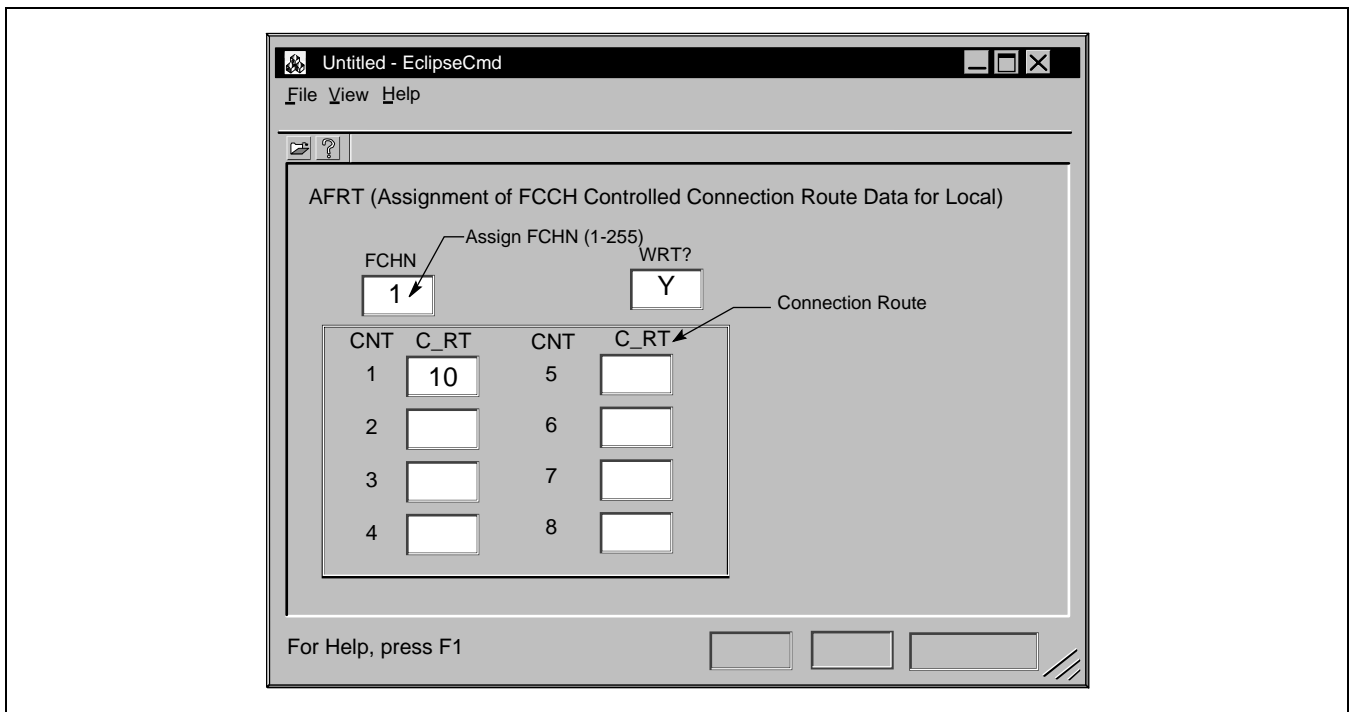


Figure 5-30 AFRT Command Display

DATA PROGRAMMING

Assignment of FCH Related Data

STEP 3: AFPC

Assign FCH routing data using the AFPC command. A maximum of 8 connection routes and FCHN/FPCN can be assigned on a node basis. FCHN is used for Fusion System with FCH. FPCN is used for Fusion System without FCH. The list box labeled FCH on the AFPC command determines the system type. Assign "0" for Fusion System without FCH and "1" for Fusion System with FCH. In this step, the explanation is given using the following network as an example. Figure 5-31 shows a sample Fusion network. Each number in the circle represents the Fusion Point Code (FPC).

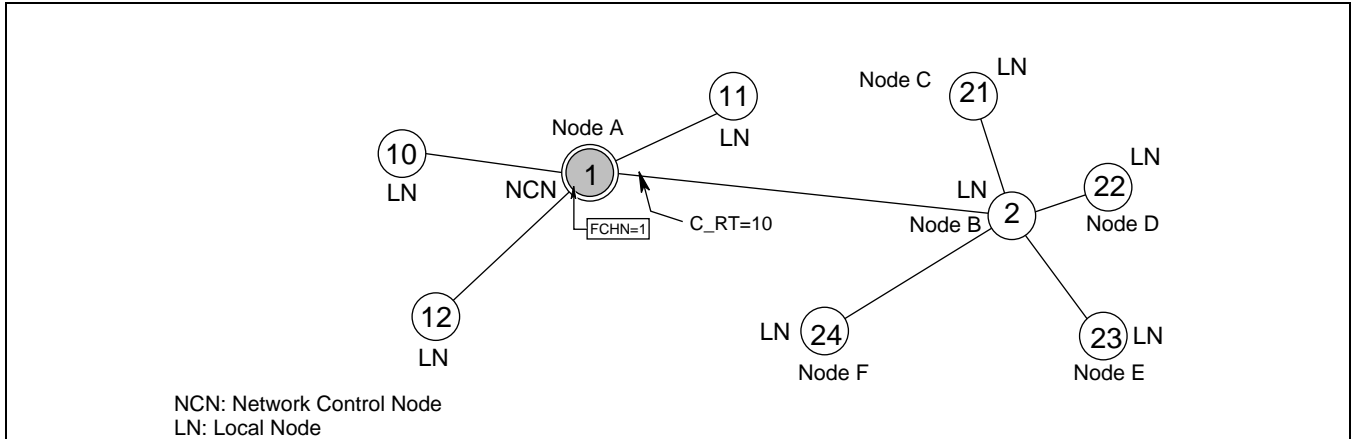


Figure 5-31 Fusion Network (example)

The AFPC command display (Fusion with FCH) should look similar to the following:

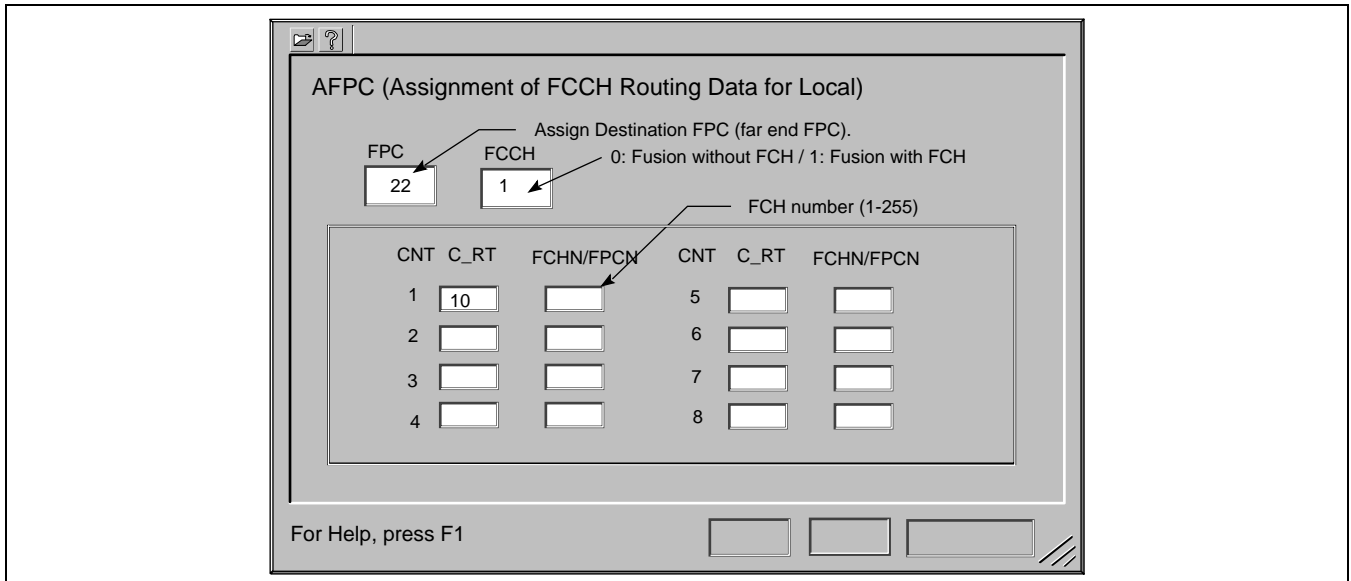
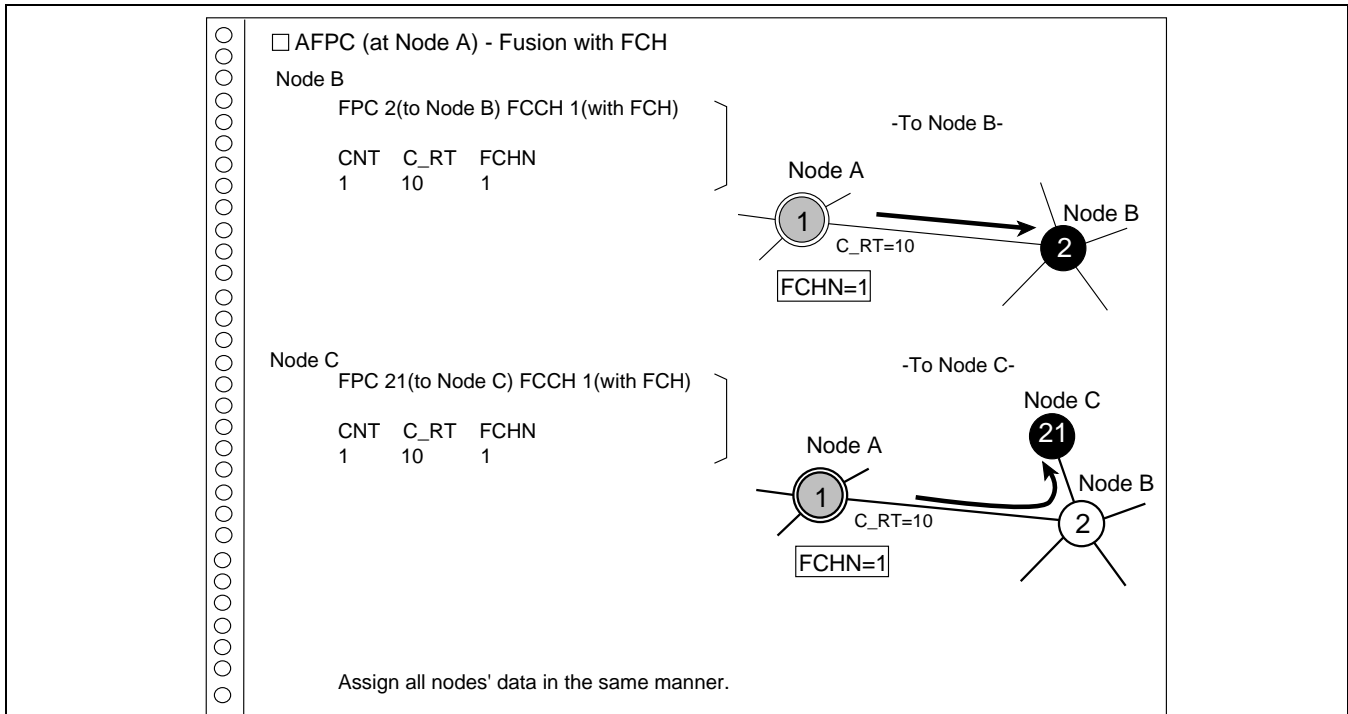


Figure 5-32 AFPC Command Display (example)

WARNING: The AFPC command affects communications between nodes. Change the data with extreme care.

The table in Figure 5-33 shows a sample data sheet for Node A on a Fusion network with FCH. Assign the data for all nodes including the nodes which are not directly connected on the network. For example, in this figure Node C and Node D are not directly connected to the network.



This table shows a sample data sheet for Node A on the fusion network without FCH. Assign the data for all nodes including the nodes which are not directly connected on the network. (i.e. Node C, Node D.....)

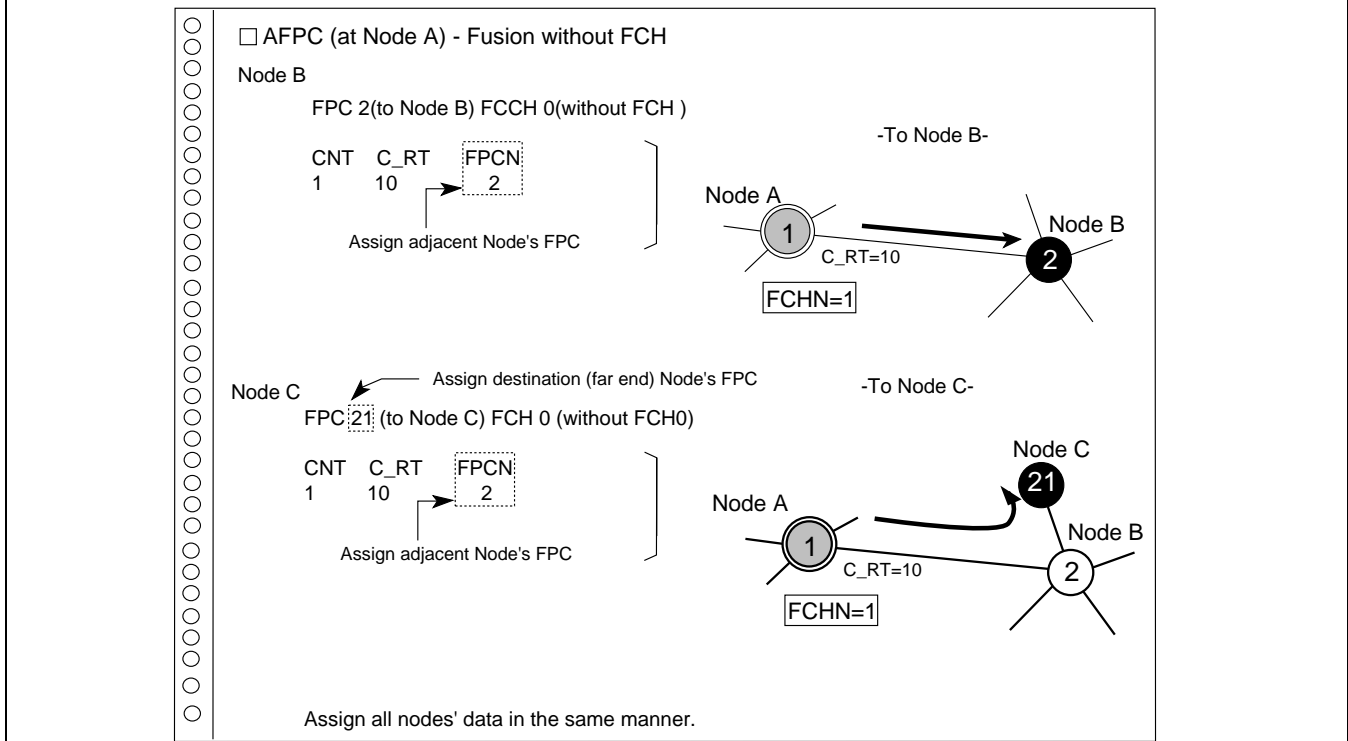


Figure 5-33 AFPC Sample Data Sheet

DATA PROGRAMMING

Assignment of FCH Related Data

STEP 4: ACAN

Assign the Fusion Connection Index Code (FCIC) and the LENS on an adjacent FPC basis. Figure 5-34 shows a sample data sheet for Node A.

Note: It is not necessary to assign the same number as trunk and FCIC. However, FCIC numbers between adjacent nodes must be identical.

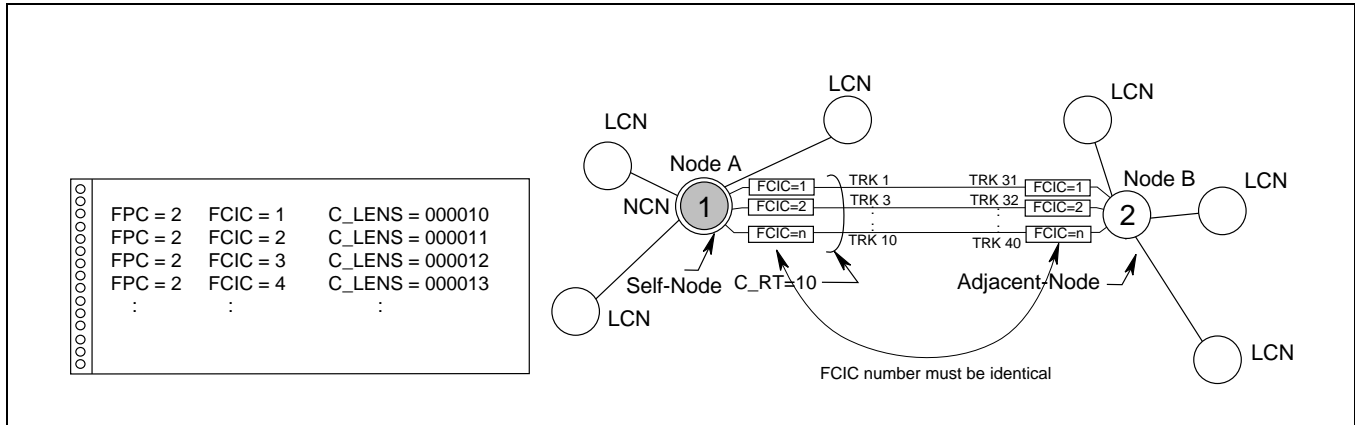


Figure 5-34 ACAN Sample Data Sheet

The ACAN command display should look similar to the following:

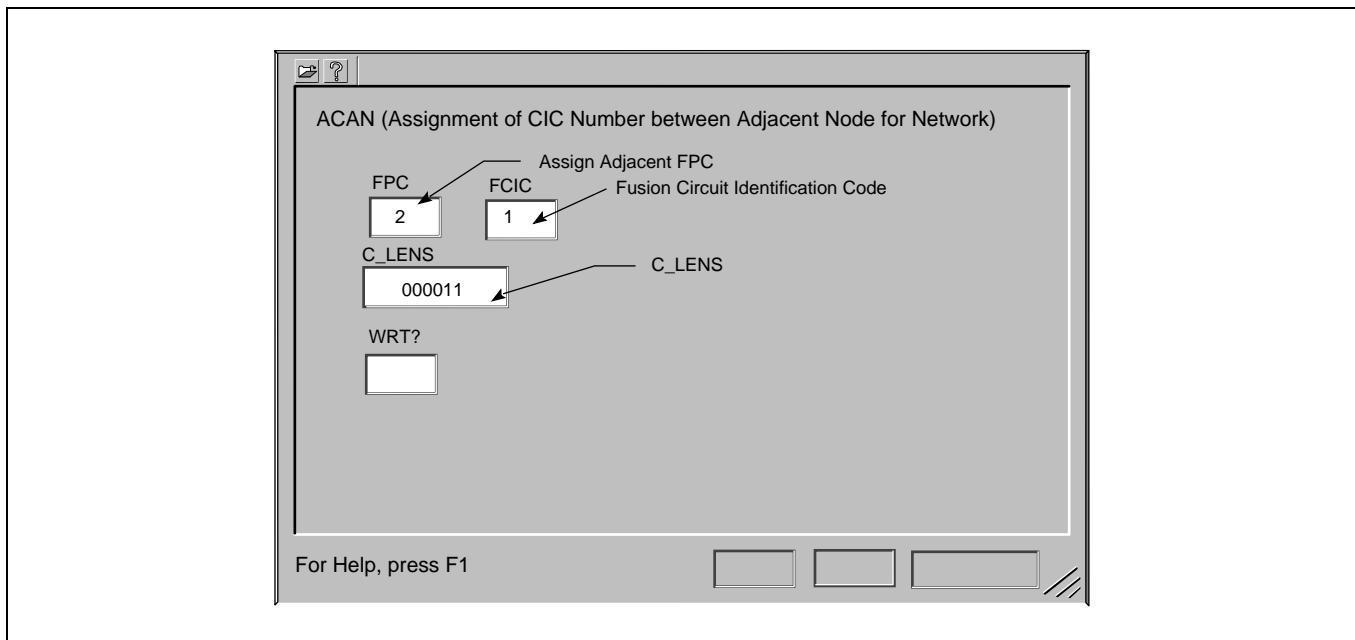
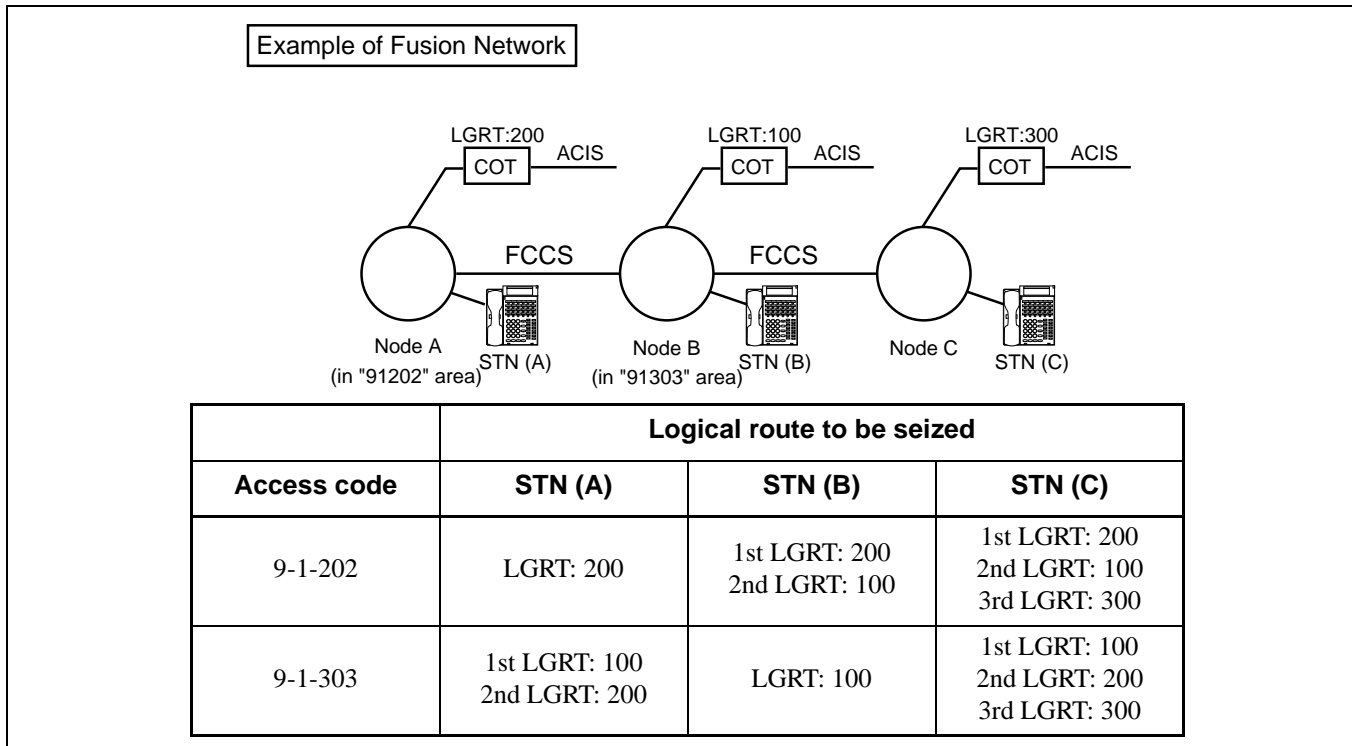


Figure 5-35 ACAN Command Display (example)

7.1 Assignment of Access Code for Tandem Connection via FCCS - ACIS

For Release 3 or later software, tandem connection via FCCS - ACIS link can be established. Using LDM, appropriate routing data for each node can be assigned as shown in the following example.



Note: When the related data is assigned to DM, outgoing connection is available only for external routes in self node (i.e. FCCS - ACIS link cannot be established).

To initiate seizure of an external trunk, one of four methods - OGC, OGCA, LCR, LCRS - can be used (See the following sections).

7.1.1 OGC

A procedure for assigning the OGC access code is explained using the following example.

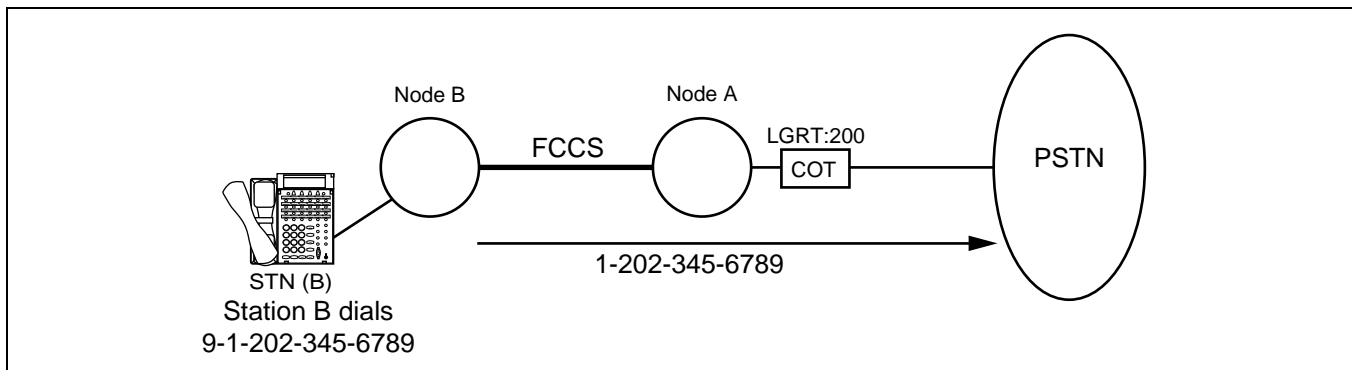


Figure 5-36 Example of OGC

DATA PROGRAMMING

Assignment of FCH Related Data

STEP 1: ANPDN/ANPDL **Note**

Assign the first digit of the OGC access code. When the access code is common to all nodes, use the ANPDN command. When the access code is assigned for each node, use the ANPDL command.

1st DC=9 CI=N (Normal) NND=1

1st DC=9 CI=H (Hooking) NND=1

STEP 2: ASPAN/ASPAL **Note**

Assign the OGC access code. When the access code is common to all nodes, use the ASPAN command. When the access code is assigned for each node, use the ASPAL command.

ACC=9 CI=N (Normal) SRV=OGC LGRT=200

ACC=9 CI=H (Hooking) SRV=OGC LGRT=200

STEP 3: ANNDL/AMND

Assign the necessary number of digits using the ANNDL or the AMND command depending on the route data.

- When the ARTD command OSGS is 2 (Second Dial Tone), use the ANNDL (Necessary Digits Data) command.

RT=200 OG NND=12

- When the ARTD command OSGS is 4/6/7 (Sender Immediate Start/Sender Delay Dial Start/Sender Wink Start), use the AMND command.

DC=9 MND=12

STEP 4: ARSCN

Assign the Route Restriction Class (RSC) that allows RRI for the external trunk route. The same route restriction data must be assigned for each node.

Note: *When entering the data in STEP 1 and STEP 2, do not mix the commands for LDM and NDM. Write the data on the same data memory as shown below:*

- When writing the data on the LDM: **ANPDL (STEP 1) → ASPAL (STEP 2)**
- When writing the data on the NDM: **ANPDN (STEP 1) → ASPAN (STEP 2)**

7.1.2 OGCA

A procedure for assigning OGCA access code is explained using the following example.

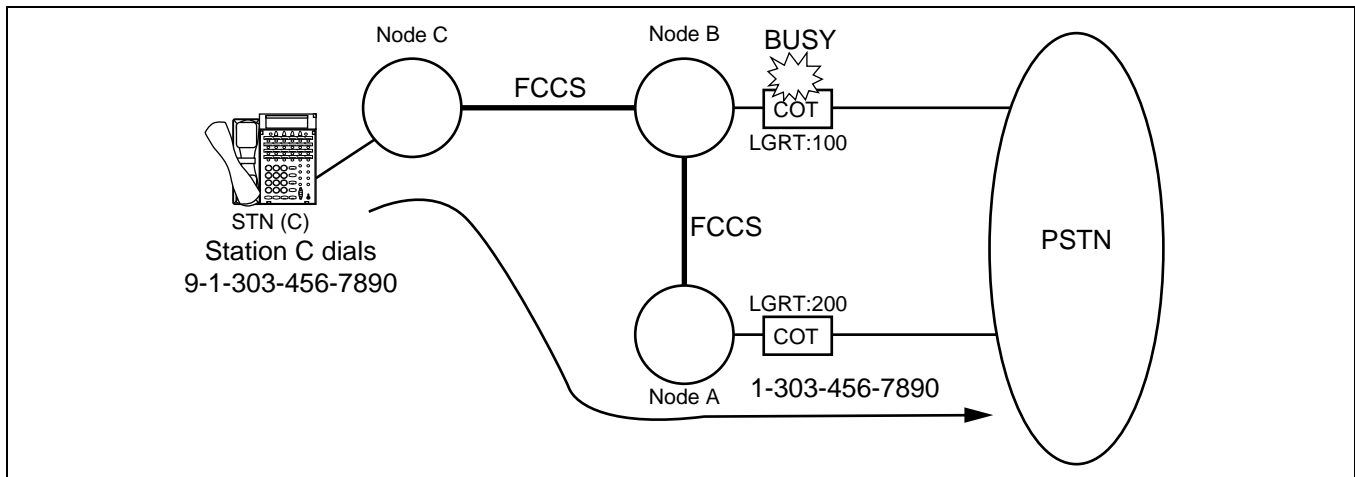


Figure 5-37 Example of OGCA

STEP 1: ANPDN/ANPDL Note

Assign the first digit of the OGCA access code. When the access code is common to all nodes, use the ANPDN command. When the access code is assigned for each node, use the ANPDL command.

1st DC=9 CI=N (Normal) NND=1

1st DC=9 CI=H (Hooking) NND=1

STEP 2: ASPAN/ASPAL Note

Assign the OGCA access code. When the access code is common to all nodes, use the ASPAN command. When the access code is assigned for each node, use the ASPAL command.

ACC=9 CI=N (Normal) SRV=OGCA COUNT=2 1st LGRT=100 2nd LGRT=200

ACC=9 CI=H (Hooking) SRV=OGCA COUNT=2 1st LGRT=100 2nd LGRT=200

Note: *When entering the data in STEP 1 and STEP 2, do not mix the commands for LDM and NDM. Write the data on the same data memory as shown below:*

- *When writing the data on the LDM: ANPDL (STEP 1) → ASPAL (STEP 2)*
- *When writing the data on the NDM: ANPDN (STEP 1) → ASPAN (STEP 2)*

DATA PROGRAMMING

Assignment of FCH Related Data

STEP 3: ANNDL/AMND

Assign the necessary number of digits using the ANNDL or the AMND command depending on the route data.

- When the ARTD command OSGS is 2 (Second Dial Tone), use the ANNDL (Necessary Digits Data) command.

RT=100 OG NND=12

RT=200 OG NND=12

- When the ARTD command OSGS is 4/6/7 (Sender Immediate Start/Sender Delay Dial Start/Sender Wink Start), use the AMND command.

DC=9 MND=12

STEP 4: ARSCN

Assign the Route Restriction Class (RSC) that allows RRI for the external trunk route. The same route restriction data must be assigned for each node.

7.1.3 LCR/LCRS

A procedure for assigning LCR/LCRS access code is explained using the following example.

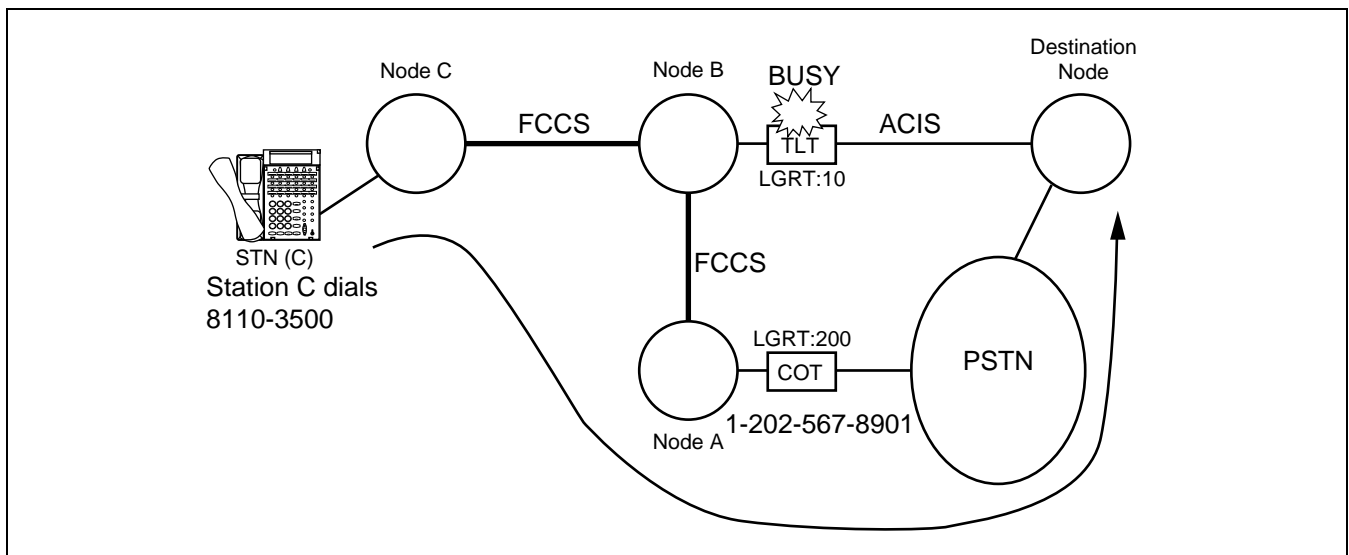


Figure 5-38 Example of LCR/LCRS

STEP 1: ANPDN/ANPDL Note

Assign the first digit of the LCR/LCRS access code. When the access code is common to all nodes, use the ANPDN command. When the access code is assigned for each node, use the ANPDL command.

TN=1 1st DC=8 CI=N (Normal) NND=1

TN=1 1st DC=8 CI=H (Hooking) NND=1

STEP 2: ASPAN/ASPAL Note

Assign the LCR/LCRS access code for a dummy route number. When the access code is common to all nodes, use the ASPAN command. When the access code is assigned for each node, use the ASPAL command.

ACC=8 CI=N (Normal) SRV=LCR/LCRS LGRT=Dummy route number

ACC=8 CI=H (Hooking) SRV=LCR/LCRS LGRT=Dummy route number

STEP 3: AMND

Using AMND, assign the Maximum Necessary Digits to be received by Register (ORT) circuit.

DC=8110 MND=8

STEP 4: ARNPL

Using ARNPL, assign the access code for each external trunk route, but not for a dummy route.

RT=10 ACC=8

RT=200 ACC=9

Note: When entering the data in STEP 1, 2, 6, 7 and 8, do not mix the commands for LDM and NDM. Write the data on the same data memory as shown below:

- When writing the data on the LDM:

ANPDL → *ASPAL* → *AFRSL* → *AOPRL* → *AADCL*

(STEP 1) (STEP 2) (STEP 6) (STEP 7) (STEP 8)

- When writing the data on the NDM:

ANPDN → *ASPAN* → *AFRSN* → *AOPRN* → *AADCN*

(STEP 1) (STEP 2) (STEP 6) (STEP 7) (STEP 8)

DATA PROGRAMMING

Assignment of FCH Related Data

STEP 5: ARTD/ARTDN

Using ARTD, assign the following CDN data for the dummy route number. **Note 1**

CDN 6 (TCL)=1 or 4 (depending on requirement)

CDN 7 (L/T)=1

CDN 13 (AC)=1

The other CDNs may be left default (data 0) for the dummy route.

STEP 6: AFRSL/AFRSN **Note 2**

Using AFRSL, assign the Number Pattern Code (NPC) and the Outgoing Route Selection Pattern Number (OPR) for the dummy route number.

LGRT=Dummy route number NPC=8110 OPR=1

STEP 7: AOPRL/AOPRN **Note 2**

Using AOPRL, assign the external route number to OPR assigned in the AFRSL command.

TDPTN=0 OPR=1 RA=0 E=1 LGRT=10 SKIP=4 PNL=0 OVFT=0
PRSC=0

TDPTN=0 OPR=1 RA=1 E=0 LGRT=200 SKIP=8 PNL=128 OVFT=0
PRSC=0

STEP 8: AADCL/AADCN **Note 2**

Using AADCL, assign the additional Digit Code to PNL assigned in the AOPRL command.

PNL=128

DC=12025678901

STEP 9: ARSCN

Using ARSCN, assign the Route Restriction Class (RSC) that allows RRI for the external trunk route. The same route restriction data must be assigned for each node.

Note 1: *The dummy route must be assigned to all nodes (including a node which does not have external routes).*

Note 2: *When entering the data in STEP 1, 2, 6, 7 and 8, do not mix the commands for LDM and NDM. Write the data on the same data memory as shown below:*

- When writing the data on the LDM:

ANPDL → ASPAL → AFRSL → AOPRL → AADCL
(STEP 1) (STEP 2) (STEP 6) (STEP 7) (STEP 8)

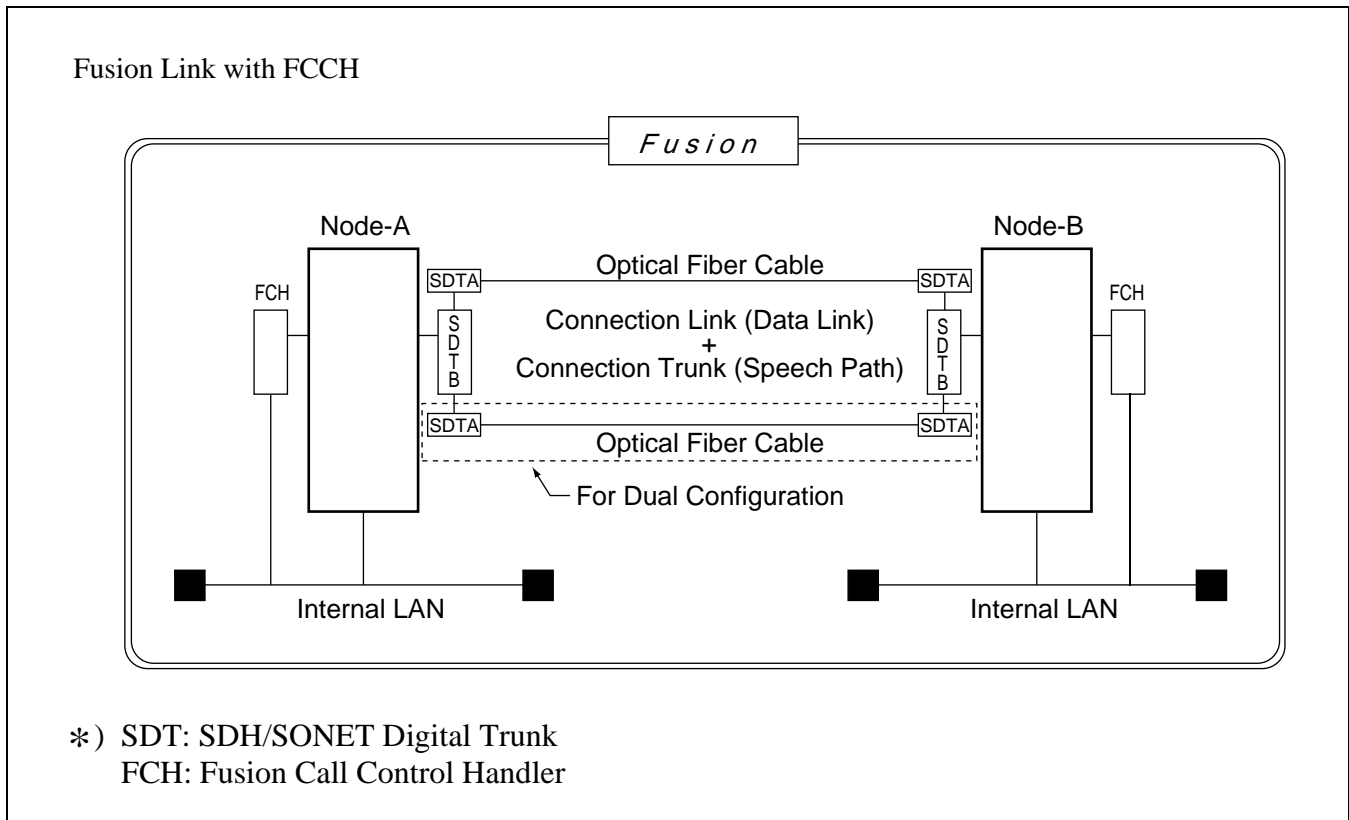
- When writing the data on the NDM:

ANPDN → ASPAN → AFRSN → AOPRN → AADCN
(STEP 1) (STEP 2) (STEP 6) (STEP 7) (STEP 8)

7.2 Data Assignment for 52M-SDH Interface

This section explains the Fusion Connection with 52M-SDH interface, which is available for Release 4 or later software.

The figures below explain the connection pattern.



DATA PROGRAMMING

Assignment of FCH Related Data

Specifications for the SDH data setting are described below.

- When FCCS and CCIS links are used together in the network, the different route number must be assigned to each Connection Trunk (B-ch), Connection Link (D-ch), Speech Line for CCIS and Signal Line for CCIS.

Example:

○ Available

Network	Route	Route Number
FCCS	Connection Trunk	RT=10
	Connection Link	RT=11
CCIS	Speech Line	RT=20
	Signal Line	RT=21

× Not Available

Network	Route	Route Number
FCCS	Connection Trunk	RT=10
	Connection Link	RT=11
CCIS	Speech Line	RT=10
	Signal Line	RT=11

The same route number can not be used for the different route.

- System data (SYS1, INDEX 531) must be assigned prior to the trunk data assignment for the SDT.
- When the SDT card is used to replace with the DTI card, and the trunk data has already been assigned for the DTI, perform the circuit card initialization after setting system data.
- When assigning Connection Links to the SDT card, a maximum of 512kbps (8ch) TS (Time slot) can be used as Connection Link (data link). Assignment order of TSs used for Connection Link between SDT and FCH must be identical. Any TS can be used for Connection link.

7.2.1 Data Programming

STEP 1: ASYDL

Designate the MG of accommodating the SDT circuit card.

b0-b7 Assign "1" to the bit number corresponding to the mounted MG number.

Note: SDT can be mounted in the odd MG only.

STEP 2: ACRD

Assign the Connection Route Class data.

- Connection trunk (for Voice)

C_RT: 10

TF=3

TCL=4

RLP=2

LSG=12

- Connection Link (for Data)

C_RT: 11

TCL=4 LSG=13

STEP 3: ACTK

Assign the Connection Trunk data for B-ch and D-ch.

Example: (When using 512kbps (8ch) TS as Connection link)

- Connection trunk (B-ch)

C_RT: 10 TK: 1-664 CLENS: LEN for the SDT

- Connection Link (D-ch)

C_RT: 11 TK: 1-8 CLENS: LEN for the FCH

C_RT: 11 TK: 9-16 CLENS: LEN for the SDT

Note: *Set the switch on the FCH card depending on the transmission speed.*

See “[CHAPTER 4 INSTALLATION](#)” for more information on switch settings.

STEP 4: AFCH

Assign the FCCH number for each FCCH.

FCHN: 2 (FCCH number) FCHEN: LEN of FCCH

STEP 5: AFPC

Assign the FCCS routing data.

FPC: 1 (FPC of the adjacent node) FCCH: 1 (with FCCH)

CRT: 10 FCHN: 2

STEP 6: ACAN

Assign the CIC number to the connection trunk.

FPC: 1 FCIC: 1-664 CLENS: LEN of the connection trunk

STEP 7: AFRT

Assign the FCCH Controlled Connection Route data.

FCHN: 2 CRT: 10

DATA PROGRAMMING

Assignment of FCH Related Data

STEP 8: AFPC

Assign the FCCS routing data.

FPC: 1 (FPC of the adjacent node) FCCH: 1 (with FCCH)

CRT: 10

FCHN: 2

STEP 9: ACAN

Assign the CIC number to the connection trunk.

FPC: 1 FCIC: 1-664 CLENS: LEN of the connection trunk

STEP 10: AFCD

Assign NAILED DOWN CONNECTION for the connection link established between FCCH and SDT.

LENS-A: LEN of SDT EAD-A: 07 (pad off)

LENS-B: LEN of FCCH EAD-B: 07 (pad off)

7.3 FCCS Link via Internet/Intranet

The system can exchange FCCS data via the Internet/Intranet. As shown below, an FCCS Link can be established by using the following features:

- External Router
- Fusion over IP

7.3.1 External Router

This feature allows the system to exchange the FCCS data via the Internet/Ethernet. For this feature, an FCCS link is connected to an external router.

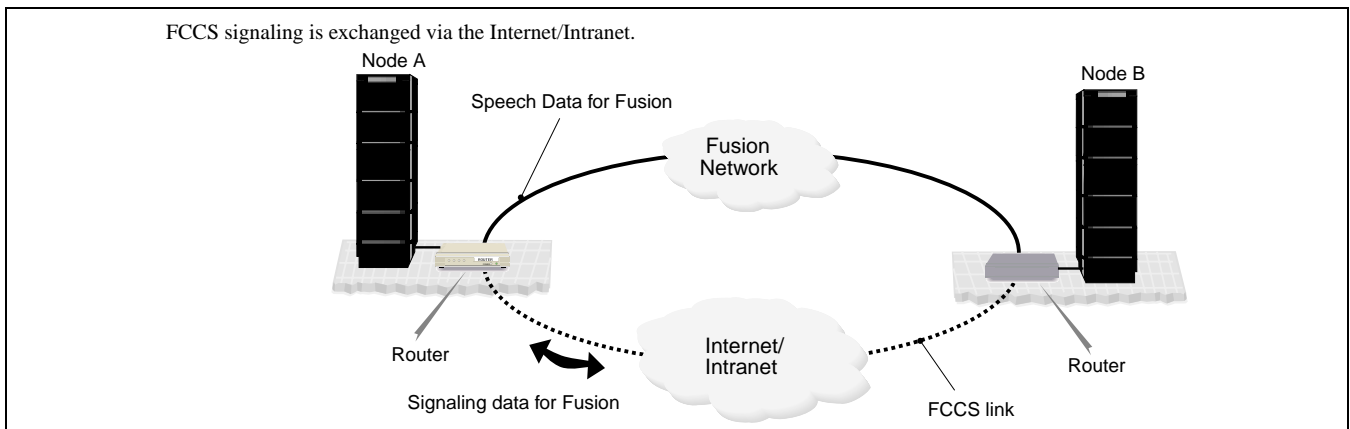


Figure 5-39 External Router - Overview

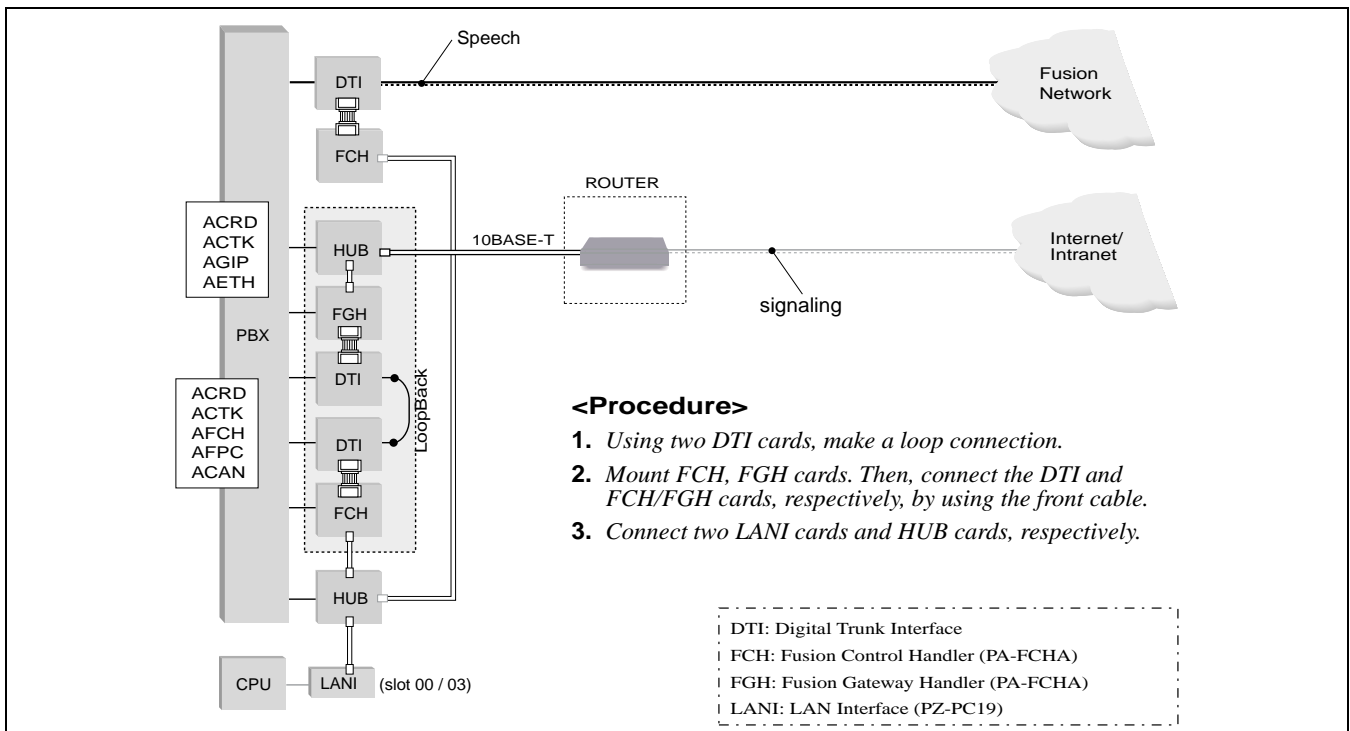


Figure 5-40 Hardware Connections for External Router

DATA PROGRAMMING

Assignment of FCH Related Data

STEP 1: ACRD

Assign Route Class Data of Speech Route, FCH, FGH routes, respectively. A sample data assignment is shown below.

See [6.1 Assignment of Connection Route/Trunk Data](#) for more detailed information.

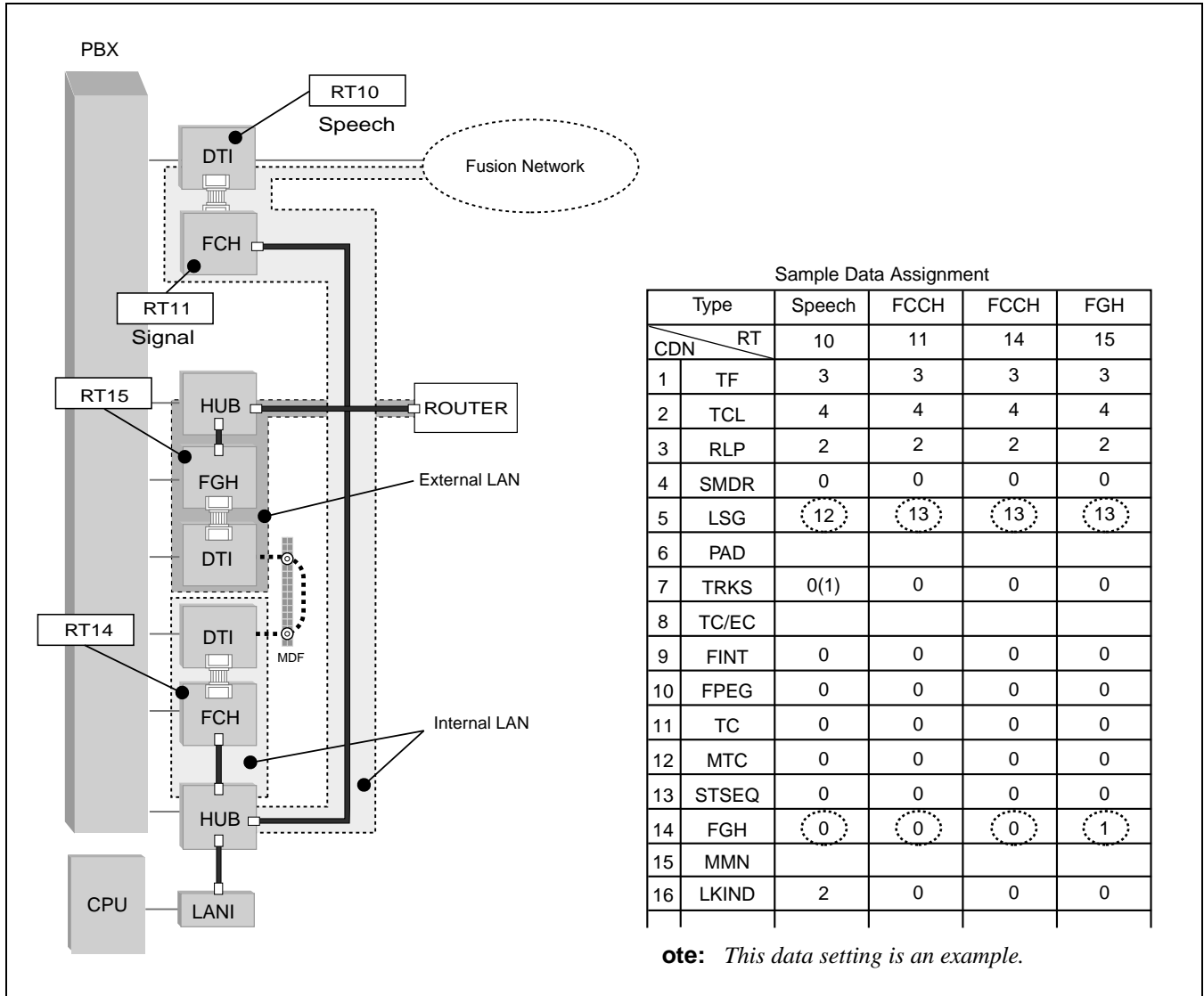
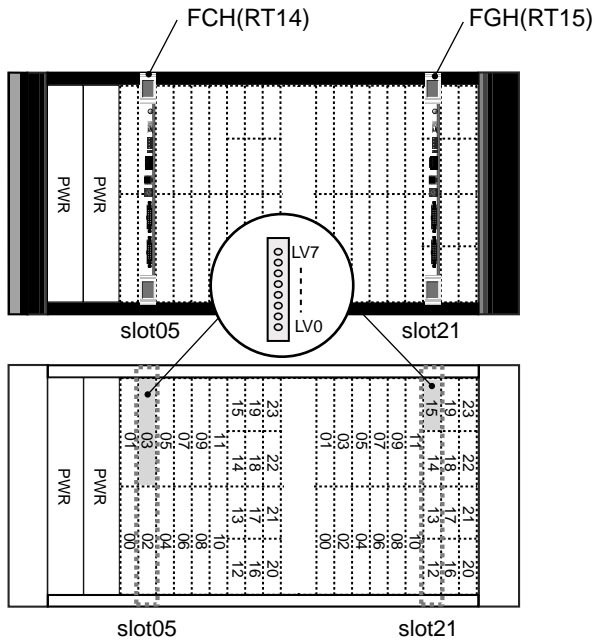


Figure 5-41 Connection Route Class Data Sample

STEP 2: ACTK

Assign the connection trunk data of DTI, FCH, and FGH cards, using the ACTK command. When assigning FCH, FGH trunk data, eight trunks must be set. A sample data assignment of FCH, FGH card is as follows.

When FCH and FGH cards are mounted in the following slots with the specified RT numbers, data setting is as follows.



C_RT (1-1023)	C_TK (1-4095)	C_LENS			
		MG 00-07	U 0-3	G 00-23	L 0-7
1, 4	1	0 0	0	0 3	0
1, 4	2	0 0	0	0 3	1
1, 4	3	0 0	0	0 3	2
1, 4	4	0 0	0	0 3	3
1, 4	5	0 0	0	0 3	4
1, 4	6	0 0	0	0 3	5
1, 4	7	0 0	0	0 3	6
1, 4	8	0 0	0	0 3	7
1, 5	1	0 0	1	1 5	0
1, 5	2	0 0	1	1 5	1
1, 5	3	0 0	1	1 5	2
1, 5	4	0 0	1	1 5	3
1, 5	5	0 0	1	1 5	4
1, 5	6	0 0	1	1 5	5
1, 5	7	0 0	1	1 5	6
1, 5	8	0 0	1	1 5	7

Figure 5-42 Sample Data Assignment (ACTK)

DATA PROGRAMMING

Assignment of FCH Related Data

STEP 3: AFCH

Assign FCH number on an FCH circuit card basis. In the following example, FCHN=1 is assigned for the FCH circuit card. For the FGH card, FCHN assignment is not necessary.

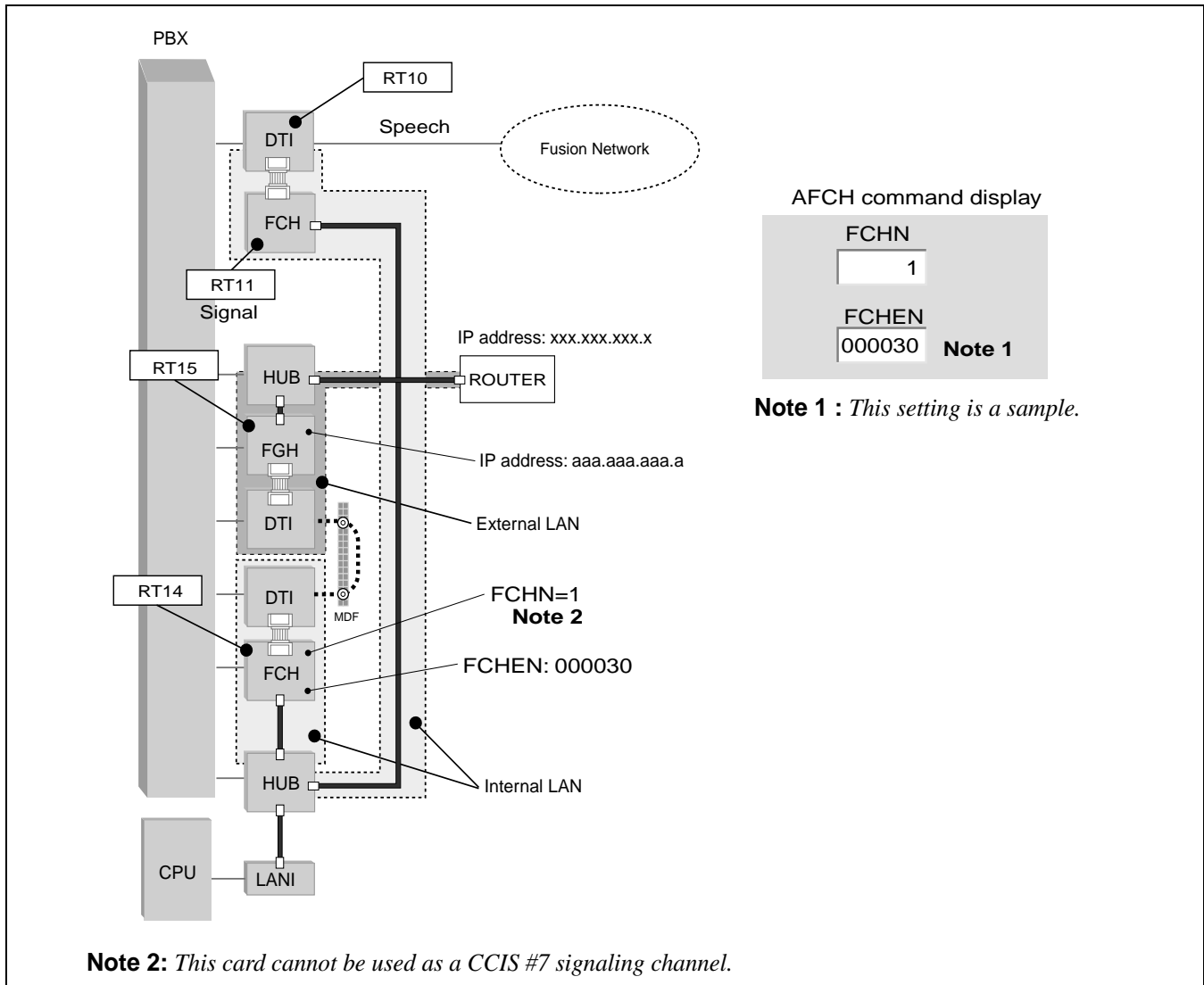


Figure 5-43 Assignment of FCHN (Example)

STEP 4: AGIP

Assign IP addresses of FGH card and its connected router.

FCHEN (FCH Equipment Number): Assign LV0 data of FGH LENS.

FGH_IP (FGH IP Address): Assign IP address of the FGH card.

DG_IP (Default Gateway IP address): Assign IP address of the router.

ARP (ARP Frame Type): Assign "2 (=DIX spec.)".

CONTTYP (Voice Channel Control Type): Assign "1 (=Server)".

LINK_NUM (Qsig-Prime Link Number) : Assign the number (1-32) of interfaces for speech (=total DTI card number).

CSLINK_NUM (Client /Server Connection Max. Number): Assign "0".

STEP 5: AFPC

Assign internal LAN routing data.

FPC (Fusion Point Code): Assign FPC number (1-253) of the Destination Node.

FCCH: Assign "1".

C_RT (Connection Router): 1-1023

FCHN/FPCN (FCH/FPC Number): Assign the FCH Number, specified in STEP 3.

USE_GATE: Assign "1 (=Gateway function is used)".

P_ROUTE (Priority Route): 0/1 = FCH/FGH

Example data assignment is shown in [Figure 5-44](#) and [Figure 5-45](#):

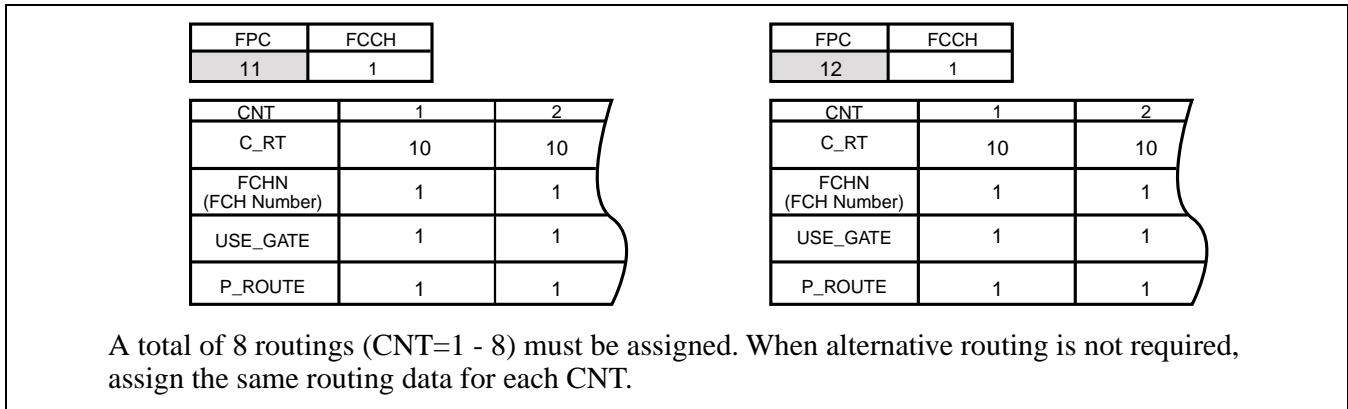


Figure 5-44 Sample Data Assignment (AFPC)

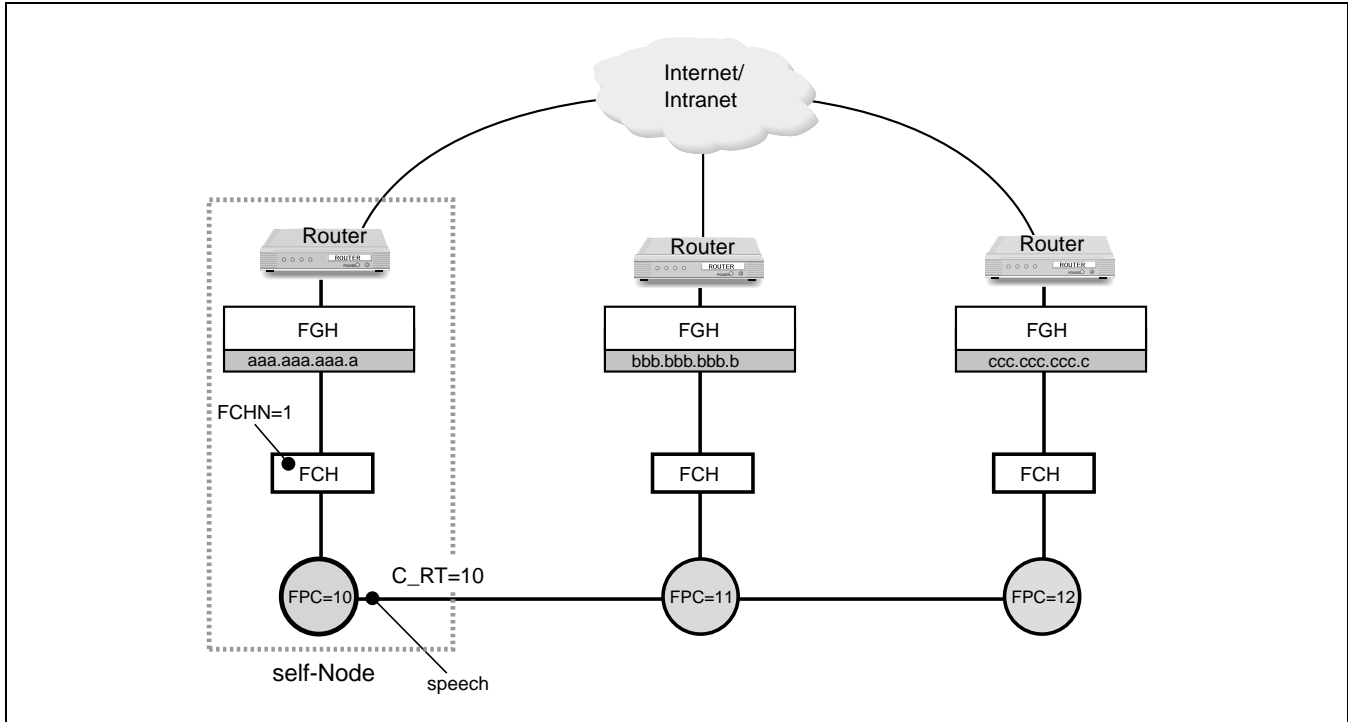


Figure 5-45 Internal LAN Routing Data Assignment Image (Example)

DATA PROGRAMMING

Assignment of FCH Related Data

STEP 6: AETH

Assign the external router routing data.

FPC (Fusion Point Code): Assign FPC number (1-253) of the Destination Node.

USE_GATE: Assign "1 (=use Gateway)".

FCHN (FCH Number): Assign the FCH Number, specified in STEP 3.

C_RT (Connection Route): 1-1023

DST_IP (Destination IP Address): Assign FGH IP address of the Destination Node.

NEXT_IP (Next IP Address): Assign FGH IP address of the Next Node (Node to be passed to).

Example data assignment is shown in [Figure 5-46](#) and [Figure 5-47](#).

FPC	USE_GATE
11	1

CNT	1	2
C_RT	10	
FCHN (FCH Number)	1	
DST_IP	bbb.bbb.bbb.b	
NEXT_IP	bbb.bbb.bbb.b	

FPC	USE_GATE
12	1

CNT	1	2
C_RT	10	
FCHN (FCH Number)	1	
DST_IP	ccc.ccc.ccc.c	
NEXT_IP	bbb.bbb.bbb.b	

A maximum of 8 routings are available.

Figure 5-46 Sample Data Assignment (AETH)

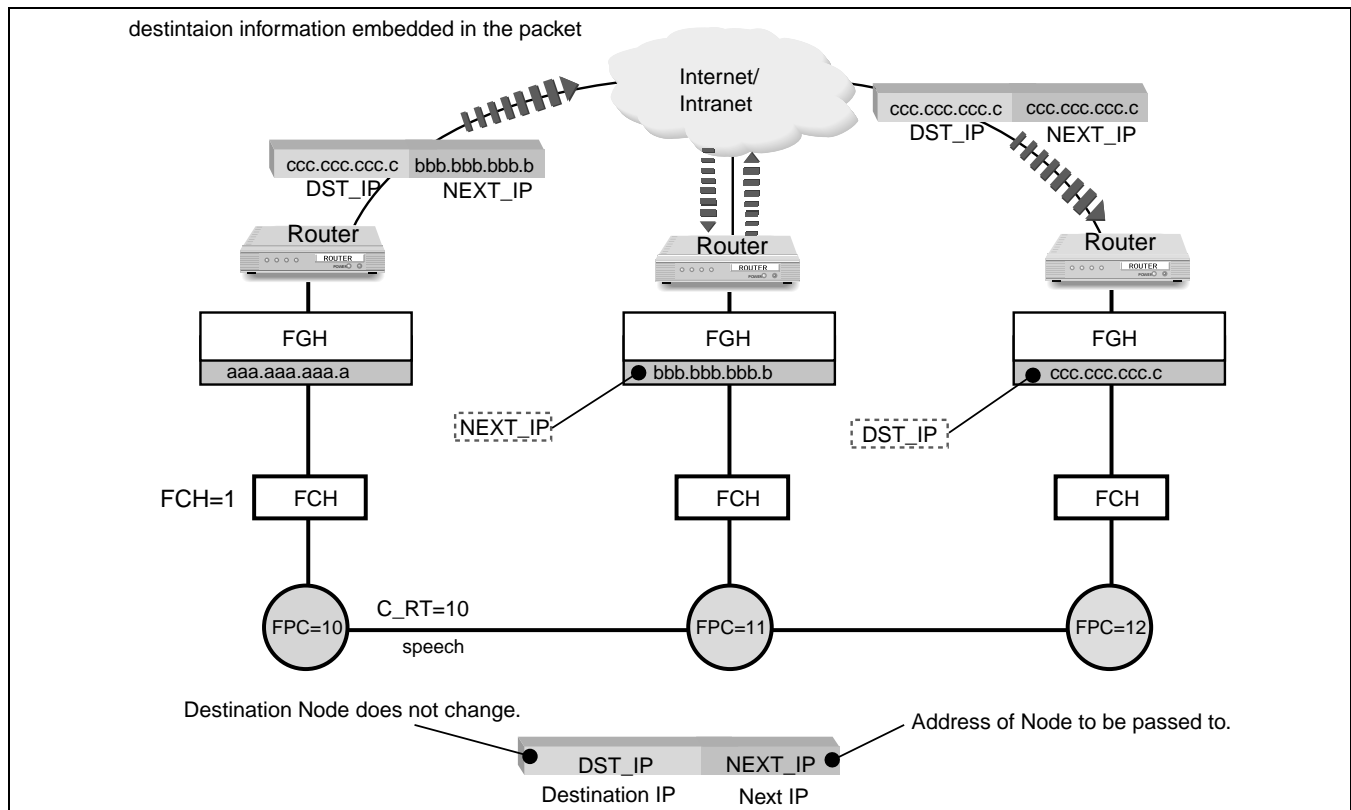


Figure 5-47 How to Assign Destination IP and Next IP

STEP 7: ACAN

Assign the Fusion Connection Index Code (FCIC) for the Next Node.

FPC (Fusion Point Code): Assign FPC number of the Next Node (Node to be passed to).

FCIC (Fusion Connection Index Code): Assign Fusion CIC of the Next Node (Node to be passed to).

C_LENS (Connection_LENS): Assign DTI LENS data (Bch data), specified in STEP 2.

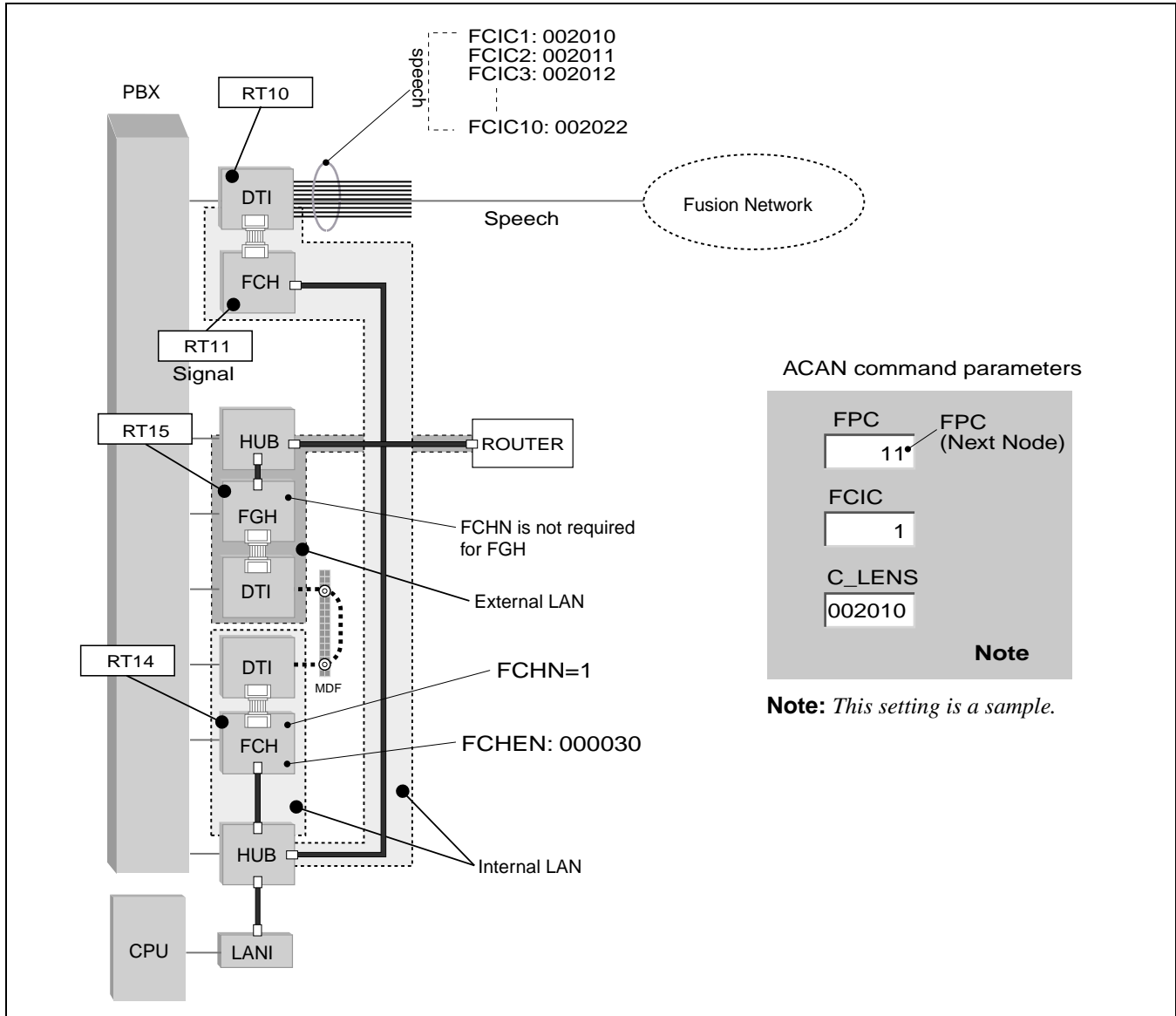


Figure 5-48 Sample Data Assignment (ACAN)

STEP 8: MBCT

Unbusy the connection trunk data assigned in the previous steps, by using the MBCT command, This is required for FCH, FGH trunks as well as speech channels.

DATA PROGRAMMING

Assignment of FCH Related Data

7.3.2 FCCS Networking over IP

This feature allows the system to exchange both speech and FCCS signaling over Internet/Intranet. To establish/release a call, Q-sig is used between the system and the router. H.323 is used as a protocol between routers.

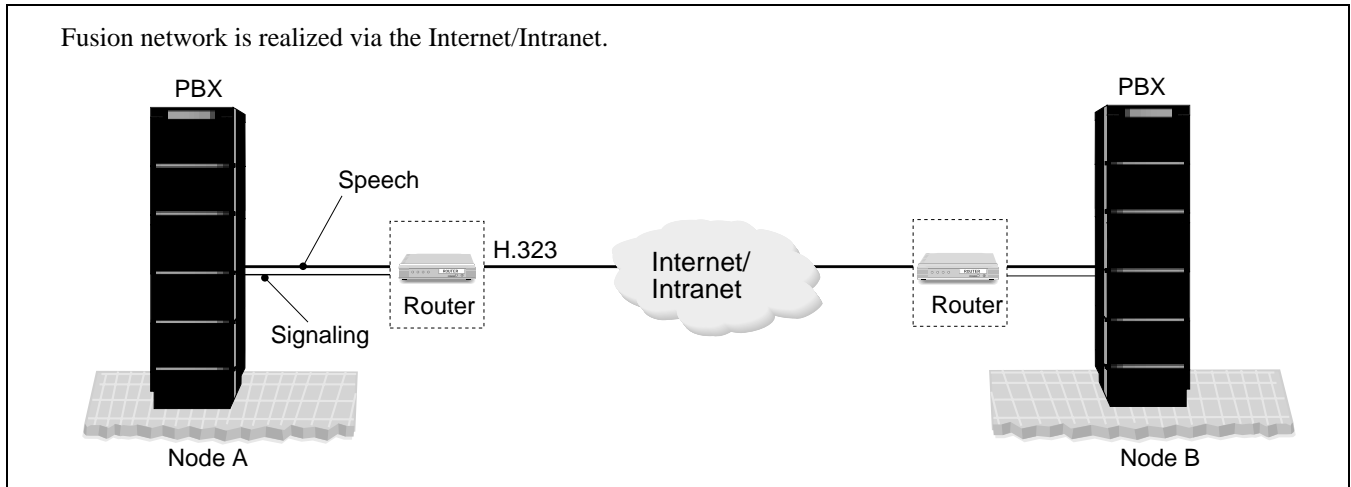


Figure 5-49 FCCS Networking over IP - Overview

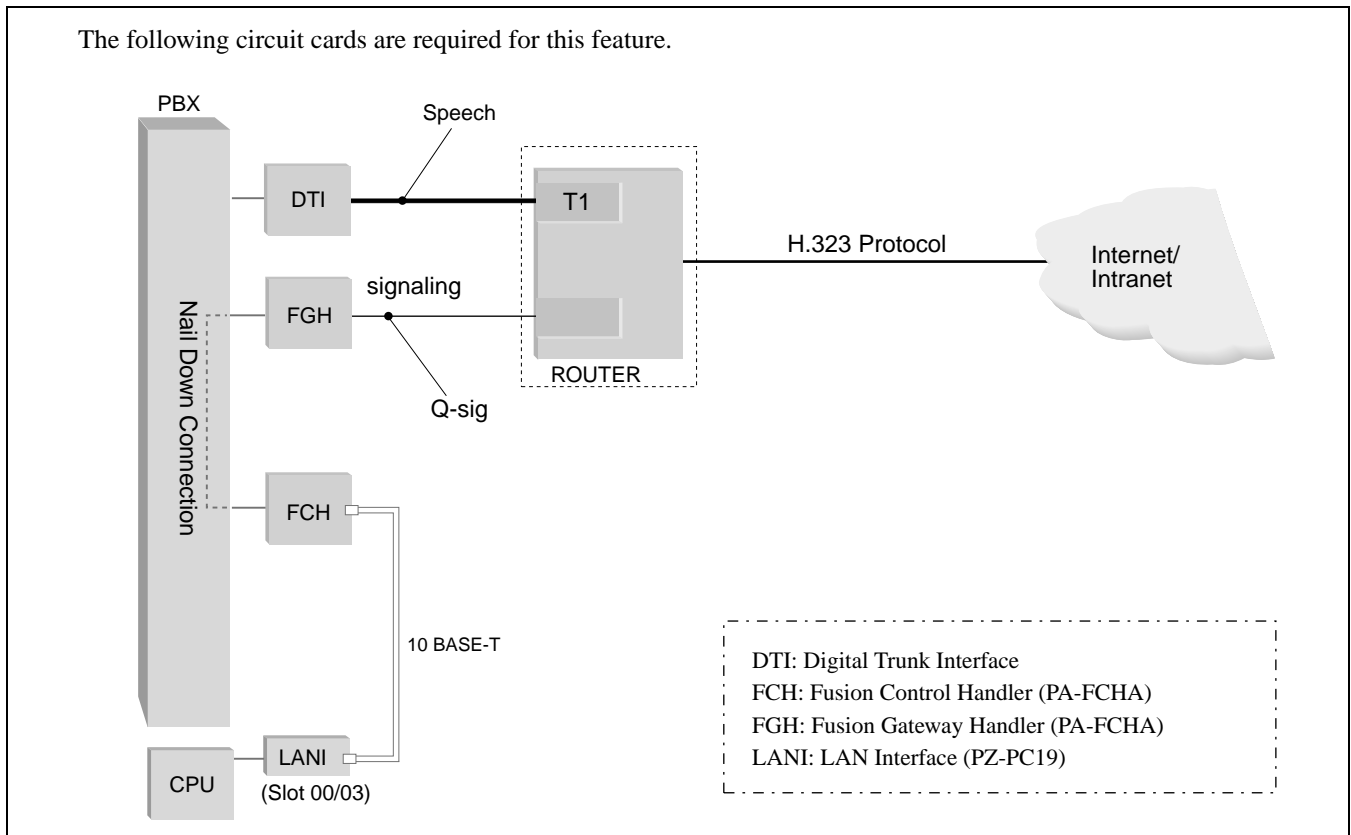


Figure 5-50 Hardware Connections for FCCS Networking over IP

STEP 1: ACRD

Assign Route Class Data of Speech Route, FCH, FGH routes, respectively. A sample data assignment is shown below.

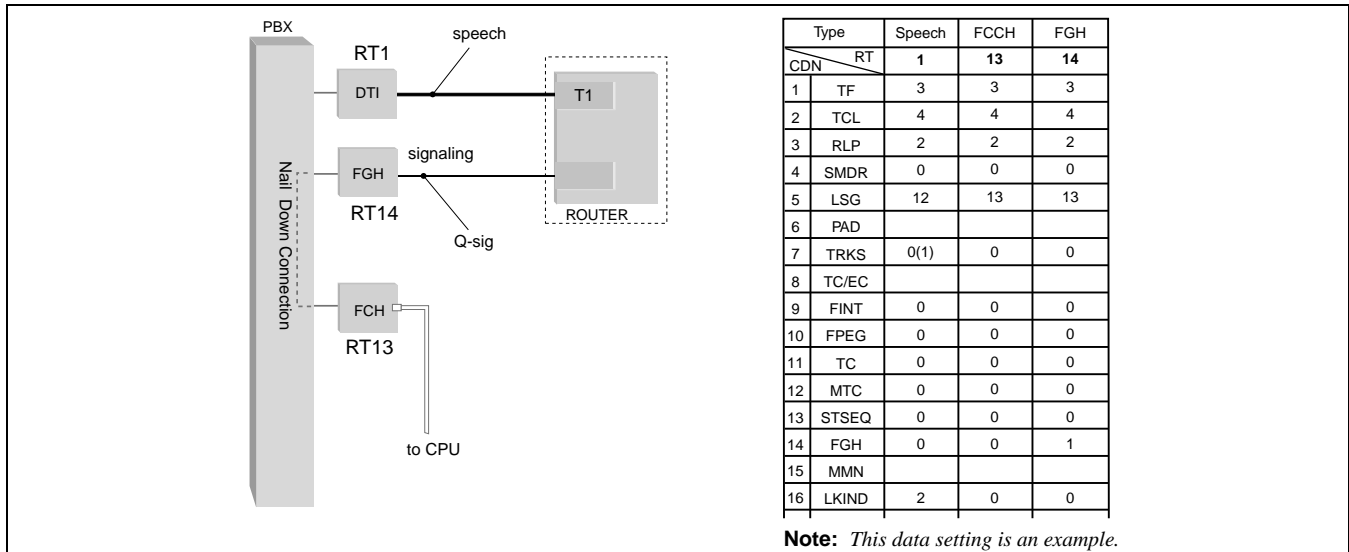


Figure 5-51 Sample Data Assignment (ACRD)

STEP 2: ACTK

Assign the connection trunk data of DTI, FCH, and FGH cards, using the ACTK command. When assigning FCH, FGH trunk data, eight trunks must be set. A sample data assignment of FCH, FGH card is as follows.

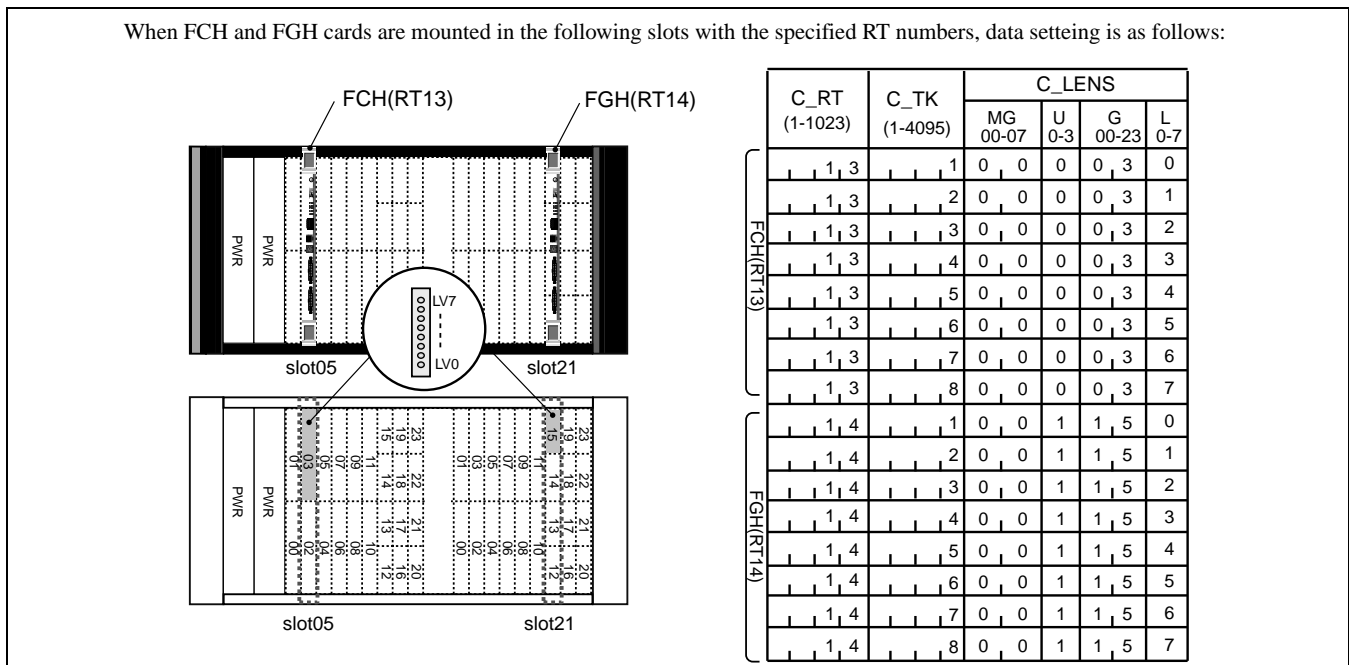


Figure 5-52 Sample Data Assignment (ACTK)

DATA PROGRAMMING

Assignment of FCH Related Data

STEP 3: MBCT

Unbusy the connection trunk data assigned in the previous step, by using the MBCT command. This is required for FCH, FGH trunks as well as speech channels.

STEP 4: AFCH

Assign FCH number on an FCH circuit card basis. In the following example, FCHN=1 is assigned for the FCH circuit card. For the FGH card, FCHN assignment is not necessary.

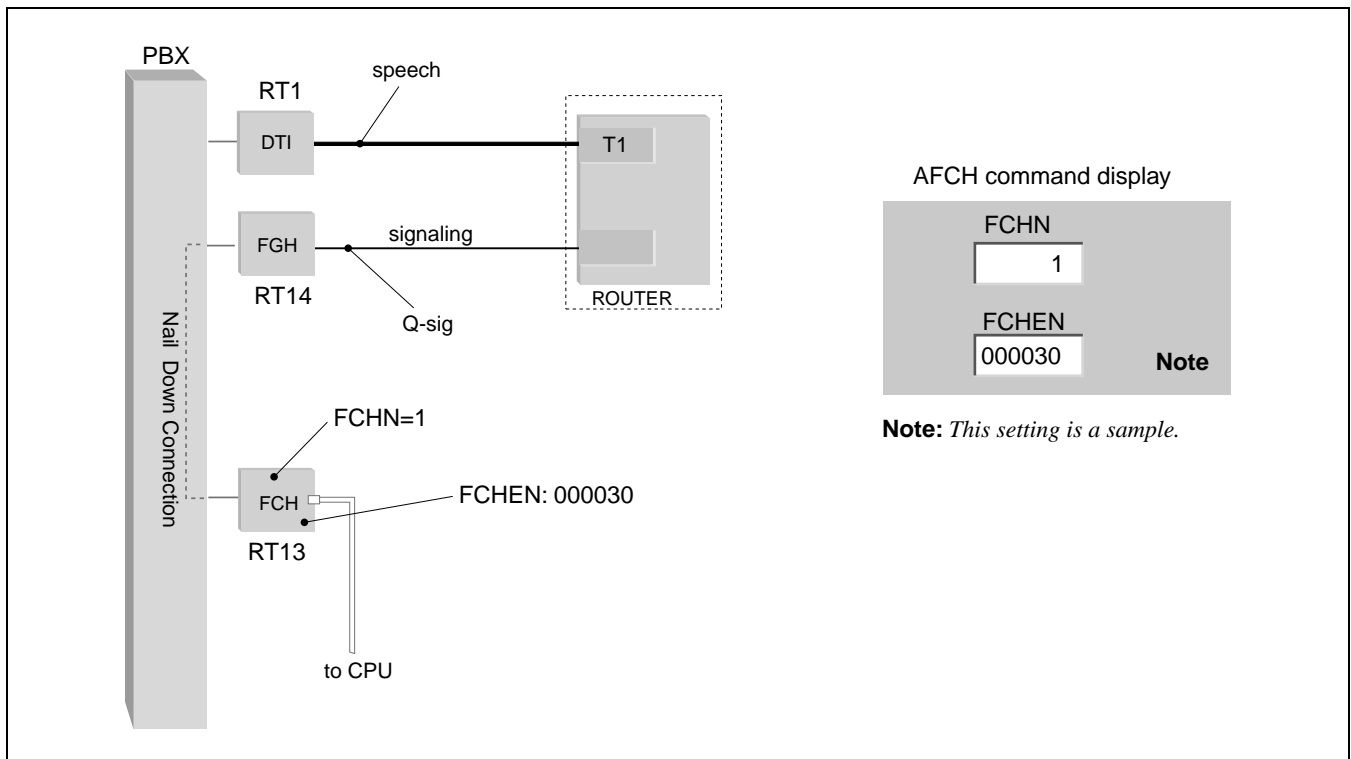


Figure 5-53 Assignment of FCHN (Example)

STEP 5: AETH

Assign the FCCS routing data, when external router is used by specifying IP address.

FPC (Fusion Point Code): Assign FPC number (1 - 253) of the Destination Node.

USE_GATE: Assign "0 (= not use gateway)".

FCHN (FCH Number): Assign the FCH Number, specified in STEP 4.

C_RT (Connection Route): 1 - 1023

DST_IP (Destination IP Address): Assign FGH IP address of the Destination Node.

NEXT_IP (Next IP Address): Assign FGH IP address of the Next Node (Node to be passed to).

Example data assignment is shown in [Figure 5-54](#) and [Figure 5-55](#).

<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th style="width: 50%;">FPC</th><th style="width: 50%;">USE_GATE</th></tr> <tr><td style="text-align: center;">11</td><td style="text-align: center;">0</td></tr> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th style="width: 33%;">CNT</th><th style="width: 33%;">1</th><th style="width: 33%;">2</th></tr> <tr><td>C_RT</td><td style="text-align: center;">1</td><td></td></tr> <tr><td>FCHN (FCH Number)</td><td style="text-align: center;">1</td><td></td></tr> <tr><td>DST_IP</td><td style="text-align: center;">bbb.bbb.bbb.b</td><td></td></tr> <tr><td>NEXT_IP</td><td style="text-align: center;">bbb.bbb.bbb.b</td><td></td></tr> </table>	FPC	USE_GATE	11	0	CNT	1	2	C_RT	1		FCHN (FCH Number)	1		DST_IP	bbb.bbb.bbb.b		NEXT_IP	bbb.bbb.bbb.b		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th style="width: 50%;">FPC</th><th style="width: 50%;">USE_GATE</th></tr> <tr><td style="text-align: center;">12</td><td style="text-align: center;">0</td></tr> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th style="width: 33%;">CNT</th><th style="width: 33%;">1</th><th style="width: 33%;">2</th></tr> <tr><td>C_RT</td><td style="text-align: center;">1</td><td></td></tr> <tr><td>FCHN (FCH Number)</td><td style="text-align: center;">1</td><td></td></tr> <tr><td>DST_IP</td><td style="text-align: center;">ccc.ccc.ccc.c</td><td></td></tr> <tr><td>NEXT_IP</td><td style="text-align: center;">bbb.bbb.bbb.b</td><td></td></tr> </table>	FPC	USE_GATE	12	0	CNT	1	2	C_RT	1		FCHN (FCH Number)	1		DST_IP	ccc.ccc.ccc.c		NEXT_IP	bbb.bbb.bbb.b	
FPC	USE_GATE																																						
11	0																																						
CNT	1	2																																					
C_RT	1																																						
FCHN (FCH Number)	1																																						
DST_IP	bbb.bbb.bbb.b																																						
NEXT_IP	bbb.bbb.bbb.b																																						
FPC	USE_GATE																																						
12	0																																						
CNT	1	2																																					
C_RT	1																																						
FCHN (FCH Number)	1																																						
DST_IP	ccc.ccc.ccc.c																																						
NEXT_IP	bbb.bbb.bbb.b																																						

A maximum of 8 routings are available.

Figure 5-54 Sample Data Assignment (AETH)

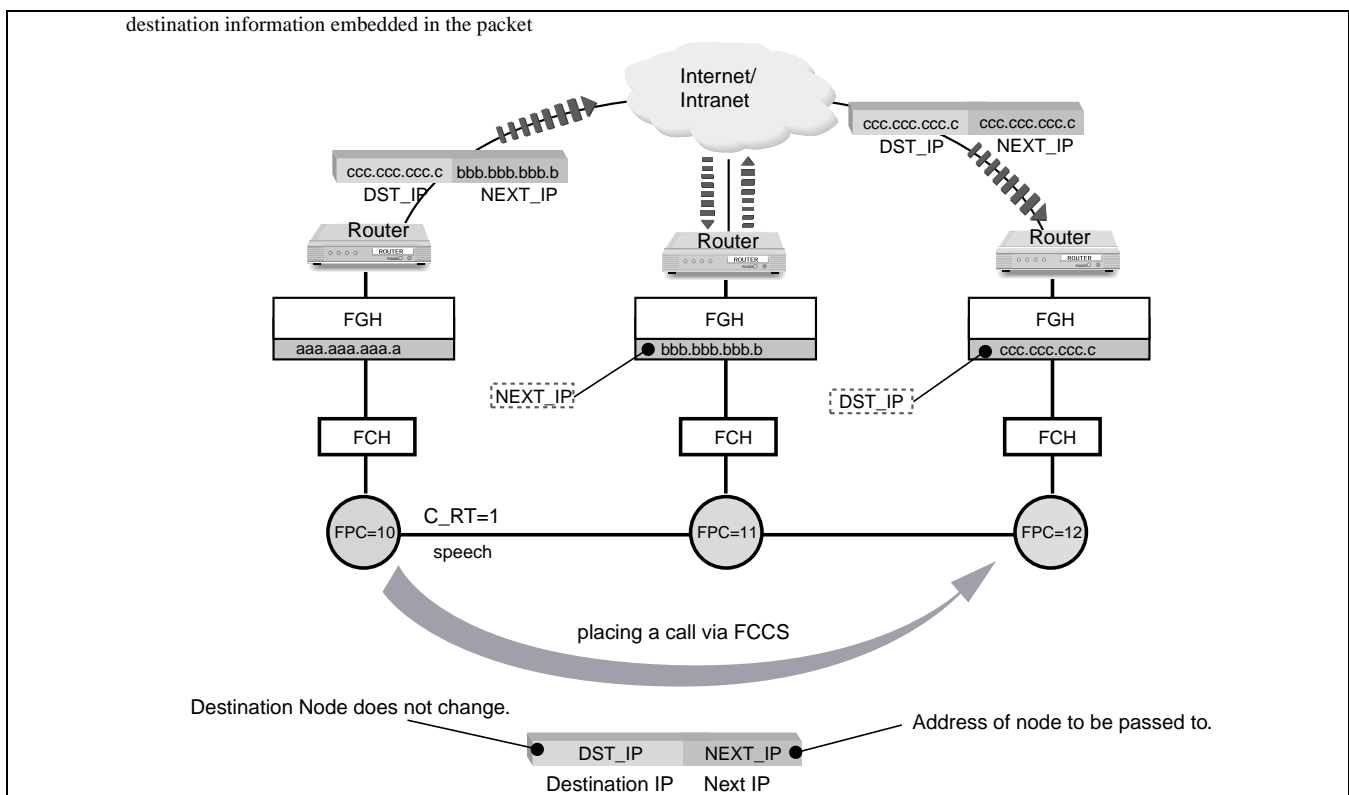


Figure 5-55 How to Assign Destination IP and Next IP

DATA PROGRAMMING

Assignment of FCH Related Data

STEP 6: ACAN

Assign the Fusion Connection Index Code (FCIC) for the Next Node.

FPC (Fusion Point Code): Assign FPC number of the Self-node.

FCIC (Fusion Connection Index Code): Assign Fusion CIC of the Self-node.

C_LENS (Connection_LENS): Assign DTI LENS data (Bch data), specified in STEP 2.

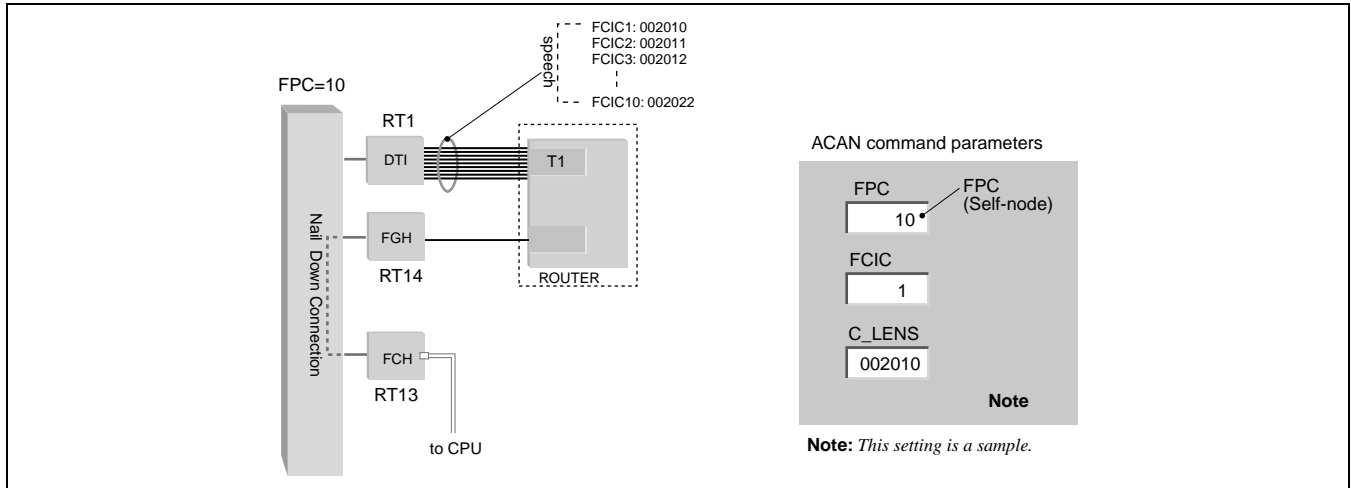


Figure 5-56 Sample Data Assignment (ACAN)

STEP 7: AFRT

Set Connection Route Numbers of the Speech Channels for the FCHN which was assigned in STEP 4.

FCHN (FCH Number): Assign FCHN, specified in STEP 4.

C_RT (Connection Route): Assign Connection Route of the Speech Channels, specified in STEP 2.

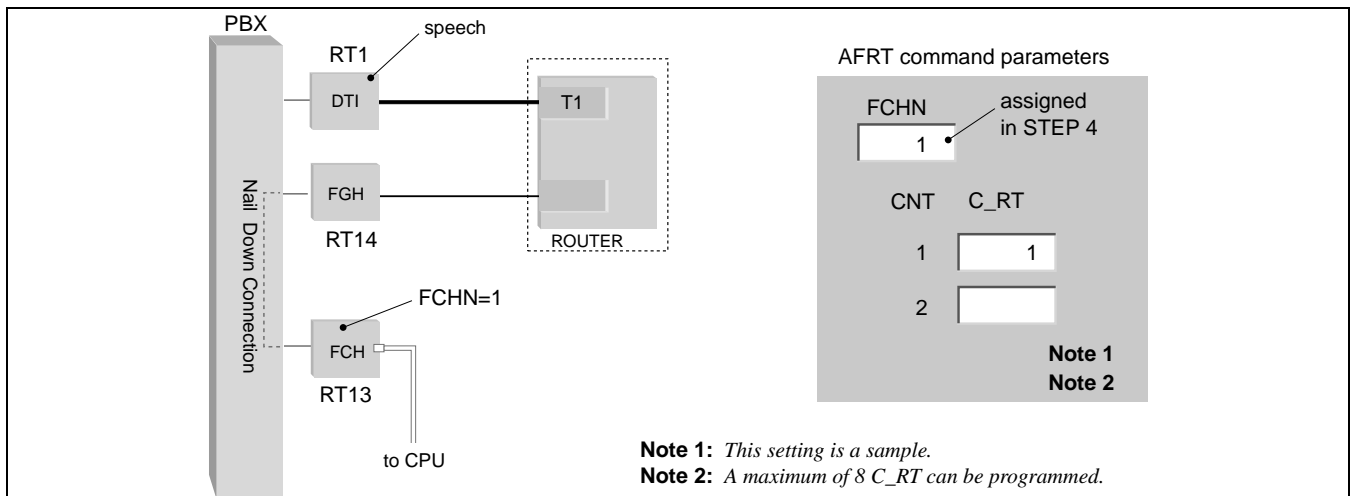


Figure 5-57 Sample Data Assignment (AFRT)

STEP 8: AGIP

Assign IP addresses of FGH card and its connected router.

FCHEN (FCH Equipment Number): Assign LV0 data of FGH LENS.

FGH_IP (FGH IP Address): Assign IP address of the FGH card.

DG_IP (Default Gateway IP Address): Assign IP address of the router.

ARP (ARP Frame Type): Assign "2 (= DIX spec.)".

CONTTYP (Voice Channel Control Type): Assign "1 (= Server)".

LINK_NUM (Qsig-Prime Link Number): Assign the number (1 - 32) of interfaces for speech (= total DTI card number).

CSLINK_NUM (Client/Server Connection Max. Number): Assign "0".

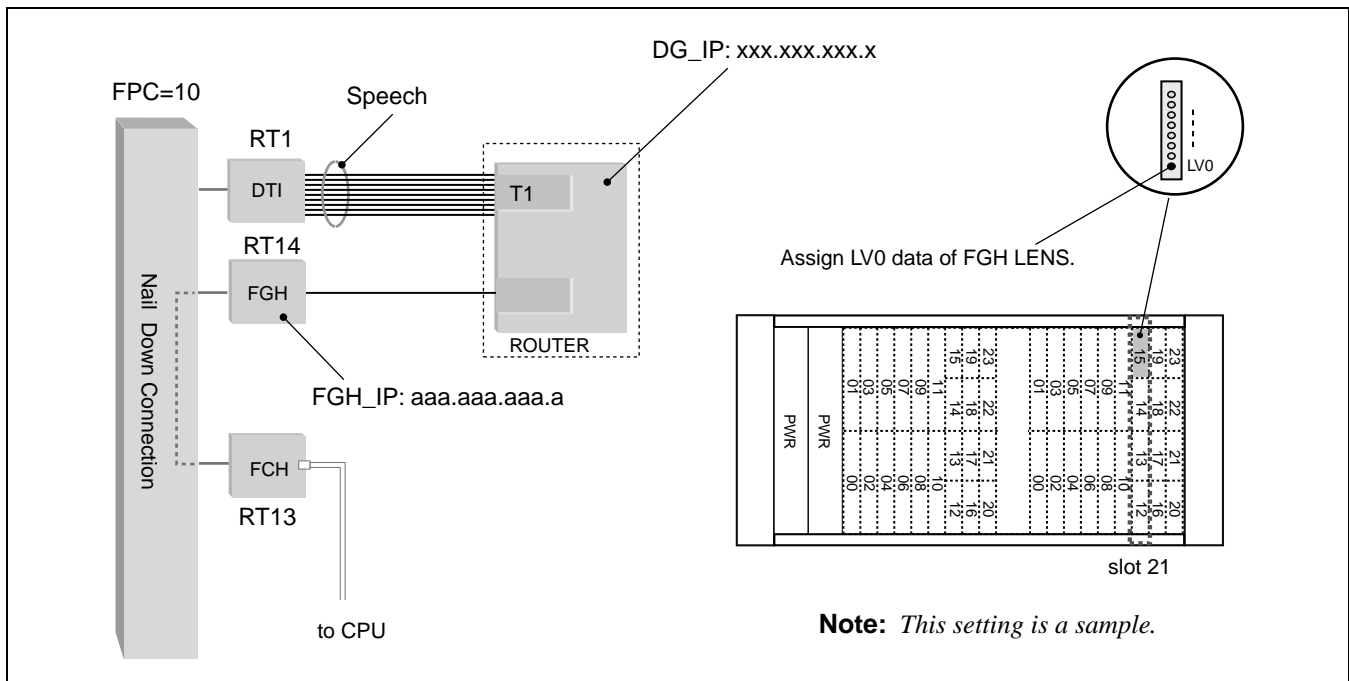


Figure 5-58 Sample Data Assignment (AGIP)

DATA PROGRAMMING

Assignment of FCH Related Data

STEP 9: AFIP

Assign the FCCS Networking over IP data for controlling Speech Channels between PBX and router.

FCHN (FCH Number): Assign FCHN specified in STEP 4.

FGHEN (FGH Equipment Number): Assign LV0 data of FGH LENSs.

LENS (Equipment Number of Qsig-Prime B channel): Assign basic LENS of the Speech Channels.

Note 2

RT-ACC (Router Access Number): Assign the Router Access Number (max. 16 digits).

Note 1: Assign "LENS" and "RT_ACC" corresponding to the router port.

Note 2: Assign the "Basic LENS data" of the Speech Channels (1st LEN of the HW block where the DTI card is mounted).

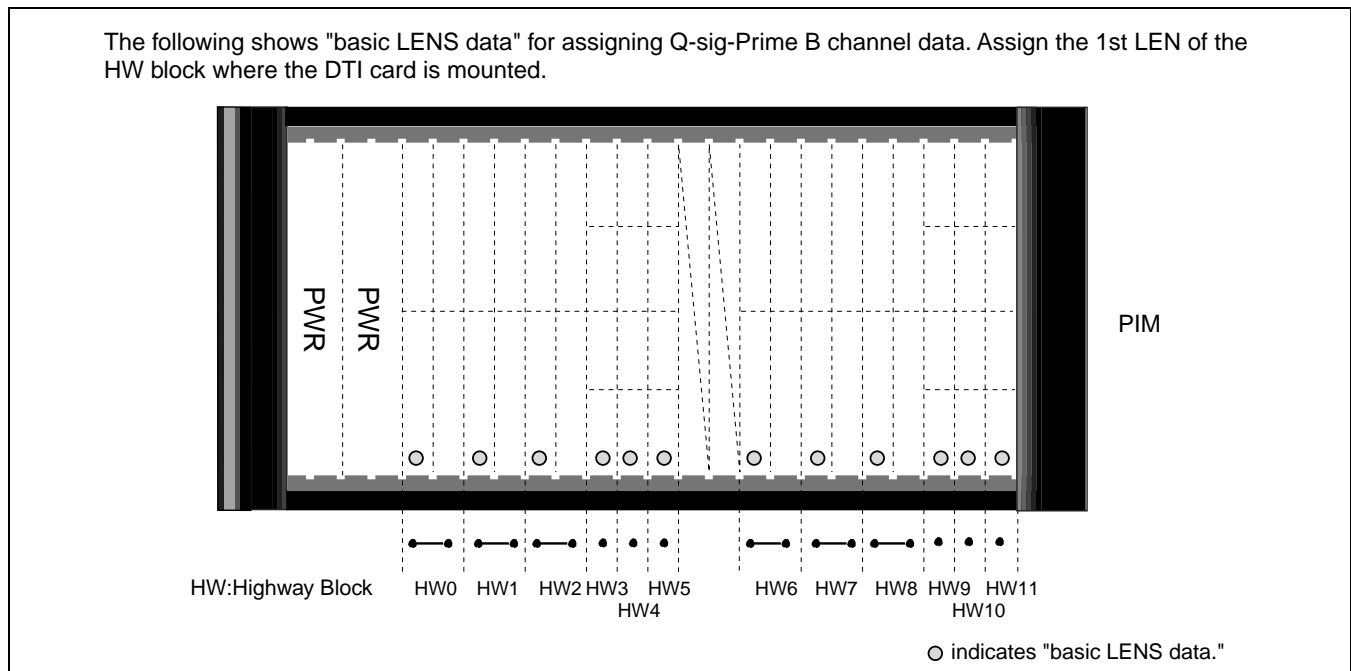


Figure 5-59 "Basic LENS Data" Assignment of Speech Channels (AFIP)

STEP 10: ASYD

Assign the data for nailed-down connection between FCH and FGH cards.

SYS 1, Index 60, b4 = 1 (Nailed-down connection: In service)

STEP 11: AFCD

Assign the detailed nailed-down connection data.

LENS-A: Assign the LENS data of FCH card.

EAD-A: Assign "0".

LENS-B: Assign the LENS data of FGH card.

EAD-B: Assign "0".

Note: Assign all the data for FCH/FGH LENS (LV0-LV7).

7.4 Flexible Routing - FCCS

A Fusion trunk call can be routed via "non-Fusion" trunk (C.O. or Tie Line), if the Fusion trunks are all busy or Data Link Failure occurs at the FCH card, etc. This feature can be used since program software Release 5.

Service Conditions

- This feature may be activated when the Fusion trunks are all busy or FCCS Link Failure (Layer 2 down) occurs at the FCH card.
- This feature is available when the called party is an analog station, D^{term} or ISDN terminal. (When the called party is wireless terminal or DAT/Paging Trunk, the feature is not activated.)
- Use LCR/LCRS for this feature.
- The access code of this feature (ACC: max. 24 digits) is assigned by the AFRFL command.
- When the selected "non-Fusion" trunks (LCR/LCRS) are also busy, route selection is performed according to the LCR/LCRS table. The same is performed when the selection encounters a Fusion trunk "busy" again.

STEP 1: Basic Data

Make sure that the following data has been already assigned for the Fusion network.

Flexible Route Numbering Plan Data (LCR/LCRS data)
Station-to-Station connection data

STEP 2: AFRFL

Assign Flexible Route data (tenant number, destination node FPC and feature access code) by the AFRFL command.

TN: Tenant Number of the Calling Party

FPC: Fusion Point Code of the destination node

ACC: Access Code for Flexible Routing (to C.O. or Tie Line), the same number assigned by ASPA command for LCR/LCRS

8. Office Data Sheets

8.1 Data Sheet for AFMUPL

FUSION POINT CODE (FPC) 1-253	MODULE GROUP (MG) 0/1	UNIT 0-3	REMARKS	
	0	0		
		1		
	1			
	0	0		
		1		
	1			
	0	0		
		1		
	1			
	0	0		
		1		
	1			

DATA PROGRAMMING
Office Data Sheets

8.3 Data Sheet for ANPD/ANPDL/ANDPN

TENANT NUMBER (TN)	1ST DIGIT (1ST DC)	CONNECTION STATUS INDEX (CI)	BUSY LAMP FIELD (BLF)

8.4 Data Sheet for ASPA/ASPAL

TENANT NUMBER (TN)	ACCESS CODE (ACC) MAX. 6 DIGITS	CONNECTION STATUS INDEX (CI) 1/2		KIND OF SERVICE (SRV)	ANNOUNCEMENT TENANT NUMBER (TN) 1-125	ANNOUNCEMENT EQUIPMENT NUMBER (EQP) 122-125	REMARKS	
		N	Normal	10				
		H	Hooking					
			N	Normal	10			
			H	Hooking				
			N	Normal	10			
			H	Hooking				
			N	Normal	10			
			H	Hooking				
			N	Normal	10			
			H	Hooking				
			N	Normal	10			
			H	Hooking				
			N	Normal	10			
			H	Hooking				
			N	Normal	10			
			H	Hooking				
			N	Normal	10			
			H	Hooking				
			N	Normal	10			
			H	Hooking				
			N	Normal	10			
			H	Hooking				
			N	Normal	10			
			H	Hooking				
		N	Normal	10				
		H	Hooking					
		N	Normal	10				
		H	Hooking					
		N	Normal	10				
		H	Hooking					
		N	Normal	10				
		H	Hooking					
		N	Normal	10				
		H	Hooking					
		N	Normal	10				
		H	Hooking					

8.9 Data Sheet for ACRD

CDN	CONNECTION RT No. (C_RT) 1-1023						
	FUNCTION (FUNC)						
1	TF - Type of Trunk 0-2 = - 3 = Bothway Trunk (BWT)	3	3	3	3	3	3
2	TCL - Trunk Class (Fixed "4") 0-3 = - 4 = Fusion Trunk 5-31 = -	4	4	4	4	4	4
3	RLP - Trunk Release Pattern (Fixed "2") 0-1 = - 2 = First party Release 3 = -	2	2	2	2	2	2
4	SMDR - Detailed Billing Information (Fixed "0") 0 = SMDR is out of service 1 = SMDR is in service	0	0	0	0	0	0
5	LSG - Line Signal 0-11 = - 12 = B-channel 13 = D-channel 14, 15 = -						
6	PAD - PAD control (Fixed "7") 0=0dB (Default) 1 = Send 8dB, Receive 0dB 2 = Send 4dB, Receive 4dB 3 = Send 8dB, Receive 12dB 4 = Send 8dB, Receive 8dB 5 - 6 = - 7 = 0dB	0	0	0	0	0	0
7	TRKS - Trunk Selection Sequence 0 = LIFO 1 = FIFO	0	0	0	0	0	0
8	TC/EC (Fixed "0") 0 = No MPC/EC 1 = EC 2 = MPC 3 = Not used	0	0	0	0	0	0
9	FINT - Fusion Interface Specification 0 = Fusion standard 1-15 = -	0	0	0	0	0	0

CDN	CONNECTION RT No. (C_RT) 1-1023						
	FUNCTION (FUNC)						
10	FPEG - Fusion-PEG (Fixed "0") 0 = Nothing of FUSION-PEG 1 = Exist of FUSION-PEG	0	0	0	0	0	0
11	TC - Timer Class (Fixed "0") 1 = 1 sec. 2 = 2 sec. 3 = 8 sec. 4 = 30 sec.	0	0	0	0	0	0
12	MTC - Miscellaneous Timer Counter (Fixed "0") Timer value = (TC) × (MTC)	0	0	0	0	0	0
13	STSEQ - Status ENQ (Fixed "0") Fusion link status check 0 = Available 1 = Unavailable	0	0	0	0	0	0
14	FGH - Fusion Gateway Handler (Fixed "0")	0	0	0	0	0	0
15	MMN - Kind of Multiple Equipment 0 = TDM 1 = MM - Node 2 - 3 = -	0	0	0	0	0	0

8.11 Data Sheet for AFCH

FCCH NUMBER (FCHN) 1-255	LENS OF FCCH (FCHEN)				REMARKS
	MG	U	G	L	
1				0	
2				0	
3				0	
4				0	
5				0	
6				0	
7				0	
8				0	
9				0	
10				0	
11				0	
12				0	
13				0	
14				0	
15				0	
16				0	
17				0	
18				0	
19				0	
20				0	
21				0	
22				0	
23				0	
24				0	
25				0	
26				0	
27				0	
28				0	
29				0	
30				0	
31				0	
32				0	
33				0	

DATA PROGRAMMING

Office Data Sheets

FCCH NUMBER (FCHN) 1-255	LENS OF FCCH (FCHEN)				REMARKS
	MG	U	G	L	
34				0	
35				0	
36				0	
37				0	
38				0	
39				0	
40				0	
41				0	
42				0	
43				0	

8.12 Data Sheet for AFPC

FUSION POINT CODE (FPC) 1-253	FCCH USE OR NOT USE (FCCH) 0/1								
		1	2	3	4	5	6	7	8
CONNECTION ROUTE (C_RT) 1-1023									
FCCH NUMBER/FUSION POINT CODE NUMBER (FCHN/FPCN) 1-255/1-253									
FUSION POINT CODE (FPC) 1-253	FCCH USE OR NOT USE (FCCH) 0/1								
		1	2	3	4	5	6	7	8
CONNECTION ROUTE (C_RT) 1-1023									
FCCH NUMBER/FUSION POINT CODE NUMBER (FCHN/FPCN) 1-255/1-253									
FUSION POINT CODE (FPC) 1-253	FCCH USE OR NOT USE (FCCH) 0/1								
		1	2	3	4	5	6	7	8
CONNECTION ROUTE (C_RT) 1-1023									
FCCH NUMBER/FUSION POINT CODE NUMBER (FCHN/FPCN) 1-255/1-253									

DATA PROGRAMMING

Office Data Sheets

FUSION POINT CODE (FPC) 1-253	FCCH USE OR NOT USE (FCCH) 0/1								
		1	2	3	4	5	6	7	8
CONNECTION ROUTE (C_RT) 1-1023									
FCCH NUMBER/FUSION POINT CODE NUMBER (FCHN/FPCN) 1-255/1-253									

CHAPTER 6 POST INSTALLATION TEST

This chapter covers how to perform installation tests focusing on the Fusion Call Control Signal (denoted in the remainder of this manual as FCCS) connections, after hardware installation and data assignment. This chapter describes the following tests:

- How to Check Fusion Link by LEDs on an FCH Card
- Repair Procedure When LED Indicates Abnormality
- FCCS Network Connection Test
- FCCS Alternate Routing Test
- Fusion and Non-Fusion Connection Test

At the end of this chapter, the Fusion Link Test Sheet is attached. Make photo-copies of the sheet to record the test results.

In this chapter, explanations are given using the following network numbering as an example.

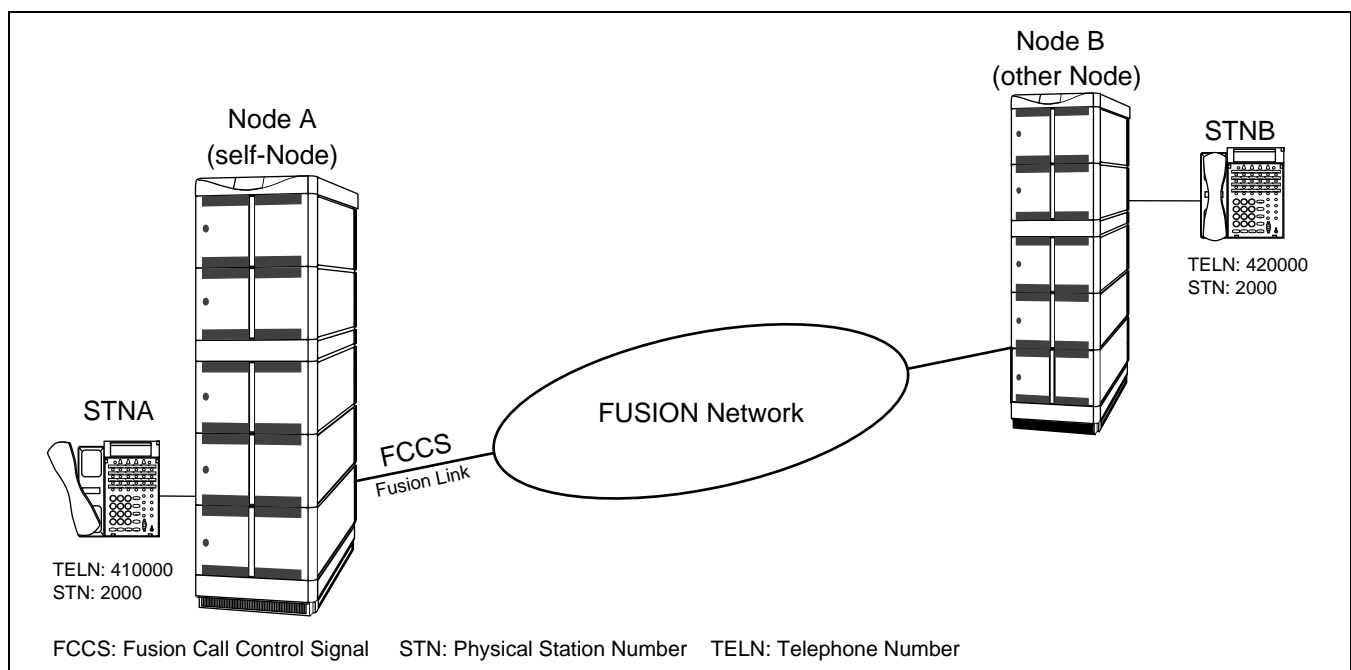


Figure 6-1 Fusion Network

Note: *The Individual Trunk Access feature is not available for Fusion Trunks. To seize a specific Fusion Trunk, use the MBCT command to make busy trunks which are not being tested. This command leaves the Fusion trunk to be tested in an idle state.*

1. How to Check Fusion Link by LEDs on FCH Card

Before performing the Fusion link test, be sure to check the Fusion Link LEDs. Refer to [Figure 6-2](#). When the Fusion link is established, the LYR lamp lights green on the FCH (PA-FCHA) circuit card. However, if it remains off, the layer 2 (Link Layer) is not established. If this is the case, follow the repair procedure listed here.

POST INSTALLATION TEST

Repair Procedure When LED Indicates Abnormality

1.1 How to check LYR LED

1. Confirm the LYR LED lights green on the front edge of the FCH (PA-FCHA) circuit card. (See "LED Indication (A)" in Figure 6-2.) When the LED lights green, the fusion link is established.
2. Make sure that any alarm LED is not ON (red/yellow). (See LED Indication (B) in Figure 6-2.)

When all alarm LEDs are OFF, the DTI (PA-24DTR) card is in normal operation.

If any abnormal state is detected, please see the NEAX2400 IMX Circuit Card Manual.

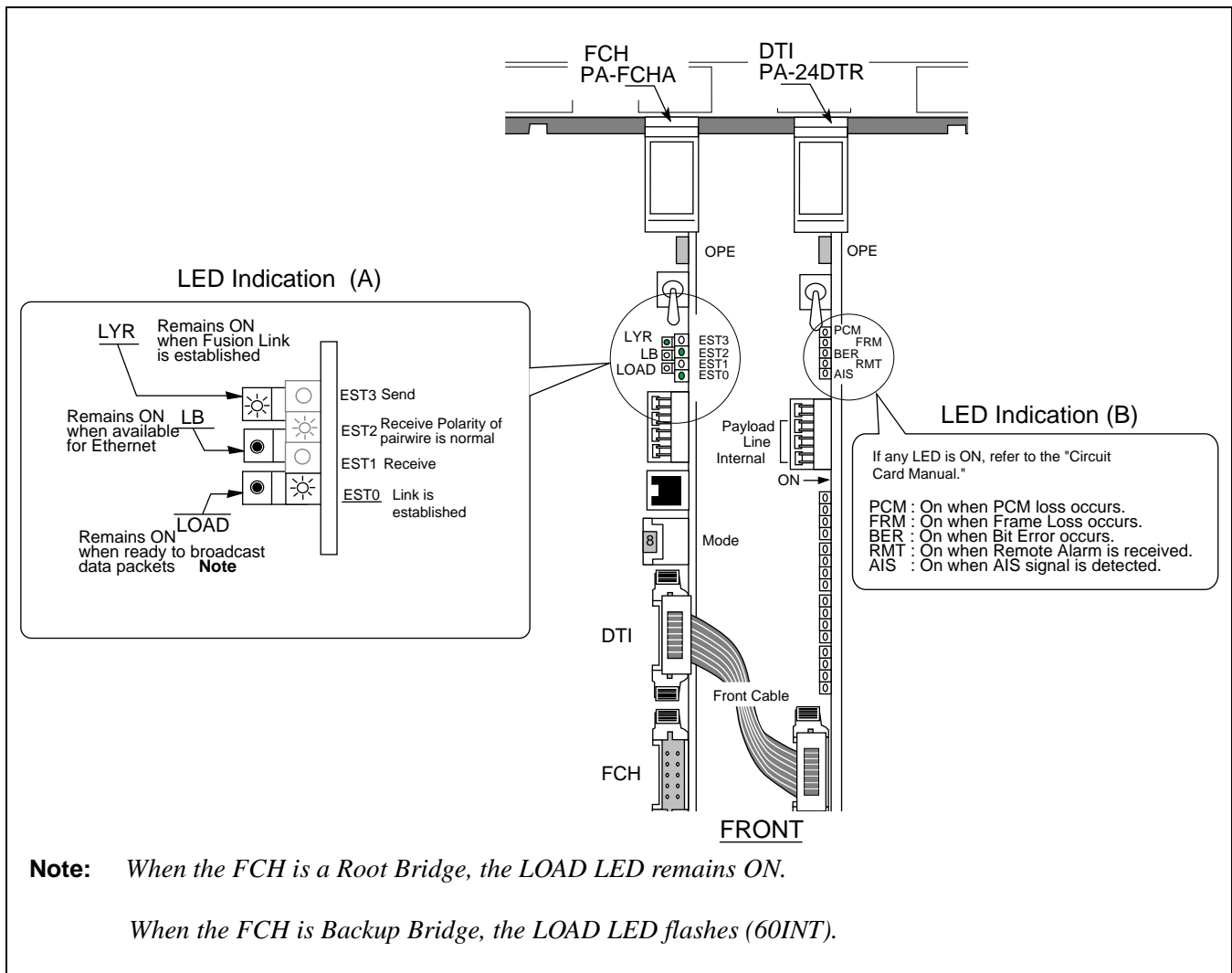


Figure 6-2 LED Indications on Fusion Link Related Circuit Cards

2. Repair Procedure When LED Indicates Abnormality

If the LED indication appears abnormal, check the following items again:

2.1 Front Cable

Make sure that front cable 10AL (10) FLT CA is securely inserted into the connectors.

- FCH (PA-FCHA) switch setting

Make sure that the following keys are set properly:

- Dch TS designation (0ch - 23ch: SW11, SW12, SW13)
- Data Link Signal Logic (positive/negative: SW14-1)
- Fusion Data Link Speed (48/56/64 kbps: SW14-2, 3)
- LAPD Signal Link (user/network: SW14-4)

- 24DTI (PA-24DTR) switch setting

Make sure that the keys are properly set on the card. See the NEAX2400 IMX Circuit Card Manual.

If the Fusion link is not established using this repair procedure, perform the Fusion Link Test.

2.2 How to Perform the Fusion Link Test

2.2.1 Fusion Link Test Mode Setting

To set the FCH card in Fusion Link Test Mode, set the Mode Switch to 9. Initialize the FCH card using the MB key. When the Mode is 9, the Fusion Link Controller on the FCH card sends a test data pattern. When the same pattern is received again the PM activates the LYR LED, flashing the LED at 60-INT, which means the test result is OK.

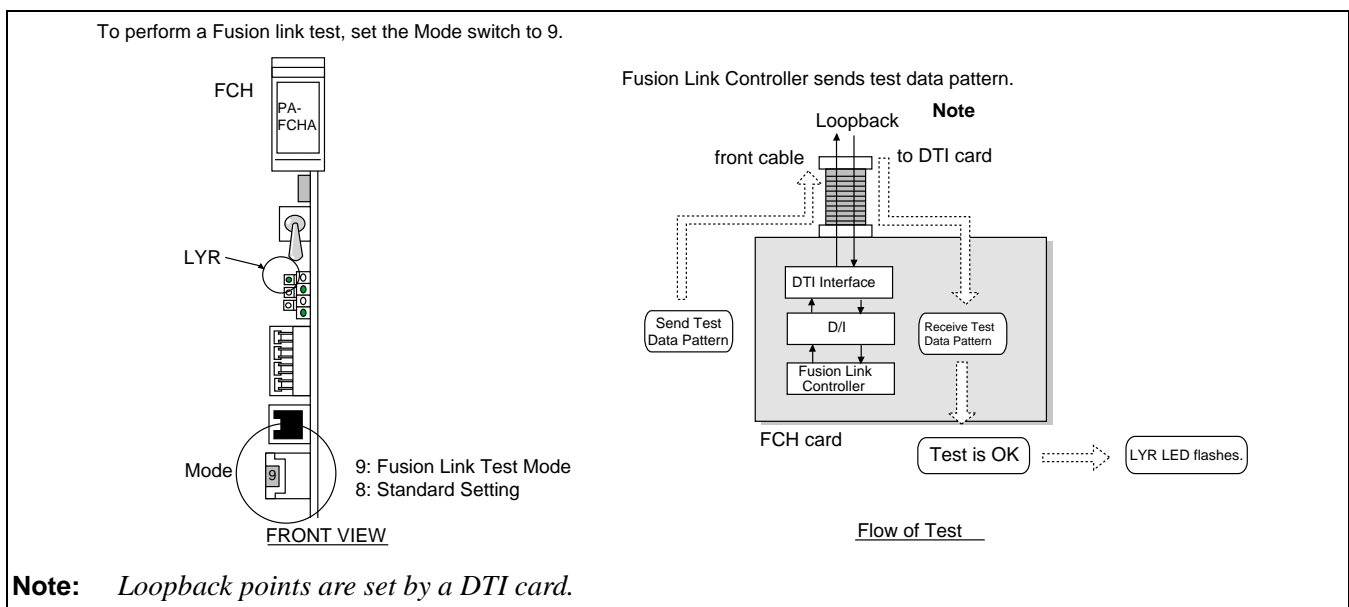


Figure 6-3 Fusion Link Test Mode

Note: Be sure to initialize the FCH (PA-FCHA) card, after changing the setting of the Mode Switch.

2.2.2 Loopback Point Designation

The DTI card can be set at one of the following loopback points:

1. Internal Loopback

POST INSTALLATION TEST

Repair Procedure When LED Indicates Abnormality

All 24 B-channels sent from the TSW are looped back to the TSW at Interface on the card. At this time, the adjacent node detects AIS signals. (See ① in the figure below.)

2. Line Loopback

All 24 B-channels sent from the line are looped back to the line at Line Interface on the card. (See ② in the figure below.)

3. Payload Loopback

All 24 B-channels sent from the line are looped back to the line at Speech Path Control Block on the card. (See ③ in the figure below.)

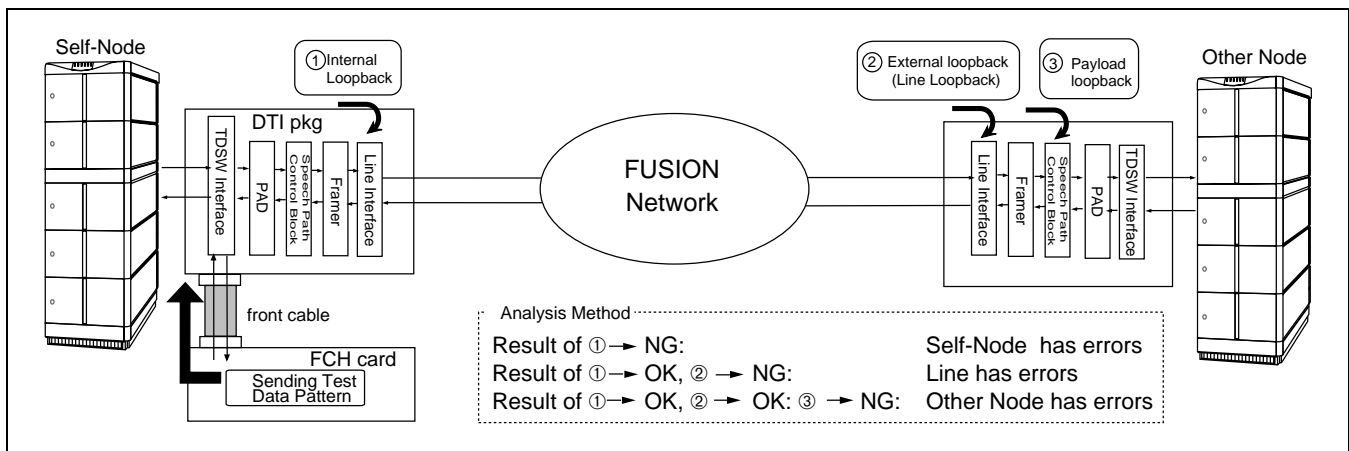


Figure 6-4 Loopback Points of DTI Card

2.3 Test Procedure

STEP 1: Set the MODE switch to 9 (Fusion Link Test) from 8 (standard setting) on the FCH card and initialize the circuit card by turning the MB switch ON→OFF

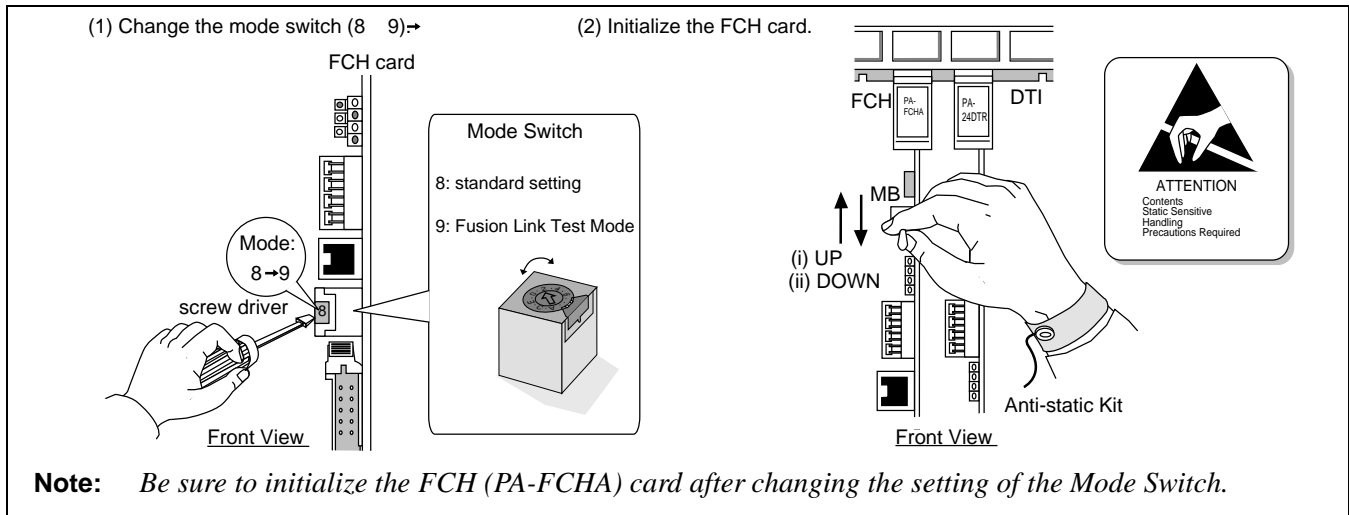


Figure 6-5 How to Set the Fusion Link Test Mode

STEP 2: Select an appropriate loopback point by setting the switch (SW01/SW13B).

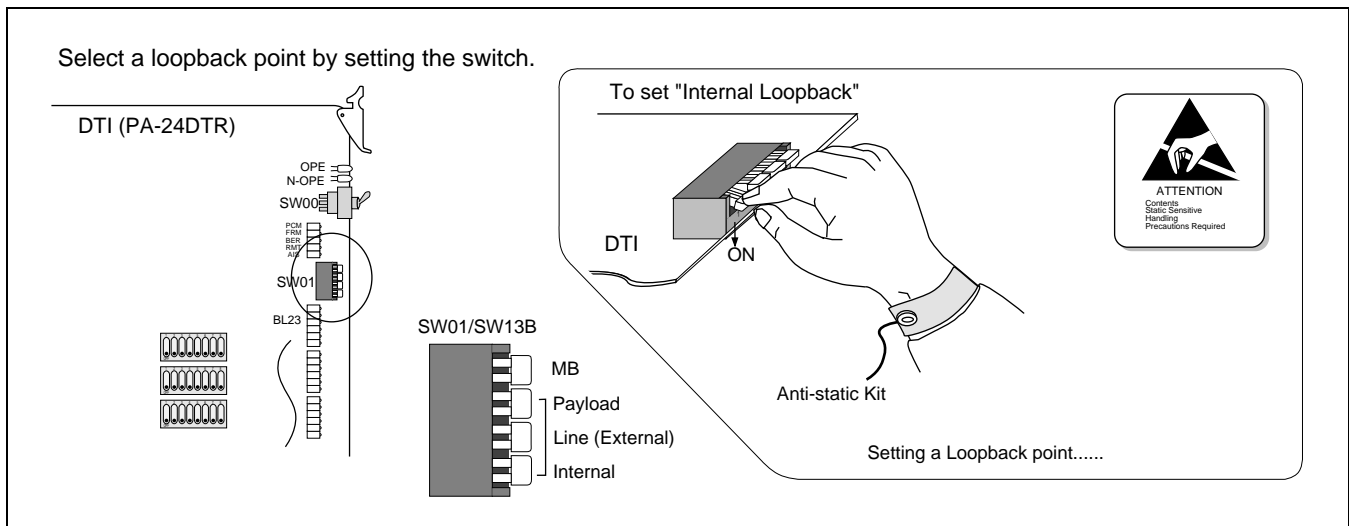


Figure 6-6 Loopback Point Designation

STEP 3: When the LYR LED flashes at 60-INT, the loopback in the block specified in Step 2 is OK.

POST INSTALLATION TEST
FCCS Network Connection Test

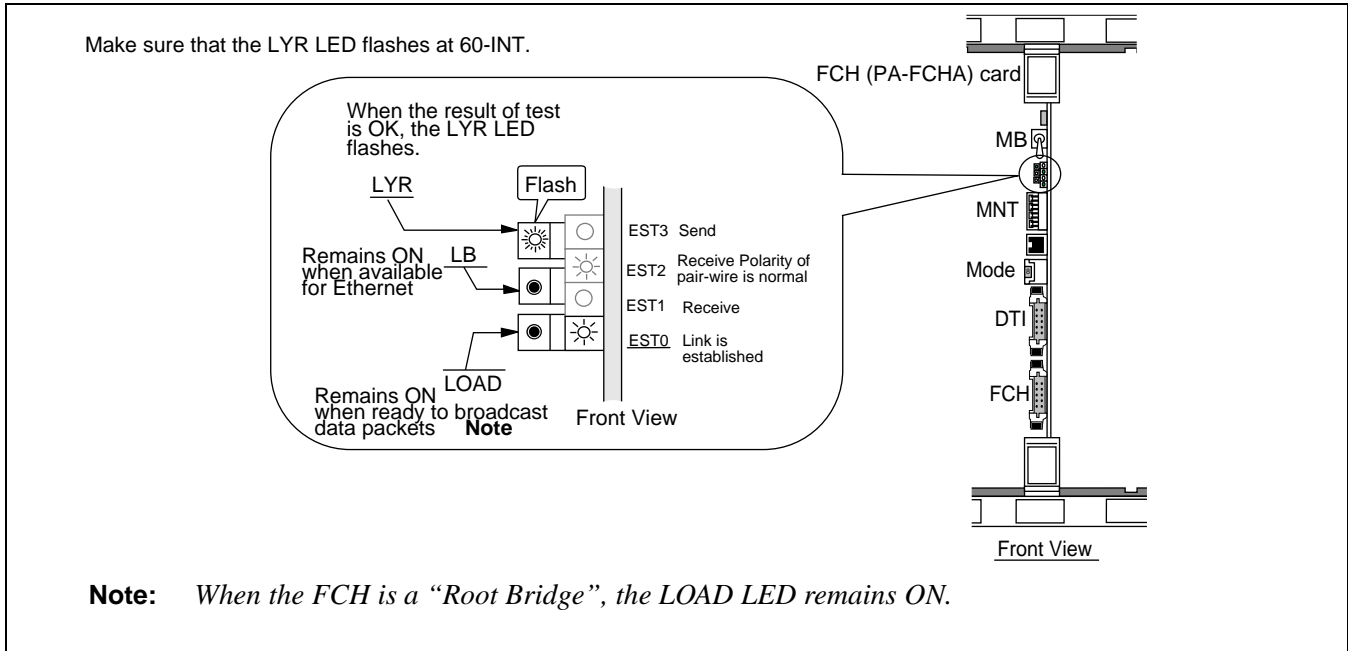


Figure 6-7 Fusion Link-Test Results

STEP 4: Return Mode to 8 (standard setting) when the test is complete.

STEP 5: Initialize the FCH (PA-FCHA) card using the MB switch.

Note: Be sure to initialize the FCH (PA-FCHA) card, after changing the setting of the Mode Switch.

3. FCCS Network Connection Test

This section explains how to perform the following connection tests within the Fusion network:

- Station-to-Station Connection Test (via FCCS)
- ATTCON Connection Test (via FCCS)
- Line (LC, ELC, DLC card) Connection Test (via FCCS)
- 3-party Conference Trunk Function Test (via FCCS)

3.1 Station-to-Station Connection Test (via FCCS)

Perform the station-to-station connection test, following the procedure listed below.

3.1.1 FCCS Call Origination Test

Check

STEP 1: Using the MBCT command, make busy all trunks in the route except the trunk to be tested.

STEP 2: Lift the handset of STN A in Node A.

STEP 3: Dial a Telephone Number (STN B) which belongs to another node.

STEP 4: The call terminates on STN B.

STEP 5: Confirm the speech condition is sufficient (no noise, not one-way speech, etc.).

STEP 6: Replace the handset of STN A.

STEP 7: Repeat the above steps for all Fusion links.

3.1.2 FCCS Call Termination Test

Check

STEP 1: Using the MBCT command, make busy all trunks in the origination route except the trunk to be tested at Node B.

STEP 2: Lift the handset of STN B in Node B.

STEP 3: Dial a Telephone Number (STN A) which belongs to the self-node.

STEP 4: The call terminates on STN A.

STEP 5: Confirm the speech condition is sufficient (no noise, not one-way speech, etc.).

STEP 6: Replace the handset of STN B.

STEP 7: Repeat the above steps for all Fusion links

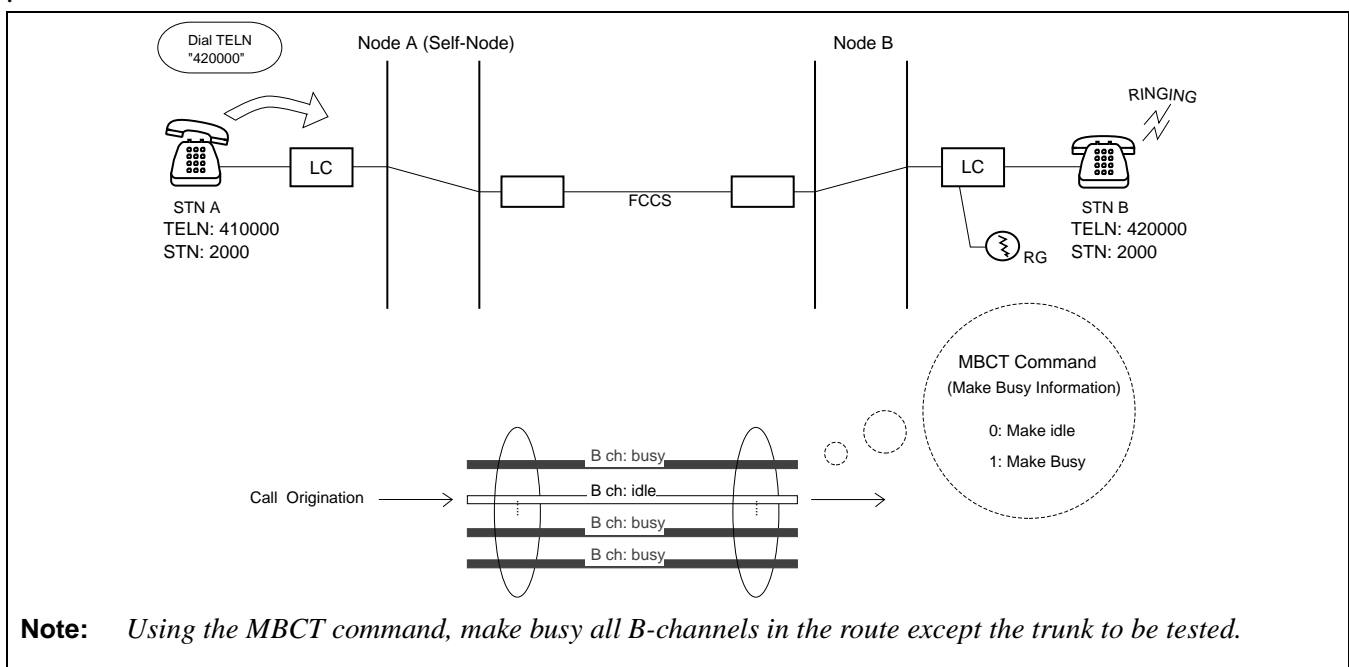


Figure 6-8 Station-to-Station Connection Test (origination) via FCCS

POST INSTALLATION TEST
FCCS Network Connection Test

3.2 ATTCON Connection Test (via FCCS)

Perform the ATTCON connection test, using the following procedure.

3.2.1 ATTCON Call Origination Test

Check

- STEP 1: Dial the operator access code (normally "0"), from STN A in Node A.
- STEP 2: Confirm that the ATT lamp flashes and ringer sounds at each ATTCON in Node B.
- STEP 3: Answer the call by pressing the ATND key.
- STEP 4: Confirm the speech condition is sufficient (no noise, not one-party speech, etc.).
- STEP 5: Release the call by pressing the CANCEL key.
- STEP 6: Replace the handset of STN A in Node A.

3.2.2 ATTCON Call Termination Test

Check

- STEP 1: Press a LOOP key on an ATTCON in Node B.
- STEP 2: Dial the Telephone Number of STN A.
- STEP 3: Confirm the ringer sounds properly at STN A.
- STEP 4: Answer the call and confirm the speech condition is sufficient (no noise, not one-way speech, etc.).
- STEP 5: The operator at the ATTCON releases the call by pressing the CANCEL key.
- STEP 6: Replace the handset of STN A in Node A.

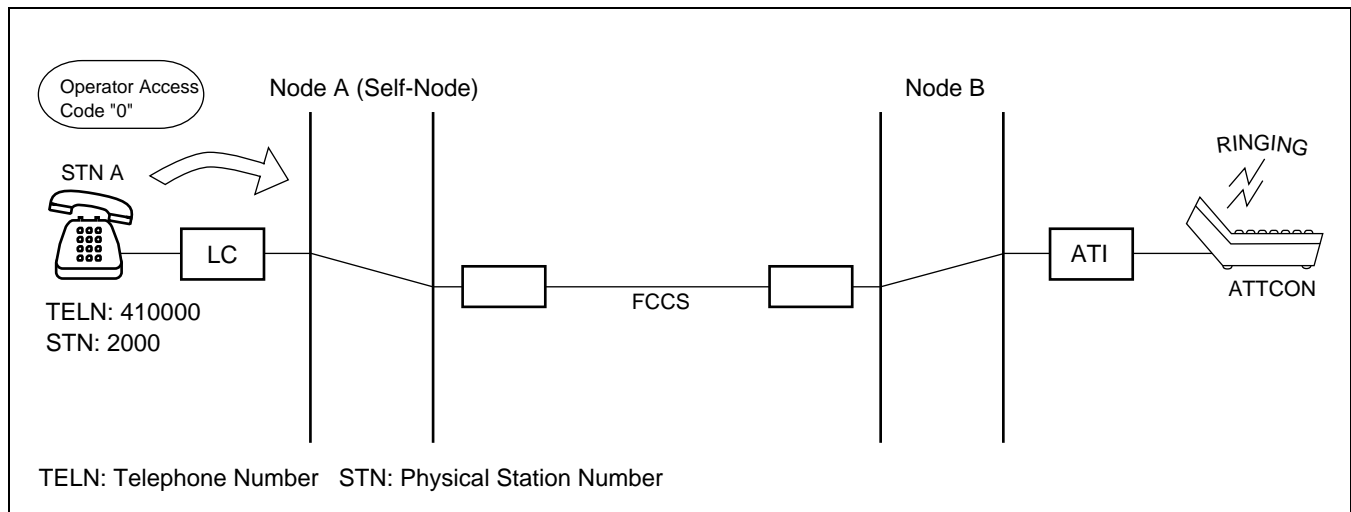


Figure 6-9 ATTCON Connection Test (origination) via FCCS

3.3 Line (LC, ELC, DLC Card) Connection Test (via FCCS)

Perform the Line (LC, ELC, DLC Card) connection test, following the procedures listed below.

3.3.1 Line Origination Test: Confirmation of Physical/Telephone STN Number

Check

- STEP 1: Connect the line circuit card to be tested to a telephone set in Node A (self-Node).
- STEP 2: Lift the handset of STN A and confirm DT (Dial Tone).
- STEP 3: Place a call to an ATTCON or D^{term} in Node B.
- STEP 4: Answer the call and confirm the speech condition and Physical/Telephone (station) number of the calling station.
- STEP 5: Release the call.

3.3.2 Line Termination Test: Confirmation of Telephone STN Number

Check

- STEP 1: Place a call from ATTCON/D^{term} in Node B using the Telephone Number of STN A.
- STEP 2: Answer the call.
- STEP 3: Confirm the number dialed and that the Telephone Number of STN A are the same on the display of the ATTCON/D^{term}.
- STEP 4: Release the call.

3.3.3 Line Connection Test: Case of Hot Line/House Phone Involved

Check

- STEP 1: The Station to be tested goes off-hook and confirms Ring Back Tone (RBT).
- STEP 2: Check whether the call is routed to the predetermined station/ATTCON.
- STEP 3: Answer the calls and confirm the speech condition.
- STEP 4: Release the call.

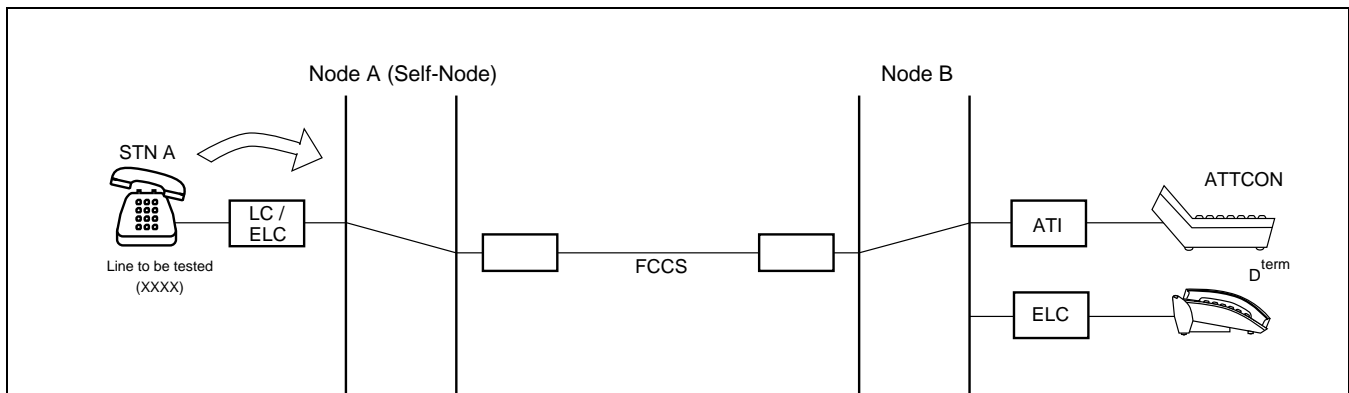


Figure 6-10 Line Connection Test (origination) via FCCS

POST INSTALLATION TEST
FCCS Network Connection Test

3.4 3-party Conference Trunk Function Test (via FCCS)

Perform the 3-party conference trunk function test, following the procedures listed below.

- STEP 1: Using the MBTK Command, make busy all 3-party Conference Trunk (CFTs) except the trunk to be tested.
- STEP 2: Establish a station-to-station connection between STNs A and B in self node (Node A). Check
- STEP 3: STN A goes to Switch Hook Flash (SHF), and after hearing SPDT, dials the Telephone Number of STN C in other node (Node B).
- STEP 4: STN C answers the call.
- STEP 5: STN A, after a brief talk with STN C, makes a SHF, and confirms that a three-way connection has been set up.
- STEP 6: Release the call.
- STEP 7: Repeat the above steps for all CFTs.
- STEP 8: Using the MBTK command, cancel the make-busy status of the trunk.

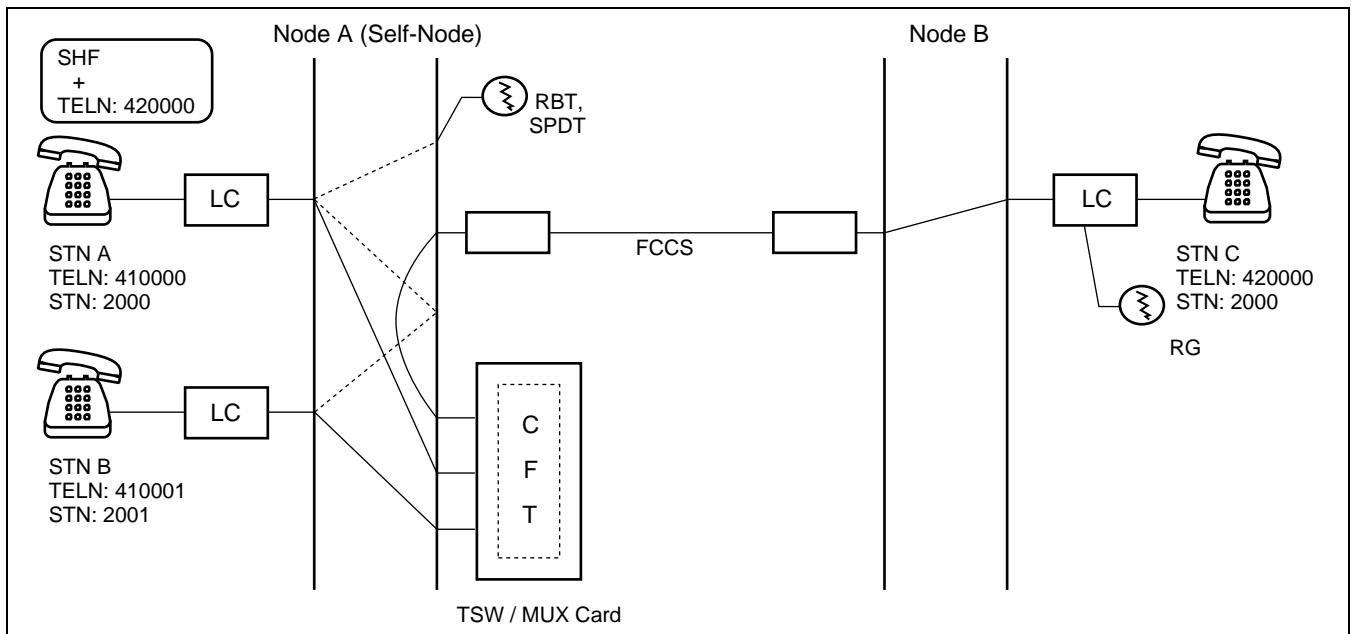


Figure 6-11 3-party Conference Trunk Function Test via FCCS

Note: When a station activates this feature, CFT in Self-Node is used. In this case, CFT in Node A is used.

3.5 FCCS Alternate Routing Test

This section explains how to perform the test for Fusion-link alternate routing. Following the procedures below, make sure that the connection and alternate routing to all FCCS lines are normal and correctly established.

3.5.1 Primary Route Trunk Test

Check

STEP 1: Using the MBCT command, make busy all trunks in the primary route except the trunk to be tested.

STEP 2: Lift the handset of STN A in self-node (Node A).

STEP 3: Dial the Telephone Number of STN B which belongs to other node (STN B).

STEP 4: Confirm the speech condition is sufficient (no noise, not one-way speech, etc.).

STEP 5: Replace the handset of STN A.

STEP 6: Make idle all the trunks which were placed in make-busy state in STEP 1.

3.5.2 Alternate Route Trunk Test

Check

STEP 1: Using the MBCT command, make busy all trunks in the primary route.

STEP 2: Using the MBCT command, make busy all trunks in the alternate route except the trunk to be tested.

STEP 3: Lift the handset of STN A.

STEP 4: Dial the Telephone Number of STN B.

STEP 5: Confirm the speech condition is sufficient (no noise, not one-way speech, etc.).

STEP 6: Replace the handset of STN A.

STEP 7: Make idle all the trunks which were placed in make-busy state in STEP 1 and STEP 2.

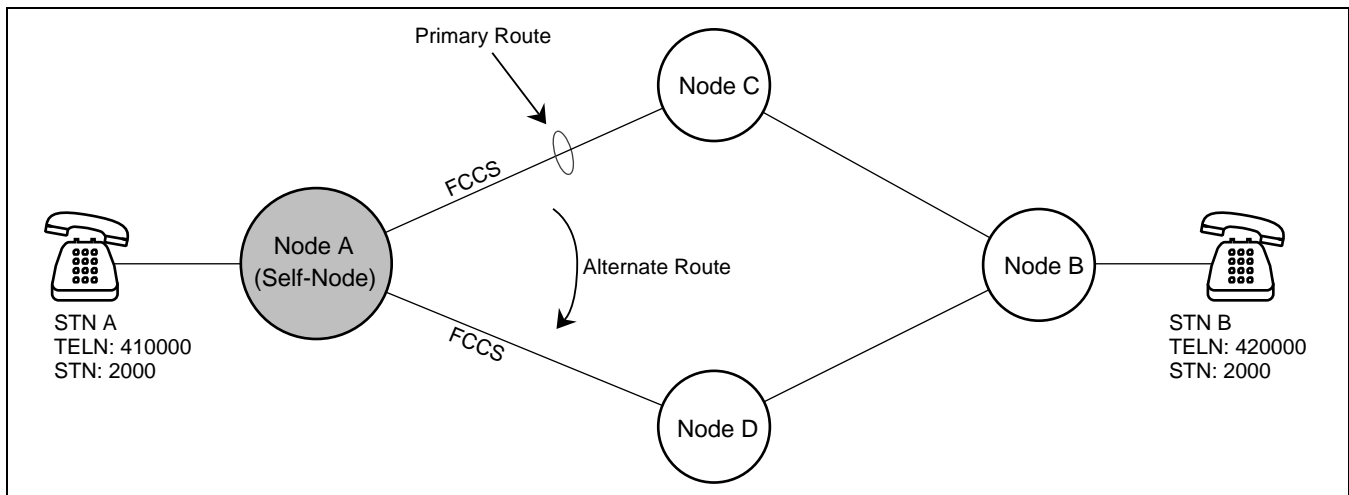


Figure 6-12 Fusion Alternate Routing Test

4. Fusion and Non-Fusion Connection Tests

Use the following procedures to perform the connection test between the FCCS and non-Fusion Common Channel Interoffice Signaling (CCIS) or Associated Channel Interoffice Signaling (ACIS):

POST INSTALLATION TEST

Fusion and Non-Fusion Connection Tests

4.1 When Seizing a Trunk from a Station

Check

STEP 1: Using the MAT command, make busy all trunks in the route except the trunk to be tested.

STEP 2: Station A in self-node (Node A) dials the Physical Station Number for Station B in Node C.

STEP 3: The call terminates to Station B via FCCS and non-FCCS.

STEP 4: Confirm the speech condition is sufficient (no noise, not one-way speech, etc.).

STEP 5: Replace the handset of STN A.

STEP 6: Repeat the above steps for all Fusion links.

4.2 When Seizing a Trunk from an ATTCON

Check

STEP 1: The operator at the ATTCON in Self-Node (Node A) dials Physical Station Number for Station B in Node C.

STEP 2: The call terminates to Station B via FCCS and non-FCCS.

STEP 3: Confirm the speech condition is sufficient (no noise, not one-way speech, etc.)

STEP 4: The operator at the ATTCON releases the call by pressing the CANCEL key.

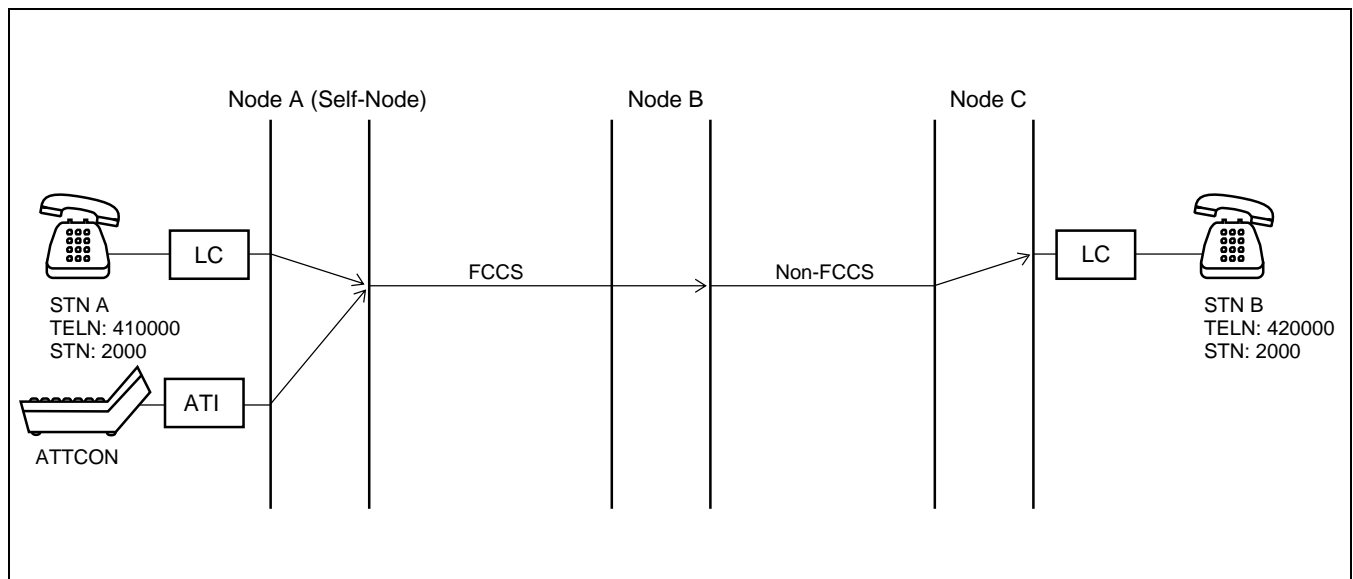


Figure 6-13 CCIS-FCCS Outgoing Call Test

5. SDT Card Loopback Test

The patterns for loopback test, which can be set by the SDT card, are as follows:

1. Local Loopback

Loopback tests are performed only on the SDT card at the self-node.

2. Remote Loopback

Loopback tests are performed between different nodes. The result of this test can be confirmed not at the self-node, but at the distant node.

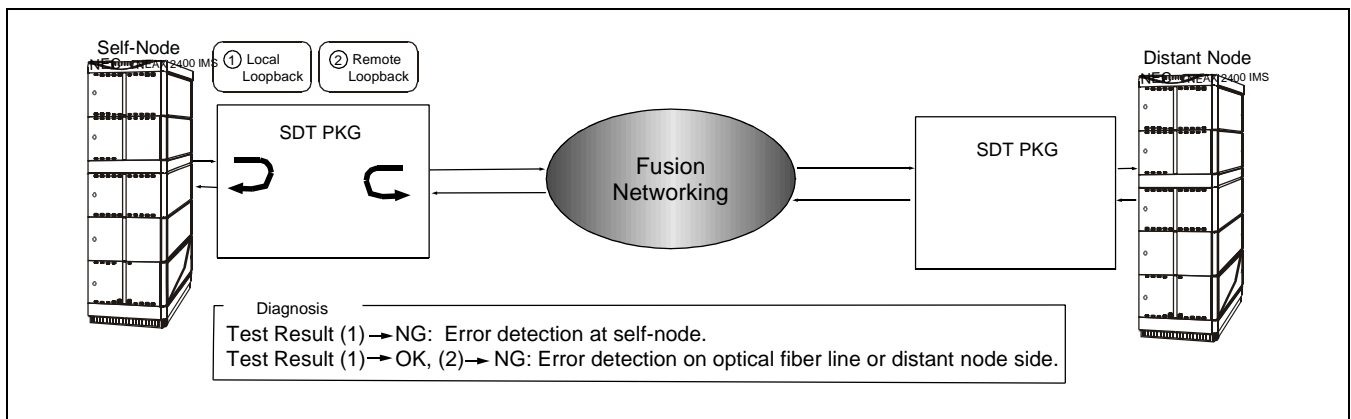


Figure 6-14 Loopback Points of SDT Card

- Test Procedure

STEP 1: Designate the loopback test pattern by setting the P-SW key on the SDT (PA-SDTA) card (see [Figure 6-15](#)).

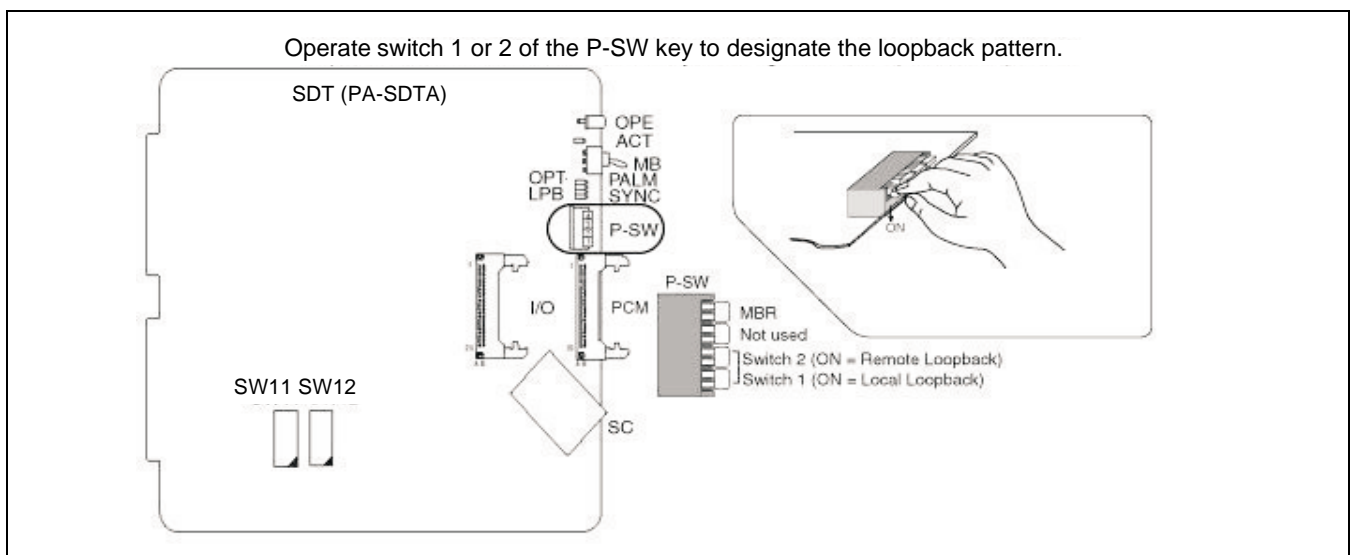


Figure 6-15 Loopback Setting by P-SW key on PA-SDTA Card

POST INSTALLATION TEST

SDT Card Loopback Test

- STEP 2: Make sure that the “LPB” lamp on the PA-SDTA card, or the “SYCxx” lamp on the PA-SDTB card lights steady-green.
- STEP 2.5: When the loopback pattern is “local loopback,” confirm that the “OPT” and “SYNC” lamps are both OFF on the PA-SDTA card.
 (“OPT” and “SYNC” lamps are OFF = Result of loopback test is fine)
- STEP 3: Return the key settings of the P-SW key (on PA-SDTA card: see Figure 6-15) to the original position.

CHAPTER 7 TROUBLESHOOTING

This chapter explains the Fusion-related system messages that may be displayed, together with procedures on how to repair the indicated failure. If the message is displayed, follow the procedure described in each system message. For more information on the other system messages, see the NEAX2400 IMX System Operations and Maintenance Manual.

1. List of Fusion-related System Messages

Table 7-1 List of Fusion-related System Messages

No.	System Message		Remarks
1	3-B	PM C-level Infinite Loop (Permanent)	
2	3-C	PM C-level Infinite Loop (Temporary)	
3	3-D	PM Lockup Failure (Permanent)	
4	3-E	PM Lockup Failure (Temporary)	
5	13-H	Signaling Link Failure (Permanent)	
6	13-I	Signaling Link Failure (Temporary)	
7	13-J	Signaling Link Failure (Recovery)	
8	23-S	FCH Failure Notification (Detection)	
9	23-T	FCH Fault Notification (Recovery)	
10	23-U	FCH Status Information	
11	23-W	FCH Alternate Routing Start Notification	
12	23-X	FCH Alternate Routing End Notification	

TROUBLESHOOTING

List of Fusion-related System Messages

Figure 7-1 shows a sample system configuration. The number of cards and cables may vary depending on the system.

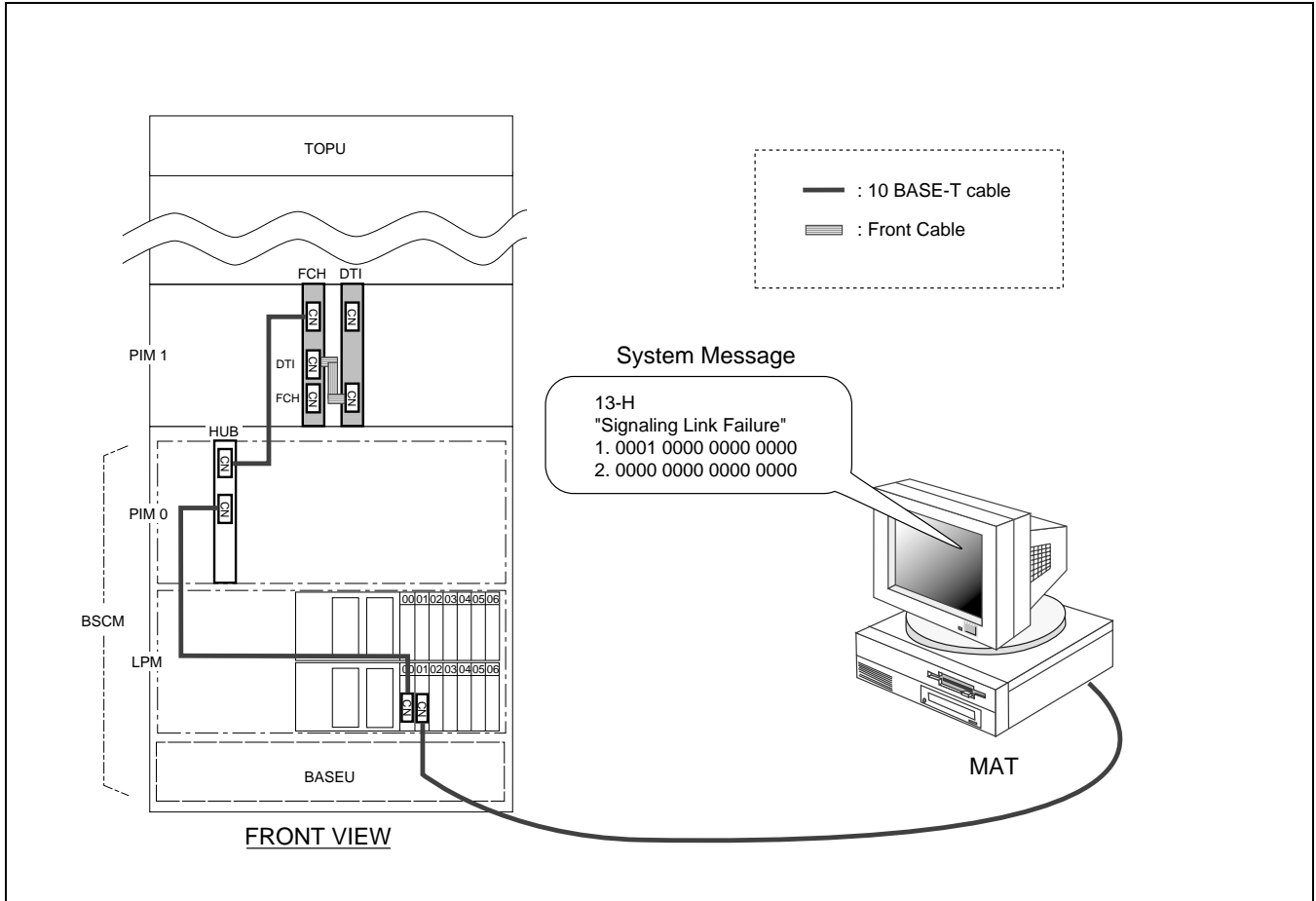


Figure 7-1 Related Hardware

2. 3-B PM C-level Infinite Loop (Permanent)

This message is displayed when a C-level program abnormal state has been detected as permanent. When the abnormal state is detected by the Port Microprocessor (PM) on an FCH card, the PM places the card into make-busy status. If the failure occurs more than 15 times an hour, the system judges the failure as permanent, issuing 3-B system message.

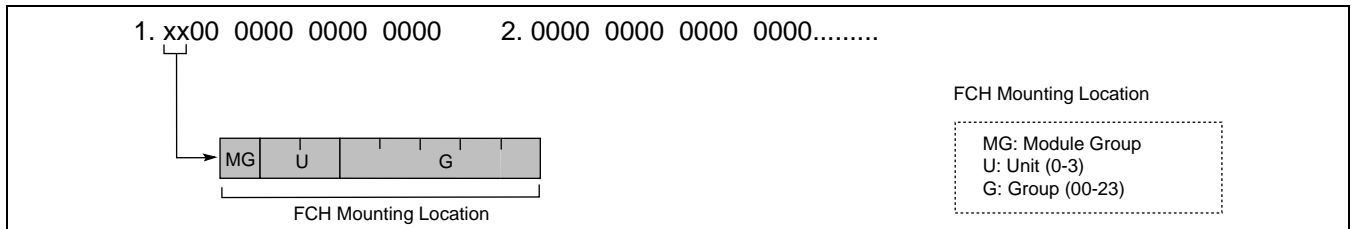


Figure 7-2 3-B PM C-level Infinite Loop (Permanent)

2.1 Repair Procedure

STEP 1: Initialize the indicated FCH (PA-FCHA) card using the MB key. (MB key: Down → Up → Down)

When the LED on the FCH card lights green and the related system messages are not displayed, monitor the system for a while. Otherwise move to STEP 2.

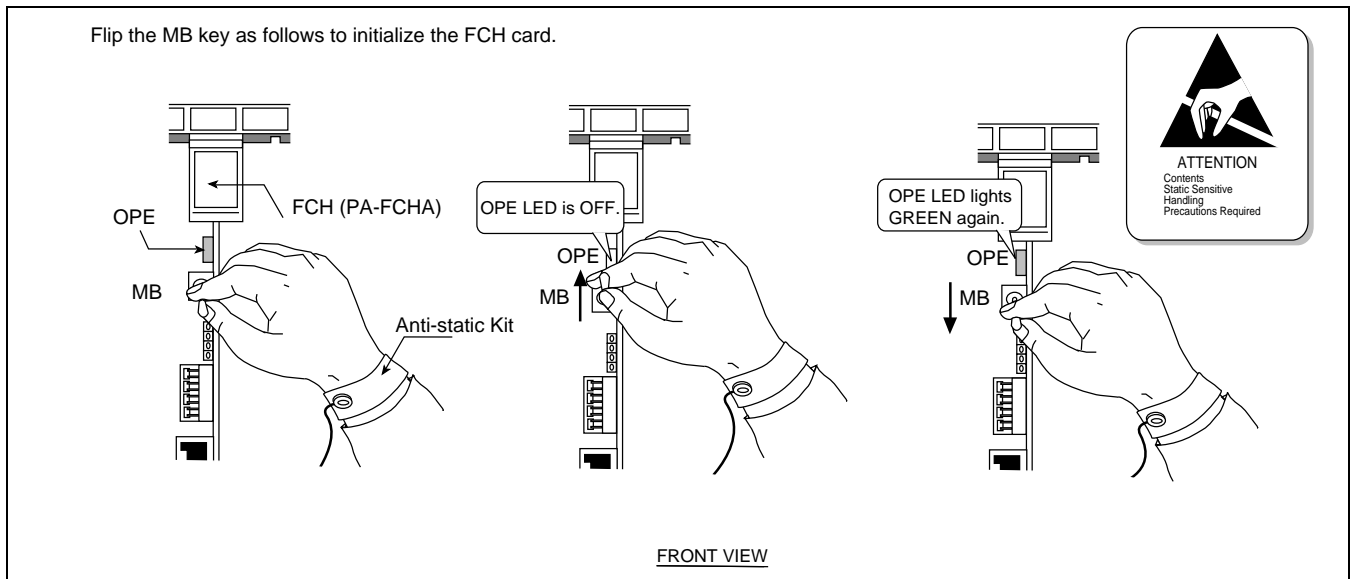


Figure 7-3 How to Initialize the FCH (PA-FCHA) Card

STEP 2: Replace the FCH card, following the procedure listed in [Figure 7-4](#) “How to Replace the FCH (PA-FCHA) card.”

TROUBLESHOOTING

3-B PM C-level Infinite Loop (Permanent)

[How to Replace FCH card]

- 1) Provide the anti-static kit.
- 2) Turn ON the MNT 3 switch. (make-busy-request)
- 3) Make sure that system message (23-W) "FCH Alternate Routing (Start)" is displayed.
- 4) Turn the MB key upward. (make-busy)
- 5) Disconnect the front cable from the FCH card with care.
- 6) Extract the FCH card from the slot.
- 7) Set key settings on the new FCH card.
- 8) Turn ON the MNT 3 switch on the new FCH card. (make-busy-request)
- 9) Turn the MB key upward on the new FCH card.
- 10) Mount the new FCH card in the same slot.
- 11) Connect the disconnected front cable again with care.
- 12) Turn the MB key downward.
- 13) Turn OFF the MNT 3 switch. (make idle)
- 14) Make sure that system message (23-X) "FCH Alternate Routing (Stop)" is displayed.

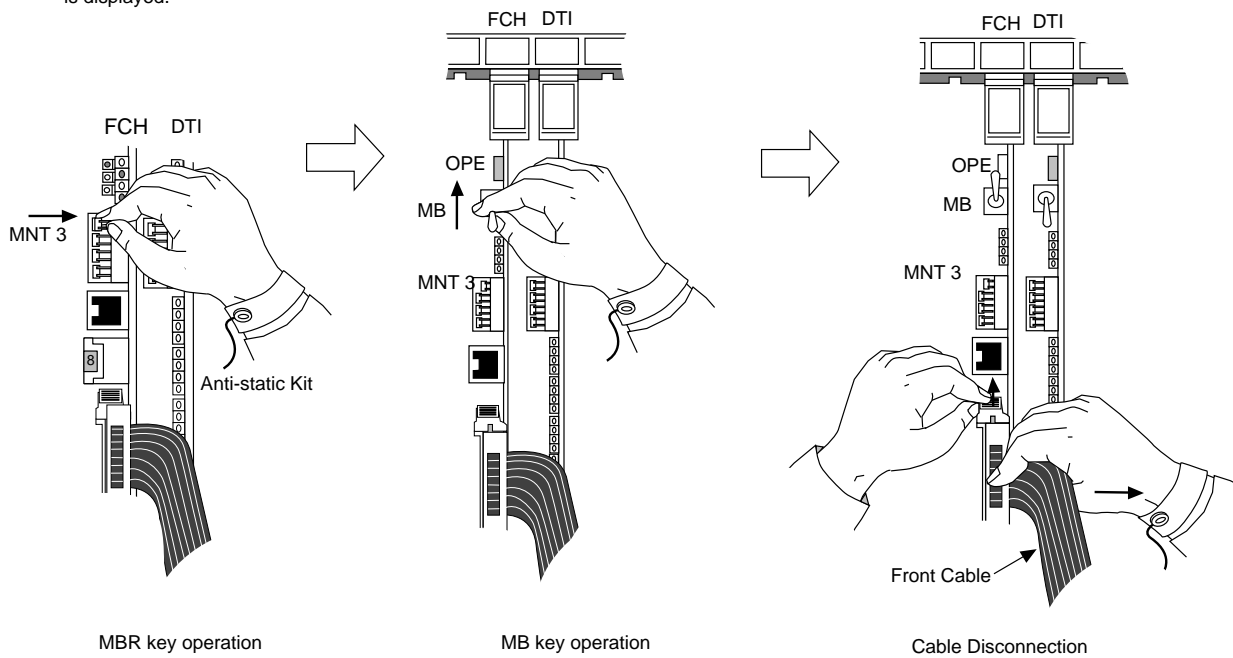
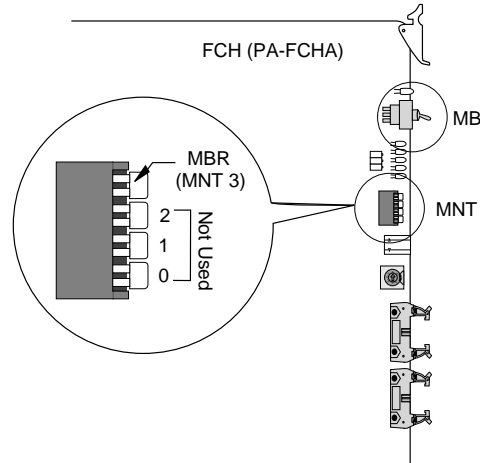


Figure 7-4 How to Replace the FCH (PA-FCHA) Card

3. 3-C PM C-level Infinite Loop (Temporary)

This message is displayed when the C-level program has been detected as abnormal by the Port Microprocessor (PM) mounted on the FCH (PA-FCHA) card. In this instance, the system performs an appropriate restart (B-monitor/Initial restart) according to the frequency of the failures. If the frequency exceeds 15 times an hour, it is judged as permanent. See "3-B PM C-level Infinite Loop (Permanent)".

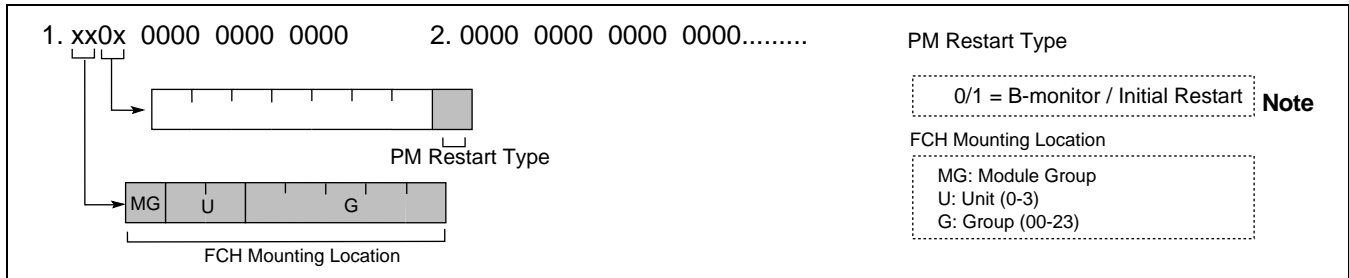


Figure 7-5 3-C PM C-level Infinite Loop (Temporary)

Note: *B-monitor Restart:* Ports whose link has already been established remain connected, while ports processing a call-origination may be released.

Initial Restart: All ports on the circuit card are force released to be placed in idle state.

3.1 Repair Procedure

STEP 1: If the 3-C message has been displayed only once or twice, monitor the failure for a while. Otherwise, move to STEP 2.

STEP 2: Initialize the indicated FCH (PA-FCHA) card using the MB key. See Figure 7-3 "How to Initialize the FCH (PA-FCHA) card."

When the LED on the FCH card lights green, and the related system messages are not displayed, monitor the system for a while. Otherwise move to STEP 3.

STEP 3: Replace the FCH card, following the procedure listed in Figure 7-4 "How to Replace FCH (PA-FCHA) card."

4. 3-D PM Lockup Failure (Permanent)

The CPU sends diagnosis data at periodic intervals to the Port Microprocessor (PM) on FCH (PA-FCHA) cards in order to monitor the PM. If the CPU cannot receive the return data within a predetermined time period, the system displays this data. When the failure is detected more than 15 times per hour, the failure is judged as permanent. Otherwise, 3-E PM Lockup Failure (Temporary) is displayed.

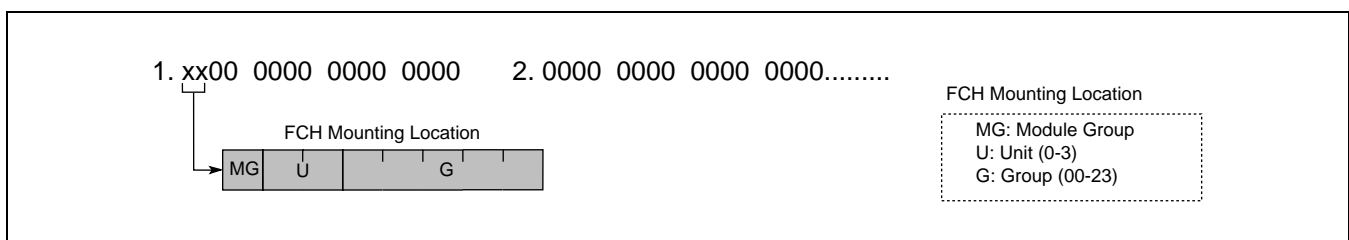


Figure 7-6 3-D PM Lockup Failure (Permanent)

TROUBLESHOOTING

3-E PM Lockup Failure (Temporary)

4.1 Repair Procedure

STEP 1: Make sure that station-to-station connections can be established in the PIM containing the indicated FCH (PA-FCHA) card.

If the station-to-station connections cannot be established, the PIM is faulty. Repair the PIM. Otherwise, move to STEP 2.

STEP 2: Initialize the FCH card using the MB key. See [Figure 7-3](#) “How to Initialize FCH (PA-FCHA) Card.”

When the LED lights green and no system message related to this failure displays again, monitor the system for a while. Otherwise, move to STEP 3.

STEP 3: Replace the FCH card. Refer to [Figure 7-4](#) “How to Replace FCH (PA-FCHA) Card.”

5. 3-E PM Lockup Failure (Temporary)

The CPU sends diagnosis data at periodic intervals to the Port Microprocessor (PM) on the FCH (PA-FCHA) cards in order to monitor the PM. If the CPU cannot receive the return data within a predetermined time period, the system displays this data. When the failure is detected more than 15 times per hour, the failure is judged as permanent. Otherwise, 3-E “PM Lockup Failure (Temporary)” is displayed.

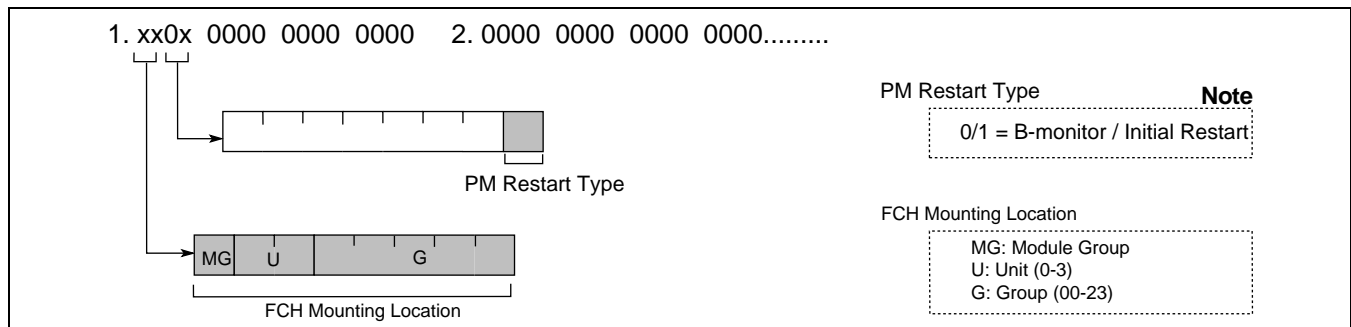


Figure 7-7 3-E PM Lockup Failure (Temporary)

Note: *B-monitor Restart: Ports whose link have already been established remain connected, while ports processing a call-origination may be released.*

Initial Restart: All ports on the circuit card are force released to be placed in idle state.

5.1 Repair Procedure

STEP 1: If this system message has been displayed only once or twice, monitor the failure for a while. Otherwise, move to STEP 2.

STEP 2: Initialize the FCH (PA-FCHA) card using the MB key. See [Figure 7-3](#) “How to Initialize FCH Card.”

If this message is not displayed any more, monitor the FCH card for a while. Otherwise, move to STEP 3.

STEP 3: Replace the FCH card, referring to [Figure 7-4](#) “How to Replace FCH (PA-FCHA) Card.”

6. 13-H/I/J Signaling Link Failure (Permanent)/(Temporary)/(Recovery)

This message is displayed when the Fusion link (D-ch) has a failure. If the failure occurs frequently, the system displays 13-H Signaling Link Failure (Permanent). The shaded area in the figure listed below is related to this message.

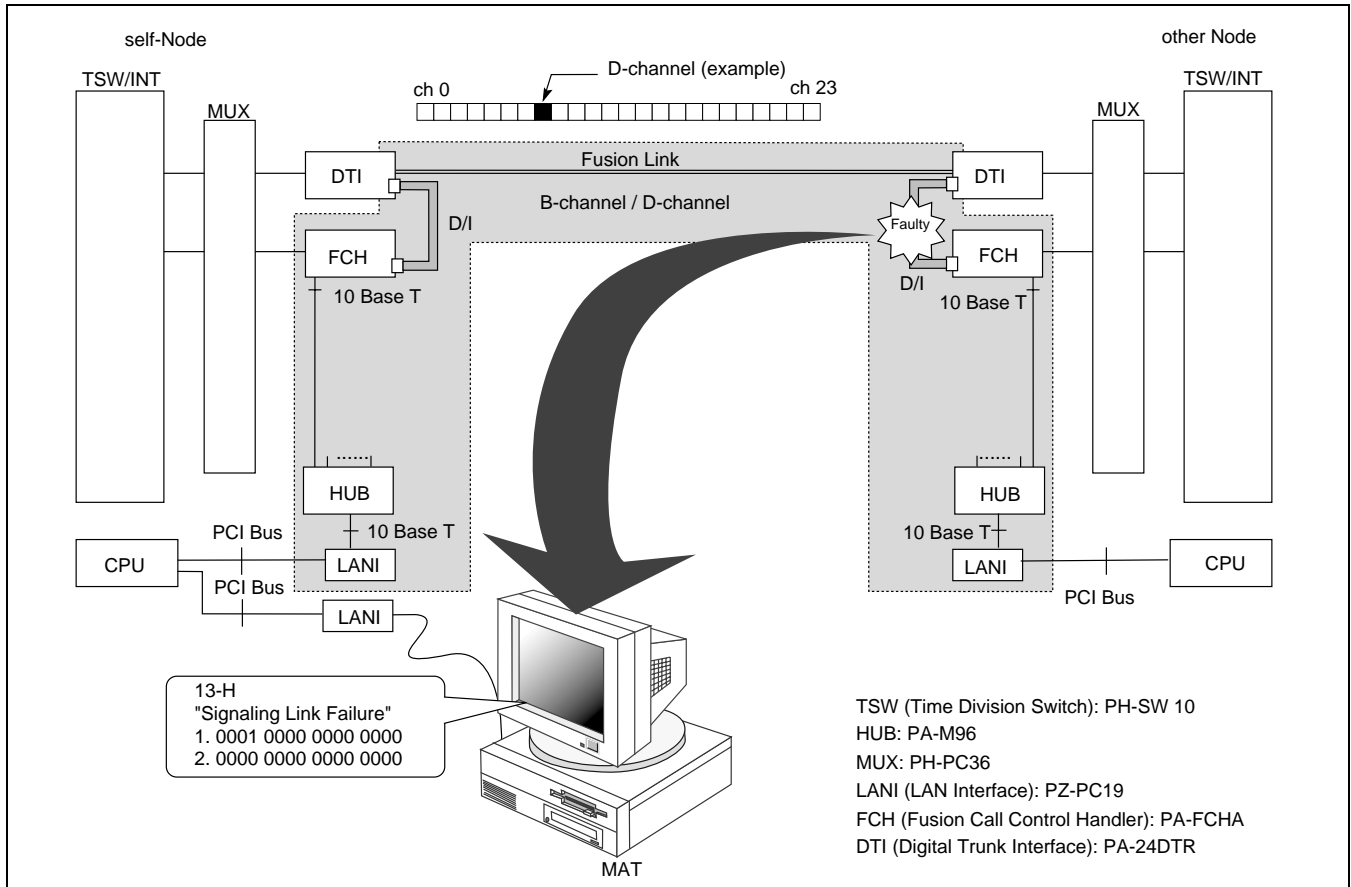


Figure 7-8 Fusion Link (Signaling Link) Failure

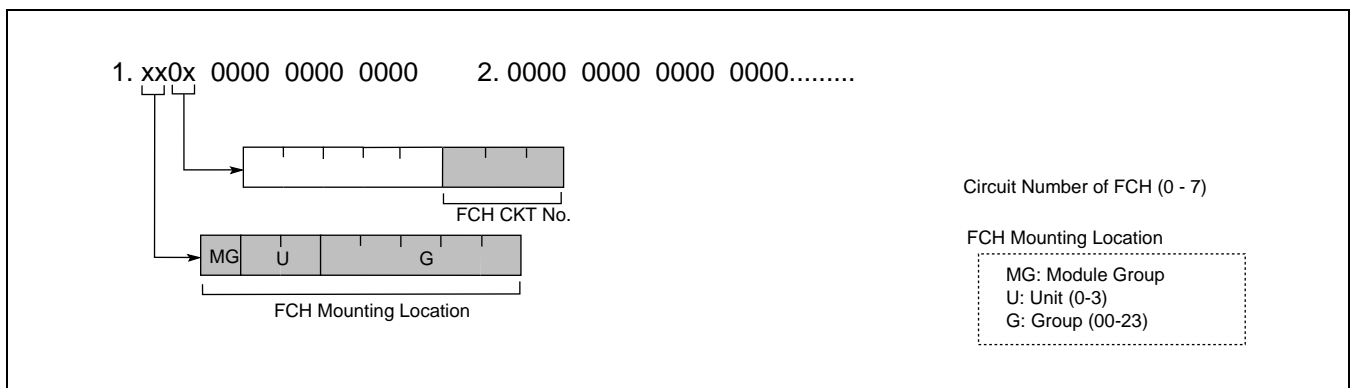


Figure 7-9 13-H/13-I/13-J Signaling Link Failure System Message

TROUBLESHOOTING

13-H/I/J Signaling Link Failure (Permanent)/(Temporary)/(Recovery)

6.1 Repair Procedure

- 13-H (Permanent)

STEP 1: Make sure that the front cable is securely inserted. See [Figure 7-10](#) below.

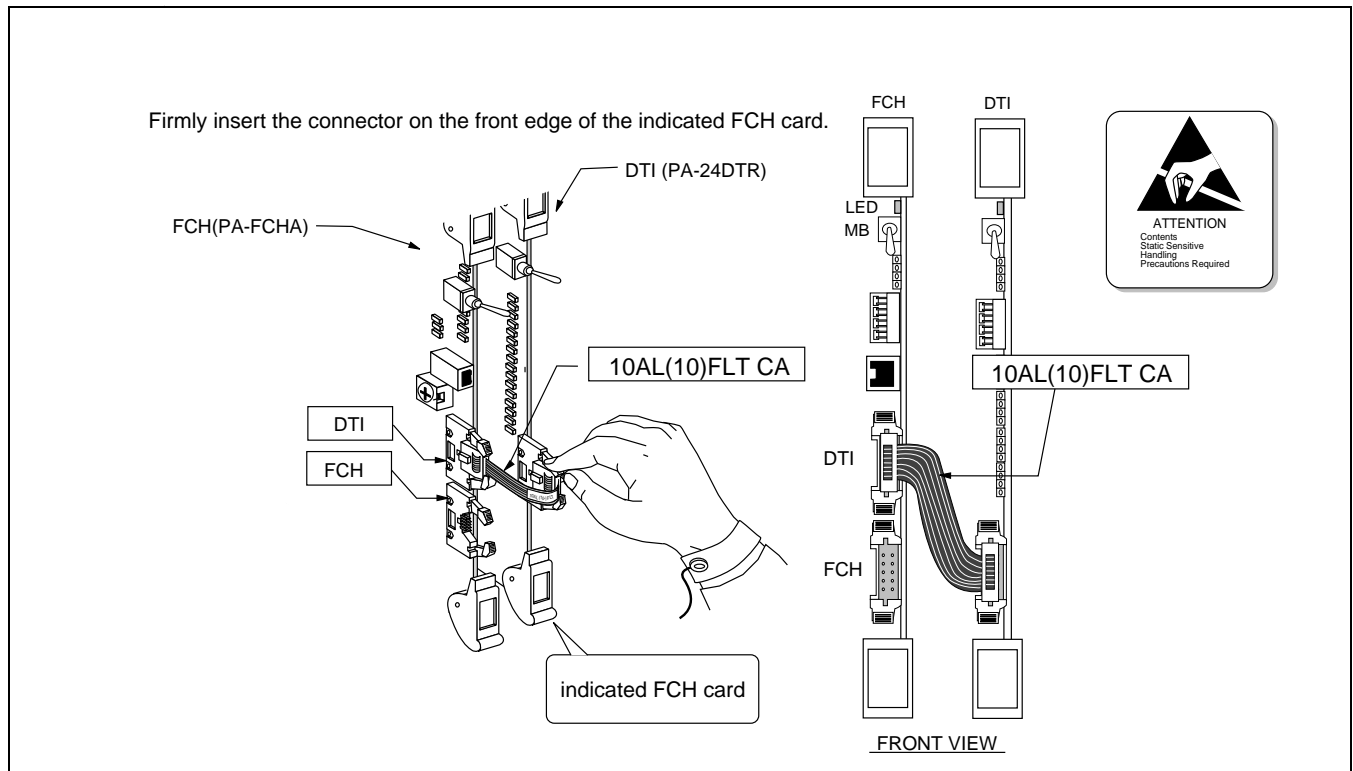


Figure 7-10 FCH-DTI Connection

STEP 2: Initialize the indicated FCH (PA-FCHA) card using the MB key. (MB key: Down → Up → Down)

See [Figure 7-3](#). When the LED on the FCH card lights green and the related system messages are not displayed anymore, monitor the system for a while. Otherwise, move to STEP 3.

STEP 3: Replace the FCH card, following the procedure listed in [Figure 7-4](#). If the failure exists after card replacement, move to STEP 4.

STEP 4: Replace the front cable labeled 10AL (10) FLT CA, since the cable is suspected as faulty.

6.2 Repair Procedure

- 13-I (Temporary)

STEP 1: Make sure that the front cable is securely inserted. (See [Figure 7-10](#).)

STEP 2: If this message has been displayed once or twice, monitor the failure for a while. Otherwise, move to STEP 3.

STEP 3: If 13-J (Recovery) has been displayed after this message, monitor the failure for a while. Otherwise, move to STEP 4.

STEP 4: Initialize the indicated FCH (PA-FCHA) card using the MB key. (MB key: Down → Up → Down)

See [Figure 7-3](#). When the LED on the FCH card lights green and the related system messages are not displayed any more, monitor the system for a while. Otherwise, move to STEP 5.

STEP 5: Replace the FCH card, following the procedure listed in [Figure 7-4](#). If the failure exists after card replacement, move to STEP 6.

STEP 6: Replace the front cable labeled 10AL (10) FLT CA, since the cable is suspected as faulty.

7. 23-S FCH Failure Notification (Detection)

This message is displayed when the FCH (PA-FCHA) card is faulty due to the problems such as an Ethernet controller initial failure.

The message is displayed in the following format. If this message is displayed, check the related Ethernet cables, following the procedure listed on the next page.

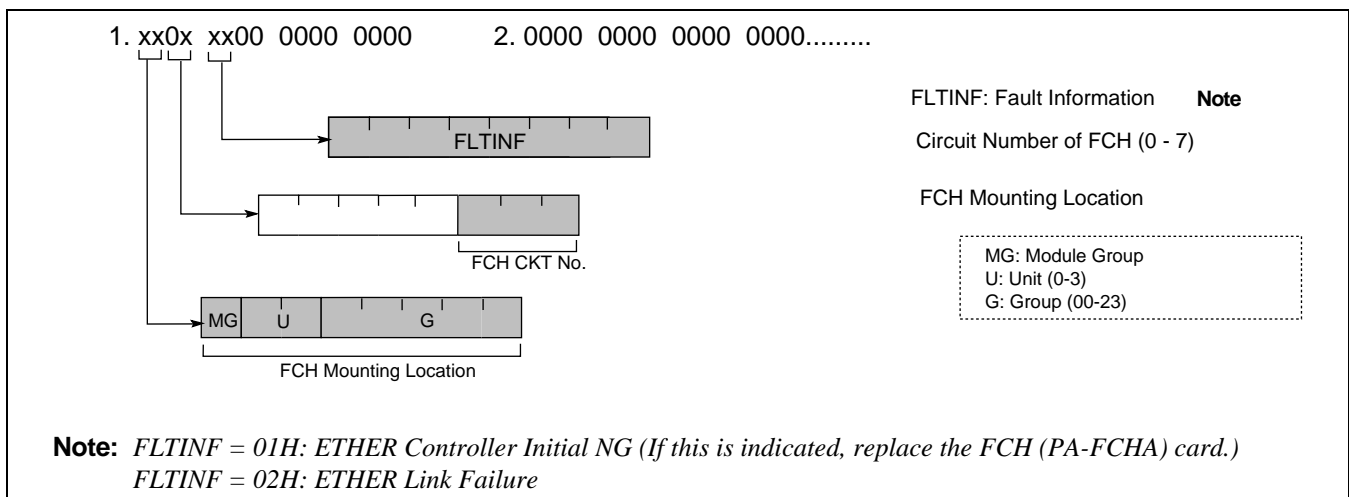


Figure 7-11 23-S FCH Failure Notification

TROUBLESHOOTING

23-S FCH Failure Notification (Detection)

7.1 Repair Procedure

STEP 1: Make sure that the related Ethernet cables are securely inserted into the connectors. (See the example shown below.) If not, securely insert the cable. In this instance, confirm whether System Message 23-T FCH Fault Recovery Notification is displayed as the result of cable insertion. If no fault is found in this step, move to STEP 2.

STEP 2: The following equipment is suspected to be faulty. Check for each item:

- Ethernet cables (10 BASE-T cables) ← See [Figure 7-13](#) “How to Check 10 BASE-T cables.”
- HUB (PA-M96) ← See [Figure 7-14](#) “How to Replace HUB (PA-M96) card.”
- FCH (PA-FCHA) ← See [Figure 7-4](#) “How to Replace FCH (PA-FCHA) card.”

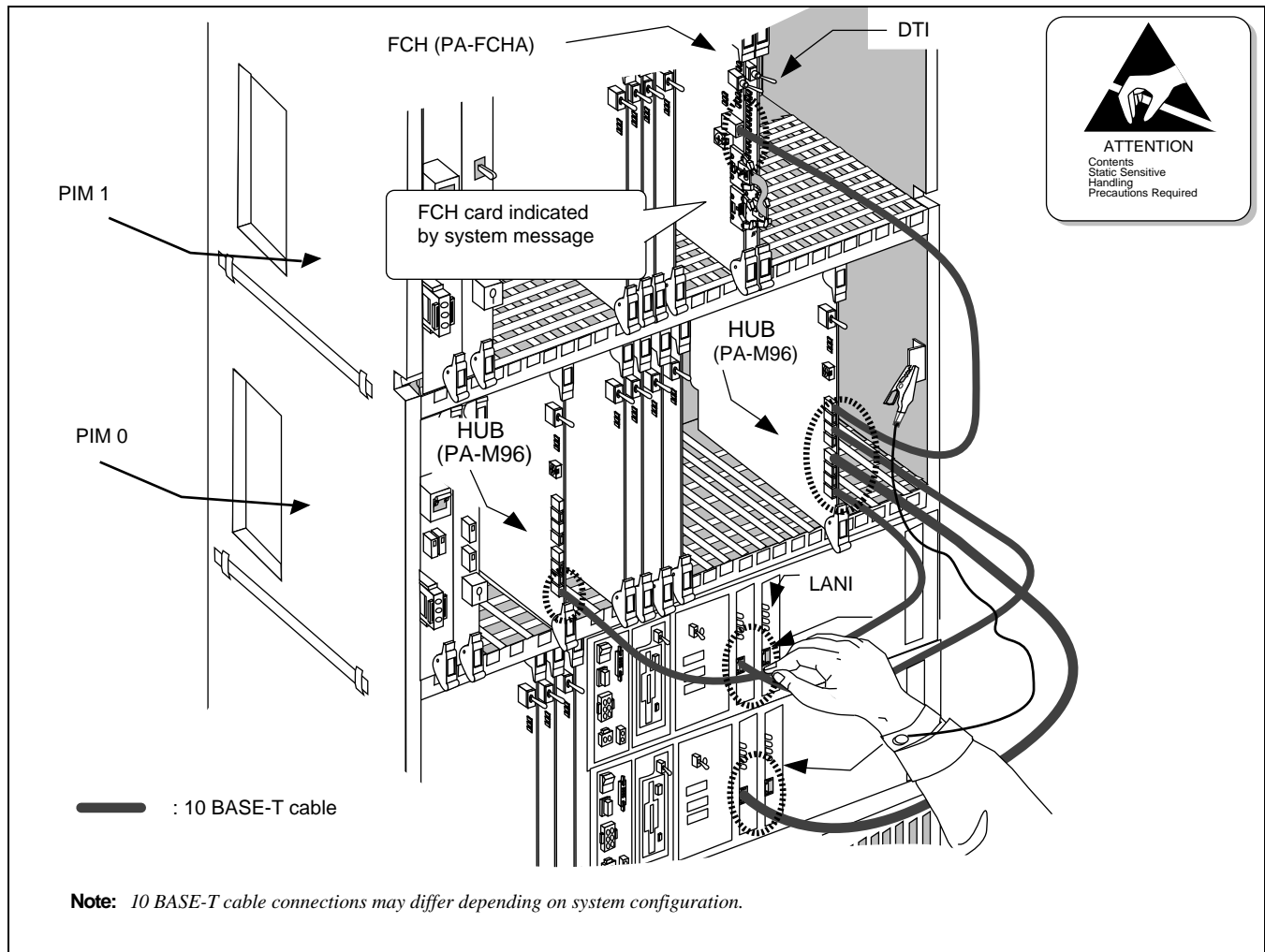
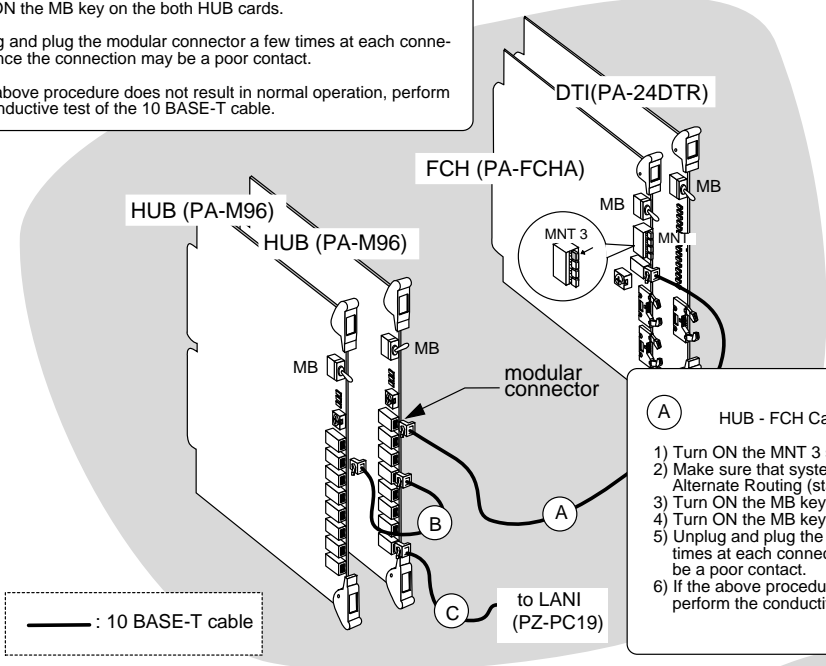


Figure 7-12 10 BASE-T Cable Connection Check



- B** HUB-HUB Cable Connection Test
- 1) Turn ON the MNT switch of the FCH cards which are connected to the both HUB cards.
 - 2) Make sure that system message (23-W) "FCH Alternate Routing (start)" is displayed for each FCH.
 - 3) Turn ON the MB key on the both HUB cards.
 - 4) Unplug and plug the modular connector a few times at each connector since the connection may be a poor contact.
 - 5) If the above procedure does not result in normal operation, perform the conductive test of the 10 BASE-T cable.



- A** HUB - FCH Cable Connection Test
- 1) Turn ON the MNT 3 switch on the FCH card. (make-busy-request)
 - 2) Make sure that system message (23-W) "FCH Alternate Routing (start)" is displayed.
 - 3) Turn ON the MB key on the FCH card. (make-busy)
 - 4) Turn ON the MB key on the HUB card. (make-busy)
 - 5) Unplug and plug the modular connector a few times at each connector since the connection may be a poor contact.
 - 6) If the above procedure does not result in normal operation, perform the conductive test of the 10 BASE-T cable.

- C** HUB-LANI Cable Connection Test
- 1) Turn ON the MNT3 switch of the FCH cards which are connected to the both HUB cards.
 - 2) Make sure that system message (23-W) "FCH Alternate Routing (start)" is displayed for each FCH.
 - 3) Turn ON the MB key on the HUB card.
 - 4) Unplug and plug the modular connector a few times at each connector since the connection may be a poor contact.
 - 5) If the above procedure does not result in normal operation, perform the conductive test of the 10 BASE-T cable.

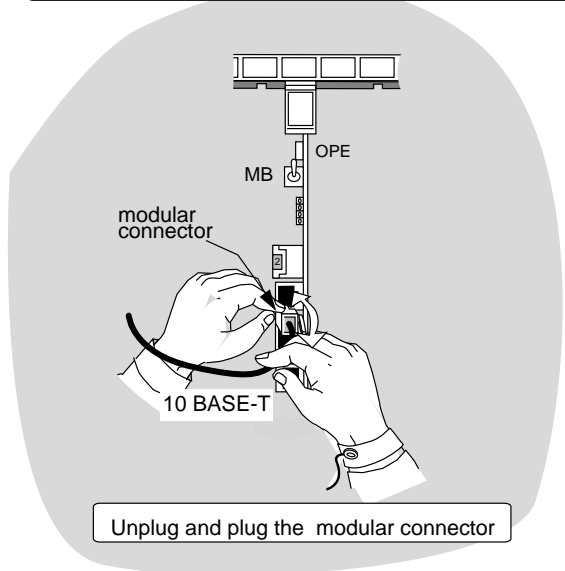


Figure 7-13 How to Check 10 BASE-T Cables

WARNING: When a HUB card is placed in make-busy, all BASE-T interfaces connected to the HUB card become inoperative.

TROUBLESHOOTING

23-S FCH Failure Notification (Detection)

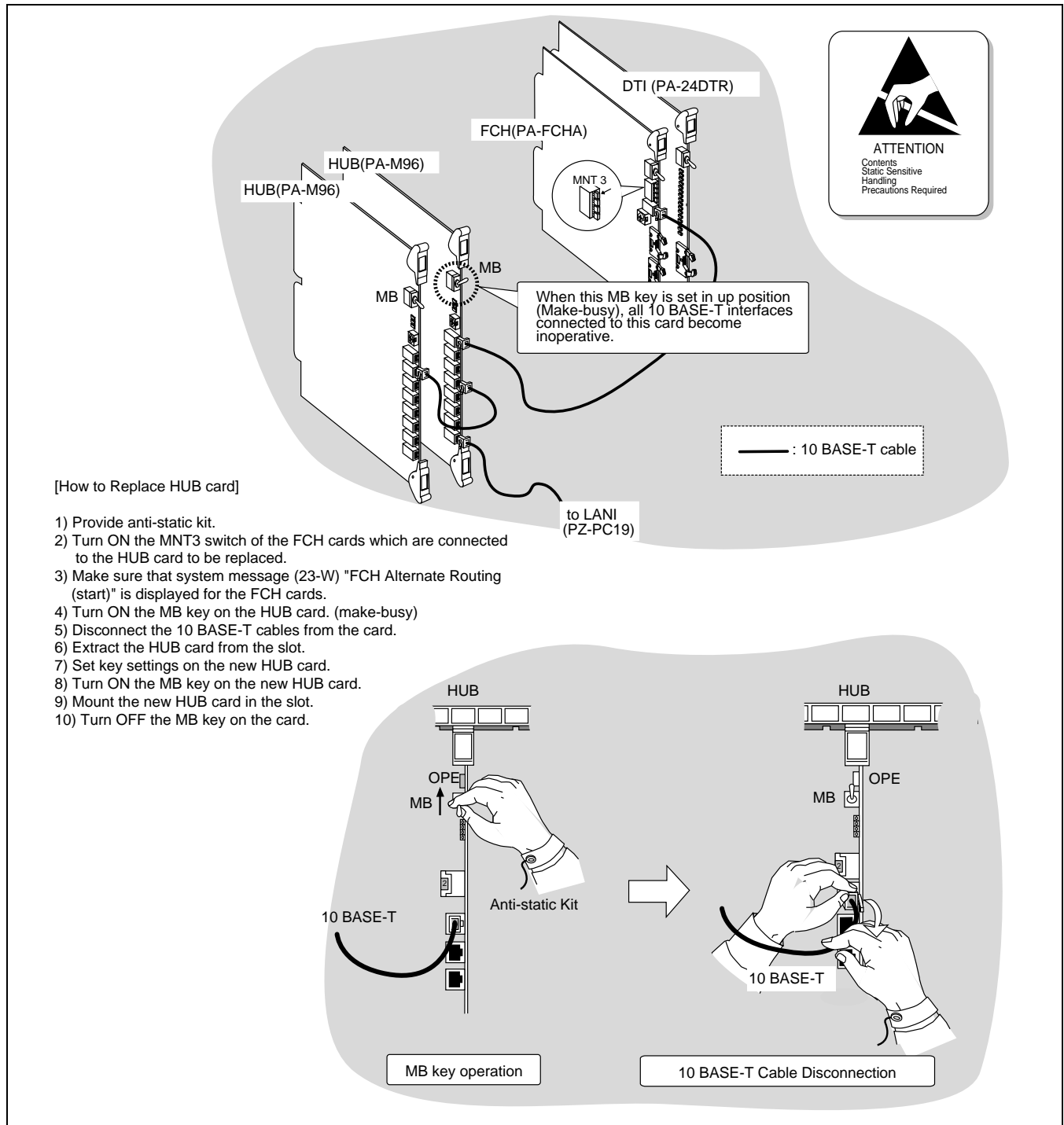


Figure 7-14 How to Replace HUB (PA-M96) Card

WARNING: When a HUB card is placed in make-busy, all BASE-T interfaces connected to the HUB card become inoperative.

8. 23-T FCH Fault Notification (Recovery)

This message is displayed when the FCH (PA-FCHA) card that was detected as faulty is recovered. The message is displayed in the following format.

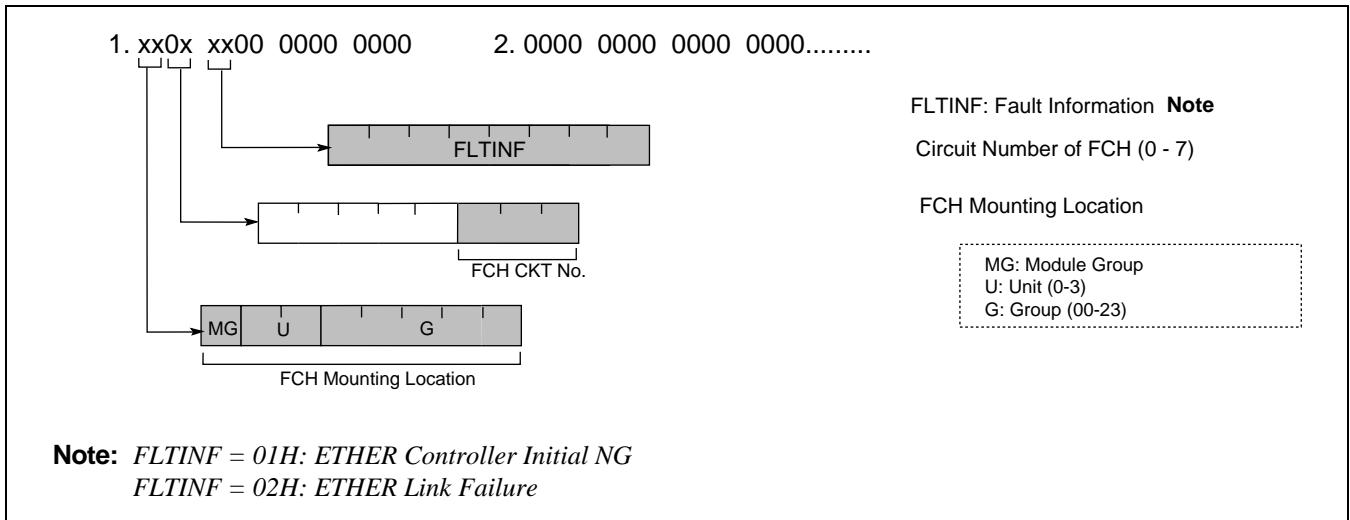


Figure 7-15 23-T FCCH Fault Recovery Notification

TROUBLESHOOTING

23-U FCH Status Information

9. 23-U FCH Status Information

This message is displayed when the status change of FCH (PA-FCHA) card is detected, which includes “FCH Initial Setting Failure,” “ETHER Transfer Failure.” When this message is displayed, follow the procedure explained on a fault information basis. The figure below shows the general format of this message.

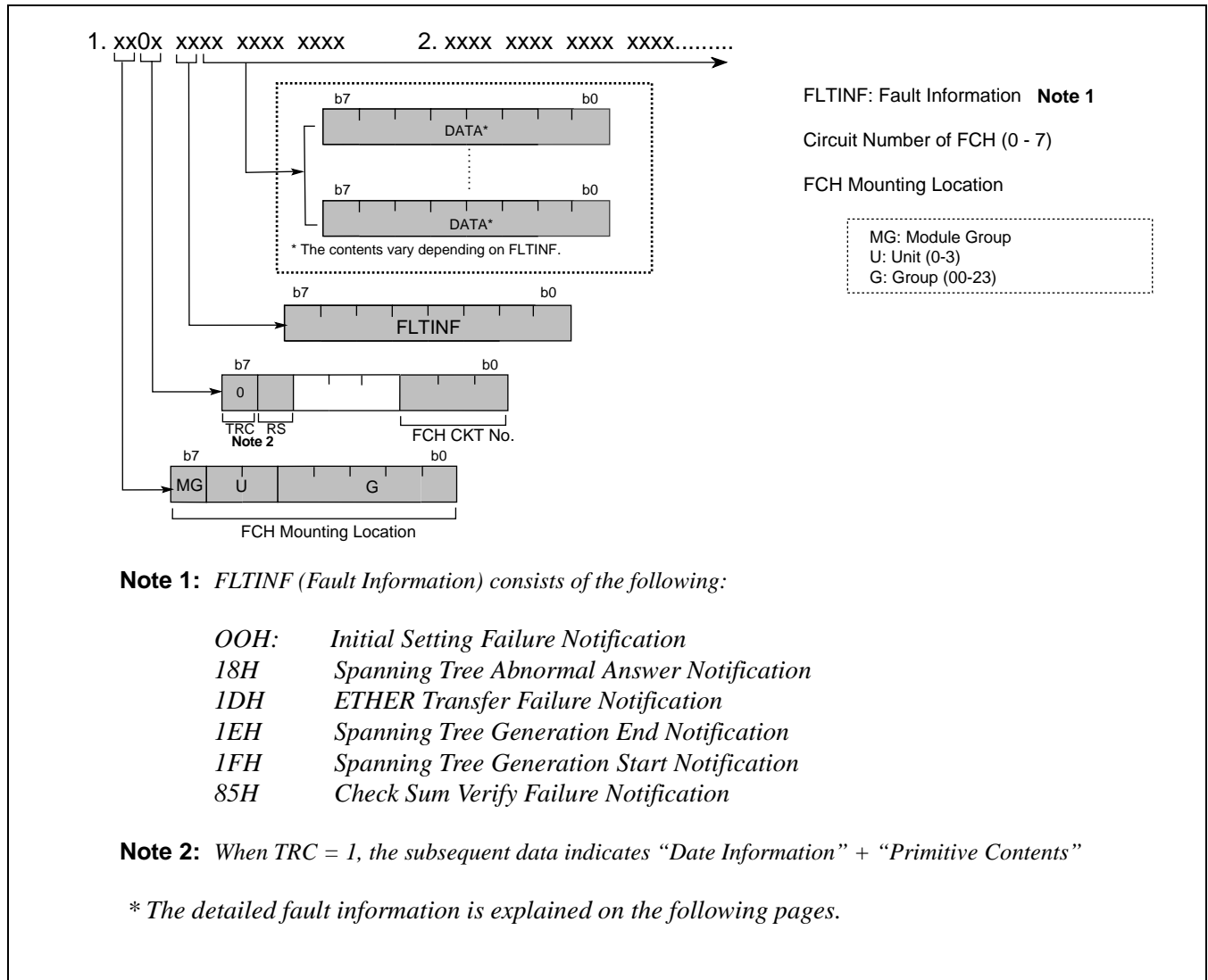


Figure 7-16 23-U FCCH Status Information

9.1 FLTINF = 00H Initial Setting Failure

This message is displayed when the Ethernet Controller Initial Setting ends in failure. The detailed information is indicated in the following format.

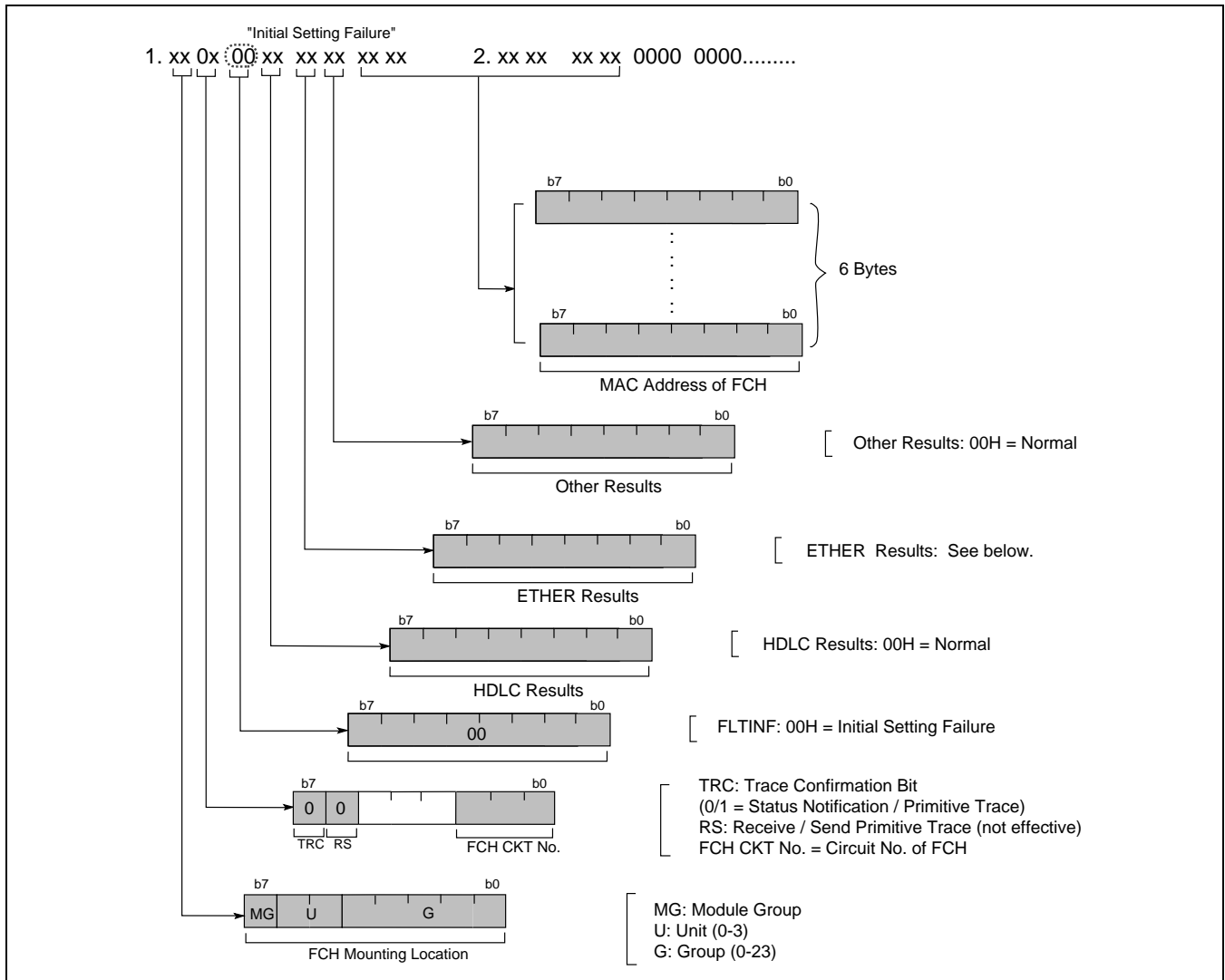


Figure 7-17 23-U FCCH Status Notification - Initial Setting Failure

ETHER Results

00H: Normal

01H: ETHER Controller Reset Impossible

03H: ETHER Controller Initial NG

02H: Configuration Error

04H: ETHER Controller Initial NG

TROUBLESHOOTING

23-U FCH Status Information

9.2 FLTINF = 18H Spanning Tree Abnormal Answer

This message is displayed when Spanning Tree Abnormal Answer is detected. The detailed information is indicated in the following format.

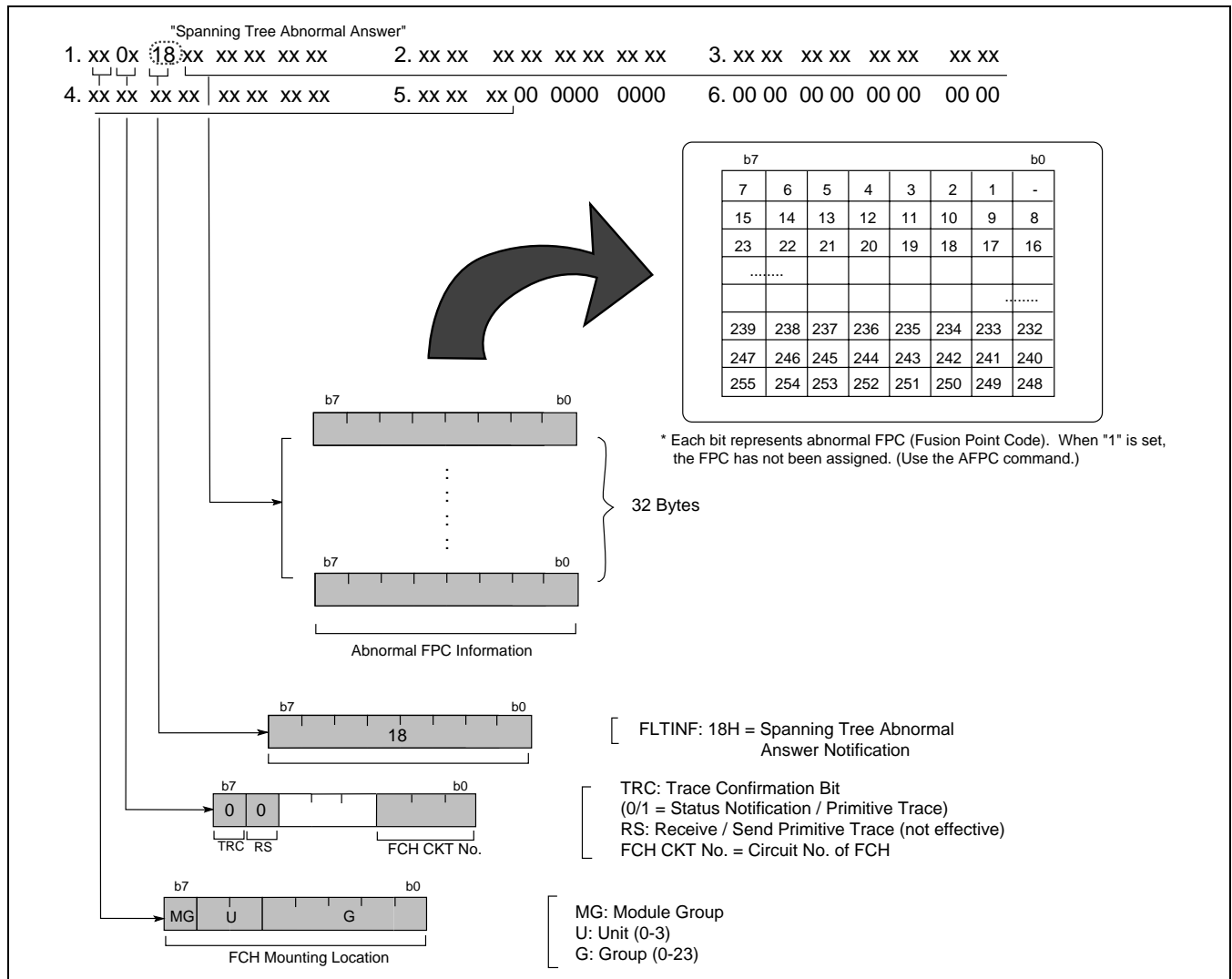


Figure 7-18 23-U FCCH Status Notification - Spanning Tree Abnormal Answer

9.2.1 Repair Procedure

A Fusion Point Code (FPC) is assigned using the AFPC command. If any FPC data has not been assigned properly, this message is displayed. Make sure that the indicated FPC data is properly assigned. See the sample below.

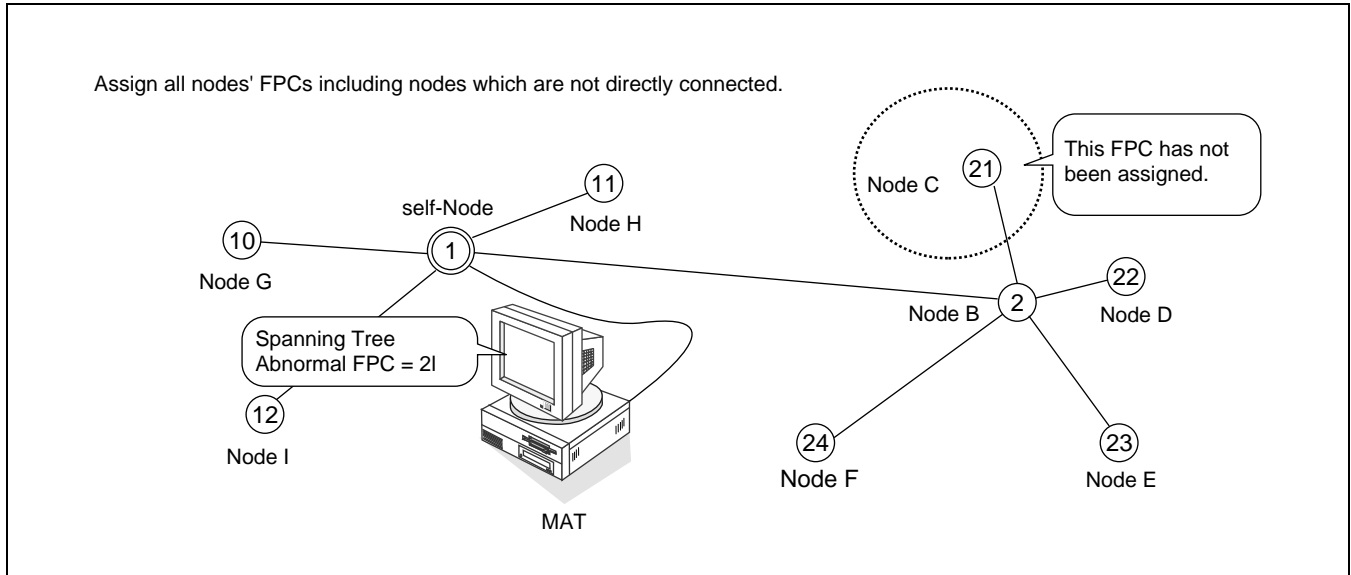


Figure 7-19 Spanning Tree Abnormal Answer

TROUBLESHOOTING

23-U FCH Status Information

9.3 FLTINF = 1DH ETHER Transfer Failure

This message is displayed when an FCH card discards an abnormal Ethernet packet (i.e. abnormal IP address destination) that was received from other node on the network.

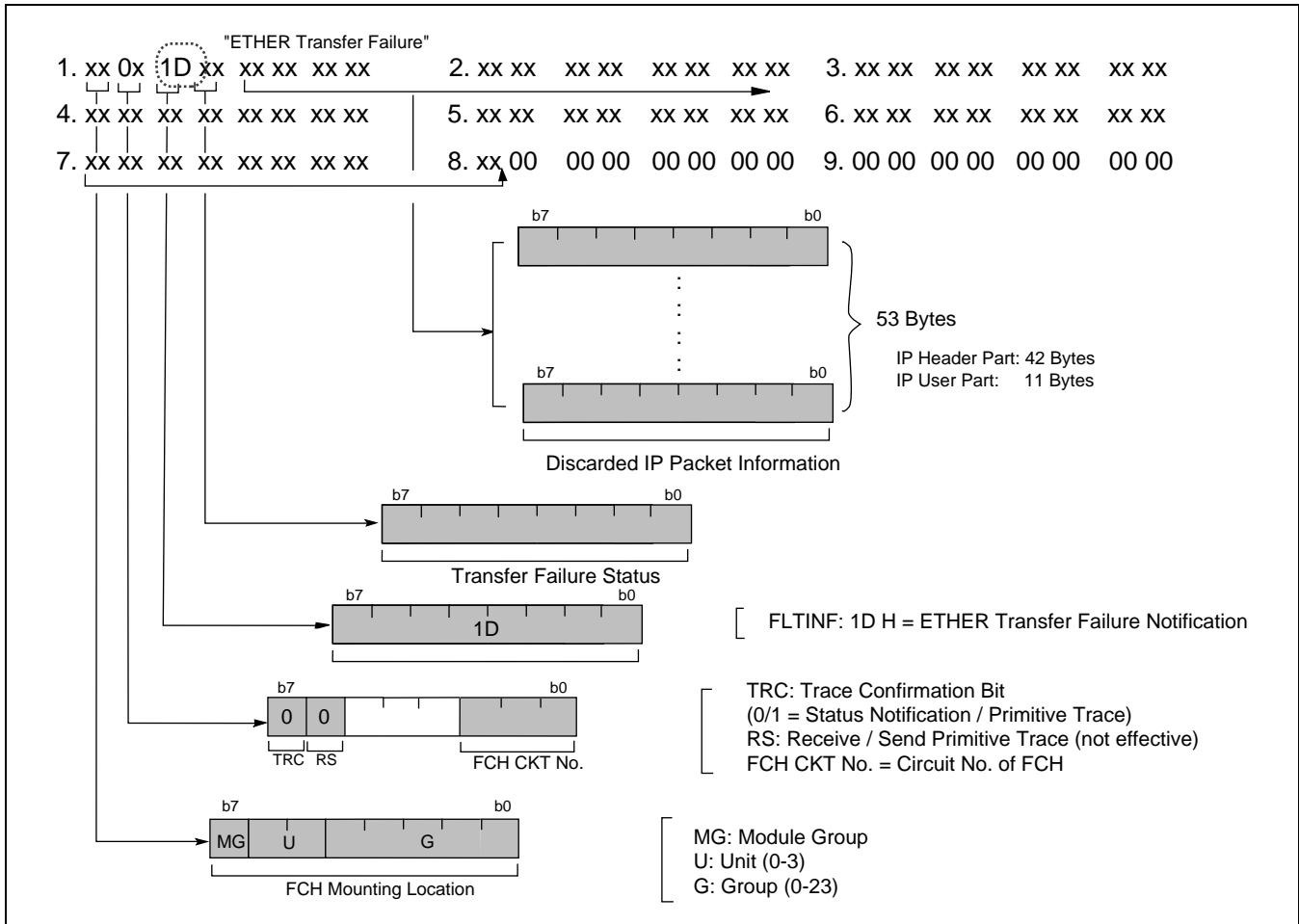


Figure 7-20 23-U ETHER Transfer Failure

9.4 FLTINF = 1EH Spanning Tree Generation End

This message is displayed when Spanning Tree Generation is complete. The detailed information is indicated in the following format.

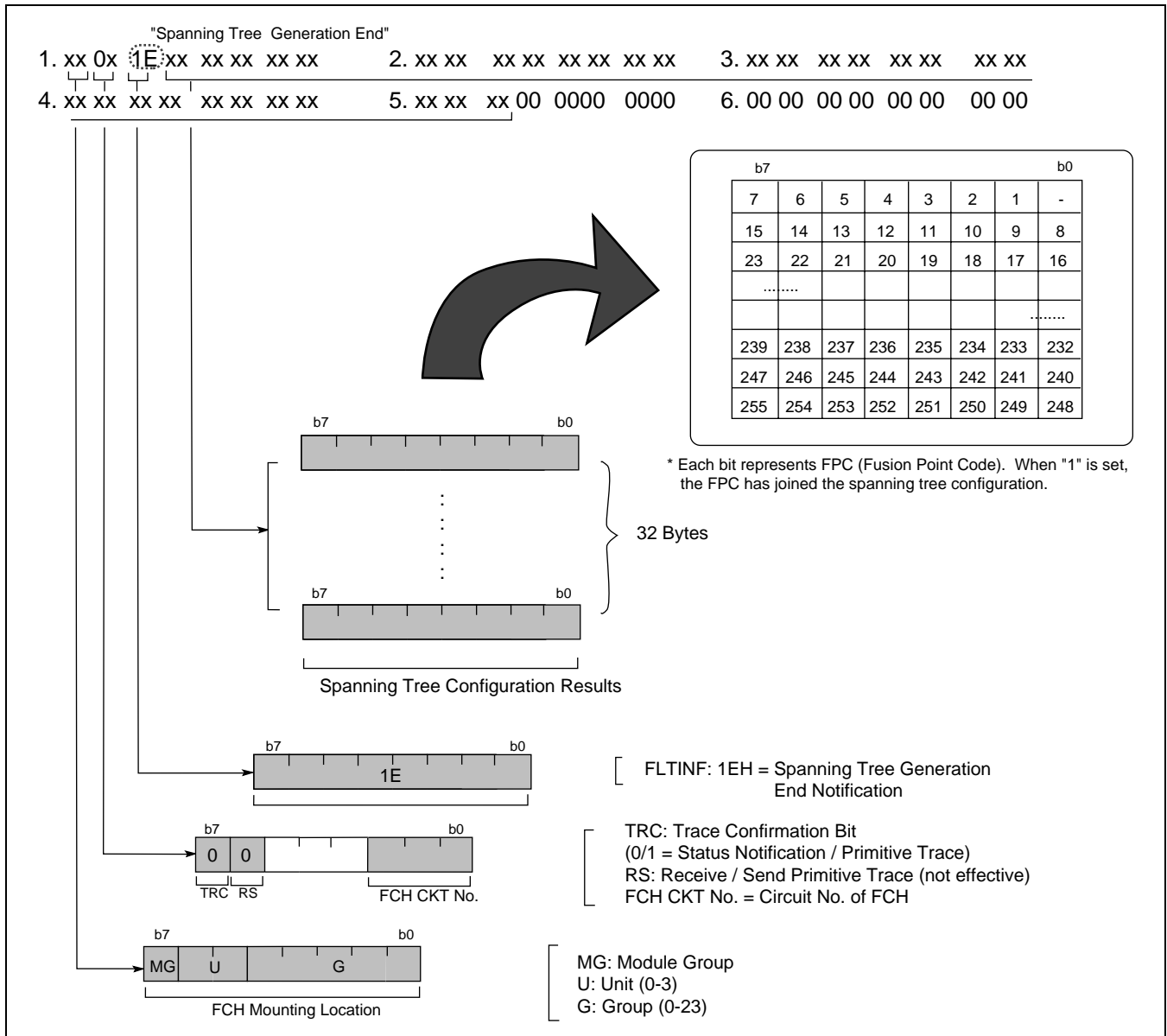


Figure 7-21 23-U FCCH Status Notification - Spanning Tree Generation End

TROUBLESHOOTING

23-U FCH Status Information

9.5 FLTINF = 1FH Spanning Tree Generation Start

This message is displayed when Spanning Tree Generation starts.

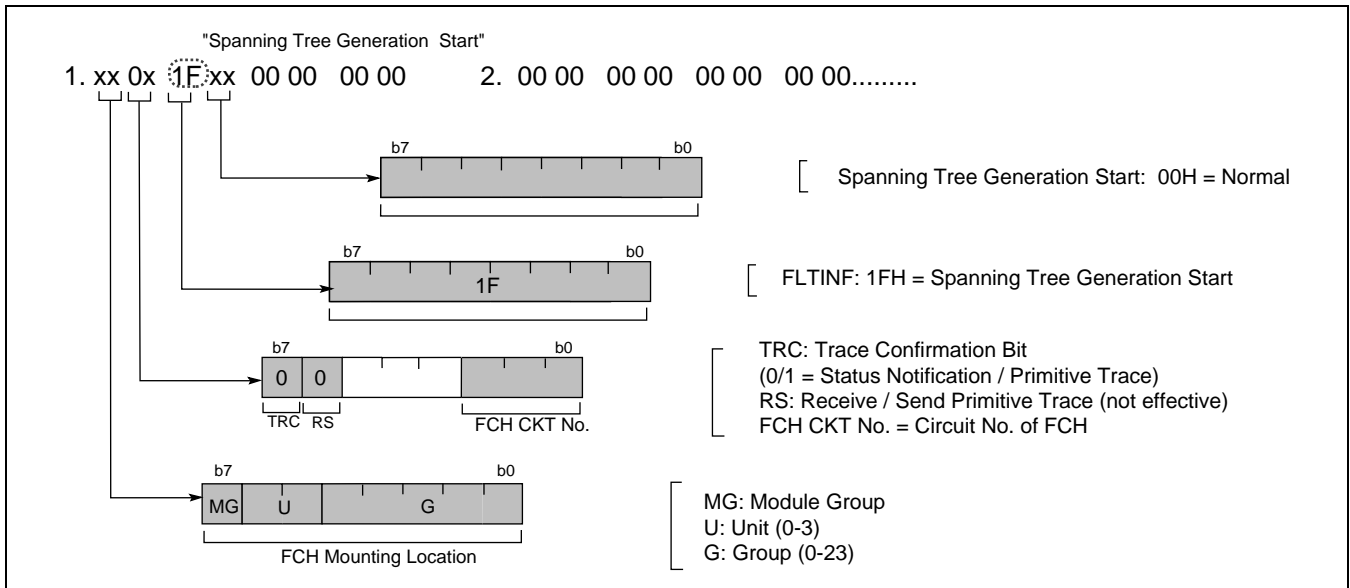


Figure 7-22 23-U FCCH Status Notification - Spanning Tree Generation

9.6 FLTINF = 85H Checksum Verification Failure

This message is displayed when Checksum verification has resulted in failure between the PBX and the firm-ware.

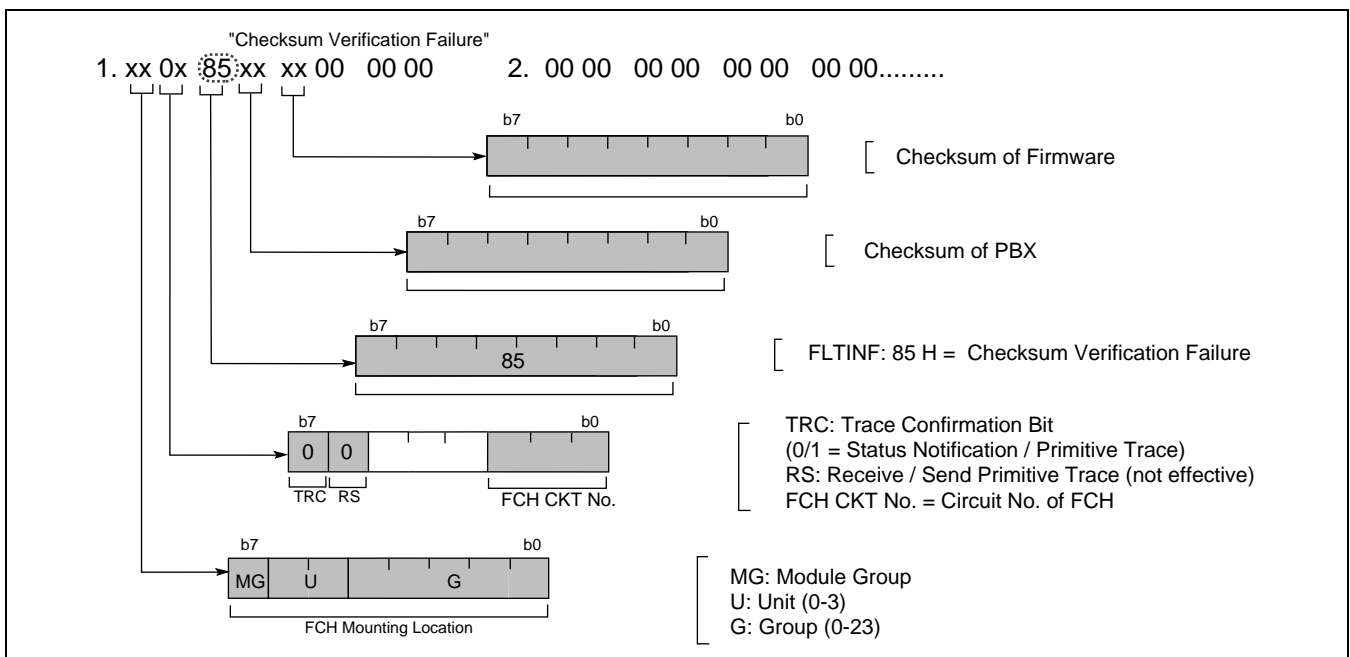


Figure 7-23 23-U FCCH Status Notification - Checksum Verification Failure

10. 23-W FCH Alternate Routing Start Notification

This message is displayed when the indicated FCH card of self-Node becomes inoperative. This message is also displayed when the card is placed in make busy status by MNT 3 switch operation. In addition, when the FCH of the adjacent node becomes inoperative, this message is displayed.

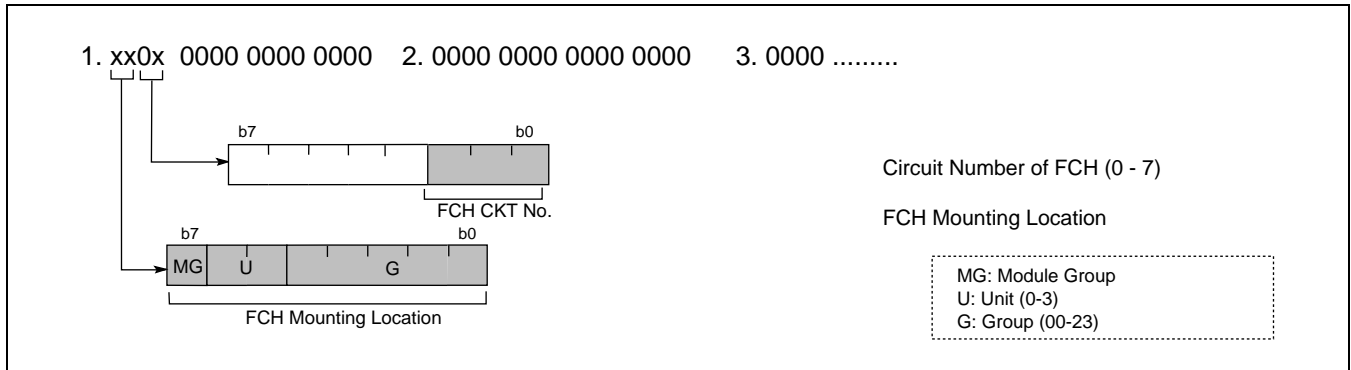


Figure 7-24 23-W FCCH Alternate Routing Start Notification

11. 23-X FCH Alternate Routing End Notification

This message is displayed when an inoperative FCH card of self-Node resumes its operation. Therefore, when the card is placed in make idle status by MNT 3 switch operation, this message is also displayed.

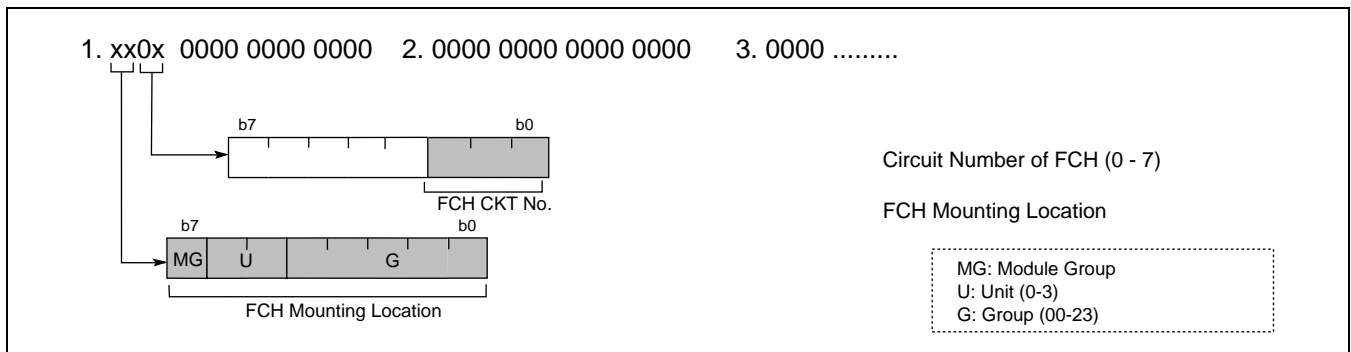


Figure 7-25 23-X FCCH Alternate Routing End Notification

This page is for your notes.

CHAPTER 8 EX- FCCS

1. General

This feature provides the following functions (they are activated when connecting multiple Fusion networks) or a NEAX2000 IVS² system to a Fusion Network using the Enhanced CCIS feature. The network connected by EX-FCCS function is referred as EX-FCCS Network in this manual. The network connected via Enhanced CCIS function is referred to as Enhanced CCIS network in the manual.

1. Number Portability *See Section 3.1 “Number Portability”.*

The Telephone Number data in a Fusion Network can be moved to another different Fusion Network by a simple command operation from the sole Centralized-MAT in multiple Fusion Networks connected through EX-FCCS link or Enhanced CCIS link. See “Centralized Maintenance ([Centralized-MAT for EX-FCCS](#))” for explanation of the Centralized-MAT.

2. Centralized Maintenance ([Centralized-MAT for EX-FCCS](#))

See Section 3.2 “Centralized-MAT for EX-FCCS”

All nodes (NEAX2400 IMX system) in the multiple Fusion Networks and NEAX2000 IVS² systems connected through Enhanced CCIS link can be maintained from one MAT. The MAT used for Centralized Maintenance is called as “Centralized-MAT for EX-FCCS”.

3. Inter-network service equivalent to CCIS features

For details of CCIS features activated through EX-FCCS networks and Enhanced CCIS networks, see [3.3 “CCIS Features Activated with EX-FCCS”](#).

For the basic operation or the data programming for NEAX2000 IVS², see other manuals specified the NEAX2000 IVS² system.

2. EX-FCCS Network Configuration

2.1 Network Configuration

The summary of network configuration classified into two types are shown in Table 8-1. See Table 8-1 in conjunction with Figure 8-1 for easy understanding of network configuration. The following items and sections explain more details.

Table 8-1 EX-FCCS Network Type Classification

× : Available

TYPE	CONNECTION TYPE		A MAXIMUM NUMBER OF TELEPHONE NUMBER	SERVICE		CENTRALIZED FUNCTION		
	IMX to IMX	IVS ² to IMX		IMX to IMX	IVS ² to IMX	MAINTENANCE	BILLING	MCI
1	FCCS	Enhanced CCIS	120,000	FCCS service	CCIS service	×	×	×
2	EX-FCCS	Enhanced CCIS	120,000	CCIS service	CCIS service	×	×	×

Note: [Hardware Configuration]

For IMX to IMX connection type, both FCH and CCH cards are available.

For IVS² to IMX connection type, FCH card is not available. Use CCH card.

*PA-SC18 (CCH) card is not available for the EX-FCCS network establishment.

There are two connection types.

- (1) NEAX2000 IVS² to NEAX2400 IMX connection (Enhanced CCIS)
- (2) NEAX2400 IMX to NEAX2400 IMX connection (EX-FCCS)

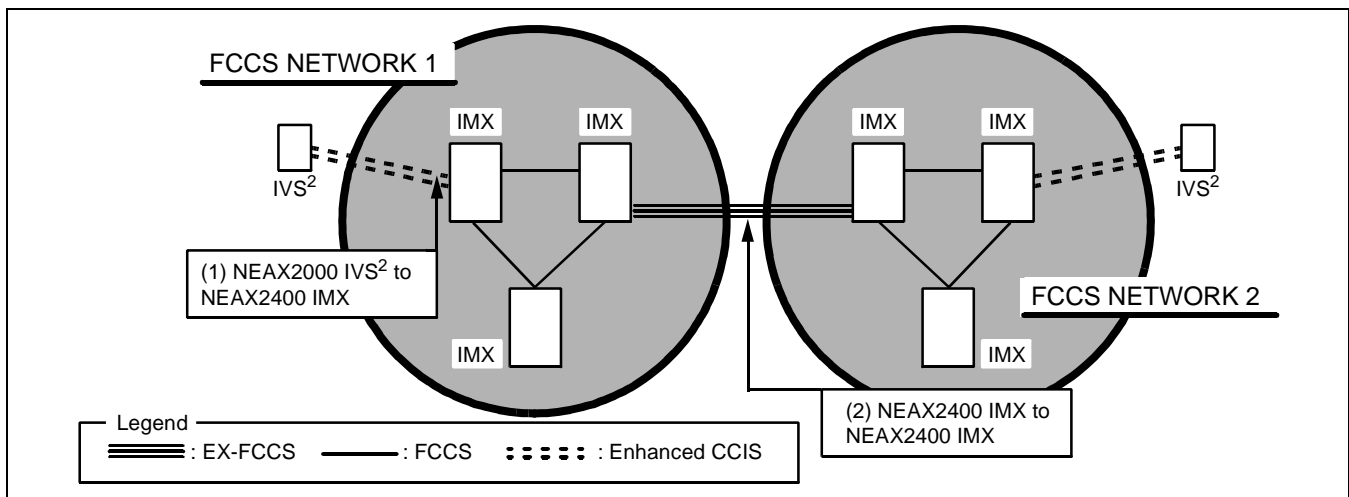


Figure 8-1 Network Connection Type

2.2 Conditions for Network Establishment (NEAX2000 IVS² to NEAX2400 IMX Connection)

Conditions for connecting the NEAX2000 IVS² to NEAX2400 IMX are described below.

1. All IVS² systems must be directly connected to an IMX. See [Figure 8-2](#).

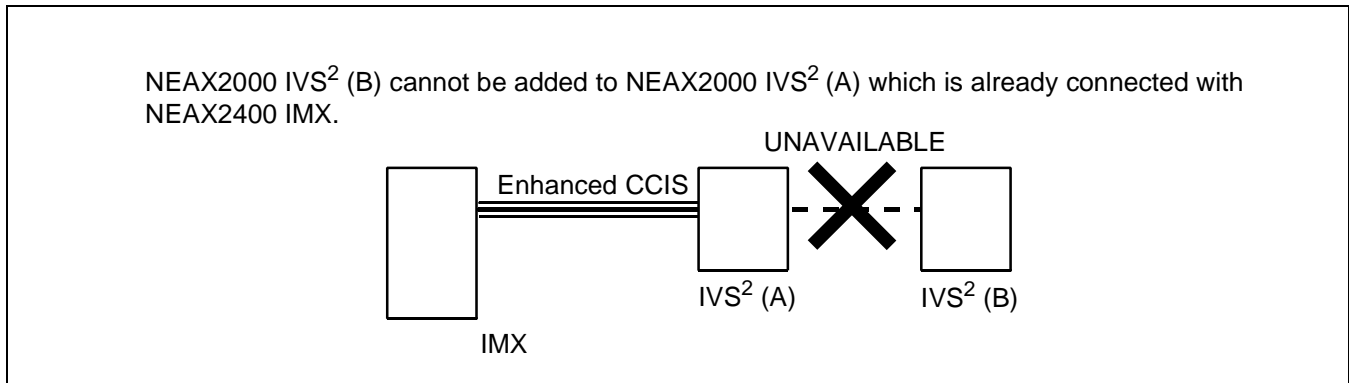


Figure 8-2 NEAX2000 IVS² to NEAX2400 IMX Connection

2. The number of logical routes available (899) in the FCCS network is reduced by one for every route provide in the NEAX2000 IVS² when connected via Enhanced CCIS.

Note: *The above is a condition of data assignment in the NEAX2400 IMX system. The NEAX2000 IVS² system accommodates up to 255 nodes (including NEAX2400 IMX and NEAX2000 IVS² systems). The number of point codes assignable in the NEAX2000 IVS² system is a maximum of 255, including Enhanced CCIS networks.*

3. When directly connecting a NEAX2000 IVS² to a NEAX2400 IMX, one signal channel may support multiple voice routes. However, when the Enhanced CCIS function is provided with EVENT BASED-CCIS, a signal route must be provided per voice route.

2.3 Conditions for Network Establishment (NEAX2400 IMX to NEAX2400 IMX Connection)

Conditions for establishing a FCCS network (NEAX2400 IMX to NEAX2400 IMX) are shown below.

1. Each Fusion Network can accommodate a maximum of 253 network IDs.
2. Each Fusion Network can accommodate a maximum of 899 logical routes.
3. The NCN and NDM exist individually in each Fusion Network.

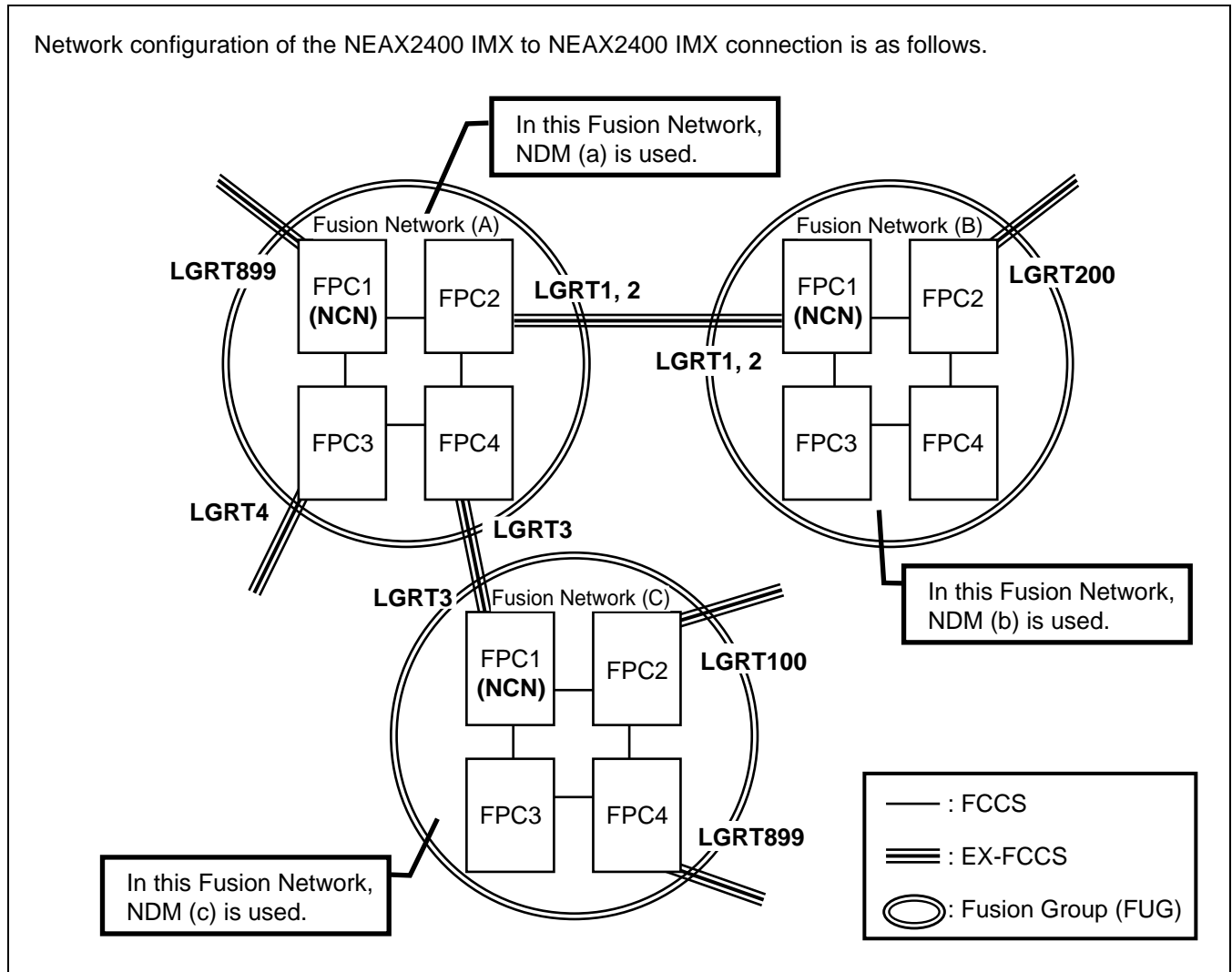


Figure 8-3 NEAX2400 IMX to NEAX2400 IMX Connection

2.4 Fusion Network Group (FUG)

[Fusion Network Group (FUG)]

When connecting multiple Fusion networks using EX-FCCS, a Fusion Network group number is required to distinguish different Fusion Network groups. A Fusion Network Group is called as “Fusion Group (FUG)”. A maximum of 4 FUGs can be connected via EX-FCCS.

[Center Fusion Group (Center FUG)]

Identify the Center Fusion Group (Center FUG) from the FUGs in the EX-FCCS network. This is the sole node allowed to assign or delete Telephone Numbers within the self FUG and the other FUG.

1. An EX-FCCS network may consist of FUGs (connected via EX-FCCS) and NEAX2000 IVS² systems (connected via Enhanced CCIS). All FUGs must be connected to the Center FUG within a range of 1 or 2 EX-FCCS links or 1 or 2 Enhanced CCIS links from the Center FUG. In order for an end-to-end connection to be established, no more than 4 EX-FCCS or Enhanced CCIS links may be used. See [Figure 8-4](#).

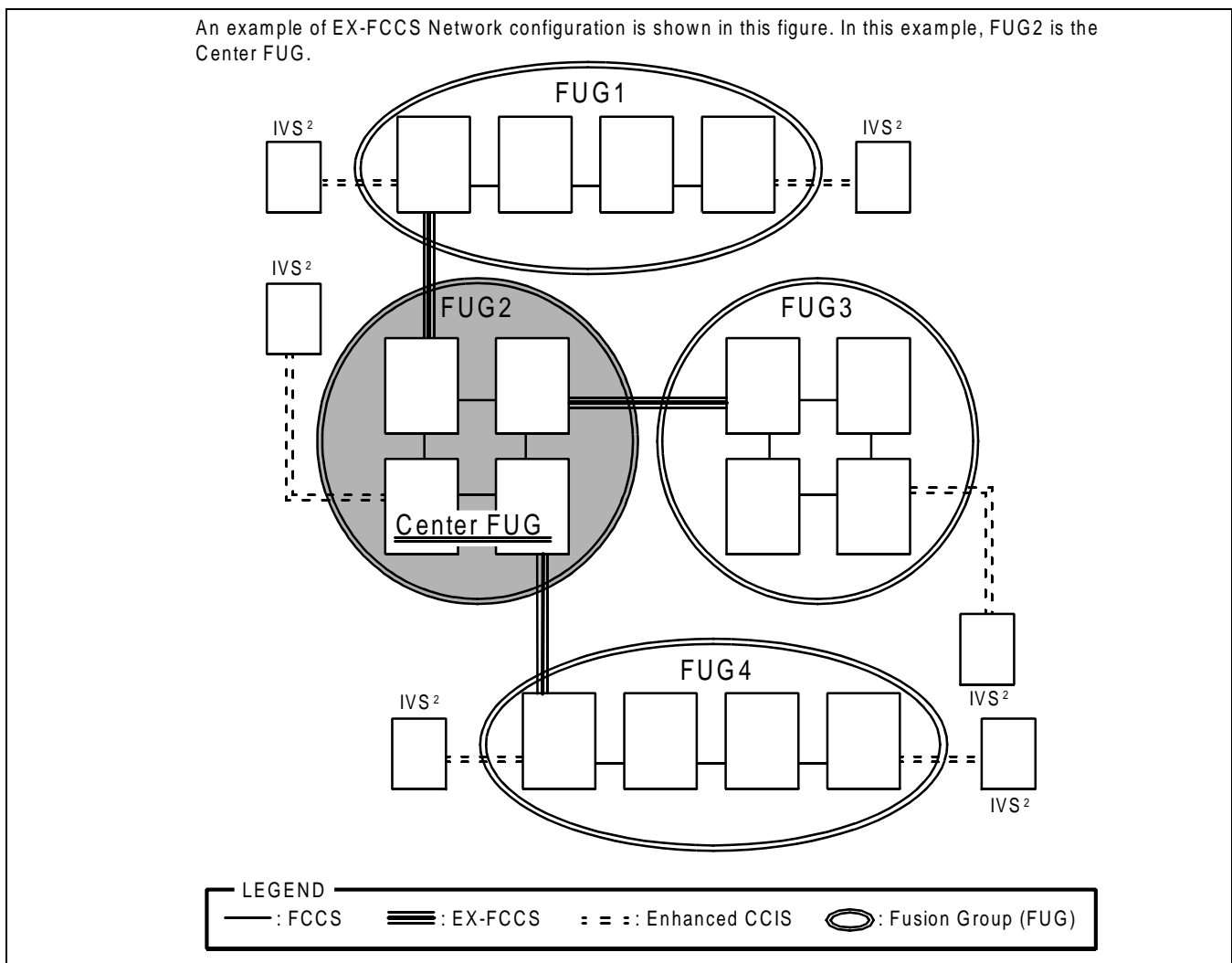


Figure 8-4 Allowable SPAN from the Center FUG

2.5 Interactions

1. Conditions for PS Service

Roaming and Hand-over feature cannot be activated between FUG-FUG in an EX-FCCS network and FUG-IVS² in an Enhanced CCIS network. To execute roaming service, connect other Q.931a/IS-11572 lines.

2. Conditions for OAI/ACD Service

The OAI/ACD service in EX-FCCS Network is executed on the same condition in CCIS Network.

3. EX-FCCS Features

3.1 Number Portability

[Operating Procedure]

1. Log in to the NCN of the Center FUG from the Centralized-MAT for EX-FCCS.
2. Assign the Telephone Number data using AELGN command. The new data is automatically copied to the NDM in the self-FUG and the other FUG in an EX-FCCS network. AELGN command is also used to delete or change Telephone Number data in addition to assignment.

Note 1: *AELGN command is used to operate Number Portability for Telephone Numbers used in NEAX2400 IMX systems. For the NEAX2000 IVS² system, several commands are required for assignment. For details, see related NEAX2000 IVS² manuals.*

Note 2: *When logging in to the node other than the NCN of the Center FUG (LN in Center FUG or LN/NCN in other FUGs), only reading out the AELGN command data is available.*

Note 3: *If the center FUG group is not "0" and FUG no. "0" is assigned to another group, AELGN command data assignment is available for the node to be logged in only.*

[Service Conditions]

1. A closed numbering network is recommended for numbering plan of the EX-FCCS network.
2. Only Telephone Number (max. 8 digits) is allowed for the extension number used in an EX-FCCS network.

3. The node that requires the data programming or data change for Number Portability depends on the pattern. See [Figure 8-5](#) and [Table 8-2](#) that explain the eight patterns.

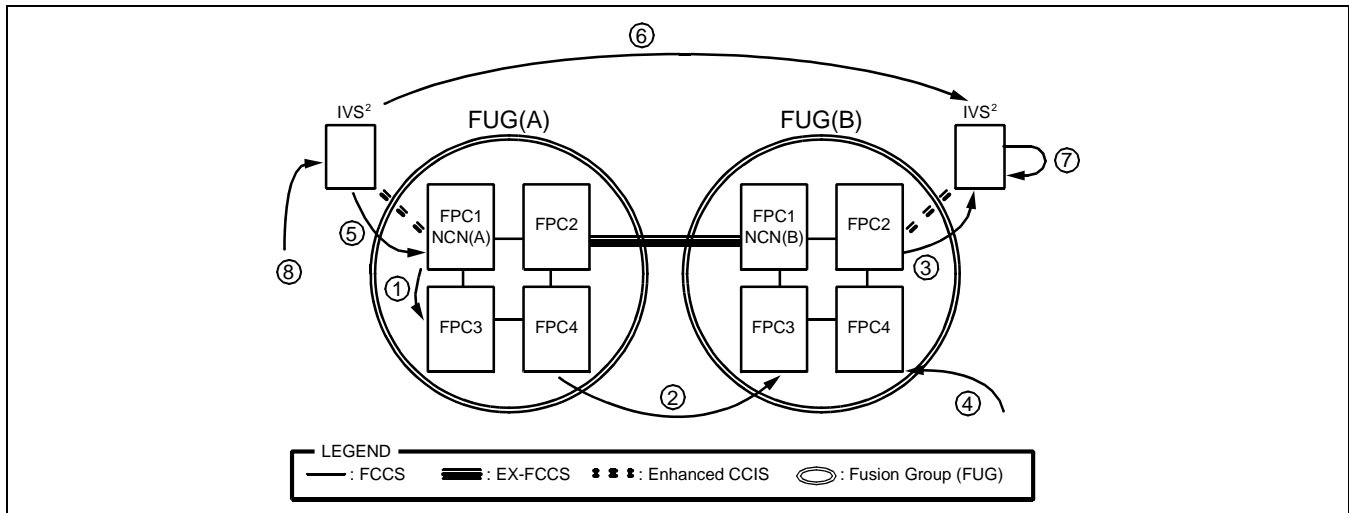


Figure 8-5 Patterns of Number Portability

Table 8-2 Patterns of Number Portability

NO.	PATTERN (Telephone Number is moved from A to B)	NODE REQUIRED DATA CHANGE
①	Moving a number within the same FUG	NCN in Center FUG
②	Moving a number in an FUG to another FUG	NCN in Center FUG
③	Moving a number in a FUG to a NEAX2000 IVS ²	NCN in Center FUG + NEAX2000 IVS ² Note 1
④	Adding a new number to an FUG	NCN in Center FUG + NEAX2000 IVS ² Note 2
⑤	Moving a number in a NEAX2000 IVS ² to an FUG	NCN in Center FUG + NEAX2000 IVS ² Note 3
⑥	Moving a number from a NEAX2000 IVS ² to another NEAX2000 IVS ²	NCN in Center FUG + a NEAX2000 IVS ² Note 3 + another NEAX2000 IVS ² Note 1
⑦	Moving a number within the same NEAX2000 IVS ²	NEAX2000 IVS ² Note 1, Note 3
⑧	Adding a new number in an NEAX2000 IVS ²	NCN in Center FUG + NEAX2000 IVS ² Note 1

Note 1: Destination node

Note 2: Node to be connected to the FUG where the new number is added

Note 3: Node where Telephone Number is located before the Number Portability activation

4. Telephone Numbers used in the other FUG and the connected NEAX2000 IVS² system are managed in the new table in NDM (the table differs from the existing table for Telephone Numbers used in self FUG).
- (a) Telephone Number data in a NEAX2000 IVS² is managed in the NDM of NCNs within all FUGs and the NEAX2000 IVS².
 - (b) Telephone Number data in a NEAX2400 IMX is managed in the NDM of NCN within all FUGs.

5. Up to a maximum of 120,000 Telephone Numbers may be assigned in the entire Enhanced CCIS/EX-FCCS network (including Telephone Numbers in the NEAX2000 IVS²) and a maximum of 48,000 per FUG (not to exceed 120,000 per total network).

3.2 Centralized-MAT for EX-FCCS

[Centralized Maintenance]

(a) NEAX2000 IVS²

1. MAT software for NEAX2400 IMX system and NEAX2000 IVS² system are installed on a PC called the "MAT." Depending on the system logged into determines the MAT software used.
2. To log in the NEAX2000 IVS² system, Point Code of the system is designated.
3. See the manual describing NEAX2000 IVS² for the method of checking the log-in user.
4. The data transmission speed between NEAX2000 IVS² and NEAX2400 IMX may be a maximum of 64Kbps since the CCH card is used.

(b) NEAX2400 IMX

1. All systems in the EX-FCCS network can be maintained by one MAT.
2. To log in to the NEAX2400 IMX system, assign FUG no. to designate the desired Fusion Network Group (FUG) and FPC to designate the desired node in the FUG.
3. The user ID and password written in the NDM of each FUG is checked when logging into the NEAX2400 IMX. This data is programmed using the AUIDN command.
4. When any of the conditions below are met, the MAT is logged into the node designated by the FPC, but within the FUG where the MAT is installed regardless of entered FUG no. data.
 - No data is assigned to SELF_ FUG (Fusion Group number in the self-FUG) in AFUGN command.
 - FUG requested by the MAT is 0
 - FUG requested by the MAT is the FUG number of self-FUG
5. The existing system (not NEAX2400 IMX) can not be maintained via the Centralized-MAT for EX-FCCS.
6. Time required for transmitting the 1Mbyte data (1 block of DM) is 2 hours at 64Kbps data speed/1 hour at 128Kbps data speed/15 minutes at 512Kbps data speed.

Note: *The number of MAT to be installed may vary depending on the customer specification (one or two MAT can be used to centralize the MAT operation or three or more MATs can be used to separate the MAT operation).*

EX- FCCS
EX-FCCS Features

[Centralized Traffic Collecting]

1. The feature to collect traffic information of NEAX2000 IVS² system is activated by logging in to the NEAX2000 IVS² node with Centralized-MAT for EX-FCCS using the traffic collecting command dedicated for NEAX2000 IVS² system.
2. For IMX systems, logging in to the NCN of each FUG with Centralized-MAT activates the feature to collect traffic information.

[Centralized System Management Report]

1. This function is controlled by the Centralized-MAT for EX-FCCS only.
2. The Centralized-MAT for EX-FCCS connected to Center Office collects fault information by polling all of the nodes (NEAX2400 IMX and NEAX2000 IVS²).
3. When a fault occurs at a NEAX2000 IVS² system, only basic fault information is collected by the Center Office using the polling method. To collect more detail information, log in to the system where the fault has occurred.
4. The buffer for fault information of the NEAX2400 IMX and NEAX2000 IVS² systems is separate. There are a maximum of 64 buffers per site. Therefore, the fault that occurs when the buffer is full can not be stored at the center system. The center system sends a NACK signal to the system with the fault. After a predetermined time, the system with the fault attempts to resend the information.
5. [Table 8-3](#) shows the controllability of the fault information indication received from the NEAX2000 IVS² system: (1) alarm indication LED of the TOPU, (2) “IMX MAT Menu” displayed on the MAT, (3) DFTD command operation

Table 8-3 NEAX2000 IVS² Fault Information

× : Controllable – : Not controllable

	Connection Method	SMJ/SMN Lamp on TOPU	Menu Display on MAT	DFTD command
IVS ² to IMX	Enhanced CCIS	–	– Note	–
IMX (A) to IMX (B) within an FUG	FCCS	–	×	×
FUG (A) to FUG (B)	EX-FCCS	×	×	×

Note: Available when the alarm grade is changed via ALMG command.

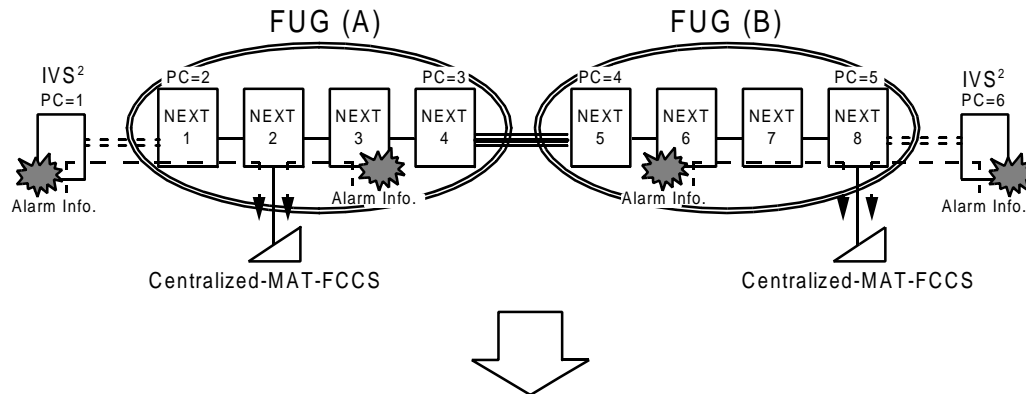
6. The fault information of the NEAX2000 IVS² received at the Center Office is cleared by the RALM/RALMN command.

7. When the fault information occurring at all FUGs is managed by the Centralized-MAT for EX-FCCS, the destination for the output of the fault message must be changed to the designated Center Office (for example, NCN) at each LN (including NEAX2000 IVS² System). See Figure 8-6.

When collecting the fault information of nodes (including the connected NEAX2000IVS²) at each FUG,

[Example Data]

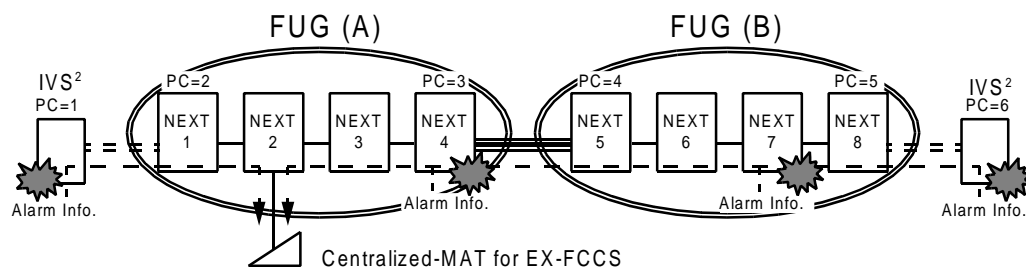
- FUG (A)
PC1- the node of Centralized Management Report-CCIS is PC2
NEXT1,3,4-ASYDL,SYS1,INDEX532 (the CN of Centralized Maintenance-Fusion) is FPC of NEXT2
NEXT2-ASYDL,SYS1,INDEX532 (the CN of Centralized Maintenance-Fusion) is 0
- FUG (B)
PC6- the node of Centralized Management Report-CCIS is PC5
NEXT5~7-ASYDL,SYS1,INDEX532 (the CN of Centralized Maintenance-Fusion) is FPC of NEXT8
NEXT2-ASYDL,SYS1,INDEX532 (the CN of Centralized Maintenance-Fusion) is 0



When collecting the fault information of all FUGs and connected NEAX2000IVS²s at one MAT in FUG (A),

[Example Data]

- FUG (A)
PC1- the node of Centralized Management Report-CCIS is PC2
NEXT1,3,4-ASYDL,SYS1,INDEX532 (the CN of Centralized Maintenance-Fusion) is FPC of NEXT2
NEXT2-ASYDL,SYS1,INDEX532 (the CN of Centralized Maintenance-Fusion) is 0
- FUG (B)
PC6- the node of Centralized Management Report-CCIS is PC3
NEXT6-8-ASYDL,SYS1,INDEX532 (the CN of Centralized Maintenance-Fusion) is FPC of NEXT5
NEXT5-ASYD,SIS1,INDEX184 and 185 (the node of Centralized Management Report-CCIS) is PC3
ASYDL,SYS1,INDEX532 (the CN of Centralized Maintenance-Fusion) is 0



LEGEND
 - - - : FCCS ≡ : EX-FCCS = = : Enhanced CCIS ○ : Fusion Group (FUG) ✶ : Alarm Occurrence

Figure 8-6 Centralized Maintenance - EX-FCCS

EX- FCCS

EX-FCCS Features

3.3 CCIS Features Activated with EX-FCCS

1. CCIS features in [Table 8-4](#) are available in EX-FCCS network.

Table 8-4 CCIS Service in EX-FCCS Network

FEATURE CODE	FEATURE NAME	NETWORK CONFIGURATION	
		without NEAX2000 IVS ²	with NEAX2000 IVS ²
A-44	ASYNCHRONOUS DATA SWITCHING - CCIS	×	
A-45	ATTENDANT CAMP-ON WITH TONE INDICATION - CCIS	×	× Note 1
B-9	BUSY VERIFICATION - CCIS	×	× Note 1
C-44	CALL BACK - CCIS	×	× Note 1
C-45	CALL FORWARDING-ALL CALLS - CCIS	×	×
C-46	CALL FORWARDING-BUSY LINE - CCIS	×	×
C-47	CALL FORWARDING-DON'T ANSWER - CCIS	×	×
C-50	CALL TRANSFER-ALL CALLS - CCIS	×	×
C-52	CALLING/CALLED NUMBER DISPLAY - CCIS	×	× Note 2
C-54	CALL TRANSFER-ATTENDANT - CCIS	×	× Note 1
C-55	CENTRALIZED BILLING - CCIS Note: <i>Message Format is the same as before.</i>	×	× Note 1
C-56	CENTRALIZED DAY/NIGHT MODE CHANGE - CCIS	×	× Note 1
C-57	CENTRALIZED SYSTEM MANAGEMENT REPORT - CCIS	×	×
D-68	DATA PRIVACY ON DEMAND - CCIS	×	
D-71	DIAL ACCESS TO ATTENDANT - CCIS	×	× Note 1
D-72	DIGITAL DISPLAY-STATION - CCIS	×	
D-74	DIRECT-IN TERMINATION - CCIS	×	×
D-75	DISTINCTIVE RINGING - CCIS	×	×
D-76D	DO NOT DISTURB-D ^{term} - CCIS	×	×
E-8	EXECUTIVE RIGHT-OF-WAY - CCIS	×	
H-12	HOTLINE - CCIS	×	×
M-34	MESSAGE REMINDER - CCIS	×	
M-34D	MESSAGE REMINDER-D ^{term} - CCIS	×	
M-38	MISCELLANEOUS TRUNK RESTRICTION - CCIS	×	
N-37	NAME DISPLAY - CCIS	×	×
S-52	SERIAL CALL - CCIS	×	
S-53D	SERVICE DISPLAY-D ^{term} - CCIS	×	
S-57	STATION-TO-STATION-CALLING - CCIS	×	×
S-59	STEP CALL - CCIS	×	
S-60	SYNCHRONOUS DATA SWITCHING - CCIS	×	
S-73	SUPERVISORY CALL - CCIS	×	
T-26	TOLL RESTRICTION-3/6DIGIT - CCIS	×	
V-7	VOICE CALL - CCIS	×	×

Note: Telephone Numbers should be used for activating CCIS services through the network.

Note 1: This feature is available on the condition that the NEAX2000 IVS² is the satellite office.

Note 2: This feature is available for calling number display only

2. Unique PCs (Point Codes) in the CCIS network connected with EX-FCCS are required.

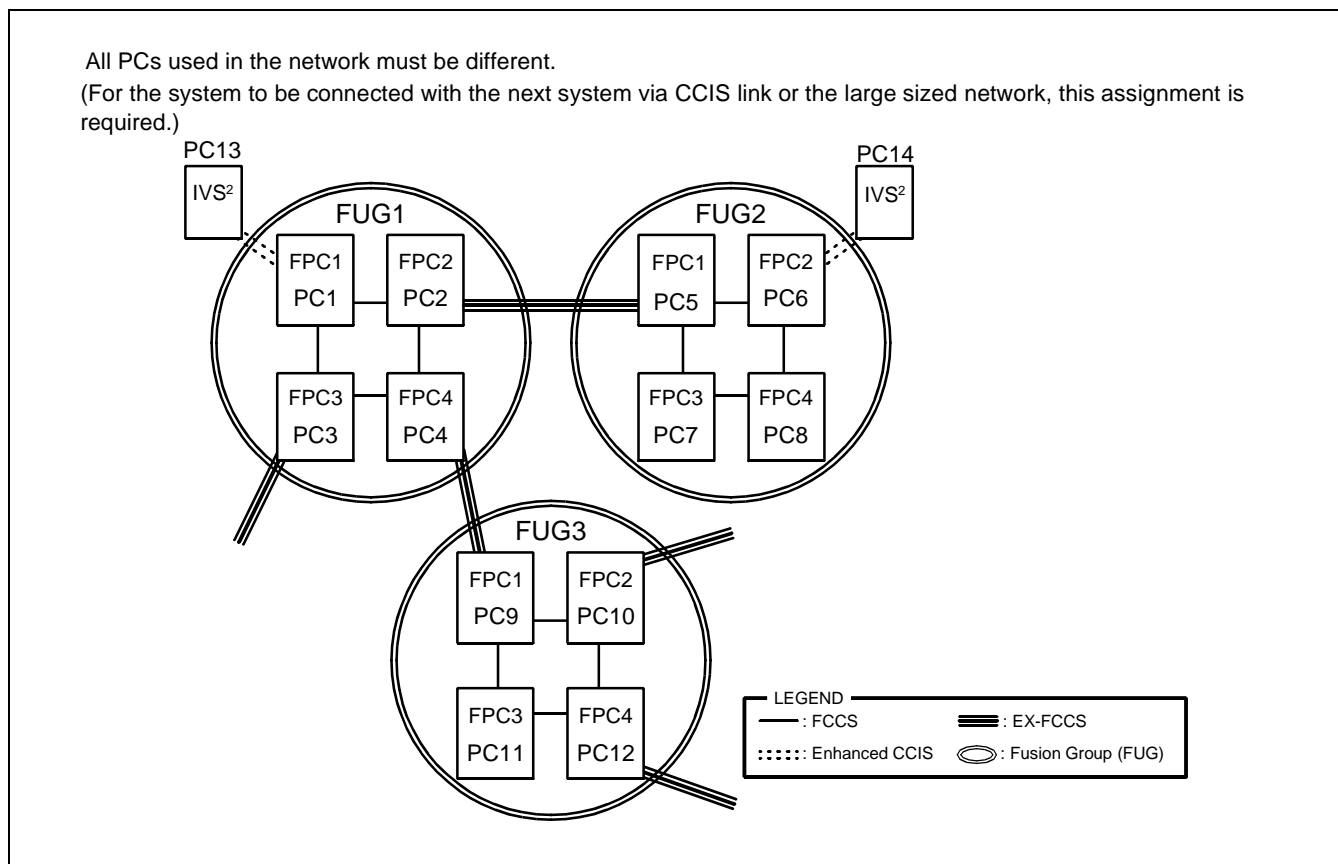


Figure 8-7 PC Assignment in EX-FCCS Network

3. The CCH to be used is selected as follows.
- 1) when the call is processed using the speech line (Bch), the outgoing/incoming route, Logical Route (LRT), decides CCH.
LRT → PC → CSCG → CCH
 - 2) when the call is processed without speech line (Bch) - inter-office service such as CALL BACK, MESSAGE WAITING service, MCI, etc., the called party's number or PC of the destination decides CCH.
 - (a) the called party's number → LRT → PC → CSCG → CCH
 - (b) PC → CSCG → CCH
 - 3) when logging into NEAX2000 IVS² or remote FUG from the Centralized-MAT, PC of the node to be logged in decides CCH.
 - (a) NEAX2000 IVS²
PC → CSCG → CCH
 - (b) Remote FUG
FUG+FPC → PC → CSCG → CCH
*FUG and FPC to be designated for log-in are converted automatically within the system.

3.4 Centralized Message Center Interface - EX-FCCS

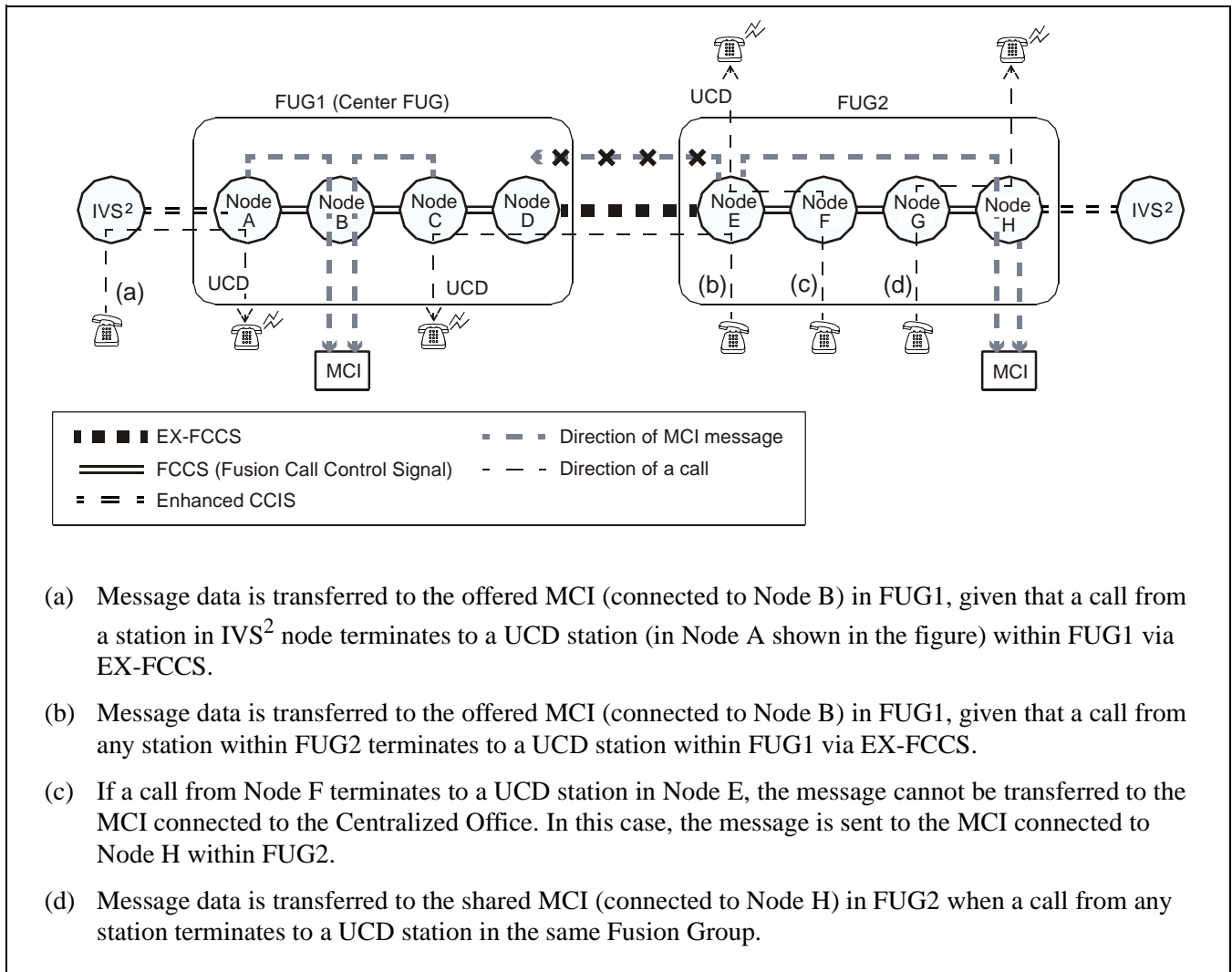
This section explains the conditions of Centralized Message Center Interface feature within EX-FCCS Network. This feature provides an interface to the external CPU for Message Center (MC) information when a specified UCD group in the network is called. This interface allows external control of Message Waiting Lamp (MWL) indications on equipped PBX stations.

Note: *Calls terminated to a UCD hunt group within a FUG will output MCI data to the Centralized MCI output port for that FUG if assigned. Each FUG that requires a message center interface must have a message center interface assigned within the FUG,*

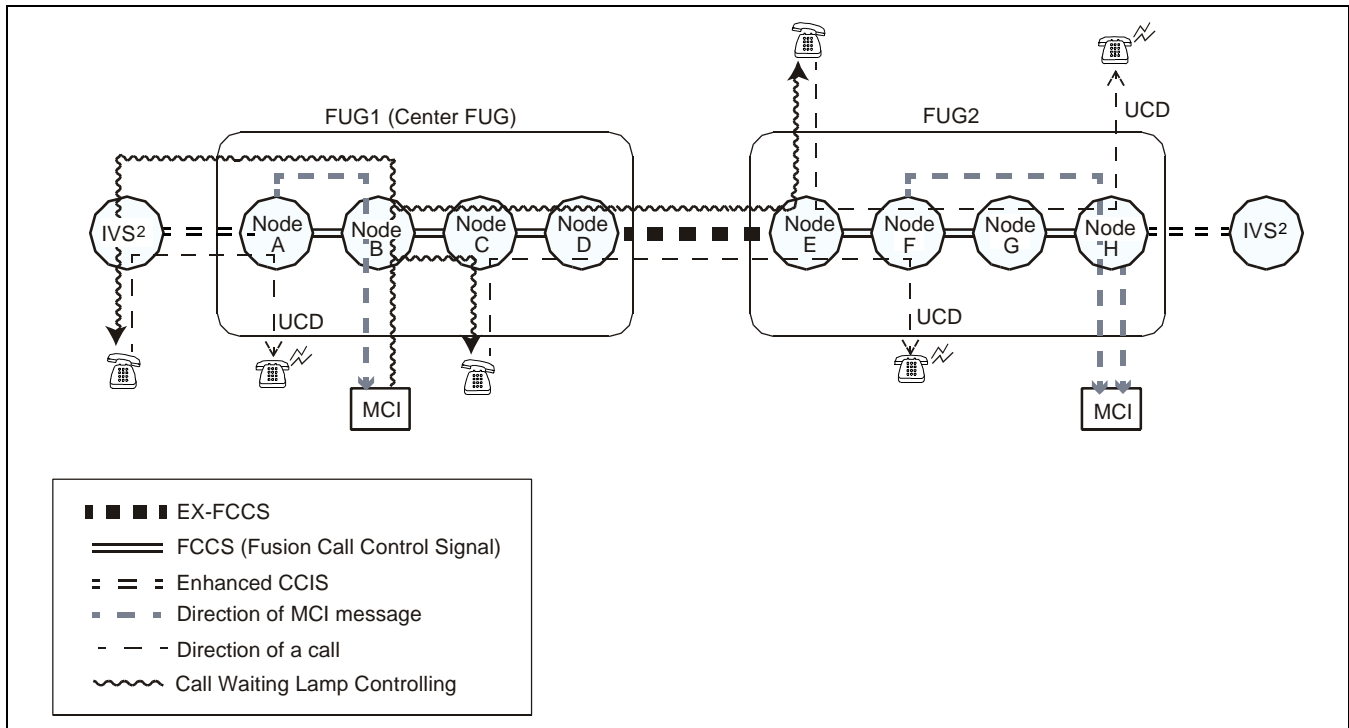
- The number of digits to be indicated for MCI message (in case 7 or 8-digit Telephone Number is used) is determined by the following system data.
ASYD SYS1, INDEX246, b3. Maximum valid number of MCI digits is, 0/1=6 digits/8 digits.

Note: *MCI equipment must be able to support 8-digit numbers.*

- Centralized MCI feature is activated by assigning MCI equipment and UCD group at Centralized Office for the specific FUG. (MCI message cannot be transferred to the Centralized Office via EX-FCCS.)



- Call Waiting Lamp Control information is sent from the MCI within Center FUG to other Fusion Groups and NEAX2000 IVS² system via CCIS.



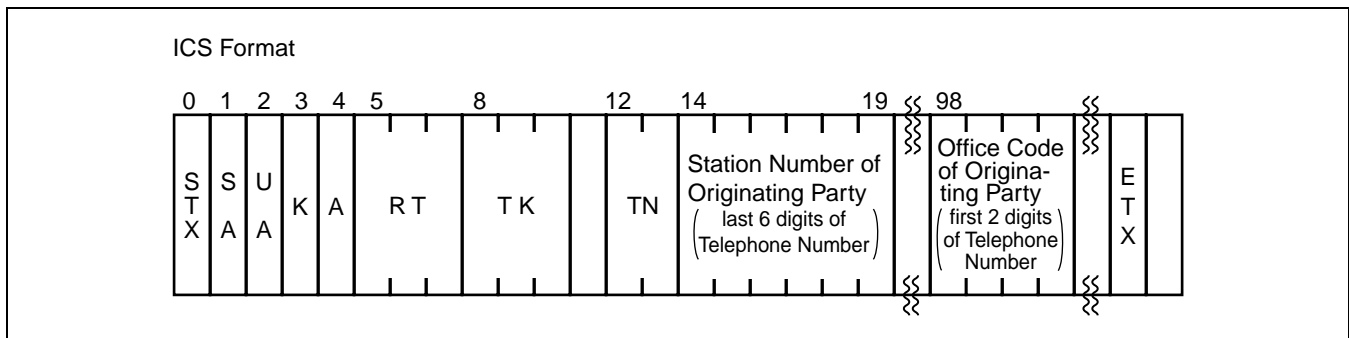
- When the Centralized Office adopts the ICS MCI format method, the receiving message field is output as it is. When in the IMX MCI format method, the originating information field is also output to Telephone Number field.

3.5 Centralized Billing - EX-FCCS (Polling Method)

This section explains the conditions of Centralized Billing feature within EX-FCCS Network.

- Two methods of administering Centralized Billing information are available: either the CCIS billing method or the FCCS billing method.
- When a 7-digit or 8-digit EX-FCCS Telephone Number is used in the network, for the NEAX2000 IVS² system, the EX-FCCS Telephone Number is output to Station Number field and the Office Code field of the originating party.

As Telephone Number is not used in ICS text format, when 7 or 8 digits Telephone Number is used in the network, the number is converted to Office Code and Station Number, then the Station Number is output to Station Number field of originating party, and the Office Code is output to Office Code field of originating party.



- When the Centralized Billing Office adopts the CCIS billing method, receiving message field is output as it is.
- When the Centralized Billing Office adopts the Fusion billing method, the information field of originating call is also output to Telephone Number field.

4. Data Programming

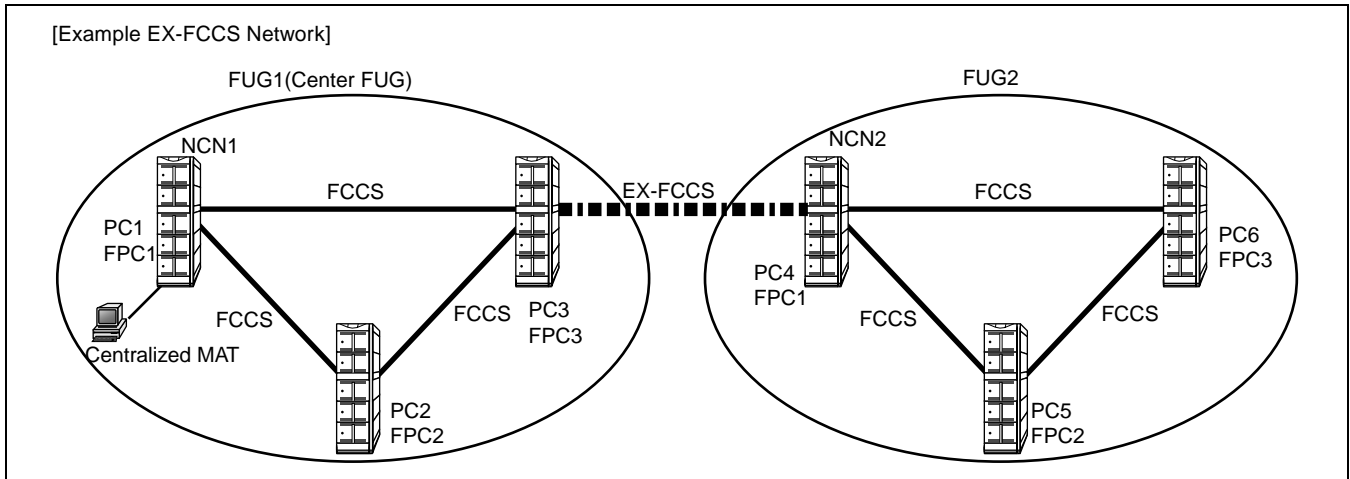
This section explains how to assign a brand-new EX-FCCS network data.

There are some conditions for data programming to be required for EX-FCCS.

1. When connecting a stand-alone NEAX2400 IMX, non-fusion system (via EX-FCCS) or a NEAX2000 IVS² using Enhanced CCIS feature to an existing FUG:
 - (a) The system must be the NCN.
 - (b) The system is programmed as the Fusion Network configured by one NCN only.
 - (c) Use the NDM of the system to program the network data.
2. When connecting the NEAX2400 IMX system and the NEAX2000 IVS² system, CIC (Circuit Identification Code) =1 should always be assigned using ACIC2 command.
3. ACSCL command data (CCH location per CSCG) must be programmed against the PC of the connected NEAX2400 IMX or NEAX2000 IVS² system using ACIC1 command.

4.1 Brand-new EX-FCCS Network

To install EX-FCCS network as a brand-new system between two Fusion Groups (when no CCIS data has been assigned), the overall data programming procedure is as follows.



4.1.1 To Log in to All Nodes in EX-FCCS Network

Assign the following system data for all the nodes in the network. According to the condition of each node, perform necessary data programming as follows.

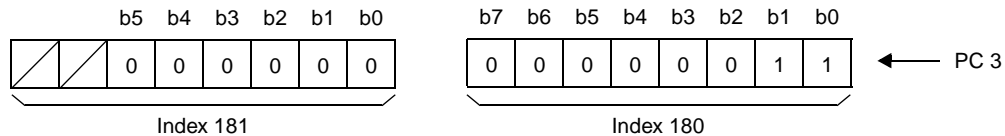
<Node which accommodates CCIS Trunk (PC3 in the example)>

STEP 1: ASYD

Assign the Point Code for all the Nodes in the network uniquely. Since Point Code is used to identify each office in the EX-FCCS network, any identical PCs are not allowed in the same network.

Originating Point Code (OPC) assigned by Indexes 180 and 181:

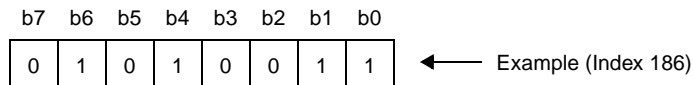
The OPC is a self-office code, which should be assigned without exception. 14 bits can be used for specifying OPC. Note that available PC ranges from 1 to 16367 (PCs 16368~16383 are used for Loop Back Test). FPC3 in FUG1 whose OPC is 3, for example, should be assigned as follows.



Miscellaneous Data

Index 186:

b6 must be assigned as 1 (CCIS is in service). The remaining data should be determined depending on customer's requirements.



STEP 2: ARTD

Assign the following three routes for this feature:

- Speech Path Route (Traffic Route)
- Signaling Route
- Dummy Route (Flag Route)

Assign each route data in accordance with the table shown below. Note that data assignment in this table is a typical example.

Route	CDN												
	2	4	5	6	7	8	13	15	28	30	43	49	50
Speech	2	2	3	4	1	2	0	12	1	0	1	0/1	1
Signaling	2	2	0	4	1	0	0	13	0	7	0	0	0
Dummy	0	0	0	4	1	0	1	0	0	0	0	0	0

The other data than above should be set "0" (default data).

STEP 3: ATRK

Assign the LENs data of the trunks. See [Figure 8-8](#).

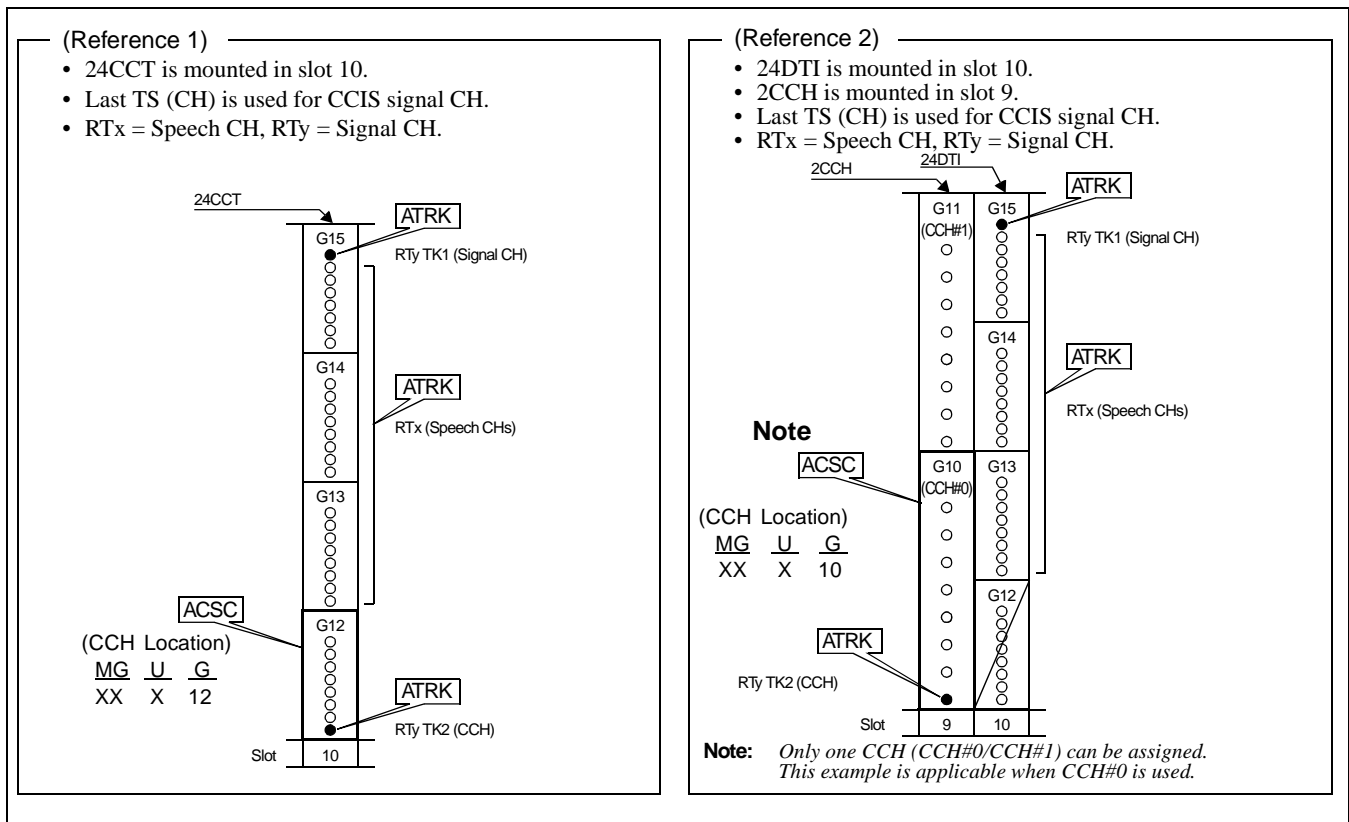


Figure 8-8 Port Allocation and Related Command for CCIS Trunk

EX- FCCS

Data Programming

STEP 4: MBTC

Assign IDLE status of trunks by designating Route Number and Trunk Number.

STEP 5: ADPC

Assign the destination PC (Point Code) on RT (for speech path) number basis for all the nodes in the EX-FCCS network.

STEP 6: ACSC

Assign the location of the CCH in CSCG (Common Channel Signaling Controller Group).

Assign the location of the CCH using the ACSC command. The following is sample data assignment. In this sample, PC 3 is equipped with three DTI cards. Note that if the system employs one CCIS link, enter the same data in CSCG130 and CSCG131.

CSCG	MG	U	G	CICG	
130 (Basic/ Primary Route)	AA	A	AA	0	← CCH 0
	BB	B	BB	1	
	BB	B	BB	2	
	BB	B	BB	3	
	BB	B	BB	4	← CCH 1
	BB	B	BB	5	
	BB	B	BB	6	
	BB	B	BB	7	

CSCG	MG	U	G	CICG	
131 (Alternate Route)	CC	C	CC	0	
	CC	C	CC	1	
	CC	C	CC	2	
	CC	C	CC	3	
	CC	C	CC	4	← CCH 2
	CC	C	CC	5	
	CC	C	CC	6	
	CC	C	CC	7	

Note 1: In the case of actual data entry, enter corresponding LEN numbers instead of letters such as “AAAAA”.

Note 2: Refer to [Figure 8-8 “Port Allocation and Related Command for CCIS Trunk”](#).

STEP 7: ACIC1

Assign CSCG for Basic/Primary Route. The odd numbered CSCG for Alternate Route assignment.

PC	CSCG
4	130

STEP 8: ACIC2

Assign CICs (Circuit Identification Codes) corresponding to trunk number. Although trunk number and the CIC may not be identical, the same CIC must be given to one speech line between two nodes as illustrated in Figure 8-9. Be sure to assign PCs of all the nodes in the EX-FCCS network corresponding to ADPC/ACIC1 command.

Relationship between CICG and CIC

PC	CIC	LEN					
4	1	X	X	X	X	X	X
	2	X	X	X	X	X	X
	N	X	X	X	X	X	X

CICG	CIC (1 ~ 999)					
0	8	16	24	-	992	
1	1	9	17	25	-	993
2	2	10	18	26	-	994
3	3	11	19	27	-	995
4	4	12	20	28	-	996
5	5	13	21	29	-	997
6	6	14	22	30	-	998
7	7	15	23	31	-	999

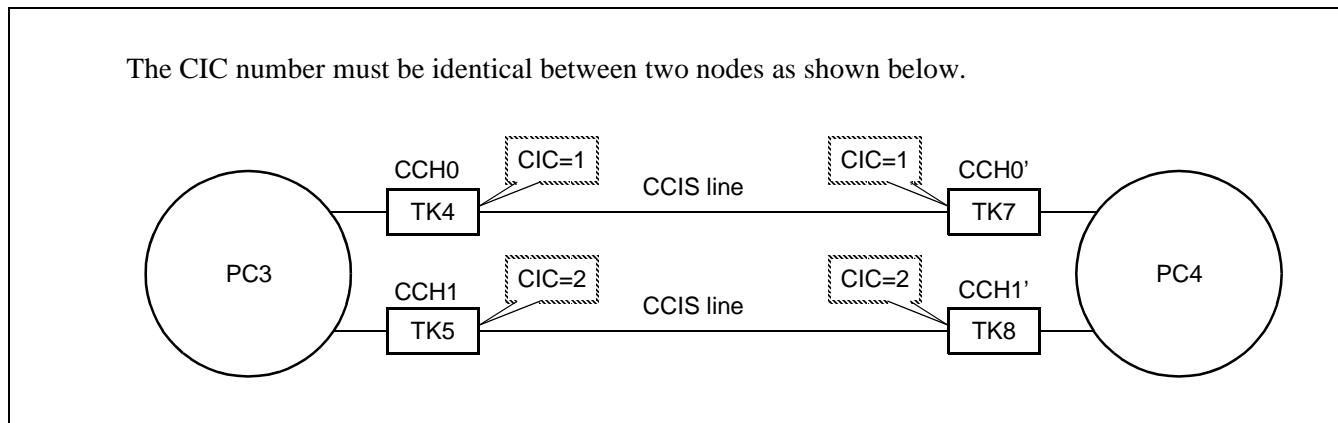


Figure 8-9 CIC Number Assignment

<Node which uses CCIS Trunk via Fusion Link (PC1 and PC2 in the example)>

STEP 1: ASYD

Assign the Point Code to all the nodes in the network uniquely as described on Page 163.

STEP 2: ADPCL

Assign the destination PC (Point Code) on LGRT (for speech path) number basis for all the nodes in the network.

STEP 3: ACSCCL

Assign the location of the CCH and FPC of the node which accommodates CCIS trunk in CSCG (Common Channel Signaling Controller Group) for all the nodes in the network.

- Assign the location of the CCH using the ACSC command. The following is sample data assignment. In this sample, PC 3 is equipped with three DTI cards. Note that if the system employs one CCIS link, enter the same data in CSCG130 and CSCG131.

CSCG	MG	U	G	CICG	
130 (Basic/ Primary Route)	AA	A	AA	0	← CCH 0
	BB	B	BB	1	
	BB	B	BB	2	← CCH 1
	BB	B	BB	3	
	BB	B	BB	4	
	BB	B	BB	5	
	BB	B	BB	6	
	BB	B	BB	7	

CSCG	MG	U	G	CICG	
131 (Alternate Route)	CC	C	CC	0	← CCH 2
	CC	C	CC	1	
	CC	C	CC	2	
	CC	C	CC	3	
	CC	C	CC	4	
	CC	C	CC	5	
	CC	C	CC	6	
	CC	C	CC	7	

Note 1: In the case of actual data entry, enter corresponding LEN numbers instead of letters such as “AAAAA”.

Note 2: Refer to [Figure 8-8 “Port Allocation and Related Command for CCIS Trunk”](#).

STEP 4: ACIC1

Assign CSCG for Basic/Primary Route. The odd numbered CSCG for alternate Route assignment.

PC	CSCG
4	130

<Network Control Node (PC1 in the example)>

STEP 1: ALRTN

Assign the Logical Route Numbers to all external trunks used in the EX-FCCS network. Assign unique Logical Route Numbers to the whole routes for external trunks on the network (including COT, DAT, Dummy route, etc.) using this command. The data must be set at the NCN in each Fusion Group and is to be set for every external route in all the nodes.

STEP 2: ARSCN

Assign route restriction information according to the Route Restriction Class (RSC) of the Logical Route Number in the network.

STEP 3: AFUGN

Assign EX-FCCS Fusion Group data. Designate Self-FUG Number, Connection FUG Number and Fusion Point Code (FPC) of the NCN within each FUG. Either of FUG is set as the Center FUG by checking the “CENTER” parameter.

STEP 4: AEXFN

Assign the EX-FCCS CCH Selection Data by designating all the Fusion Point Code (FPC) and the Point Code (PC) in the connected Fusion Group.

Note: *Confirm whether the data assignment is correctly performed by logging in to each node with Centralized MAT. Reexamine the assigned system data if log-in can't be activated. There may be some error in data setting so far.*

4.1.2 To Access EX-FCCS Trunk via ACC + Telephone Number

Assign the data at all the nodes in the EX-FCCS network. For each NCN, perform the data setting from STEP 1 through STEP 7. For other Local Nodes, the assignment of STEP 5 and STEP 6 is required. Just for the NCN of the Center Fusion Group, assign EX-FCCS Telephone Number data using AELGN command.

<NCN/LN>

STEP 1: ANPDN

Assign Numbering Plan Data referring to the following example using ANPDN command.

TN: 1 1st DC: 8 CI: N/H NND: 3 BLF:0
--

STEP 2: ASPAN

Assign Special Access Code, using the ASPAN command referring to the following example. Note that “LCR” must be selected in the ASPAN command to activate EX-FCCS features.

TN: 1 ACC: 820 C1: N/H SRV: LCR
RT: 31 2nd DT: 0 AH: 0 SUB: 0

Note: *In this example, RT31 is dummy route.*

STEP 3: AFRSN

Assign NPC (Number Pattern Code) and OPR (Outgoing Route Selection Number) for dummy route number.

STEP 4: AOPRN

Assign the routes and in what order these routes will be selected corresponding to the data assigned by AFRSN command.

EX- FCCS

Data Programming

STEP 5: ARNPL

Assign the access code for LCR/LCRS as assigned in ASPAN associated with the logical routes for each external trunk assigned in ARTD/ARTDN.

STEP 6: AMND

Assign the Maximum Necessary Digit (MND).

Note 1: *The MND is the total number of ACC + Telephone Number.*

Note 2: *Refer to CHAPTER 5, Section 7.1 “Assignment of Access Code for Tandem Connection via FCCS - ACIS” for more detail data programming related to LCR/LCRS such as AFRSN, AOPRN, ARNPL and AMND command.*

STEP 7: AEADN

Assign the ADC (Abbreviate Digit Code) for Connection Fusion Group. Enter the FUG Number assigned by AFUGN command, TN, and ADC to be assigned.

Note: *Check whether the trunk originating call via CCIS can be executed by dialing ACC + Telephone Number here. Reexamine the assigned numbering plan data if the call cannot be connected. There may be some error in data setting so far.*

4.1.3 To Access EX-FCCS Trunk via EX-FCCS Telephone Number

<NCN of the Center Fusion Group>

AELGN: Telephone Numbers must be assigned for all the station within the network uniquely. Use AELGN command to allocate EX-FCCS Telephone Number. FUG data must be assigned previously by AFUGN command to activate this command.

Only readout function can be used by this command in case both the Self FUG Number and the Connection FUG Number are assigned, if the Self FUG is not the Center FUG.

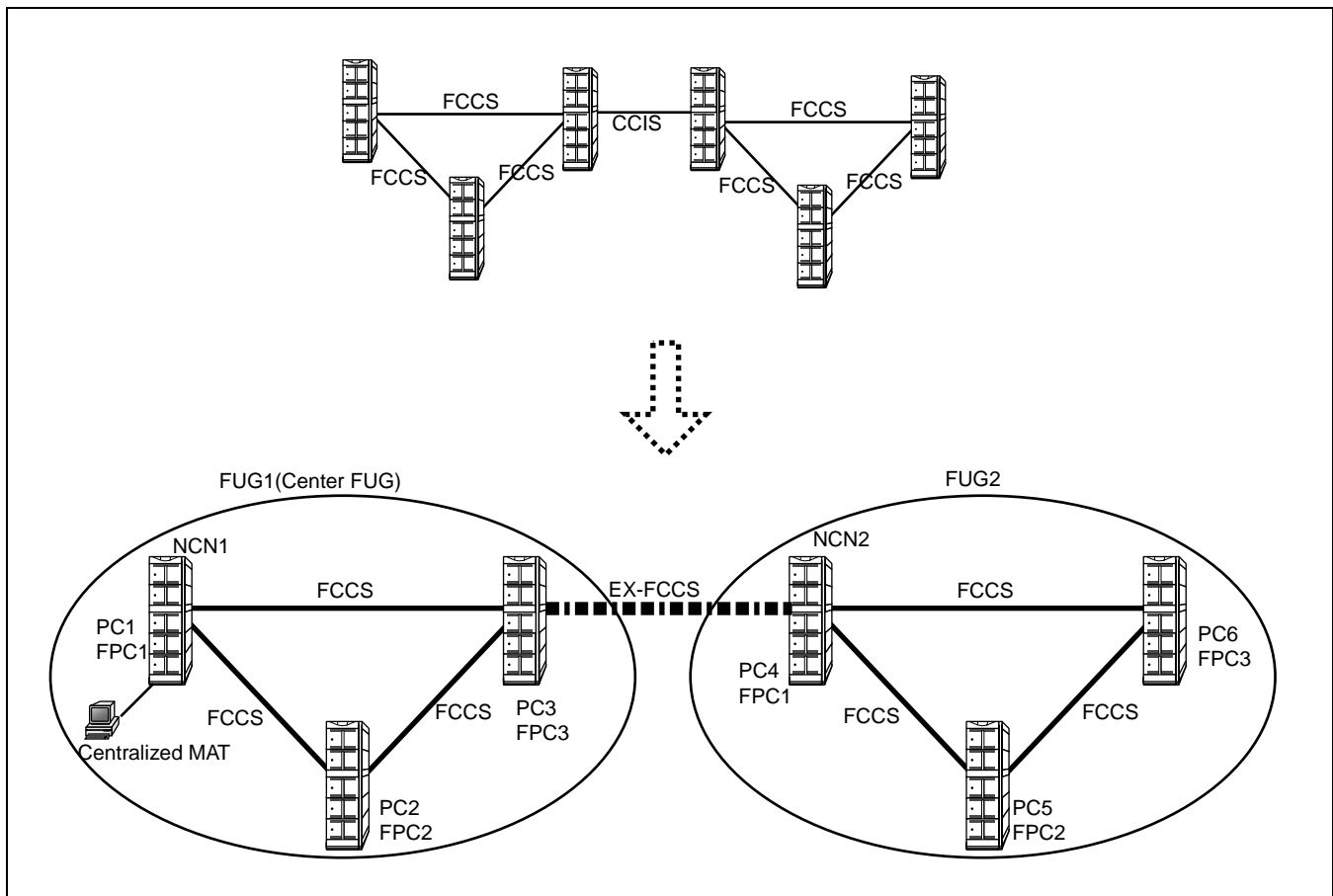
Note: *Check whether the trunk originating call via CCIS can be executed by dialing EX-FCCS Telephone Number. Reexamine the assigned numbering plan data if the call cannot be connected. There may be some error in data setting.*

4.2 Upgrading CCIS Network to EX-FCCS Network

This section explains the way to assign the data when upgrading a CCIS Network to an EX-FCCS Network. Perform the necessary data programming using the following upgrading patterns:

- Upgrading CCIS between FUGs to EX-FCCS Network
- Upgrading CCIS between FUG and IVS² system to Enhanced CCIS Network
- Upgrading CCIS between IMX system and IVS² systems to Enhanced CCIS Network

4.2.1 Upgrading CCIS between FUGs to EX-FCCS Network



EX- FCCS

Data Programming

1. To Log-in to All Nodes in EX-FCCS Network

Perform the following data programming at each NCN of all the Fusion Groups.

STEP 1: AFUGN

Assign EX-FCCS Fusion Group data. Designate Self FUG Number, connection FUG Number and Fusion Point Code of the NCN within each FUG. Either of the FUGs assigned as the Center FUG by clicking the "CENTER" check box.

STEP 2: AEXFN

Assign the CCH Selection Data by designating all the Fusion Point Code (FPC) and the Point Code (PC) in the connected Fusion Group.

Note: *Confirm whether the Centralized MAT can log in to each node here. Reexamine the assigned data so far if log in can't be executed. There may be some error in data setting.*

2. To Access EX-FCCS Trunk via EX-FCCS Telephone Number

Assign the data at the NCN of each Fusion Group. Abbreviate Digit Code (ADC) data must be set by AEADN command at each NCN of all the FUGs. Assign the EX-FCCS Telephone Number data by using AELGN command at the NCN of the Center FUG only.

<NCN of each FUG>

AEADN: Assign the Abbreviate Digit Code (ADC) for connection Fusion Group. Enter the FUG Number assigned by AFUGN command, TN, and ADC to be assigned.

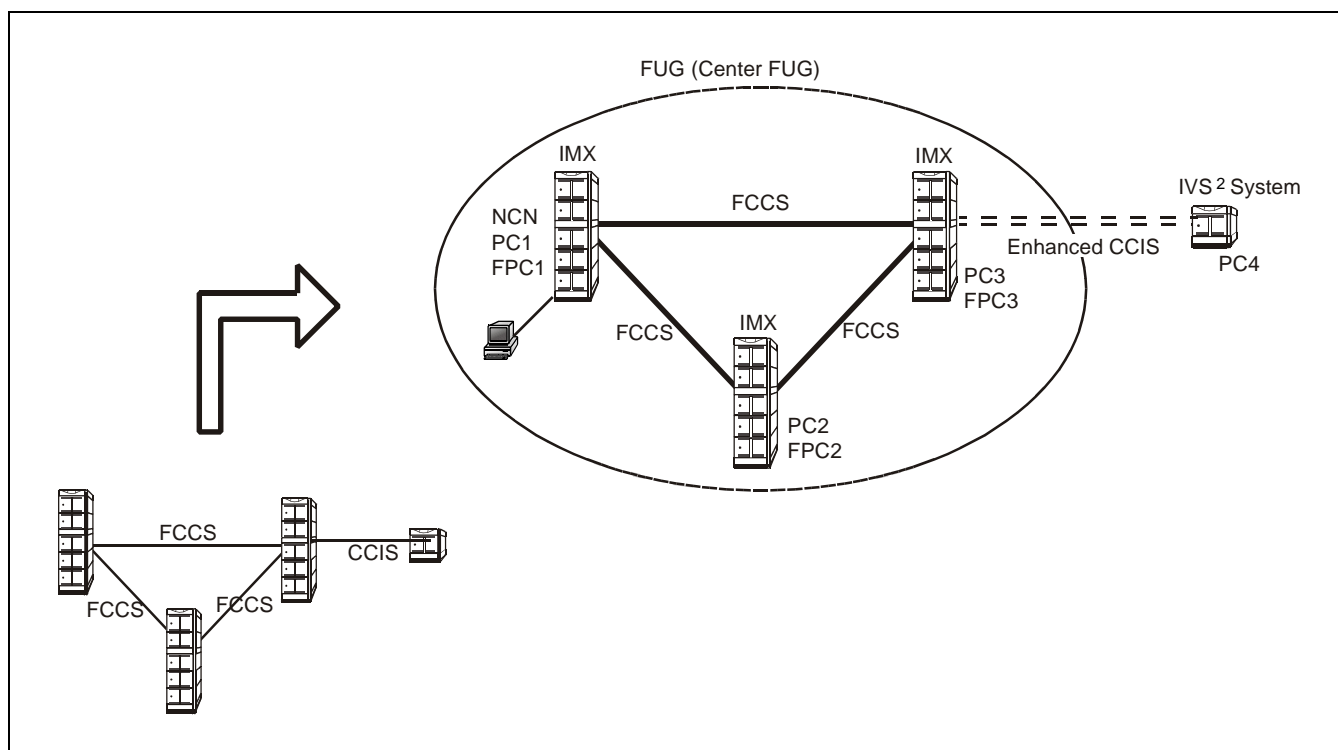
<NCN of the Center FUG>

AELGN: Telephone Numbers must be assigned for all the station within the network uniquely. Use AELGN command to allocate EX-FCCS Telephone Number. FUG data must be assigned previously by AFUGN command to activate this command.

Only readout function can be used by this command in case both the Self FUG Number and the Connection FUG Number are assigned, if the Self FUG is not the Center FUG.

Note: *Check whether the trunk originating call via CCIS can be executed by dialing EX-FCCS Telephone Number here. Reexamine the assigned data if the call cannot be connected. There may be some error in data setting up to now.*

4.2.2 Upgrading CCIS between FUG and IVS2 System to Enhanced CCIS Network



1. To Log-in to All Nodes in EX-FCCS Network

Assign the following data at the NCN of FUG with Centralized MAT for Fusion.

STEP 1: AFUGN

Assign EX-FCCS Fusion Group data. Designate Self-FUG Number, Connection FUG Number and Fusion Point Code (FPC) of the NCN within each FUG. Assign the FplUG as the Center by clicking the check box in the “CENTER” parameter.

STEP 2: AEXFN

Assign the CCH Selection Data by designating all the Fusion Point Code (FPC) and the Point Code (PC) in the connected Fusion Group.

Note: *Confirm the Centralized MAT can log in to each node here. Reexamine the assigned data if log-in can not be executed. There may be some error in data setting so far.*

EX- FCCS
Data Programming

2. To Access EX-FCCS Trunk via EX-FCCS Telephone Number

Assign the following data at NCN of the FUG.

STEP 1: AEADN

Assign the ADC (Abbreviate Digit Code) for connection Fusion Group. Enter the FUG Number assigned by AFUGN command, TN, and ADC to be assigned.

STEP 2: AELGN

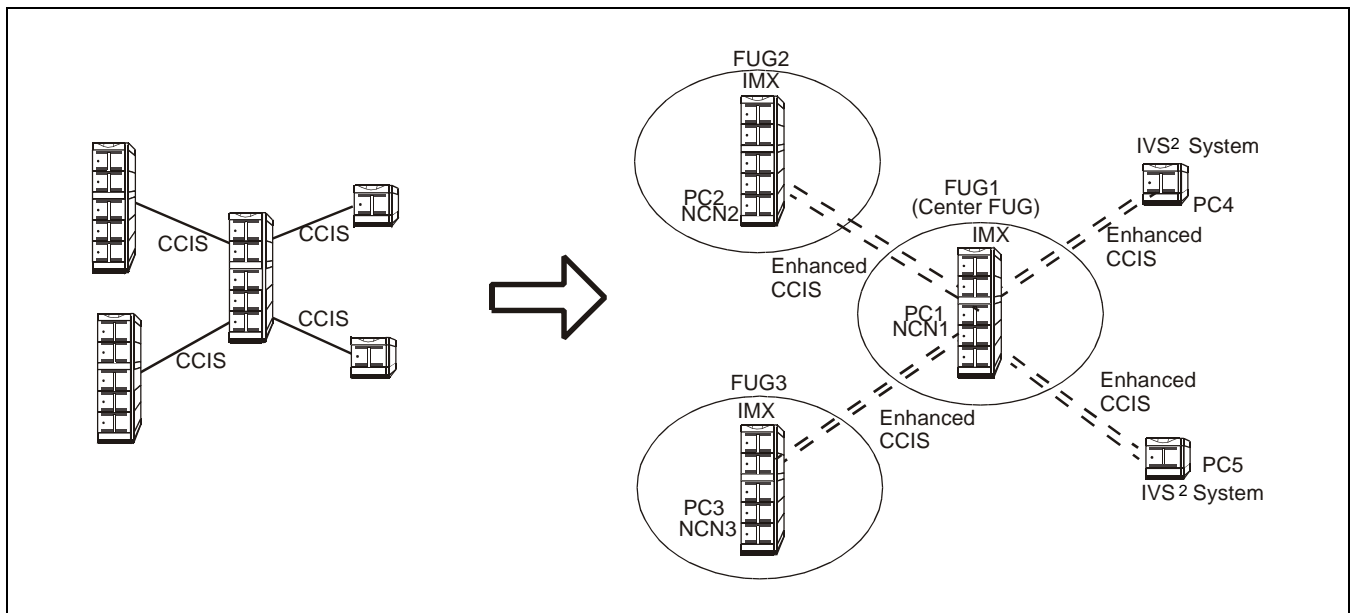
Telephone Numbers must be assigned for all the station within the network uniquely. Use AELGN command to allocate EX-FCCS Telephone Number. FUG data must be assigned previously by AFUGN command to activate this command.

Only readout function can be used by this command in case both the Self FUG Number and the Connection FUG Number are assigned, if the Self FUG is not the Center FUG.

Note 1: Check whether the trunk originating call via CCIS can be executed by dialing EX-FCCS Telephone Number here. Reexamine the assigned data if the call cannot be connected. There may be some error in data setting so far.

Note 2: Refer to the service feature manual for NEAX2000 IVS² system as to the data programming on NEAX2000 IVS² side.

4.2.3 Upgrading CCIS Network including IVS² System to EX-FCCS Network



1. To Log-in to All Nodes in EX-FCCS Network

To upgrade CCIS network to EX-FCCS Network as shown in the figure on the previous page, all the IMX systems are set as NCNs respectively. To construct a EX-FCCS Network including stand-alone IMX system, the node must be assigned as a Fusion Network configured by the NCN only, and handled by the NDM data. Assign the following data at all the NCNs (that is, all the IMX systems of each node) within the EX-FCCS Network.

STEP 1: AFUGN

Assign EX-FCCS Fusion Group data such as Self FUG Number and connection FUG Number designating Fusion Point Code of the NCN within FUG. Assign one of the IMX systems as the Center Fusion Group by clicking the check box in the “CENTER” parameter.

STEP 2: AEXFN

Assign the CCH Selection Data by designating all the Fusion Point Code (FPC) and the Point Code (PC) in the connected Fusion Group.

Note: *Confirm the Centralized MAT can log in to each node here. Reexamine the assigned data if log-in can not be executed. There may be some error in data setting so far.*

2. To Access to EX-FCCS Trunk via EX-FCCS Telephone Number

Assign the following data to activate originating calls via EX-FCCS trunk. EX-FCCS Abbreviated Digit Code (ADC) must be assigned by using AEADN command at all the IMX nodes in the network. Only at the NCN of the Center Fusion Group, allocate EX-FCCS Telephone Numbers for all the stations in the network uniquely.

<All the nodes consist of IMX system>

AEADN: Assign the ADC (Abbreviate Digit Code) for connection Fusion Group. Enter the FUG Number assigned by AFUGN command, TN, and ADC to be assigned.

<NCN of the Center FUG>

AELGN: Telephone Numbers must be assigned for all the station within the network uniquely. Use AELGN command to allocate EX-FCCS Telephone Number. FUG data must be assigned previously by AFUGN command to activate this command.

Only readout function can be used by this command in case both the Self FUG Number and the Connection FUG Number are assigned, if the Self FUG is not the Center FUG.

Note 1: *Refer to the service feature manual for NEAX2000 IVS² system as to the data programming on NEAX2000 IVS² side.*

Note 2: *Check whether the trunk originating call via CCIS can be executed by dialing EX-FCCS Telephone Number here. Reexamine the assigned numbering plan data if the call cannot be connected. There may be some error in the data setting so far.*

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