

UNIVERGE SV9500

FP95-115 V5

Data Programming Manual - FCCS

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UNIVERGE SV9500
Data Programming Manual - FCCS

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CHAPTER 1

INTRODUCTION

1. General

This manual covers the installation of the Fusion Call Control Signaling (FCCS) system.

2. How to Follow This Manual

This manual consists of the following chapters.

- [CHAPTER 1 INTRODUCTION](#)

This chapter explains how to use this manual.

- [CHAPTER 2 GENERAL](#)

This chapter outlines the FCCS system configuration and lists available service features.

- [CHAPTER 3 SYSTEM CONFIGURATION](#)

This chapter explains the hardware configuration of the FCCS system.

- [CHAPTER 4 INSTALLATION](#)

This chapter consists of the following topic:

- [Circuit Cards Required](#)

- [CHAPTER 5 DATA PROGRAMMING](#)

This chapter provides basic data assignment procedures.

- [CHAPTER 6 POST INSTALLATION TEST](#)

This chapter explains how to perform installation tests, focusing on the FCCS link connection test.

- [CHAPTER 7 TROUBLE SHOOTING](#)

This chapter explains FCCS-related system messages and the repair procedures.

3. Related Manuals

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

- Appliance Model Installation Manual
- Circuit Card Description
- Data Programming Manual - Business
- Data Programming Manual - CCIS

This manual assumes that the reader has sufficient knowledge of the installation of both the CCIS No. 7 and the Associated Channel Inter-Office Signaling (ACIS) systems. For more information on these systems, refer to the related manuals.



CHAPTER 2 GENERAL

1. Fusion Call Control Signaling (FCCS)

The main advantages of the Fusion Call Control Signaling (FCCS) system are as follows:

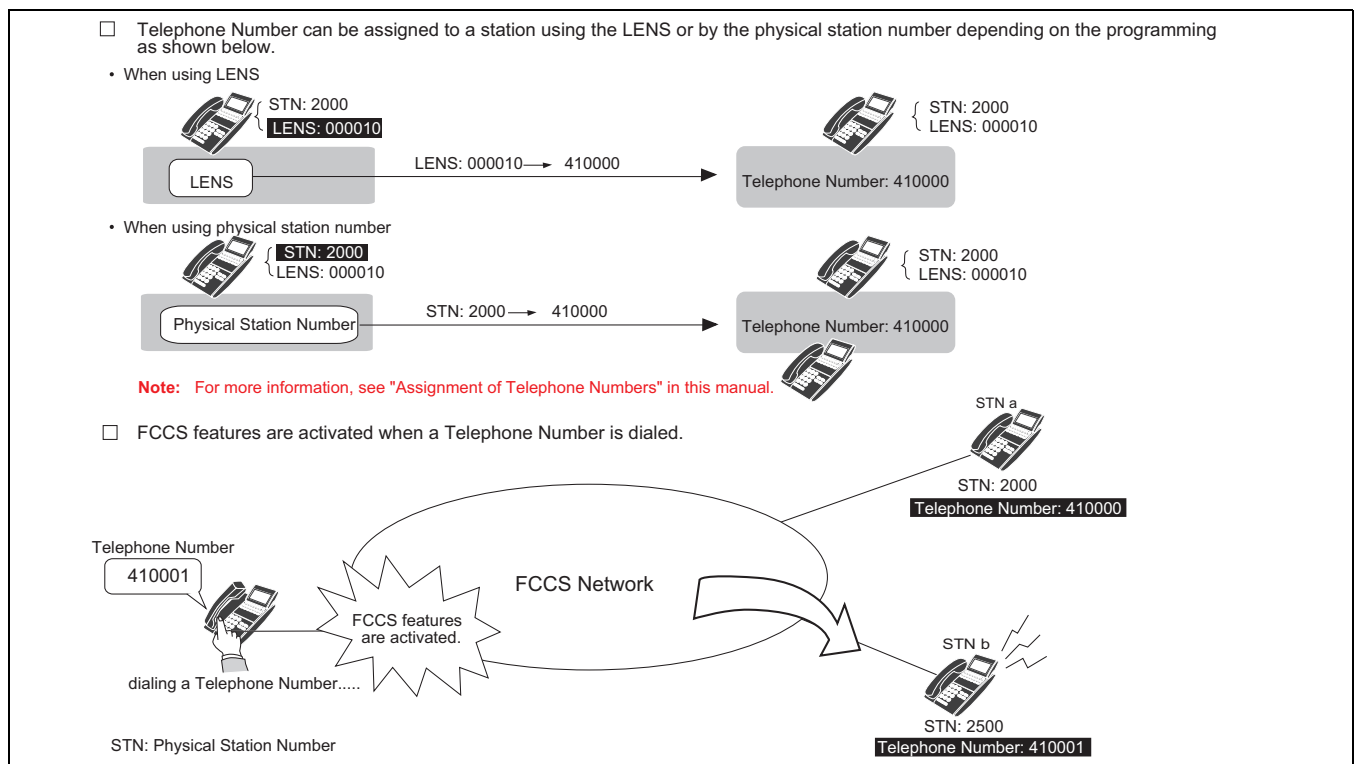
1.1 Improved Inter-Office Service Features

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

1.2 Use of Telephone Numbers

An FCCS system allows the user to use telephone numbers in addition to existing station numbers. (Physical station numbers). The FCCS 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 an FCCS 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 FCCS system. The figure below shows the use of telephone numbers in the FCCS network.

Telephone Number



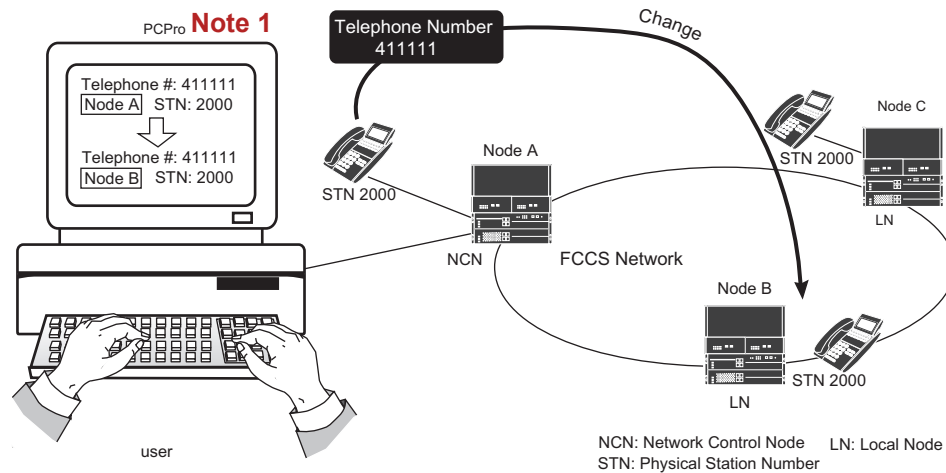
Note: A maximum of 16 digits are used as Telephone Number. However, the maximum of digits may vary depending on features or systems. For details, refer to the related manuals.

1.3 Free Location

A telephone number is assigned to a desired station on the FCCS network with the command operation as shown in the figure below.

Free Location

In this figure, the user is changing the location of Telephone Number "411111" to Node B.

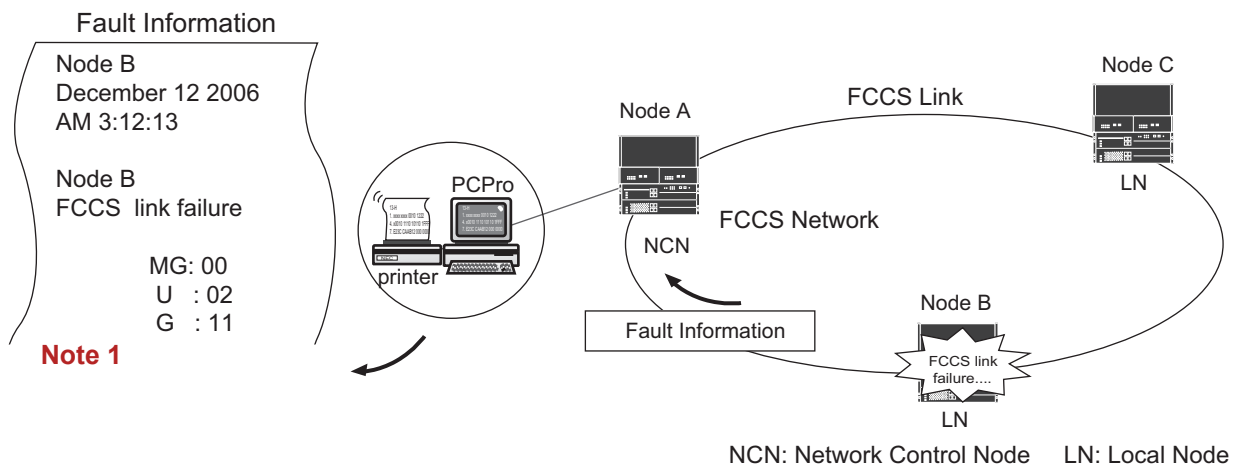


Note 1: See Assignment of Telephone Numbers in Chapter 5 for more detail.

1.4 PCPro on FCCS Network

An FCCS network has one Network Control Node (NCN) and Local Node (LN). The NCN has the Centralized Maintenance Console (PCPro) that runs on Windows. PCPro collects fault information from all nodes on the network. The NCN has Network Data Memory that stores the data related to the network level. The telephone numbers are changed using the PCPro at the NCN. PCPro also allows the user to manage network-level office data.

PCPro on FCCS Network



Note 1: Actual system message is indicated in a different format.

2. Nodes

An FCCS network consists of the following types of nodes:

- Network Control Node

The Network Control Node that must be assigned on an FCCS network, manages other nodes on the network. This node has the Centralized Maintenance Console (PCPro) to collect fault and billing information from other nodes on the network. Multiple nodes cannot be assigned as a Network Control Node. Multiple nodes cannot be assigned as a Network Control Node.

- Local Node

All nodes other than the Network Control Node are called Local Nodes. Fault information generated at a Local Node is sent to the Network Control Node via an FCCS link, allowing the Network Control Node to collect the fault information. An FCCS network can have a maximum of 63 nodes on the network. (Refer to Maximum System Configuration.)

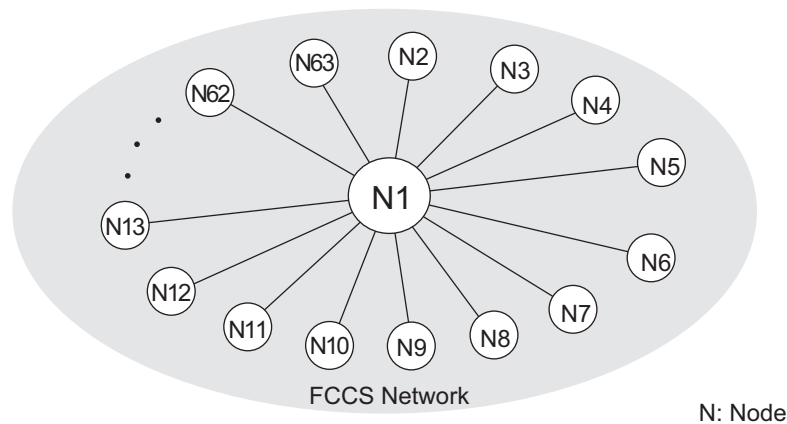
- Center Node (for Centralized Billing - FCCS and Centralized Management Report-FCCS)

Center Node can collect fault and billing information from the nodes in FCCS network. Multiple Center Nodes can be installed on one network.

Center Node for Centralized Billing is set by ASYDL SYS1 Index 577. Polling target Local Nodes are set by ASYDL SYS1 Indexes 608 through 639 specified with Fusion Point Code (FPC). See Centralized Billing - FCCS in Data Programming Manual - Business.

Maximum System Configuration

An FCCS Network can have a maximum of 63 nodes.



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

3. Data Memory Configuration

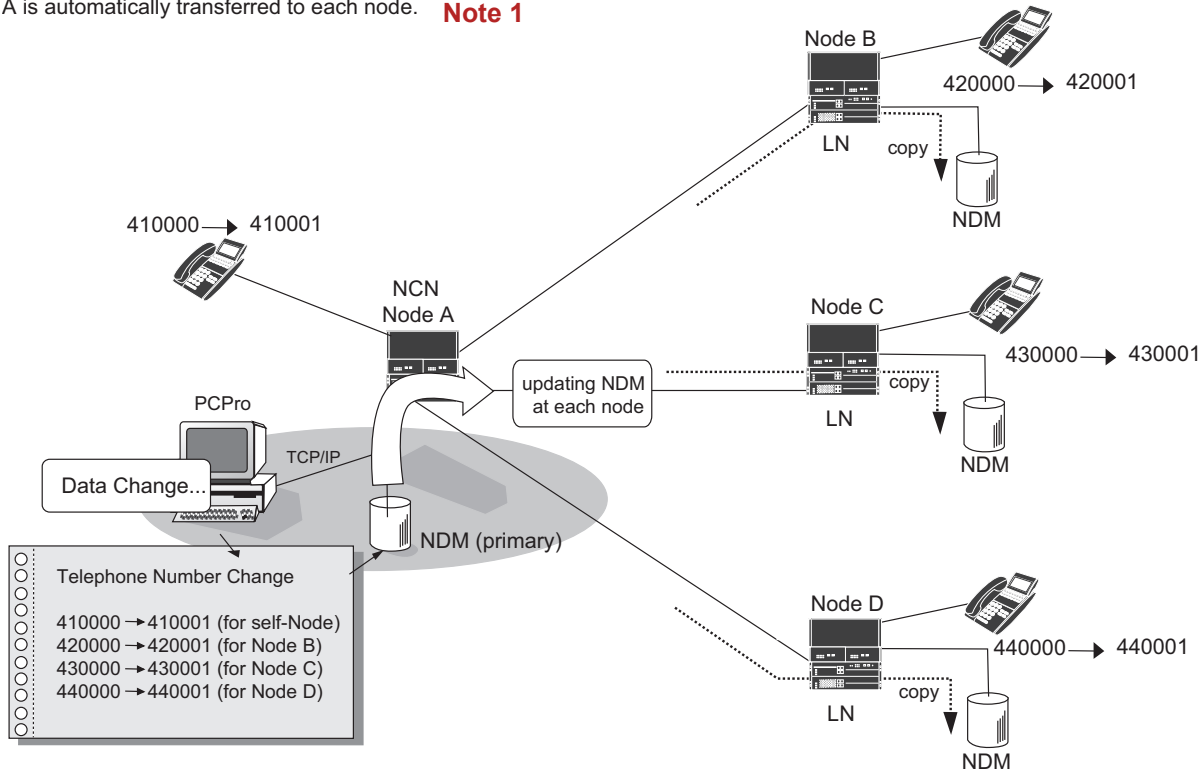
Each node on an FCCS network has the following three kinds of Data Memory:

- Data Memory (DM)
- Local Data Memory (LDM)
- Network Data Memory (NDM) - Programmable 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 the primary memory. The figure below shows how a telephone number change is performed in an FCCS network.

Network Data Memory

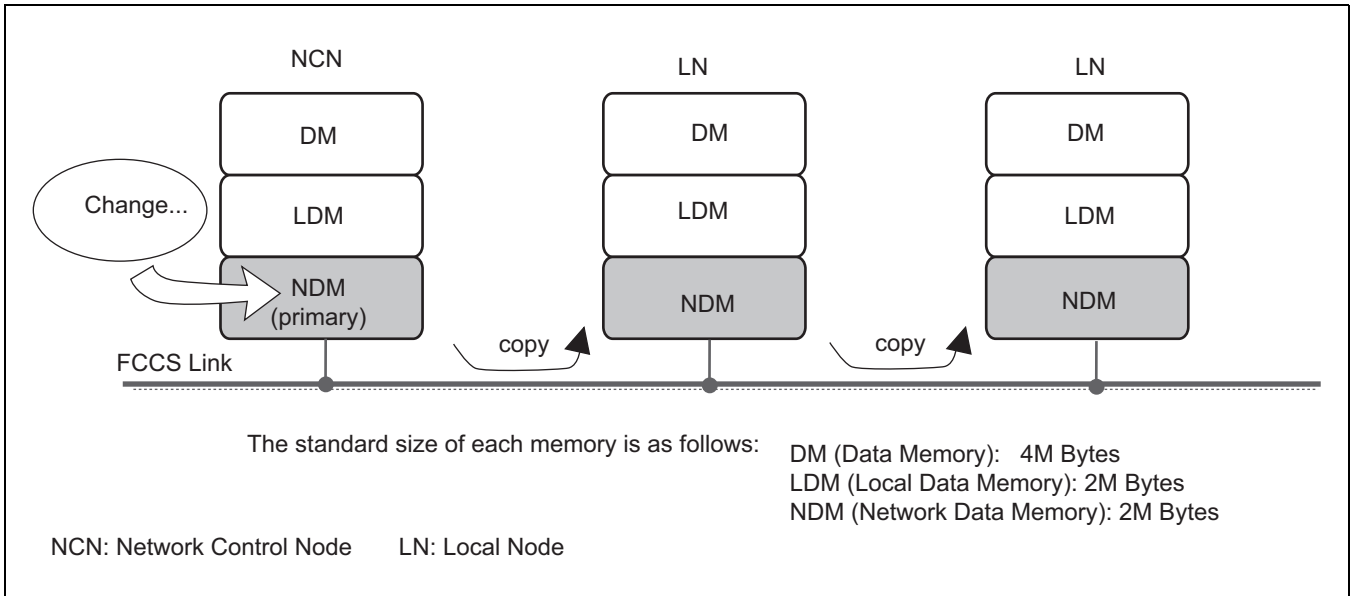
When Telephone Numbers are changed, the change at the NCN will affect all nodes on the network. In this figure, data change at Node A is automatically transferred to each node. **Note 1**



Note 1: The data must be manually transferred using the CBCN command when the FCCS system is configured for the first time or the system is once initialized at the NCN.

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

Network Data Memory Copy

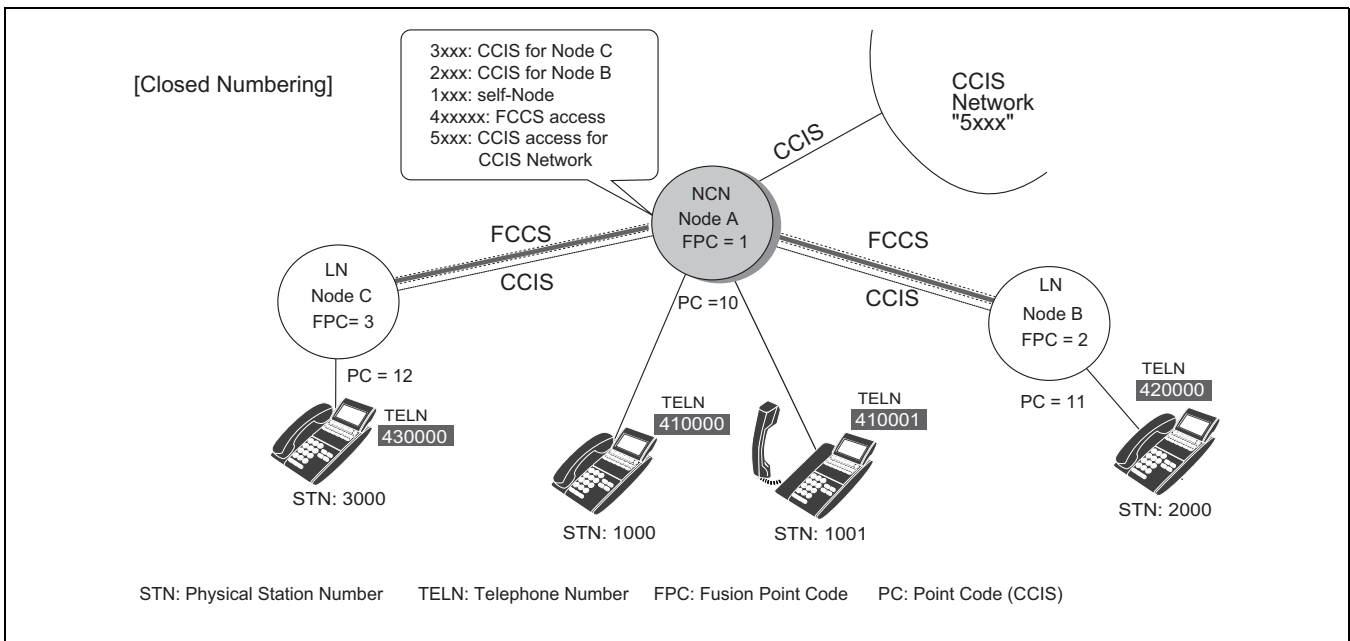


4. FCCS and CCIS Coexisting Network

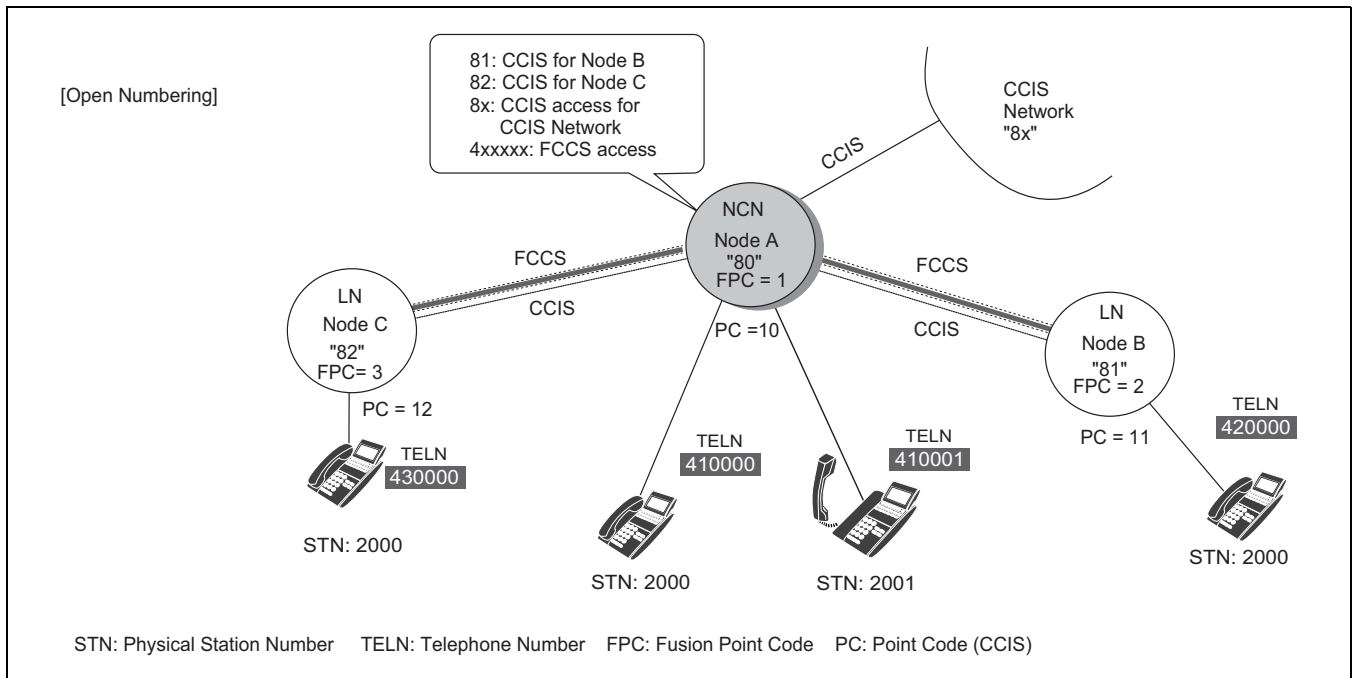
Closed Numbering FCCS - CCIS Network and Open Numbering FCCS - CCIS Network show examples of FCCS networks. When incorporating the FCCS system with the existing CCIS network, connect all nodes via CCIS links.

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

Closed Numbering FCCS - CCIS Network



Open Numbering FCCS - CCIS Network



When incorporating the FCCS system with the CCIS network, consider the following conditions for the available telephone number digits:

×: Available
N: Not available
C: Conditionally available

Telephone Number Composition Note 1	Display		Inter-Office Service	MCI Note 4	SMDR	
	Desktop terminal	ATTCON/DESKCON			CCIS	FCCS
4 digits or less	×	×	×	×	×	×
5-8 digits	×	×	×	×	×	×
9 digits or more	C Note 2, Note 3	C Note 2, Note 3	C Note 2	C Note 5	N	×

Note 1: When the network is Open Numbering, the digits must be the number of office code digits + Telephone Number digits.

Note 2: A maximum 16 digits of Telephone Number is available when the 16-Digit Dial Plan Support for CCIS over IP (PHC) feature is enabled (ASYDL/ASYDN, SYS1, Index 1131, Bit4=0). For detailed conditions for calls via CCIS, refer to CCIS NETWORKING VIA IP [C-163] in Data Programming Manual - CCIS.

Note 3: A maximum 16 digits of Telephone Number is available in FCCS (conditions of self station calls via FCCS).

Note 4: The number provided to MCI consists of:

- When the IMS format is used,
Station number area: 1 - 6 digits (*1)
- When the MMX format is used,
Station number area: 1 - 8 digits (*1)
Telephone Number area: 1 - 16 digits (*2)

*1: One of the following is provided to MCI:

- Station number
- Telephone Number
- Combination of Office Number and station number
- Combination of Office Number and Telephone Number

Output information varies depending on Office Data settings. For more details, refer to MESSAGE CENTER INTERFACE [M-26] in Data Programming Manual - Business.

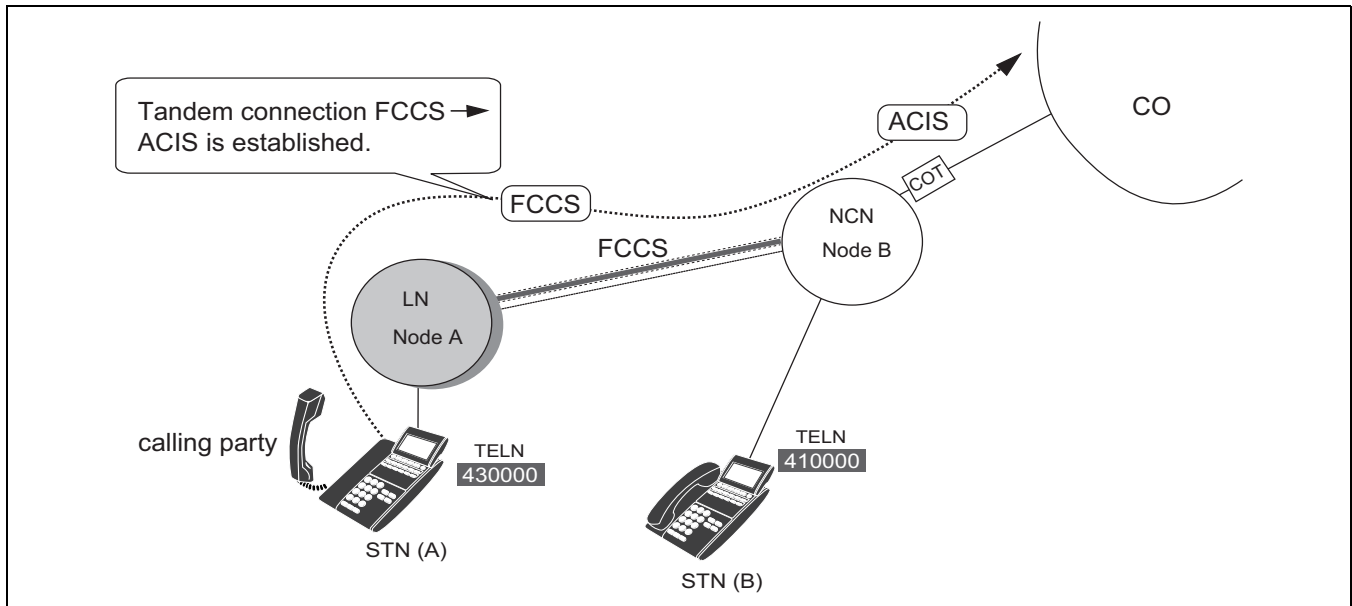
*2: Telephone Numbers in an FCCS system are available. However, when a station in the FCCS system makes or transfers a call via CCIS, MCI does not transmit the Telephone Number as a calling/called number.

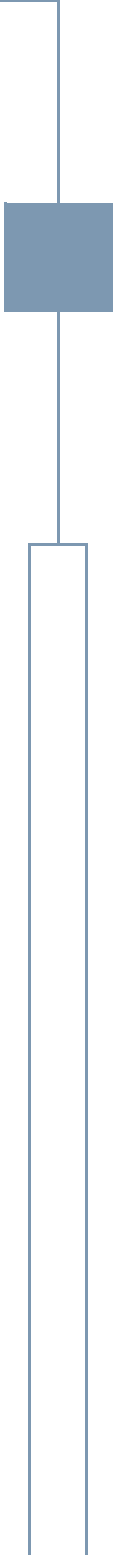
Note 5: MCI is not supported for calls via CCIS.

5. Tandem Connections via FCCS Link

Tandem connections via the FCCS-ACIS are established. As shown in the figure below, STN (A) can place a tandem call via the FCCS-ACIS.

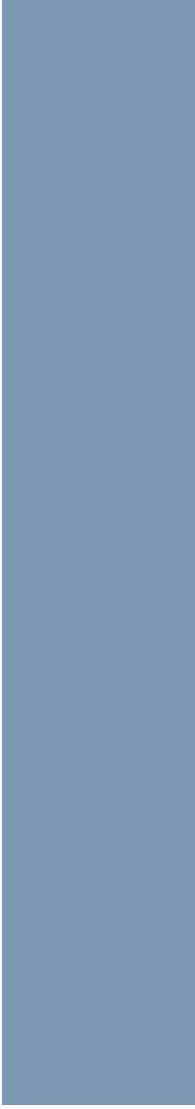
Tandem Connections via FCCS Link





CHAPTER 3

SYSTEM CONFIGURATION



The FCCS systems are divided into the three types:

- FCCS Networking via IP (Peer-to-Peer)
- FCCS system without FCH **Note 1**
- FCCS system with FCH **Note 1**

Note 1: FCCS Call Control Handler (FCH): PA-FCHA

The production and sales of FCH PKG (PA-FCHA) have been stopped. For configuring an FCCS Network, use FCCS Networking via IP (Peer-to-Peer) configuration enabled by IPPAD as an alternative. If speech signal is sent/received via DTI, use the system configuration including LAN connections for FCCS control signal as an alternative.

This chapter explains the system configuration of each FCCS system.

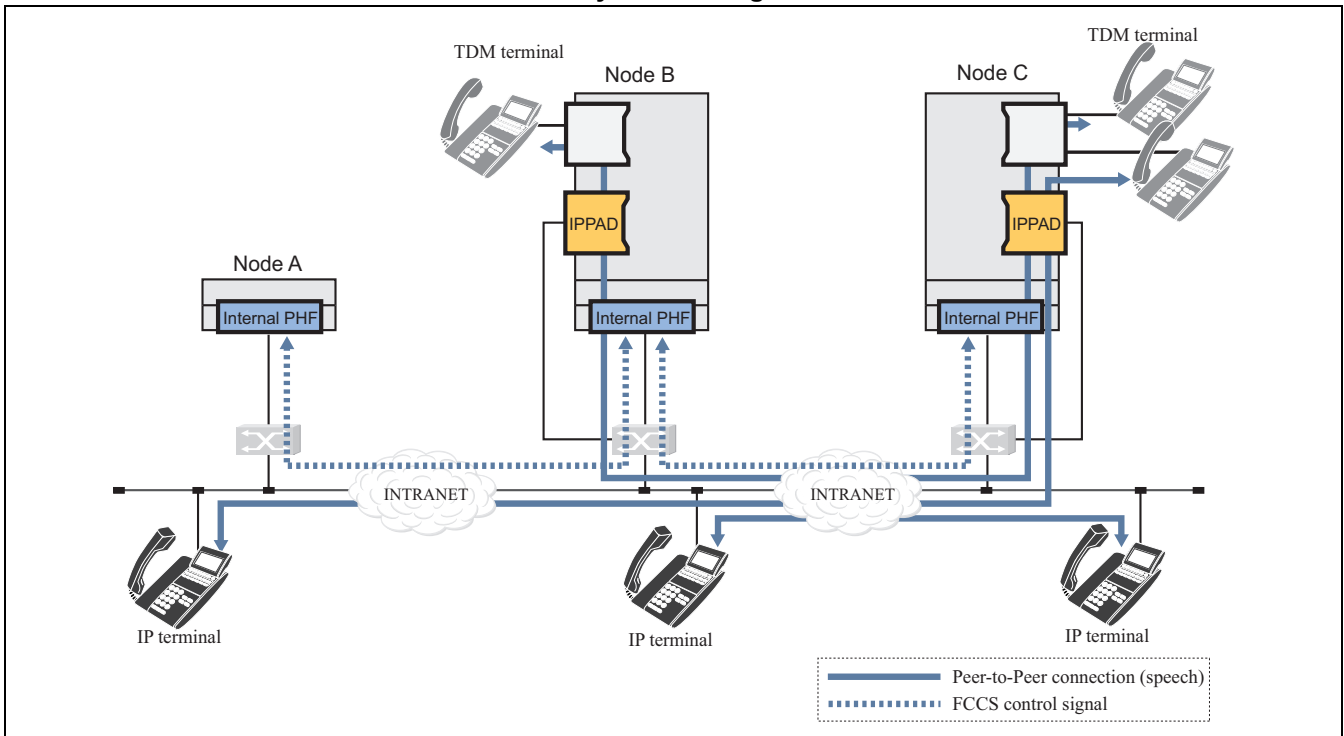
1. FCCS Networking via IP (Peer-to-Peer)

FCCS control signal transfers on the IP network (Intranet) via Internal PHF of telephony server, whereas speech signal between the stations is sent/received in Peer-to-Peer connection.

Internal PHF is an interface with IP network, handling the IP packets of link information. Internal PHF sends/receives control signal between the nodes and packetizes the FCCS link information to IP packets; FCCS link signal and IP packets are mutually converted via Internal PHF.

Note: FCCS Networking via IP (by IPTRK) is available only for a migrated system from IPX, SV7000 and SV8500. For FCCS Networking via IP (by IPTRK), refer to FCCS Networking via IP [F-36] in Data Programming Manual - Business.

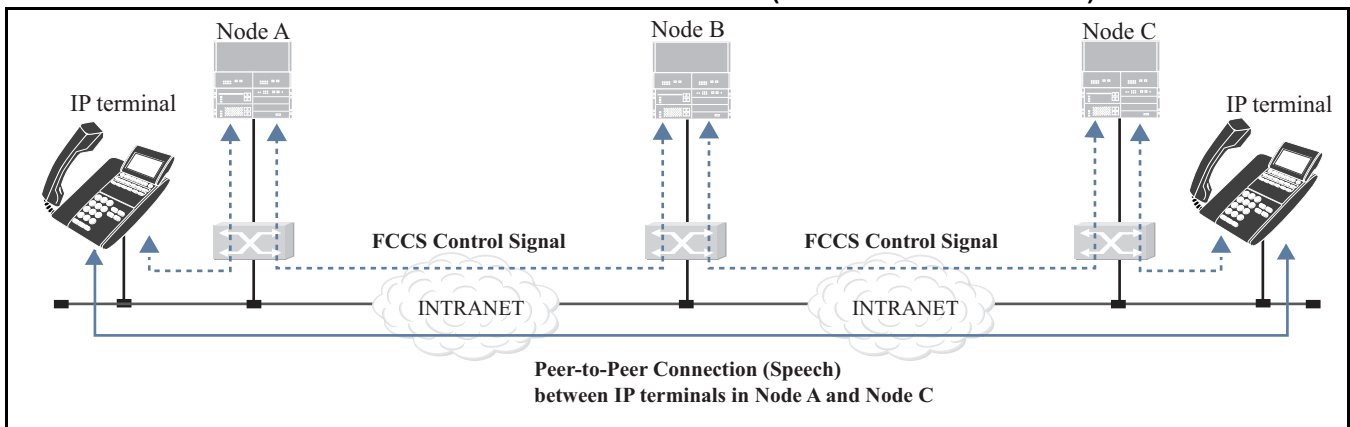
FCCS System Configuration



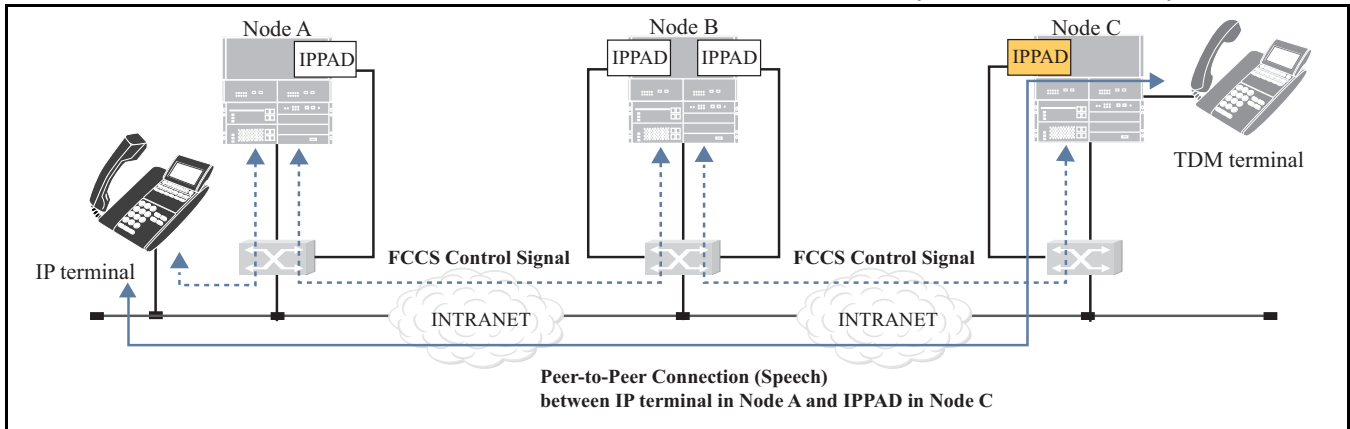
1.1 Network Configuration

The following figures show network configuration examples of the FCCS system. Speech data between IP stations is sent/received in Peer-to-Peer connection, while the control signal is handled by using Internal PHF of telephony server. The control signal link called Virtual Connection Link enables FCCS Core Control of the system.

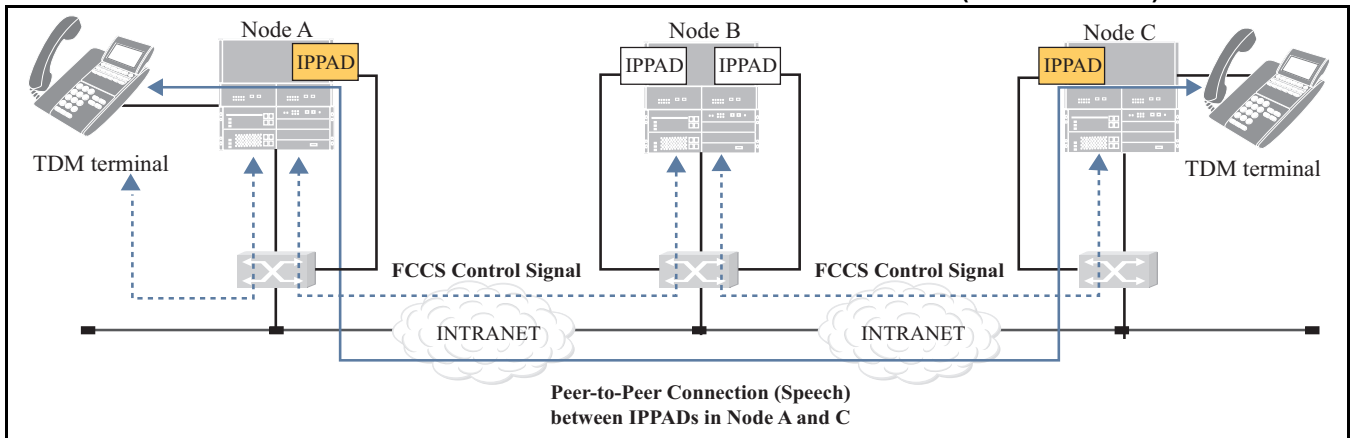
FCCS Connection between IP Terminals (IP Terminal - IP Terminal)



FCCS Connection between IP Terminal and TDM Terminal (IP Terminal - IPPAD)



FCCS Connection between TDM Terminal and TDM Terminal (IPPAD - IPPAD)



1.2 FCCS Network Conditions

Take the following conditions into consideration when designing FCCS network.

1. A maximum of 63 nodes can be connected in an FCCS network.
2. If a Layer 2 failure occurs, the connections are released.
3. Tandem path through control to FCCS is not available.
4. DP signal cannot be relayed via FCCS. However, PB signal can be relayed when IPPAD with Sub Board is used.

5. Use the IP address of destination node assigned by AFIPN command. Use the port number of destination node assigned by ADTM command (default: 60180). When the port number is changed, initialize Internal PHF (**Note 1**) by either of the following ways:

COMMAND	COMMAND MENU	OPERATION
ADTM	Restart	All the IP-related ports, including the Internal PHF communication port, are disconnected and then generated again. The destination node information and sending control information handled by Internal PHF is cleared.
ADPM	Module Initialize	Internal PHF communication port is disconnected and then generated again. The destination node information and sending control information handled by Internal PHF is cleared.
	Module Reset	All the IP-related ports, including the Internal PHF communication port, are disconnected and then generated again. The destination node information and sending control information handled by Internal PHF is kept.

Note 1: Internal PHF is an interface with IP network and it packetizes the link information of FCCS between the nodes.

6. Broadband service (H0, H1) for ISDN and CCIS is not supported.
7. When FCCS system with DTI and FCH circuit cards (hereinafter called DTI FCCS) and Peer-to-Peer FCCS coexist to configure an FCCS network, consider the followings;
 - Peer-to-Peer FCCS takes priority when a node has both DTI FCCS and Peer-to-Peer FCCS routing. DTI FCCS setting is used as backup for alternate routing in the case of Peer-to-Peer FCCS link down.
 - Because IP terminal cannot send tone to opposite party, tone receiving node varies depending on the FCCS type as shown in the table below:

	TONE TYPE	DTI FCCS	Peer-to-Peer FCCS
0	Dial Tone (DT)	Self Node	Self Node
1	Special Dial Tone (SPDT)	Self Node	Self Node
2	Ringback Tone (RBT)	Destination node	Note 2
3	Call Waiting Tone (CWT)	Self Node	Self Node
4	Busy Tone (BT)	Self Node	Self Node
5	Reorder Tone (ROT)	Self Node	Self Node
6	Service Set Tone (SST)	Self Node	Self Node
7	Second Dial Tone (SDT)	Destination node	Note 2
8	Tone Ringer (TRG)	Self Node	Self Node
9	Sender Transmitting Tone (SDTT)	Destination node	Note 2
10	Call Waiting RBT (CWRBT)	Destination node	Note 2

	TONE TYPE	DTI FCCS	Peer-to-Peer FCCS
11	Music on Hold (MUSIC)	Destination node	Note 2
12	No tone	Self Node	Self Node

Note 2: - When DTI FCCS node stands between the destination nodes, the tone generated in the DTI FCCS connected node is received.
 - When the network configures only with Peer-to-Peer FCCS, IP terminals hear internal tone.

- In the tandem connection between FCCS and CCIS networking via IP (Peer-to-Peer), take note the conditions for the connection patterns below:

	CONNECTION PATTERN	CONNECTION
1	P2P FCCS ↔ P2P FCCS ↔ CCIS networking via IP (P2P)	Available
2	P2P FCCS ↔ DTI FCCS ↔ CCIS networking via IP (P2P)	Available
3	DTI FCCS ↔ P2P FCCS ↔ CCIS networking via IP (P2P)	Conditionally available Note 3
4	DTI FCCS ↔ DTI FCCS ↔ CCIS networking via IP (P2P)	Available

Note 3: Connections using PHS/PCS, SP Controlled Standard SIP terminal and WLAN Handset (MH Series) are not applied.

- In an FCCS network, SPs of each Telephony Server must have different SIP Server IDs.
- When adding a new Network Control Node (NCN) office to the existing stand-alone office to configure an FCCS network system, delete all the SP-related data (including SIP station data) of the existing office and set the data again after the FCCS system is configured.
- For adding a new node to the system in which the soft key data is already assigned by ADSLN command (**Note 4**), carry out any of the following operations.
 - Reassign SKP (soft key pattern) and SN (status number) by ADSLN command. (To reassign them, press [Get], [Del] and then [set] buttons in that order.)
 - Back up the Office Data in all nodes and initialize the system. (**Note 5**)

Note 4: It corresponds to the following situations:

- a new node is added to the existing standalone system and that system is upgraded to FCCS system.
- a new node is added to the existing standalone system and that system is upgraded to FCCS system.

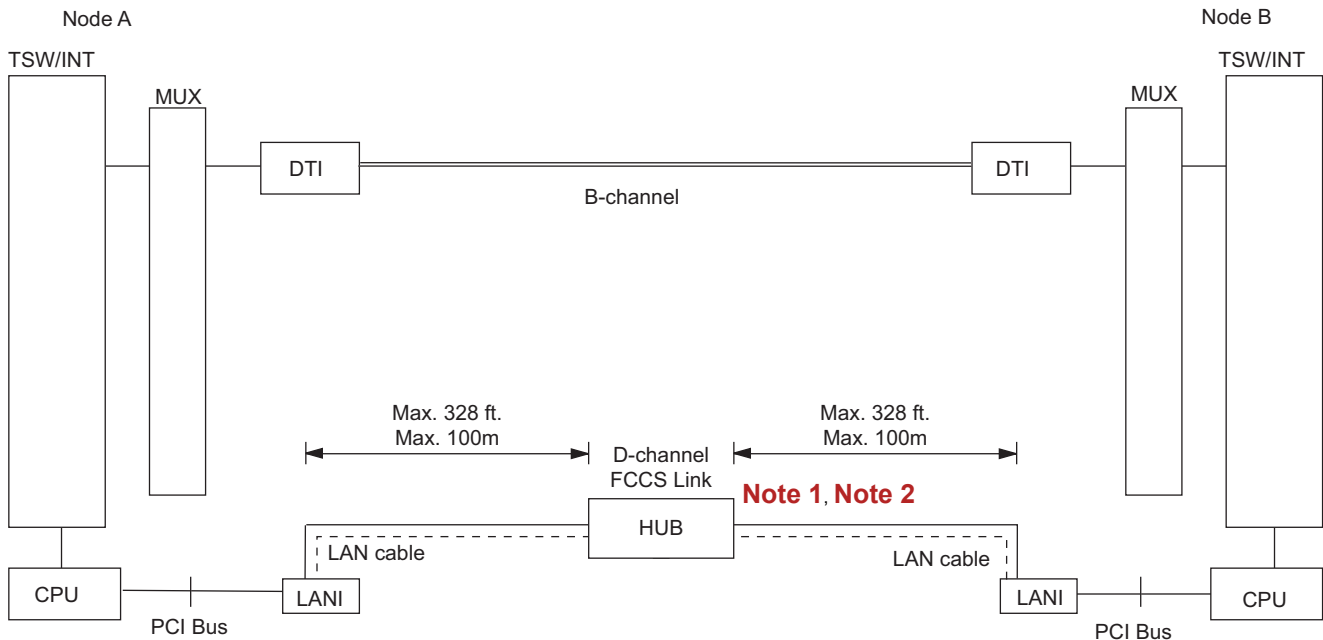
Note 5: Execute MEM_HDD_N command from NCN to perform the Office Data Backup.

2. FCCS System without FCH

FCCS system configuration without FCH card employs Ethernet to establish links between nodes. In this configuration, DTI card carries only B-Channels. D-Channels are not sent/received via DTI.

FCCS System Configuration without FCH

This figure shows an FCCS System Configuration without FCH.



TSW : Time Division Switch
 MUX : Multiplexer
 LANI : LAN Interface
 DTI : Digital Trunk Interface

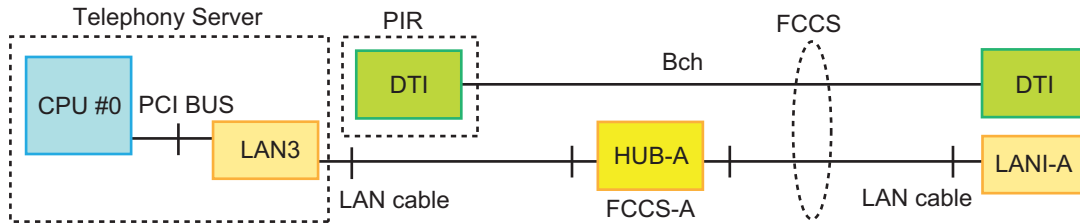
Note 1: A maximum of four HUBs can be cascaded between originating node and terminating node (IEEE802.3 standard).

Note 2: Use Repeater HUB because SW-HUB cannot be used.

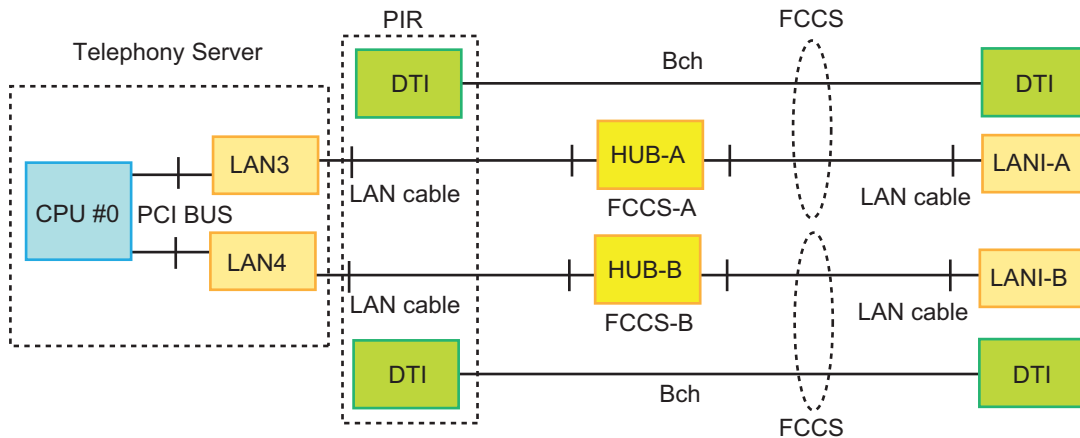
Note: Node connection cannot cross router.

[CASE-1] Single Configuration Telephony Server + Single Configuration FCCS

The figure below shows connection of Telephony Server to FCCS where neither has redundancy configuration.

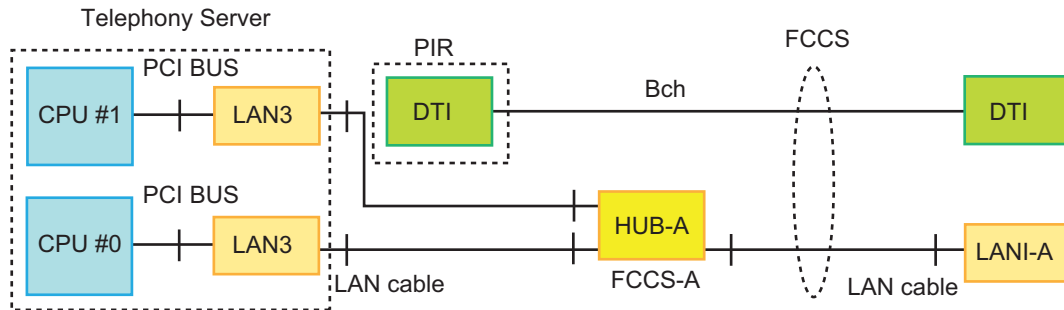
**[CASE-2] Single Configuration Telephony Server + Dual Configuration FCCS**

The figure below shows connection of Telephony Server to FCCS where only FCCS side has redundancy configuration. In this connection, LAN3 and LAN4 need HUB cards respectively, which are referred as HUB-A/B in the figure.

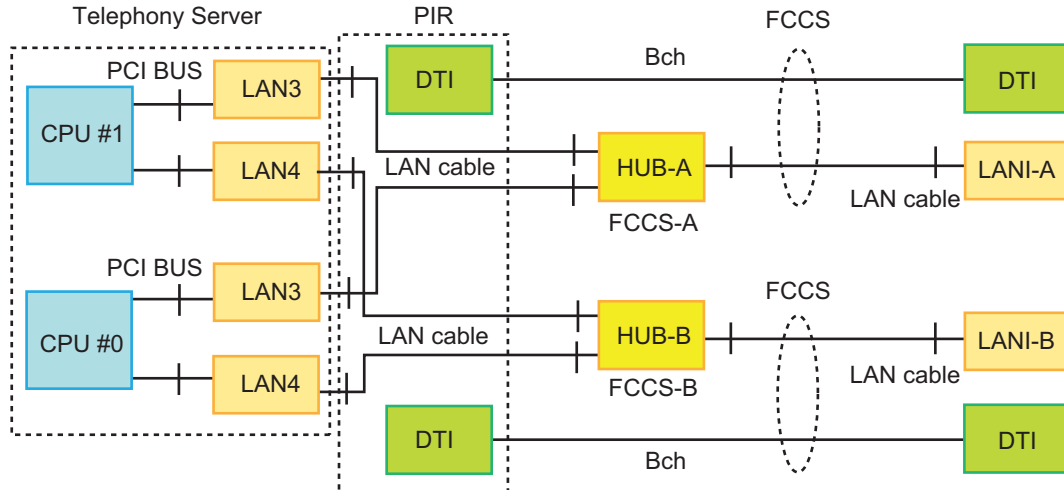


[CASE-3] Dual Configuration Telephony Server + Single Configuration FCCS

The figure below shows connection of Telephony Server to FCCS where only Telephony Server side has redundancy configuration.

**[CASE-4] Dual Configuration Telephony Server + Dual Configuration FCCS**

The figure below shows connection of Telephony Server to FCCS where both sides have redundancy configuration. In this connection, LAN3 and LAN4 need HUB cards respectively, which are referred as HUB-A/B in the figure.

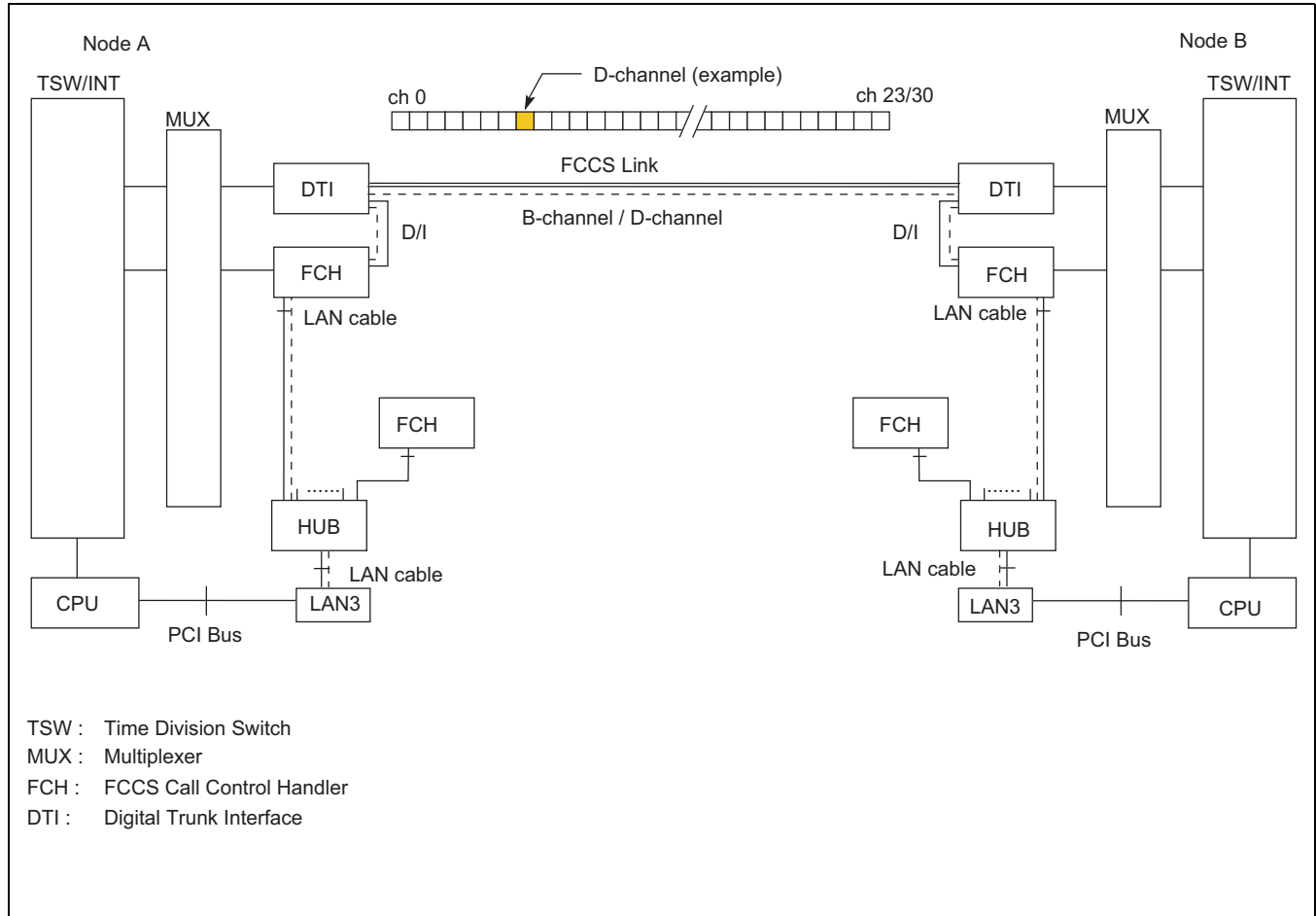


3. FCCS System with FCH

3.1 System Configuration

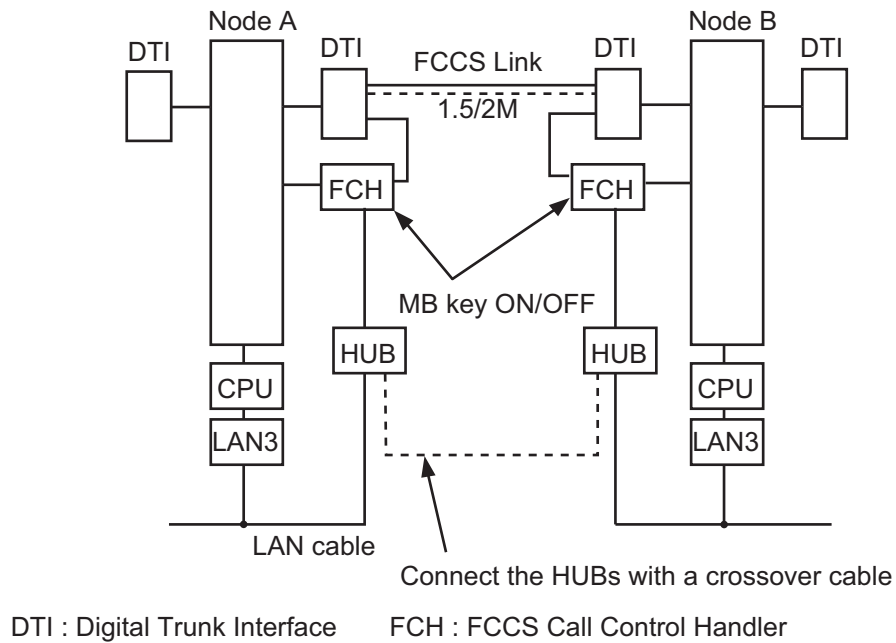
A sample FCCS system configuration that uses a DTI to carry D-Channel is shown in the figure below. In this configuration, the FCCS link is established between nodes via the T1 link.

FCCS System Configuration with FCH



Note: When a direct connection is added to the existing FCCS system with an FCH card between the two nodes, execute Make-busy operation (MB key ON/OFF) on the FCH cards to prevent packet loop.

Adding a Direct Connection to FCCS System with FCH



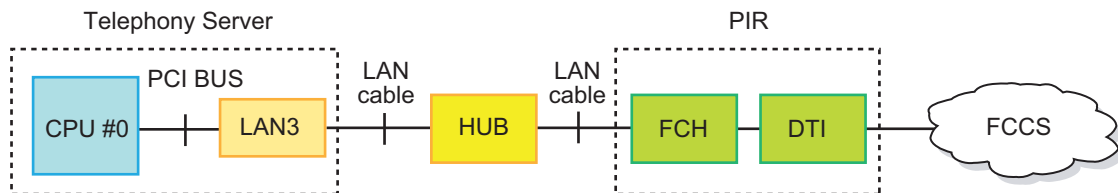
On other occasions when adding direct connection (connect cross cable between the HUBs) to the FCCS network consisting of multiple nodes, perform the MB key ON/OFF operation on a single FCH card to prevent packet loop. When the system applies dual-configuration, MB key ON/OFF operation is executed to an FCH card on each A/B side.

3.2 Redundancy of FCCS Link

The FCH (PA-FCHA) card uses Drop/Insert (D/I) function to handle an FCCS link, allocating one of the time slots on the DTI card to D-channels. The FCCS system (with FCH) can have one of the following configurations, taking the configurations of Telephony Server into consideration.

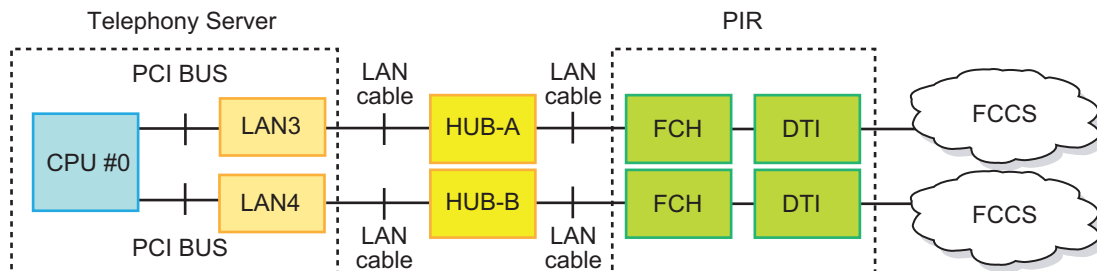
[CASE-1] Single Configuration Telephony Server + Single Configuration FCCS

The figure below shows connection of Telephony Server to FCCS where neither has redundancy configuration.



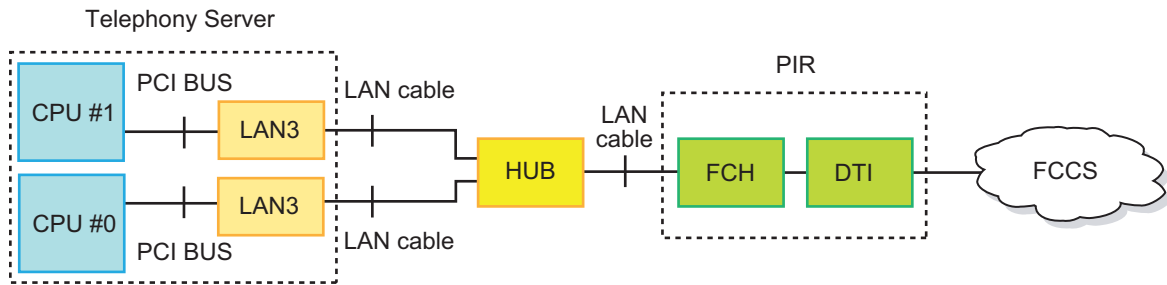
[CASE-2] Single Configuration Telephony Server + Dual Configuration FCCS

The figure below shows connection of Telephony Server to FCCS where only FCCS side has redundancy configuration. In this connection, LAN3 and LAN4 need HUB cards respectively, which are referred as HUB-A/B in the figure.



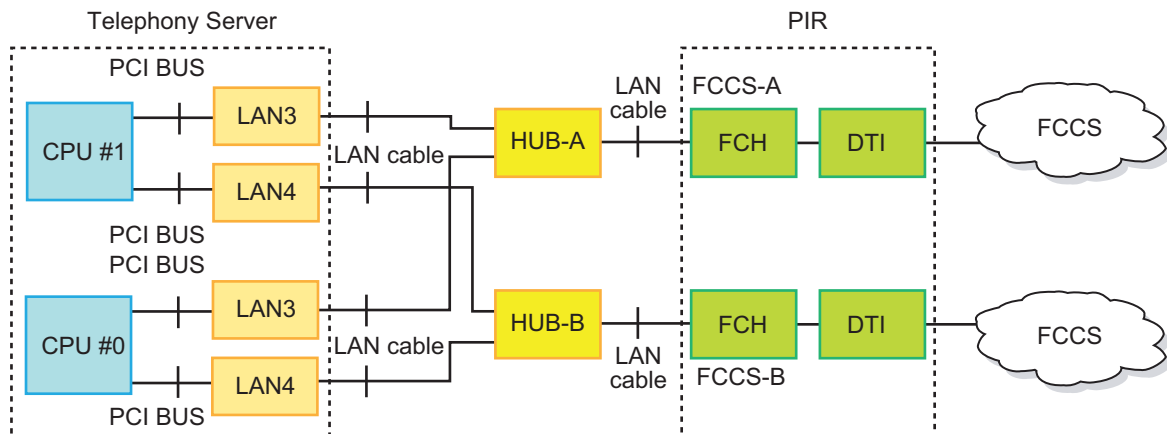
[CASE-3] Dual Configuration Telephony Server + Single Configuration FCCS

The figure below shows connection of Telephony Server to FCCS where only Telephony Server side has redundancy configuration.



[CASE-4] Dual Configuration Telephony Server + Dual Configuration FCCS

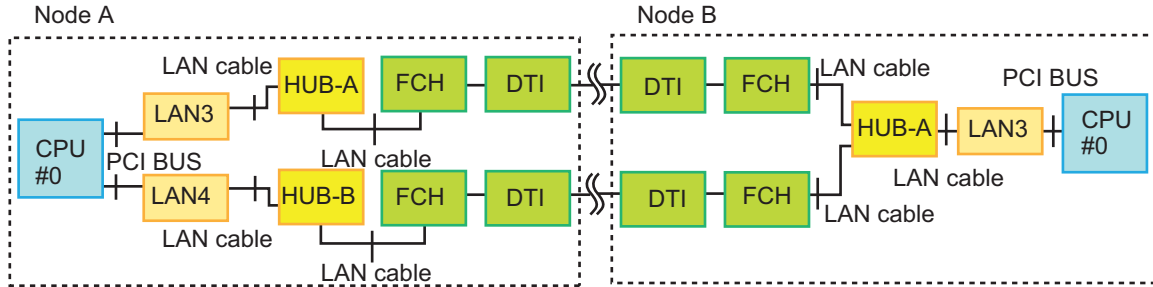
The figure below shows connection of Telephony Server to FCCS where both sides have redundancy configuration. In this connection, LAN3 and LAN4 need HUB cards respectively, which are referred as HUB-A/B in the figure.



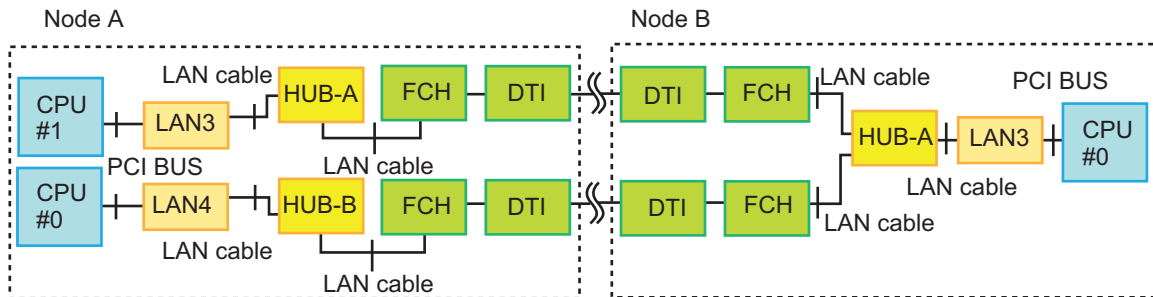
Note: Node using 2 HUBs and one using 1 HUB cannot be connected face to face, as the following cases.

[CASE-1]

	Telephony Server	HUB	FCCS
Node A	Single Configuration	Dual Configuration	Dual Configuration
Node B	Single Configuration	Single Configuration	Single Configuration

**[CASE-2]**

	Telephony Server	HUB	FCCS
Node A	Dual Configuration	Dual Configuration	Dual Configuration
Node B	Single Configuration	Single Configuration	Single Configuration



4. System Considerations for FCCS System without FCH/FCCS System with FCH

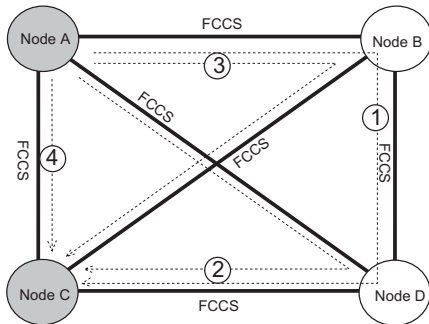
4.1 FCCS Network Conditions

This section explains how to design an FCCS network. The figure below shows an FCCS link printed in a solid line and a CCIS link printed in a dotted line.

Condition 1: The maximum number of nodes on an FCCS network is 63 nodes.

FCCS Network Topologies

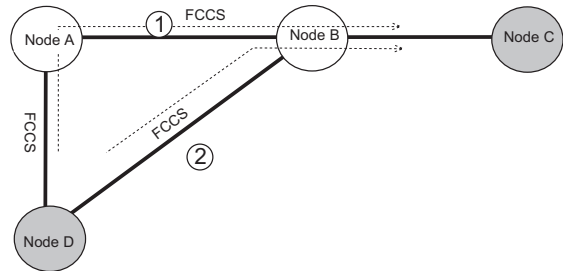
example 1



Routing from Node A → Node C

- ① Node A → Node B → Node D → Node C
- ② Node A → Node D → Node B → Node C
- ③ Node A → Node B → Node C
- ④ Node A → Node C

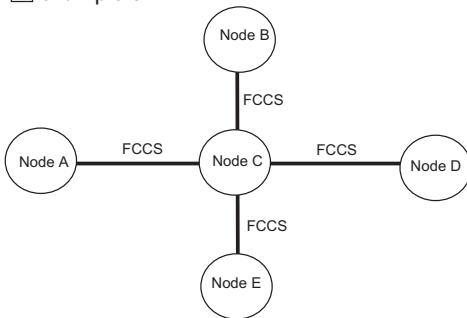
example 2



Routing from Node D → Node C

- ① Node D → Node A → Node B → Node C
- ② Node D → Node B → Node C

example 3

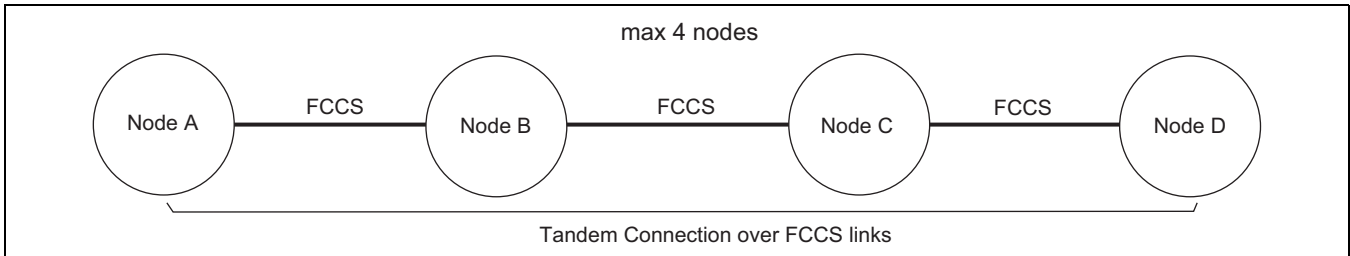


example 4



Condition 2: A maximum of four nodes are connected as tandem nodes.

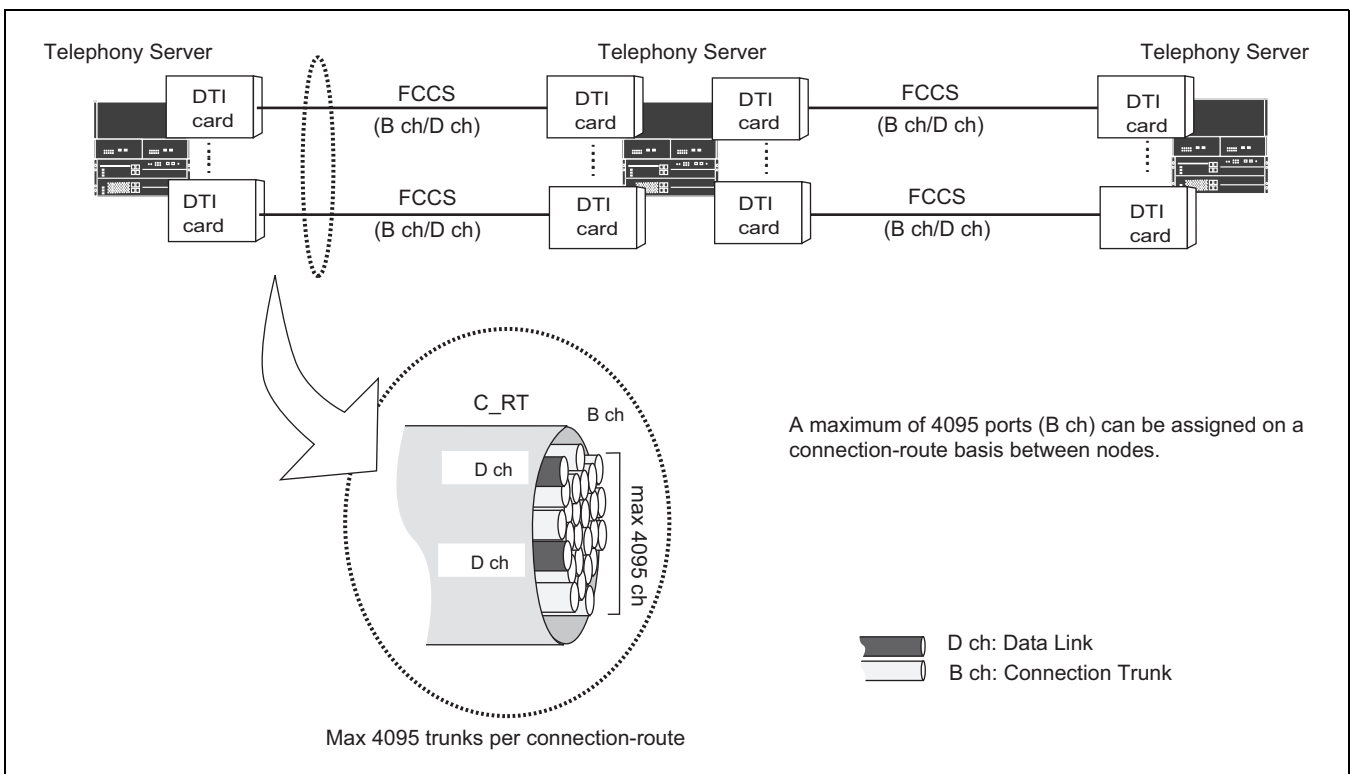
FCCS Tandem Connections



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.

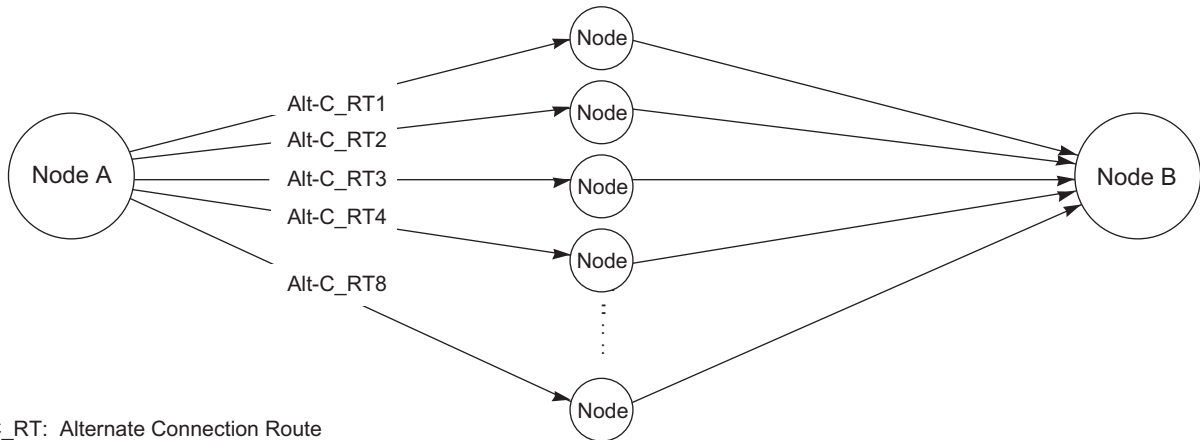
Maximum Number of Ports between Nodes



Condition 5: Up to eight routes are assigned as alternate routes for a connection trunk.

Connection Trunk Alternate Routing

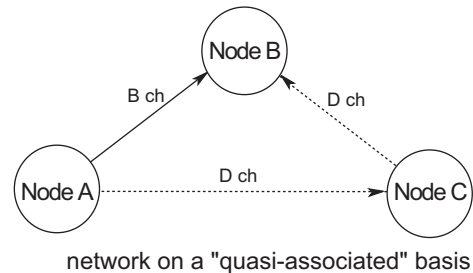
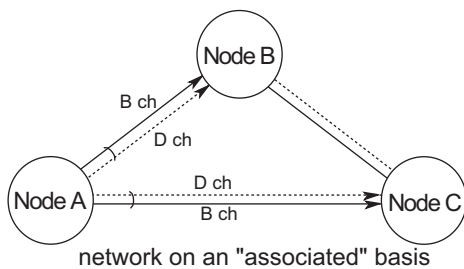
A maximum of eight (8) alternate routes can be assigned for Connection Trunks.



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

FCCS Network on an Associated Basis

B ch: Connection Trunk D ch: FCCS Data Link



Condition 7: One FCCS data link must be assigned on each digital line.

Note: The recommended speed is 128 kbps (64 kbps x 2 channels) or more. Change data link speed through switch setting on FCH card if possible. For details on data link speed setting, see the section on SW14 of PA-FCHA FCCS Call Control Handler in Circuit Card Description.

Condition 8: A maximum of eight data links are used for a connection trunk for redundancy.

Condition 9: The maximum data link speed is 1.5 Mbps (24DTI) or 2 Mbps (30DTI).

Condition 10: Connection trunks (B-Channel) 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.
- Connection trunk seizure NG will occur under the following conditions:
 Data Link Failure
 Connection Trunk all busy
 LAN connector - FCH failure
- Connection test for connection trunks is not provided.
- Nailed-down connection is not provided for connection trunks.

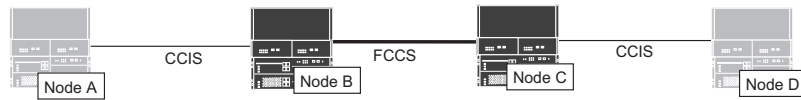
Condition 11: If a Layer 2 failure occurs, the connections are released.

Condition 12: When FCCS links and CCIS links co-exist on an FCCS network, the following conditions are considered:

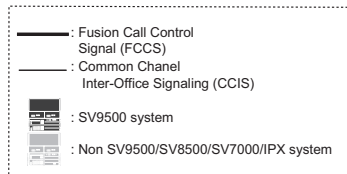
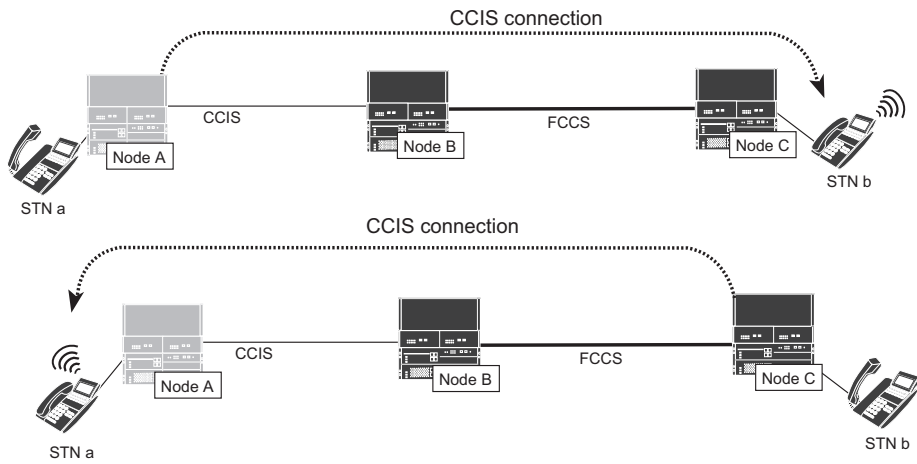
An FCCS link may be used as a CCIS link through data programming. In this instance, if the other node accommodates a dedicated CCIS card, CCIS will not work even if the Self Node accommodates an FCCS link card. The same FCCS link card accommodates at both nodes. The figure below shows an example of CCIS and FCCS networks.

CCIS and FCCS Network

- When an additional service feature is activated from Node A to Node D, the feature is performed as a CCIS feature.



- In the both cases, the connections are performed as CCIS connections.



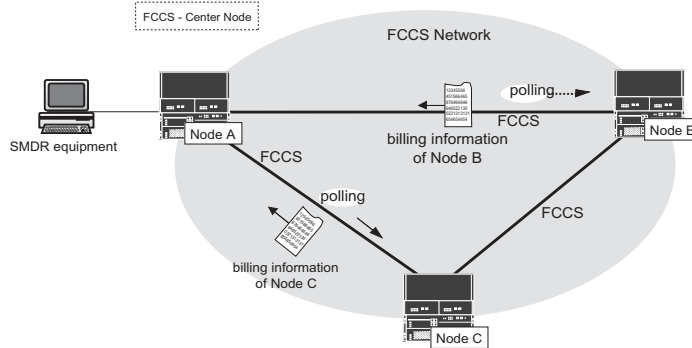
4.2 Centralized Billing - FCCS (Polling Method)

This section explains the conditions of Centralized Billing - FCCS, focusing on when CCIS links are involved. To use this feature, select Center Nodes on the FCCS network.

Centralized Billing - FCCS (1/3)

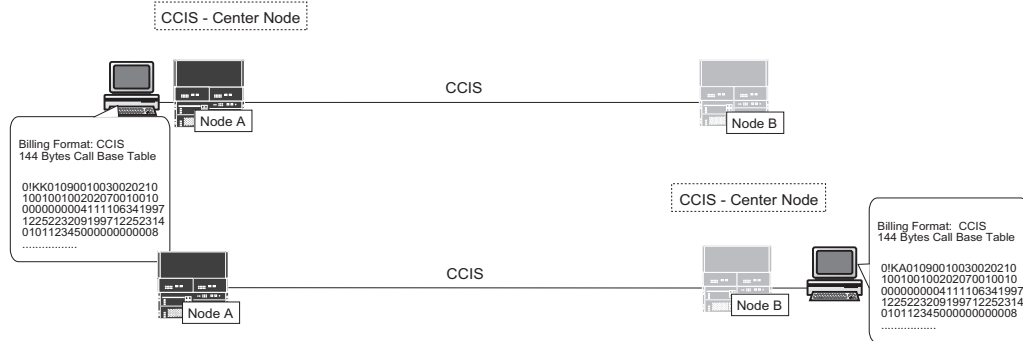
- Example 1

- Node A (FCCS - Center Node) collects the billing information of Nodes B and C via FCCS using polling method.



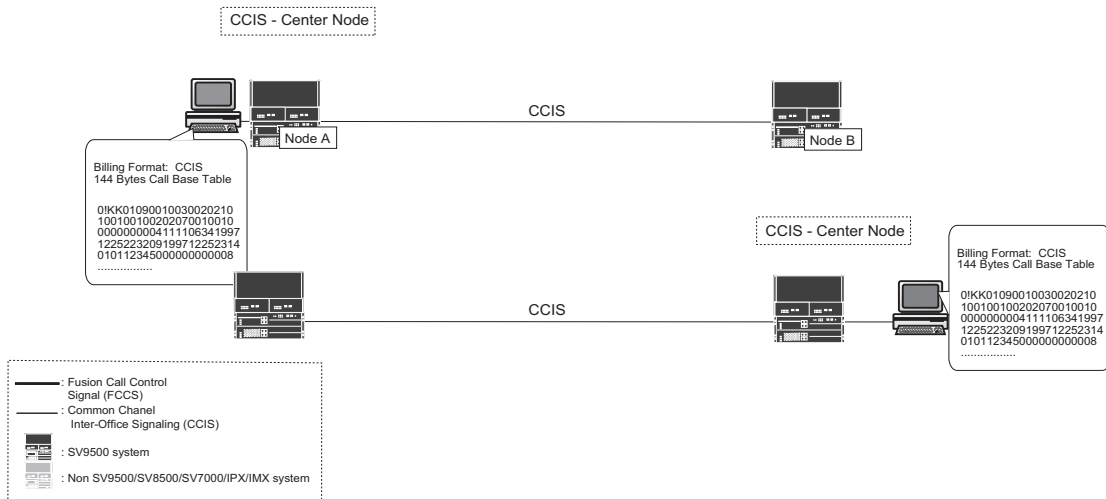
- Example 2

In either case, "Centralized Billing - CCIS" is used. (The size of call base table is 144 Bytes.)



- Example 3

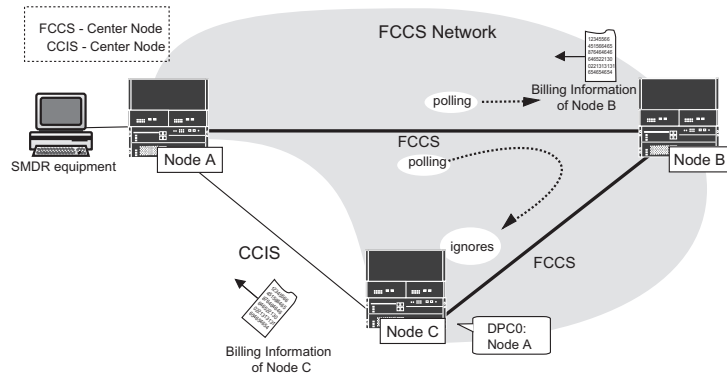
In either case, "Centralized Billing - CCIS" is used. (The size of call base table is 144 Bytes.)



Centralized Billing - FCCS (2/3)

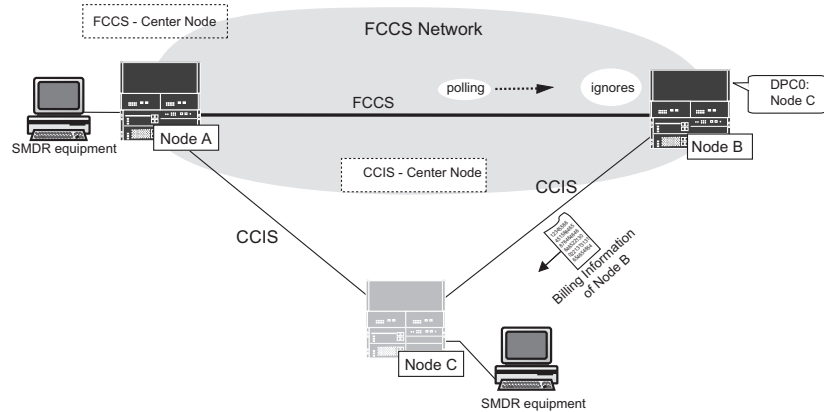
- Example 4

- 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.



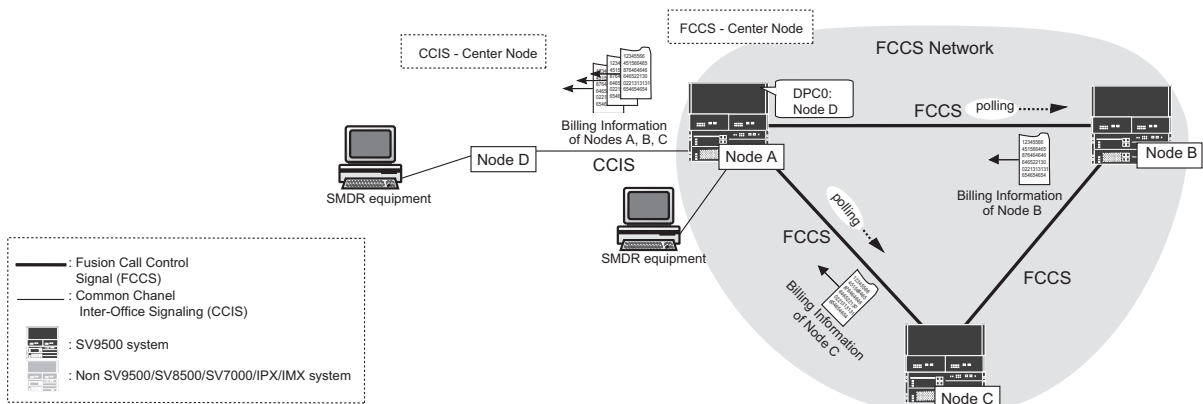
- Example 5

- 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

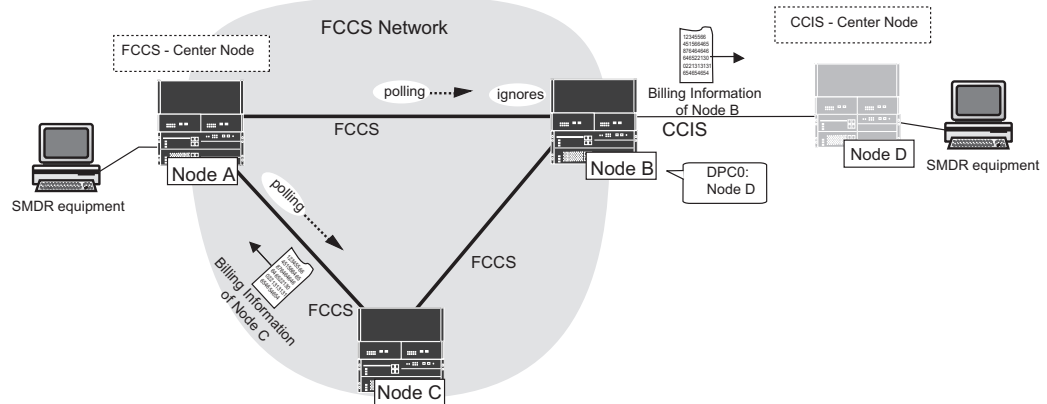
- Node A collects the billing information of Node B and Node C via FCCS using polling method.
- Node A sends the billing information of Node A, Node B, and Node C to Node D.



Centralized Billing - FCCS (3/3)

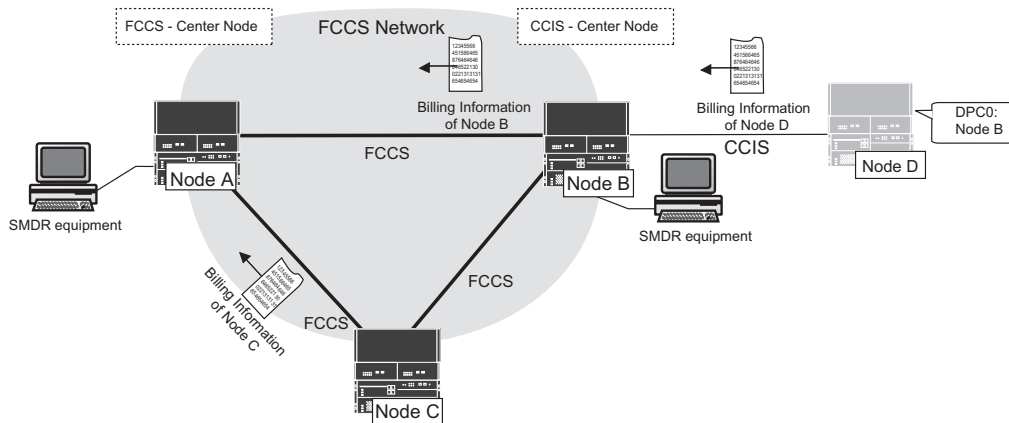
- Example 7

- 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.

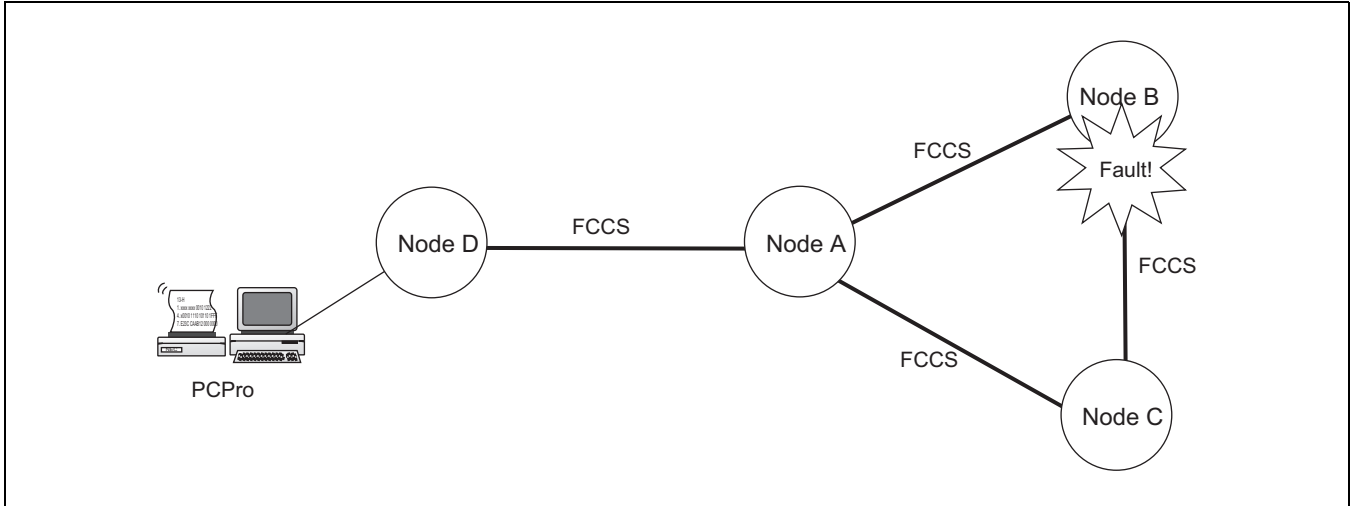


- DPC : Destination Point Code
- : Fusion Call Control Signal (FCCS)
- : Common Channel Inter-Office Signaling (CCIS)
- SV9500 system
- Non SV9500/SV8500/SV7000/IPX/IMX system

4.3 Centralized Management Report-FCCS

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

Centralized Management Report - FCCS



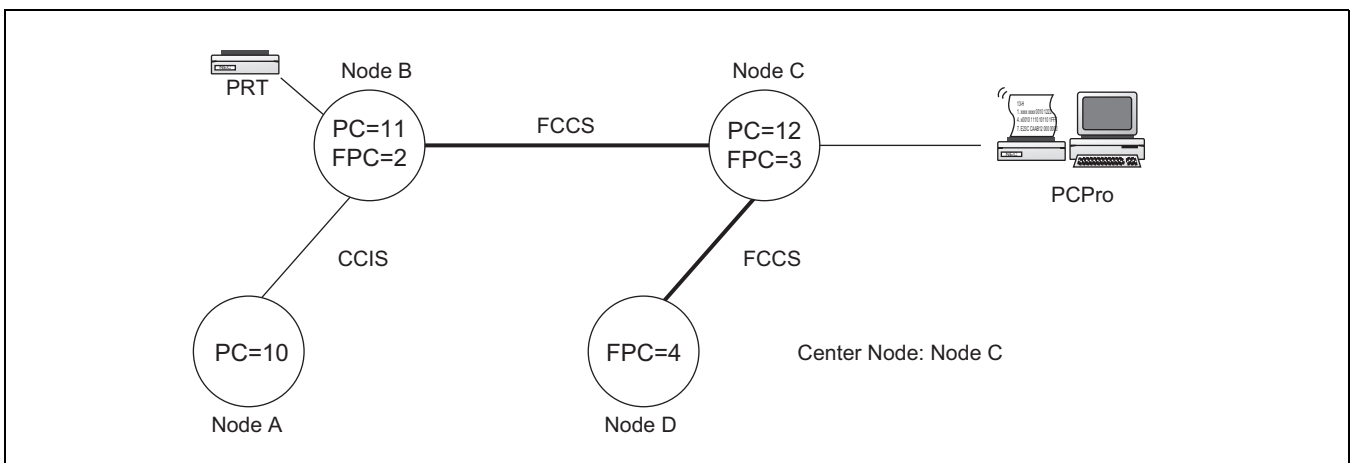
- Center Node for Centralized Management Report-FCCS is specified in system data: ASYDL, SYS1, Index 532 (FPC of Center Node for Centralized Management Report-FCCS).
- System messages received from the LNs are stored in the buffer memory for Centralized Management Report-FCCS at the Center Node.
- PCPro is connected to the Center Node polls.
- Office name (with AOFC command) is used for identifying each node.
- Once a system message has been sent to the Center Node, the message is regarded as an old message.
- When the system fails transmission of a system message to the Center Node, retry operation is executed. When the retry operation fails, transmission is aborted and the message is sent together with the next system message.

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

- When FCCS network is added to the existing CCIS network:
Fault information detected in FCCS network is not output to the Centralized Maintenance Console (PCPro) for CCIS.
- When the existing CCIS network is upgraded to FCCS network:
To use both Centralized Maintenance Console (PCPro) for CCIS and FCCS, be sure to leave the CCIS signal channel data unchanged on each node. Added FCCS node cannot send out fault information to the Centralized Maintenance Console (PCPro) for CCIS.

Example: 1 When the network comprises FCCS and CCIS links

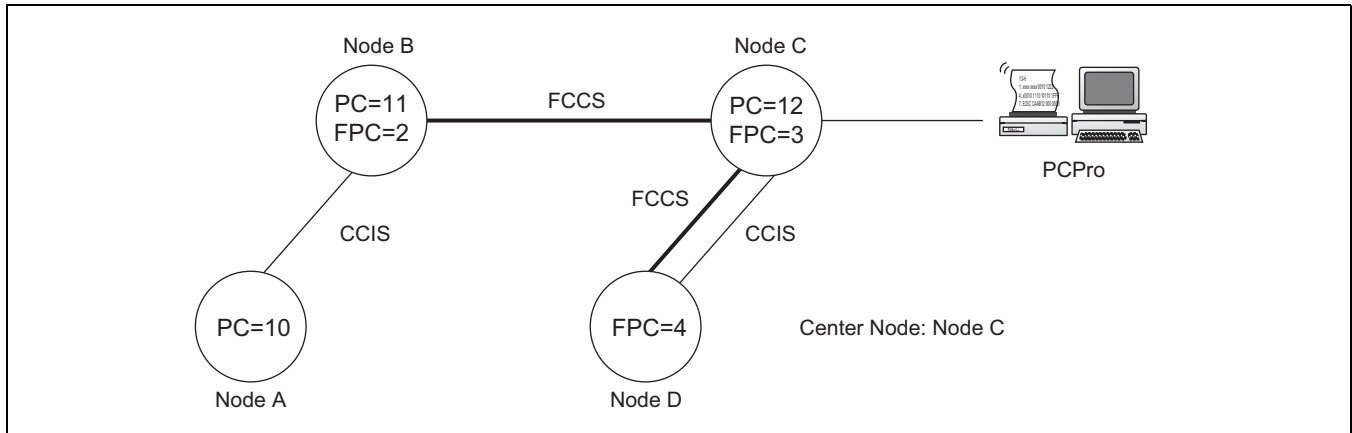
Centralized Management Report - FCCS (Example 1)



- 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, SYS 1, Index 532. When this system data is assigned, system messages received from Node A are also transferred to Node C. When data is not assigned (0), system messages received from Node A are ignored and not transferred to Node C.
- Node C: Received system messages are stored in the memory area for Centralized Management Report - FCCS.
- Node D: To send system messages to Node C, assign Fusion Point Code of Node C (3) to ASYDL, SYS 1, Index 532.

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

Centralized Management Report-FCCS (Example 2)

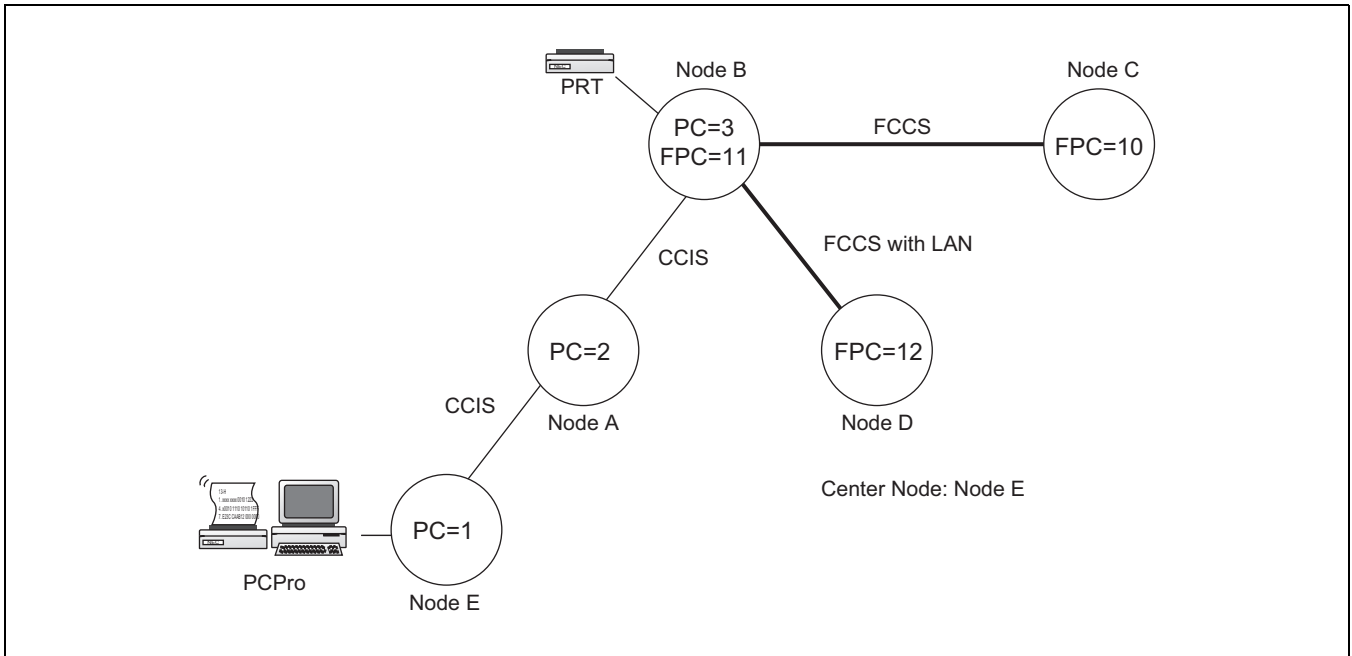


Node A/B/C: Refer to “Example: 1 When the network comprises FCCS and CCIS links.”

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.

Example: 3 When a node is linked with LAN interface

Centralized Management Report-FCCS (Example 3)



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

4.4 FCCS Attendant/Desktop Console

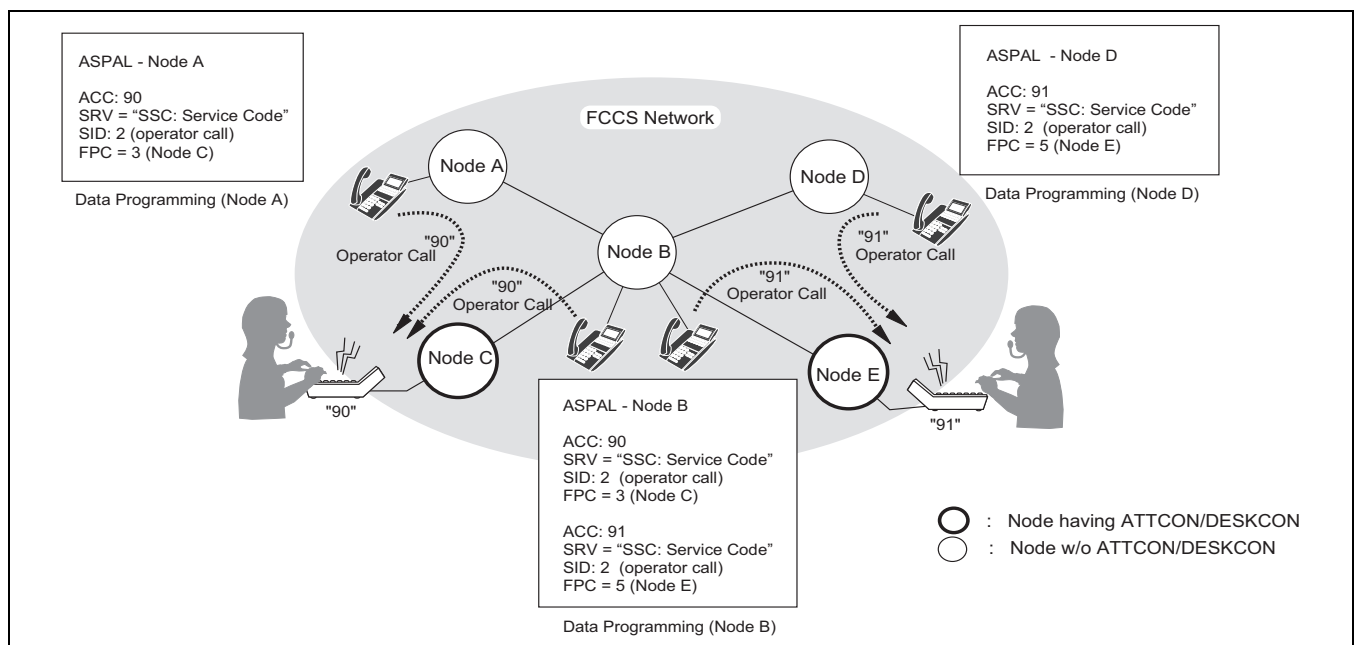
4.4.1 Operator Call

An operator call is placed from each node by assigning the access code using the ASPAL/ASPAN command. This allows the user to specify an appropriate node on the FCCS network by entering the FPC. The figure below shows a station user at Node B calling an operator at Node C or Node E by dialing 90 or 91.

Note: Develop the unified data at each node (Waiting Call Display data):
ASYD, SYS 2, Index 8
ASYD, SYS 2, Index 9

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

Operator Calls on an FCCS Network



4.4.2 Central Office Incoming Call (Ringdown)

Each node can specify a terminating node for Ringdown 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).

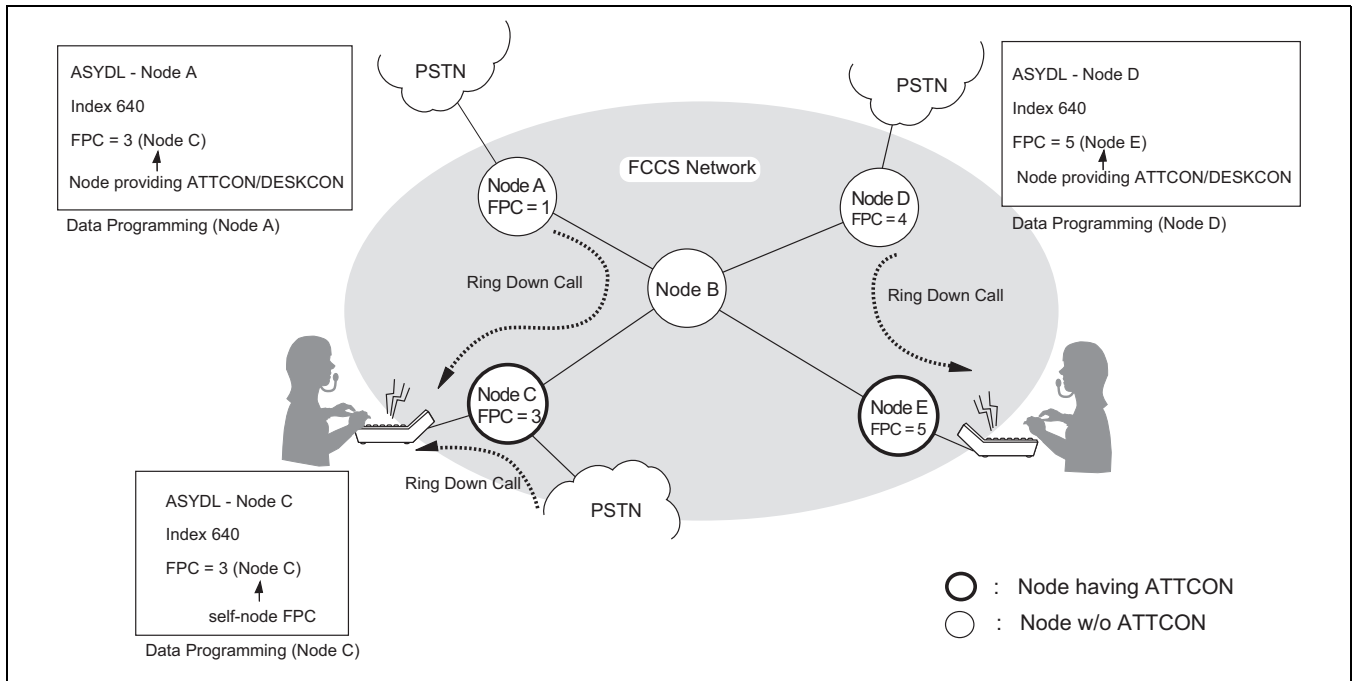
Note: Self-FPC is assigned at the terminating node.

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

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

Note: When the connection routes (C_RT) are all busy, any attempted call via the C.O. line is not connected to the ATT. As a result, the calling party is provided with the Ringback 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.

Ringdown Calls on an FCCS Network



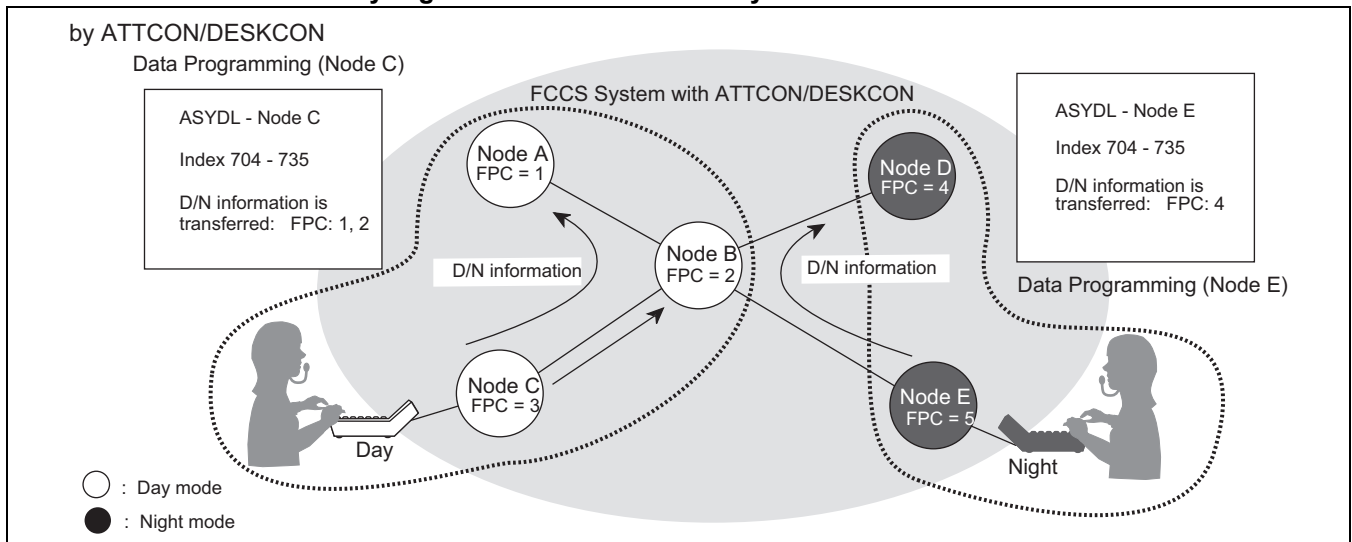
4.4.3 Day/Night Change

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 through 735. Node A and Node B specify Node C as a terminating node for Ringdown calls from PSTN by assigning FPC 3 in Index 640. Node E specifies Node D as a destination.

Note: When assigning ATTCON/DESKCON on the FCCS network, develop the unified system data at each node.

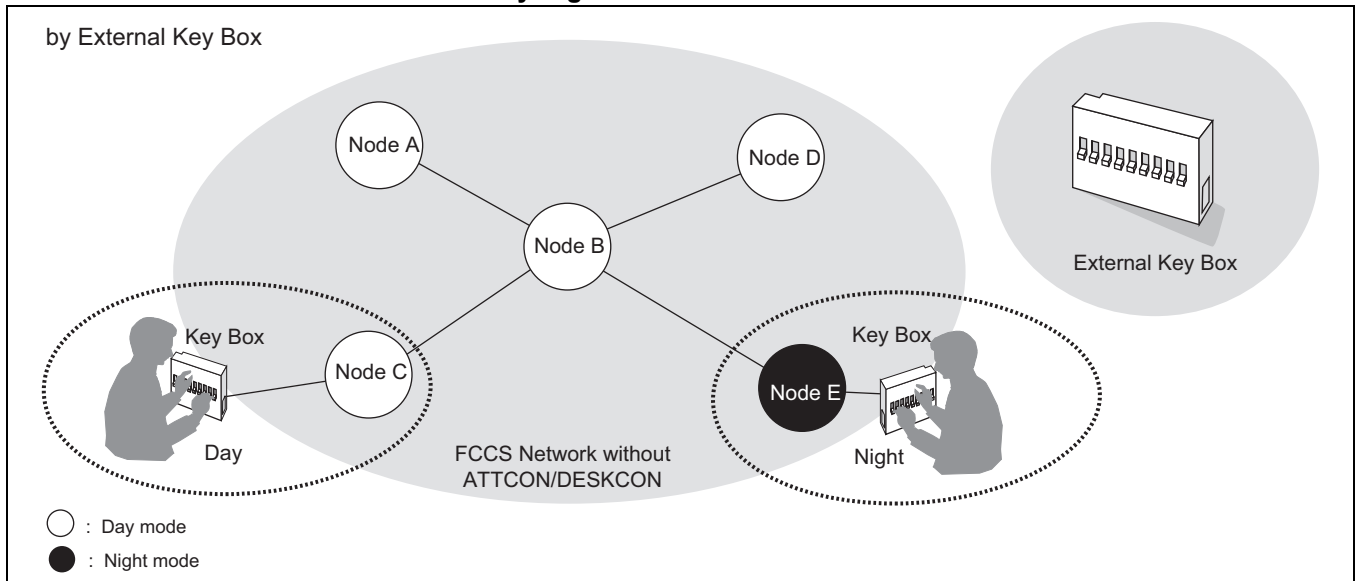
Note: Terminating node cannot be assigned differently at each Tenant (TN).

Day/Night Information Transfer by ATTCON/DESKCON



When an ATTCON/DESKCON is not provided on the FCCS network, Day/Night information is effective for a node to accommodate an external key box.

Day/Night Information Transfer





CHAPTER 4 INSTALLATION

1. Circuit Cards Required

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

- FCCS Networking via IP (Peer-to-Peer)
IPPAD (CH-IPDA/PA-32IPDA/PA-32IPDB)

Note: It is not required when no Digital terminal and Analog terminal is connected.

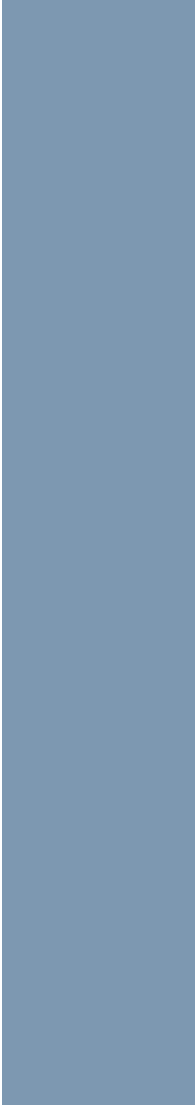
- FCCS with FCH
FCH (PA-FCHA)
DTI (PA-PRTC (1.5M DTI)/PA-PRTC (2M DTI))
- FCCS without FCH
DTI (CH-PRTA (1.5M DTI)/CH-PRTA (2M DTI)/PA-PRTC (1.5M DTI)/PA-PRTC (2M DTI))

Before starting installation, make sure all the necessary cards are at the site. Refer to Circuit Card Description for setting keys on each circuit card.



CHAPTER 5

DATA PROGRAMMING



1. Basic Data Programming Assignment

For the basic office data assignment, refer to Data Programming Manual - Business. When CCIS services are activated in an FCCS Network, refer to Data Programming Manual - CCIS for CCIS service data assignment.

2. FCCS Data Programming Assignment

This chapter explains how to set FCCS network data, and it describes the following:

- FCCS Networking via IP (Peer-to-Peer)
- Assignment of System Data **Note 1**
- Assignment of Logical RT in Network DM (NDM)
- Assignment of Numbering Data for Telephone Numbers
- Assignment of Telephone Numbers
- Assignment of Connection Route/Trunk Data **Note 1**
- Assignment of FCH Related Data **Note 1**
- Assignment of Access Code for Tandem Connection via FCCS - ACIS
 - OGC
 - OGCA
 - LCR/LCRS
- Flexible Routing - FCCS
- Network Data Programming for Tandem Connection via FCCS - CCIS
- BLF over FCCS
- PAD/EC Control IP Support - FCCS
- FCCS Location Diversity
- SR-MGC Location Diversity

Note 1: These data programs are related to FCCS system without FCH/FCCS system with FCH. When the FCCS system is FCCS Networking via IP, these are not required.

2.1 FCCS Networking via IP (Peer-to-Peer)

This FCCS Networking via IP (Peer-to-Peer) allows the system to exchange both Speech and FCCS Signals over an Intranet. This feature can be activated by using Internal PHF. The Speech data between the IP stations can be sent/received in a Peer-to-Peer connection, while the control signals are handled by the System. For details on this feature, refer to FCCS Networking via IP [F-36] in Data Programming Manual - Business.

Note: FCCS Networking via IP (by IPTRK) is available only for a migrated system from IPX, SV7000 and SV8500. For a newly installed SV9500 system, use FCCS Networking via IP (Peer-to-Peer).

☐ Operating Procedure

No manual operation is required.

☐ Service Conditions

For information about service conditions for FCCS Networking via IP, refer to FCCS Networking via IP [F-36] in Data Programming Manual - Business.

☐ Data Assignments

The outline of the data programming for this feature is shown in the following table:

Data Programming	ASYDL	ADTM	AFRIL	AFIPN	CBCN	ADPM
First-time Assignment (in NCN)	Required	Required	Required	Required	Required	Required in some cases
First-time Assignment (in LN)	Required	Required	Required	Not required	Not required	Required in some cases
Adding a new LN (in NCN)	Required in some cases	Required in some cases	Required	Required	Not required	Required in some cases
Changing PHF Retransmission Timer Value	Required	Not required	Not required	Not required	Not required	Required
Changing the Number of PHF Packet Retransmissions	Required	Not required	Not required	Not required	Not required	Required
Changing PHF UDP Port Number	Not required	Required	Not required	Not required	Not required	Required
Changing ToS Value	Not required	Not required	Not required	Not required	Not required	Required
Changing IP Address [Note 1]	Not required	Required	Not required	Required	Required	Not required

STEP 1: **ASYDL** - System Data 1, Index 512. Assign FPC of the Self Node.
System Data 1, Index 513. LDM usage.

System Data 1, Index 514. NDM usage.

System Data 1, Index 527, Bit 5 = 0 Enables Speech Link Reconnection via FCCS Networking via IP.

System Data 1, Index 534, Bit 2 = 1 [Broadcasting method when changing NDM command (SP)]

Note 1

System Data 1, Index 534, Bit 7 = 1 [NDM data individual broadcasting (from NCN to the LN)]

Note 1

Note: For how to change the IP address of each node, refer to [\[How to Change IP Address\]](#).

Note 1: This setting is also required for all nodes in an environment where Peer-to-Peer FCCS network and DTI FCCS network coexist.

System Data 1, Index 880, Bit 4 = 1 Enables Internal PHF.

System Data 1, Index 892, Bit 0 - 3. PHF Packet Retransmission Timer (Optional). **Note 2**

Note 2: When this data is changed, the PHF Module Reset with the ADPM command is necessary.

b3	b2	b1	b0	
0	0	0	0	: 128 ms (Normal Setting)
0	0	0	1	: 32 ms
0	0	1	0	: 64 ms
0	0	1	1	: 256 ms
0	1	0	0	: 512 ms
0	1	0	1	: 1024 ms
0	1	1	0	: 2048 ms
the others				: Not used.

System Data 1, Index 892, Bit 4 = 0/1 [PHF Retransmission Control is available (Normal Setting)/not available]

Note: PHF Retransmission Control is used to ensure the integrity of control signals exchanged between nodes.

To implement this scheme, you need to make sure all of the following conditions are met:

Note 3

- PHF Retransmission Control must be enabled on all nodes.
- All nodes must use the same settings for PHF Packet Retransmission Timer (ASYDL, System Data 1, Index 892, Bit 0-3) and Number of PHF Packet Retransmissions (ASYDL, System Data 1, Index 1078, Bit 0-3).

Note 3: In a network system where two Peer-to-Peer FCCS networks are connected in tandem with one DTI-FCCS network in between (Peer-to-Peer FCCS - DTI-FCCS - Peer-to-Peer FCCS), PHF Retransmission Control can be implemented not only on the entire network system but also on one of the Peer-to-Peer FCCS.

System Data 1, Index 1078, Bit 0-3 = Number of PHF Packet Retransmissions [0-5 (maximum)].

b3	b2	b1	b0	
0	0	0	0	: 1 time (Normal Setting)
0	0	0	1	: 1 time
0	0	1	0	: 2 times
0	0	1	1	: 3 times
0	1	0	0	: 4 times
0	1	0	1	: 5 times (Maximum)
the others				: Not used.

Note: Set the number of times of PHF packet retransmission to one (normal setting), unless it is necessary. Increase the number only in the case of frequent packet loss due to network error.

Note: When the number of PHF packet retransmissions is increased, the whole system performance may go down depending on the network conditions.

Note: When the number of PHF packet retransmissions is changed, Internal PHF Module Reset is required by using ADPM command.

STEP 2: **ASYDN** - System Data 1, Index 641. Specify a node for a sender to be selected when originating a trunk call via Peer-to-Peer FCCS.

Bit 6 = 0 (Node accommodating the calling party) *Node accommodating the outgoing trunk is selected if this node cannot be selected.

Bit 6 = 1 (Node accommodating the outgoing trunk) *Node accommodating the calling party is selected if this node cannot be selected.

STEP 3: **ADTM** - Assign the Internal PHF UDP port number (default: 60180).

Note: When changing the default port number, assign the identical value to all nodes in the network. After the port number change, the PHF Module Reset by ADPM is necessary.

STEP 4: **AFRIL** - Assign the destination FPC and the relay FPC. For details, refer to the following example data assignment.

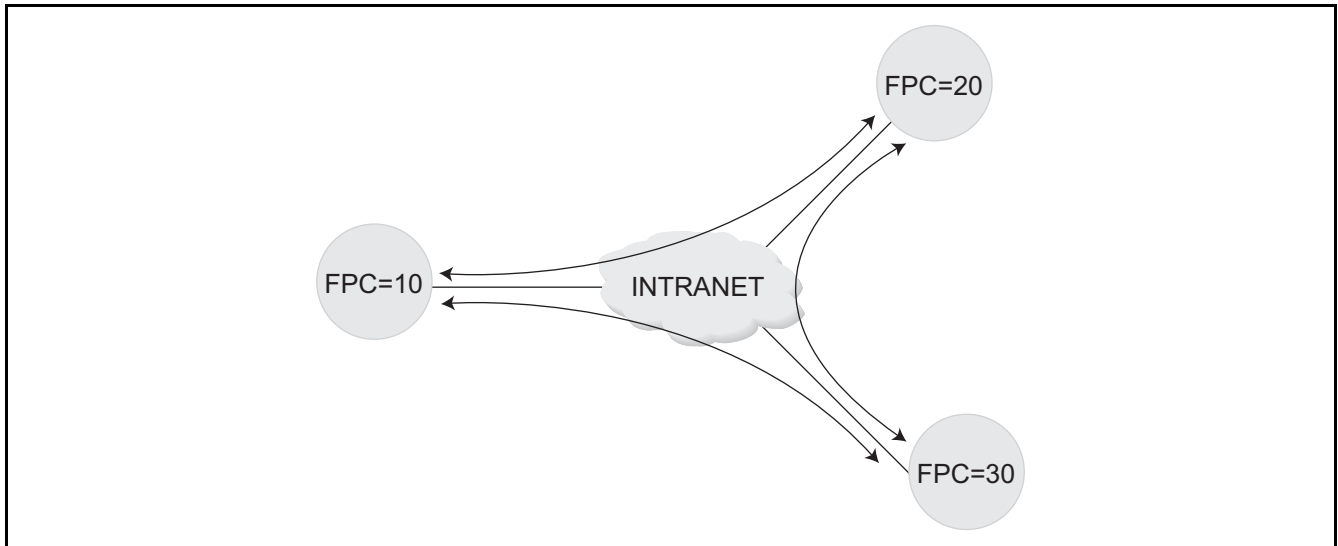
FPC: Assign the destination FPC.

CNT: A maximum of eight FPCs can be assigned to a destination FPC. **Note 4**

DST FPC: Assign the destination FPC.

Note 4: Usually, CNT 2-8 are not used.

- Example of three-node network configuration



Data Assignment in FPC 10

FPC (Destination FPC)	CNT	DST FPC (Relay FPC)	Remarks
20	1	20	FCCS control packet for FPC 20 is transferred to FPC 20.
30	1	30	FCCS control packet for FPC 30 is transferred to FPC 30.

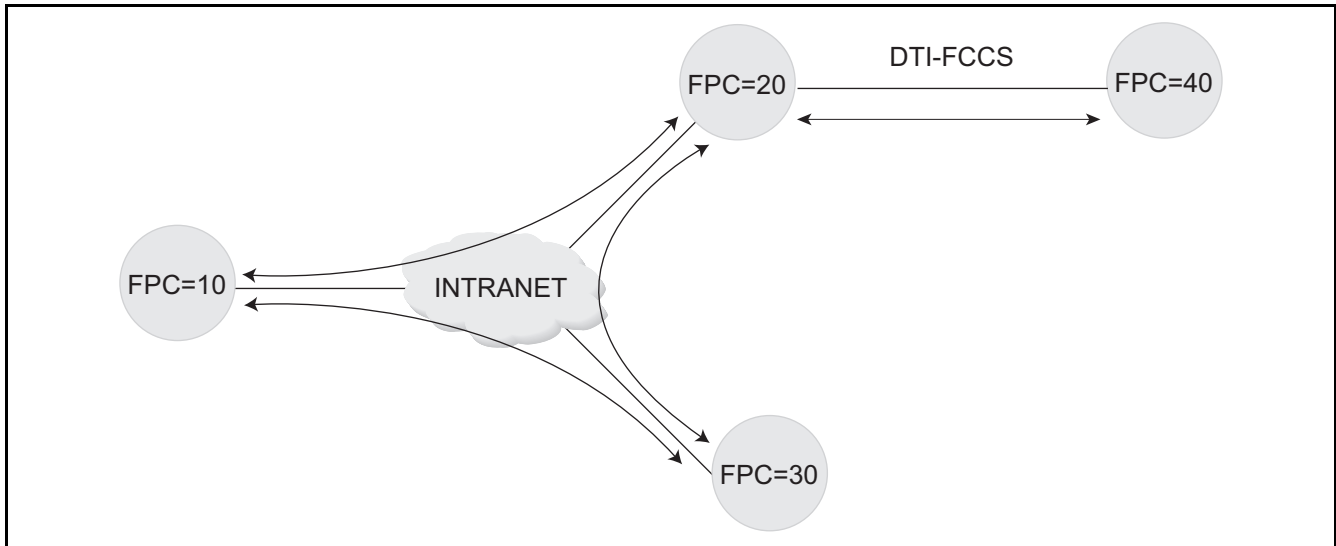
Data Programming in FPC 20

FPC (Destination FPC)	CNT	DST FPC (Relay FPC)	Remarks
10	1	10	FCCS control packet for FPC 10 is transferred to FPC 10.
30	1	30	FCCS control packet for FPC 30 is transferred to FPC 30.

Data Programming in FPC 30

FPC (Destination FPC)	CNT	DST FPC (Relay FPC)	Remarks
10	1	10	FCCS control packet for FPC 10 is transferred to FPC 10.
20	1	20	FCCS control packet for FPC 20 is transferred to FPC 20.

- Example of four-node network configuration



Note: This example is based on the assumption that DTI-FCCS is properly configured.

Data Assignment in FPC 10

FPC (Destination FPC)	CNT	DST FPC (Relay FPC)	Remarks
20	1	20	FCCS control packet for FPC 20 is transferred to FPC 20.
30	1	30	FCCS control packet for FPC 30 is transferred to FPC 30.
40	1	20	FCCS control packet for FPC 40 is transferred to FPC 20.

Data Programming in FPC 20

FPC (Destination FPC)	CNT	DST FPC (Relay FPC)	Remarks
10	1	10	FCCS control packet for FPC 10 is transferred to FPC 10.
30	1	30	FCCS control packet for FPC 30 is transferred to FPC 30.

Data Programming in FPC 30

FPC (Destination FPC)	CNT	DST FPC (Relay FPC)	Remarks
10	1	10	FCCS control packet for FPC 10 is transferred to FPC 10.
20	1	20	FCCS control packet for FPC 20 is transferred to FPC 20.
40	1	20	FCCS control packet for FPC 40 is transferred to FPC 20.

STEP 5: **AFIPN** - Assign FPCs and IP addresses of LAN1/LAN2 (ACT) for all Nodes in the network. This data must be assigned in NCN.

FPC: Fusion Point Code (1-253)

IP ADDRESS: IP Address of LAN1/LAN2 (ACT) for the FPC assigned in the above FPC parameter.

STEP 6: **CBCN** - Specify the destination of the NDM data broadcast from the NCN, to update the data of all the destination Nodes. Be sure to activate this command after the completion of the Local Node data assignment.

Note: After the first-time NDM data setting or the system initialization of NCN, be sure to execute this command.

STEP 7: **ADPM** - Assign the ToS data for the PHF module.

Note: This data is assigned only when changing the ToS default data. After the data change, be sure to reset the PHF module by this command.

- IP PRECEDENCE/DIFFSERV: Select either IP Precedence or DiffServe.

When selecting IP Precedence:

Priority: 0-7

Low Delay: Click the check box to set Low Delay to ON.

Through Put: Click the check box to set High Through Put to ON.

Reliability: Click the check box to set High Reliability to ON.

Min Cost: Click the check box to set Cost Precedence to ON.

When selecting DiffServe:

Priority: 0-63

- Internal PHF Module Reset: Required when executing the following.
 - Changing PHF Packet Retransmission Timer Value
 - Changing the Number of PHF Packet Retransmissions
 - Changing PHF UDP Port Number
 - Changing ToS Value

[How to Change IP Address]

The following shows how to change the IP addresses of each node in FCCS network.

Note: When changing the IP address of NCN/LN, change the IP address of NCN first. If you change the IP address of LN first, the FCCS Networking via IP (Peer-to-Peer) does not work.

- For NCN

STEP 1: **AFIPN** - Delete the IP address of NCN.

STEP 2: **ADTM** - Change the IP address of NCN.

Note: When changing IP address, PCPro will be disconnected automatically. After the automatic disconnection, set the login setting again and reconnect.

STEP 3: **AFIPN** - Assign the IP address of NCN.

STEP 4: **CBCN** - Specify the destination of broadcasting and update the NDM data of other node.

Note: Execute the CBCN command after the data setting at LN side is completed.

- For LN

(a) IP Address Deletion of LN at NCN

STEP 1: **AFIPN** - Delete the corresponding IP address of LN

(b) IP Address Change at LN

STEP 1: **ADTM** - Change the IP address of LN.

Note: When changing IP address, PCPro will be disconnected automatically. After the automatic disconnection, set the login setting again and reconnect.

(c) IP Address Assignment of LN at NCN

STEP 1: **AFIPN** - Assign the IP address of LN.

STEP 2: **CBCN** - Specify the corresponding LN and update the NDM data.

2.2 Assignment of System Data

Network Control Node	ASYDN, ASYDL
Local Node	ASYDL

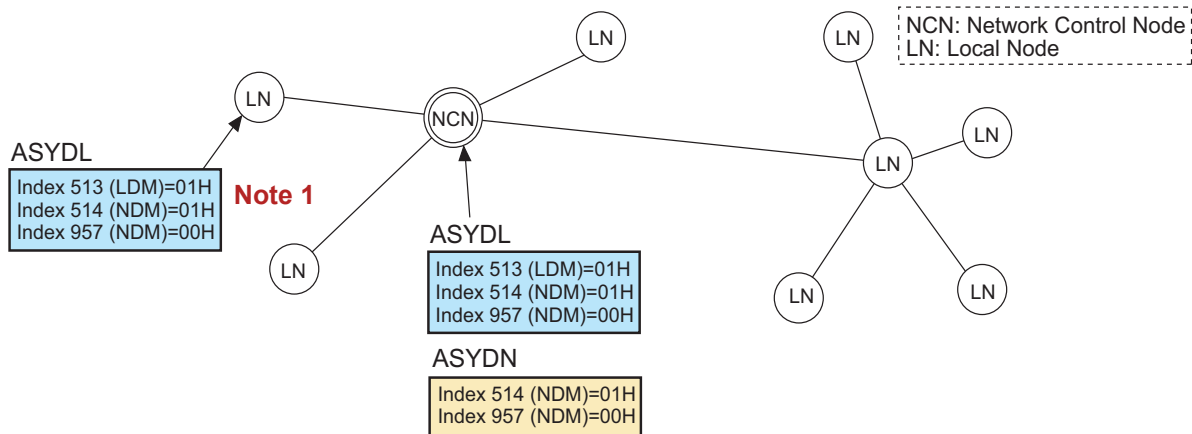
Note: The following assignment varies depending on the node type. The mark on the right of each assignment describes the use of a command by the node type. Not required indicates the assignment is not necessary for the node type.

STEP 1: **ASYDL, 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. The figure below shows an example when assigning 2M-LDM and 2M-NDM.

Assignment of Memory Block (example)

The ASYDN command is used at NCN only. Use the ASYDL command at all nodes.



Note 1: ASYDL must be assigned at each node on the network.

- ☐ Index 513 Local Data Memory (LDM) usage

ASYDL - Assign 1 for bits corresponding to data memory block used as Local Data Memory (LDM).

LDM uses Block 0 through Block 5 as shown in LDM and NDM Allocation. Assign 01H for systems having 2M-LDM.

This data must be assigned at each node.

- ☐ Indexes 514 and 957 Network Data Memory (NDM) usage

ASYDL - Assign 1 for bits corresponding to data memory block used as Network Data Memory (NDM).

NDM uses block #0 through block #15 (**Note 2**) as shown in LDM and NDM Allocation. Assign 01H for systems having 2M-NDM. This data must be assigned at each node.

ASYDN - Assign 1 for bits corresponding to data memory block used as Network Data Memory (NDM). This data must be assigned at the Network Control Node (NCN) only.

Note 2: Index 957 is fixed to 00H except when Index 514 = FFH.

Note: When the Network Data Memory is not enough, change the value from 01H → 03H → 07H → 0FH → 1FH → 3FH → 7FH → FFH. Avoid having a gap between memory blocks.

Note: System Initialization is not required for changing this data.

Note: The data size is 2MB per memory block.

[Example of Index 514 and Index 957 Data for NDM Expansion]

NDM Expansion from 6 MB to 32 MB

NDM Expansion	Index 514	Index 957
Before Expansion	07hex	00hex
After Expansion	FFhex	FFhex

Note: When you set both Index 957 and Index 514, be sure to set Index 514 first and then set Index 957.

Note: NDM can be expanded to the maximum 32 MB at a time.

<Important Notes on Deleting Memory Blocks>

- You can delete unused memory blocks only. Do not delete used memory blocks.
- Whether memory blocks are used or not can be checked in DDMMO command window. Unused memory blocks can be recognized by checking for a “Used-size” field of 4,096 bytes.

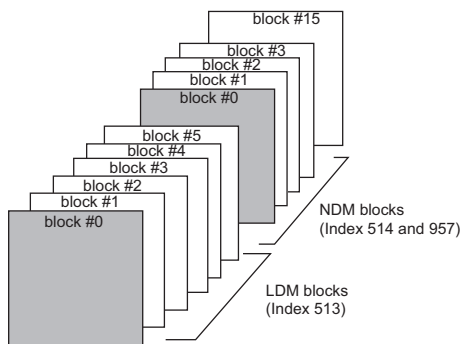
Note: Deleting used memory blocks causes the mismatch in office data (NDM), so do not delete used memory blocks.

Note: Delete memory blocks in descending order from the last memory block and avoid having a gap between the memory blocks.

Note: System Initialization is not required for deleting memory blocks.

LDM and NDM Allocation

Each bit corresponds to one block having 2M Bytes.



Relationship between Bit and Block Number

INDEX	BIT	SETTING	MEANING
513 (LDM)	0	1	Memory Block #0
	1	0/1	Memory Block #1
	2	0/1	Memory Block #2
	3	0/1	Memory Block #3
	4	0/1	Memory Block #4
	5	0/1	Memory Block #5
	6	0	Not used
	7	0	Not used
514 (NDM)	0	1	Memory Block #0
	1	0/1	Memory Block #1
	2	0/1	Memory Block #2
	3	0/1	Memory Block #3
	4	0/1	Memory Block #4
	5	0/1	Memory Block #5
	6	0/1	Memory Block #6
	7	0/1	Memory Block #7
957 (NDM)	0	0/1	Memory Block #8
	1	0/1	Memory Block #9
	2	0/1	Memory Block #10
	3	0/1	Memory Block #11
	4	0/1	Memory Block #12
	5	0/1	Memory Block #13
	6	0/1	Memory Block #14
	7	0/1	Memory Block #15

Note 1 : These bits are normally assigned as "0" (i.e. "01H" is normally set for both Index 513 and 514). The flagging of the bit(s) is possible, but only in the case that your system should use the bit-corresponding Memory Block(s).

STEP 2: **ASYDL**

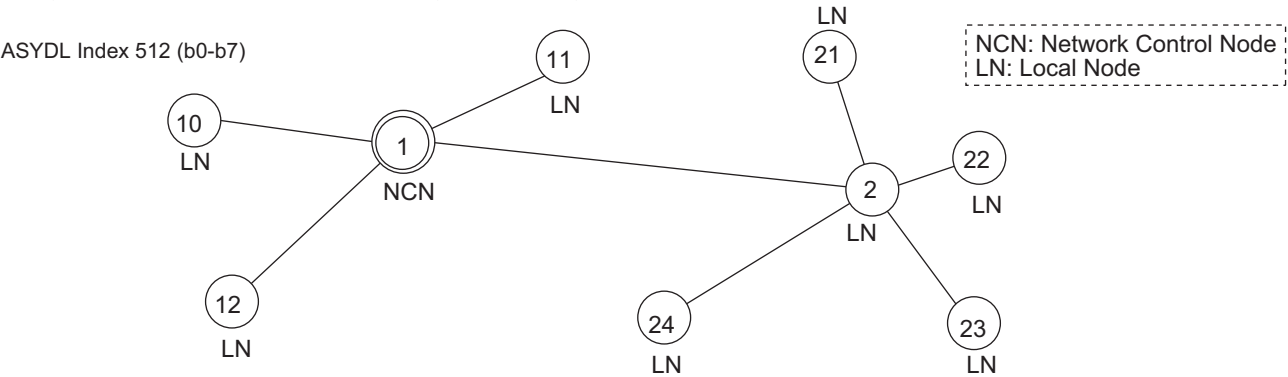
Assign the self-Fusion Point Code (self-FPC) at each node. FPC ranges from 1 to 253. Use the ASYDL command (Index 512 b0-b7).

☐ Index 512 self-FPC

Assign a unique FPC for each node.

Self-FPC Assignment

This figure shows an example of FPC assignment. Assign a unique FPC for each node.

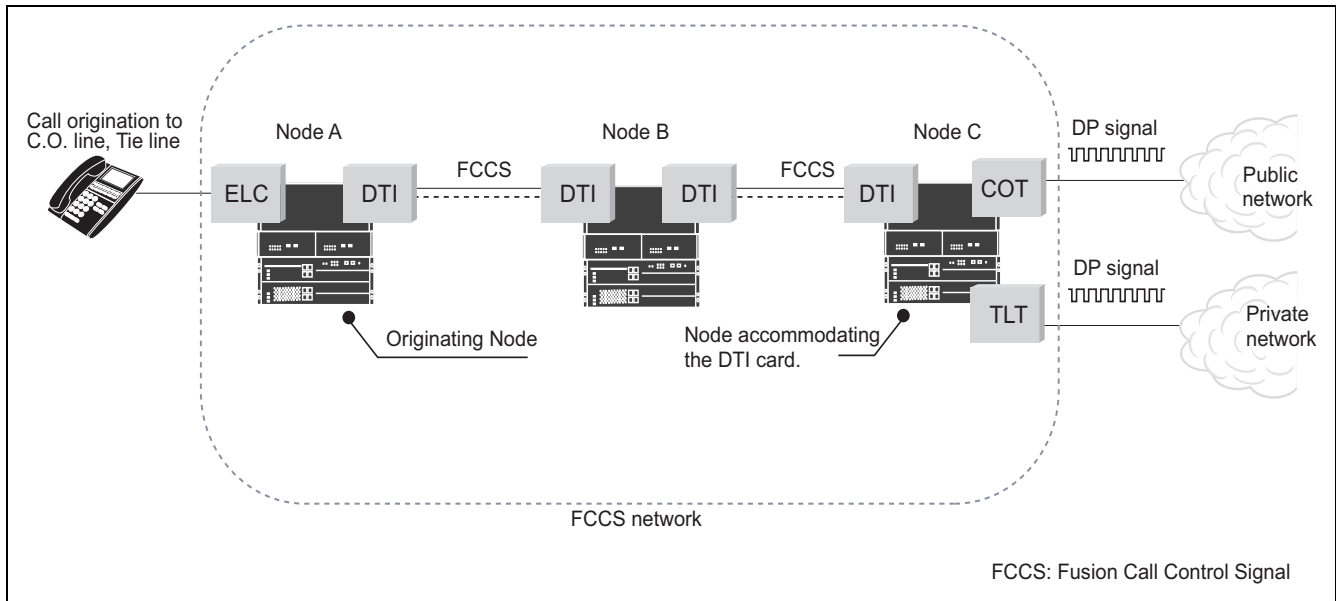


STEP 3: **ASYDL**

Assign the data of Dial Pulse (DP) relay broadcasting to the FCCS link using the ASYDL command (Index 527, b4): 0/1=DP relay broadcasting to the FCCS link is invalid/valid.

Note: If the DP (10 or 20 pps) is set in the Signal Selecting for Outgoing C.O./TIE Line calls, assign this data to bit4=1 (DP relay broadcasting is valid) when a call is originated at the node that doesn't accommodate C.O./TIE line trunk. Conditions for the DTI circuit card are as follows:

DP Signal Relay Broadcasting over FCCS Link



STEP 4: **ASYDL**

Assign the data of FCCS control information for selective routing. This data is required when several routings are specified by the AFPC/AETH commands.

- ☐ Index 814 b2: 0 = FCCS look ahead routing out of service
1 = FCCS look ahead routing inn service (standard setting).

If either way cannot take the primary route on operation, the data is rerouted to the next node specified by the AFPC/AETH commands.

STEP 5: ASYDL, ASYDN

Assign other system data using the ASYDL/ASYDN command.
When Timing Start is used, assign the following data.

- ☐ **ASYDN**
Index 161b6: 0/1=-/Timing Start using “#” code
b7: 0/1=-/Timing Start using “*” code
- ☐ **ASYD/ASYDN**
Index 170b4: 0/1=Timing Start out of Service/Timing Start in Service **Note 3**
- ☐ **ASYDL/ASYDN**
Index 534b0: 0/1= Broadcast retry is performed/not performed. (Usually 1 is set for systems having FCCS in a redundant configuration.)
b1: 0/1=Automatic Data Copy from NDM to LNs/Manual Copy (by CBCN)
b2: 0/1=NDM Data Broadcast is performed by MP transfer process
b3: 0/1=NDM Periodical Refresh in through FCCS network is used/Not used
b4: 0/1=-/Office Data Copy Status is output as System Message
b7: 0/1=NDM Data Broadcast is performed by Broadcast Packets/Individual Packets
- ☐ **ASYDL/ASYDN**
Index 640Fusion Point Code (FPC) of node providing ATTCON **Note 4**
- ☐ **ASYDL**
Index 704~735
FPC of the node to which ATTCON transfers the information.

Note 5

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

Note 3: When Timing Start is in service, called Sub-address for ISDN network cannot be dialed.

Note 4: This data is necessary at each node. Assign the self-FPC at the terminating node.

Note 5: This data is necessary at the node providing ATTCON.

- ☐ **ASYDL**
Index 800
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/-
- ☐ **ASYDN**
Index 800
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.

Note: Execute Non-Load Initial after setting the FPC data. The assigned FPC becomes effective by this operation.

☐ **ASYDN**

To activate the traffic measurement order by ATRFN command, the following data assignment is needed.

Index 8 = Number of Tenants **Note 6**

Index 9 = Number of Attendant Consoles **Note 7**

Note 6: Assign the largest value of Number of Tenants (ASYDN, Index 8) in all nodes to activate Station Peg Count, ATTCON Peg Count and Service Peg Count.

Note 7: Assign the largest value of Number of Attendant Consoles (ASYDN, Index 9) in all nodes to activate ATTCON Peg Count and ATT Answer Peg Count.

☐ **ASYDN**

To reduce the office data consumption of the AFRSN command, the following data assignment is needed. **Note 8**

Index 1126

b4: 0/1 = Former AFRSN table is referred to for call handling (routing)
/New AFRSN is used

b5: 0/1 = Former AFRSN table is operated (for reading, writing, deleting,
and listing) /New AFRSN table is used

Note 8: Assign “1” to both bit 4 and 5 of ASYDN Index 1126 to reduce the office data consumption of the AFRSN command. For details, see 2.3 Reduction of Data Consumption of the AFRSN Command.

2.3 Reduction of Data Consumption of the AFRSN Command

Network Control Node	AFRSN
Local Node	not required

2.3.1 Overview

You can reduce the office data consumption of the flexible routing data. With the existing data assignment procedure, the office data becomes larger in proportion to the increase in the number of registered data especially when it is necessary to register discrete flexible routing data at each node for using functions such as DIAL PLAN TO SUPPORT IP CENTREX FUNCTIONALITY [D-166].

This enhancement reduces both the number and the amount of registered data; the NDM consumption of the AFRSN command can be reduced up to a tenth. (**Note 1**) (The reduction rate depends on what is registered in the system.)

You can reduce the data consumption of the AFRSN command for the following functions where setting the AFRSN command and assigning the Message Area ID (MA-ID: identification of location information) are required. For the detailed setting information, see each feature.

- LEAST COST ROUTING FOR MG-PRI [L-54] of CHAPTER 3 BUSINESS FEATURES in Data Programming Manual - Business
- DIAL PLAN TO SUPPORT IP CENTREX FUNCTIONALITY[D-166] of CHAPTER 3 BUSINESS FEATURES in Data Programming Manual - Business
- TIME-BASED ROUTING FOR MULTIPLE TIME ZONES [T-68] of CHAPTER 3 BUSINESS FEATURES in Data Programming Manual - Business

Note 1: If 400 existing AFRSN data are replaced with 40 new AFRSN data, 80 KByte data can be reduced to 8 KByte.

2.3.2 Reducing the Number of Registered Data

How to Reduce the Number of Registered Data When the Data with Mixed Number of Digits Exist

The data with the mixed number of digits cannot be registered to Number Pattern Code (NPC) with the former AFRSN. If you split number development plans with prefixes to flexible routes, the number of data to register ($\cong$ the amount of data) becomes even larger.

The new AFRSN command allows the data with mixed number of digits to be registered to NPC. When a station originates a call to C.O. line, the Outgoing Route Selection Pattern Number (OPR) of the NPC that matches the most digits with the dialed number is selected.

When registering the NPC of mixed number of digits, there is no restriction for the order of registration. Even if the data with fewer digits is registered first, the stored data are sorted automatically from the one with the longest digits first within the office data.

For example, when the LCR/LCRS access code is “#”, and if you want to separate the outgoing routes to 080-XXXX-XXXX and 0800-XXX-XXXX, the registration patterns with the former and the new AFRSN are as follows:

<Former AFRSN>

TN	Dummy RT	NPC	MA-ID	OPR
1	99	#	151	914
1	99	#1	151	914
§	§	§	§	§
1	99	#9	151	914
1	99	#01	151	914
§	§	§	§	§
1	99	#07	151	914
1	99	#081	151	914
§	§	§	§	§
1	99	#089	151	914
1	99	#0801	151	1914
§	§	§	§	§
1	99	#0809	151	1914
1	99	#0800	151	914
1	99	#08001	151	914
§	§	§	§	§
1	99	#08009	151	914
§	§	§	§	§

<New AFRSN>

TN	Dummy RT	NPC	MA-ID	OPR	Meaning
1	99	#	151	914	Other numbers beginning with # are OPR=914
1	99	#080	151	1914	Numbers beginning with #080 are OPR=1914
1	99	#0800	151	914	Numbers beginning with #0800 are OPR=914

How to Reduce the Number of Registered Data of Unused/Restricted Number Pattern

The data registration methods of C.O. dead numbers (unused number patterns) or restricted number patterns differ between the former and the new AFRSN commands. Let's take an example where the LCR/LCRS access code is "#", and you want to restrict the numbers beginning with "0990". To restrict outgoing calls to 0990 with the former AFRSN command, you have to register OPR from 9991 to 9999, and leave 0990 without any data registration, however, with the new method, all you have to do is to register unused OPR to 0990.

The following table shows a data setting example for restricting #0990 when NPCs are from #0990 to #0999.

<Former AFRSN>					<New AFRSN>				
TN	Dummy RT	NPC	MA-ID	OPR	TN	Dummy RT	NPC	MA-ID	OPR
1	99	#0991	151	914	1	99	#099	151	914
5	5	5	5	5	1	99	#0990	151	0
1	99	#0999	151	914					

※NPC = #0990 is not used for registration. ※OPR = 0 is registered to NPC = #0990.

When an unused OPR has been registered with less-than-maximum number of digits, you cannot originate a call by using digits more than ones defined by its related NPC.

The following table shows an example of data registration where call origination is not available.

TN	Dummy RT	NPC	MA-ID	OPR	Remarks
1	99	#	151	0	Register unused OPR
1	99	#080	151	1914	Outgoing calls are restricted
1	99	#0800	151	914	Outgoing calls are restricted

Thus, the number of digits of NPC for unused OPR must be the same or larger than NPCs which are allowed to originate a call.

How to Reduce the Number of Registered Data Supporting IP Centrex Functionality

With the former AFRSN command, even when there is a node that has only one C. O. route in the system where the dial plan to support IP Centrex functionality is operated, the same OPR must be registered to all NPCs because the NPC is common to all nodes.

On the other hand, with the new AFRSN command, it is possible to register discrete NPC per MA-ID.

For example, when node A has the former AFRSN data with two OPRs (meaning that there are two C. O. routes within the node A), node B which has only one OPR (there is only one C. O. route) must register data per NPC that is registered at node A.

With this enhancement, node B that has only one OPR can do with only one data registration.

<Former AFRSN>

<New AFRSN>

- Node A (The same data for reducing the number of registered data when the mixed number of digits exist.)

TN	Dummy RT	NPC	MA-ID	OPR
1	99	#	151	914
1	99	#1	151	914
1	99	#9	151	914
1	99	#01	151	914
1	99	#07	151	914
1	99	#081	151	914
1	99	#089	151	914
1	99	#0801	151	1914
1	99	#0809	151	1914
1	99	#0800	151	914
1	99	#08001	151	914
1	99	#08009	151	914

TN	Dummy RT	NPC	MA-ID	OPR	Meaning
1	99	#	151	914	Other numbers beginning with # are OPR=914
1	99	#080	151	1914	Numbers beginning with #080 are OPR=1914
1	99	#0800	151	914	Numbers beginning with #0800 are OPR=914

- Node B

TN	Dummy RT	NPC	MA-ID	OPR
1	99	#	522	193
1	99	#1	522	193
1	99	#9	522	193
1	99	#01	522	193
1	99	#07	522	193
1	99	#081	522	193
1	99	#089	522	193
1	99	#0801	522	193
1	99	#0809	522	193
1	99	#0800	522	193
1	99	#08001	522	193
1	99	#08009	522	193

TN	Dummy RT	NPC	MA-ID	OPR
1	99	# (LCR/LCRS access code)	522	193

※With the former method, Node B (MA-ID=522) must register all OPRs of the node per NPC that is registered for Node A, even though Node B uses only one OPR.

When the dial plan to support IP Centrex functionality is operated, if large nodes and smaller nodes co-exist, and there are many small nodes that have only one C. O. route, you can reduce the number of data entries and the amount of data to register significantly by using the new AFRSN command.

2.3.3 Specifications for New AFRSN

1. When you use this feature, use the LCR method. If you use this feature with LCRS method, calls may be routed to wrong numbers or restricted because of the setting of mixed number of digits.
2. You can reduce the data consumption with the new AFRSN command only; not with the AFRS/AFRSL commands. Data of the AFRS/AFRSL commands are not affected even if the system data is modified.
3. Use the new AFRSN command to register route selection pattern per MA-ID by using LEAST COST ROUTING FOR MG - PRI [L-54], especially at the office where the dial plan to support IP Centrex functionality is operated.
4. Up to 100 entries of NPC can be registered to a single MA-ID. If 101 or more entries are attempted to be registered, the display of PCPro shows message: "The data entered is over the number that can be assigned." However, there is no limit for the number of entries of NPC that are common to all nodes (not split with MA-ID).
5. When listing is executed with former/new AFRSN without checking the MA-ID with the LFRSN command, the listing methods differ.

	"Use MA-ID" is selected with the LFRSN command	"Use MA-ID" is not selected with the LFRSN command
ASYDN SYS1, Index 1126, b5=1 (New AFRSN table is operated (for reading, writing, deleting, and listing) with the AFRSN command)	Only the data with the specified MA-ID are listed	Only the data with MA-ID not specified are listed
ASYDN SYS1, Index 1126, b5=0 (Former AFRSN table is operated (for reading, writing, deleting, and listing) with the AFRSN command)		All data are listed Note 1

Note 1: Both the data with MA-ID specified and not specified are listed.

6. When ASYDN SYS1, Index 1126, b5=1 is set, if you enter "T" for NPC of the AFRSN command and push [Write] button, a popup window is displayed stating "The data entered cannot be used in this system."
7. Data assignment procedure differs between using the former and new AFRSN commands.

Let's say that the LCR/LCRS access code begins with "#", and NPC "#080" has already been registered. With the former AFRSN command, if you enter one digit, #, as NPC, and press [Enter] key on the keyboard, the error message "Digit Code request exists." is displayed.

With the new AFRSN, however, as it is possible to enter mixed number of digits as NPC, this error message is not displayed and the MA-ID entry window is displayed.

8. The data table is shared between the former/new AFRSN and AUNEN/ASTPN. Each command has a priority for Tenant (TN)/Logical Route Number (LGRT)/Number Pattern Code data (NPC).

(a) New AFRSN

- When the same data (TN, LGRT, NPC) is assigned between new AFRSN and AUNEN, the data for AUNEN has a priority.
- When the same data (TN, LGRT) is assigned between new AFRSN and ASTPN, the data for ASTPN has a priority.
- The same data cannot be assigned between AUNEN and ASTPN.

(b) Former AFRSN

- The same data cannot be assigned between former AFRSN, AUNEN, and ASTPN.

The data table is shared between the former AFRSN and AUNEN/ASTPN. Thus, when you attempt to assign the Tenant (TN)/Logical Route Number (LGRT)/Number Pattern Code data (NPC) (for AFRSN and AUNEN) through either of AFRSN and AUNEN/ASTPN while the data is already assigned through the other command, an error message appears and the data cannot be assigned. However, the new AFRSN does not share the data table with AUNEN/ASTPN. The same data (TN, LGRT, NPC) can be assigned through both AFRSN and AUNEN/ASTPN, and no error message appears. When the same data (TN, LGRT, NPC) is assigned between AFRSN and AUNEN/ASTPN, the data (TN, LGRT, NPC) for AUNEN/ASTPN has a priority.

When a dialed number matches with the data assigned through AUNEN, the AUNEN data (TN, LGRT, NPC) has a priority regardless of the number of assigned digits.

- The error message to be displayed.

- For AFRSN/ASTPN

Command error.

XXXXXX.GET 01:0411

Line Signal Data already assigned. (Double Assignment)

Note: “XXXXXX” indicates the command name (AFRSN/ASTPN).

Note: For the new AFRSN command, the above error messages are not displayed.

- For AUNEN

Line Signal Data already assigned. (Double Assignment) (Error 0x0411)

2.3.4 Migration From the Former AFRSN to New AFRSN

This section explains how to switch a node operating with the former AFRSN to the new AFRSN. The following steps enable you to migrate to the new AFRSN without interrupting the operation.

You can execute the following steps only when the former AFRSN data are correctly set, and the data to register to the new AFRSN are already prepared. Check also that there is enough capacity in the CF card to register the new and former AFRSN data.

- STEP 1: Change the ASYDN SYS1, Index 1126 b5 to “1” (New AFRSN table is operated (for reading, writing, deleting, and listing) with the AFRSN command.)
Data to refer to and set with PCPro is changed to the new AFRSN.

Note: The currently operating former AFRSN is not affected at this moment.

- STEP 2: Register the new AFRSN data. (QuickPro is recommended for use.)
Register the new AFRSN command leaving the former AFRSN data as they are. Create new AFRSN data sheet by referring to section 2.3.2 Reducing the Number of Registered Data.

Note: For how to create data using QuickPro, see 5. Procedures to Create/Register the Data of CHAPTER 7 QuickPro in PCPro Setup Manual.

- STEP 3: Change the ASYDN SYS1, Index 1126 b4 to “1” (New AFRSN table is referred to for call handling (routing))
After completing the registration and confirmation of the new AFRSN data, the AFRSN table that the call handling refers to is switched to the new version.

Note: If you experience any system failure after switching to the new AFRSN, you can switch back to the operation using the former AFRSN data without interrupting the operation.

- STEP 4: Change the ASYDN SYS1, Index 1126 b5 to “0” (Former AFRSN table is operated (for reading, writing, deleting, and listing) with the AFRSN command), and delete the former AFRSN data.
If you are sure that the operation using the new AFRSN is stable, switch the ASYDN SYS1, Index 1126 b5 to “0” temporarily, and delete the former AFRSN data. When there is ample capacity for the office data, you can omit this step.
Use QuickPro, and deleting the former AFRSN data is easy.

- STEP 5: Change the ASYDN SYS1, Index 1126 b5 back to “1” (New AFRSN table is operated (for reading, writing, deleting, and listing) with the AFRSN command.)
When deleting the data completes, change the ASYDN SYS1, Index 1126 b5 back to “1”.

2.4 Assignment of Logical RT in Network DM (NDM)

Network Control Node	ALRTN/ARTKN
Local Node	not required

ALRTN/ARTKN

This command is used to assign logical route numbers to all external trunks used on an FCCS network. Assign unique telephone numbers to the whole route for external trunks on the network by using this command.

Note: This data is set at the NCN and set for every external route in every node.

Attention: Do not assign a Logical Route to a Physical Route of the following nodes.

- Nodes which Route Class Data (ARTD) for Physical Route is not assigned
- Nodes which are disconnected from the link to NCN

Follow the procedures listed below if a Logical Route is assigned mistakenly.

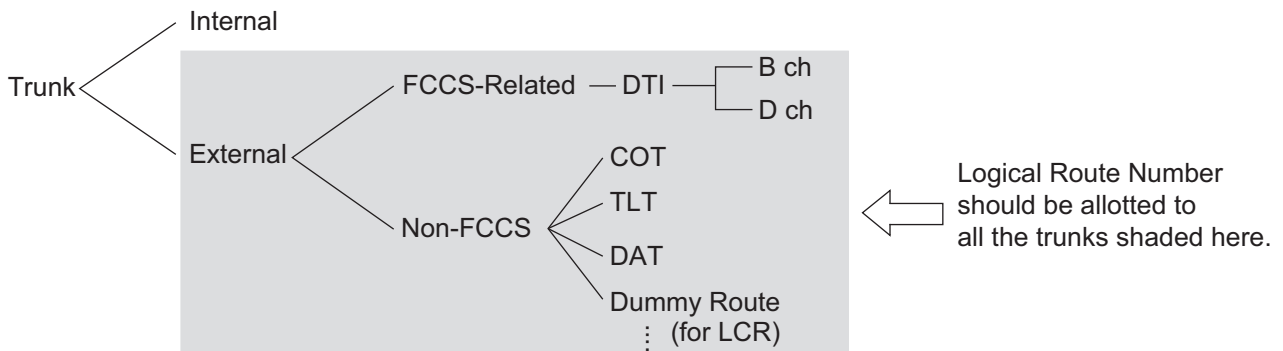
(1) Delete LGRT by ALRTN command

(2) Assign LGRT by ALRTN command after verifying that the two conditions of nodes listed above are improved

(3) Verify that the data is assigned successfully by ARTDN command

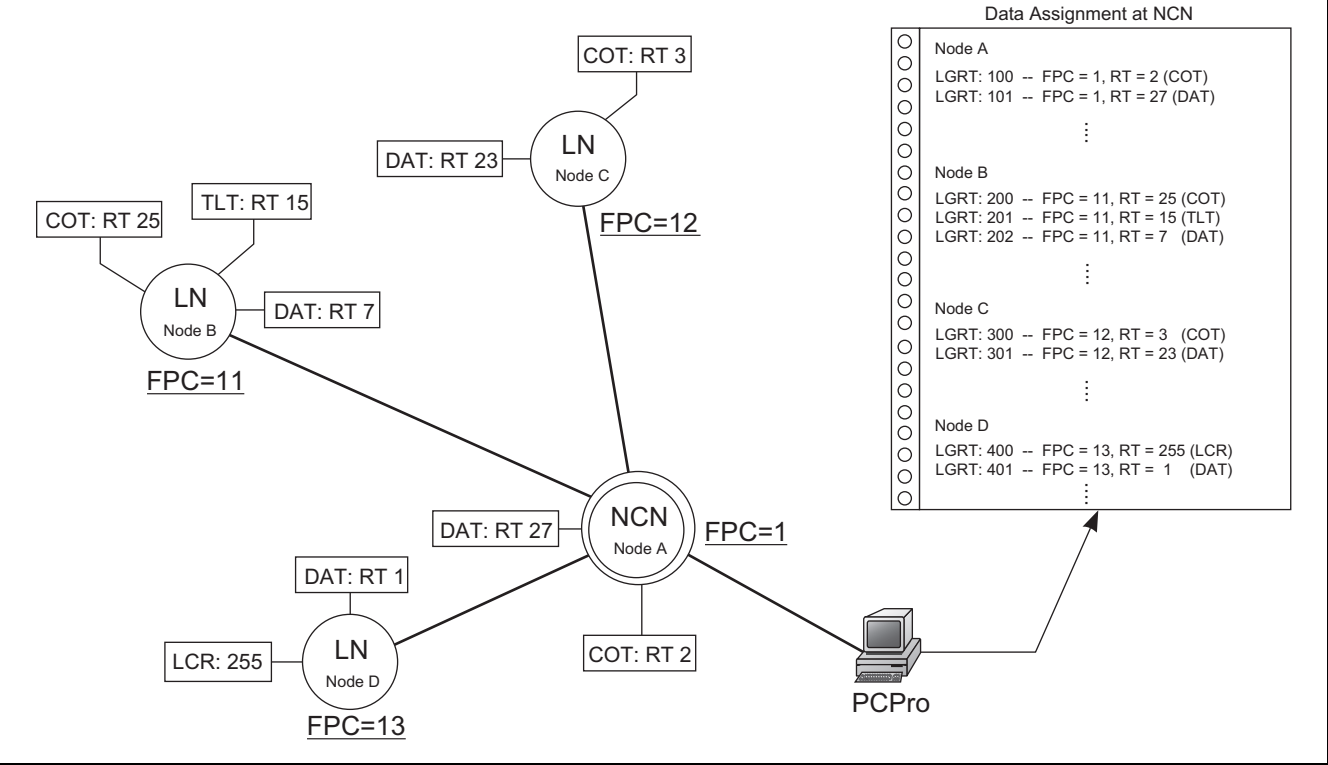
Logical Route Number Required

The "Logical Route Numbers" should be allotted to the whole external trunks, such as the Non-FCCS trunks including COT, TLT, DAT and LCR as well as DTI's B ch and D ch (used for FCCS). Assign the necessary data by using the ALRTN/ARTKN command.



Assignment of Logical Route Number

This figure shows an example data assignment of this "Logical Route" data.

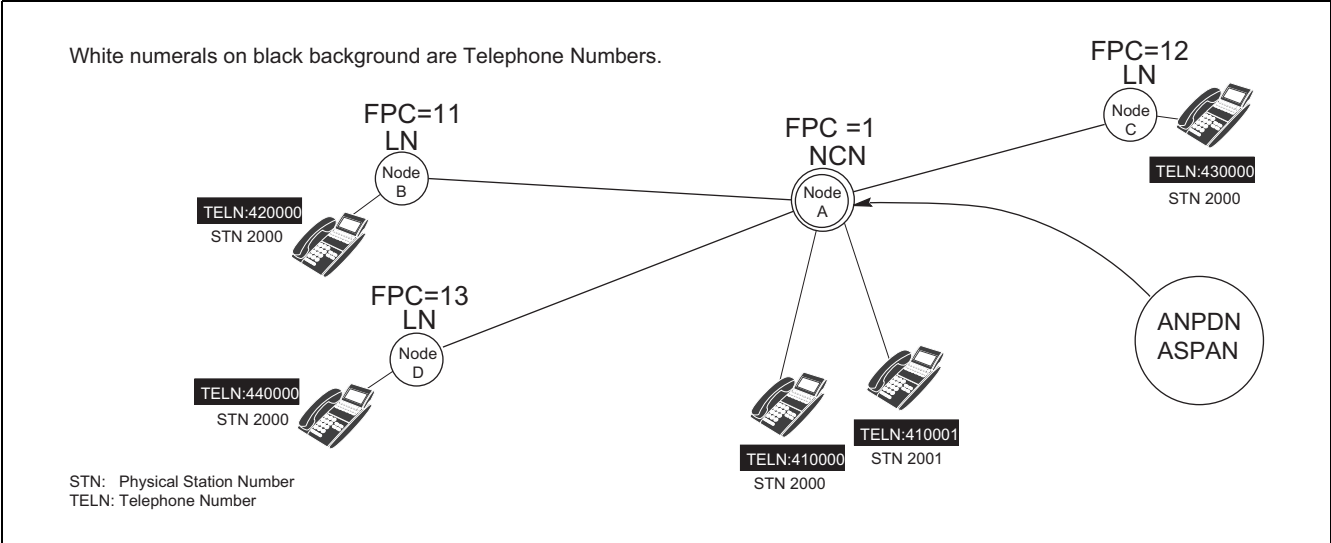


2.5 Assignment of Numbering Data for Telephone Numbers

Network Control Node	ANPDN, ASPAN
Local Node	not required

Make a telephone numbering plan on the network. The explanation is given here on the assumption that the network adopts the following numbering plan. Make modifications to the data assignment when assigning the data on the network as shown in the figure below.

Telephone Number Allocation



STEP 1: ANPDN

Assign pre-translation data for the telephone numbers planned in STEP 1 by using the ANPDN command at NCN. The figure below shows an example of the data setting that is followed.

ANPDN Sample Data Sheet

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

STEP 2: **ASPAN**

Assign the special access code data for the telephone numbers by using the ASPAN command. SRV = “TELN: Telephone Number” is the data for telephone numbers.

ASPAN Sample Data Sheet

○							
○							
○	- ASPAN Data Sheet (example)						
○	- NCN (Node A)						
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Note: When assigning the special access code data for telephone numbers using more than one tenant with the ASPAL/ASPAN command, the valid value for NND will be the one of the last assigned tenant.

Example:

- 1) TN: 1, ACC: 21, CI: N, SRV: TELN and NND: 5 are assigned with ASPAL/ASPAN command.
- 2) TELN: 21000 is assigned with ALGSL/ALGSN command.
- 3) TN: 2, ACC: 2, CI: N, SRV: TELN and NND: 4 are assigned with ASPAL/ASPAN command.
- 4) TELN: 2000 is assigned with ALGSL/ALGSN command.
- 5) Try to get the data for TELN: 21000 with ALGSL/ALGSN command.

Because the valid NND value is 4 (the last assigned) and the NND value for 21000 is 5, TELN: 21000 data cannot be obtained and an error message will be displayed.

2.6 Assignment of Telephone Numbers

Network Control Node	ALGSN/ATSTN
Local Node	not required

This section explains how to program telephone numbers. To program telephone numbers, use the ALGSN/ATSTN command. The telephone number is assigned to a station by using the LENS or by using the physical station number depending on programming.

Note: The FCCS link must be operational before programming telephone numbers in the FCCS network.

ALGSN/ATSTN

Assign telephone numbers to physical station number (Type 2) or to physical LENS (Type 1) by using the ALGSN command. An example data sheet-Type 2 is shown as follows.

ALGSN Sample Data Sheet

- 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 = 2001
Type = 2	UGN = 1	TELN = 420000	FPC = 11	TN = 1	STN = 2000
Type = 2	UGN = 1	TELN = 430000	FPC = 12	TN = 1	STN = 2000
Type = 2	UGN = 1	TELN = 440000	FPC = 13	TN = 1	STN = 2000
	:	:			
	:	:			

Note: On the Attendant Console, telephone numbers (2-5 digits) are indicated as the station numbers.

Note: Telephone numbers used in own node (ALGSL) and for network (ALGSN) cannot co-exist in an FCCS network.

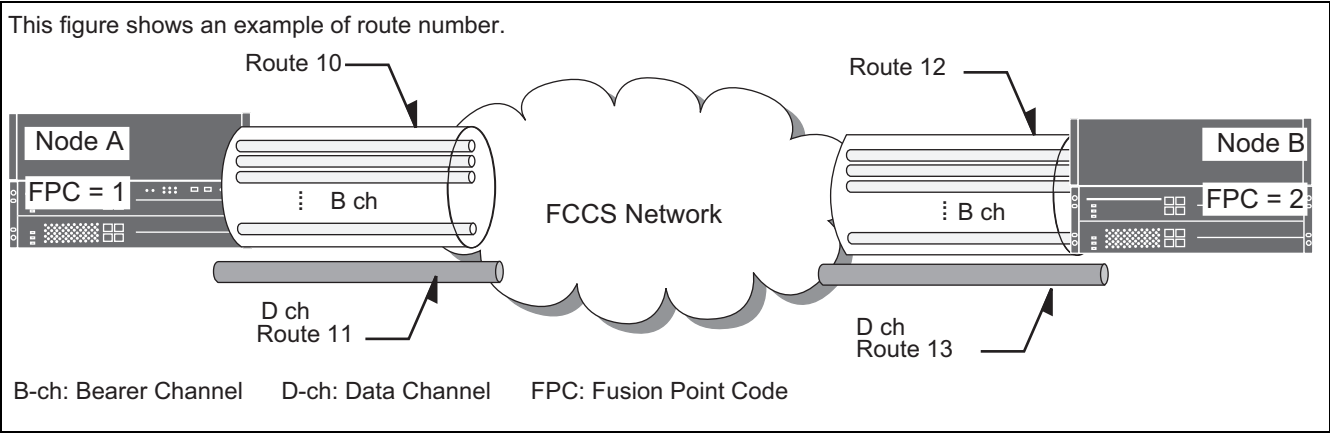
2.7 Assignment of Connection Route/Trunk Data

Network Control Node	ACRD, ACTK, MBCT
Local Node	ACRD, ACTK, MBCT

STEP 1: **ACRD**

By using ACRD command, assign the connection route data of the FCCS link. The data must be assigned for both B-Channel and D-Channel. Refer to the figure below for assigning appropriate data.

B-Channel and D-Channel



Route Class Data Assignment

CDN	FUNC	NODE A		NODE B		DESCRIPTION
		B-CHANNEL	D-CHANNEL	B-CHANNEL	D-CHANNEL	
		C_RT: 10	C_RT: 11	C_RT: 12	C_RT: 13	
1	TF	3	3	3	3	Type of Trunk Function: 3 (fixed)
2	TCL	4	4	4	4	Trunk Class: 4 (fixed)
3	RLP	2	2	2	2	Trunk Release Pattern: 2 (fixed)
4	SMDR	0	0	0	0	Detailed Billing Information: 0 (fixed)
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	FCCS Interface Specification: Assign 0
10	FPEG	0	0	0	0	FCCS Trunk Peg Count: Assign 0
11	TC	0	0	0	0	Timer Class: Assign 0
12	MTC	0	0	0	0	Timer Counter: Assign 0
13	STSEQ	0	0	0	0	Status ENQ: Assign 0
14	FGH	0	0	0	0	Fusion Gateway Handler: Assign 0
15	MMN					
16	LKIND					
17	IPLYR					
18	IPTRK					
19	IPPAD					
20	LMG					

CDN 1: Type of Trunk Function (TF)
 0: -
 1: Outgoing Trunk (OGT)
 2: Incoming Trunk (ICT)
 3: Bothway Trunk (BWT)

CDN 2: Trunk Class (TCL)
 0-3: -
 4: FCCS Trunk
 5-31: -

CDN 3: Trunk Release Pattern (RLP)
 0: Calling Party Release
 1: Called Party Release
 2: First Party Release
 3: -

CDN 4: Detailed Billing Information (SMDR)
 0: SMDR is out of service

	1: SMDR is in service
CDN 5:	Line Signal (LSG) 12: B-Channel 13: D-Channel
CDN 6:	PAD control (PAD) Note 1 0: 0 dB 1-6: Depends on key setting on the card 7: 0 dB
Note 1: When PAD data is assigned by the AFPD command, AFPD data takes precedence over this data.	
CDN 7:	Trunk Select Sequence (TRKS) 0: Select from the trunk that becomes idle first 1: Select from the trunk that becomes idle last
CDN 8:	TC/EC 0: No MPC/EC 1: EC 2: MPC 3: -
CDN 9:	FCCS Interface Specification (FINT) 0: FCCS standard 1-15: -
CDN 10:	FCCS Trunk Peg Count (FPEG) 0: Nothing of FCCS - PEG 1: Exist of FCCS - PEG
CDN 11:	Timer Class (TC) 0: - 1: 1 second 2: 2 second 3: 8 second 4: 20 second 5-7: -
CDN 12:	Miscellaneous Timer Counter (MTC) Time value: (TC) × (MTC)
CDN 13:	Status ENQ (STSEQ) 0: Available 1: Unavailable
CDN 14:	Fusion Gateway Handler (FGH)

	0: FCH 1: FGH
CDN 15:	Kind of Multiple Equipment (MMN) 0: TDM 1: MM-Node 2-3: -
CDN 16:	Kind of FCCS Link (LKIND) 0: DTI 1: ISW 2: FCCS over IP (Router) 3: IPTRK 4-15: -
CDN 17:	Voice over IP (IPLYR) 0: DTI interface 1.5 Mbps 1: DTI interface 2.0 Mbps
CDN 18:	IP Trunk (IPTRK) 0: Out of service 1: In service
CDN 19:	IPPAD 0: Out of service 1: In service
CDN 20:	IPPAD for Connection between TDM terminals (for UMGi/RNIP system) (LMG) 0: Out of service 1: In service

STEP 2: ACTK

Assign the connection trunk data of both B-Channel and D-Channel using the ACTK command.

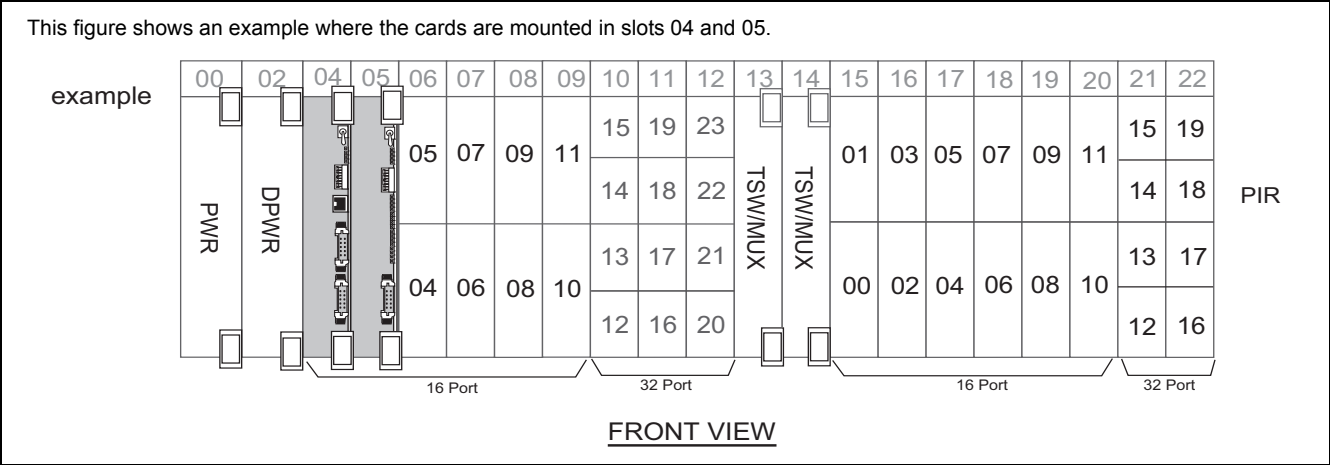
Data assignment procedure varies depending on the type of DTI card, and the mounting location of FCH and DTI cards.

- When 24DTI and FCH are mounted in regular density slots (16-port slots)
- When 24DTI and FCH are mounted in high density slots (32-port slots)
- When 30DTI and FCH are mounted in regular density slots (16-port slots)
- When 30DTI and FCH are mounted in high density slots (32-port slots)

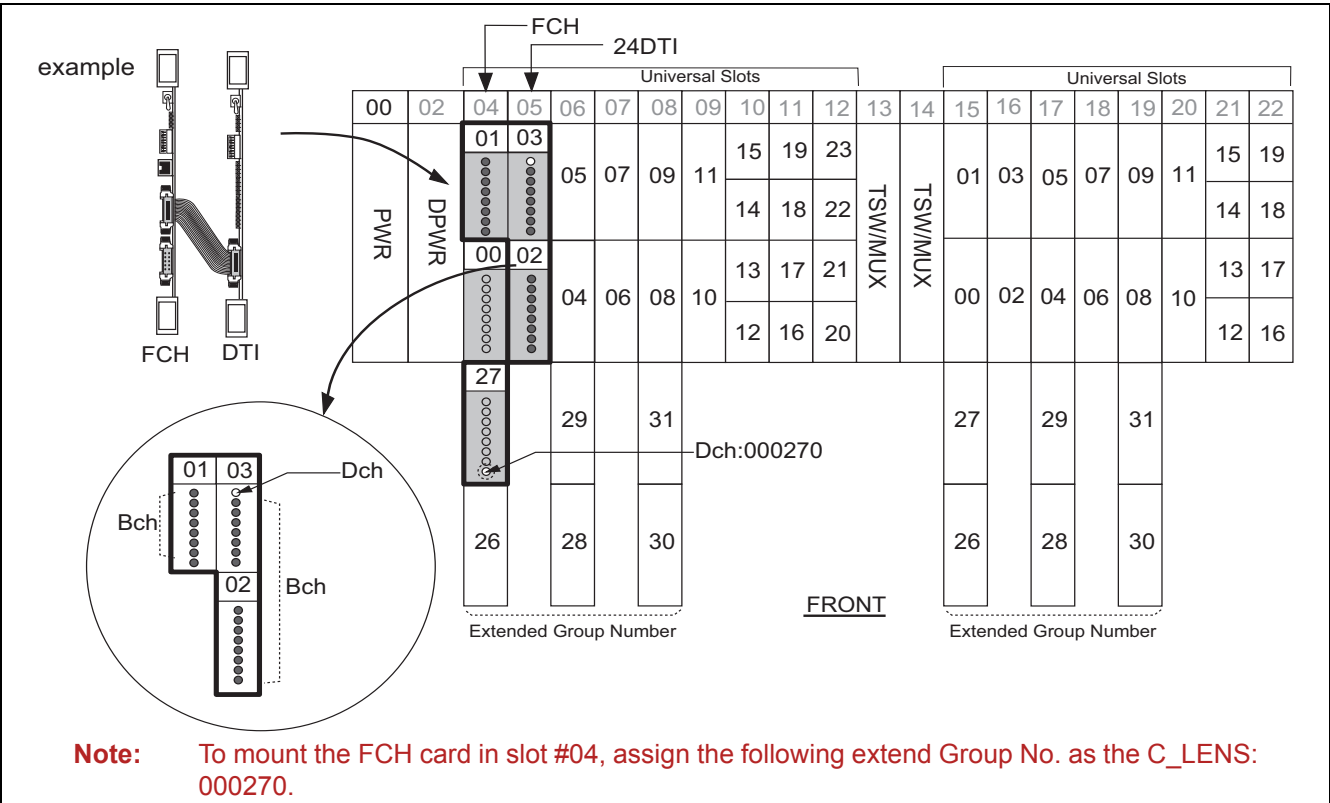
[When 24DTI and FCH Mounted in Regular Density Slots]

If the 24DTI and FCH are mounted in the regular density slots, the connection trunk should be assigned as shown in the figures below. If the mounting location of FCH is in any of the Slot 04, 06, 08 or 15, 17, 19, the following extended group is used for the D-Channel trunk: G27, 29 or 31.

Mounting 24DTI and FCH Cards in Regular Density Slots (8U-PIR)

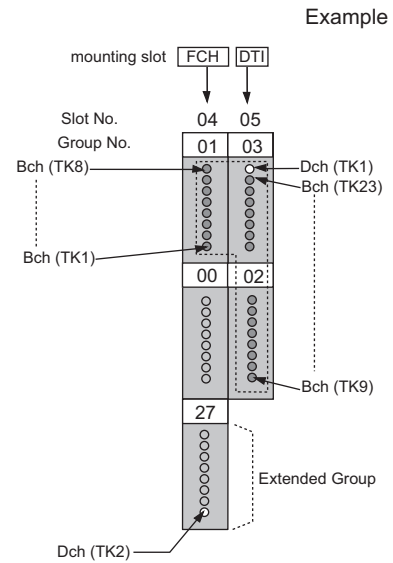


How to Assign C_LENS Data for 24DTI and FCH Cards in Regular Density Slots (8U-PIR)



Data Programming Sheet for Regular Density Slot – 24DTI + FCH (example)

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	0	1
	2	0	0	0	0	0	2
	3	0	0	0	0	0	3
	4	0	0	0	0	0	4
	5	0	0	0	0	0	5
	6	0	0	0	0	0	6
	7	0	0	0	0	0	7
	8	0	0	0	0	1	0
	9	0	0	0	0	1	1
	10	0	0	0	0	1	2
	11	0	0	0	0	1	3
	12	0	0	0	0	1	4
	13	0	0	0	0	1	5
	14	0	0	0	0	1	6
	15	0	0	0	0	1	7
	16	0	0	0	0	2	1
	17	0	0	0	0	2	2
	18	0	0	0	0	2	3
	19	0	0	0	0	2	4
	20	0	0	0	0	2	5
	21	0	0	0	0	2	6
	22	0	0	0	0	2	7
	23	0	0	0	0	3	0
	24	0	0	0	0	3	1
	25	0	0	0	0	3	2
	26	0	0	0	0	3	3
	27	0	0	0	0	3	4
	28	0	0	0	0	3	5
	29	0	0	0	0	3	6
	30	0	0	0	0	3	7
11 (D-ch)	1	0	0	0	0	2	0
	2	0	0	0	2	7	0



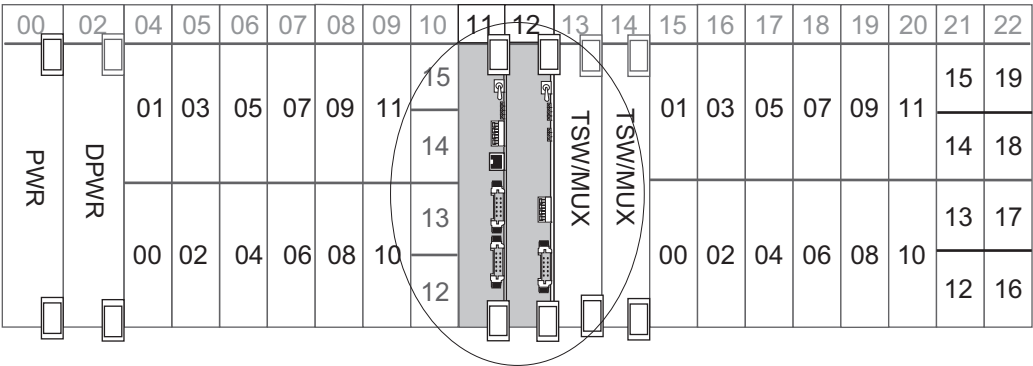
Specify Dch -TS by setting switch on FCH.

[When 24DTI and FCH are Mounted in High Density Slots]

If the 24DTI and FCH are mounted in the high density slots, the connection trunk data should be assigned as shown in the figures below.

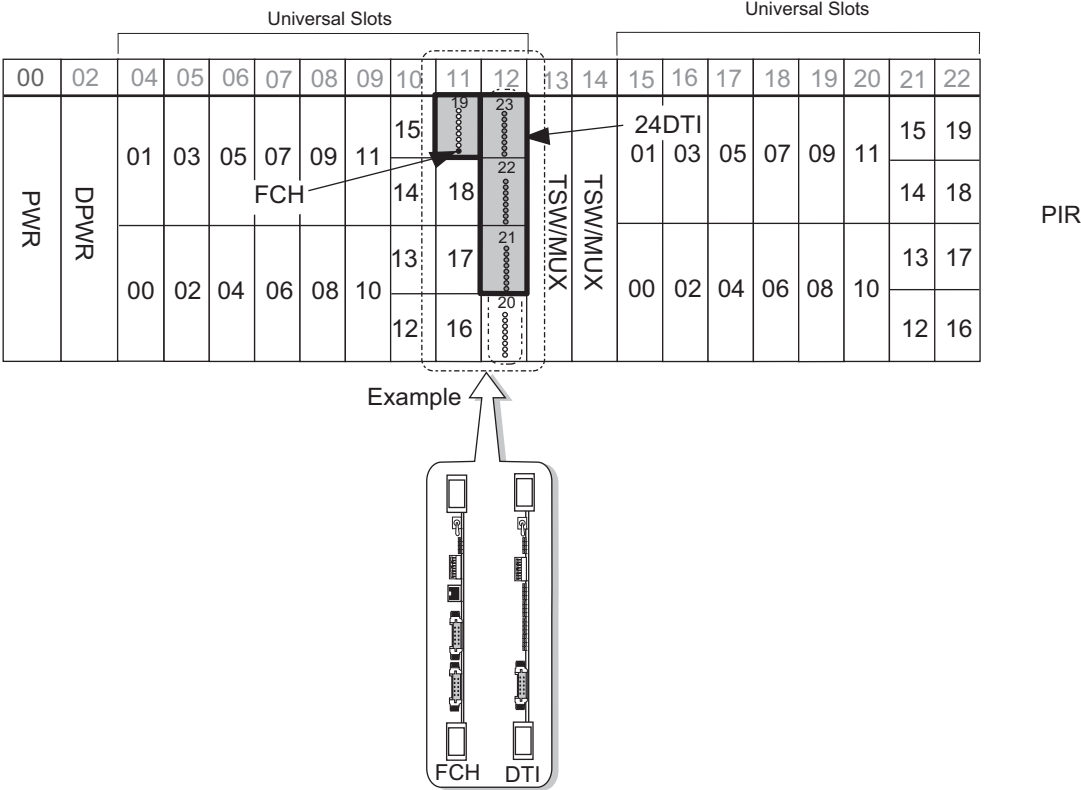
Mounting 24DTI and FCH Cards in High-Density Slots (8U-PIR)

The figure below shows an example where the cards are mounted in slots 11 and 12.



How to Assign C_LENS Data for 24DTI and FCH Cards in High Density Slots (8U-PIR)

When the 24DTI and FCH cards are mounted in high density slots, the C_LENS data are as follows:



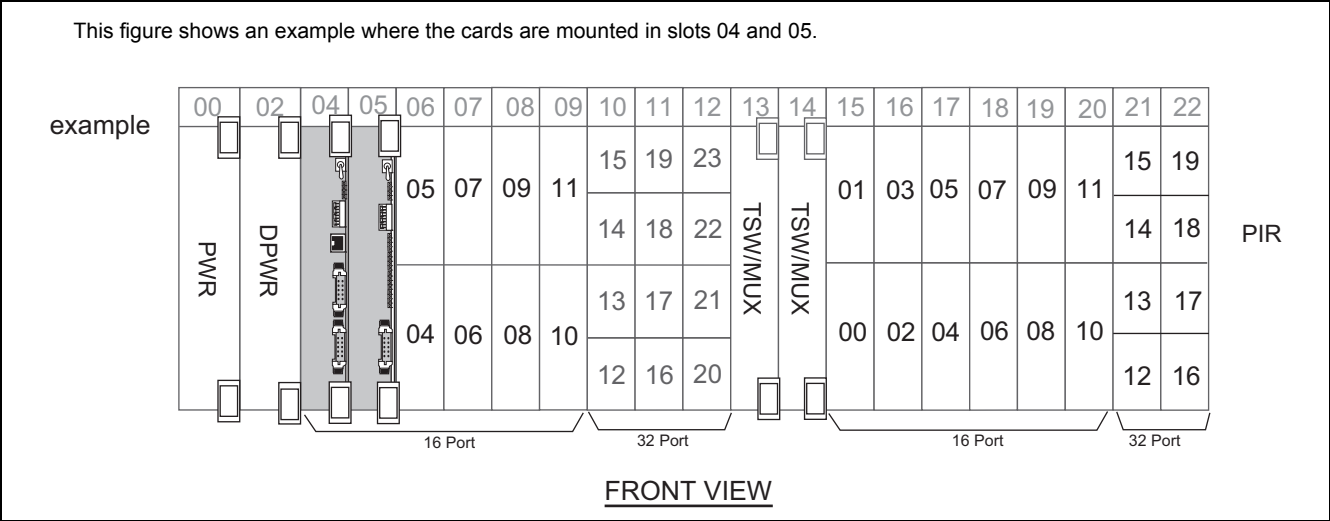
Data Programming Sheet for High Density Slot – 24DTI + FCH (example)

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		

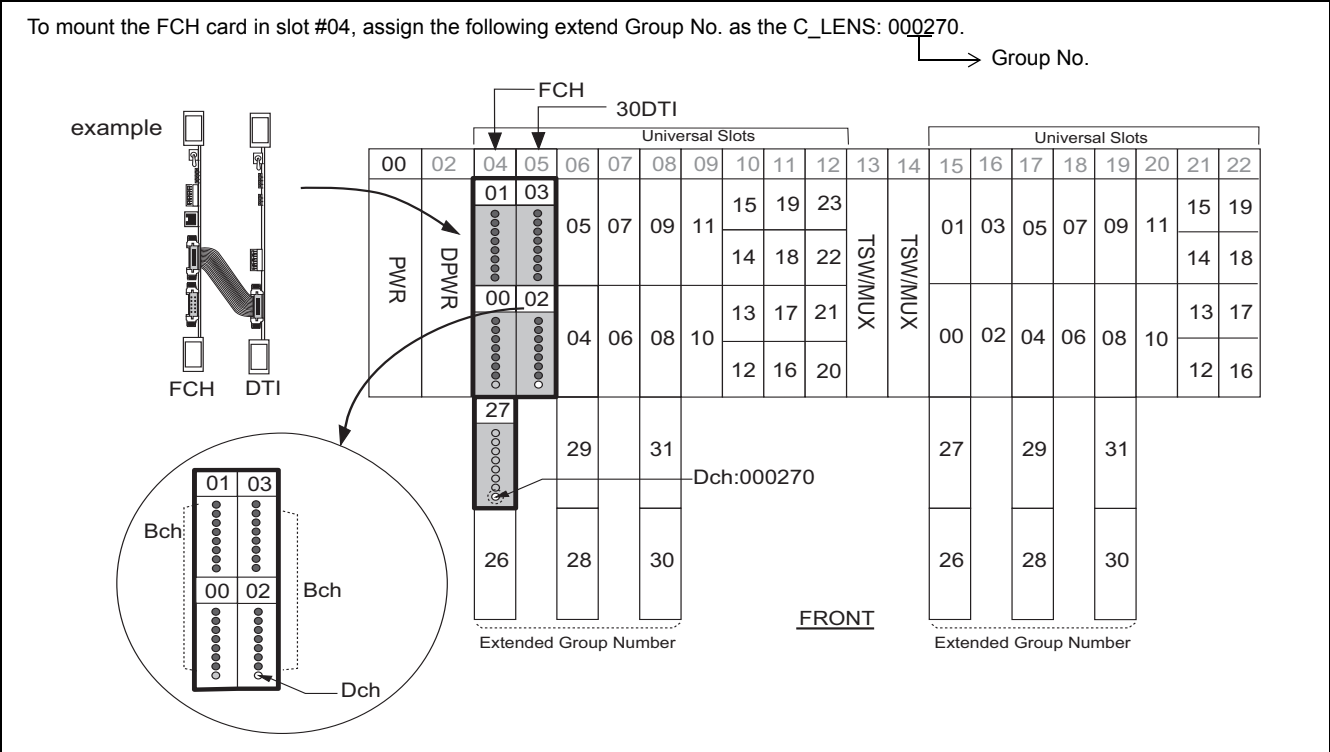
[When 30DTI and FCH are Mounted in Regular Density Slots]

If the 30DTI and FCH are mounted in the regular density slots, the connection trunk should be assigned as shown in the figures below. If the mounting location of FCH is in Slot 04, 06, 08 or 15, 17, 19, the following extended group is used for the D-Channel trunk: G27, 29 or 31.

Mounting 30DTI and FCH Cards in Regular Density Slots (8U-PIR)



How to Assign C_LEN Data for 30DTI and FCH Cards in Regular Density Slots (8U-PIR)



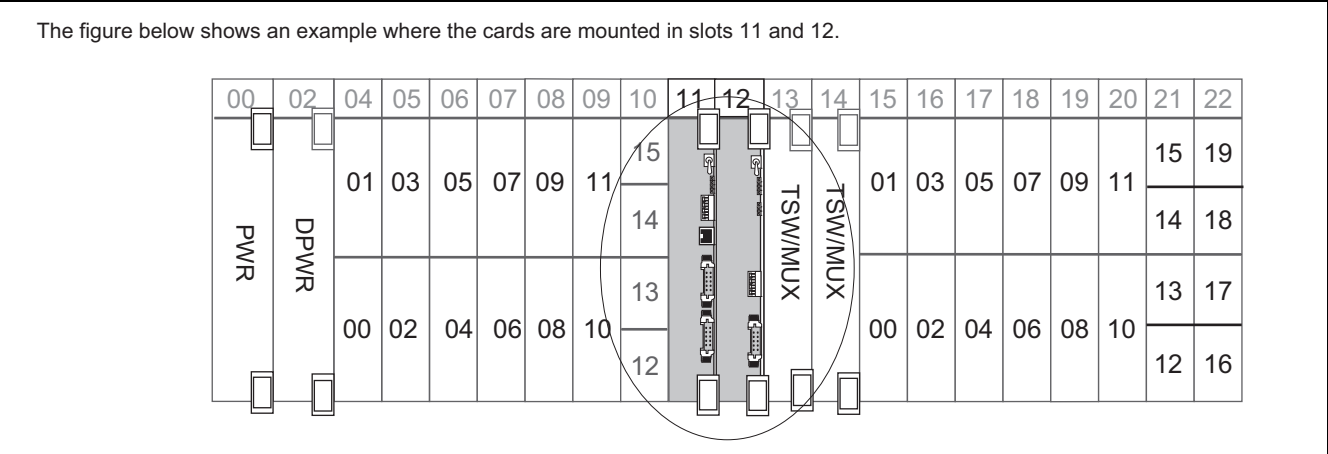
Data Programming Sheet for Regular Density Slot – 30DTI + FCH

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	0	0	1	Example mounting slot FCHDTI Slot No. 0405 Group No. 0103 Bch (TK15) Bch (TK30) Bch (TK1) Bch (TK16) Dch (TK1) 27 Dch (TK2) Extended Group Specify Dch -TS by setting switch on FCH.
	2	0	0	0	0	0	0	2	
	3	0	0	0	0	0	0	3	
	4	0	0	0	0	0	0	4	
	5	0	0	0	0	0	0	5	
	6	0	0	0	0	0	0	6	
	7	0	0	0	0	0	0	7	
	8	0	0	0	0	0	1	0	
	9	0	0	0	0	0	1	1	
	10	0	0	0	0	0	1	2	
	11	0	0	0	0	0	1	3	
	12	0	0	0	0	0	1	4	
	13	0	0	0	0	0	1	5	
	14	0	0	0	0	0	1	6	
	15	0	0	0	0	0	1	7	
	16	0	0	0	0	0	2	1	
	17	0	0	0	0	0	2	2	
	18	0	0	0	0	0	2	3	
	19	0	0	0	0	0	2	4	
	20	0	0	0	0	0	2	5	
	21	0	0	0	0	0	2	6	
	22	0	0	0	0	0	2	7	
	23	0	0	0	0	0	3	0	
	24	0	0	0	0	0	3	1	
	25	0	0	0	0	0	3	2	
	26	0	0	0	0	0	3	3	
	27	0	0	0	0	0	3	4	
	28	0	0	0	0	0	3	5	
	29	0	0	0	0	0	3	6	
	30	0	0	0	0	0	3	7	
11 (D-ch)	1	0	0	0	0	0	2	0	
	2	0	0	0	0	2	7	0	

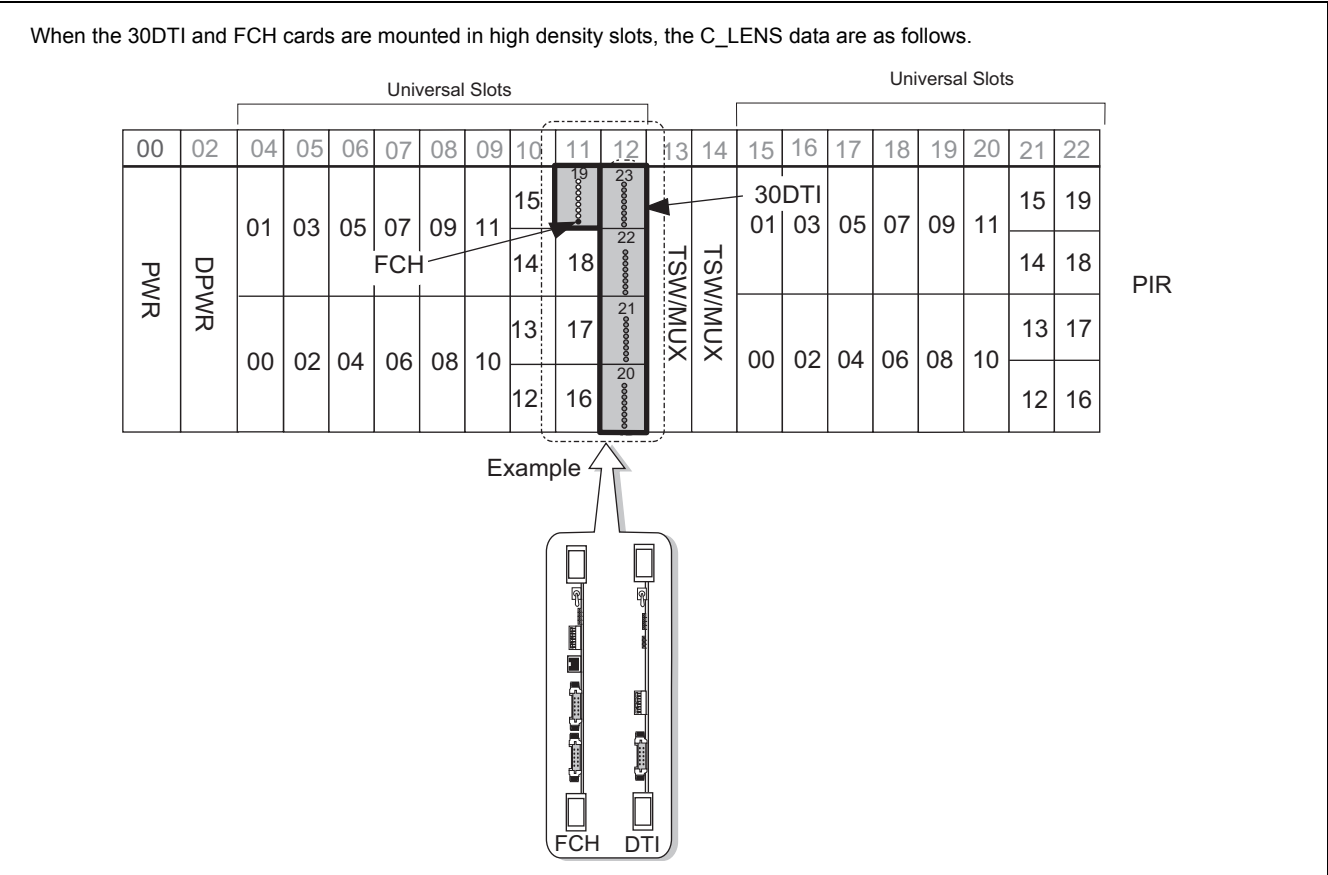
[When 30DTI and FCH are Mounted in High Density Slots]

If the 30DTI and FCH are mounted in the high density slots, the connection trunk data should be assigned as shown in the figures below.

Mounting 30DTI and FCH Cards in High-density Slots (8U-PIR)



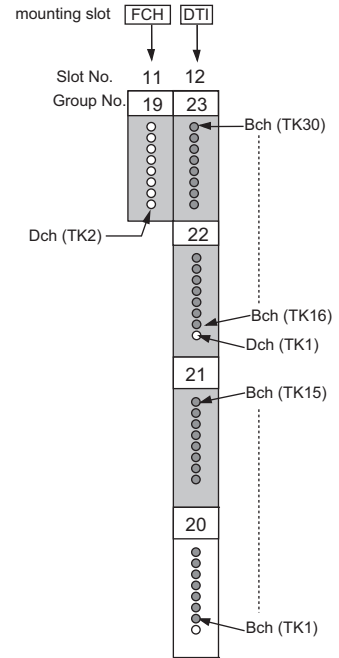
How to Assign C_LENS Data for 30DTI and FCH Cards in High Density Slots (8U-PIR)



Data Programming Sheet for High Density Slot – 30DTI + FCH

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	0	1
	2	0	0	0	2	0	2
	3	0	0	0	2	0	3
	4	0	0	0	2	0	4
	5	0	0	0	2	0	5
	6	0	0	0	2	0	6
	7	0	0	0	2	0	7
	8	0	0	0	2	1	0
	9	0	0	0	2	1	1
	10	0	0	0	2	1	2
	11	0	0	0	2	1	3
	12	0	0	0	2	1	4
	13	0	0	0	2	1	5
	14	0	0	0	2	1	6
	15	0	0	0	2	1	7
	16	0	0	0	2	2	1
	17	0	0	0	2	2	2
	18	0	0	0	2	2	3
	19	0	0	0	2	2	4
	20	0	0	0	2	2	5
	21	0	0	0	2	2	6
	22	0	0	0	2	2	7
	23	0	0	0	2	3	0
	24	0	0	0	2	3	1
	25	0	0	0	2	3	2
	26	0	0	0	2	3	3
	27	0	0	0	2	3	4
	28	0	0	0	2	3	5
	29	0	0	0	2	3	6
	30	0	0	0	2	3	7
11 (D-ch)	1	0	0	0	2	2	0
	2	0	0	0	1	9	0

Example



STEP 3: ACAN

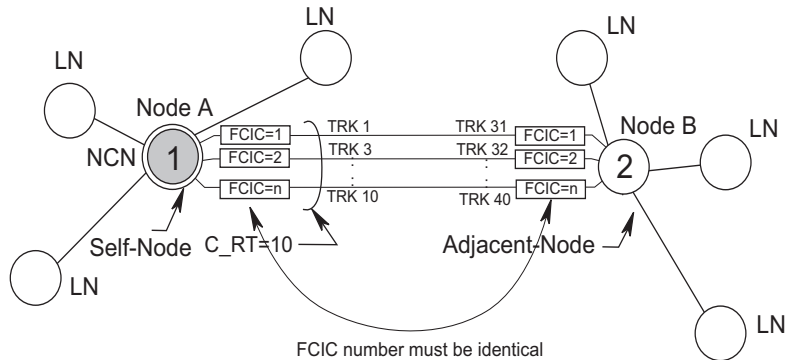
Assign the Fusion Connection Index Code (FCIC) and the LENS on an adjacent FPC basis.

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

ACAN Sample Data Sheet

A sample data sheet at Node A is as follows.

FPC = 2	FCIC = 1	C_LENS = 000010
FPC = 2	FCIC = 2	C_LENS = 000011
FPC = 2	FCIC = 3	C_LENS = 000012
FPC = 2	FCIC = 4	C_LENS = 000013
:	:	:

**STEP 4: MBCT**

Unbusy the connection trunk data assigned in the previous step by using Make-Busy of Connection Trunk (MBCT) command.

This is required for both B-Channel and D-Channel trunks.

2.8 Assignment of FCH Related Data

FCCS with FCH
FCCS without FCH

AFCH, AFPC, ACAN, AFRT

AFPC, ACAN

STEP 1: **AFCH** (FCCS system with FCH)

Assign FCH number on an FCH (PA-FCHA) circuit card basis.

The FCH number must conform to the following conditions:

- FCH number must be within a range between 1 and 255.

- The same FCH Numbers are assigned at the network level. They must be unique at the node level.

Note: Before assigning FCHN, the trunk data must have been assigned by using the ACTK.

An example of data assignment is shown in the following figures:

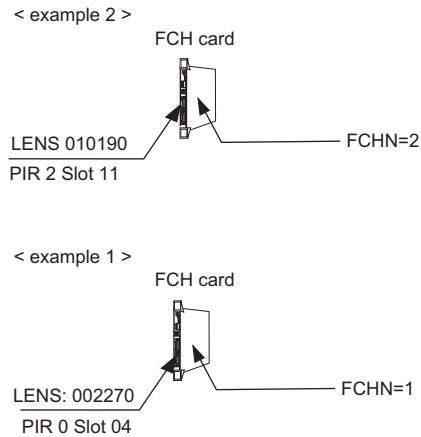
Figure : 24DTI + FCH

Figure : 30DTI + FCH

Assignment of FCH Number (When using 24DTI)

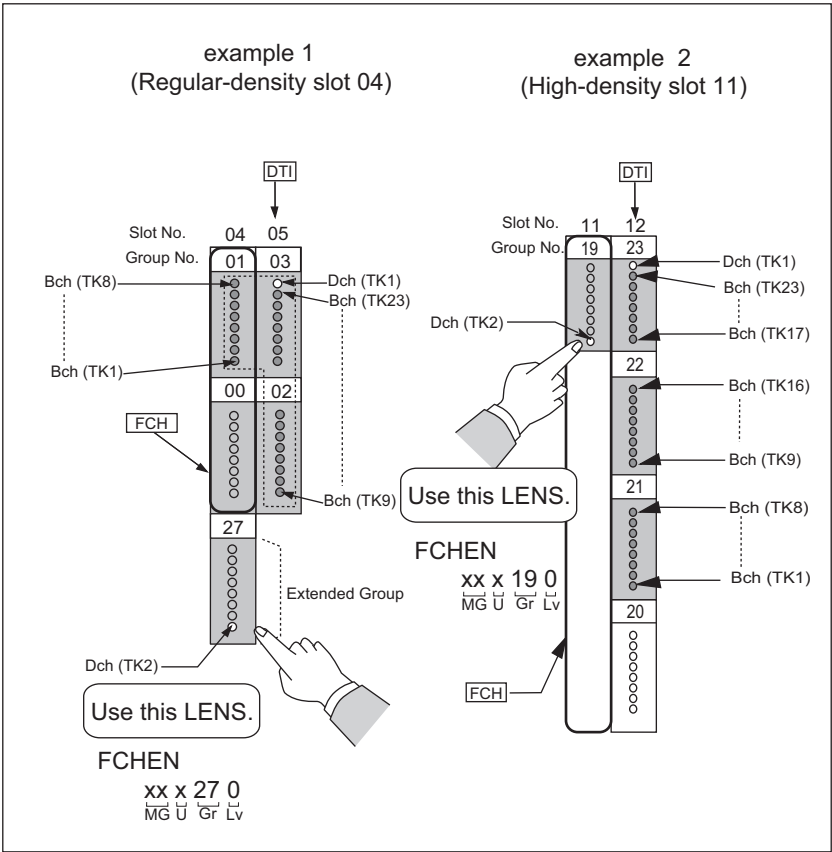
As an example, data assignment when FCH cards are accommodated in the following slots is shown here.
PIR 1, slot 4 and PIR 2, slot 11

Use "odd number" as the Group No. and "Level 0" for the FCHN.



Data Assignment

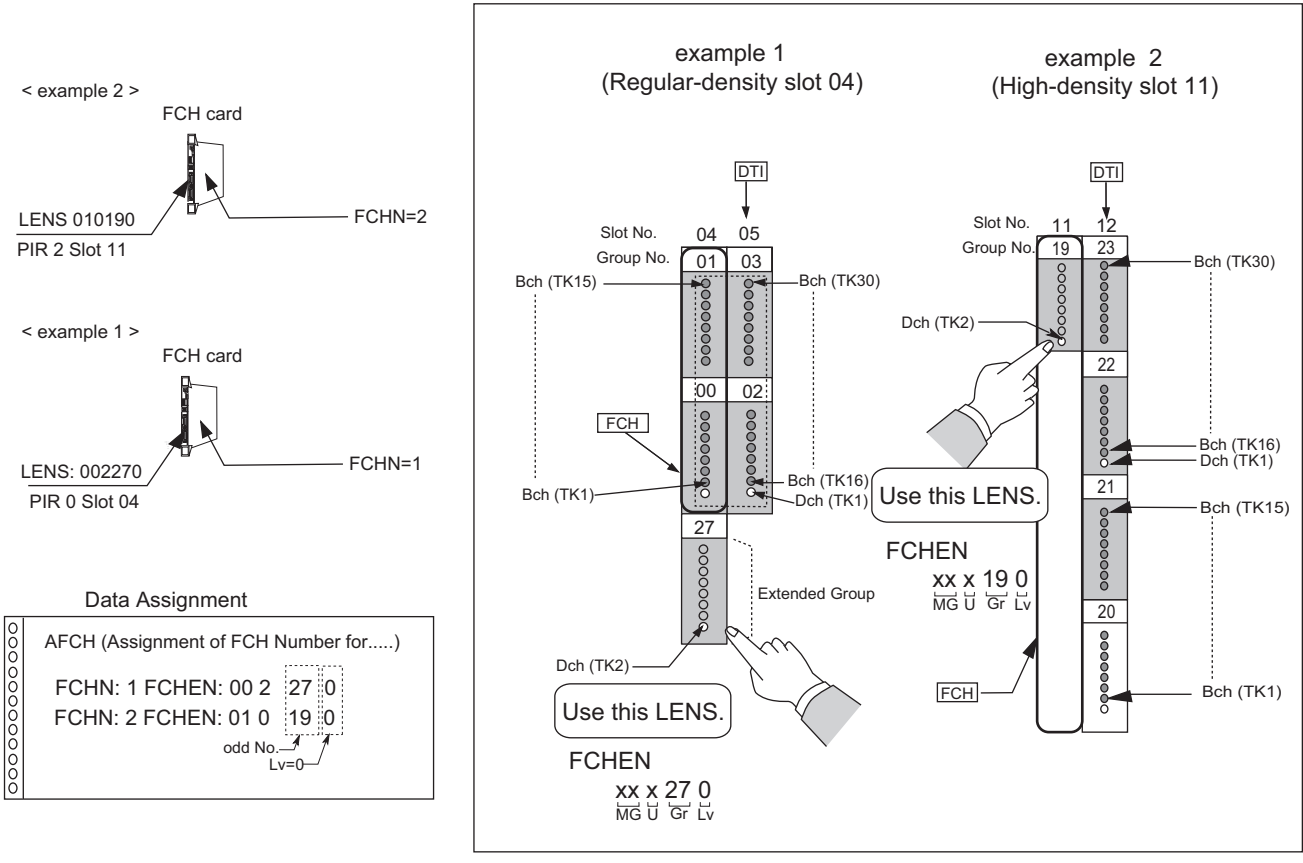
AFCH (Assignment of FCH Number for.....)			
FCHN: 1	FCHEN: 00 2	27	0
FCHN: 2	FCHEN: 01 0	19	0
		odd No.	Lv=0



Assignment of FCH Number (When using 30DTI)

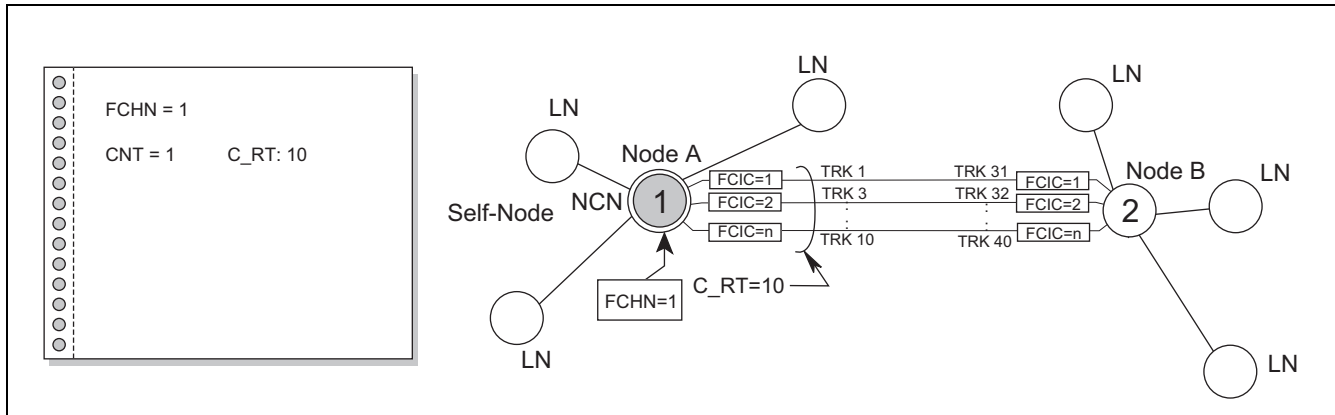
As an example, data assignment when FCH cards are accommodated in the following slots is shown here.
PIR 1, slot 4 and PIR 2, slot 11

Use "odd number" as the Group No. and "Level 0" for the FCHN.

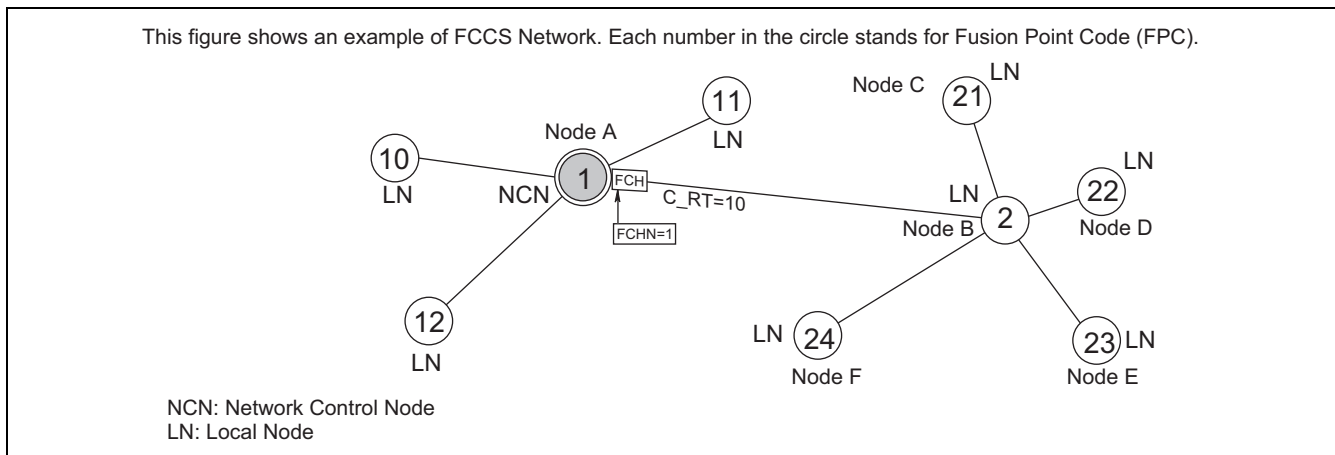


STEP 2: AFRT (FCCS system with FCH only)

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

AFRT Sample Data Sheet**STEP 3: AFPC**

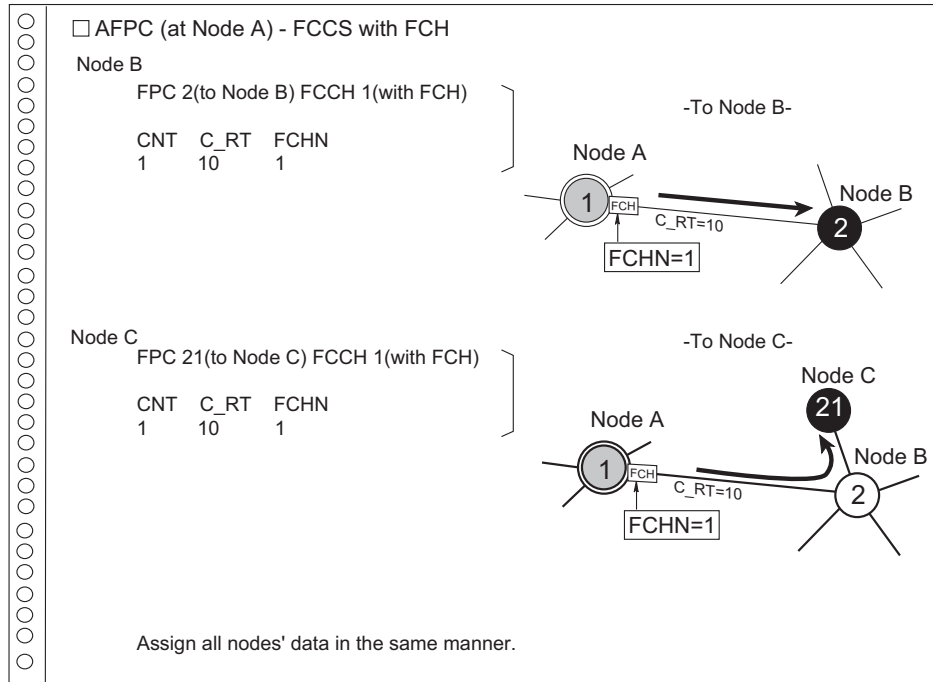
Assign routing data for the FCCS link by using the AFPC command. A maximum of eight digit connection_routes and FCHN/FPCN are assigned on a node basis. The list box labeled FCCH on the AFPC command determines the network configuration type between the self-node and intermediate node. Assign "0" for FCCS without FCH and "1" for FCCS System with FCH. If FCCH=1, enter FCCH number for intermediate node to FCHN/FPCN parameter. If FCCH=0, enter the FPC number of the intermediate node to FCHN/FPCN parameter. An example is given in the figure below.

FCCS Network (example)

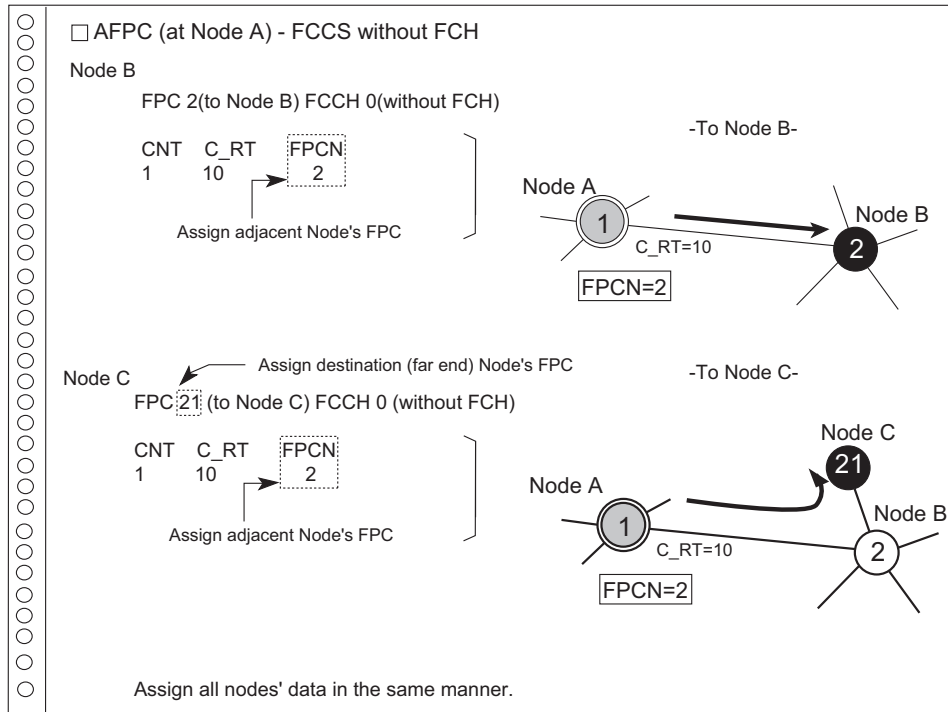
WARNING: The AFPC command affects communications between nodes, and according to conditions, it might be unable to communicate between the nodes. Operate PCPro directly connected to each node as the need to modify the data setting.

AFPC Sample Data Sheet

This table shows a sample data sheet for Node A on the FCCS Network with FCH. Assign the data for all nodes including the nodes which are not directly connected on the network. (i.e. Node C, Node D.....)



This table shows a sample data sheet for Node A on the FCCS 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.....)



Note: When one FCCS network takes the configuration with FCH and without FCH together, it is necessary to assign the routing data using both AFPC and AETH command. A sample data assignment is shown in the figure below.

AFPC/AETH Sample Data Assignment

- ☐ AFPC/AETH (at Node A) - FCCS with FCH & FCCS without FCH is both configured in One Network Control
- * This example shows the data assignment having the priority to the connection between Node A and Node C with FCH card.

① To Node C directly with FCH

AETH

FPC: 3 (FPC Number of Node C)

C_RT	FCHN	DST_IP	NEXT_IP
10	1	0	0
20	2	0	0

② To Node C via Node B

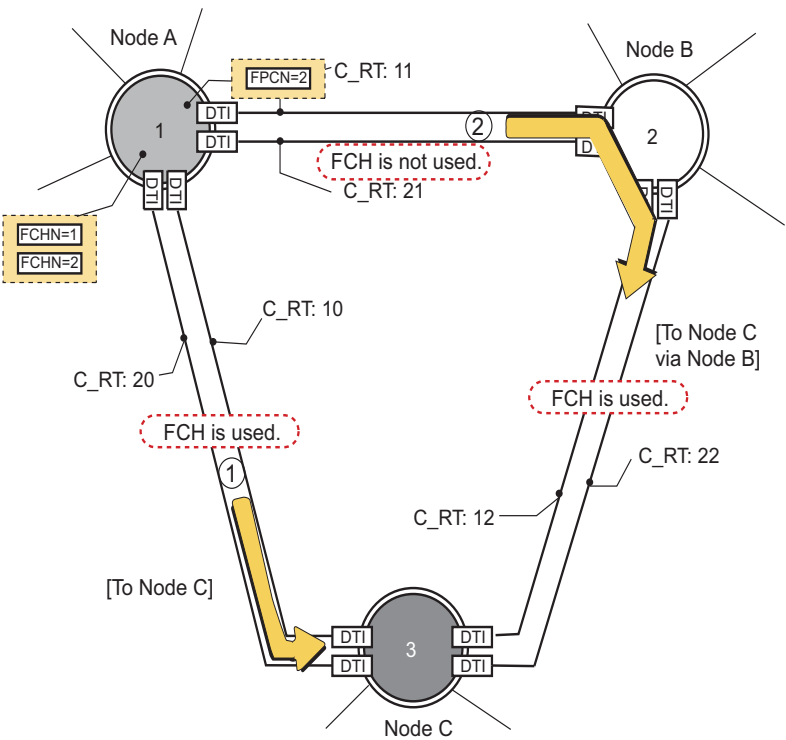
AFPC

FPC: 3 (FPC Number of Node C)

FCCH: 0 (FCH card is not used)

P_ROUTE: 1

CNT	C_RT	FPCN
1	11	2
2	21	2

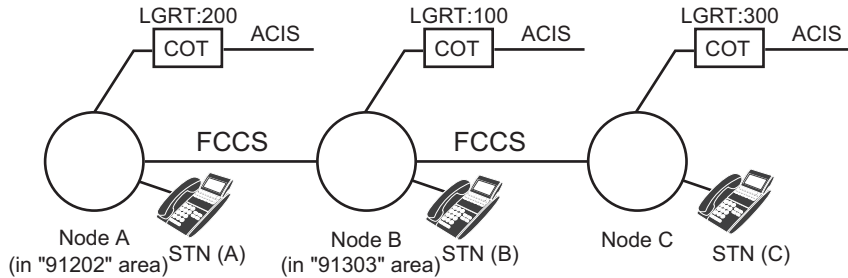


Note: "USE_GATE" data is automatically assigned since Release 8 software enhancement.

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

Tandem connection via FCCS-ACIS link is established. The appropriate routing data for each node is assigned by using LDM, as shown in the following example.

Example of FCCS Network



	Logical route to be seized		
Access code	STN (A)	STN (B)	STN (C)
9-1-202	LGRT: 200	1st LGRT: 200 2nd LGRT: 100	1st LGRT: 200 2nd LGRT: 100 3rd LGRT: 300
9-1-303	1st LGRT: 100 2nd LGRT: 200	LGRT: 100	1st LGRT: 100 2nd LGRT: 200 3rd LGRT: 300

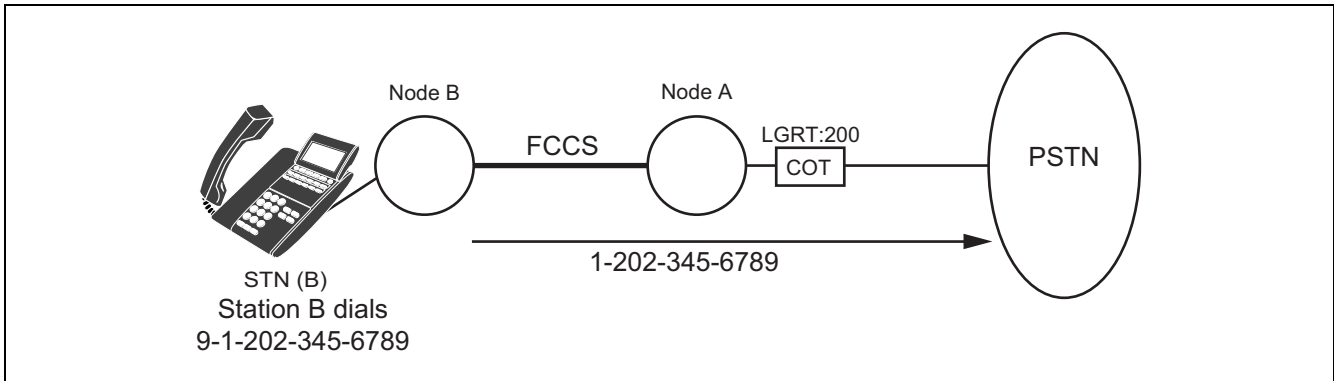
Note: When the related data is assigned to the DM, an outgoing connection is available for external routes in self-node (FCCS - ACIS link cannot be established).

To initiate seizure of an external trunk, the following methods are used.

- OGC
- OGCA
- LCR/LCRS

2.9.1 OGC

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

Example of OGC**STEP 1: ANPDN/ANPDL Note 1**

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

STEP 2: ASPAN/ASPAL Note 1

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: Outgoing Call"	LGRT=200
ACC=9	CI="H: Hooking"	SRV="OGC: Outgoing Call"	LGRT=200

Note 1: 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)

STEP 3: AMND/ANNDL

Depending on the route data, assign the necessary number of digits using the AMND or ANNDL command.

- When the ARTD command OSGS is 2 (Second Dial Tone), use AMND command.

DC=9 MND=12

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

RT=200 OG NND=12

STEP 4: ARSCN Note 2

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

Note 2: When the existing network is upgraded to the FCCS network, DM and NDM data for Route Restriction class (ARSC/ARSCN) and Alternate Route Restriction (ARRC/ARRCN) can co-exist in one FCCS network. It is not necessary to perform the NDM data setting by ARSCN and ARRCN at the same time. The following system data needs to be assigned.

ASYDN, Index 804, bit2:DM and NDM data for FCCS route restriction class (ARSC/ARSCN and ARRC/ARRCN) can co-exist in the FCCS network.
0/1=Invalid/Valid

Required conditions for this function are as follows:

It is recommended that the Route Restriction data (NDM) be assigned to the whole LGRT. The FCCS network will check the DM on all the applicant nodes if NDM data is not assigned.

This function is used only when the existing network is upgraded to the FCCS network. It is not adapted for the already built FCCS network.

Once the system data ASYDN, Index 804, bit2=0 is set, on executing the Restriction data assignment to one route by the ARSCN/ARRCN command, the DM data assigned by the ARSC and ARRC is invalid.

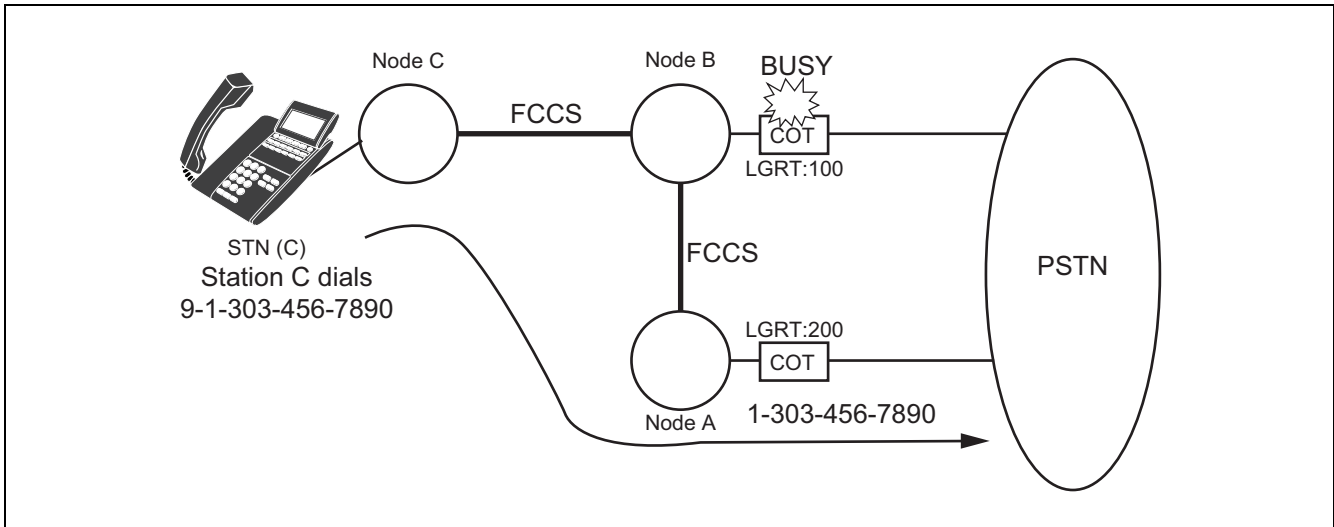
When all the restriction data to a specified route is assigned to "0" (RRI 0-3, RSC 0-15) by the ARSCN command, the restriction data by the ARSC command becomes effective for the route. To restrict every incoming/outgoing call, it is required to set all the Restriction data to "0" by both ARSC and ARSCN.

Even if a tandem connection is restricted in ARRCN, the connection is allowed in case it is set in ARRC. To restrict the tandem connection in LGRT, the restriction data must be set both in ARRCN and ARRC.

2.9.2 OGCA

The procedure for assigning OGCA access code is explained in the following.

Example of OGCA

STEP 1: **ANPDN/ANPDL** **Note 1**

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

1st DC=9 CI=N (Normal Service) NND=1
 1st DC=9 CI=H (Hooking Service) NND=1

STEP 2: **ASPAN/ASPAL** **Note 1**

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: Outgoing Call with route advance"
 CNT=2 1st LGRT=100 2nd LGRT=200
 ACC=9 CI="H: Hooking" SRV="OGCA: Outgoing Call with route advance"
 CNT=2 1st LGRT=100 2nd LGRT=200

Note 1: 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)

STEP 3: AMND/ANNDL

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

- When the ARTD command OSGS is 2 (Second Dial Tone), use the AMND command.

DC=9 MND=12

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

RT=100 OG NND=12

RT=200 OG NND=12

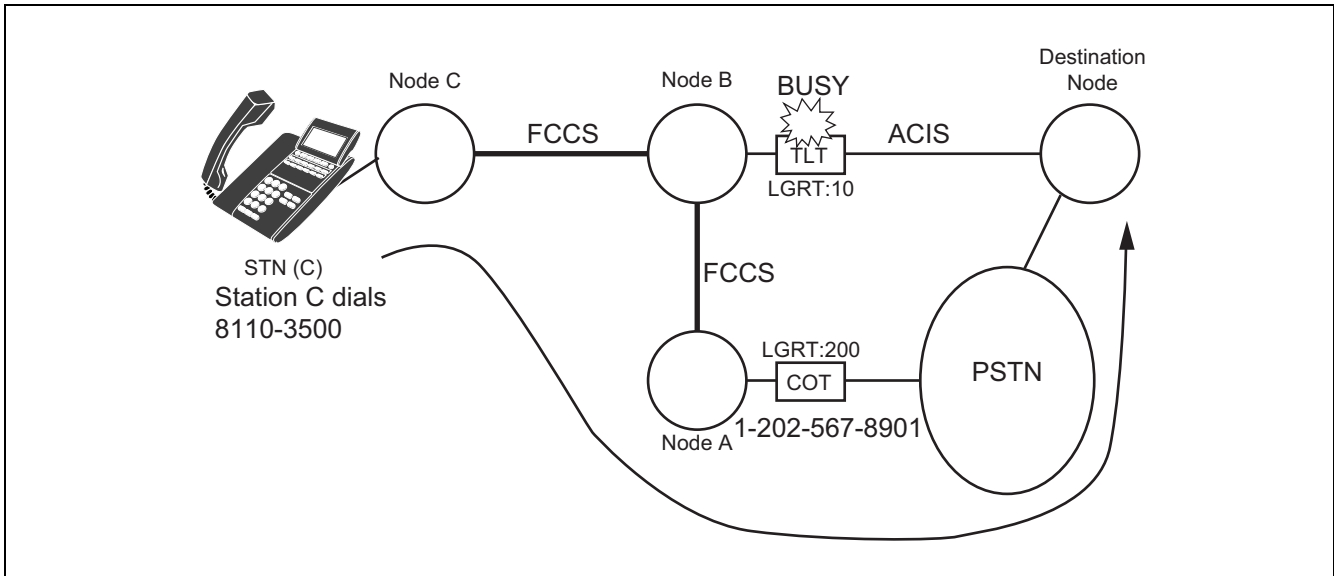
STEP 4: ARSCN Note 2

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

Note 2: DM and NDM for route restriction data (ARSC/ARSCN and ARRC/ARRCN) can co-exist in one FCCS network. For more information on this function, refer to **Note 2** on Page 93.

2.9.3 LCR/LCRS

The procedure for assigning LCR/LCRS access code is explained in the following.

Example of LCR/LCRS**STEP 1: ANPDN/ANPDL Note 1**

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 ANPDL command.

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

STEP 2: ASPAN/ASPAL Note 1

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: Least Cost Routing"/"LCRS: Register Sender LCR"
LGRT=Dummy route number		
ACC=8	CI="H: Hooking"	SRV="LCR: Least Cost Routing"/"LCRS: Register Sender LCR"
LGRT=Dummy route number		

Note 1: 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)

STEP 8: AADCL/AADCN Note 3

Assign an additional Digit Code to the PNL assigned in the AOPRL/AOPRN command.

PNL=128
DC=12025678901

STEP 9: ARSCN Note 5

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

Note 2: The dummy route must be assigned to all nodes (including a node that does not have external routes).

Note 3: 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)

Note 4: Be sure to assign 0 at the last RA.

Note 5: DM and NDM for route restriction data (ARSC/ARSCN and ARRC/ARRCN) can co-exist in one FCCS network. For more information on this function, refer to **Note 2** on Page 93.

2.10 Flexible Routing - FCCS

If FCCS trunks are all busy or data link failure occurs at the FCH card, the FCCS trunk call is routed via non-FCCS trunk (C.O. or TIE line).

☐ Service Conditions

1. This feature may be activated when the FCCS trunks are all busy or FCCS link failure (Layer 2 down) occurs at the FCH card.
2. This feature is available when the called party is an analog station, Desktop terminal or ISDN terminal. (When the called party is a wireless terminal or DAT/Paging Trunk, this feature is not activated.)
3. Use LCR/LCRS for this feature.
4. The access code of this feature (ACC: maximum of 24 digits) is assigned by the AFRFL command.
5. When the selected non-FCCS trunks (LCR/LCRS) are busy, route selection is performed according to the LCR/LCRS table. The same is performed when the selection encounters an FCCS trunk busy again.
6. Route advance to PSTN line is available for an ISDN line. Sub-addressing dialing requires at node receiving the advanced call.
7. When System Data [ASYD: System Data 1, Index 20, Bit 7=1 (The Billing Party is the station that has set Call Forwarding - Outside service)] is assigned, routing is not available.
8. The following services can be provided with this feature:

•CALL FORWARDING - BUSY LINE	[C-2]
•CALL FORWARDING - DON'T ANSWER	[C-3]
•CALL FORWARDING - ALL CALLS	[C-5]
•CALL TRANSFER - ALL CALLS	[C-11]
•CALL FORWARDING - ALL CALLS - ANNOUNCEMENT	[C-69] Note 1
•DIRECT INWARD DIALING (DID)	[D-8]
•DISTINCTIVE RINGING	[D-10] Note 2
•INTERMEDIATE STATION NUMBER DISPLAY -D	[I-10D] Note 3
•PRIORITY CALL	[P-9]
•REMOTE ACCESS TO SYSTEM	[R-2]
•STATION HUNTING	[S-7, 8, 9] Note 4
•STATION-TO-STATION CALLING	[S-11]
•STEP CALL	[S-13] Note 5
•SPEED CALLING - GROUP	[S-23]
•SERVICE DISPLAY -D	[S-25D] Note 3

•SPLIT CALL FORWARDING

[S-99] **Note 6**

•UNIFORM CALL DISTRIBUTION

Note 1: Available when CCIS is activated in the network.

Note 2: When a call terminates from the Alternative Route, the ringing for the Trunk Call is provided.

Note 3: The display is changed depending on the specification of ACIS.

Note 4: Has priority over FLEXIBLE ROUTING - FCCS Service. FLEXIBLE ROUTING - FCCS is activated only when the FCCS Trunk for the Destination Station is busy.

Note 5: A Trunk is used after the call encounters Station Busy between the Stations in the FCCS Network.

Note 6: Available only at the time of the data assignment for Alternative Route.

9. The following services are available when the Alternative Route is CCIS and the service is provided in the CCIS Network:

•CALL FORWARDING - ALL CALLS - CCIS	[C-45]
•CALL FORWARDING - BUSY LINE - CCIS	[C-46]
•CALL FORWARDING - DON'T ANSWER - CCIS	[C-47]
•CALLING NUMBER DISPLAY - CCIS	[C-52]
•DATA PRIVACY ON DEMAND - CCIS	[D-68]
•DIGITAL DISPLAY - CCIS	[D-72]
•DISTINCTIVE RINGING - CCIS	[D-75]
•MESSAGE REMINDER - CCIS	[M-34]
•NAME DISPLAY - SYSTEM - CCIS	[N-37]
•STEP CALL - CCIS	[S-59]
•VOICE CALL - CCIS	[V-7]

STEP 1: Basic Data

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

Flexible Route Numbering Plan Data (LCR/LCRS data)

Station-to-Station connection data

STEP 2: AFRFL

Assign flexible route numbering plan 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 Routing FPC

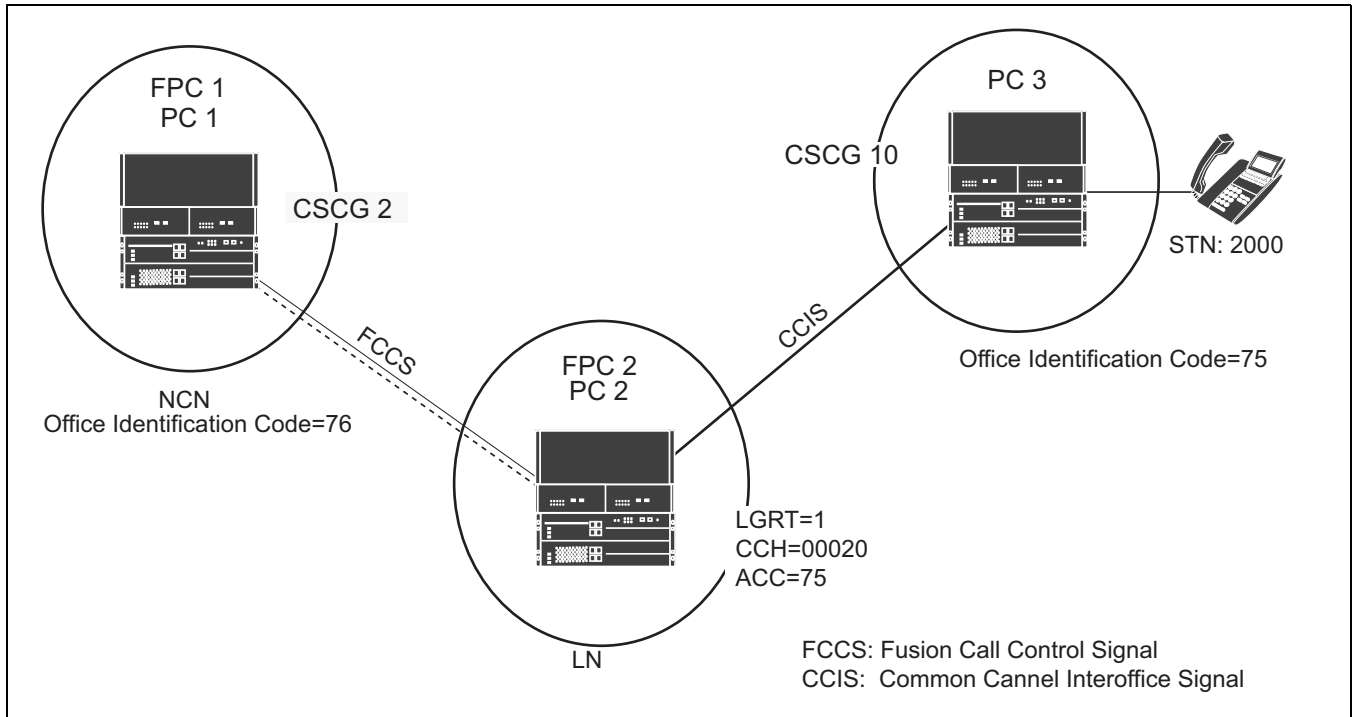
The same number assigned by ASPA command for LCR/LCRS (C.O or TIE line)

2.11 Network Data Programming for Tandem Connection via FCCS - CCIS

To establish CCIS services between FPC 1 (PC 1) and PC 3 via FCCS - CCIS link, it is required to perform the following data assignment at FPC1 (PC1) node as explained.

CCIS link data is assigned between FPC 2 (PC 2) and PC 3 nodes as shown as below:

FCCS - CCIS Co-existing Network



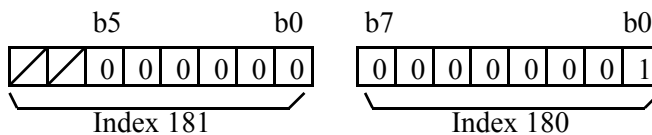
The following data setting must be assigned at FPC1 (PC1) node.

STEP 1: **ASYD**

- ☐ Assign the Originating Point Code (OPC) within the range 1-16367.

Indexes 180 and 181:

Ex.) OPC=1



- ☐ Miscellaneous Data

Index 186:

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

STEP 2: **ANPDL/ANPDN**

Assign the first digit and the Number of Necessary Digits (NNDs) of the LCR access code.

1st DC=7 CI=N (Normal Service)/H (Hooking Service) NND=2

STEP 3: ASPAL/ASPAN

Assign the dummy route number to the LCR access code.

ACC=75 SRV="LCR: Least Cost Routing" LGRT=Dummy route number

STEP 4: AMND

Assign Maximum Necessary Digits (MND) including the access code

DC=752 MND=6

STEP 5: ARNPL

Assign the access code to the logical route of speech path. It is not required to assign this data to the logical route of signal controlling channel and dummy route.

LGRT=1 ACC=75

STEP 6: ARNP

Enter RT=0 for the self-office code (self-office identification code) in Open Numbering Network. This number is used when Called Number Display for SMDR/Desktop terminal/Desktop Console, or CCIS services, such as Call Back - CCIS/Message Reminder - CCIS/Message Waiting Lamp - CCIS, are provided in this network.

RT=0 ACC=76

STEP 7: AFRSL/AFRSN

Assign Number Pattern Code (NPC), including the access code for LCR, and the Outgoing Route Selection Pattern (OPR) for the dummy route number.

LGRT=Dummy route number NPC=75 OPR=1

STEP 8: AOPRL/AOPRN

Assign the LCR routing pattern for the OPR routing number. The actual route selection pattern and the conditions are designated in this command.

TDPTN=0 OPR=1 LGRT=1 SKIP=0

STEP 9: ADPCL

Assign the destination Point Code (PC) on a speech channel route (logical route) basis.

LGRT=1 PC=3

STEP 10: ACSCL

Assign the CSC Group Number (CSCG) for designating the D-Channel and the location of the CCH. The CCH - node is specified by FPC.

CSCG 2-254(n)	CICG	FPC	LENS of CCH		
			MG	U	G
2 (Basic/ Primary Route)	0	2	00	0	20
	1	2	00	0	20
	2	2	00	0	20
	3	2	00	0	20
	4	2	00	0	20
	5	2	00	0	20
	6	2	00	0	20
	7	2	00	0	20

CSCG 2-255(n+1)	CICG	FPC	LENS of CCH		
			MG	U	G
3 (Alternate Route)	0	2	00	0	20
	1	2	00	0	20
	2	2	00	0	20
	3	2	00	0	20
	4	2	00	0	20
	5	2	00	0	20
	6	2	00	0	20
	7	2	00	0	20

STEP 11: ACIC1

Assign the data to establish the relation between the PC of the destination node and the CSC Group (CSCG) of the basic route.

Enter the destination PC assigned by the ADPCL command, and CSCG number of the basic route (even number) assigned by the ACSCL command. The CSC group number of the alternate route is not required.

Ex.) PC=3 CSCG=2

The following is a sample data for assigning ACIC1 data at PC 3 node.

Make a relationship between PC of each node and Basic route's CSC Group (CSCG). Assign the PC set by ADPCL command and Basic route's CSC Group number (even number) set by ASCL command. Note that CSCG of alternate route is not required.

Note: When CCIS nodes which are not directly connected exist on the network, assign the point codes of these nodes.

PC=2, CSCG = 10

PC=1, CSCG = 10

When connecting the FCCS to the CCIS network, the data programming related to the CSC group and Point Code (PC) changes as follows to simplify the maintenance operation.

This section shows the data assignment for configuring the CCIS - FCCS co-existing network using some example network configurations.

☐ Service Conditions

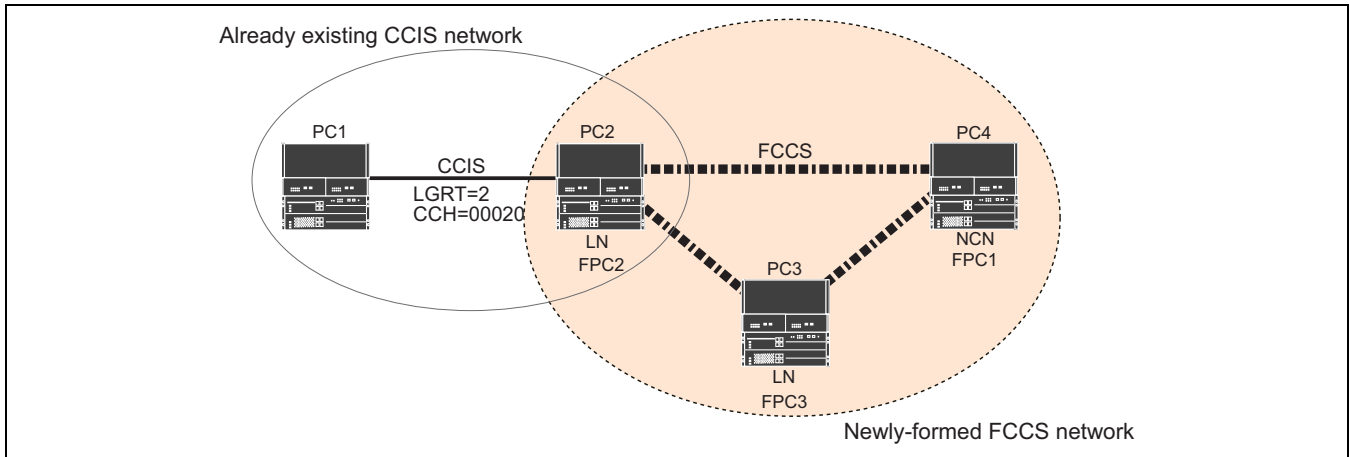
1. Perform the data setting by the ADPCN/ACSCN/ACIC1N commands to the CCIS link connected to the FCCS system.
2. The LDM/DM data turns invalid when NDM data assignment is executed. Be careful when assigning the NDM data on the node holding CCIS/ISDN data.
3. The CSCG already used in the ISDN network, cannot be assigned in duplicate. (It is recommended to specify the CSCG with a range from 2 through 127 for the CCIS network.)
4. On the CCH - accommodated node, assign the basic data for No.7 CCIS by using the ADPC, ACSC, ACIC1, and ACIC2 commands. For more information, refer to the No.7 CCIS System Manual.
5. In the FCCS network, assignment direction to CCIS is limited to maximum 126 routes (2 through 127 and 130 through 255).

Note: This explanation goes on the condition that other data (system data and numbering plan data) has been already assigned. Refer to the basic data assignment for CCIS network and FCCS network.

<Example 1> Connecting the new FCCS system to the existing CCIS network;

Perform the following CCIS data programming at FPC1 (NCN) as shown in the figure below.

CCIS - FCCS Co-existing Network (example 1)



STEP 1: ADPCN

Assign the destination Point Code (PC) on a speech channel route (logical route) basis.

LGRT=2 PC=1

STEP 2: ACSCN

Assign the CSC Group number (CSCG) for designating the D-Channel and the location of the CCH card. The CCH - accommodated node is specified by FPC.

CSCG 2-254 (n)	CICG	FPC	LENS of CCH		
			MG	U	G
2 (Basic/ Primary Route)	0	2	0	0	0
	1	2	0	0	0
	2	2	0	0	0
	3	2	0	0	0
	4	2	0	0	0
	5	2	0	0	0
	6	2	0	0	0
	7	2	0	0	0

CSCG 2-255 (n+1)	CICG	FPC	LENS of CCH		
			MG	U	G
3 (Alternate Route)	0	2	0	0	0
	1	2	0	0	0
	2	2	0	0	0
	3	2	0	0	0
	4	2	0	0	0
	5	2	0	0	0
	6	2	0	0	0
	7	2	0	0	0

STEP 3: ACIC1N

Assign the data to establish the relation between the PC of the destination node/other nodes in the network and the CSC Group (CSCG) of the basic route.

Enter the destination PC specified by the ADPCN command, and the CSCG number (even number) of the basic route by the ACSCN command. The CSC group number of the alternate route is not required.

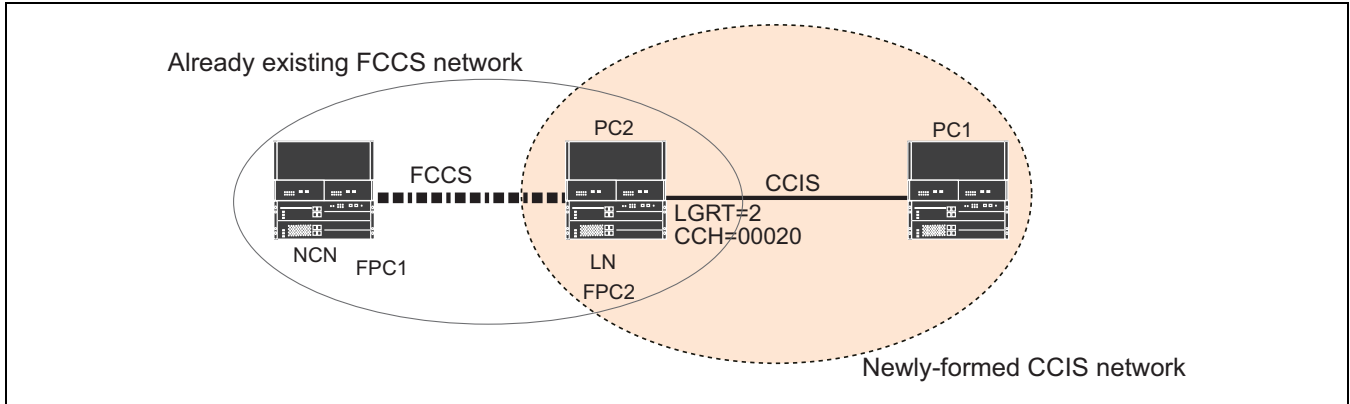
PC=1 CSCG=2

Note: The data deletion is performed in the converse order.

<Example 2> Connecting the new CCIS network to existing FCCS network

Perform the following CCIS link data programming at FPC1 (NCN) as shown in the figure below. CCIS link data setting is required on PC1.

CCIS - FCCS Coexisting Network (example 2)



STEP 1: **ADPCN**

Assign the destination Point Code (PC) on a speech channel route (logical route) basis.

LGRT=2 PC=1

STEP 2: **ACSCN**

Assign the CSC Group number (CSCG) for designating the D-Channel and the location of the CCH card. The CCH accommodated node is specified by FPC.

CSCG 2-254 (n)	CICG	FPC	LENS of CCH		
			MG	U	G
2 (Basic/ Primary Route)	0	2	0 0	0	2 0
	1	2	0 0	0	2 0
	2	2	0 0	0	2 0
	3	2	0 0	0	2 0
	4	2	0 0	0	2 0
	5	2	0 0	0	2 0
	6	2	0 0	0	2 0
	7	2	0 0	0	2 0

CSCG 2-255 (n+1)	CICG	FPC	LENS of CCH			
			MG	U	G	
3 (Alternate Route)	0	2	0 0	0	2 0	
	1	2	0 0	0	2 0	
	2	2	0 0	0	2 0	
	3	2	0 0	0	2 0	
	4	2	0 0	0	2 0	
	5	2	0 0	0	2 0	
	6	2	0 0	0	2 0	
	7	2	0 0	0	2 0	

STEP 3: **ACIC1N**

Assign the data to establish the relation between the PC of the destination node/other nodes in the network and the CSC Group (CSCG) of the basic route.

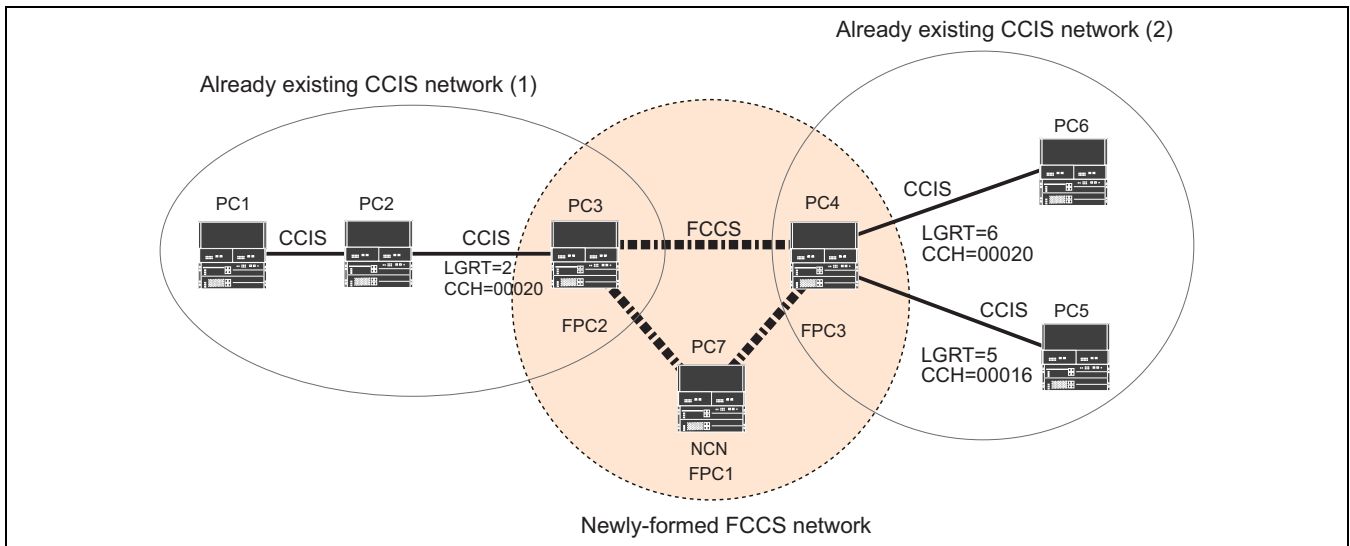
Enter the destination PC specified by the ADPCN command, and CSCG number (even number) of basic route by the ACSCN command. The CSC group number of the alternate route is not required.

PC=1 CSCG=2

<Example 3> Connecting the new FCCS to multiple CCIS networks

Perform the following CCIS link data setting on FPC 1 (NCN) as shown in the figure below.

FCCS to Multiple CCIS Network (example 3)



STEP 1: ADPCN

Assign the destination Point Code (PC) on a speech channel route (logical route) basis.

LGRT=2	PC=2
LGRT=5	PC=5
LGRT=6	PC=6

STEP 2: ACSCN

Assign the CSC Group (CSCG) number for designating the D-Channel and the location of the CCH card. The CCH accommodated node is specified by FPC.

CSCG 2-254 (n)	CICG	FPC	LENS of CCH		
			MG	U	G
2 (Basic/ Primary Route)	0	2	0 0	0	2 0
	1	2	0 0	0	2 0
	2	2	0 0	0	2 0
	3	2	0 0	0	2 0
	4	2	0 0	0	2 0
	5	2	0 0	0	2 0
	6	2	0 0	0	2 0
	7	2	0 0	0	2 0
4 (Basic/ Primary Route)	0	3	0 0	0	1 6
	1	3	0 0	0	1 6
	2	3	0 0	0	1 6
	3	3	0 0	0	1 6
	4	3	0 0	0	1 6
	5	3	0 0	0	1 6
	6	3	0 0	0	1 6
	7	3	0 0	0	1 6
6 (Basic/ Primary Route)	0	3	0 0	0	2 0
	1	3	0 0	0	2 0
	2	3	0 0	0	2 0
	3	3	0 0	0	2 0
	4	3	0 0	0	2 0
	5	3	0 0	0	2 0
	6	3	0 0	0	2 0
	7	3	0 0	0	2 0
CSCG 2-255 (n+1)	CICG	FPC	LENS of CCH		
			MG	U	G
3 (Alternate Route)	0	2	0 0	0	2 0
	1	2	0 0	0	2 0
	2	2	0 0	0	2 0
	3	2	0 0	0	2 0
	4	2	0 0	0	2 0
	5	2	0 0	0	2 0
	6	2	0 0	0	2 0
	7	2	0 0	0	2 0
5 (Alternate Route)	0	3	0 0	0	1 6
	1	3	0 0	0	1 6
	2	3	0 0	0	1 6
	3	3	0 0	0	1 6
	4	3	0 0	0	1 6
	5	3	0 0	0	1 6
	6	3	0 0	0	1 6
	7	3	0 0	0	1 6
7 (Alternate Route)	0	3	0 0	0	2 0
	1	3	0 0	0	2 0
	2	3	0 0	0	2 0
	3	3	0 0	0	2 0
	4	3	0 0	0	2 0
	5	3	0 0	0	2 0
	6	3	0 0	0	2 0
	7	3	0 0	0	2 0

STEP 3: ACIC1N

Assign the data to establish the relation between the PC of the destination node/other nodes in the network and the CSC Group (CSCG) of the Basic Route.

Enter the destination PC specified by the ADPCN command, and CSCG number (even number) of basic route designated by the ACSCN command. The CSC group number of the alternate route is not required.

PC=2 CSCG=2

PC=1 CSCG=2

PC=5 CSCG=4

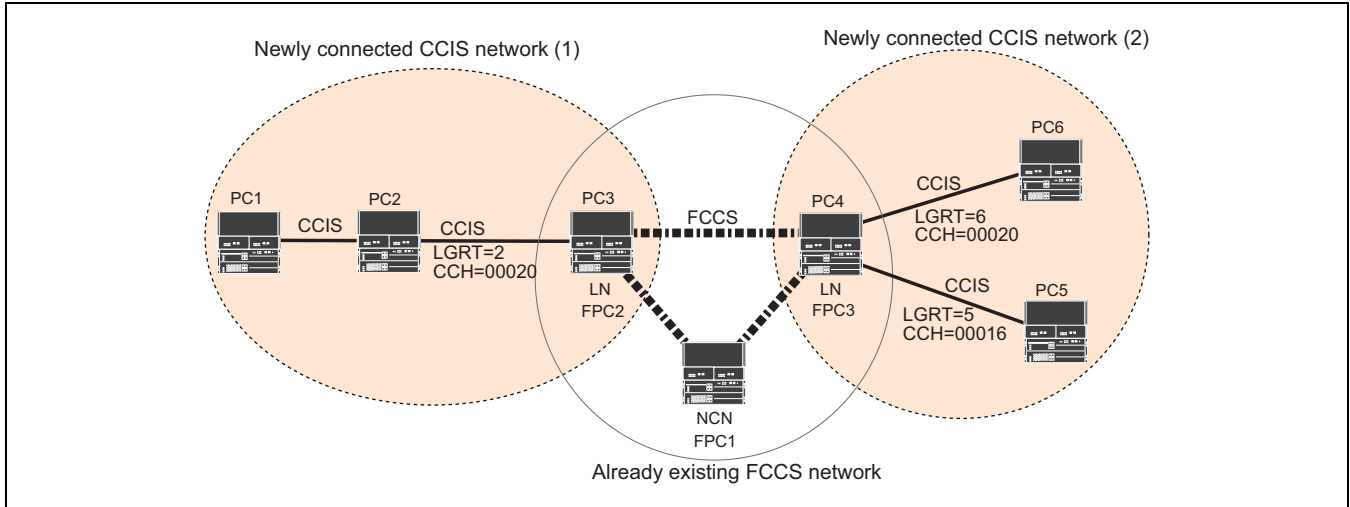
PC=6 CSCG=6

Note: The data deletion is performed in the converse order.

<Example 4> Connecting the new CCIS networks to multiple FCCS networks

Perform the following data setting on FPC 1 (NCN) in the figure below. Usual CCIS link data setting is required on PC 1, PC 2, PC 5, and PC 6 nodes.

CCIS - Multiple FCCS Networks (example 4)



STEP 1: **ADPCN**

Assign the destination Point Code (PC) on speech channel route (logical route) basis.

LGRT=2	PC=2
LGRT=5	PC=5
LGRT=6	PC=6

STEP 2: ACSCN

Assign the CSC Group number (CSCG) for designating the D-Channel and the location of the CCH card. The CCH accommodated node is specified by FPC.

CSCG 2-254 (n)	CICG	FPC	LENS of CCH		
			MG	U	G
2 (Basic/ Primary Route)	0	2	0 0	0	2 0
	1	2	0 0	0	2 0
	2	2	0 0	0	2 0
	3	2	0 0	0	2 0
	4	2	0 0	0	2 0
	5	2	0 0	0	2 0
	6	2	0 0	0	2 0
	7	2	0 0	0	2 0
4 (Basic/ Primary Route)	0	3	0 0	0	1 6
	1	3	0 0	0	1 6
	2	3	0 0	0	1 6
	3	3	0 0	0	1 6
	4	3	0 0	0	1 6
	5	3	0 0	0	1 6
	6	3	0 0	0	1 6
	7	3	0 0	0	1 6
6 (Basic/ Primary Route)	0	3	0 0	0	2 0
	1	3	0 0	0	2 0
	2	3	0 0	0	2 0
	3	3	0 0	0	2 0
	4	3	0 0	0	2 0
	5	3	0 0	0	2 0
	6	3	0 0	0	2 0
	7	3	0 0	0	2 0
CSCG 2-255 (n+1)	CICG	FPC	LENS of CCH		
			MG	U	G
3 (Alternate Route)	0	2	0 0	0	2 0
	1	2	0 0	0	2 0
	2	2	0 0	0	2 0
	3	2	0 0	0	2 0
	4	2	0 0	0	2 0
	5	2	0 0	0	2 0
	6	2	0 0	0	2 0
	7	2	0 0	0	2 0
5 (Alternate Route)	0	3	0 0	0	1 6
	1	3	0 0	0	1 6
	2	3	0 0	0	1 6
	3	3	0 0	0	1 6
	4	3	0 0	0	1 6
	5	3	0 0	0	1 6
	6	3	0 0	0	1 6
	7	3	0 0	0	1 6
7 (Alternate Route)	0	3	0 0	0	2 0
	1	3	0 0	0	2 0
	2	3	0 0	0	2 0
	3	3	0 0	0	2 0
	4	3	0 0	0	2 0
	5	3	0 0	0	2 0
	6	3	0 0	0	2 0
	7	3	0 0	0	2 0

STEP 3: ACIC1N

Assign the data to establish the relation between the PC of the destination node/other nodes in the network and the CSC Group (CSCG) of the basic route.

Enter the destination PC specified by the ADPCN command, and CSCG number (even number) of basic route designated by the ACSCN command. (The CSC group number of the alternate route is not required here.)

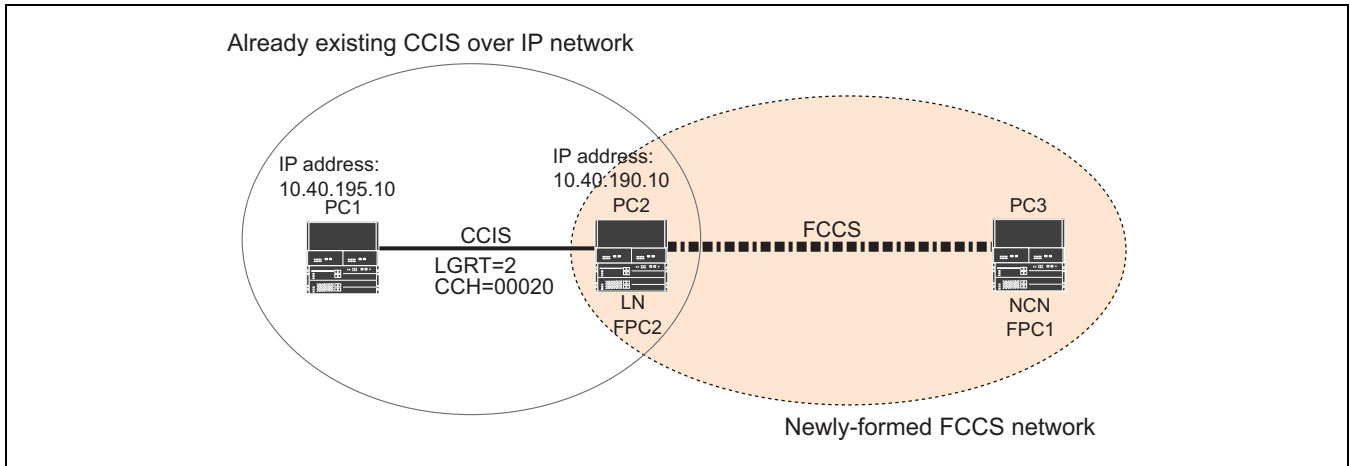
PC=2	CSCG=2
PC=1	CSCG=2
PC=5	CSCG=4
PC=6	CSCG=6

Note: The data deletion is performed in the converse order.

<Example 5> Connecting the new FCCS network to the existing network of CCIS Networking via IP:

Perform the following CCIS data programming at PC3 (FPC1) node.

CCIS - FCCS Co-existing Network (example 5)



STEP 1: **APIPL/APIPN**

Allocate the IP address to the destination Point Code (PC).

PC = 1

IP ADDRESS = 10.40.195.10 (Destination IP address)

MODE: Permanent Virtual Connection/Switched Virtual Connection

TIMER: 0-127 (0: 15 minutes (default), 1-127: 1-127 minutes) **Note 1**

LKRCN = 1 (Link reconnection is ON)

Note 1: When Switched Virtual Connection is selected in the parameter MODE, assign the expiring timer to disconnect TCP connection.

STEP 2: **ADPCL/ADPCN**

Assign the destination Point Code (PC) on a speech channel route (logical route) basis.

LGRT=2 PC=1

STEP 3: ACSCL/ACSCN

Assign the CSC Group number (CSCG) with the FPC of the node contacting to CCIS over IP.

CSCG 2-254 (n) Note 2	CICG	FPC Note 3	LENS of CCH Note 4		
			MG	U	G
2 (Basic/ Primary Route)	0	2	0 0	0	2 0
	1	2	0 0	0	2 0
	2	2	0 0	0	2 0
	3	2	0 0	0	2 0
	4	2	0 0	0	2 0
	5	2	0 0	0	2 0
	6	2	0 0	0	2 0
	7	2	0 0	0	2 0
CSCG 2-255 (n+1) Note 2	CICG	FPC Note 3	LENS of CCH Note 4		
			MG	U	G
3 (Alternate Route)	0	2	0 0	0	2 0
	1	2	0 0	0	2 0
	2	2	0 0	0	2 0
	3	2	0 0	0	2 0
	4	2	0 0	0	2 0
	5	2	0 0	0	2 0
	6	2	0 0	0	2 0
	7	2	0 0	0	2 0

Note 2: Assign the same CSCG with PC2.

Note 3: Assign the FPC of PC2.

Note 4: Specify the LENS of the PC2's controlling channel (D-channel).

STEP 4: ACIC1/ACIC1N

Assign the data to establish the relation between the PC of the destination node/other nodes in the network and the CSC Group (CSCG) of the basic route. Enter CSCG number (even number) to the PC of CCIS over IP accommodating node (PC2) and all the other destination nodes.

[CCIS over IP accommodating node]

PC=2 CSCG=2

[Destination node]

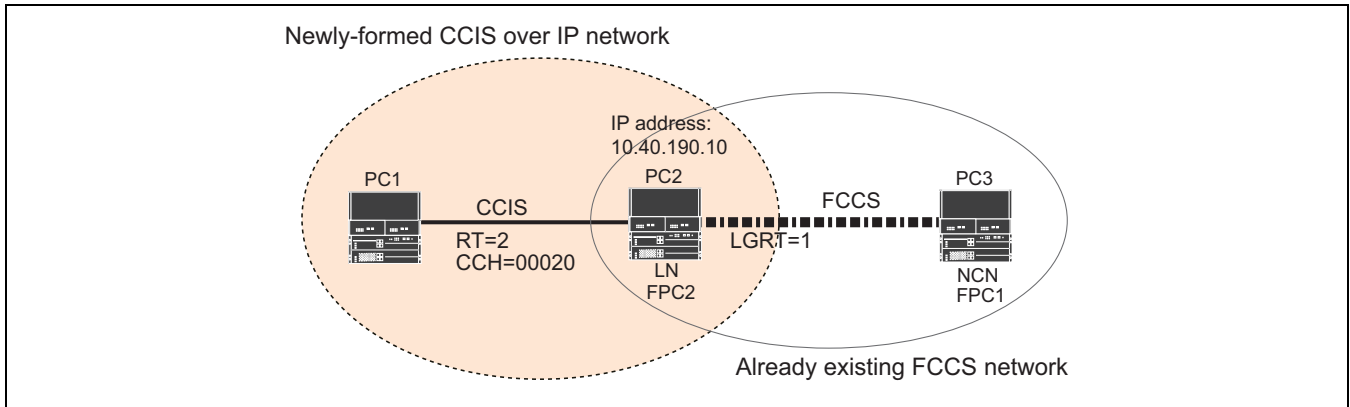
PC=1 CSCG=2

Note: The data deletion is performed in the converse order.

<Example 6> Connecting new CCIS Networking via IP network to the existing FCCS network;

Perform the following CCIS link data programming at PC1 shown below.

CCIS - FCCS Coexisting Network (example 6)



STEP 1: APIPL

Allocate the IP address to the destination Point Code (PC).

PC = 2

IP ADDRESS = 10.40.190.10 (Destination IP address)

MODE: Permanent Virtual Connection/Switched Virtual Connection

TIMER: 0-127 (0: 15 minutes (default), 1-127: 1-127 minutes) **Note 5**

LKRCN = 1 (Link reconnection is ON)

PC = 3

IP ADDRESS = 10.40.190.10 (PC2's IP address as destination IP address)

MODE: Permanent Virtual Connection/Switched Virtual Connection

TIMER: 0-127 (0: 15 minutes (default), 1-127: 1-127 minutes) **Note 5**

LKRCN = 1 (Link reconnection is ON)

Note 5: When Switched Virtual Connection is selected in the parameter MODE, assign the expiring timer to disconnect TCP connection.

STEP 2: ADPC

Assign the destination Point Code (PC) on a virtual speech channel route basis.

RT = 2 PC = 1

STEP 3: ACSC

Assign the CSC Group number (CSCG) for designating the controlling channel (D-channel).

CSCG 2-254 (n)	CICG	LENS of CCH		
		MG	U	G
2 (Basic/ Primary Route)	0	0 0	0	2 0
	1	0 0	0	2 0
	2	0 0	0	2 0
	3	0 0	0	2 0
	4	0 0	0	2 0
	5	0 0	0	2 0
	6	0 0	0	2 0
	7	0 0	0	2 0
CSCG 2-255 (n+1)	CICG	LENS of CCH		
		MG	U	G
3 (Alternate Route)	0	0 0	0	2 0
	1	0 0	0	2 0
	2	0 0	0	2 0
	3	0 0	0	2 0
	4	0 0	0	2 0
	5	0 0	0	2 0
	6	0 0	0	2 0
	7	0 0	0	2 0

STEP 4: ACIC1

Assign the data to establish the relation between the PC of the destination node/other nodes in the network and the CSC Group (CSCG) of the basic route. Enter CSCG number (even number) to the PC of CCIS over IP accommodating node (PC2) and all the other destination nodes.

[CCIS over IP accommodating node]

PC=2 CSCG=2

[Destination node]

PC=1 CSCG=2

STEP 5: ACIC2

Allocate CIC number (channel ID) of virtual speech channel to the self Point Code assigned on ACIC1 command. (CIC number allocation is not required for the nodes not contacting directly.) Assign CIC number to each LENS of virtual speech channel.

PC = 1

CIC: 1-999

LENS: Accommodating location of speech channel

STEP 6: AGIP

Assign own IP address and destination router IP address to Internal PHC.

LENS: Accommodating location of speech channel

KIND: Internal PHC (CCIS)

ToS: IP Precedence/Diffserv (standard setting) **Select depending on the connecting router.*

QoS1: QoS value for controlling packet (0-7 for IP Precedence/00-3F for Diffserv)

IRT: 2 (Incoming and outgoing route number of PC1)

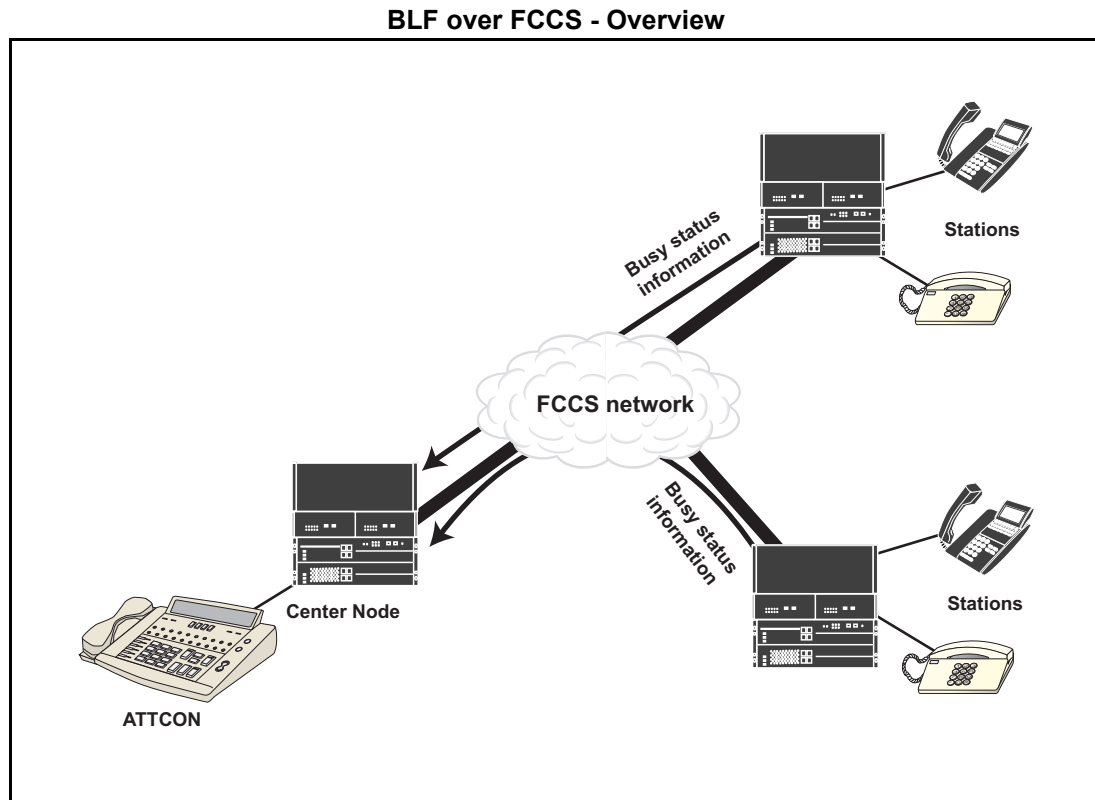
NETID: 0

CSLINK_NUM: Maximum number of client/server connection

Note: The data deletion is performed in the converse order.

2.12 BLF over FCCS

The system can exchange Busy Lamp Field (BLF) data. As shown below, the busy status information of the other nodes within FCCS network can be displayed on the ATTCON of the Center Node designated by the system data.



☐ Service Conditions

1. Service conditions of this feature accord to service condition of [B-2] Busy Lamp Field - Flexible.
2. This feature is available only when Centralized attendant is used.
3. This feature is available over FCCS network.
4. Center node is to be assigned by the system data [ASYDL SYS1, Index640, b0-b7].
5. The station to send the busy-information can be specified by the ASFC command [SFI 218 = 1].
6. A maximum of four digits can be used for BLF. When using five digits, the last four digits must be unique within the system.
7. When an FCCS link-down occurs, the system clears the BLF information of five corresponding stations per second interval. Therefore, the BLF information of some stations may be cleared after a while.
8. BLF can also be displayed in Wireless/PCS/PHS system.

9. This feature can also be used in a Hotel system.
10. When the traffic is 6 HCS and conversation time is 180 seconds, the number of stations available to use the BLF within the FCCS network are as shown below.

TRANSMISSION SPEED	NUMBER OF STATION AVAILABLE TO USE BLF
64k	399 stations
128k	798 stations
256k	1596 stations
10M	10000 stations

11. When there are 400 stations assigned in a node as an example, it requires 80 seconds to clear the BLF information.
12. This feature is not available when the number of digits for station number / Telephone Number is equal or exceeds six digits.

2.12.1 Busy Lamp Field Information Transfer

BLF information was sent toward the ATTCON of self-node only.

All the BLF information is also sent to the Center Node to expand the use of this feature over FCCS network.

2.12.2 Busy Lamp Field Clear Information

This feature clears the BLF information periodically to avoid the misreading of the BLF information. Miss-read of the information occurs in a situation such as FCCS link down.

Each Local Node executes the health check toward the center node at 30-second intervals. Nodes with NG state send out the clear request when next health check is OK.

The center node clears the BLF information of the corresponding node at one second intervals. The information of five stations per second is cleared.

STEP 1: **ASYDL** (Assignment of System Data for Local Data Memory)

SYS1, Index650, b6 Send the system message when BLF information clear has started **Note 1**

0/1 = Send/Not send

Note 1: This data is to be assigned in the Center Node only

SYS1, Index650, b7 BLF information clear

0/1 = Not Clear/Clear

STEP 2: **ASFC** (Assignment of Service Feature Restriction Class)

Permits this feature with the Service Feature Restriction Class for each station.

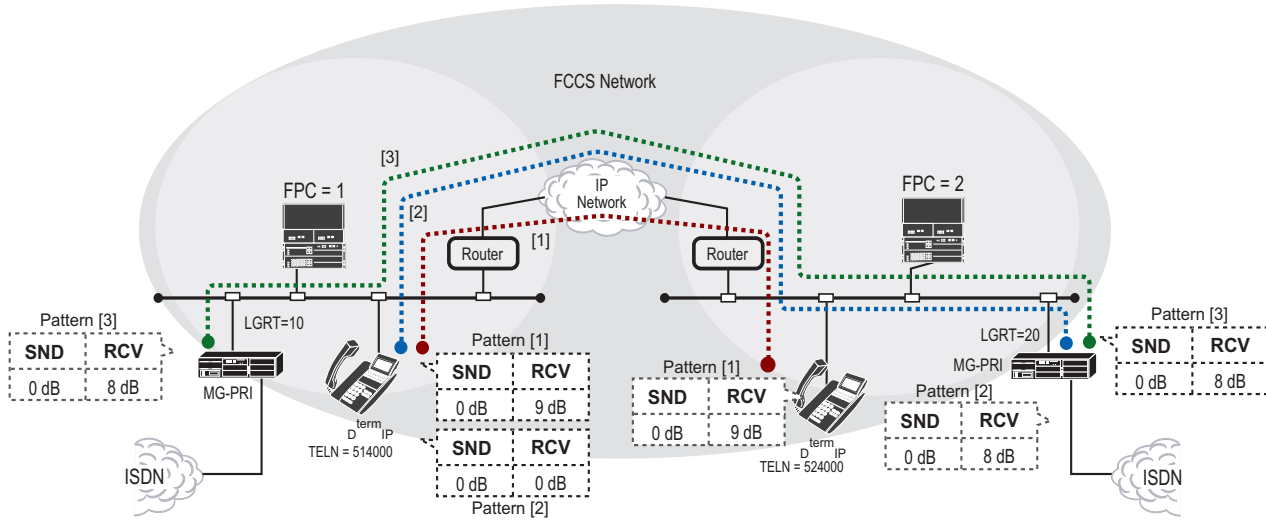
SFI = 218 (BLF over FCCS)

RES = 1 (Allowed)

2.13 PAD/EC Control IP Support - FCCS

This PAD/EC Control allows the maintenance personnel to adjust PAD/EC value to match Peer-to-Peer FCCS network environment. Without assigning any data, adequate PAD/EC value is automatically applied according to connection types. The default PAD/EC value is prepared for each country. If required, PAD/EC value can be set on an IP device, IPPAD basis. The following shows a case where default PAD/EC value is used.

When default value is used, the following PAD/EC is applied. If required, the default value can be modified on a designated connection basis. Note that EC is set to ON in all patterns when default value is used.



PAD/EC Default Value

IP DEVICE	CONNECTION DESTINATION								
	STATION			C.O. LINE			TIE LINE		
	SND	RCV	EC	SND	RCV	EC	SND	RCV	EC
IP station	0	9	ON	0	0	ON	0	0	ON
MG-PRI	0	8	ON	0	8	ON	0	8	ON

Pattern 1 (IP station - FCCS Network - IP station):

- IP station (514000) is applied PAD value: SND = 0 dB, RCV = 9 dB (Connection Destination is STATION)
- IP station (524000) is applied PAD value: SND = 0 dB, RCV = 9 dB (Connection Destination is STATION)

Pattern 2 (IP station - FCCS Network - MG-PRI):

- IP station (514000) is applied PAD value: SND = 0 dB, RCV = 0 dB (Connection Destination is C.O. LINE)
- MG-PRI (LGRT=20) is applied PAD value: SND = 0 dB, RCV = 8 dB (Connection Destination is STATION)

Pattern 3 (MG-PRI - FCCS Network - MG-PRI):

- MG-PRI (LGRT=10) is applied PAD value: SND = 0 dB, RCV = 8 dB (Connection Destination is C.O. LINE)
- MG-PRI (LGRT=20) is applied PAD value: SND = 0 dB, RCV = 8 dB (Connection Destination is C.O. LINE)

To set PAD/EC value, one of the following can be used.

2.13.1 Initial Value

Initial PAD/EC value is applied on a system basis by assigning ASYDL, SYS 1, Index 825, Bits 0, 1, 4, 5. As to the initial value, click the Initial Value Display button.

2.13.2 To Change Initial Value

If the initial value is not adequate for a particular network, the PAD/EC value can be modified on a Connection Type (**Note 1**) basis. There are two ways to change the PAD/EC data.

(1) PAD/EC Initial Value Modification

After selecting an IP device (such as IP station, Analog MC) from the list box, the default value can be modified on an IP device basis.

(2) Designated Connection Pattern

After selecting Connection Pattern (P2P Connection / Legacy Connection), PAD/EC value can be modified by using Service Feature Restriction Class (SFC) and/or Logical Route Number (LGRT) in combination. This data assignment is useful when the default is not sufficient for a particular terminal such as an Off-Premise Station (OPS).

Note 1: The following Connection Type tabs can be used:

- Station-to-Station tab
- Tandem tab
- OG/IC (Station) tab
- OG/IC (Trunk) tab
- Other tab
- FCCS tab
- Advanced tab

2.13.3 Designated Station Assignment

Default PAD value or PAD value set by the above setting can be adjusted by applying additional value ($\pm\alpha$) on a Station basis. To facilitate the data assignment of stations that have serial station numbers, 'en bloc data assignment' is also available. If a case arises where voice is too low to hear from a particular Station, the PAD value can be tuned by specifying the station number.

PAD Value Setting by Designated Station

	RECEIVE	SEND
DEFAULT	9 (dB)	0 (dB)
Additional Value for Designated Station	-3 (dB)	3 (dB)
APPLIED PAD VALUE	6 (dB)	3 (dB)

☐ Service Conditions

- For this PAD/EC control, IP devices such as IP terminals, PHD, IPPAD program are required to support this feature. Also the following data assignment is required.
 - ASYDL, SYS 1, Index 825, Bit 0 = 1 and Bit 1 = 0 (PAD / EC - IP Support is in service)
 - APDIL
- When this feature is activated by assigning ASYDL, SYS 1, Index 825 (Bit 0 = 1, Bit 1 = 0), PAD/EC - IP Support has precedence over the following PAD control data.
 - APAD/APADN
 - AIVCL
 - AFPD
 - ARTD/ARTDN
 - ACRD (PAD value assignment for IPPAD)
 - ASYD, SYS 1, Index 4, Bit 5 = 0 (5 dB PAD for Station-to-Station is in service)
- The minimum and maximum PAD value is as follows.

IP DEVICE	MINIMUM [dB]	MAXIMUM [dB]
IP station	- 20	20
Analog MC	0	15
MC-MG (COT) [MC]	0	20
MC-MG (COT) [MG]	-10	
MG-PRI	-16	
IPPAD [with VCT]		
VS 32 Conference Server	- 12	

- The following shows command priority for this feature. The command listed on top has the highest priority.

PRIORITY	DATA ASSIGNMENT
1 (High)	APDIL: Designated Connection Pattern
2	APDIL: Initial Value Modification
3 (Low)	Initial Value

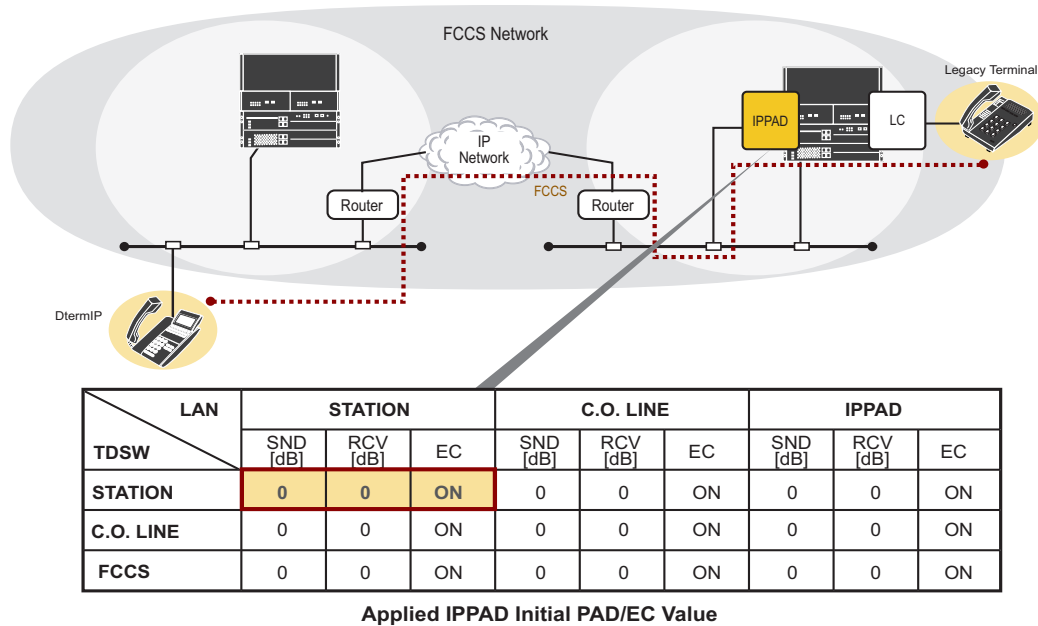
- This PAD/EC control is not applied to a legacy Station / Trunk. For these devices, use APAD, AIVCL, AFPD, ARTD/ARTDN, ACRD commands.

6. When Country Codes are not the same between two nodes, PAD/EC control cannot be performed correctly. Adjust the value by using Initial Value Modification at one node.
7. For PAD/EC control - IP Support (Stand Alone) or PAD/EC control - IP Support (PHC), please refer to Data Programming Manual - Business.
8. When IPPAD circuit card is involved, the following PAD/EC initial value is applied.

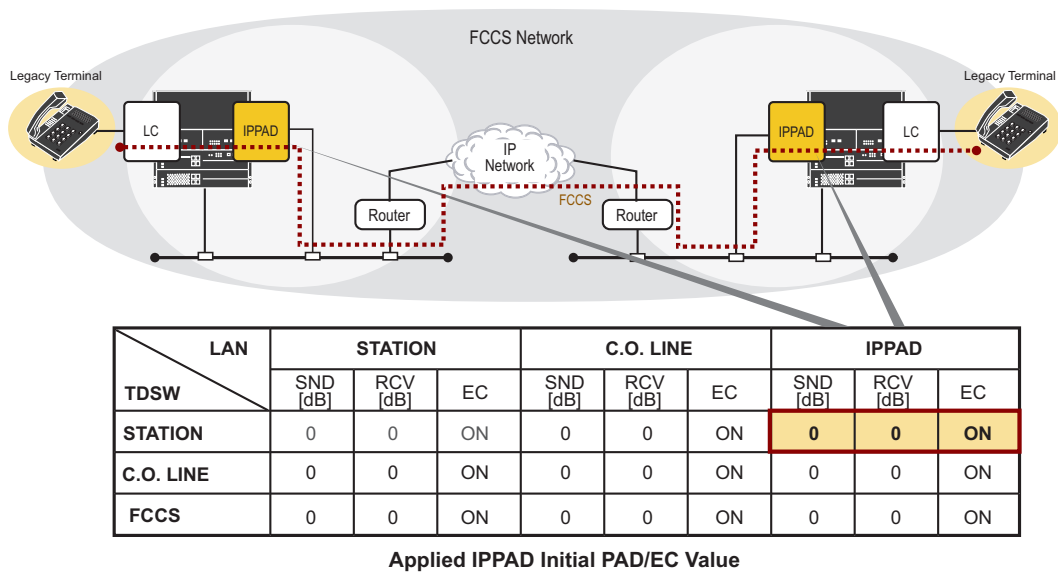
LAN	STATION			C.O. LINE			TIE LINE		
TDSW	SND [dB]	RCV [dB]	EC	SND [dB]	RCV [dB]	EC	SND [dB]	RCV [dB]	EC
STATION	0	0	ON	0	0	ON	0	0	ON
C.O. LINE	0	0	ON	0	0	ON	0	0	ON
FCCS	0	0	ON	0	8	ON	0	0	ON

[Type A] P2P FCCS Connection (IP device - IPPAD)

In this case, connection is established between DtermIP and Legacy Terminal via IPPAD. The system regards this connection as STATION (TDSW) - STATION (LAN), applying PAD/EC value as SND = 0 [dB], RCV = 0 [dB], EC = ON.

**[Type B] P2P FCCS Connection (IPPAD - IPPAD)**

In this case, connection is established between Legacy Terminals via IPPAD. However, the connection is a P2P FCCS connection. The system regards this connection as STATION (TDSW) - IPPAD (LAN), applying PAD/EC value as SND = 0 [dB], RCV = 0 [dB], EC = ON.



STEP 1: **ASYDL** - Assign the following system data.

SYS 1

Index 811: Tone Code by Counties. (See Command Manual for the detail.)

Index 825, Bit 0 = 1, Bit 1 = 0: PAD / EC - IP Support is in service

ASYDL SYS 1 Index 825		
Bit 1	Bit 0	PAD/EC Control
0	0	PAD/EC Control - IP Support is out of service
0	1	PAD/EC Control - IP Support is in service Note 1
1	0	-
1	1	-

Note 1: Available for terminals that support this feature. If the terminal does not support this feature, the existing PAD control is applied.

STEP 2: **APDIL** - Assign PAD/EC - IP support data by selecting an appropriate tab from Connection Type.

[Connection Type] Select FCCS tab from the following.

Station-to-Station: Used when IP device (Station) is connected to Station.

Tandem: Used when IP device (Trunk) is connected to C.O. line or TIE line.

OG/IC (Station): Used when IP device (Station) is connected to C.O. line or TIE line.

OG/IC (Trunk): Used when IP device (Trunk) is connected to Station.

Other: Used when IP device (Station/Trunk) is connected to other than above.

FCCS: Used when IP device (Station/Trunk) is connected to Connection Trunk.

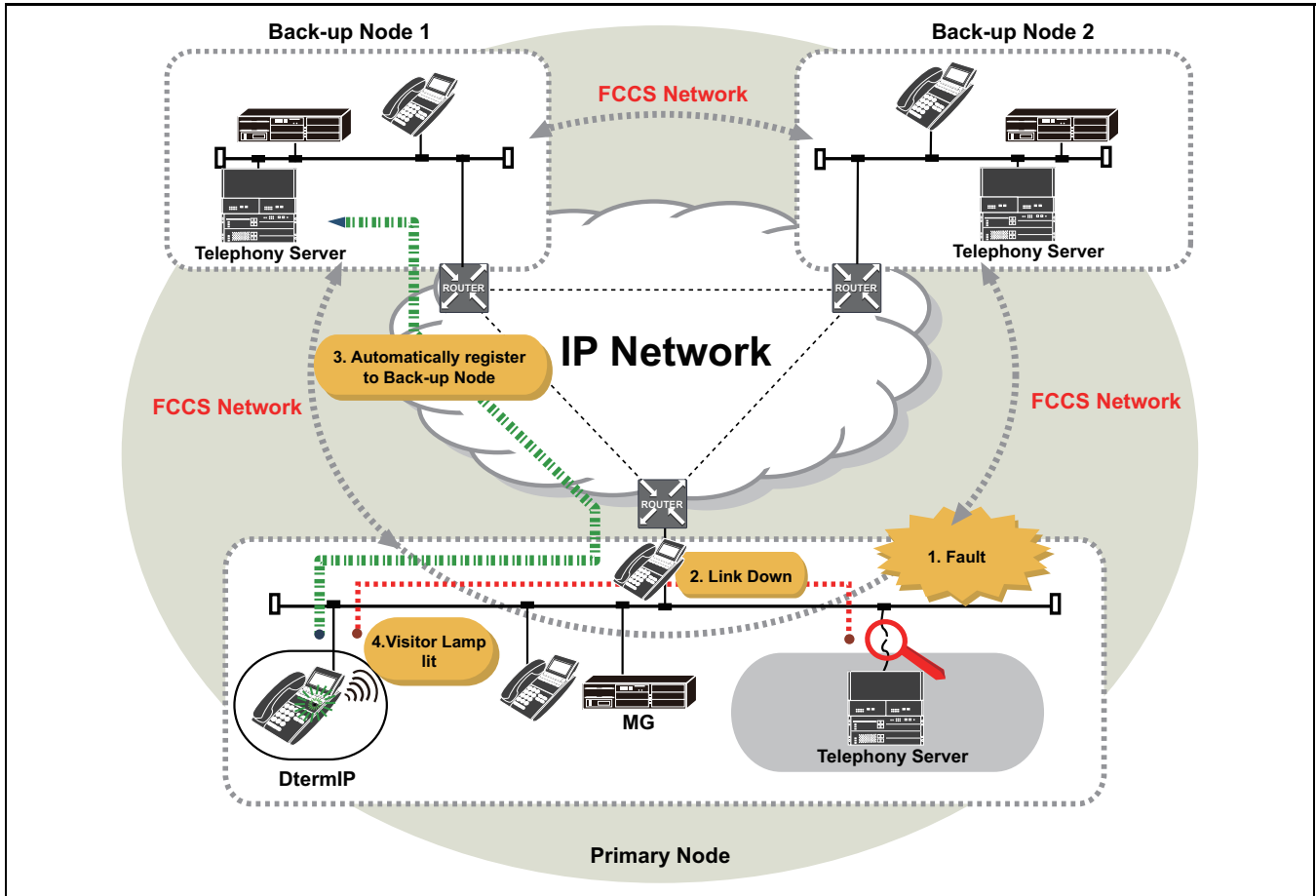
Advanced: Used when assigning additional value to the initial value or modified value by "Initial Value Modification" or "Connection Pattern Designed" or Used for IP

Please assign the remainder of data following the parameters on the screen.

2.14 FCCS Location Diversity

In the FCCS network, when a communication failure occurs between IP terminals and Primary Node, the IP terminals can automatically Re-register to a predetermined Backup Node. While the IP terminals are placed under the control of Backup Node, the IP terminals can operate as they were in Primary Node. By using MAC Authentication feature, the IP terminals automatically become operative after the Registration to Backup Node.

The following figure describes the outline of this feature.



After the IP terminals start to operate in Backup Node, the Backup Node monitors the connection status between Primary Node and the IP terminals periodically. When Primary Node recovers from a failure, IP terminals can go back to under the control of Primary Node according to the instruction from the Backup Node. The office data setting (AFCMN command) can decide on the timing of the recovery of the IP terminals (to Primary Node).

- When the connections between IP terminals and Primary Node are reestablished and the terminals become operative (Immediately)
- At designated times (By the office data setting)
- When the Visitor key on each terminal is pressed or the terminal is reset by the operation (CBKS command, etc.) from PCPro (Manual operation)

☐ Operating Procedure

For more information about operating procedure for FCCS Cluster, refer to the FCCS Cluster part of Location Diversity [L-55] in the Data Programming Manual - Business.

☐ Service Conditions

For more information about service conditions for FCCS Cluster, refer to the FCCS Cluster part of Location Diversity [L-55] in the Data Programming Manual - Business.

<Data Assignment for FCCS Cluster>

The procedure for assigning FCCS Location Diversity is explained in the following.

Data assignment for this feature varies depending on the terminals/equipment. For more details, see “Sample of Data Assignment.”

For UG50 settings, proceed as explained in “[Assignment of the Station/Analog Media Converter]” in the case of UG50 (DLC) and UG50 (LC), for other UG50, proceed as explained in “[Assignment of the Media Gateway]”.

[Assignment of the Station/Analog Media Converter]

STEP 1: **ADTM**

Options tab; Configuring Application Port
- FCCS Cluster: LAN1 (default is LAN2)

Options tab; TCP/IP Module Control
Initialize the TCP/IP module to enable the preceding setting.
- System: Select the system which is currently running **Note 1**
- Menu: Restart

The initialization involves disconnection of IP terminals; IP terminals which are controlled by the SP of an initialized system restart.

Note 1: You can check the running system in the TCP/IP Module Current Status box of the ADTM's initial screen.

STEP 2: **AFCMN**

Assign the registration information. Select “Node Data Settings” and click the Execute button.

<Node Data Settings>

- Master Node IP Address **Note 2**
- Sub-Master Node IP Address **Note 2**
- Port Number (TCP)

Note 2: The IP address specified here is the LAN1 (ACT) address of a corresponding node.

Assign the supervisory setting toward the terminals. Select “Home Node monitoring interval” and click the Execute button. **Note 3**

<Home Node monitoring interval>

- Assign the Length of time to confirm connection establishment with the Home Node (Default: 60 seconds) **Note 4**
- Assign the Station data synchronization processing time (HH [00-23]:MM [00-59])
When the check box of “Assign station data synchronization processing time” is clicked, “After station data synchronization is completed” is displayed.
- Assign Time value to re-connect to the Home Node
After confirmation of connection establishment with the Home Node (Immediate switchover)
After station data synchronization is completed (Specified-time switchover)
Only when [Visitor Indication] Button is pressed (Manual switchover)

Note 3: This settings can be performed also as the last step.

Note 4: Be sure to set the default value (60 seconds).

STEP 3: **ASYDN**

System Data 1, Index 960, Bit 1 (UG50 Multi-mode information registration with AUPDN command. 0/1 = Out of service/In service).

Note: Available from FP95-114 V4 Issue 2.0.

Note: Setting needed if UG50 (DLC) or UG50 (LC) are registered with the AUPDN command.

System Data 1, Index 963, Bit 1 (Location Diversity Feature) must be assigned as data “1”.

STEP 4: **APPDN**

This command is used to reserve (pool) the range of station numbers and LENS within each node for the visitor station to be accommodated in case of fault recovery. Assign the pool data shown below for the visitor station.

- Pool Number (PNUM)
- Fusion Point Code (FPC)
- Telephone Equipment Class (TEC)
- Station Number / PS Station Number (STN / PS STN) **Note 5**
- Line Equipment Numbers to Start the Pool [MG, UNIT, GROUP] (START LENS)
- Pool Size (PSIZE)
- Line Equipment Numbers to End the Pool (END LENS)

Note 5: The station number to pool must be conformed to the numbering plan for STN of AS-PA.

Note: Assign this data if necessary. Any other data cannot be assigned to the LENS reserved (pooled) here unless the assigned data is deleted by this command.

STEP 5: AKTDN

This command is used optionally when all terminals assigned with APPDN command are using the same key data. By assigning this command, Key Data assignment of AUPDN command can be simplified. The same data can be assigned using AUPDN command per terminal basis.

- Basic Information Entry
 - Line Key Pattern (LKP)
 - Soft Key Pattern (SKP)
 - Page Scroll (PG)
 - Priority of Answering Call (PRI)
 - Soft Key Pattern (SKP)
 - Message Waiting Data Display Selection (MWD)
 - Line Preference (SPK, ANS and ORG)
- Function Key Assignment

Note: Use this command when applicable. Settings of this command are not necessary for Analog MC.

STEP 6: AUPDN Note 6

Assign the Telephone Number, Registration Information and Name Display Information for each user.

- User Group Number (UGN)
- Telephone Number (TELN)
- Setting of Primary Station Data **Note 7**
(P FPC, TEC, KIND, P TN, UG50 Multi-Slot Mode (**Note 8**), P STN/P PS STN, P LENS/P PHIN, P RSC, and P SFC)
- MAC Data (when using Analog MC) **Note 9**
- FAX Setting Data (when using Analog MC) **Note 10**
- Key Data Information **Note 11**
- Setting of Master Extension (Effective when TEC=18)

Note 6: Please note the following:

- When a failure occurs on the Primary Node, and the terminals are operating on the Backup Node, this command is not available (SET/GET cannot be used).
- When Analog MC or 8MC (SIP) is going to be set for IP KIND with this command, if the same data is assigned to the Primary Node with the AISTL and ALGSN commands, erase the data in AISTL and ALGSN before setting with this command. If the data is not erased, a reading error is displayed when trying to execute the settings.

Note 7: By pressing “Get Station Data” button, system obtains “P STN/P PS STN” and “P LENS/P PHIN” from the physical station pool data.

Note 8: Please note the following:

- Place a mark in this check box if UG50 in Multi-slot mode is used.
- Available from FP95-114 V4 Issue 2.0.
- Valid only when IP KIND is set to Dterm IP, Analog MC or 8MC (SIP). If TN/STN/LENS are already assigned to the Primary Node with the AISTL command, the data of AISTL is displayed, in this case, the check box cannot be changed. Also, in case the data of KIND and UG50 Multi-slot mode is different, when the data registration of the Backup Node is performed in the Backup Node, if TN/STN/

LENS data registered with the AISTL command is used, registration is not possible.

- Because UG50 (DLC) does not allow manual switch back, set “visitor display” with the AUPKDN command.

Note 9: This parameter is displayed when KIND=4: Analog MC/5: Digital MC/34: 8MC (SIP) is assigned.

Note 10: This parameter is displayed when KIND=4: Analog MC/34: 8MC (SIP) is assigned.

Note 11: Please note the following:

- This parameter is displayed only when TEC=12 is assigned. The template setting can be changed when Key Template Name List corresponds to the data read out.
- When you change the key data, press “Customizing of Key Data” and execute AUPKDN command.

STEP 7: **AMACN**

Assign the MAC Information according to the User Profile Data.

- User Group Number (UGN): User Group Number
- Telephone Number (TELN): Telephone Number pertaining to the MAC Address (Maximum: 16 digits)
- MAC Address: MAC Address assigned on the IP station

Note: This command assignment is not necessary for Analog MC and UG50.

[Assignment of the Media Gateway]

STEP 1: **ADTM**

Options tab; Configuring Application Port

- FCCS Cluster: LAN1 (default is LAN2)

Options tab; TCP/IP Module Control

Initialize the TCP/IP module to enable the preceding setting.

- System: Select the system which is currently running **Note 12**
- Menu: Restart

The initialization involves disconnection of IP terminals; IP terminals which are controlled by the SP of an initialized system restart.

Note 12: You can check the running system in the TCP/IP Module Current Status box of the ADTM's initial screen.

STEP 2: **AFCMN**

Assign the registration information. Select “Node Data Settings” and click the Execute button.

<Node Data Settings>

- Master Node IP Address **Note 13**
- Sub-Master Node IP Address **Note 13**
- Port Number (TCP)

Note 13: The IP address specified here is the LAN1 (ACT) address of a corresponding node.

Assign the supervisory setting toward the terminals. Select “Home Node monitoring interval” and click the Execute button. **Note 14**

<Home Node monitoring interval>

- Assign the Length of time to confirm connection establishment with the Home Node (Default: 60 seconds) **Note 15**

- Assign the Station data synchronization processing time (HH [00-23]:MM [00-59])

When the check box of “Assign station data synchronization processing time” is clicked, “After station data synchronization is completed” is displayed.

- Assign Time value to re-connect to the Home Node

After confirmation of connection establishment with the Home Node (Immediate switchover)

After station data synchronization is completed (Specified-time switchover)

Only when [Visitor Indication] Button is pressed (Manual switchover)

Note 14: This settings can be performed also as the last step.

Note 15: Be sure to set the default value (60 seconds).

STEP 3: ASYDN

System Data 1, Index 963, Bit 1 (Location Diversity Feature) must be assigned as data “1”.

STEP 4: AMGIL

Assign the MAC Information of the Media Gateway to all the nodes to which MG will register.

Note: Originating/Terminating calls from/to the appropriate MGs must be available at each node. In this case, the route information has to be assigned with DM. (Route Information: ARTD, ARTI, ATRK)

STEP 5: ALRTN

Assign the Physical Route information (FPC, RT) toward the Logical Route (LGRT). Maximum of three nodes can be assigned for this feature, and Address List will be created pertaining to this information.

[Manual switching of station from Backup Node to Primary Node]

STEP 1: CBKS

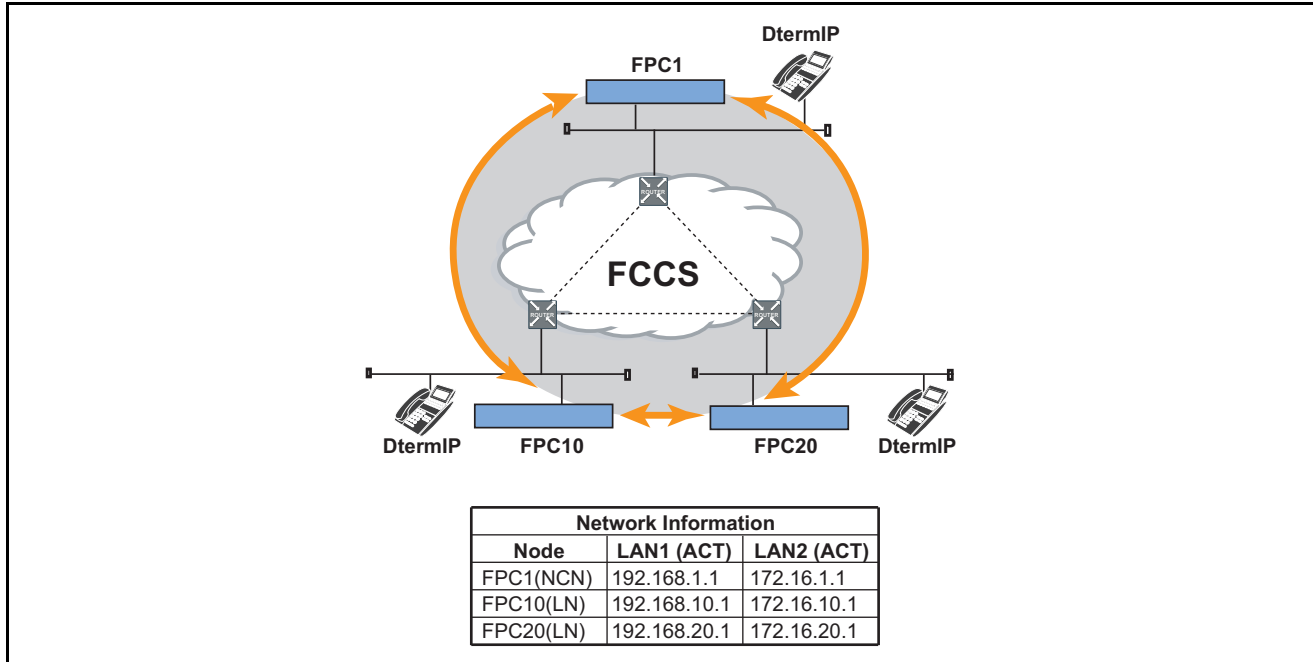
Displays the information of terminals registered within the Backup Node. This command also can reset the terminal.

□ Sample of Data Assignment

<Sample of Data Assignment for FCCS Cluster>

Sample of Data Assignment for FCCS Cluster is shown below.

(1) FCCS Cluster Common Setting



Command	Parameter	FPC1	FPC10	FPC20
ADTM (Configure Application Port)	LAN Interface to be used x FCCS Cluster	LAN1		
AFCMN (Node Data Setting)	Master Node IP Address	192.168.1.1 (IP Address of LAN1 (ACT))		
	Sub-Master Node IP Address	192.168.10.1 (IP Address of LAN1 (ACT))		
	Port Number (TCP)	0 (Default: 60210)		
AFCMN (Home Node Monitoring Interval)	Length of Time to Confirm Connection Establishment with the Home Node (60-300sec)	60 seconds (Default)		
	Station Data Synchronization Processing Time	02:00		
	Time Value to Re-Connect to the Home Node	After station data synchronization is completed (Specified-time switchover)		

Command	Parameter	FPC1	FPC10	FPC20
ASYDN	SYS1 Index960 Note 1	Bit 1=1 (UG50 Multi-mode information registration with AUPDN command is in service)		
	SYS1 Index963	Bit 1=1 (Location Diversity feature “enabled”)		

Note 1: Available from FP95-114 V4 Issue 2.0. Setting needed if UG50 (DLC) or UG50 (LC) is used.

STEP 1: **ADTM** (Assignment of Data for TCP/IP Module)

<Configure Application Port>

LAN Interface to be used x FCCS Cluster = LAN1

STEP 2: **AFCMN** (Assignment of FCCS Location Diversity Miscellaneous Data for NDM)

<Node Data Setting> **Note 2**

Master Node IP Address=192.168.1.1

Sub-Master Node IP Address=192.168.10.1

Port Number (TCP)=0 (Default=60210)

Note 2: To change the node information during operation, follow the procedure listed below. FCCS Cluster Information on Backup station and route may be lost and call origination/termination may become unavailable if you do not take this procedures.

(a) Confirm that no Backup station or MG exist by using the CBKS command.

(b) Assign as ASYDN SYS1 Index963 Bit 1=0.

(c) Change the detailed information for nodes.

(d) Assign as ASYDN SYS1 Index963 Bit 1=1.

<Home Node monitoring interval> **Note 3**

Length of time to confirm connection establishment with the Home Node: 60 seconds

Station data synchronization processing time: 02:00

Time value to re-connect to the Home Node: After station data synchronization is completed (Specified-time switchover)

Note 3: This section can be assigned at the end.

<DtermIP MAC Address Registration Password> **Note 4**

Setting of password to be used when assigning the MAC Address from the terminal to the system. The data assigned to the system (NDM) can be read out/deleted by AMACN command.

New Password: *****

New Password Confirmation: *****

Note 4: This section can be assigned at the end.

When logging in by using DtermIP MAC Address Registration Password, the Login Code and MAC address will be assigned as follows, depending on the system data for FCCS Cluster (ASYDN SYS1 Index963 Bit1).

	ASYDN: Index 963, Bit 1=0	ASYDN: Index 963, Bit 1=1
AISTL Note 5	Login Code and MAC address are assigned to the system (LDM). Note 8	Login Code and MAC address are not assigned.
ALGSN Note 6	Login Code and MAC address are assigned to the system (LDM). Note 8	Login Code and MAC address are assigned to the system (NDM).
AUPDN Note 7	Login Code and MAC address are assigned to the system (LDM). Note 8	Login Code and MAC address are assigned to the system (NDM).

Note 5: IP STN (station number of IP station) assigned by AISTL command is used as Login Code.

Note 6: TELN (Telephone Number) assigned by ALGSN command is used as Login Code.

Note 7: TELN (Telephone Number) assigned by AUPDN command is used as Login Code.

Note 8: The data assigned to the system (LDM) can be read out/deleted by AMAC command.

STEP 3: ASYDN (Assignment of System Data for NDM)

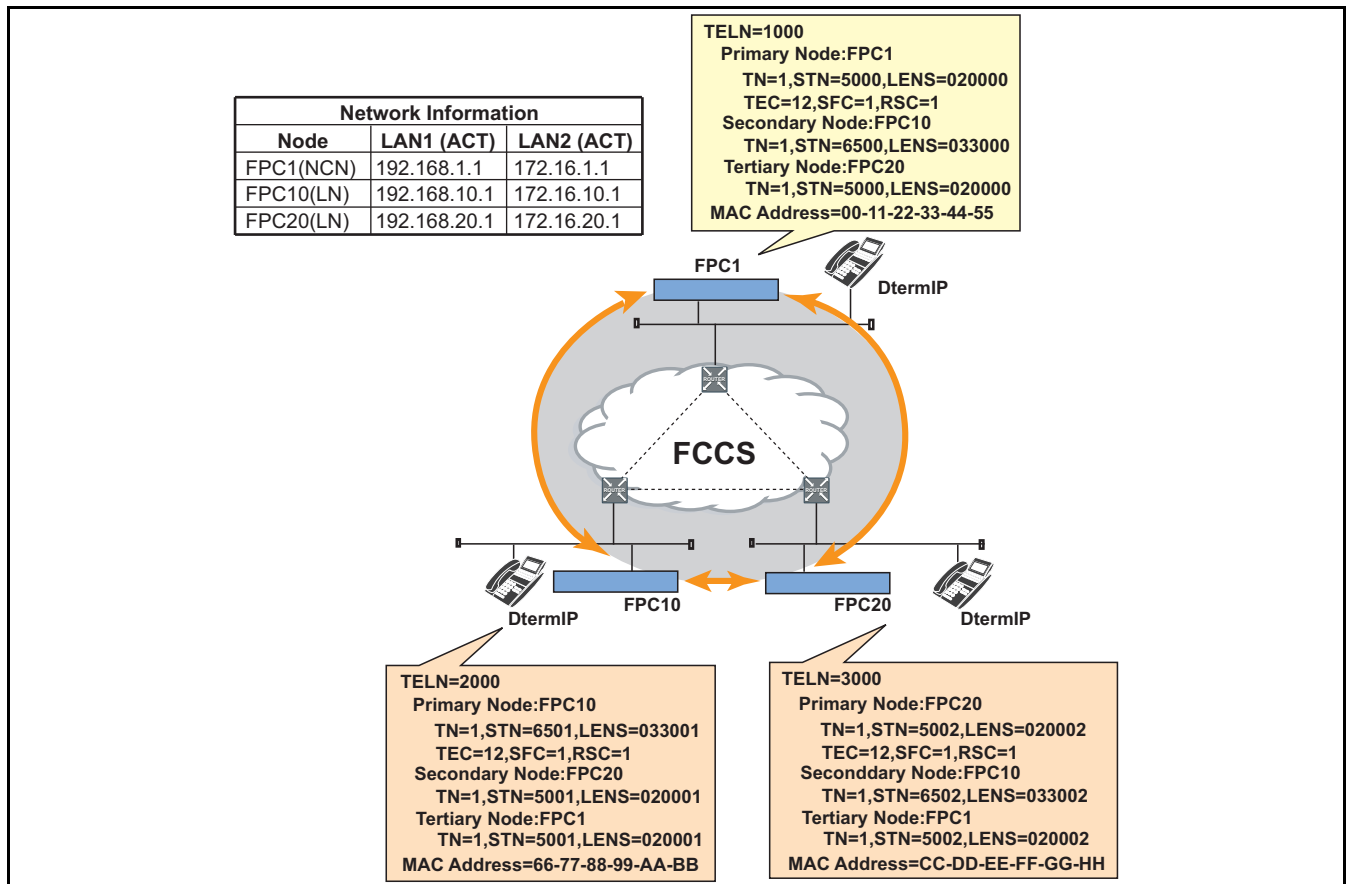
System Data 1, Index 960, Bit 1=1 (UG50 Multi-mode information registration with AUPDN command in service).

Note: Available from FP95-114 V4 Issue 2.0.

Note: Setting needed if UG50 (DLC) or UG50 (LC) is used.

SYS1, Index963, Bit 1=1 (Location Diversity feature enabled)

(2) Station Line (Except Virtual Line, Analog MC, and MC&MG-COT)



<<The data setting example for TELN=1000>>

Command	Parameter	FPC1	FPC10	FPC20
APPDN	Pool Number (PNUM)	1	2	3
	Fusion Point Code (FPC)	1	10	20
	Telephone Equipment Class (TEC)	12	12	12
	Station Number / PS Station Number (STN /PS STN)	5000	6500	5000
	Line Equipment Numbers to Start the Pool [MG, UNIT, GROUP] (START LENS)	020000	033000	020000
	Pool Size (PSIZE)	192	40	192
AKTDN	Key Template Name	Basic1 (example)		

<<The data setting example for TELN=1000>>				
Command	Parameter	FPC1	FPC10	FPC20
AUPDN	Location Order	Primary Node	Secondary Node	Tertiary Node
	TEC	12	12	12
	Station Number (Note 1) (P STN/P PS STN) (S STN/S PS STN) (T STN/T PS STN)	5000	6500	5000
	Line Equipment Numbers (Note 1) (P LENS/P PHIN) (S LENS/S PHIN) (T LENS/T PHIN)	020000	033000	020000
AMACN	MAC Address	00-11-22-33-44-55 (example)		

Note 1: If the data for TEC has been assigned on APPDN command and an idle station number (STN) exists in the pool, these numbers are acquired automatically.

STEP 1: Perform the assignment of “1. FCCS Cluster Common Setting”.

STEP 2: **APPDN** (Assignment of Physical Station Pool Data for NDM)

Note: This data setting is not necessary when physical station number assigned on AISTL command is to be manually used for the AUPDN command data setting.

- Pool Number (PNUM)=1
 - FPC=1
 - TEC=12 (Dterm)
 - STN / PS STN=5000
 - START LENS=020000
 - PSIZE=192
- Pool Number (PNUM)=2
 - FPC=10
 - TEC=12 (Dterm)
 - STN / PS STN=6500
 - START LENS=033000
 - PSIZE=40
- Pool Number (PNUM)=3
 - FPC=20
 - TEC=12 (Dterm)
 - STN / PS STN=5000
 - START LENS=020000
 - PSIZE=192

STEP 3: **AKTDN** (Assignment of Key Template Data for NDM)

Note: This data setting is not necessary when key data is to be assigned with AUPKDN command individually.

- Key Template Name: Basic1
 <Base Information> Tab
 Choose the applicable pattern
 <Function Key> Tab
 KYN=15
 Service Index: Function key
 Function Key (FKY): 156 (Visitor display)

 KYN=16
 Service Index: Multi-line
 Designate as My Line: Checked
 Designate as Prime Line: Checked
 Ringing Information=VALID

Note: When assigning the key data by using the key template of the AKTDN command, Multiline can be assigned between FCCS networks, however, call origination and termination in Multiline are available only within the same node to which the terminal is registered.

- <Dedicated Function Key> Tab
 Choose the applicable pattern.

STEP 4: **AUPDN** (Assignment of User Profile Data for NDM)

- Assignment for Station 1000
 - UGN=1
 - TELN=1000
 - Primary Station Data
 - P FPC=1
 - TEC=12 (Dterm)
 - KIND=1: Dterm IP
 - P TN=1
 - P STN/P PS STN=5000 **Note 2**
 - P LENS/P PHIN=020000 **Note 2**
 - P SFC=1
 - P RSC=1
 - Secondary Station Data
 - S FPC=10
 - S TN=1

S STN/S PS STN=6500 **Note 2**
 S LENS/S PHIN=033000 **Note 2**
 S SFC=1
 S RSC=1

- Tertiary Station Data

T FPC=20
 T TN=1
 T STN/T PS STN=5000 **Note 2**
 T LENS/T PHIN=020000 **Note 2**
 T SFC=1
 T RSC=1

Note 2: By clicking “Get Station Data” button, these parameters will be assigned automatically by loading the information of station pool data assigned on the APPDN command.

- Setting of Key Data (Equivalent to the AKYD command)

Note: By clicking “Customizing of Key Data” button, the key template data assigned on AK-TDN command can be selected.

- Setting of Name Display (Equivalent to the ANDD command)

Note: When this information is already assigned by the ANDD command, it takes precedence over information assigned by the AUPDN command.

- Assignment for Station 2000

- UGN=1
- TELN=2000
- Primary Station Data
 - P FPC=10
 - TEC=12 (Dterm)
 - KIND=1: Dterm IP
 - P TN=1
 - P STN/P PS STN=6501 **Note 3**
 - P LENS/P PHIN=033001 **Note 3**
 - P SFC=1
 - P RSC=1
- Secondary Station Data
 - S FPC=20
 - S TN=1
 - S STN/S PS STN=5001 **Note 3**
 - S LENS/S PHIN=020001 **Note 3**
 - S SFC=1
 - S RSC=1

- Tertiary Station Data

T FPC=1

T TN=1

T STN/T PS STN=5001 **Note 3**

T LENS/T PHIN=020001 **Note 3**

T SFC=1

T RSC=1

Note 3: By clicking “Get Station Data” button, these parameters will be assigned automatically by loading the information of station pool data assigned on the APPDN command.

- Setting of Key Data (Equivalent to the AKYD command)

Note: By clicking “Customizing of Key Data” button, the key template data assigned on AKTDN command can be selected.

- Setting of Name Display (Equivalent to the ANDD command)

Note: When this information is already assigned by the ANDD command, it takes precedence over information assigned by the AUPDN command.

- Assignment for Station 3000

- UGN=1

- TELN=3000

- Primary Station Data

P FPC=20

TEC=12 (Dterm)

KIND=1: Dterm IP

P TN=1

P STN/P PS STN=5002 **Note 4**

P LENS/P PHIN=020002 **Note 4**

P SFC=1

P RSC=1

- Secondary Station Data

S FPC=10

S TN=1

S STN/S PS STN=6502 **Note 4**

S LENS/S PHIN=033002 **Note 4**

S SFC=1

S RSC=1

- Tertiary Station Data

T FPC=1

T TN=1

T STN/T PS STN=5002 **Note 4**

T LENS/T PHIN=020002 **Note 4**

T SFC=1

T RSC=1

Note 4: By clicking “Get Station Data” button, these parameters will be assigned automatically by loading the information of station pool data assigned on the APPDN command.

- Setting of Key Data (Equivalent to the AKYD command)

Note: By clicking “Customizing of Key Data” button, the key template data assigned on AK-TDN command can be selected.

- Setting of Name Display (Equivalent to the ANDD command)

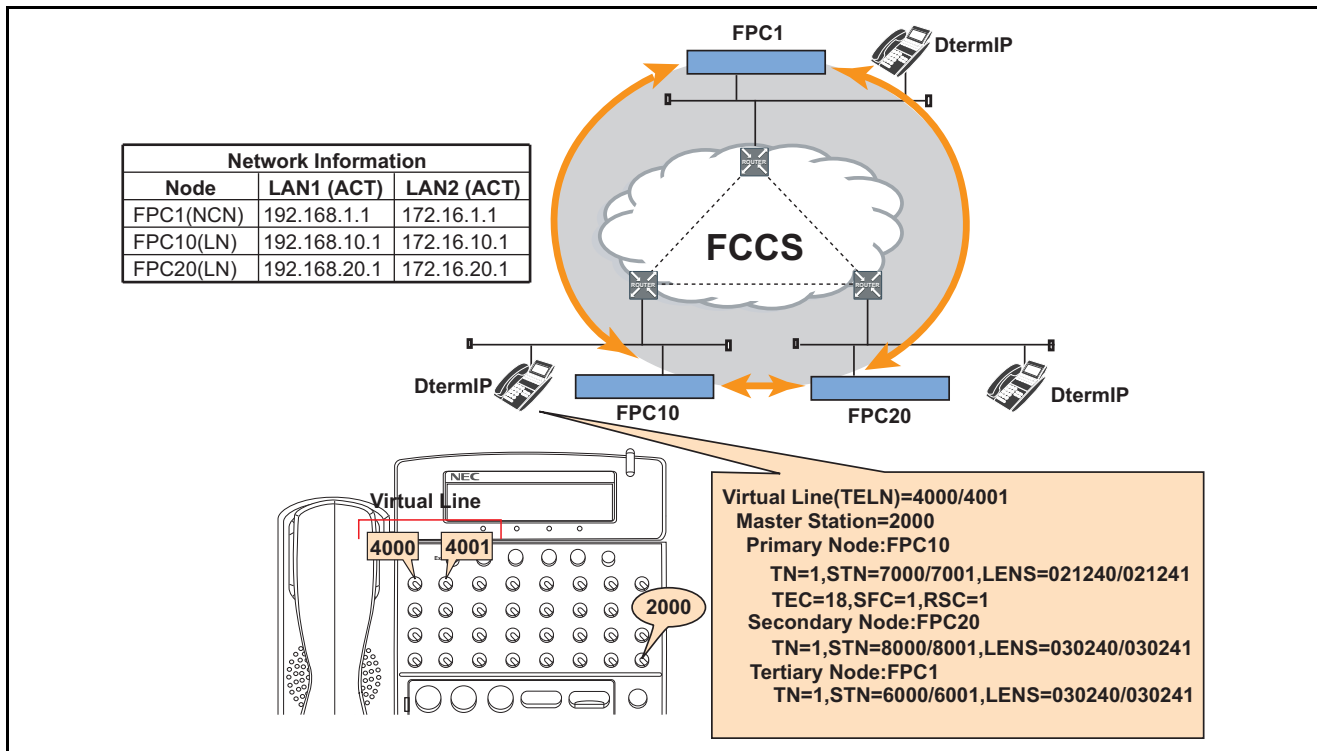
Note: When this information is already assigned by the ANDD command, it takes precedence over information assigned by the AUPDN command.

STEP 5: **AMACN** (Assignment of MAC Address of IP Terminals for NDM)

Note: MAC address of the appropriate station number (STN) which has been assigned on AMAC command can be used here by pressing “Get MAC Address” button.

- Assignment for Station 1000
 - UGN=1
 - TELN=1000
 - MAC Address=00-11-22-33-44-55
- Assignment for Station 2000
 - UGN=1
 - TELN=2000
 - MAC Address=66-77-88-99-AA-BB
- Assignment for Station 3000
 - UGN=1
 - TELN=3000
 - MAC Address=CC-DD-EE-FF-GG-HH

(3) Station Line (Virtual Line)



Example Data Assignment: TELN=4000

Command	Parameter	FPC10	FPC20	FPC1
APPDN	Pool Number (PNUM)	4	5	6
	Fusion Point Code (FPC)	10	20	1
	Telephone Equipment Class (TEC)	18	18	18
	Station Number / PS Station Number (STN / PS STN)	7000	8000	6000
	Line Equipment Numbers to Start the Pool [MG, UNIT, GROUP](START LENS)	021240	030240	030240
	Pool Size (PSIZE)	40	40	40
AKTDN	Key Template Name	Basic1		

Command	Parameter	FPC10	FPC20	FPC1
AUPDN	Telephone Equipment Class (TEC)	18	18	18
	Station Number (Note 1) (P STN/P PS STN) (S STN/S PS STN) (T STN/T PS STN)	7000	8000	6000
	Line Equipment Numbers (Note 1) (P LENS/P PHIN) (S LENS/S PHIN) (T LENS/T PHIN)	021240	030240	030240
	Master Station	2000 (Match the FPC of Primary Node to TELN=2000)		

Note 1: If the data for TEC has been assigned on APPDN command and an idle station number (STN) exists in the pool, these numbers are acquired automatically.

STEP 1: Perform the assignment of “1. FCCS Cluster Common Setting”.

STEP 2: **APPDN** (Assignment of Physical Station Pool Data for NDM)

Note: This data setting is not necessary when physical station number assigned on AISTL command is to be manually used for the AUPDN command data setting.

- Pool Number (PNUM)=4
 - P FPC=10
 - TEC=18 (Virtual Line Appearance (for Dterm Multi-Line))
 - STN / PS STN=7000
 - START LENS=021240
 - PSIZE=40
- Pool Number (PNUM)=5
 - FPC=20
 - TEC=18 (Virtual Line Appearance (for Dterm Multi-Line))
 - STN / PS STN=8000
 - START LENS=030240
 - PSIZE=40
- Pool Number (PNUM)=6
 - FPC=1
 - TEC=18 (Virtual Line Appearance (for Dterm Multi-Line))

- STN / PS STN=6000
- START LENS=030240
- PSIZE=40

STEP 3: **AUPDN** (Assignment of User Profile Data for NDM)

- Assignment for Station 4000
 - UGN=1
 - TELN=4000
 - Primary Station Data
 - P FPC=10
 - TEC=18 (Virtual Line Appearance (for Dterm Multi-Line))
 - P TN=1
 - P STN/P PS STN=7000 **Note 2**
 - P LENS/P PHIN=021240 **Note 2**
 - P SFC=1
 - P RSC=1
 - Master Extension **Note 3**
 - MST UGN=1
 - MST TELN=2000 **Note 4**
 - Secondary Station Data
 - S FPC=20
 - S TN=1
 - S STN/S PS STN=8000 **Note 2**
 - S LENS/S PHIN=030240 **Note 2**
 - S SFC=1
 - S RSC=1
 - Tertiary Station Data
 - T FPC=1
 - T TN=1
 - T STN/T PS STN=6000 **Note 2**
 - T LENS/T PHIN=030240 **Note 2**
 - T SFC=1

T RSC=1

- Setting of Name Display (Equivalent to the ANDD command)

Note: When this information is already assigned by the ANDD command, it takes precedence over information assigned by the AUPDN command.

Note 2: By clicking “Get Station Data” button, these parameters will be assigned automatically by loading the information of station pool data assigned on the APPDN command.

Note 3: This data setting is available after the Primary Station data of Virtual Line has been assigned. Also, set this data before the Secondary Station data of Virtual Line is assigned.

Note 4: Station assigned as Master Station must accommodate a Virtual Line as its Sub Line.

- Assignment for Station 4001

- UGN=1

- TELN=4001

- Primary Station Data

P FPC=10

TEC=18 (Virtual Line Appearance (for Dterm Multi-Line))

P TN=1

P STN/P PS STN=7001 **Note 5**

P LENS/P PHIN=021241 **Note 5**

P SFC=1

P RSC=1

- Master Extension **Note 6**

MST UGN=1

MST TELN=2000 **Note 7**

- Secondary Station Data

S FPC=20

S TN=1

S STN/S PS STN=8001 **Note 5**

S LENS/S PHIN=030241 **Note 5**

S SFC=1

S RSC=1

- Tertiary Station Data

T FPC=1

T TN=1

T STN/T PS STN=6001 **Note 5**

T LENS/T PHIN=030241 **Note 5**

T SFC=1

T RSC=1

- Setting of Name Display (Equivalent to the ANDD command)

Note: When this information is already assigned by the ANDD command, it takes precedence over information assigned by the AUPDN command.

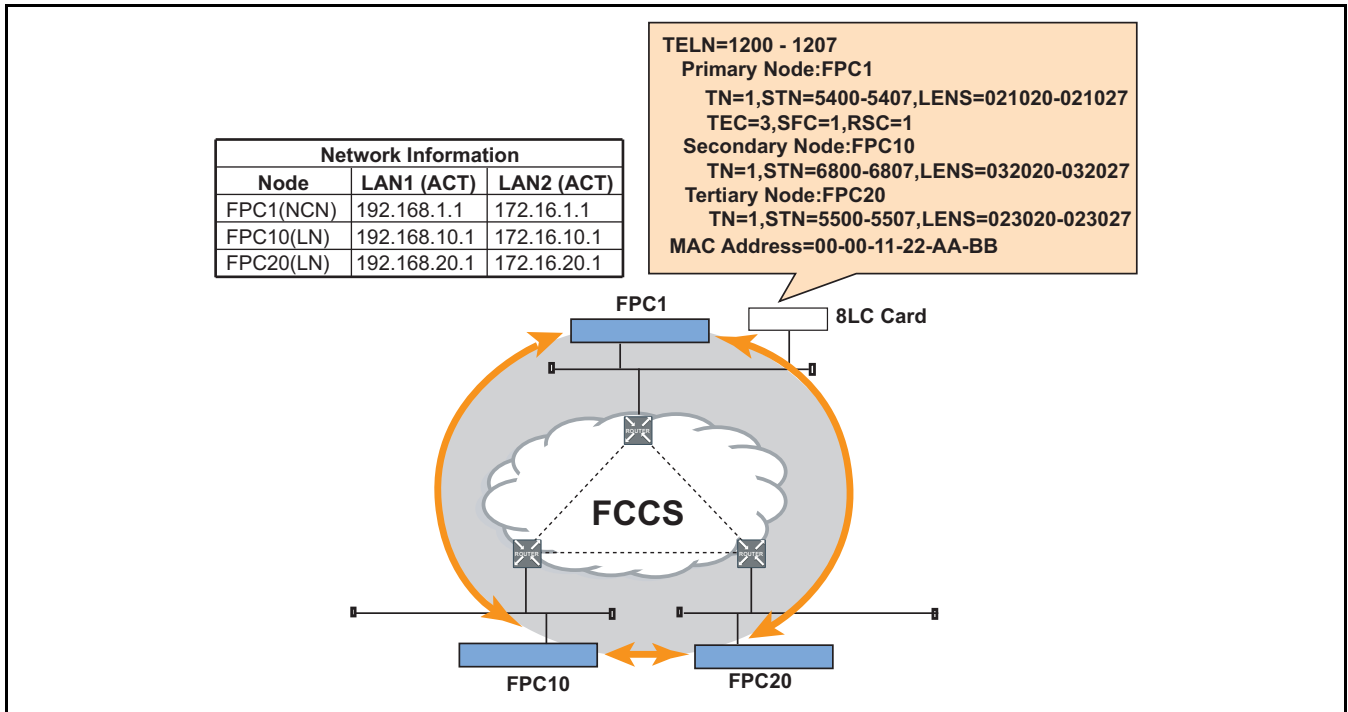
Note 5: By clicking “Get Station Data” button, these parameters will be assigned automatically by loading the information of station pool data assigned on the APPDN command.

Note 6: This data setting is available after the Primary Station data of Virtual Line has been assigned. Also, set this data before the Secondary Station data of Virtual Line is assigned.

Note 7: Station assigned as Master Station must accommodate a Virtual Line as its Sub Line.

(4) Station Line (For Analog MC [Analog 2MC/8LC Card])

Example: 8LC Card, TELN=1200-1207



Command	Parameter	FPC1	FPC10	FPC20
APPDN	PNUM	7	8	9
	FPC	1	10	20
	TEC	3	3	3
	STN / PS STN	5400	6800	5500
	START LENS	021020	032020	023020
	PSIZE	32	32	32
AUPDN	Location Order	Primary Node	Secondary Node	Tertiary Node
	TEC	3	3	3
	Station Number (Note 8) (P STN/P PS STN) (S STN/S PS STN) (T STN/T PS STN)	5400 - 5407	6800 - 6807	5500 - 5507
	Line Equipment Numbers (Note 8) (P LENS/P PHIN) (S LENS/S PHIN) (T LENS/T PHIN)	021020 - 021027	032020 - 032027	023020 - 023027

Note 8: When TECs have been assigned by the APPDN command, this data will be automatically distributed until all of the source (non-use LENSs) are extinguished.

STEP 1: Perform the data assignment for Analog MC by referring to the Peripheral Equipment Description (IP Devices).

STEP 2: Perform the data assignment of “1. FCCS Cluster Common Setting”.

STEP 3: **APPDN** (Assignment of IP Station Data for LDM)

- Pool Number (PNUM)=7
 - Fusion Point Code (FPC) =1
 - Telephone Equipment Class (TEC)=3 (DP/PB)
 - Station Number / PS Station Number (STN / PS STN)=5400
 - Line Equipment Numbers to Start the Pool [MG, UNIT, GROUP] (START LENS)=021020
 - Pool Size (PSIZE)=32
- Pool Number (PNUM)=8
 - Fusion Point Code (FPC) =10
 - Telephone Equipment Class (TEC)=3 (DP/PB)
 - Station Number / PS Station Number (STN / PS STN)=6800
 - Line Equipment Numbers to Start the Pool [MG, UNIT, GROUP] (START LENS)=032020
 - Pool Size (PSIZE)=32
- Pool Number (PNUM)=9
 - Fusion Point Code (FPC) =20
 - Telephone Equipment Class (TEC)=3 (DP/PB)
 - Station Number / PS Station Number (STN / PS STN)=5500
 - Line Equipment Numbers to Start the Pool [MG, UNIT, GROUP] (START LENS)=023020
 - Pool Size (PSIZE)=32

STEP 4: **AUPDN** (Assignment of User Profile Data for NDM)

- Assignment for Station 1200 - 1207
 - UGN=1
 - TELN=1200 - 1207
 - Primary Station Data
 - P FPC=1
 - TEC=3 (DP/PB)
 - P TN=1
 - P STN/P PS STN=5400 - 5407 **Note 10**
 - P LENS/P PHIN=021020 - 021027 **Note 10**
 - P SFC=1
 - P RSC=1
 - MAC Data = 00-00-11-22-AA-BB **Note 9**
 - MC-ID: The ID of MC
 - MC-CH: Channel Number of MC (0-7 (for Analog 2MC, 0-1))

Note 9: If STN has been already assigned by the AISTL command, use the LENS->GET MAC Address button to read out the information on MAC address and the number of channels.

- Secondary Station Data
S FPC=10
S TN=1
S STN/S PS STN=6800 - 6807 **Note 10**
S LENS/S PHIN=032020 - 032027 **Note 10**
S SFC=1
S RSC=1
- Tertiary Station Data
T FPC=20
T TN=1
T STN/T PS STN=5500 - 5507 **Note 10**
T LENS/T PHIN=023020 - 23027 **Note 10**
T SFC=1
T RSC=1

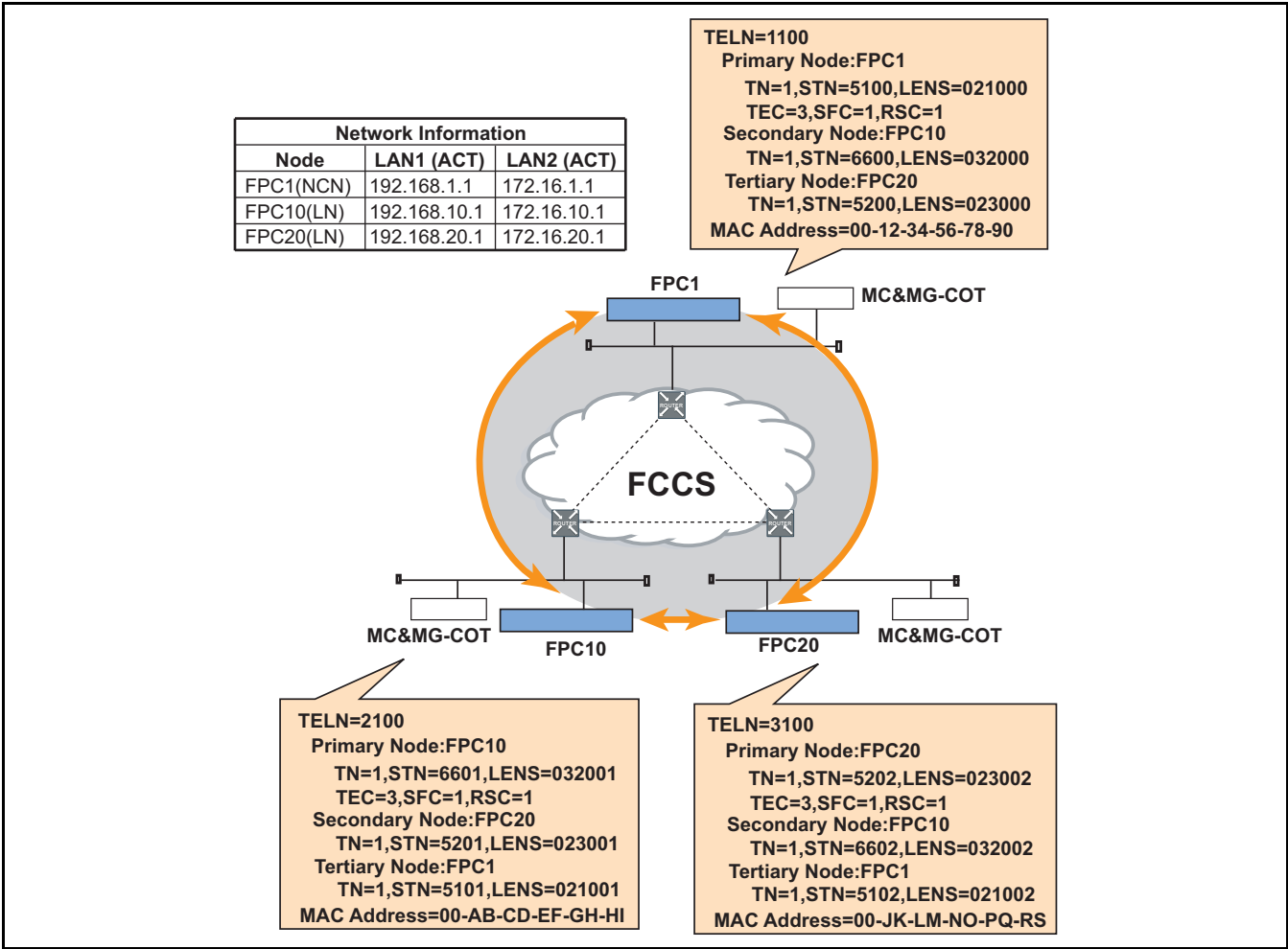
Note 10: If data has been already assigned by the APPDN command, use the Get Station Data button to read out the data.

- Setting of Name Display (Equivalent to the ANDD command)

Note: When this information is already assigned by the ANDD command, it takes precedence over information assigned by the AUPDN command.

(5) Station Line (For MC&MG-COT)

Example: MC&MG with PFT, TELN=1100



Command	Parameter	FPC1	FPC10	FPC20
ASYDL	SYS 1 Index 880	bit 3=1	bit 3=1	bit 3=1
ALIDL	PH LENS	020040	020080	020040
	PH TYPE	Internal PHE	Internal PHE	Internal PHE
ADPM	Internal PHE	Module Initialize	Module Initialize	Module Initialize
AISTL	TN	1	1	1
	IP STN	5100	6600	5200
	KIND	MC-MG(COT)	MC-MG(COT)	MC-MG(COT)
	TEC	3	3	3
	RSC	1	1	1
	SFC	1	1	1
	LENS	021000	032000	023000
	MC-ID	00-12-34-56-75-90		
	MC-CH	0	0	0
AUPDN	Location Order	Primary Node	Secondary Node	Tertiary Node
	TEC	3	3	3
	Station Number (P STN/P PS STN) (S STN/S PS STN) (T STN/T PS STN)	5100	6600	5200
	Line Equipment Numbers (P LENS/P PHIN) (S LENS/S PHIN) (T LENS/T PHIN)	021000	032000	023000

STEP 1: Perform the assignment of “FCCS Cluster Common Setting.”

STEP 2: The registration of MC&MG-COT is to be done on each nodes beforehand. Refer to “Outside Line (MC&MG-COT/MG-COT/MG(BRI))” for details.

STEP 3: **AISTL** (Assignment of IP Station Data for LDM)

- Assignment on FPC1
 - TN=1
 - STN=5100/5101/5102
 - KIND=16: MC-MG(COT)
 - TEC=3 (DP/PB)
 - SFC=1
 - RSC=1
 - LENS=021000/021001/021002
 - MC-ID=00-12-34-56-78-90/00-AB-CD-EF-GH-HI/00-JK-LM-NO-PQ-RS

- MC-CH=0
- Assignment on FPC10
 - TN=1
 - STN=6600/6601/6602
 - KIND=16: MC-MG(COT)
 - TEC=3 (DP/PB)
 - SFC=1
 - RSC=1
 - LENS=032000/032001/032002
 - MC-ID=00-12-34-56-78-90/00-AB-CD-EF-GH-HI/00-JK-LM-NO-PQ-RS
 - MC-CH=0
- Assignment on FPC20
 - TN=1
 - STN=5200/5201/5202
 - KIND=16: MC-MG(COT)
 - TEC=3 (DP/PB)
 - SFC=1
 - RSC=1
 - LENS=023000/023001/023002
 - MC-ID=00-12-34-56-78-90/00-AB-CD-EF-GH-HI/00-JK-LM-NO-PQ-RS
 - MC-CH=0

STEP 4: **AUPDN** (Assignment of User Profile Data for NDM)

- Assignment for Station 1100
 - UGN=1
 - TELN=1100
 - Primary Station Data
 - P FPC=1
 - TEC=3 (DP/PB)
 - KIND=16: MC-MG(COT)
 - P TN=1
 - P STN/P PS STN=5100
 - P LENS/P PHIN=021000
 - P SFC=1
 - P RSC=1
 - Secondary Station Data
 - S FPC=10
 - S TN=1
 - S STN/S PS STN=6600
 - S LENS/S PHIN=032000

- S SFC=1
- S RSC=1
- Tertiary Station Data
 - T FPC=20
 - T TN=1
 - T STN/T PS STN=5200
 - T LENS/T PHIN=023000
 - T SFC=1
 - T RSC=1
- Setting of Name Display (Equivalent to the ANDD command)

Note: When this information is already assigned by the ANDD command, it takes precedence over information assigned by the AUPDN command.

- Assignment for Station 2100
 - UGN=1
 - TELN=2100
 - Primary Station Data
 - P FPC=10
 - TEC=3 (DP/PB)
 - KIND=16: MC-MG(COT)
 - P TN=1
 - P STN/P PS STN=6601
 - P LENS/P PHIN=032001
 - P SFC=1
 - P RSC=1
 - Secondary Station Data
 - S FPC=20
 - S TN=1
 - S STN/S PS STN=5201
 - S LENS/S PHIN=023001
 - S SFC=1
 - S RSC=1
 - Tertiary Station Data
 - T FPC=1
 - T TN=1
 - T STN/T PS STN=5101
 - T LENS/T PHIN=021001
 - T SFC=1
 - T RSC=1
 - Setting of Name Display (Equivalent to the ANDD command)

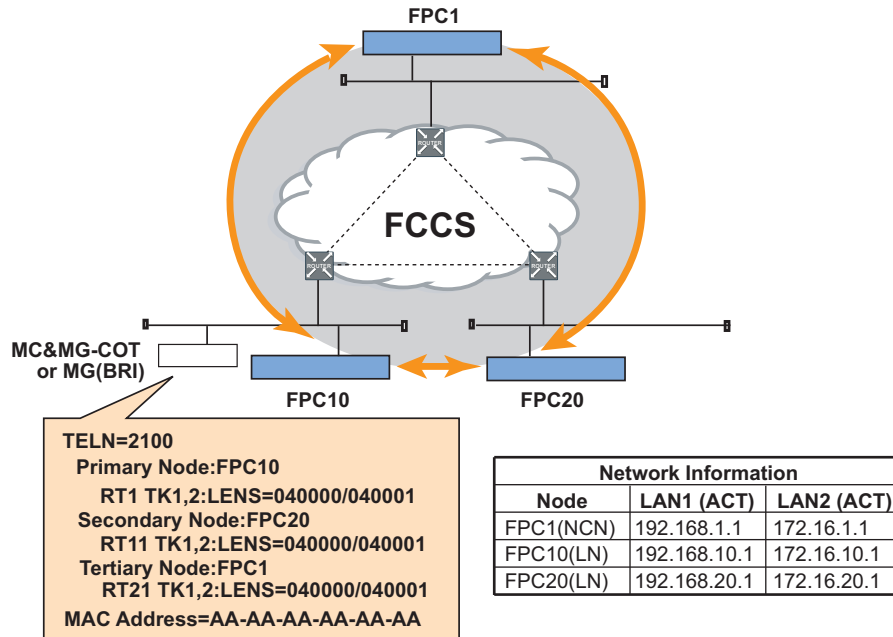
Note: When this information is already assigned by the ANDD command, it takes precedence over information assigned by the AUPDN command.

- Assignment for Station 3100
 - UGN=1
 - TELN=3100
 - Primary Station Data
 - P FPC=20
 - TEC=3 (DP/PB)
 - KIND=16: MC-MG(COT)
 - P TN=1
 - P STN/P PS STN=5202
 - P LENS/P PHIN=023002
 - P SFC=1
 - P RSC=1
 - Secondary Station Data
 - S FPC=10
 - S TN=1
 - S STN/S PS STN=6602
 - S LENS/S PHIN=032002
 - S SFC=1
 - S RSC=1
 - Tertiary Station Data
 - T FPC=1
 - T TN=1
 - T STN/T PS STN=5102
 - T LENS/T PHIN=021002
 - T SFC=1
 - T RSC=1
 - Setting of Name Display (Equivalent to the ANDD command)

Note: When this information is already assigned by the ANDD command, it takes precedence over information assigned by the AUPDN command.

(6) Outside Line (MC&MG-COT/MG-COT/MG(BRI))

Example: MG(BRI)



Command	Parameter	FPC1	FPC10	FPC20
ASYD	SYS1 Index186	Bit6=1	Bit6=1	Bit6=1
ASYDL	SYS1 Index880	Bit1=1	Bit1=1	Bit1=1
ALIDL	Internal PHI-BRI	04300	04300	04300
ARTD	RT		21	11
	CDN	60	1	1
		65	6	6
		114	1	1
ARTI	RT		21	11
	CDN	68	2	2
ATRK	RT/TK		21/1, 2	11/1, 2
	LENS		040000/040001	040000/040001
ALRTN	LGRT		1	
	Location Information		Tertiary Node	Primary Node
ARTDN	LGRT		1	
MBRT	RT/TK		21/1, 2	11/1, 2
AMGIL	MGID		00-AA-AA-AA-AA-AA	
	CH		0, 1	0, 1
	LENS		040000/040001	040000/040001

STEP 1: Perform the assignment of “1. FCCS Cluster Common Setting”.

STEP 2: **ASYD** (Assignment of System Data)
SYS1 Index186 Bit6=1 (ISDN enabled)
SYS1 Index 187=00 (Fixed)

STEP 3: **ASYDL** (Assignment of System Data for LDM)
SYS1 Index880 Bit1=1 (Internal PHI-PRI/BRI is available)

STEP 4: **ALIDL** (Assignment of LAN Information Data for LDM)
Assign the Internal PHI-BRI.
PH LENS=04300
PH TYPE=Internal PHI
REGMAX=256

STEP 5: **ARTD** (Assignment of Route Class Data)
Assign individually to each of FPC 1/10/20.
RT=21/1/11
CDN60 (TC/EC)=1 (EC enabled)
CDN65 (INT)=6 (ETSI BRI) **Note 1**
CDN114 (DCH)=1 (Channel Integration enabled) **Note 2**

Note: To change the data for existing route (RT), reboot the MG.

Note 1: This parameter depends on your country's ISDN specification, “ETSI BRI” is used here for example.

Note 2: Effective for MG(BRI).

STEP 6: **ARTI** (Assignment of Trunk Application Data)
Assign individually to each of FPC 1/10/20.
RT=21/1/11
CDN68 (VIR)=2 (Virtual Trunk Data: MG Connection)

Note: To change the data for existing route (RT), reboot the MG.

STEP 7: **ATRK** (Assignment of Trunk Data)
Assign individually to each of FPC 1/10/20.
RT=21/1/11
TK1, 2:LENS=040000/040001

STEP 8: **MBTK** (Make Busy of Trunk)
Assign individually to each of FPC 1/10/20.
TK1, 2
MB=0 (Make Idle)

STEP 9: **ALRTN** (Assignment of Logical RT for NDM)

LGRT=1

Primary Node: FPC=10, RT=1

Secondary Node: FPC=20, RT=11

Tertiary Node: FPC=1, RT=21

STEP 10: **ARTDN** (Assignment of Route Class Data for NDM)

LGRT=1

CDN60 (TC/EC)=1 (EC enabled)

CDN65 (INT)=6 (ETSI BRI) **Note 3**

CDN114 (DCH)=1 (Channel Integration enabled) **Note 4**

Note: When data assigned with ARTDN command is to be modified, the settings toward logical route data (assigned by ALRTN command) in Secondary Node and Tertiary Node need to be modified individually at each node.

Note 3: This parameter depends on your country's ISDN specification, "ETSI BRI" is used here for example.

Note 4: Effective for MG(BRI).

STEP 11: **AMGIL** (Assignment of Media Gateway Information for LDM)

Assign individually to each of FPC 1/10/20.

MG-ID=00-AA-AA-AA-AA-AA

Function=Setting

KIND=ISDN Trunk (BRI)

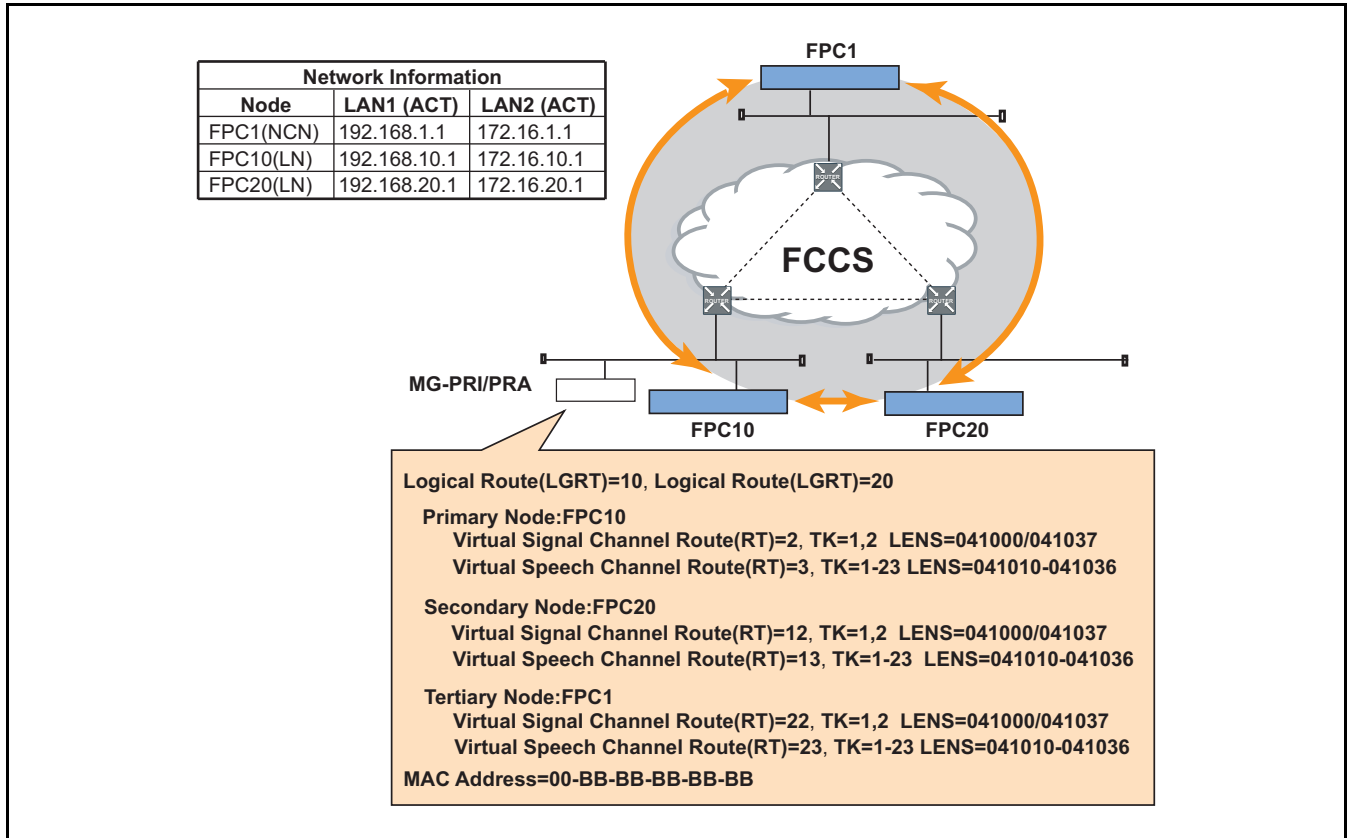
LINE=0

CH=0/1 (Channel B1/Channel B2)

LENS=040000/040001

(7) Outside Line (MG(PRI))

Example: MG-PRI/MG-PRA



Command	Parameter		FPC1	FPC10	FPC20
ASYD	SYS1 Index186		Bit6=1	Bit6=1	Bit6=1
ASYDL	SYS1 Index880		Bit1=1	Bit1=1	Bit1=1
ARTD	RT		22/23	2/3	12/13
	CDN	60	0/1	0/1	0/1
		65	3/3	3/3	3/3
ARTI	RT		22/23	2/3	12/13
	CDN	68	2/2	2/2	2/2
ATRK	RT/TK	Dch	22/1, 2	2/1, 2	12/1, 2
		Bch	23/1-23	3/1-23	13/1-23
	LENS	Dch	041000/041037	041000/041037	041000/041037
		Bch	041010 -	041010 -	041010 -
ALRTN	LGRT		Dch=10, Bch=20		
	Location Information		Tertiary Node	Primary Node	Secondary Node
ARTDN	LGRT		Dch=10, Bch=20		
ADPC	RT/PC		22, 23/50	2, 3/50	12, 13/50

Command	Parameter	FPC1	FPC10	FPC20
ACSC	CSCG	130/131	130/131	130/131
	CCH	04100	04100	04100
ACIC1	PC	50	50	50
	CSCG	130	130	130
MBTK	RT/TK	23/1-23	3/1-23	13/1-23
AMGIL	MG-ID	00-BB-BB-BB-BB-BB		
	CH	0	0	0
	LENS	041000	041000	041000

STEP 1: Perform the assignment of “1. FCCS Cluster Common Setting”.

STEP 2: **ASYD** (Assignment of System Data)
 SYS1 Index186 Bit6=1 (ISDN enabled)
 SYS1 Index 187=00 (Fixed)

STEP 3: **ASYDL** (Assignment of System Data for LDM)
 SYS1 Index880 Bit1=1 (Internal PHI-PRI/BRI is available)

STEP 4: **ARTD** (Assignment of Route Class Data)
 Assign individually to each of FPC 1/10/20.
 RT=22, 23/2, 3/12, 13
 CDN60 (TC/EC)=1 (EC enabled)
 CDN65 (INT)=4 (ITU (CCITT), ETSI) **Note 1**

Note 1: This parameter depends on your country's ISDN specification, “ITU (CCITT), ETSI” is used here for example.

Note: To change the data for existing route (RT), reboot the MG.

STEP 5: **ARTI** (Assignment of Trunk Application Data)
 Assign individually to each of FPC 1/10/20.
 RT=22, 23/2, 3/12, 13
 CDN68 (VIR)=2 (Virtual Trunk Data: MG Connection)

Note: To change the data for existing route (RT), reboot the MG.

STEP 6: **ATRK** (Assignment of Trunk Data)
 Assign individually to each of FPC 1/10/20.
 RT=22/2/12
 TK1, 2:LENS=041000/041037
 RT=23/3/13
 TK1-23:LENS=041010-041036

STEP 7: **ALRTN** (Assignment of Logical RT for NDM)

LGRT=10, 20

Primary Node: FPC=10, RT=2, 3

Secondary Node: FPC=20, RT=12, 13

Tertiary Node: FPC=1, RT=22, 23

STEP 8: **ARTDN** (Assignment of Route Class Data for NDM)

LGRT=10, 20

CDN60 (TC/EC)=1 (EC enabled)

CDN65 (INT)=4 (ITU (CCITT), ETSI) **Note 2**

Note: To change the data for existing route (RT), reboot the MG.

Note: When data assigned with ARTDN command is to be modified, the settings of logical route data (assigned by the ALRTN command) in Secondary Node and Tertiary Node need to be modified individually at each node.

Note 2: This parameter depends on your country's ISDN specification, "ITU (CCITT), ETSI" is used here for example.

STEP 9: **ADPC** (Assignment of Determinate Point Code Data)

Assign individually to each of FPC 1/10/20.

RT=22/2/12

PC=50

RT=23/3/13

PC=50

STEP 10: **ACSC** (Assignment of CSC Data)

Assign individually to each of FPC 1/10/20.

CSCG=130 [GROUP: 0-7, CCH: 04100]

CSCG=131 [GROUP: 0-7, CCH: 04100]

STEP 11: **ACIC1** (Assignment of CIC Code Data 1)

Assign individually to each of FPC 1/10/20.

PC=50

CSCG=131

STEP 12: **MBTK** (Make Busy of Trunk)

Assign individually to each of FPC 1/10/20.

RT=22/2/12

TK1, 2

MB=0 (Make Idle)

RT=23/3/13

TK1- 23

MB=0 (Make Idle)

STEP 13: **AMGIL** (Assignment of Media Gateway Information for LDM)

Assign individually to each of FPC 1/10/20.

MG-ID=00-BB-BB-BB-BB-BB

Function=Setting

KIND=ISDN Trunk (PRI 1.5M)

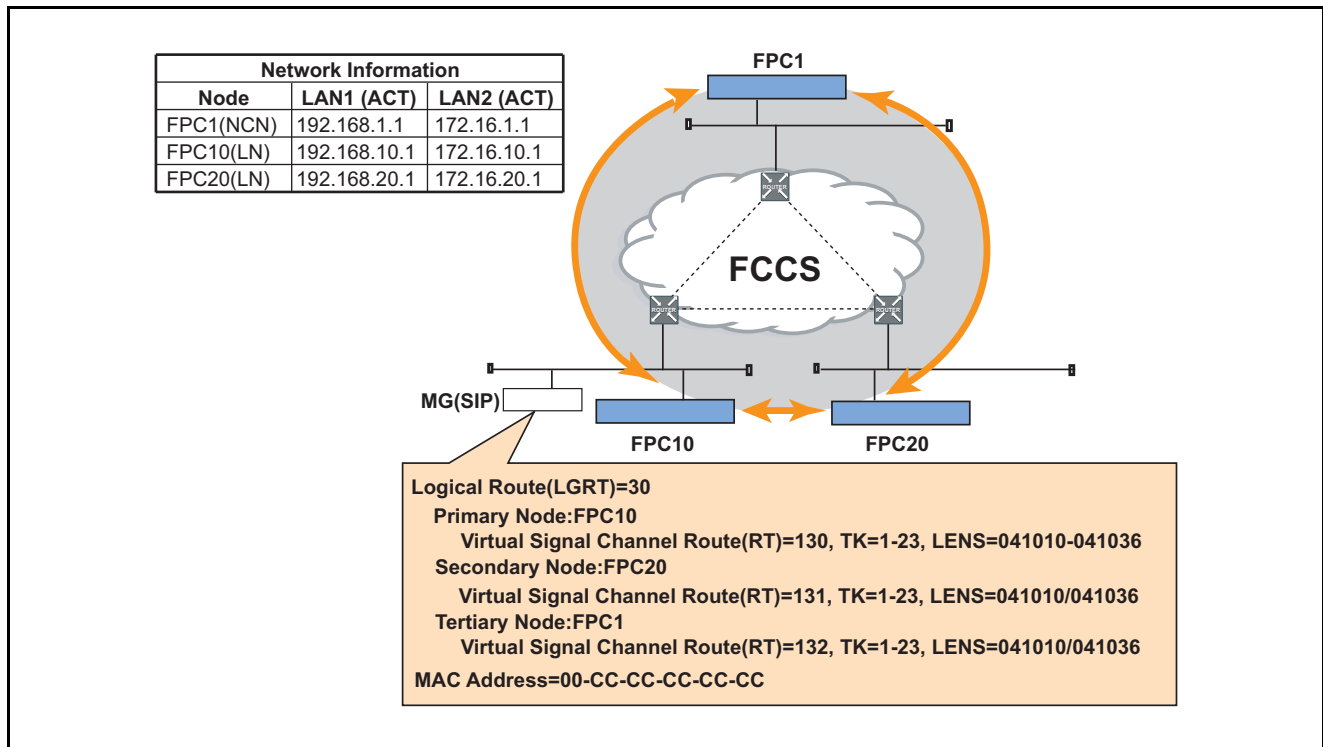
UG50 Multi-Slot Mode: Select this check box if registering UG50 in Multi-slot mode.

LINE=0 (Fixed)

CH=0 (Fixed)

LENS=041000

(8) Outside Line (MG(SIP))



Command	Parameter	FPC1	FPC10	FPC20
ASYD	SYS1 Index64	Bit7=1	Bit7=1	Bit7=1
	SYS1 Index186	Bit6=1	Bit6=1	Bit6=1
	SYS1 Index220	Bit6=0	Bit6=0	Bit6=0
ASYDL	SYS1 Index880	Bit1=1	Bit1=1	Bit1=1
ALIDL	Internal PHI-BRI	04300	04300	04300
ARTD	RT	132	130	131
	CDN	15	12	12
		60	1	1
		65	10	10
ARTI	RT	132	130	131
	CDN	47	2	2
		68	2	2
ATRK	RT/TK	132/1 -	130/1 -	131/1 -
	LENS	042000 -	042000 -	042000 -
ALRTN	LGRT	30		
	Location Information	Tertiary Node	Primary Node	Secondary Node
ARTDN	LGRT	30		
ADPC	LGRT/PC	132/60	130/60	131/60

Command	Parameter	FPC1	FPC10	FPC20
ACSC	CSCG	140	140	140
	CCH	04200	04200	04200
ACIC1	PC	60	60	60
	CSCG	140	140	140
ACIC2	PC	30	30	30
	CIC	1 -	1 -	1 -
	LENS	042000	042000	042000
MBTK	RT/TK	132/1 -	130/1 -	131/1 -
AMGIL	MG-ID	00-CC-CC-CC-CC-CC		
	CH	0	0	0
	LENS	042000	042000	042000

STEP 1: Perform the assignment of “1. FCCS Cluster Common Setting”.

STEP 2: **ASYD** (Assignment of System Data)
 SYS1 Index64 Bit7=1 (Music-on-Hold service: enabled)
 SYS1 Index186 Bit6=1 (ISDN enabled)
 SYS1 Index 187=00 (Fixed)
 SYS1 Index 220 Bit6=0 (ISDN Service: enabled)

STEP 3: **ASYDL** (Assignment of System Data for LDM)
 SYS1 Index880 Bit1=1 (Internal PHI-PRI/BRI is available)

STEP 4: **ALIDL** (Assignment of LAN Information Data for LDM)
 Assign each Internal PHI-BRI.
 PH LENS=04300
 PH TYPE=Internal PHI
 REGMAX=256

STEP 5: **ARTD** (Assignment of Route Class Data)
 Assign individually to each of FPC 1/10/20.
 RT=132/130/131
 CDN15 (LSG)=12 (Speech Line (for CCIS or Bch of ISDN)
 CDN60 (TC/EC)=1 (EC enabled)
 CDN65 (INT)=10 (Q-sig, (ETS 300 172)/IS-11572)

Note: To change the data for existing route (RT), reboot the MG.

STEP 6: **ARTI** (Assignment of Trunk Application Data)
 Assign individually to each of FPC 1/10/20.
 RT=132/130/131
 CDN47 (INTD)=2 (SIP)
 CDN68 (VIR)=2 (Virtual Trunk Data: MG Connection)

Note: To change the data for existing route (RT), reboot the MG.

- STEP 7: **ATRK** (Assignment of Trunk Data)
Assign individually to each of FPC 1/10/20.
RT=132/130/131
TK1-: LENS=042000 -
- STEP 8: **ALRTN** (Assignment of Logical RT for NDM)
LGRT=30
Primary Node: FPC=10, RT=130
Secondary Node: FPC=20, RT=131
Tertiary Node: FPC=1, RT=132
- STEP 9: **ARTDN** (Assignment of Route Class Data for NDM)
LGRT=30
CDN60 (TC/EC)=1 (EC enabled)
CDN65 (INT)=4 (ITU (CCITT), ETSI) **Note 1**
CDN114 (DCH)=1 (Channel Integration enabled)

Note: To change the data for existing route (RT), reboot the MG.

Note: When data assigned with ARTDN command is to be modified, the settings of logical route data (assigned by the ALRTN command) in Secondary Node and Tertiary Node need to be modified individually at each node.

Note 1: This parameter depends on your country's ISDN specification, "ITU (CCITT), ETSI" is used here for example.

- STEP 10: **ADPC** (Assignment of Determinate Point Code Data)
Assign individually to each of FPC 1/10/20.
RT=132/130/131
PC=60
- STEP 11: **ACSC** (Assignment of CSC Data)
Assign individually to each of FPC 1/10/20.
CSCG=140 [GROUP: 0-7, CCH: 04200]
- STEP 12: **ACIC1** (Assignment of CIC Code Data 1)
Assign individually to each of FPC 1/10/20.
PC=60
CSCG=140
- STEP 13: **ACIC2** (Assignment of CIC Code Data 2)
Assign individually to each of FPC 1/10/20.
PC=60
CIC=1 -
CSCG=140

STEP 14: **MBTK** (Make Busy of Trunk)

Assign individually to each of FPC 1/10/20.

RT=132/130/131

TK1 -

MB=0 (Make Idle)

STEP 15: **AMGIL** (Assignment of Media Gateway Information for LDM)

Assign individually to each of FPC 1/10/20.

MG-ID=00-CC-CC-CC-CC-CC

Function=Setting

KIND=SIP-MG

LINE=0 (Fixed)

CH=0 (Fixed)

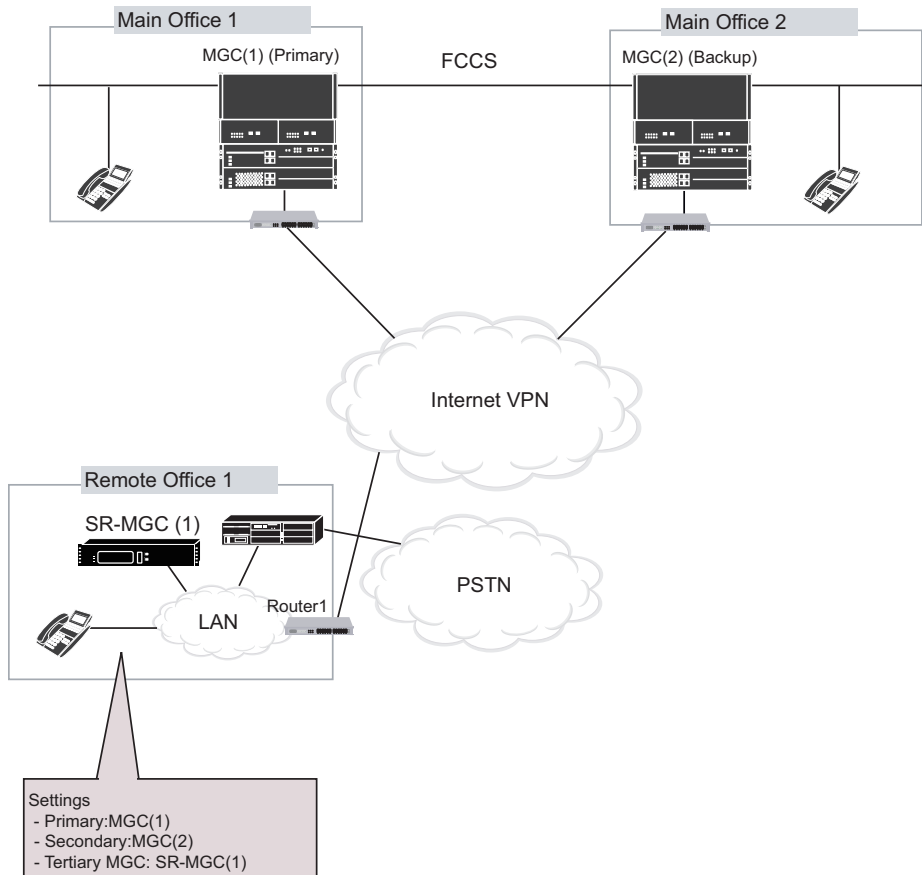
LENS=042000

2.15 SR-MGC Location Diversity

This feature is available in cooperation with SR-MGC, which is called “SR-MGC Location Diversity”. When network failure occurs and causes connection failure between terminals and an MGC, in addition, if keeping terminals' connection by the FCCS Cluster feature is not available, SR-MGC will be activated.

For example, in the next figure, if Router 1 in Remote Office 1 is down, SR-MGC will have trouble communicating with MGC(1) (Primary) and MGC(2) (Backup). And then it soon realizes the managed-terminals' connections are not able to be kept by other MGCs, and the SR-MGC activates itself to keep those connections alive.

Note: MGC shown below indicates Telephony Server.



Note: When the SR-MGC is used in the network and a failure occurs, the registration of servers and terminals is changed as follows:

CAUSE	TERMINAL STATUS
MGC(1) has network failure	Terminals in Remote Office 1 are registered to MGC(2).
MGC(1) and MGC(2) have network failure	Terminals in Remote Office 1 are registered to SR-MGC(1).

☐ Service Conditions

For information on Service Conditions for SR-MGC Location Diversity, refer to the SR-MGC Location Diversity part of Location Diversity [L-55] in the Data Programming Manual - Business.

<Data Assignment for SR-MGC Location Diversity>

For information on Data Assignment for SR-MGC Location Diversity, refer to the Data Assignment of SR-MGC part in the Peripheral Equipment Description (IP Devices).



CHAPTER 6

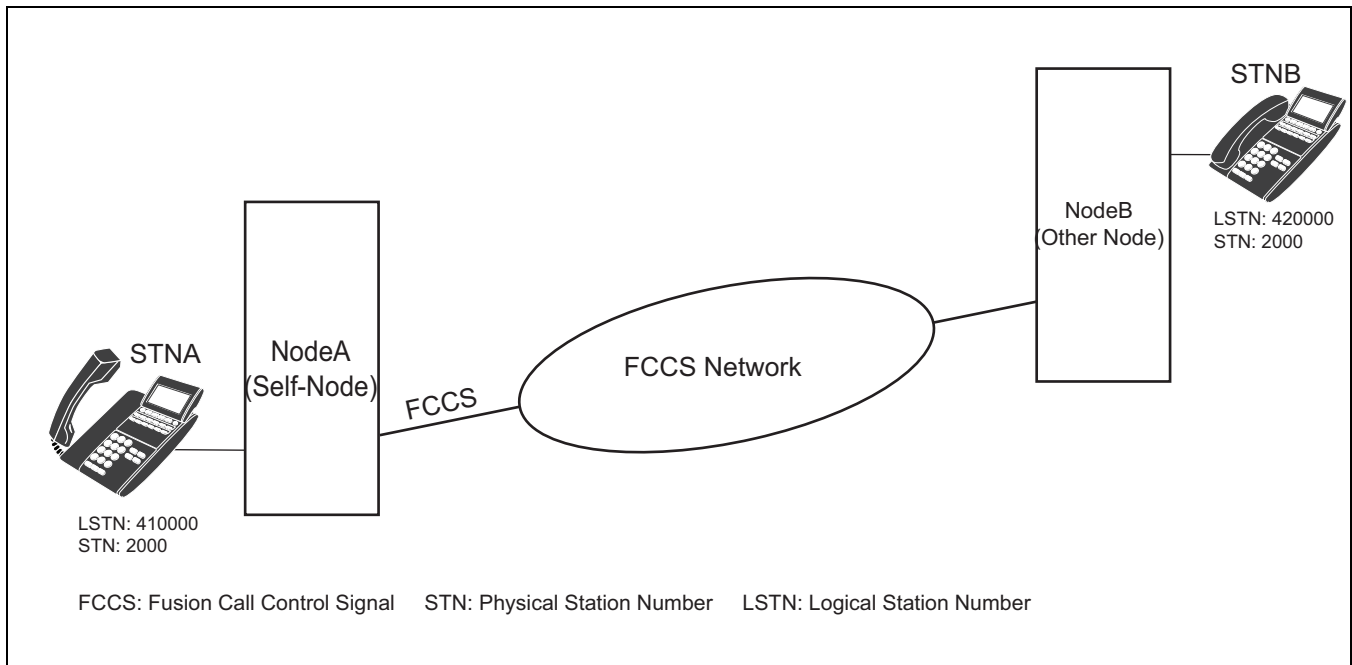
POST INSTALLATION TEST

This chapter describes 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. The installation tests are as follows:

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

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

FCCS Network



Note: The individual trunk access feature is not available for FCCS trunks. To seize a specific FCCS trunk, use the MBCT command to make-busy trunks which are not being tested. This command leaves the FCCS trunk tested in an idle state.

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

Before performing the FCCS link test, check the FCCS link LEDs. Refer to the figure below. When the FCCS 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 in the following section.

1.1 How to Check LYR LED

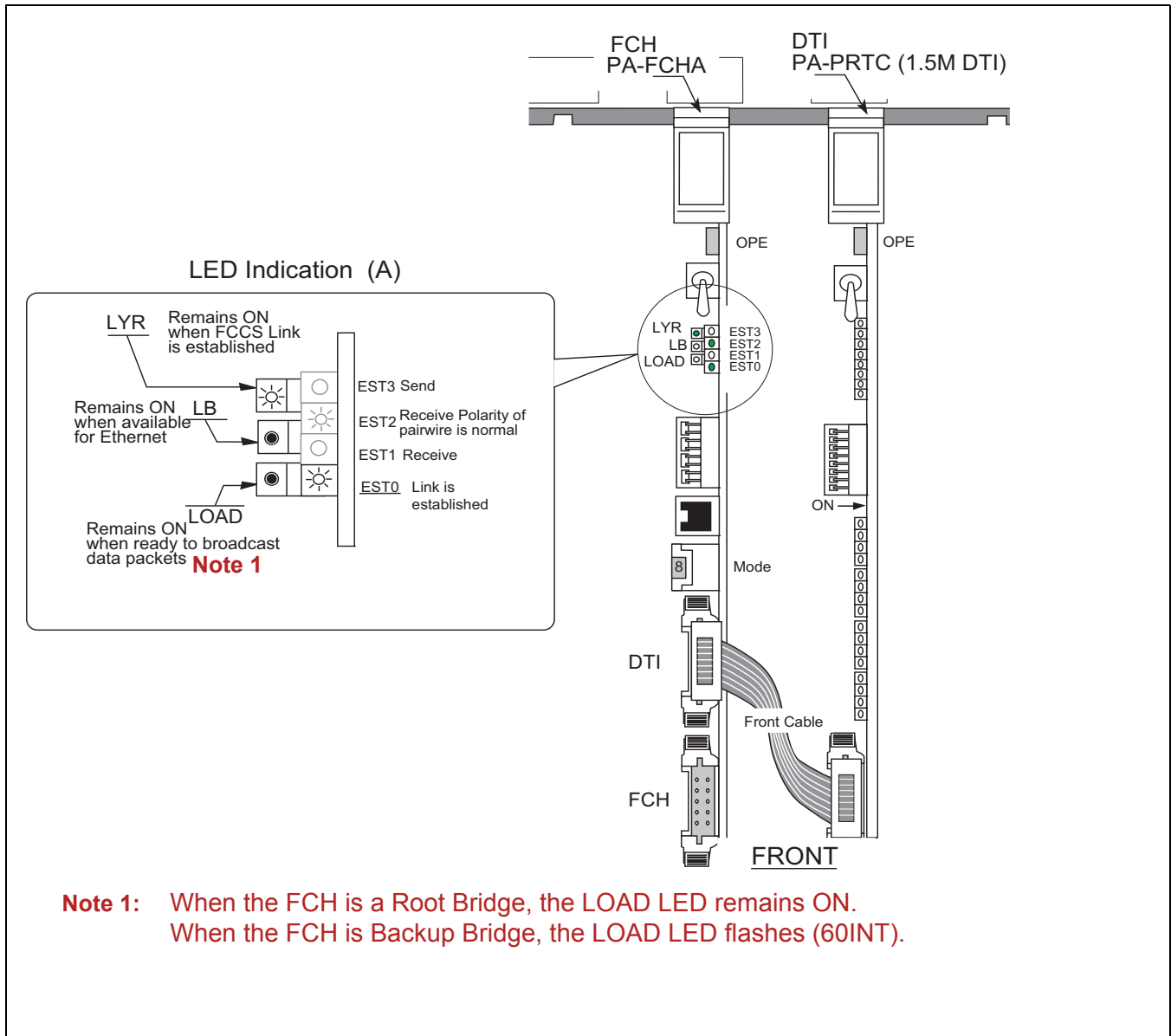
[PA-PRTC (1.5M DTI)]

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

When all alarm LEDs are OFF, the DTI card is in normal operation.

If any abnormal state is detected, please see Appliance Model Installation Manual.

LED Indications on FCCS Link Related Circuit Cards

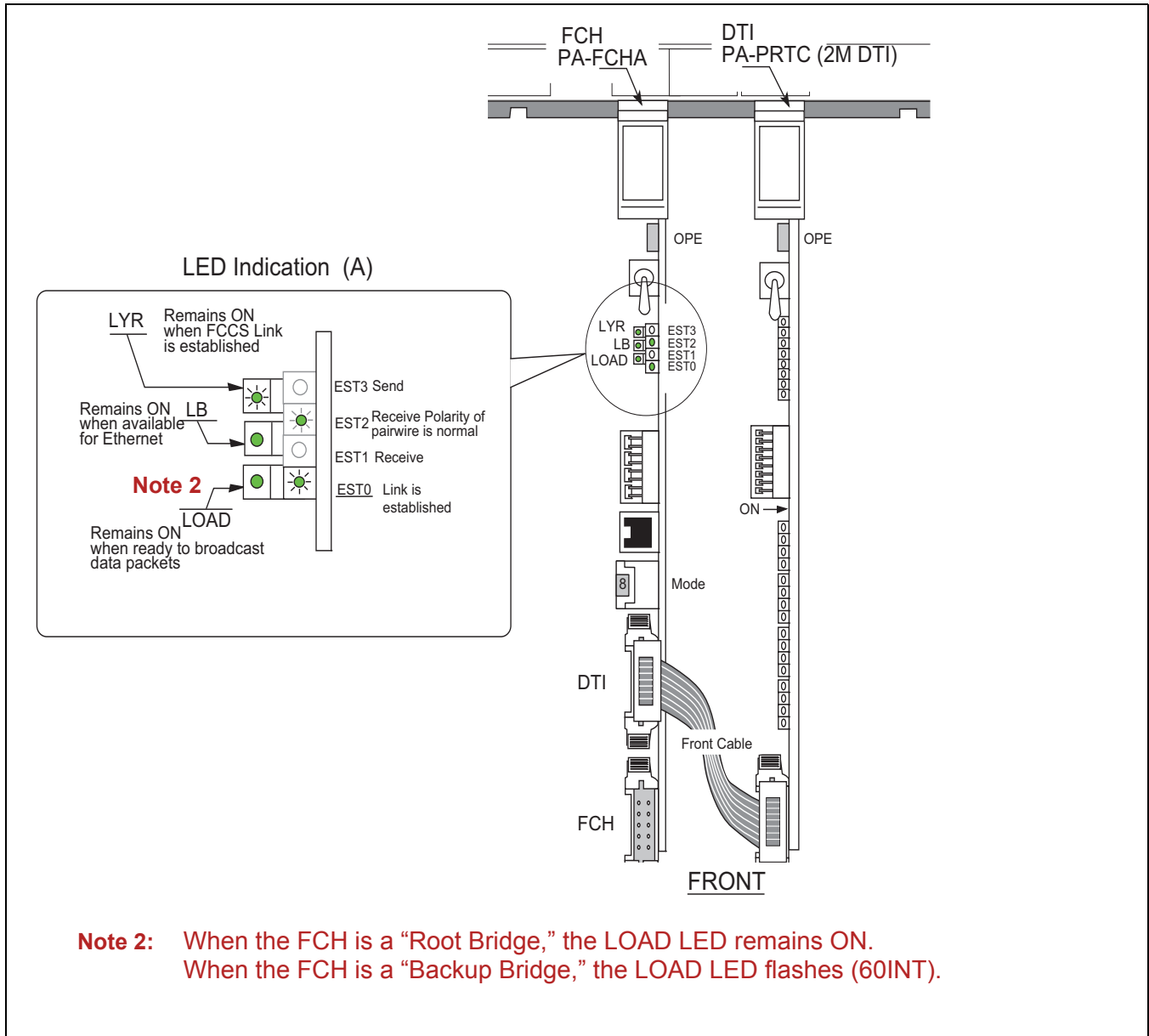


[PA-PRTC (2M DTI)]

1. Confirm the LYR LED lights green on the front edge of the FCH card. See LED Indication (A). When the LED lights green, the FCCS link is established.
2. Make sure that any alarm LED is not ON (red/yellow) (See LED Indication (B) in the figure below). When all alarm LEDs are OFF, the DTI card is in normal operation.

If any abnormal state is detected, please see Circuit Card Description.

LED Indications on FCH and 30DTI Cards



2. Repair Procedure When LED Indicates Abnormality

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

2.1 Procedure

2.1.1 Front Cable

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

2.1.2 FCH (PA-FCHA) Switch Setting

Make sure the following keys are set properly:

- D-Channel TS designation (0-channel through 31-channel: SW10, SW11, SW12, SW13)
- Data Link Signal Logic (positive/negative: SW 14-1)
- FCCS Data Link Speed (48/56/64 kbps: SW 14-2, 3)
- LAPD Signal Link (user/network: SW 14-4)

2.1.3 PA-PRTC (1.5M DTI)/PA-PRTC (2M DTI) Switch Setting

Make sure that the keys are properly set on the card. See Circuit Card Description.

If the FCCS link is not established using this repair procedure, perform the FCCS link test.

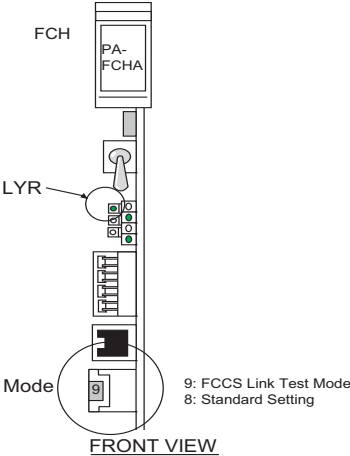
2.2 How to Perform the FCCS Link Test

2.2.1 FCCS Link Test Mode Setting

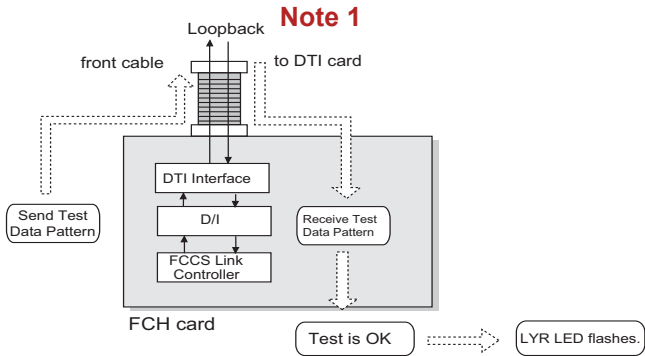
To set the FCH card in FCCS link test mode, set the mode switch to 9. Initialize the FCH card using the MB key. When the mode is 9, the FCCS link controller on the FCH card sends a test data pattern. When the same pattern is received again, the PM activates the LYR LED, flashing the LED at 60-INT, which means the test result is OK.

FCCS Link Test Mode

To perform an FCCS link test, set the Mode switch to 9.



FCCS Link Controller sends test data pattern.



Flow of Test

Note 1: Loopback points are set by a DTI card.

Note: Initialize the FCH (PA-FCHA) card, after changing the setting of the mode switch.

2.2.2 Loopback Point Designation

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

1. Internal Loopback

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

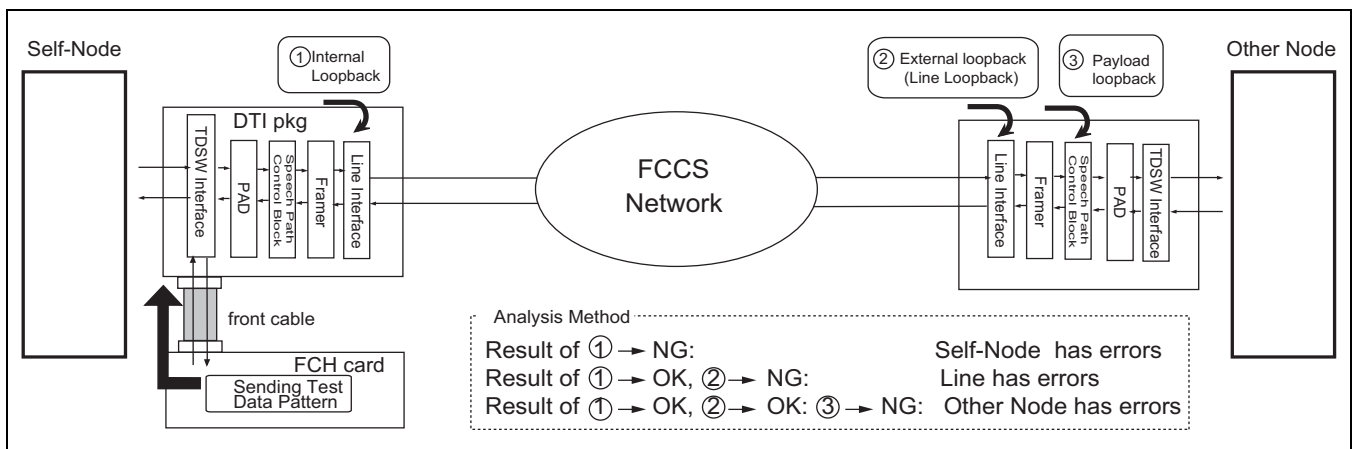
2. Line Loopback

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.)

Loopback Points of DTI Card



2.3 Test Procedure

STEP 1: Set the mode switch to 9 (FCCS link test) from 8 (standard setting) on the FCH card and initialize the circuit card by turning the MB switch ON→OFF.

How to Set the FCCS Link Test Mode

(1) Change the mode switch (8 → 9).

Mode Switch
8: standard setting
9: FCCS Link Test Mode

Mode: 8 → 9

screw driver

Front View

(2) Initialize the FCH card.

MB

(i) UP
(ii) DOWN

Front View

Anti-static Kit

ATTENTION
Contents
Static Sensitive
Handling
Precautions Required

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

STEP 2: Select an appropriate loopback point by setting the switch (SW 01/SW 13B).

Loopback Point Designation (24DTI)

Select a loopback point by setting the switch.

PA-PRTC (1.5M DTI)

SW01

<PA-PRTC>
SW01

To set "Internal Loopback"

DTI

ON

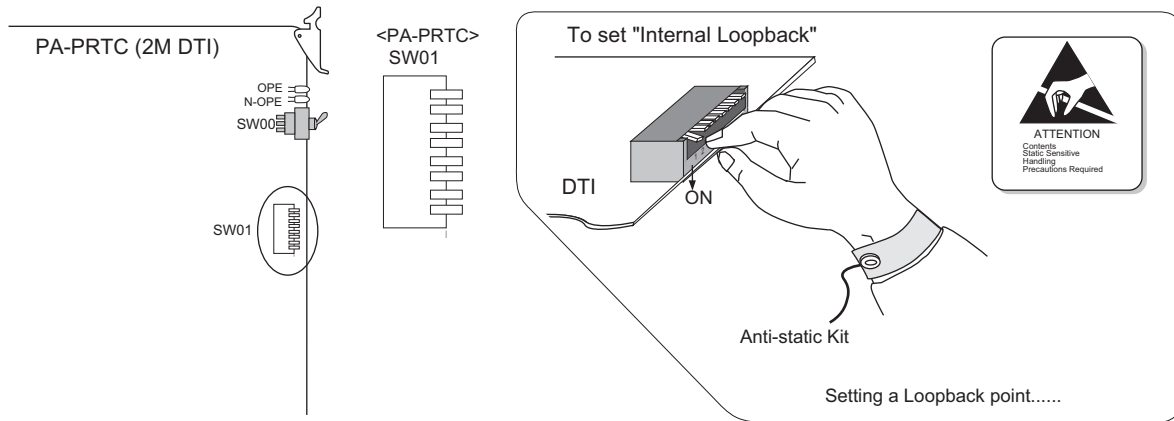
Anti-static Kit

ATTENTION
Contents
Static Sensitive
Handling
Precautions Required

Setting a Loopback point.....

Loopback Point Designation (30DTI)

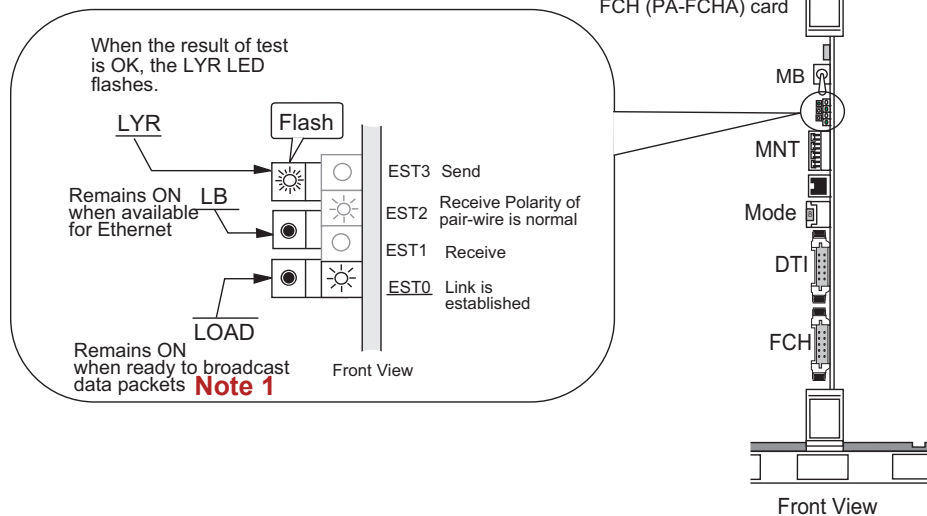
Select a loopback point by setting the switch.



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

FCCS Link-Test Results

Make sure that the LYR LED flashes at 60-INT.



Note 1: When the FCH is a "Root Bridge", the LOAD LED remains ON.
When the FCH is "Backup Bridge", the LOAD LED flashes (60INT).

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

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

Note: 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 FCCS 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 Origination Call Test

Check
☐

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

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

STEP 3: Dial a telephone number (STN B) that belongs to another node.

STEP 4: The call terminates on STN B.

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

STEP 6: Replace the handset of STN A.

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

3.1.2 FCCS Termination Call Test

Check
☐

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

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

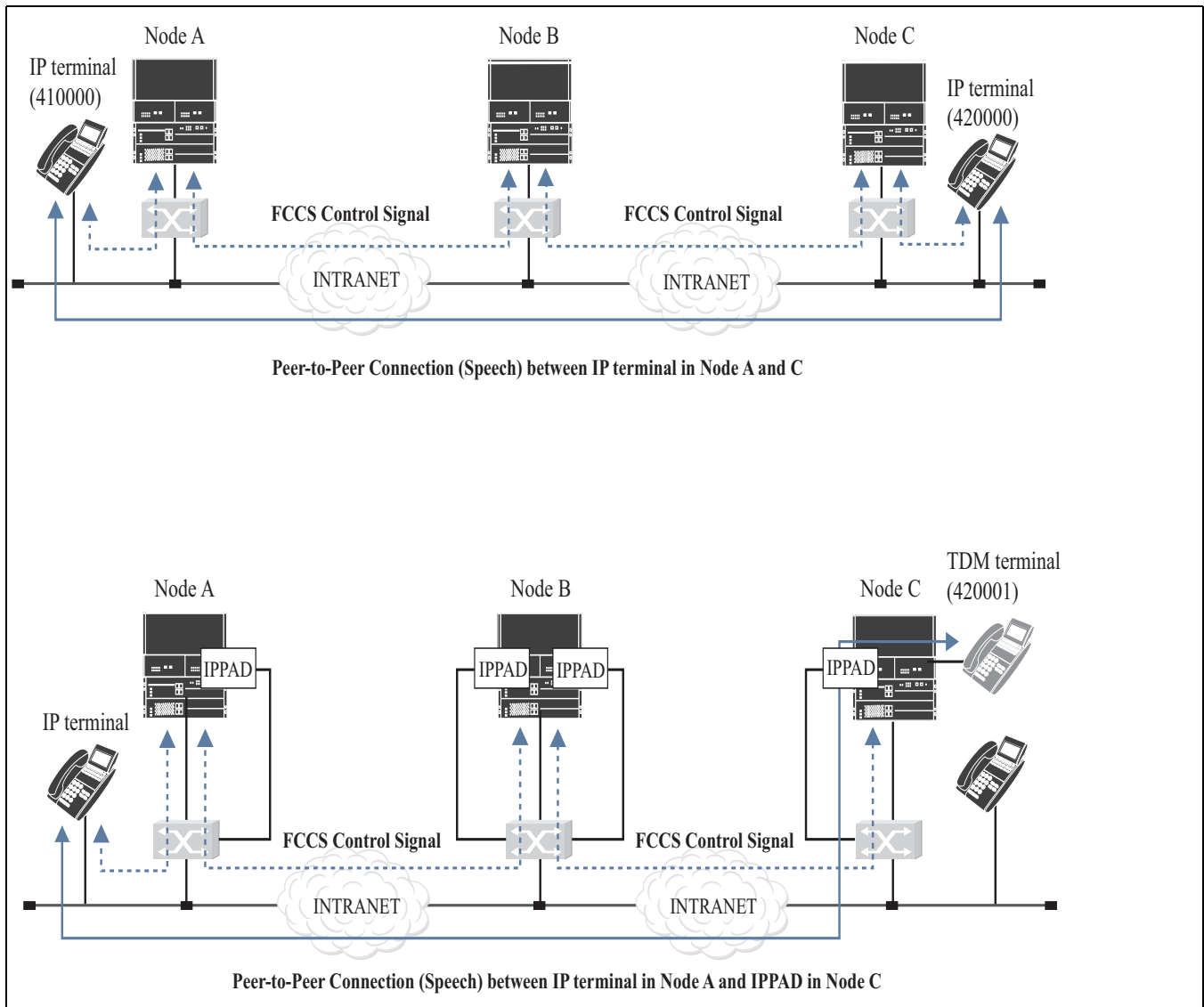
STEP 3: Dial a telephone number (STN A) that belongs to the self-node.

STEP 4: The call terminates on STN A.

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

STEP 6: Replace the handset of STN B.

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

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

3.2 ATTCON Connection Test (via FCCS)

Perform the ATTCON connection test, using the following procedure.

3.2.1 ATTCON Call Termination 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 and not 1-Party speech).
- 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 Origination 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 and not one-way speech).
- 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.

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

Perform the line (LC, ELC, DLC) 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 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 a Digital terminal 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/Digital terminal 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/Digital terminal.
- STEP 4: Release the call.

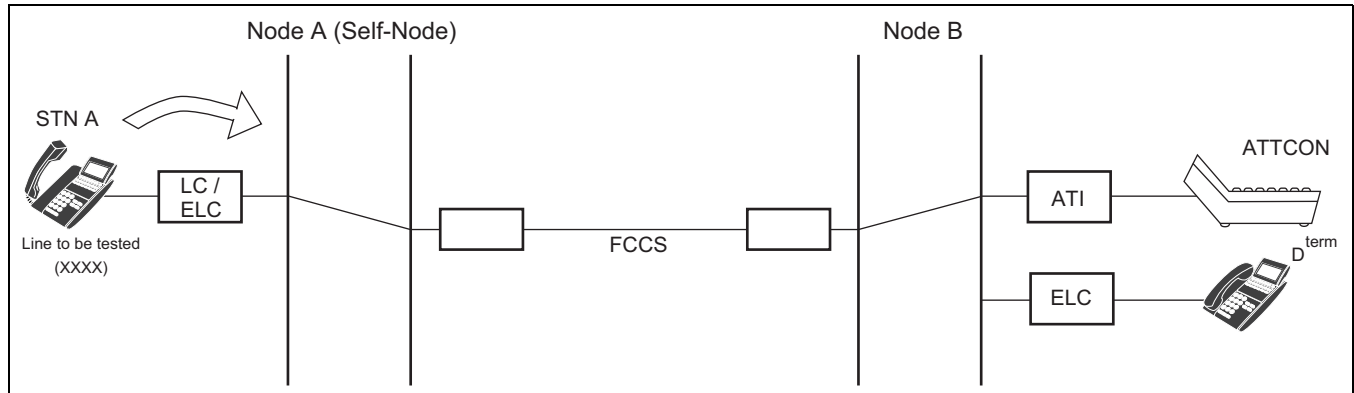
3.3.3 Line Connection Test: Case of Hot Line/House Phone InvolvedCheck
☐

STEP 1: The station tested goes off-hook and confirms Ringback 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.

Line Connection Test (origination) via FCCS**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 Trunks (CFTs) except the trunk 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 Switchhook 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.

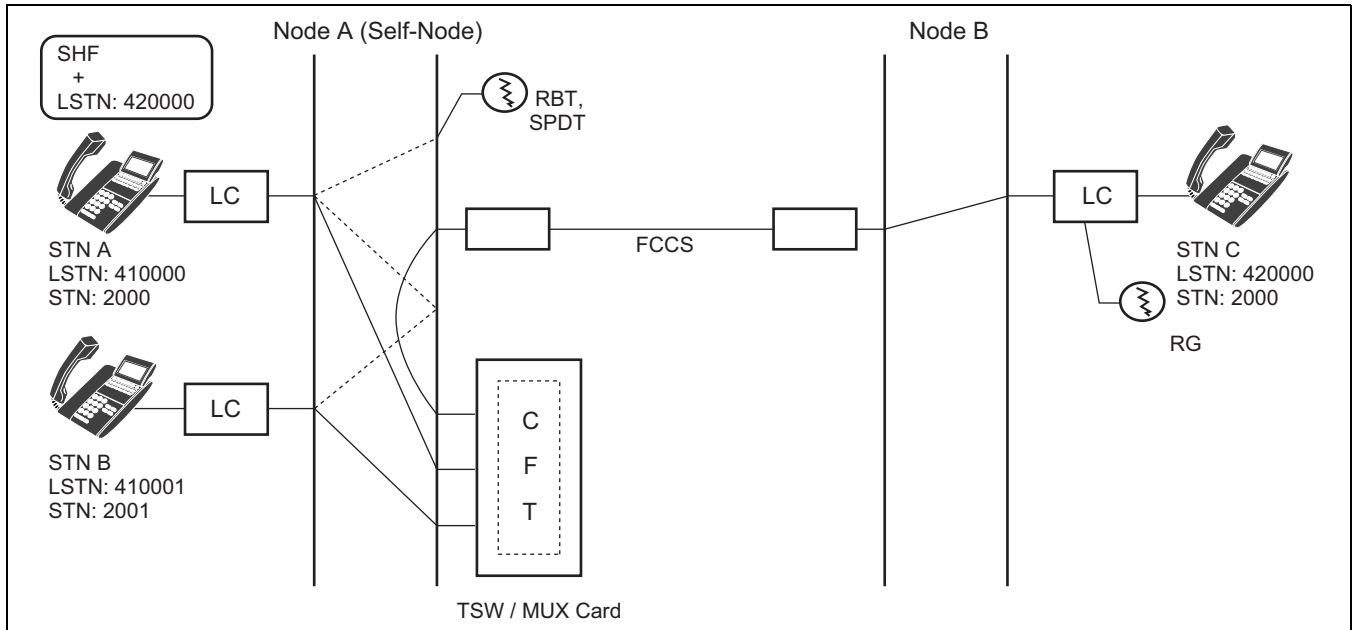
STEP 5: STN A, after a brief talk with STN C, makes a SHF, and confirms that a three-way connection has been set up.

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.

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 FCCS 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 tested.
- STEP 2: Lift the handset of STN A in self-node (Node A).
- STEP 3: Dial the telephone number of STN B that belongs to other node (STN B).
- STEP 4: Confirm the speech condition is sufficient (no noise and one-way speech, etc.).
- STEP 5: Replace the handset of STN A.
- STEP 6: Make idle all the trunks that 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 tested.

STEP 3: Lift the handset of STN A.

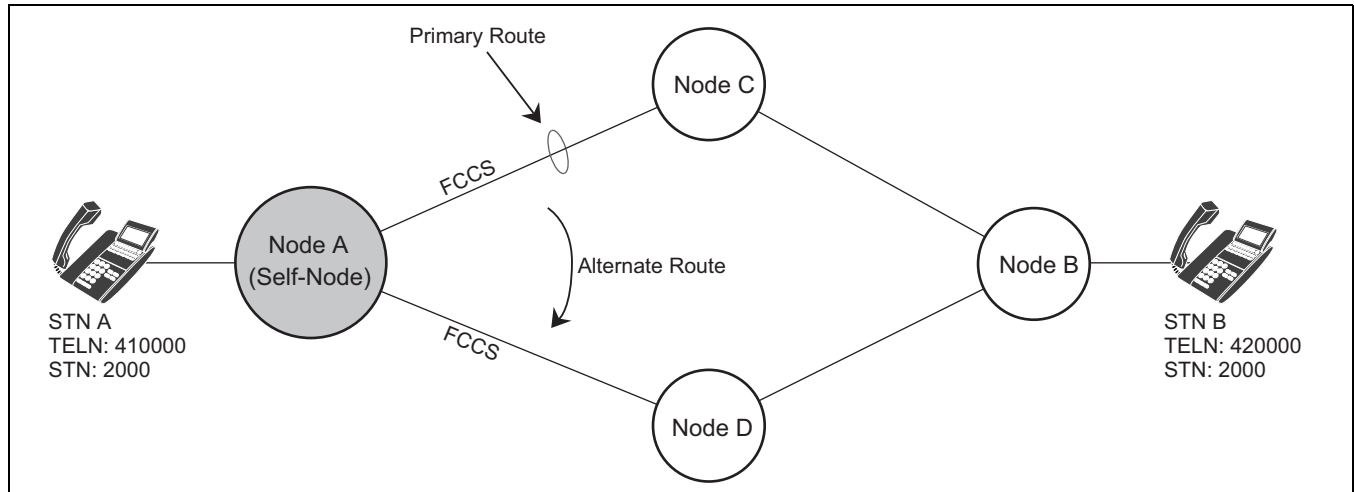
STEP 4: Dial the telephone number of STN B.

STEP 5: Confirm the speech condition is sufficient (no noise and one-way speech).

STEP 6: Replace the handset of STN A.

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

FCCS Alternate Routing Test



4. FCCS and Non-FCCS Connection Tests

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

4.1 When Seizing a Trunk from a Station

Check
☐

STEP 1: Using PCPro command, make-busy all trunks in the route except the trunk 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 and one-way speech, etc.).

STEP 5: Replace the handset of STN A.

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

4.2 When Seizing a Trunk from an ATTCN

Check
☐

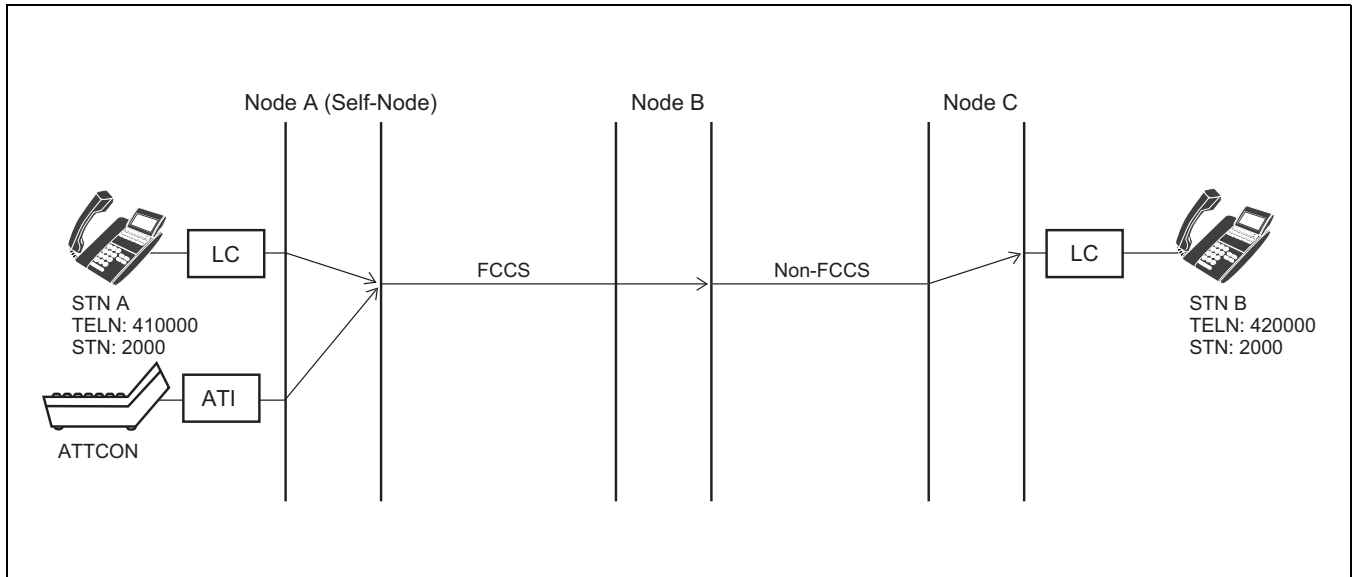
STEP 1: The operator at the ATTCN in self-node (Node A) dials physical station number for Station B in Node C.

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

STEP 3: Confirm the speech condition is sufficient (no noise and one-way speech, etc.)

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

CCIS-FCCS Outgoing Call Test





CHAPTER 7

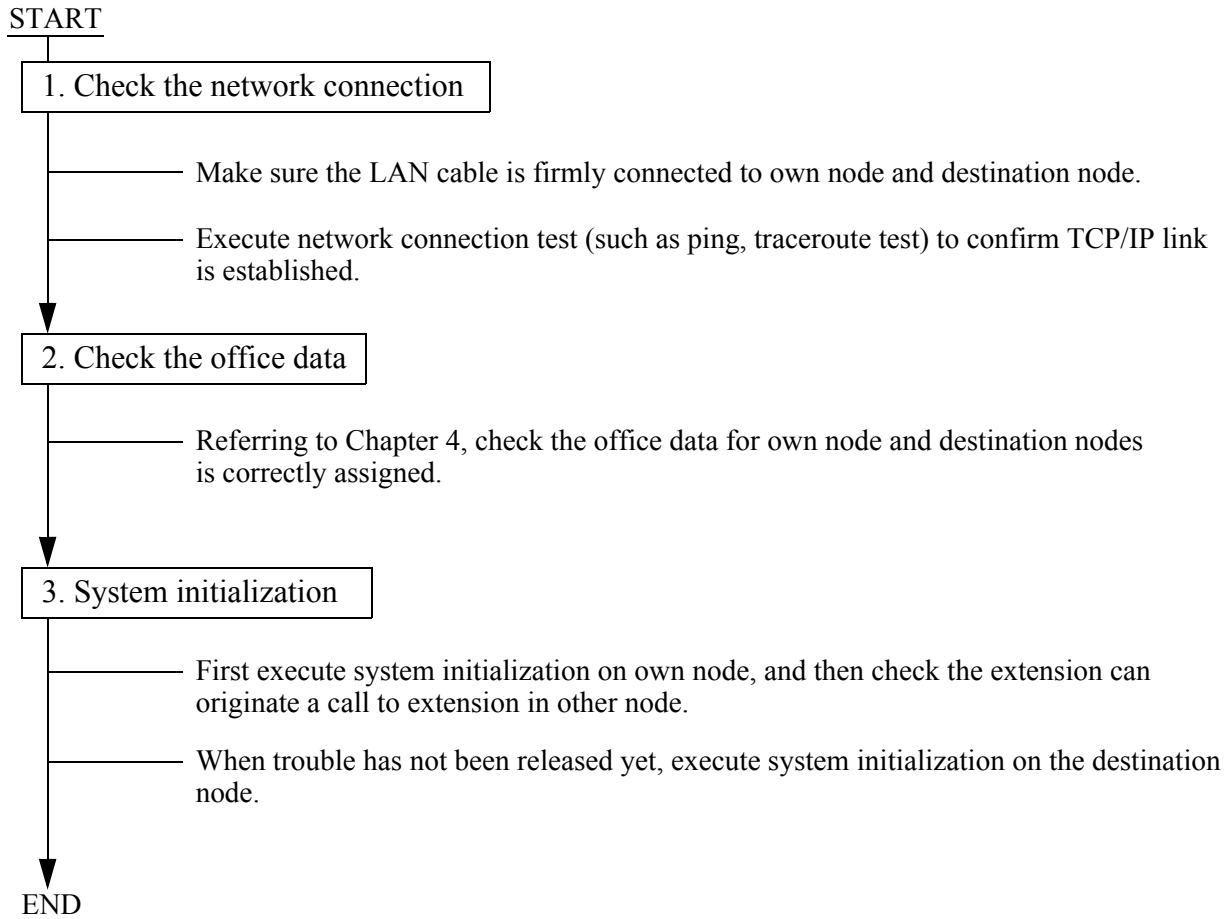
TROUBLE SHOOTING

1. FCCS Networking via IP (Peer-to-Peer)

This section describes the procedure to recover FCCS link when the following troubles are found in FCCS network.

- Station-to-station call cannot be originated to other nodes via FCCS
- System Message 36-F shows the Health Check error (Peer-to-Peer FCCS link time-out occurs)

Follow the procedure below:



Note: When system message is output, follow the procedure described in each system message. Refer to Operations and Maintenance Manual.

2. Other FCCS related systems

This chapter explains the FCCS 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 Operations and Maintenance Manual.

2.1 List of FCCS related System Messages

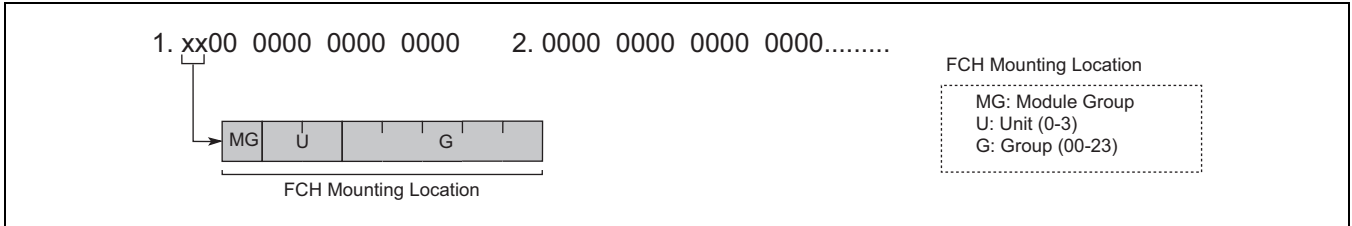
List of FCCS-related System Messages

No.	System Message		Default Alarm	Default Grade
1	3-B	PM C-level Infinite Loop (Permanent)	MN	3
2	3-C	PM C-level Infinite Loop (Temporary)	SUP	1
3	3-D	PM Lockup Failure (Permanent)	MN	3
4	3-E	PM Lockup Failure (Temporary)	SUP	1
5	13-H	Signaling Link Failure (Permanent)	SUP	3
6	13-I	Signaling Link Failure (Temporary)	NON	1
7	13-J	Signaling Link Failure (Recovery)	NON	3
8	23-S	FCH Failure Notification (Detection)	NON	0
9	23-T	FCH Fault Notification (Recovery)	NON	0
10	23-U	FCH Status Information	NON	0
11	23-W	FCH Alternate Routing Start Notification	NON	0
12	23-X	FCH Alternate Routing End Notification	NON	0
13	36-F	Fusion Health Check Report (Temporary/Permanent)	SUP	3
14	36-K	Fusion Health Check Report (Recovery)	NON	3
15	36-T	Fusion Health Check Report (Permanent)	SUP	3

2.2 [3-B] PM C-level Infinite Loop (Permanent)

[3-B] PM C-level Infinite Loop (Permanent) 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 a [3-B] system message.

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

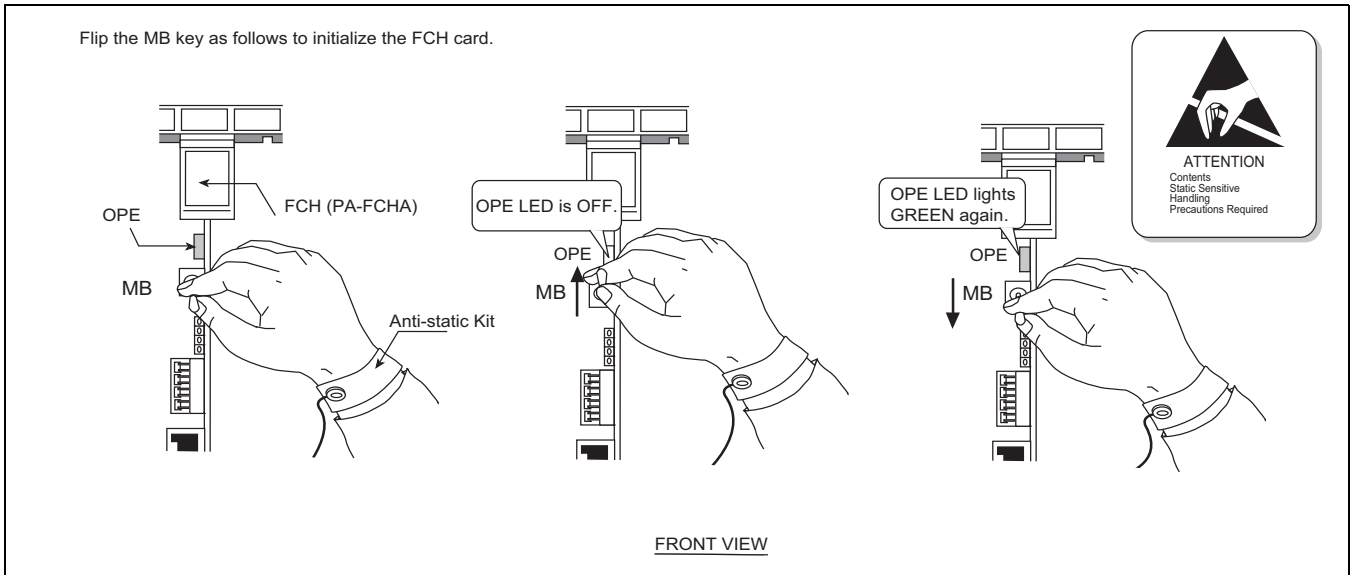


Repair Procedure

STEP 1: Initialize the FCH card using the MB key. Refer to the figure below, How to Initialize 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. Move to STEP 2.

How to Initialize the FCH (PA-FCHA) Card

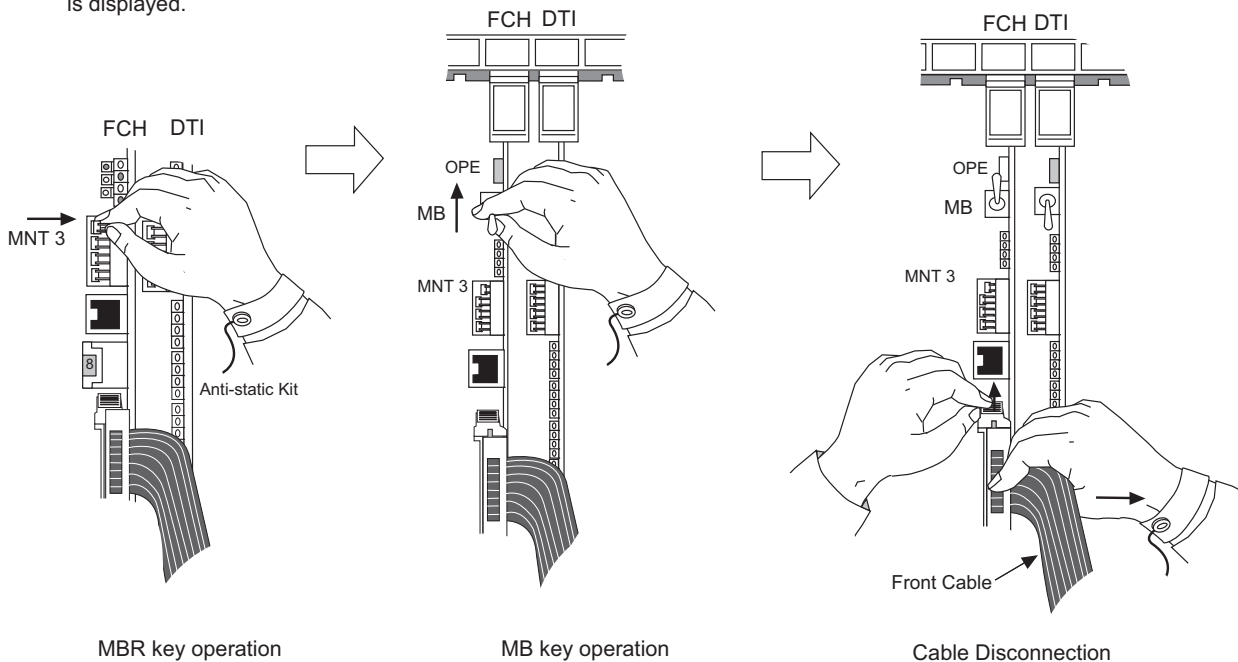
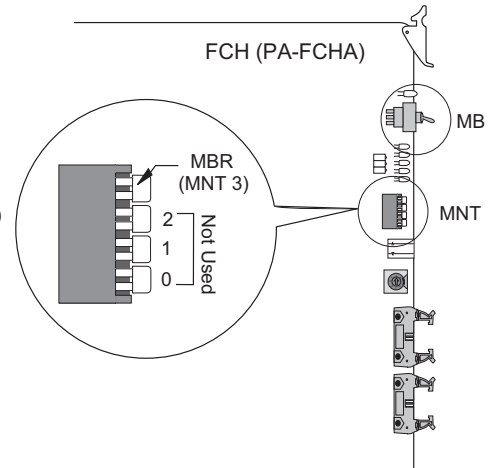


STEP 2: Replace the FCH card by following the procedure listed in the figure below.

How to Replace the FCH (PA-FCHA) Card

[How to Replace FCH card]

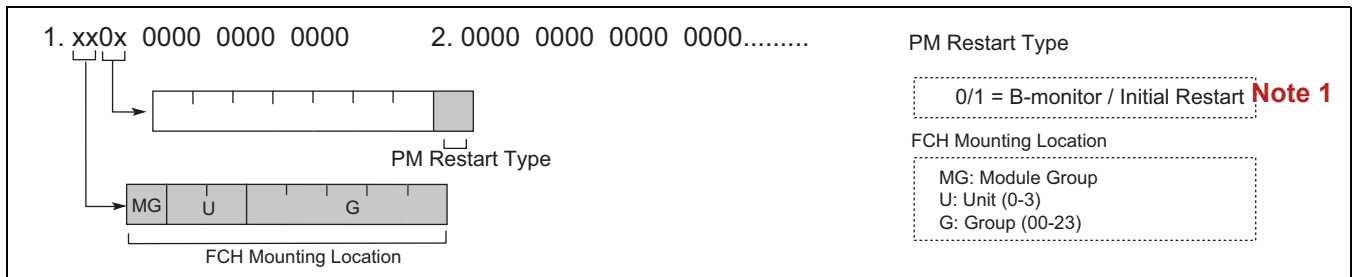
- 1) Provide the anti-static kit.
- 2) Turn ON the MNT 3 switch. (make-busy-request)
- 3) Make sure that system message (23-W) "FCH Alternate Routing (Start)" is displayed.
- 4) Turn the MB key upward. (make-busy)
- 5) Disconnect the front cable from the FCH card with care.
- 6) Extract the FCH card 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) Check the OPE lamp lights green.
- 14) Turn OFF the MNT 3 switch. (make idle)
- 15) Make sure that system message (23-X) "FCH Alternate Routing (Stop)" is displayed.



2.3 [3-C] PM C-level Infinite Loop (Temporary)

[3-C] PM C-level Infinite Loop (Temporary) 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 "Other FCCS related systems".

[3-C] PM C-level Infinite Loop (Temporary)



Note 1: 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 and placed in idle state.

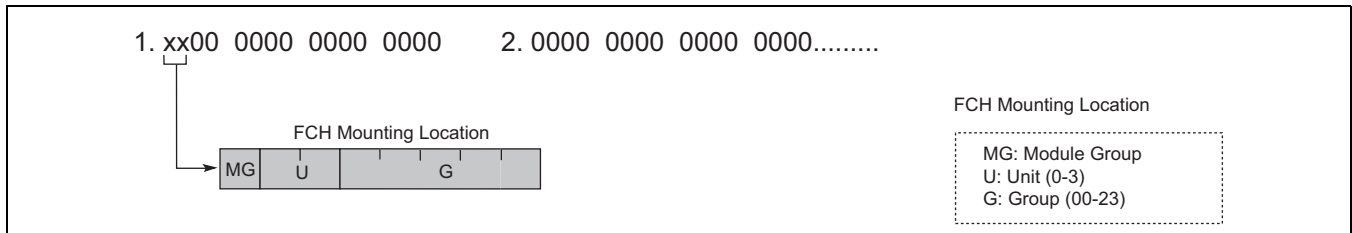
Repair Procedure

- STEP 1: If the [3-C] message has been displayed only once or twice, monitor the failure for a while. Move to STEP 2.
- STEP 2: Initialize the FCH card using the MB key. For details, refer to “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. Move to STEP 3.
- STEP 3: Replace the FCH card. For details, refer to the procedure listed in “How to Replace the FCH (PA-FCHA) Card.”

2.4 [3-D] PM Lockup Failure (Permanent)

[3-D] PM Lockup Failure (Permanent) message is displayed when 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.

[3-D] PM Lockup Failure (Permanent)



Repair Procedure

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

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

STEP 2: Initialize the FCH card using the MB key. For details, see “How to Initialize the FCH (PA-FCHA) Card.”

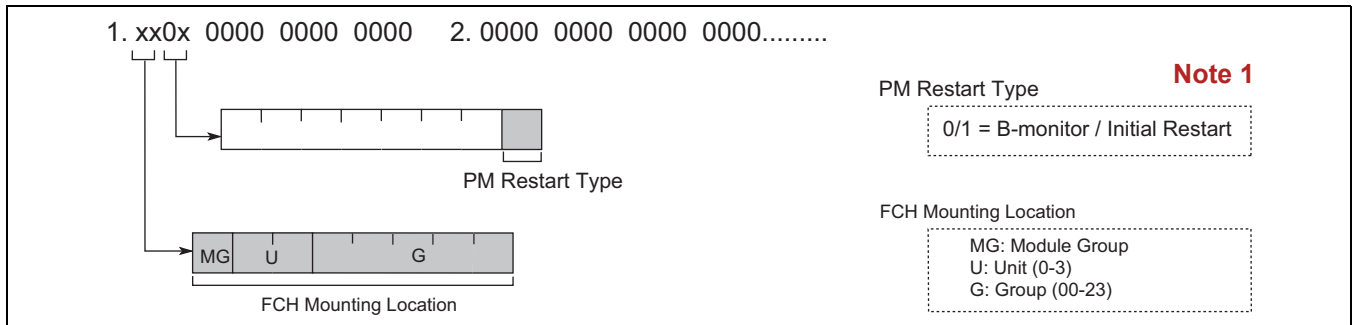
When the LED lights green and no system message related to this failure displays again, monitor the system for a while. Move to STEP 3.

STEP 3: Replace the FCH card. For details, refer to the procedure listed in “How to Replace the FCH (PA-FCHA) Card.”

2.5 [3-E] PM Lockup Failure (Temporary)

[3-E] PM Lockup Failure (Temporary) message is displayed when 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.

[3-E] PM Lockup Failure (Temporary)



Note 1: 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.

Repair Procedure

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

STEP 2: Initialize the FCH (PA-FCHA) card using the MB key. For details, see “How to Initialize the FCH (PA-FCHA) Card.”

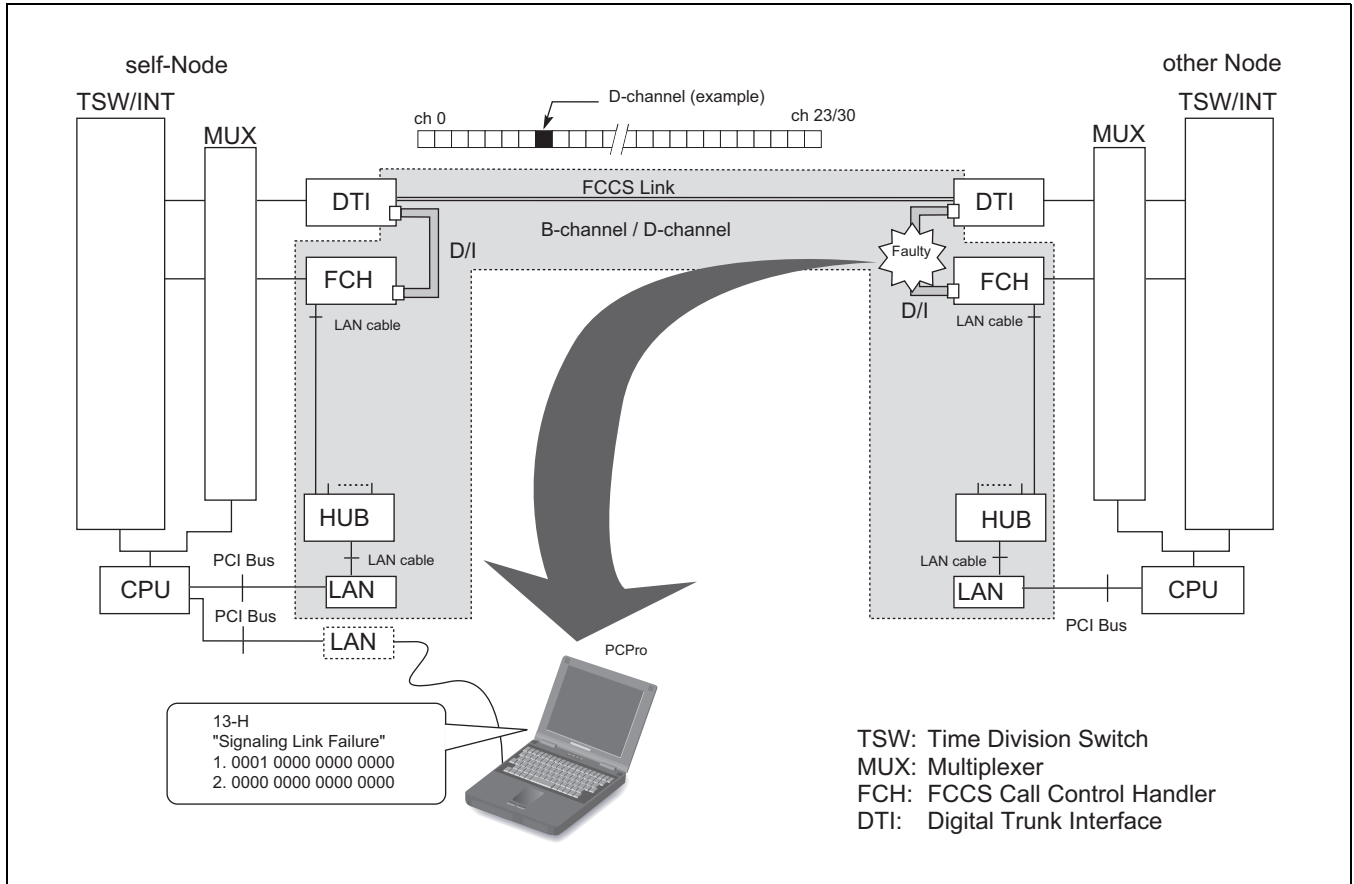
If this message is not displayed any more, monitor the FCH card for a while. Move to STEP 3.

STEP 3: Replace the FCH card. For details, refer to “How to Replace the FCH (PA-FCHA) Card.”

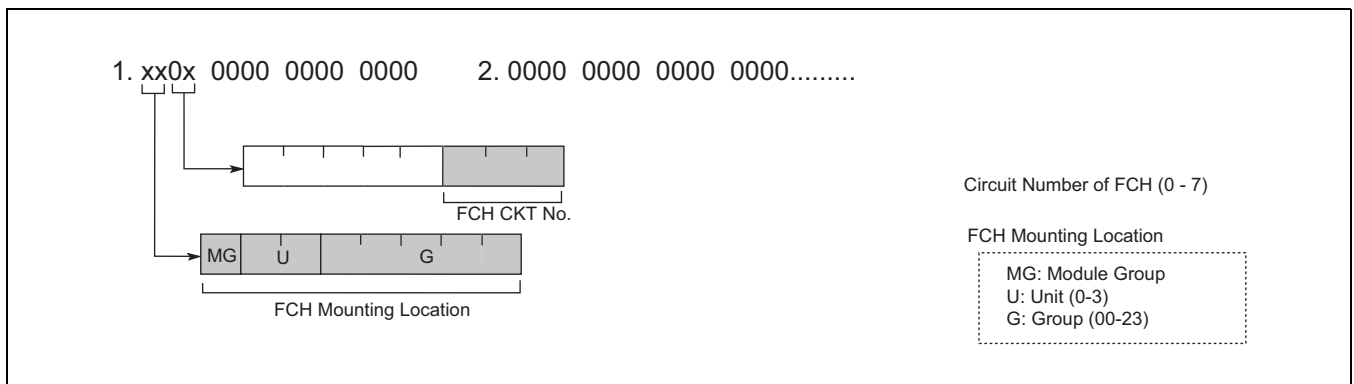
2.6 [13-H]/[13-I]/[13-J] Signaling Link Failure

[13-H] [13-I] [13-J] Signaling Link Failure message is displayed when the FCCS link (D-Channel) has a failure. If the failure occurs frequently, the system displays [13-H] Signaling Link Failure (Permanent). The shaded area in the figure below is related to this message.

FCCS Link (Signaling Link) Failure



[13-H]/[13-I]/[13-J] Signaling Link Failure System Message

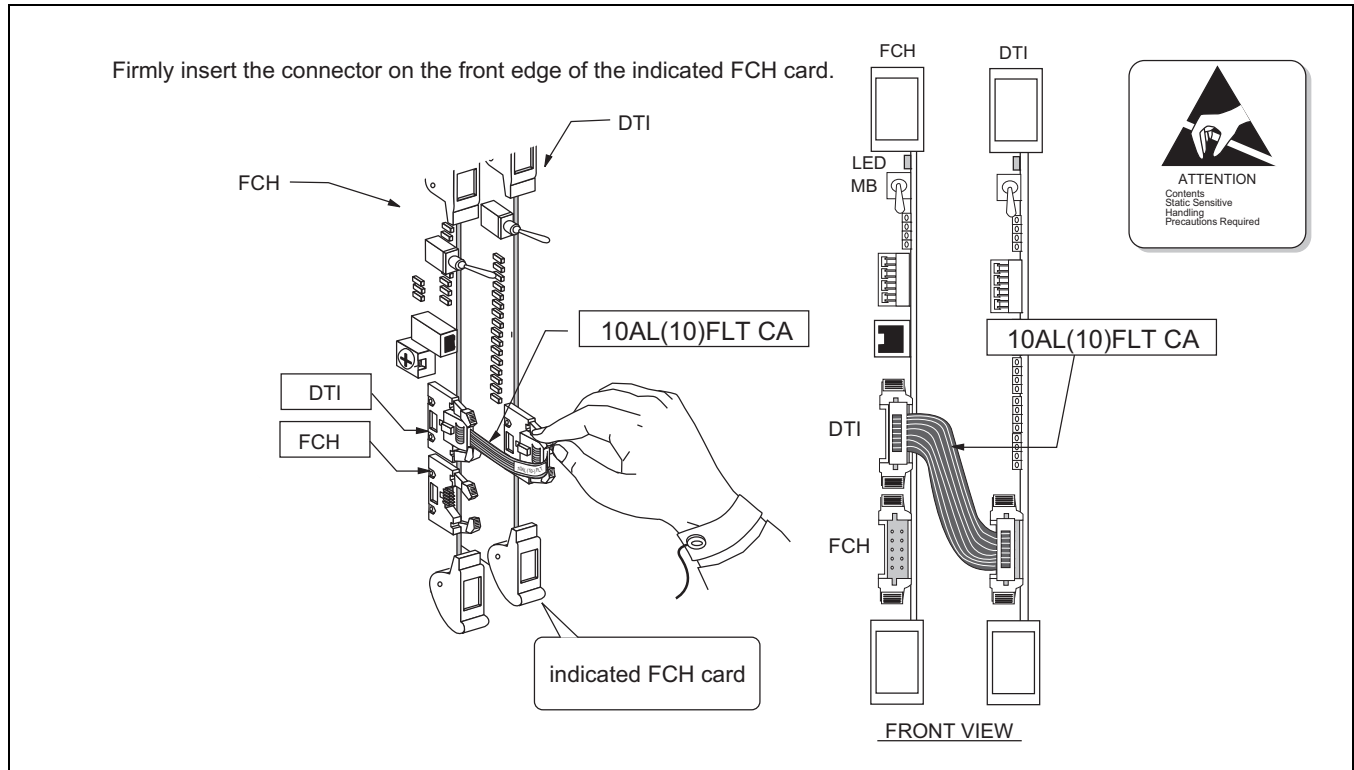


Repair Procedure

- [13-H] Signaling Link Failure (Permanent)

STEP 1: Make sure the front cable is securely inserted. See the figure below.

FCH-DTI Connection



- STEP 2: Initialize the FCH card using the MB key. For details, refer to “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. Move to STEP 3.
- STEP 3: Replace the FCH card. For details, refer to the procedure listed in “How to Replace the FCH (PA-FCHA) Card.” 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.

- [13-I] Signaling Link Failure (Temporary)

STEP 5: Make sure the front cable is securely inserted. (See FCH-DTI Connection.)

STEP 6: If this message has been displayed once or twice, monitor the failure for a while. Move to STEP 3.

STEP 7: If [13-J] (Recovery) has been displayed after this message, monitor the failure for a while. Move to STEP 4.

STEP 8: Initialize the indicated FCH (PA-FCHA) card using the MB key. (MB key: Down → Up → Down)

See “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 any more, monitor the system for a while. Otherwise, move to STEP 5.

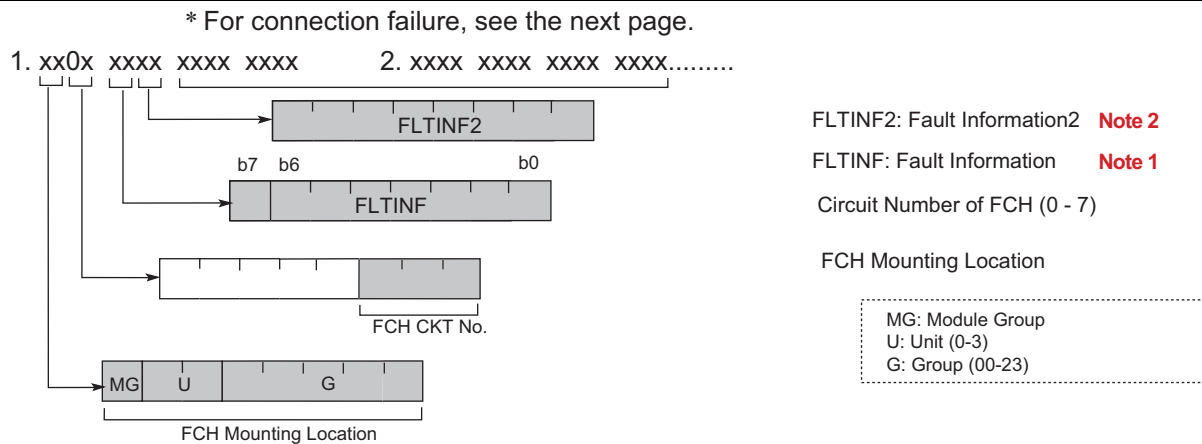
STEP 9: Replace the FCH card. For details, refer to the procedure listed in “How to Replace the FCH (PA-FCHA) Card.” If the failure exists after the card replacement, move to STEP 6.

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

2.7 [23-S] FCH Failure Notification (Detection)

[23-S] FCH Failure Notification (Detection) message is displayed when the FCH (PA-FCHA) card is faulty due to the problems such as an Ethernet controller initial failure. If this message is displayed, check the related LAN cables. This message is displayed in the following format:

[23-S] FCH Failure Notification (1/2)



Note 1: FLTINF (Fault Information) consists of the following:

b0-b6

01H: ETHER Controller Initial NG (If this is indicated, replace the FCH (PA-FCHA) card)

02H: ETHER Link Failure

03H: Connection Failure

b7

Kind of Circuit Card (This information is valid when b0-b6=03H: Connection Failure only)

0: FCCH/IPTRK

1: FGH

Note 2: FLTINF2 (Fault Information) consists of the following:

01H: Configuration Error

02H: ETHER Controller Reset Invalid

03H: ETHER Controller Initial NG

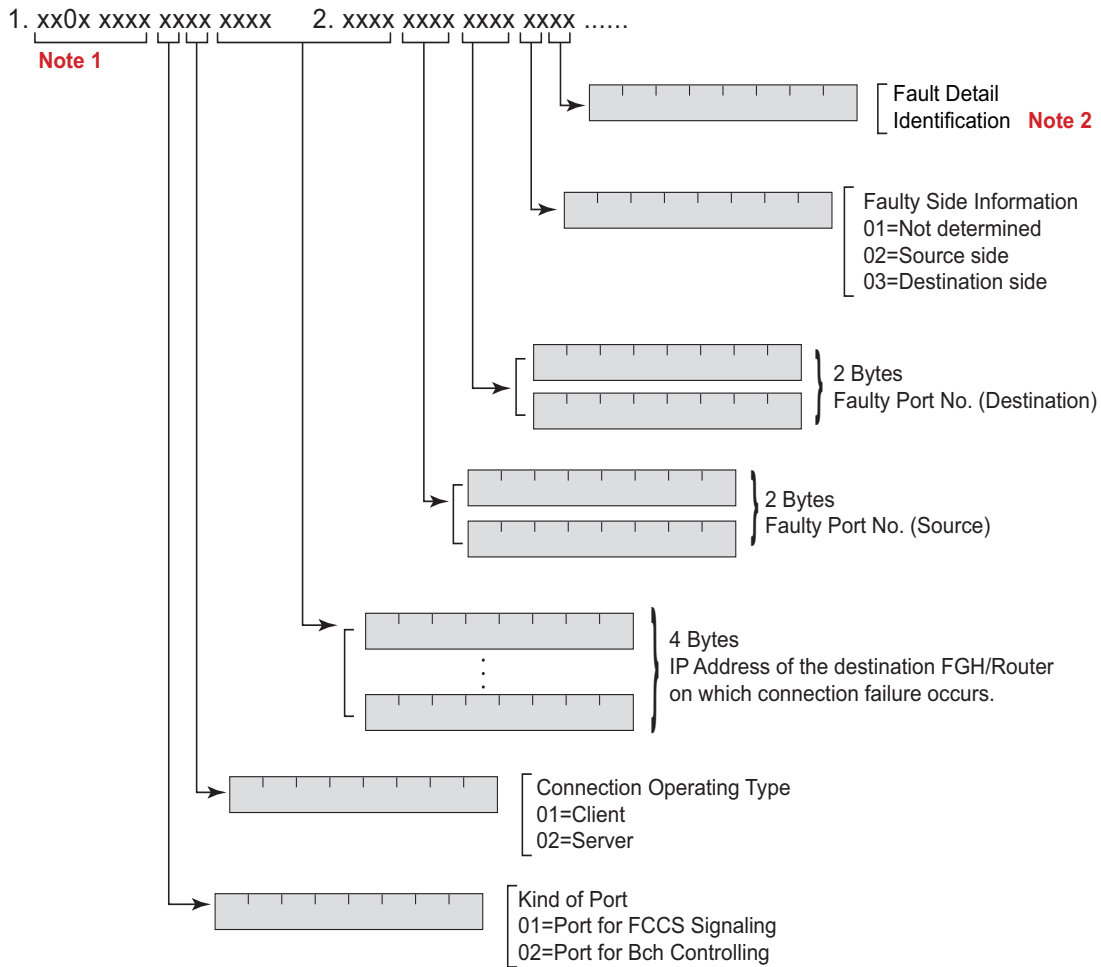
04H: MAC Address NG

This information is valid when FLTINF=01H: ETHER Controller Initial only

***The detailed fault information for 03H indication is explained on the next page.**

[23-S] FCH Failure Notification (2/2)

FLTINF=03H is indicated;



Note 1: Refer to the previous page for this information.

Note 2: Failure Detail Identification consists of the following:

02=TCP Link Error

Probable causes are;

- KEEP ALIVE packet time out
- TCP packet sending failure
- RST packet receiving
- ICMP (Information that unable to reach to the destination) receiving
- ICMP (Parameter irregular information) receiving

11=Receiving Packet Error 1

Sending/Receiving of User Header Information is started, however, Time Out occurs when the sending/receiving of information is not completed within the determined time period.

12=Receiving Packet Error 2

When User Header Information included in receiving packet is searched and not found state continues over the determined time period.

13=Receiving Packet Error 3

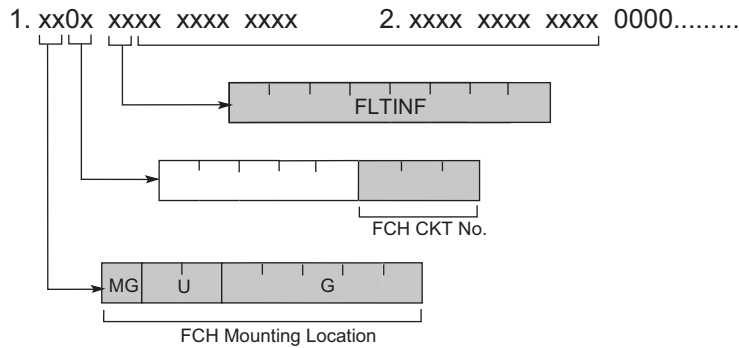
Time out occurs because user data following the User Header Information have not received completely within the determined time period.

2.8 [23-T] FCH Fault Notification (Recovery)

[23-T] FCH Fault Notification (Recovery) message is displayed when the FCH (PA-FCHA) card that was detected as faulty is recovered. This message is displayed in the following format.

[23-T] FCCH Fault Recovery Notification (1/2)

Note 1



FLTINF: Fault Information **Note 2**

Circuit Number of FCH (0 - 7)

FCH Mounting Location

MG: Module Group
U: Unit (0-3)
G: Group (00-23)

Note 1: For more information, refer to [23-T] FCCH Fault Recovery Notification (2/2).

Note 2: FLTINF (Fault Information) consists of the following:

b0-b6

01H: ETHER Controller Initial NG (If this is indicated, replace the FCH (PA-FCHA) card)

02H: ETHER Link Failure

03H: Connection Failure

b7

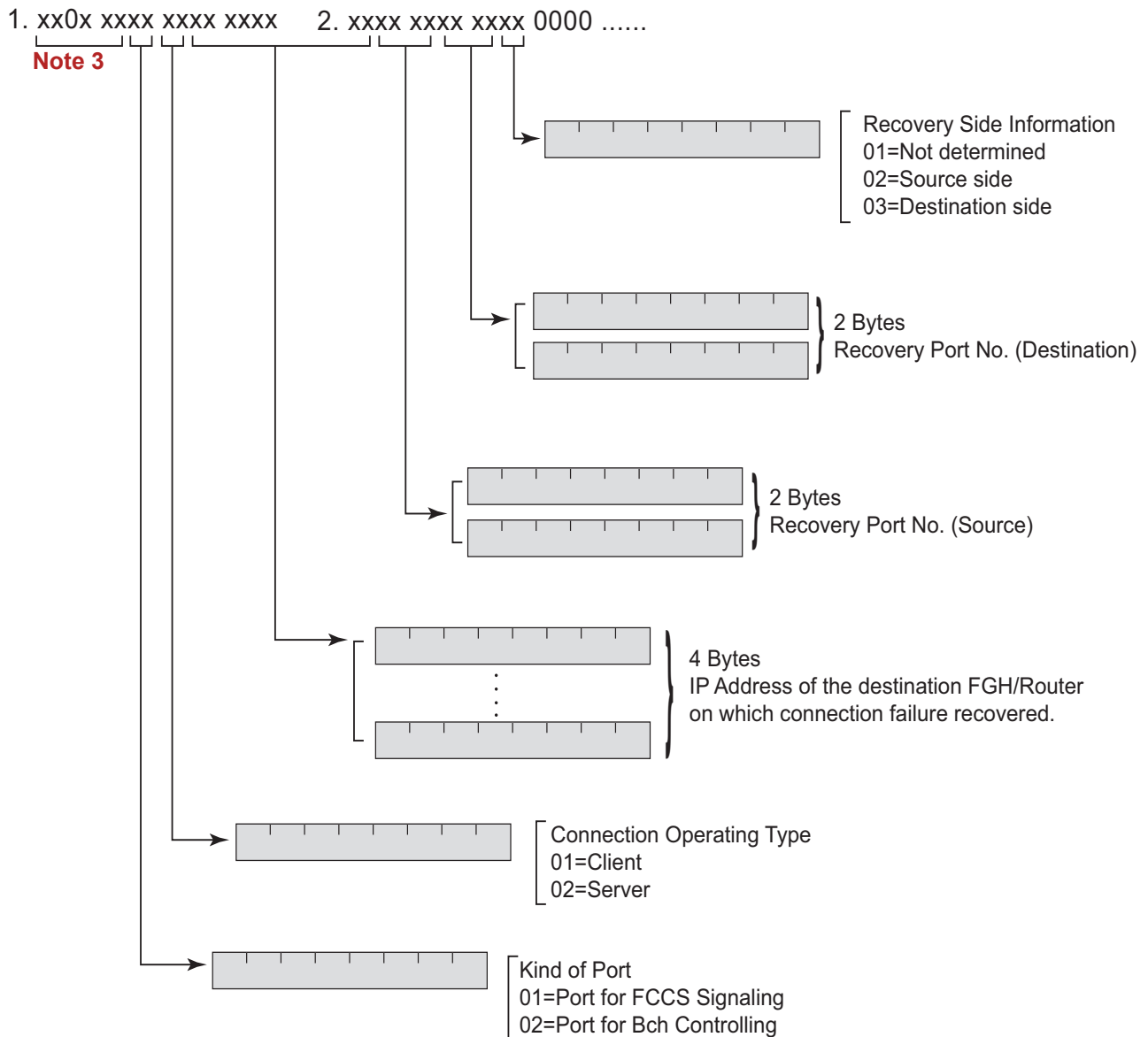
Kind of Circuit Card (This information is valid when b0-b6=03H: Connection Failure only)

0: FCCH/IPTRK

1: FGH

[23-T] FCCH Fault Recovery Notification (2/2)

FLTINF=03H is indicated;

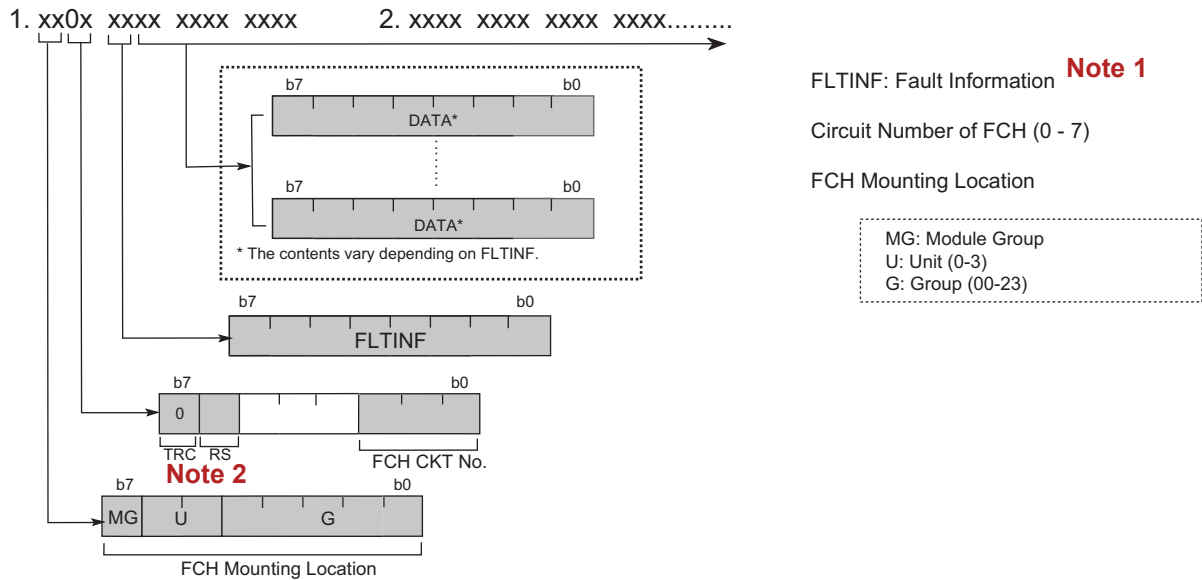


Note 3: Refer to the previous page for this information.

2.9 [23-U] FCH Status Information

[23-U] FCH Status Information message is displayed when the status change of FCH (PA-FCHA) card is detected, which includes FCH Initial Setting Failure and ETHER Transfer Failure. When this message is displayed, follow the procedure explained on a fault information. This message is displayed in the following format.

[23-U] FCCH Status Notification



Note 1: FLTINF (Fault Information) consists of the following:

OOH:Initial Setting Failure Notification
 18HSpanning Tree Abnormal Answer Notification
 1DHETHER Transfer Failure Notification
 1EHSpanning Tree Generation End Notification
 1FHSpanning Tree Generation Start Notification
 85HCheck Sum Verify Failure Notification

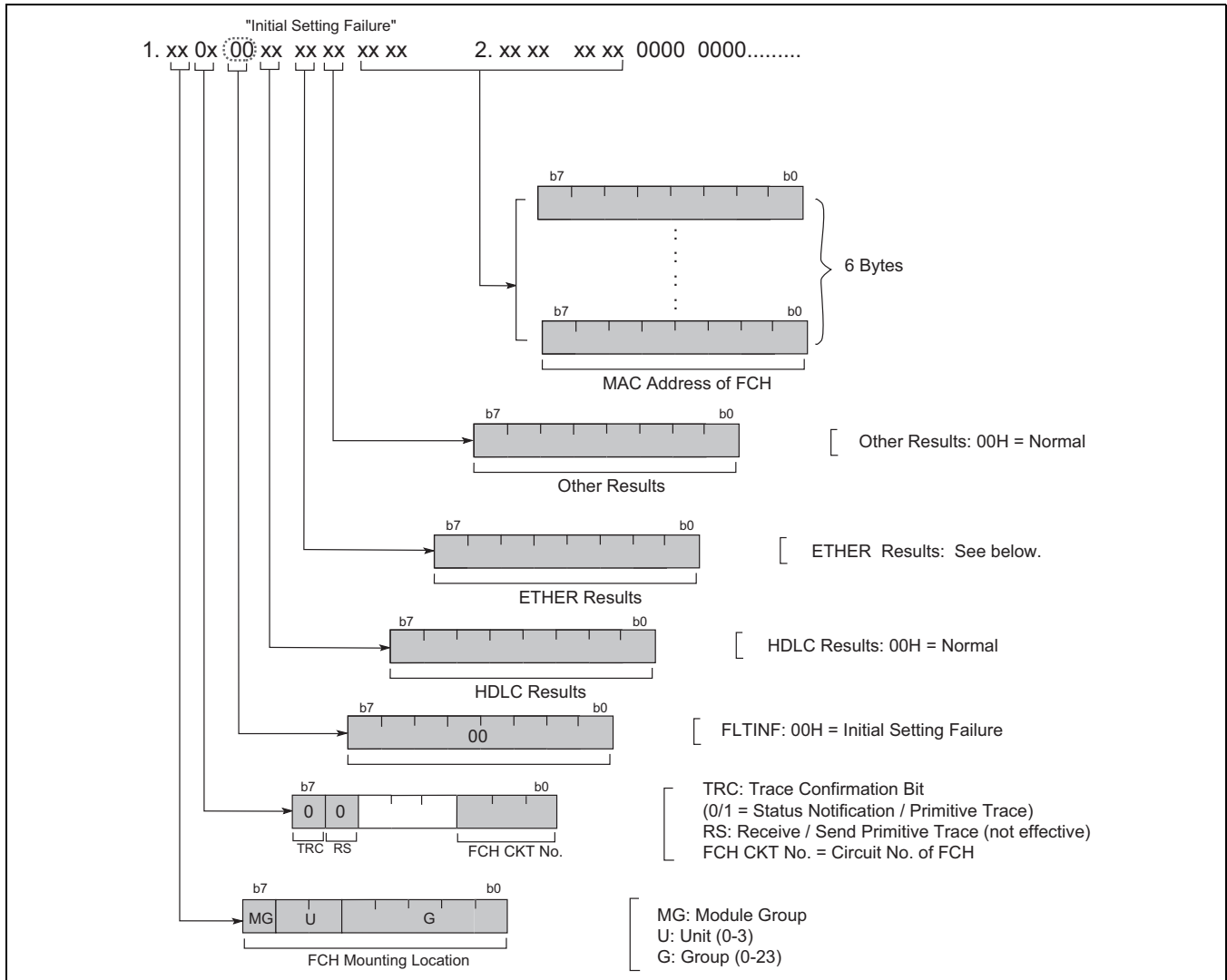
Note 2: When TRC = 1, the subsequent data indicates "Date Information" + "Primitive Contents"

Note: The detailed fault information is explained on the following pages.

2.9.1 FLTINF = 00H Initial Setting Failure

FLTINF = 00H Initial Setting Failure message is displayed when the Ethernet Controller Initial Setting ends in failure. This message is displayed in the following format.

[23-U] FCCH Status Notification - Initial Setting Failure



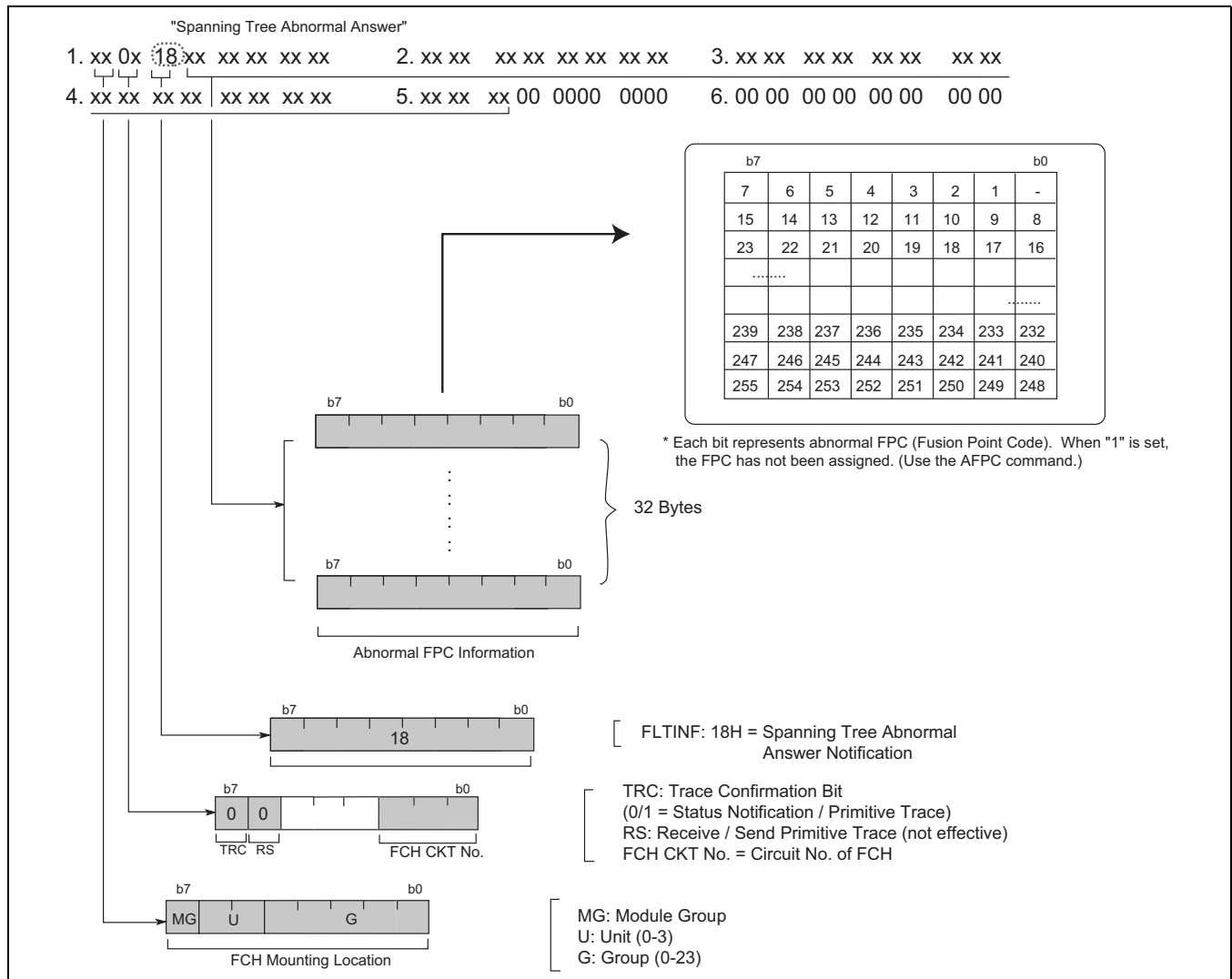
ETHER Results

- 00H: Normal
- 01H: ETHER Controller Reset Impossible
- 02H: Configuration Error
- 03H: ETHER Controller Initial NG
- 04H: ETHER Controller Initial NG

2.9.2 FLTINF = 18H Spanning Tree Abnormal Answer

FLTINF = 18H Spanning Tree Abnormal Answer message is displayed when Spanning Tree Abnormal Answer is detected. This message is displayed in the following format.

[23-U] FCCH Status Notification - Spanning Tree Abnormal Answer

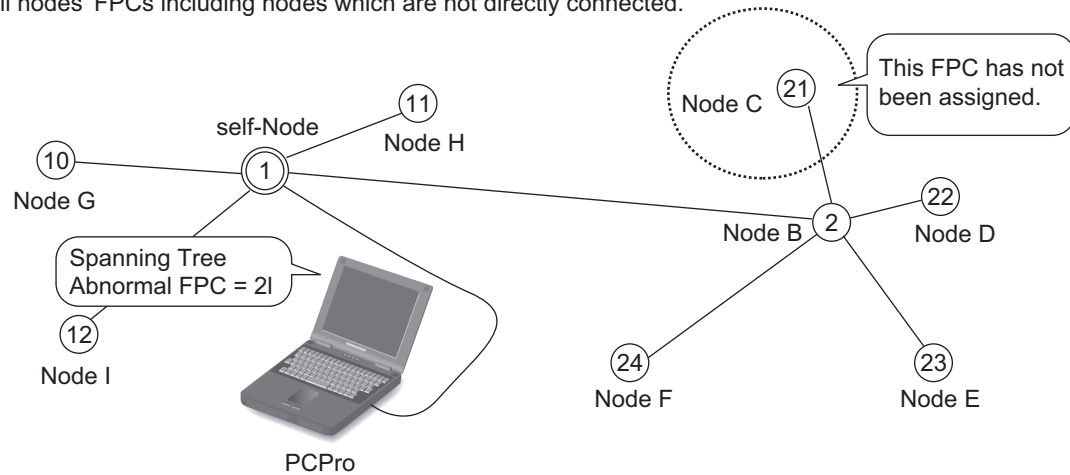


Repair Procedure

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

Spanning Tree Abnormal Answer

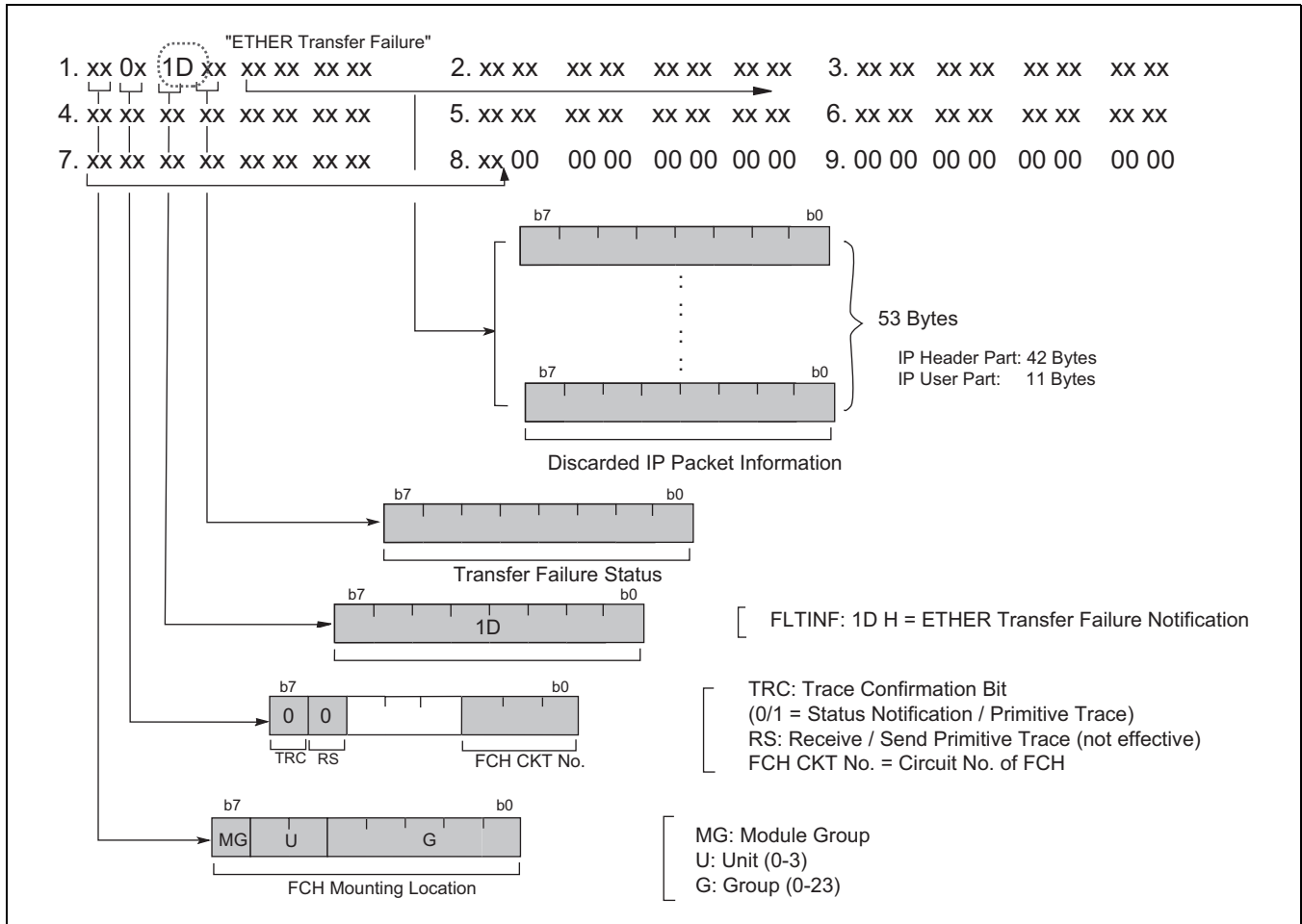
Assign all nodes' FPCs including nodes which are not directly connected.



2.9.3 FLTINF = 1DH ETHER Transfer Failure

FLTINF = 1DH ETHER Transfer Failure 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.

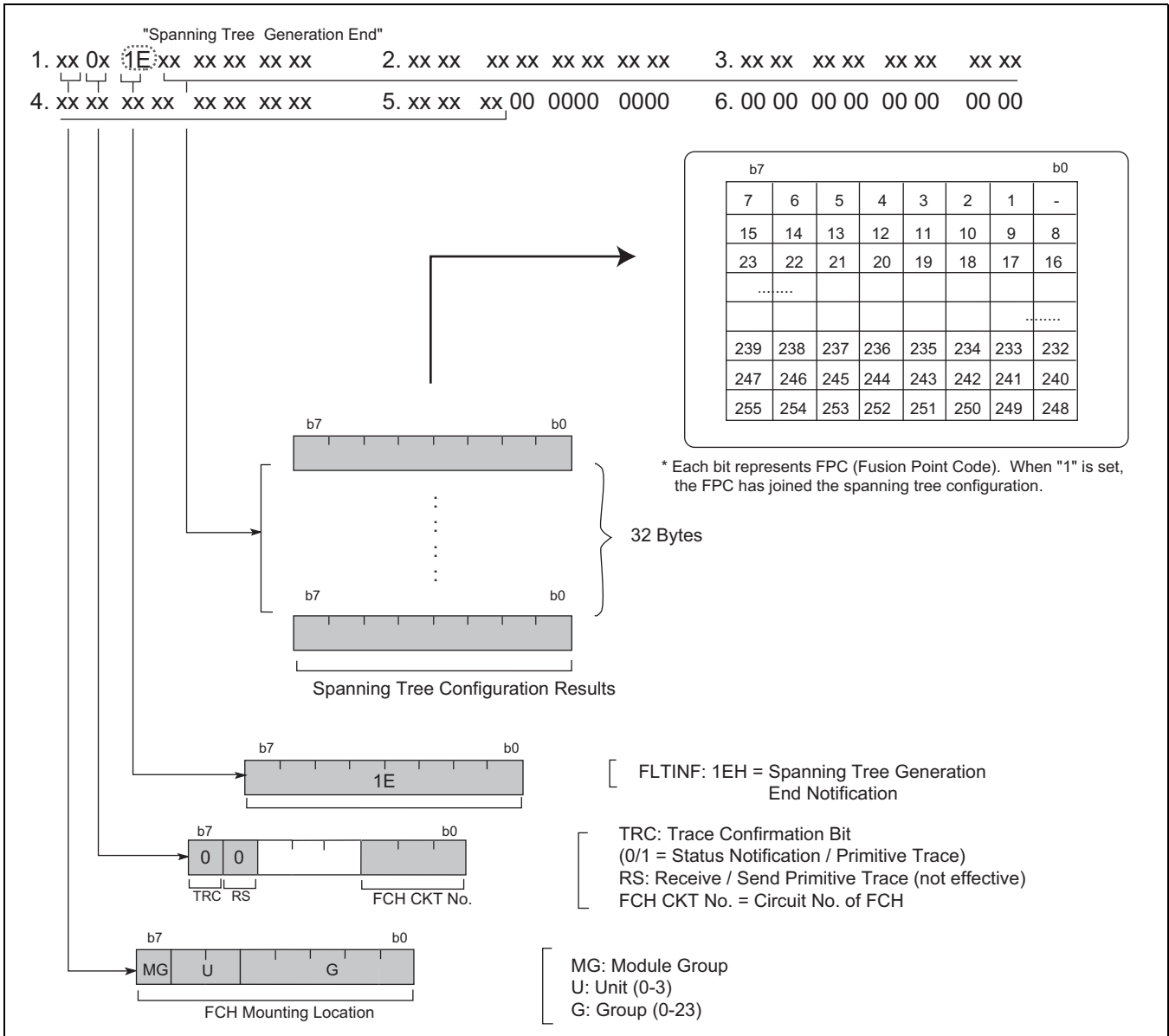
[23-U] ETHER Transfer Failure



2.9.4 FLTINF = 1EH Spanning Tree Generation End

FLTINF = 1EH Spanning Tree Generation End message is displayed when Spanning Tree Generation is complete. This message is displayed in the following format.

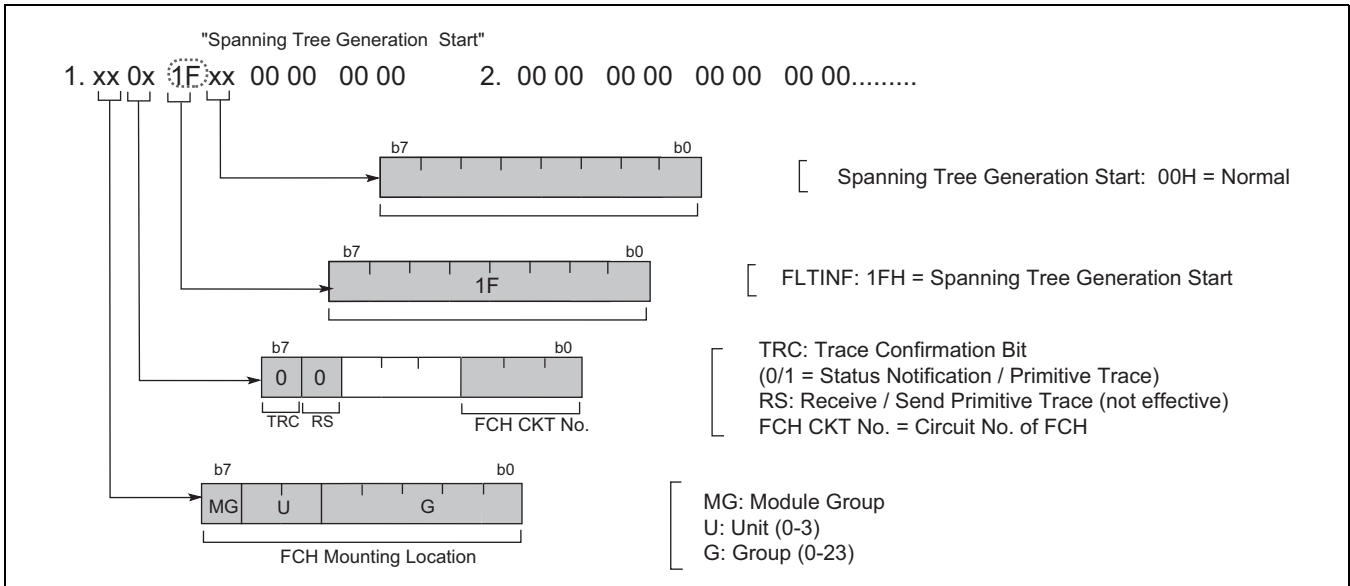
[23-U] FCCH Status Notification - Spanning Tree Generation End



2.9.5 FLTINF = 1FH Spanning Tree Generation Start

FLTINF = 1FH Spanning Tree Generation Start message is displayed when Spanning Tree Generation starts. This message is displayed in the following format.

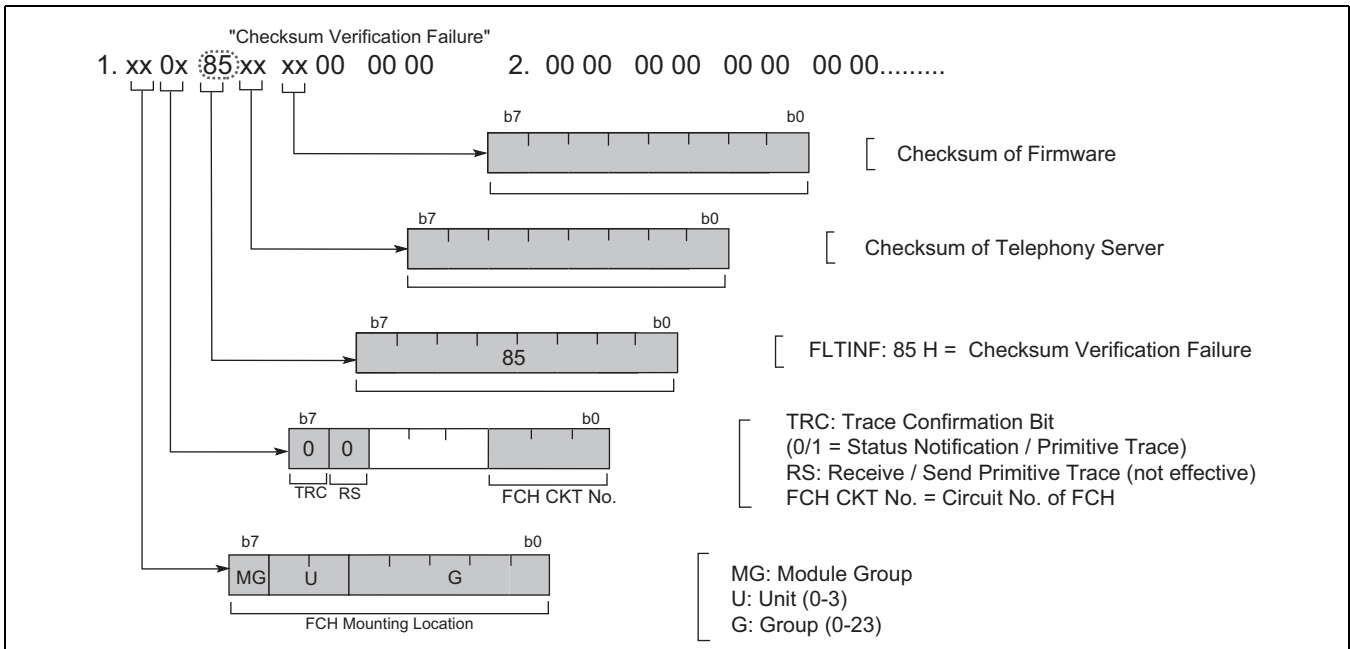
[23-U] FCCH Status Notification - Spanning Tree Generation



2.9.6 FLTINF = 85H Checksum Verification Failure

FLTINF = 85H Checksum Verification Failure message is displayed when Checksum verification has resulted in failure between the Telephony Server and the firmware.

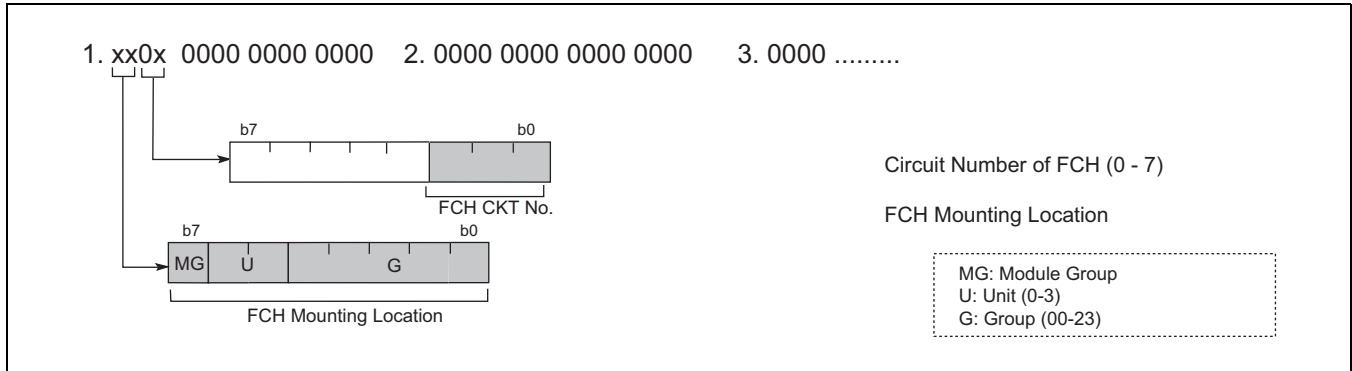
[23-U] FCCH Status Notification - Checksum Verification Failure



2.10 [23-W] FCH Alternate Routing Start Notification

[23-W] FCH Alternate Routing Start Notification 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. When the FCH of the adjacent node becomes inoperative, this message is displayed.

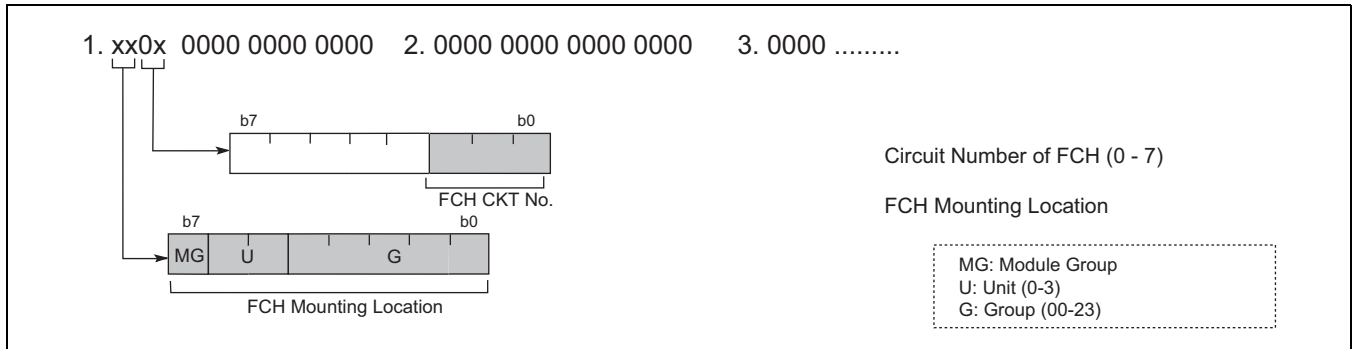
[23-W] FCCH Alternate Routing Start Notification



2.11 [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.

[23-X] FCCH Alternate Routing End Notification



2.12 [36-F] Fusion Health Check Report (Temporary/Permanent)

[36-F] Fusion Health Check Report (Temporary/Permanent) is output when the timeout of Fusion Health Check is detected.

This message is of two types: Temporary and Permanent.

The temporary failure message is displayed when the timeout of Fusion Health Check is detected. **Note 1**
The permanent failure message is displayed when the timeout of Fusion Health Check has been detected ten consecutive times.

Fusion Health Check is executed by assigning the system data [ASYDL/ASYDN: SYS1, Index 530]. Also, the system message [36-F/36-K/36-T] is output when the timeout of Fusion Health Check is detected, by assigning the system data [ASYDL/ASYDN: SYS1, Index 534]. Refer to Command Manual for the detail.

Note 1: By default, the message is defined to be output at the first timeout; this output timing can be changed by the system data [ASYDL/ASYDN:SYS1, Index 656, Bits 0-3].

Note: While [36-F] Fusion Health Check Report (Temporary/Permanent) has been output for the temporary timeout of Fusion Health Check, if Release Alarm is executed, the Error Counter will be cleared. Therefore, if the timeout of Fusion Health Check is detected after Release Alarm is executed, the [36-F] Fusion Health Check Report (Temporary/Permanent) will be output for the temporary timeout of Fusion Health Check. Also, if Release Alarm is executed when the timeout of Fusion Health Check is detected, [36-K] Fusion Health Check Report (Recovery) will not be output.

Note: [36-T] Fusion Health Check Report (Permanent) can be output instead of [36-F] Fusion Health Check Report (Temporary/Permanent) for the permanent timeout of Fusion Health Check when the system data [ASYDL/ASYDN: SYS1, Index 655, Bit 0-2 = 1] is assigned, which can be specified on an FCCS type basis as shown on the table below.

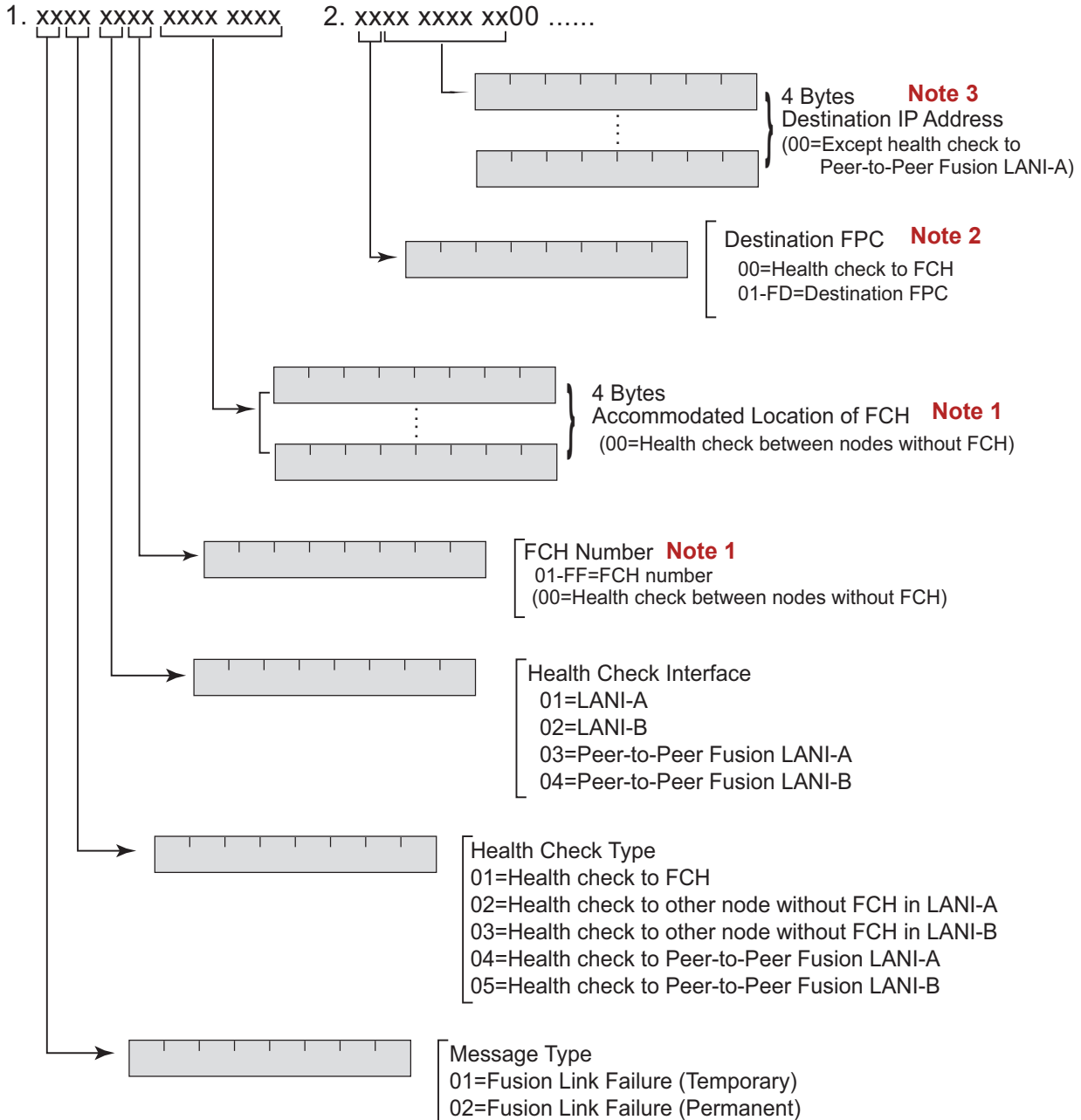
FCCS Type		Target Device	Remark
Peer-to-Peer		External LAN → External LAN	Except for Ether Link Disconnection
Legacy	FCH/IPTRK	HUB → FCH/IPTRK	Except for Internal LAN Cable Disconnection
	Internal LAN Direct Connection	HUB → HUB	

Note: When [36-F] Fusion Health Check Report (Temporary/Permanent) or [36-T] Fusion Health Check Report (Permanent) is output, if there is no alternate route, a call cannot be made to the node where a failure is occurring until [36-K] Fusion Health Check Report (Recovery) is output. However, a call can be made within the same node or node where a failure is not occurring.

Note: When [36-F] Fusion Health Check Report (Temporary/Permanent) or [36-T] Fusion Health Check Report (Permanent) is output, [36-K] Fusion Health Check Report (Recovery) is output when released.

The details of this message are in the following:

[36-F] Fusion Health Check Report (Temporary/Permanent)



Note 1: Used for systems with FCH only. For systems without FCH, 00 is displayed.

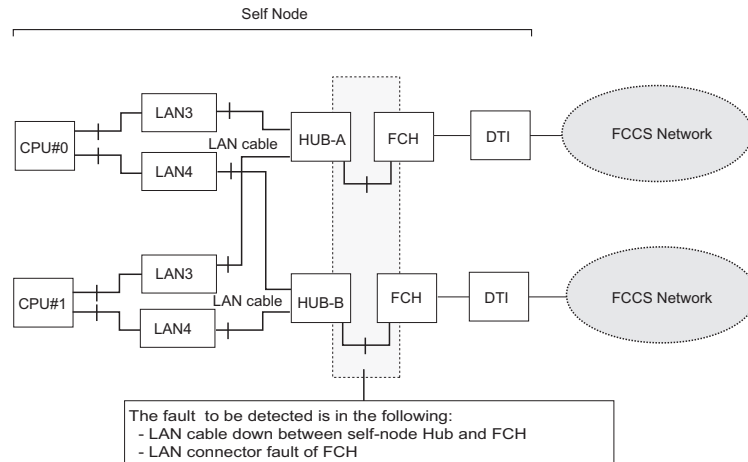
Note 2: Used for systems without FCH only. For systems with FCH, 00 is displayed.

Note 3: Available from FP95-112 V2.

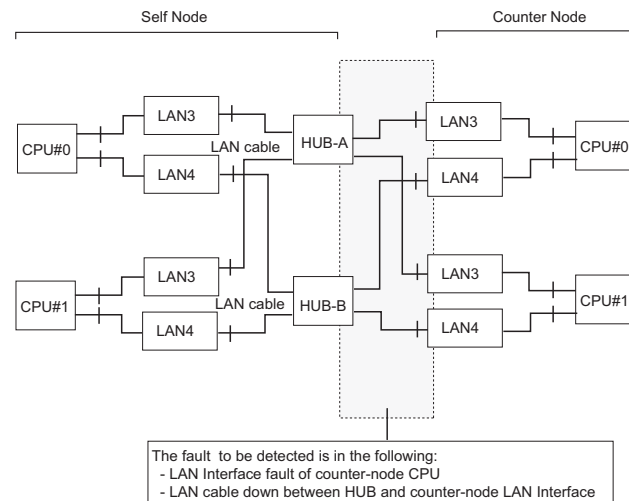
Health check to be performed is of two types: health check to FCH and FPC. The health check to FCH is performed between CPU and FCH of a switch in FCCS network, connected via FCH. The health check to FPC is performed between its node and another node in FCCS network, connected via Hub or other network equipment (without FCH). The following shows the range of these health checks in the systems.

Health Check Range of System and Detected Fault Information

Health Check to FCH



Health Check to FPC



Note: FCCS stands for Fusion Call Control Signaling.

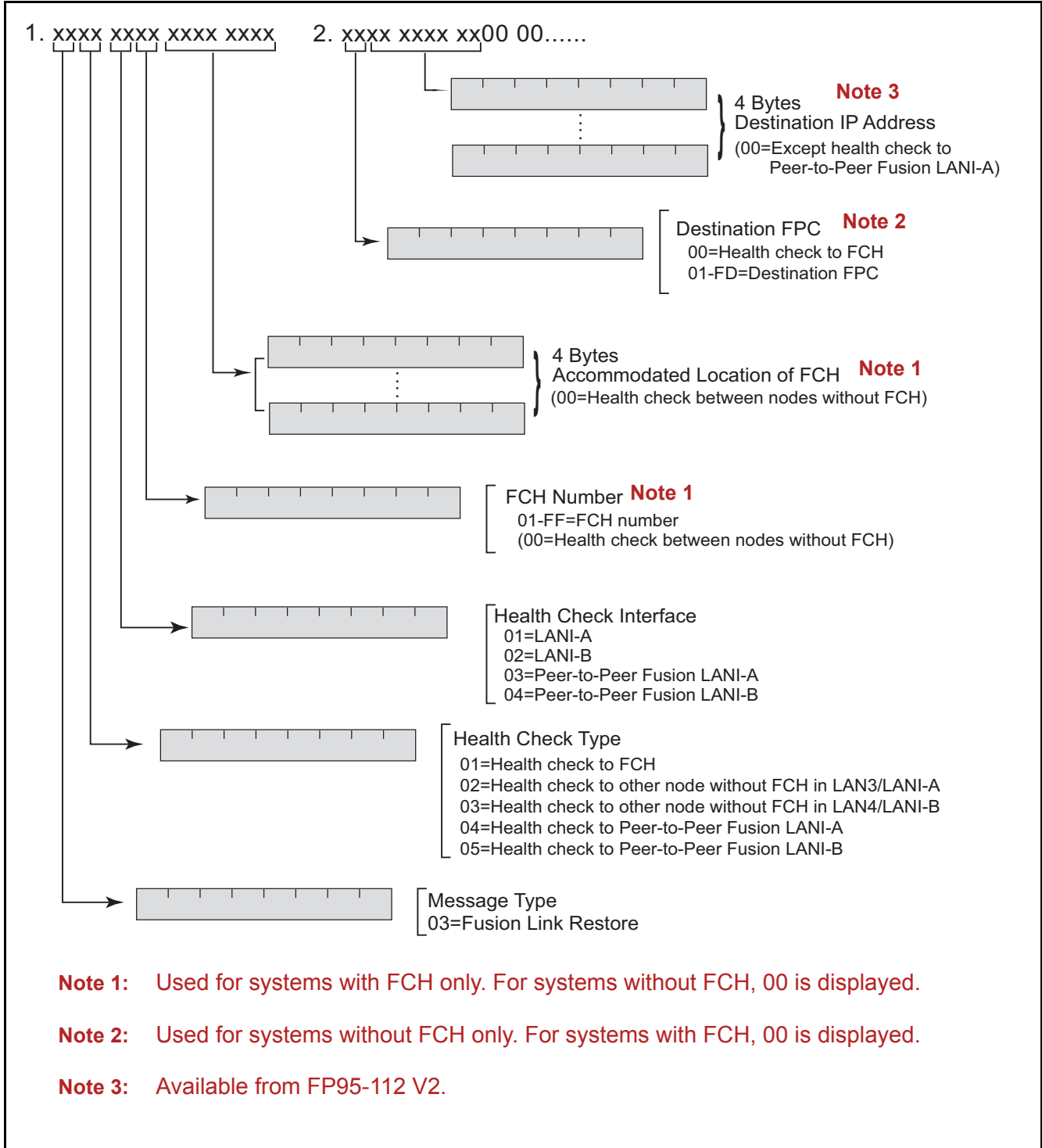
Repair Procedure

Make sure the LAN cable and connectors referring to Repair Procedure of “23-S FCH Failure Notification (Detection)”.

2.13 [36-K] Fusion Health Check Report (Recovery)

[36-K] Fusion Health Check Report (Recovery) message is output when Fusion Health check succeeded after [36-F] Fusion Health Check Report (Temporary/Permanent) or [36-T] Fusion Health Check Report (Permanent) is output. The details of this message are in the following:

[36-K] Fusion Health Check Report (Recovery)



2.14 [36-T] Fusion Health Check Report (Permanent)

[36-T] Fusion Health Check Report message (Permanent) is output when the timeout of Fusion health check has been detected ten consecutive times after an output of temporary timeout of Fusion Health Check of [36-F] Fusion Health Check Report (Temporary/Permanent). At this time, the temporary timeout is not counted.

Fusion Health Check is executed by assigning the system data [ASYDL/ASYDN: SYS1, Index 530]. Also, the system message [36-F/36-K/36-T] is output when the timeout of Fusion Health Check is detected, by assigning the system data [ASYDL/ASYDN: SYS1, Index 534]. Refer to Command Manual for the detail.

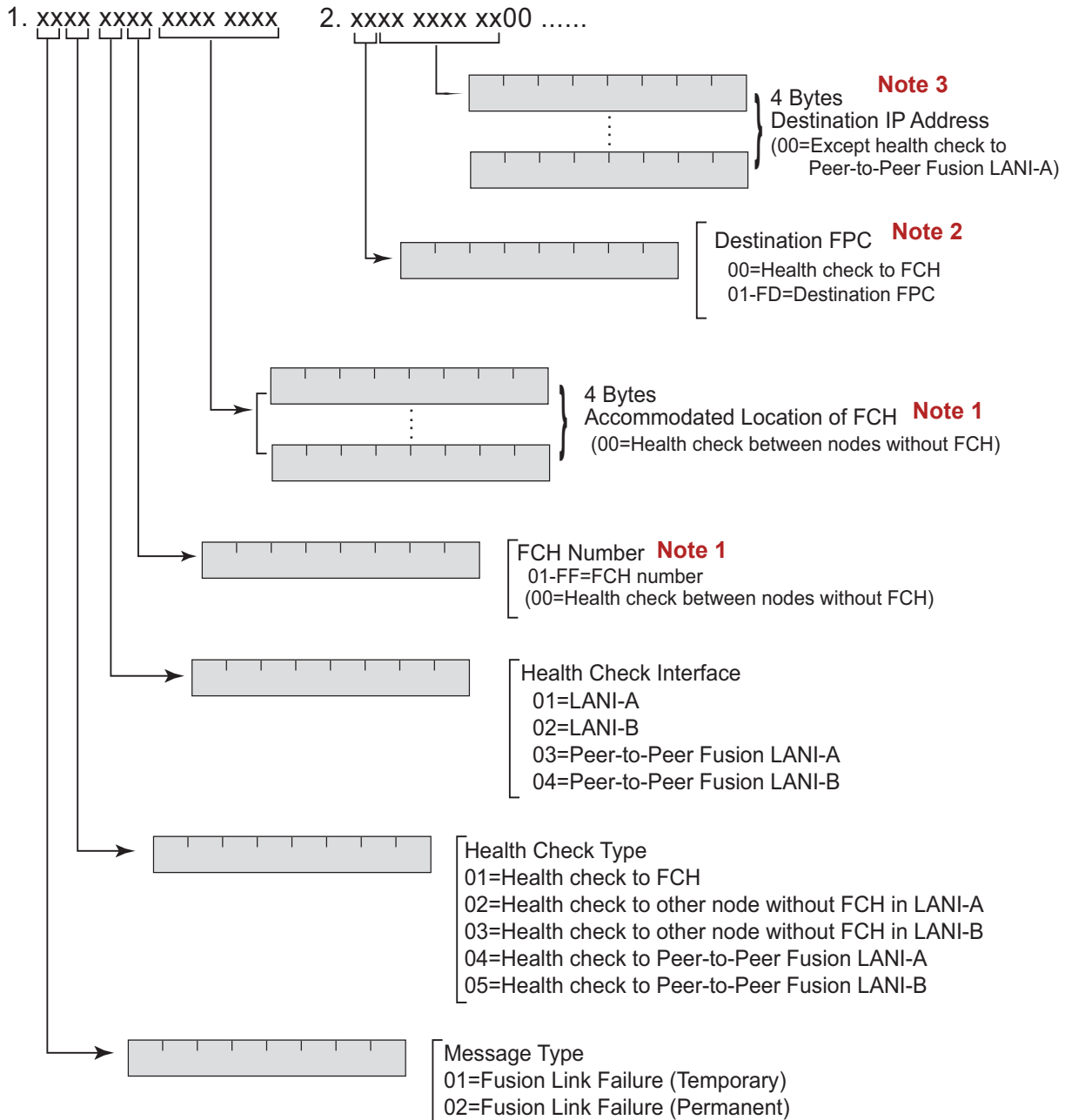
Note: [36-T] Fusion Health Check Report (Permanent) can be output instead of [36-F] Fusion Health Check Report (Temporary/Permanent) for the permanent timeout of Fusion Health Check when the system data [ASYDL/ASYDN: SYS1, Index 655, Bit 0-2 = 1] is assigned, which can be specified on an FCCS type basis as shown on the table below.

FCCS Type		Target Device	Remark
Peer-to-Peer		External LAN → External LAN	Except for Ether Link Disconnection
Legacy	FCH/IPTRK	HUB → FCH/IPTRK	Except for Internal LAN Cable Disconnection
	Internal LAN Direct Connection	HUB → HUB	

Note: When [36-F] Fusion Health Check Report (Temporary/Permanent) or [36-T] Fusion Health Check Report (Permanent) is output, if there is no alternate route, a call cannot be made to the node where a failure is occurring until [36-K] Fusion Health Check Report (Recovery) is output. However, a call can be made within the same node or node where a failure is not occurring.

Note: When [36-F] Fusion Health Check Report (Temporary/Permanent) or [36-T] Fusion Health Check Report (Permanent) is output, Fusion Health Check Report (Recovery) [36-K] is output when released.

The details of this message are in the following:

[36-F] Fusion Health Check Report (Temporary/Permanent)

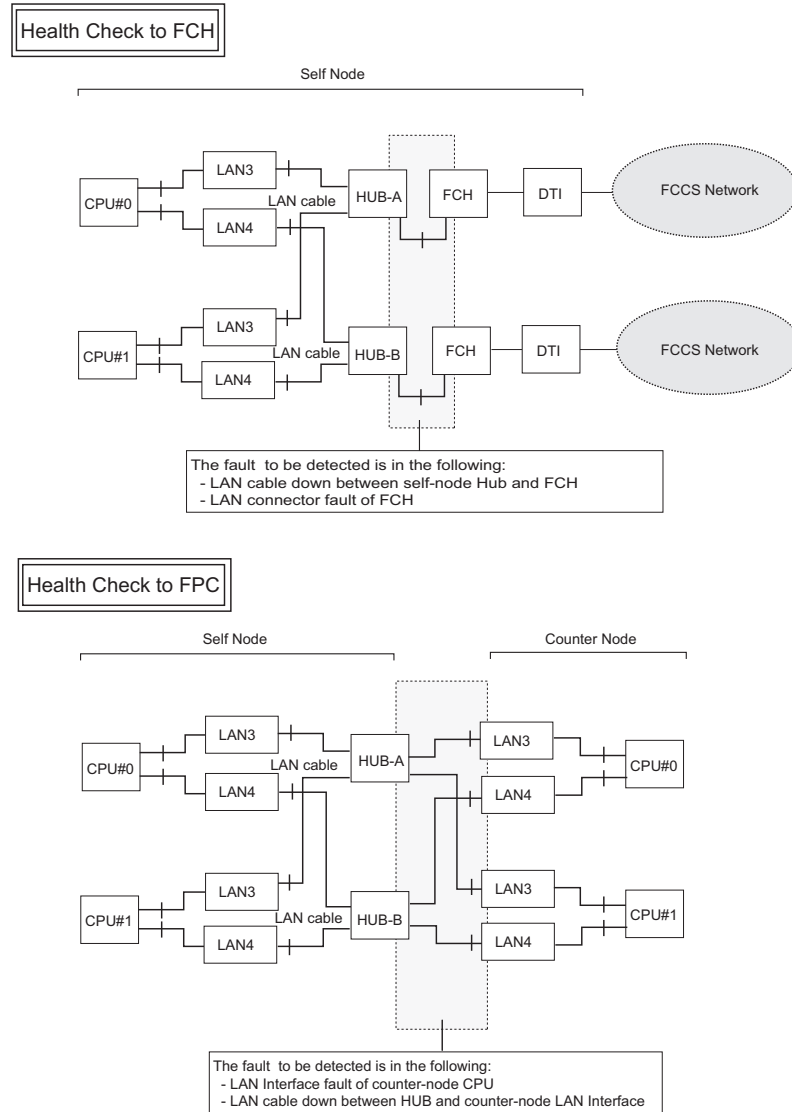
Note 1: Used for systems with FCH only. For systems without FCH, 00 is displayed.

Note 2: Used for systems without FCH only. For systems with FCH, 00 is displayed.

Note 3: Available from FP95-112 V2.

Health check to be performed is of two types: health check to FCH and FPC. The health check to FCH is performed between CPU and FCH of a switch in FCCS network, connected via FCH. The health check to FPC is performed between its node and another node in FCCS network, connected via Hub or other network equipment (without FCH). The following shows the range of these health checks in the systems.

Health Check Range of System and Detected Fault Information



Note: FCCS stands for Fusion Call Control Signaling.

Repair Procedure

Make sure the LAN cable and connectors referring to Repair Procedure of “23-S FCH Failure Notification (Detection)”.

UNIVERGE SV9500

Data Programming Manual - FCCS

NWD-165809-001

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