NEC

ND-70182 (E)
ISSUE 4
STOCK # 200866

NEAX® 2400 IMX

Circuit Card Manual

MAY, 2000

NEC America, Inc.

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LIST OF TABLES

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CHAPTER 1 INTRODUCTION

1. General

This manual provides the circuit card description for the NEAX2400 IMX system.

This manual is for those persons who are involved in the system setup and administration activities for the NEAX2400 IMX. For each circuit card the following items are explained:

- General function
- Slot to mount the circuit card
- Precautions for mounting the card
- Location of the electronic devices on the card surface
- Description of the LED
- Description of the switches
- Physical interface

The circuit cards explained in this manual are divided into two categories, the Control Circuit Cards and the Line/Trunk Circuit Cards. You can easily define the card category by the pull tab color of the circuit card.

- Control Circuit Card

  White or red pull tab circuit cards are categorized as control circuit card. Also, the circuit cards in the Central Processor Rack (CPR) have white or red pull tabs.

- Line/Trunk Circuit Card

  Blue or yellow pull tab circuit cards are categorized as line/trunk circuit cards.

Note: *This manual is intended to describe only the basic line/trunk interface circuit cards of the NEAX2400 IMX. When you use circuit cards not shown in this manual, you may refer to the NEAX2400 ICS Circuit Card Manual with the following changes:*

- *The line/trunk circuit card shown in the above mentioned manual is compatible with NEAX2400 IMX; however, the exceptions are PA-CS02-C (2AT1) and PA-CS08B (H/MATI).*
- *The external appearance of PIM U (which is the standard port interface module of NEAX2400 IMX) is the same as the PIM J of the NEAX2400 ICS.*
- *The PCM highway running in PIM is different. More details are explained in this manual's section on PH-PC36 (MUX).*

2. Mounting Location of Circuit Card

The control circuit cards for the 1 IMG system should be mounted in their dedicated slots, as shown in Figure 1-1. The control circuit cards for the 4 IMG system should be mounted in their dedicated slots, as shown in Figure 1-2 through Figure 1-2. The control circuit cards for the IMX-U system should be mounted in their dedicated slots as shown in Figure 1-3 through Figure 1-3.

As a general rule, the blue pull tab line/trunk circuit cards are mounted in the universal slots that are located in Slots 04 - 12 and 15 - 23 of the Port Interface Module (PIM).

The yellow pull tab line/trunk circuit cards (MISC) are mounted in Slots 00 - 02 of the LPM.

Additional GT/LANI cards are mounted in the CPR.

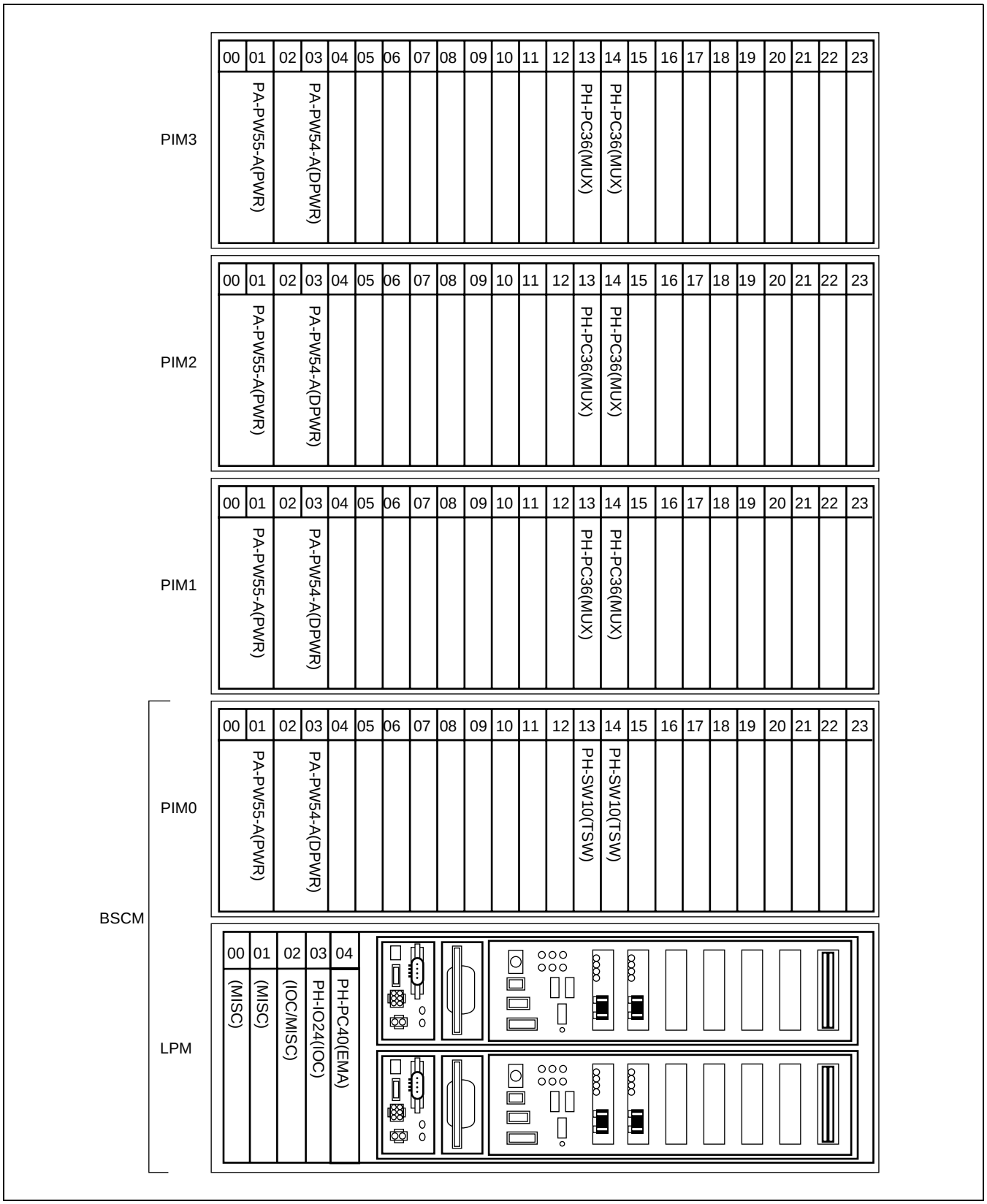


Figure 1-1 Card Mounting Slot for the 1 IMG System

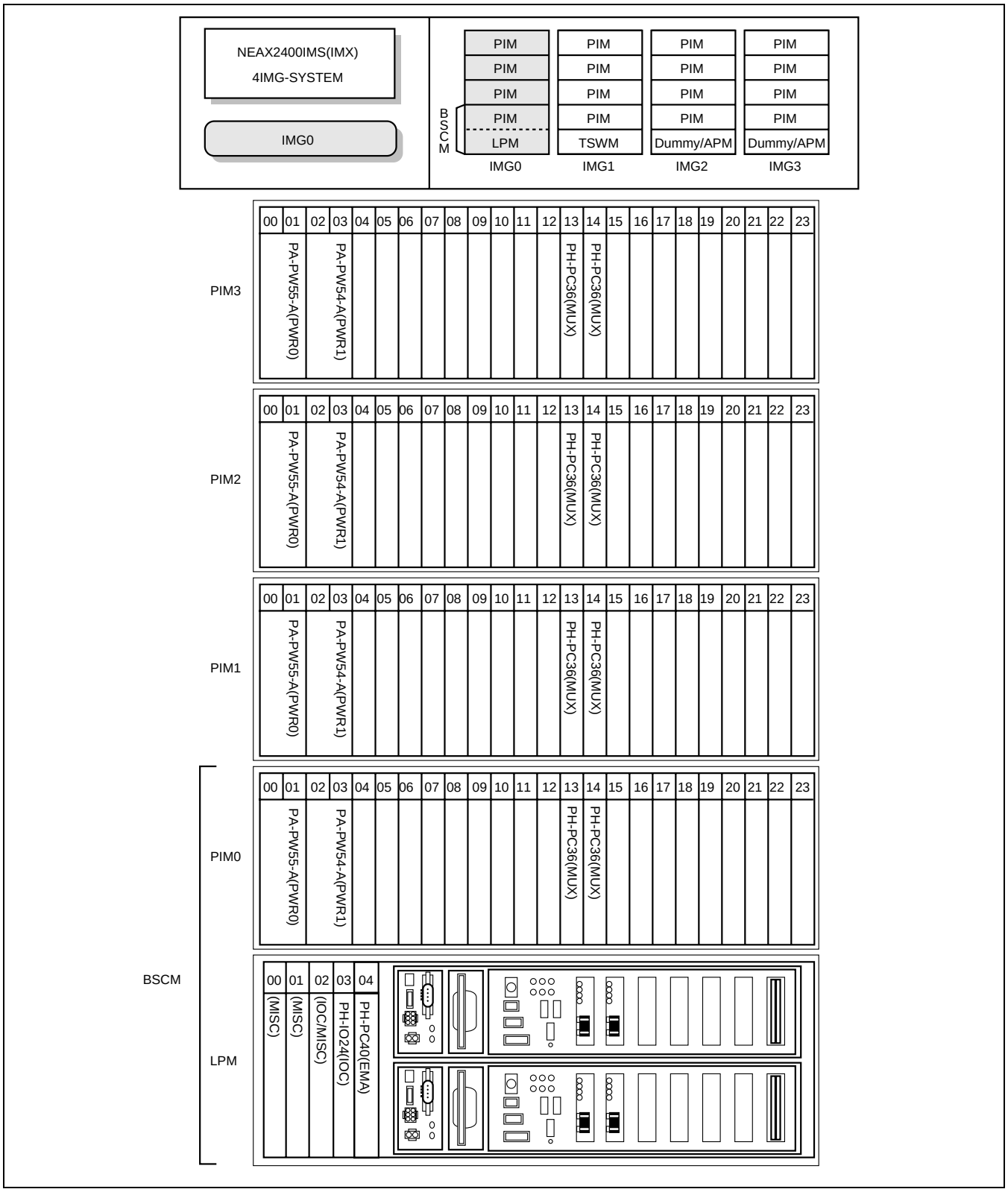


Figure 1-2 Card Mounting Slot for the 4 IMG System (1/4)

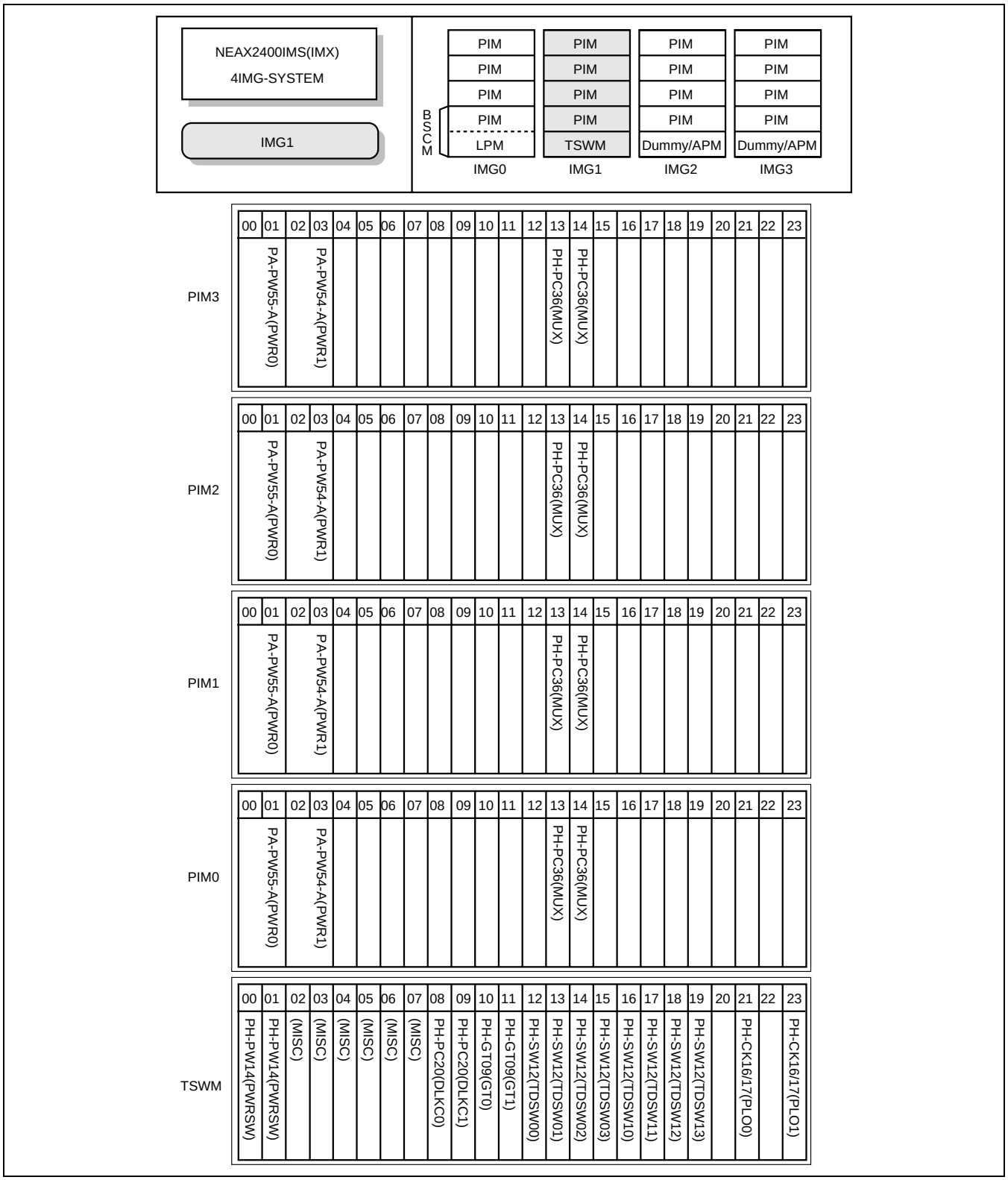


Figure 1-2 Card Mounting Slot for the 4 IMG System (2/4)

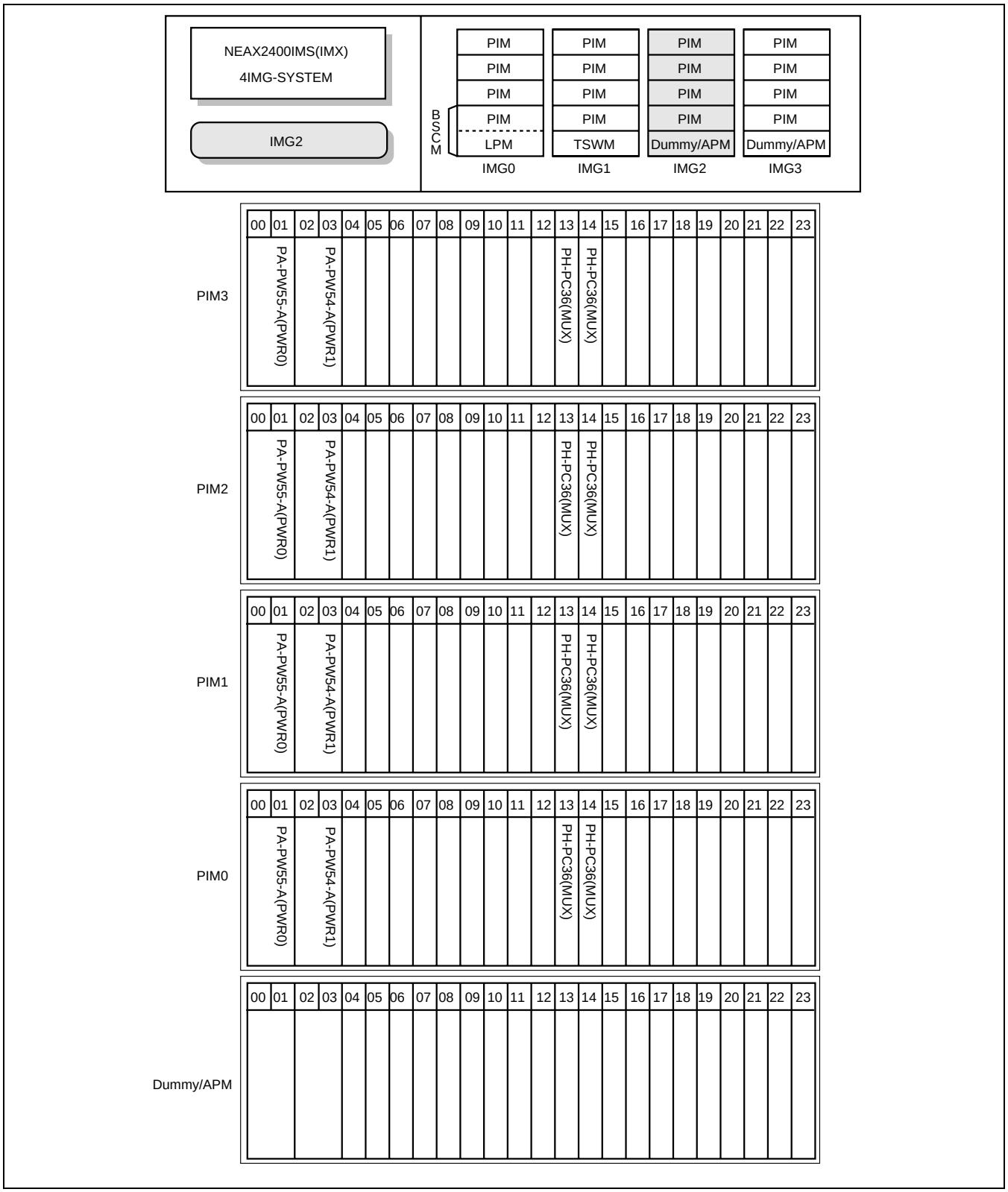


Figure 1-2 Card Mounting Slot for the 4 IMG System (3/4)

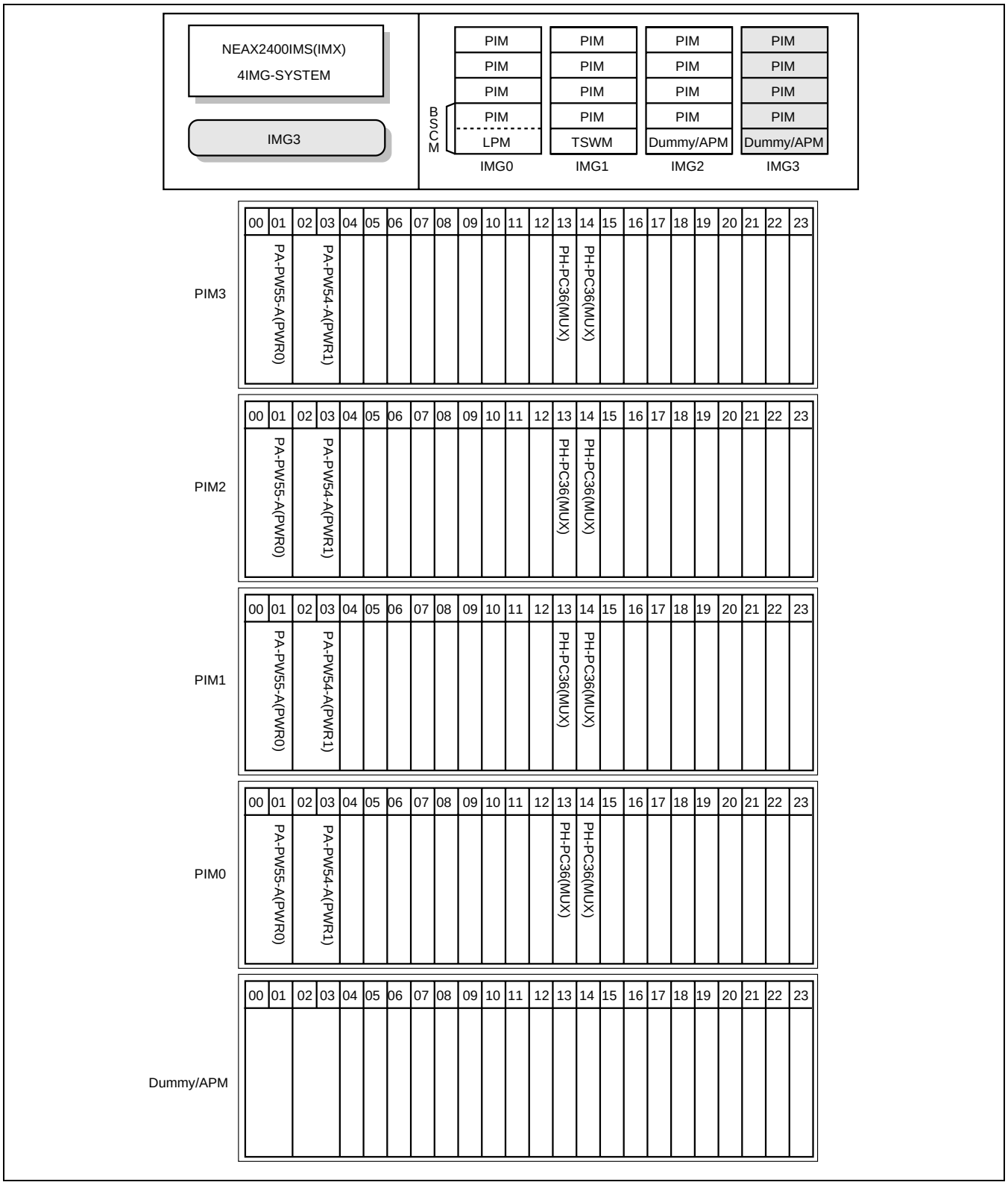
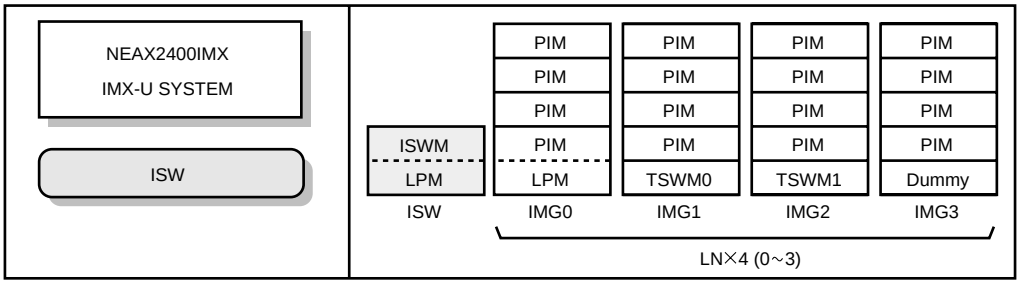
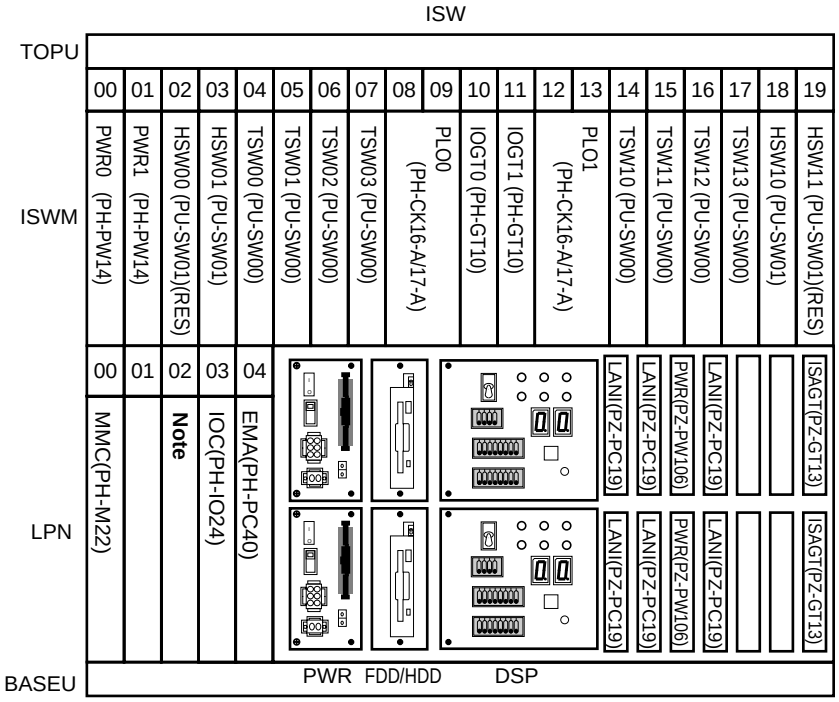


Figure 1-2 Card Mounting Slot for the 4 IMG System (4/4)





Note: *The 2nd IOC card (optional) may be mounted in the slot.*

Figure 1-3 Card Mounting Slot for the IMX-U System (1/5)

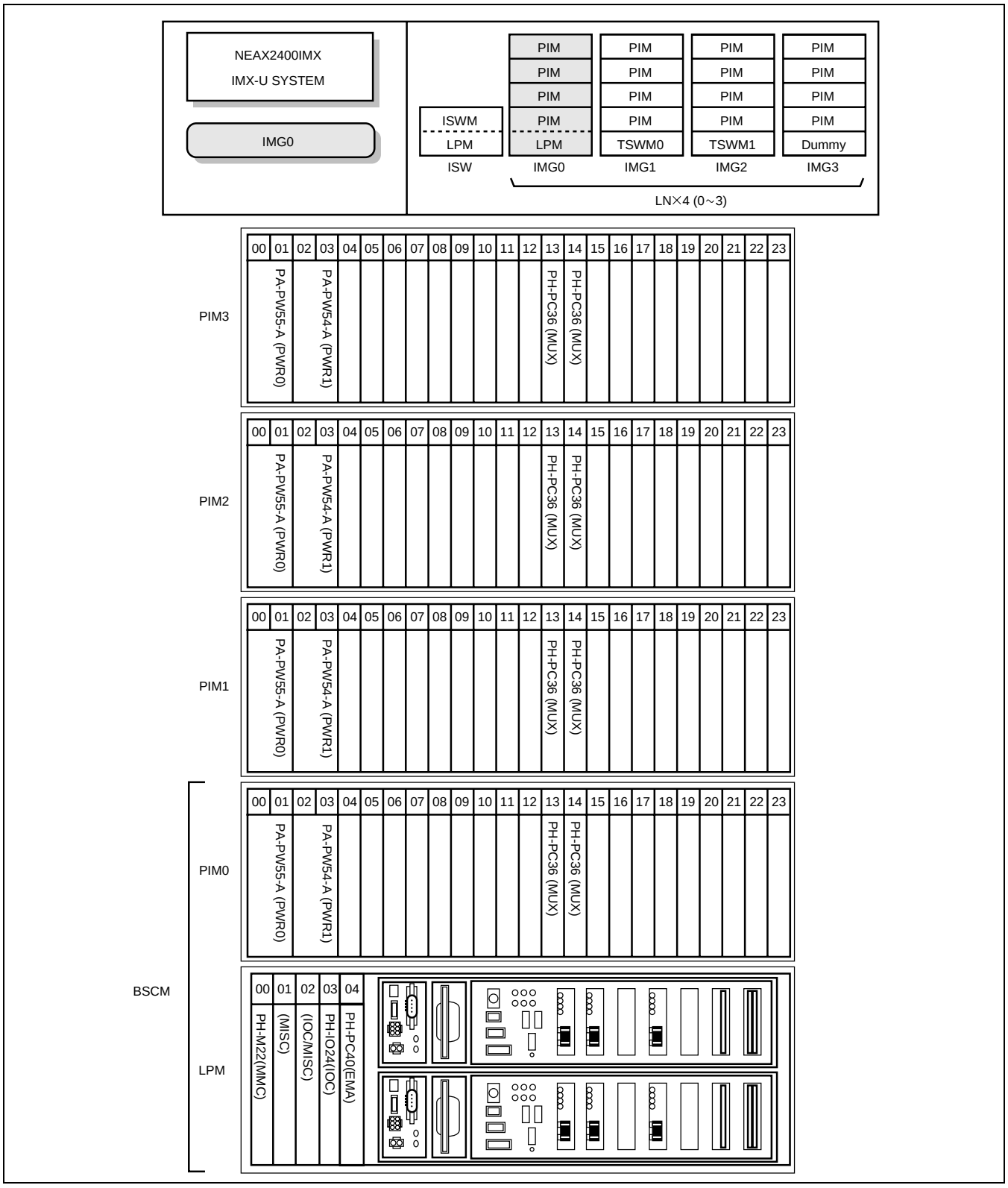


Figure 1-3 Card Mounting Slot for the IMX-U System (2/5)

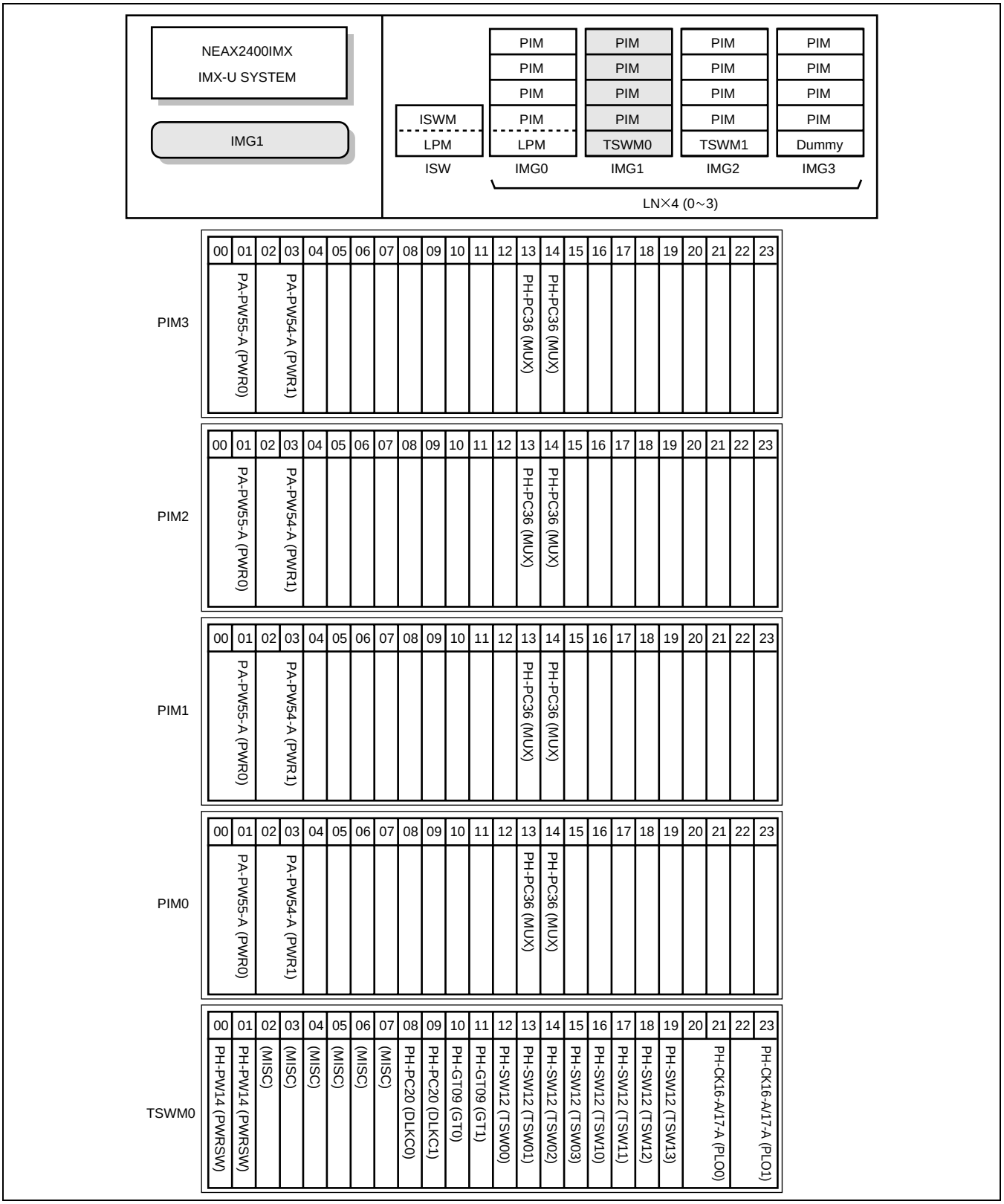


Figure 1-3 Card Mounting Slot for the IMX-U System (3/5)

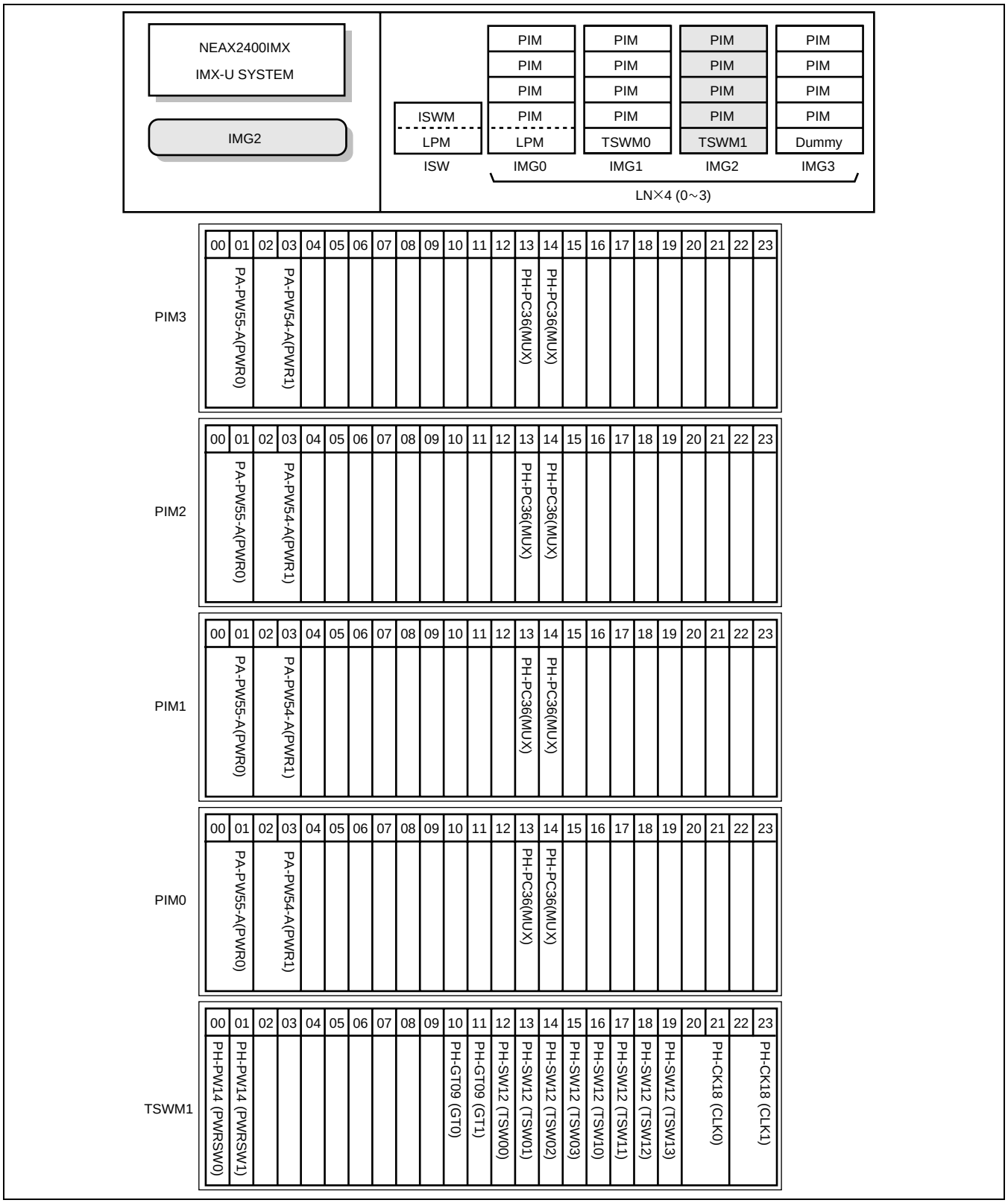


Figure 1-3 Card Mounting Slot for the IMX-U System (4/5)

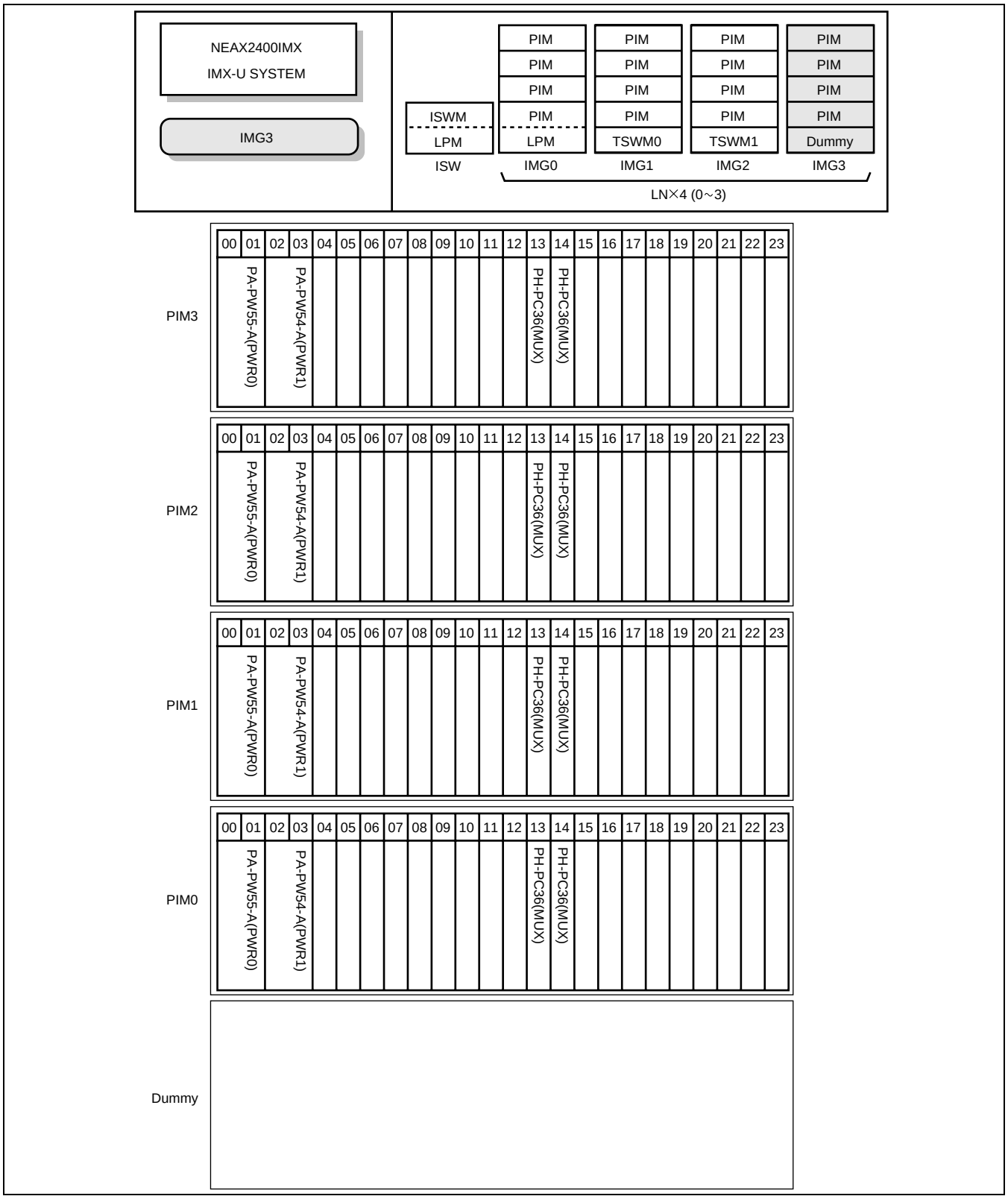


Figure 1-3 Card Mounting Slot for the IMX-U System (5/5)

CHAPTER 2 CONTROL CIRCUIT CARD REFERENCE

This chapter explains the following items for each Control Circuit Card.

- General Function

  Explains the general function and purpose of each control circuit card.

- Mounting Location/Condition

  Explains the mounting location (mounting module name and slot number, etc.) for each circuit card. If there are any conditions pertaining to mounting the circuit cards, they are also explained.

- Face Layout of Lamps, Switches, and Connectors

  The locations of the lamps, switches, and connectors provided on each circuit card are illustrated by a face layout.

- Lamp Indications

  The names, colors, and indication states of lamps mounted on each circuit card are listed.

- Switch Settings

  Each circuit card's switches are listed with their names, switch numbers, their setting and its meaning, standard setting, etc.

- External Interface

  If the lead outputs of the circuit card are provided by an LT connector, the relation between the mounting slots and the LT connectors is illustrated by an LT Connector Lead Face Layout. If the lead outputs are provided by other than an LT connector, or are provided by the circuit card front connector, the connector lead locations and the connecting routes are shown.

In addition, a Switch Setting Sheet, which may be used to record the switch settings, is provided at the end of the explanation for each circuit card.

SN1374 CPRP-A
CPU Board

1. General Function

   The Central Processing Rack (CPR) consists of the following components.

   (a) CPU BOARD: Contains the Main Processor Unit (MPU), ROM, and 128 Mbyte of Random Access Memory (RAM). Also, this board may be equipped with the ISAGT (PZ-GT16) on its Industrial Standard Architecture (ISA) and LANI (PZ-PC19) on the Peripheral Component Interconnect (PCI).

   (b) DSP: Contains the CPR switches and the CPR status indicator lamps.

   (c) FDD/HDD: Floppy Disk Drive (FDD) and Hard Disk Drive (HDD) are mounted on a circuit card, which can be extracted and/or inserted while the system is in operation, if required.

   (d) PWR: Supplies the operating power to the CPR, and also the MISC slots of the LPM.

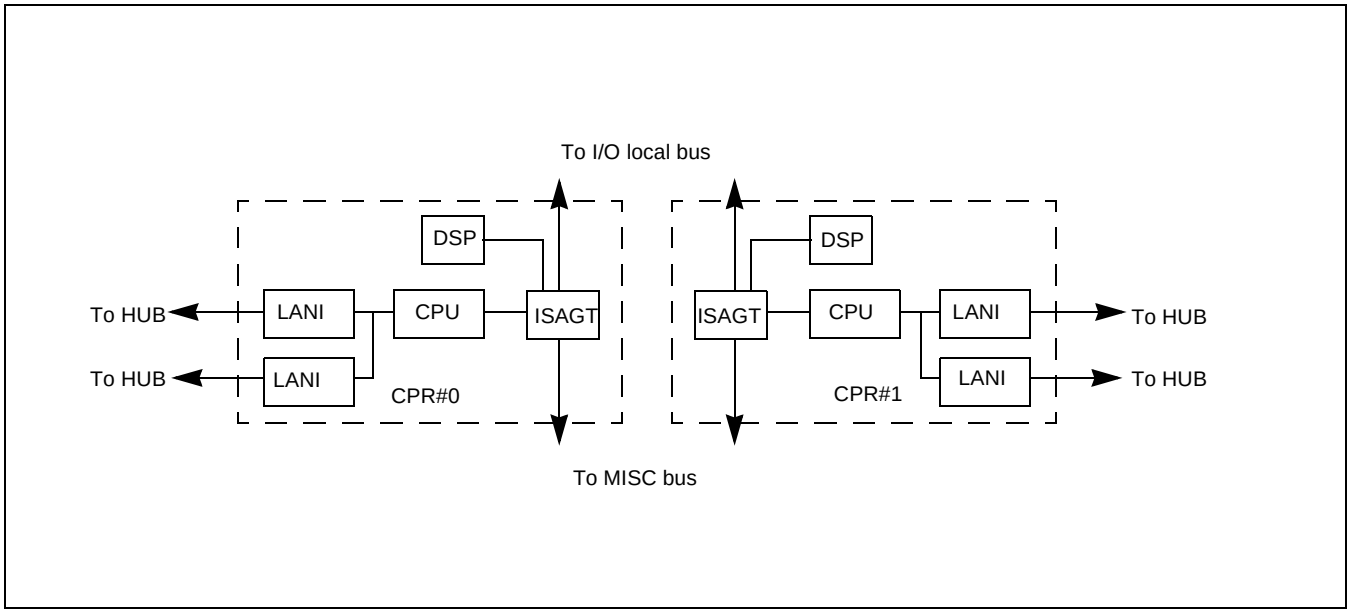


Figure 2-1 Location of SN1374 CPRP-A (CPR) in the System

2. Mounting Location/Condition

The CPR is composed of a CPU BOARD, DSP, FDD/HDD and PWR, and is located in the Local Processor Module (LPM) as shown below. Since the CPR provides the Industry Standard Architecture (ISA) bus and Peripheral Component Interconnect (PCI) bus, the GT and LANI cards are located in those busses respectively.

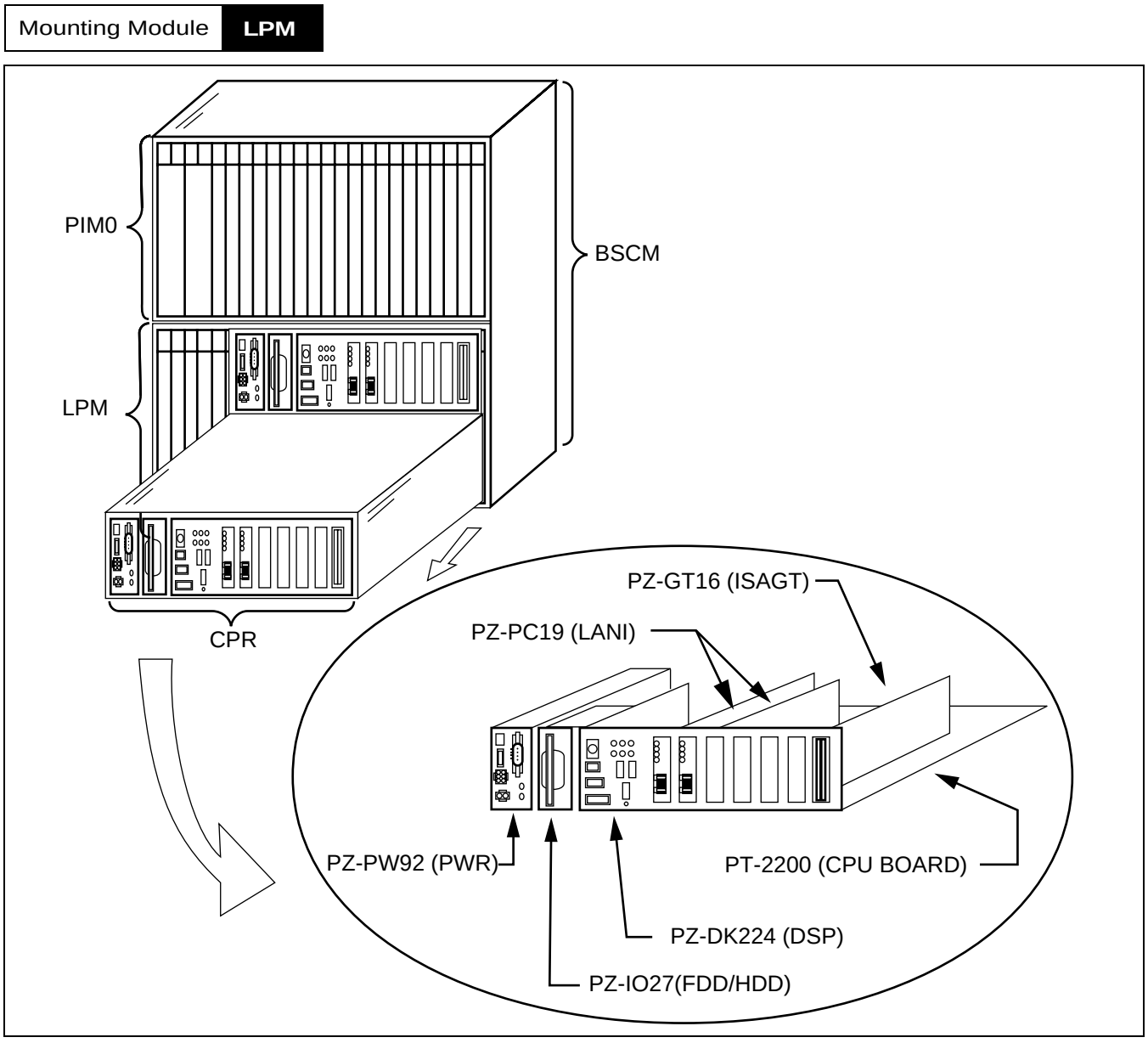


Figure 2-2 CPR Location

3. Face Layout of Lamps, Switches and Connectors

   The CPR has the following lamps, switches and connectors.

   Slot numbers 0-3 provide the Peripheral Component Interconnect (PCI) bus, and slot numbers 4-6 are the Industrial Standard Architecture (ISA) bus.

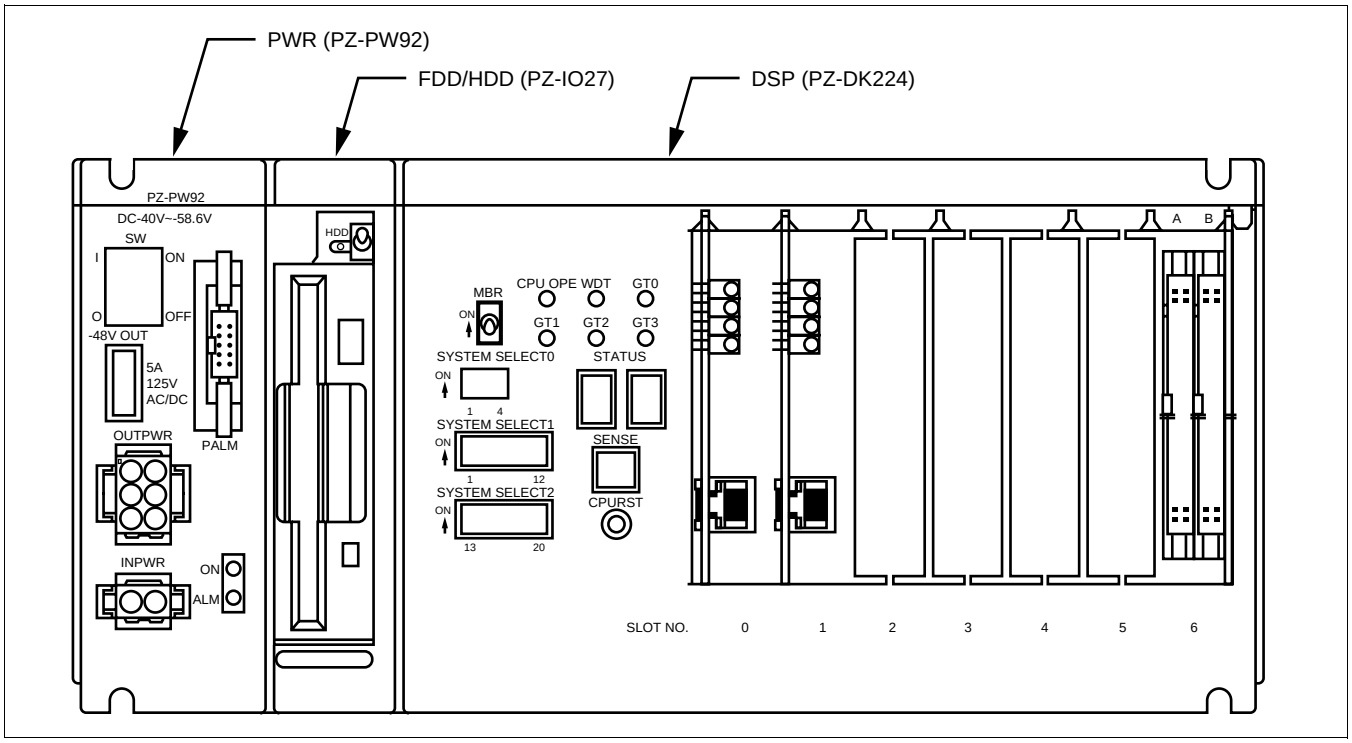


Figure 2-3 Front View of CPR

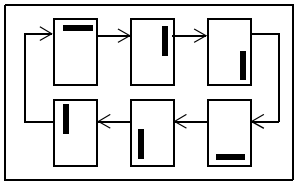
4. Lamp Indications

LAMP NAME	COLOR	DESCRIPTION
ON (PWR)	Green	Lights green when the PWR is supplied.
ALM (PWR)	Red	Lights red when the PWR is abnormal.
HDD (HDD)	Red	Lights red while the HDD is being accessed.
WDT (DSP)	Red	Lights red when Watch-dog Timer (WDT) time-out has occurred.
CPU OPE (DSP)	Green	Lights green when the CPU is in active state.
IMG0 (DSP)	Green	Lights green when PZ-GT16 (located in Slot 6) is in active state.
		Flashes green when PZ-GT16 (located in Slot 6) is in stand-by state
IMG1 (DSP)	Green	Not used.
IMG2 (DSP)	Green	Not used
IMG3 (DSP)	Green	Not used

<table>
<tr><th>LAMP NAME</th><th>DESCRIPTION</th></tr>
<tr><td>STATUS (DSP)</td><td>
Two sets of “7-segment LED” show the CPR processing status. The CPR processing status is determined by the Sense switch settings, and the new processing status starts when the CPURST button is pressed. The 7-segment LED indication on each CPR processing status is listed below.
<table>
<tr><th rowspan="2">SENSE</th><th colspan="2">STATUS</th><th rowspan="2">DESCRIPTION</th></tr>
<tr><th>LEFT</th><th>RIGHT</th></tr>
<tr><td rowspan="2">1</td><td>Not used</td><td>“F”
“c”
“d”</td><td>1. When Program Install
The HD in the CPR initializes and the program installs. (These processes execute)
“F” indicated during HD format.
“c” indicated when copying data from FD
“d” indicated while creating the directory on the HD</td></tr>
<tr><td>Not used</td><td>“1”</td><td>2. When Program Load
After program installation, the program should be transferred from the HD to the memory.
“1” indicated during this process.</td></tr>
<tr><td rowspan="3">2</td><td>“0-9”</td><td>“0-9”</td><td>3. On-line active CPR
The active CPR in ON LINE status indicates the CPU occupancy rate in percentages (00-99%)</td></tr>
<tr><td>Not used</td><td>“S”
“b”
“y”</td><td>4. On-line stand-by CPR
The stand-by CPR in ON LINE status indicates “S,” “b,” “y”</td></tr>
<tr><td>Not used</td><td>“1” → “0”</td><td>5. Program & Office data load
“1” indicated during the Program and Office data transfer from the HD to memory
“0” indicated during the Office data load.</td></tr>
<tr><td>3</td><td>Not used</td><td>“c”</td><td>“c” indicated when copying the data from FD to HD</td></tr>
<tr><td>4</td><td>Not used</td><td>“d”</td><td>“d” indicated while making the directory on the HD</td></tr>
<tr><td>5</td><td>Not used</td><td>“1” →“0”</td><td>The CPR is starting-up with ON LINE (OAI memory clear restart).
“1” indicated during the Program load.
“0” indicated during the process.</td></tr>
<tr><td>6</td><td>Not used</td><td>“F”</td><td>“F” indicated during HD format.</td></tr>
<tr><td>C</td><td>Not used</td><td>“H”</td><td>The CPR is starting-up with OFF LINE.
“H” indicated during the ROM data loading.</td></tr>
</table>
</td></tr>
</table>

Note: *The segment spinning indication shows a processing status has completed successfully, or “E” means the processing failed.*

Segment Spinning Indication



5. Switch Settings

SWITCH NAME	SWITCH NO.	SETTING	STANDARD SETTING	MEANING
SW (PWR)	—	ON	×	PWR is supplied to the CPR.
		OFF		PWR is not supplied to the CPR.
MB **Note** (FDD/HDD)	—	ON (Up)		Make-busy of the FDD/HDD.
		OFF (Down)	×	Normal setting
MBR (DSP)	—	ON (Up)		Make-busy Request of the CPR in which GT is located.
		OFF (Down)	×	Normal setting
CPURST	—	—		Execute the CPR processing according to the SENSE setting.
SYSTEM SELECT0 (DSP)	1	OFF	×	Not used
	2	OFF	×	Not used
	3	OFF	×	Not used
	4	ON		Watchdog Timer time-out is not detected.
		OFF	×	Watchdog Timer time-out is detected.
SYSTEM SELECT1 (DSP)	1	ON		PCI Card (Slot 0) MBR ON
		OFF		PCI Card (Slot 0) MBR OFF
	2	ON		PCI Card (Slot 1) MBR ON
		OFF		PCI Card (Slot 1) MBR OFF
	3	ON		PCI Card (Slot 2) MBR ON
		OFF		PCI Card (Slot 2) MBR OFF
	4	ON		PCI Card (Slot 3) MBR ON
		OFF		PCI Card (Slot 3) MBR OFF
	5~8	OFF	×	Fixed to “OFF.”
SYSTEM SELECT2 (DSP)	1~8	OFF	×	Not used

Note: *Make-busy of this circuit card is not allowed while the Floppy Disk Drive or Hard Disk Drive is being accessed.*

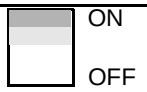
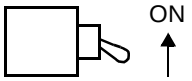
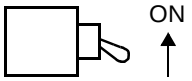
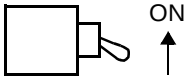
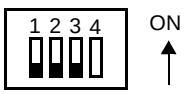
SWITCH NAME	SETTING	STANDARD SETTING	MEANING
SENSE **Note**	1		The following three processes are executed at the FDD/HDD. • HD format • File copied from FDD to HD • Directory created on the HD
	2		On-line mode
	3		File copied from FDD to HD in the FDD/HD
	4		The directory created on the HD of the FDD/HDD
	5		OAI memory cleared, and the CPR started up in ON LINE mode by loading the ROM data
	6		HD format of the FDD/HDD
	C		The CPR starts up in OFF LINE mode by loading the ROM data.

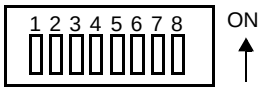
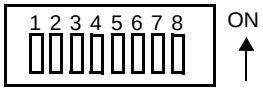
Note: *The SENSE switch designates the CPR processing status. The new processing status starts when the CPRRST switch on the DSP is pressed while setting the SENSE switch.*

6. External Interface

   See the NEAX2400 IMX Installation Manual.

7. Switch Setting Sheet

SWITCH NAME	SWITCH SHAPE	REMARKS
SW (PWR)		
MB (FDD/HDD)		
MBR (DSP)		
NMI-SEL		
SYSTEM SELECT0 (DSP)		

SWITCH NAME	SWITCH SHAPE	REMARKS
SYSTEM SELECT1 (DSP)		
SYSTEM SELECT2 (DSP)		
SENSE (DSP)		

SN1401 CPRAC-A
CPU Board

1. General

   The CPR consists of the following components.

   (a) CPU BOARD: Contains the Main Processor Unit (MPU), ROM, and 128 Mbyte of Random Access Memory (RAM). Additionally, this board may be equipped with the ISAGT (PZ-GT13) on its Industrial Standard Architecture (ISA) bus, and LANI (PZ-PC19) on the Peripheral Component Interconnect (PCI).

   (b) DSP: Contains the CPR switches and the CPR status indicator lamps.

   (c) FDD/HDD: Floppy Disk Drive (FDD) and Hard Disk Drive (HDD) are mounted on a circuit card, which can be extracted and/or inserted while the system is in operation, if necessary.

   (d) PWR: Supplies the operating power to the CPR and also the MISC slots of the LPM.

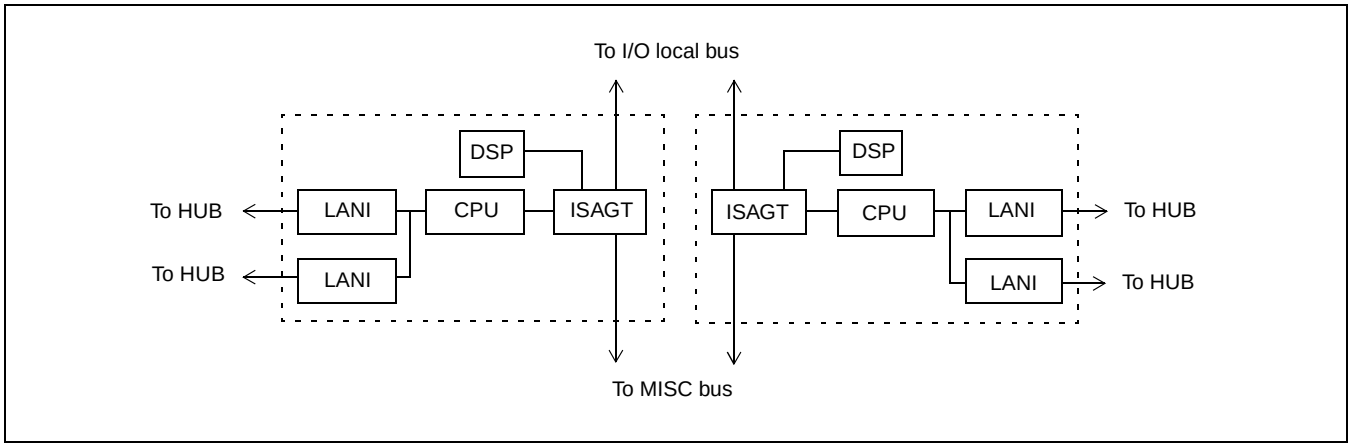


Figure 2-4 Location of SN1401 CPRAC-A (CPR) in the System

2. Mounting Location/Condition

The CPR is composed of the CPU BOARD, DSP, FDD/HDD, and PWR and is located in the Local Processor Module (LPM) as shown below. Since the CPR provides the Industrial Standard Architecture (ISA) bus and Peripheral Component Interconnect (PCI) bus, the GT and LANI cards are located in those busses respectively.

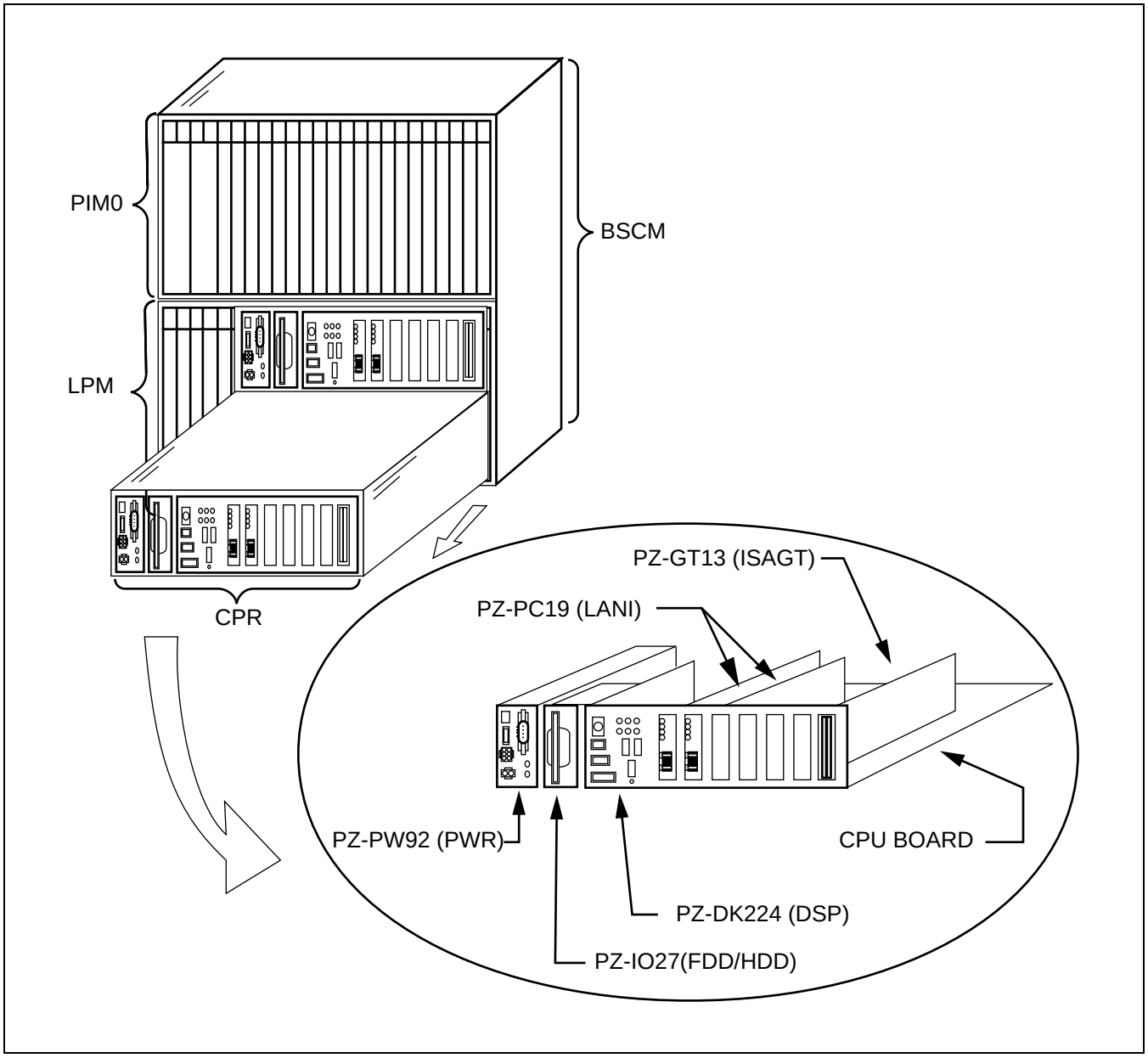


Figure 2-5 CPR Location

3. Face Layout of Lamps, Switches, and Connectors

The CPR has the following lamps, switches and connectors.

Slots 0-3 provide the Peripheral Component Interconnect (PCI) bus, and Slots 4-6 are the Industrial Standard Architecture (ISA) bus.

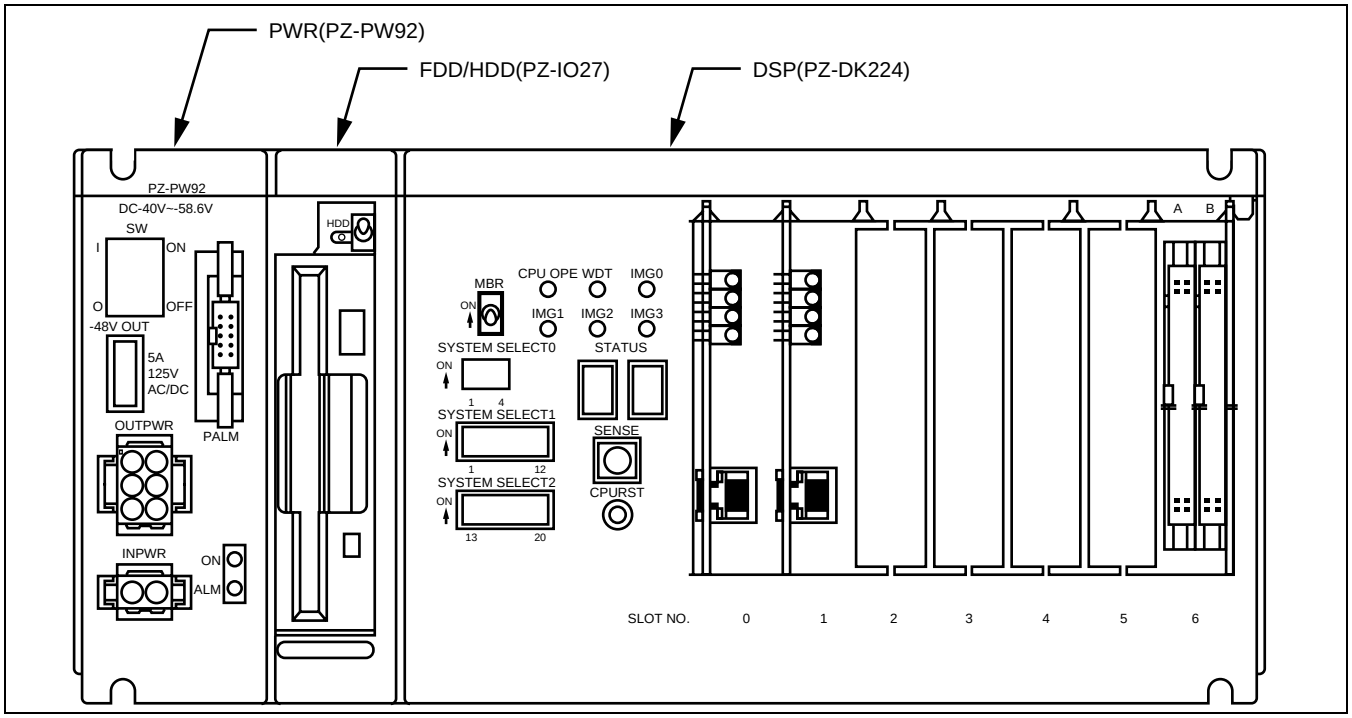


Figure 2-6 Front View of CPR

4. Lamp Indications

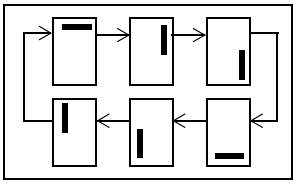
LAMP NAME	COLOR	DESCRIPTION
ON (PWR)	Green	Lights green when the PWR is supplied.
ALM (PWR)	Red	Lights red when the PWR is abnormal.
HDD (FDD/HDD)	Red	Lights red while the HDD or FDD is being accessed.
WDT (DSP)	Red	Lights red when Watch-dog Timer (WDT) time-out has occurs.
CPU OPE (DSP)	Green	Lights green when the CPU is in active state.
IMG0 (DSP)	Green	Lights green when PZ-GT13 (located in Slot 6) is in active state.
		Flashes green when PZ-GT13 (located in Slot 6) is in stand-by state.
IMG1 (DSP)	Green	Flashes green when IMG1 is mounted. **Note**
IMG2 (DSP)	Green	Flashes green when IMG2 is mounted. **Note**
IMG3 (DSP)	Green	Flashes green when IMG3 is mounted. **Note**

Note: *No lamp indication in STBY mode.*

<table>
<tr><th>LAMP NAME</th><th>DESCRIPTION</th></tr>
<tr><td>STATUS (DSP)</td><td>
Two set of “7-segment LED” shows the CPR processing status. The CPR processing status is determined by the SENSE switch settings, and the new processing status starts when the CPURST switch is pressed. The 7-segment LED indication on each CPR processing status is listed below.
<table>
<tr><th rowspan="2">SENSE</th><th colspan="2">STATUS</th><th rowspan="2">DESCRIPTION</th></tr>
<tr><th>LEFT</th><th>RIGHT</th></tr>
<tr><td rowspan="2">1</td><td>Not used</td><td>“F”
“c”
“d”</td><td>1. When Program Install
The HD in the CPR initializes and the program is installed. (These processes execute)
“F” indicated during HD format.
“c” indicated when copying the data from FD to HD
“d” indicated while creating the directory on the HD</td></tr>
<tr><td>Not used</td><td>“1”</td><td>2. When Program Load
After the program installation, the program should be transferred from the HD to the memory.
“1” indicated during this process.</td></tr>
<tr><td rowspan="3">2</td><td>“0-9”</td><td>“0-9”</td><td>3. On-line active CPR
The active CPR which is in ON LINE status indicates the CPU occupancy rate in percentages. (00-99%)</td></tr>
<tr><td>Not used</td><td>“S”
“b”
“y”</td><td>4. On-line stand-by CPR
The stand-by CPR which is in ON LINE status indicates “S,” “b,” “y”</td></tr>
<tr><td>Not used</td><td>“1” → “0”</td><td>5. Program & Office data load
“1” indicated during the Program and Office data transferred from the HD to the memory
“0” indicated during the Office data load</td></tr>
<tr><td>3</td><td>Not used</td><td>“c”</td><td>“c” indicated during copy the data from FD to HD</td></tr>
<tr><td>4</td><td>Not used</td><td>“d”</td><td>“d” indicated while making the directory on the HD</td></tr>
<tr><td>5</td><td>Not used</td><td>“1” → “0”</td><td>The CPR is starting-up with ON LINE (OAI memory clear restart).
“1” indicated during the Program load.
“0” indicated during the process.</td></tr>
<tr><td>6</td><td>Not used</td><td>“F”</td><td>“F” indicated during HD format.</td></tr>
<tr><td>C</td><td>Not used</td><td>“H”</td><td>The CPR is starting-up with OFF LINE.
“H” indicated during the ROM data loading.</td></tr>
</table>
</td></tr>
</table>

Note: *The segment spinning indication shows a processing status has completed successfully, or else “E” means the processing failed.*

Segment Spinning Indication



5. Switch Settings

SWITCH NAME	SWITCH NO.	SETTING	STANDARD SETTING	MEANING
SW (PWR)	—	ON	×	PWR is supplied to the CPR.
		OFF		PWR is not supplied to the CPR.
MB **Note** (FDD/HDD)	—	ON (Up)		Make-busy of the FDD/HDD.
		OFF (Down)	×	Normal setting.
MBR (DSP)	—	ON (Up)		Make-busy Request of the CPR in which the GT is located.
		OFF (Down)	×	Normal setting.
CPURST	—	—		Execute the CPR processing according to the SENSE setting.
SYSTEM SELECT0 (DSP)	1	OFF	×	Not used
	2	OFF	×	Not used
	3	OFF	×	Not used
	4	ON		Watchdog Timer time-out is not detected.
		OFF	×	Watchdog Timer time-out is detected.
SYSTEM SELECT1 (DSP)	1	ON		PCI Card (Slot 0) MBR ON
		OFF		PCI Card (Slot 0) MBR OFF
	2	ON		PCI Card (Slot 1) MBR ON
		OFF		PCI Card (Slot 1) MBR OFF
	3	ON		PCI Card (Slot 2) MBR ON
		OFF		PCI Card (Slot 2) MBR OFF
	4	ON		PCI Card (Slot 3) MBR ON
		OFF		PCI Card (Slot 3) MBR OFF
	5~8	OFF	×	Fixed to “OFF.”
SYSTEM SELECT2 (DSP)	1~8	OFF	×	Not used

Note: *Make-busy of this circuit card is not allowed while the Floppy Disk Drive or Hard Disk Drive is being accessed.*

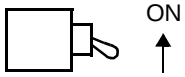
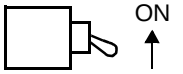
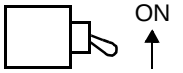
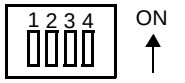
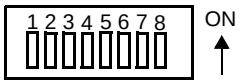
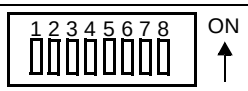
SWITCH NAME	SETTING	STANDARD SETTING	MEANING
SENSE **Note**	1		The following three process are executed at the FDD/HDD. • HD format • File copied from FDD to HD • Directory created on the HD
	2	×	On line mode.
	3		File copied from FDD to HD within the FDD/HDD.
	4		Directory created on the HD of the FDD/HDD.
	5		OAI memory clear, and the CPR starts up in ON LINE mode by loading the ROM data.
	6		HD format of the FDD/HDD.
	C		The CPR starts up in OFF LINE mode by loading the ROM data.

Note: *The SENSE switch designates the CPR processing status. The new processing status starts when the CPRRST switch on the DSP is pressed while setting the SENSE switch.*

6. External Interface

   See the NEAX2400 IMX Installation Manual.

7. Switch Setting Sheet

SWITCH NAME	SWITCH SHAPE	REMARKS
SW (PWR)		
MB (FDD/HDD)		
MBR (DSP)		
NMI-SEL		
SYSTEM SELECT0		
SYSTEM SELECT1		
SYSTEM SELECT2		
SENSE		

PH-GT09
Gate

1. General Function

   The PH-GT09 (GT) circuit card provides both the TSW I/O Local bus and the MISC bus interface. The CPR controls TSW, PLO, DLKC, and MISC via the ISAGT and GT.

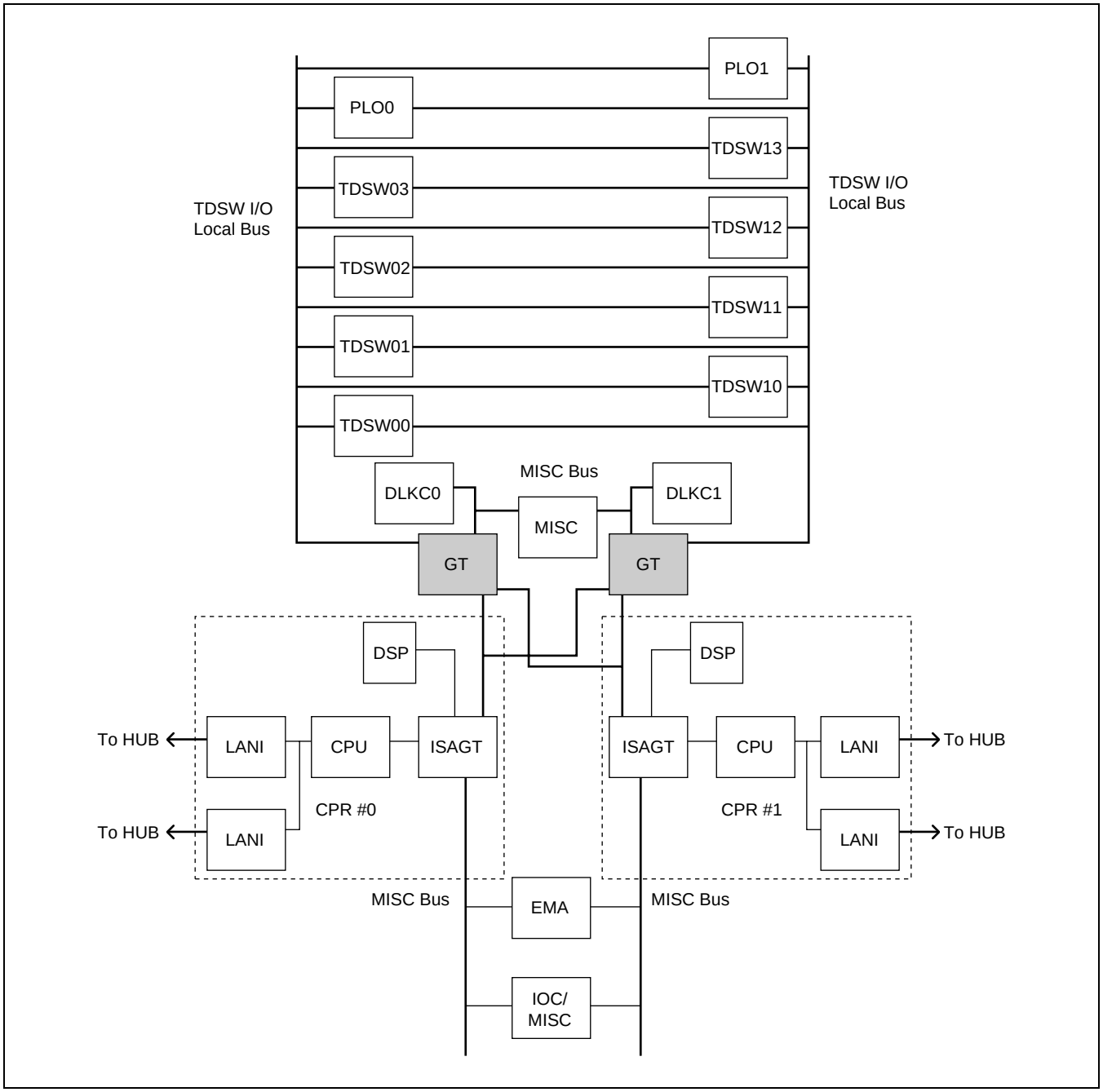


Figure 2-7 Location of PH-GT09 (GT) Card in the System

2. Mounting Location/Condition

This circuit card is mounted in the TSWM of the slot shown below.

Mounting Module	TSWM

00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
										GT0	GT1												

3. Face Layout of Lamps, Switches, and Connectors

The face layout of lamps, switches, and connectors is shown in Figure 2-8.

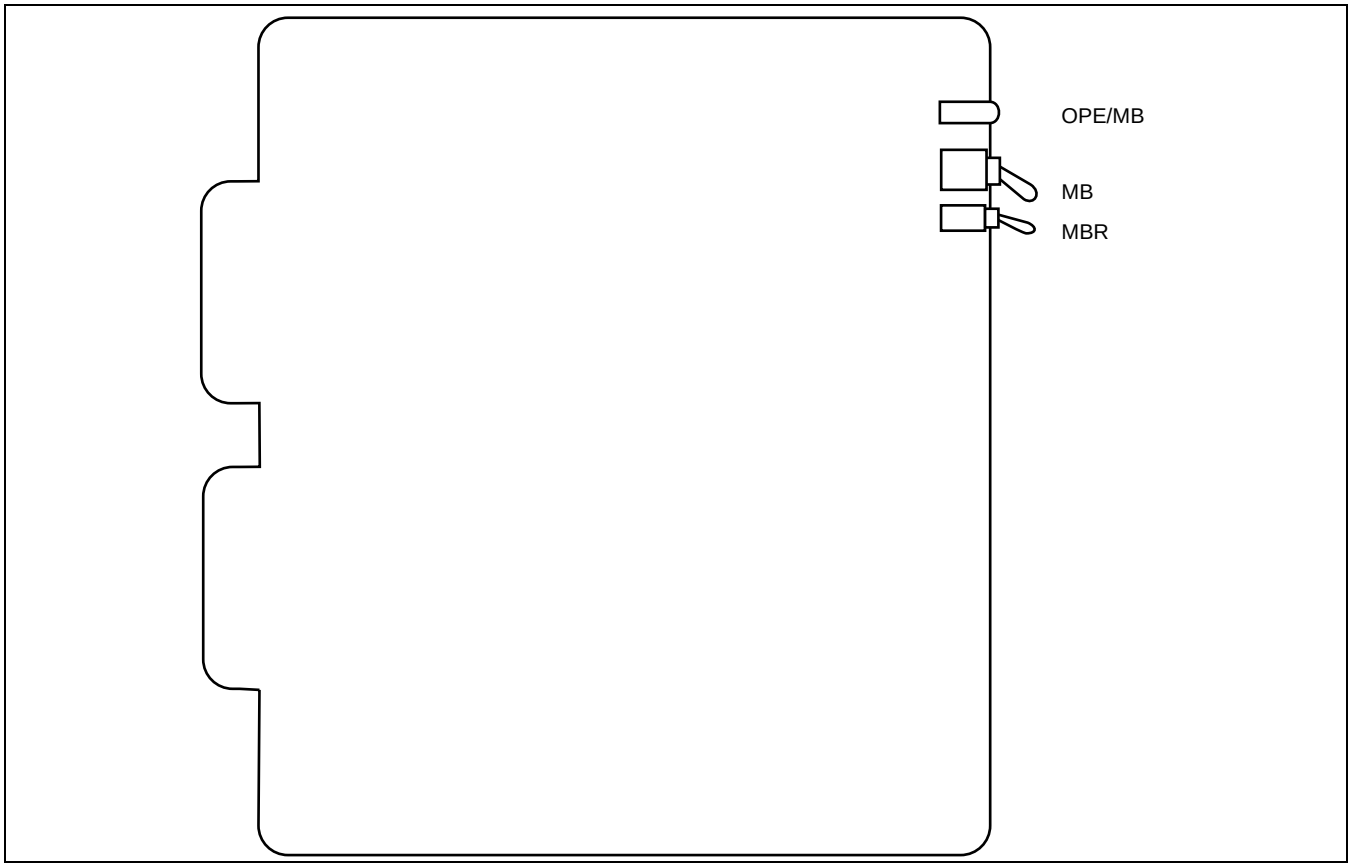


Figure 2-8 Face Layout of PH-GT09 (GT)

4. Lamp Indications

   Lamp indications for this circuit card are shown in the table below.

LAMP NAME	COLOR	STATE
OPE/MB	Green	Remains lit while this circuit card is in ACT state.

5. Switch Settings

   Standard settings for switches on this circuit card are shown in the table below.

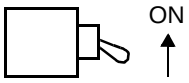
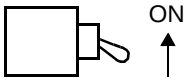
SWITCH NAME	SETTING	STANDARD SETTING	MEANING
MB	UP		Make-busy of circuit card
	DOWN	×	Normal setting
MBR Note	UP		When the ACT side of GT's MBR switch is flipped, the ST-BY side of TSW, DLKC, and GT is forced to switch over the ACT side. (When the TSW is dual configuration.)
	DOWN	×	Normal setting.

Note: *Prior to extracting the GT card, flip the MBR switch on and then flip the MB switch on.*

6. External Interface

   See the NEAX2400 IMX Installation Manual.

7. Switch Setting Sheet

SWITCH NAME	SWITCH SHAPE	REMARKS
MB		
MBR		

SN1455 CPRAQ-A/SN1531 CPRAS-A
CPU Board

1. General Function

   The CPR consists of the following components.

   (a) CPU BOARD: Contains the Main Processor Unit (MPU), ROM, and 128 Mbyte of Random Access Memory (RAM). This board may also contain the ISAGT (PZ-GT13/PZ-GT20) on its Industrial Standard Architecture (ISA) bus, and LANI (PZ-PC19) on the Peripheral Component Interconnect (PCI).

   (b) DSP: Contains the CPR switches and the CPR status indicator lamps.

   (c) FDD/HDD: Floppy Disk Drive (FDD) and Hard Disk Drive (HDD) are mounted on a circuit card, which, if necessary, can be extracted and/or inserted while the system is in operation.

   (d) PWR: Supplies the operating power to the CPR and also the MISC slots of the LPM.

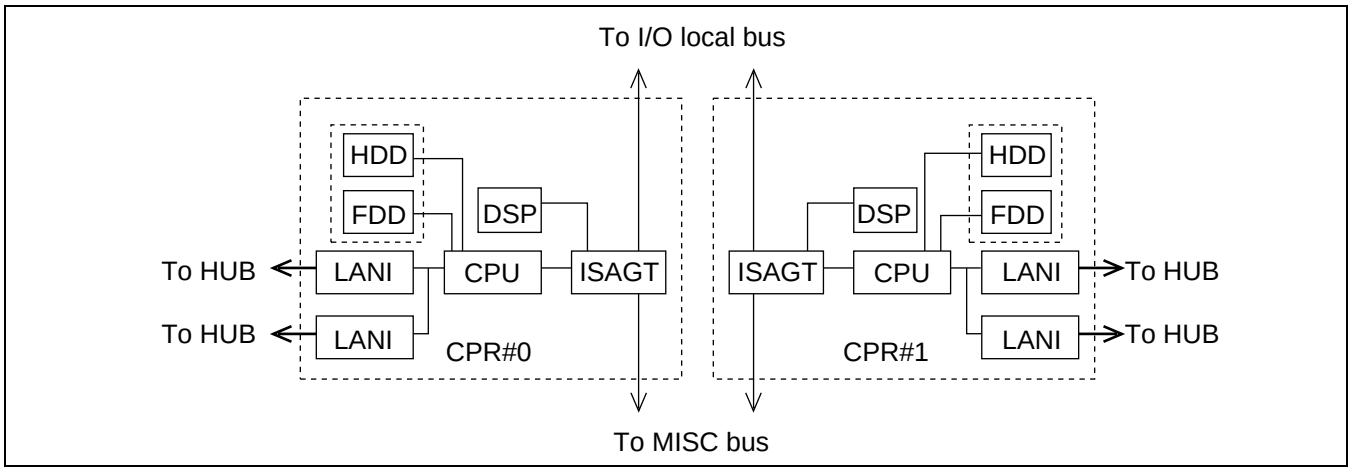
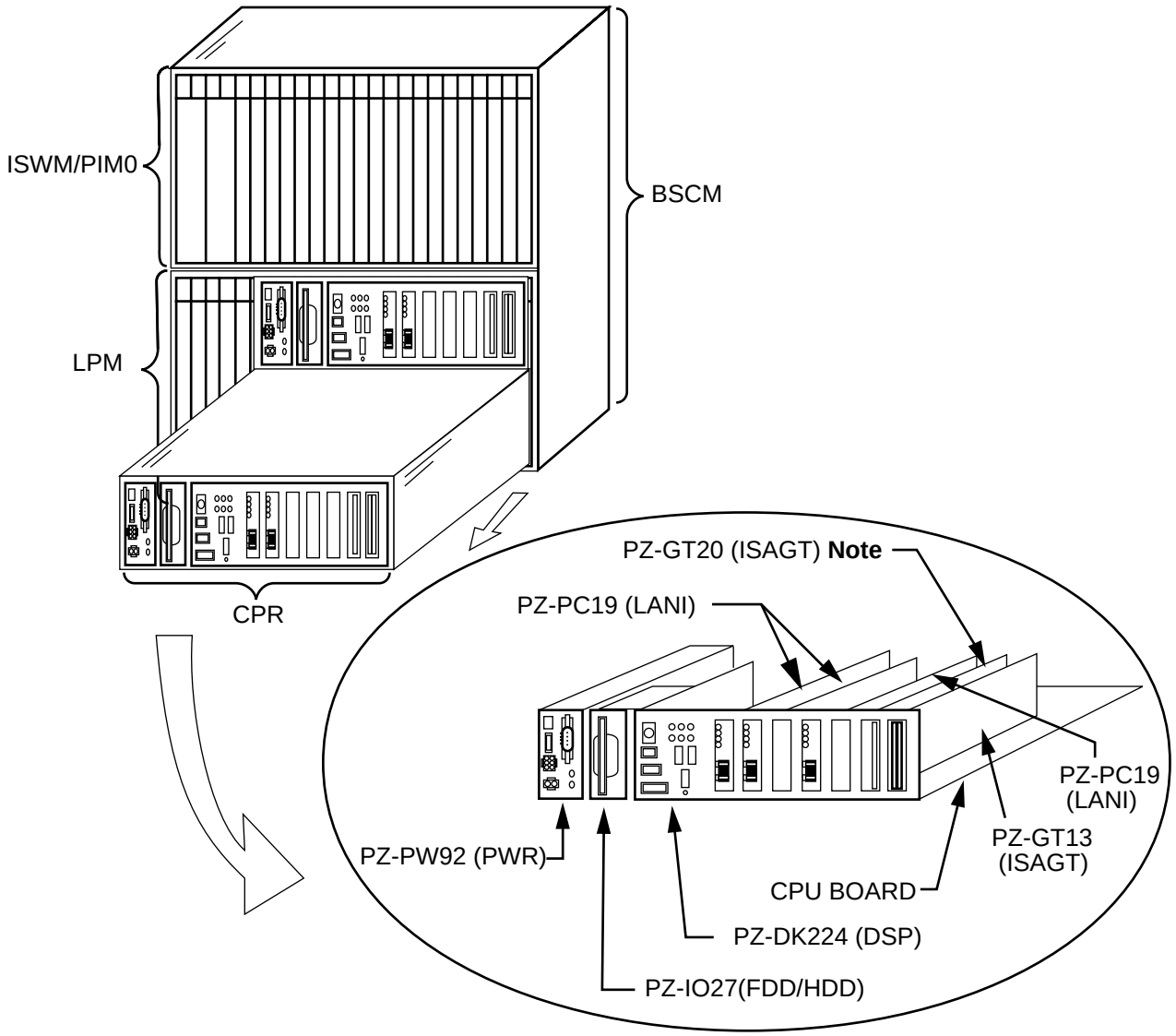


Figure 2-9 Location of SN1455 CPRAQ-A/SN1531 CPRAS-A (CPR)

2. Mounting Location/Condition

The CPR is composed of the CPU BOARD, DSP, FDD/HDD, and PWR and is located in the Local Processor Module (LPM) as shown in Figure 2-10. Since the CPR provides the Industrial Standard Architecture (ISA) bus and Peripheral Component Interconnect (PCI) bus, the ISAGT and LANI cards are located in those busses respectively.



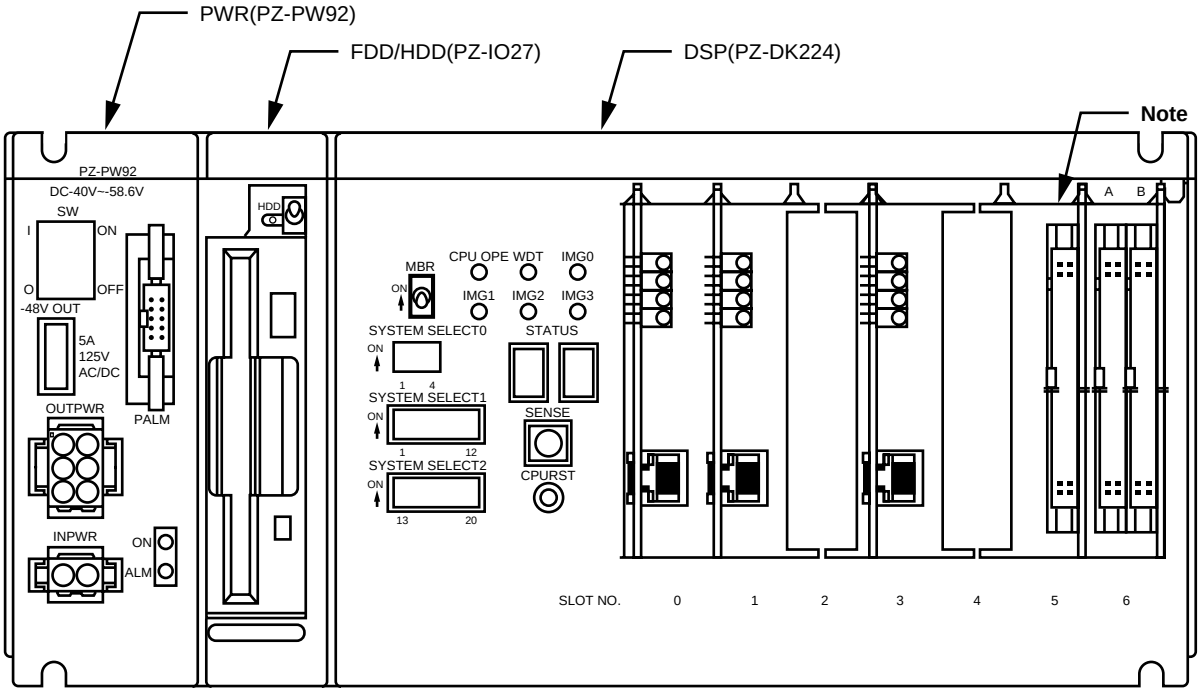
Note: *This card is mounted in the IMG0 of the IMX-U system only.*

Figure 2-10 CPR Location

3. Face Layout of Lamps, Switches, and Connectors

   The CPR contains the following lamps, switches and connectors.

   Slots 0-3 provide the Peripheral Component Interconnect (PCI) bus, and Slots 4-6 are the Industrial Standard Architecture (ISA) bus.



Note: *This card is mounted in the IMG0 of the IMX-U system only.*

Figure 2-11 Front View of CPR

4. Lamp Indications

   Lamp Indications vary depending on the node. The following shows the lamp indications for the CPR in the IMG.

LAMP NAME	COLOR	DESCRIPTION
ON (PWR)	Green	Lights green when the PWR is supplied.
ALM (PWR)	Red	Lights red when the PWR is abnormal.
HDD (FDD/HDD)	Red	Lights red while the HDD or FDD is being accessed.
WDT (DSP)	Red	Lights red when Watch-dog Timer (WDT) time-out has occurred.
CPU OPE (DSP)	Green	Lights green when the CPU is in active state.
CPU OPE (DSP)	Green	Lights green when the CPU is in active state.

LAMP NAME	COLOR	DESCRIPTION
IMG0 (DSP)	Green	Flashes green when PZ-GT13 (located in slot number 6) is in operation.
IMG1 (DSP)	Green	Flashes green when IMG1 is mounted. **Note**
IMG2 (DSP)	Green	Flashes green when IMG2 is mounted. **Note**
IMG3 (DSP)	Green	Flashes green when IMG3 is mounted. **Note**

Note: *No lamp indication in STBY mode.*

The following shows the lamp indication for the CPR in the ISW

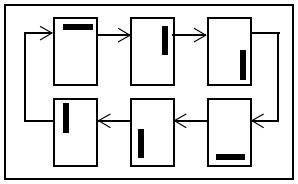
LAMP NAME	COLOR	DESCRIPTION
ON (PWR)	Green	Lights green when the PWR is supplied.
ALM (PWR)	Red	Lights red when the PWR is abnormal.
HDD (FDD/HDD)	Red	Lights red while the HDD or FDD is being accessed.
WDT (DSP)	Red	Lights red when Watch-dog Timer (WDT) time-out has occurred.
CPU OPE (DSP)	Green	Lights green when the CPU of the ISW is in active state.
IMG0 (DSP)	Green	Lights green when the CPU of the ISW is in active state.
		Flashes green when the CPU of the ISW is in stand-by state.
IMG1 (DSP)	Green	Lights green when the TSW1 of the ISW is used. **Note**
IMG2 (DSP)	Green	Lights green when the TSW2 of the ISW is used. **Note**
IMG3 (DSP)	Green	Lights green when the TSW3 of the ISW is used. **Note**

Note: *No lamp indication in STBY mode.*

<table>
<tr><th>LAMP NAME</th><th>DESCRIPTION</th></tr>
<tr><td>STATUS (DSP)</td><td>
Two sets of “7-segment LED” show the CPR processing status. The CPR processing status is determined by the SENSE switch settings, and the new processing status starts when the CPURST switch is pressed. The 7-segment LED indication on each CPR processing status is listed below.
<table>
<tr><th rowspan="2">SENSE</th><th colspan="2">STATUS</th><th rowspan="2">DESCRIPTION</th></tr>
<tr><th>LEFT</th><th>RIGHT</th></tr>
<tr><td rowspan="2">1</td><td>Not used</td><td>“F”
“c”
“d”</td><td>1. When Program Install
The HD in the CPR is initialized and the program is installed. (These three processes execute)
“F” indicated during HD format.
“c” indicated when copying data from FD to HD
“d” indicated while making the directory on the HD</td></tr>
<tr><td>Not used</td><td>“1”</td><td>2. When Program Load
After program installation, the program should be transferred from the HD to memory.
“1” is indicated during this process.</td></tr>
<tr><td rowspan="3">2</td><td>“0-9”</td><td>“0-9”</td><td>3. On-line active CPR
The active CPR which is in ON LINE status indicates the CPU occupancy rate by percentage. (00-99%)</td></tr>
<tr><td>Not used</td><td>“S”
“b”
“y”</td><td>4. On-line stand-by CPR
The stand-by CPR which is in ON LINE status indicates “S,” “b,” “y”</td></tr>
<tr><td>Not used</td><td>“1” ⟶ “0”</td><td>5. Program & Office data load
“1” indicated during the Program and Office data transfer from the HD to the memory
“0” indicated during the Office data load</td></tr>
<tr><td>3</td><td>Not used</td><td>“c”</td><td>“c” indicated when copying the data from FD to HD</td></tr>
<tr><td>4</td><td>Not used</td><td>“d”</td><td>“d” indicated while making the directory on the HD</td></tr>
<tr><td>5</td><td>Not used</td><td>“1” ⟶ “0”</td><td>The CPR is starting-up with ON LINE (OAI memory clear restart).
“1” indicated during the Program load.
“0” indicated during the process.</td></tr>
<tr><td>6</td><td>Not used</td><td>“F”</td><td>“F” indicated during HD format.</td></tr>
<tr><td>C</td><td>Not used</td><td>“H”</td><td>The CPR is starting-up OFF LINE.
“H” indicated during the ROM data loading.</td></tr>
</table>
</td></tr>
</table>

Note: *The segment spinning indication shows a processing status has completed successfully, or indicates “E” meaning the processing failed.*

Segment Spinning Indication



5. Switch Settings

SWITCH NAME	SWITCH NO.	SETTING	STANDARD SETTING	MEANING
SW (PWR)	—	ON	×	PWR is supplied to the CPR.
		OFF		PWR is not supplied to the CPR.
MB **Note** (FDD/HDD)	—	ON (Up)		Make-busy of the FDD/HDD.
		OFF (Down)	×	Normal setting.
MBR (DSP)	—	ON (Up)		Make-busy Request of the CPR in which GT is located.
		OFF (Down)	×	Normal setting.
CPURST (DSP)	—	—		Execute the CPR processing according to the SENSE setting.
SYSTEM SELECT0 (DSP)	1	OFF	×	Not used
	2	OFF	×	Not used
	3	OFF	×	Not used
	4	ON		Watchdog Timer time-out is not detected.
		OFF	×	Watchdog Timer time-out is detected.
SYSTEM SELECT1 (DSP)	1	ON		PCI Card (Slot 0) MBR ON.
		OFF		PCI Card (Slot 0) MBR OFF.
	2	ON		PCI Card (Slot 1) MBR ON.
		OFF		PCI Card (Slot 1) MBR OFF.
	3	ON		PCI Card (Slot 2) MBR ON.
		OFF		PCI Card (Slot 2) MBR OFF.
	4	ON		PCI Card (Slot 3) MBR ON.
		OFF		PCI Card (Slot 3) MBR OFF.
	5~7	OFF	×	Fixed to “OFF.”
	8	ON		IMX-U System
		OFF		1 IMG/4 IMG System
SYSTEM SELECT2 (DSP)	1~8	OFF	×	Not used

Note: *Make-busy of this circuit card is not allowed while the Floppy Disk Drive or Hard Disk Drive is being accessed.*

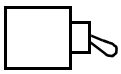
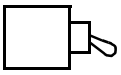
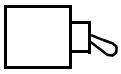
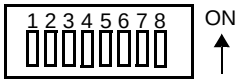
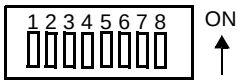
SWITCH NAME	SETTING	STANDARD SETTING	MEANING
SENSE (DSP) **Note**	1		The following three processes are executed at the FDD/HDD. • HD formatted • File copied from FDD to HD • Directory created on the HD
	2	×	On-line mode.
	3		File copied from FDD to HD within the FDD/HDD.
	4		Directory created on the HD of the FDD/HDD.
	5		OAI memory cleared, and the CPR started up in ON LINE mode by loading the ROM data.
	6		HD format of the FDD/HDD.
	C		The CPR starts up in OFF LINE mode by loading the ROM data.

Note: *The SENSE switch designates the CPR processing status. The new processing status starts when the CPRRST switch on the DSP is pressed while setting the SENSE switch.*

6. External Interface

   See the NEAX2400 IMX Installation Manual.

7. Switch Setting Sheet

SWITCH NAME	SWITCH SHAPE	REMARKS
SW (PWR)		
MB (PWR:PZ-PW106)		
MB (FDD/HDD)		
MBR (DSP)		
SYSTEM SELECT0 (DSP)		
SYSTEM SELECT1 (DSP)		
SYSTEM SELECT2 (DSP)		
SENSE (DSP)		

PH-GT10
Input Output Gate

1. General Function

The PH-GT10 circuit card provides the TSW I/O bus interface for permitting the CPU board to control the TSW, HSW, and PLO cards within the Inter-node Switch Module (ISWM) of the ISW. Additionally, this circuit card is equipped with the copy function to be consistent with the data of TSW I/O bus in both systems (single/dual). This circuit card is used for the IMX-U system.

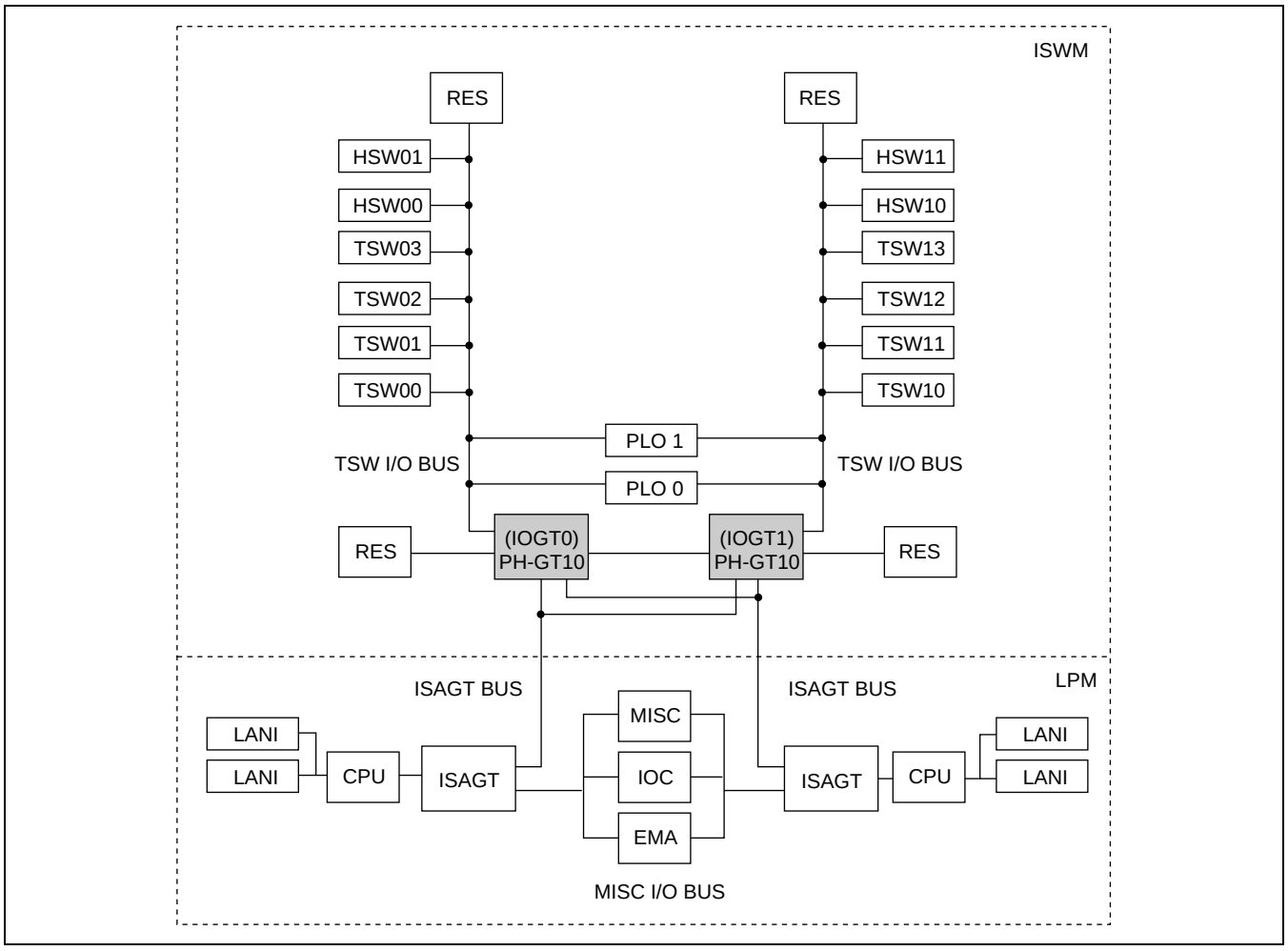


Figure 2-12 Location of PH-GT10 (IOGT)

2. Mounting Location/Condition

This circuit card can be mounted in the shaded slots shown below.

Mounting Module **ISWM**

00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19
										IOGT(#0)	IOGT(#1)								

3. Face Layout of Lamps, Switches, and Connectors

The face layout of lamps, switches, and connectors are shown in Figure 2-13.

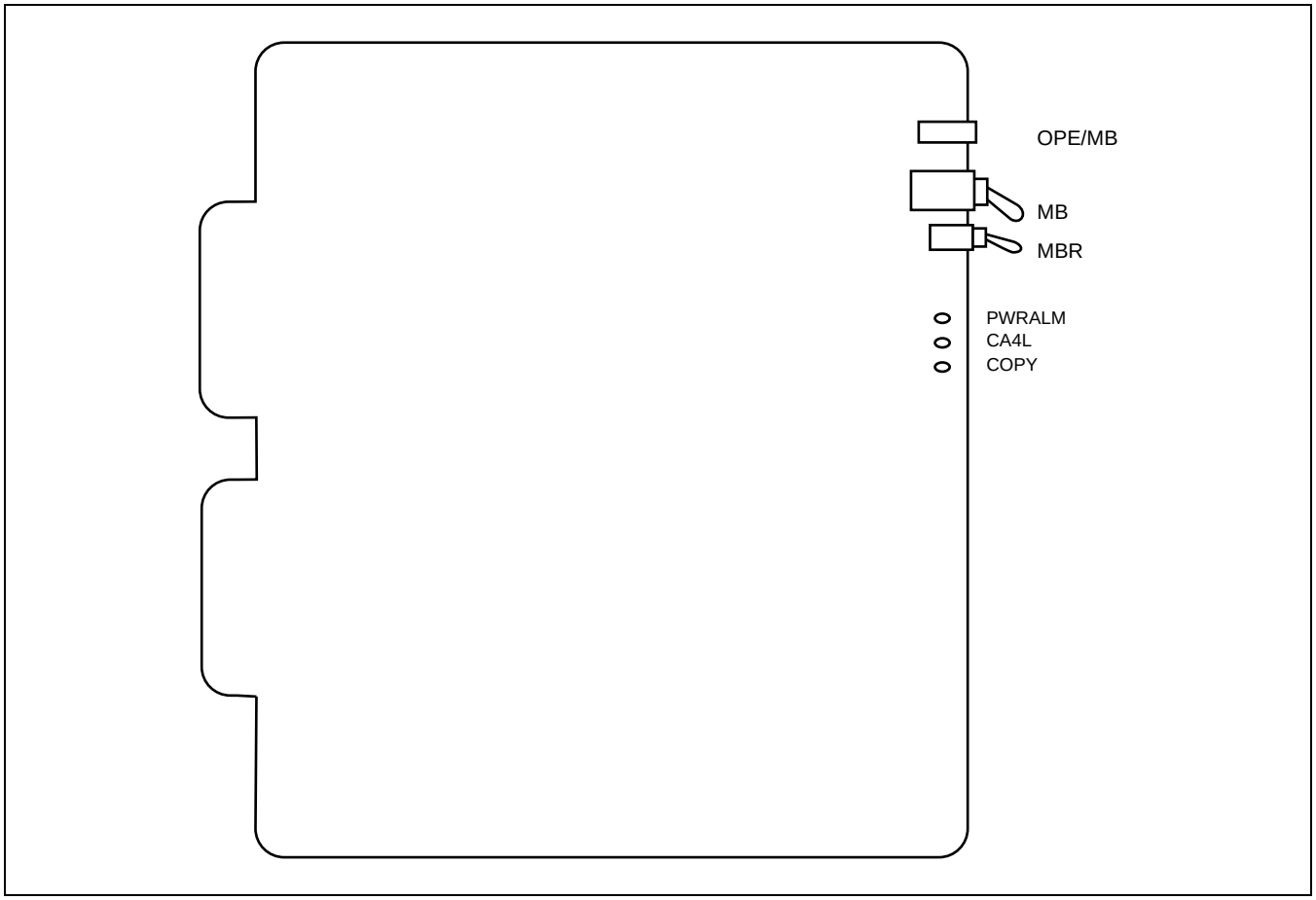


Figure 2-13 Face Layout of PH-GT10 (IOGT)

4. Lamp Indications

The contents of lamp indications on this circuit card are shown in the table below.

LAMP NAME	COLOR	MEANING
TSW ACT	Green	Lights when this circuit card is in ACT state.
	OFF	This circuit card is in ST-BY state.
	Red	Lights when this circuit card is in make-busy state.
PWRALM	Red	Lights when On-Board Power Supply for this circuit card is abnormal.
CA4L	Red	Lights when 4MHz clock supplied for Local I/O Bus is faulty.
COPY	Green	Lights when this circuit card is in COPY mode.

5. Switch Settings

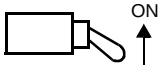
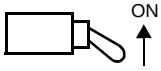
Standard settings of switches on this circuit card are shown in the table below.

SWITCH NAME	SETTING	STANDARD SETTING	MEANING
MB	UP		Circuit Card make busy
	DOWN	×	Circuit Card make busy cancel
MBR	UP		Make busy request
	DOWN	×	Make busy request cancel

6. External Interface

See the NEAX2400 IMX Installation Manual.

7. Switch Setting Sheet

SWITCH NAME	SWITCH SHAPE	
MB		**Note:** *Normal operating mode is down.*
MBR		**Note:** *Normal operating mode is down.*

PA-PC94
Data Link Multiplexer

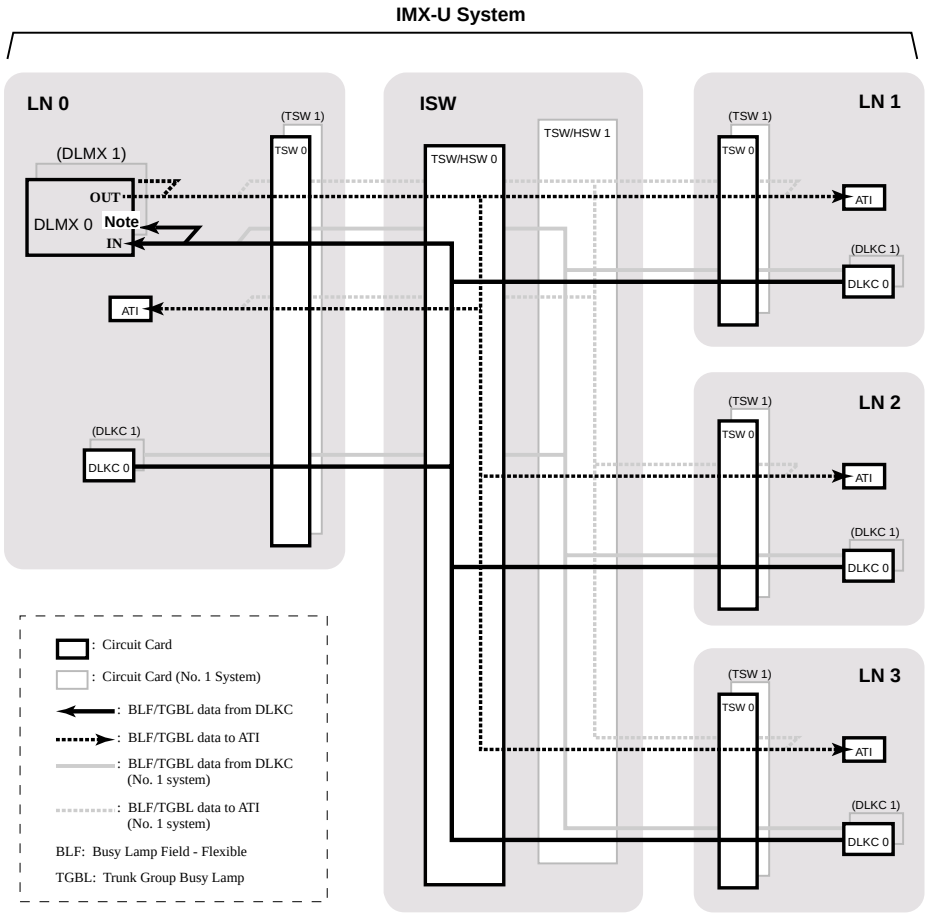
1. General Function

This circuit card mainly provides the two functions: 1) collection of BLF/TGBL information (associated with Attendant/Desk Console operation) from DLKC cards of all nodes in an IMX-U system, and 2) distribution of the collected data to ATI cards of all nodes. While a DLKC card can manage this processing solely on an accommodated node basis, the use of this card makes possible the BLF/TGBL management even on a system basis, via the Inter-node Switch (ISW). Note that this card is mounted in a PIM of any node, and if necessary, can have an optional dual configuration.

For details on BLF/TGBL information, refer to the following service features explained in the "Feature Programming Manual".

- Busy Lamp Field-Flexible [B-2]
- Trunk Group Busy Lamp [T-9]

This figure shows an example where a pair of DLMX cards (No. 0/No. 1 system) is accommodated in a PIM of LN0.



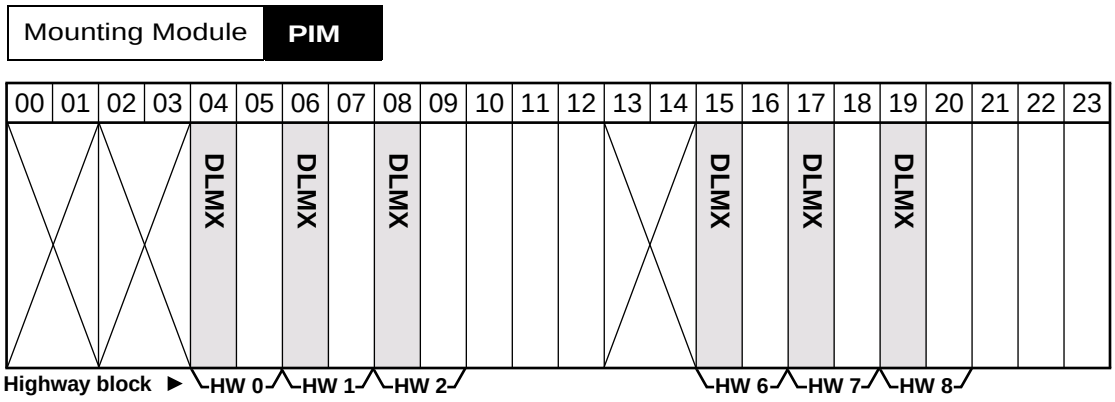
Note: *IN - DLMX card gathers BLF/TGBL information from DLKC card of each node, viaISW.*
OUT - DLMX card sends the collected BLF/TGBL information to ATI card(s) of each node, via ISW.

Figure 2-14 Location of PA-PC94 (DLMX)

2. Mounting Location/Condition

- When this circuit card is used in a single configuration.

  Mount this circuit card in any of the shaded slots



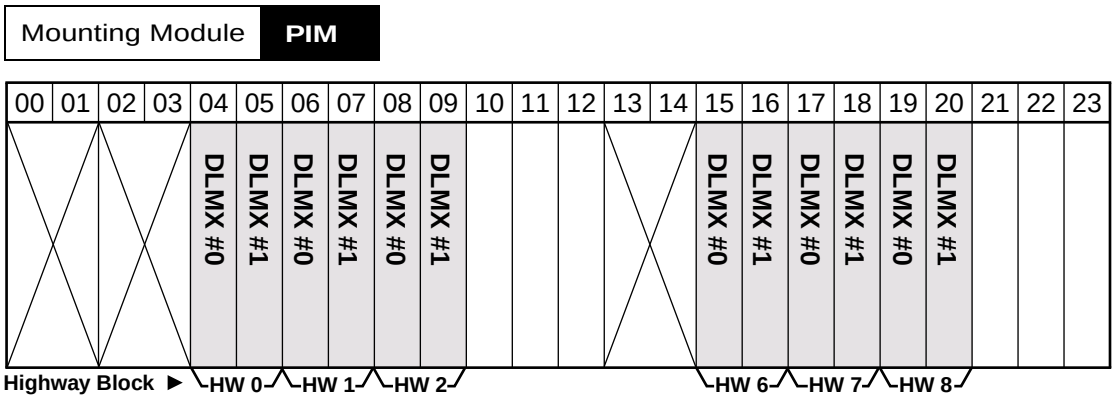
Mounting Condition

Mounting conditions of this circuit card are as follows:

1. This circuit card cannot be mounted in Slot 05, 07, 09, 10, 11, 12, 16, 18, 19, 21, 22, 23.
2. This card is used in odd-number group (G) of the shaded slots above.
3. To used this card, be sure to assign “RT=938” on the ASDT command.
4. Do not mount another line/trunk circuit card in a slot adjoining the DLMX card within the same Highway Block (HW) (i.e. do not mount other line/trunk card in the right side of the slot where a DLMX card is mounted).

- When this circuit card is used in a dual configuration.

  Mount this circuit card in any of the shaded slots:



Mounting Condition

Mounting conditions of this circuit card are as follows:

1. A pair of DLMX card No. 0/No. 1 systems must be mounted in the same Highway Block (HW).
2. This circuit card cannot be mounted in 32-port slot (10, 11,12, 21, 22, 23).
3. This card is used in odd-number group (G) of the shaded slots above.
4. To use this card, be sure to assign “RT=938” on the ASDT command.

3. Face Layout of Lamps and Switches

   The face layout of lamps and switches is shown in Figure 2-15.

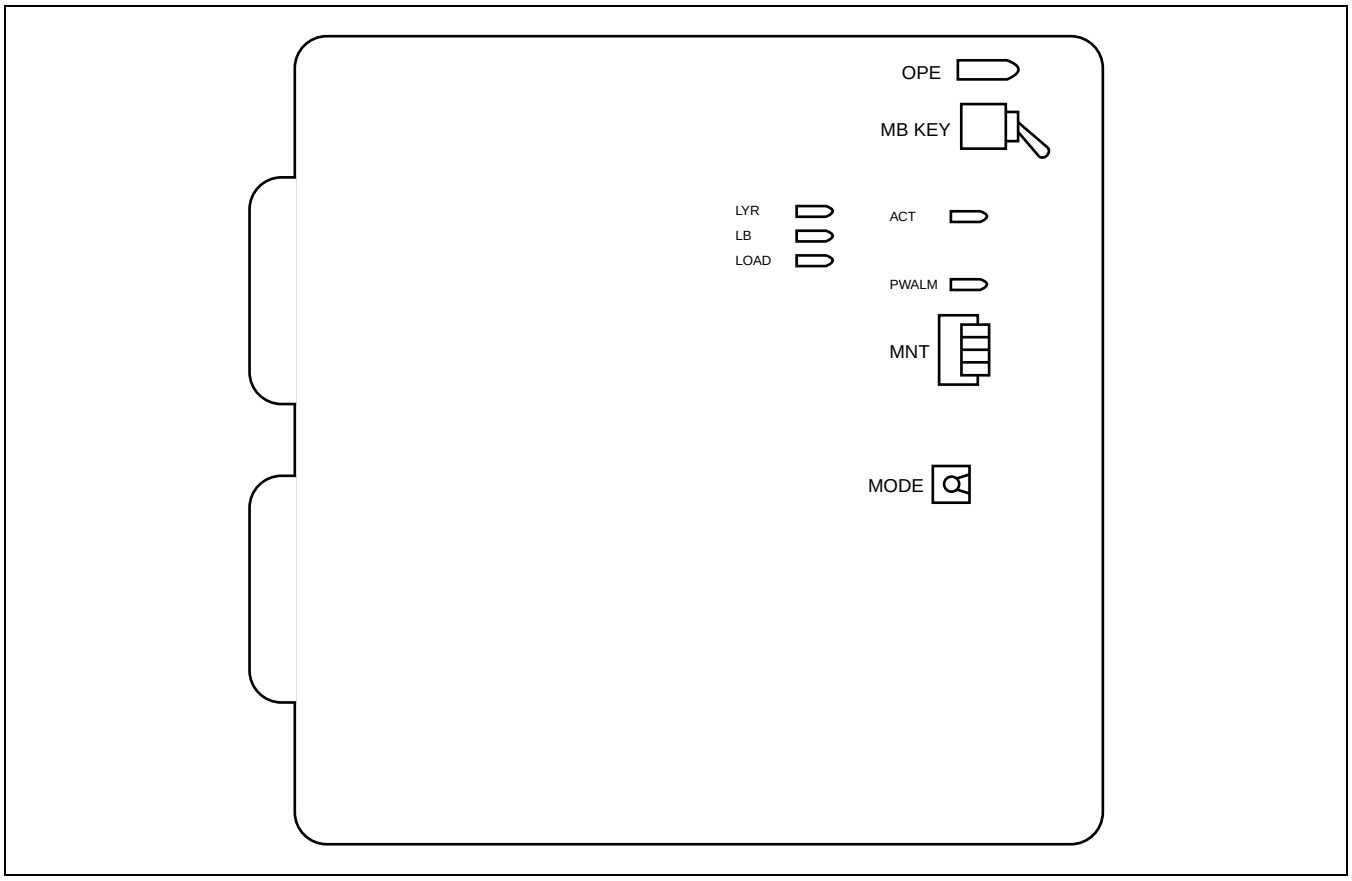


Figure 2-15 Face Layout of PA-PC94 (DLMX)

4. Lamp Indications

   The contents of lamp indications on this circuit card are shown in the table below:

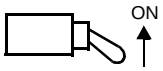
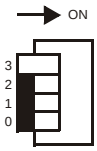
LAMP NAME	COLOR	STATE
OPE	Green	Remains lit while this circuit card is in normal operation.
ACT	Green	Lights when this circuit card is in a active state.
	OFF	Off when this circuit card is in a stand-by state.
LYR	OFF	Off when this circuit card is in normal operation.
LB	OFF	Off when this circuit card is in normal operation.
LOAD	OFF	Off when this circuit card is in normal operation.
PWALM	Red	Lights when OBP alarm

5. Switch Settings

Standard settings of switches on this circuit card are shown in the table below.

SWITCH NAME	SWITCH No.	SETTING	STANDARD SETTING	MEANING
MB		UP		Circuit card make-busy.
		DOWN		Circuit card make-busy cancel
MNT	0	OFF	×	Fixed to OFF.
	1	OFF	×	Fixed to OFF.
	2	OFF	×	Fixed to OFF.
	3	ON		Make-busy-request.
		OFF		Cancel the make-busy-request.
MODE	0		×	Standard setting. (TSW fixed connection)
	1-7			Not used

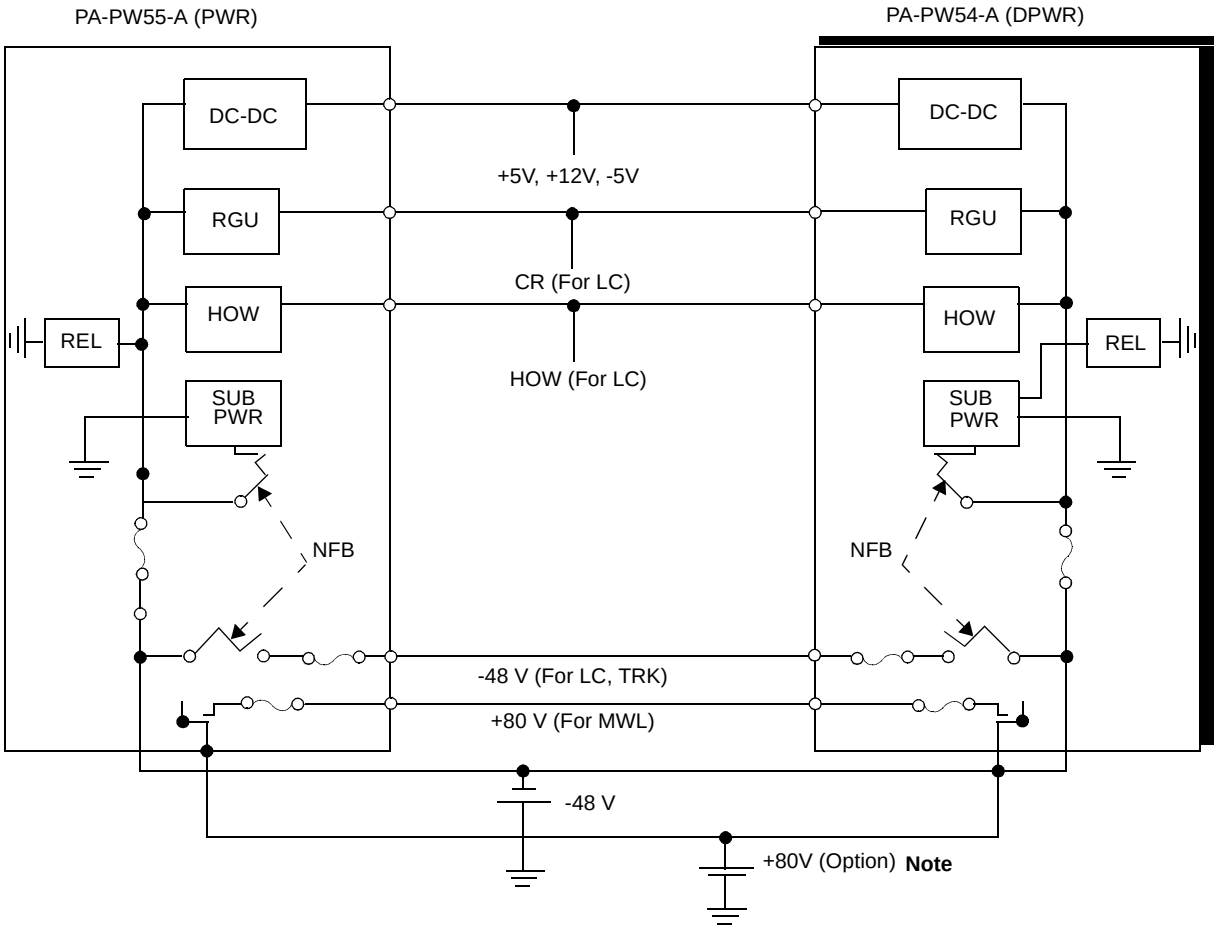
6. Switch Setting Sheet

SWITCH NAME	SWITCH SHAPE	REMARKS
MB		
MNT		
MODE		

PA-PW54-A
Dual Power

1. General Function

   The PA-PW54-A (DPWR) circuit card supplies operating power to circuit cards located in the PIM. The -48 V input power source, which is converted to +5 V, -5 V, and +12 V, is distributed to each circuit card in the PIM. This card also has a Ringing Generator Unit (RGU), whose output frequency and voltage can be selected from 20 Hz, 25 Hz, 75 Vrms, 90 Vrms by switch setting on this card. In addition, a Howler Tone circuit resides on this card.

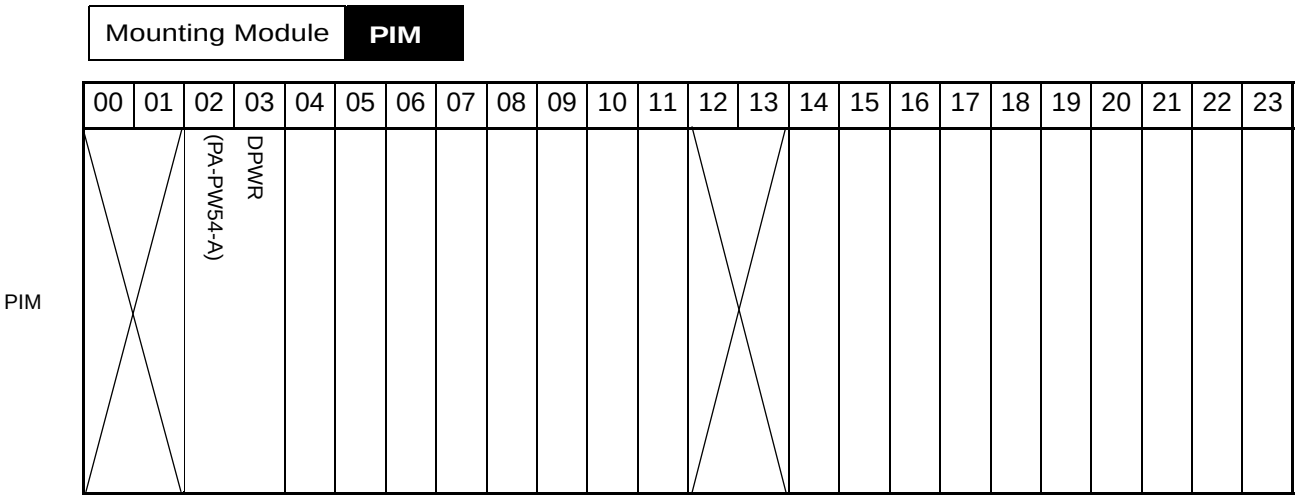


Note: *The +80V input is required for activating Message Waiting Lamps (MWLs) .*

Figure 2-16 Location of PA-PW54-A (DPWR) Card in the System

2. Mounting Location/Conditions

This circuit card is mounted in the following slot.



3. Face Layout of Lamps, Switches, and Connectors

   The face layout of lamps, switches, and connectors on this circuit card is shown in Figure 2-17.

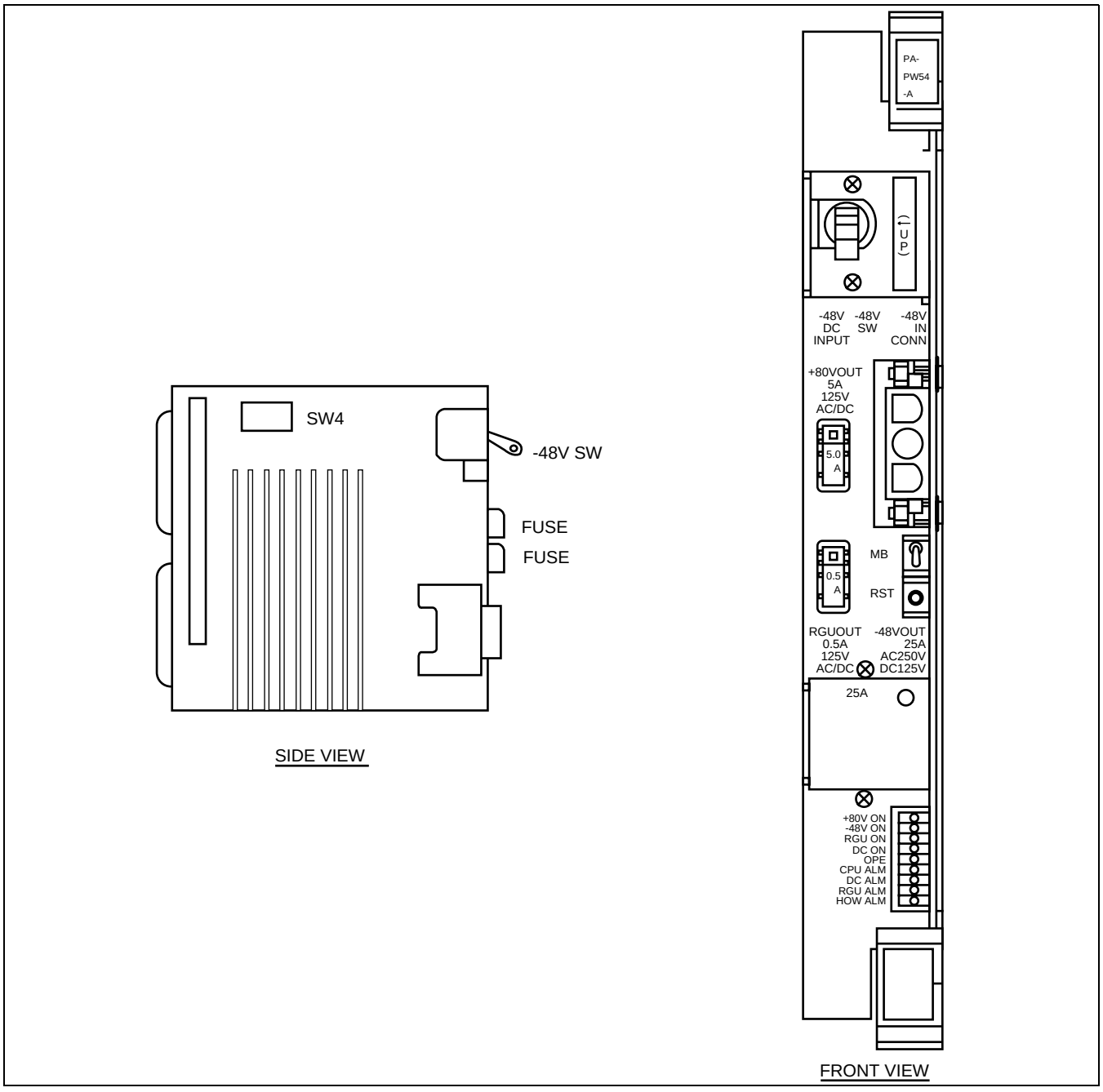


Figure 2-17 Face Layout of PA-PW54-A (DPWR) Card

4. Lamp Indications

Lamp indications for this circuit card are shown in the table below.

LAMP NAME	COLOR	STATE
+80V ON	Green	Remains lit while +80 V input power is being supplied.
–48 V ON	Green	Remains lit while –48 V input power is being supplied.
RGU ON	Green	Remains lit while RGU output is in progress.
DC ON	Green	Remains lit while +5 V, +12 V, and –5 V are being output normally.
OPE	Green	Lights when information exchange with the CPU is possible.
CPUALM	Red	Lights when reset of the microprocessor has been activated.
DCALM	Red	Lights when +5 V, +12 V, or –5 V outputs alarm.
RGUALM	Red	Lights when RGU voltage alarm.
HOWALM	Red	Lights when howler alarm.

5. Switch Settings

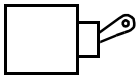
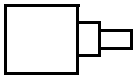
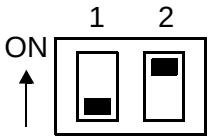
This circuit card has the following switches.

SWITCH NAME	SWITCH No.	SETTING	STANDARD SETTING	DESCRIPTION
–48V SW	—	ON	×	–48 V input power is supplied.
		OFF		–48 V input power is not supplied.
RESET	—	PUSH		Hardware reset of the circuit card.
		—	×	Normal setting.
MB	—	ON		Make-busy of the circuit card.
		OFF	×	Normal setting.
SW4	1	ON		Frequency of Ringing Signal: 25 [Hz]
		OFF	×	Frequency of Ringing Signal: 20 [Hz]
	2	ON	×	Voltage of Ringing Signal: 90 [Vrms]
		OFF		Voltage of Ringing Signal: 75 [Vrms]

6. External Interface

No cable connections are required.

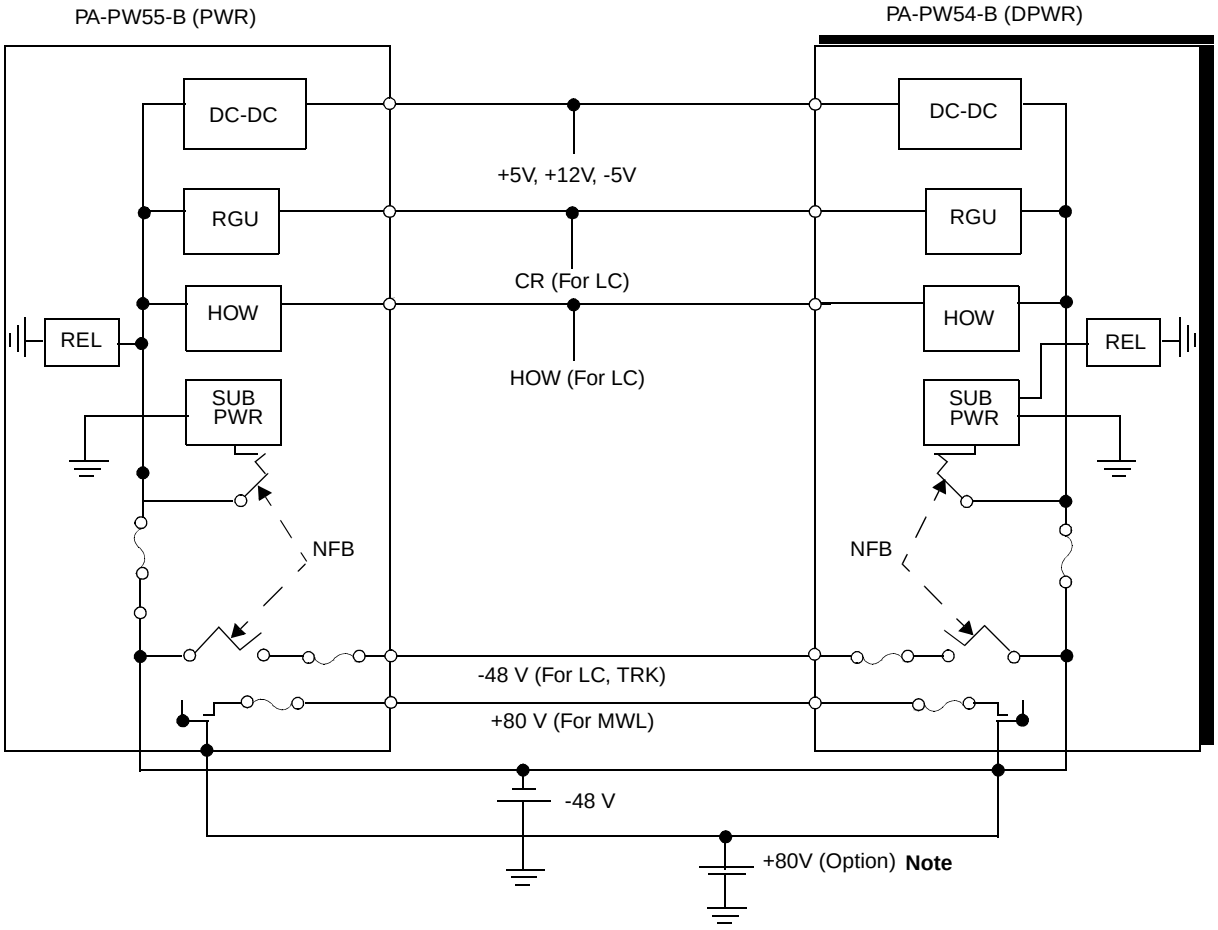
7. Switch Setting Sheet

SWITCH NAME	SWITCH SHAPE	REMARKS
–48 V		
RESET		
MB	DOWN	Circuit card Make-busy cancel
SW4		20 [Hz] 90 [Vrms]

PA-PW54-B
Dual Power

1. General Function

The PA-PW54-B (DPWR) circuit card supplies operating power to circuit cards accommodated in the PIM. The -48V input power source, which is converted to +5V, -5V, and +12V, is distributed to each circuit card in the PIM. This card is also equipped with a Ringing Generator Unit (RGU), whose output frequency and voltage can be selected among 20Hz, 25Hz, 75Vrms, 90Vrms by switch setting on this card. In addition, a Howler Tone circuit resides on this card.



Note: *The +80V input is required for activating Message Waiting Lamps (MWLs).*

Figure 2-18 Location of PA-PW54-B (DPWR) Card within the System

2. Mounting Location/Conditions

This circuit card is mounted in the following slot.

Mounting Module	**PIM**

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
PIM			DPWR (PA-PW54-B)																					

3. Face Layout of Lamps, Switches, and Connectors

The face layout of lamps, switches, and connectors on this circuit card is shown in Figure 2-19.

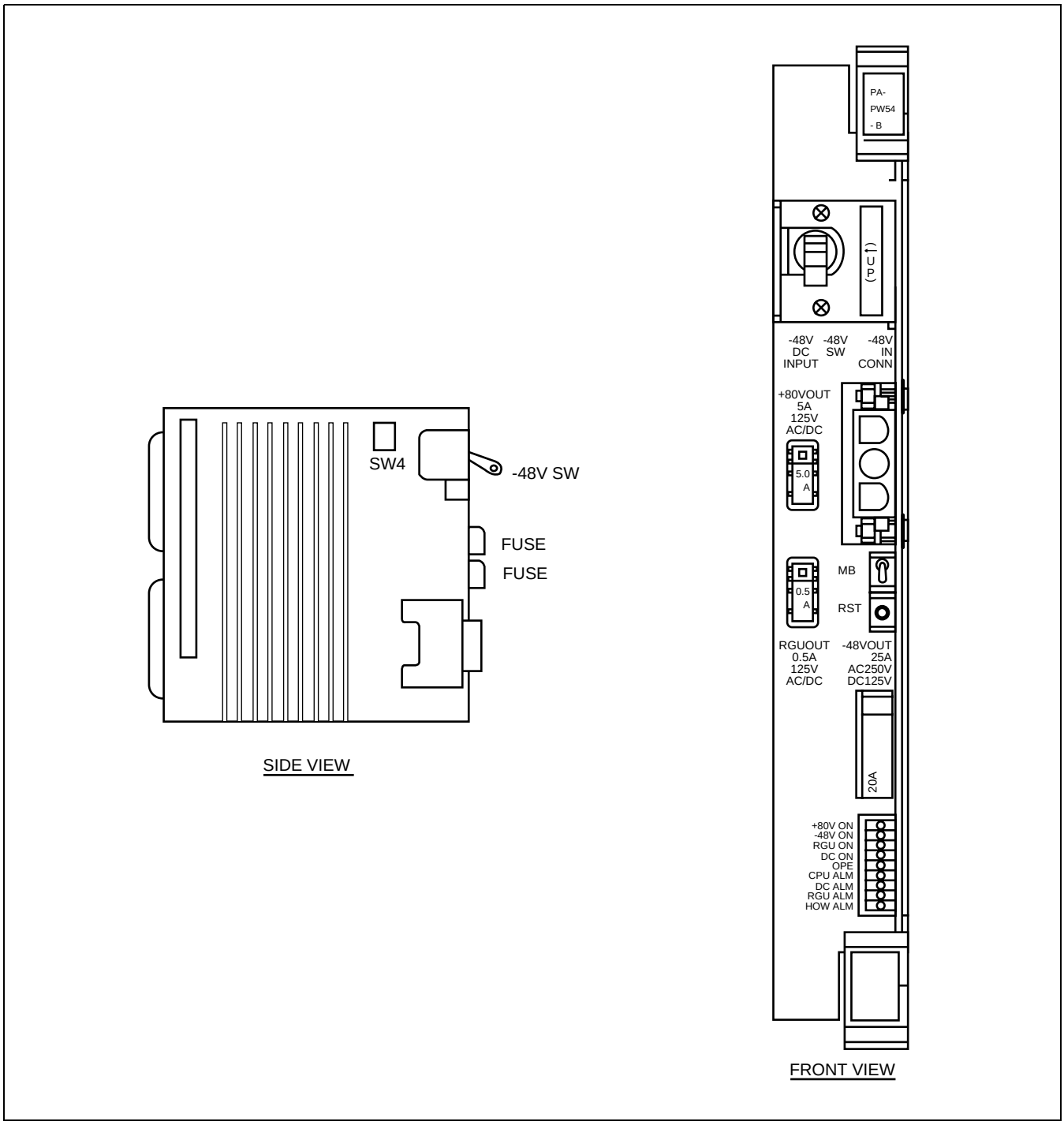


Figure 2-19 Face Layout of PA-PW54-B (DPWR) Card

4. Lamp Indications

The contents of lamp indications on this circuit card are shown in the table below.

LAMP NAME	COLOR	STATE
+80V ON	Green	Remains lit while +80 V input power is being supplied.
–48 V ON	Green	Remains lit while –48 V input power is being supplied.
RGU ON	Green	Remains lit while RGU output is in progress.
DC ON	Green	Remains lit while +5 V, +12 V, and –5 V are being output normally.
OPE	Green	Lights when information exchange with the CPU is possible.
CPUALM	Red	Lights when reset of the microprocessor has been activated.
DCALM	Red	Lights in the case of +5V, +12V, or –5 V outputs alarm.
RGUALM	Red	Lights in the case of RGU voltage alarm.
HOWALM	Red	Lights in the case of howler alarm.

5. Switch Settings

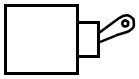
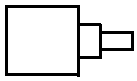
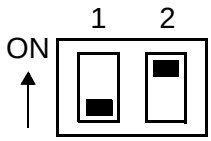
This circuit card has the following switches.

SWITCH NAME	SWITCH No.	SETTING	STANDARD SETTING	DESCRIPTION
–48V SW	—	ON	×	–48V input power is supplied.
		OFF		–48V input power is not supplied.
RESET	—	PUSH		Hardware reset of the circuit card.
		—	×	Normal setting
MB	—	ON		Make busy of the circuit card.
		OFF	×	Normal setting
SW4	1	ON		Frequency of Ringing Signal: 25 [Hz]
		OFF	×	Frequency of Ringing Signal: 20 [Hz]
	2	ON	×	Voltage of Ringing Signal: 90 [Vrms]
		OFF		Voltage of Ringing Signal: 75 [Vrms]

6. External Interface

No cable connections are required.

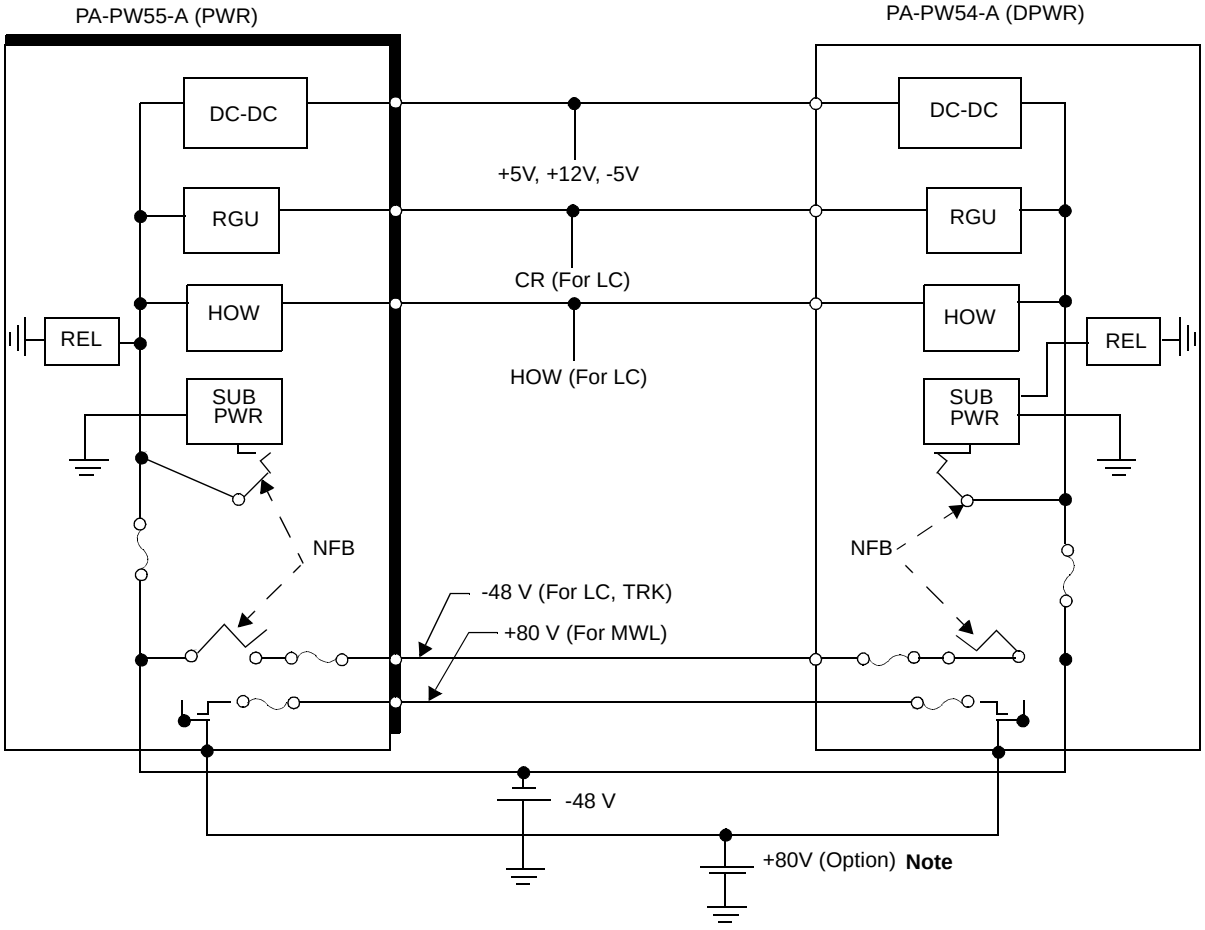
7. Switch Setting Sheet

SWITCH NAME	SWITCH SHAPE	REMARKS
–48 V		
RESET		
MB	DOWN	Circuit card make busy cancel
SW4		20 [Hz] 90 [Vrms]

PA-PW55-A
Power

1. General Function

The PA-PW55-A (PWR) circuit card supplies operating power to circuit cards located in the PIM. The -48 V input power source, which is converted to +5 V, -5 V, and +12 V, is distributed to each circuit card in the associated PIM. This card also has a Ringing Generator Unit (RGU), whose output frequency and voltage can be selected from 20 Hz, 25 Hz, 75 Vrms, 90 Vrms by switch setting on this card. In addition, a Howler Tone circuit resides on this card.

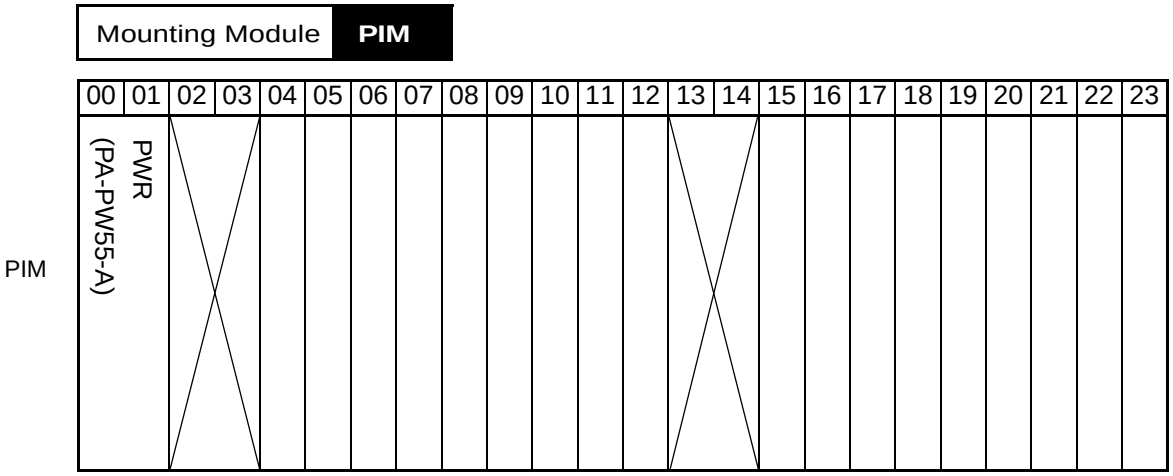


Note: *The +80V input is required for activating Message Waiting Lamps (MWLs) .*

Figure 2-20 Location of PA-PW55-A (PWR) Card in the System

2. Mounting Location/Conditions

This circuit card is mounted in the following slots.



3. Face Layout of Lamps, Switches, and Connectors

   The face layout of lamps, switches, and connectors on this circuit card is shown in Figure 2-21.

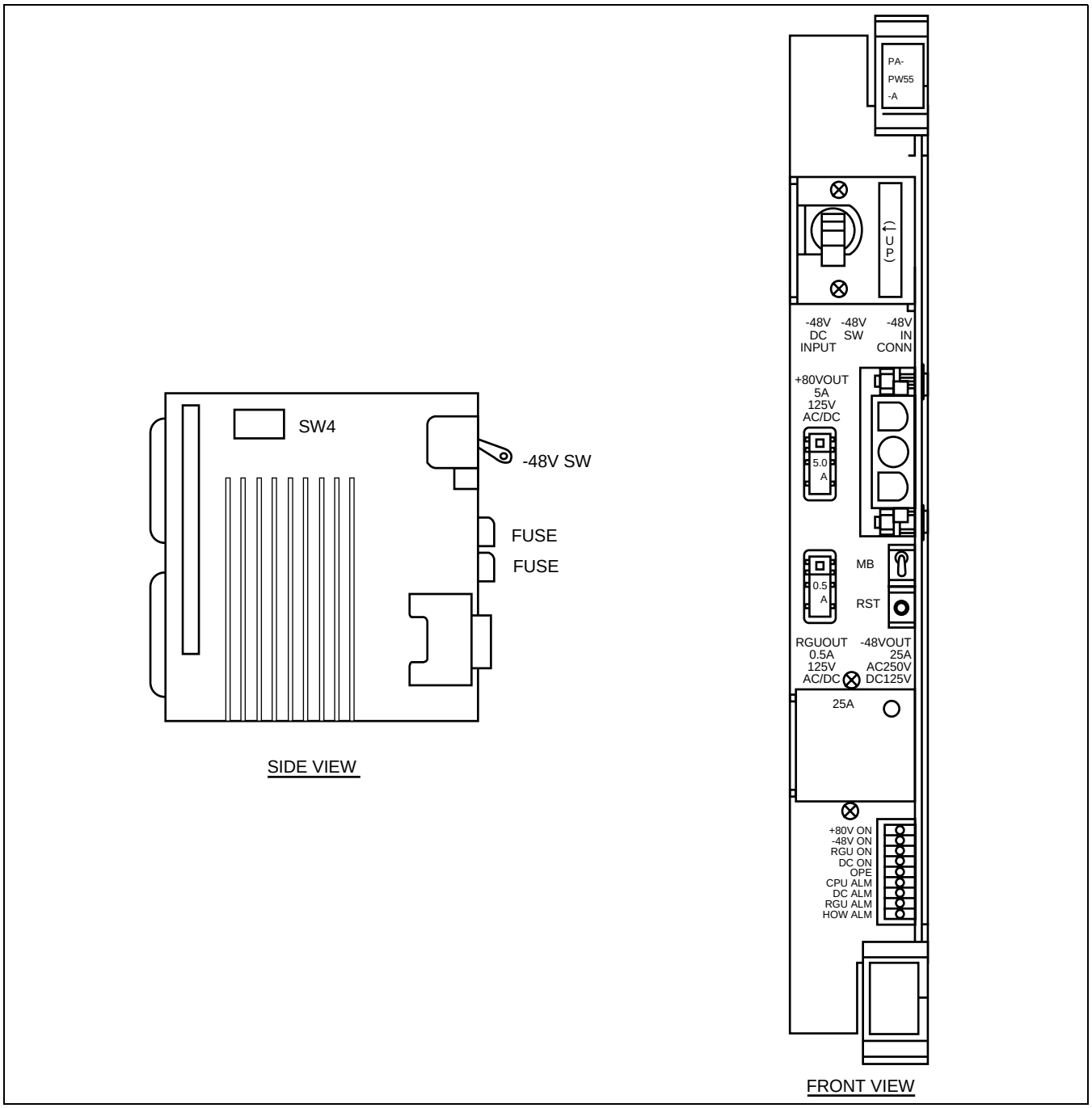


Figure 2-21 Face Layout of PA-PW55-A Card

4. Lamp Indications

Lamp indications for this circuit card are shown in the table below.

LAMP NAME	COLOR	STATE
+80V ON	Green	Remains lit while +80 V input power is being supplied.
–48 V ON	Green	Remains lit while –48 V input power is being supplied.
RGU ON	Green	Remains lit while RGU output is in progress.
DC ON	Green	Remains lit while +5 V, +12 V, and –5 V are being output normally.
OPE	Green	Lights when information exchange with the CPU is possible.
CPUALM	Red	Lights when reset of the microprocessor has been activated.
DCALM	Red	Lights when +5 V, +12 V, or –5 V outputs alarm.
RGUALM	Red	Lights when RGU voltage alarm.
HOWALM	Red	Lights when howler alarm.

5. Switch Settings

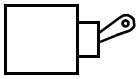
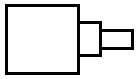
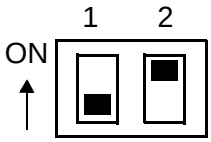
This circuit card has the following switches.

SWITCH NAME	SWITCH No.	SETTING	STANDARD SETTING	DESCRIPTION
–48 V SW		ON	×	–48 V input power is supplied.
		OFF		–48 V input power is not supplied.
RESET		PUSH		Hardware reset of the circuit card.
		—	×	Normal setting
MB	—	ON		Make-busy of the circuit card.
		OFF	×	Normal setting
SW4	1	ON		Frequency of Ringing Signal: 25 [Hz]
		OFF	×	Frequency of Ringing Signal: 20 [Hz]
	2	ON	×	Voltage of Ringing Signal: 90 [Vrms]
		OFF		Voltage of Ringing Signal: 75 [Vrms]

6. External Interface

No cable connections are required.

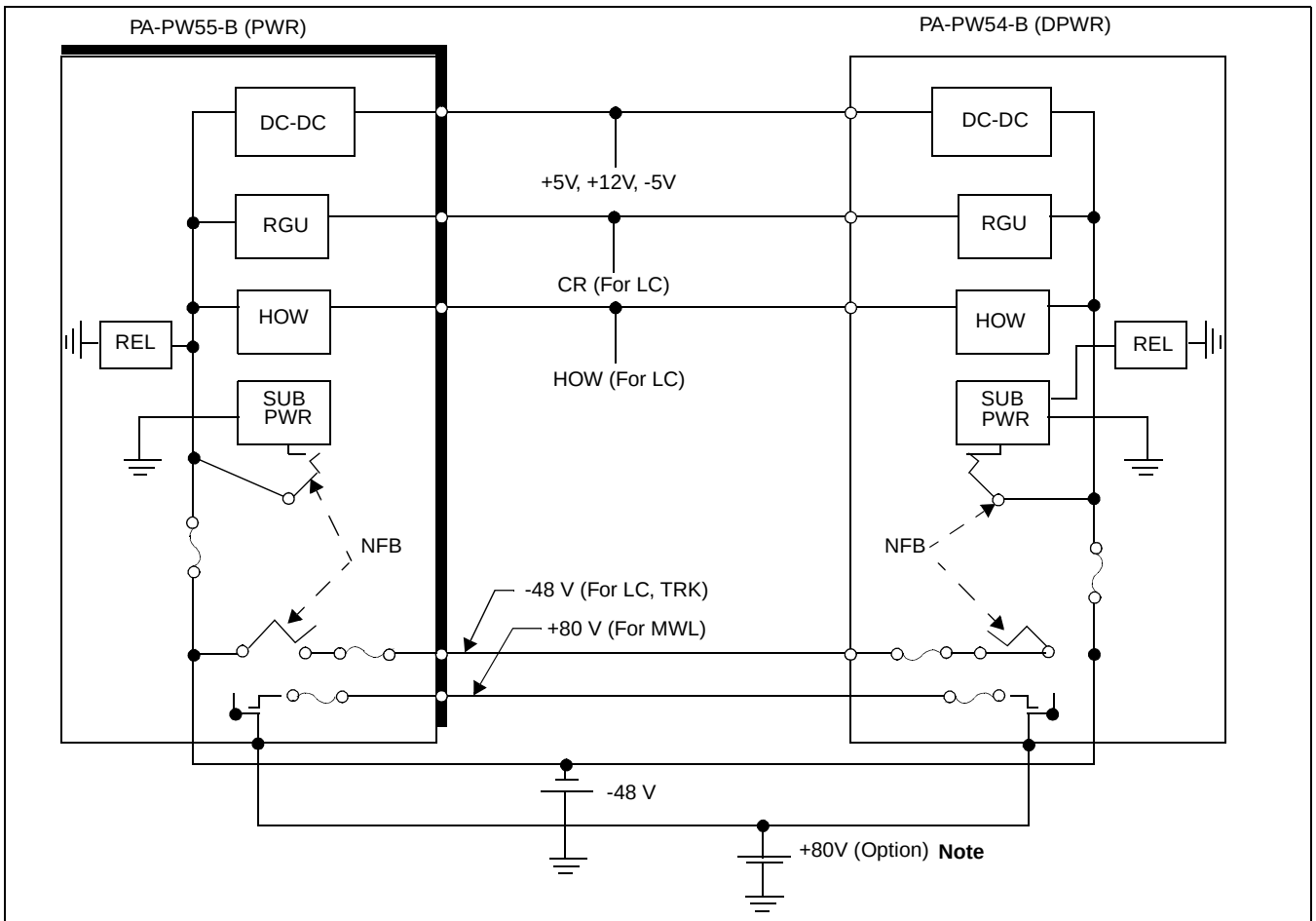
7. Switch Setting Sheet

SWITCH NAME	SWITCH SHAPE	REMARKS
–48 V		
RESET		
MB	DOWN	Circuit card Make-busy cancel.
SW4		20 [Hz] 90 [Vrms]

PA-PW55-B
Power

1. General Function

The PA-PW55-B (PWR) circuit card supplies operating power to circuit cards accommodated in the PIM. The -48V input power source, which is converted to +5V, -5V, and +12V, is distributed to each circuit card in the associated PIM. This card is also equipped with a Ringing Generator Unit (RGU), whose output frequency and voltage can be selected among 20Hz, 25Hz, 75Vrms, 90Vrms by switch setting on this card. In addition, a Howler Tone circuit resides on this card.



Note: *The +80V input is required for activating Message Waiting Lamps (MWLs).*

Figure 2-22 Location of PA-PW55-B (PWR) Card Within the System

2. Mounting Location/Conditions

This circuit card is mounted in the following slots.

Mounting Module	**PIM**

	00	**01**	**02**	**03**	**04**	**05**	**06**	**07**	**08**	**09**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**
PIM	PWR (PA-PW55-B)		X											X										

3. Face Layout of Lamps, Switches, and Connectors

   The face layout of lamps, switches, and connectors on this circuit card is shown in Figure 2-23.

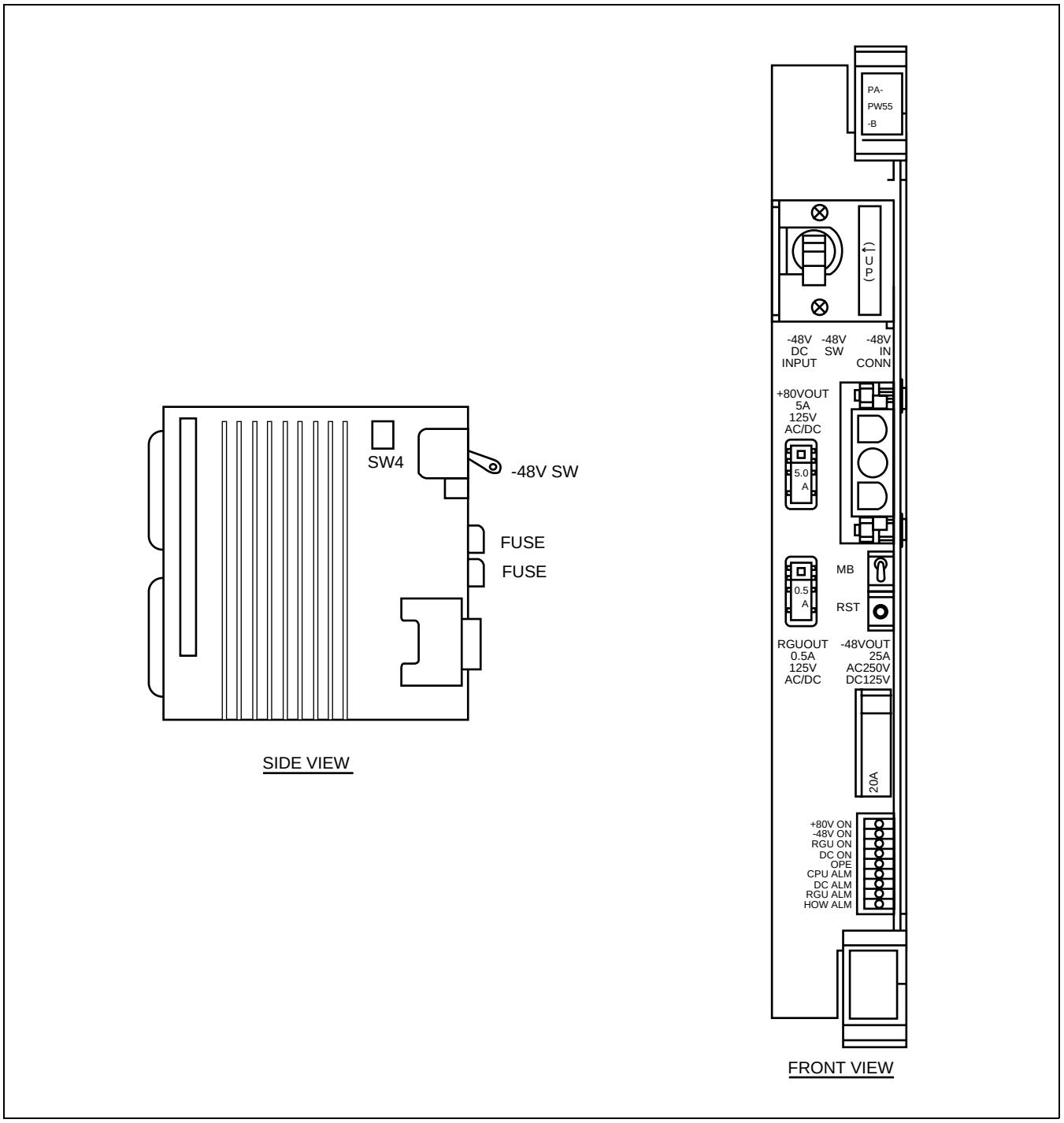


Figure 2-23 Face Layout of PA-PW55-B Card

4. Lamp Indications

   The contents of lamp indications on this circuit card are shown in the table below.

LAMP NAME	COLOR	STATE
+80V ON	Green	Remains lit while +80 V input power is being supplied.
–48 V ON	Green	Remains lit while –48 V input power is being supplied.
RGU ON	Green	Remains lit while RGU output is in progress.
DC ON	Green	Remains lit while +5 V, +12 V, and –5 V are being output normally.
OPE	Green	Lights when information exchange with the CPU is possible.
CPUALM	Red	Lights when reset of the microprocessor has been activated.
DCALM	Red	Lights in the case of +5V, +12V, or –5 V outputs alarm.
RGUALM	Red	Lights in the case of RGU voltage alarm.
HOWALM	Red	Lights in the case of howler alarm.

5. Switch Settings

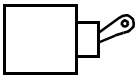
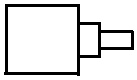
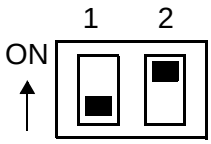
   This circuit card has the following switches.

SWITCH NAME	SWITCH No.	SETTING	STANDARD SETTING	DESCRIPTION
–48V SW		ON	×	–48V input power is supplied.
		OFF		–48V input power is not supplied.
RESET		PUSH		Hardware reset of the circuit card.
		—	×	Normal setting
MB	—	ON		Make busy of the circuit card.
		OFF	×	Normal setting
SW4	1	ON		Frequency of Ringing Signal: 25 [Hz]
		OFF	×	Frequency of Ringing Signal: 20 [Hz]
	2	ON	×	Voltage of Ringing Signal: 90 [Vrms]
		OFF		Voltage of Ringing Signal: 75 [Vrms]

6. External Interface

   No cable connections are required.

7. Switch Setting Sheet

SWITCH NAME	SWITCH SHAPE	REMARKS
–48 V		
RESET		
MB	DOWN	Circuit card make busy cancel
SW4		20 [Hz] 90 [Vrms]

PH-IO24
Input/Output Controller

1. General Function

   The PH-IO24 (IOC) circuit card supplies the system with a serial interface, which conforms to RS-232C, between external equipment such as the Maintenance Administration Terminal (MAT), Station Message Detail Recording System (SMDR), Message Center Interface (MCI). Property Management System (PMS). The relationship between the IOC card and the associated cards is as follows, when the CPU is composed in a dual configuration.

Note: *Firmware SP-3290 IO24 LV2 PROG-A is required in the Hotel system for PMS and Hotel Printer.*

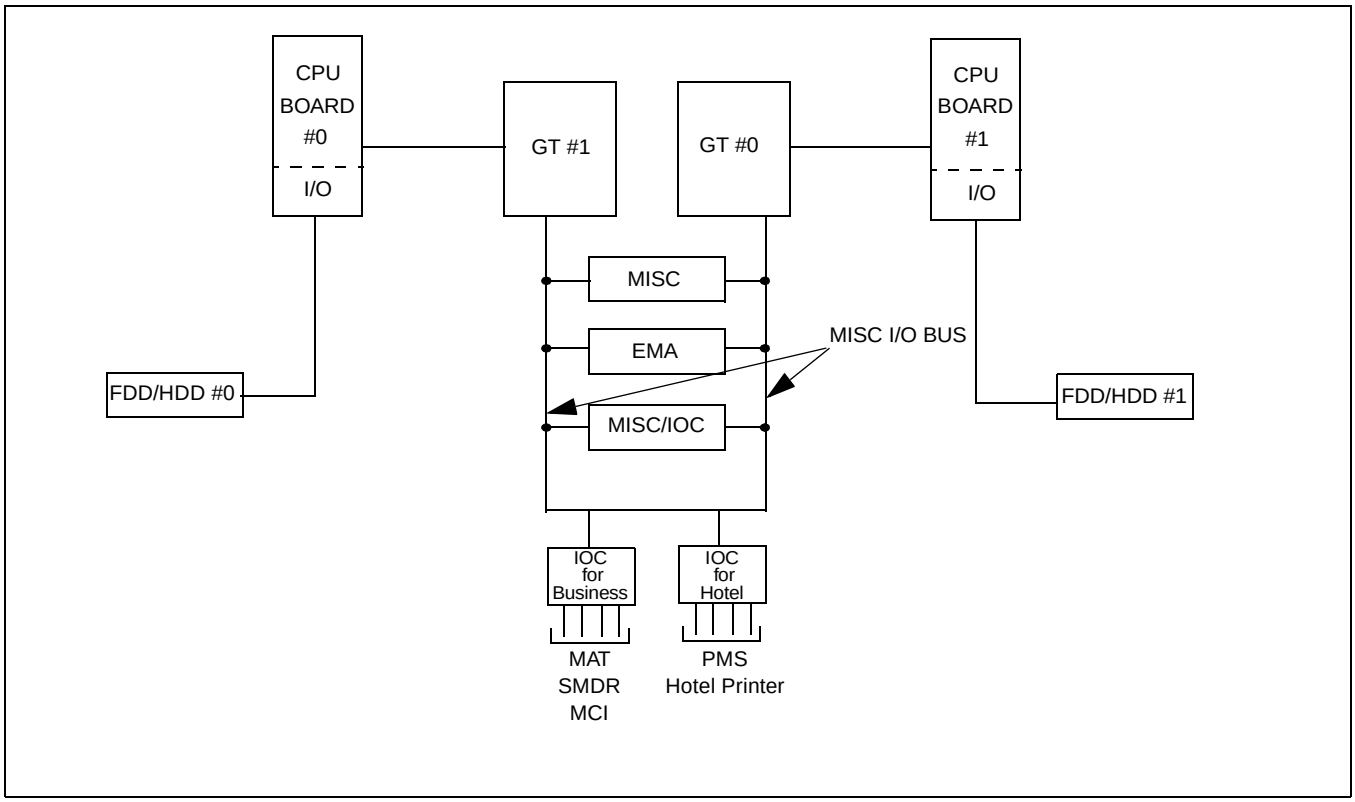
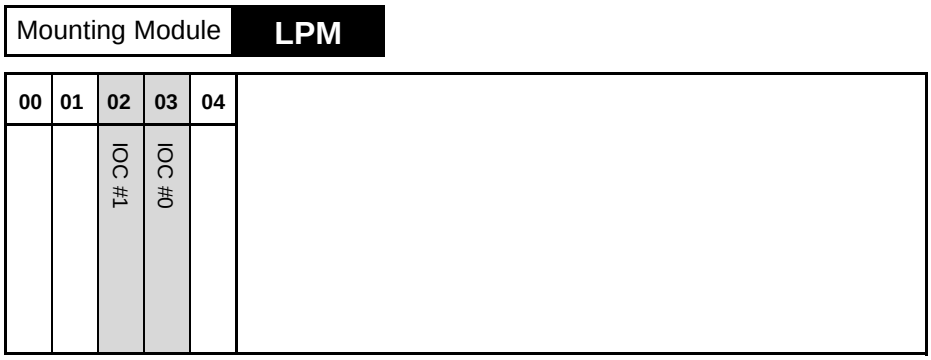


Figure 2-24 Location of PH-IO24 (IOC) Card within the System

2. Mounting Location/Condition

   The IOC cards can be accommodated in the shaded slots (02, 03) as shown below.

Note: *When using Business system and Hotel system, prepare the circuit card for each system.*



3. Face Layout of Lamps, Switches and Connectors

   The face layout of lamps, switches and connectors on this circuit card is shown in Figure 2-25.

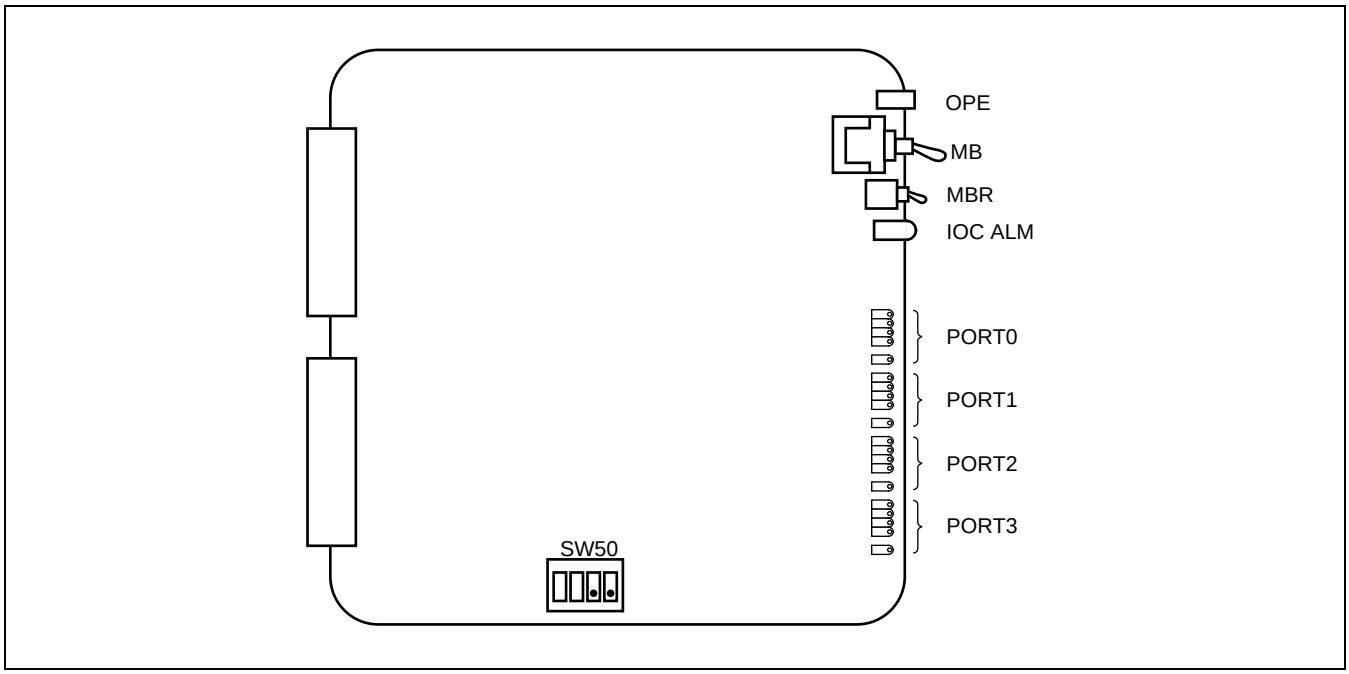


Figure 2-25 Face Layout of PH-IO24 (IOC) Card

4. Lamp Indications

The table below shows lamp indications on this circuit card.

LAMP NAME	COLOR	DESCRIPTION
OPE/MB	Green	This circuit card is operating normally.
	Red	This circuit card is placed in the make busy state.
IOC ALM	Red	Clock down WDT alarm occurs to the microprocessor.
PORT0 - PORT3		RS-232C signal status indication. n = port number (0-3)
SDn	Green	SD:Send Data
RDn	Green	RD:Receive Data
ERn	Green	ER:Equipment Ready
DRn	Green	DR:Data Ready
CDn	Green	CD:Carrier Detect

5. Switch Settings

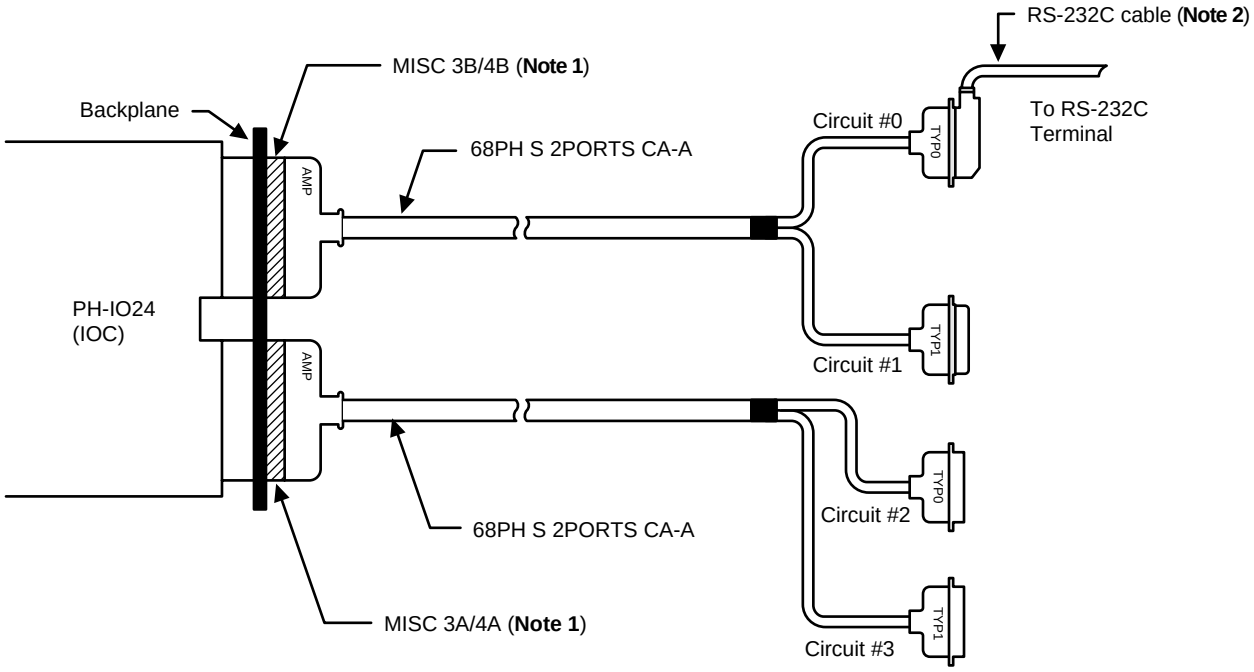
The following is a brief description of the switches on this circuit card. When a switch has a standard setting, it is indicated with "×" in the table below.

SWITCH NAME	SWITCH NO.	SETTING	STANDARD SETTING	DESCRIPTION
MB		UP		The circuit card is placed into a make busy status.
		DOWN	×	Cancellation of Make Busy.
MBR		UP		The circuit card is placed into a make busy request status.
		DOWN	×	Cancellation of Make Busy Request.
SW50	1	ON		This circuit card is used as the extended I/O circuit card #1.
		OFF		This circuit card is used as the extended I/O circuit card #0.
	2	ON		Not used (For Business System Only).
		OFF	×	
	2	ON		Free Wheeling with ACK signal (For Hotel System Only).
		OFF	×	Free Wheeling.
	3	ON		Not used
		OFF	×	
	4	ON		Not used
		OFF	×	

6. External Interface

As illustrated below, the "68PH S 2PORTS CA-A" cable is required to connect external equipment such as the MAT, SMDR, MCI and PRT.

Securely insert the connector of the 68PH S 2PORTS CA-A into the appropriate MISC connector. Refer to the table listed below.



Note 1: *The relationship between the MISC connectors and the mounting slot of the IOC (PH-IO24) circuit card is shown below.*

Mounting Slot	IOC Circuit Number	MISC Connector
02	#0, #1	MISC 3B
	#2, #3	MISC 3A
03	#0, #1	MISC 4B
	#2, #3	MISC 4A

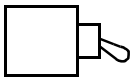
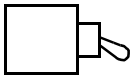
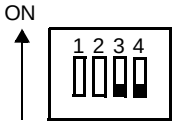
Note 2: *The type of cables varies depending on a connected terminal and/or whether modems are used or not. More detailed information on the connecting cables is explained in the "Installation Procedure Manual".*

TYP0, 1 Connector			
Pin	Signal name	Pin	Signal name
01	SD	26	
02	RD	27	
03	RS	28	
04	CS	29	
05	DR	30	
06	SG	31	
07	CD	32	
08	ER	33	
09	PB/CI	34	
10	RT	35	
11	ST1	36	
12	ST2	37	
13		38	
14		39	
15		40	
16		41	
17			

TYP0, 1 Lead Accommodation

Figure 2-26 External Cable Connection for PH-IO24 (IOC)

7. Switch Setting Sheet

SWITCH NAME	SWITCH SHAPE	REMARKS
MB		
MBR		
SW50		Meaning of SW50-1: ON: This card is used as the No. 1 circuit card. OFF: This card is used as the No. 0 circuit card.

PH-M22
MMC

1. General Function

The main functions of the PH-M22 circuit card are:

- To collect the key setting information on the TOPU of the ISW and send the information to the ISW/ the other LNs, depending on the ISEL key setting on the ISW.
- To collect various alarm information from all the IMGs/ISW and activate MJ/MN LED on the TOPU display.

This circuit card is used for the IMX-U system.

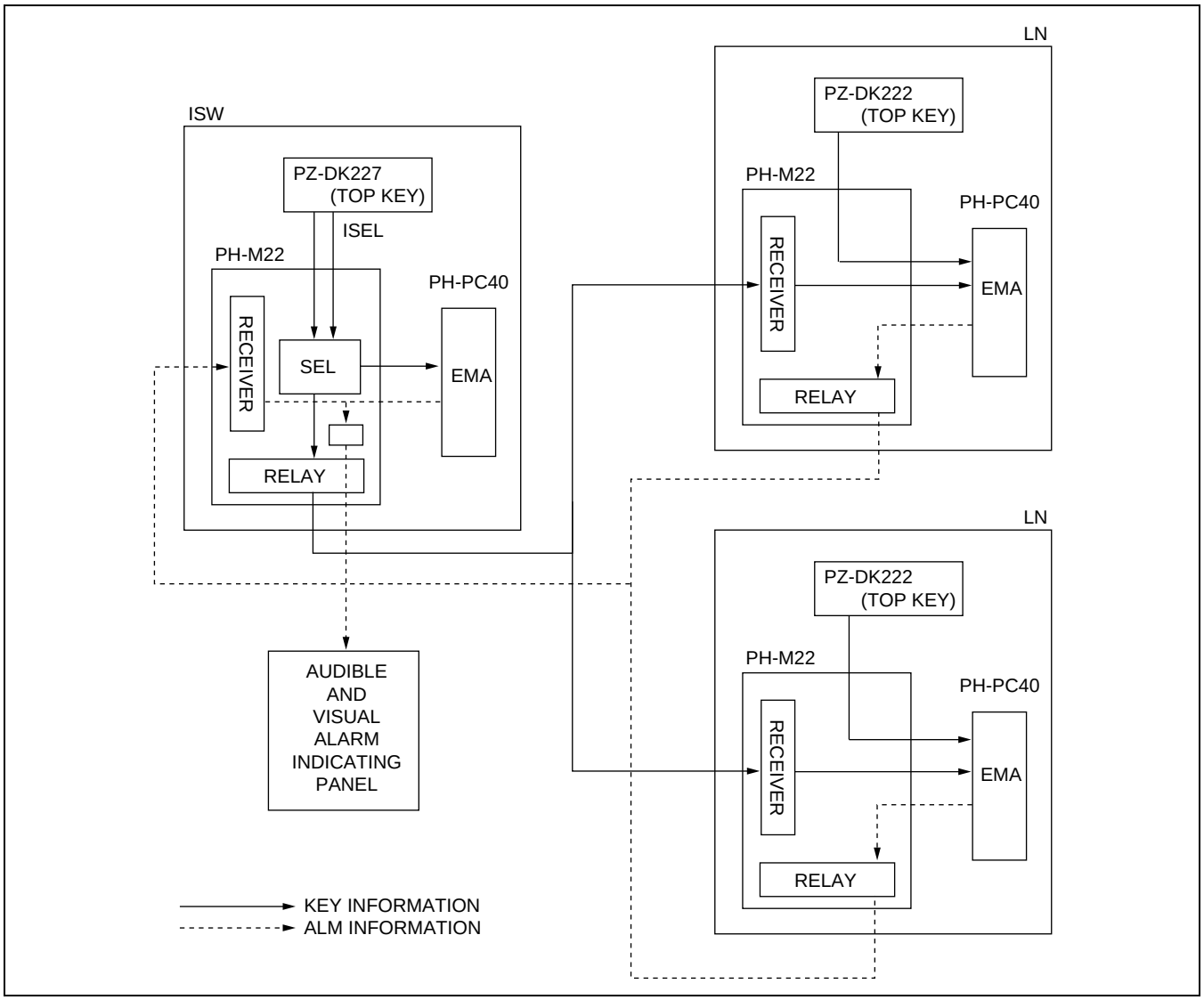


Figure 2-27 Location of PH-M22 (MMC)

2. Mounting Location/Condition

   This circuit card can be mounted in the shaded slots shown below.

Mounting Module	LPM				
00	**01**	**02**	**03**	**04**	
MMC					CPRAQ-A/CPRAS-A
					CPRAQ-A/CPRAS-A

3. Face Layout of Lamps, Switches, and Connectors

   The face layout of lamps, switches, and connectors are shown in Figure 2-28.

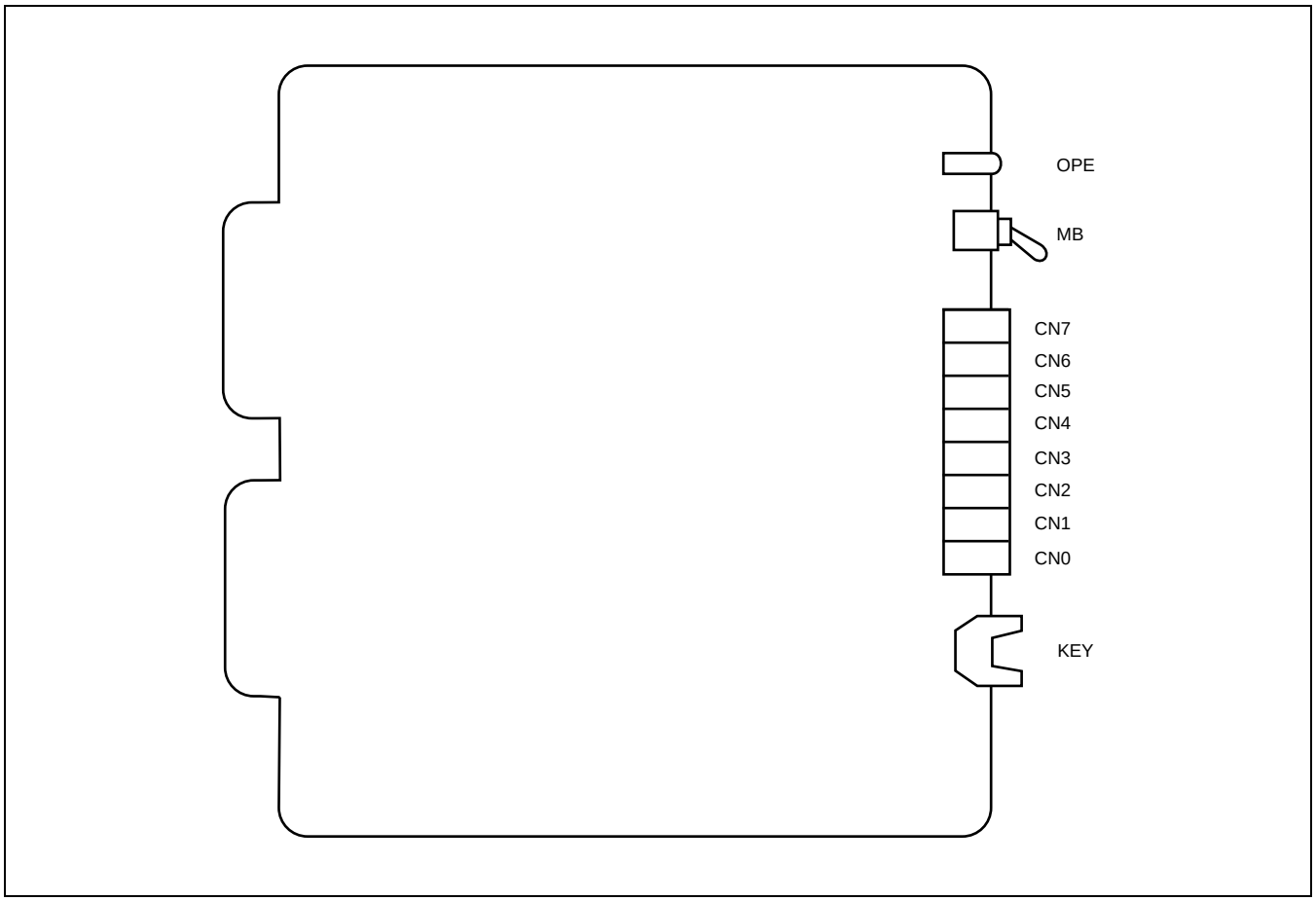


Figure 2-28 Face Layout of PH-M22 (MMC)

4. Lamp Indications

The contents of lamp indications on this circuit card are shown in the table below.

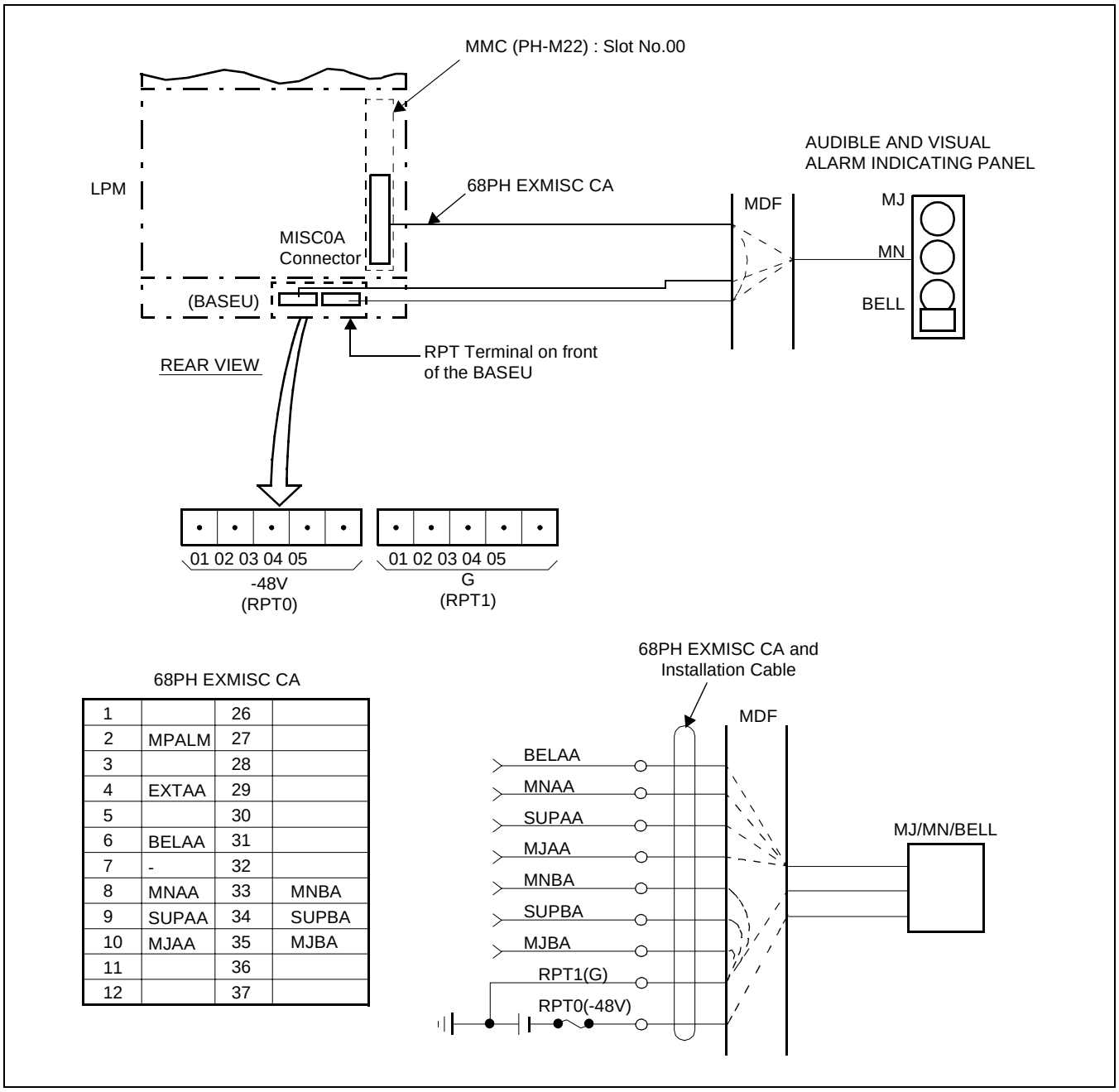
LAMP NAME	COLOR	STATE
OPE	Green	Lights when this circuit card is in operation.

5. Switch Settings

Switch settings on this circuit card are shown in the table below.

SWITCH NAME	SETTING	STANDARD SETTING	MEANING
MB	UP		Circuit Card make-busy
	DOWN	×	Circuit Card make-busy cancel

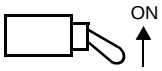
6. External Interface



68PH EXMISC CA			
1		26	
2	MPALM	27	
3		28	
4	EXTAA	29	
5		30	
6	BELAA	31	
7	-	32	
8	MNAA	33	MNBA
9	SUPAA	34	SUPBA
10	MJAA	35	MJBA
11		36	
12		37	

Figure 2-29 Connection of Alarm Indicating Panel

7. Switch Setting Sheet

SWITCH NAME	SWITCH SHAPE	REMARKS
MB		**Note:** *Normal operating mode is down.*

PH-M16/PH-M23
Line Test

1. General Function

   This circuit card controlled by CPU is used for line test of a subscriber's line. The circuit card supports to send Howler Tone to external test equipment, besides the circuit card can detect or send various tones, and send PB (DTMF) signal for automatic trunk test.

Note: *A system cannot send Howler Tone during line test. The number of available lines within the line test/automatic trunk test at the same time is only one.*

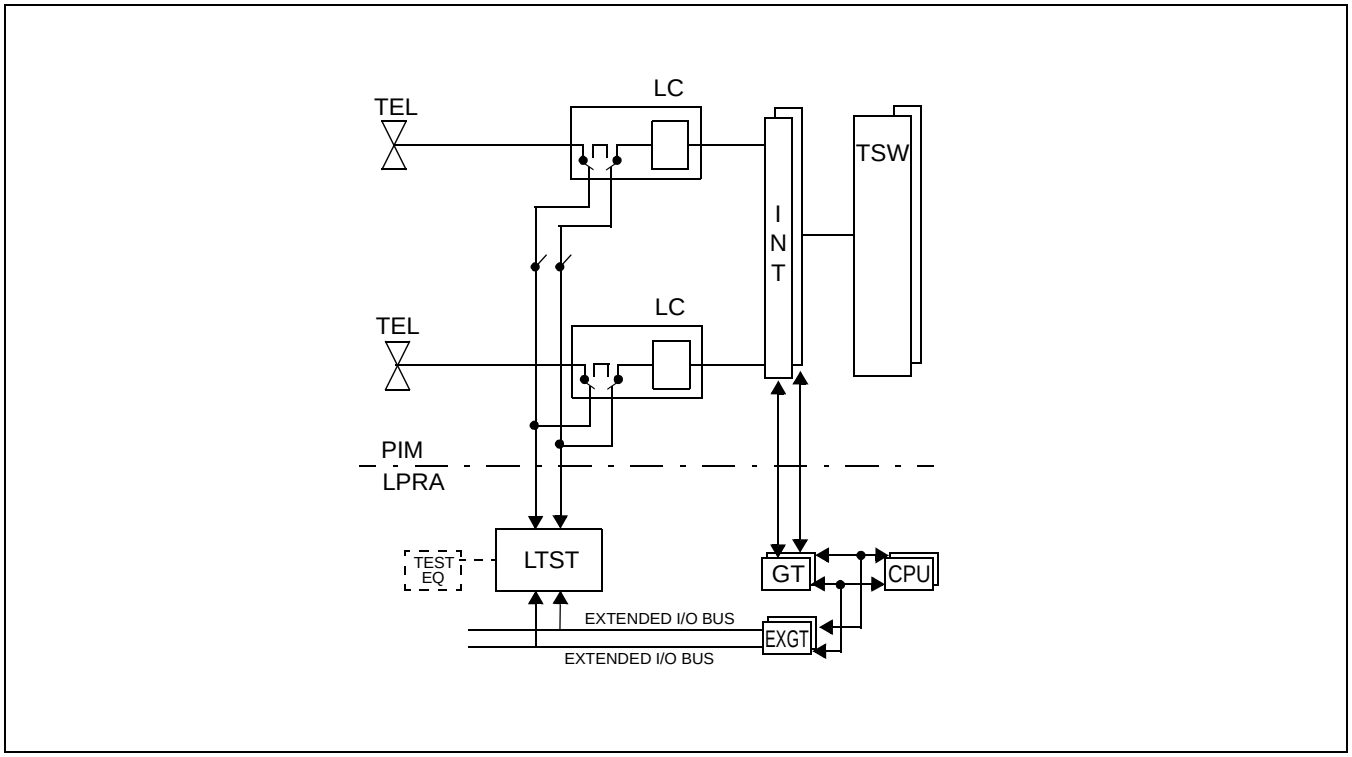


Figure 2-30 Location of PH-M16/PH-M23 (LTST) Card Within the System

2. Mounting Location/Condition

The LTST circuit card can be accommodated in the shaded slots (00, 01, 02) as shown below:

Note: *IMX: Slot 00, Slot 01, Slot 02.*
IMX-U: Slot 01, Slot 02 (Considering PH-M22 MMC)

Mounting Module	LPM

00	01	02	03	04	
PH-M16/PH-M23	PH-M16/PH-M23	PH-M16/PH-M23			

3. Face Layout of Lamps, Switches, and Connectors

The face layout of lamps, switches, and connectors on this circuit card is shown in Figure 2-31.

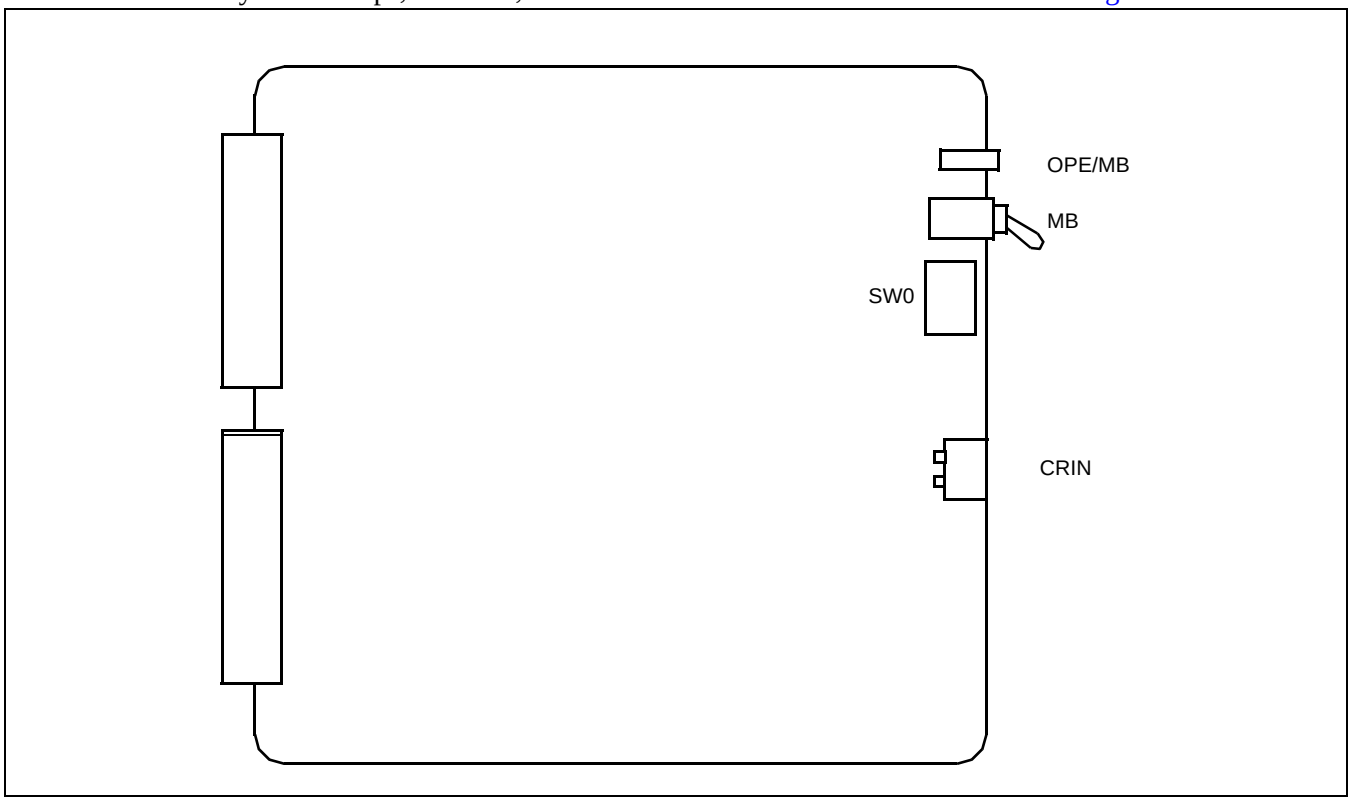


Figure 2-31 Face Layout of PH-M16/PH-M23 (LTST) Card

Note: *CRIN is used to connect with CRIN test equipment.*

4. Lamp Indications

LAMP NAME	COLOR	DESCRIPTION
OPE/MB	Green	This circuit card is operating in normal mode.
	Red	This circuit card is Make-busy.

5. Switch Settings

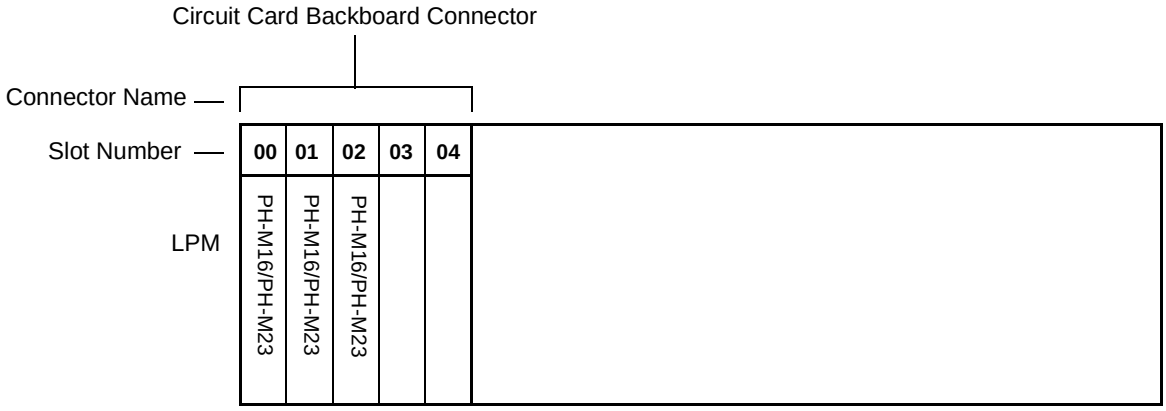
SWITCH NAME	SWITCH NO	SETTING	STANDARD SETTING	MEANING
MB		UP		Circuit card Make-busy
		DOWN		Circuit card Make-busy cancel
SW0	1	ON	×	Setting of a condition of DT detection (440Hz+350Hz)
	2	ON	×	Setting of a condition of RBT detection (440Hz+480Hz)
	3	ON		Time of PB (DTMF) signal sending (67msec.)
		OFF	×	Time of PB (DTMF) signal sending (133msec.)
	4	ON		Setting of M-wire control which is concerned with sending test tone of ODT (Set soft control or E-wire loop-back)
		OFF		Setting of M-wire control which is concerned with sending test tone of ODT (Set soft control only)
	5			**BASIC INTERVAL TIMER**
	6			
	7			
	8			

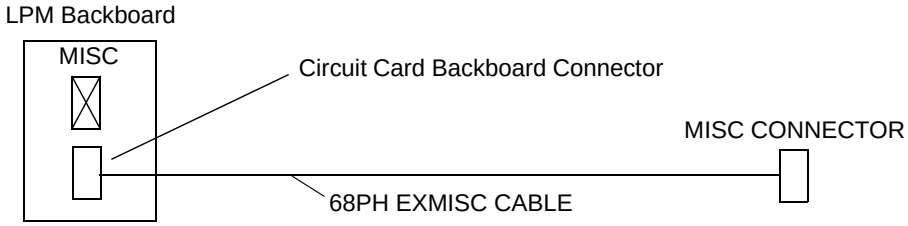
BASIC INTERVAL TIMER

SW0				
5	**6**	**7**	**8**	**TIME**
ON	OFF	OFF	OFF	8µ
ON	ON	OFF	OFF	16µ
ON	ON	ON	OFF	32µ
ON	ON	ON	ON	64µ

6. External Interface

MISC Connector Accommodation





MISC CONNECTOR

26	TE	1	TM
27		2	
28		3	
29	TELB	4	TELA
30	LCB	5	LCA
31	THOWB	6	THOWA
32	THOWS	7	ONHK
33	SE	8	TCR
34		9	ATM
35	ATB	10	ATA
36	OUTB	11	OUTA
37	TB1	12	TA1
38		13	
39		14	
40		15	
41		16	
42		17	
43		18	
44	INB	19	INA
45		20	
46		21	
47		22	
48		23	
49		24	
50		25	

Figure 2-32 LT Connector Lead Accommodation

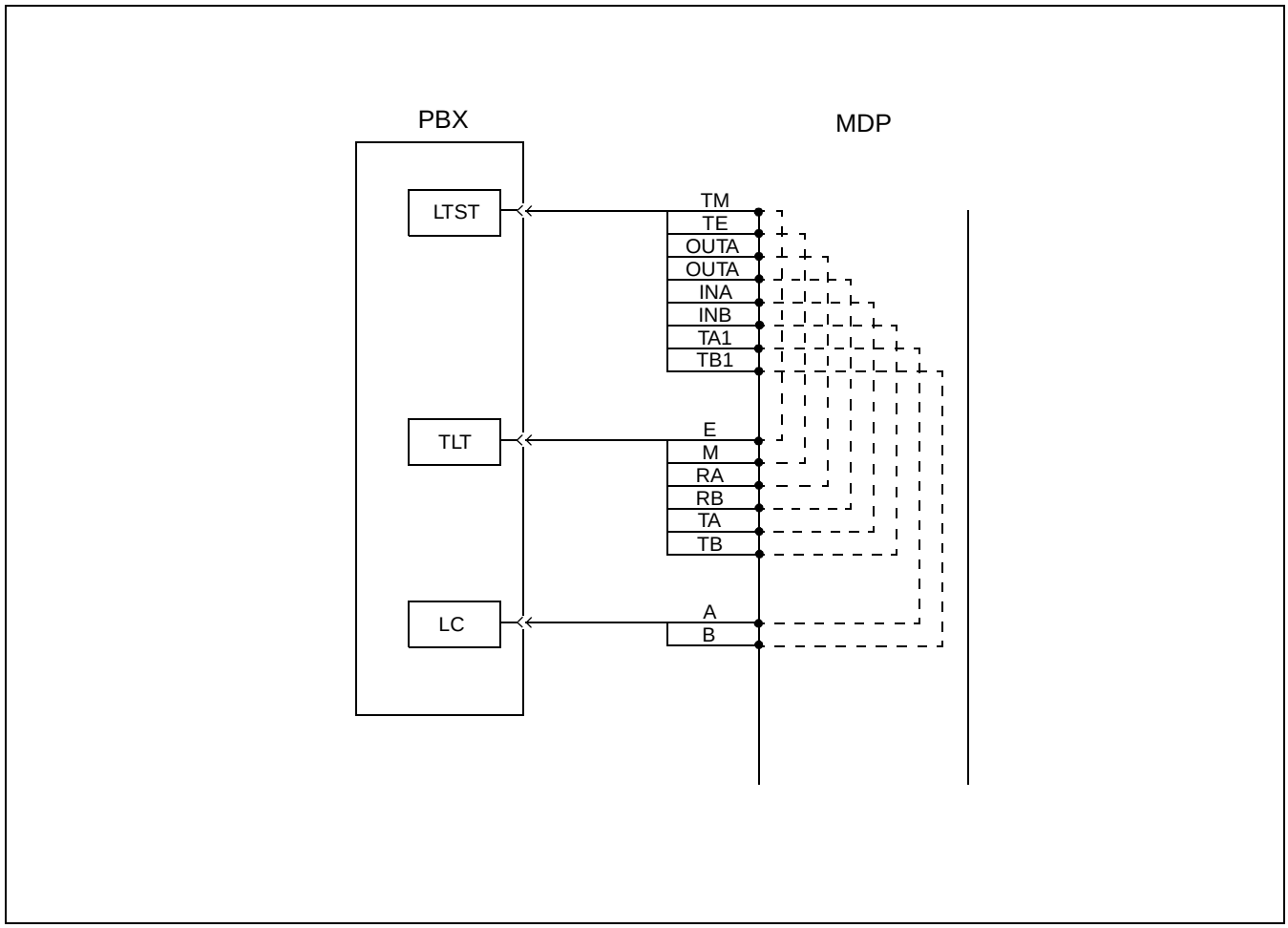
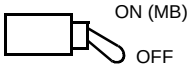
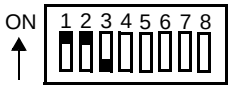


Figure 2-32 Connecting Route Diagram

7. Switch Setting Sheet

SWITCH NAME	SWITCH SHAPE	REMARKS
MB		
SW0		

PH-PC36
Multiplexer

1. General Function

The PH-PC36 (MUX) circuit card is an interface card for mounting line circuits and/or trunks. In between the CPR and the Port Microprocessor (PM) of the line/trunk circuit, this circuit card provides an interface for PM control and management by the CPU. Likewise in between the TSW and the line circuit/trunks, this circuit card provides an interface for multiplexing/de-multiplexing of voice Pulse Code Modulation (PCM) information and digital data information.

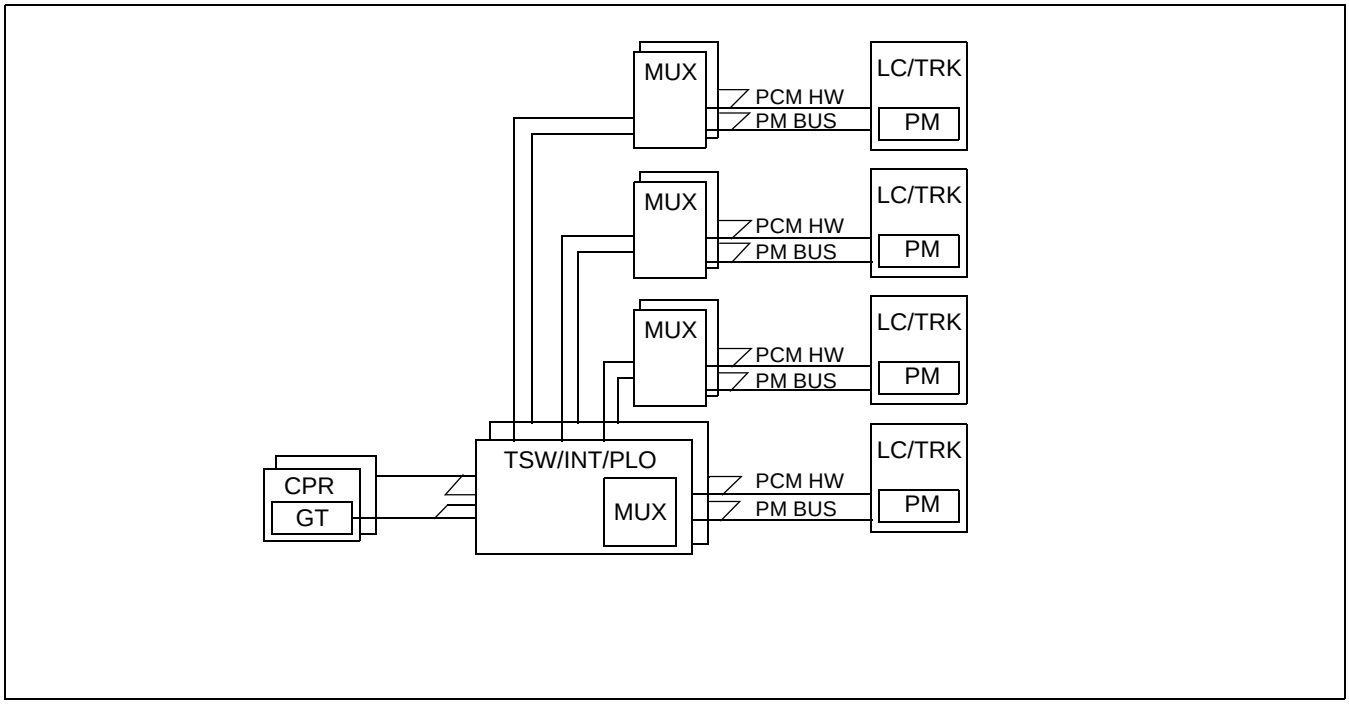


Figure 2-33 Location of PH-PC36 (MUX) Card in the 1 IMG System

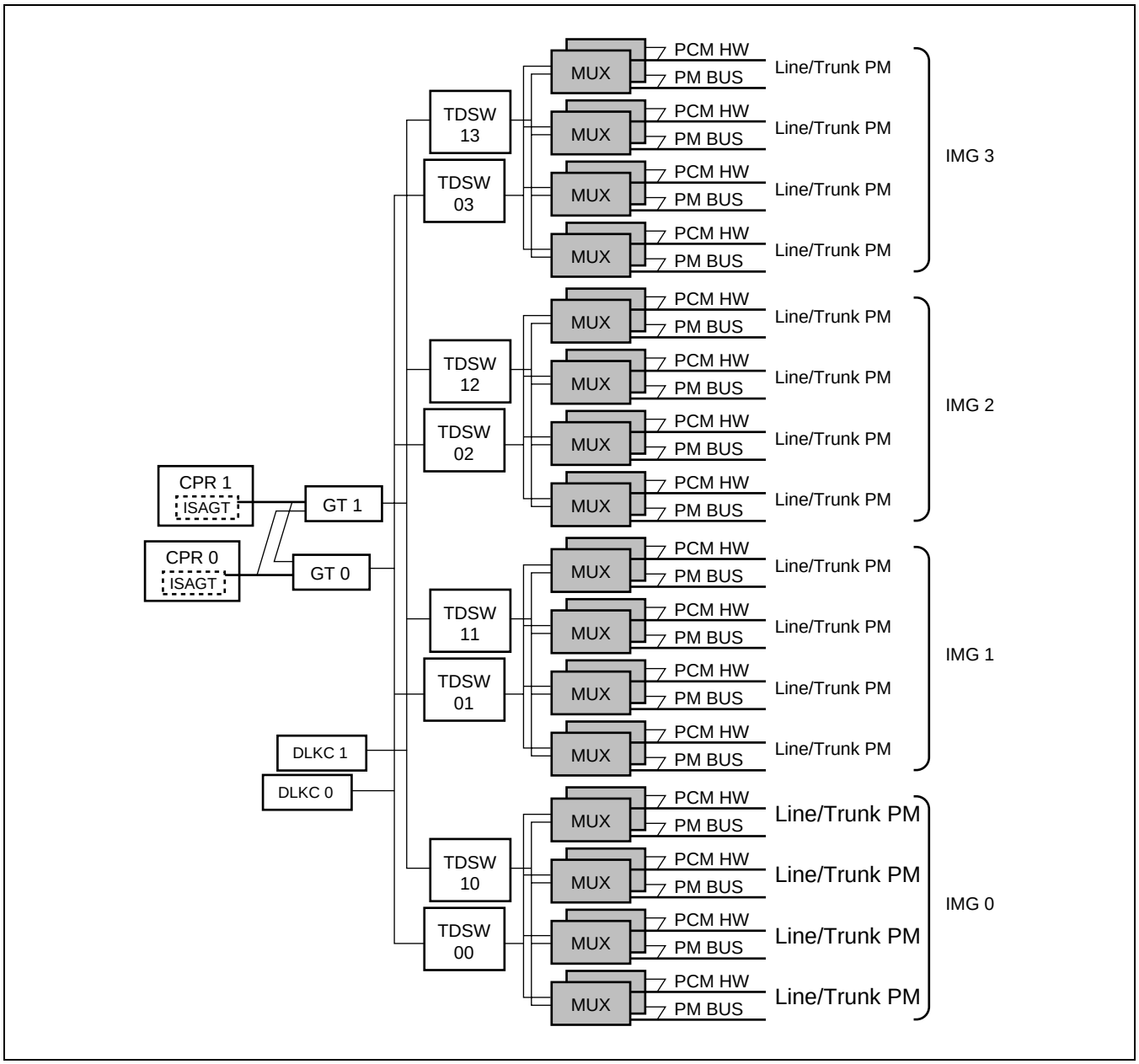


Figure 2-34 Location of PH-PC36 (MUX) Card in the 4 IMG System

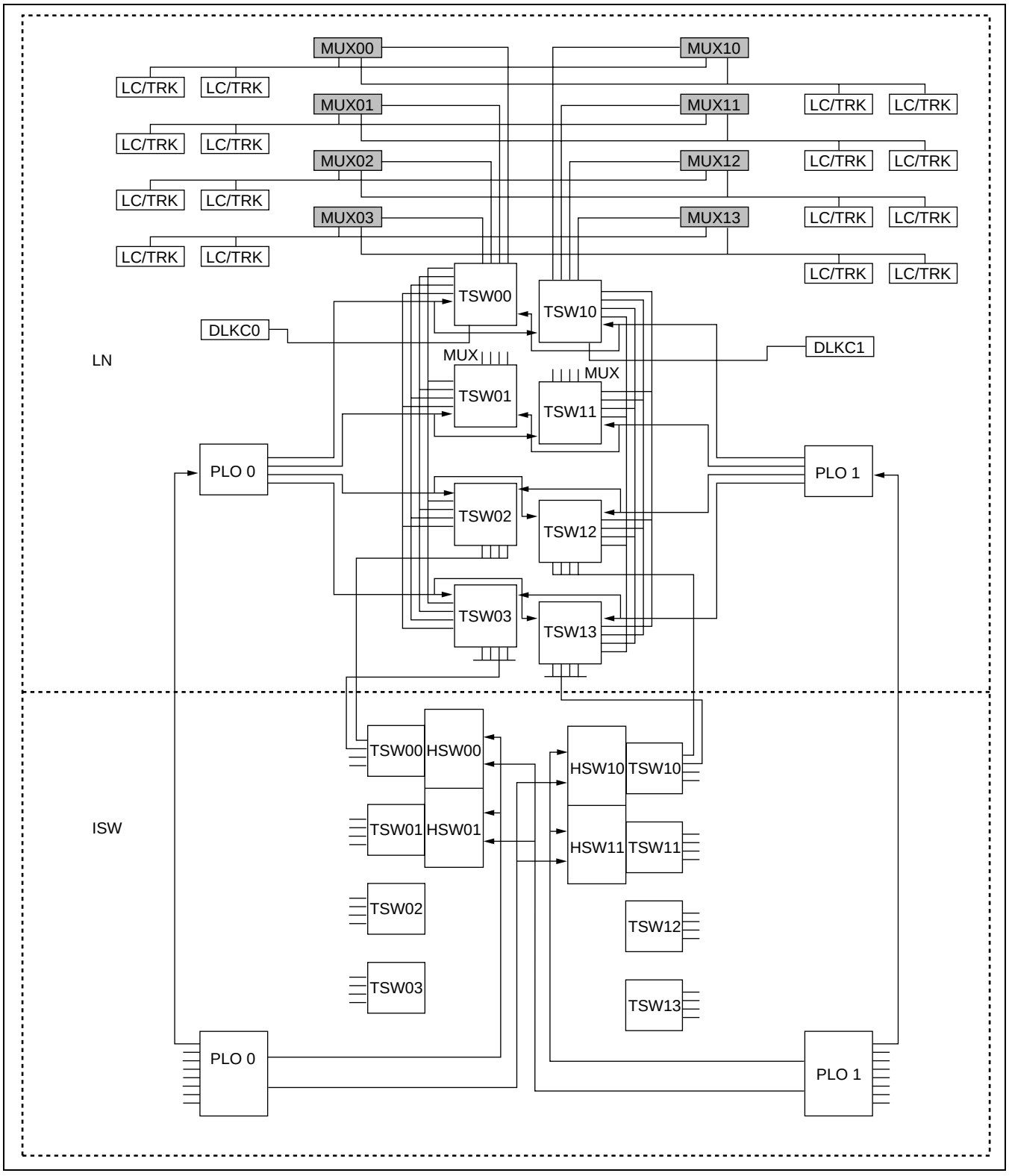


Figure 2-35 Location of PH-PC36 (MUX) Card in the IMX-U System

The PCM highway running is illustrated in the figure below. There are sixteen 2Mbps PCM highways (HW0 - HW15) in the PIM. Each PCM highway runs from a card slot to the MUX circuit card. For instance, highway number zero (HW0) appears in Slot 04 and also Slot 05, thus the HW0 carries the PCM of the Group 0, 1, 2 and 3.

Likewise, the HW6, 7, 14, 15 cover the Groups 24 through 31. However, the time slots of Groups 24 and 25 are exclusively used for the Speech Path Memory (SPM).

All highways in the PIM lead to a MUX card, so 512 time slots (32 time slots per highway × 16 highways = 512 time slots) of PCM are multiplexed/de-multiplexed at a MUX and sent/received to/from the TSW circuit card across the 32.786Mbps of the Low Voltage Differential Signaling (LVDS).

Also the MUX card provides the PM bus interface. The CPR controls and administrates the PM of the line/ trunk circuit card via the TSW and the MUX.

In addition, this circuit card supports 3-Party Conference (CFT) function and is equipped with eight circuits of 3-Party Conference. The CFT appear in time Slots 8 through 31 of the HW13 (Group 21 - 23).

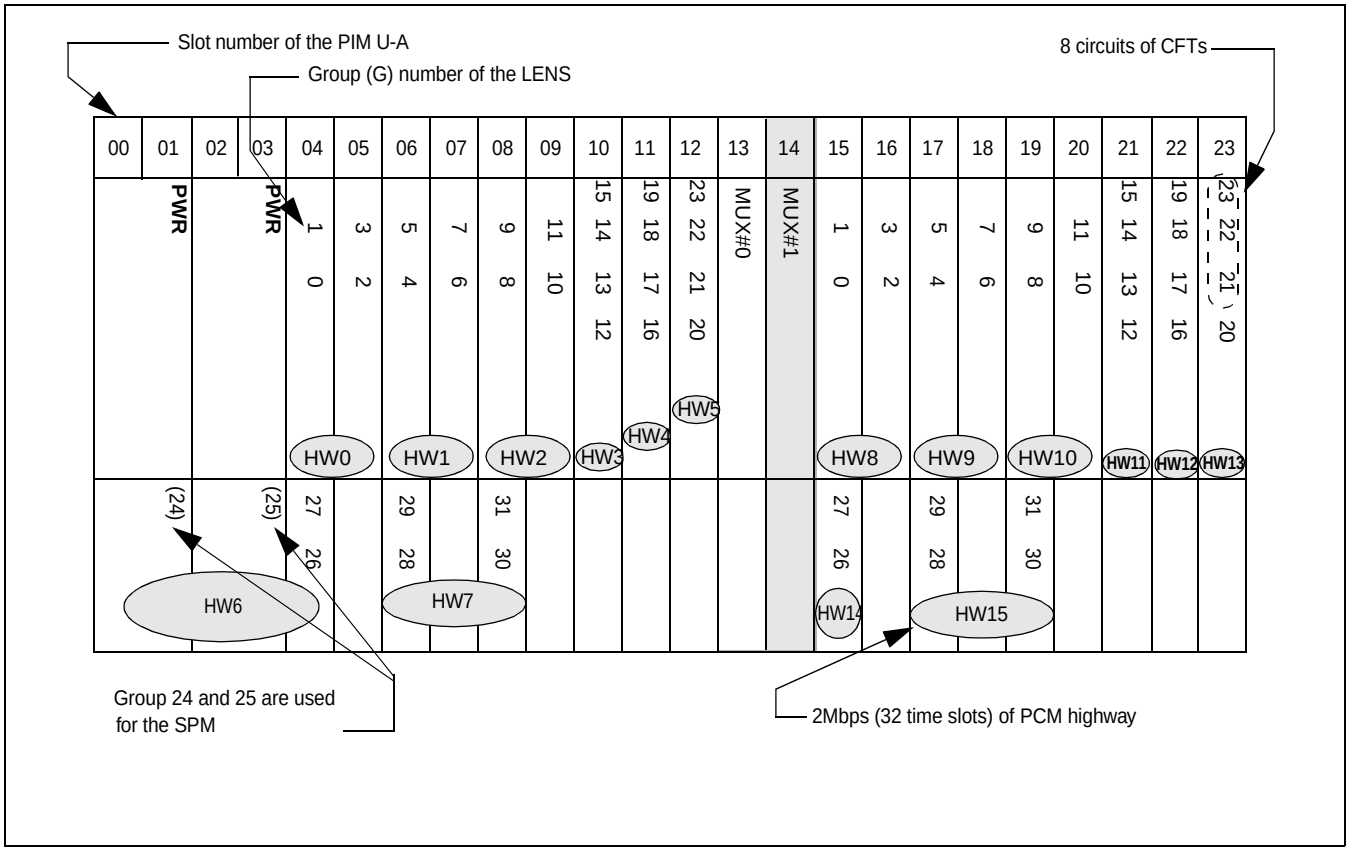


Figure 2-36 PCM Highway Running

2. Mounting Location/Condition

   For the 1 IMG system, the PH-PC36 (MUX) card is mounted in the PIM 1, 2, and 3.

   For the 4 IMG system, the PH-PC36 (MUX) card is required in all PIMs.

Mounting Module	PIM

PIM	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
													MUX #0	MUX #1										

3. Face Layout of Lamps, Switches, and Connectors

   The face layout of lamps, switches, and connectors is shown in Figure 2-37.

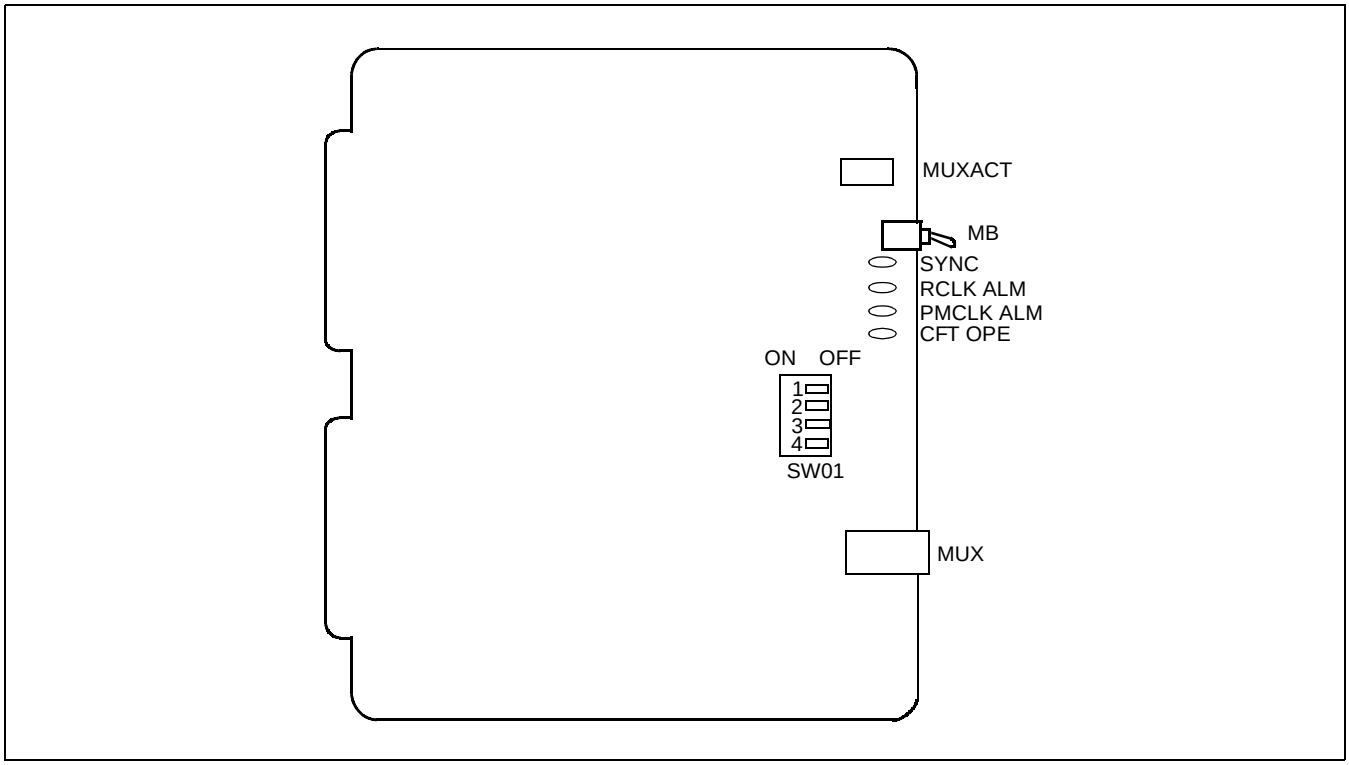


Figure 2-37 Face Layout of PH-PC36 (MUX)

4. Lamp Indications

The contents of lamp indications of this circuit card are shown in the table below.

LAMP NAME	COLOR	STATE
MUX ACT	Green	Remains lit while this circuit card is in ACT state.
SYNC	Green	Lights when 32 Mbps Frame Head (FH) synchronization is established between the MUX and TSW.
RCLK ALM	Red	Lights when the 32 Mbps clock signals (which is supplied by TSW) loss has occurred.
PMCLK ALM	Red	Lights when either the following clock signals output failure has occurred. • 2 Mbps clock signals (which supplies to the line/trunks) • Frame Head signal • 4 Mbps clock signals
CFT OPE	Green	Lights when the CFT circuit is valid.

5. Switch Settings

Standard settings of switches on this circuit card are shown in the table below.

SWITCH NAME	SWITCH NO	SETTING	STANDARD SETTING	MEANING
MB		UP		Circuit card Make-busy.
		DOWN	×	Circuit card Make-busy cancel.
SW01	1	ON		3-Party Conference Function (CFT) is valid.
		OFF		3-Party Conference Function (CFT) is invalid.
	2	ON		Setting of A-Law in the CFT function block.
		OFF	×	Setting μ-Law in the CFT function block.
	3	OFF	×	Not used
	4	OFF	×	Not used

6. External Interface

For the 1 IMG system, the cable connections between the MUX and the TSW are shown in Figure 2-38.

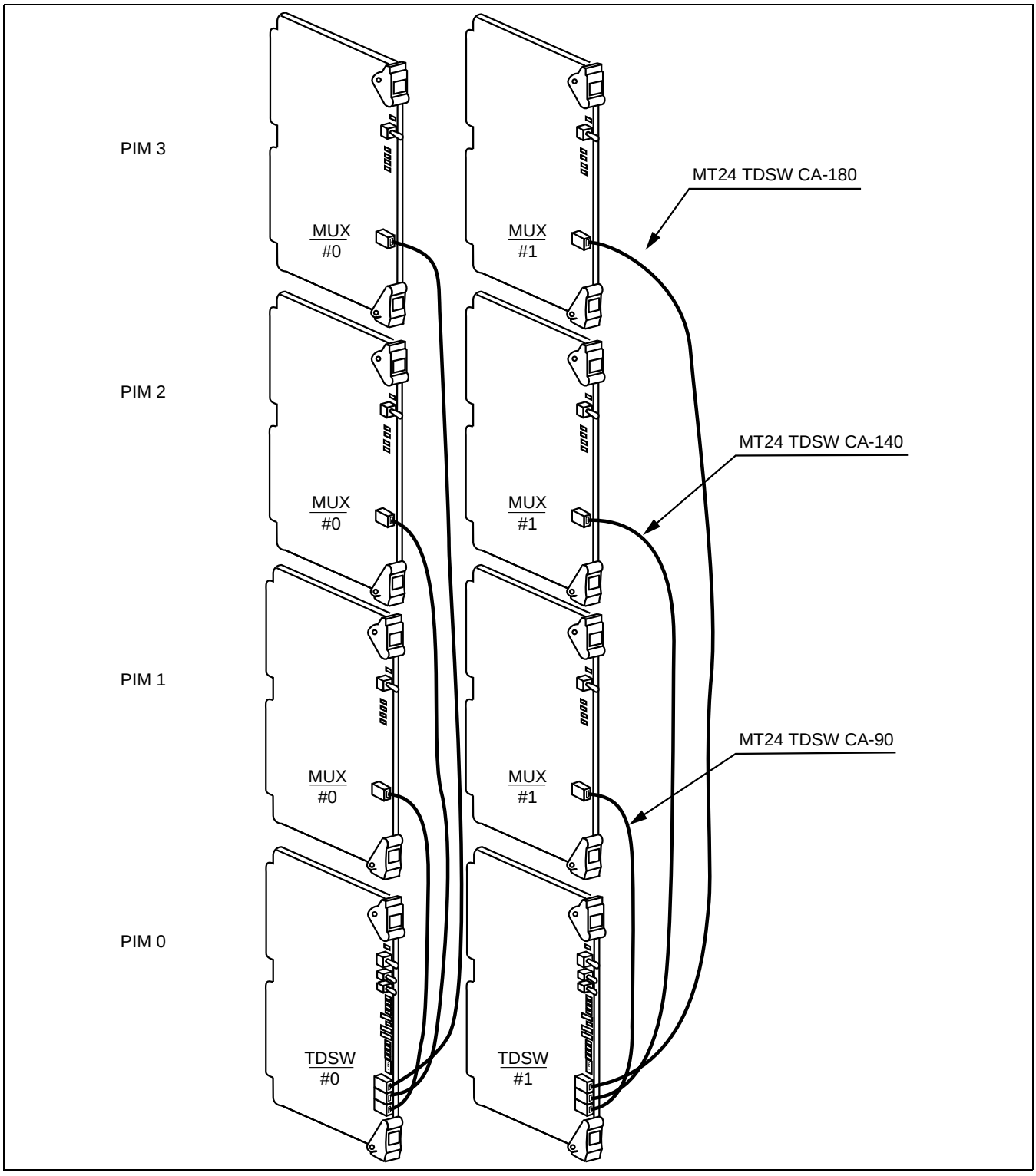


Figure 2-38 External Interface for PH-PC36

The cable connections between the MUX and the TSW are shown in Figure 2-39. As seen in this illustration, the cable connected to the front of the MUX leads to the "MUX###" connector on the Back Wired Board (BWB) of the TSWM. See the NEAX2400 IMX Installation Manual for more details.

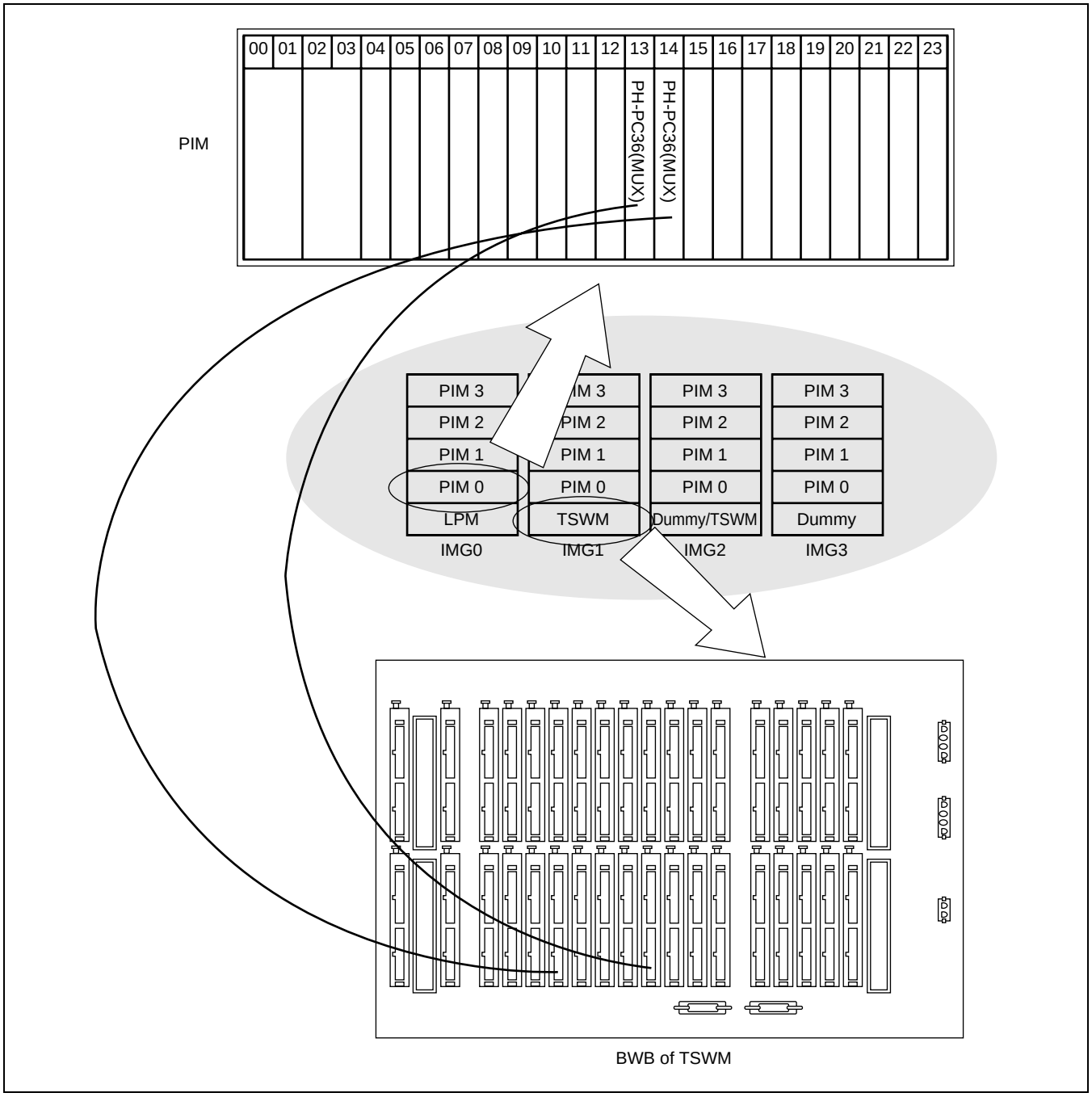
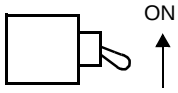
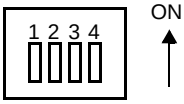


Figure 2-39 Cable Connections between the MUX and the TSW

7. Switch Setting Sheet

SWITCH NAME	SWITCH SHAPE	REMARKS
MB		
SW01		

PH-PC20
Data Link Controller

1. General Function

   This circuit card simultaneously provides all the Attendant Consoles (ATTs) in the system (except the 1-IMG system) with information such as the termination/answer/release (abandoned) information of ATT calls, or the station idle/busy information through the TSW system link.

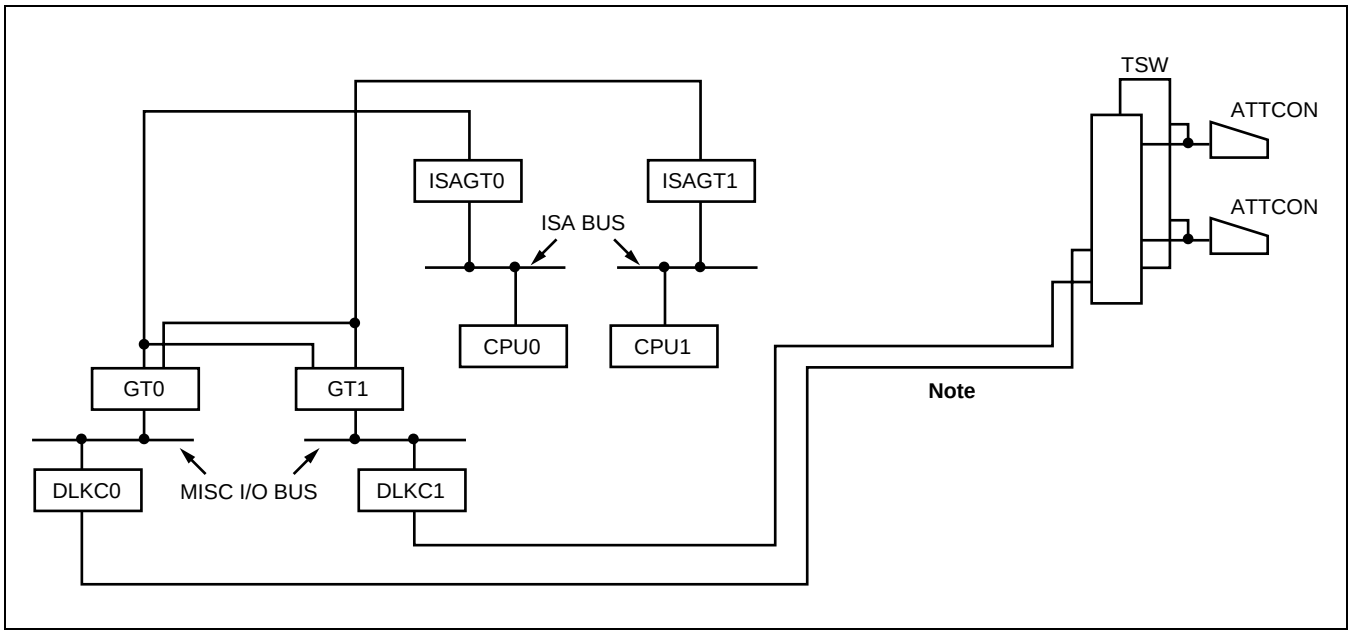


Figure 2-40 Location of PC-PH20 in the System

Note: *MG = 01/03/05/07, Unit = 2, Group = 25, Level = 6-7 are used to input the information into TSW by the DLKC.*

2. Mounting Location/Conditions

Mounting Module **TSWM**

00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
								DLKC#0	DLKC#1														

3. Face Layout of Lamps, Switches, and Connectors

   The face layout of lamps, switches and connectors of this circuit card is shown in Figure 2-41.

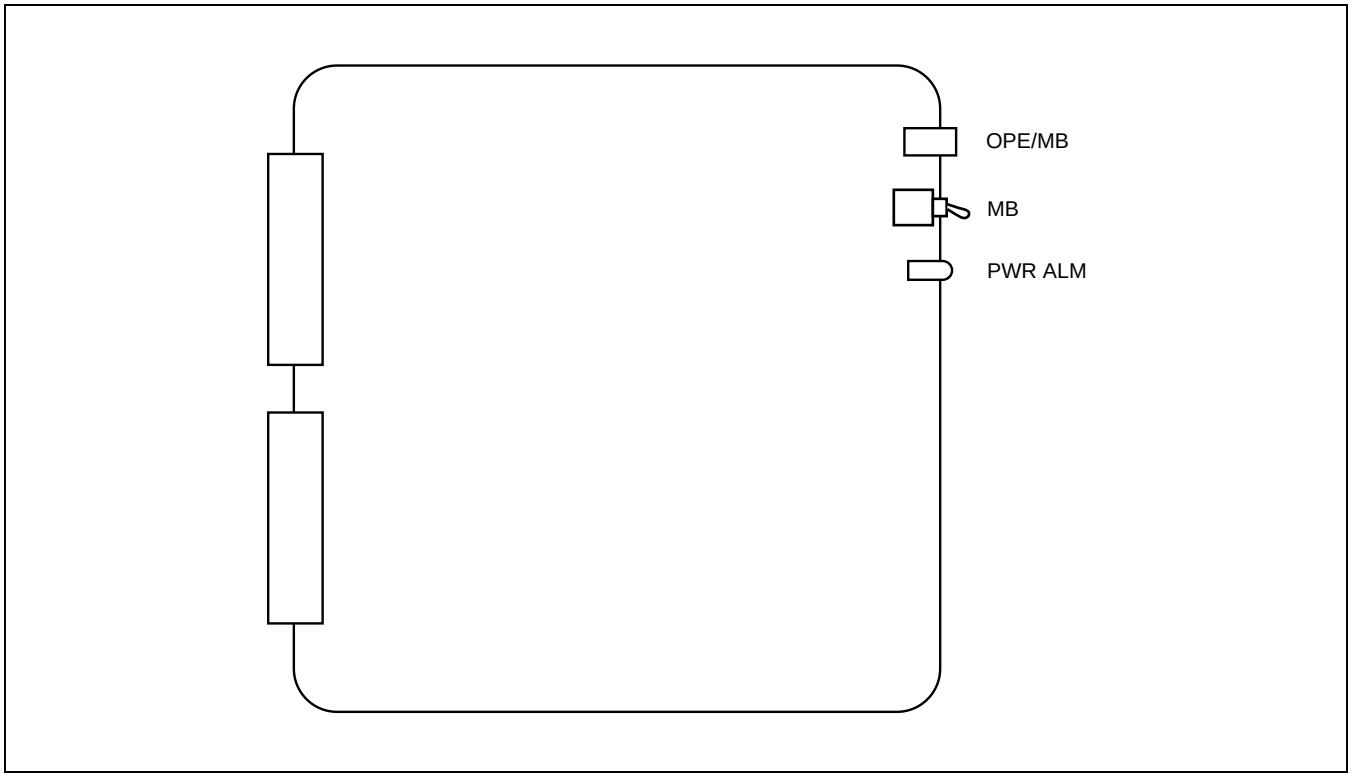


Figure 2-41 Face Layout of the PH-PC20 Card

4. Lamp Indications

   Lamp indications for this circuit card are shown in the table below.

LAMP NAME	COLOR	STATE
OPE/MB	Green	Remains lit while this circuit card is in ACT state.
	Red	Remains lit while this circuit card is in Make-busy state or when the firmware is abnormal.
PWR ALM	Red	Lights when the On-Board Power Supply located on this circuit card is abnormal.

5. Switch Settings

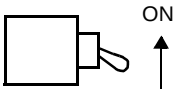
   Standard settings of various switches on this circuit card are shown in the table below.

SWITCH NAME	SWITCH NO.	SETTING	STANDARD SETTING	MEANING
MB		UP		Circuit card Make-busy.
		DOWN		Circuit card Make-busy cancel.

6. External Interface

   No cable connections are required.

7. Switch Setting Sheet

SWITCH NAME	SWITCH SHAPE	REMARKS
MB		

PH-PC40
Emergency Alarm Controller

1. General Function

The PH-PC40 (EMA) circuit card detects various kinds of alarms which might occur in the system, and sends out information about the detected alarm to the circuits concerned. This circuit card can activate the system MJ/MN LEDs on the TOPU. Additionally, this card can control the active/stand-by status of the CPU in the case of dual configuration. For the 1 IMG system, this circuit card has the Music-On-Hold sending function.

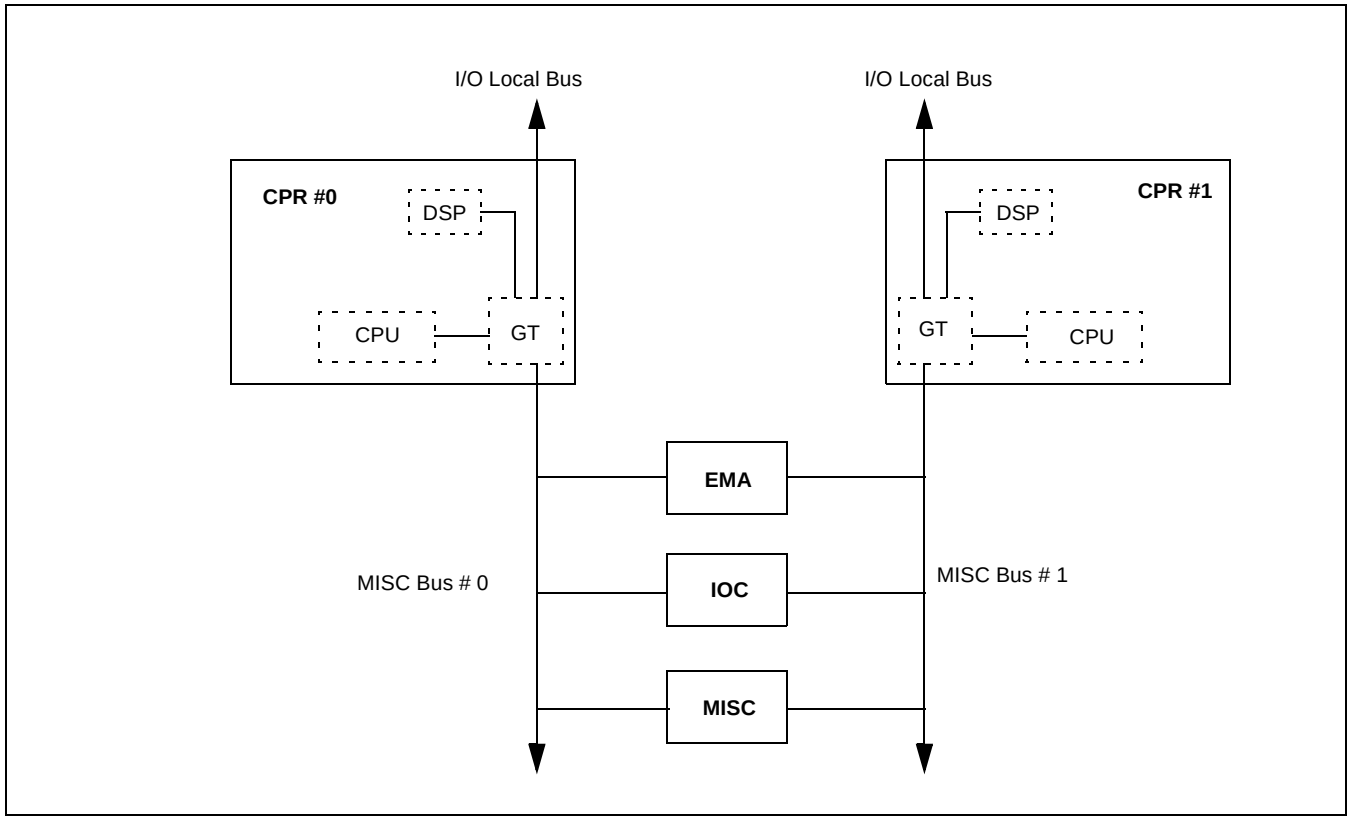
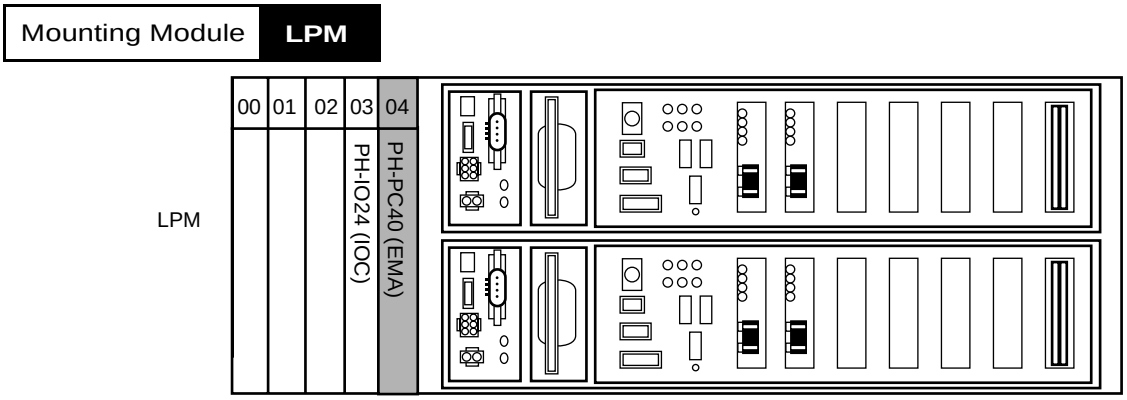


Figure 2-42 Location of PH-PC40 (EMA) Card in the System

2. Mounting Location/Condition

The PH-PC40 (EMA) card is mounted in Slot 04 of the LPM, as shown below.



3. Face Layout of Lamps, Switches, and Connectors

The face layout of lamps, switches, and connectors is shown in Figure 2-43.

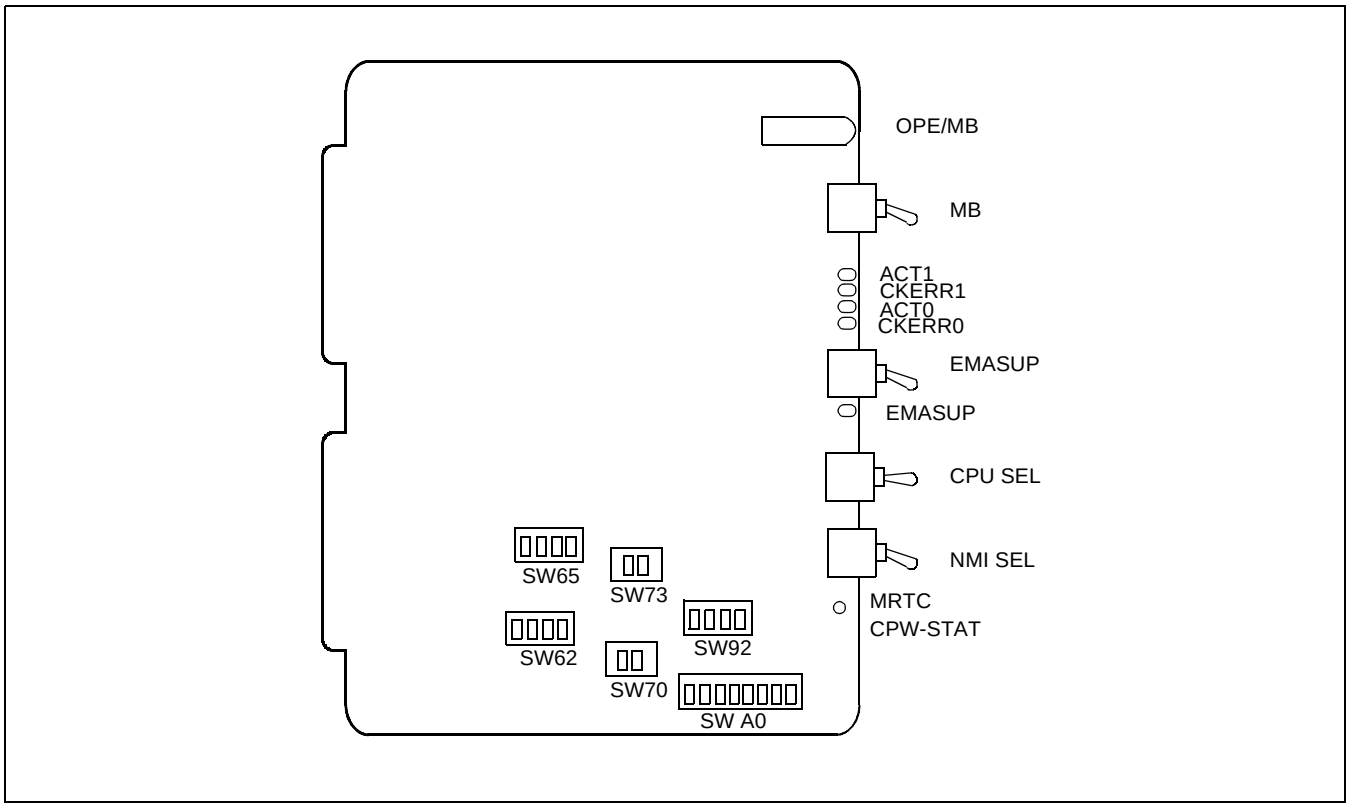


Figure 2-43 Face Layout of the PH-PC40 (EMA) Card

4. Lamp Indications

Lamp indications for this circuit card are shown in the table below.

LAMP NAME	COLOR	STATE
OPE/MB	Green	Indicates the circuit card is operating normally.
	Red	Indicates the circuit card is in a Make-busy state.
ACT1	Green	CPU #1 is in the ACT state.
CKERR 1	Red	CPU #1 clock failure has occurred.
ACT0	Green	CPU #0 is in the ACT state.
CKERR 0	Red	CPU #0 clock failure has occurred.
EMSUP	Green	Disable the CPU change-over. (When EMSUP key is set upward .)
	OFF	Enable to the CPU change-over.

5. Switch Settings

Standard settings for switches on this circuit card are shown in the table below.

SWITCH NAME	SETTING	STANDARD SETTING	MEANING
MB	UP		Make-busy of the circuit card.
	DOWN		Normal setting
EMASUP	UP		Make-busy of the CPU change-over circuit.
	DOWN	×	Normal setting
CPUSEL	UP		Forced activating the CPU #1.
	MIDDLE	×	Denial of the forced CPU selection. **Note**
	DOWN		Forced activating the CPU #0.
NMISEL	UP		Outputs the Non-Maskable Interruption (NMI) signal to the CPU when a fault occurs.
	DOWN	×	Outputs the RST (Reset) signal to the CPU when a fault occurs.

Note: *Set CPUSEL switch downward, if it is single CPU system.*

<table>
<tr><th>SWITCH NAME</th><th>SWITCH NO</th><th>SETTING</th><th>STANDARD SETTING</th><th>MEANING</th></tr>
<tr><td rowspan="8">SW62
Note 1</td><td rowspan="2">1</td><td>ON</td><td></td><td rowspan="8">Power Shut Down (PSDN) function
(used in Australia only)

<table><tr><th>SW62</th><th>ON</th><th>OFF</th></tr><tr><td>SW62-1</td><td>IMG#0 valid</td><td>IMG0# invalid</td></tr><tr><td>SW62-2</td><td>IMG#1 valid</td><td>IMG1# invalid</td></tr><tr><td>SW62-3</td><td>IMG#2 valid</td><td>IMG2# invalid</td></tr><tr><td>SW62-4</td><td>IMG#3 valid</td><td>IMG3# invalid</td></tr></table></td></tr>
<tr><td>OFF</td><td>×</td></tr>
<tr><td rowspan="2">2</td><td>ON</td><td></td></tr>
<tr><td>OFF</td><td>×</td></tr>
<tr><td rowspan="2">3</td><td>ON</td><td></td></tr>
<tr><td>OFF</td><td>×</td></tr>
<tr><td rowspan="2">4</td><td>ON</td><td></td></tr>
<tr><td>OFF</td><td>×</td></tr>
<tr><td rowspan="8">SW65</td><td rowspan="2">1</td><td>ON</td><td>×</td><td>Output the CPU-ACT Signal to the another EMA (when this circuit card is used in the one frame stack configuration).</td></tr>
<tr><td>OFF</td><td></td><td>CPU-ACT Signal does not output.</td></tr>
<tr><td rowspan="2">2</td><td>ON</td><td></td><td>Not used</td></tr>
<tr><td>OFF</td><td>×</td><td>Not used</td></tr>
<tr><td rowspan="2">3</td><td>ON</td><td></td><td>Dual CPU configuration</td></tr>
<tr><td>OFF</td><td></td><td>Single CPU configuration</td></tr>
<tr><td rowspan="2">4</td><td>ON</td><td>×</td><td>PZ-DK223 (or PZ-DK173) is used for the DSPP on the TOPU.</td></tr>
<tr><td>OFF</td><td></td><td>PZ-DK179 is used for the DSPP on the TOPU.</td></tr>
<tr><td rowspan="4">SW70</td><td rowspan="2">1</td><td>ON</td><td></td><td>External music on hold source (FM lead) is used.</td></tr>
<tr><td>OFF</td><td></td><td>Internal music on hold source IC is used.</td></tr>
<tr><td rowspan="2">2</td><td>ON</td><td></td><td>Output the alarm information for the external indicator (used in Australia only).</td></tr>
<tr><td>OFF</td><td>×</td><td>Alarm information does not output.</td></tr>
<tr><td rowspan="4">SW73</td><td rowspan="2">1</td><td>ON</td><td>×</td><td>Power Failure Transfer (PFT) control is valid.</td></tr>
<tr><td>OFF</td><td></td><td>PFT control is invalid.</td></tr>
<tr><td rowspan="2">2</td><td>ON</td><td>×</td><td>μ-law PCM CODEC is applied for the music.</td></tr>
<tr><td>OFF</td><td></td><td>A-law PCM CODEC is applied for the music.</td></tr>
</table>

<table>
<tr><th>SWITCH NAME</th><th>SWITCH NO</th><th colspan="3">SETTING / STANDARD SETTING / MEANING</th></tr>
<tr><td rowspan="4">SW92
Note</td><td>1
2</td><td colspan="3">
<table>
<tr><th>SW92-1</th><th>SW92-2</th><th>Impedance of the External Music Source 0 (FM 0)</th></tr>
<tr><td>OFF</td><td>OFF</td><td>600 Ω</td></tr>
<tr><td>ON</td><td>OFF</td><td>8.2 Ω</td></tr>
<tr><td>OFF</td><td>ON</td><td>47K Ω</td></tr>
</table>
</td></tr>
<tr><td>3
4</td><td colspan="3">
<table>
<tr><th>SW92-1</th><th>SW92-2</th><th>Impedance of the External Music Source 1 (FM 1)</th></tr>
<tr><td>OFF</td><td>OFF</td><td>600 Ω</td></tr>
<tr><td>ON</td><td>OFF</td><td>8.2 Ω</td></tr>
<tr><td>OFF</td><td>ON</td><td>47K Ω</td></tr>
</table>
</td></tr>
<tr><td rowspan="8">SWA0
Note</td><td>1
2
3</td><td colspan="3">MUSIC CH0 selection. This selection is valid when SW70-1 is OFF.
<table>
<tr><th>SWA0-1</th><th>SWA0-2</th><th>SWA0-3</th><th>MUSIC</th></tr>
<tr><td>OFF</td><td>OFF</td><td>OFF</td><td>Für Elise</td></tr>
<tr><td>ON</td><td>OFF</td><td>OFF</td><td>Maiden’s prayer</td></tr>
<tr><td>Not Used</td><td>OFF</td><td>ON</td><td>Buzzer</td></tr>
<tr><td>Not Used</td><td>ON</td><td>OFF</td><td>Chime</td></tr>
</table>
</td></tr>
<tr><td rowspan="2">4</td><td>ON</td><td></td><td>Not used</td></tr>
<tr><td>OFF</td><td>×</td><td>Not used</td></tr>
<tr><td>5
6
7</td><td colspan="3">MUSIC CH1 selection. The kind of music varies depending on the melody IC located on this circuit card.</td></tr>
<tr><td rowspan="2">8</td><td>ON</td><td></td><td>Not used</td></tr>
<tr><td>OFF</td><td>×</td><td>Not used</td></tr>
</table>

Note: *SW92 and SWA0 are used in the 1 IMG system only.*

6. External Interface

External equipment may be connected to this circuit card. The physical connection diagram for the external equipment for Music-On-Hold and External Alarm is shown in Figure 2-44.

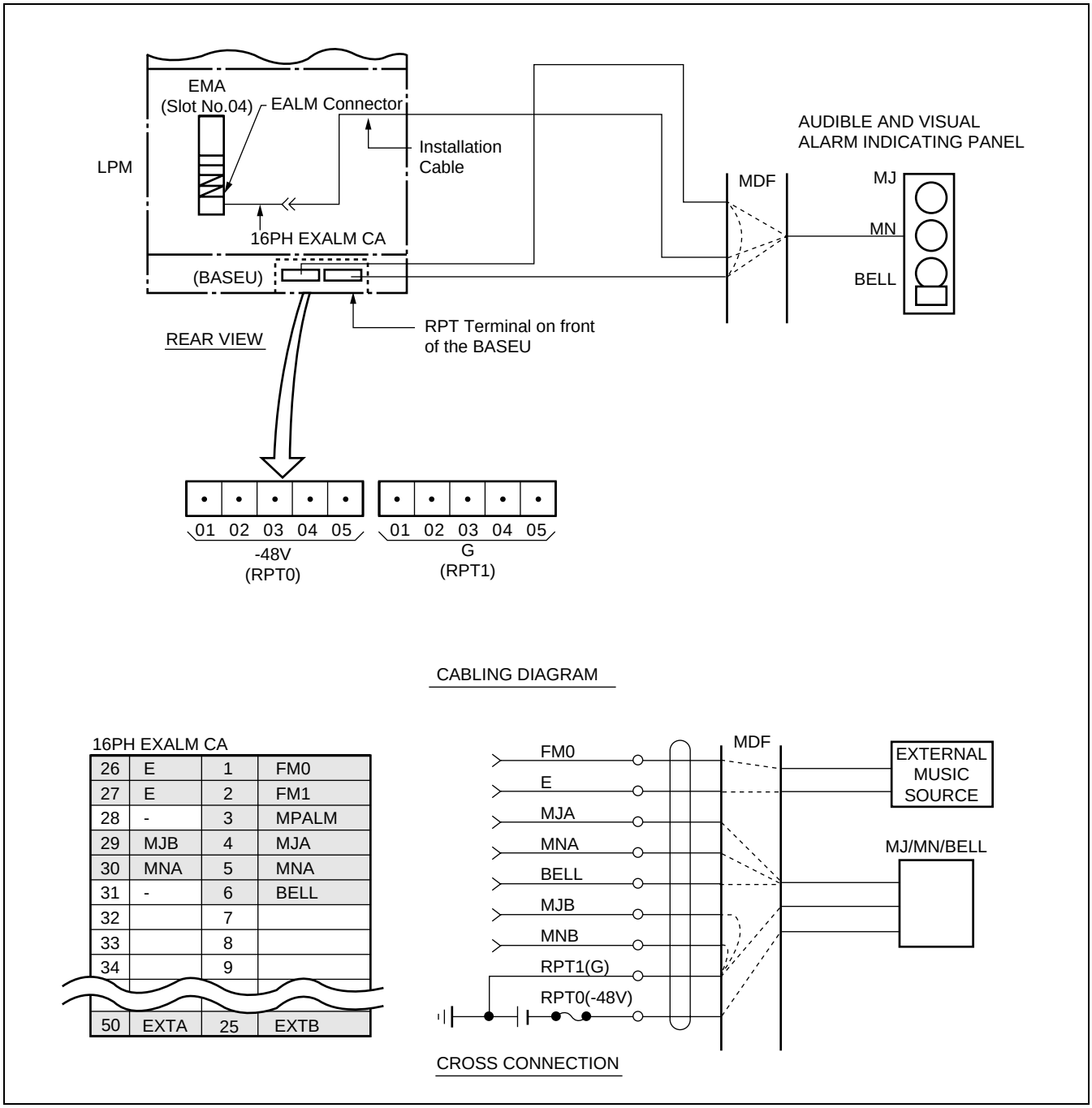
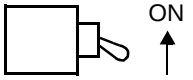
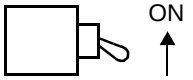
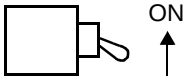
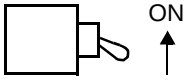
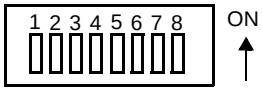
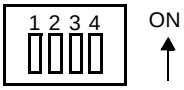
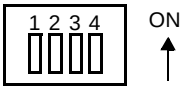
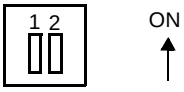
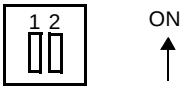
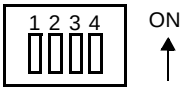


Figure 2-44 Connection of Alarm Indicating Panel and Music on Hold

7. Switch Setting Sheet

SWITCH NAME	SWITCH SHAPE	REMARKS
MB		
EMA-SUP		
CPU-SEL		
NMI-SEL		
SWA0		
SW62		
SW65		
SW70		
SW73		
SW92		

PH-PW14
Power Switch

1. General Function

   This circuit card is a power supply card that supplies DC -48 V operating power to the circuit cards mounted in the TSWM. It also provides the DC-DC converter function which generates output power DC +5V, -5 V, and +12 V to MISC slots.

   The two PWR SWs cards make the power supply redundant.

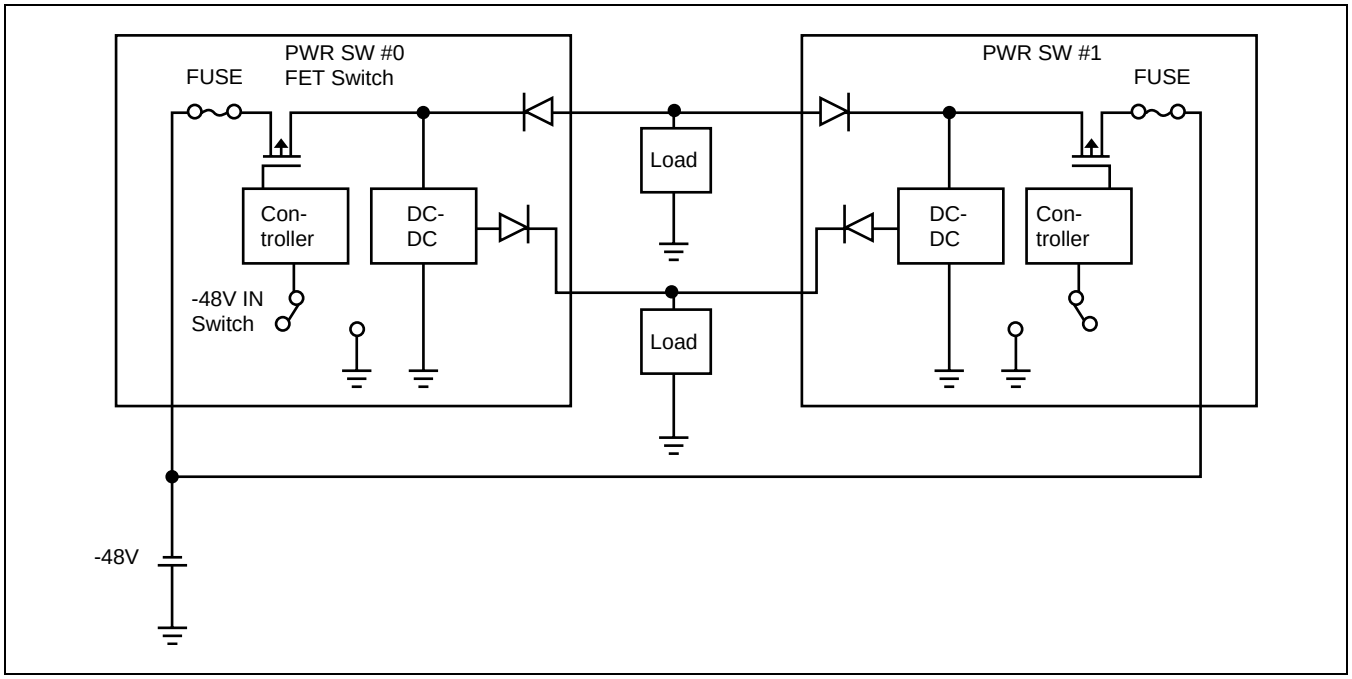


Figure 2-45 -48 V Output Circuit Diagram

2. Mounting Location/Conditions

This circuit card is mounted in the following shaded slots (00, 01).

Mounting Module	**TSWM/ISWM**

00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
PWR SW#0	PWR SW#1																						

3. Face Layout of Lamps, Switches, and Connectors

The face layout of lamps, switches, and connectors for this circuit card is shown in Figure 2-46.

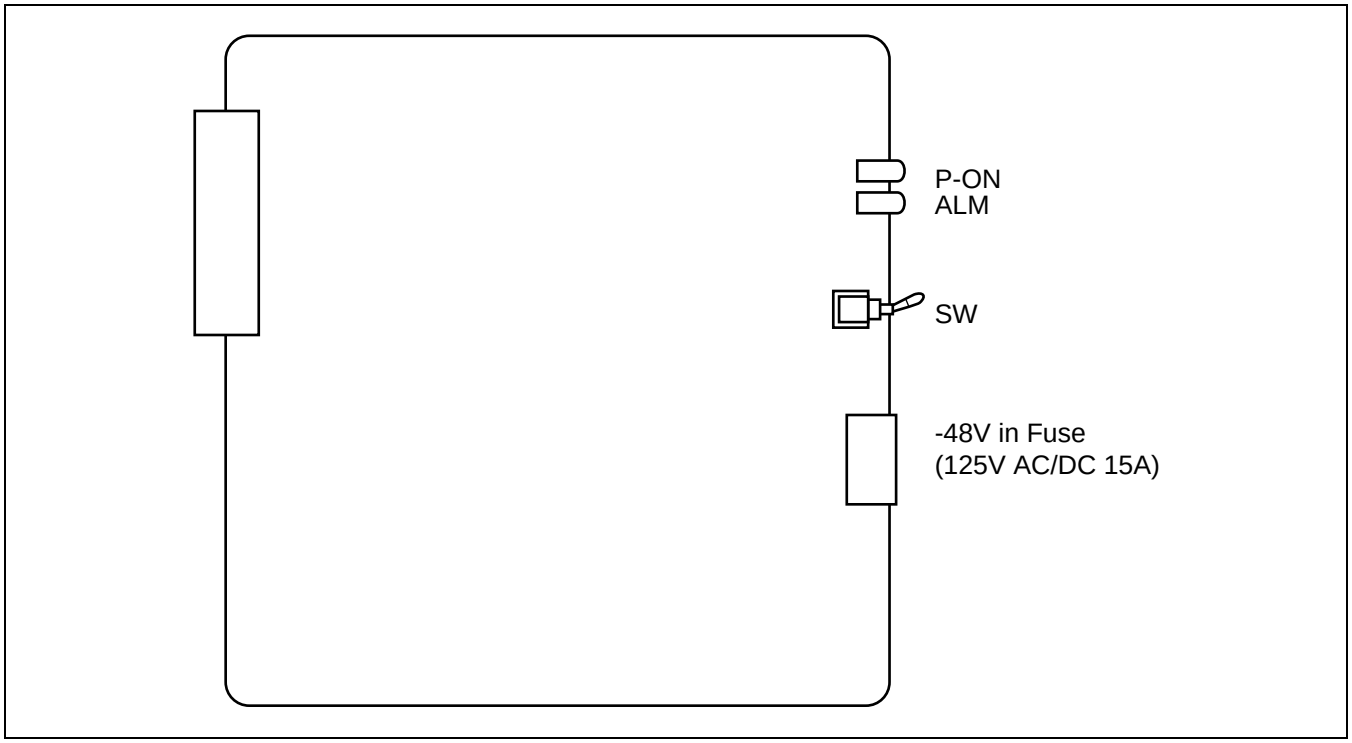


Figure 2-46 Face Layout of the PH-PW14 Card

4. Lamp Indications

   Lamp indications for this circuit card are shown in the table below.

LAMP NAME	COLOR	STATE
P-ON	Green	Remains lit while this circuit card is operating.
ALM	Red	Lights when SW switch is set at OFF position or it is faulty.

5. Switch Settings

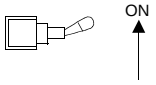
   Standard settings for various switches on this circuit card are shown in the table below.

SWITCH NAME	SWITCH NO.	SETTING	STANDARD SETTING	MEANING
SW		ON	×	The card supplies the operating power to various circuit cards.
		OFF		

6. External Interface

   No cable connections are required.

7. Switch Setting Sheet

MODULE	SLOT NO.	SWITCH NAME	SWITCH SHAPE	REMARKS
	00 01	SW		-48 V operating power is supplied to various circuit cards.

PH-SW10
Time Division Switch

1. General Function

This circuit card combines the Time Division Switch (TSW) with INT, PLO, MUX, and CFT.

The TSW capacity is 2048×2048 time slots, and it allows non-block switching for the maximum IMX configuration. The INT is an intermediate circuit of the CPR which controls and administrates the Port Microprocessor (PM) of line/trunk circuit cards via the PM BUS.

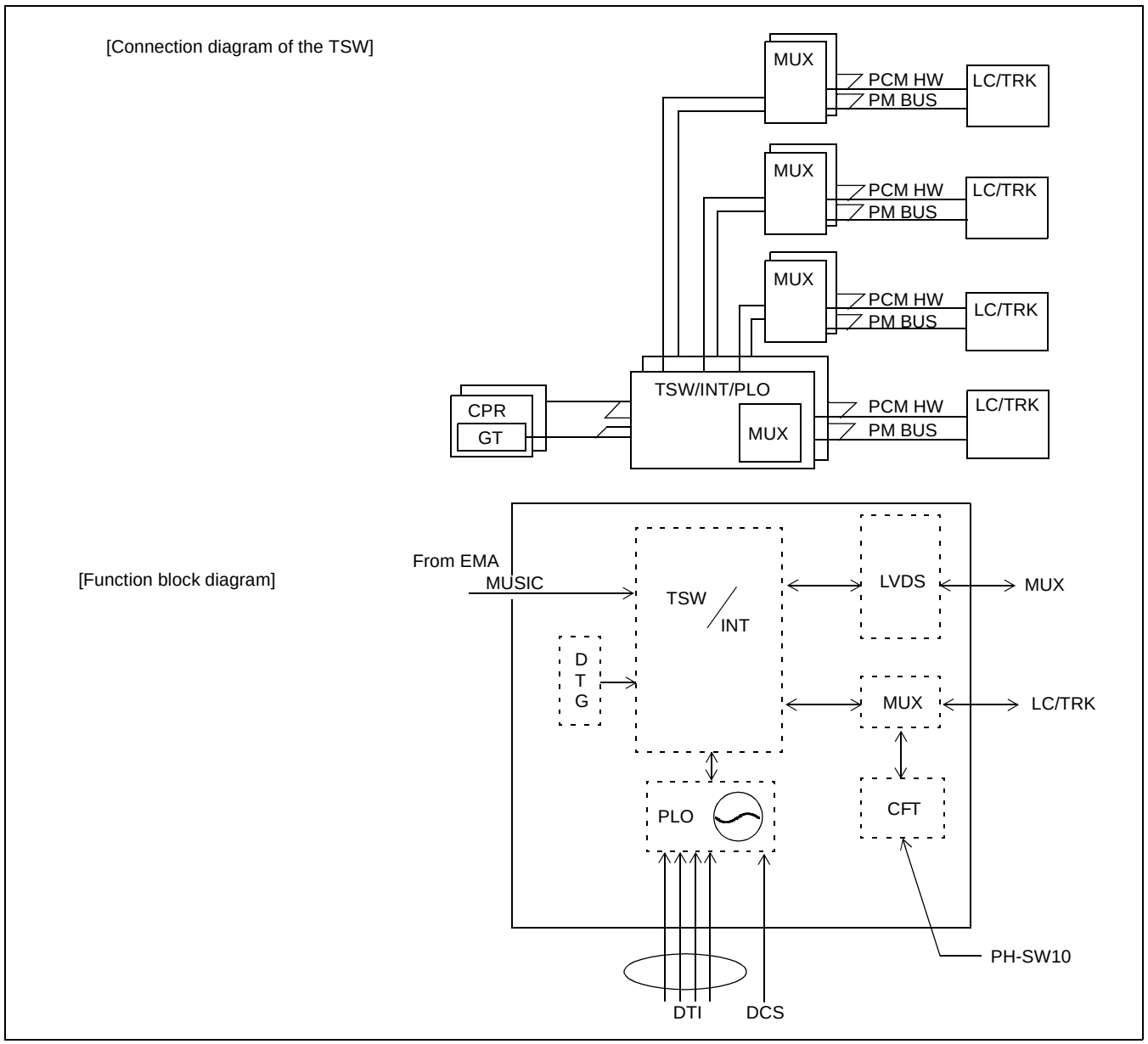


Figure 2-47 Location of PH-SW10 (TSW) Card in the System

Figure 2-48 shows the clock signal routing around the Phase Locked Oscillator (PLO).

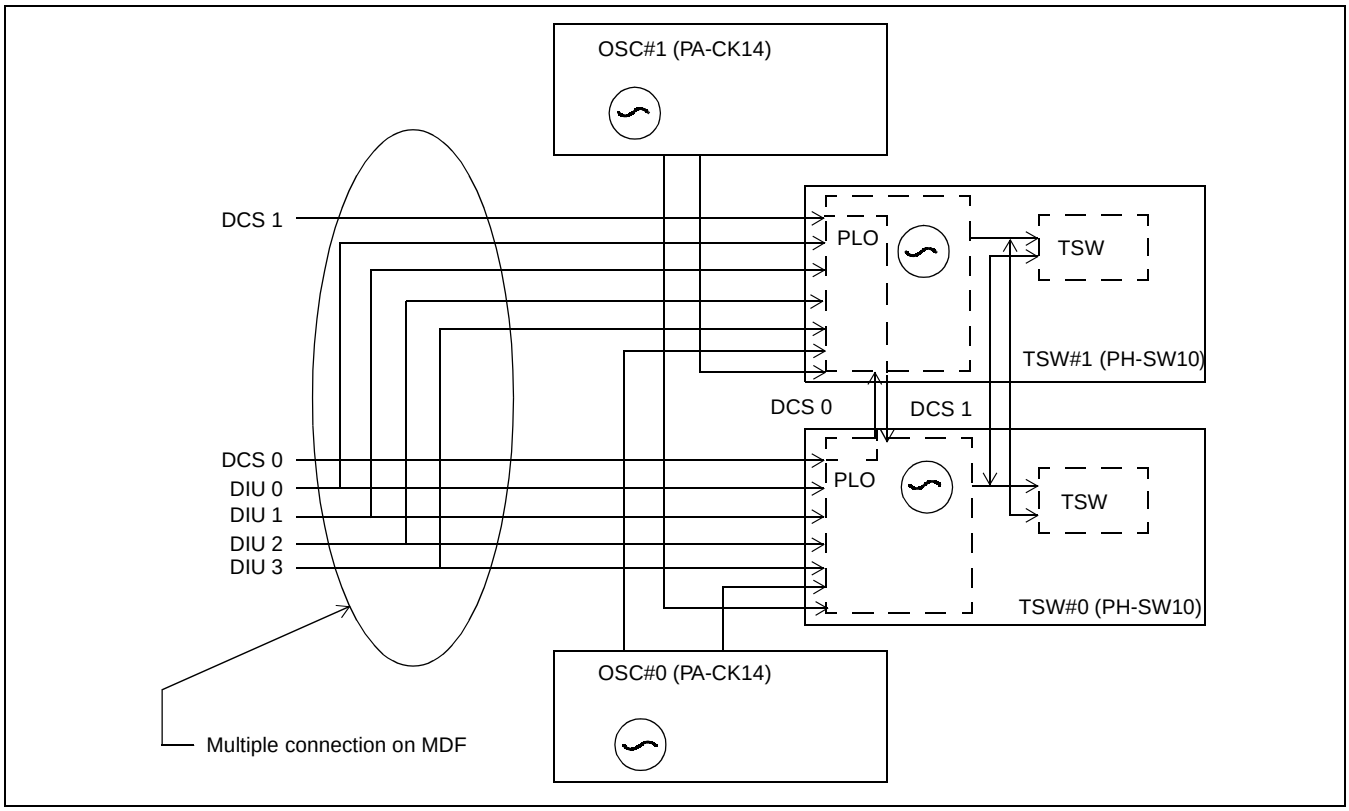


Figure 2-48 PLO Function Diagram

When the system operates as the clock source office of the digital network, the OSC (PA-CK14) card is required, and the OSC supplies the high-precision clock signals (±0.3ppm deviation) for the base clock of the PLO. When the system operates as the clock subordinate office, the TSW internal oscillator (±5ppm deviation) can be the base clock of the PLO. The source clock of the subordinate office is either the digital clock supply (DCS) or the digital interface clock (DIU0 - DIU3). When the clock source failure has occurred, the PLO chooses another clock source automatically in the order of:

1 DCS0

2. DCS1

3. DIU0

4. DIU1

5. DIU2

6. DIU3

7. Drifting with the TSW internal oscillator

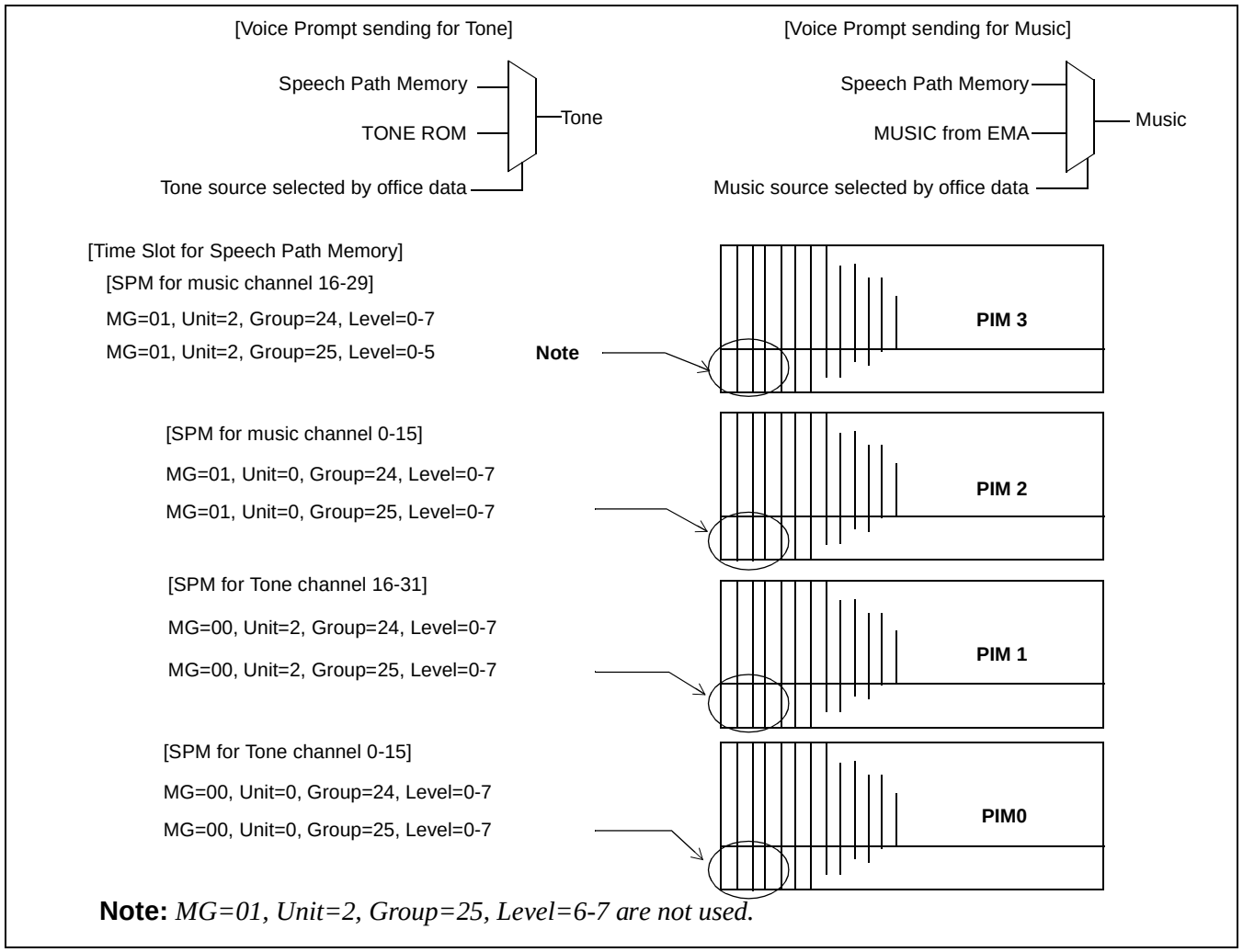
The PLO can output the clock signals (CLK) and the frame head signals (FH) as follows:

- 32.768MHz CLK
- 8KHz FH
- 5 msec × "n" FH (for wireless module).

The MUX performs multiplexing/de-multiplexing of the 2 Mbps PCM highways running in PIM 0, and it sends/receives the PCM to/from the TSW, and operates like the MUX card of PIM 1/2/3.

This circuit card includes the Digital Tone Generator (DTG) and hold tone (MUSIC) insertion circuit. The TONE ROM located on this circuit card contains the audible tone, and the hold tone is supplied from the EMA card. In addition, the designated time slot of PCM (Speech Path Memory: SPM) can be inserted as a tone/music voice prompt. (For example, you can join the SPM and a DAT port by the nailed down connection, and the DAT's voice prompt is given to the system instead of ordinary tone/music.)

Additionally, this circuit card supports the CFT (3-Party Conference) function and is equipped with eight (8) circuits of 3-Party Conference Trunk.



Note: *MG=01, Unit=2, Group=25, Level=6-7 are not used.*

Figure 2-49 Voice Prompting

2. Mounting Location/Condition

This circuit card is mounted in PIM0 in the slot shown below.

Mounting Module	PIM

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
PIM0													TSW #0	TSW #1										

3. Face Layout of Lamps, Switches, and Connectors

The face layout of lamps, switches and connectors is shown below.

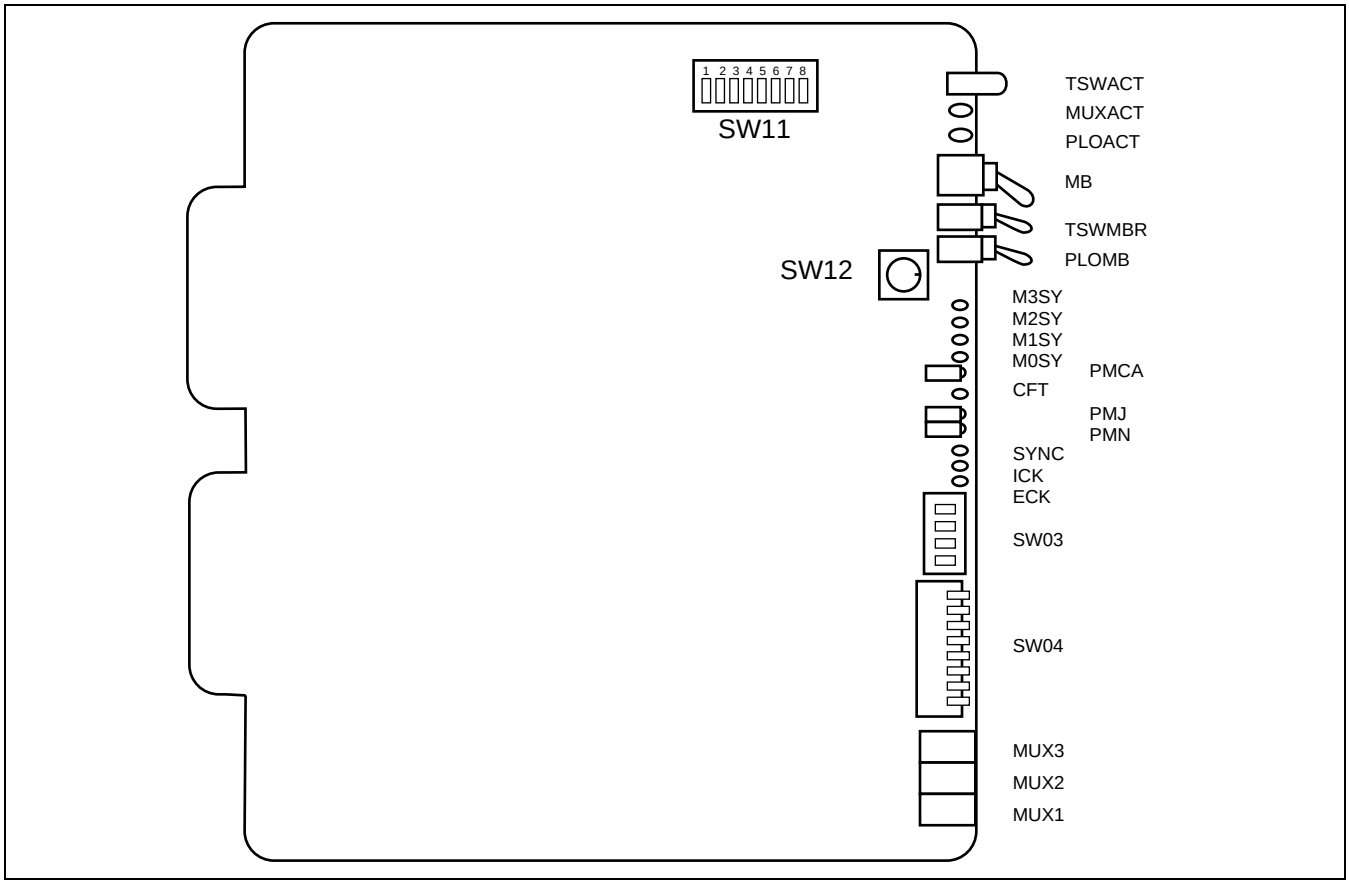


Figure 2-50 Face Layout of PH-SW10 (TSW)

4. Lamp Indications

Lamp indications for this circuit card are shown in the table below.

LAMP NAME	COLOR	STATE
TSWACT	Green	Remains lit while the TSW block is in ACT state.
	Red	Remains lit while the TSW block is in Make-busy state.
	Off	Remains off while the TSW block is ST-BY side.
MUXACT	Green	Remains lit while MUX block is in ACT state.
PLOACT	Green	Remains lit while PLO block is in ACT state.
M3SY	Green	Lights when MUX #3 synchronization has been established.
M2SY	Green	Lights when MUX #2 synchronization has been established.
M1SY	Green	Lights when MUX #1 synchronization has been established.
M0SY	Green	Lights when MUX #0 synchronization has been established.
PMCA	Red	Lights when the PM/PCM bus clock FH failure has occurred.
CFT	Green	Lights when the CFT circuit is valid.
PMJ	Red	Lights when the following MJ fault has occurred: • All of the clock supply routes have failed when the system operates as the clock subordinate office • 32.768 MHz output clock failure • 8 KHz output FH failure • 5 msec × "n" output FH failure • Input Frame Pulse (FP) failure (FP is supplied by the SYNC card) • Both internal OSC (±5 ppm deviation) and high-precision clock signals (±0.3 ppm deviation) have failed when the system operates as the clock source office
PMN	Yellow	Lights when the following MN fault has occurred: • One or more (but not all) DTI/DCS clock supply routes have failed • Drifting failure • Internal OSC (±5 ppm) failure • High-precision clock signals (±0.3 ppm) failure

LAMP NAME	COLOR	STATE
SYNC	Green	Remains lit while the system is synchronized with the network.
	OFF	Remains off when any of the following have occurred. • DCS clock failure when receiving the clock signals from the DCS. • DTI clock failure when receiving the clock signals from the DTI. • Drifting failure
ICK	Green	Lights when the TSW (PA-SW10) internal oscillator is operating normally. **Note:** *The ICK LED will illuminate even when the internal PLO circuit is operational.*
ECK	Green	Lights when the high-precision clock signals are received from OSC circuit card (PA-CK14). **Note:** *The ICK LED will not illuminate when thePA-CK14 is operational.*

5. Switch Settings

Standard settings for switches on this circuit card are shown in the table below.

SWITCH NAME	SETTING	STANDARD SETTING	MEANING
MB	UP		Circuit card Make-busy.
	DOWN	×	Circuit card Make-busy cancel.
TSWMBR	UP		TSW Make-busy request.
	DOWN	×	TSW Make-busy request cancel.
PLOMBR	UP		PLO Make-busy request.
	DOWN	×	PLO Make-busy request cancel.
SW12	1-F	1	Fixed to “1.”

SWITCH NAME	SWITCH NO	SETTING	STANDARD SETTING	MEANING
SW03	1	ON		3-Party Conference Trunk (CFT) is valid.
		OFF		3-Party Conference Trunk (CFT) is invalid.
	2	ON		Setting of A-law in the CFT function block.
		OFF	×	Setting of μ-law in the CFT function block.
	3	OFF	×	Fixed.
	4	ON		Only MUX function is valid (If this card is mounted in PIM 1/2/3). **Note**
		OFF	×	TSW/INT/PLO/MUX are valid (When this card is mounted in PIM 0).
SW04	1	ON		DIU 0 is used as the DTI clock supply route zero.
		OFF		DIU 0 is not used.
	2	ON		DIU 1 is used as the DTI clock supply route one.
		OFF		DIU 1 is not used.
	3	ON		DIU 2 is used as the DTI clock supply route two.
		OFF		DIU 2 is not used.
	4	ON		DIU 3 is used as the DTI clock supply route three.
		OFF		DIU 3 is not used.
	5	ON	×	1.5 M clock for DIU 0
		OFF		2 M clock for DIU 0
	6	ON	×	1.5 M clock for DIU 1
		OFF		2 M clock for DIU 1
	7	ON	×	1.5 M clock for DIU 2
		OFF		2 M clock for DIU 2
	8	ON	×	1.5 M clock for DIU 3
		OFF		2 M clock for DIU 3

Note: *When MUX card mode (SW03-4 ON), only MUX and CFT functions are valid. MUX 1 is used for a connection to TSW (Don't use MUX 2, 3). The LED of MUXACT, M0SY, CFT, and PMCA are valid, other LED is not lit. In the case of this mode, only SW03 is valid.*

SWITCH NAME	SWITCH NO.	SETTING	STANDARD SETTING	MEANING
SW11	1	ON		PLO operates as the clock subordinate office.
		OFF		PLO operates as the clock source office.
	2	ON		Digital Clock Supply route zero (DCS 0) is used.
		OFF		Digital Clock Supply route zero (DCS 0) is not used.
	3	ON		Digital Clock Supply route one (DCS 1) is used.
		OFF		Digital Clock Supply route one (DCS 1) is not used.
	4	ON		8 KHz of Frame Head signals are not extracted from the DCS signals (which is composed of 64KHz + 8KHz).
		OFF		8 KHz of Frame Head signals are extracted from the DCS signals (which is composed of 64KHz + 8KHz).
	5	ON		When clock source failure has occurred in all supply routes, the PLO outputs the original clock of the internal oscillator.
		OFF		When clock source failure has occurred in all supply routes, the PLO continues outputting the current phase clock.
	6	ON		This card is associated with SYNC (PA-CK16 WCS) card.
		OFF		This card is not associated with SYNC (PA-CK16 WCS) card.
	7	ON		(The last byte data of the DTG ROM is “FE”)
		OFF	×	(The last byte data of the DTG ROM is “FF”)
	8	OFF	×	Not used

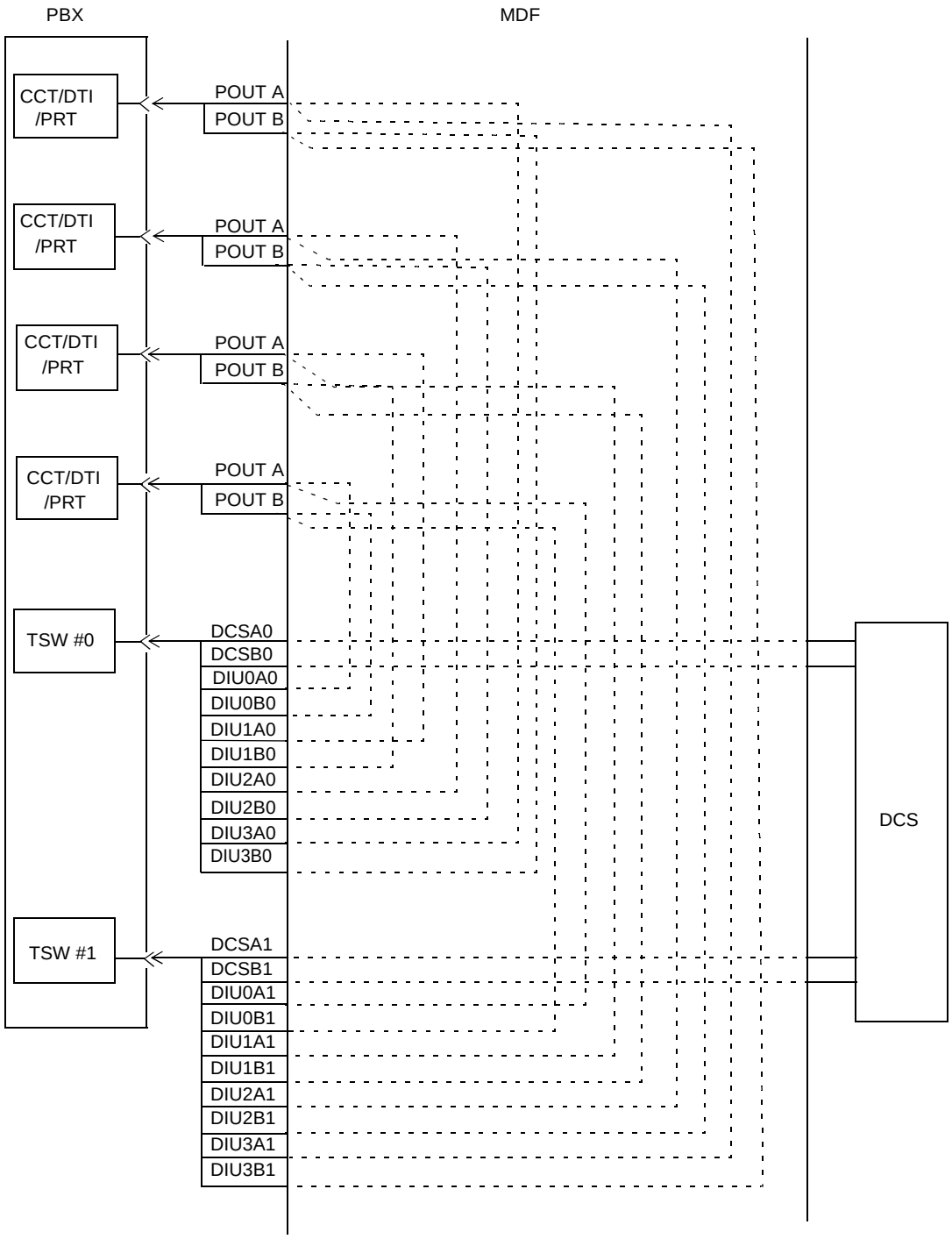
6. External Interface

When this circuit card is used in “clock subordinate office”, clock signals from DTI, CCT, PRT must be extracted. See Figure 2-52 for more information. When this circuit card is used in “clock source office” cable connections are not necessary.

Mounting Module **PIM**

26	DCSB0	1	DCSA0
27	DIU0B0	2	DIU0A0
28	DIU1B0	3	DIU1A0
29	DIU2B0	4	DIU2A0
30	DIU3B0	5	DIU3A0
31	SYN0B0	6	SYN0A0
32	SYN1B0	7	SYN1A0
33		8	
34		9	
35		10	
36		11	
37		12	
38		13	
39		14	
40		15	
41		16	
42	DCSB1	17	DCSA1
43	DIU0B1	18	DIU0A1
44	DIU1B1	19	DIU1A1
45	DIU2B1	20	DIU2A1
46	DIU3B1	21	DIU3A1
47	SYN0B1	22	SYN0A1
48	SYN1B1	23	SYN1A1
49		24	
50		25	

Figure 2-51 PLO Connector Leads Location



Note: *The following circuit cards have Clock Output leads for a PLO card: CCT (PA-24CCTA, PA30CCTB), DTI (PA-24DTR, PA-30DTS), and PRT (A-24PRT, PA-PRTC).*

Figure 2-52 Connecting Route Diagram

The front cable connections are shown in Figure 2-53.

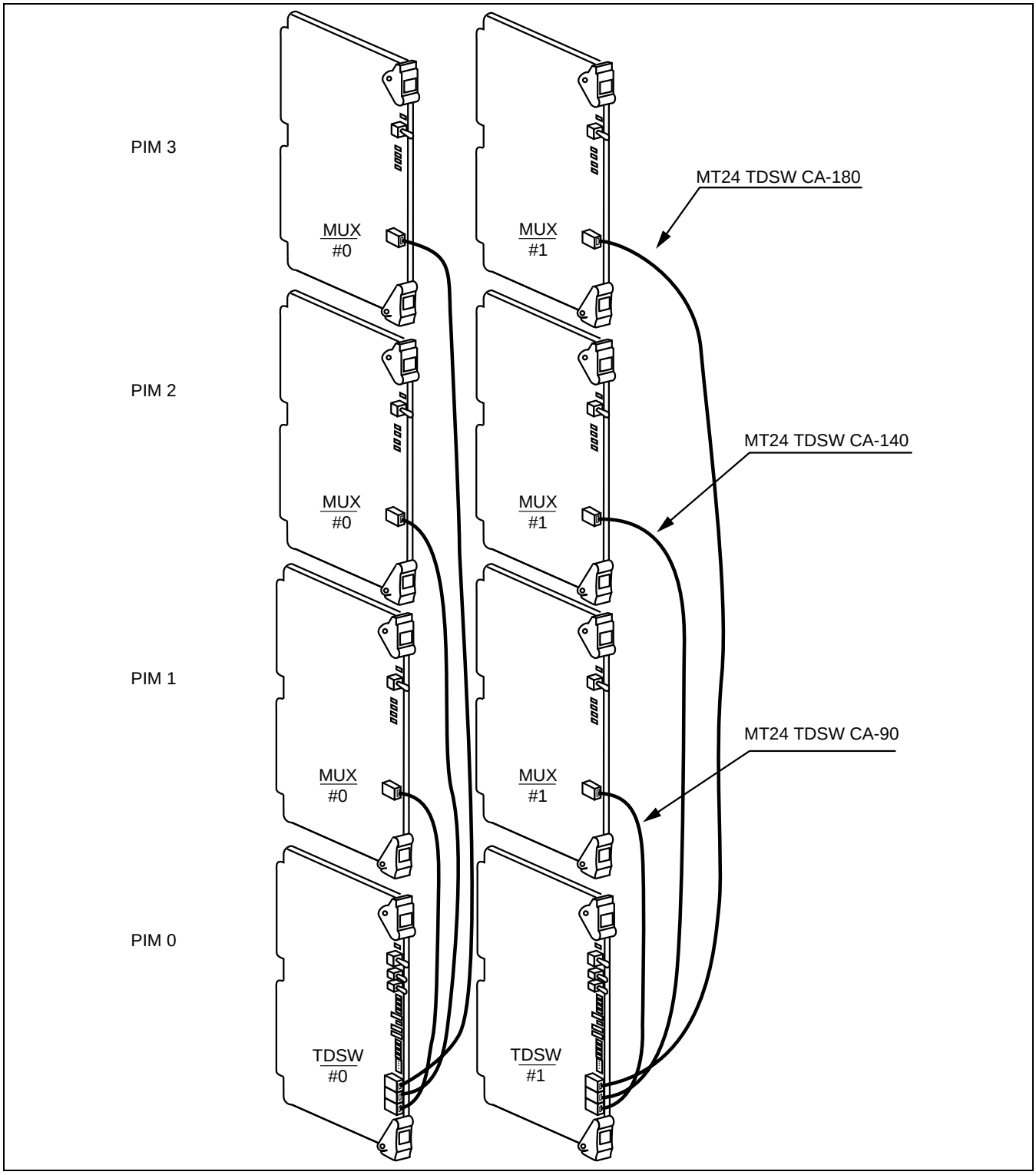
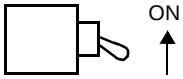
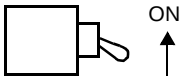
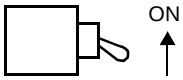
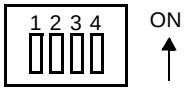
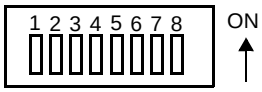
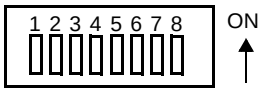


Figure 2-53 Front Cable Connections for PH-SW10

7. Switch Setting Sheet

SWITCH NAME	SWITCH SHAPE	REMARKS
MB		
TSWMBR		
PLOMB		
SW03		
SW04		
SW11		
SW12		

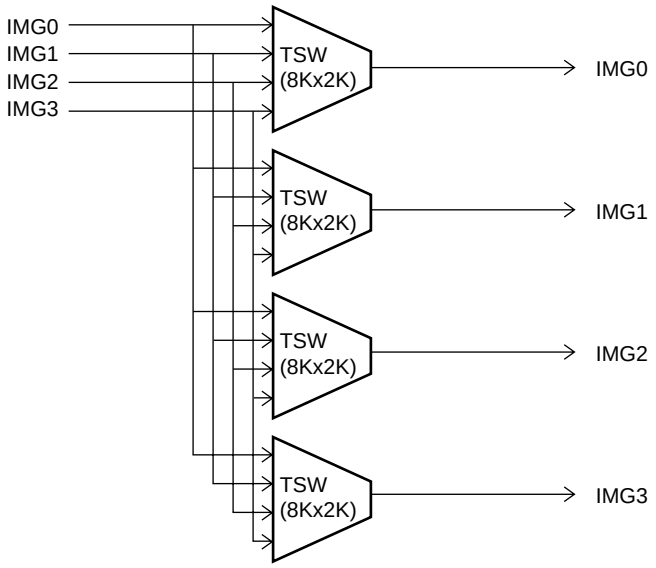
PH-SW12
Time Division Switch

1. General Function

This circuit card provides the Time Division Switch (TSW) and INT function for the system. Each TSW card is capable of 8192 × 2048 Time Slot (TS) switching for an Interface Module Group (IMG). Four cards allow 8192 × 8192 TS switching for the 4 IMG configuration.

The INT is an intermediate circuit of the CPR which controls and administrates the Port Microprocessor (PM) for line/trunk circuit cards.

[TSW configuration]



[INT configuration]

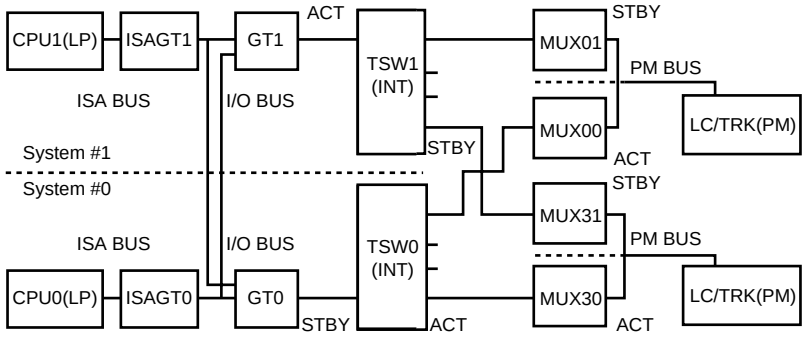


Figure 2-54 TSW Configuration

The TONE ROM located on this circuit card contains the audible tones, such as Dial Tone, Busy Tone, Ring Back Tone, etc. The music on hold source, either the MUSIC ROM or the external source via FM lead, is located on the PLO card. The tone and the music are inserted into their time slot at this circuit card. Additionally, this circuit card provides the Voice Prompt function that inserts the designated time slot of PCM (Speech Path Memory : SPM) into the tone or music time slot.

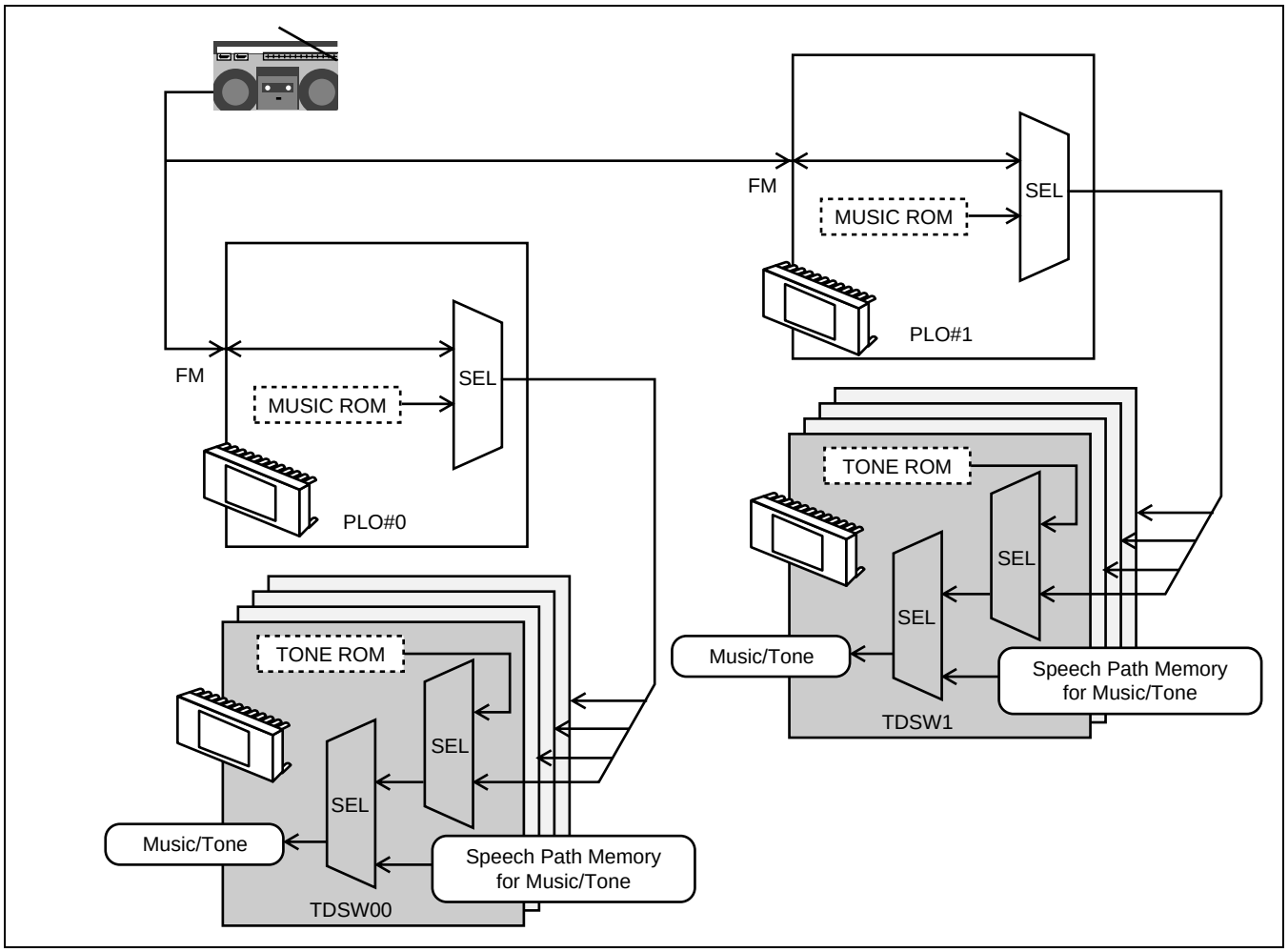


Figure 2-55 Music/Tone Insertion

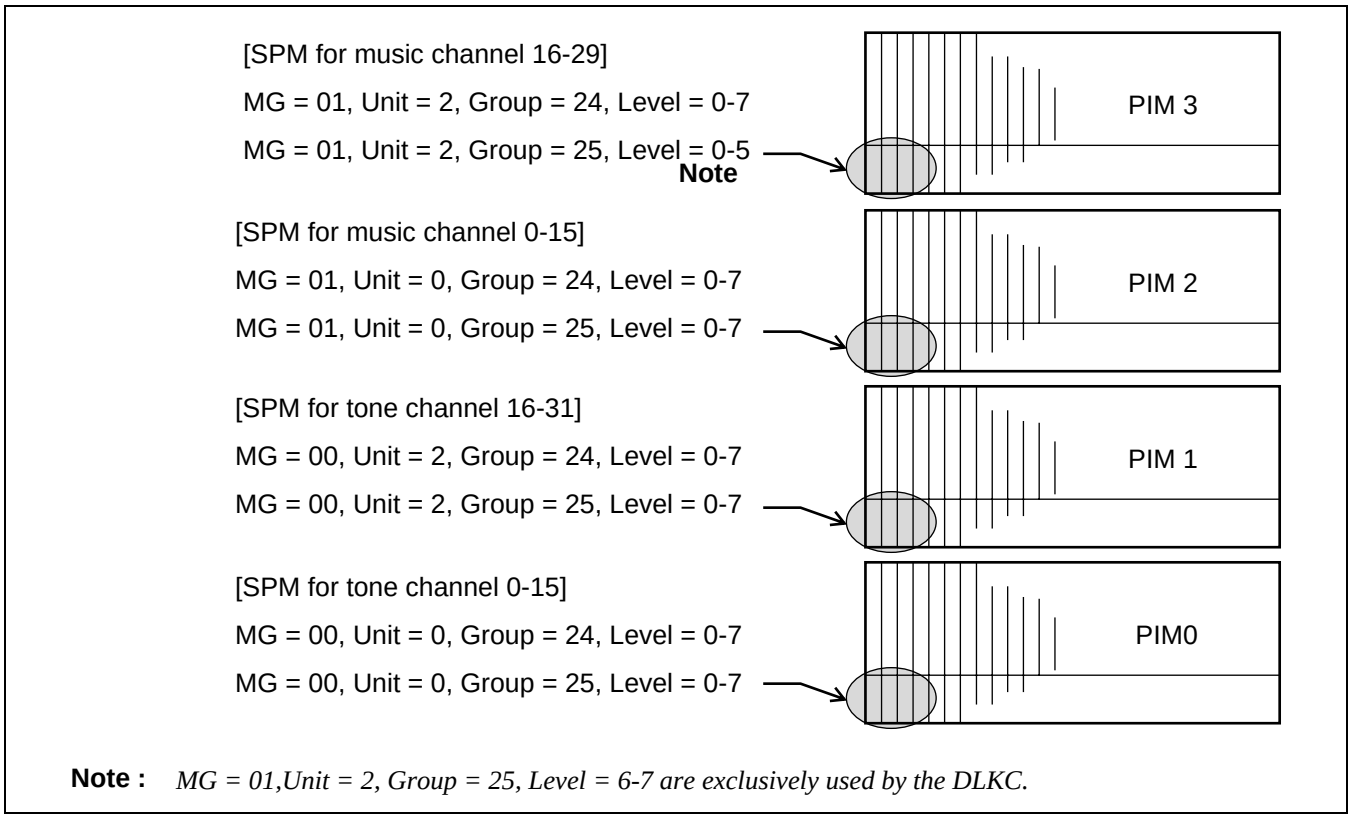


Figure 2-56 Speech Path Memory (SPM) for Voice Prompt Function

2. Mounting Location/Condition

This circuit card is mounted in the TSWM of the slot shown below. The IMX-U system accommodates two TSWMs (TSWM0/1).

Mounting Module	**TSWM**

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
TSWM													TSW 00	TSW 01	TSW 02	TSW 03	TSW 10	TSW 11	TSW 12	TSW 13				

The definition of the TSW00 - TSW03/TSW10 - TSW13 are listed below.

- 4-IMG System

SYMBOL	SYSTEM	CONTROLLED IMG
TSW00	0	IMG 0
TSW01		IMG 1
TSW02		IMG 2
TSW03		IMG 3
TSW10	1	IMG 0
TSW11		IMG 1
TSW12		IMG 2
TSW13		IMG 3

- IMX-U system

  This card is mounted in the TSWM0/1 for the IMX-U system.

  - For the card in TSWM0

SYMBOL	SYSTEM	FUNCTION	CONTROLLED IMG
TSW00	0	Collects the PCM data	IMG 0
TSW01			IMG 1
TSW02		Sends the PCM data to the ISW	IMG 0
TSW03			IMG 1
TSW10	1	Collects the PCM data	IMG 0
TSW11			IMG 1
TSW12		Sends the PCM data to the ISW	IMG 0
TSW13			IMG 1

  - For the card in TSWM1

SYMBOL	SYSTEM	FUNCTION	CONTROLLED IMG
TSW00	0	Collects the PCM data	IMG 2
TSW01			IMG 3
TSW02		Sends the PCM data to the ISW	IMG 2
TSW03			IMG 3

SYMBOL	SYSTEM	FUNCTION	CONTROLLED IMG
TSW10	1	Collects the PCM data	IMG 2
TSW11			IMG 3
TSW12		Sends the PCM data to the ISW	IMG 2
TSW13			IMG 3

3. Face Layout of Lamps, Switches, and Connectors

   The face layout of lamps, switches, and connectors is shown below.

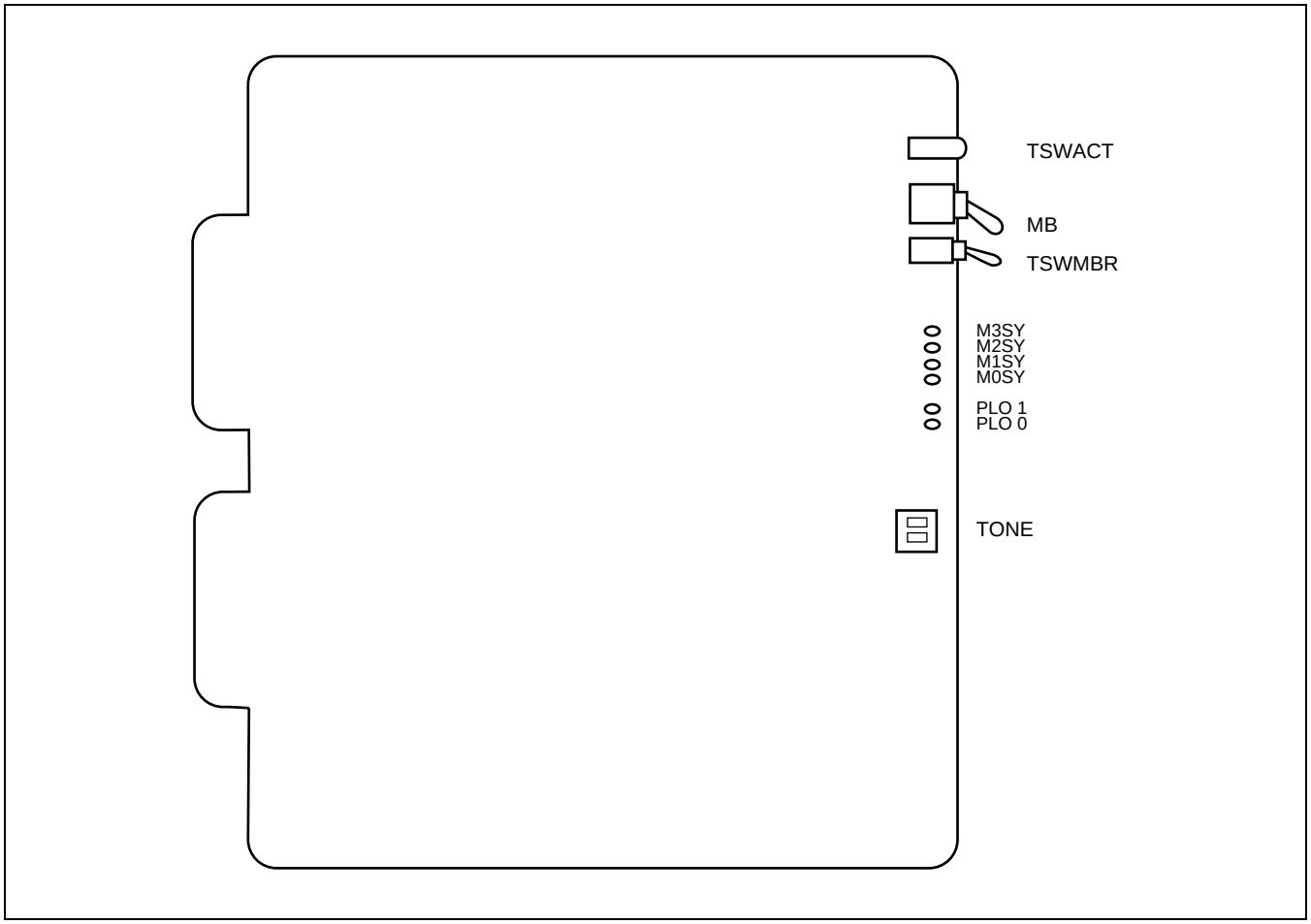


Figure 2-57 Face Layout of PH-SW12 (TSW)

4. Lamp Indications

Lamp indications for this circuit card are shown in the table below.

LAMP NAME	COLOR	STATE
TSWACT	Green	Remains lit while the TSW block is in ACT state.
	Red	Remains lit while the TSW block is in Make-busy state.
	Off	Remains off while the TSW block is ST-BY side.
M3SY	Green	Lights when MUX #3 synchronization has been established.
M2SY	Green	Lights when MUX#2 synchronization has been established.
M1SY	Green	Lights when MUX#1 synchronization has been established.
M0SY	Green	Lights when MUX#0 synchronization has been established.
PLO 1	Green	Lights when the Frame Head signal and clock signals are received from the PLO 1.
PLO 0	Green	Lights when the Frame Head signal and clock signals are received from the PLO 0.

5. Switch Settings

Standard settings for switches on this circuit card are shown in the table below.

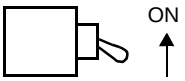
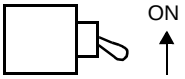
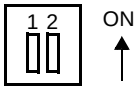
SWITCH NAME	SETTING	STANDARD SETTING	MEANING
MB	UP		Circuit card Make-busy.
	DOWN	×	Circuit card Make-busy cancel.
TSWMBR	UP		TSW Make-busy request.
	DOWN	×	TSW Make-busy request cancel.

SWITCH NAME	SWITCH NO.	SETTING	STANDARD SETTING	MEANING
TONE	1	OFF	×	Fixed.
	2	ON		(The last byte data of the DTG ROM is “FE.”)
		OFF	×	(The last byte data of the DTG ROM is “FF.”)

6. External Interface

See the NEAX2400 IMX Installation Manual for information about the cable connection to MUX.

7. Switch Setting Sheet

SWITCH NAME	SWITCH SHAPE	REMARKS
MB		
TSWMBR		
TONE		

PU-SW00
Time Division Switch

1. General Function

The PU-SW00 circuit card provides the Time division Switch (TSW) and INT function for the IMX-U system. Each circuit card provides switching for a Local Node (LN) and four PU-SW00 cards and two PU-SW01 (HSW) cards achieve a maximum of 32,768 time slot (TS) switching for four (4) LNs. This circuit card is located in ISWM of the ISW.

【TSW Configuration】

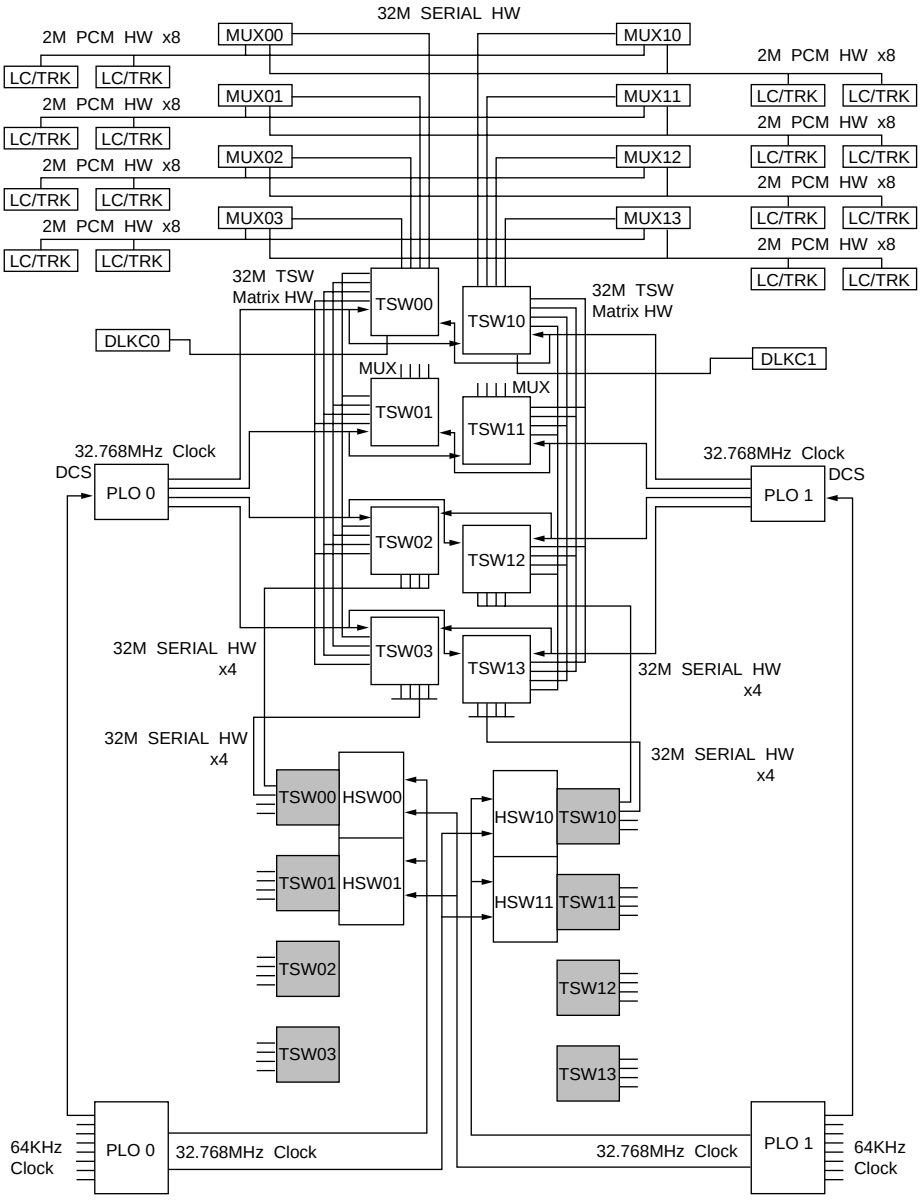


Figure 2-58 Location of PU-SW00 (TSW) (1/2)

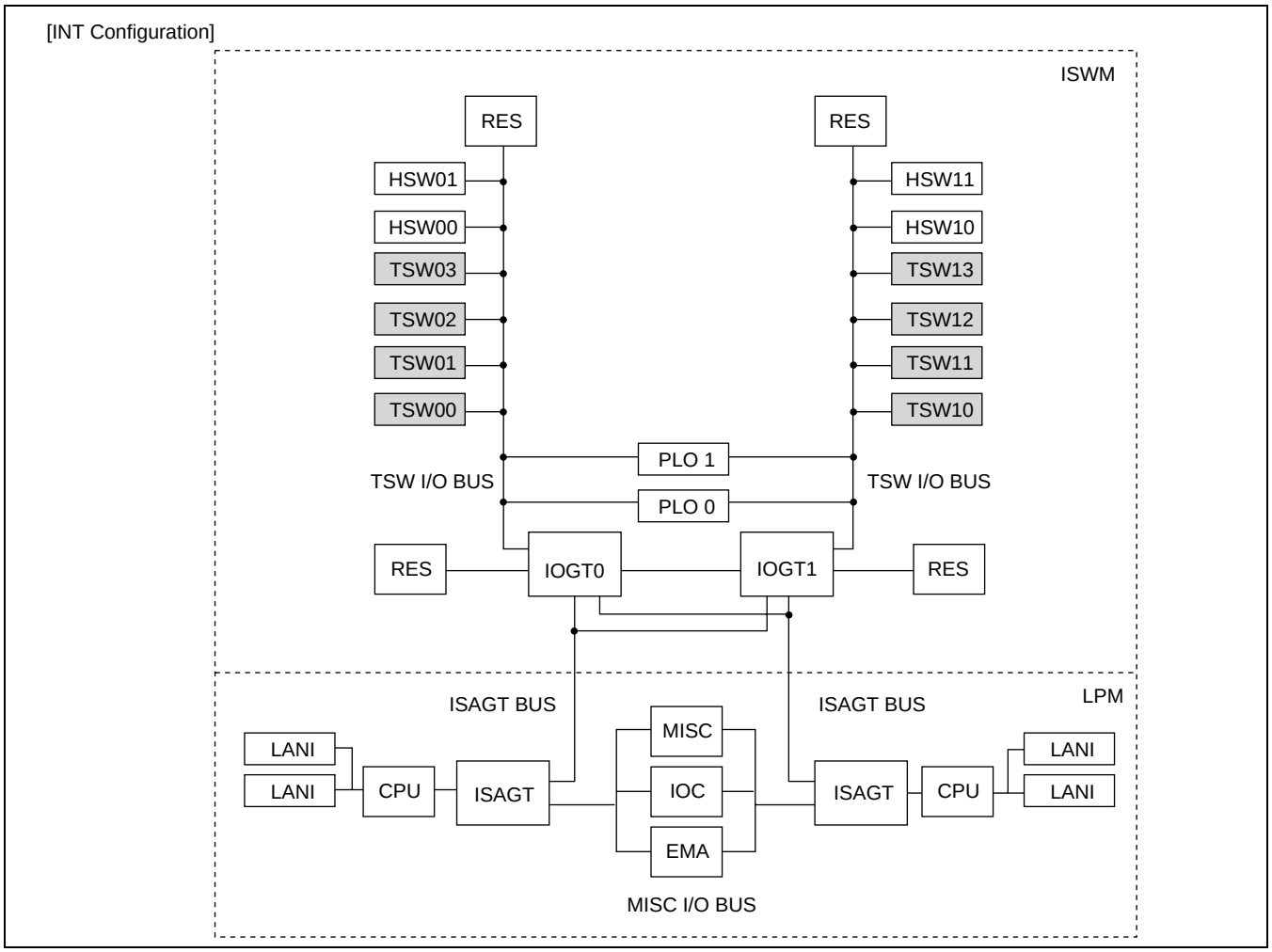


Figure 2-59 Location of PU-SW00 (TSW) (2/2)

2. Mounting Location/Condition

This circuit card can be mounted in the shaded slots shown below.

Mounting Module **ISWR**

00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
				TSW (00)	TSW (01)	TSW (02)	TSW (03)							TSW (10)	TSW (11)	TSW (12)	TSW (13)						

3. Face Layout of lamps, Switches, and Connectors

   The face layout of lamps, switches, and connectors is shown in Figure 2-60.

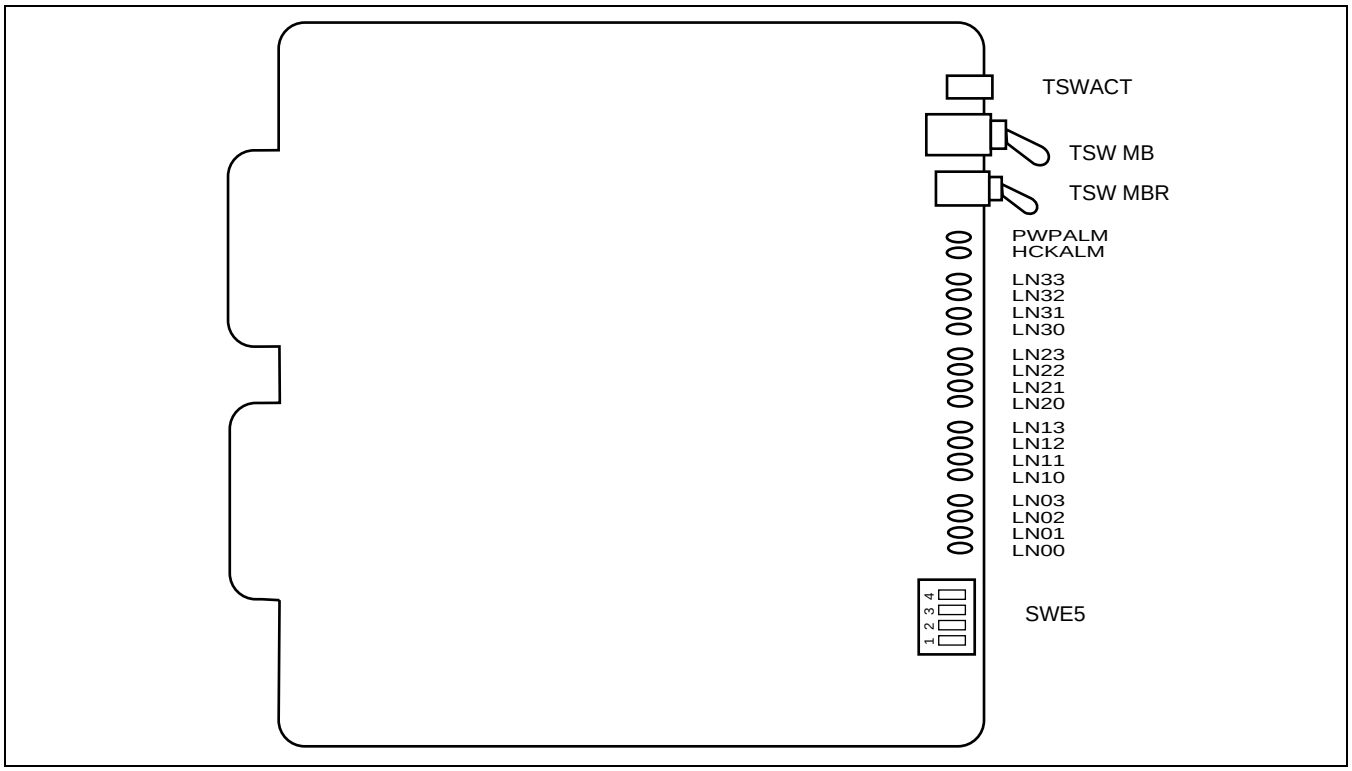


Figure 2-60 Face Layout of PU-SW00 (TSW)

4. Lamp Indications

   Lamp indications for this circuit card are shown in the table below.

LAMP NAME	COLOR	STATE
TSWACT	Green	Lights when the TDSW block is active.
	Red	Lights when the TDSW block is in Make-busy state.
PWPALM	Red	Lights when the On-Board Power Supply (+5V) for this circuit card is abnormal.
HCKALM	Red	Lights when clock failure (clock down or FH output failure) occurs on the HSW card.
LN33	Green	Lights when this circuit card is synchronized with the corresponding TSW/MUX of LN.
LN32	Green	Lights when this circuit card is synchronized with the corresponding TSW/MUX of LN.
LN31	Green	Lights when this circuit card is synchronized with the corresponding TSW/MUX of LN.
LN30	Green	Lights when this circuit card is synchronized with the corresponding TSW/MUX of LN.

LAMP NAME	COLOR	STATE
LN23	Green	Lights when this circuit card is synchronized with the corresponding TSW/MUX of LN.
LN22	Green	Lights when this circuit card is synchronized with the corresponding TSW/MUX of LN.
LN21	Green	Lights when this circuit card is synchronized with the corresponding TSW/MUX of LN.
LN20	Green	Lights when this circuit card is synchronized with the corresponding TSW/MUX of LN.
LN13	Green	Lights when this circuit card is synchronized with the corresponding TSW/MUX of LN.
LN12	Green	Lights when this circuit card is synchronized with the corresponding TSW/MUX of LN.
LN11	Green	Lights when this circuit card is synchronized with the corresponding TSW/MUX of LN.
LN10	Green	Lights when this circuit card is synchronized with the corresponding TSW/MUX of LN.
LN03	Green	Lights when this circuit card is synchronized with the corresponding TSW/MUX of LN.
LN02	Green	Lights when this circuit card is synchronized with the corresponding TSW/MUX of LN.
LN01	Green	Lights when this circuit card is synchronized with the corresponding TSW/MUX of LN.
LN00	Green	Lights when this circuit card is synchronized with the corresponding TSW/MUX of LN.

5. Switch Settings

Switch settings for this circuit card are shown in the table below.

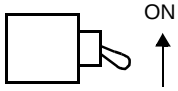
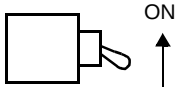
SWITCH NAME	SETTING	STANDARD SETTING	MEANING
TSW MB	UP		Circuit card Make-busy.
	DOWN	×	Circuit card Make-busy cancel.
TSW MBR	UP		Circuit card Make-busy request.
	DOWN	×	Circuit card Make-busy request cancel.

SWITCH NAME	SWITCH NO.	SETTING	STANDARD SETTING	MEANING
SWE5	1	ON	×	Local Node connection mode.
		OFF		MUX connection mode.
	2	OFF	×	Not used
	3	OFF	×	Not used
	4	OFF	×	Not used

6. External Interface

See the NEAX2400 IMX Installation Manual.

7. Switch Setting Sheet

SWITCH NAME	SWITCH SHAPE	REMARKS
TSW MB		
TSW MBR		

PU-SW01
Highway Switch

1. General Function

The PU-SW01 circuit card, which is used for the IMX-U system, supports the following functions.

(a) The switch composition is T-T-S-T (T: Time division, S: Space division, T: Time division), and the space division is composed with this circuit card.

(b) This circuit card collects the 16 highways of PCM data from and sends 8 highways to TSW by one card. It is used to perform 16 highways switching by 2 PU-SW01 cards.

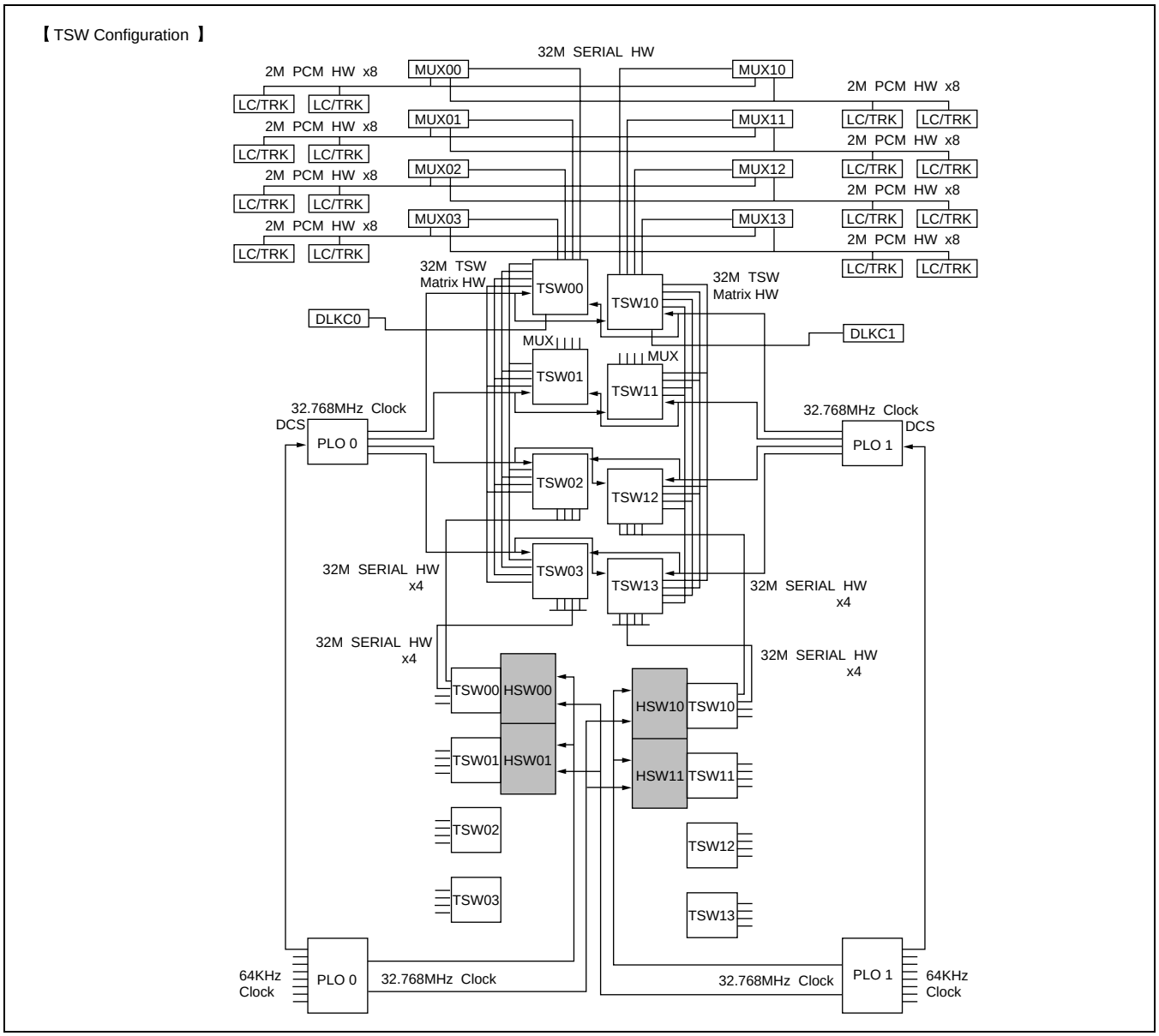


Figure 2-61 Location of PU-SW01 (HSW) (1/2)

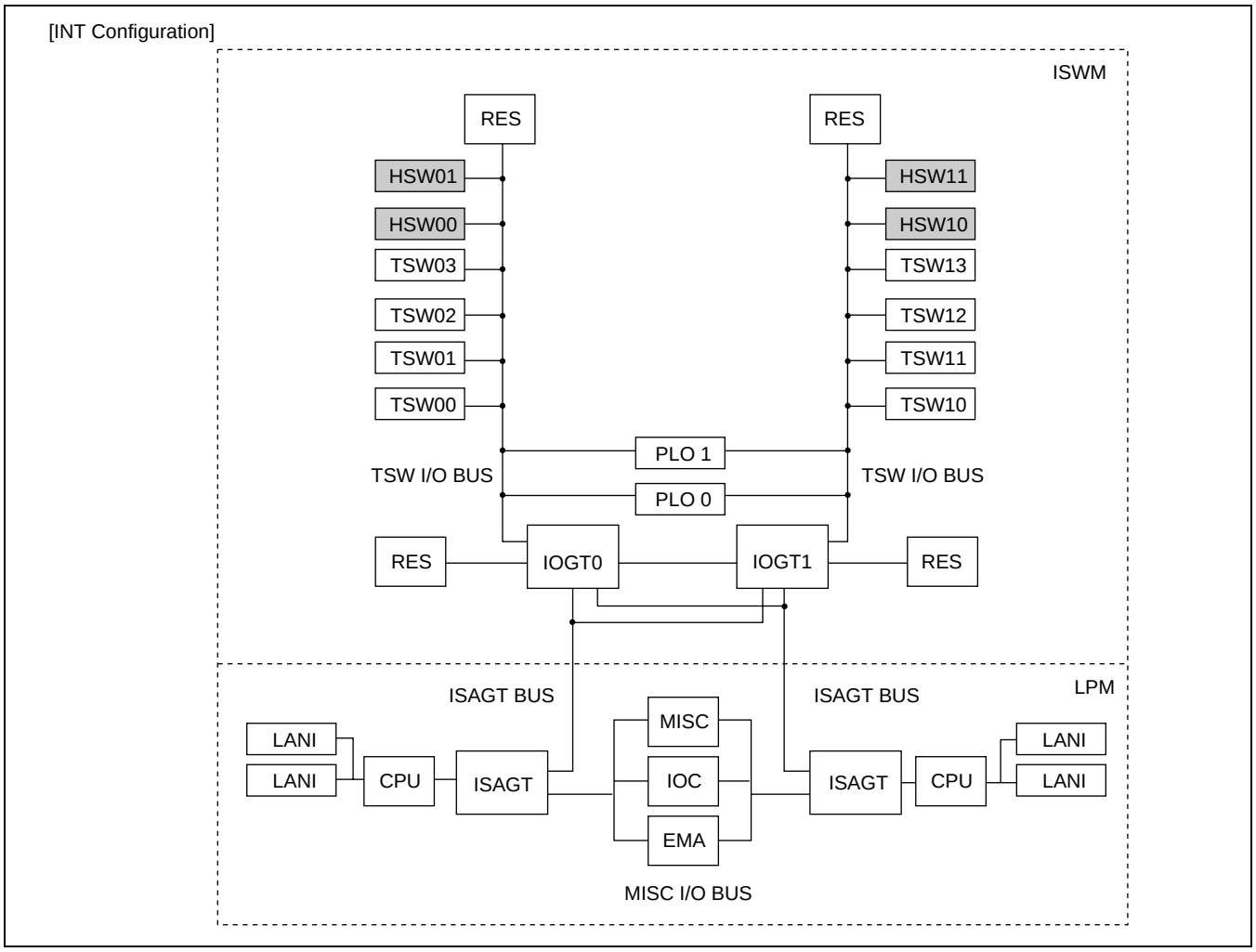


Figure 2-61 Location of PU-SW01 (HSW) (2/2)

2. Mounting Location/Condition

This circuit card is mounted in ISWM located in the ISW. The mounted slots are the shaded parts shown below.

Mounting Module **ISWM**

00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19
		HSW (00)	HSW (01)															HSW (10)	HSW (11)

3. Face Layout of lamps, Switches, and Connectors

The face layout of lamps, switches, and connectors are shown in Figure 2-62.

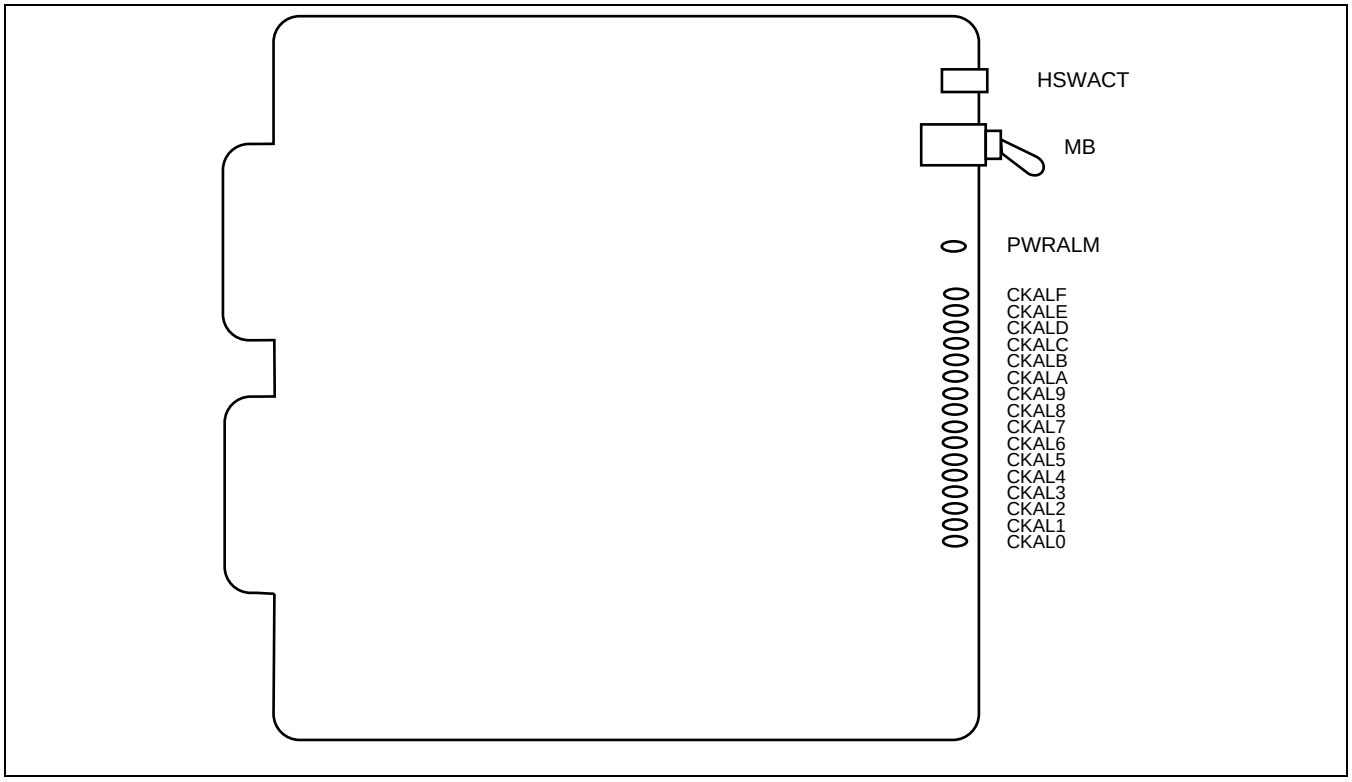


Figure 2-62 Face Layout of PU-SW01 (HSW)

4. Lamp Indications

Lamp indications for this circuit card are shown in the table below.

LAMP NAME	COLOR	STATE
HSWACT	Green	Lights when the HSW block is active.
	Red	Lights when the HSW block is in Make-busy state.
PWPALM	Red	Lights when the On-Board Power Supply (-48 V) for this circuit card is abnormal.
CKALF	Green	Lights when the clock/Frame Head signals are sent from #15 circuit of TSW in ISW.
	Off	Goes off when the clock/Frame Head signals are not sent from #15 circuit of TSW in ISW.
CKALE	Green	Lights when the clock/Frame Head signals are sent from #14 circuit of TSW in ISW.
	Off	Goes off when the clock/Frame Head signals are not sent from #14 circuit of TSW in ISW.
CKALD	Green	Lights when the clock/Frame Head signals are sent from #13 circuit of TSW in ISW.
	Off	Goes off when the clock/Frame Head signals are not sent from #13 circuit of TSW in ISW.
CKALC	Green	Lights when the clock/Frame Head signals are sent from #12 circuit of TSW in ISW.
	Off	Goes off when the clock/Frame Head signals are not sent from #12 circuit of TSW in ISW.
CKALB	Green	Lights when the clock/Frame Head signals are sent from #11 circuit of TSW in ISW.
	Off	Goes off when the clock/Frame Head signals are not sent from #11 circuit of TSW in ISW.
CKALA	Green	Lights when the clock/Frame Head signals are sent from #10 circuit of TSW in ISW.
	Off	Goes off when the clock/Frame Head signals are not sent from #10 circuit of TSW in ISW.
CKAL9	Green	Lights when the clock/Frame Head signals are sent from #09 circuit of TSW in ISW.
	Off	Goes off when the clock/Frame Head signals are not sent from #09 circuit of TSW in ISW.
CKAL8	Green	Lights when the clock/Frame Head signals are sent from #08 circuit of TSW in ISW.
	Off	Goes off when the clock/Frame Head signals are not sent from #08 circuit of TSW in ISW.
CKAL7	Green	Lights when the clock/Frame Head signals are sent from #07 circuit of TSW in ISW.
	Off	Goes off when the clock/Frame Head signals are not sent from #07 circuit of TSW in ISW.
CKAL6	Green	Lights when the clock/Frame Head signals are sent from #06 circuit of TSW in ISW.
	Off	Goes off when the clock/Frame Head signals are not sent from #06 circuit of TSW in ISW.
CKAL5	Green	Lights when the clock/Frame Head signals are sent from #05 circuit of TSW in ISW.
	Off	Goes off when the clock/Frame Head signals are not sent from #05 circuit of TSW in ISW.
CKAL4	Green	Lights when the clock/Frame Head signals are sent from #04 circuit of TSW in ISW.
	Off	Goes off when the clock/Frame Head signals are not sent from #04 circuit of TSW in ISW.

LAMP NAME	COLOR	STATE
CKAL3	Green	Lights when the clock signal is sent normally from #03 circuit of TSW inISW.
	Off	Goes off when the clock failure occurs on #03 circuit of TSW in ISW.
CKAL2	Green	Lights when the clock/Frame Head signals are sent from #02 circuit of TSW in ISW.
	Off	Goes off when the clock/Frame Head signals are not sent from #02 circuit of TSW in ISW.
CKAL1	Green	Lights when the clock/Frame Head signals are sent from #01 circuit of TSW in ISW.
	Off	Goes off when the clock/Frame Head signals are not sent from #01 circuit of TSW in ISW.
CKAL0	Green	Lights when the clock/Frame Head signals are sent from #00 circuit of TSW in ISW.
	Off	Goes off when the clock/Frame Head signals are not sent from #00 circuit of TSW in ISW.

5. Switch Settings

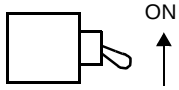
   Switch settings on this circuit card are shown in the table below.

SWITCH NAME	SETTING	STANDARD SETTING	MEANING
MB	UP		Circuit card Make-busy.
	DOWN	×	Circuit card Make-busy cancel.

6. External Interface

   No cable connections are required.

7. Switch Setting Sheet

SWITCH NAME	SWITCH SHAPE	REMARKS
MB		

PZ-GT13
Industrial Standard Architecture Gateway

1. General Function

The PZ-GT13 (ISAGT) circuit card controls the TSDW, DLKC, PLO etc. using the PH-GT09 (GT) in the TSWM. This card also provides the MISC I/O bus interface, which permits a microprocessor on the CPR to control EMA and IOC/MISC. The Industrial Standard Architecture (ISA) bus is used to connect this circuit card onto the CPR.

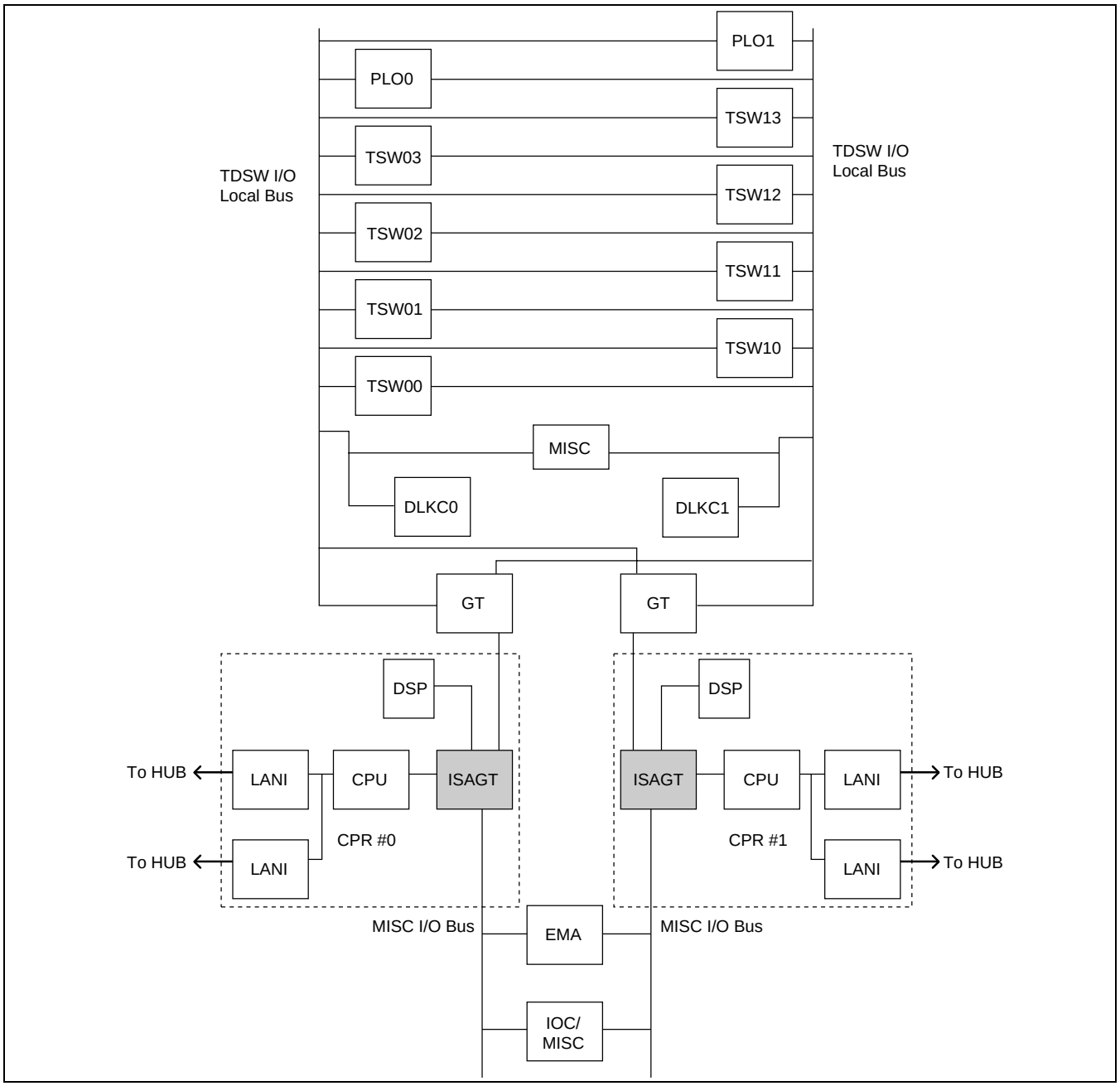


Figure 2-63 Location of PZ-GT13 (ISAGT)

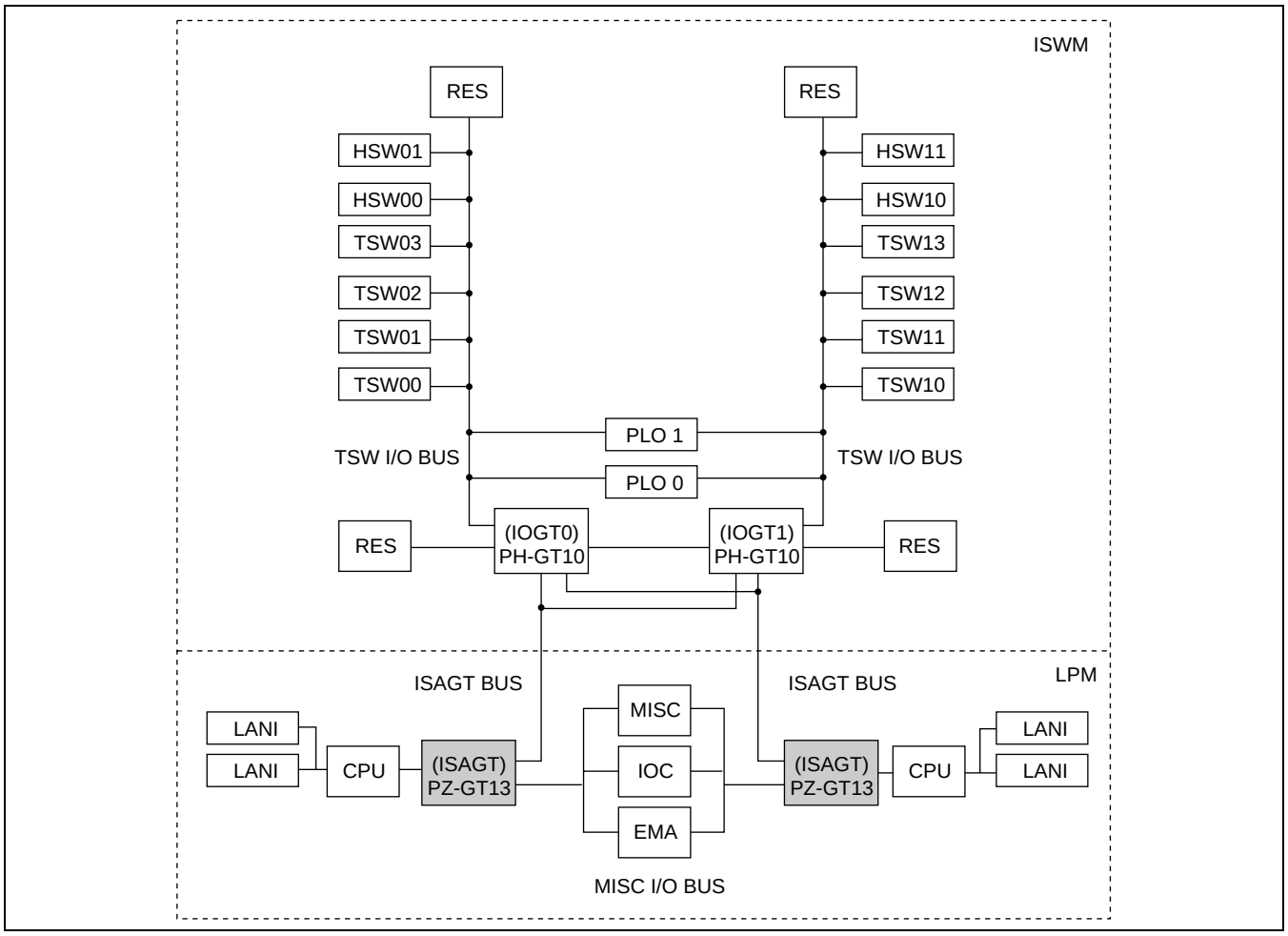
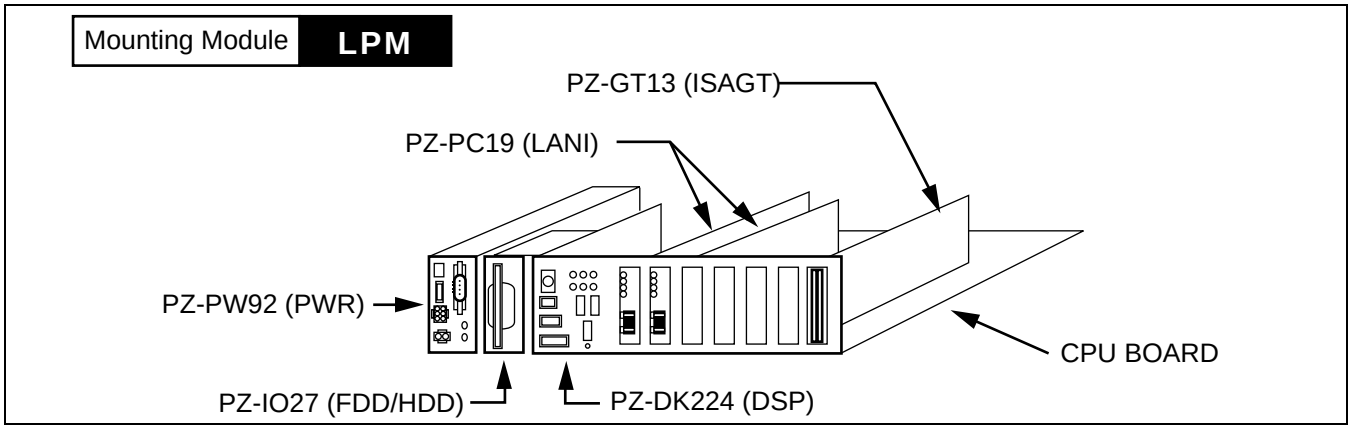


Figure 2-64 Location of PZ-GT13 (ISAGT) in the IMX-U System (ISW)

2. Mounting Location/Condition

The PZ-GT13 is located on the ISA bus, which is allocated in the CPR as shown below.



3. Face Layout of Connectors

   The face layout of connectors is shown Figure 2-65. Neither lamps nor switches are located on this circuit card.

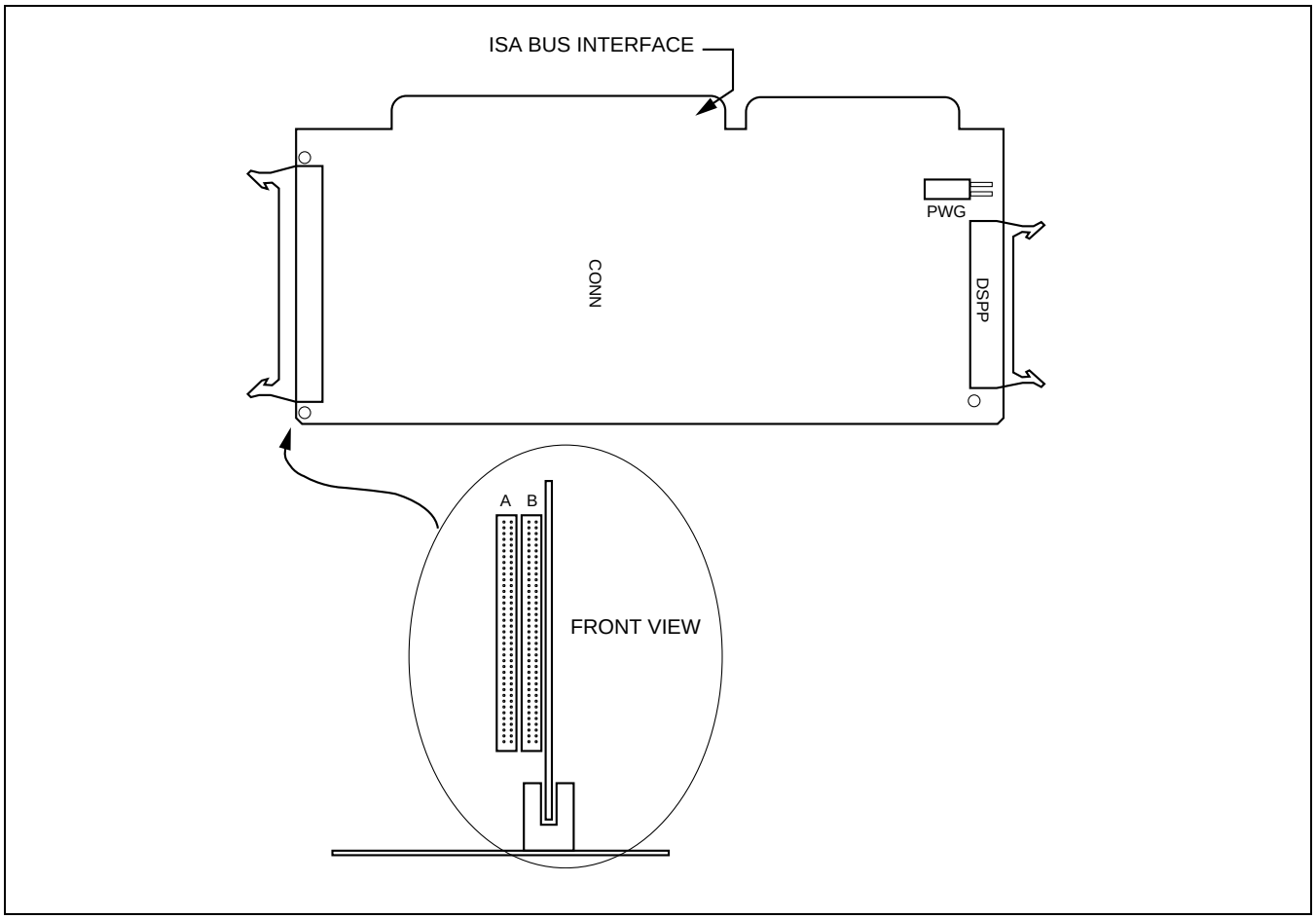


Figure 2-65 Face Layout of PZ-GT13 (ISAGT)

4. External Interface

   This card has no lamps.

5. Switch Settings

   No switch settings are required.

6. External Interface

   See the NEAX2400 IMX Installation Manual.

7. Switch Setting Sheet

   No switch settings are required.

PZ-GT16
Industrial Standard Architecture Gateway

1. General Function

The PZ-GT16 (ISAGT) circuit card provides both the I/O Local bus and the MISC bus interface, which permits a microprocessor on the CPR to control the lower echelons of circuit cards. The Industrial Standard Architecture (ISA) bus is used to connect this circuit card onto the CPR.

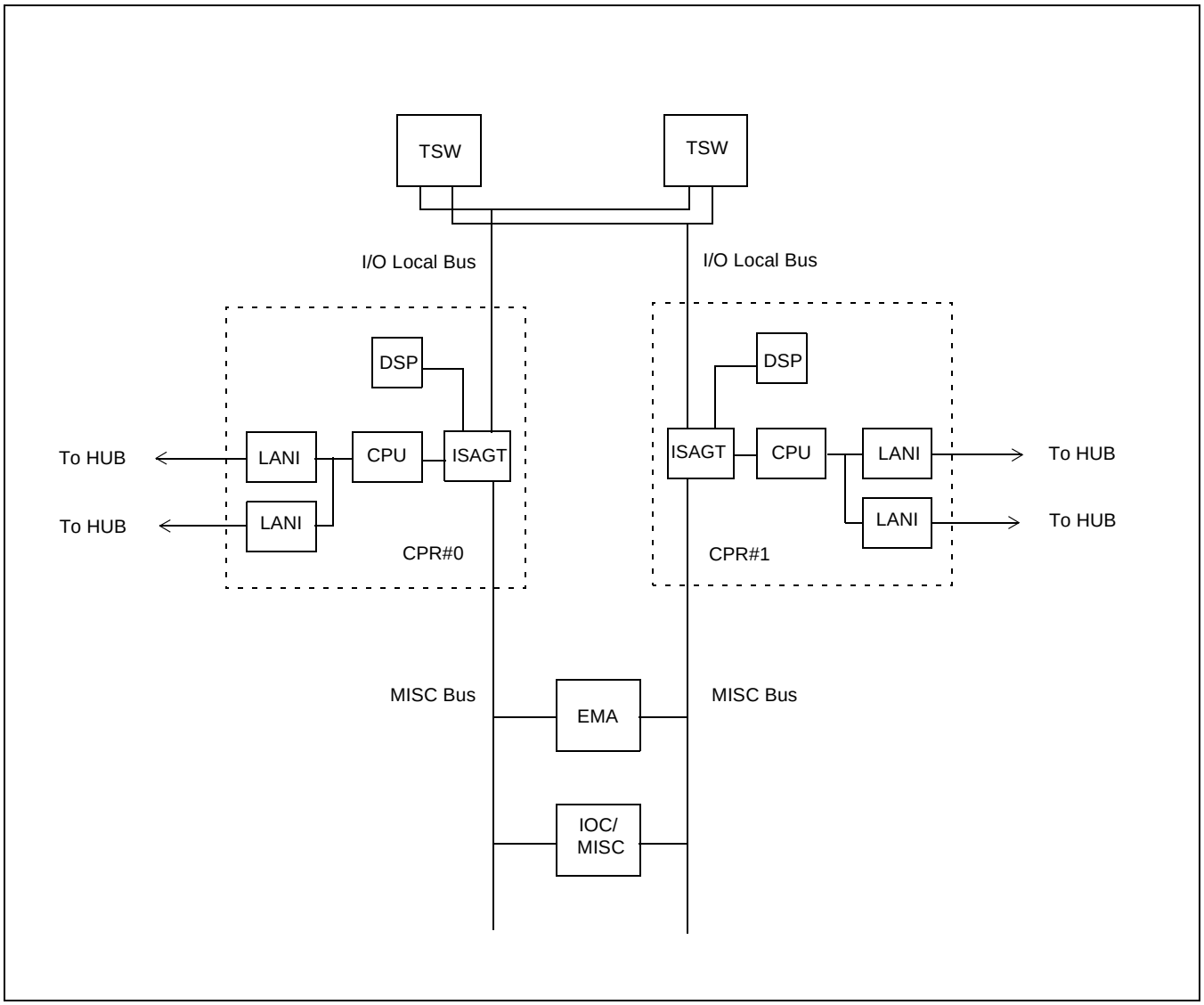
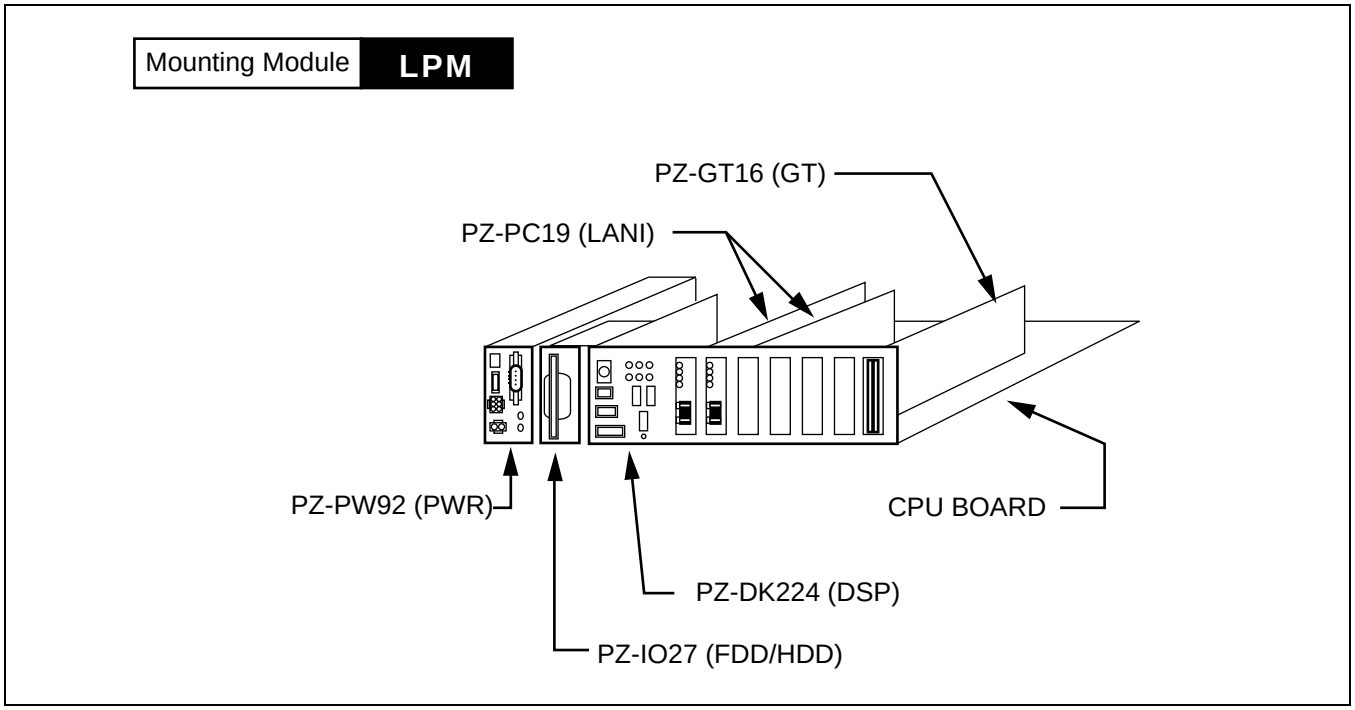


Figure 2-66 Location of PZ-GT16 (ISAGT)

2. Mounting Location/Condition

The PZ-GT16 (ISAGT) is located on the ISA bus, which is allocated in the CPR as shown below.



3. Face Layout of Connectors

   The face layout of connectors is shown in Figure 2-67. There are no lamps or switches on this circuit card.

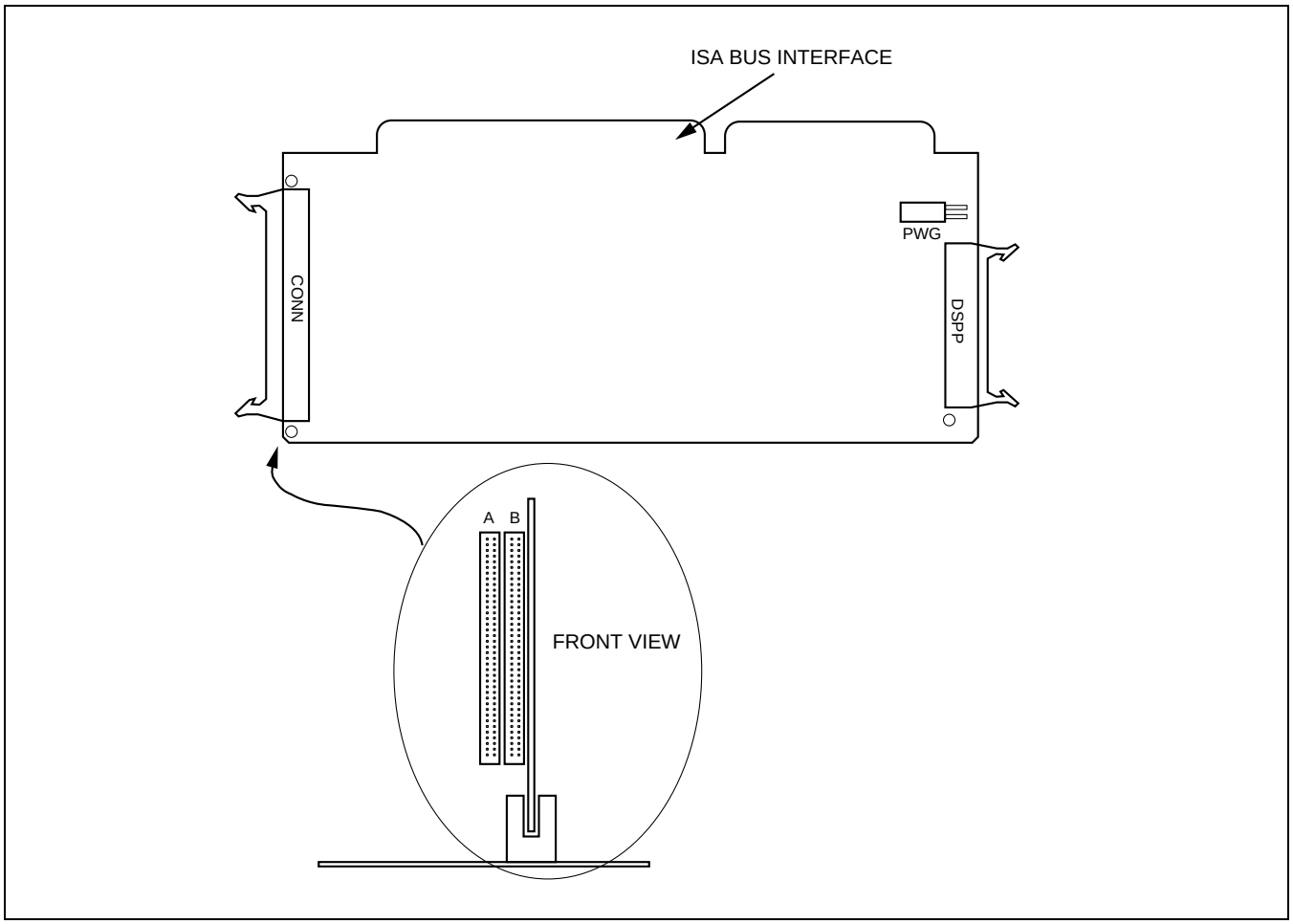


Figure 2-67 Face Layout of PZ-GT16 (ISAGT)

4. Lamp Indications

   This card contains no lamps.

5. Switch Settings

   No switch settings are required.

6. External Interface

   See the NEAX2400 IMX Installation Manual.

7. Switch Setting Sheet

   No switch settings are required.

PZ-GT20
Industry Standard Architecture Gateway

1. General Function

The main function of the PZ-GT20 circuit card is to connect the Industry Standard Architecture (ISA) bus located on the CPU and the Local I/O bus, permitting the microprocessor on the CPU to control the TSW, MUX cards of IMG2, 3 via the PH-GT09 card in the TSWM1. This circuit card is used for the IMX-U system.

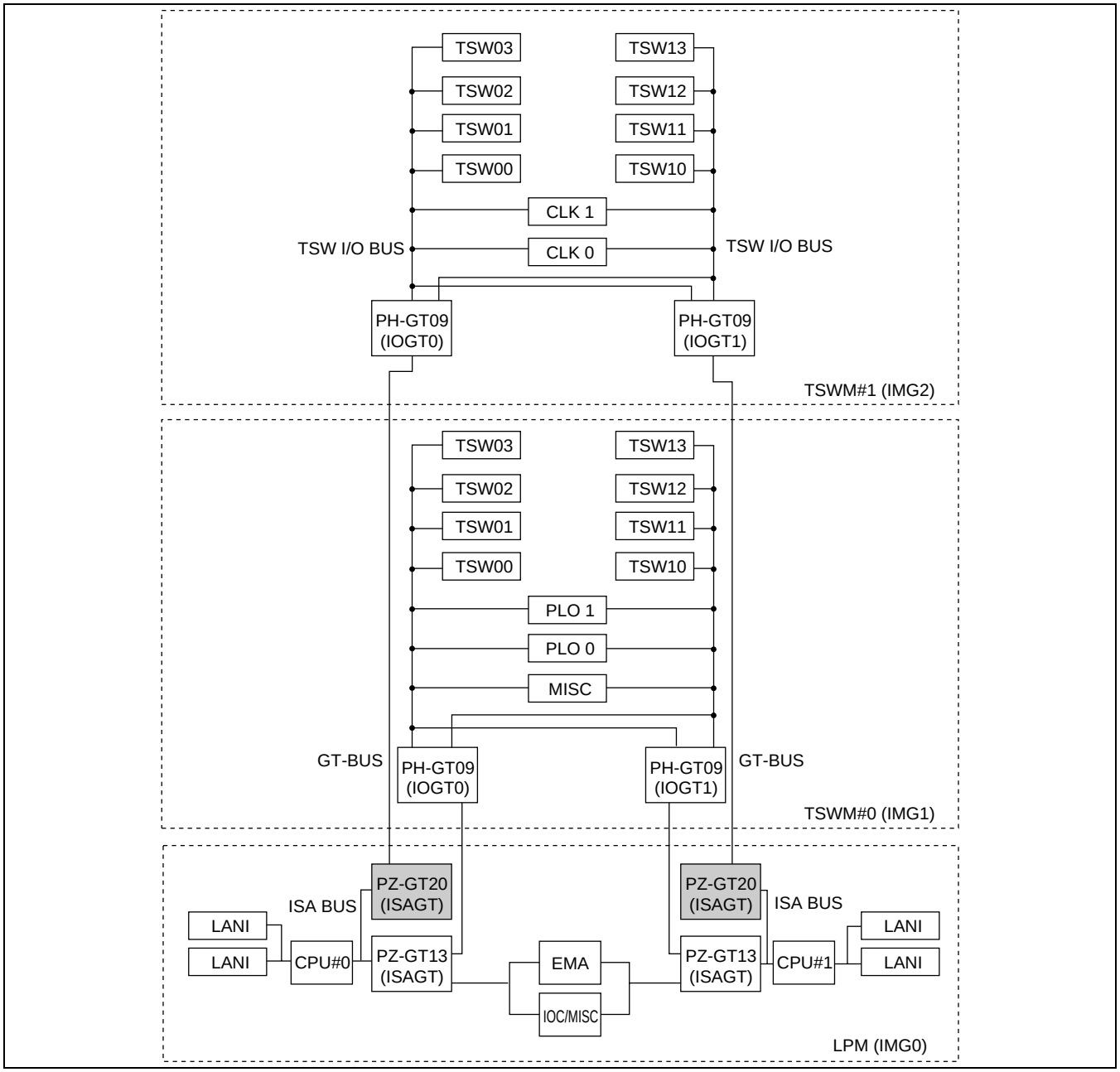
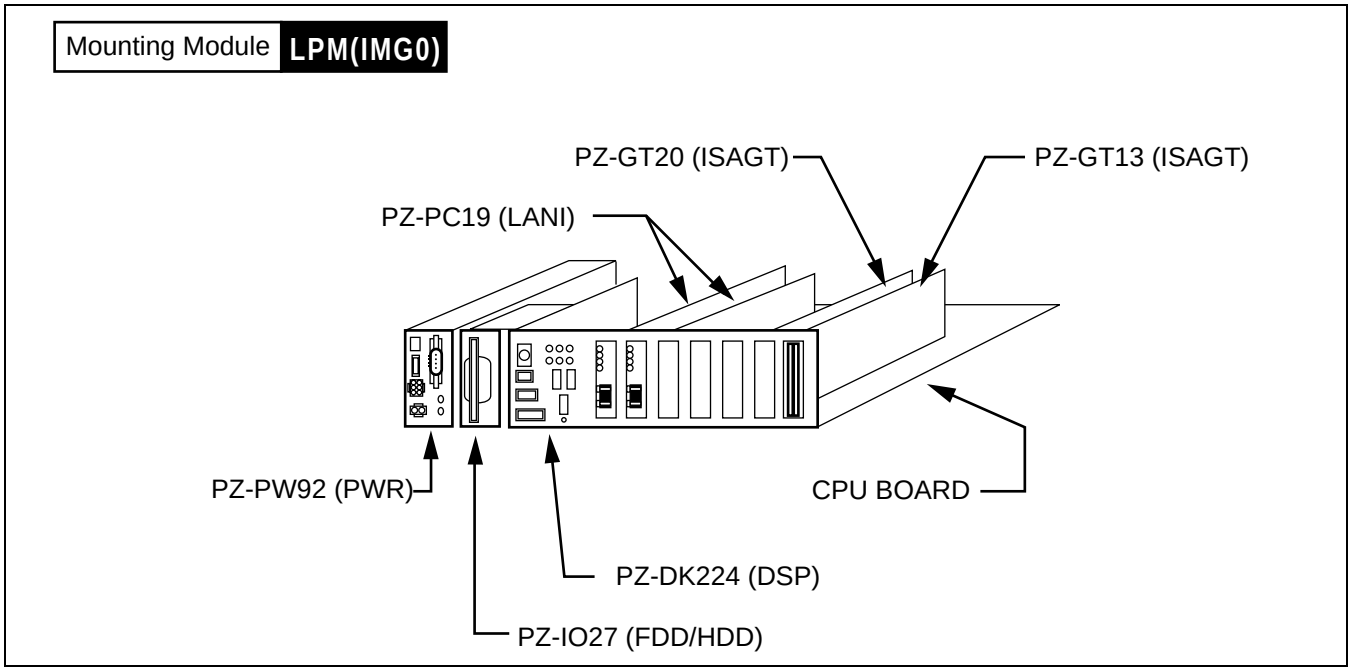


Figure 2-68 Location of PZ-GT20 (ISAGT)

2. Mounting Location/Condition

The PZ-GT20 resides on the ISA bus that is located in the CPR as shown below.



3. Face Layout of Connectors

The face layout of connectors are shown in Figure 2-69. Neither lamps nor switches are located on this circuit card.

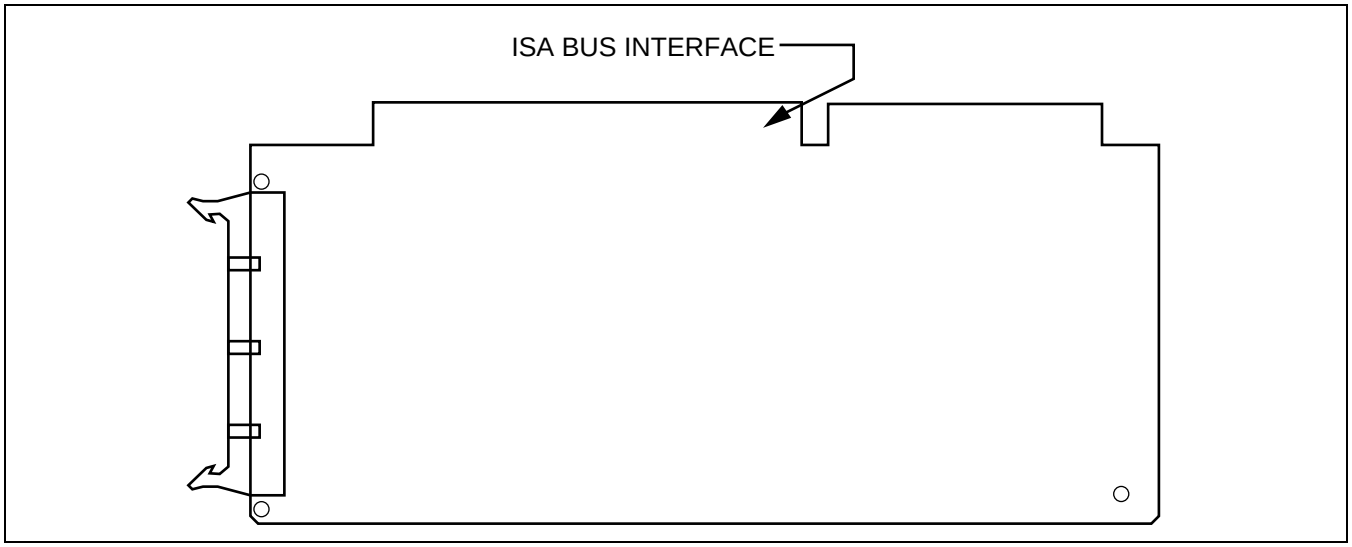


Figure 2-69 Face Layout of PZ-GT20 (ISAGT)

4. External Interface

   This card contains no lamps.

5. Switch Settings

   No switch settings are required.

6. External Interface

   See the NEAX2400 IMX Installation Manual.

7. Switch Setting Sheet

   No switch settings are required.

PZ-PC19
Local Area Network Interface

1. General Function

The PZ-PC19 (LANI) circuit card provides the interface for the 10-BASE-T and the Peripheral Component Interconnect (PCI) Bus. The microprocessor on the CPR sends/receives the Fusion Link Data and/or Maintenance Administration Terminal (MAT) data across the LAN interface (LANI).

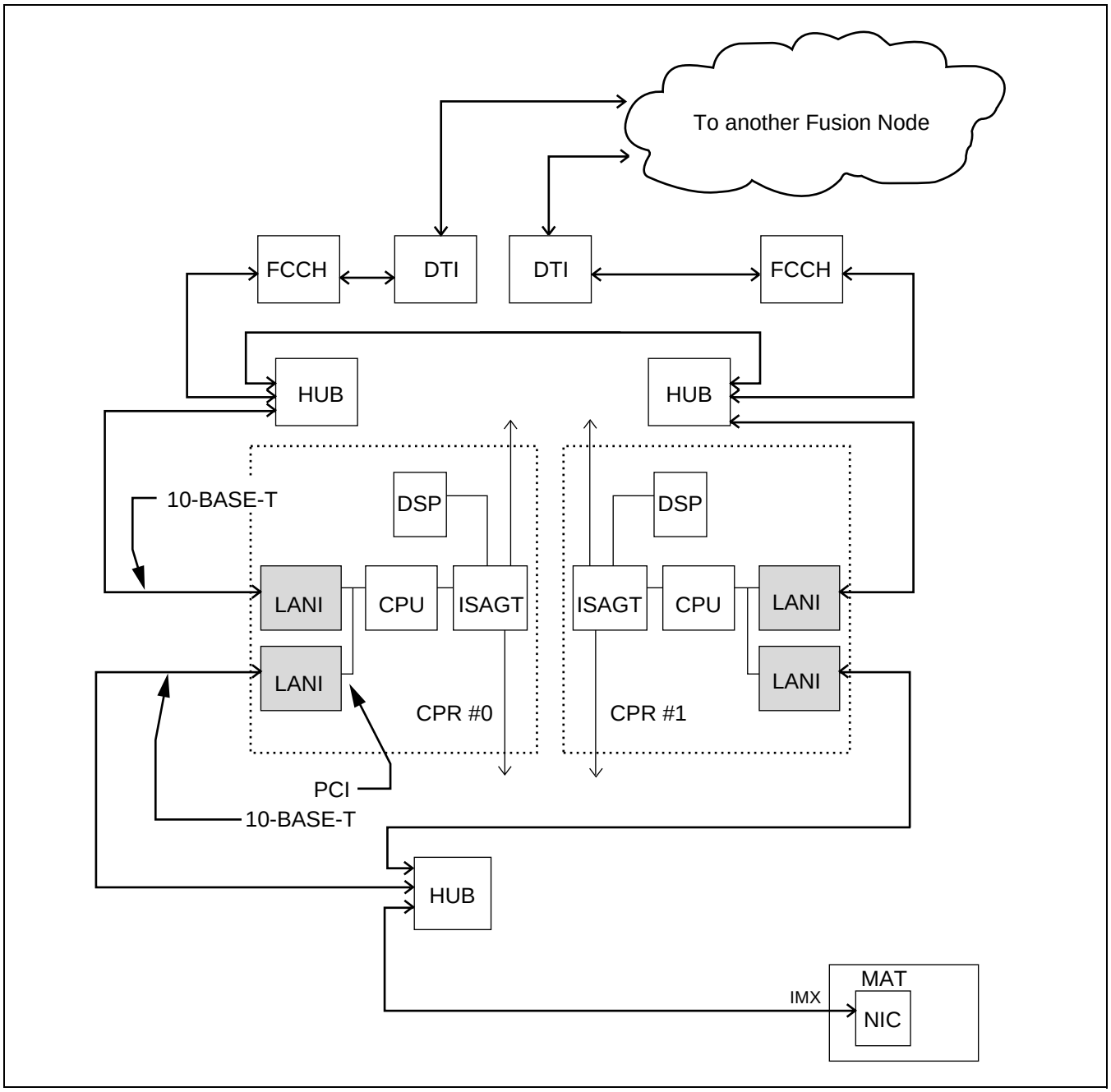
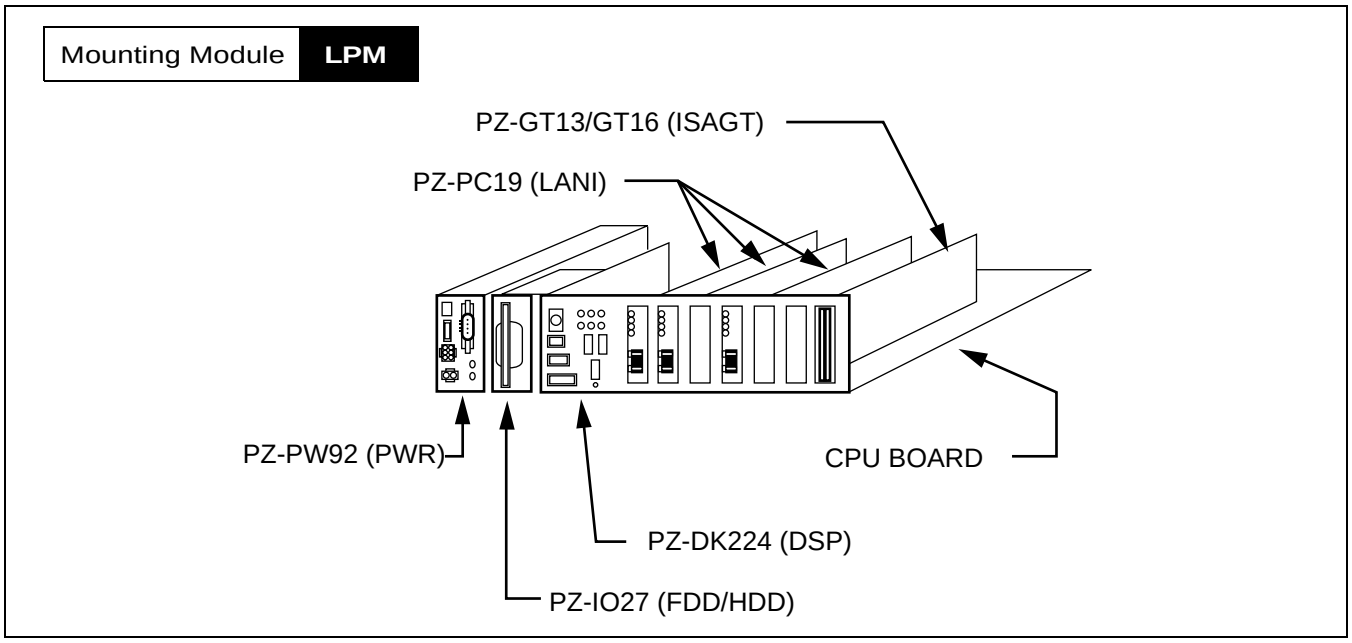


Figure 2-70 Location of PZ-PC19 (LANI)

2. Mounting Location/Condition

The PZ-PC19 (LANI) is located on the PCI bus in the CPR as shown below.



3. Face Layout of Lamps, Switches and Connectors

The face layout of lamps, switches and connectors is shown in Figure 2-71.

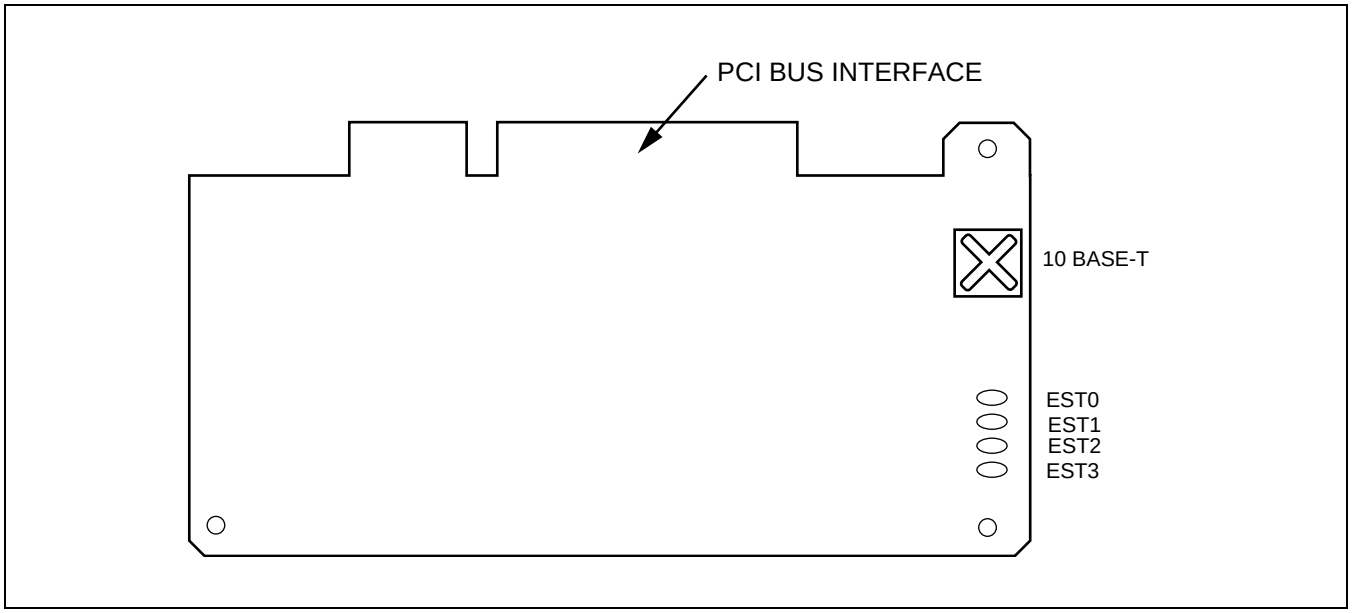


Figure 2-71 Face Layout of PZ-PC19

4. Lamp Indications

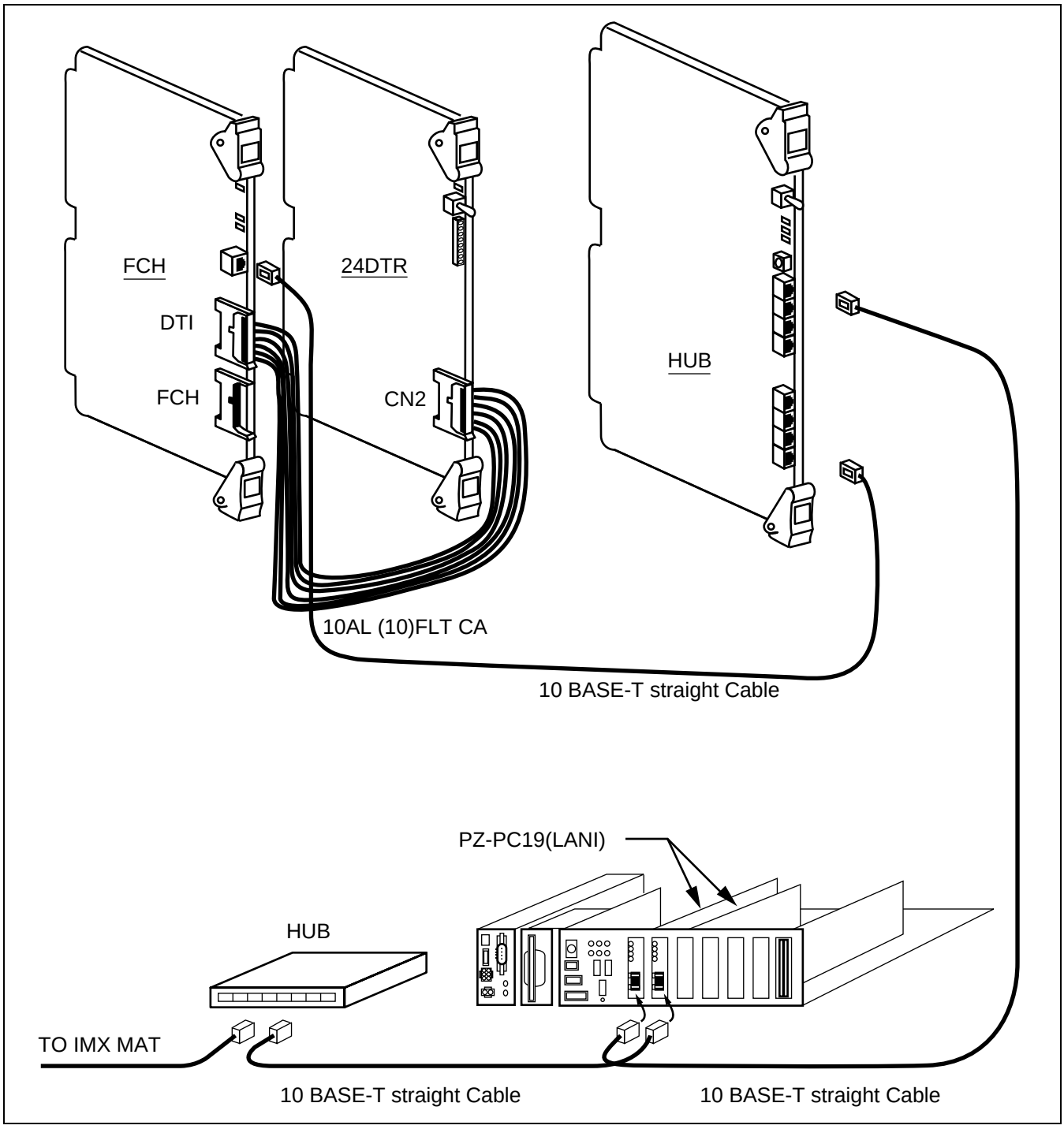
Lamp indications for this circuit card are shown in the table below.

LAMP NAME	COLOR	DESCRIPTION
EST0	Green	Layer 1 link has established.
EST1	Green	Data packet sending/receiving.
EST2	Red	Layer 1 link failure.
EST3	Yellow	Data packet collision has occurred.

5. Switch Settings

No switch settings are required.

6. External Interface



7. Switch Setting Sheet

No switch settings are required.

CHAPTER 3 LINE/TRUNK CIRCUIT CARD REFERENCE

1. General

This chapter explains the following items about circuit cards.

- General Function

  Explains the general function and purpose for each control circuit card.

- Mounting Location/Condition

  Explains the mounting location (mounting module name and slot number, etc.) of each circuit card. If there are any conditions pertaining to mounting the circuit cards, they are also explained.

- Face Layout of Lamps, Switches, and Connectors

  The locations of the lamps, switches, and connectors provided on each circuit card are illustrated by a face layout.

- Lamp Indications

  Names, colors, and indication states of lamps mounted on each circuit card are listed.

- Switch Settings

  Each circuit card's switches are listed with their names, switch numbers, setting and its meaning, standard setting, etc.

- External Interface

  If the lead outputs of the circuit card are provided by an LT connector, the relation between the mounting slots and the LT connectors is illustrated by an LT Connector Lead Face Layout. If the lead outputs are provided by other than an LT connector, or are provided by the circuit card front connector, the connector lead locations and the connecting routes are shown.

  In addition, a Switch Setting Sheet is provided at the end of the explanation of circuit cards.

PA-CFTB
8-party Conference Trunk

1. General Function

The PA-CFTB (CFT) circuit card provides an interface for establishing a conference, which is made up of a maximum of eight parties.
A maximum of seven Tie Lines can participate in a conference when the associated trunks can receive an answer signal and a release signal from the distant switching system. On the other hand, in the case of a C.O. line, one C.O. line can be connected even if the public switching system cannot send an answer signal and/or release signal. Note that a Tie Line and a C.O. Line cannot take part in a conference at the same time. The card adopts "N-1 addition" method for establishing a conference.

Note: *This circuit card is used for following features:*
- *Station-Controlled Conference (Refer to Feature Programming Manual) [S-56]*
- *Attendant-Controlled Conference (Refer to Feature Programming Manual) [A-2]*
- *Add On Conference-8 Party (Refer to Feature Programming Manual) [A-121]*
- *Group Call-Automatic Conference (20-party) (Refer to Wireless System Manual)*

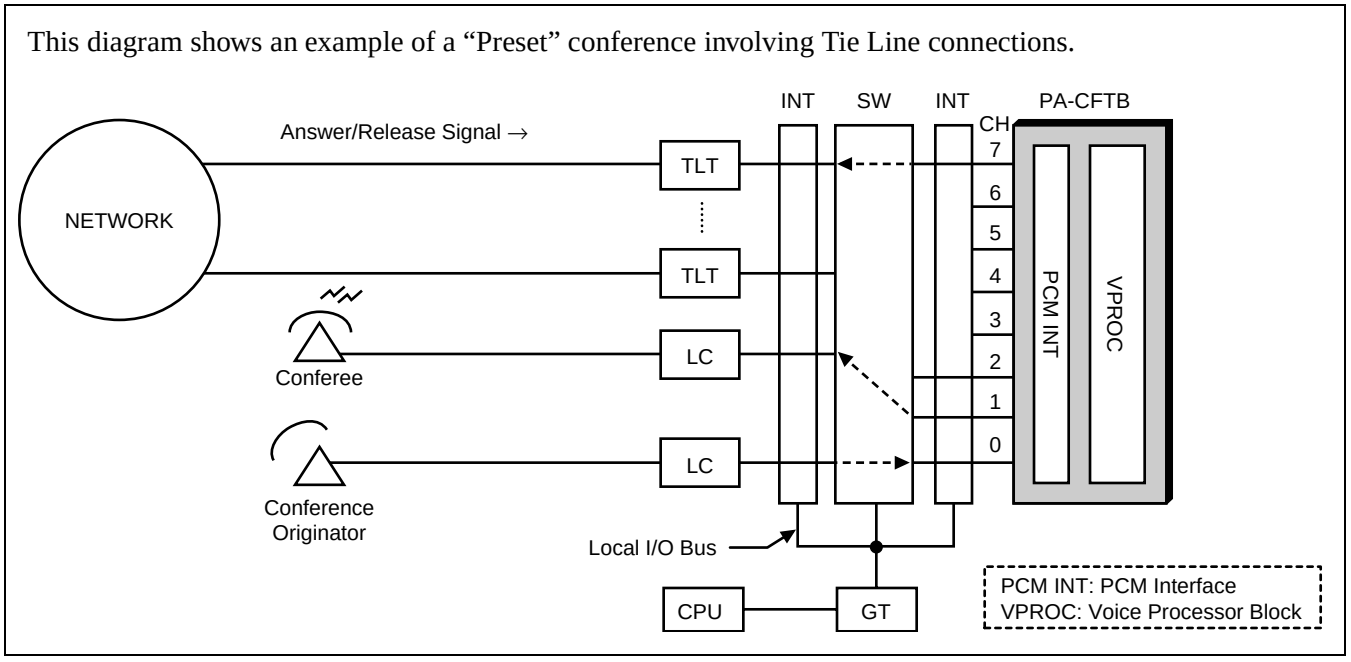
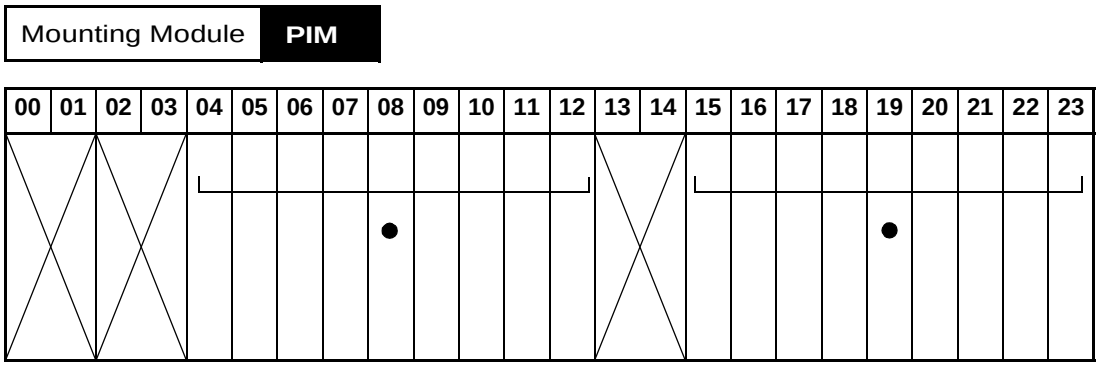


Figure 3-1 Location of PA-CFTB (CFT) within the System

2. Mounting Location/Condition

The PA-CFTB (CFT) card can be mounted in any universal slots as shown below.



Note: ● *Indicates universal slots for line/trunk circuit cards.*

3. Face Layout of Lamps, Switches, and Connectors

   The face layout of lamps, switches, and connectors on this circuit card is shown in Figure 3-2.

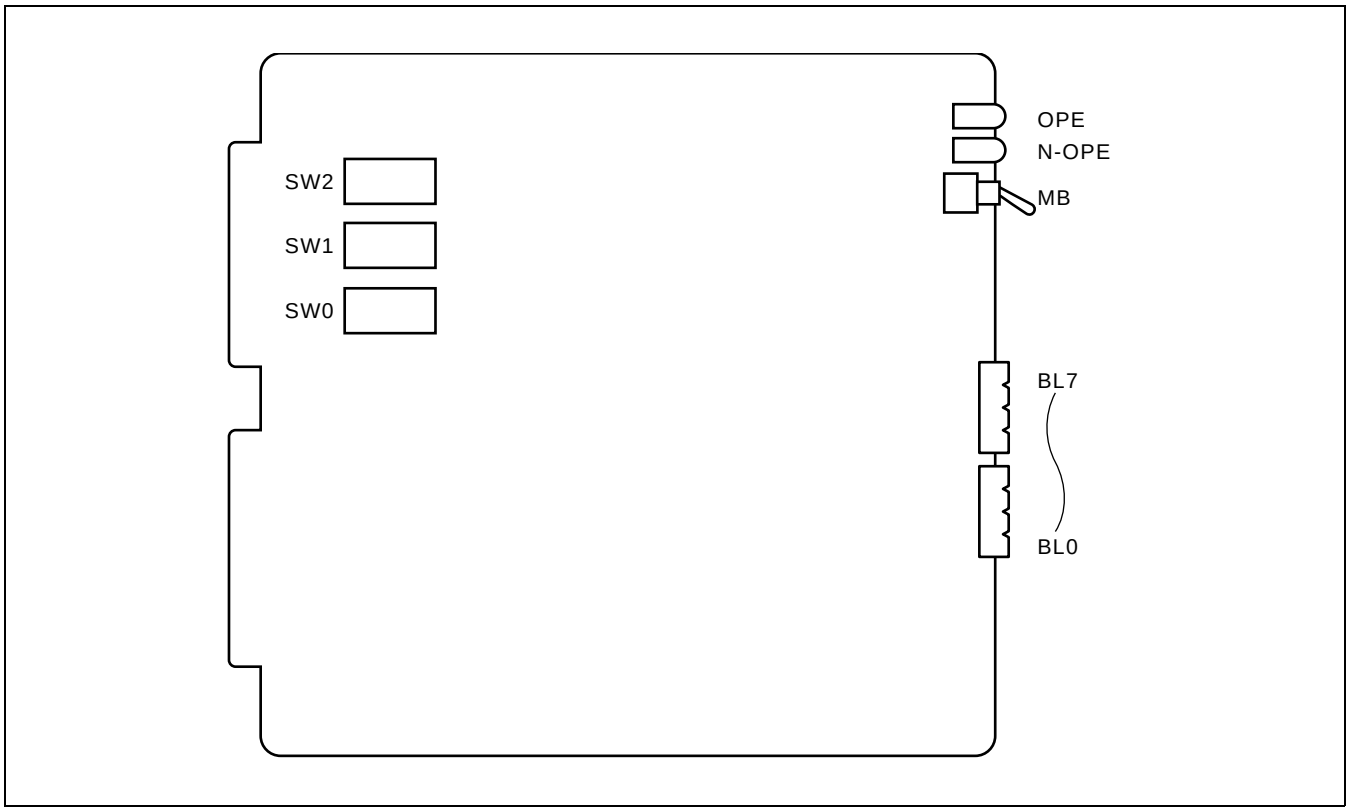


Figure 3-2 Face Layout of PA-CFTB (CFT)

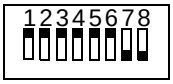
4. Lamp Indications

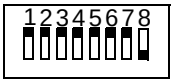
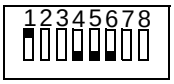
   The contents of lamp indications of this circuit card are shown in the table below.

LAMP NAME	COLOR	STATE
OPE	Green	Remains lit while this circuit card is operating.
N-OPE	Red	Remains lit while this circuit card is in make-busy state.
BL0 ~ BL7	Red	BL-lamp remains lit while the corresponding circuit is busy.
	Flash	BL-lamp flashes when the corresponding circuit is busy.

5. Switch Settings

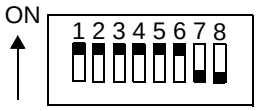
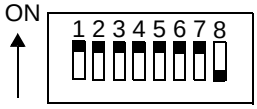
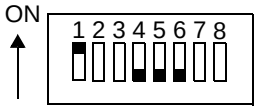
Standard settings of switches on this circuit card are shown in the table below.

SWITCH NAME	SWITCH NO.	SETTING	STANDARD SETTING	MEANING
MB		UP		Circuit card make busy
		DOWN	×	Circuit card make busy cancel
SW0 	1	ON	×	Fixed in the system
		OFF		
	2	ON	×	Fixed in the system
		OFF		
	3	ON	×	Fixed in the system
		OFF		
	4	ON	×	Fixed in the system
		OFF		
	5	ON	×	Fixed in the system
		OFF		
	6	ON	×	Fixed in the system
		OFF		
	7	ON		
		OFF	×	Fixed in the system
	8	ON		
		OFF	×	Fixed in the system

SWITCH NAME	SWITCH NO.	SETTING	STANDARD SETTING	MEANING
SW1 	1	ON	×	Fixed in the system
		OFF		
	2	ON	×	Fixed in the system
		OFF		
	3	ON	×	Fixed in the system
		OFF		
	4	ON	×	Fixed in the system
		OFF		
	5	ON	×	Fixed in the system
		OFF		
	6	ON	×	Fixed in the system
		OFF		
	7	ON	×	Fixed in the system
		OFF		
	8	ON		
		OFF	×	Fixed in the system
SW2 	1	ON	×	μ-law PCM encoder
		OFF		A-law PCM encoder
	2	ON		Conference connection is set up by PB tel.
		OFF		Conference connection is not set up by PB tel.
	3	ON		When port Microprocessor (PM) is SP-388, SP-457, SP-863, SP-990, SP-1114.
		OFF		When Port Microprocessor (PM) is SP-519, SP-1141.
	4	OFF	×	Not used
	5	OFF	×	Not used
	6	OFF	×	Not used

<table>
<tr><th>SWITCH NAME</th><th>SWITCH NO.</th><th>SETTING</th><th>STANDARD SETTING</th><th>MEANING</th></tr>
<tr><td rowspan="4">SW2</td><td rowspan="2">7</td><td>ON</td><td></td><td rowspan="4">CFTB Insertion Loss (PAD value) Setting
<table><tr><th>SW2-7</th><th>SW2-8</th><th>PAD [dB]</th></tr><tr><td>OFF</td><td>OFF</td><td>0</td></tr><tr><td>OFF</td><td>ON</td><td>3</td></tr><tr><td>ON</td><td>OFF</td><td>6</td></tr><tr><td>ON</td><td>ON</td><td>9</td></tr></table></td></tr>
<tr><td>OFF</td><td></td></tr>
<tr><td rowspan="2">8</td><td>ON</td><td></td></tr>
<tr><td>OFF</td><td></td></tr>
</table>

6. Switch Setting Sheet

MODULE	SLOT NO.	SWITCH NAME	SWITCH SHAPE	REMARKS
PIM		SW0		
		SW1		
		SW2		
		MB	DOWN	Circuit card make busy cancel

PA-CK14
Oscillator

1. General Function

The PLO block of the TSW card generates its base clock signals, and adjusts their phase with the source clock signals so the PLO can send the synchronized clock signals to the TSW. When the 1 IMG system is a clock-subordinate-office of the digital network, the base clock accuracy of the PLO/ PH-SW10 (±5 ppm deviation) is sufficient. However, the more high-precision base clock signals are required at the clock-source-office, as this circuit card provides --- PA-CK14 (±0.3 ppm deviation). When this circuit card is mounted, the 1 IMG system selects the PA-CK14 (OSC) clocks as the base clock of the PLO.

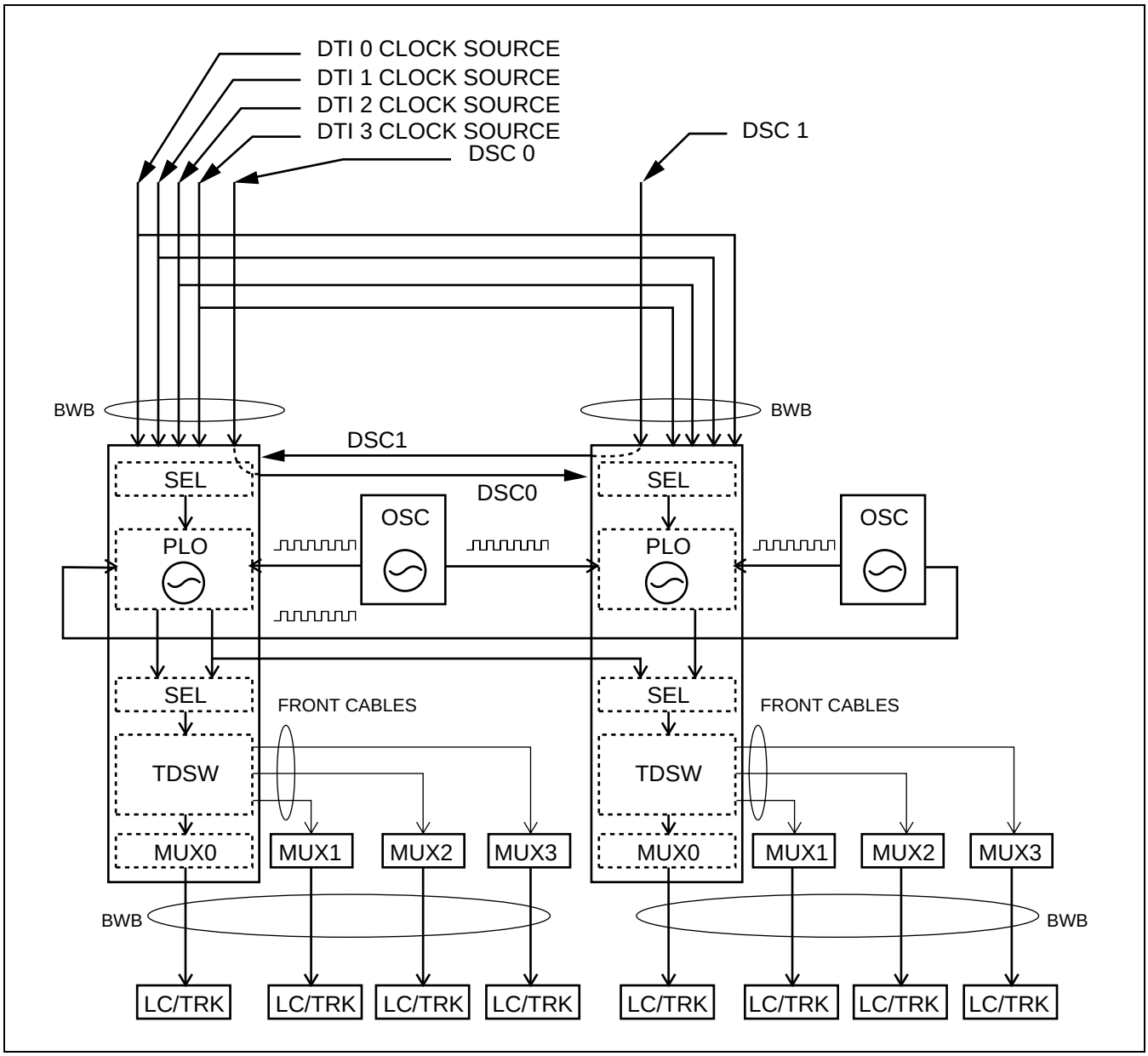


Figure 3-3 Location of PA-CK14 (OSC) Card in the System

2. Mounting Location/Condition

The PA-CK14 (OSC) is located in PIM0. The card mounted in Slot 09 works as the primary OSC, 17 for the secondary OSC.

Mounting Module **PIM**

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
PIM0										OSC#0								OSC#1						

Note: *This card occupies two slots.*

3. Face Layout of Lamps, Switches, and Connectors

The face layout of lamps, switches, and connectors is shown below.

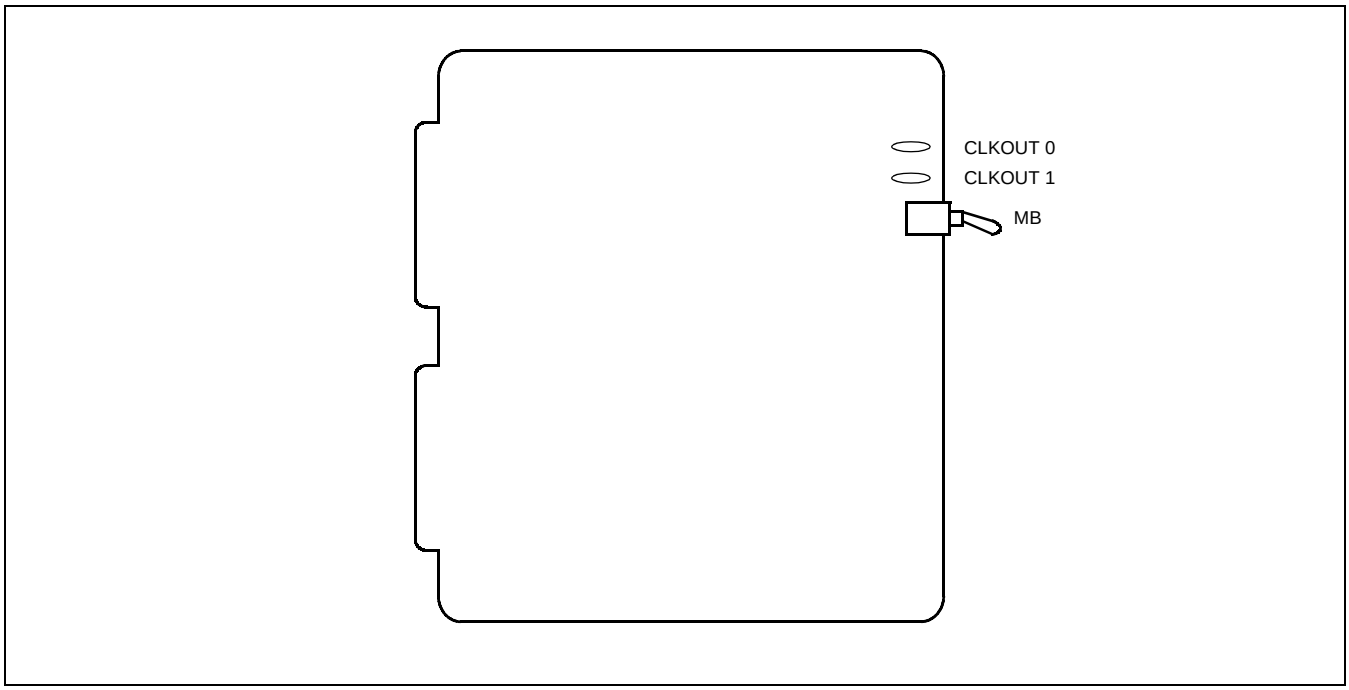


Figure 3-4 Face Layout of PA-CK14 (OSC) Card

4. Lamp Indications

   Lamp indications for this circuit card are shown in the table below.

LAMP NAME	COLOR	STATE
CLKOUT0	Green	Lights when OSC card delivers the clock signals to TSW#0.
CLKOUT1	Green	Lights when OSC card delivers the clock signals to TSW#1.

5. Switch Settings

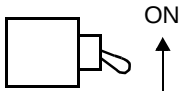
   Standard settings for switches on this circuit card are shown in the table below.

SWITCH NAME	SETTING	STANDARD SETTING	MEANING
MB	ON		Make-busy of the circuit card.
	OFF	×	Normal setting.

6. External Interface

   Since the base clock signals are delivered through the printed-wiring on the Back Wired Board (BWB) of PIM 0, this circuit card does not require any external cabling.

7. Switch Setting Sheet

SWITCH NAME	SWITCH SHAPE	REMARKS
MB		

PH-CK16
Phase Lock Oscillator

1. General Function

This circuit card, used together with a direct digital interface circuit card, sets up network synchronization with the network. With this circuit card, the 4 IMG system can be a clock subordinate office of the digital network. As seen in the figure below, the PLO can be redundant regardless of the system switching network selection.

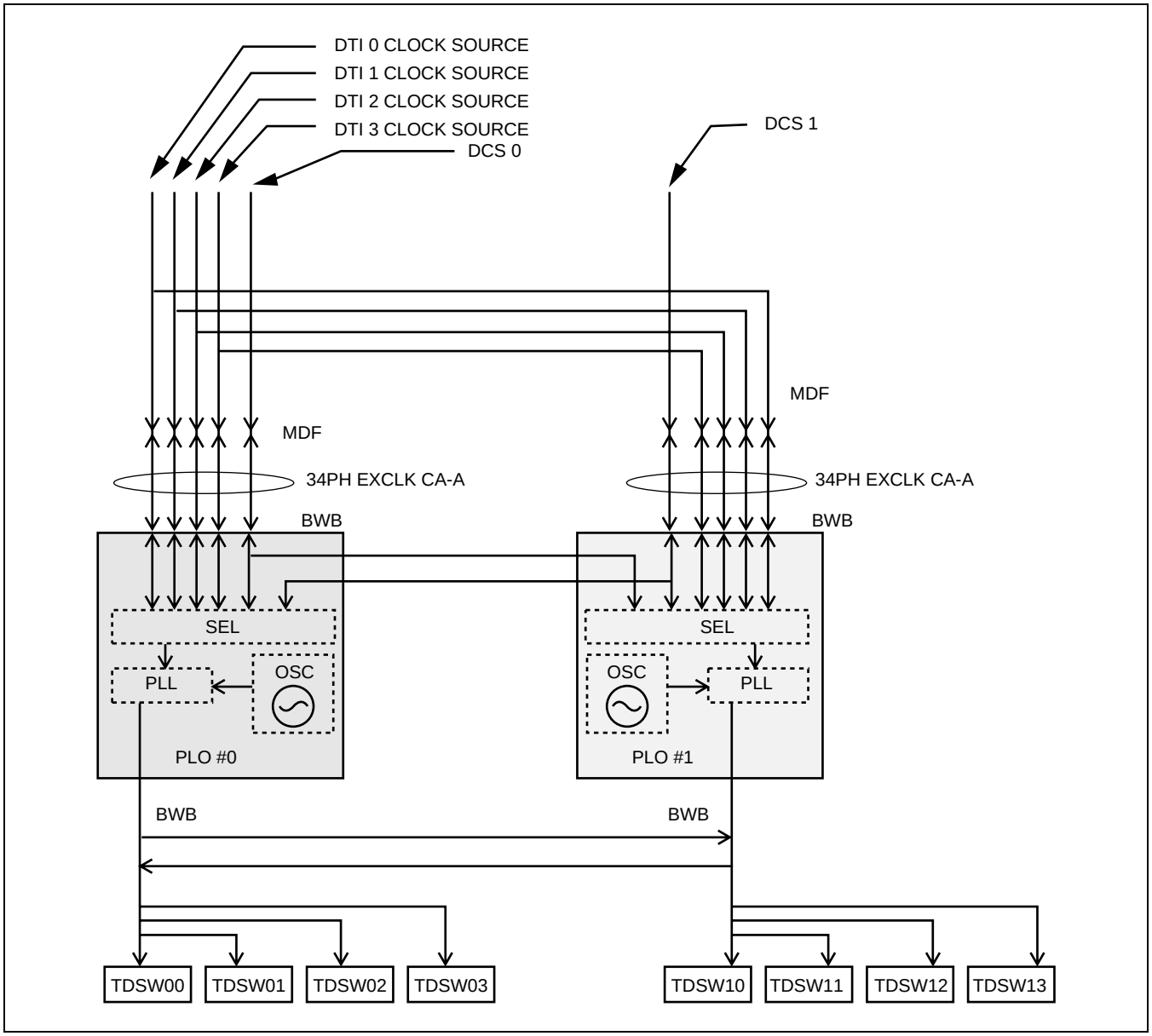


Figure 3-5 Location of PH-CK16 (PLO) Card in the System

The source clock of the clock subordinate office is either the digital clock supply (DCS) or the digital interface clock (DIU0 - DIU3). When clock source failure has occurred, the PLO chooses another clock source automatically in the order of:

1. DCS
2. DIU0
3. DIU1
4. DIU2
5. DIU3
6. PLO changeover or the PLO internal oscillator drifting

The PLO can output the clock signals (CLK) and the frame head signals (FH) as follows:

- 32.768 MHz CLK
- 8 KHz FH
- 5 msec × "n" FH

The MUSIC ROM located on this circuit card also contains the hold tone, and is supplied to the TSW circuit card. When an external music on hold is applied to the 4 IMG system, this circuit card provides the interface for the external hold tone source.

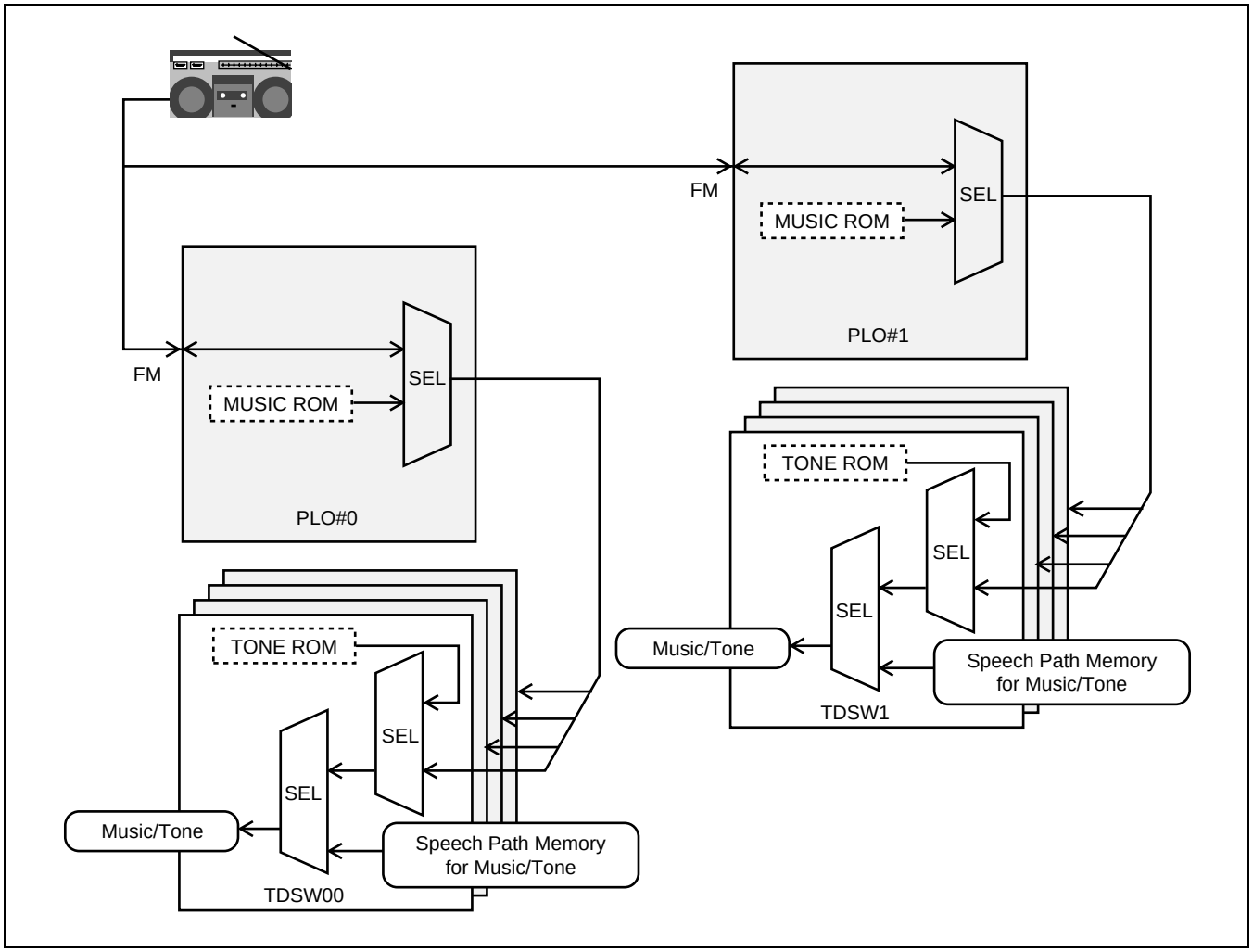


Figure 3-6 Music Source

2. Mounting Location/Condition

This circuit card is mounted in the TSWM of the slot shown below.

Mounting Module **TSWM**

00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
																					PLO 0		PLO 1

3. Face Layout of Lamps, Switches, and Connectors

The face layout of lamps, switches, and connectors is shown below.

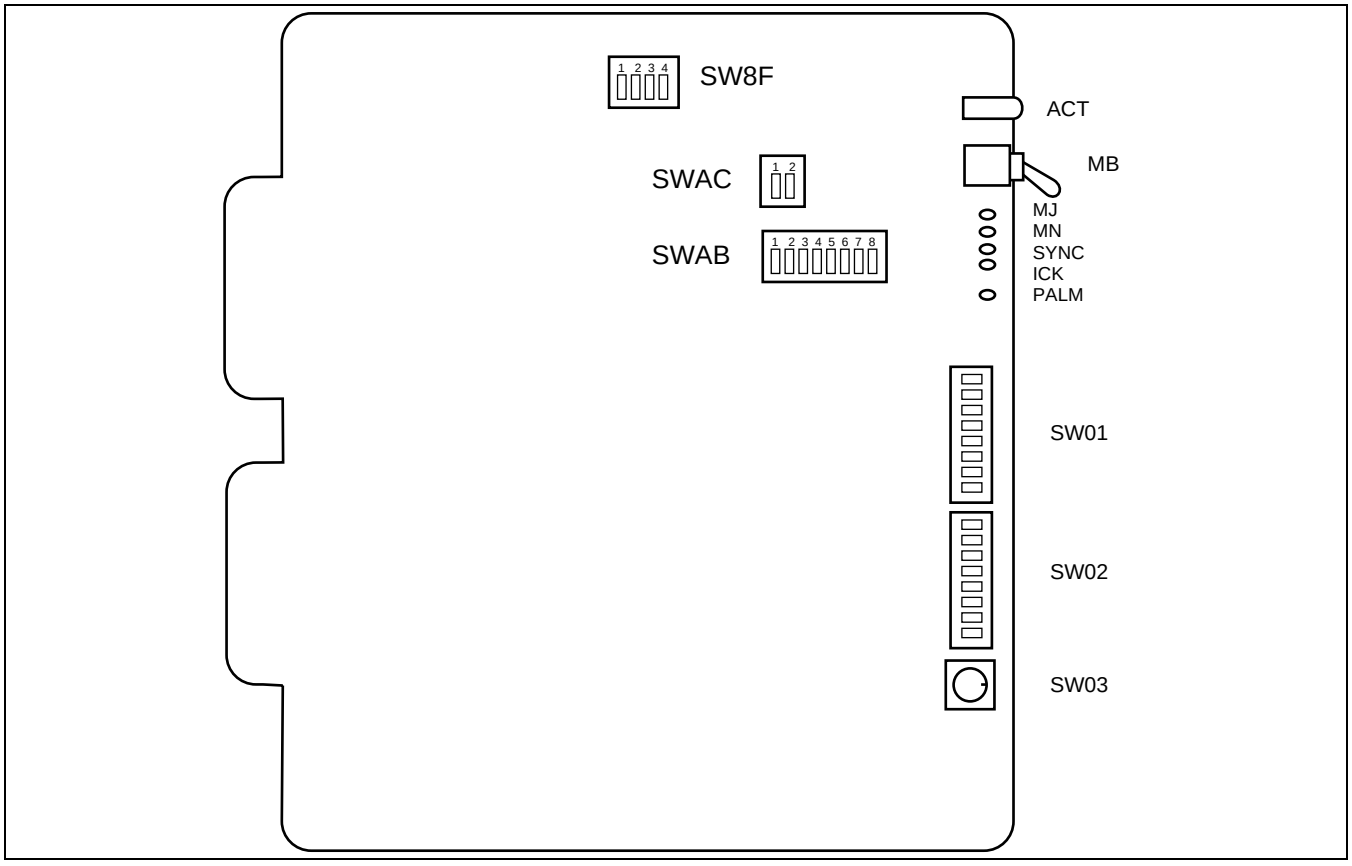


Figure 3-7 Face Layout of PH-CK16 (PLO)

4. Lamp Indications

Lamp indications for this circuit card are shown in the table below.

LAMP NAME	COLOR	STATE
ACT	Green	Remains lit while this circuit card is in active state.
	Off	Remains off while this circuit card is in stand-by state.
MJ	Red	Lights when the following MJ fault has occurred: • All of the clock supply routes have failed when the system operates as the clock subordinate office • 32.768 MHz output clock failure • 8 KHz output FH failure • 5 msec × "n" output FH failure • Input Frame Pulse (FP) failure (FP is supplied by the SYNC card) • Internal OSC (±5 ppm deviation) has failed when the system operates as the clock source office
MN	Red	Lights when the following MN fault has occurred: • One or more (but not all) DTI/DCS clock supply routes have failed • Drifting failure • Internal OSC (±5 ppm deviation) failure
SYNC	Green	Remains lit while the system is synchronized with the network.
	OFF	Remains off when either of the following has occurred: • DCS clock failure when receiving the clock signals from the DCS. • DTI clock failure when receiving the clock signals from the DTI. • Drifting failure
ICK	Green	Lights when the internal oscillator is operating normally.
PALM	Red	Remains lit when power is abnormal.

5. Switch Settings

Standard settings of switches on this circuit card are shown in the table below.

SWITCH NAME	SETTING	STANDARD SETTING	MEANING
MB	UP		Circuit card Make-busy.
	DOWN	×	Circuit card Make-busy cancel.
SW03	1 - F	1	Fixed to "1."

SWITCH NAME	SWITCH NO.	SETTING	STANDARD SETTING	MEANING
SW01	1	ON	×	Clock subordinate office.
		OFF		Clock source office.
	2	ON		Digital Clock Supply route zero (DCS 0) is used.
		OFF		Digital Clock Supply route zero (DCS 0) is not used.
	3	ON		Digital Clock Supply route one (DCS 1) is used.
		OFF		Digital Clock Supply route one (DCS 1) is not used.
	4	ON		8 KHz of Frame Head signals are not extracted from the DCS signals (which is composed of 64 KHz + 8 KHz).
		OFF		8 KHz of Frame Head signals are extracted from the DCS signals (which is composed of 64 KHz + 8 KHz).
	5	ON		When clock source failure has occurred in all supply routes, the PLO outputs the original clock of the internal oscillator.
		OFF		When clock source failure has not occurred in all supply routes, the PLO continues outputting the current phase clock.
	6	ON		This circuit card is associated with SYNC (PA-CK16 WCS) card.
		OFF		This circuit card is not associated with SYNC (PA-CK16 WCS) card.
	7	ON		A-law CODEC is used for the hold music.
		OFF	×	μ-law CODEC is used for the hold music.
	8	OFF	×	Not used

SWITCH NAME	SWITCH NO.	SETTING	STANDARD SETTING	MEANING
SW02	1	ON		DIU 0 is used as the DTI clock supply route zero.
		OFF		DIU 0 is not used.
	2	ON		DIU 1 is used as the DTI clock supply route one.
		OFF		DIU 1 is not used.
	3	ON		DIU 2 is used as the DTI clock supply route two.
		OFF		DIU 2 is not used.
	4	ON		DIU 3 is used as the DTI clock supply route three.
		OFF		DIU 3 is not used.
	5	ON	×	1.5 M clock for DIU 0
		OFF		2 M clock for DIU 0
	6	ON	×	1.5 M clock for DIU 1
		OFF		2 M clock for DIU 1
	7	ON	×	1.5 M clock for DIU 2
		OFF		2 M clock for DIU 2
	8	ON	×	1.5 M clock for DIU 3
		OFF		2 M clock for DIU 3
SWAC	1	ON		External hold tone source is used via FM lead.
		OFF	×	MUSIC ROM is used as the hold tone.
	2	OFF	×	Not used
SW8F	1			
	2			
	3			
	4			

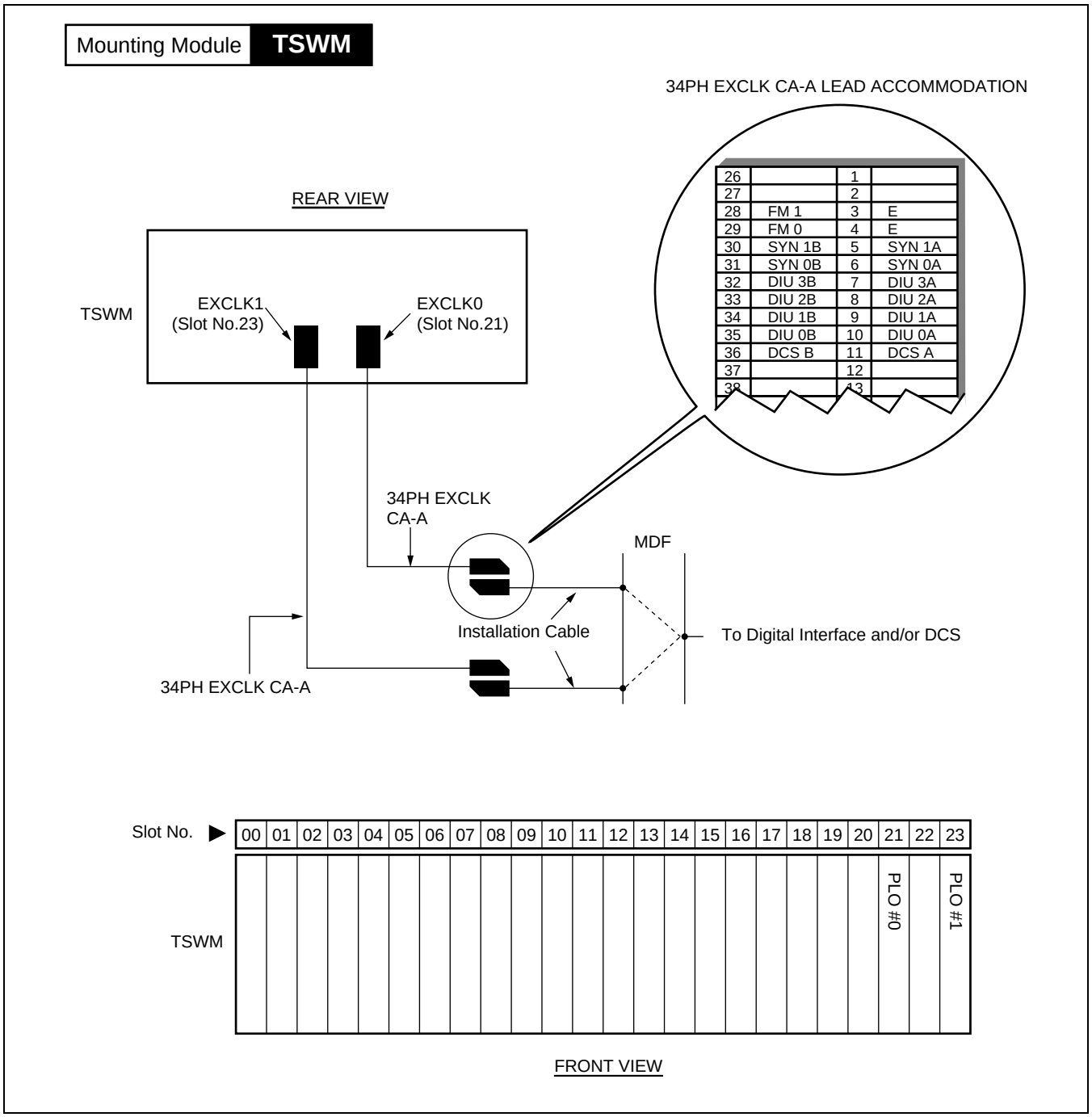
SW8F-1	SW8F-2	Impedance of the External Music Source 0 (FM 0)
OFF	OFF	600 Ω
ON	OFF	8.2 Ω
OFF	ON	47K Ω

SW8F-3	SW8F-4	Impedance of the External Music Source 1 (FM 1)
OFF	OFF	600 Ω
ON	OFF	8.2 Ω
OFF	ON	47K Ω

<table>
<tr><th>SWITCH NAME</th><th>SWITCH NO.</th><th>SETTING</th><th>STANDARD SETTING</th><th>MEANING</th></tr>
<tr><td rowspan="8">SWAB</td><td rowspan="3">1
2
3</td><td colspan="3"><table>
<tr><th>SWA0-1</th><th>SWA0-2</th><th>SWA0-3</th><th>MUSIC</th></tr>
<tr><td>OFF</td><td>OFF</td><td>OFF</td><td>Für Elise</td></tr>
<tr><td>ON</td><td>OFF</td><td>OFF</td><td>Maiden’s prayer</td></tr>
<tr><td>Not used</td><td>OFF</td><td>ON</td><td>Buzzer</td></tr>
<tr><td>Not used</td><td>ON</td><td>OFF</td><td>Chime</td></tr>
</table></td></tr>
<tr><td rowspan="2">4</td><td>ON</td><td></td><td>Not used</td></tr>
<tr><td>OFF</td><td>×</td><td>Not used</td></tr>
<tr><td>5
6
7</td><td colspan="3">MUSIC CH1 selection. The kind of music varies depending on the melody IC located on this circuit card.</td></tr>
<tr><td rowspan="2">8</td><td>ON</td><td></td><td>Not used</td></tr>
<tr><td>OFF</td><td>×</td><td>Not used</td></tr>
</table>

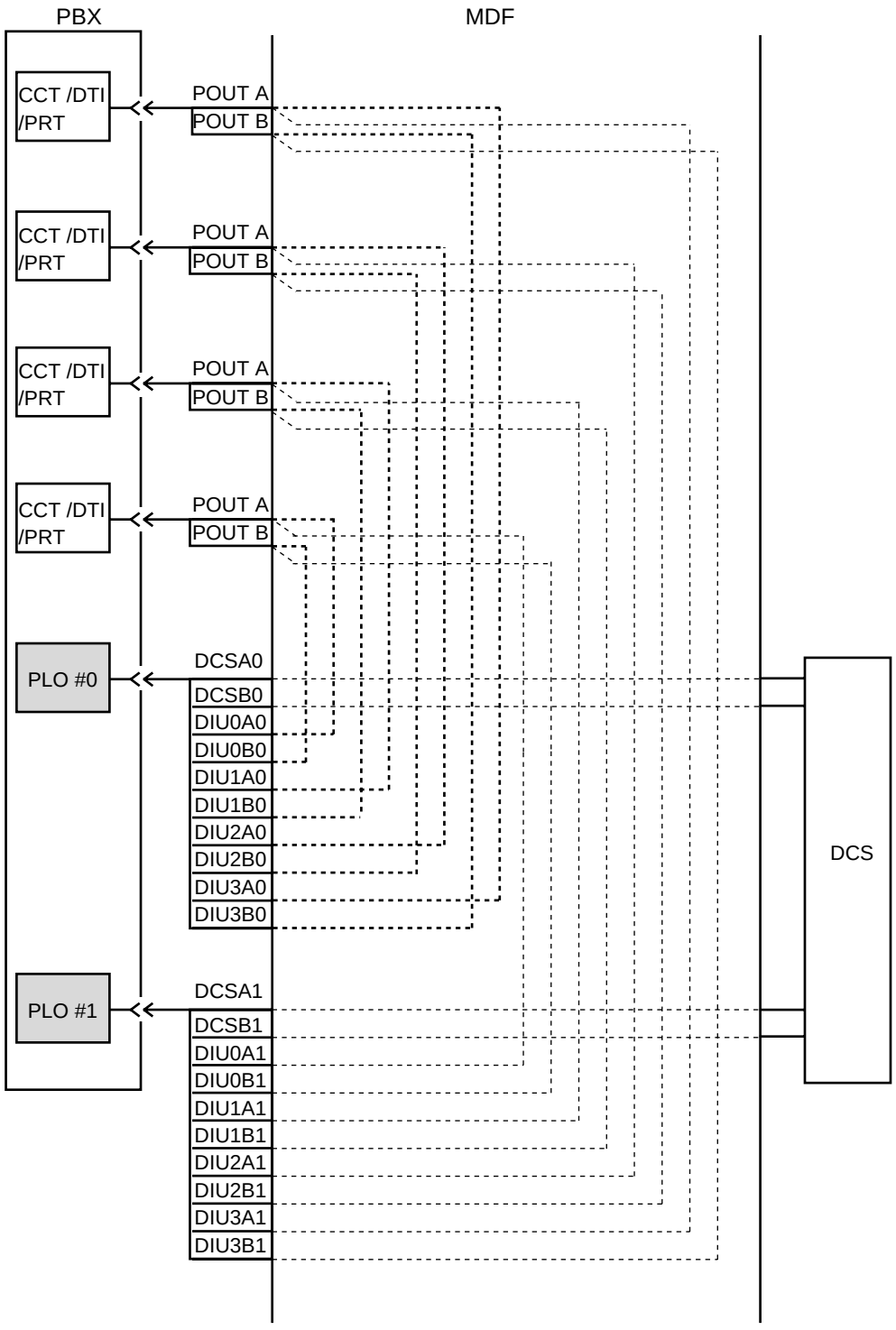
6. External Interface

When this circuit card is located in the TSWM, connect 34PH EXCLK CA-A to the EXCLK0/EXCLK1 connectors on the backplane of the TSWM.



26		1	
27		2	
28	FM 1	3	E
29	FM 0	4	E
30	SYN 1B	5	SYN 1A
31	SYN 0B	6	SYN 0A
32	DIU 3B	7	DIU 3A
33	DIU 2B	8	DIU 2A
34	DIU 1B	9	DIU 1A
35	DIU 0B	10	DIU 0A
36	DCS B	11	DCS A
37		12	
38		13	

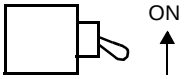
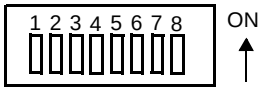
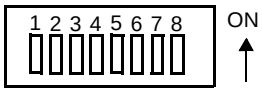
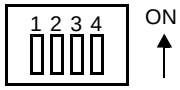
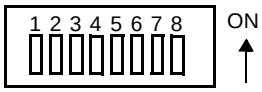
Figure 3-8 LT Connector Lead Location of PLO (TSWM)



Note : *The following circuit cards have Clock Output Leads for a PLO card: CCT (PA-24CCTA, PA-30CCTB), DTI (PA-24DTR, PA-30DTS), and PRT (PA-24PRT, PA-30PRTC).*

Figure 3-9 Connecting Route Diagram

7. Switch Setting Sheet

SWITCH NAME	SWITCH SHAPE	REMARKS
MB		
SW01		
SW02		
SW03		
SWAC		
SW8F		
SWAB		

PH-CK16-A
Phase Lock Oscillator

1. General Function

   This circuit card, used together with a direct digital interface circuit card, sets up network synchronization. With this circuit card, the system can be a clock subordinate office of the digital network. As seen in the figure below, the PLO can be redundant regardless of the system switching network selection. This circuit card is used for the IMX-U system.

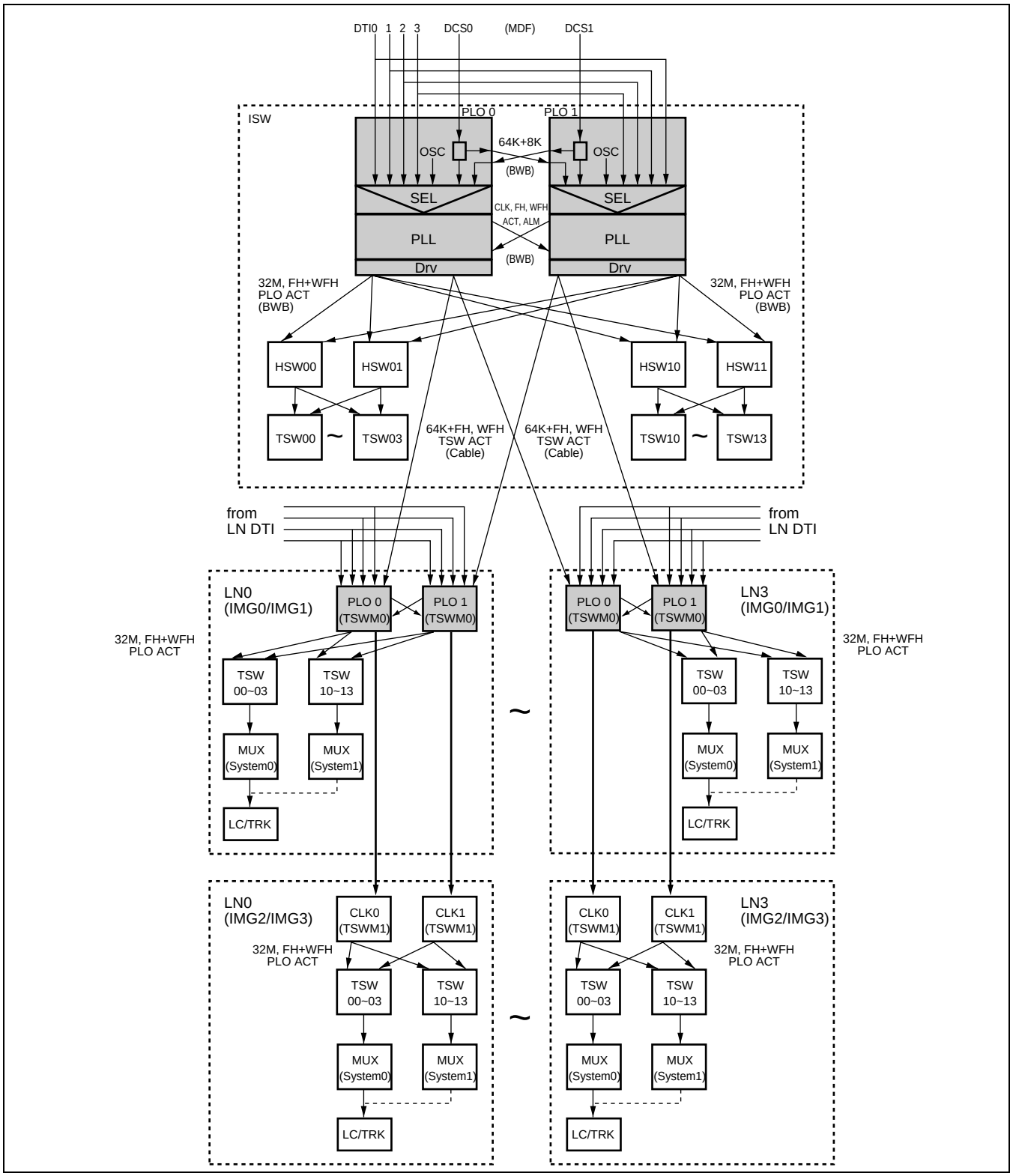


Figure 3-10 Location of PH-CK16-A (PLO)

2. Mounting Location/Condition

This circuit card can be mounted in the shaded slots shown below.

Mounting Module **ISWM**

00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19
									PLO (#0)				PLO (#1)						

Mounting Module **TSWM0 (IMG1)**

00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
																					PLO (#0)		PLO (#1)

3. Face Layout of Lamps, Switches, and Connectors

The face layout of lamps, switches, and connectors are shown in Figure 3-11.

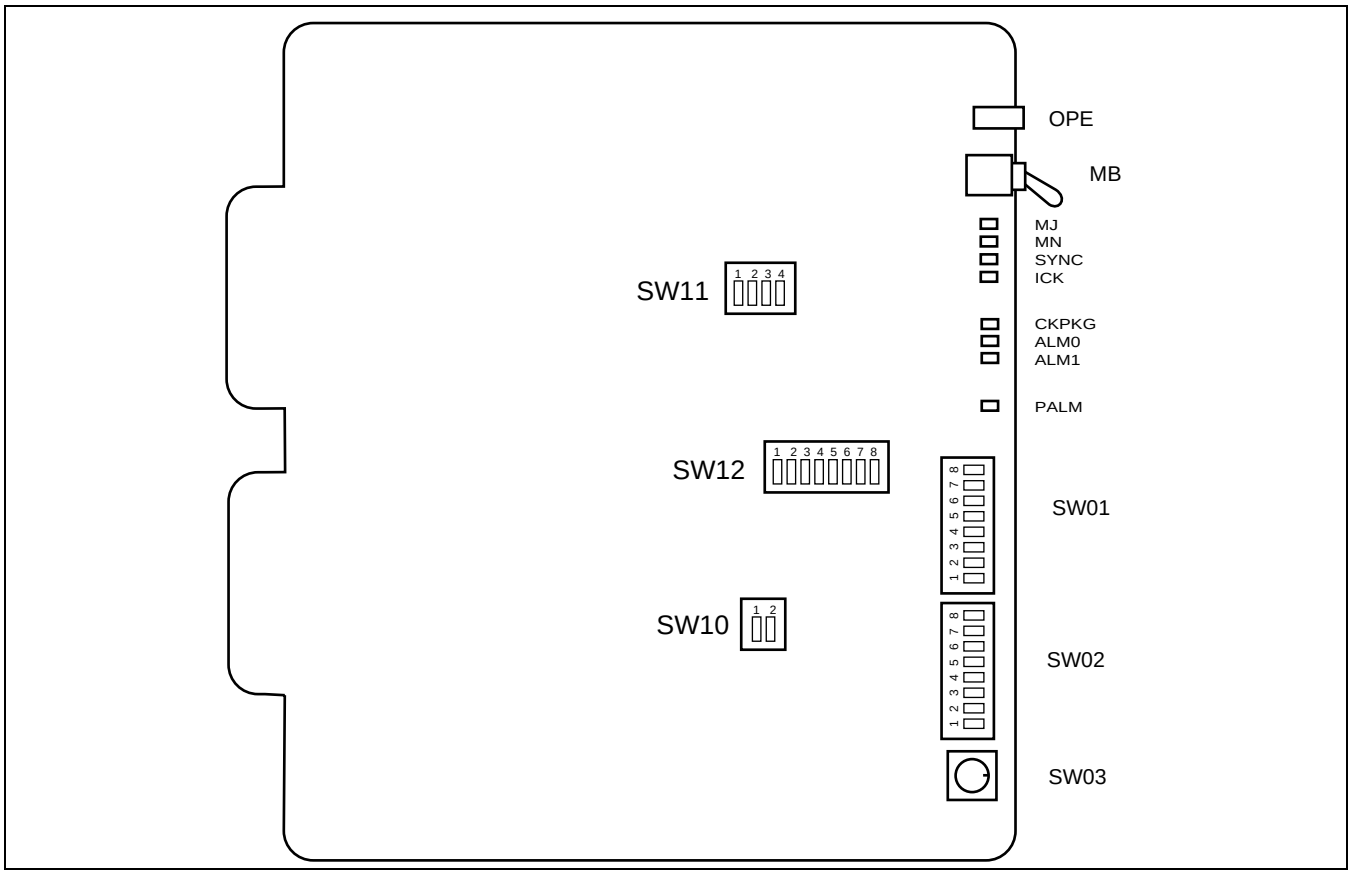


Figure 3-11 Face Layout of PH-CK16-A (PLO)

4. Lamp Indications

Lamp indications for this circuit card are shown in the table below:

LAMP NAME	COLOR	STATE
OPE	Green	Remains lit while this circuit card is in active state.
MJ	Red	Lights when the following MJ fault has occurred: • All of the clock supply routes have failed when the system operates as the clock subordinate office • 32.768 MHz output clock failure (including CLK card) • 8 KHz output clock failure (including CLK card) • Input Frame Pulse (FP) failure (FP is supplied by the SYNC card) Internal OSC (±5 ppm deviation) has failed when the system operates as the clock source office
MN	Red	Lights when the following MN fault has occurred: • One or more (but not all) DTI/DCS clock supply route has failed • Drifting failure • Internal OSC (±5 ppm deviation) failure
SYNC	Green	Remains lit while the system is synchronized with the network.
ICK	Green	Lights when the internal oscillator is operating normally.
CKPKG **Note**	Green	Lights when the CLK card in TSWM1 is in normal operation.
ALM0 **Note**	Red	Lights when clock failure has occurred in the CLK card.
ALM1 **Note**	Red	Lights when FH failure has occurred in the CLK card.
PALM	Red	Remains lit when the On-Board Power Supply is abnormal.

Note: *This lamp is effective when this card is mounted in TSWM0 of the IMX-U system.*

5. Switch Settings

Standard settings for switches on this circuit card are shown in the table below.

SWITCH NAME	SETTING	STANDARD SETTING	MEANING
MB	UP		Circuit card Make-busy.
	DOWN	×	Circuit card Make-busy cancel.
SW03	1 - F	1	Fixed to “1."

SWITCH NAME	SWITCH NO.	SETTING	STANDARD SETTING	MEANING
SW01 **Note**	1	ON	× **Note 1**	Clock subordinate office.
		OFF		Clock source office.
	2	ON	× **Note 1**	Digital Clock Supply route zero (DCS 0) is used.
		OFF		Digital Clock Supply route zero (DCS 0) is not used.
	3	ON	× **Note 1**	Digital Clock Supply route one (DCS 1) is used.
		OFF		Digital Clock Supply route one (DCS 1) is not used.
	4	ON		8 KHz of Frame Head signals are extracted from the DCS signals (which is composed of 64 KHz + 8 KHz).
		OFF	× **Note 1**	8 KHz of Frame Head signals are not extracted from the DCS signals (which is composed of 64 KHz + 8 KHz).
	5	ON		When clock source failure has occurred in all supply routes, the PLO outputs the original clock of the internal oscillator.
		OFF	×	When clock source failure has not occurred, the PLO keeps on outputting the current phase clock.
	6	ON	× **Note 1**	This circuit card is associated with SYNC (PA-CK11) card.
		OFF		This circuit card is not associated with SYNC (PA-CK16 WCS) card.
	7	ON		A-law CODEC is used for Music-on-Hold.
		OFF	×	μ-law CODEC is used for Music-on-Hold.
	8	OFF	×	Fixed OFF (Not used).

Note: *When this card is used in the 4-IMG or ISWM of the IMX-U system, specify the clock source (DCS or DTI) according to the clock network configuration for the office.*

Note 1: *This standard setting is applicable when this card is mounted in TSWM0 of the IMX-U system.*

SWITCH NAME	SWITCH NO.	SETTING	STANDARD SETTING	MEANING
SW02 **Note**	1	ON		DIU 0 is used as the DTI clock supply route zero.
		OFF		DIU 0 is not used.
	2	ON		DIU 1 is used as the DTI clock supply route one.
		OFF		DIU 1 is not used.
	3	ON		DIU 2 is used as the DTI clock supply route two.
		OFF		DIU 2 is not used.
	4	ON		DIU 3 is used as the DTI clock supply route three.
		OFF		DIU 3 is not used.
	5	ON	×	1.5 M clock for DIU 0.
		OFF		2 M clock for DIU 0.
	6	ON	×	1.5 M clock for DIU 1.
		OFF		2 M clock for DIU 1.
	7	ON	×	1.5 M clock for DIU 2.
		OFF		2 M clock for DIU 2.
	8	ON	×	1.5 M clock for DIU 3.
		OFF		2 M clock for DIU 3.
SW10	1	ON		External hold tone source is used via FM lead.
		OFF	×	MUSIC ROM is used as the hold tone.
	2	ON		CLK card is not used.
		OFF		CLK card is used.

Note: *When this card is mounted in TSWM0 of the IMX-U system, the DCS clock from the ISW is used. The DTI clock can also be used as an alternate clock supply route in case of DCS clock failure.*

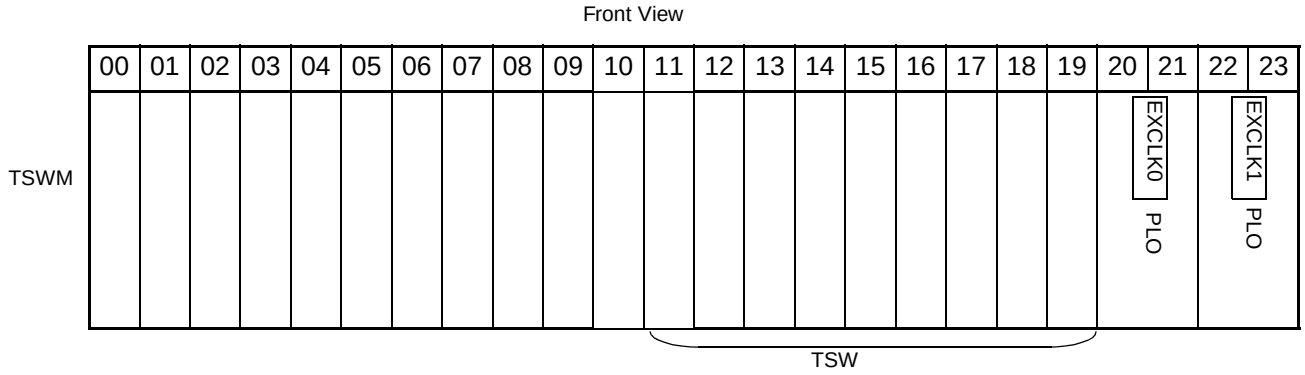
<table>
<tr><th>SWITCH NAME</th><th>SWITCH NO.</th><th>SETTING</th><th>STANDARD SETTING</th><th>MEANING</th></tr>
<tr><td rowspan="4">SW11</td><td rowspan="2">1
2</td><td colspan="3"><table><tr><th>SW11-1</th><th>SW11-2</th><th>Impedance of the External Music Source 0 (FM 0)</th></tr><tr><td>OFF</td><td>OFF</td><td>600 Ω</td></tr><tr><td>ON</td><td>OFF</td><td>8.2 Ω</td></tr><tr><td>OFF</td><td>ON</td><td>47K Ω</td></tr></table></td></tr>
<tr><td rowspan="2">3
4</td><td colspan="3"><table><tr><th>SW11-3</th><th>SW11-4</th><th>Impedance of the External Music Source 1 (FM 1)</th></tr><tr><td>OFF</td><td>OFF</td><td>600 Ω</td></tr><tr><td>ON</td><td>OFF</td><td>8.2 Ω</td></tr><tr><td>OFF</td><td>ON</td><td>47K Ω</td></tr></table></td></tr>
<tr><td rowspan="9">SW12</td><td rowspan="3">1
2
3</td><td colspan="3"><table><tr><th>SW12-1</th><th>SW12-2</th><th>SW12-3</th><th>MUSIC</th></tr><tr><td>OFF</td><td>OFF</td><td>OFF</td><td>Für Elise</td></tr><tr><td>ON</td><td>OFF</td><td>OFF</td><td>Maiden’s prayer</td></tr><tr><td>Not Used</td><td>ON</td><td>OFF</td><td>Buzzer</td></tr><tr><td>Not Used</td><td>OFF</td><td>ON</td><td>Chime</td></tr></table></td></tr>
<tr><td rowspan="2">4</td><td>ON</td><td></td><td>Not used</td></tr>
<tr><td>OFF</td><td>×</td><td>Not used</td></tr>
<tr><td>5
6
7</td><td colspan="3">MUSIC (CH1) selection. The music varies depending on the melody IC located on this circuit card.</td></tr>
<tr><td rowspan="2">8</td><td>ON</td><td></td><td>Not used</td></tr>
<tr><td>OFF</td><td>×</td><td>Not used</td></tr>
</table>

6. External Interface

   PLO leads appear on the LT connectors labeled EXCLK0 and EXCLK1.

- PLO mounting slots

  The PLO card is mounted in Slots 21 and 23 of TSWM.



- LT cable connectors

  Connect the LT cables to the connectors labeled EXCLK0 and EXCLK1 on the TSWM backplane.

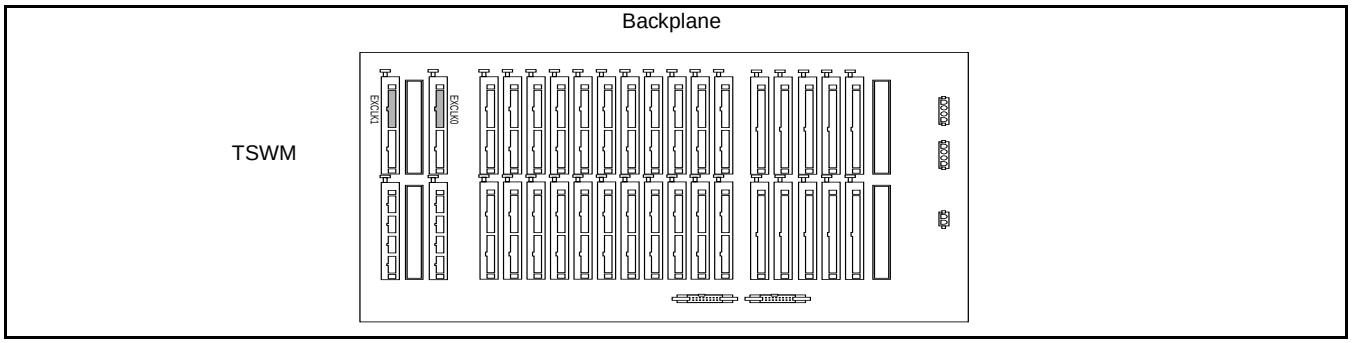


Figure 3-12 PLO Pin Assignments for Receiving Clock (4 IMG System) (1/2)

- EXCLK0/EXCLK1 connector Pin Assignment

  Pins are assigned as follows on the EXCLK0/EXCLK1 connectors. When the clock is distributed from a digital interface, use one pair of DIUxxx in one of the 4 inputs. (There are a maximum of 4 inputs.) DIU leads have the following precedence: DIU0xx (high) → DIU3xx (low).

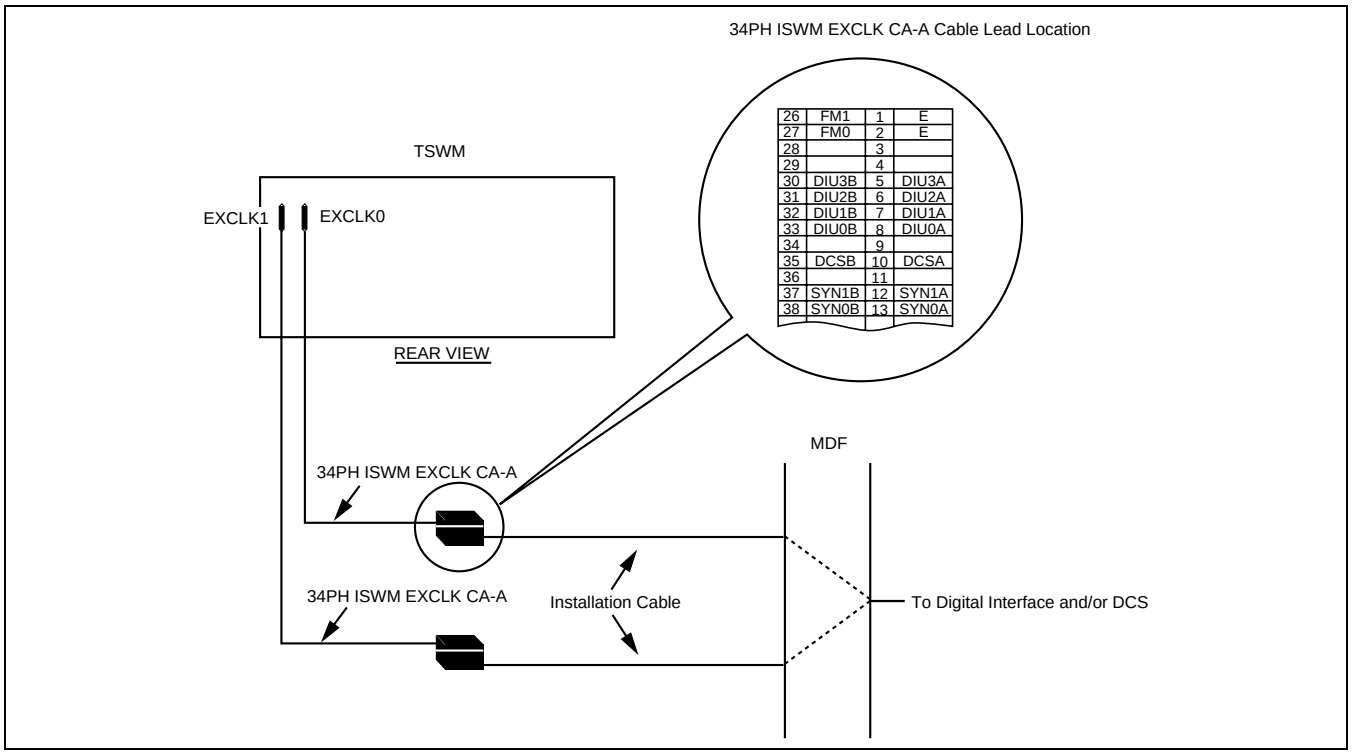
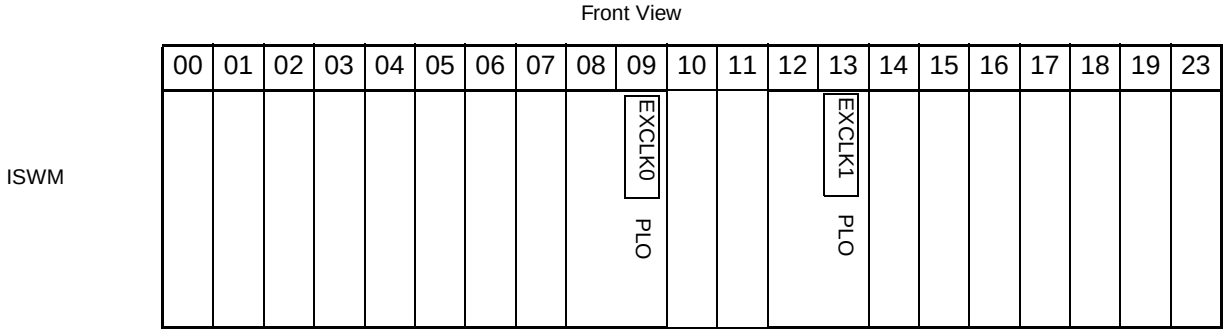


Figure 3-12 PLO Pin Assignments for Receiving Clock (4 IMG System) (2/2)

PLO input leads appear on the LT connectors labeled EXCLK0 and EXCLK1.

- PLO mounting slots

  The PLO card is mounted in Slots 09 and 13 of ISWM.



- LT cable connectors

  Connect LT cables to the connectors labeled EXCLK0 and EXCLK! on the ISWM backplane.

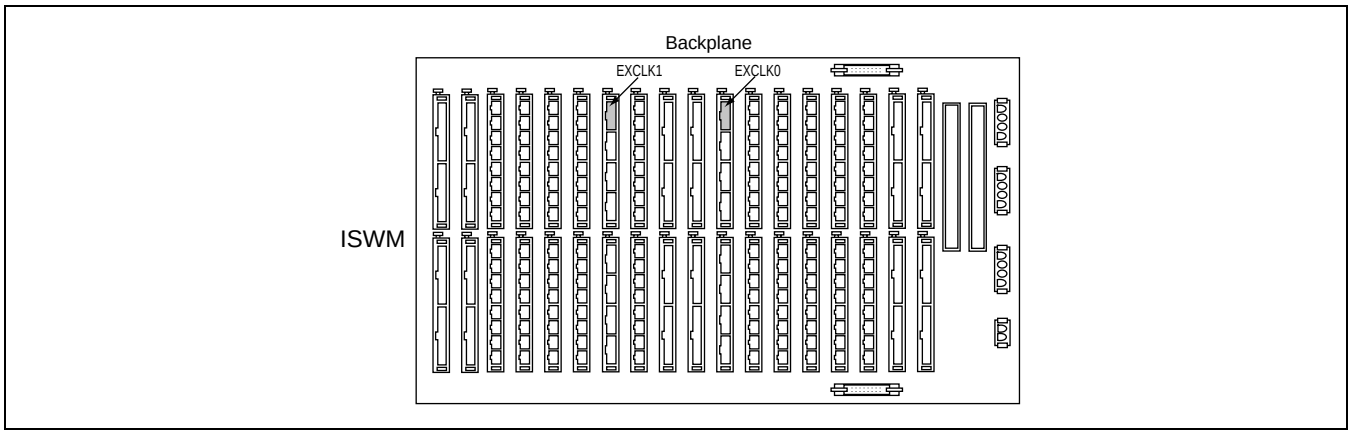
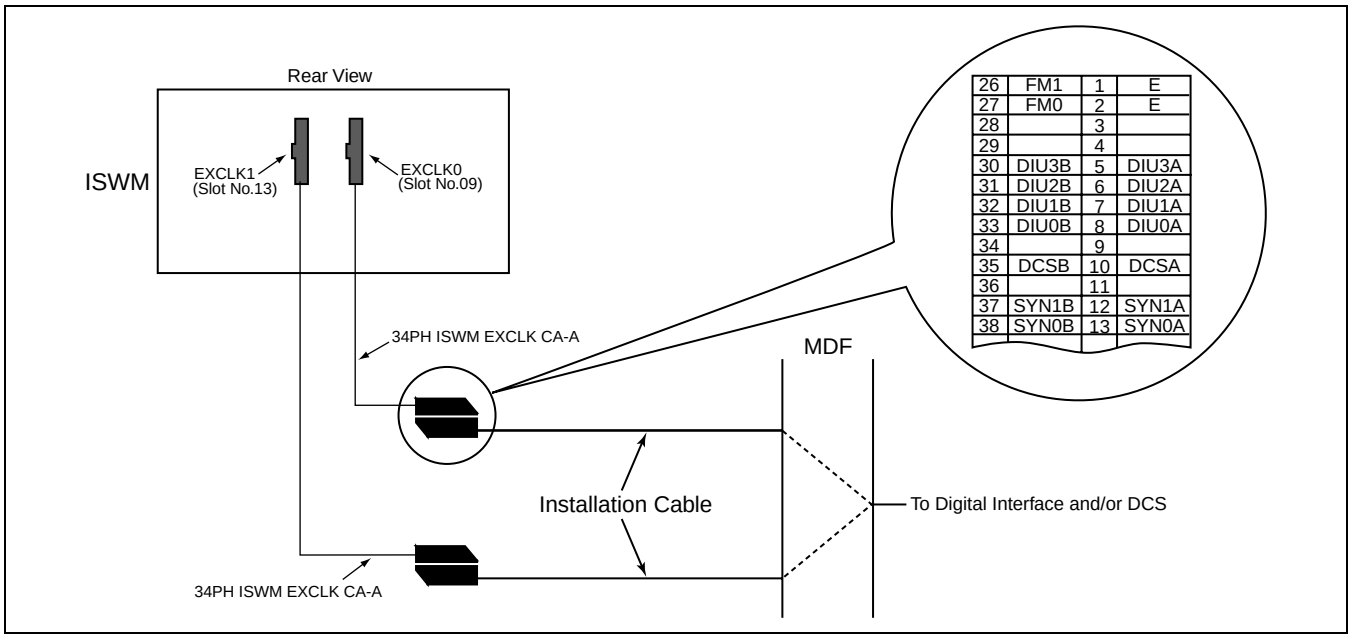


Figure 3-13 PLO Pin Assignment for Receiving Clock (ISW) (1/2)

- EXCLK0/EXCLK1 connector Pin Assignment

  Pins are assigned as follows on the EXCLK0/EXCLK1 connectors. When the clock is distributed from a digital interface, use one pair of DIUxxx in one of the 4 inputs. (There are a maximum of 4 inputs.) DIU leads have the following precedence: DIU0xx (high) → DIU3xx (low).



26	FM1	1	E
27	FM0	2	E
28		3	
29		4	
30	DIU3B	5	DIU3A
31	DIU2B	6	DIU2A
32	DIU1B	7	DIU1A
33	DIU0B	8	DIU0A
34		9	
35	DCSB	10	DCSA
36		11	
37	SYN1B	12	SYN1A
38	SYN0B	13	SYN0A

Figure 3-13 PLO Pin Assignment for Receiving Clock (ISW) (2/2)

- Cable Connection Diagram

  Provide the following wiring at the MDF. Figure 3-14 shows an example of a system that has the PLO cards in dual configuration.

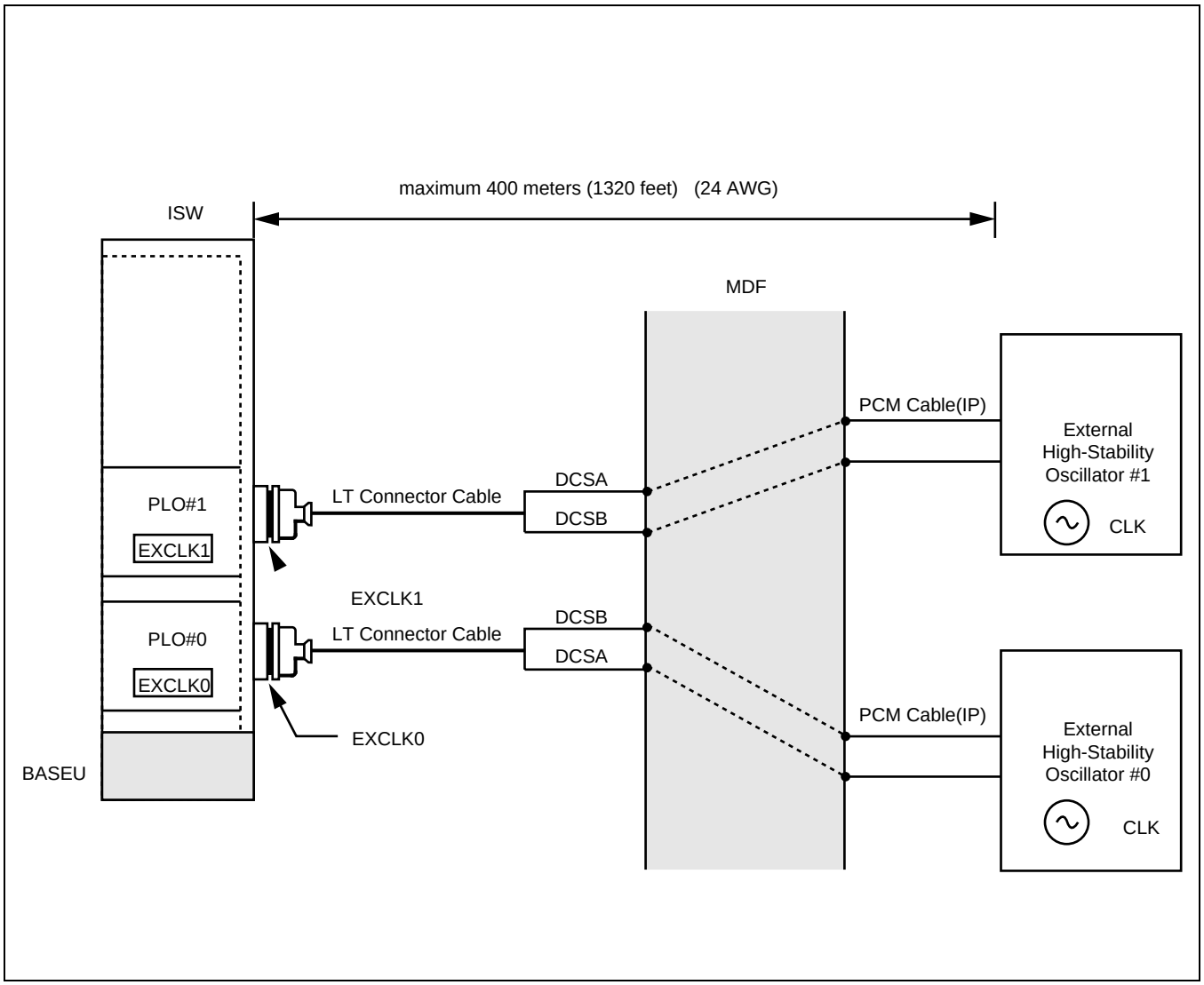
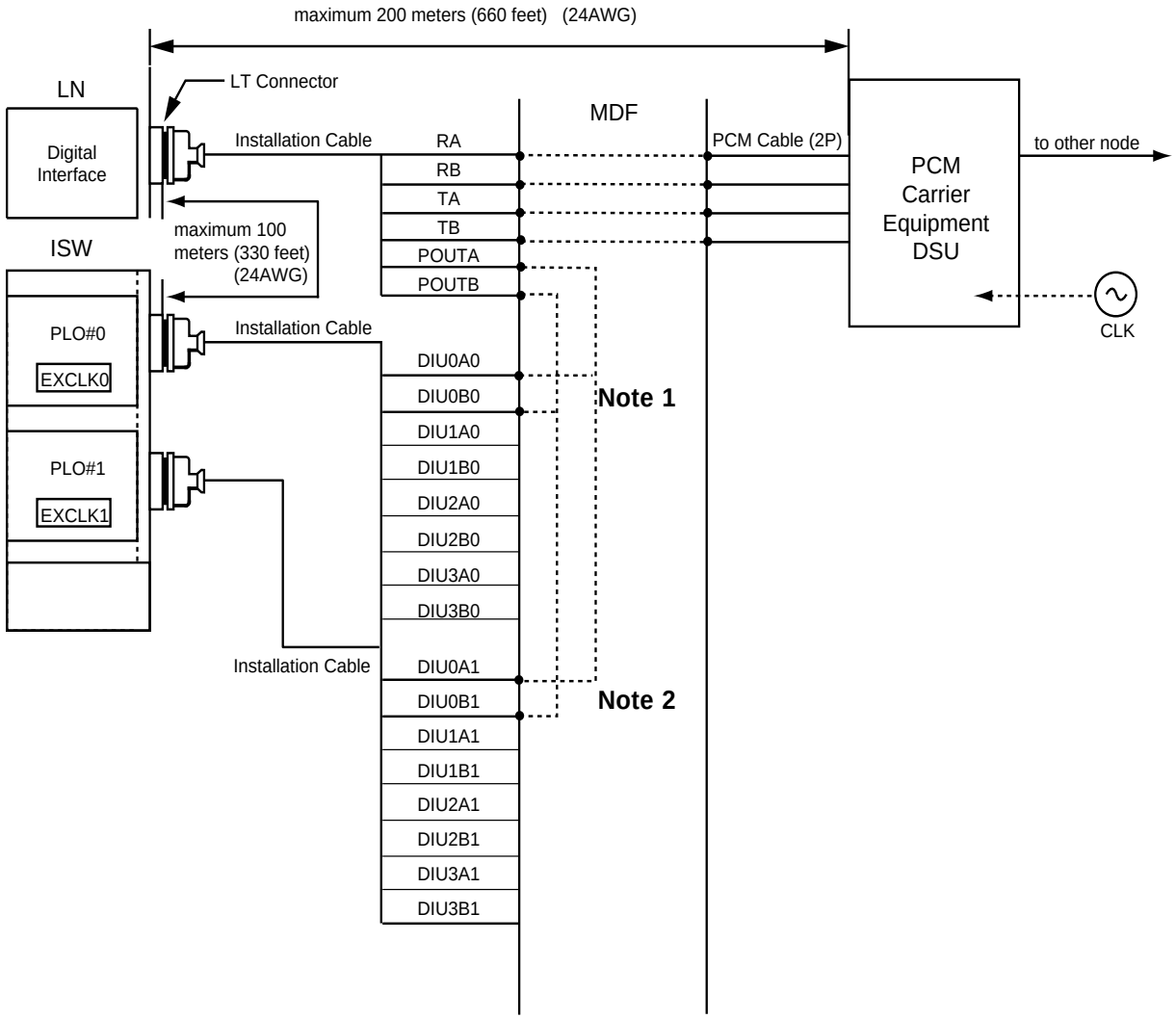


Figure 3-14 Cable Connection Diagram (ISW) for Accepting Synchronization Clocks from an External High-Stability Oscillator

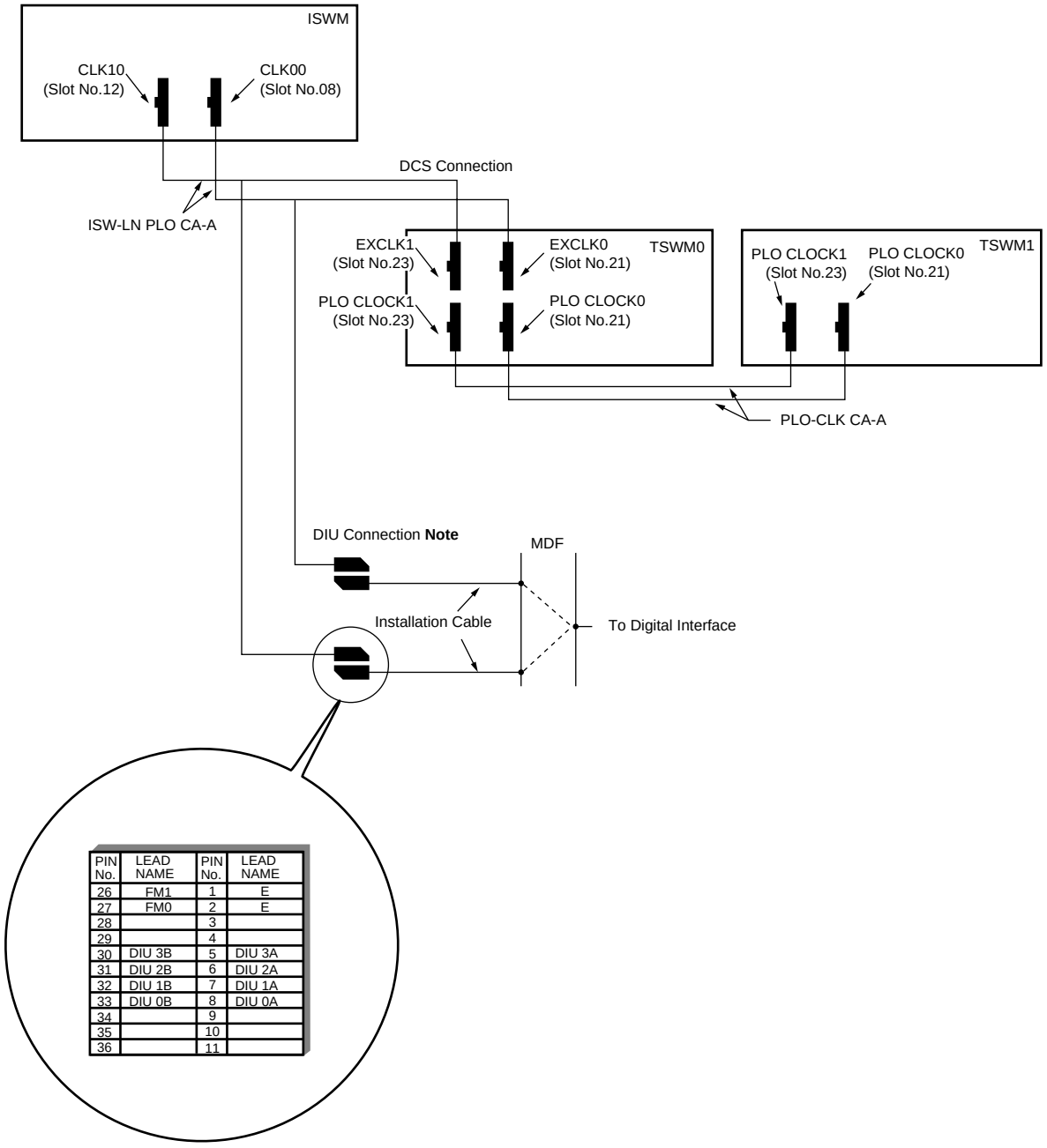
Figure 3-15 shows an example of distributing clock from a digital interface in LN. This example assumes that the Digital Trunk POUT leads are used as the first clock distribution route.



Note 1: *PLO has a maximum 4 inputs. DIU0xx leads are used for the 1st clock distribution routes. DIU3xx leads are used for the 4th. The first input has the highest priority.*

Note 2: *The connection is required for a dual PLO system.*

Figure 3-15 Cable Connection Diagram (ISW) for Receiving Clock from Digital Interface

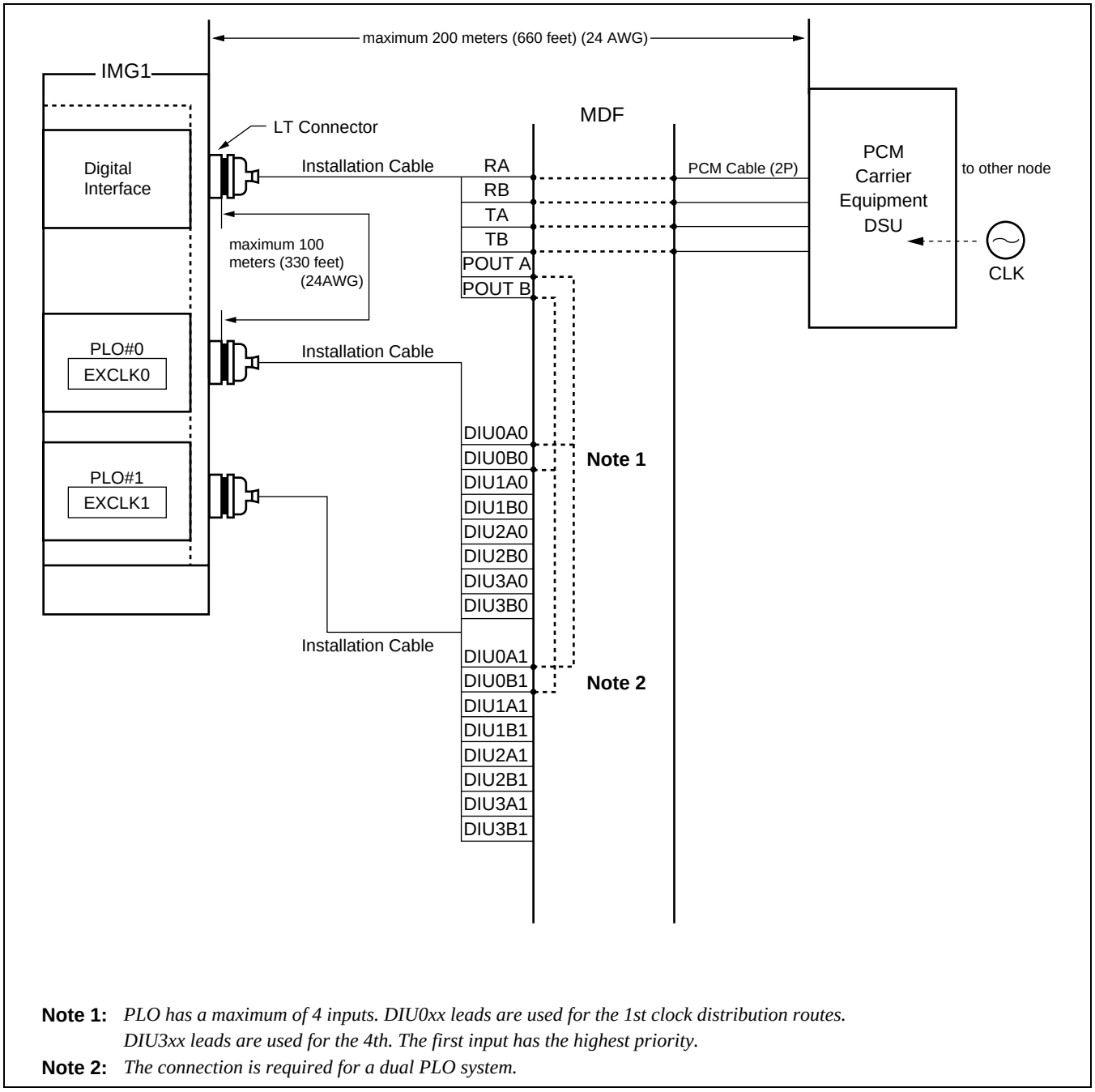


PIN No.	LEAD NAME	PIN No.	LEAD NAME
26	FM1	1	E
27	FM0	2	E
28		3	
29		4	
30	DIU 3B	5	DIU 3A
31	DIU 2B	6	DIU 2A
32	DIU 1B	7	DIU 1A
33	DIU 0B	8	DIU 0A
34		9	
35		10	
36		11	

Note: *For the DUI connection route diagram, see Figure 3-17.*

Figure 3-16 LT Connector Lead Location of PLO (ISW-LN0)

Figure 3-17 shows an example of distributing clock from a digital interface. This figure assumes that the Digital Trunk POUT leads are used as the first clock distribution route.



Note 1: *PLO has a maximum of 4 inputs. DIU0xx leads are used for the 1st clock distribution routes. DIU3xx leads are used for the 4th. The first input has the highest priority.*

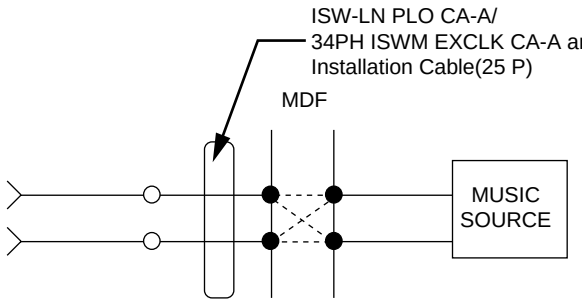
Note 2: *The connection is required for a dual PLO system.*

Figure 3-17 Cable Connection Diagram (4-IMG System/LN) for Receiving Clock from Digital Interface

ISW-LN PLO CA-A cable/
34PH ISWM EXCLK CA-A
Pin Assignment

PIN No.	LEAD NAME	PIN No.	LEAD NAME
26	FM1	1	E
27	FM0	2	E
28		3	
29		4	
30		5	
31		6	
32		7	
33		8	
		9	

Note

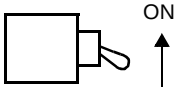
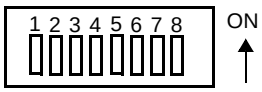
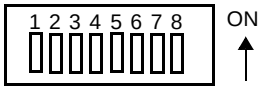
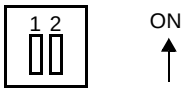
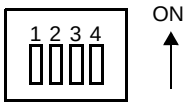
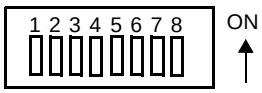


Multiple connections between systems 0 and 1 are required on the MDF.

Note: *FM1 is not used.*

Figure 3-18 Connection of External Music-On-Hold

7. Switch Setting Sheet

SWITCH NAME	SWITCH SHAPE	
MB		
SW01		
SW02		
SW03		
SW10		
SW11		
SW12		

PH-CK17
Phase Lock Oscillator

1. General Function

This circuit card, used together with a direct digital interface circuit card, sets up network synchronization with the network. Since this circuit card provides a high precision base clock oscillator, the 4 IMG system can be a clock source office for the digital network. As seen in Figure 3-19, the PLO can be redundant regardless of the system switching network selection.

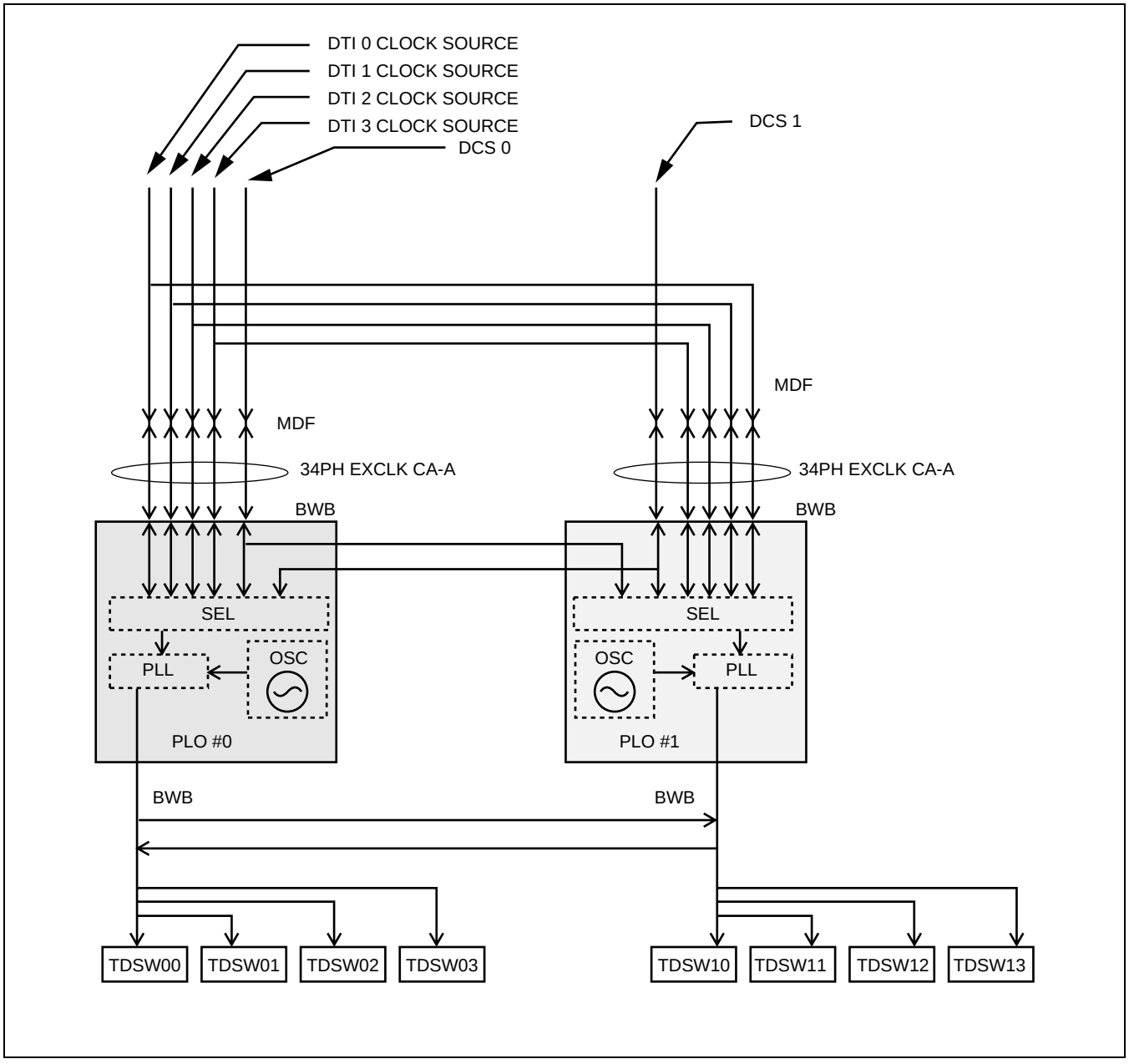


Figure 3-19 Location of PH-CK17 (PLO) Card in the System

The source clock of the clock subordinate office is either the digital clock supply (DCS) or the digital interface clock (DIU0 - DIU3). When clock source failure has occurred, the PLO chooses another clock source automatically in the order of:

1. DCS
2. DIU0
3. DIU1
4. DIU2
5. DIU3
6. PLO changeover or the PLO internal oscillator drifting

The PLO can output the clock signals (CLK) and the frame head signals (FH) as follows:

- 32.768 MHz CLK
- 8 KHz FH
- 5 msec × “n” FH

The MUSIC ROM also located on this circuit card contains the hold tone, and is supplied to the TSW circuit card. When an external music on hold is applied to the 4 IMG system, this circuit card provides the interface for the external hold tone source.

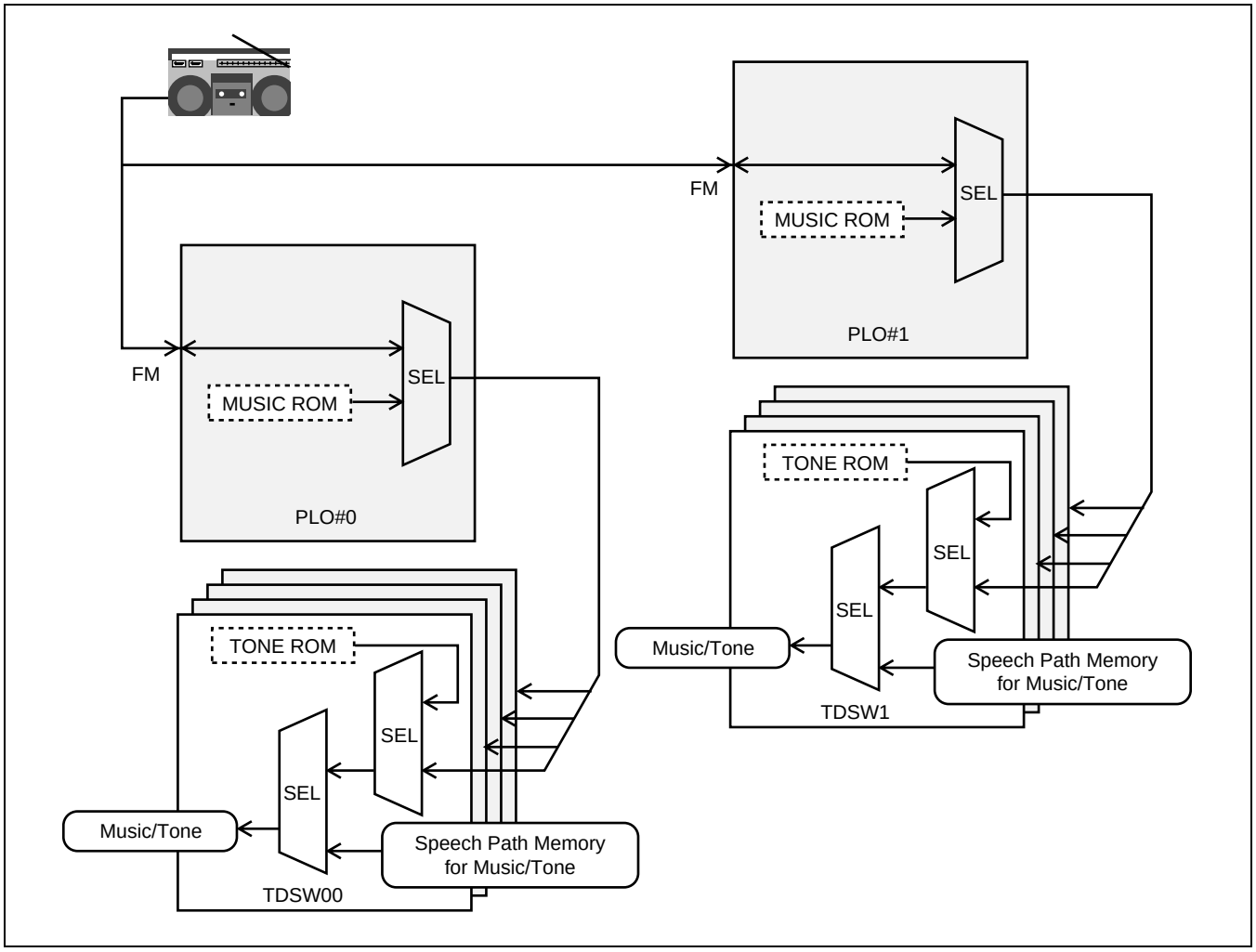


Figure 3-20 Music Source

2. Mounting Location/Condition

This circuit card is mounted in the TSWM of the slot shown below.

Mounting Module	TSWM

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
TSWM																					PLO 0		PLO 1	

3. Face Layout of Lamps, Switches, and Connectors

The face layout of lamps, switches, and connectors is shown in Figure 3-21.

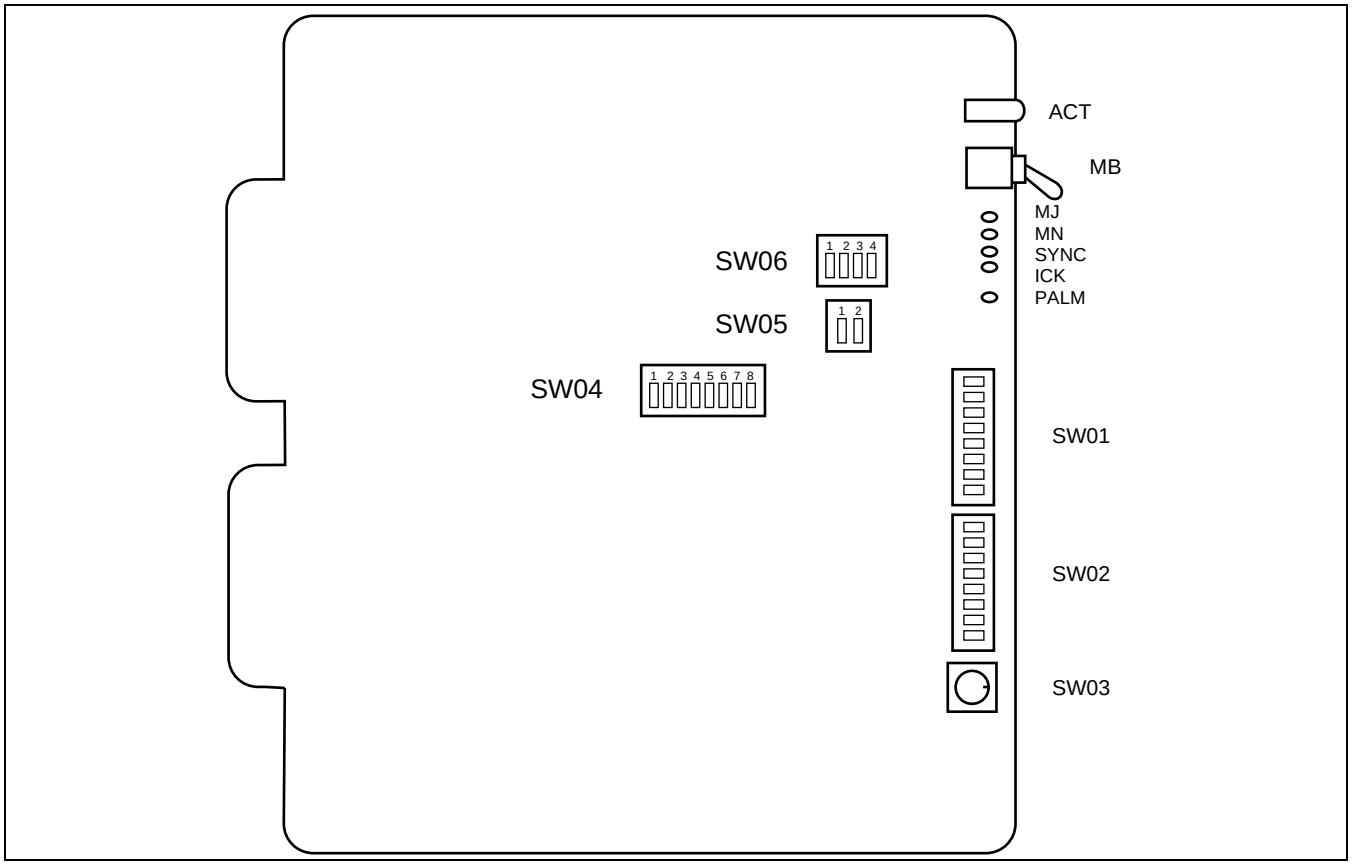


Figure 3-21 Face Layout of PH-CK17 (PLO)

4. Lamp Indications

Lamp indications for this circuit card are shown in the table below.

LAMP NAME	COLOR	STATE
ACT	Green	Remains lit while this circuit card is in active state.
	Off	Remains off while this circuit card is in stand-by state.
MJ	Red	Lights when the following MJ fault has occurred: • All of the clock supply routes have failed when the system operates as the clock subordinate office. • 32.768 MHz output clock failure. • 8 KHz output FH failure. • 5 msec × "n" output FH failure. • Input Frame Pulse (FP) failure (FP is supplied by the SYNC card). • Internal OSC (±0.3 ppm deviation) has failed when the system operates as the clock source office.
MN	Red	Lights when the following MN fault has occurred: • One or more (but not all) DTI/DCS clock supply routes failed. • Drifting failure. • Internal OSC (±0.3 ppm deviation) failure.
SYNC	Green	Remains lit while the system is synchronized with the network.
	OFF	Remains off when either of the following has occurred. • DCS clock failure when receiving the clock signals from the DCS. • DTI clock failure when receiving the clock signals from the DTI. • Drifting failure.
ICK	Green	Lights when the internal oscillator is operating normally.
PALM	Red	Remains lit when power is abnormal.

5. Switch Settings

Standard settings for switches on this circuit card are shown in the table below.

SWITCH NAME	SETTING	STANDARD SETTING	MEANING
MB	UP		Circuit card Make-busy.
	DOWN	×	Circuit card Make-busy cancel.
SW03	1 - F	1	Fixed to "1."

SWITCH NAME	SWITCH NO.	SETTING	STANDARD SETTING	MEANING
SW01	1	ON		Clock subordinate office.
		OFF		Clock source office.
	2	ON		Digital Clock Supply route zero (DCS 0) is used.
		OFF		Digital Clock Supply route zero (DCS 0) is not used.
	3	ON		Digital Clock Supply route one (DCS 1) is used.
		OFF		Digital Clock Supply route one (DCS 1) is not used.
	4	ON		8 KHz of Frame Head signals are not extracted from the DCS signals (which is composed of 64 KHz + 8 KHz).
		OFF		8 KHz of Frame Head signals are extracted from the DCS signals (which is composed of 64 KHz + 8 KHz).
	5	ON		When clock source failure has occurred in all supply routes, the PLO outputs the original clock of the internal oscillator.
		OFF		When clock source failure has occurred in all supply routes, the PLO continues outputting the current phase clock.
	6	ON		This circuit card is associated with SYNC (PA-CK11) card.
		OFF		This circuit card is not associated with SYNC (PA-CK11) card.
	7	ON		A-law CODEC is used for the hold music.
		OFF	×	μ-law CODEC is used for the hold music.
	8	OFF	×	Not used

SWITCH NAME	SWITCH NO.	SETTING	STANDARD SETTING	MEANING
SW02	1	ON		DIU 0 is used as the DTI clock supply route zero.
		OFF		DIU 0 is not used.
	2	ON		DIU 1 is used as the DTI clock supply route one.
		OFF		DIU 1 is not used.
	3	ON		DIU 2 is used as the DTI clock supply route two.
		OFF		DIU 2 is not used.
	4	ON		DIU 3 is used as the DTI clock supply route three.
		OFF		DIU 3 is not used.
	5	ON	×	1.5 M clock for DIU 0
		OFF		2 M clock for DIU 0
	6	ON	×	1.5 M clock for DIU 1
		OFF		2 M clock for DIU 1
	7	ON	×	1.5 M clock for DIU 2
		OFF		2 M clock for DIU 2
	8	ON	×	1.5 M clock for DIU 3
		OFF		2 M clock for DIU 3
SW05	1	ON		External hold tone source is used via FM lead.
		OFF	×	MUSIC ROM is used as the hold tone.
	2	OFF		Not used

SWITCH NAME	SWITCH NO.	SETTING	STANDARD SETTING	MEANING
SW06	1			
	2			
	3			
	4			

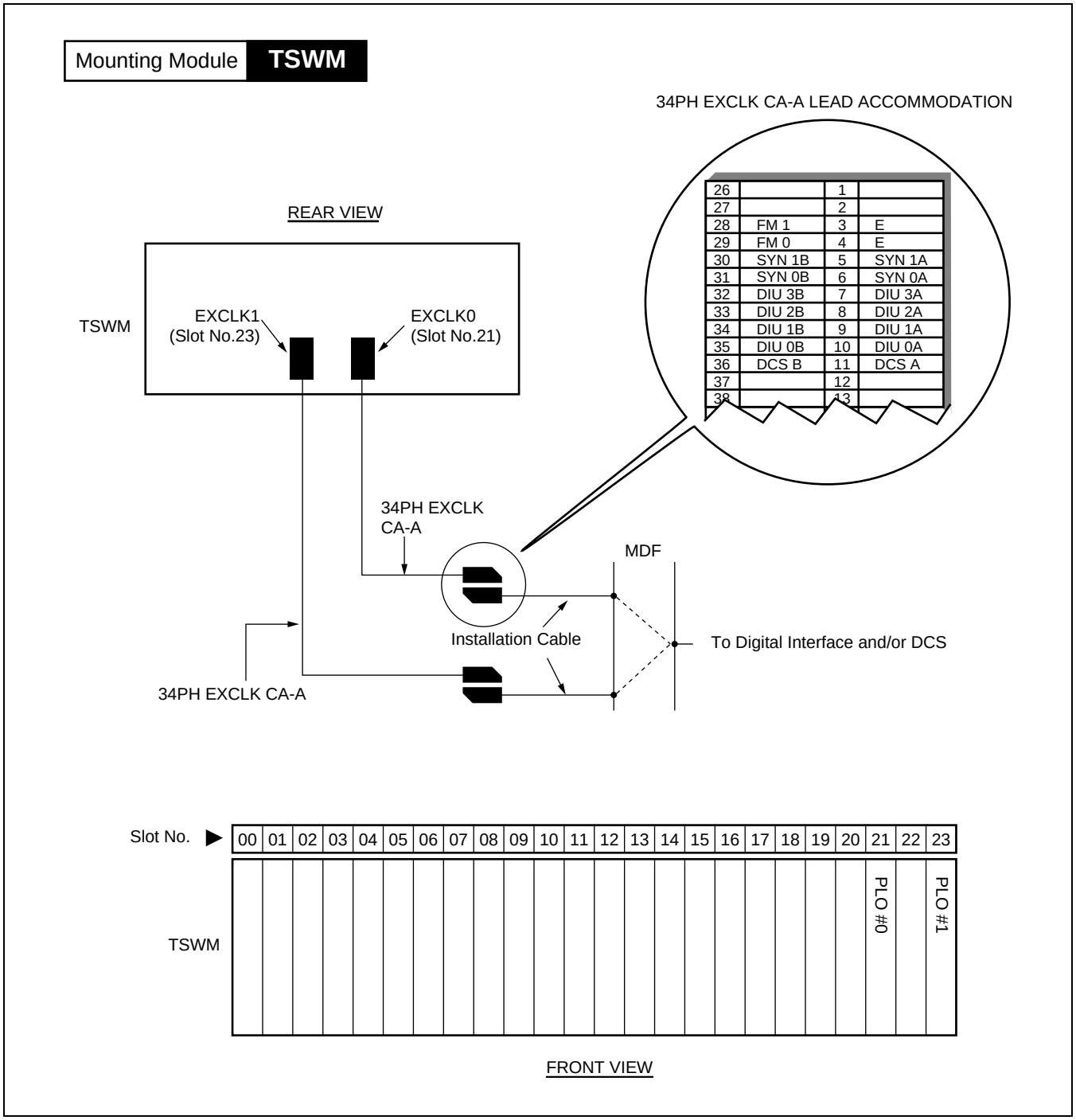
SW8F-1	SW8F-2	Impedance of the External Music Source 0 (FM 0)
OFF	OFF	600 Ω
ON	OFF	8.2 Ω
OFF	ON	47K Ω

SW8F-3	SW8F-4	Impedance of the External Music Source 1 (FM 1)
OFF	OFF	600 Ω
ON	OFF	8.2 Ω
OFF	ON	47K Ω

<table>
<tr><th>SWITCH NAME</th><th>SWITCH NO.</th><th>SETTING</th><th>STANDARD SETTING</th><th>MEANING</th></tr>
<tr><td rowspan="8">SW04</td><td rowspan="3">1
2
3</td><td colspan="3"><table><tr><th>SWA0-1</th><th>SWA0-2</th><th>SWA0-3</th><th>MUSIC</th></tr><tr><td>OFF</td><td>OFF</td><td>OFF</td><td>Für Elise</td></tr><tr><td>ON</td><td>OFF</td><td>OFF</td><td>Maiden’s prayer</td></tr><tr><td>Not Used</td><td>OFF</td><td>ON</td><td>Buzzer</td></tr><tr><td>Not Used</td><td>ON</td><td>OFF</td><td>Chime</td></tr></table></td></tr>
<tr><td rowspan="2">4</td><td>ON</td><td></td><td>Not used</td></tr>
<tr><td>OFF</td><td>×</td><td>Not used</td></tr>
<tr><td>5
6
7</td><td colspan="3">MUSIC CH1 selection. The kind of music varies depending on the melody IC located on this circuit card.</td></tr>
<tr><td rowspan="2">8</td><td>ON</td><td></td><td>Not used</td></tr>
<tr><td>OFF</td><td>×</td><td>Not used</td></tr>
</table>

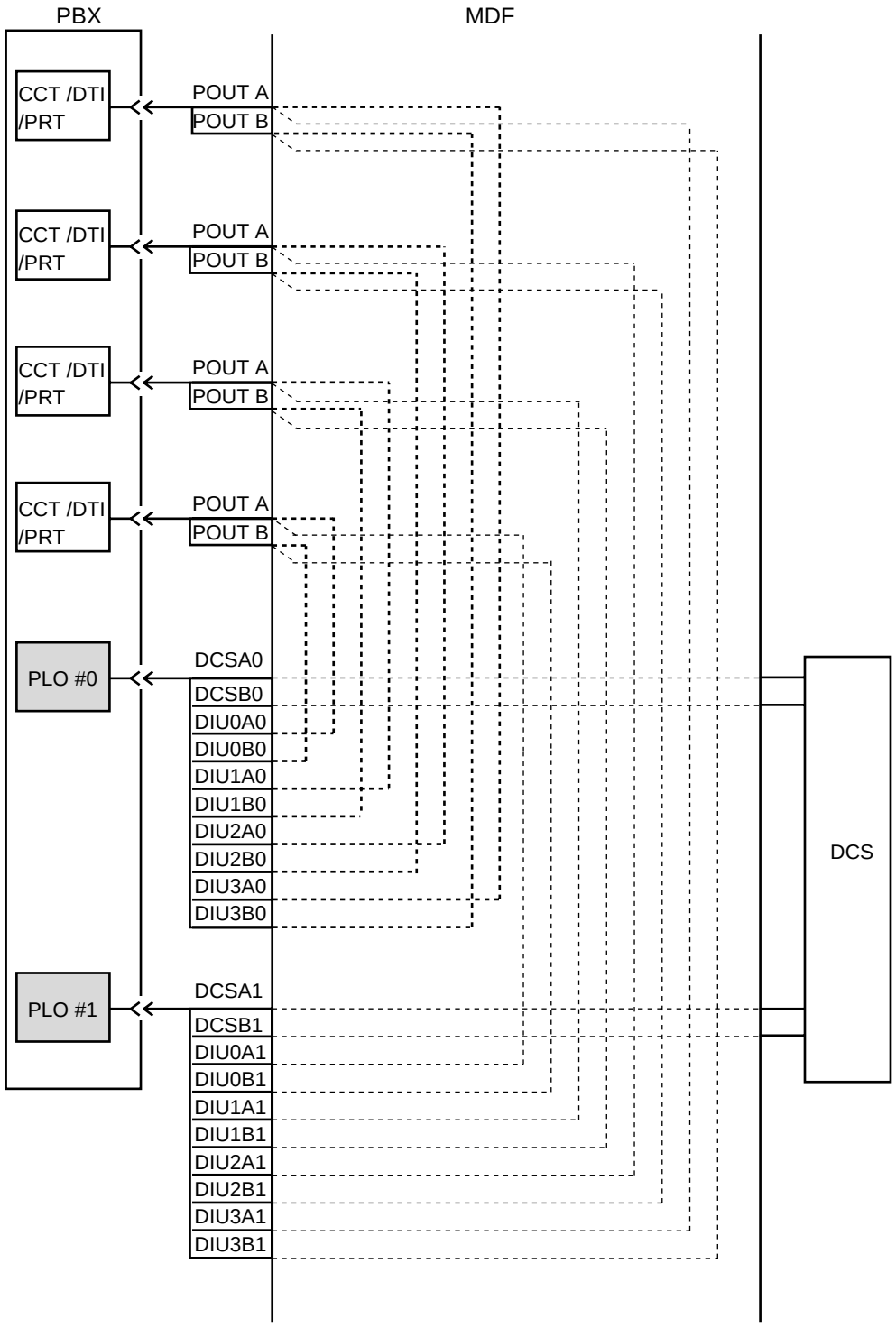
6. External Interface

When this circuit card is located in the TSWM, connect 34PH EXCLK CA-A to the EXCLK0/EXCLK1 connectors on the backplane of the TSWM.



26		1	
27		2	
28	FM 1	3	E
29	FM 0	4	E
30	SYN 1B	5	SYN 1A
31	SYN 0B	6	SYN 0A
32	DIU 3B	7	DIU 3A
33	DIU 2B	8	DIU 2A
34	DIU 1B	9	DIU 1A
35	DIU 0B	10	DIU 0A
36	DCS B	11	DCS A
37		12	
38		13	

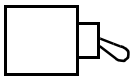
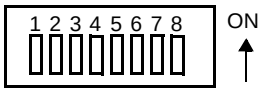
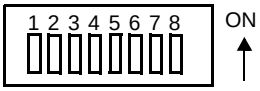
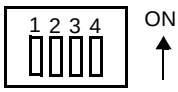
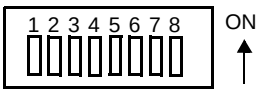
Figure 3-22 LT Connector Lead Location of PLO (TSWM)



Note : *The following circuit cards have Clock Output Leads for a PLO card: CCT (PA-24CCTA, PA-30CCTB), DTI (PA-24DTR, PA-30DTS), and PRT (PA-24PRT, PA-30PRTC).*

Figure 3-23 Connecting Route Diagram

7. Switch Setting Sheet

SWITCH NAME	SWITCH SHAPE	REMARKS
MB		
SW01		
SW02		
SW03		
SW05		
SW06		
SW04		

PH-CK17-A
Phase Lock Oscillator

1. General Function

This circuit card used together with a direct digital interface circuit card, sets up network synchronization between networks. Since this circuit card provides a high precision base clock oscillator, the system containing this circuit card can be a clock source office of the digital network. As seen in the figure below, the PLO can be redundant regardless of the system switching network selection. This circuit card is used for the IMX-U system.

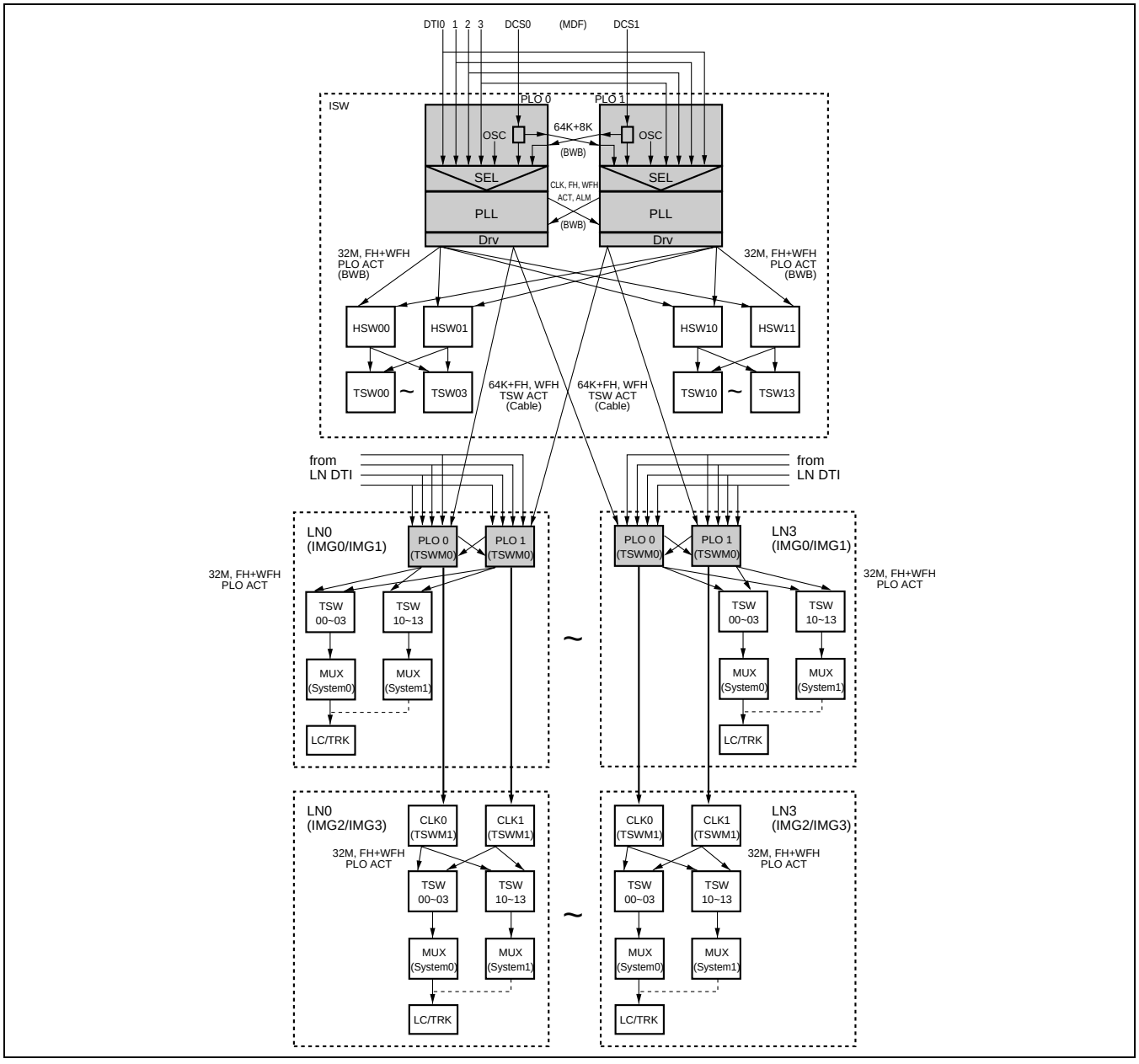


Figure 3-24 Location of PH-CK17-A (PLO)

2. Mounting Location/Condition

This circuit card can be mounted in the shaded slots shown below.

Mounting Module **ISWM**

00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19
									PLO (#0)				PLO (#1)						

Mounting Module **TSWM0 (IMG1)**

00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
																					PLO (#0)		PLO (#1)

3. Face Layout of Lamps, Switches, and Connectors

The face layout of lamps, switches, and connectors are shown in Figure 3-25

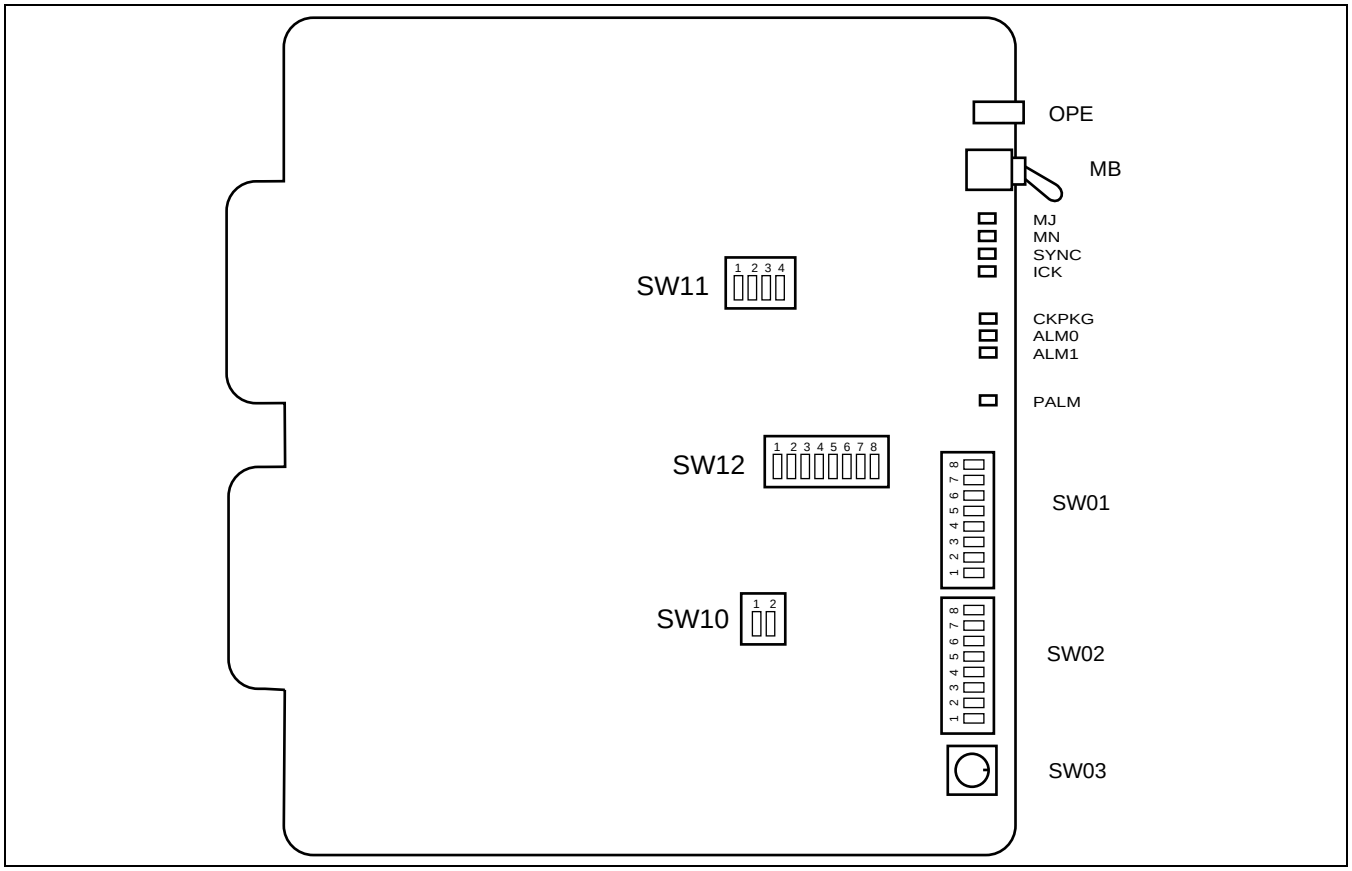


Figure 3-25 Face Layout of PH-CK17-A (PLO)

4. Lamp Indications

Lamp indications for this circuit card are shown in the table below:

LAMP NAME	COLOR	STATE
OPE	Green	Remains lit while this circuit card is in active state.
MJ	Red	Lights when the following MJ fault has occurred: • All of the clock supply routes have failed when the system operates as the clock subordinate office • 32.768 MHz output clock failure (including CLK card) • 8 KHz output clock failure (including CLK card) • Input Frame Pulse (FP) failure (FP is supplied by the SYNC card) • Internal OSC (±5 ppm deviation) have failed when the system operates as the clock source office
MN	Red	Lights when the following MN fault has occurred: • One or more (but not all) DTI/DCS clock supply routes have failed • Drifting failure • Internal OSC (±5 ppm deviation) failure
SYNC	Green	Remains lit while the system is synchronized with the network.
ICK	Green	Lights when the internal oscillator is operating normally.
CKPKG **Note**	Green	Lights when the CLK card in TSWM1 is in normal operation.
ALM0 **Note**	Red	Lights when clock failure has occurred in the CLK card.
ALM1 **Note**	Red	Lights when FH failure has occurred in the CLK card.
PALM	Red	Remains lit when the On-Board Power Supply is abnormal.

Note: *This lamp is effective when this card is mounted in TSWM0 of the IMX-U system.*

5. Switch Settings

Standard settings for switches on this circuit card are shown in the table below.

SWITCH NAME	SETTING	STANDARD SETTING	MEANING
MB	UP		Circuit card Make-busy.
	DOWN	×	Circuit card Make-busy cancel.
SW03	1 - F	1	Fixed to "1."

SWITCH NAME	SWITCH NO.	SETTING	STANDARD SETTING	MEANING
SW01 **Note 1**	1	ON	× **Note 1**	Clock subordinate office.
		OFF		Clock source office.
	2	ON	× **Note 1**	Digital Clock Supply route zero (DCS 0) is used.
		OFF		Digital Clock Supply route zero (DCS 0) is not used.
	3	ON	× **Note 1**	Digital Clock Supply route one (DCS 1) is used.
		OFF		Digital Clock Supply route one (DCS 1) is not used.
	4	ON		8 KHz of Frame Head signals are extracted from the DCS signals (which is composed of 64 KHz + 8 KHz).
		OFF	× **Note 1**	8 KHz of Frame Head signals are not extracted from the DCS signals (which is composed of 64 KHz + 8 KHz).
	5	ON		When clock source failure has occurred in all supply routes, the PLO outputs the original clock of the internal oscillator.
		OFF	×	When clock source failure has occurred in all supply routes, the PLO continues outputting the current phase clock.
	6	ON	× **Note 1**	This circuit card is associated with SYNC (PA-CK11) card.
		OFF		This circuit card is not associated with SYNC (PA-CK11) card.
	7	ON		A-law CODEC is used for Music-On-Hold.
		OFF	×	μ-law CODEC is used for Music-On-Hold.
	8	OFF	×	Fixed OFF (Not used).

Note 1: *When this card is used in the 4-IMG or ISWM of the IMX-U system, specify the clock source (DCS or DTI) according to the clock network configuration for the office.*

Note 2: *This standard setting is applicable when this card is mounted in TSWM0 of the IMX-U system.*

SWITCH NAME	SWITCH NO.	SETTING	STANDARD SETTING	MEANING
SW02 **Note**	1	ON		DIU 0 is used as the DTI clock supply route zero.
		OFF		DIU 0 is not used.
	2	ON		DIU 1 is used as the DTI clock supply route one.
		OFF		DIU 1 is not used.
	3	ON		DIU 2 is used as the DTI clock supply route two.
		OFF		DIU 2 is not used.
	4	ON		DIU 3 is used as the DTI clock supply route three.
		OFF		DIU 3 is not used.
	5	ON	×	1.5 M clock for DIU 0.
		OFF		2 M clock for DIU 0.
	6	ON	×	1.5 M clock for DIU 1.
		OFF		2 M clock for DIU 1.
	7	ON	×	1.5 M clock for DIU 2.
		OFF		2 M clock for DIU 2.
	8	ON	×	1.5 M clock for DIU 3.
		OFF		2 M clock for DIU 3.
SW10	1	ON		External hold tone source is used via FM lead.
		OFF	×	MUSIC ROM is used as the hold tone.
	2	ON		CLK card is not used.
		OFF	×	CLK card is used.

Note: *When this card is mounted in TSWM0 of the IMX-U system, DCS clock from the ISW is used. The DTI clock can also be used as an alternate clock supply route in case of DCS clock failure.*

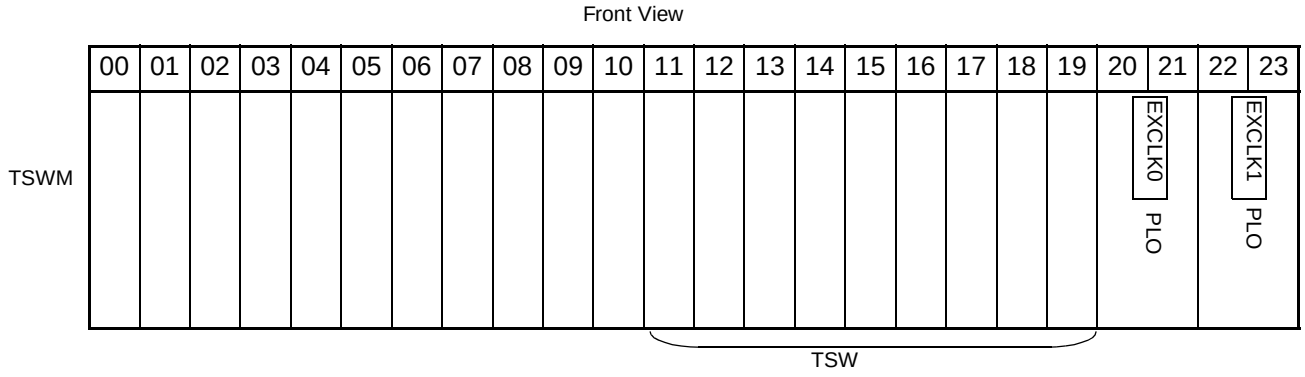
<table>
<tr><th>SWITCH NAME</th><th>SWITCH NO.</th><th>SETTING</th><th>STANDARD SETTING</th><th>MEANING</th></tr>
<tr><td rowspan="4">SW11</td><td>1</td><td colspan="3" rowspan="2">
<table>
<tr><th>SW11-1</th><th>SW11-2</th><th>Impedance of the External Music Source 0 (FM 0)</th></tr>
<tr><td>OFF</td><td>OFF</td><td>600 Ω</td></tr>
<tr><td>ON</td><td>OFF</td><td>8.2 Ω</td></tr>
<tr><td>OFF</td><td>ON</td><td>47K Ω</td></tr>
</table>
</td></tr>
<tr><td>2</td></tr>
<tr><td>3</td><td colspan="3" rowspan="2">
<table>
<tr><th>SW11-3</th><th>SW11-4</th><th>Impedance of the External Music Source 1 (FM 1)</th></tr>
<tr><td>OFF</td><td>OFF</td><td>600 Ω</td></tr>
<tr><td>ON</td><td>OFF</td><td>8.2 Ω</td></tr>
<tr><td>OFF</td><td>ON</td><td>47K Ω</td></tr>
</table>
</td></tr>
<tr><td>4</td></tr>
<tr><td rowspan="8">SW12</td><td>1</td><td colspan="3" rowspan="2">
<table>
<tr><th>SW12-1</th><th>SW12-2</th><th>SW12-3</th><th>MUSIC</th></tr>
<tr><td>OFF</td><td>OFF</td><td>OFF</td><td>Für Elise</td></tr>
<tr><td>ON</td><td>OFF</td><td>OFF</td><td>Maiden’s prayer</td></tr>
<tr><td>Not Used</td><td>ON</td><td>OFF</td><td>Buzzer</td></tr>
<tr><td>Not Used</td><td>OFF</td><td>ON</td><td>Chime</td></tr>
</table>
</td></tr>
<tr><td>2</td></tr>
<tr><td>3</td></tr>
<tr><td rowspan="2">4</td><td>ON</td><td></td><td>Not used</td></tr>
<tr><td>OFF</td><td>×</td><td>Not used</td></tr>
<tr><td>5</td><td colspan="3" rowspan="3">MUSIC (CH1) selection. The music varies depending on the melody IC located on this circuit card.</td></tr>
<tr><td>6</td></tr>
<tr><td>7</td></tr>
<tr><td rowspan="2">8</td><td>ON</td><td></td><td>Not used</td></tr>
<tr><td>OFF</td><td>×</td><td>Not used</td></tr>
</table>

6. External Interface

   PLO input leads appear on the LT connectors labeled EXCLK0 and EXCLK1

- PLO mounting slots

  The PLO card is mounted in slots 21 and 23 of TSWM.



- LT cable connectors

  Connect the LT cables to the connectors labeled EXCLK0 and EXCLK1 on the TSWM backplane.

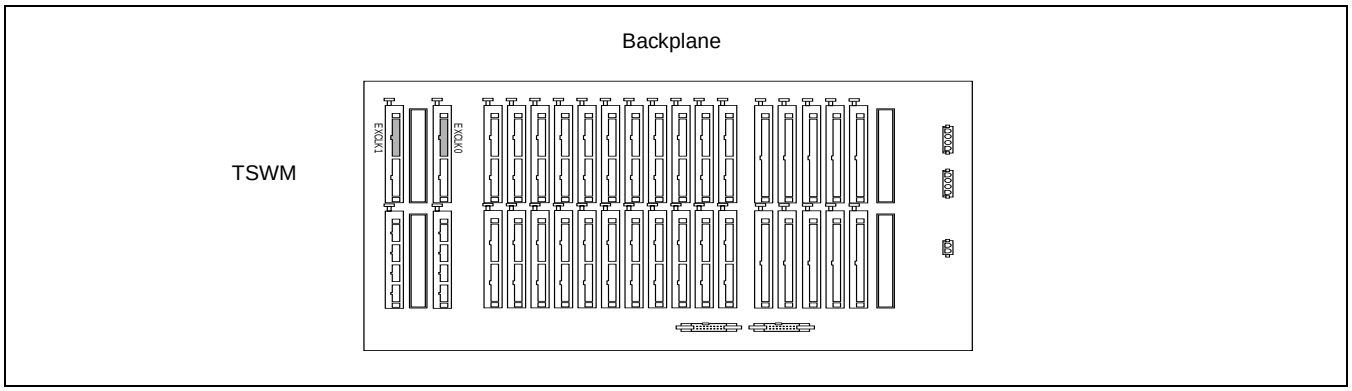


Figure 3-26 PLO Pin Assignments for Receiving Clock (4 IMG System) (1/2)

- EXCLK0/EXCLK1 connector Pin Assignment

  Pins are assigned as follows on the EXCLK0/EXCLK1 connectors. When the clock is distributed from a digital interface, use one pair of DIUxxx in one of the 4 inputs. (There are a maximum of 4 inputs.) DIU leads have the following precedence: DIU0xx (high) → DIU3xx (low).

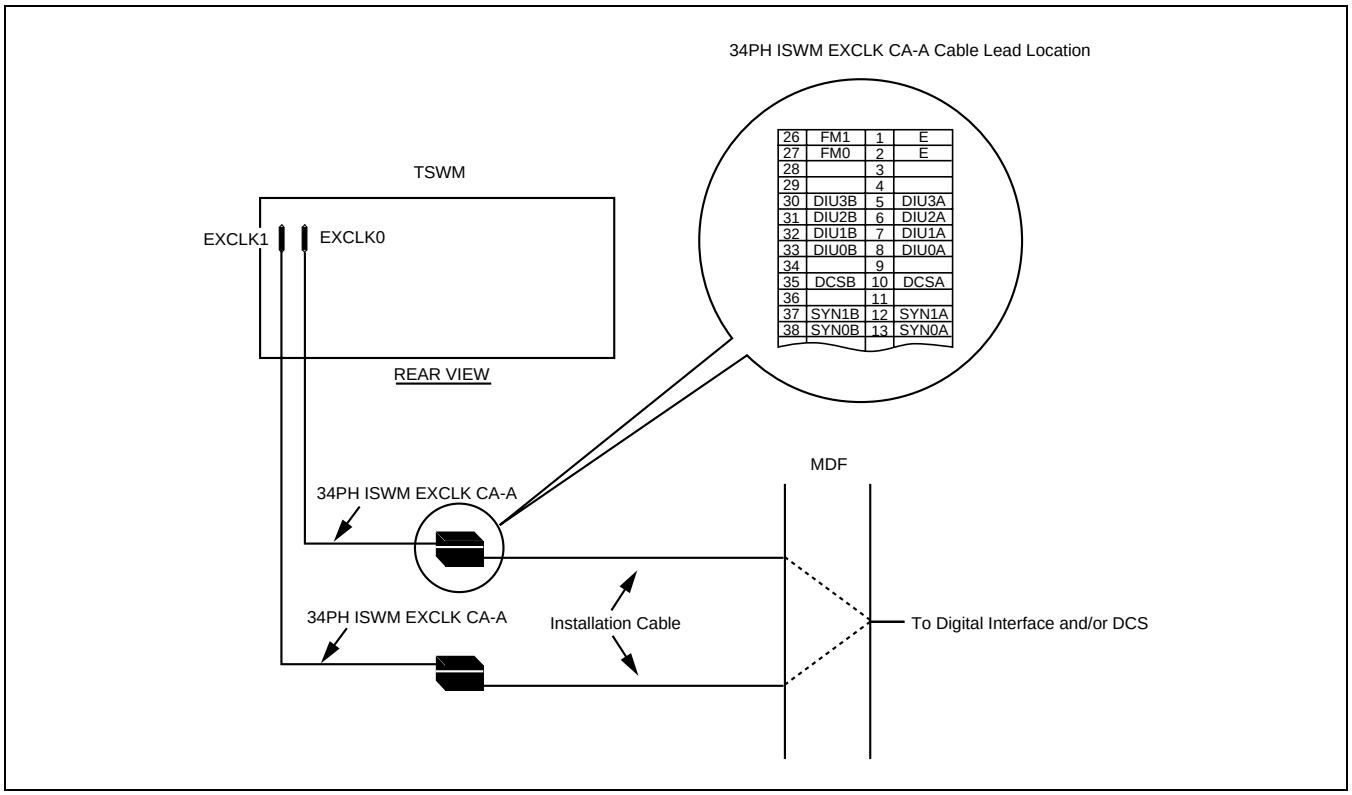
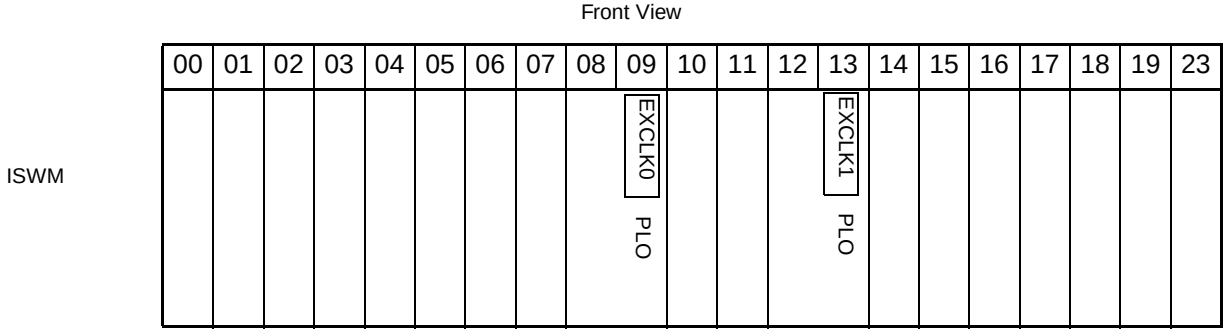


Figure 3-26 PLO Pin Assignments for Receiving Clock (4 IMG) (2/2)

PLO input leads appear on the LT connectors labeled EXCLK0 and EXCLK1.

- PLO mounting slots

  The PLO card is mounted in Slots 09 and 13 of ISWM.



- LT cable connectors

  Connect LT cables to the connectors labeled EXCLK0 and EXCLK! on the ISWM backplane.

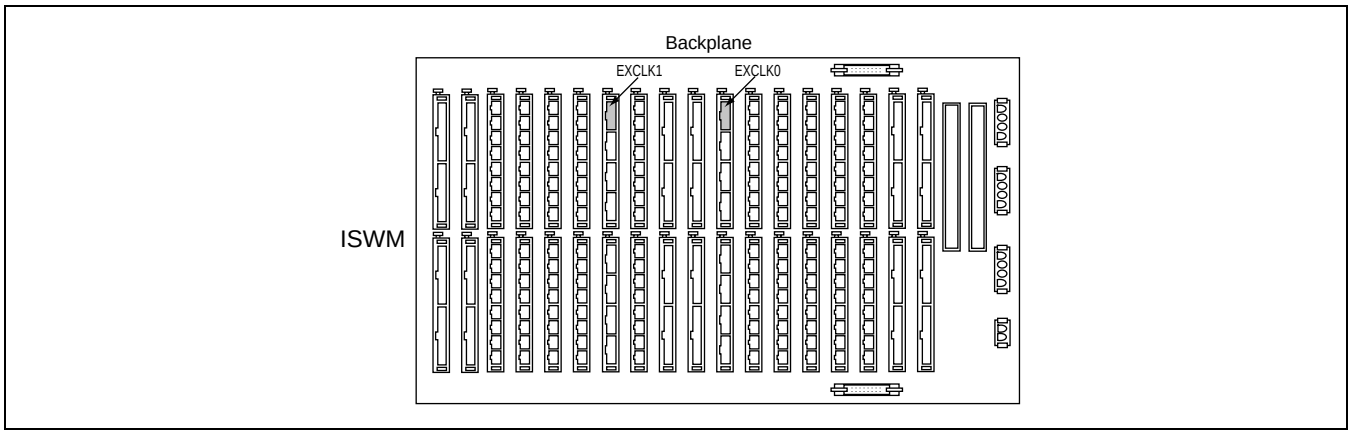
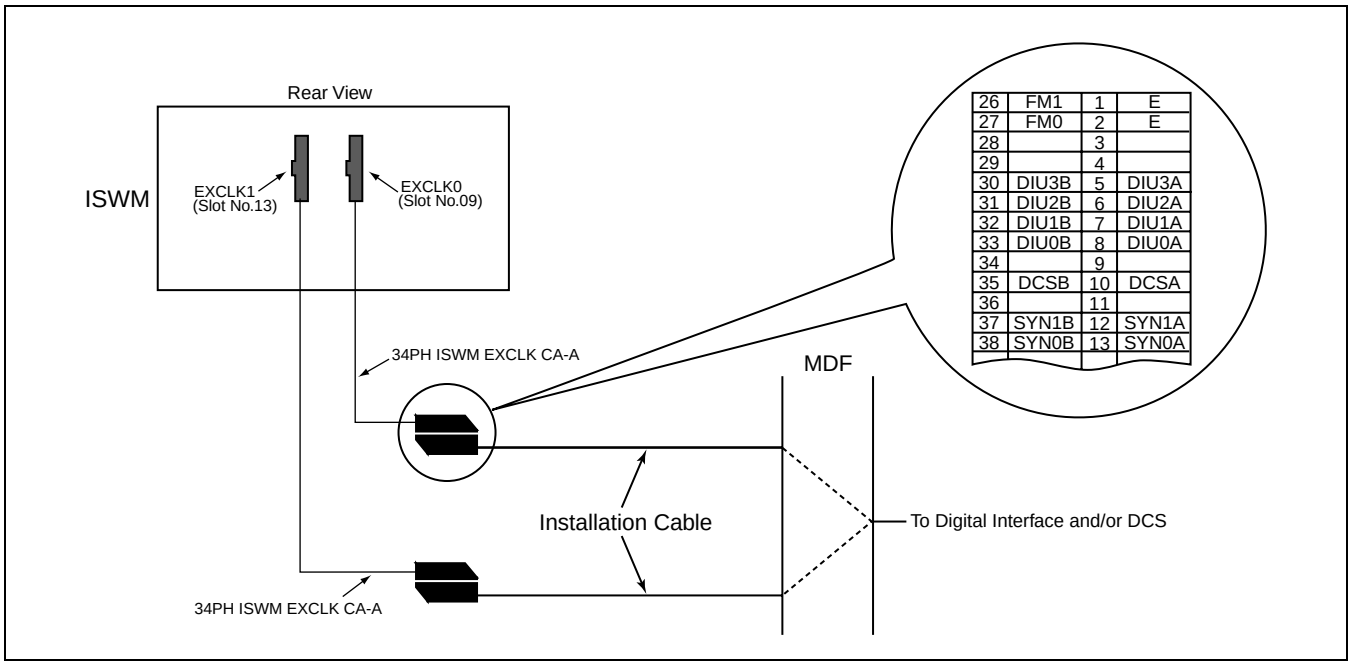


Figure 3-27 PLO Pin Assignment for Receiving Clock (ISW) (1/2)

- EXCLK0/EXCLK1 connector Pin Assignment

  Pins are assigned as follows on the EXCLK0/EXCLK1 connectors. When the clock is distributed from a digital interface, use one pair of DIUxxx in one of the 4 inputs. (There are a maximum of 4 inputs.) DIU leads have the following precedence: DIU0xx (high) → DIU3xx (low).



26	FM1	1	E
27	FM0	2	E
28		3	
29		4	
30	DIU3B	5	DIU3A
31	DIU2B	6	DIU2A
32	DIU1B	7	DIU1A
33	DIU0B	8	DIU0A
34		9	
35	DCSB	10	DCSA
36		11	
37	SYN1B	12	SYN1A
38	SYN0B	13	SYN0A

Figure 3-27 PLO Pin Assignment for Receiving Clock (ISW) (2/2)

- Cable Connection Diagram

  Provide the following wiring at the MDF. The following connection diagram shows an example of a system that has the PLO cards in dual configuration. Figure 3-28 is a cable connection diagram (ISW) for accepting synchronization clocks from an external high-stability oscillator.

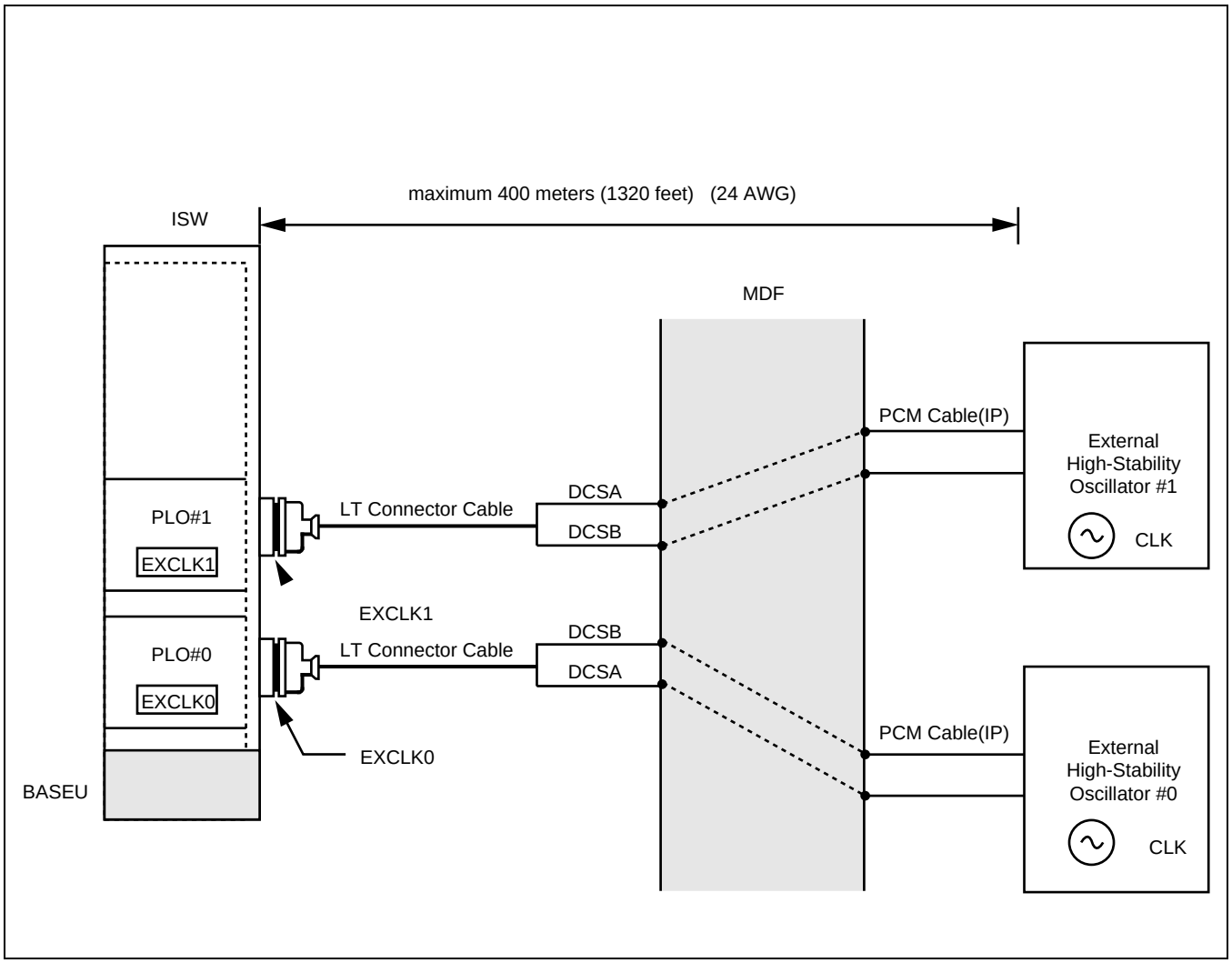
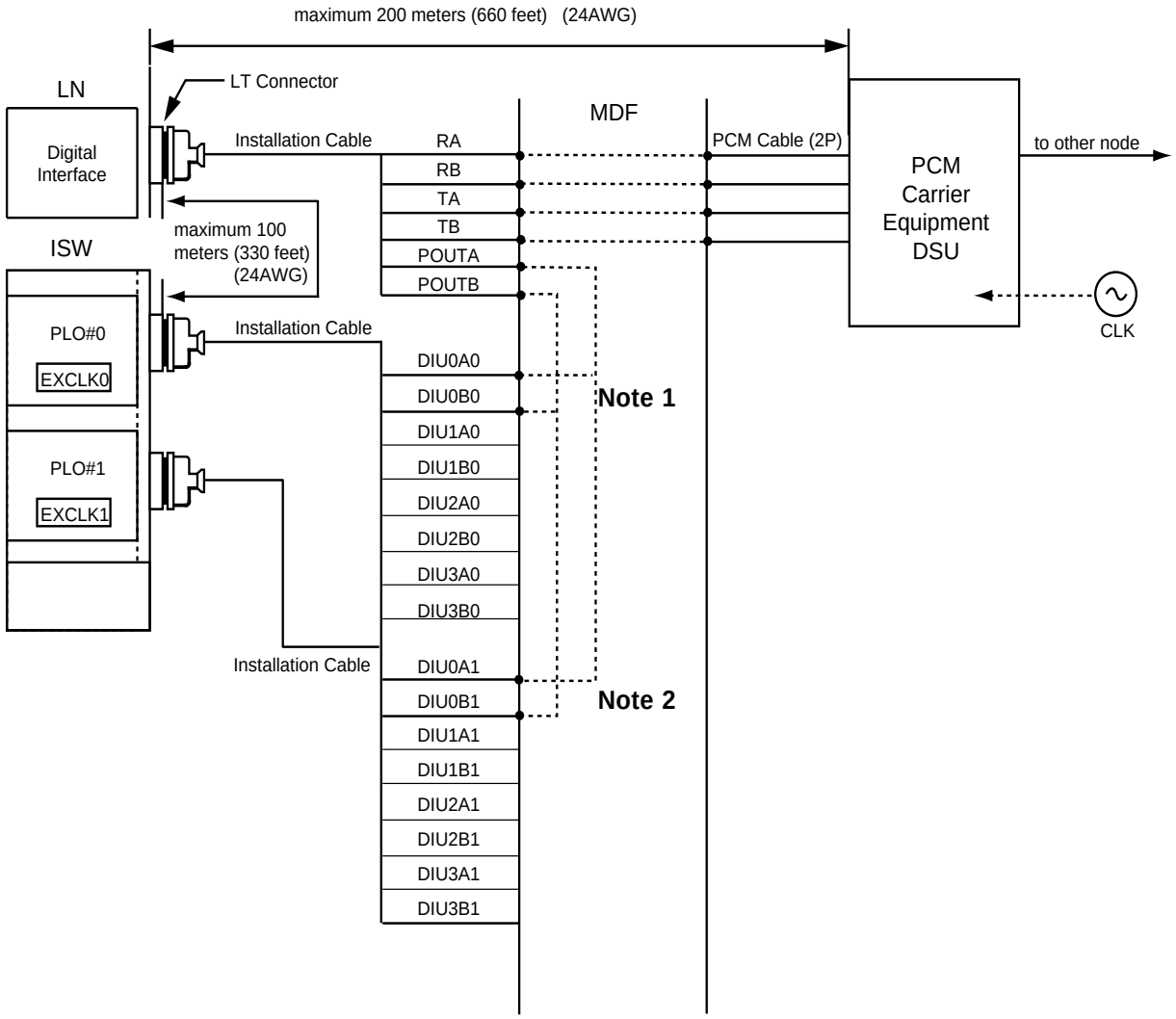


Figure 3-28 Cable Connection (ISW) for Accepting Synchronization Clocks from an External Oscillator

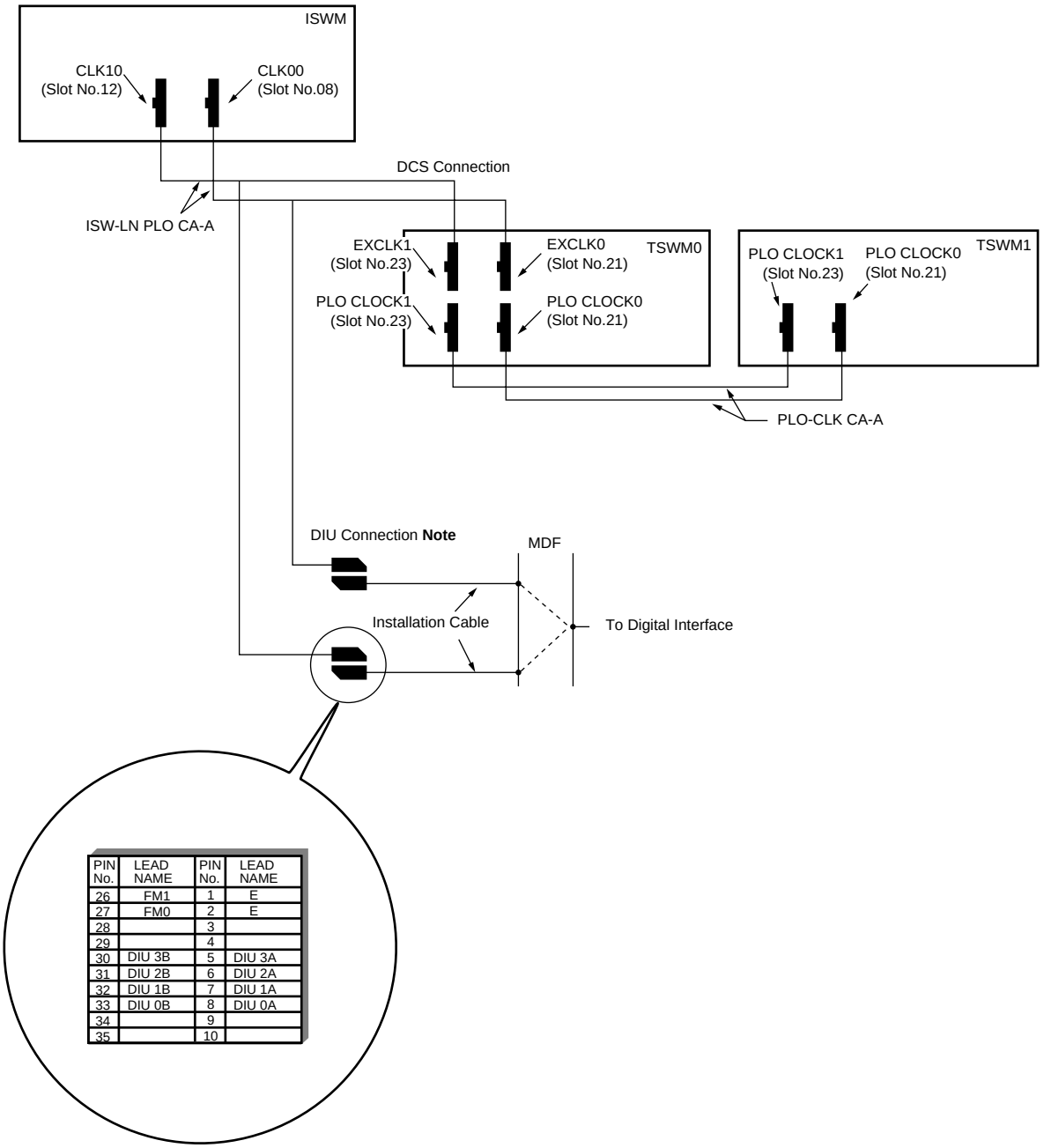
This figure shows an example of distributing clock from a digital interface in LN. This example assumes that the Digital Trunk POUT leads are used as the first clock distribution route.



Note 1: *PLO has a maximum 4 inputs. DIU0xx leads are used for the 1st clock distribution routes. DIU3xx leads are used for the 4th. The first input has the highest priority.*

Note 2: *The connection is required for a dual PLO system.*

Figure 3-29 Cable Connection Diagram (ISW) for Receiving Clock from Digital Interface

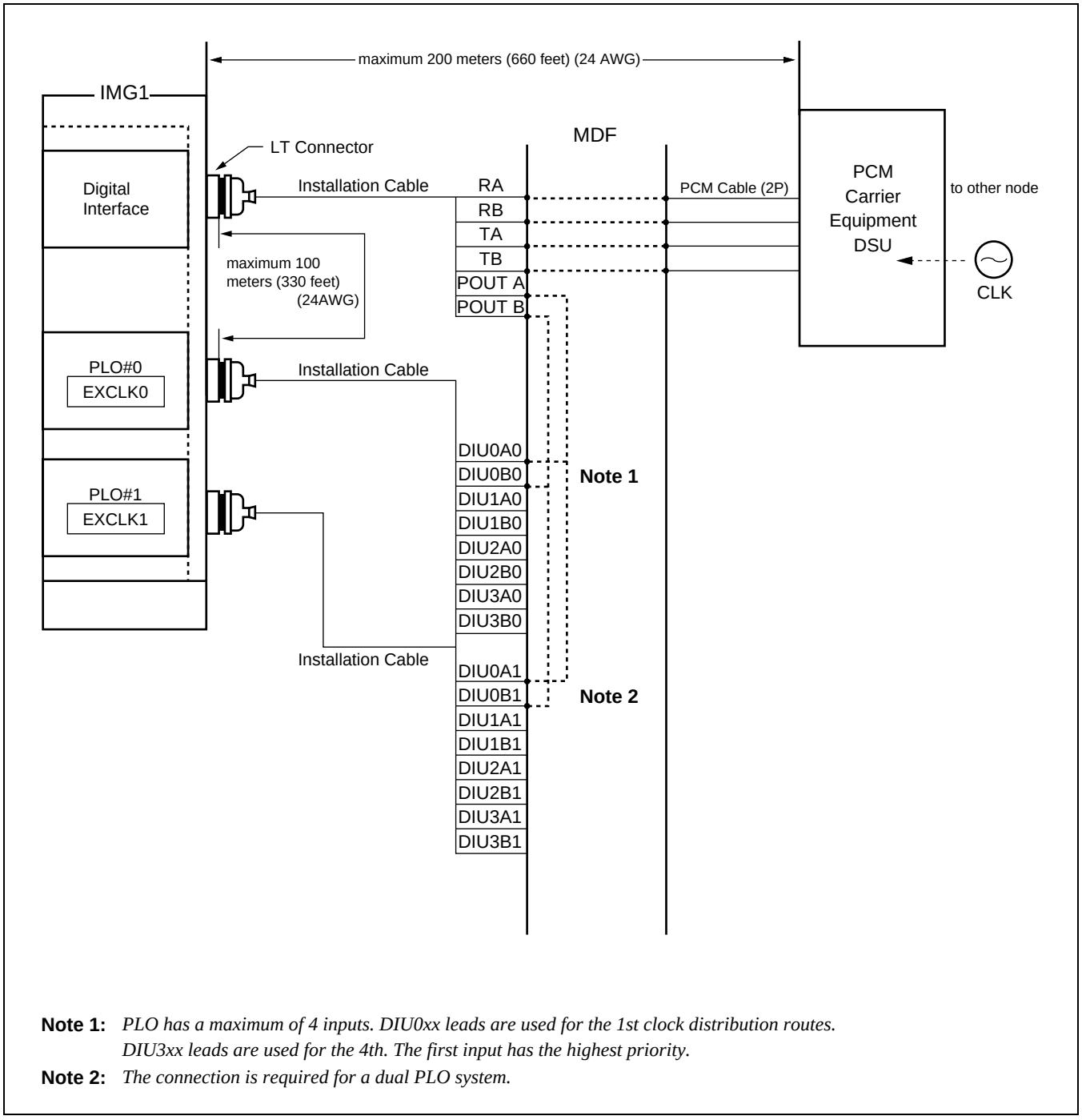


PIN No.	LEAD NAME	PIN No.	LEAD NAME
26	FM1	1	E
27	FM0	2	E
28		3	
29		4	
30	DIU 3B	5	DIU 3A
31	DIU 2B	6	DIU 2A
32	DIU 1B	7	DIU 1A
33	DIU 0B	8	DIU 0A
34		9	
35		10	

Note: *For DIU connection route diagram, see the figure on the next page.*

Figure 3-30 LT Connector Lead Location of PLO (ISW-LN0)

Figure 3-31 shows an example of distributing clock from a digital interface. This figure assumes that the Digital Trunk POUT leads are used as the first clock distribution route.



Note 1: *PLO has a maximum of 4 inputs. DIU0xx leads are used for the 1st clock distribution routes. DIU3xx leads are used for the 4th. The first input has the highest priority.*

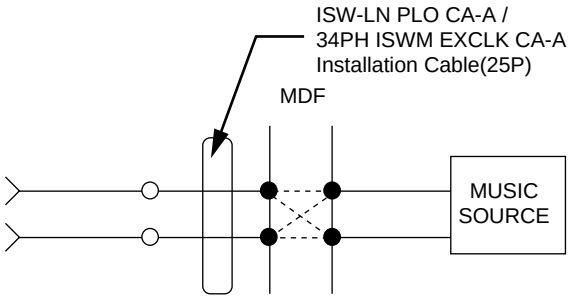
Note 2: *The connection is required for a dual PLO system.*

Figure 3-31 Cable Connection Diagram (4-IMG System/LN) for Receiving Clock from Digital Interface

ISW-LN PLO CA-A cable/
34PH ISWM EXCLK CA-A
Pin Assignment

PIN No.	LEAD NAME	PIN No.	LEAD NAME
26	FM1	1	E
27	FM0	2	E
28		3	
29		4	
30		5	
31		6	
32		7	
33		8	
		9	

Note

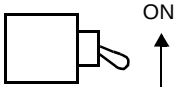
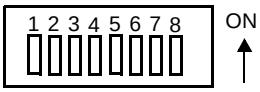
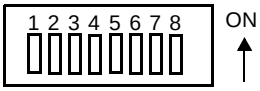
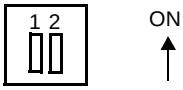
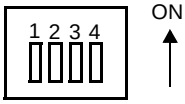
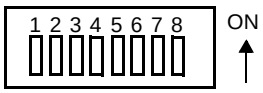


Multiple connections between the systems 0 and 1 are required on the MDF.

Note: *FM1 is not used at this time.*

Figure 3-32 Connection of External Music-On-Hold

7. Switch Setting Sheet

SWITCH NAME	SWITCH SHAPE	
MB		
SW01		
SW02		
SW03		
SW10		
SW11		
SW12		

PH-CK18
Clock

1. General Function

   This circuit card is used for the Local Node of the IMX-U system. The main function of this circuit card is to supply basic clock signals to the system. This card receives clock signals from the Phase Lock Oscillator (PLO) located in TSWM0 of IMG1, distributing the following signals to the Time Division Switch (TSW) located in TSWM1 of IMG2.

   - 32.768 MHz CLK
   - 8 KHz FH
   - 5 msec × "n" FH (for Wireless System)

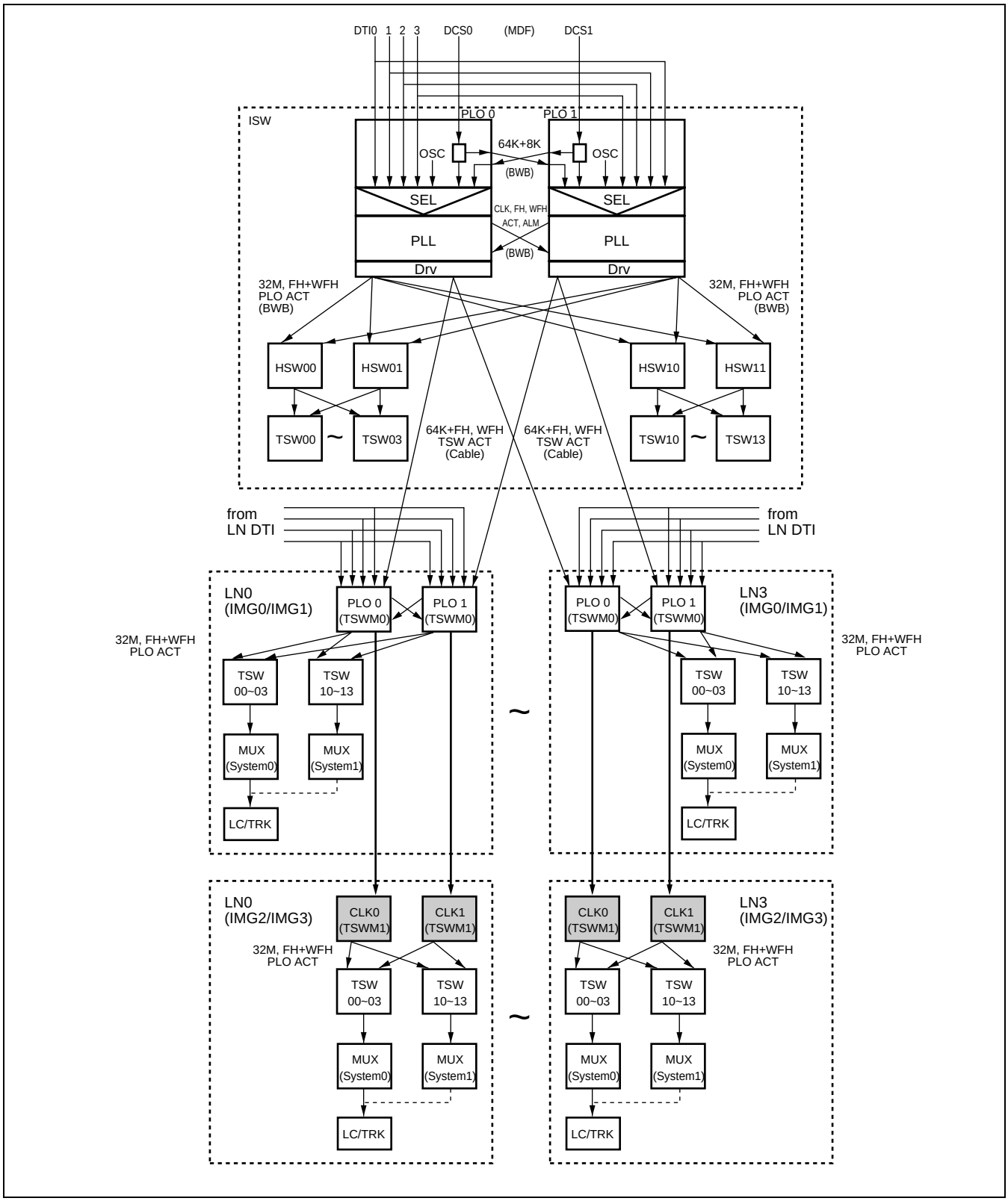


Figure 3-33 Location of PH-CK18 (CLK)

2. Mounting Location/Condition

   Mounting locations for this circuit card are shown below.

Mounting Module	**TSWM1 (IMG2)**

00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
																					CLK (#0)		CLK (#1)

3. Face Layout of Lamps, Switches, and Connectors

   The face layout of each lamp and switch on this circuit card is shown in Figure 3-34.

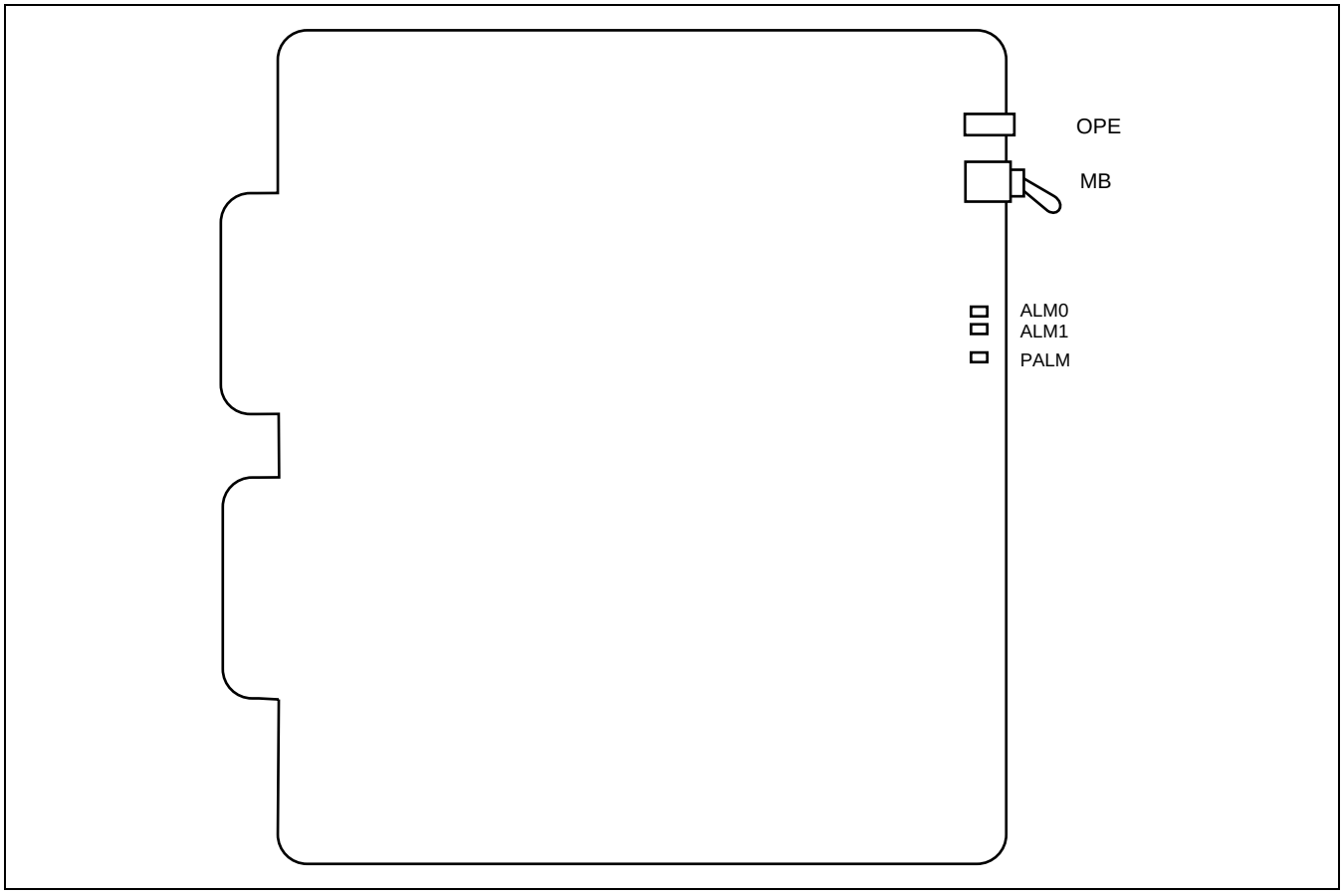


Figure 3-34 Face Layout of PH-CK18 (CLK)

4. Lamp Indications

Lamp indications for this circuit card are shown below:

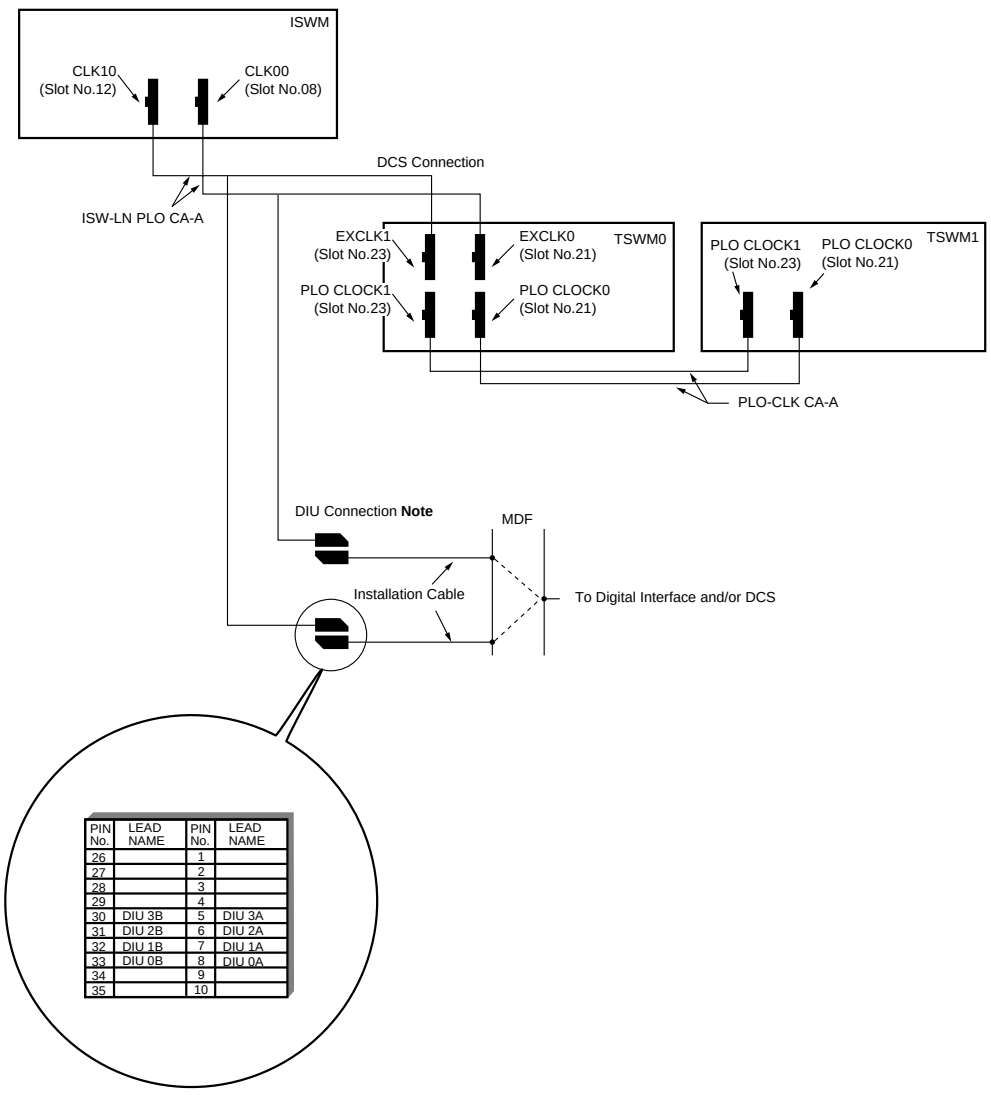
LAMP	COLOR	MEANING
OPE	Green	Lights when this circuit card is in ACT state.
ALM 0	Red	Lights when clock signal failure has occurred.
ALM 1	Red	Lights when Frame Head signal failure has occurred.
PALM	Red	Lights when the On Board Power Supply failure has occurred.

5. Switch Settings

Switch settings for this circuit card are shown below.

SWITCH NAME	SETTING	STANDARD SETTING	MEANING
MB	ON		Circuit card Make-busy.
	OFF	×	Circuit card Make-busy cancel.

6. External Interface

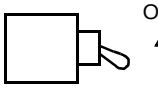


PIN No.	LEAD NAME	PIN No.	LEAD NAME
26		1	
27		2	
28		3	
29		4	
30	DIU 3B	5	DIU 3A
31	DIU 2B	6	DIU 2A
32	DIU 1B	7	DIU 1A
33	DIU 0B	8	DIU 0A
34		9	
35		10	

Note: *For DIU connection route diagram, see the figure on the next page.*

Figure 3-35 LT Connector Lead Location (ISW-LN0)

7. Switch Setting Sheet

SWITCH NAME	SWITCH SHAPE	REMARKS
MB		

PA-CS08
Hotel Attendant Interface

1. General Function

This circuit card is the Hotel Attendant Console (Hotel ATTCON) interface card that supports the interface function for the Hotel ATTCON (maximum two sets of Hotel ATTCON per card), PM function (controlling of Hotel ATTCON and exchanging of control commands with the CPU), PB/DP sending function (sending of PB signals or DP signals under control of the PM), receiving data (Hotel ATTCON Call Termination Information) link interface function, etc.

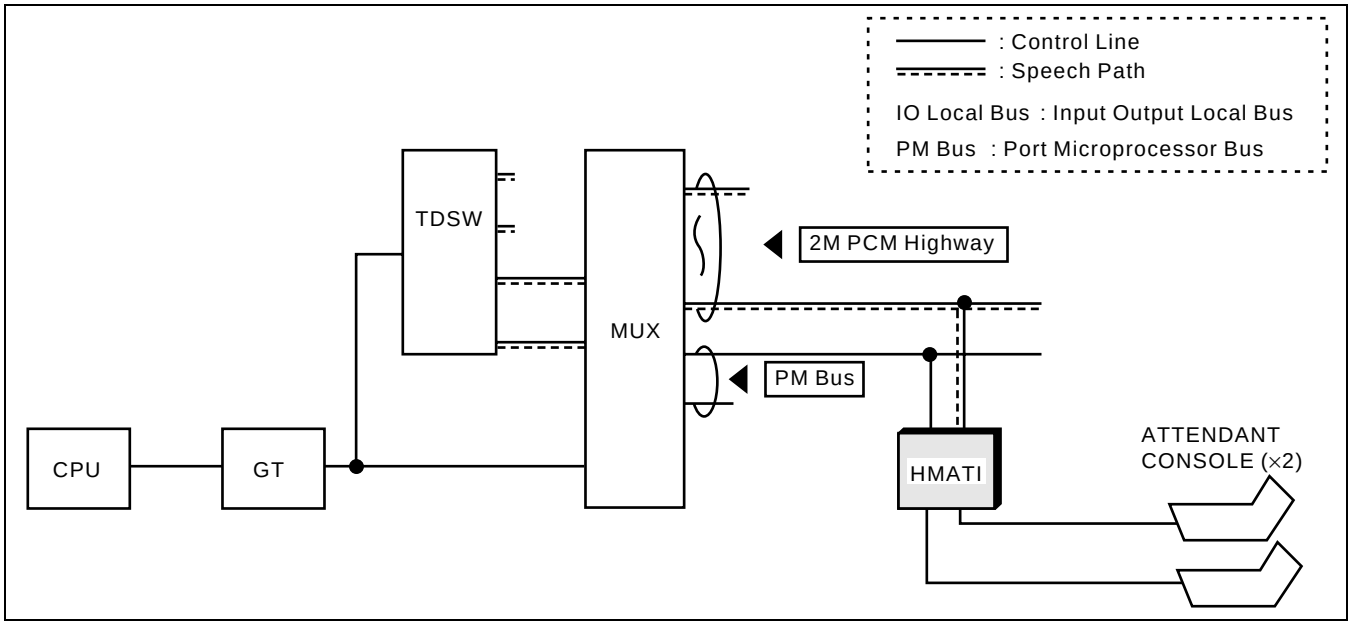
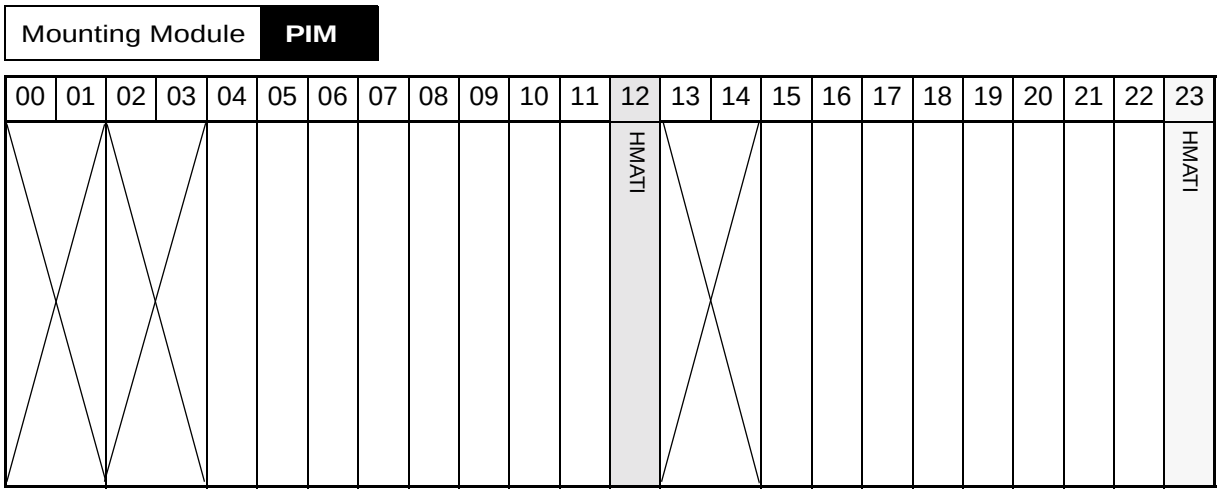


Figure 3-36 Location of PA-CS08-B (HMATI) Card in the System

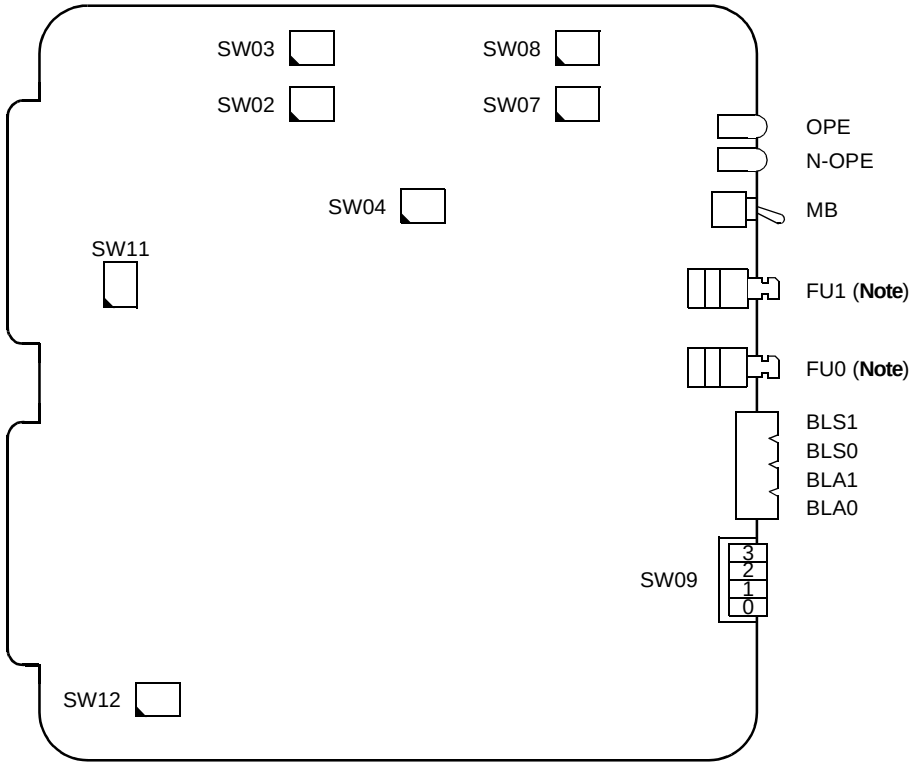
2. Mounting Location/Condition

The PA-CS08-B (HMATI) card can be mounted in the shaded slots as shown below.



3. Face Layout of Lamps, Switches, and Connectors

The face layout of lamps, switches, and connectors on this circuit card is shown in Figure 3-37.



Note: *When extracting/inserting this card, care should be taken as to the FU0, FU1.*

<Extraction> ① MB key → ON ② Remove the FU0 and FU1. ③ Extract this card.
<Insertion> ① Mount this card without the FU0 and FU1. ② Plug in the FU0 and FU1. ③ MB key → OFF

Figure 3-37 Face Layout of HMATI Card

4. Lamp Indications

Lamp indications for this circuit card are shown in the table below.

LAMP	COLOR	STATE
OPE	Green	Remains lit while this circuit card is operating.
N-OPE	Red	Remains lit while this circuit card is in Make-busy state.
BLS0 BLS1	Red	Lights when the corresponding circuit is busy.
	Blink	Blinks when the corresponding circuit is busy. **Note:** *The lamp also blinks when dial signals are being sent out.*

LAMP	COLOR	STATE
BLA0 BLA1	Red	Lights when the corresponding circuit is busy.
	Blink	Blinks when the corresponding circuit is in Make-busy state.

5. Switch Settings

Standard settings for various switches on this circuit card are shown in the table below.

SWITCH	SWITCH NO.	SETTING	STANDARD SETTING	MEANING
MB		UP		Circuit card Make-busy.
		DOWN		Circuit card Make-busy cancel.
SW02 (TAS0) SW03 (TAS1)	1			**SETTING OF TAS SIGNALLING SYSTEM**
	2			
	3			
	4			
SW04	1	ON	×	Fixed
	2	OFF	×	Fixed
	3	ON	×	Fixed
	4	OFF	×	Fixed
SW07 (TAS0) SW08 (TAS1)	1			
	2			
	3			
	4			

SETTING OF TAS SIGNALLING SYSTEM

SWITCH	TAS (A WIRE)	TAS (B WIRE)
1	-48V	G
2	CR	G
3	G	G
4	LOOP	LOOP

SETTING OFTAS CURRENT LIMIT RESISTANCE

SW7-1/ SW8-1	SW7-2/ SW8-2	SW7-3/ SW8-3	SW7-4/ SW8-4	RESISTANCE
ON	ON	ON	OFF	0 **Ω**
OFF	ON	ON	OFF	200 **Ω**
ON	OFF	ON	OFF	390 **Ω**
OFF	OFF	ON	OFF	590 **Ω**
ON	ON	OFF	OFF	820 **Ω**
OFF	ON	OFF	OFF	1020 **Ω**
ON	OFF	OFF	OFF	1210 **Ω**
OFF	OFF	OFF	OFF	1410 **Ω**

SWITCH	SWITCH NO.	SETTING	STANDARD SETTING	MEANING
SW11	1	ON		
		OFF	×	Fixed
	2	ON		
		OFF	×	Fixed
	3	ON		
		OFF	×	Fixed
	4	ON		
		OFF	×	Fixed
SW12	1	ON	×	Fixed (all ON).
		OFF		
	2	ON	×	
		OFF		
	3	ON	×	
		OFF		
	4	ON	×	
		OFF		
SW9	0	ON		No. 0 System is in Make-busy request.
		OFF	×	Normal setting.
	1	ON		No. 1 System is in Make-busy request.
		OFF	×	Normal setting
	2	OFF	×	Not used
	3	OFF	×	Not used

Note: *When the PB signal is sent from the Hotel ATT, set the SW 12-1~4 ON, and assign AHSY command, INDEX 114, b7 = I.*

6. External Interface

The location for the LT connector leads for this circuit card is shown in Figure 3-38.

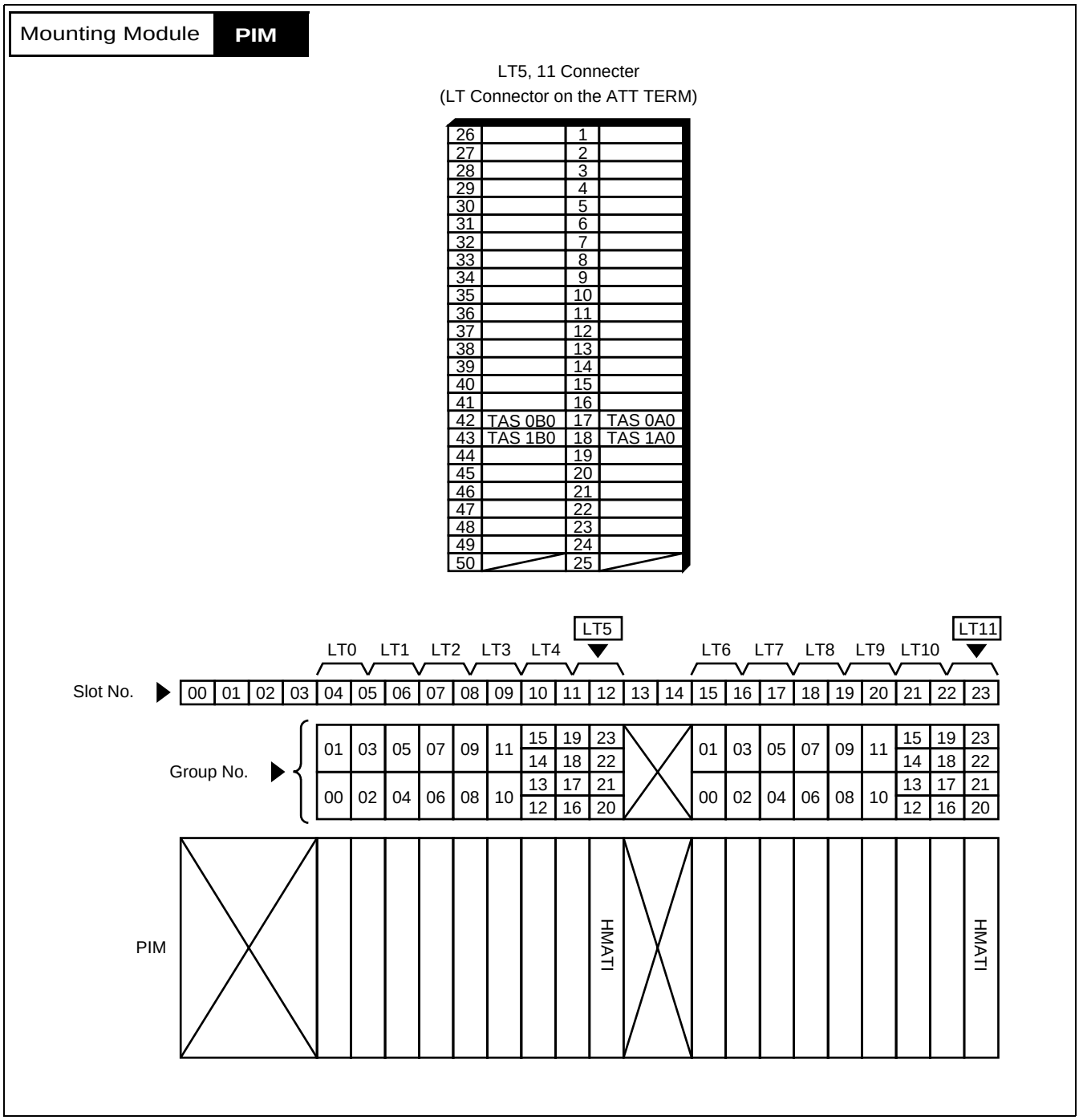
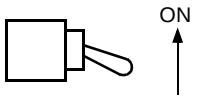
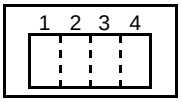
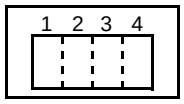
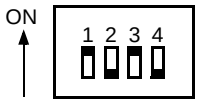
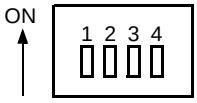
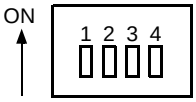
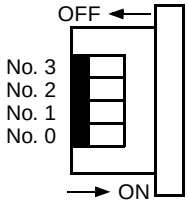
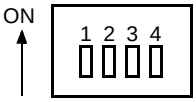
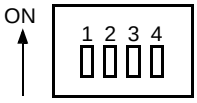


Figure 3-38 LT Connector Lead Location (PIM)

7. Switch Setting Sheet

SWITCH	SWITCH SHAPE	REMARKS
MB		UP: Circuit card Make-busy. DOWN: Circuit card Make-busy cancel.
SW02		
SW03		
SW04		
SW07		
SW08		
SW09	 (Piano Switch)	SW9-2, SW9-3: Not used.
SW11		
SW12		

PA-CS33
Attendant Interface

1. General Function

This circuit card is a Desk Console interface which supports the interface function for accommodating two sets of Desk Consoles, PB/DP sender function and Trunk Answer from any Station (TAS) function.

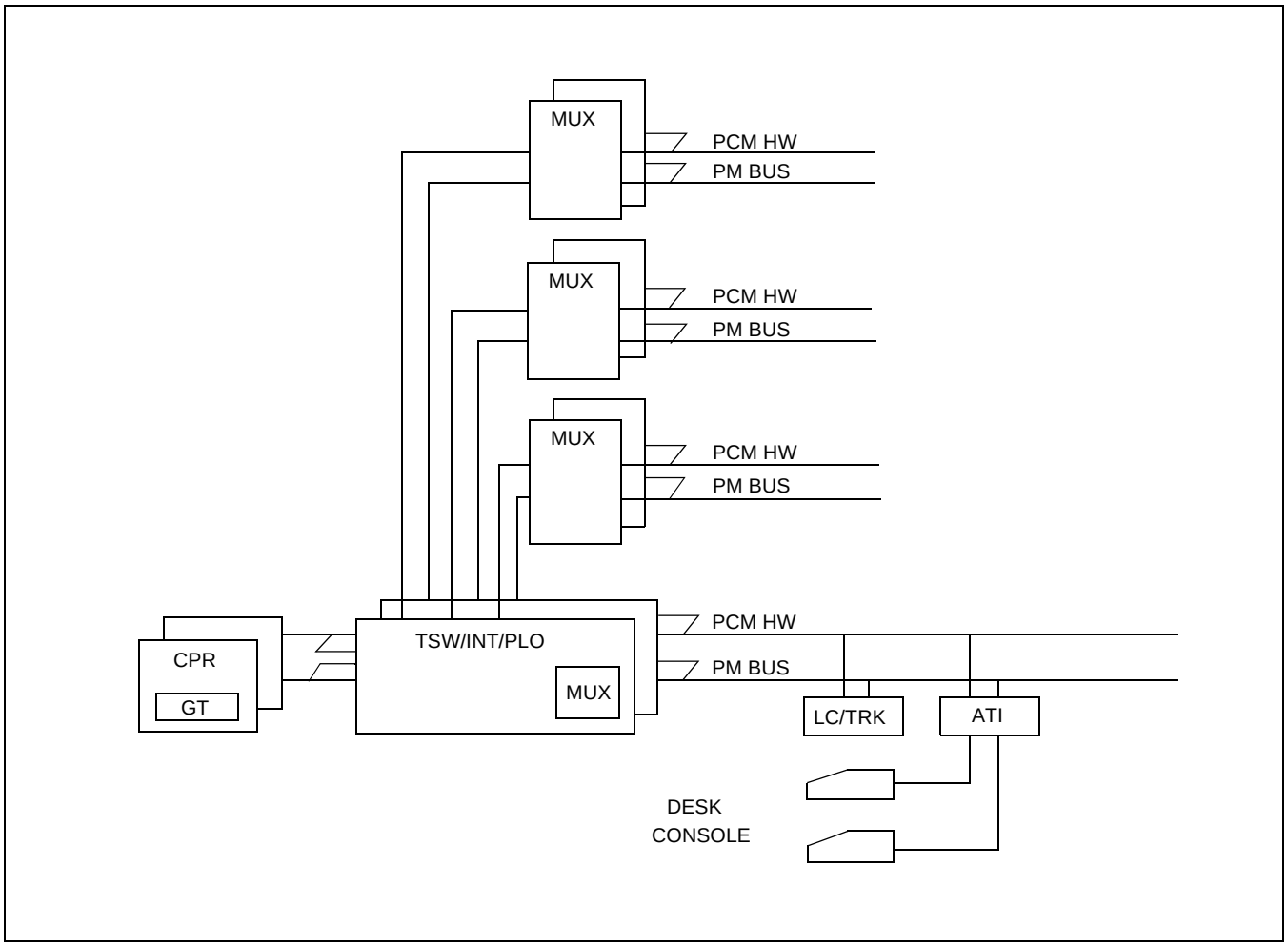
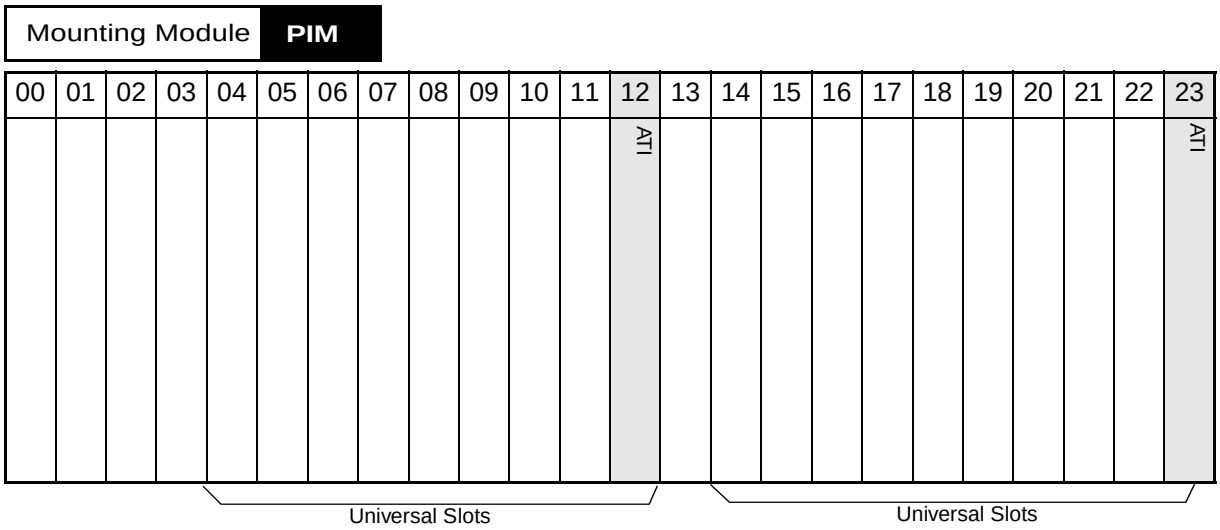


Figure 3-39 Location of PA-CS33 (ATI) Card in the System

2. Mounting Location/Condition

   The PA-CS33 (ATI) can be mounted in either Slot 12 or 23 of the PIM.



3. Face Layout of Lamps, Switches, and Connectors

   The face layout of lamps, switches and connectors is shown in Figure 3-40.

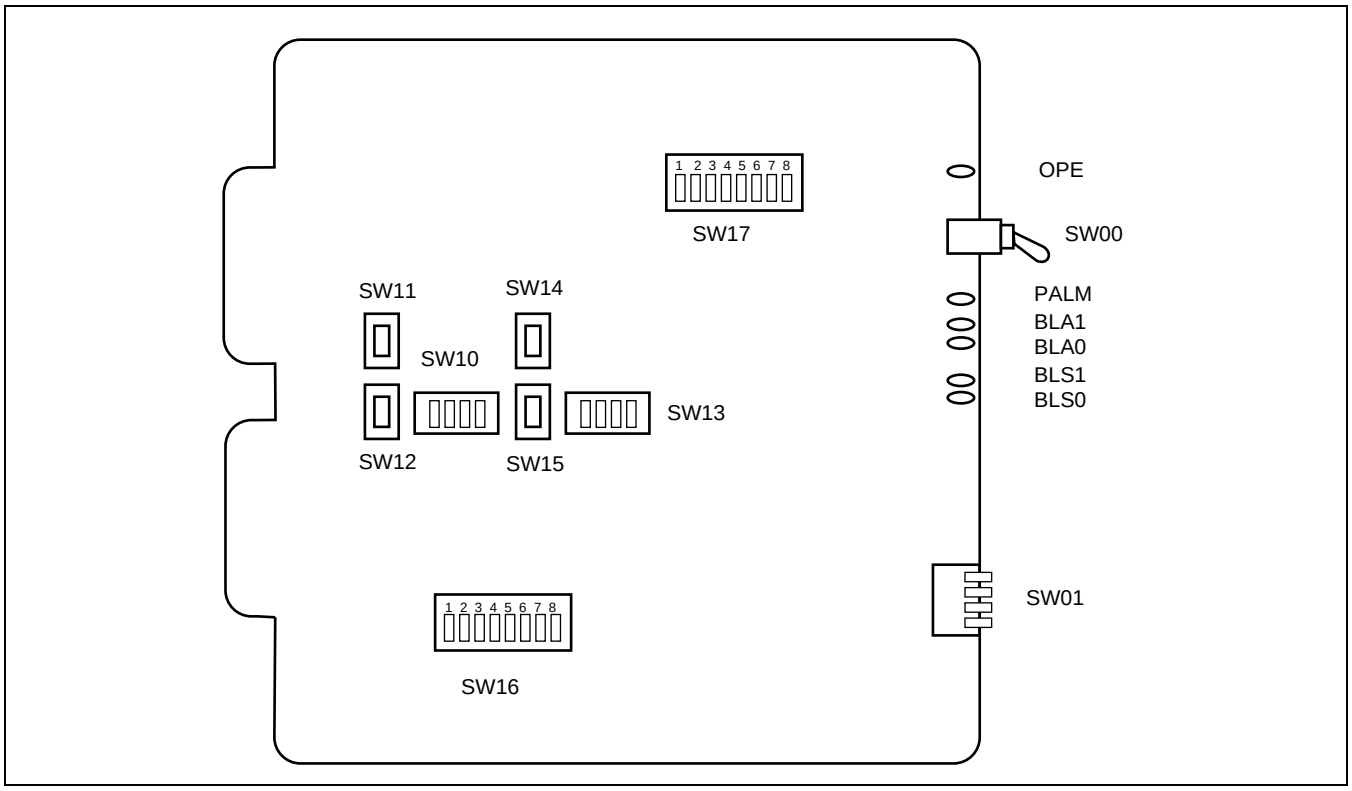


Figure 3-40 Face Layout of PA-CS33 (ATI)

4. Lamp Indications

Lamp indications for this circuit card are shown in the table below.

LAMP NAME	COLOR	STATE
OPE	Green	Remains lit while circuit card is operating normally.
	OFF	Off when circuit card is not operating.
PALM	Red	Lights when the power feeding circuit failure has occurred.
	OFF	Off when the power feeding circuit operates normally.
BLA0 BLA1	Red	Lights when the corresponding circuit busy (At the same time, turns off PA lamp on the Desk Console).
	Flash (60 IPM)	Flashes when the corresponding circuit is in Make-busy state.
	OFF	Off when the corresponding circuit is in idle (At the same time, turns onPA lamp on the Desk console).
BLS0 BLS1	Red	Lights when the corresponding sender circuit is in use.
	Flash (60 IPM)	Flashes when the corresponding sender circuit is in Make-busy state or when select signals are being transmitted.
	OFF	Off when the corresponding sender circuit is in idle.

5. Switch Setting

Standard settings for switches on this circuit card are shown in the table below.

SWITCH NAME	SETTING	STANDARD SETTING	MEANING
SW00	UP		Circuit card is Make-busy.
	DOWN	×	Circuit card is cancel for Make-busy.

SWITCH NAME	SWITCH NO	SETTING	STANDARD SETTING	MEANING
SW01	0	ON	×	Make-busy cancel for #0 Desk Console.
		OFF		Make-busy request for #0 Desk Console.
	1	ON	×	Make-busy cancel for #1 Desk Console.
		OFF		Make-busy request for #1 Desk Console.
	2	OFF	×	Not used
	3	OFF	×	Not used

SW10 (TAS#0) / SW13 (TAS#1)

SW10 and SW13 designate the current limit resistance for TAS#0 and TAS#1 respectively.

SW10-3/ SW13-3	SW10-2/ SW13-2	SW10-1/ SW13-1	STANDARD SETTING	RESISTANCE
ON	ON	ON		0 Ω
ON	ON	OFF		220 Ω
ON	OFF	ON		398 Ω
ON	OFF	OFF		618 Ω
OFF	ON	ON		800 Ω
OFF	ON	OFF		1020 Ω
OFF	OFF	ON		1198 Ω
OFF	OFF	OFF	×	1418 Ω

1	SW10 and SW13 designate the current limit resistance for TAS#0 and TAS#1 respectively.	
2		
3		
4	This switch designates theTAS signaling system in conjunction with SW 11/12 and SW14/15.	

SW11/SW12 (TAS#0) / SW14/SW15 (TAS#1)

SW11/12 and SW14/15 designate theTAS#0 andTAS#1 signaling system (in conjunction with SW10-4 (TAS#0)/SW13-4 (TAS#1).

SW12/ SW15	SW11/ SW14	SW10-4/ SW13-4	STANDARD SETTING	SIGNAL WHEN SEIZED	
				TAS 0A/ TAS 1A	TAS 0B/ TAS 1B
ON	ON	ON		CR	G
OFF	ON	ON		-48V	G
OFF	OFF	OFF	×	LOOP	LOOP
OFF	OFF	ON		G	G

<table>
<tr><th>SWITCH NAME</th><th>SWITCH NO</th><th>SETTING</th><th>STANDARD SETTING</th><th>MEANING</th></tr>
<tr><td rowspan="9">SW16</td><td>1</td><td colspan="3">For Business system, set SW16-1 and SW16-7 to OFF. When the system has Hotel application, set SW16-1 and SW16-7 according to system data as shown below.
<table>
<tr><th rowspan="2">Desk Console Key pattern to be used</th><th rowspan="2">SW16-1</th><th rowspan="2">SW16-7</th><th colspan="2">SYS 1 INDEX 160</th></tr>
<tr><th>Bit 1</th><th>Bit 0</th></tr>
<tr><td rowspan="2">Hotel type</td><td rowspan="2">ON</td><td>ON</td><td>1</td><td>1</td></tr>
<tr><td>OFF</td><td>0</td><td>1</td></tr>
<tr><td rowspan="2">Business type</td><td rowspan="2">OFF</td><td>ON</td><td>—</td><td>1</td></tr>
<tr><td>OFF</td><td>—</td><td>0</td></tr>
</table></td></tr>
<tr><td rowspan="2">2</td><td>ON</td><td></td><td>Desk Console Expanded LCD Display available.</td></tr>
<tr><td>OFF</td><td></td><td>Desk Console Expanded LCD Display not available.</td></tr>
<tr><td>3
4
5</td><td colspan="3">SW16-3/4/5 designates the nation code as showing below.
<table>
<tr><th>SW16-5</th><th>SW16-4</th><th>SW16-3</th><th>COUNTRY</th></tr>
<tr><td>ON</td><td>ON</td><td>OFF</td><td>NORTH AMERICA</td></tr>
<tr><td>ON</td><td>OFF</td><td>ON</td><td>AUSTRALIA</td></tr>
<tr><td colspan="3">Other combinations</td><td>Not used</td></tr>
</table></td></tr>
<tr><td rowspan="2">6</td><td>ON</td><td></td><td>A-law PCM coding.</td></tr>
<tr><td>OFF</td><td>×</td><td>μ-law PCM coding.</td></tr>
<tr><td>7</td><td colspan="3">Refer to SW16-1.</td></tr>
<tr><td>8</td><td>OFF</td><td>×</td><td>Not used (Fixed to OFF).</td></tr>
<tr><td rowspan="8">SW17</td><td rowspan="2">1</td><td>ON</td><td></td><td>Denial of PCM receiving while transmitting PB signals.</td></tr>
<tr><td>OFF</td><td>×</td><td>PCM receives irrespective of PB signals transmission.</td></tr>
<tr><td>2</td><td>ON</td><td>×</td><td>Fixed to ON.</td></tr>
<tr><td>3
4</td><td colspan="3">Desk Console Key Pattern. Set SW17-3 and SW17-4 according to SYS 1, Index 6.
<table>
<tr><th rowspan="2">SW17-3</th><th rowspan="2">SW17-4</th><th colspan="3">SYS 1 INDEX 6</th></tr>
<tr><th>Bit 6</th><th>Bit 5</th><th>Bit 4</th></tr>
<tr><td>OFF</td><td>OFF</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>ON</td><td>OFF</td><td>0</td><td>0</td><td>1</td></tr>
<tr><td>OFF</td><td>ON</td><td>0</td><td>1</td><td>0</td></tr>
<tr><td>ON</td><td>ON</td><td>1</td><td>0</td><td>0</td></tr>
</table></td></tr>
<tr><td>5~7</td><td>OFF</td><td>×</td><td>Fixed to OFF.</td></tr>
<tr><td rowspan="2">8
Note</td><td>ON</td><td></td><td>Start up in Night mode after circuit card initialization.</td></tr>
<tr><td>OFF</td><td>×</td><td>Start up in Day mode after circuit card initialization.</td></tr>
</table>

Note: *DESK CONSOLE starts up in Day or Night mode according to this setting after the circuit card initialization, regardless of the mode before the initialization.*

6. External Interface

Location of theLT connector leads for the DESK CONSOLE interface is as shown in Figure 3-41.

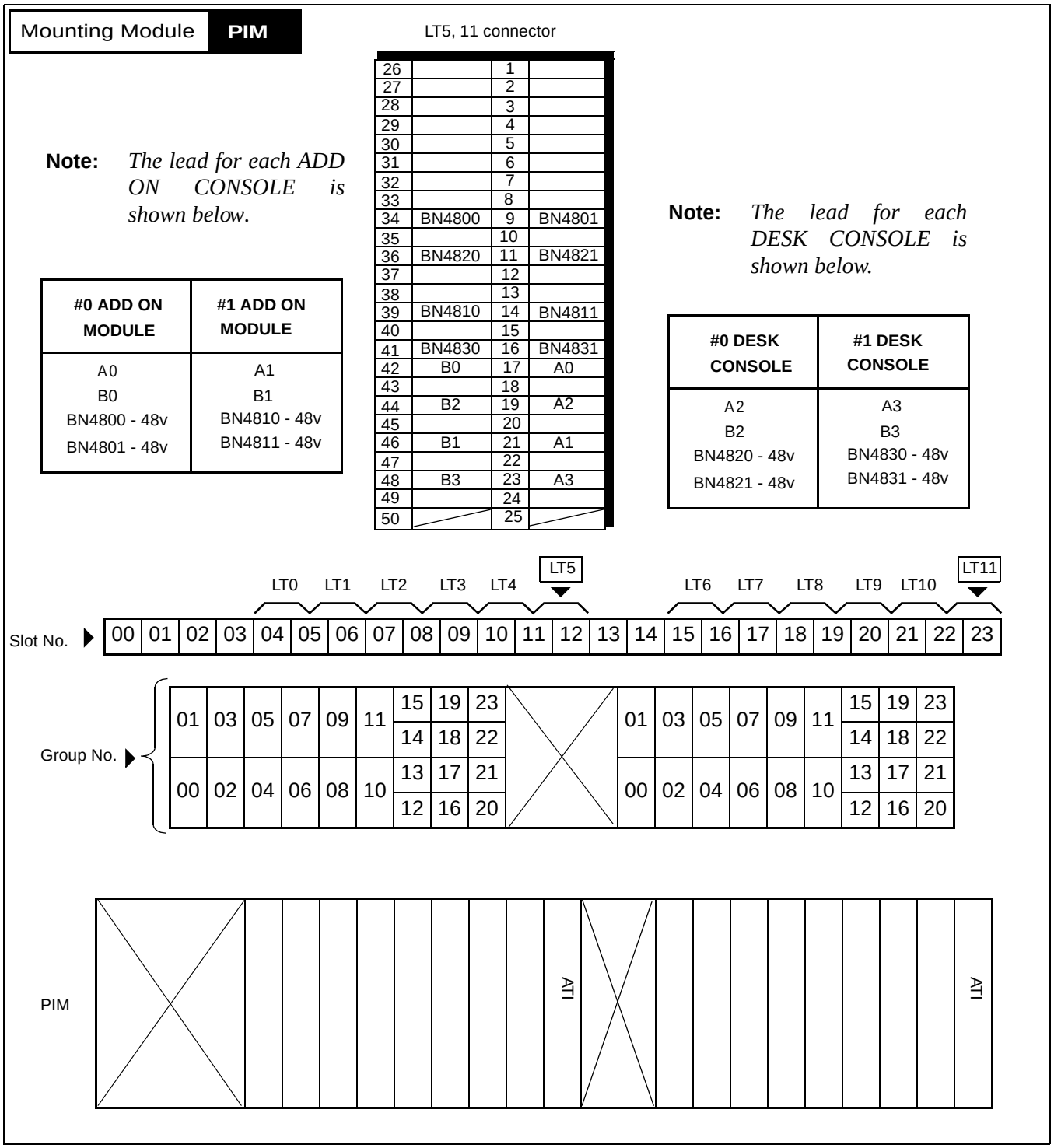


Figure 3-41 LT Connector Lead Location (PIM)

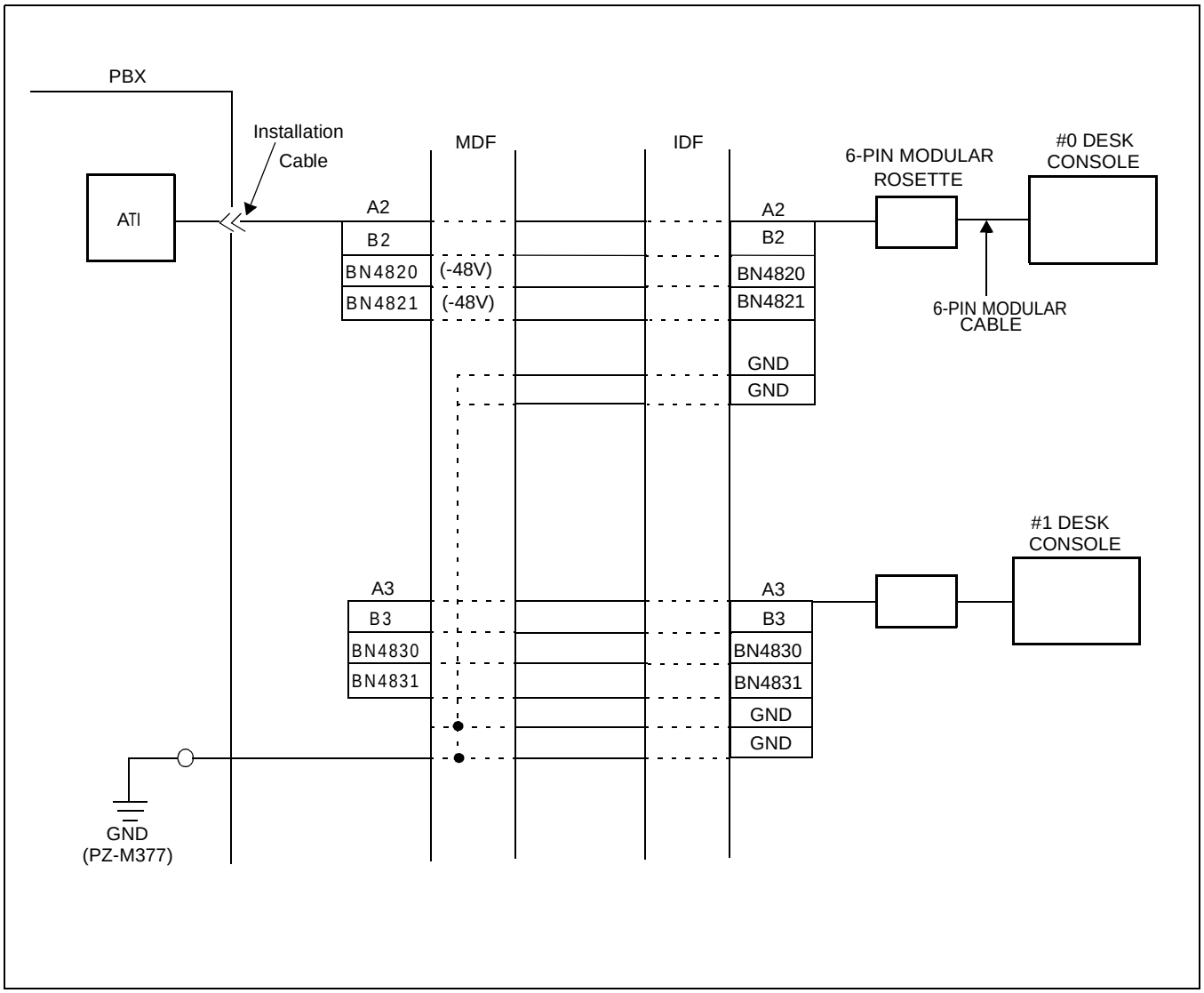
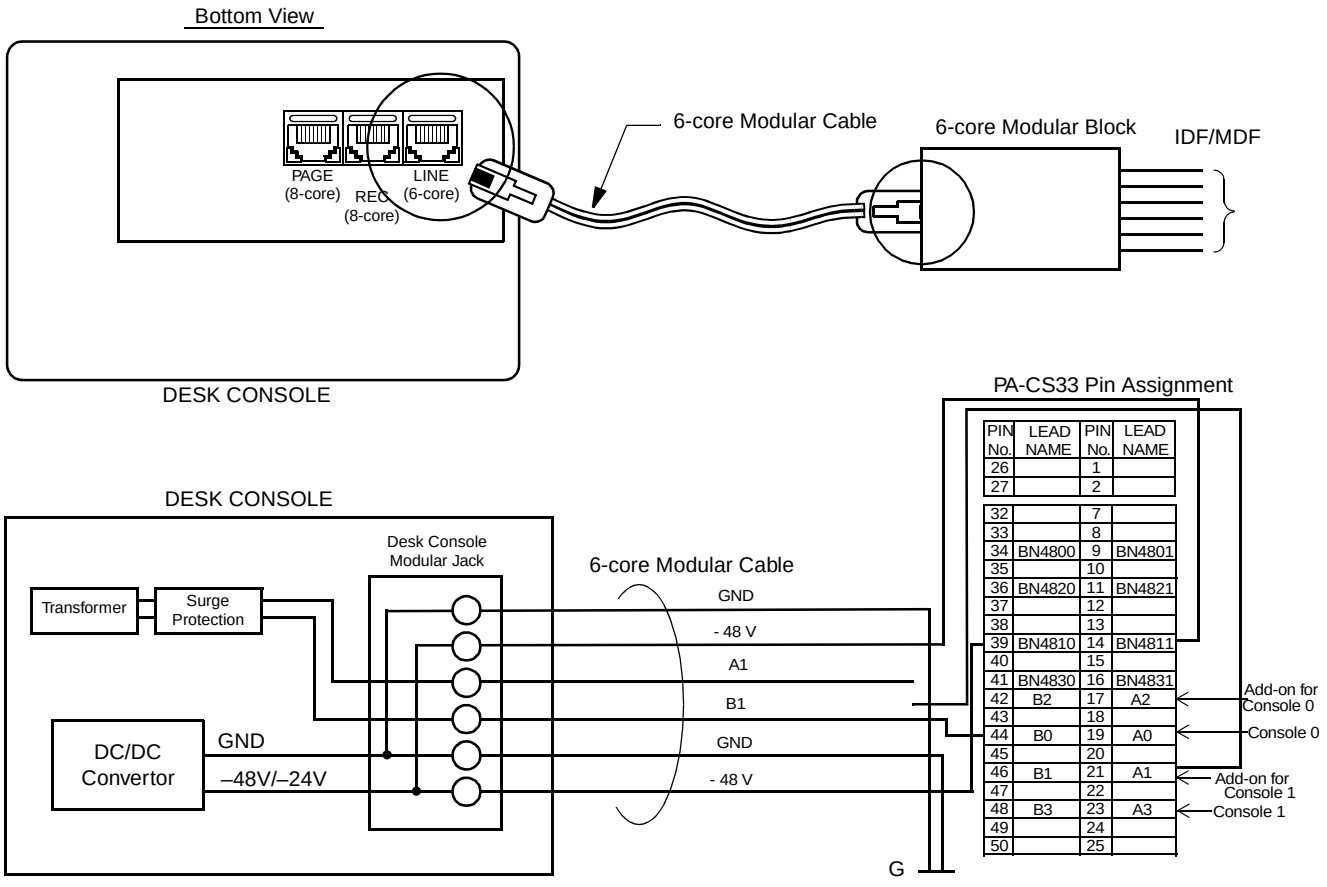


Figure 3-42 Connecting Route Diagram

Note: *The power feeding wires (BN4820/BN4821/BN4830/BN4831/GND) are not required when the power is supplied to the DESK CONSOLE locally.*

Figure 3-43 shows how to connect Desk Console.

Wire the cables to the Modular Block as shown below.



Note: *GND wires should be connected to PZ-M77. (BASE-U)*

Figure 3-43 Desk Console Connection

Power supply and the maximum distance between the ATI and Desk Console. The maximum distance between the ATI circuit card and Desk Console is as shown below.

Source	0.5 ϕ Cable	0.65 ϕ Cable
PBX	1,148 ft. (350 m)	1,640 ft. (500 m)
Local Power Supply	3,937 ft. (1,200 m)	4,921 ft. (1,500 m)

If the distance exceeds above, estimate it according to the calculations shown in Figure 3-44.

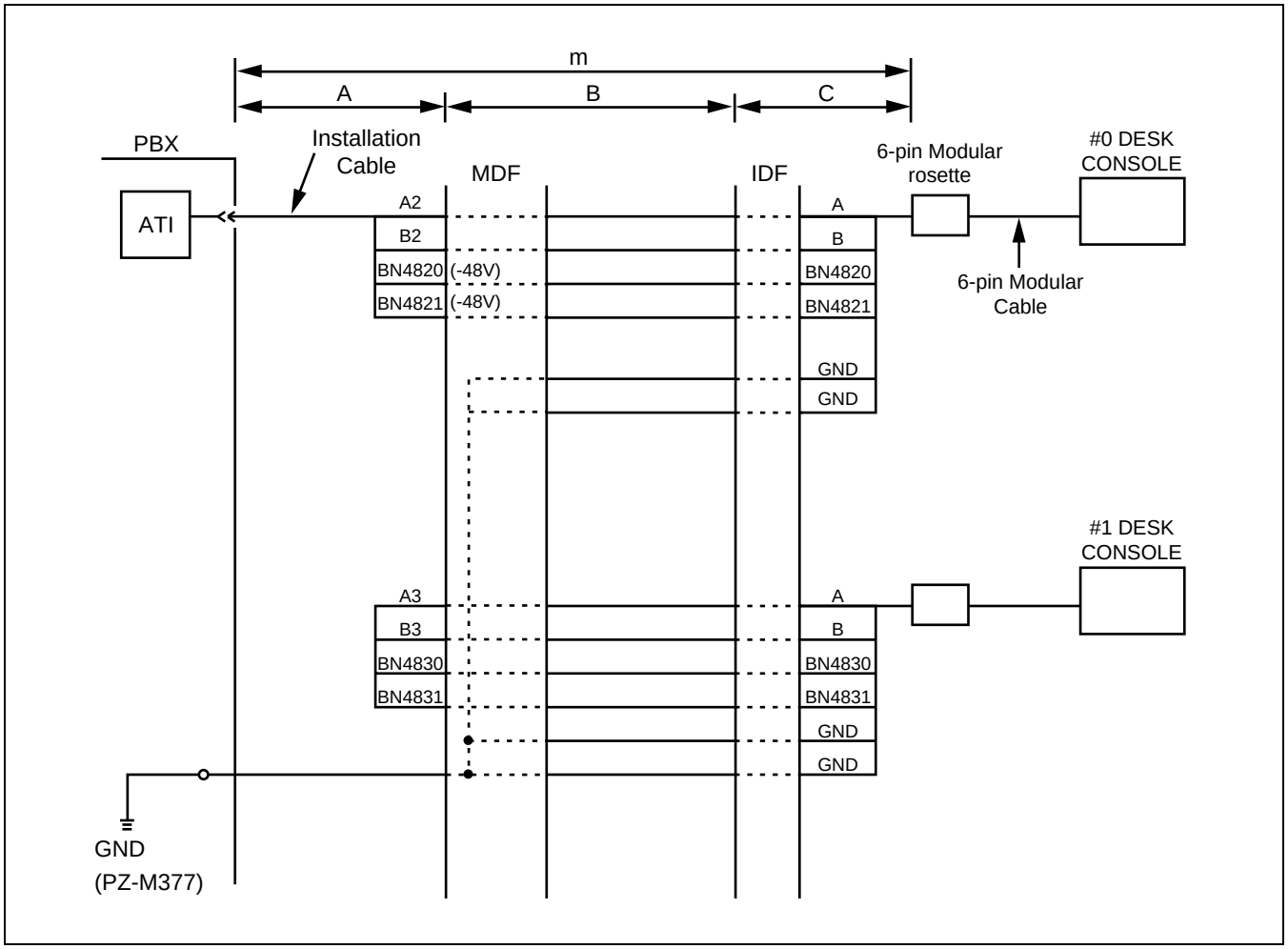


Figure 3-44 Distance between PBX and Modular Rosette of Desk Console

Calculation of the distance between the ATI circuit card and Modular Rosette
The distance M in the figure above is determined according to the Direct-Current resistance of power supply cables (-48V and GND). Note that the maximum resistance is 26 Ω as shown in the following formula:

$$m = a + b + c \leqq 26\Omega$$

m: Maximum Direct-Current resistance between the ATI circuit card and Modular Rosette
a: Direct-Current resistance of power supply cables (-48V and GND) in the range of A
b: Direct-Current resistance of power supply cables (-48V and GND) in the range of B
c: Direct-Current resistance of power supply cables (-48V and GND) in the range of C

Example of Calculation

a, b, and c are calculated by the following formulae:

Note: *You are not required to use cable lengths in meters in the following formulae. You may use cable lengths in feet, yards, or whatever units you prefer. However, the units of resistance you use must match the units of length you use. For example, if you use distance in feet, you must also use DC resistance per foot.*

$$a = \frac{\text{Cable resistance of DC -48V cables: } u\ (\Omega/m) \times x\ (m)}{\text{No. of DC -48V cables: } 2} + \frac{\text{Cable resistance on GND cables: } u\ (\Omega/m) \times x\ (m)}{\text{No. of GND cables: } 1}$$

$$b = \frac{\text{Cable resistance of DC -48V cables: } v\ (\Omega/m) \times y\ (m)}{\text{No. of DC -48V cables: } 2} + \frac{\text{Cable resistance on GND cables: } v\ (\Omega/m) \times y\ (m)}{\text{No. of GND cables: } 2}$$

$$c = \frac{\text{Cable resistance of DC -48V cables: } w\ (\Omega/m) \times z\ (m)}{\text{No. of DC -48V cables: } 2} + \frac{\text{Cable resistance on GND cables: } w\ (\Omega/m) \times z\ (m)}{\text{No. of GND cables: } 2}$$

u : DC resistance per meter in the range of A (Ω/m)

v : DC resistance per meter in the range of B (Ω/m)

w : DC resistance per meter in the range of C (Ω/m)

x : Cable length (m) in the range of A

y : Cable length (m) in the range of B

z : Cable length (m) in the range of C

The location of the LT connector leads for the TAS interface is as shown in Figure 3-45.

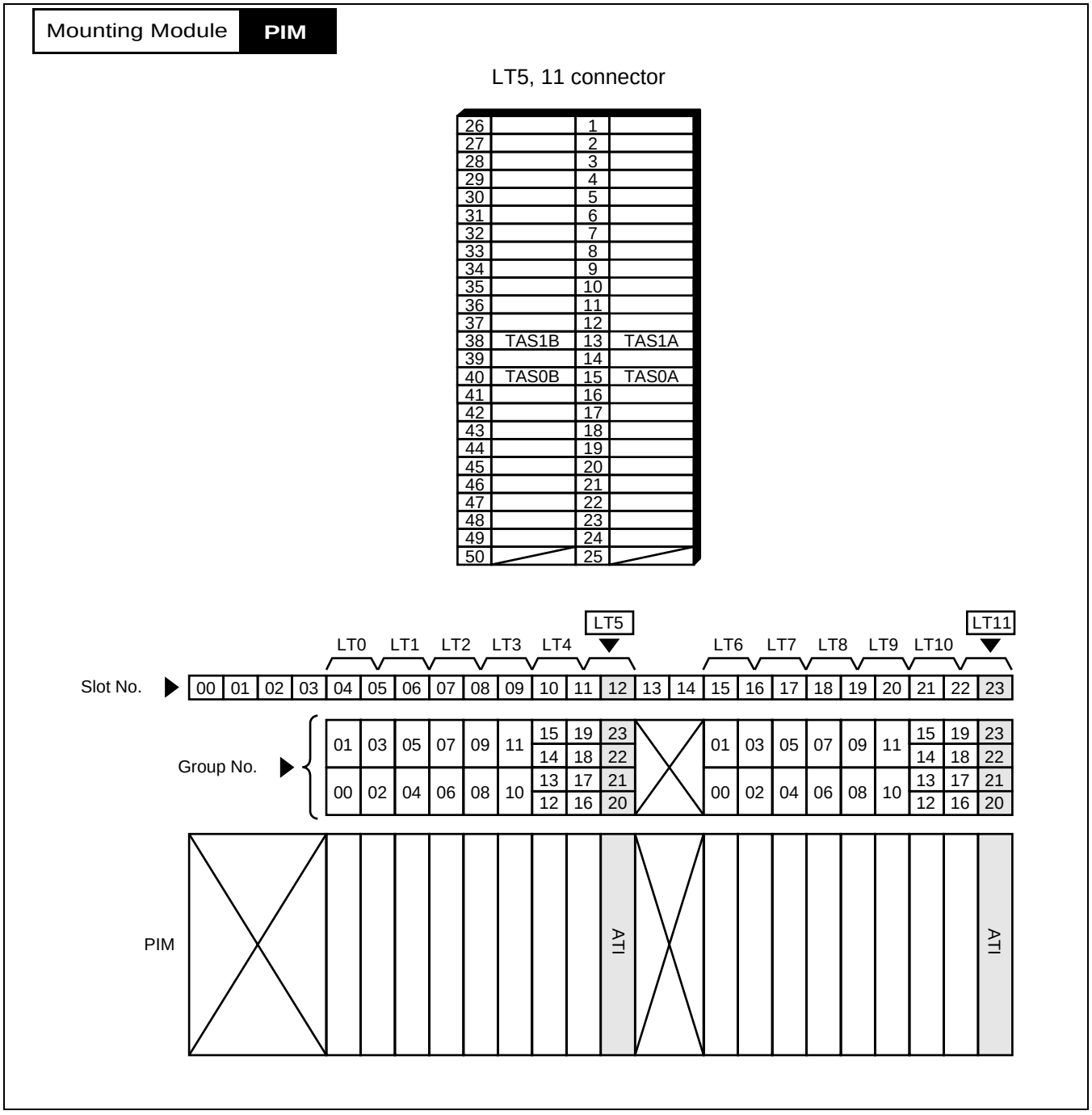
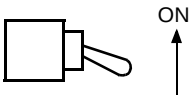
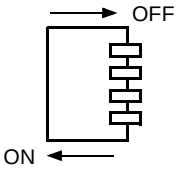
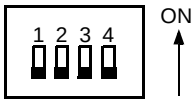
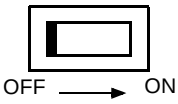
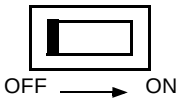
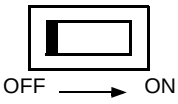
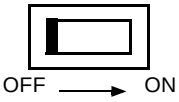
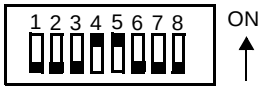
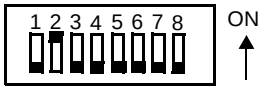


Figure 3-45 LT Connector Lead Location (PIM)

7. Switch Setting Sheet

SWITCH NAME	SWITCH SHAPE	REMARKS
SW00		
SW01		
SW10 (TAS #0)		
SW13 (TAS #1)		
SW11 (TAS #0)		
SW12 (TAS #0)		
SW14 (TAS #1)		
SW15 (TAS #1)		
SW16		
SW17		

PA-16LCBW
Line Circuit

1. General Function

The PA-16LCBW circuit card provides an interface between a maximum of 16 analog voice terminals and the system with a range of 1200 (0hm) inclusive of terminal resistance. This card also can send “Stutter Dial Tone,” which is not a continuous tone, to an associated terminal which has no Message Waiting Lamp (MWL) instead of activating the MWL if required. In addition, momentary open/reverse battery function is provided for 16 channels on this card. This is a -48V card.

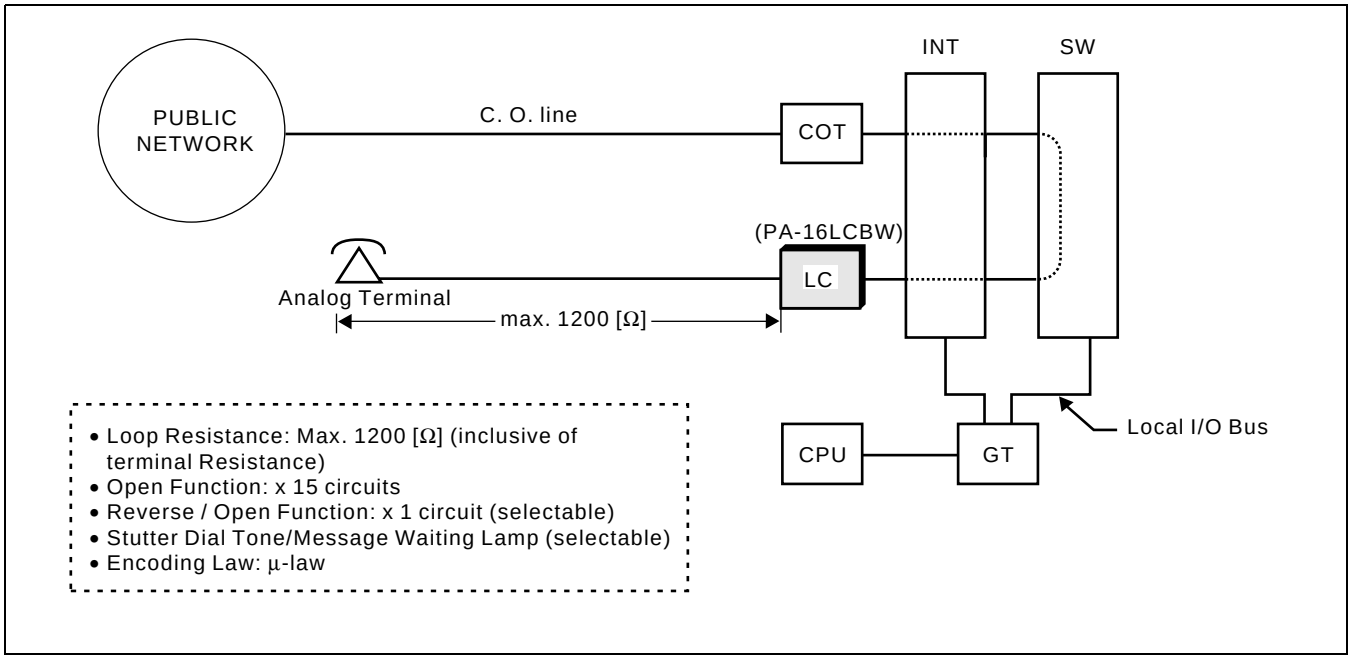


Figure 3-46 Location of PA-16LCBW (LC) within the System

2. Mounting Location/Condition

The PA-16LCBW (LC) circuit card can be mounted in the following universal slots.

Mounting Module	PIM

00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
X		X						●					X						●				

Note: ● *Indicates universal slots for line/trunk circuit cards.*

3. Face Layout of Lamps, Switches, and Connectors

The face layout of lamps, switches on this circuit card is shown in Figure 3-47.

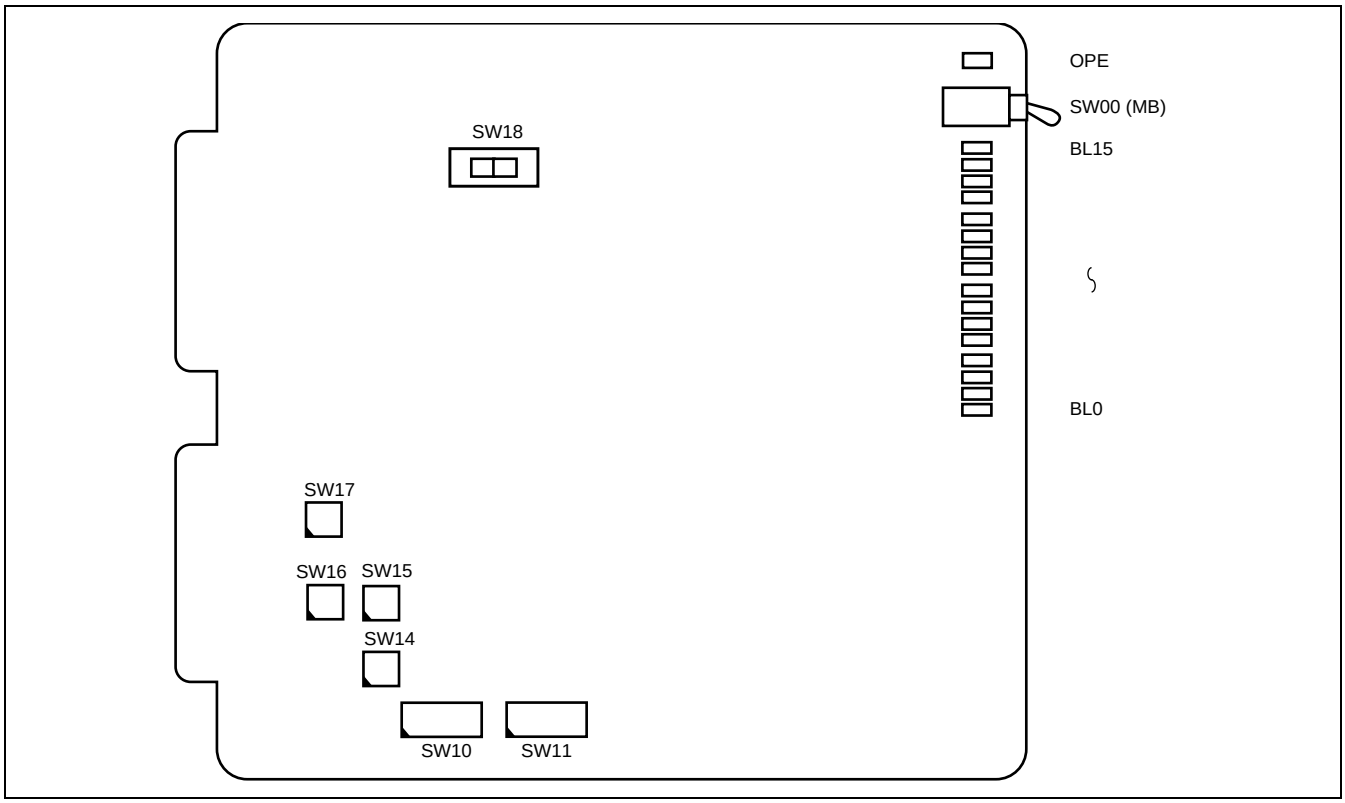


Figure 3-47 Face Layout of PA-16LCBW (LC)

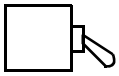
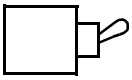
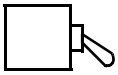
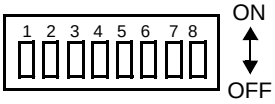
4. Lamp Indications

The contents of lamp indications of this circuit card are shown in the table below.

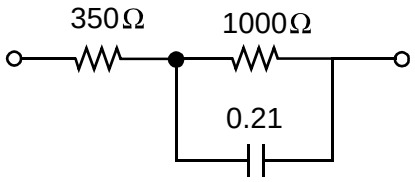
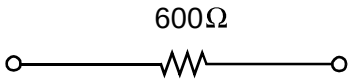
LAMP NAME	LAMP COLOR	LAMP STATUS	MEANING OF INDICATION
OPE	Green	Steady Lighting	The circuitry of the circuit card is operating normally.
BL0 ~ BL15	Green	Steady Lighting	Line loop exists.
		Flashing	1) Ringing signal is being transmitted. Busy Lamp keeps flashing in synchronizing with on/off of the ringing signal. 2) Dial pulses are being received. While dial pulses from a line are being received, Busy Lamp keeps flashing in synchronizing with the dial pulses coming from the line. 3) Line is in make-busy state. Busy Lamp keeps flashing at 60 ipm.

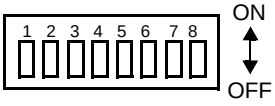
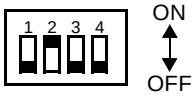
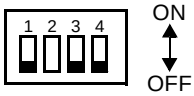
5. Switch Settings

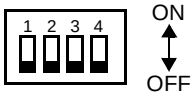
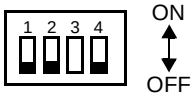
Switches on the PA-16LCBW card have the following meanings.

SWITCH	FUNCTION	SWITCH SETTING		MEANING
SW00 (MB) 	Circuit Card Make-busy Key	ON		Circuit card make-busy
		OFF		Circuit card make-busy cancel (normal operating mode)
SW10 (BNW0-7) 	Balancing Net-work Designation • Each element on this switch corre-sponds to circuit #0-#7.	ON		North America, Other Country (μ Law) BNW: Compromise Impedance (EIA/TIA-464A) **(Note)** for long distance.
		OFF		North America, Other Country (μ Law) BNW: 600 Ω **(Note)** for short distance

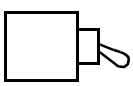
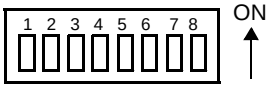
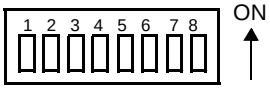
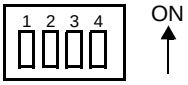
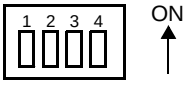
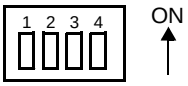
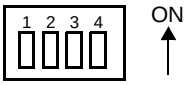
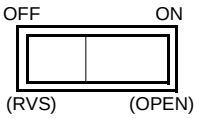
Note: *Compromise Impedance (EIA/TIA-464B) and 600Ω.*
(For North America, Other Country (μ Law))

ON	OFF
 Compromise Impedance (EIA/TIA-464B)	

SWITCH	SWITCH No.	FUNCTION	SWITCH SETTING	MEANING
SW11 (BNW8-15) 		Balancing Network Designation • Each element on this switch corresponds to Circuit #8-#15.	(This same as previous page)	
SW14 	1		OFF	Fixed to OFF
	2		ON	Fixed to ON
	3		OFF	Fixed to OFF
	4		OFF	Fixed to OFF
SW15 	1		OFF	Fixed to OFF
	2		ON	Stutter Dial Tone Available
			OFF	Stutter Dial Tone not Available
	3		OFF	Fixed to OFF
	4		OFF	Fixed to OFF

SWITCH	No.	FUNCTION	SWITCH SETTING	MEANING
SW16 	1		OFF	Fixed to OFF
	2		OFF	Fixed to OFF
	3		OFF	Fixed to OFF
	4		OFF	Fixed to OFF
SW17 	1		OFF	Fixed to OFF
	2		OFF	Fixed to OFF
	3	Message Waiting Lamp	ON	Message Waiting Lamp Flashing (Controlled by Firmware)
			OFF	Message Waiting Lamp lit or Flashing (Selected and Controlled by Software)
	4		OFF	Fixed to OFF
SW18  Slide switch	Polarity reverse or Momentary Open (Circuit #15 Only)		ON	Momentary open
			OFF	Polarity reverse

6. Switch Setting Sheet

MODULE	SLOT No.	SWITCH NAME	SWITCH SHAPE	REMARKS
PIM		SW00 (MB)		**Note:** *Normal operating mode is down.*
		SW10 (BNW0-7)		
		SW11 (BNW8-15)		
		SW14		
		SW15		
		SW16		
		SW17		
		SW18		

7. External Interface

Accommodation of theLT connector leads for this circuit card is shown in Figure 3-48.

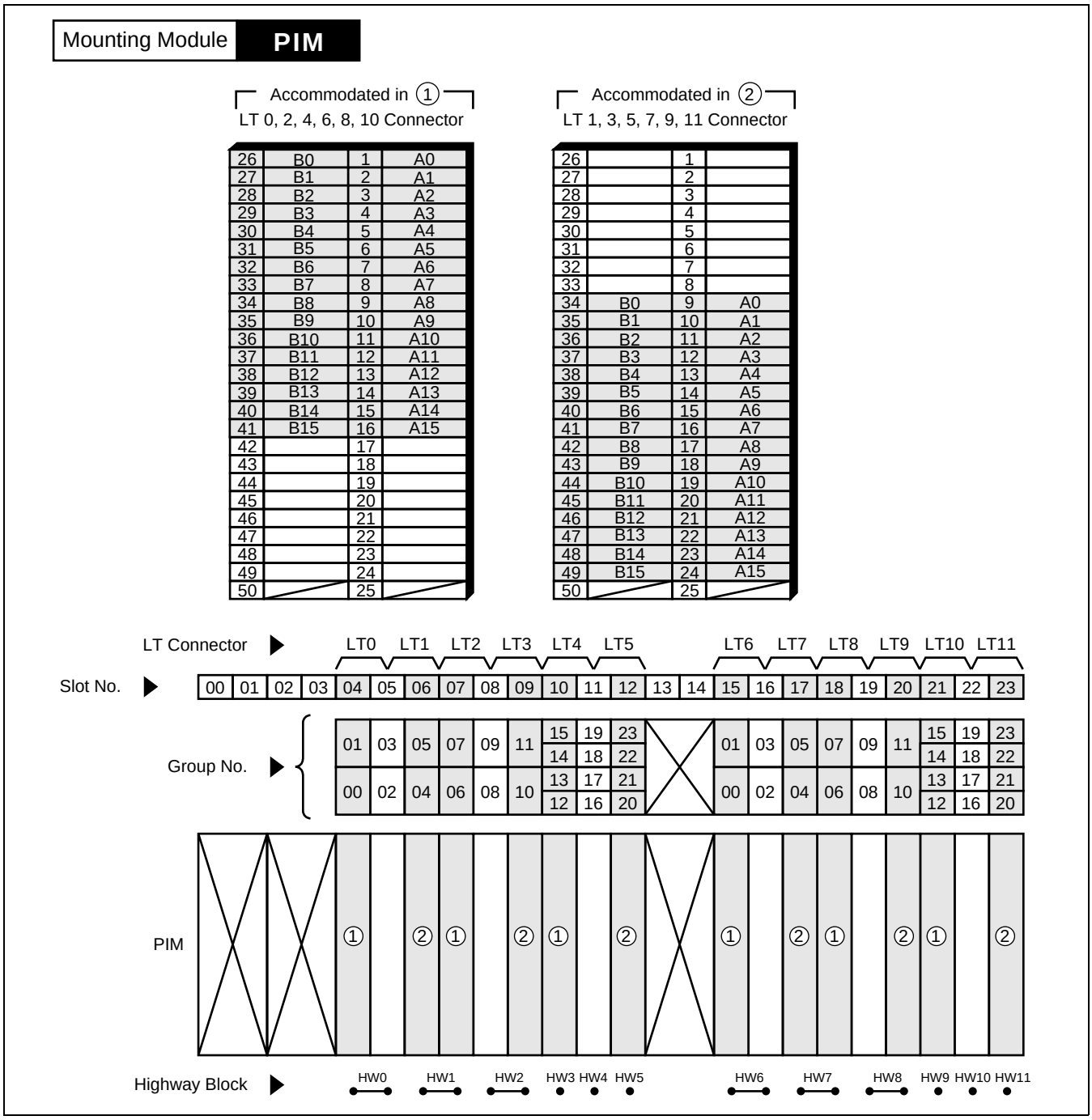


Figure 3-48 LT Connector Lead Accommodation (1/2)

See also Connecting Route Diagram.

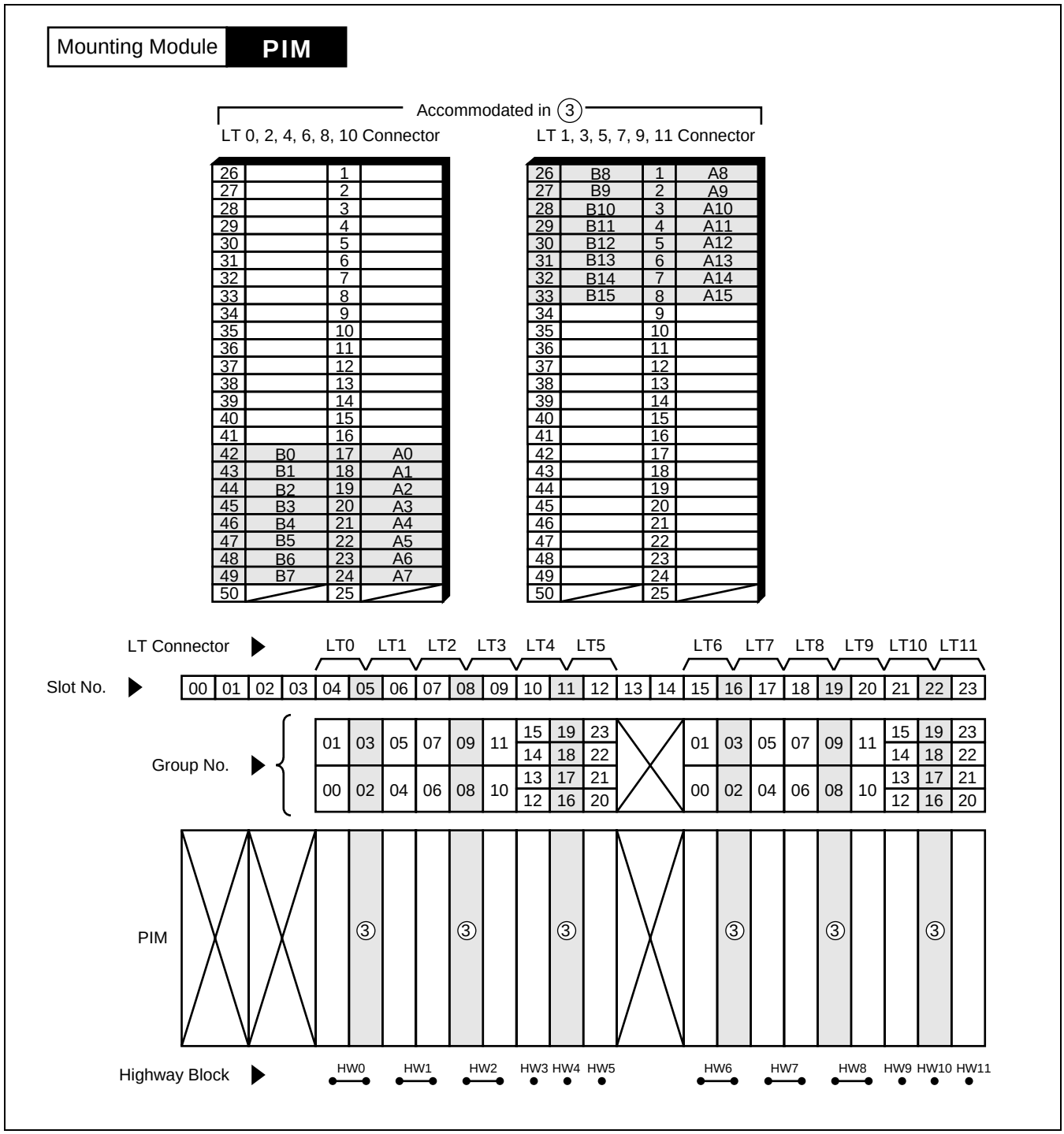


Figure 3-48 LT Connector Lead Accommodation (2/2)

Connecting Route Diagram for the PA-16 LCBW (LC) is as follows.

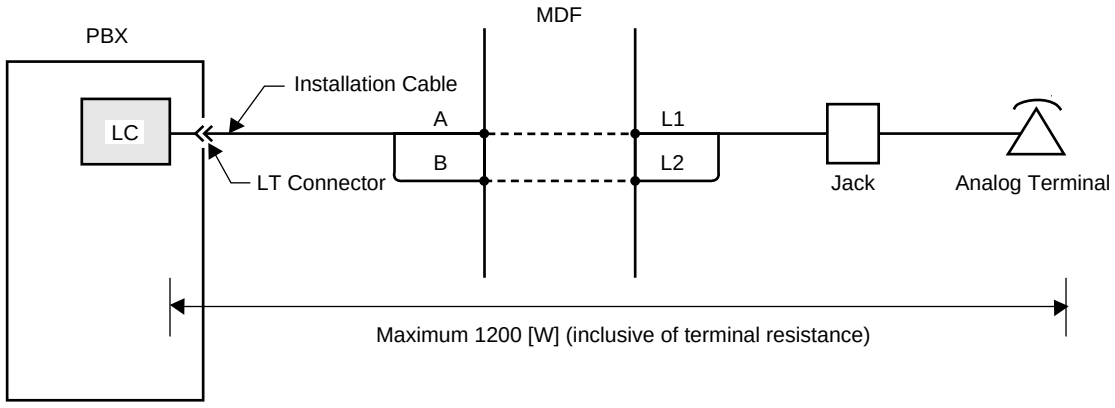


Figure 3-49 Connecting Route Diagram

PA-16LCBY
Line Circuit

1. General Function

The PA-16LCBY circuit card provides an interface between a maximum of 16 analog voice terminals and the system with a range of 1200 (Ohm) inclusive of terminal resistance. This card also can send "Stutter Dial Tone," which is not a continuous tone, to an associated terminal which has no Message Waiting Lamp (MWL) instead of activating the MWL if required. In addition, polarity reverse function is provided for 16 channels on this card. The card can be used for Caller ID service. This is a -48V card.

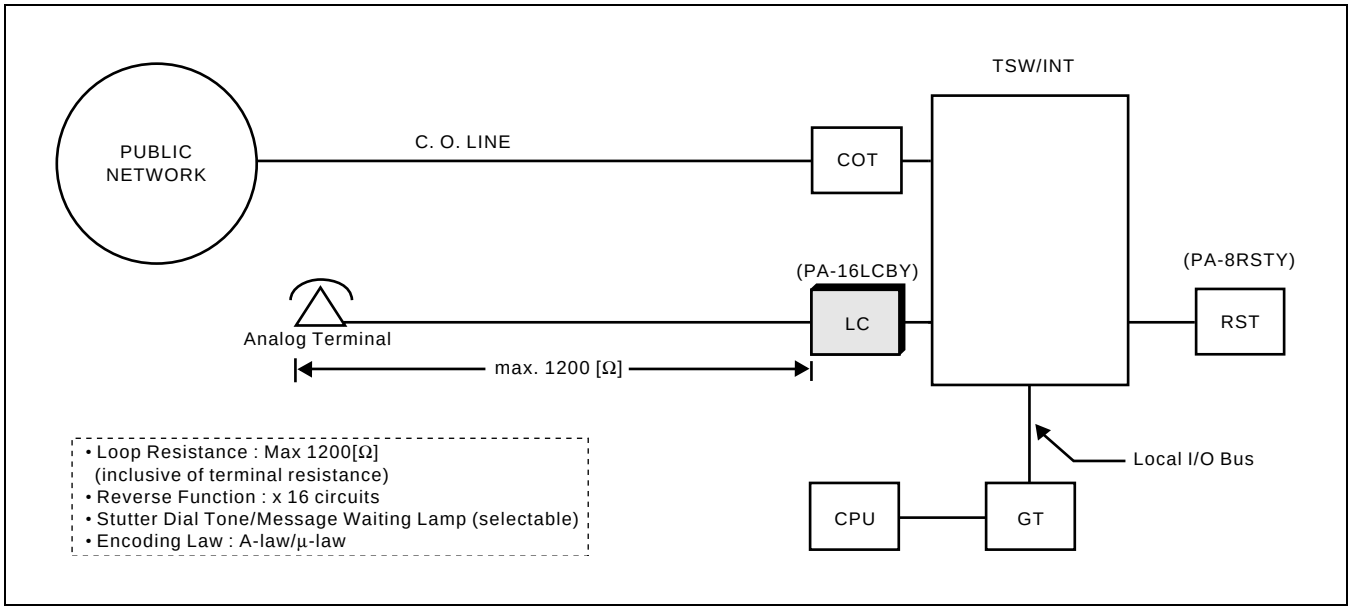


Figure 3-50 Location of PA-16LCBY(LC) Circuit card within the System

2. Mounting Location/Condition

The PA-16LCBY(LC) circuit card can be mounted in the following universal slots.

Mounting Module **PIM**

00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
X		X						●					X						●				

3. Face Layout of Lamps, Switches and Connectors

   The face layout of lamps, switches on this card is shown in Figure 3-51.

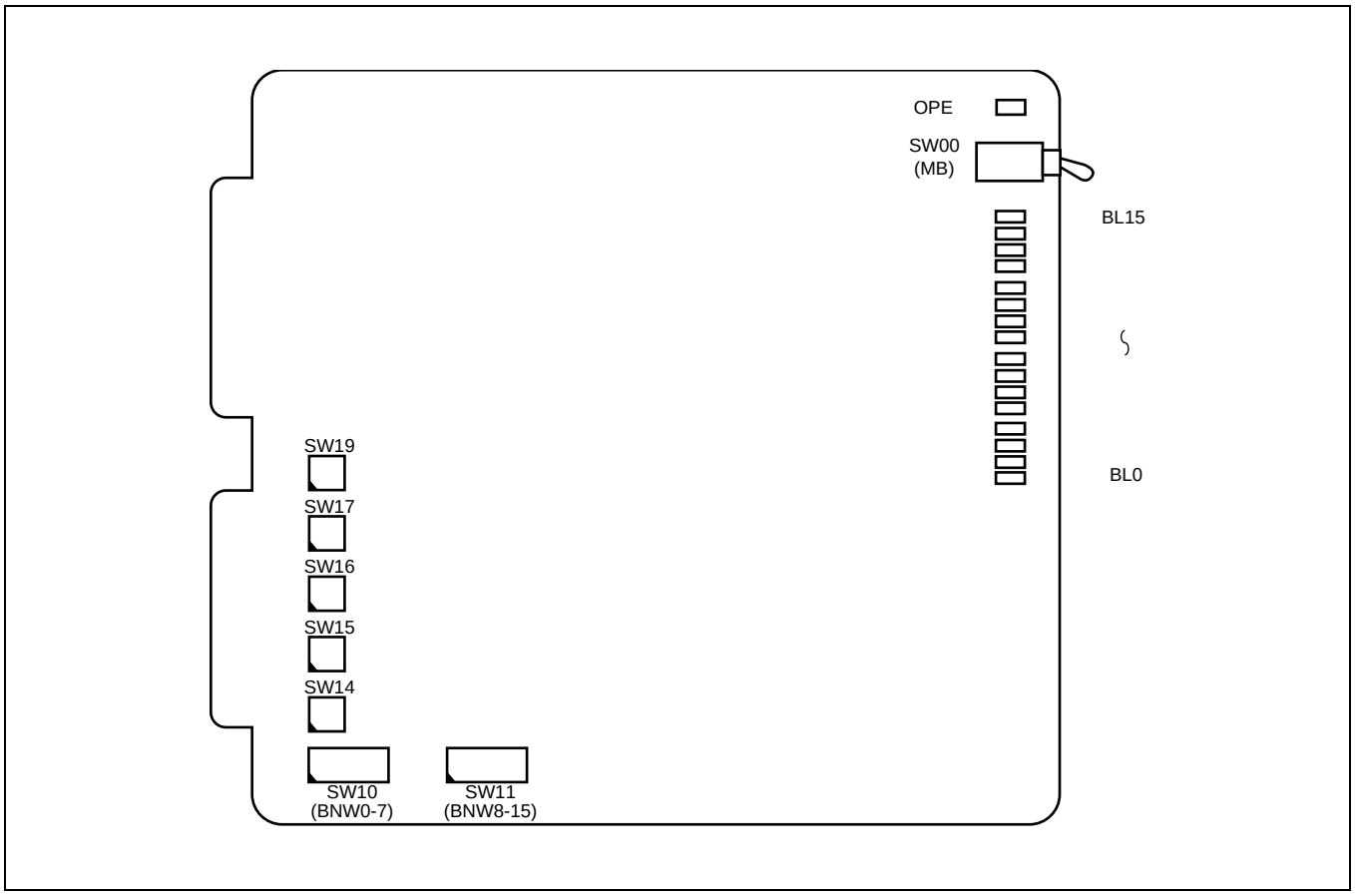


Figure 3-51 Face Layout of PA-16LCBY(LC) Card

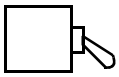
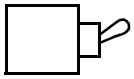
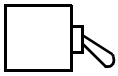
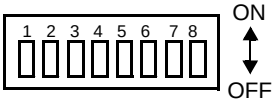
4. Lamp Indications

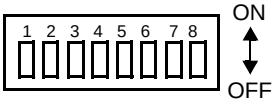
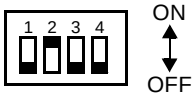
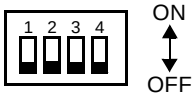
The contents of lamp indications of this circuit card are shown in the table below.

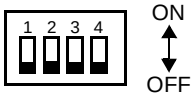
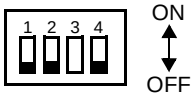
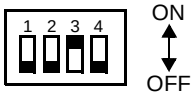
LAMP NAME	LAMP COLOR	LAMP STATUS	MEANING OF INDICATION
OPE	Green	Steady Lighting	The circuitry of the circuit card is operating normally.
BL0 ~ BL15	Green	Steady Lighting	Line loop exists.
		Flashing	1) Ringing signal is being transmitted. Busy Lamp keeps flashing in synchronizing with on/off of the ringing signal. 2) Dial pulses are being received. While dial pulses from a line are being received, Busy Lamp keeps flashing in synchronizing with the dial pulses coming from the line. 3) Line is in make-busy state. Busy Lamp keeps flashing at 60 ipm.

5. Switch Settings

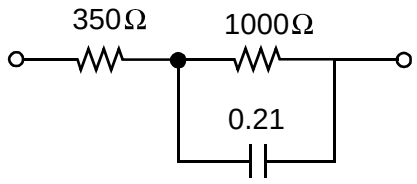
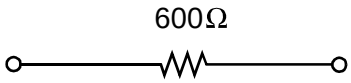
Switches on the PA-16LCBY (LC) card have the following meanings.

SWITCH	FUNCTION	SWITCH SETTING		MEANING
SW00 (MB) 	Circuit Card Make-busy Key	ON		Circuit card make-busy
		OFF		Circuit card make-busy cancel (normal operating mode)
SW10 (BNW0-7) 	Balancing Network Designation • Each element on this switch corresponds to Circuit #0-#7. When this switch has been set, see SW14.	ON		North America, Other Country (A/μ Law) BNW: Compromise Impedance (EIA/TIA-464B) **(Note)** for long distance
		OFF		North America, Other Country (A/μ Law) BNW: 600 Ω **(Note)** for short distance

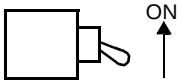
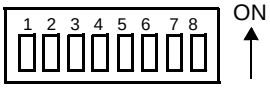
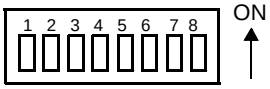
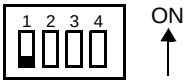
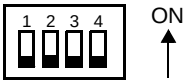
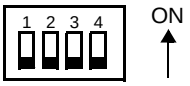
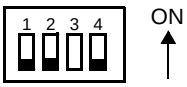
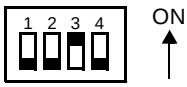
SWITCH	No.	FUNCTION	SWITCH SETTING				MEANING
SW11 (BNW8-15) 		Balancing Network Designation • Each element on this switch corresponds to Circuit #8-#15.	[the same as previous page]				
SW14 		Selection of the User	SW14-1	SW14-2	SW14-3	SW14-4	User
			OFF	ON	OFF	OFF	North America Other Country (μ-Law)
			OFF	OFF	ON	OFF	Other Country (A-Law)
			OFF	ON	ON	OFF	Australia
			OFF	OFF	OFF	ON	Brazil
			OFF	OFF	ON	ON	China
SW15 	1	North America Brazil China Other Country	OFF				Fixed to OFF
		PAD (Australia Only)	ON				NEAX 2400 PAD PAD ON/OFF = 9dB/0dB
			OFF				ICS-PBX PAD PAD ON/OFF = 9dB/6dB
	2		ON				Stutter Dial Tone Available
			OFF				Stutter Dial Tone not Available
	3		OFF				Fixed to OFF
	4		OFF				Fixed to OFF

SWITCH	No.	FUNCTION	SWITCH SETTING	MEANING
SW16 	1		OFF	Fixed to OFF
	2		OFF	Fixed to OFF
	3		OFF	Fixed to OFF
	4		OFF	Fixed to OFF
SW17 	1		OFF	Fixed to OFF
	2		OFF	Fixed to OFF
	3	Message Waiting Lamp	ON	Message Waiting Lamp Flashing (Controlled by Firmware)
			OFF	Message Waiting Lamp lit or Flashing (Selected and Controlled by Software)
	4		OFF	Fixed to OFF
SW19 	1		OFF	Fixed to OFF
	2		OFF	Fixed to OFF
	3		ON	Fixed to ON
	4		OFF	Fixed to OFF

Note: *Compromise Impedance (EIA/TIA-464B) and 600Ω (For North America, Other Country (A/μ Law))*

ON	OFF
 Compromise Impedance (EIA/TIA-464B)	

SWITCH SETTING SHEET

MODULE	SLOT No.	SWITCH NAME	SWITCH SHAPE	REMARKS
PIM		SW00 (MB)		**Note:** *Normal operating mode is down.*
		SW10 (BNW0-7)		
		SW11 (BNW8-15)		
		SW14		
		SW15		
		SW16		
		SW17		
		SW19		

6. External Interface

Accommodation of theLT connector leads for this circuit card is shown below.

When this circuit card is mounted in PIM, necessary leads appear on the LT connectors as follows.

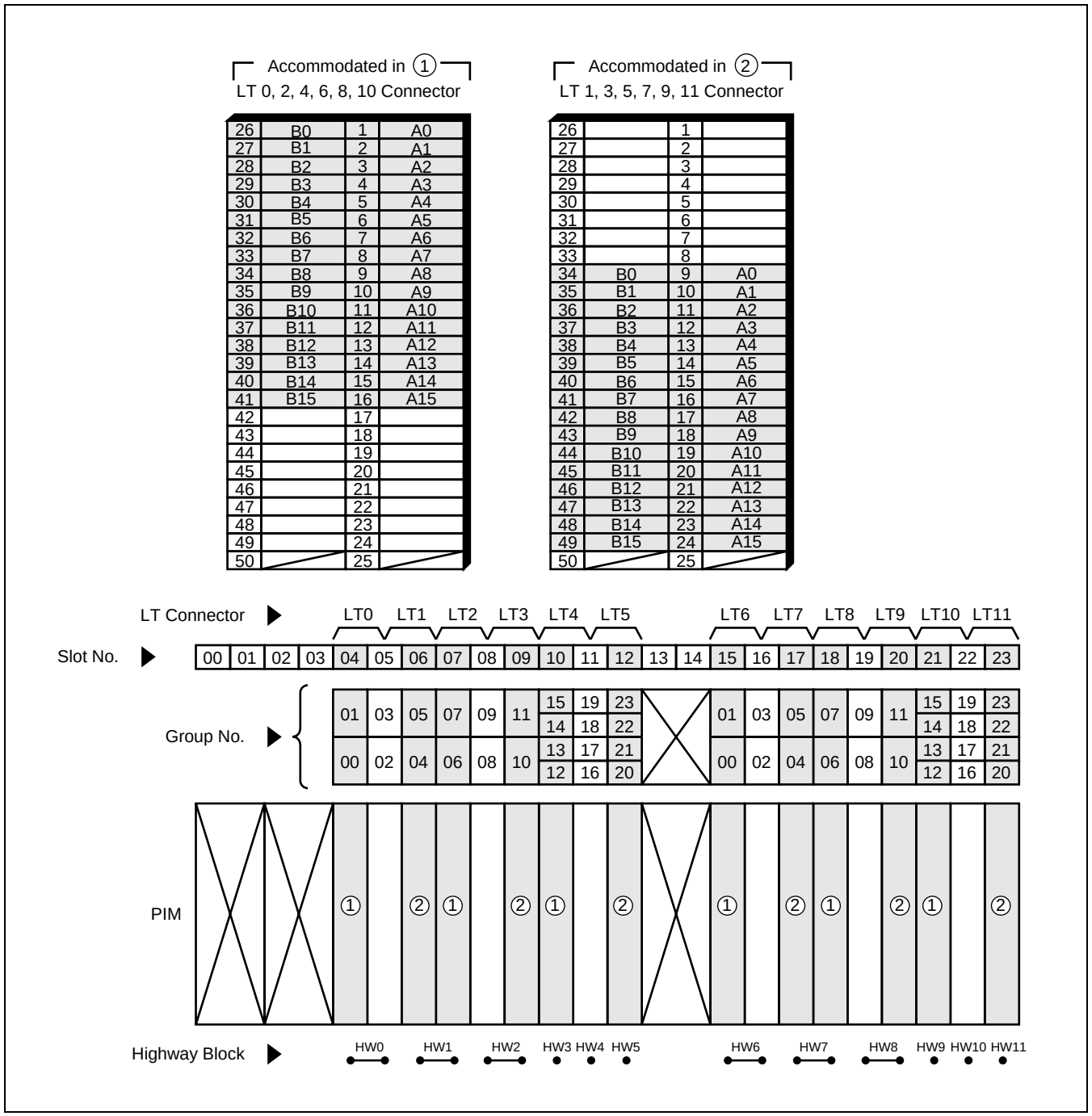


Figure 3-52 LT Connector Lead Accommodation (PIM) (1/2)

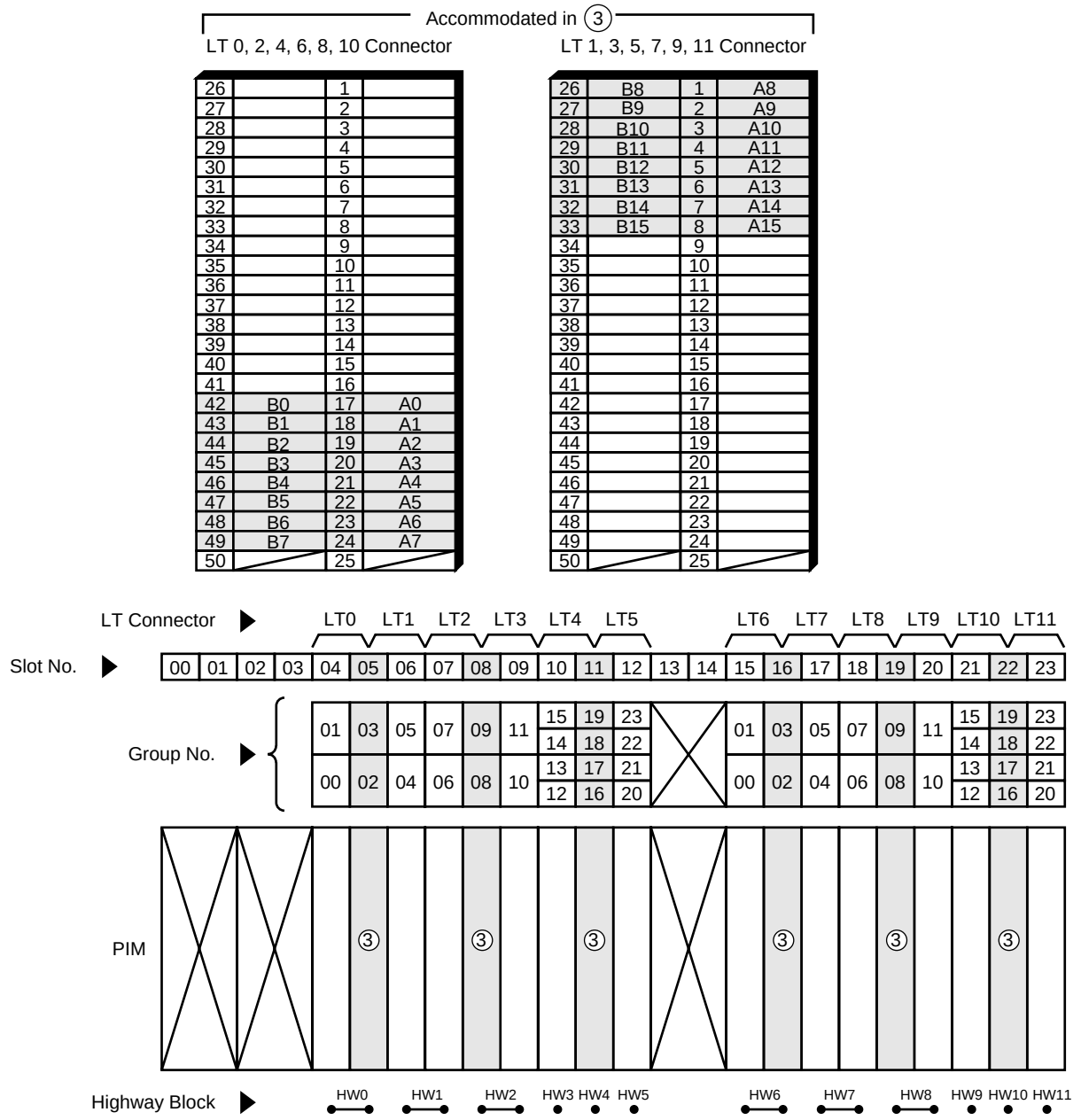


Figure 3-52 LT Connector Lead Accommodation (PIM) (2/2)

7. Connecting Route Diagram

Connecting Route Diagram for the PA-16 LCBY (LC) is as follows.

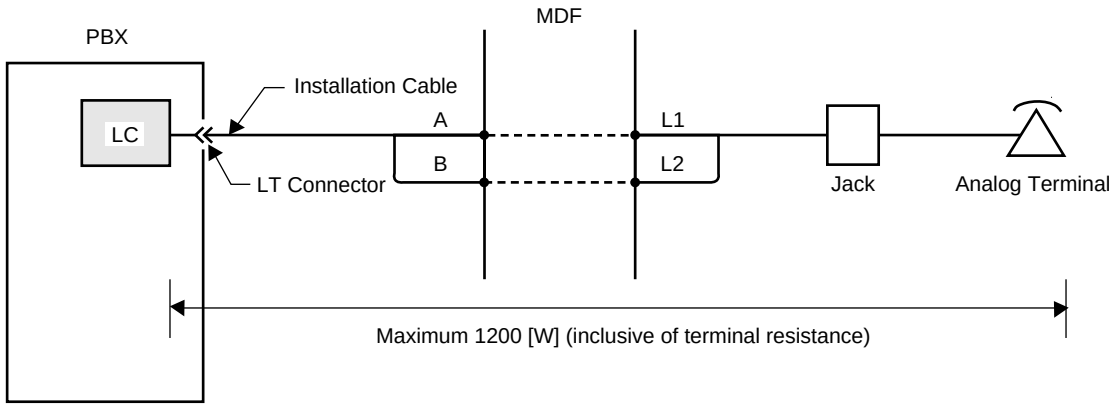


Figure 3-53 Connecting Route Diagram

PA-16ELCJ
Electric Line Current

1. General Function

The PA-16ELCJ (ELC) circuit card provides an interface between the D^{term} and the IMX. Depending on the switch settings, this card works in the following two modes.

- 16 ELC mode: A maximum of 16 sets of D^{term}s can be connected to this card (voice communications only).
- 8 DLC mode: A maximum of 8 sets of D^{term}s can be connected to this card (simultaneous voice and data communications).

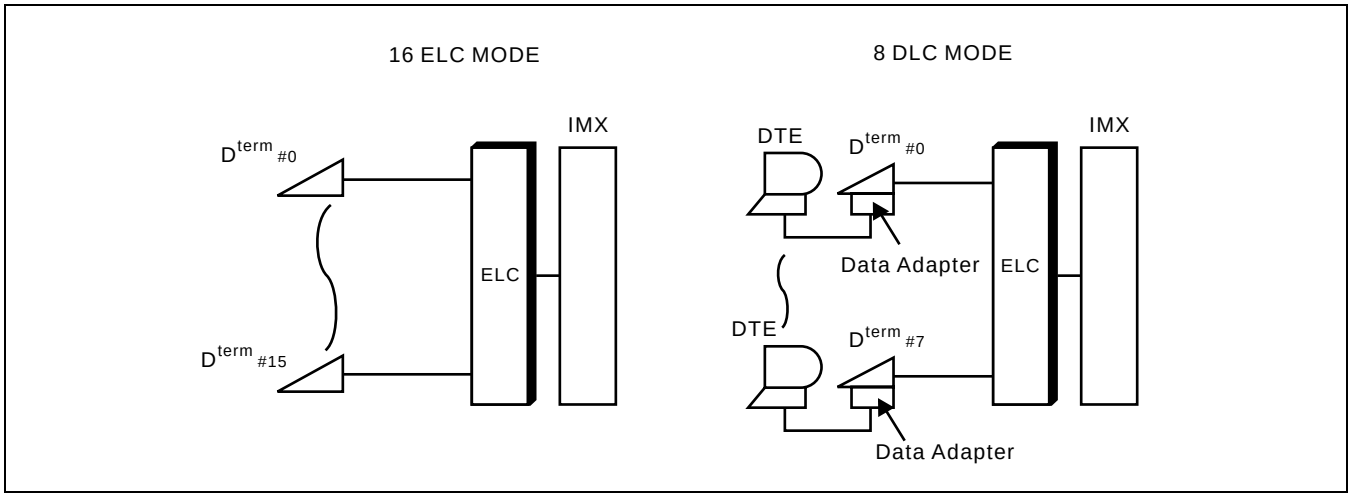


Figure 3-54 Location of PA-16ELCJ (ELC) Card in the System

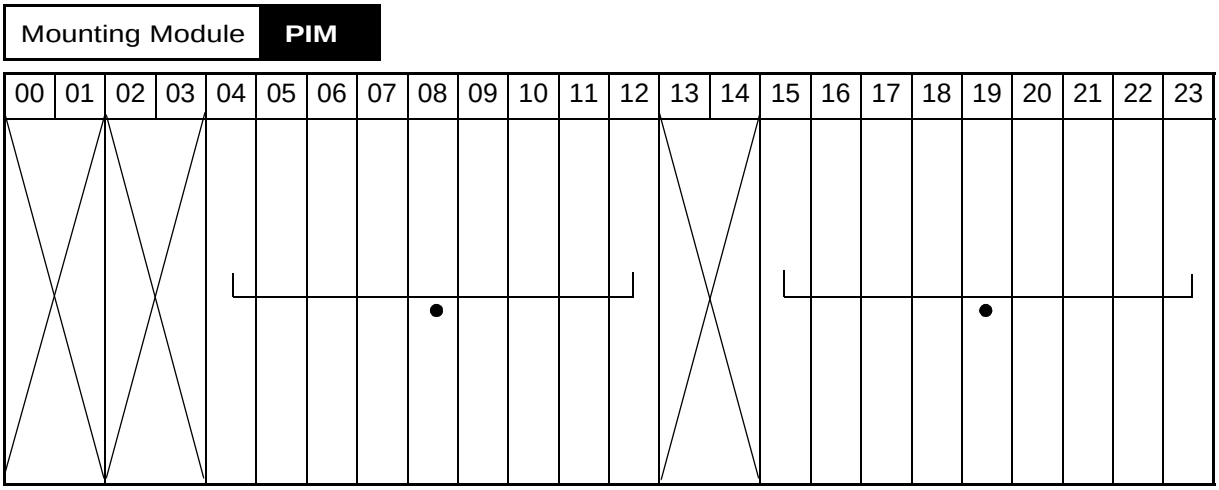
There are two different kinds of firmware EPROMs are located on thePA-16ELCJ (ELC) circuit card. SP-3295 16ELCJ PROG-B provides the full performance interface for D^{term} Series E, and SP-3270 16ELCJ PROG-A provides D^{term} Series III interface. The following table shows the D^{term} performance depending on each firmware EPROM.

Table 3-1 Performance

FIRMWARE	D^{term} SERIES E	D^{term} SERIES III
SP-3295 16ELC J PROG-B	• 24 digits wide of Liquid Crystal Display (LCD). • Month and year displays following the time and date. • Software keys are available and the software keys are controlled by the system. Thus, key function data can be changed by office data.	• 16 digits wide of LCD. • Month and year are not displayed. • Software key is not available.
SP-3270 16ELC J PROG-A	• 16 digits wide of LCD. • Month and year are not displayed. • Software keys are available. However, key function is fixed (Off-hook Ringing, Mute, Microphone, Headset).	• 16 digits wide of LCD. • Month and year are not displayed. • Software key is not available.

2. Mounting Location/Condition

The PA-16ELCJ (ELC) card can be mounted in any universal slot as shown below.



3. Face Layout of Lamps, Switches, and Connectors

The face layout of lamps, switches, and connectors on this circuit card is shown in Figure 3-55.

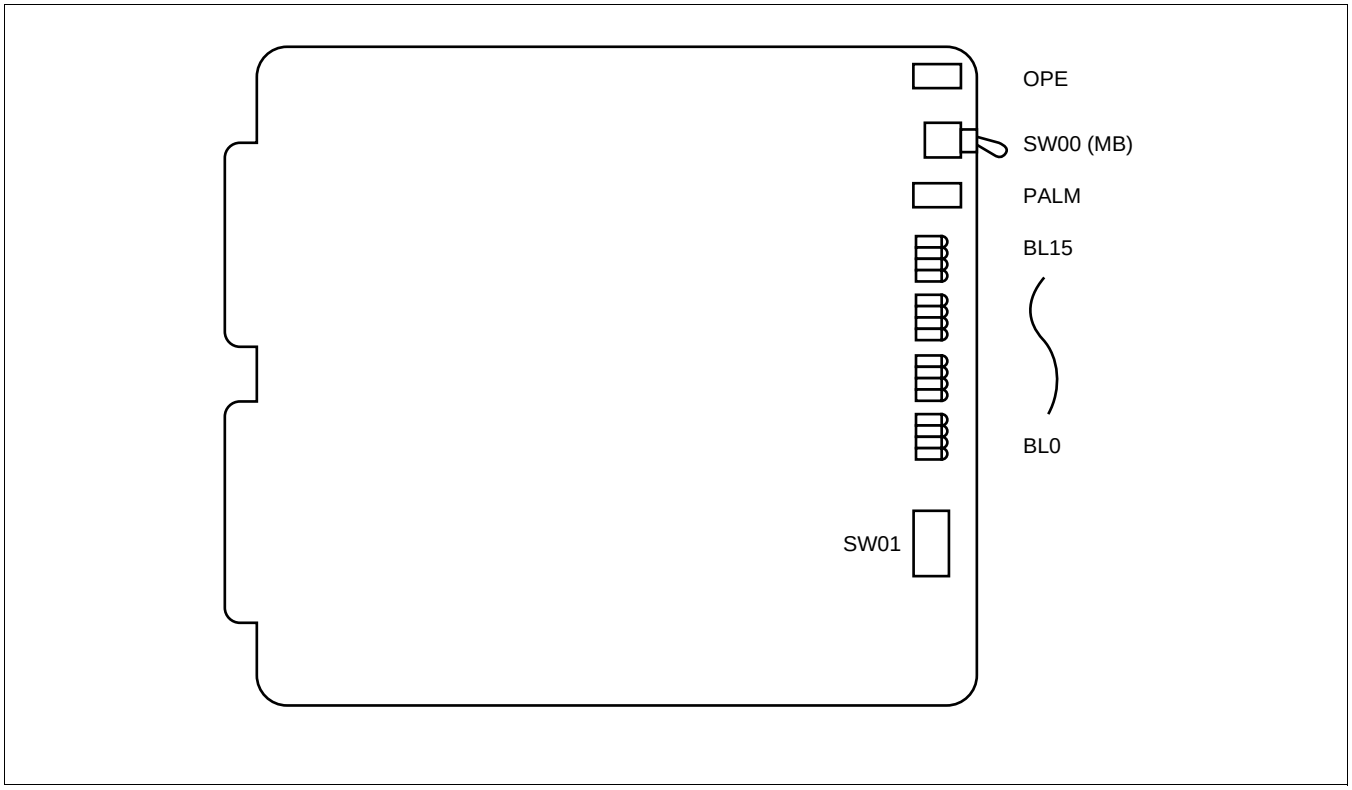


Figure 3-55 Face Layout of PA-16ELCJ (ELC) Card

4. Lamp Indications

Lamp indications for this circuit card are shown in the table below.

LAMP NAME	COLOR	STATE
OPE	Green	Remains lit while on-line operations are normal.
	OFF	Off when on-line operations are abnormal.
PALM	Red	Lights red when power supply circuit(s) is abnormal. **Note**
	OFF	Off when all the power supply circuits are normal.
BL0 ~ BL15	Green	Lights when the corresponding circuit is busy.
	Flash	Flashes when the corresponding circuit is in Make-busy state or station data has not been assigned.
	OFF	Off when the corresponding circuit is idle.

Note: *When the PALM lamp lights red, observe the following instructions.*

i) Identify the location where any in-house wires have a short circuit in all lines which belong to the PA-16ELCJ card whose PALM is on.

ii) Repair the short-circuited wires of the associated D^{term}.

iii) Disconnect the D^{term} from the rosette, then leave it disconnected for at least 1 minute.

iv) Connect the D^{term} again.

5. Switch Settings

Switches on the PA-16ELCJ card have the following meanings.

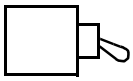
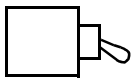
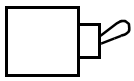
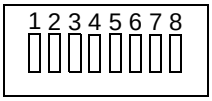
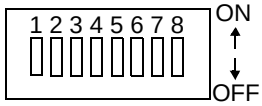
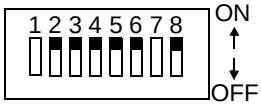
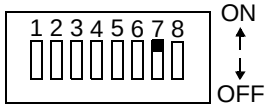
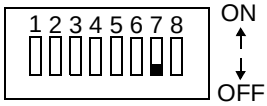
SWITCH	FUNCTION		SWITCH SETTING	MEANING
SW00 (MB) 	Circuit Card Make-busy key			Circuit card Make-busy Cancel.
				Circuit card Make-busy.
SW01 	1			See Table 3-2 below.
	2 - 6 - 8	—		Always ON (fixed).
	7	ELC/DLC mode Designation		16ELC mode.
				8DLC mode.

Table 3-2 Relationship between SW01-1 and SW01-7

SW01-7 / SW01-1	ON	OFF
ON	• 16 sets of D^{term}s per card. • Voice Communication only.	• 8 sets of D^{term}s per card. • Data Adapter is used.
OFF	• 16 sets of D^{term}s per card. • Analog Port Adapter is used, but not at the same time.	• 8 sets of D^{term}s per card. • Analog Port Adapter is used (Both D^{term} and Analog terminal can be used at the same time).

6. External Interface

Depending on the applied mode (16ELC/8 DLC mode), external interface leads appear on the LT connectors as follows.

- 6ELC mode

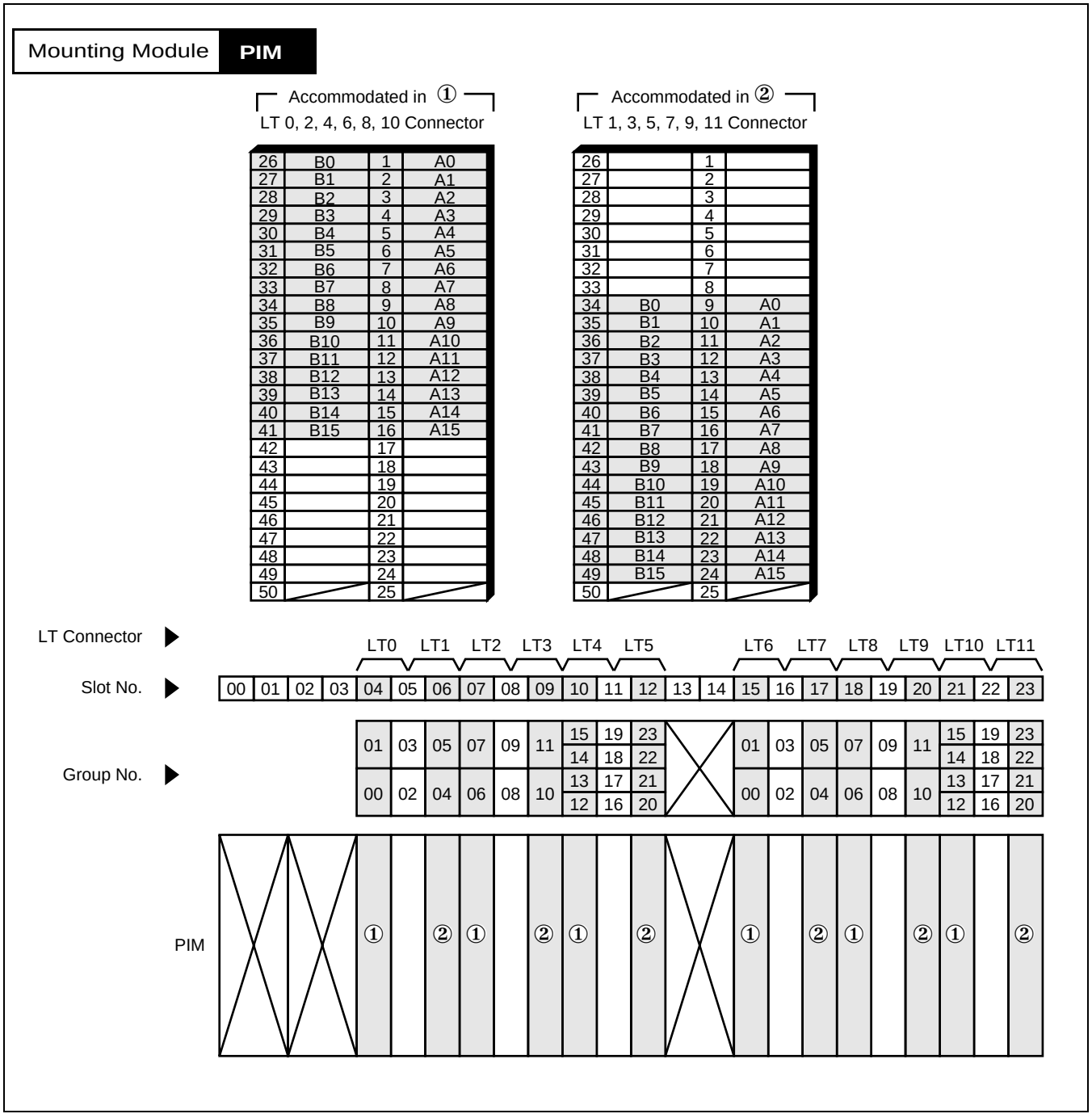


Figure 3-56 LT Connector Lead Location (16ELC Mode)

- 16ELC mode

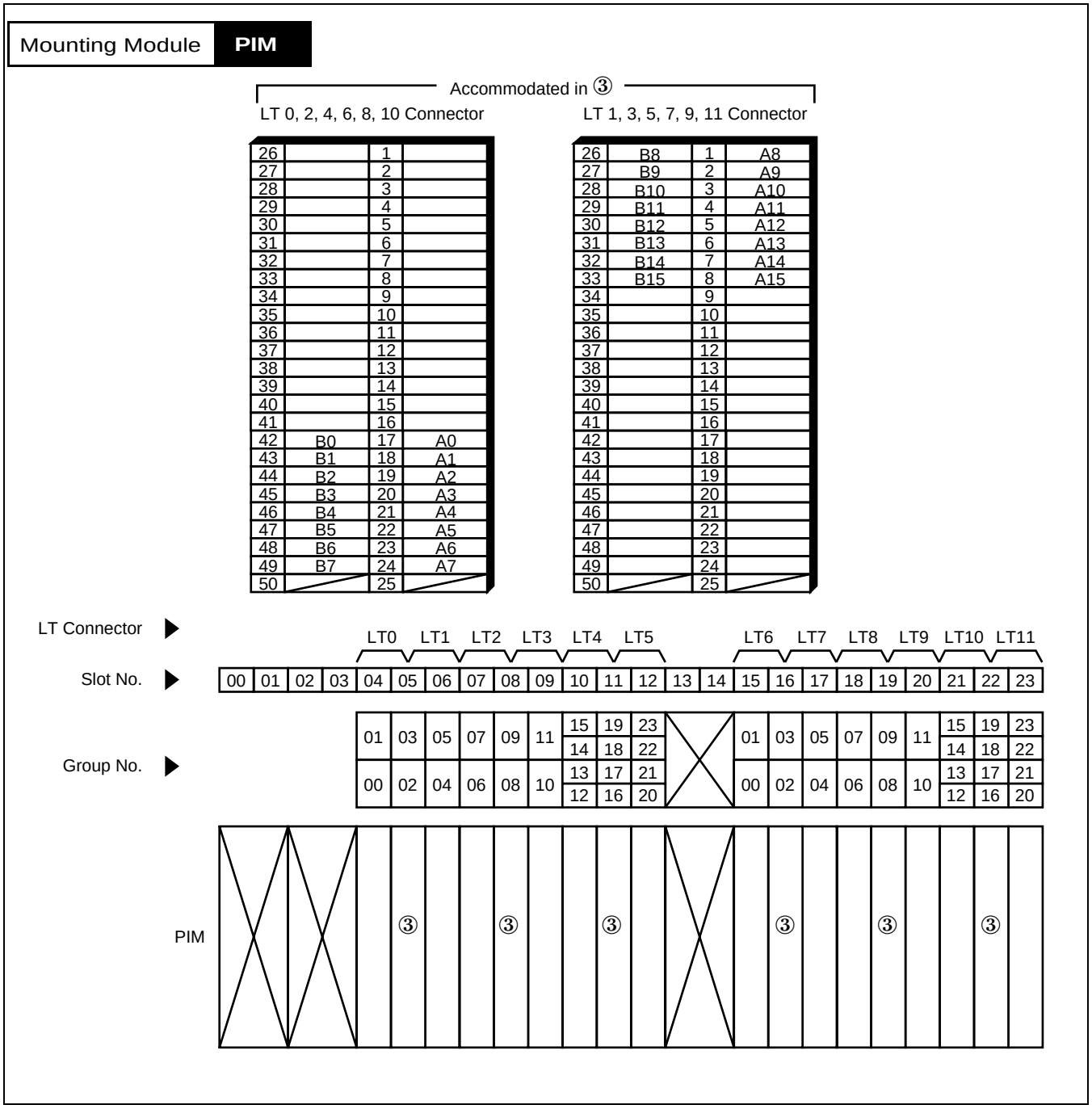
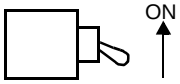
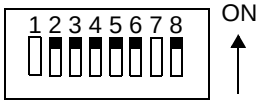


Figure 3-57 LT Connector Lead Location (16ELC Mode)

7. Switch Setting Sheet

MODULE	SLOT No.	SWITCH NAME	SWITCH SHAPE	REMARKS
PIM		SW00 (MB)		
		SW01		

PA-16ELCJ-B
Electronic Line Circuit

1. General Function

The PA-16ELCJ-B (ELC) circuit card provides an interface between D^{term} and IMX. Depending upon the switch settings, this card works in the following two modes.

- 16 ELC mode: A maximum of 16 sets of D^{term}s can be connected to this card. (voice communications only)
- 8 DLC mode: A maximum of 8 sets of D^{term}s can be connected to this card. (simultaneous voice and data communications)

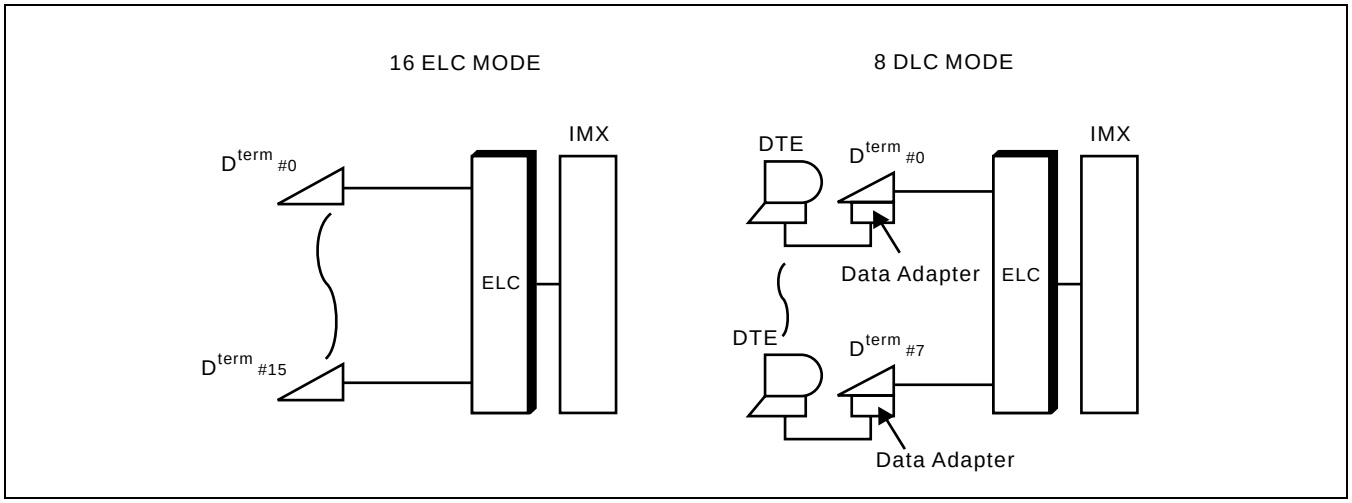


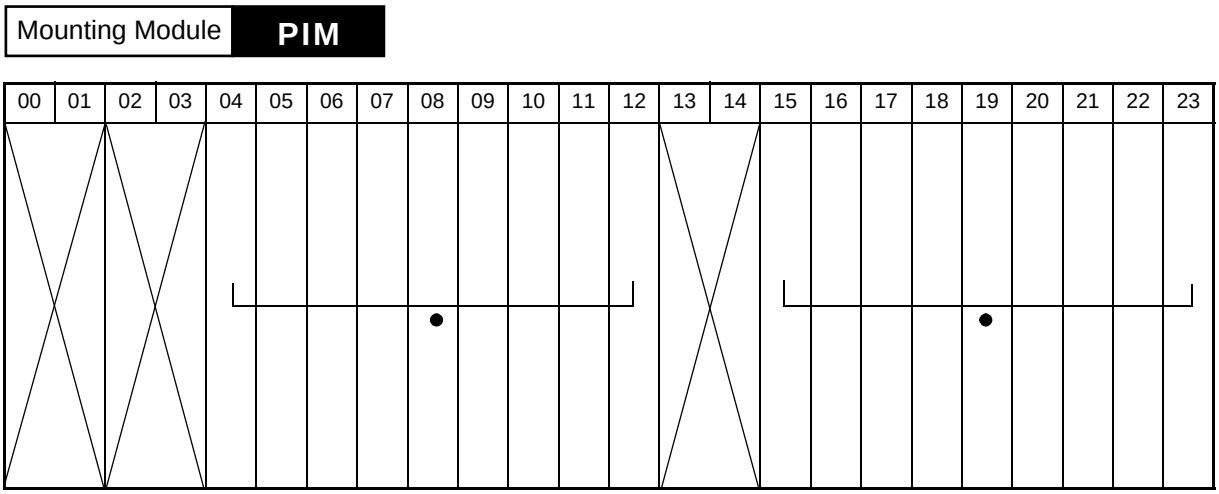
Figure 3-58 Location of PA-16ELCJ-B (ELC) Card within the System

Table 3-3 Performance

D^{term} SERIES E	D^{term} SERIES III
• 24 digits wide of Liquid Crystal Display (LCD).	• 16 digits wide of LCD.
• Month and year displays following the time and date.	• Month and year are not displayed.
• Software keys are available and the software keys are controlled by the system. Thus, key function data can be changed by office data.	• Software key is not available.

2. Mounting Location/Condition

The PA-16ELCJ-B (ELC) card can be mounted in any universal slots as shown below.



3. Face Layout of Lamps, Switches, and Connectors

The face layout of lamps, switches, and connectors on this circuit card is shown in Figure 3-59.

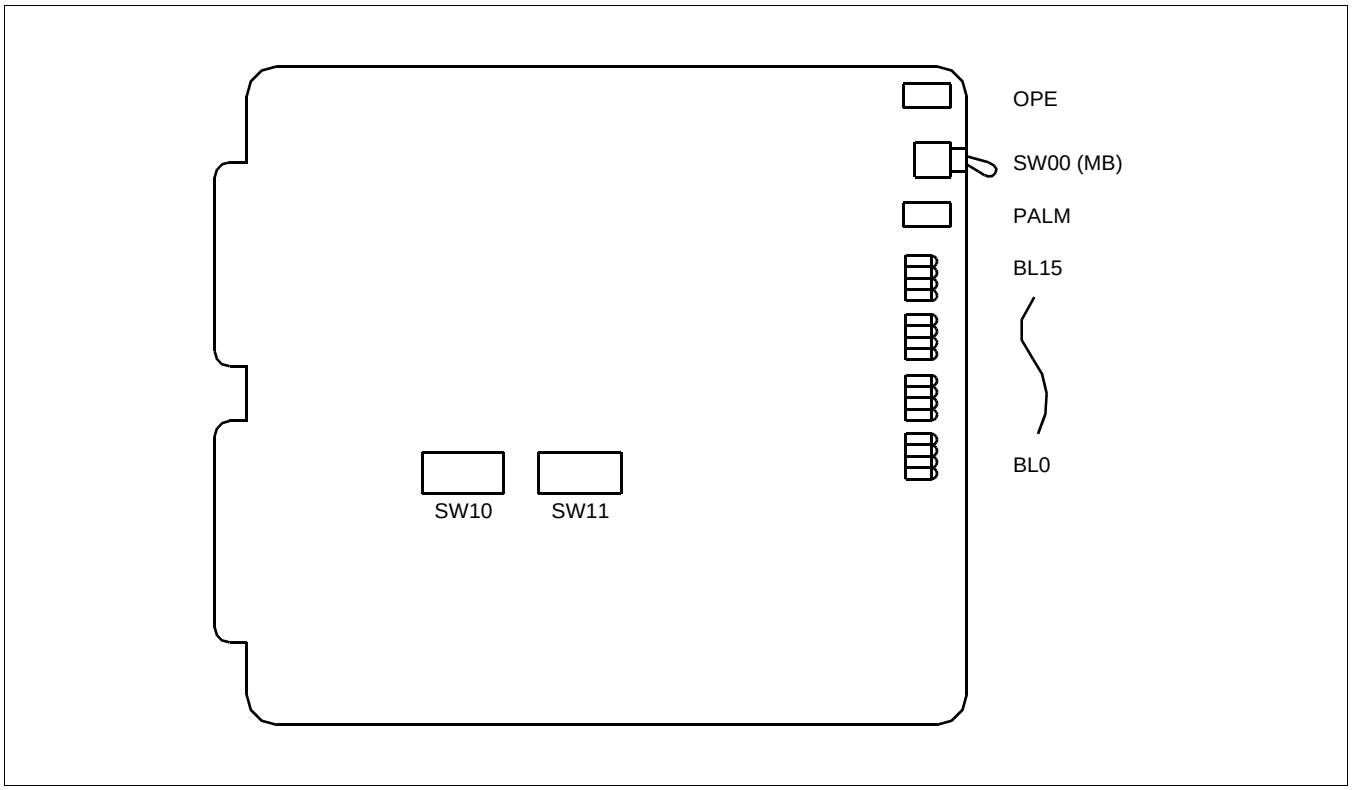


Figure 3-59 Face Layout of PA-16ELCJ-B (ELC) Card

4. Lamp Indications

The contents of lamp indications on this circuit card are shown in the table below.

LAMP NAME	COLOR	STATE
OPE	Green	Remains lit while on-line operations are normal.
	OFF	Off when on-line operations are abnormal.
PALM	Red	Lights red when power supply circuit(s) is abnormal. **Note**
	OFF	Off when all the power supply circuits are normal.
BL0 ~ BL15	Green	Lights when the corresponding circuit is busy.
	Flash	Flashes when the corresponding circuit is in make-busy state or station data has not been assigned.
	OFF	Off when the corresponding circuit is idle.

Note: *When the PALM lamp lights red, observe the following instructions.*

i) Identify the location where any in-house wires have a short circuit as to all lines which belong to the PA-16ELCJ-B card whose PALM is on.

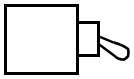
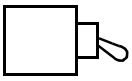
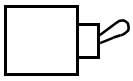
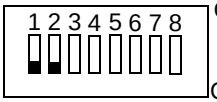
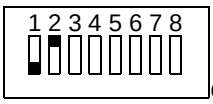
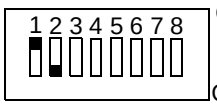
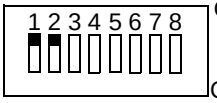
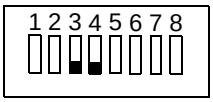
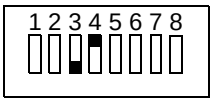
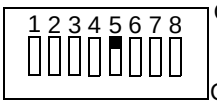
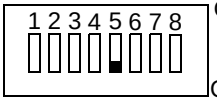
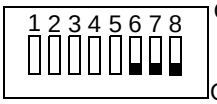
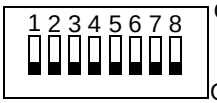
ii) Repair the short-circuited wires of the associated D^{term}.

iii) Disconnect the D^{term} from the jack, then leave it disconnected for at least 1 minute.

iv) Connect the D^{term} again.

5. Switch Settings

Switches on the PA-16ELCJ-B card have the following meanings.

SWITCH	FUNCTION		SWITCH SETTING	MEANING
SW00 (MB) 	Circuit Card Make-busy key			Circuit Card Make-busy Cancel.
				Circuit Card Make-busy.
SW10	1-2	LP-PM Interface mode setting/Group No. setting **Note**		In case of this circuit card is used from No. 0 to 25 group. Expanded Multiple Line Operation-Dterm is available.
				In case of this circuit card is used from No. 26 to 31 group (Expansion Group). Expanded Multiple Line Operation-Dterm is available.
				In case of this circuit card is used from No. 0 to 25 group. Expanded Multiple Line Operation-Dterm is available.
				Not used
Details are shown in next table.	3-4	ELC/DLC mode setting		This circuit card operates in 16 ELC mode.
				This circuit card operates in 8 DLC mode.
			Do not set another combination.	
	5	Analog Port Adapter setting		Analog Port Adapter is available.
				Analog Port Adapter is not available.
	6-8	—		Fixed to “OFF”.
SW11	1-8	—		Fixed to all “OFF”.

Note: *When using firmware SP-3419, set SW10-1=OFF, SW10-2=ON.*

	SW10-3: OFF, SW10-4: OFF	**SW10-3: OFF, SW10-4: ON**
SW10-5: OFF	• 16 set of D^{term}s per card. • Voice Communication only.	• 8 set of D^{term}s per card. • Data Adapter is used.
SW10-5: ON	• 16 set of D^{term}s per card. • Analog Port Adapter is used (Either D^{term} or Analog terminal can be used at the same time).	• 8 set of D^{term}s per card. • Analog Port Adapter is used (Both D^{term} and Analog terminal can be used at the same time).

6. External Interface

Depending upon the applied mode (16ELC/8 DLC mode), external interface leads appear on the LT connectors as follows.

- 16ELC mode

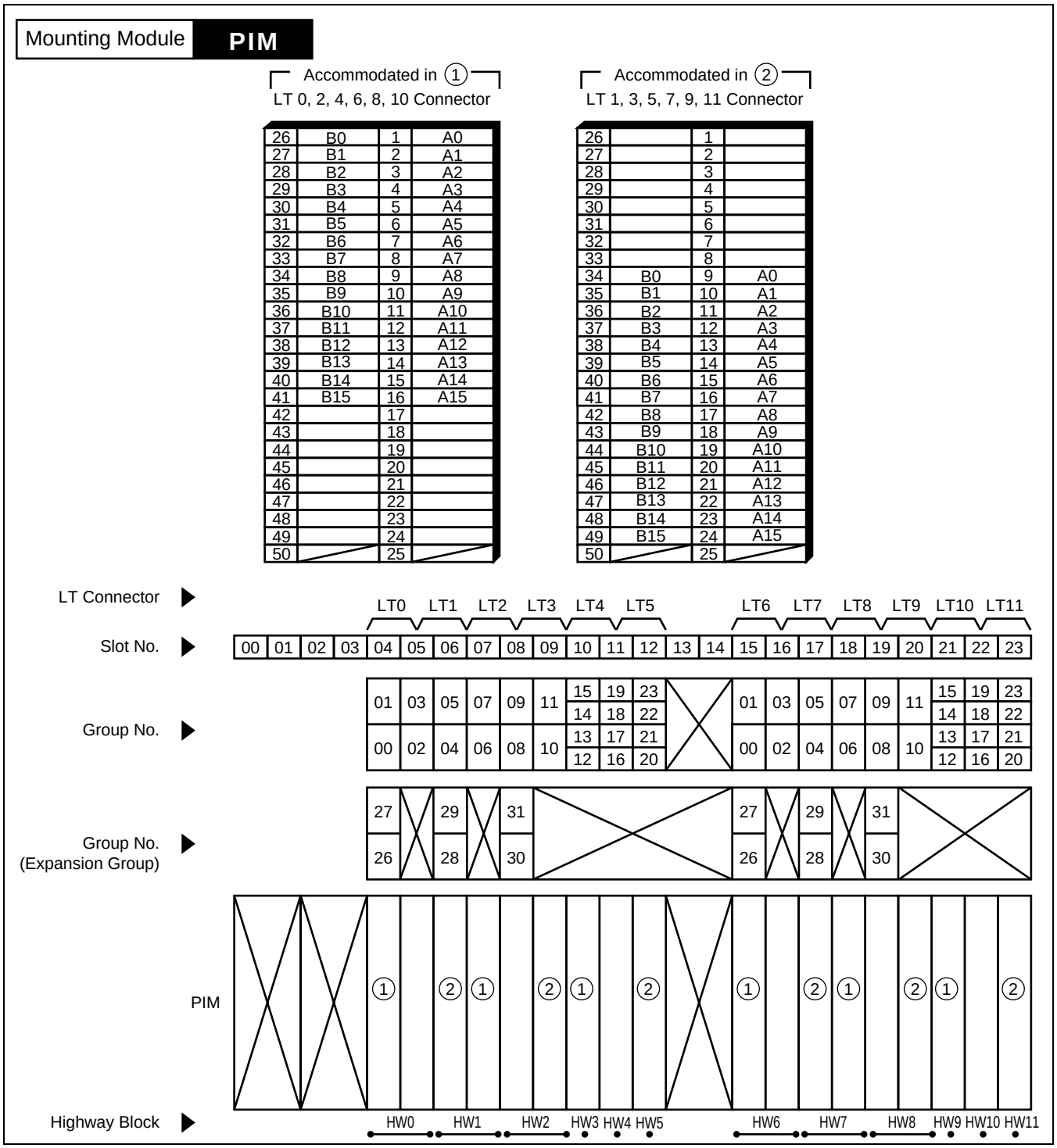


Figure 3-60 LT Connector Lead Accommodation (16ELC Mode) (1/2)

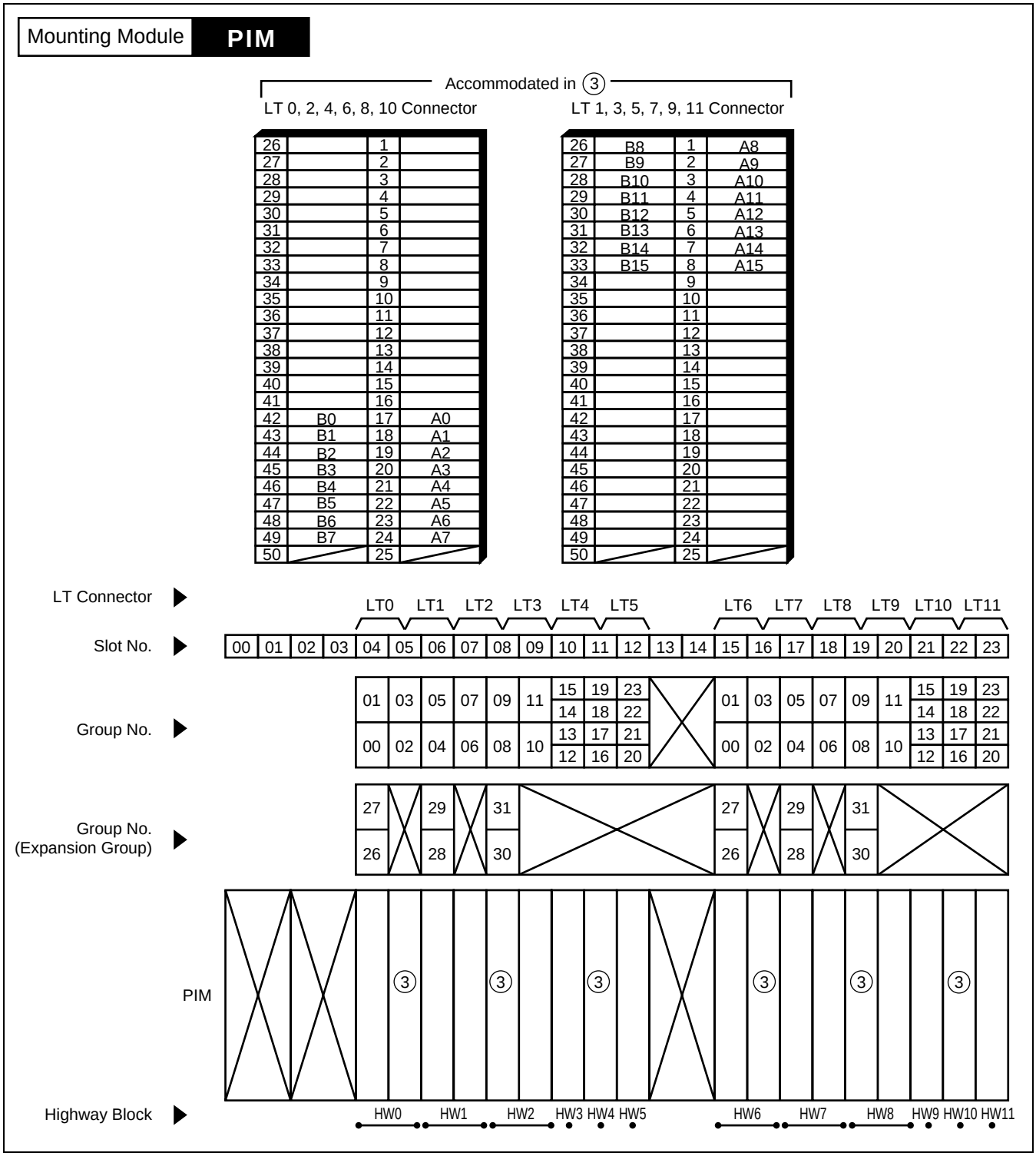


Figure 3-60 LT Connector Lead Accommodation (16ELC Mode) (2/2)

- 8DLC mode

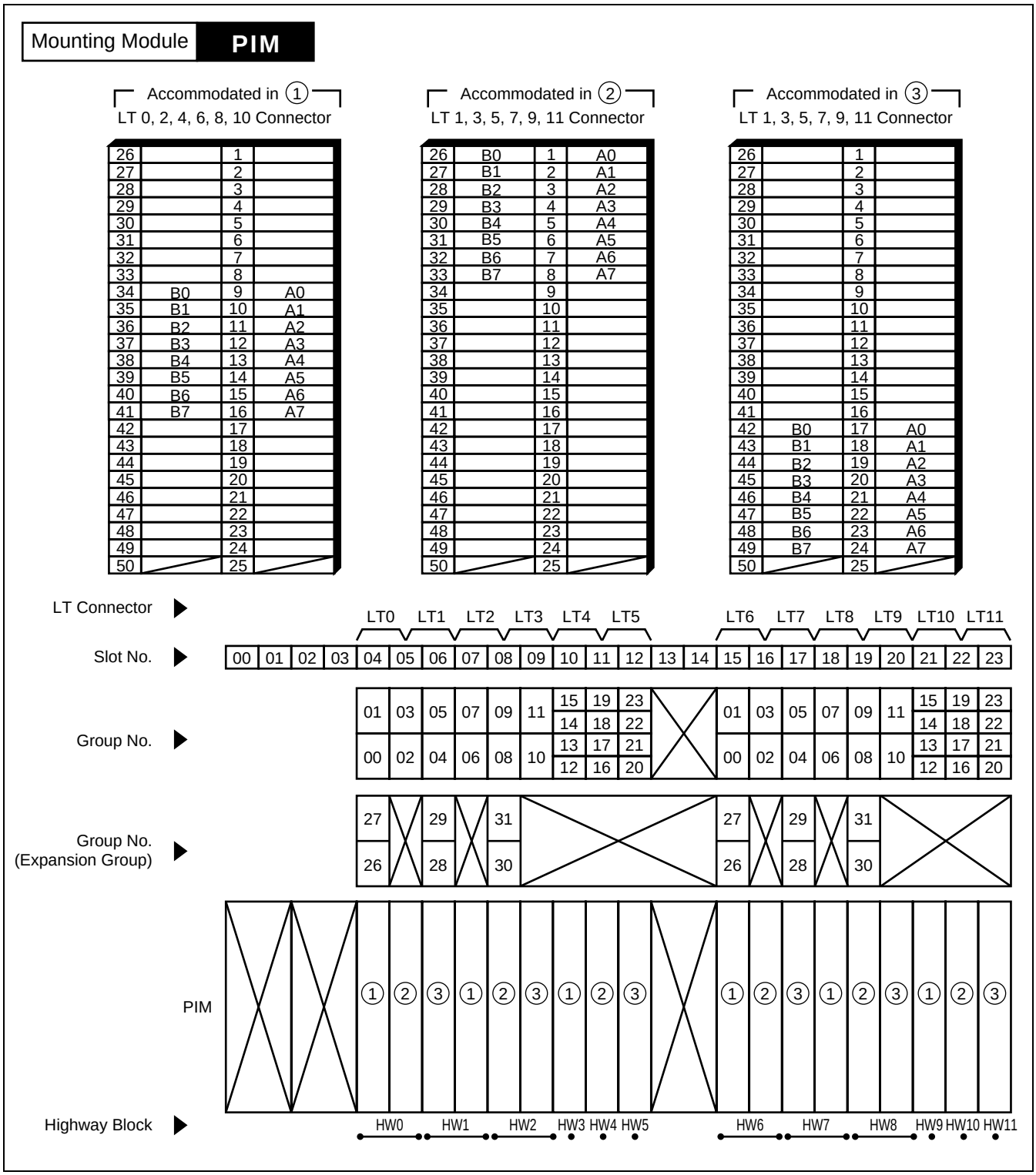
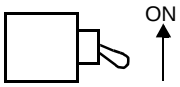
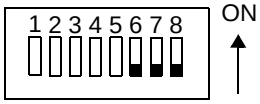
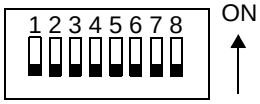


Figure 3-61 LT Connector Lead Accommodation (8DLC Mode)

7. Switch Setting Sheet

MODULE	SLOT No.	SWITCH NAME	SWITCH SHAPE	REMARKS
PIM		SW00 (MB)		
		SW10		
		SW11		

PA-24LCBV
Line Circuit

1. General Function

The PA-24LCBV circuit card provides an interface between a maximum of 24-analog terminals and the system with a range of 600 (Ohm) inclusive of terminal resistance. This card also can send "Stutter Dial Tone," which is not a continuous tone, to an associated terminal which has no Message Waiting Lamp (MWL) instead of activating the MWL if required.

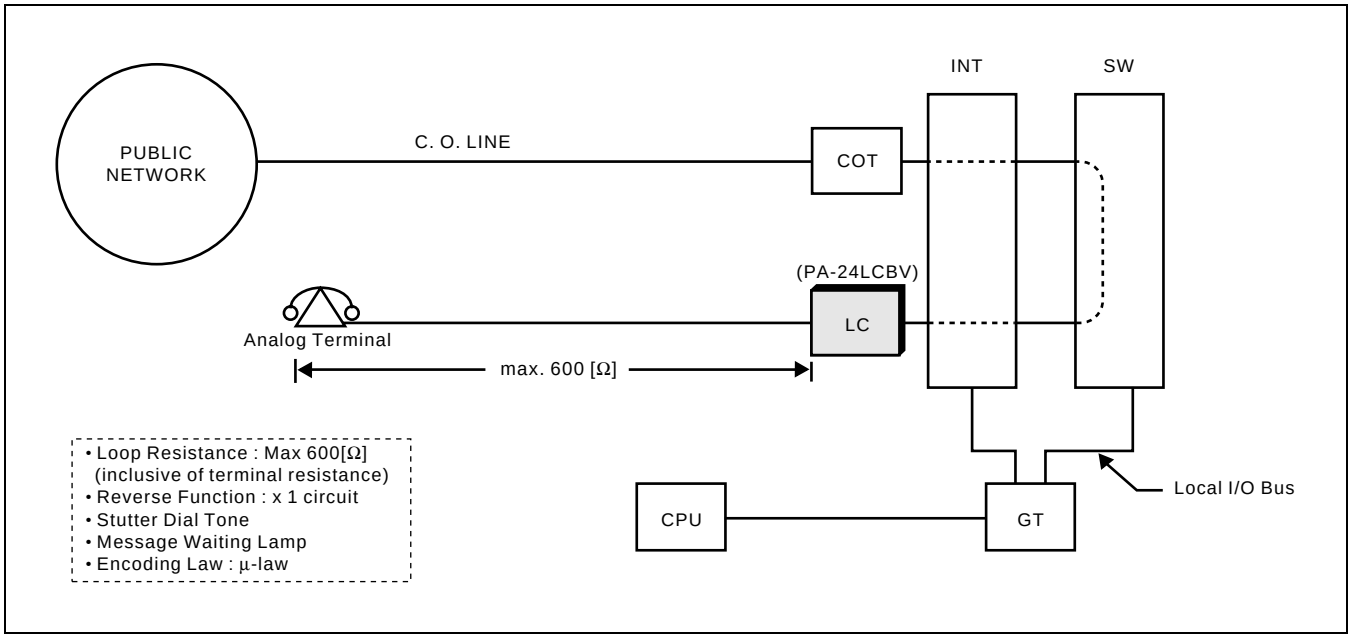
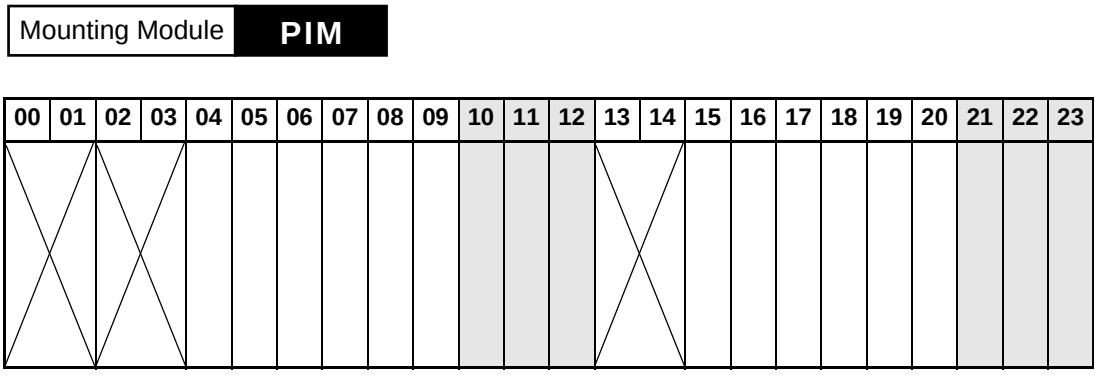


Figure 3-62 Location of PA-24LCBV(LC) Card within the System

2. Mounting Location/Condition

The PA-24LCBV(LC) circuit card can be mounted in the following shaded slots.



3. Face Layout of Lamps, Switches and Connectors

   The face layout of lamps, switches on this card is shown in Figure 3-63.

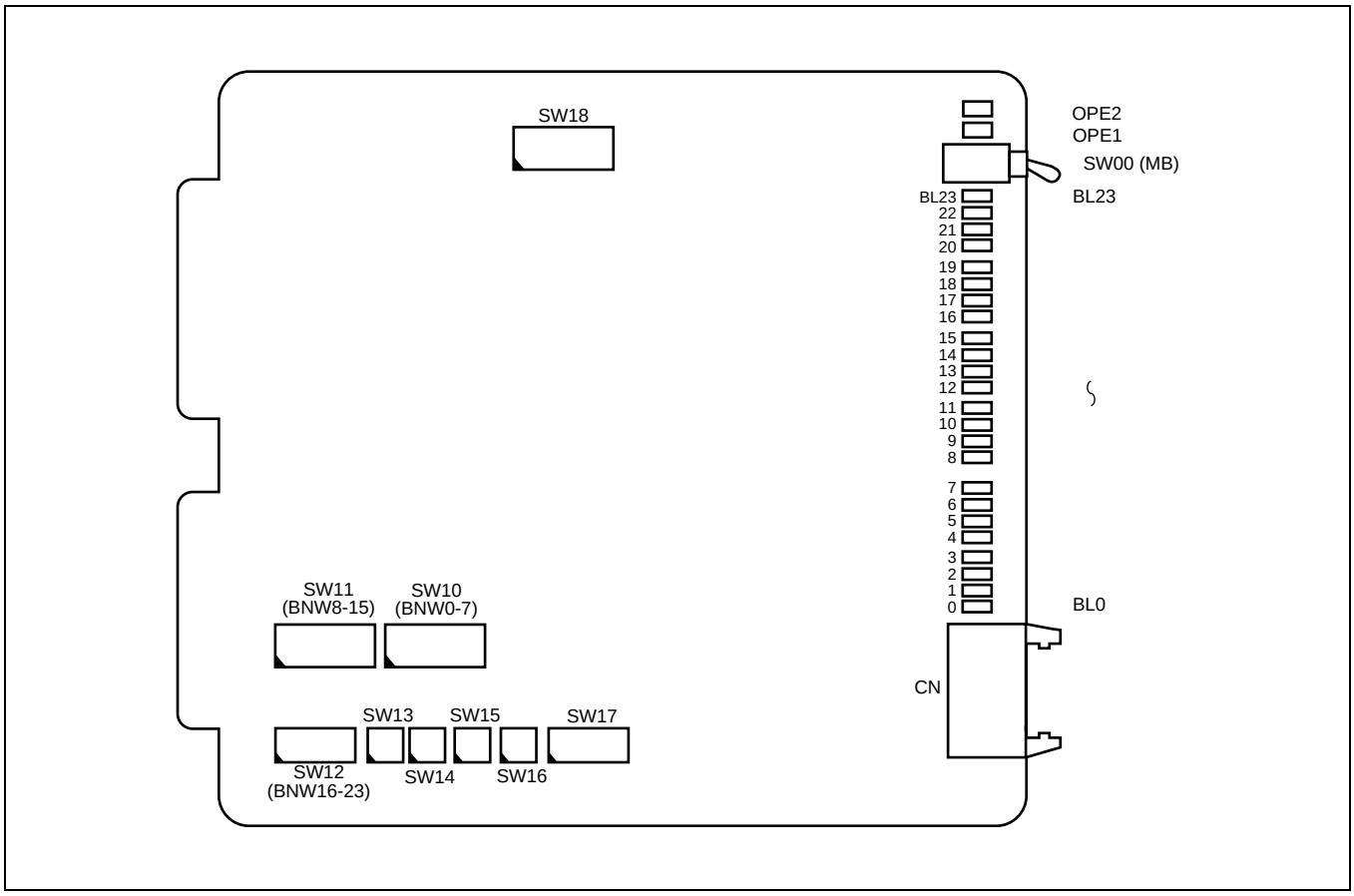


Figure 3-63 Face Layout of PA-24LCBV(LC) Card

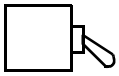
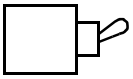
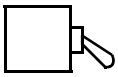
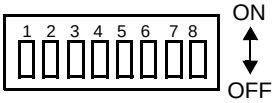
4. Lamp Indications

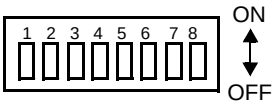
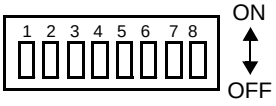
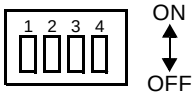
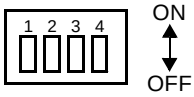
The contents of lamp indications on this card are shown below.

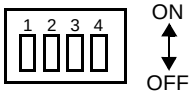
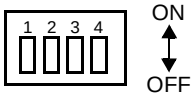
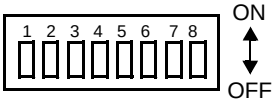
LED NAME	COLOR	LED STATUS	DESCRIPTION
OPE1	Green	Steady Lighting	The circuitry of Circuit #0-#7 is operating normally.
OPE2	Green	Steady Lighting	The circuitry of Circuit #8-#23 is operating normally.
BL0 ~ BL23	Green	Steady Lighting	Line loop exists.
		Flashing	1) Ringing signal is being transmitted. Busy LED keeps flashing in synchronizing with on/off of the ringing signal. 2) Dial pulses are being received. While dial pulses from a line are being received. Busy LED keeps flashing in synchronizing with the dial pulses coming from the line. 3) Line is in make-busy state. Busy LED keeps flashing at 60 ipm.

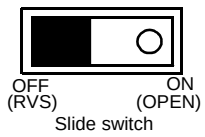
5. Switch Settings

Switches on the PA-24LCBV(LC) card have the following meanings.

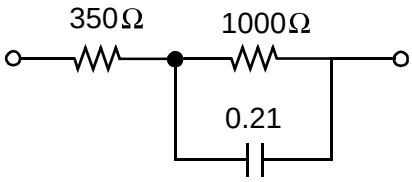
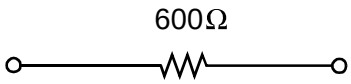
SWITCH	FUNCTION	SWITCH SETTING		MEANING
SW00 (MB) 	Circuit Card Make-busy Key	ON		Circuit card make-busy
		OFF		Circuit card make-busy cancel (normal operating mode)
SW10 (BNW0-7) 	Balancing Network Designation • Each element on this switch corresponds to Circuit #0-#7.	ON		North America, Other Country (A/μ Law) BNW: Compromise Impedance (EIA/TIA-464A) **Note** for long distance.
		OFF		North America, Other Country (A/μ Law) BNW: 600 Ω **Note** for short distance

SWITCH	No.	FUNCTION	SWITCH SETTING				MEANING
SW11 (BNW8-15) 		Balancing Network Designation • Each element on this switch corresponds to Circuit #8-#15.	[the same as previous page]				
SW12 (BMW16-23) 		Balancing Network Designation • Each element on this switch corresponds to Circuit #16-#23.	[the same as previous page]				
SW13 		Selection of the User	SW13-1	SW13-2	SW13-3	SW13-4	North America
			ON	OFF	OFF	OFF	
SW14 	1		OFF				Fixed to OFF
	2	Stutter Dial Tone	ON				Stutter Dial tone Available
			OFF				Stutter Dial tone not Available
	3		OFF				Fixed to OFF
	4		OFF				Fixed to OFF

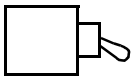
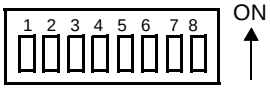
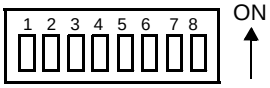
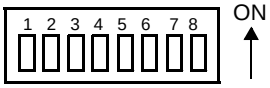
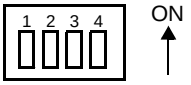
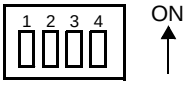
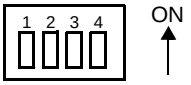
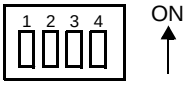
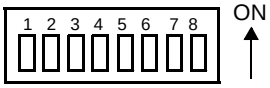
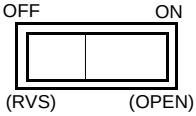
SWITCH	No.	FUNCTION	SWITCH SETTING	MEANING
SW15 	1		OFF	Fixed to OFF
	2		OFF	Fixed to OFF
	3		OFF	Fixed to OFF
	4		OFF	Fixed to OFF
SW16 	1		OFF	Fixed to OFF
	2		OFF	Fixed to OFF
	3	Message Waiting Lamp	ON	Message Waiting Lamp Flashing (Controlled by Firmware)
			OFF	Message Waiting Lamp lit or Flashing (Selected and Controlled by Software)
	4		OFF	Fixed to OFF
SW17 	1		OFF	Fixed to OFF
	2		OFF	Fixed to OFF
	3		OFF	Fixed to OFF
	4		OFF	Fixed to OFF
	5		OFF	Fixed to OFF
	6		OFF	Fixed to OFF
	7		OFF	Fixed to OFF
	8		OFF	Fixed to OFF

SWITCH	No.	FUNCTION	SWITCH SETTING	MEANING
SW18  Slide switch	Polarity reverse or Momentary Open		ON	Momentary open
			OFF	Polarity reverse

Note 1: *Compromise Impedance (EIA/TIA-464A) and 600Ω are composed as follows.*

ON	OFF
 Compromise Impedance (EIA/TIA-464B)	

6. Switch Setting Sheet

MODULE	SLOT No.	SWITCH NAME	SWITCH SHAPE	REMARKS
PIM		SW00 (MB)		**Note:** *Normal operating mode is down.*
		SW10 (BNW0-7)		
		SW11 (BNW8-15)		
		SW12 (BNW16-23)		
		SW13		
		SW14		
		SW15		
		SW16		
		SW17		
		SW18		

7. External Interface

Accommodation of the LT connector leads and LC connector leads for this circuit card is shown in Figure 3-64.

(1) PIM

When this circuit card is mounted in PIM, necessary leads appear on the LT connectors as follows.

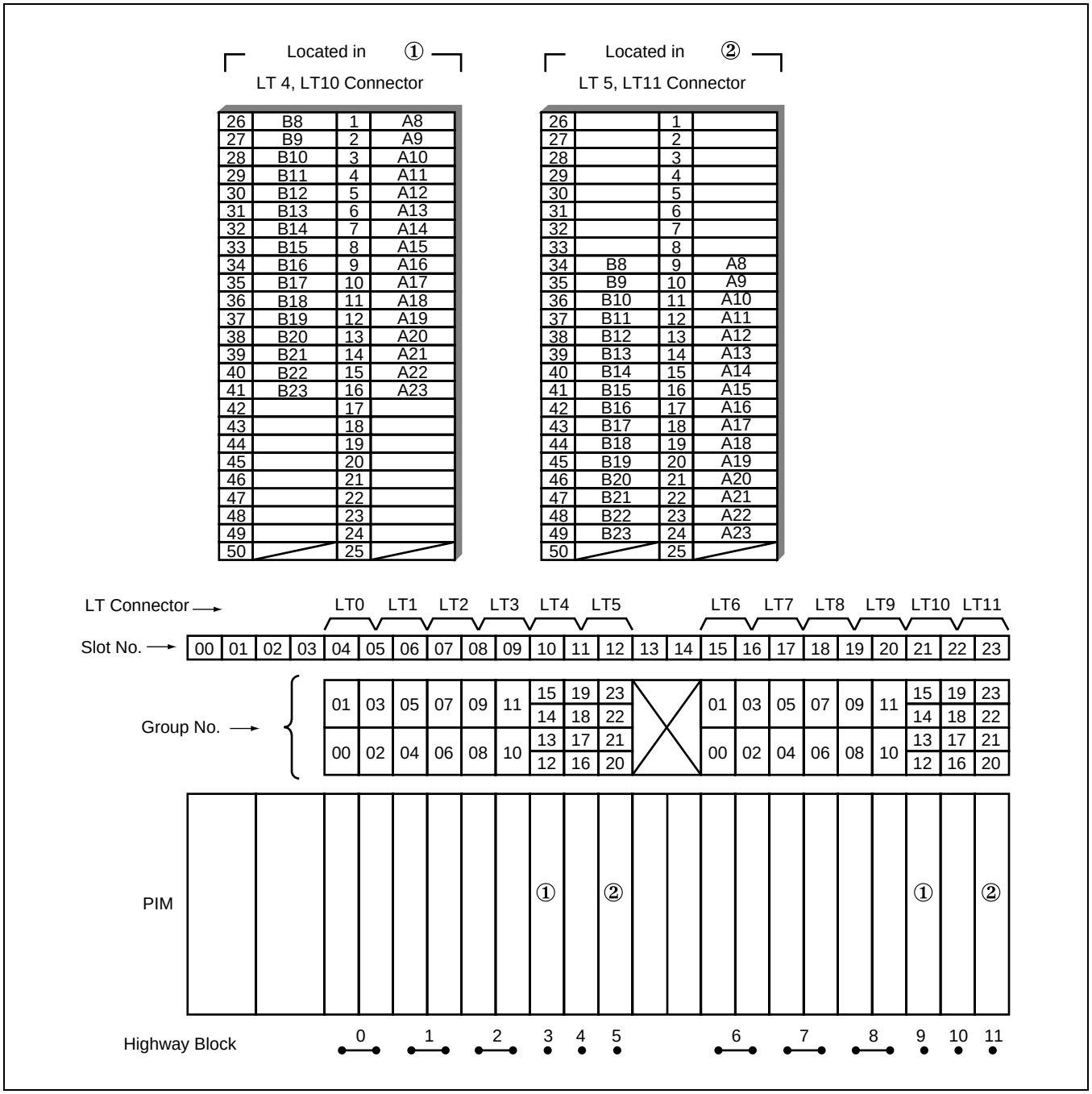


Figure 3-64 LT Connector Lead Accommodation (PIM) (1/2)

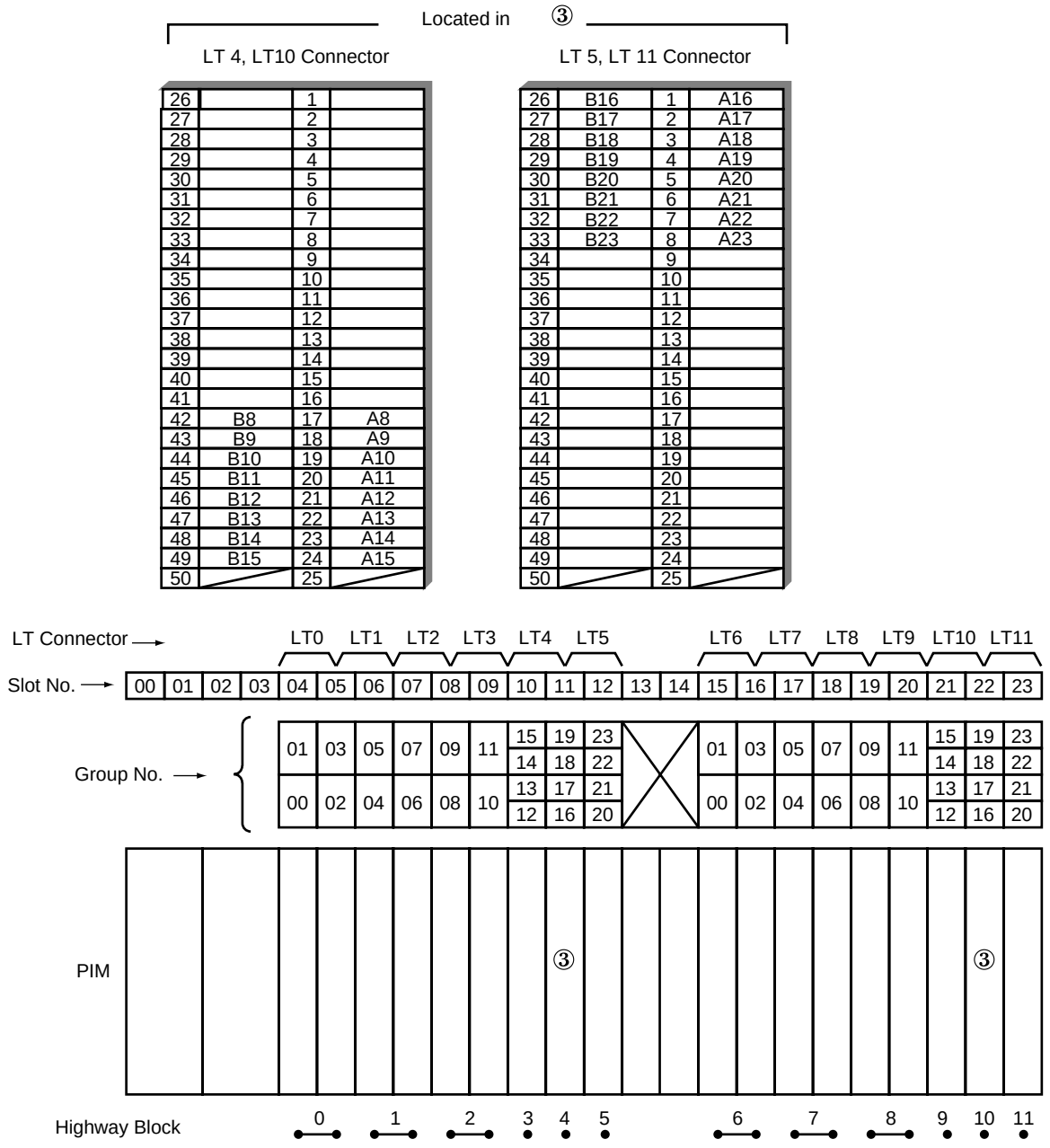


Figure 3-64 LT Connector Lead Accommodation (PIM) (2/2)

(2) LC Connector Leads

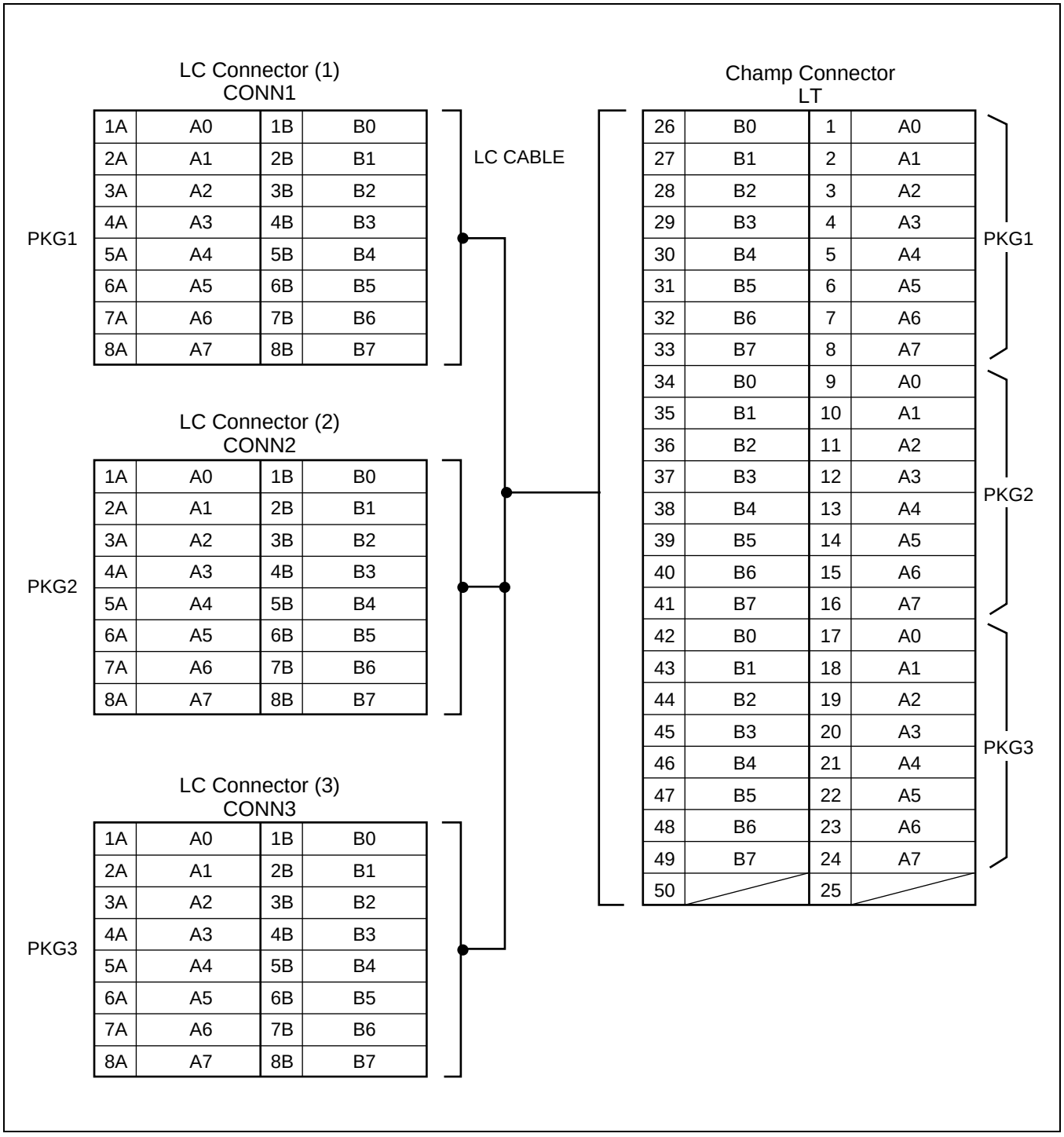


Figure 3-65 LC Connector Lead Accommodation (LC Cable)

8. Connecting Route Diagram

   Connecting Route Diagram for the PA-24LCBV(LC) is as follows:

Note: *A and B leads for Channels #0 - #7 appear from the LC Connector equipped on the front edge of the card.*

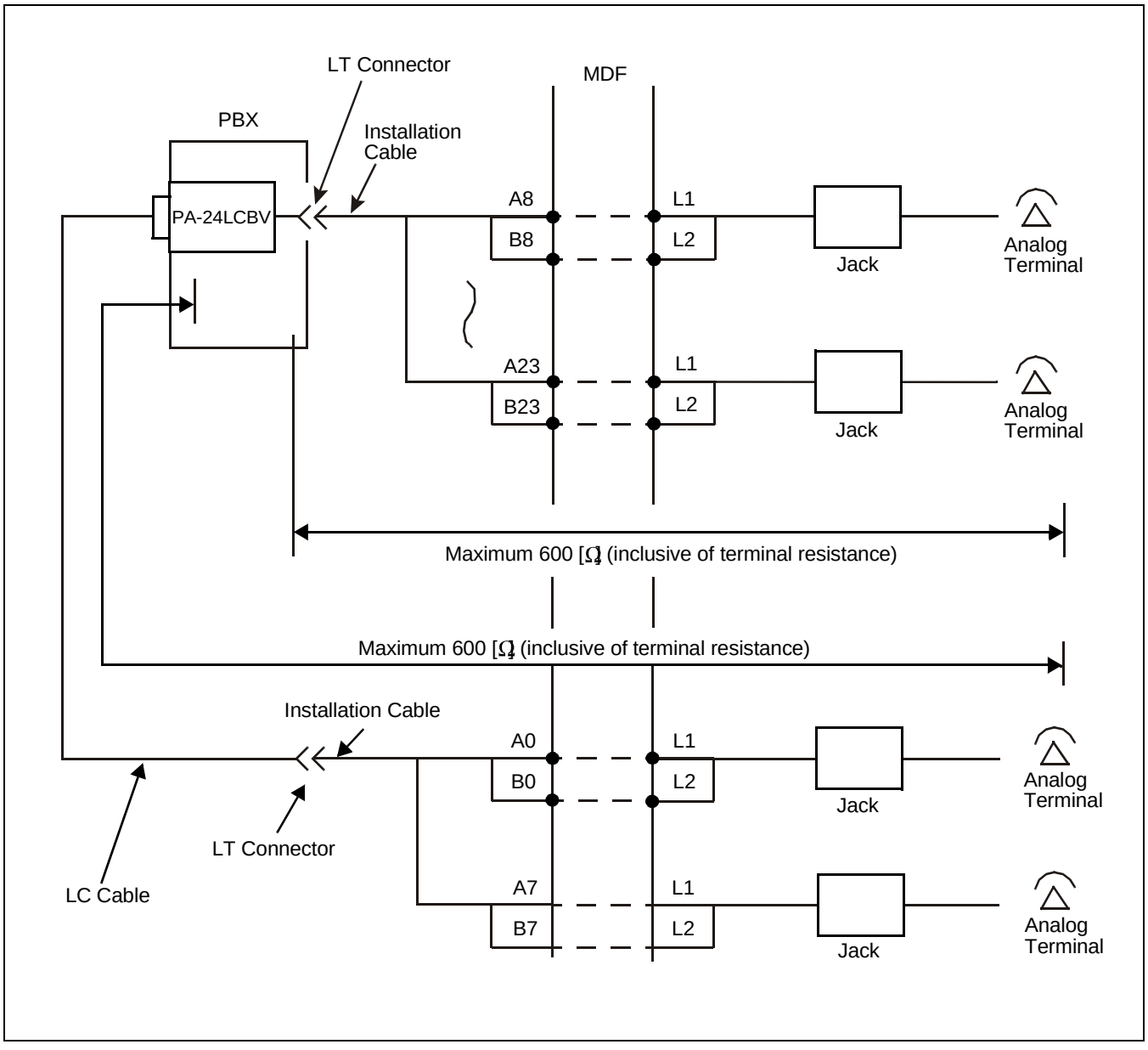


Figure 3-66 Connecting Route Diagram for the PA-24LCBV (LC)

9. LC Cable Connection

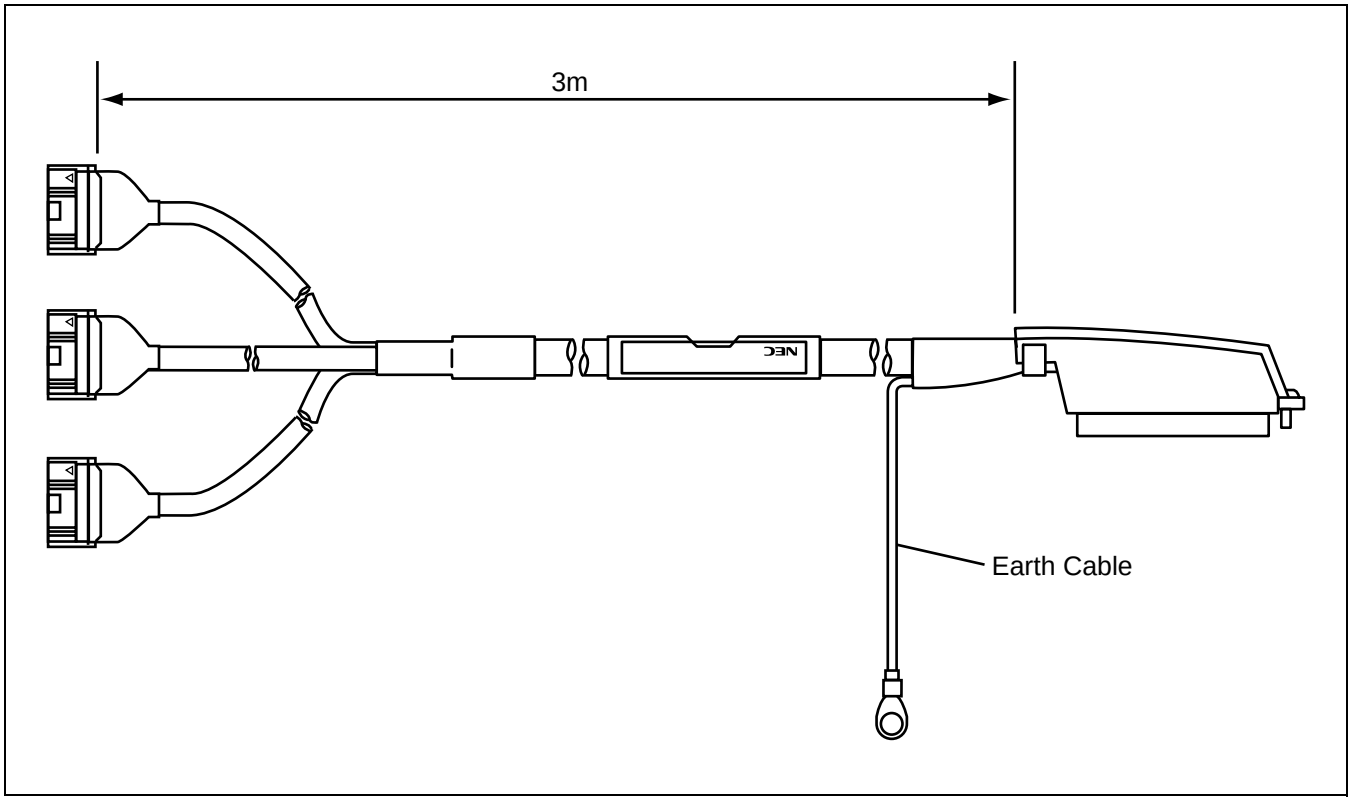


Figure 3-67 Outer View of LC Cable

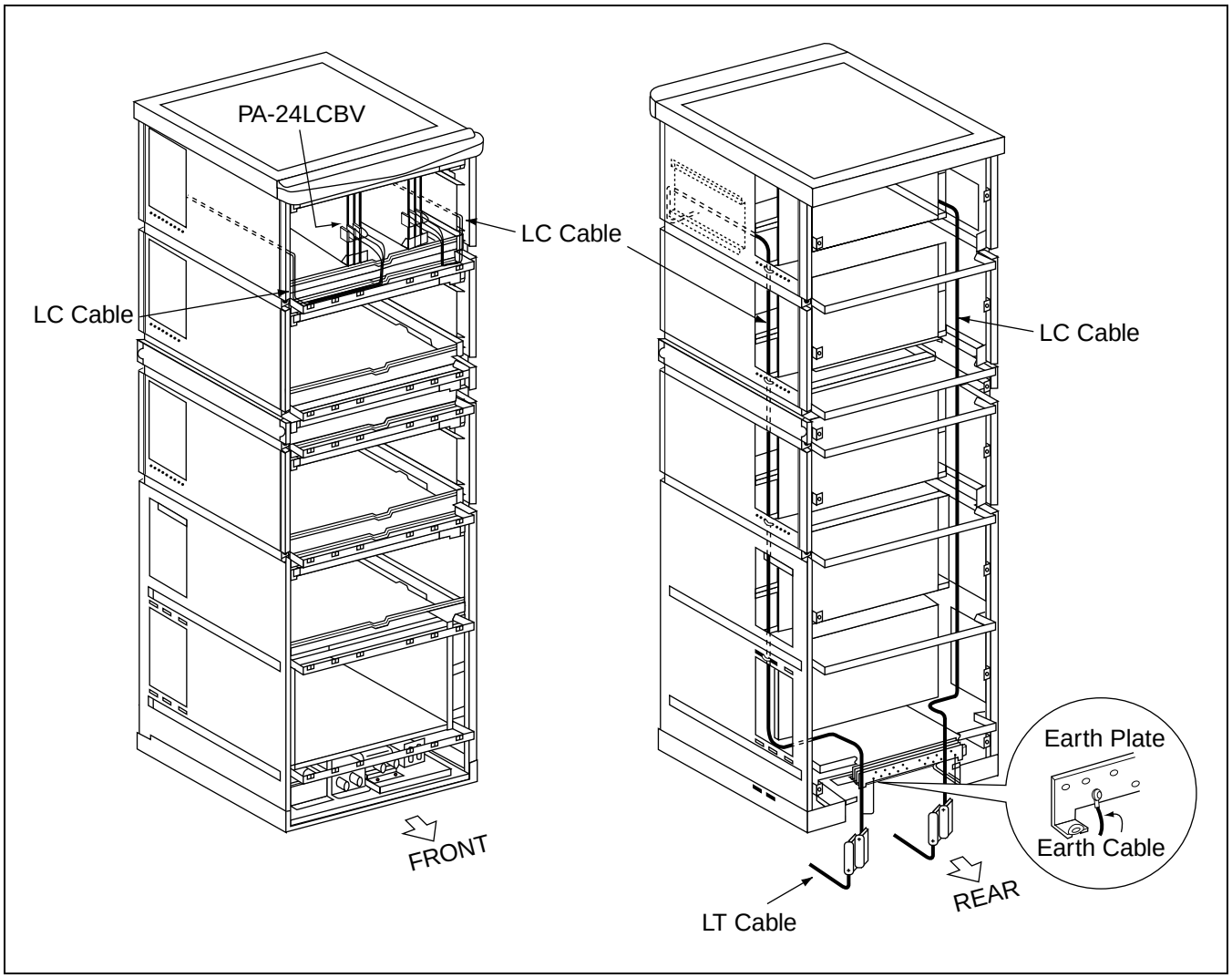
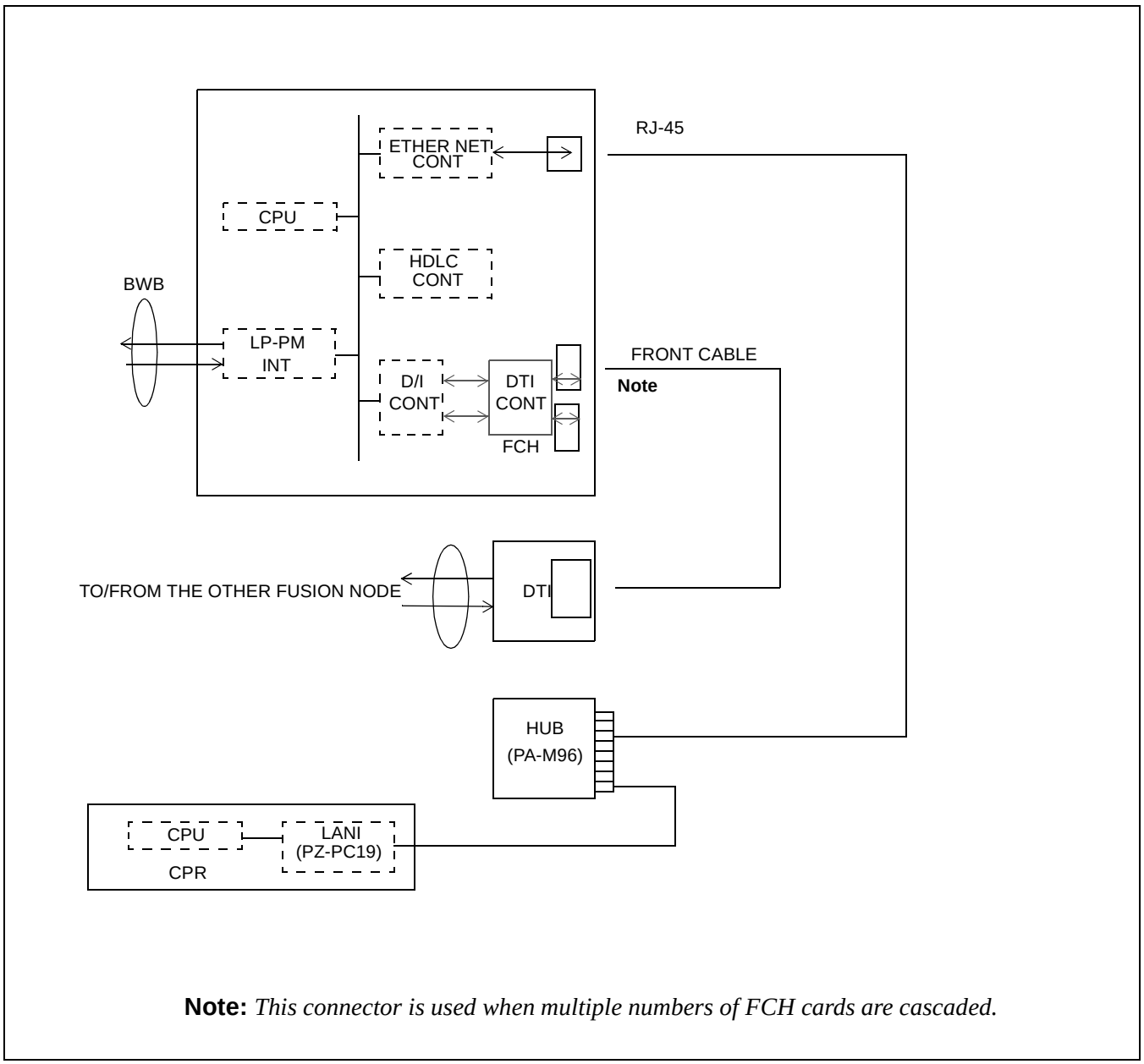


Figure 3-68 Cable Running of LC Cable (Example)

PA-FCHA
Fusion Call Control Handler

1. General Function

This circuit card is a protocol converter to carry the fusion-link-data from/to the other node. The Fusion-Link-Data is received/transferred from/to the CPR via HUB (PA-M96) across the TCP/IP interface. Once the FCH has received the fusion-link-data from the CPR, the HDLC CONT part of the FCH converts it to the High Level Data Link Controller (HDLC) format, then drops and inserts (D/I) onto a particular channel (or channels) of the ITU-T G.703 digital interface.

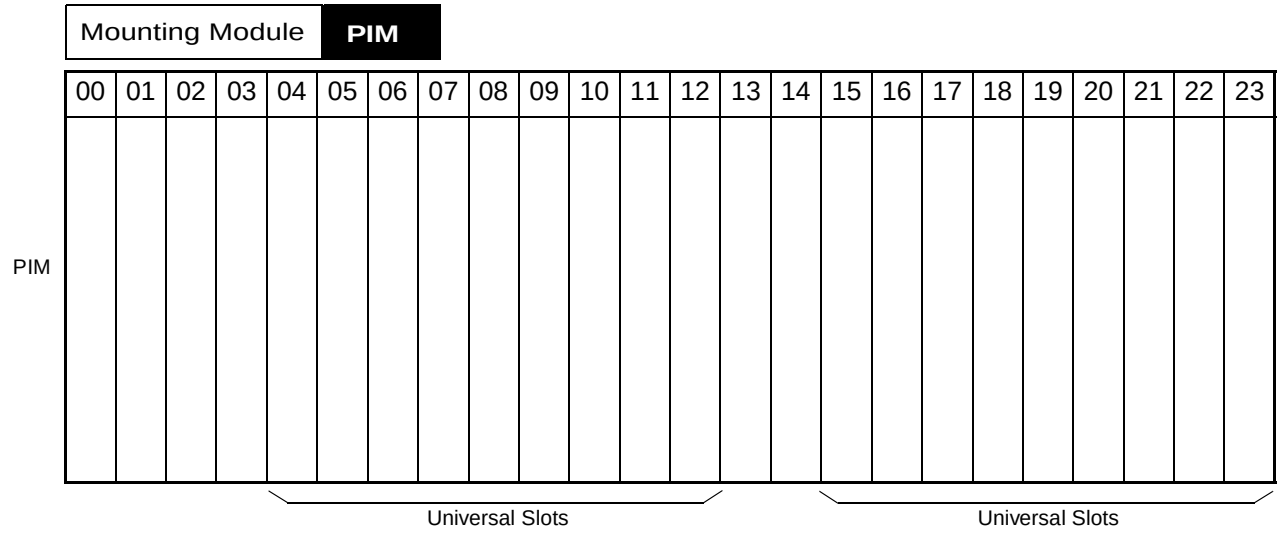


Note: *This connector is used when multiple numbers of FCH cards are cascaded.*

Figure 3-69 Location ofPA-FCHA (FCH) Card in the System

2. Mounting Location/ Condition

   The FCH can be mounted in a universal slot of the PIM.



3. Face Layout of Lamps, Switches, and Connectors

   The face layout of lamps, switches, and connectors is shown below.

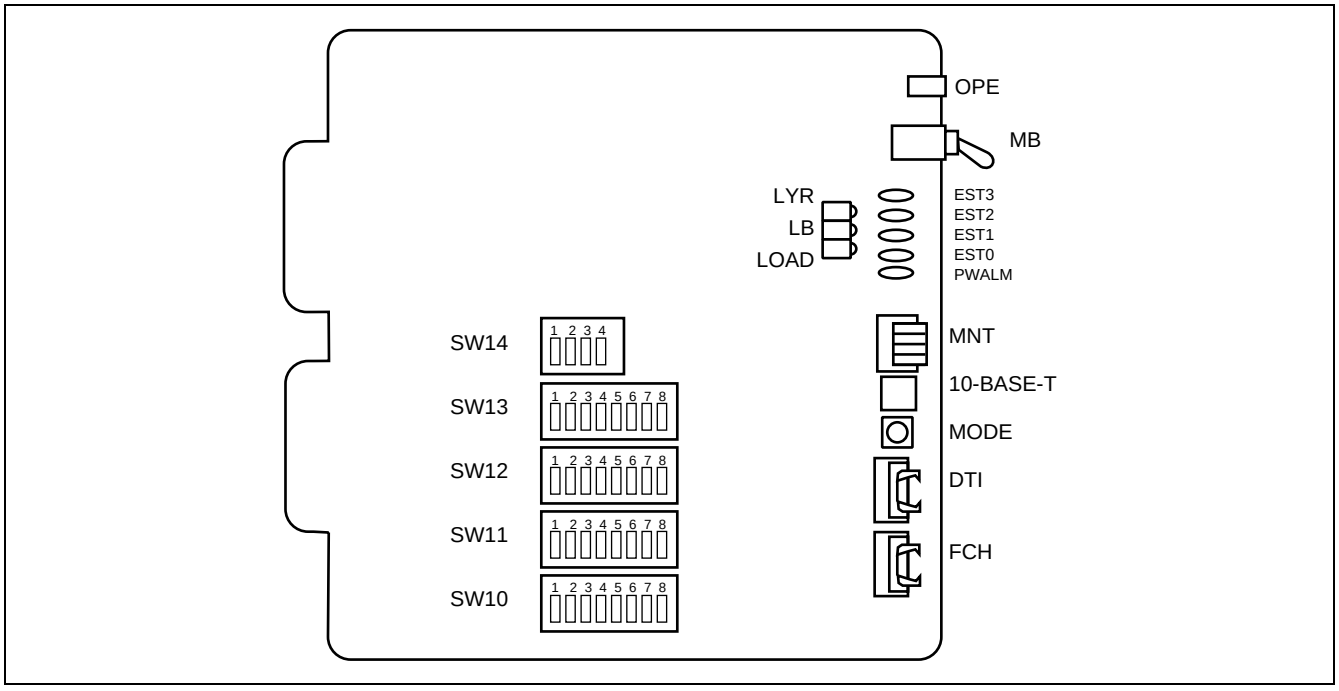


Figure 3-70 Face Layout of PA-FCHA (FCH) Card

4. Lamp Indications

Lamp indications for this circuit card are shown in the table below.

LAMP NAME	COLOR	STATE
OPE	Green	Remains lit while this circuit card is operating.
LYR	Green	Remains lit while the Fusion link is established.
	Flash	Flashes when the Fusion link test result is fair. (60IPM)
	OFF	Remains off when either the Fusion link is not established or the Fusion link test result is not fair.
LB	Green	Remains lit while 10-BASE-T port is ready to use.
	OFF	Remains off when 10-BASE-T port is not ready.
LOAD	Green	Remains lit while this circuit card is ready to broadcast data packets. (Forwarding Status)
	Flash (60 IPM)	Remains lit while this circuit card is ready to broadcast data packets. (Blocking Status)
	Flash (120 IPM)	Remains lit while this circuit card is stand-by to broadcast data packets. (Learning Status)
	OFF	Remains off when this circuit card is stand-by to broadcast data packets. (Null Status)
EST3	Green	Remains lit while sending data.
EST2	Green	Remains lit when receiving pair cable polarity is normal.
EST1	Green	Remains lit while receiving data.
EST0	Green	Remains lit while the link is established.
PWALM	Red	Remains lit when power supply failure (from the BWB) has occurred.

5. Switch setting

Standard settings for switches on this circuit card are shown in the table below.

SWITCH NAME	SWITCH NO	SETTING	STANDARD SETTING	DESCRIPTION
MB **Note**		UP		Circuit card Make-busy.
		DOWN	×	Circuit card Make-busy cancel.

SWITCH NAME	SWITCH NO	SETTING	STANDARD SETTING	DESCRIPTION
MNT	0	OFF	×	Not used.
	1	OFF	×	Not used.
	2	OFF	×	Not used.
	3 **Note**	ON		Make-busy-request.
		OFF	×	Cancel the Make-busy-request.

Note: *The following operations are required prior to extracting the card.*

(1.) Turn on the MNT3 switch.
(2.) Flip the MB switch.

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

When the D/I DTI (1.5M) is connected with the card front cable.

SWITCH NAME	SWITCH NO	SETTING	STANDARD SETTING	DESCRIPTION
SW10	1 **Note**	ON		T203 timer value is variable.
		OFF	×	T203 timer value is fixed at 10 seconds.
	2~8	OFF	×	Not used.

Note: *T203 timer designates the maximum idle time which does not transmit any data frames. As a basic rule, the shorter T203 timer value, the earlier link failure detection will be obtained.*

SWITCH NAME	SWITCH NO	SETTING	STANDARD SETTING	DESCRIPTION
SW11 **Note 1**	1	ON		This SW designates the D/I channel of the Fusion-Link-Data. (The number of D/I channels = n) Set the corresponding SW(s) to "ON" for D/I, "OFF" for denial.
		OFF		
	2	ON		
		OFF		
	3	ON		
		OFF		
	4	ON		
		OFF		
	5	ON		
		OFF		
	6	ON		
		OFF		
	7	ON		
		OFF		
	8	ON		
		OFF		

SW11	D/I channel of T1
SW11-1	CH 0
SW11-2	CH 1
SW11-3	CH2
SW11-4	CH 3
SW11-5	CH 4
SW11-6	CH 5
SW11-7	CH 6
SW11-8	CH 7

SWITCH NAME	SWITCH NO	SETTING	STANDARD SETTING	DESCRIPTION
SW12 **Note 1**	1	ON		This SW designates the D/I channel of the Fusion-Link-Data. (The number of D/I channels = n) Set the corresponding SW(s) to "ON" for D/I, "OFF" for denial.
		OFF		
	2	ON		
		OFF		
	3	ON		
		OFF		
	4	ON		
		OFF		
	5	ON		
		OFF		
	6	ON		
		OFF		
	7	ON		
		OFF		
	8	ON		
		OFF		

SW12	D/I channel of T1
SW12-1	CH 8
SW12-2	CH 9
SW12-3	CH 10
SW12-4	CH 11
SW12-5	CH 12
SW12-6	CH 13
SW12-7	CH 14
SW12-8	CH 15

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

When "n" is one or more, the corresponding D channels as "n" must be designated by SW11-SW12.

<table>
<tr><th>SWITCH NAME</th><th>SWITCH NO</th><th>SETTING</th><th>STANDARD SETTING</th><th>DESCRIPTION</th></tr>
<tr><td rowspan="16">SW13</td><td rowspan="2">1</td><td>ON</td><td></td><td rowspan="16">This SW designates the D/I channel of the Fusion-Link-Data. (The number of D/I channels = n)

Set the corresponding SW(s) to “ON” for D/I, “OFF” for denial.

<table><tr><th>SW13</th><th>D/I channel of T1</th></tr><tr><td>SW13-1</td><td>CH 16</td></tr><tr><td>SW13-2</td><td>CH 17</td></tr><tr><td>SW13-3</td><td>CH 18</td></tr><tr><td>SW13-4</td><td>CH 19</td></tr><tr><td>SW13-5</td><td>CH 20</td></tr><tr><td>SW13-6</td><td>CH 21</td></tr><tr><td>SW13-7</td><td>CH 22</td></tr><tr><td>SW13-8</td><td>CH 23</td></tr></table></td></tr>
<tr><td>OFF</td><td></td></tr>
<tr><td rowspan="2">2</td><td>ON</td><td></td></tr>
<tr><td>OFF</td><td></td></tr>
<tr><td rowspan="2">3</td><td>ON</td><td></td></tr>
<tr><td>OFF</td><td></td></tr>
<tr><td rowspan="2">4</td><td>ON</td><td></td></tr>
<tr><td>OFF</td><td></td></tr>
<tr><td rowspan="2">5</td><td>ON</td><td></td></tr>
<tr><td>OFF</td><td></td></tr>
<tr><td rowspan="2">6</td><td>ON</td><td></td></tr>
<tr><td>OFF</td><td></td></tr>
<tr><td rowspan="2">7</td><td>ON</td><td></td></tr>
<tr><td>OFF</td><td></td></tr>
<tr><td rowspan="2">8</td><td>ON</td><td></td></tr>
<tr><td>OFF</td><td></td></tr>
<tr><td rowspan="6">SW14</td><td rowspan="2">1</td><td>ON</td><td>×</td><td>Positive logic for the D/I CONT</td></tr>
<tr><td>OFF</td><td></td><td>Negative logic for the D/I CONT</td></tr>
<tr><td rowspan="2">2
Note 2</td><td>ON</td><td>×</td><td rowspan="4">The fusion data link speed inserted onto the T1 interface.
<table><tr><th>SW14-2</th><th>SW14-3</th><th>SPEED</th></tr><tr><td>ON</td><td>ON</td><td>64 Kbps × n</td></tr><tr><td>ON</td><td>OFF</td><td>56 Kbps × n</td></tr><tr><td>OFF</td><td>ON</td><td>48 Kbps × n</td></tr><tr><td>OFF</td><td>OFF</td><td>Not used</td></tr></table></td></tr>
<tr><td>OFF</td><td></td></tr>
<tr><td rowspan="2">3
Note 2</td><td>ON</td><td>×</td></tr>
<tr><td>OFF</td><td></td></tr>
<tr><td rowspan="2">4
Note 3</td><td>ON</td><td></td><td>Link Access Protocol D-channel (LAPD) signal link performs as the “network.”</td></tr>
<tr><td>OFF</td><td></td><td>LAPD signal link performs as the “user.”</td></tr>
</table>

Note 2: *Data speed 64 kbps is used for the T1 or E1 interface.*

Data speed 56 kbps is used for the T1 interface with bit stealing.
Data speed 48 kbps is used for the T1 interface with both bit stealing and the Zero Code Suppression (or Bit 7 Stuffing).

Note 3: *When a node is set "network," the distant node over the fusion link should be set "user," and vice versa.*

6. External Interface

The cable connections among the FCH, HUB, 24DTR are shown in Figure 3-71.

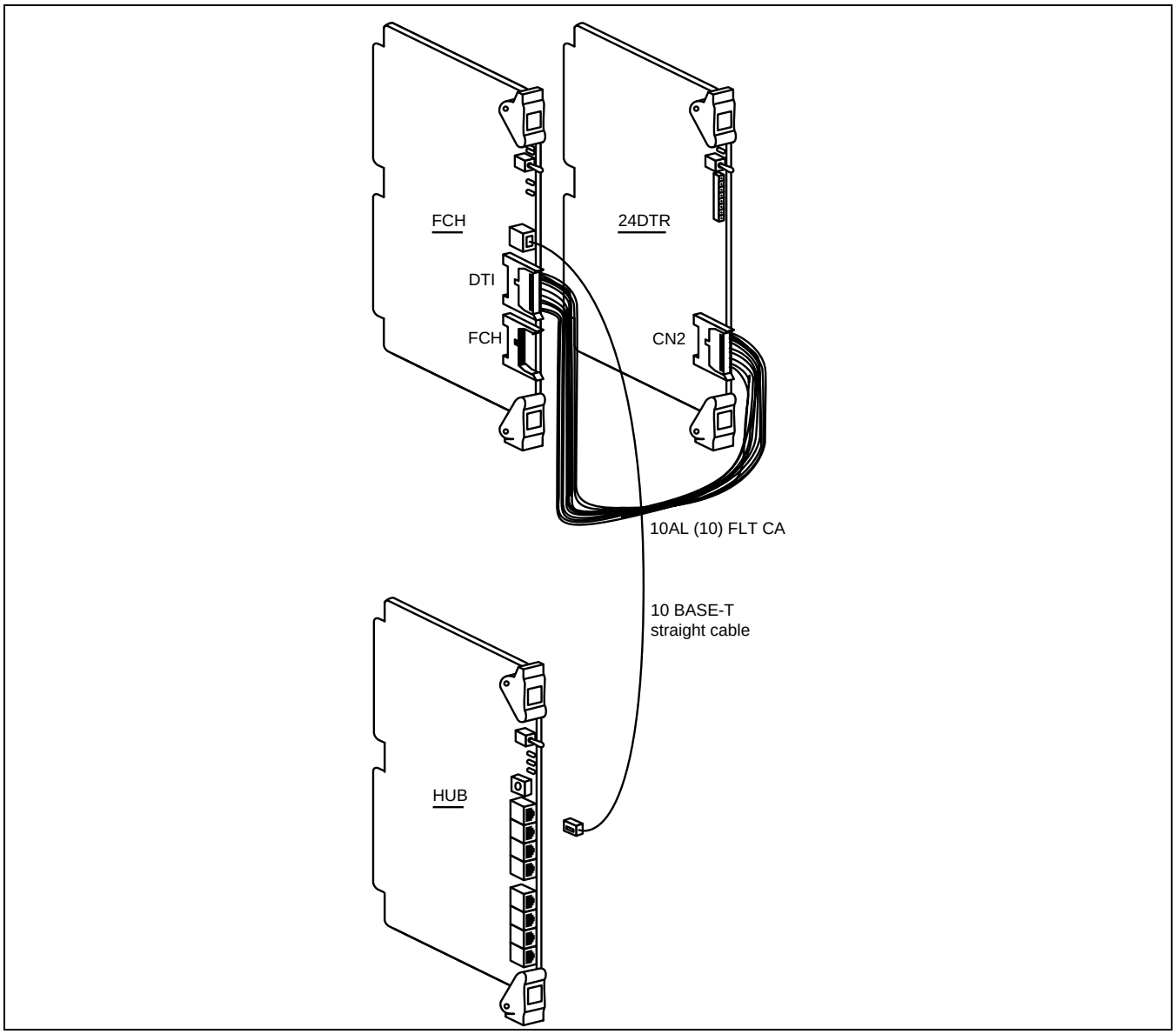


Figure 3-71 FCH/HUB/DTI Connection

See the following figure when multiple numbers of FCH circuit cards are connected to a 24DTR as a cascade connection. The FCH can be combined with CCH/DCH on a cascade connection.

One DTI card can have a maximum of five (5) Handler circuits cascaded within the FCH card, the CCH card, and/or DCH card. Since the FCH card contains one Handler circuit per card, a maximum of five (5) FCH cards can be cascaded to a DTI card.

As an example, the following (a), (b) and (c) can coexist on a cascade connection.

(a) FCH card (One (1) Handler circuit card per card)

(b) CCH card (Two (2) Handler circuits per card)

(c) DCH card (Two (2) Handler circuits per card)

Also, you must consider the cascading cable length. **Note**

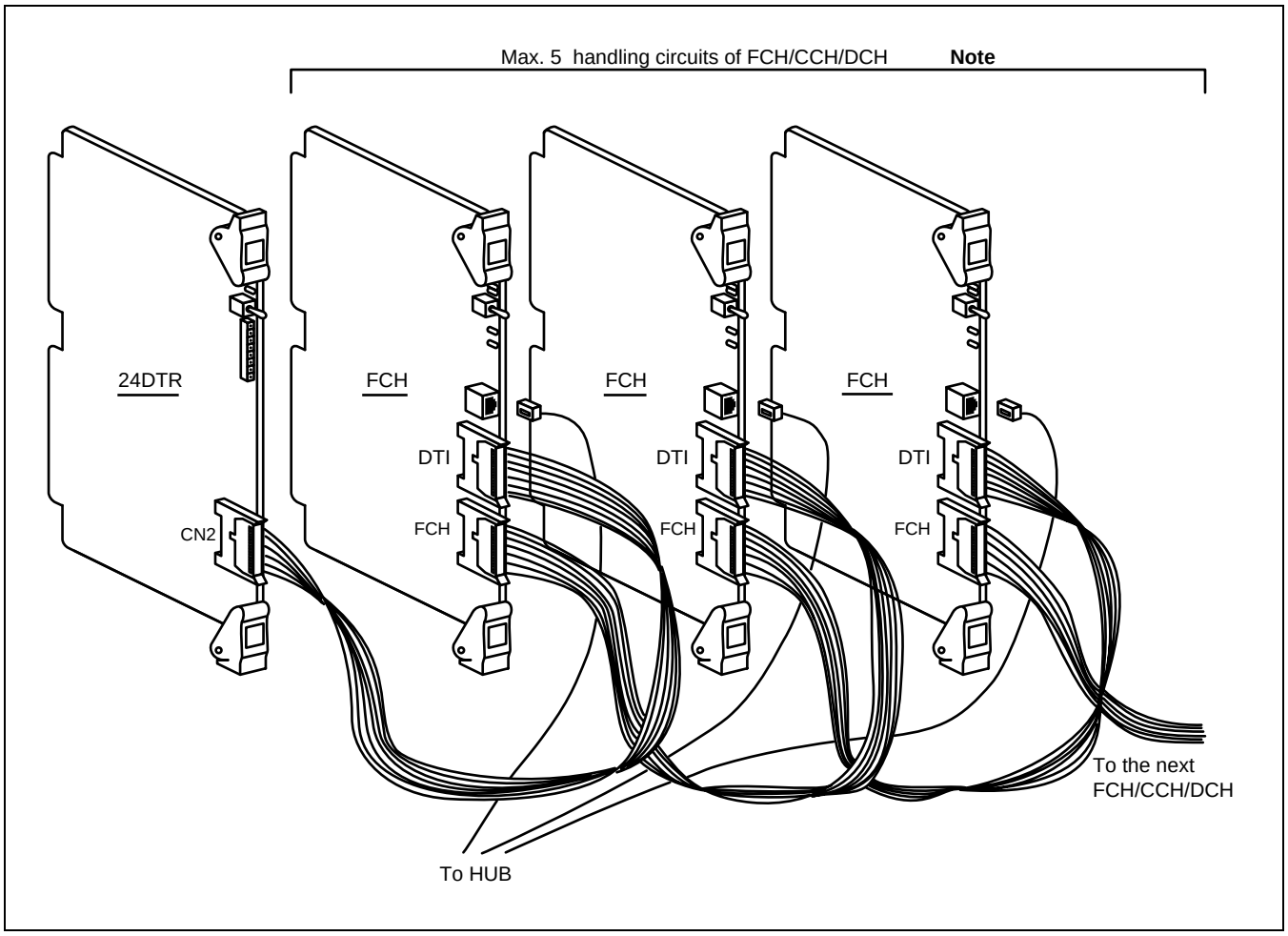
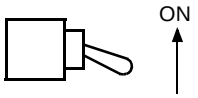
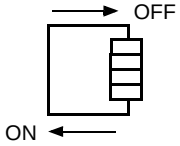
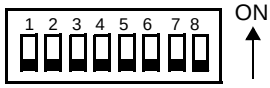
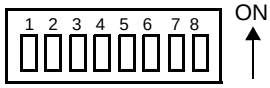
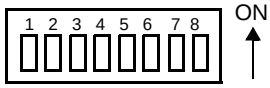
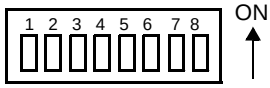
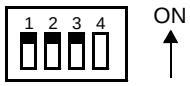


Figure 3-72 FCH Cascade Connection

Note: *A maximum cable distance between DTI and the last cascaded FCH (or CCH/DCH) is 50 cm (1' 7.6 ").*

7. Switch Setting Sheet

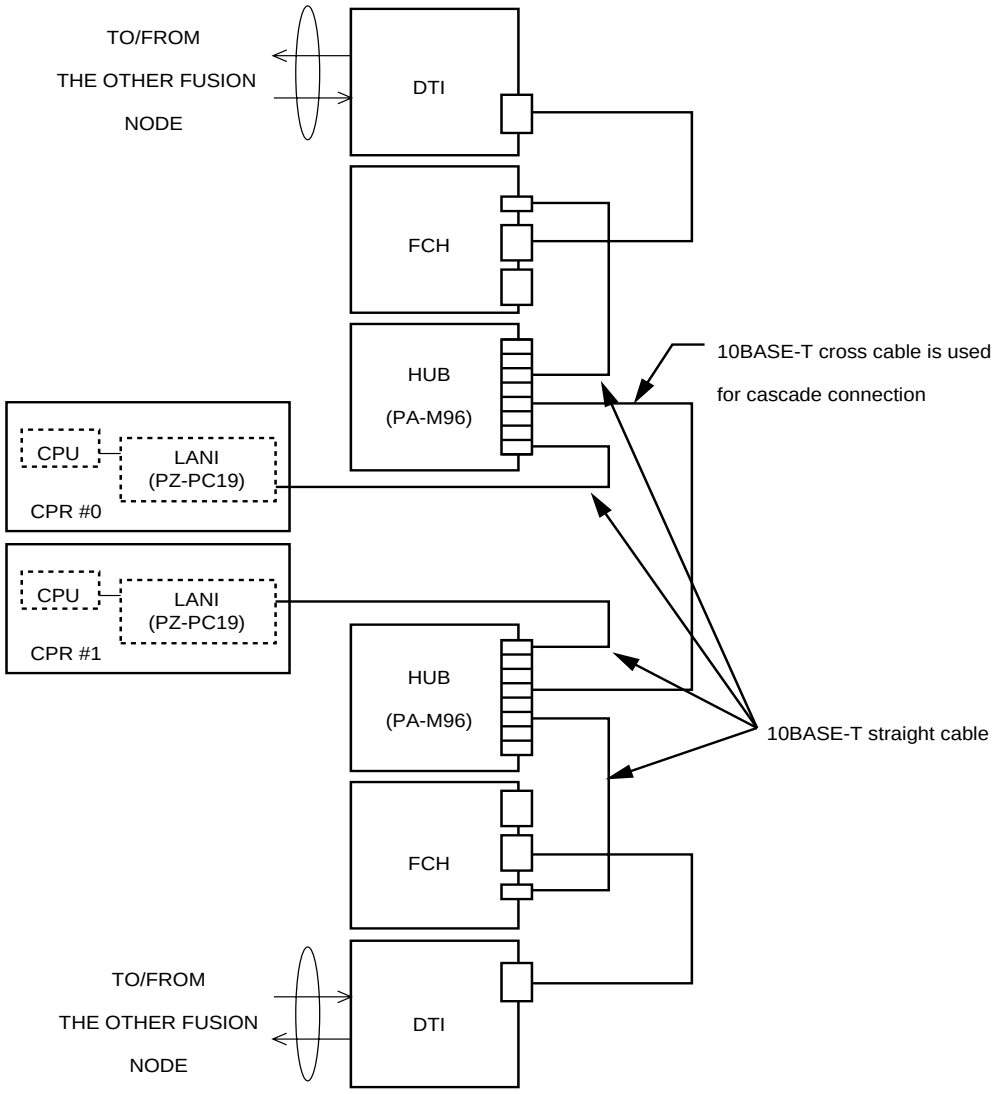
SWITCH NAME	SWITCH SHAPE	REMARKS
MB		
MNT		
MODE		
SW10		
SW11		
SW12		
SW13		
SW14		

PA-M96
HUB

1. General Function

This circuit card provides the repeater function which is based on ANSI/IEEE 802.3. Eight (8) of the 10BASE-T ports are located on a HUB card.

As seen from the functional connection diagram below, the HUB card is located between the CPR (LANI) and the FCH card. The HUB card distributes the Fusion link data onto FCH cards.

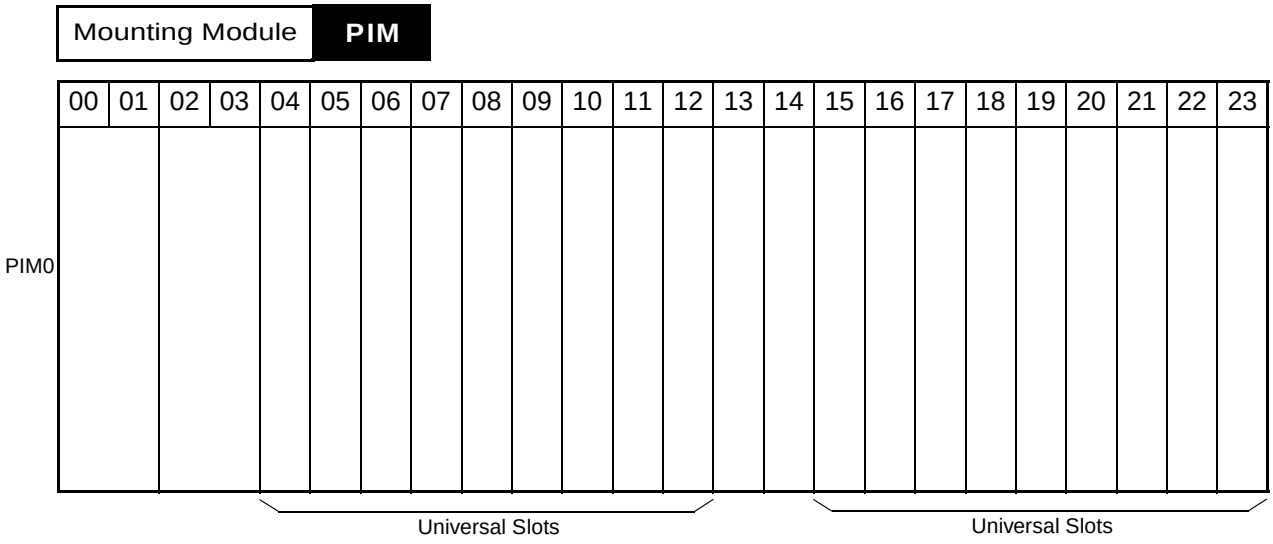


Note: *This figure shows the fusion link with full redundancy (N+1) configuration.*

Figure 3-73 Location ofPA-M96 (HUB) Card in the System

2. Mounting Location/Condition

The PA-M96 (HUB) card can be mounted in any universal slot of PIM0 as shown below.



3. Face Layout of Lamps, Switches, and Connectors

The face layout of lamps, switches, and connectors is shown in Figure 3-74.

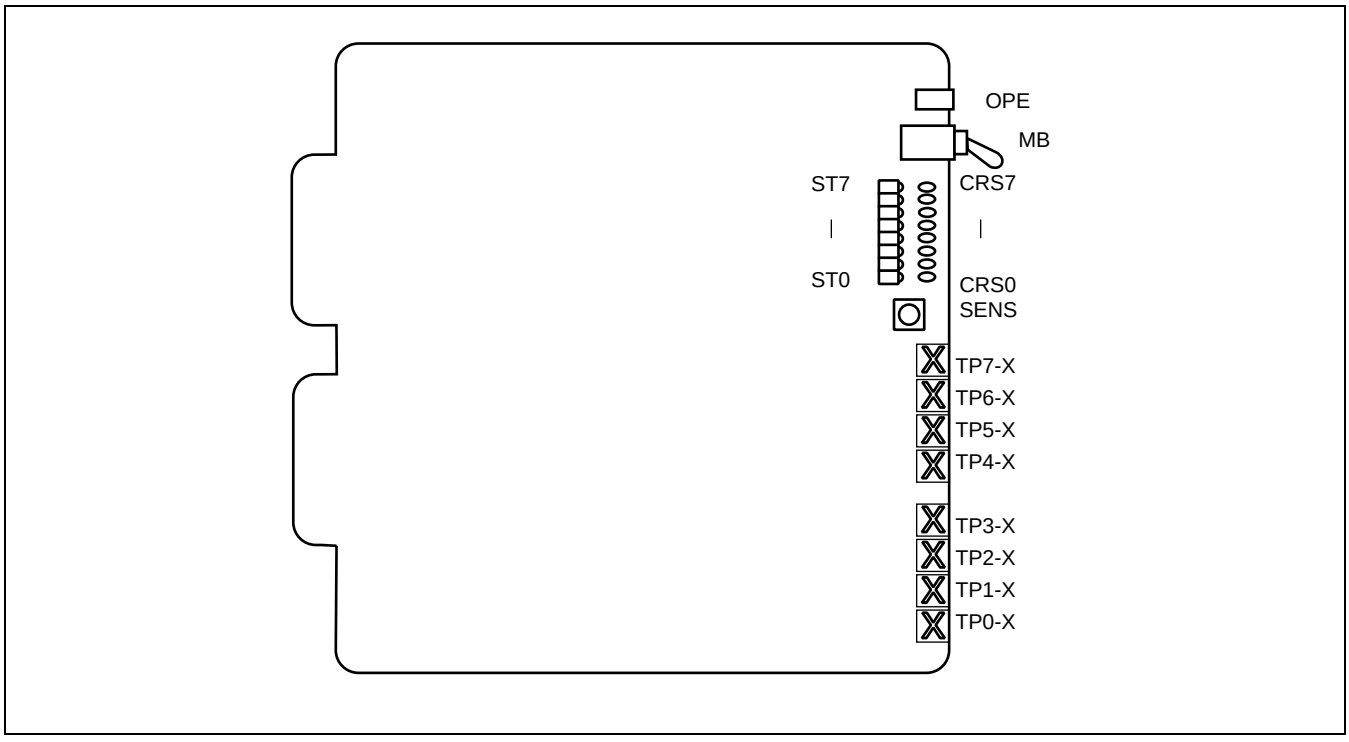


Figure 3-74 Face Layout ofPA-M96 (HUB) Card

4. Lamp Indications

Lamp indications for this circuit card are shown in the table below.

<table>
<tr><th>LAMP NAME</th><th>COLOR</th><th>STATE</th></tr>
<tr><td>OPE</td><td>Green</td><td>Remains lit while this circuit card is in normal operation.</td></tr>
<tr><td>CRS0~CRS7</td><td>Green</td><td>Lights when the circuit card detects the carrier signal form the TPn-X port.</td></tr>
<tr><td>ST0~ST7</td><td>Green</td><td>The meanings of the ST0~ST7 lamps vary depending on the SEL switch settings as shown in the table below.
<table>
<tr><th>SEL SWITCH</th><th>MEANINGS</th></tr>
<tr><td>0</td><td>Lights when the receiving pair cable polarity of the TPn-X port is reversed. (n = 0~7) Note 1</td></tr>
<tr><td>2</td><td>Lights when the 10 BASE-T (RJ-45) cable is attached to the TPn-X port, and the TCP/IP link has been established. The lamp may light regardless of the receiving pair cable polarity. (n = 0~7)</td></tr>
<tr><td>3</td><td>Lights when the TPn-X port is normal.
Remains off when collisions have occurred at the TPn-X port. (n = 0~7) Note 2</td></tr>
</table>
</td></tr>
</table>

Note 1: *This lamp is used to indicate the status of the TPn-X port. Therefore, the circuit card operates normally regardless of the cable polarity.*

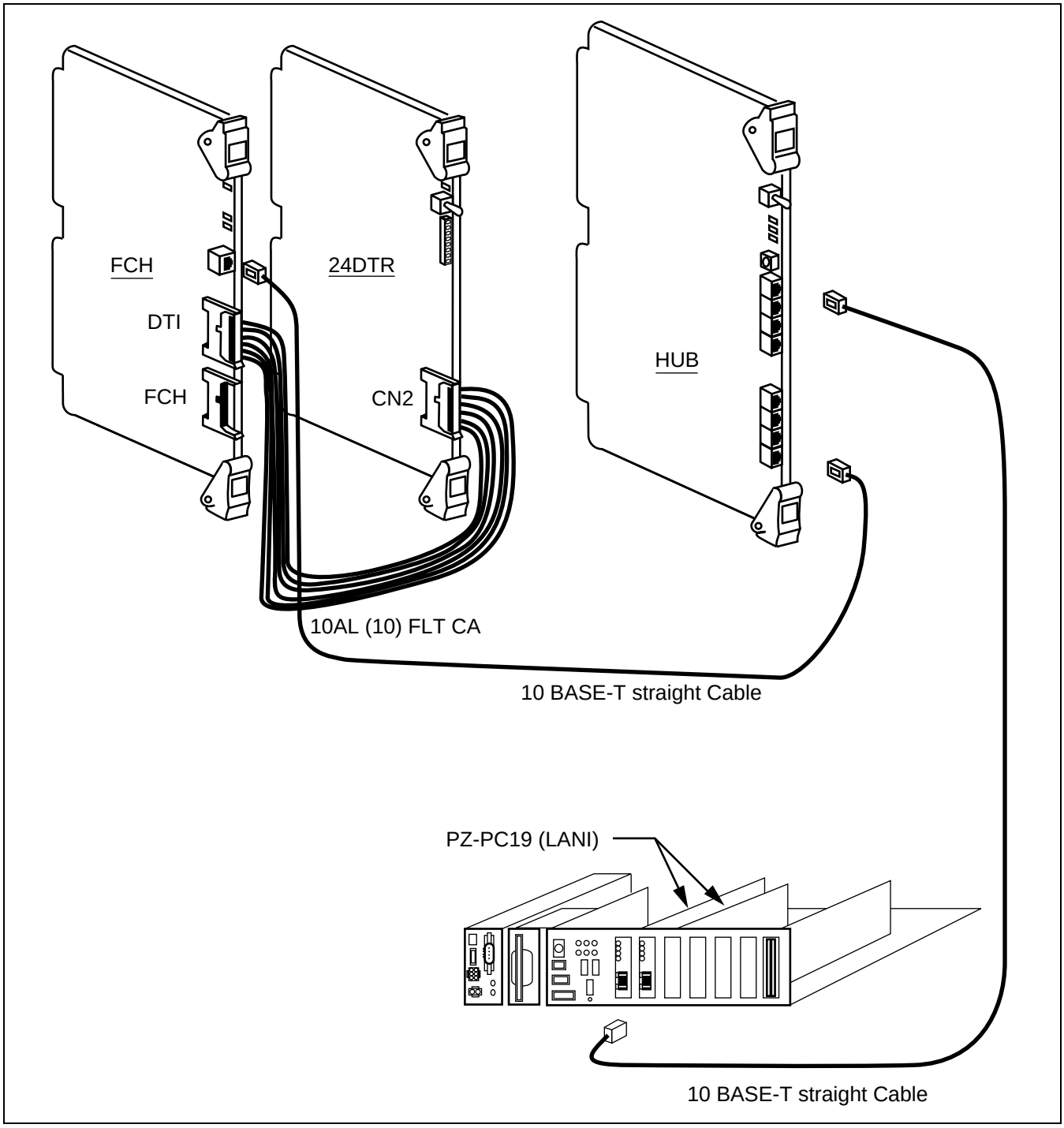
Note 2: *This circuit card can detect data packet collisions at a TPn-X port when it would be a collision of 2048bit-times (2.048 ms) or when the packet collides 32 times consecutively. The port is then locked-out until the collision is over.*

5. Switch Setting

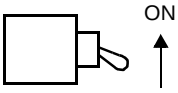
Standard settings for switches on this circuit card are shown in the table below.

SWITCH NAME	SETTING	STANDARD SETTING	DESCRIPTION
MB	UP		Circuit card Make-busy.
	DOWN	×	Circuit card Make-busy cancel.
SENSE	0		Polarity indication on the STn lamps for TPn-X ports (n = 0~7).
	1		Not used.
	2	×	TPn-X ports operate as a repeater HUB. (n = 0~7).
	3		Data-Packet-Collision indication on the STn lamps for TPn-X ports (n = 0~7).
	4 - F		Not used

6. External Interface



7. Switch Setting Sheet

SWITCH NAME	SWITCH SHAPE	REMARKS
MB		
SEL		

PA-8RSTM
Register Sender Trunk

1. Function

   This circuit card is an 8-circuit register sender trunk card that transmits and sends selective signals (DP signals, PB signals, MF signals).

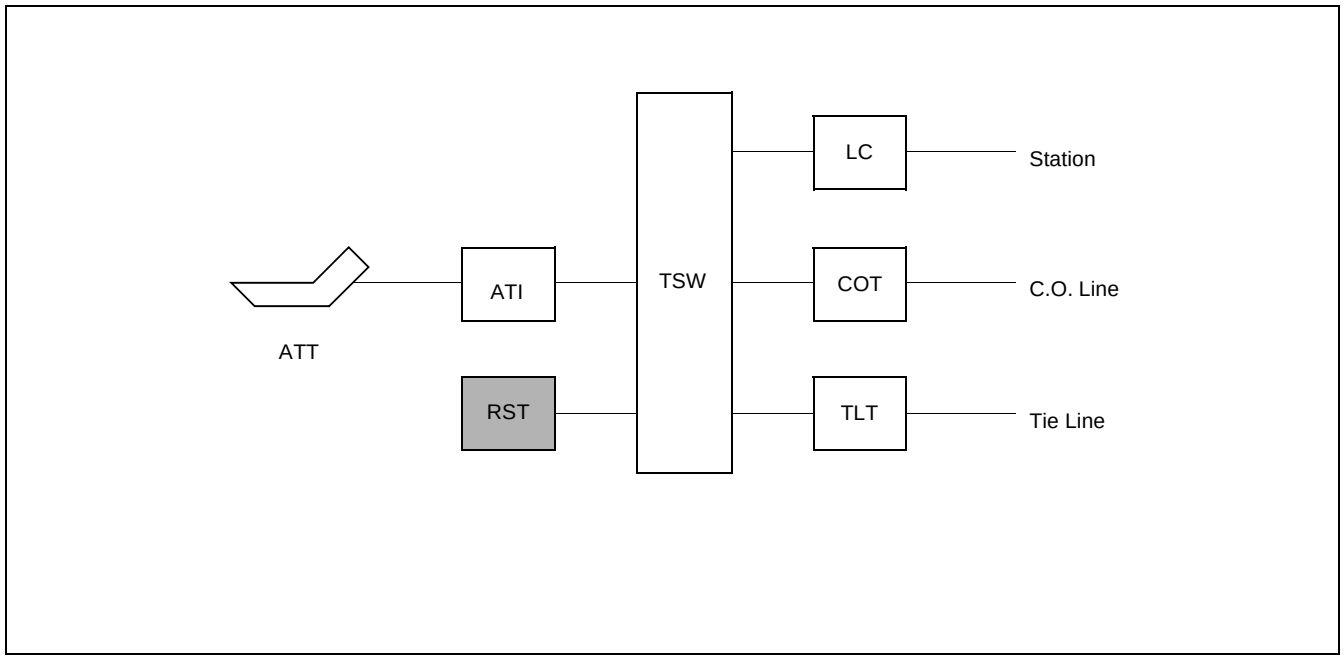


Figure 3-75 Location ofthe PA-8RSTM Card in the System

2. Mounting Location/Condition

The mounting locations for this circuit card and the conditions related to mounting are shown below.

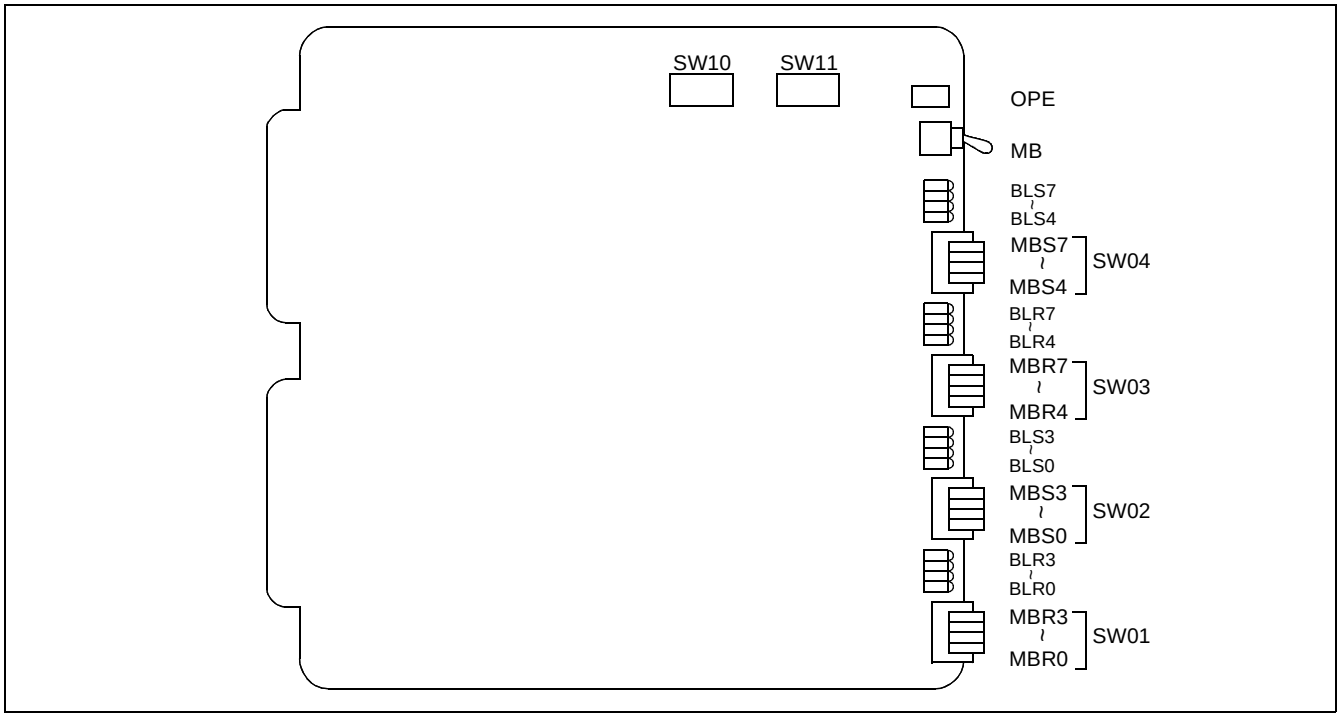
Mounting Module	PIM

00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
								●											●				

Note: ● *Indicates universal slots for line/trunk circuit cards.*

3. Face Layout of Lamps, Switches, and Connectors

The face layout of lamps, switches, and connectors for this circuit card is shown below.



4. Lamp Indications

Lamp indications for this circuit card are shown in the table below.

LAMP NAME	COLOR	STATE
OPE	Green	Remains lit while this circuit card is operating.
BLR0 ~ BLR7	Red	Lights when the corresponding circuit has received the selective signals.
	Flash	Flashes (60 IPM) while the corresponding circuit is in Make-busy state.
	OFF	Remains off when the corresponding circuit is idle.
BLS0 ~ BLS7	Red	Lights when the corresponding circuit has sent the selective signals.
	Flash	Flashes (60 IPM) when the corresponding circuit is in Make-busy state.
	OFF	Remains off while the corresponding circuit is idle.

5. Switch Settings

Standard settings for various switches on this circuit card are shown in the table below.

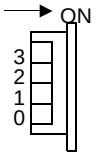
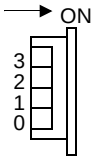
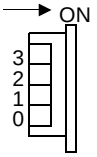
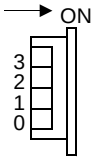
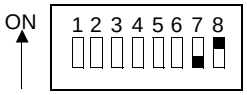
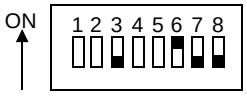
SWITCH NAME	SWITCH NO.	SETTING	STANDARD SETTING	MEANING
MB		UP		Circuit card Make-busy.
		DOWN	×	Circuit card Make-busy cancel.
MBR0~3 (SW01)	0	ON		Register Make-busy of the corresponding circuit.
		OFF	×	Register Make-busy cancel of the corresponding circuit.
	1	ON		Register Make-busy of the corresponding circuit.
		OFF	×	Register Make-busy cancel of the corresponding circuit.
	2	ON		Register Make-busy of the corresponding circuit.
		OFF	×	Register Make-busy cancel of the corresponding circuit.
	3	ON		Register Make-busy of the corresponding circuit.
		OFF	×	Register Make-busy cancel of the corresponding circuit.
MBR4~7 (SW03)	4	ON		Register Make-busy of the corresponding circuit.
		OFF	×	Register Make-busy cancel of the corresponding circuit.
	5	ON		Register Make-busy of the corresponding circuit.
		OFF	×	Register Make-busy cancel of the corresponding circuit.
	6	ON		Register Make-busy of the corresponding circuit.
		OFF	×	Register Make-busy cancel of the corresponding circuit.

SWITCH NAME	SWITCH NO.	SETTING	STANDARD SETTING	MEANING
MBR4~7 (SW03)	7	ON		Register Make-busy of the corresponding circuit.
		OFF	×	Register Make-busy cancel of the corresponding circuit.
MBS0~3 (SW02)	0	ON		Sender Make-busy of the corresponding circuit.
		OFF	×	Sender Make-busy cancel of the corresponding circuit.
	1	ON		Sender Make-busy of the corresponding circuit.
		OFF	×	Sender Make-busy cancel of the corresponding circuit.
	2	ON		Sender Make-busy of the corresponding circuit.
		OFF	×	Sender Make-busy cancel of the corresponding circuit.
	3	ON		Sender Make-busy of the corresponding circuit.
		OFF	×	Sender Make-busy cancel of the corresponding circuit.
MBS4~7 (SW04)	4	ON		Sender Make-busy of the corresponding circuit.
		OFF	×	Sender Make-busy cancel of the corresponding circuit.
	5	ON		Sender Make-busy of the corresponding circuit.
		OFF	×	Sender Make-busy cancel of the corresponding circuit.
	6	ON		Sender Make-busy of the corresponding circuit.
		OFF	×	Sender Make-busy cancel of the corresponding circuit.
	7	ON		Sender Make-busy of the corresponding circuit.
		OFF	×	Sender Make-busy cancel of the corresponding circuit.

<table>
<tr><th>SWITCH NAME</th><th>SWITCH NO.</th><th>SETTING</th><th>STANDARD SETTING</th><th>MEANING</th></tr>
<tr><td rowspan="11">SW10</td><td rowspan="2">1</td><td>ON</td><td></td><td rowspan="11"><table><tr><th colspan="4">SELECTION OF PBR THRESHOLD VALUE</th></tr><tr><th>SW0-1</th><th>SW0-2</th><th>SW0-3</th><th>PBR THRESHOLD VALUE</th></tr><tr><td>ON</td><td>ON</td><td>ON</td><td>-21 dBm0</td></tr><tr><td>OFF</td><td>ON</td><td>ON</td><td>-23 dBm0</td></tr><tr><td>ON</td><td>OFF</td><td>ON</td><td>-25 dBm0</td></tr><tr><td>OFF</td><td>OFF</td><td>ON</td><td>-27 dBm0</td></tr><tr><td>ON</td><td>ON</td><td>OFF</td><td>-29 dBm0
(Standard Setting)</td></tr><tr><td>OFF</td><td>ON</td><td>OFF</td><td>-31 dBm0</td></tr><tr><td>ON</td><td>OFF</td><td>OFF</td><td>-33 dBm0</td></tr><tr><td>OFF</td><td>OFF</td><td>OFF</td><td>-35 dBm0</td></tr></table><table><tr><th colspan="4">SELECTION OF MFR THRESHOLD VALUE</th></tr><tr><th>SW0-4</th><th>SW0-5</th><th>SW0-6</th><th>MFR THRESHOLD VALUE</th></tr><tr><td>ON</td><td>ON</td><td>ON</td><td>-17 dBm0</td></tr><tr><td>OFF</td><td>ON</td><td>ON</td><td>-19 dBm0</td></tr><tr><td>ON</td><td>OFF</td><td>ON</td><td>-21 dBm0</td></tr><tr><td>OFF</td><td>OFF</td><td>ON</td><td>-23 dBm0
(Standard Setting)</td></tr><tr><td>ON</td><td>ON</td><td>OFF</td><td>-25 dBm0</td></tr><tr><td>OFF</td><td>ON</td><td>OFF</td><td>-27 dBm0</td></tr><tr><td>ON</td><td>OFF</td><td>OFF</td><td>-29 dBm0</td></tr><tr><td>OFF</td><td>OFF</td><td>OFF</td><td>-31 dBm0</td></tr></table></td></tr>
<tr><td>OFF</td><td></td></tr>
<tr><td rowspan="2">2</td><td>ON</td><td></td></tr>
<tr><td>OFF</td><td></td></tr>
<tr><td rowspan="2">3</td><td>ON</td><td></td></tr>
<tr><td>OFF</td><td></td></tr>
<tr><td rowspan="2">4</td><td>ON</td><td></td></tr>
<tr><td>OFF</td><td></td></tr>
<tr><td rowspan="2">5</td><td>ON</td><td></td></tr>
<tr><td>OFF</td><td></td></tr>
<tr><td rowspan="2">6</td><td>ON</td><td></td></tr>
<tr><td>OFF</td><td></td></tr>
<tr><td>7</td><td>OFF</td><td>×</td><td>Threshold value is not selected (Fixed to OFF).</td></tr>
<tr><td>8</td><td>ON</td><td>×</td><td>Fixed</td></tr>
</table>

SWITCH NAME	SWITCH NO.	SETTING	STANDARD SETTING	MEANING
SW11	1	ON		MFR Receive Specification; AT&T
		OFF		MFR Receive Specification; ITU-T No. 5
	2	ON		PBR PULSE TIMER (Momentary Signal Shut Down Protect Timer) SHORT (Shorter than 10 ms.)
		OFF		PBR PULSE TIMER (Momentary Signal Shut Down Protect Timer) LONG (Shorter than 20 ms.)
	3	OFF	×	Fixed
	4	ON		Register Selection; REG 0, 1, 2, 3 of MFR.
		OFF		Register Selection; REG 0, 1, 2, 3 of PBR.
	5	ON		Register Selection; REG 4, 5, 6, 7 of MFR.
		OFF		Register Selection; REG 4, 5, 6, 7 of PBR.
	6	ON	×	DPR Receive Specification; General Spec.
		OFF		DPR Receive Specification; Australian Spec.
	7	OFF	×	No setting (Fixed to OFF)
	8	OFF	×	Fixed

6. Switch Setting Sheet

MODULE	SLOT NO.	SWITCH NAME	SWITCH SHAPE	REMARKS
PIM		MBR0-3 (SW01)		
		MBR4-7 (SW03)		
		MBS0-3 (SW02)		
		MBS4-7 (SW04)		
		SW10		
		SW11		
		MB	DOWN	Circuit card Make-busy cancel

PA-8RSTY
Register Sender Trunk

1. General Function

The PA-8RSTY circuit card is equipped with eight circuits of Registers and Senders. More specifically, this card contains Dial Pulse Register (DPR), Push Button Receiver (PBR) for receiving digits from extensions and/or the associated incoming trunks and Dial Pulse Sender (DPS), PB Signal Sender (PBS) for sending digits to a distant switching system. In addition, this card has "Register Sender" function, by which inter-digit pause can be changed and PB signals may be converted to DP signals and vice versa without intervention of the CPU. The card can be used for caller ID service.

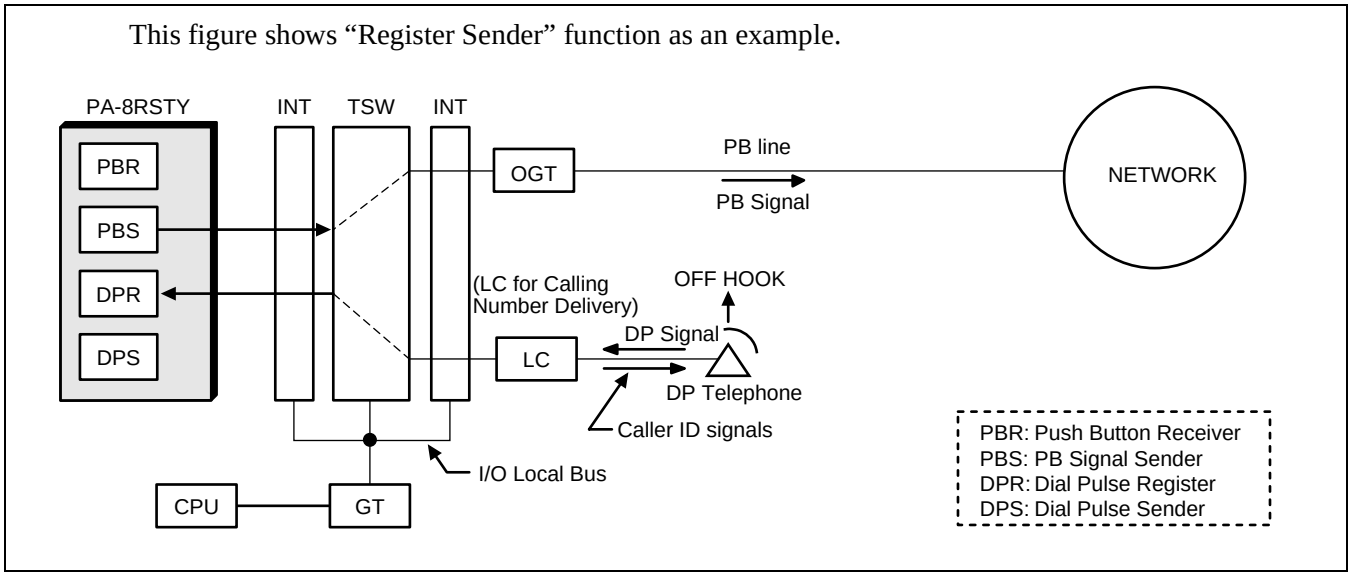
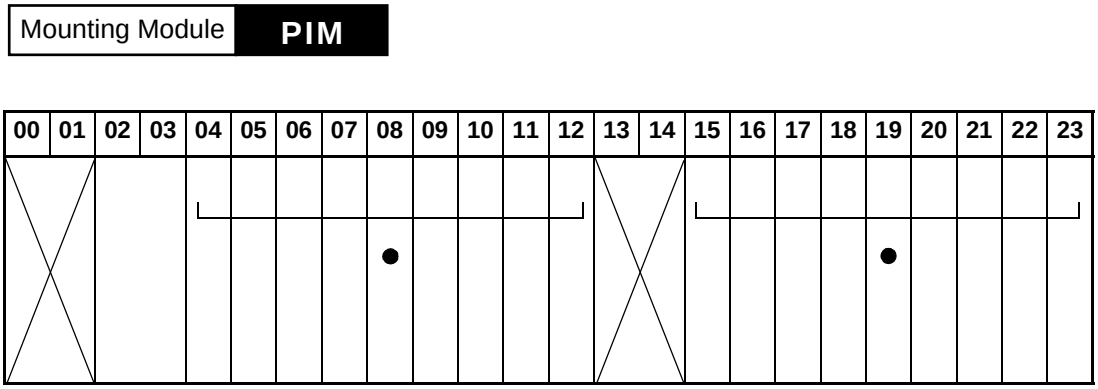


Figure 3-76 Location of PA-8RSTY (RST) Within the System

2. Mounting Location/Condition

The PA-8RSTY (RST) card can be mounted any universal slots as shown below.



Note: ● *Indicates universal slots for line/trunk circuit cards.*

3. Face Layout of Lamps, Switches, and Connectors

The face layout of lamps, switches, and connectors on this circuit card is shown in Figure 3-77.

Note: *Layout of Lamps and switches are differ from other RST cards.*

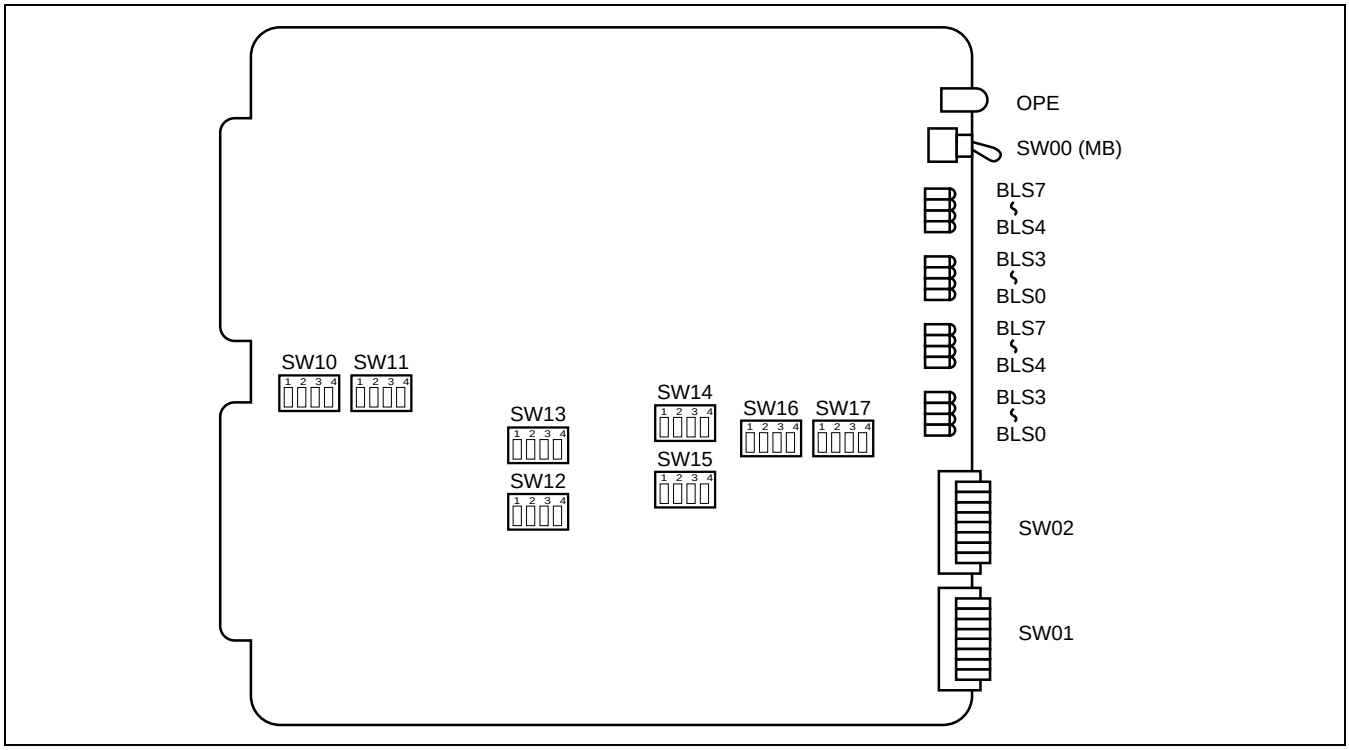


Figure 3-77 Face Layout ofPA-8RSTY (RST)

4. Lamp Indications

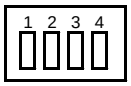
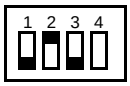
The contents of lamp indications on this circuit card are shown in the table below.

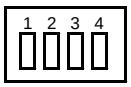
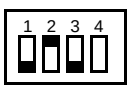
LAMP NAME	COLOR	STATE
OPE	Green	Remains lit while this circuit card is operating.
BLR0 ~ BLR7	Green	Lights when the corresponding circuit has received the selective signals.
	Flash	Flashes (60 IPM) while the corresponding circuit is in make-busy state.
	OFF	Remains off when the corresponding circuit is idle.
BLS0 ~ BLS7	Green	Lights when the corresponding circuit has sent the selective signals.
	Flash	Flashes (60 IPM) while the corresponding circuit is in make-busy state.
	OFF	Remains off when the corresponding circuit is idle.

5. Switch Settings

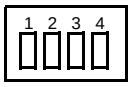
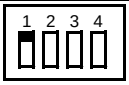
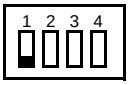
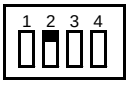
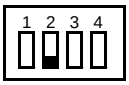
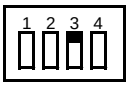
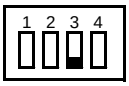
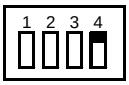
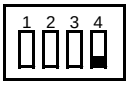
Standard settings of switches on this circuit card are shown in the table below.

SWITCH NAME	SWITCH NO.	SET-TING	STANDARD SETTING	MEANING
MB (SW00)		UP		Circuit card make busy
		DOWN	×	Circuit card make busy cancel
SW01 (MBR0-7)	0	ON		Register make busy of the corresponding circuit
	0	OFF	×	Register make busy cancel of the corresponding circuit
	1	ON		Register make busy of the corresponding circuit
	1	OFF	×	Register make busy cancel of the corresponding circuit
	2	ON		Register make busy of the corresponding circuit
	2	OFF	×	Register make busy cancel of the corresponding circuit
	3	ON		Register make busy of the corresponding circuit
	3	OFF	×	Register make busy cancel of the corresponding circuit
	4	ON		Register make busy of the corresponding circuit
	4	OFF	×	Register make busy cancel of the corresponding circuit
	5	ON		Register make busy of the corresponding circuit
	5	OFF	×	Register make busy cancel of the corresponding circuit
	6	ON		Register make busy of the corresponding circuit
	6	OFF	×	Register make busy cancel of the corresponding circuit
	7	ON		Register make busy of the corresponding circuit
	7	OFF	×	Register make busy cancel of the corresponding circuit
SW02 (MBS0-7)	0	ON		Sender make busy of the corresponding circuit
	0	OFF	×	Sender make busy cancel of the corresponding circuit
	1	ON		Sender make busy of the corresponding circuit
	1	OFF	×	Sender make busy cancel of the corresponding circuit
	2	ON		Sender make busy of the corresponding circuit
	2	OFF	×	Sender make busy cancel of the corresponding circuit
	3	ON		Sender make busy of the corresponding circuit
	3	OFF	×	Sender make busy cancel of the corresponding circuit
	4	ON		Sender make busy of the corresponding circuit
	4	OFF	×	Sender make busy cancel of the corresponding circuit
	5	ON		Sender make busy of the corresponding circuit
	5	OFF	×	Sender make busy cancel of the corresponding circuit
	6	ON		Sender make busy of the corresponding circuit
	6	OFF	×	Sender make busy cancel of the corresponding circuit
	7	ON		Sender make busy of the corresponding circuit
	7	OFF	×	Sender make busy cancel of the corresponding circuit

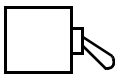
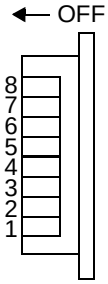
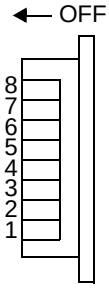
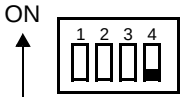
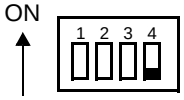
<table>
<tr><th>SWITCH</th><th colspan="2">FUNCTION</th><th>SWITCH SETTING</th><th>MEANING</th></tr>
<tr><td rowspan="2">SW10
 
</td><td>1
~
3</td><td>DTMF Signal Receiver Threshold Value</td><td> 

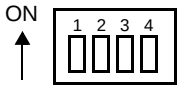
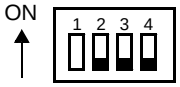
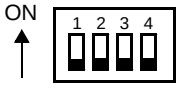
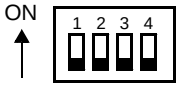
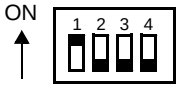
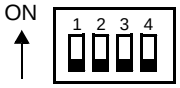
ON
OFF
[Standard Setting]</td><td>Selection of PBR Threshold Value
<table><tr><th>SW10-1</th><th>SW10-2</th><th>SW10-3</th><th>DTMF Threshold Value</th></tr><tr><td>ON</td><td>ON</td><td>ON</td><td>-21.0 dBm0</td></tr><tr><td>OFF</td><td>ON</td><td>ON</td><td>-23.0 dBm0</td></tr><tr><td>ON</td><td>OFF</td><td>ON</td><td>-25.0 dBm0</td></tr><tr><td>OFF</td><td>OFF</td><td>ON</td><td>-27.0 dBm0</td></tr><tr><td>ON</td><td>ON</td><td>OFF</td><td>-29.0 dBm0</td></tr><tr><td>OFF</td><td>ON</td><td>OFF</td><td>-31.0 dBm0</td></tr><tr><td>ON</td><td>OFF</td><td>OFF</td><td>-33.0 dBm0</td></tr><tr><td>OFF</td><td>OFF</td><td>OFF</td><td>-35.0 dBm0</td></tr></table></td></tr>
<tr><td>4</td><td></td><td>OFF</td><td>Fixed to OFF</td></tr>
<tr><td rowspan="2">SW11
 
</td><td>1
~
3</td><td>MFR Signal Receiver Threshold Value</td><td> 

ON
OFF
[Standard Setting]</td><td>Selection of MFR Threshold Value
<table><tr><th>SW11-1</th><th>SW11-2</th><th>SW11-3</th><th>MFR Threshold Value</th></tr><tr><td>ON</td><td>ON</td><td>ON</td><td>-17.0 dBm0</td></tr><tr><td>OFF</td><td>ON</td><td>ON</td><td>-19.0 dBm0</td></tr><tr><td>ON</td><td>OFF</td><td>ON</td><td>-21.0 dBm0</td></tr><tr><td>OFF</td><td>OFF</td><td>ON</td><td>-23.0 dBm0</td></tr><tr><td>ON</td><td>ON</td><td>OFF</td><td>-25.0 dBm0</td></tr><tr><td>OFF</td><td>ON</td><td>OFF</td><td>-27.0 dBm0</td></tr><tr><td>ON</td><td>OFF</td><td>OFF</td><td>-29.0 dBm0</td></tr><tr><td>OFF</td><td>OFF</td><td>OFF</td><td>-31.0 dBm0</td></tr></table></td></tr>
<tr><td>4</td><td></td><td>OFF</td><td>Fixed to OFF</td></tr>
</table>

SWITCH	FUNCTION		SWITCH SETTING	MEANING
SW12 	1	Designation of MFR Specification		• AT & T specification
				• ITU-T No. 5 specification
	2	DTMF Signal Cut-off Guard Timer		• SHORT (less than 10 ms)
			 [Standard Setting]	• LONG (less than 20 ms)
	3	Register Selection (MFR/PBR)		• REG #0, #1, #2, #3 function as MFR.
				• REG #0, #1, #2, #3 function as PBR.
	4	Register Selection (MFR/PBR)		• REG #4, #5, #6, #7 function as MFR.
				• REG #4, #5, #6, #7 function as PBR.

SWITCH	SWITCH NO.	SETTING	STANDARD SETTING	MEANING
SW13	1	ON		MF Transmission Level:-9dBm
		OFF		MF Transmission Level:-5dBm
	2	OFF	×	Fixed to OFF
	3	OFF	×	Fixed to OFF
	4	OFF	×	Fixed to OFF
SW14	1	OFF	×	Fixed to OFF
	2	OFF	×	Fixed to OFF
	3	OFF	×	Fixed to OFF
	4	OFF	×	Fixed to OFF
SW15	1	OFF	×	Fixed to OFF
	2	OFF	×	Fixed to OFF
	3	OFF	×	Fixed to OFF
	4	OFF	×	Fixed to OFF
SW16	1	ON	×	Fixed to ON
	2	OFF	×	Fixed to OFF
	3	OFF	×	Fixed to OFF
	4	OFF	×	Fixed to OFF
SW17	1	OFF	×	Fixed to OFF
	2	OFF	×	Fixed to OFF
	3	OFF	×	Fixed to OFF
	4	OFF	×	Fixed to OFF

MODULE	SLOT NO.	SWITCH NAME	SWITCH SHAPE	REMARKS
PIM		SW00 (MB)		Circuit card make busy cancel. Standard Setting: Down
		SW01 (MBR0-7)		
		SW02 (MBS0-7)		
		SW10		
		SW11		

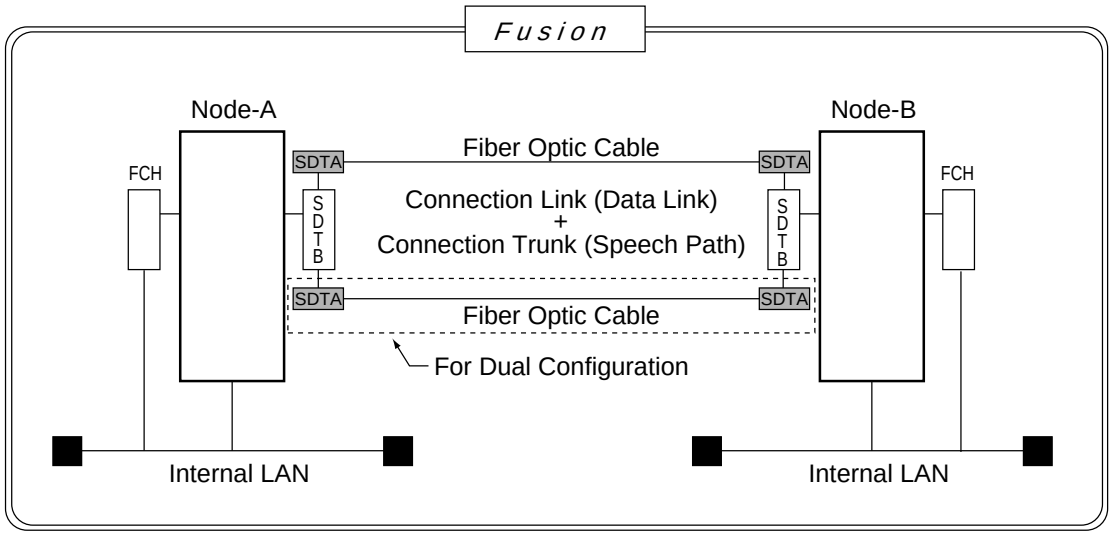
MODULE	SLOT NO.	SWITCH NAME	SWITCH SHAPE	REMARKS
PIM		SW12		
		SW13		
		SW14		
		SW15		
		SW16		
		SW17		

PA-SDTA
SDH/SONET Digital Trunk

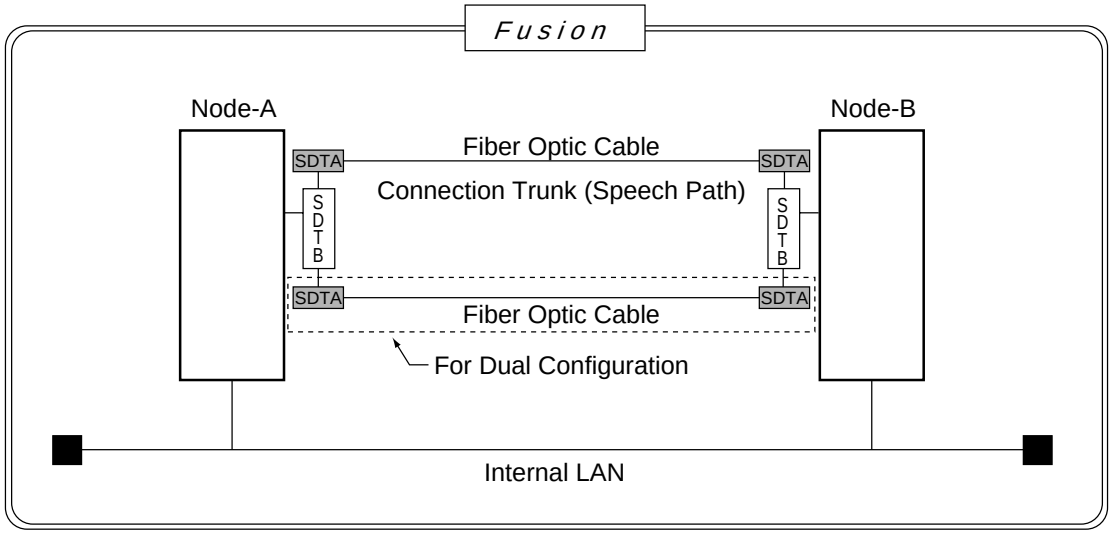
1. General Function

The PA-SDTA circuit card provides a maximum of 28 interface (1.5 Mbps) used with the fiber optic cable. This card has also the MUX function and is connected directly to the TSW card. This card is used with the PA-SDTB card.

Fusion Link with FCCH



Fusion Link without FCCH

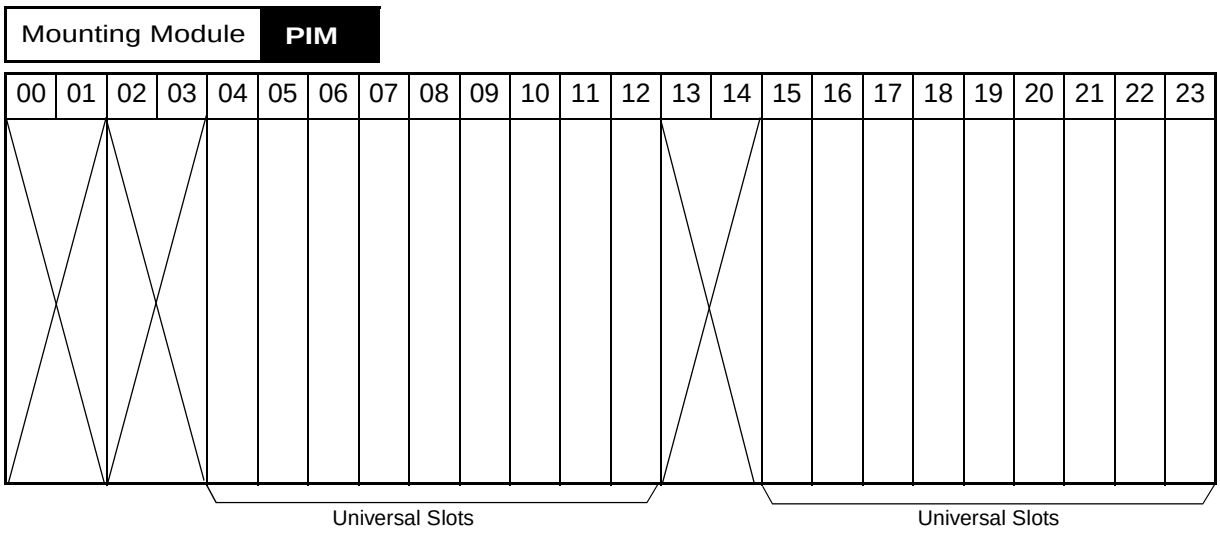


∗) SDT: SDH/SONET Digital Trunk
FCH: Fusion Call Control Handler

Figure 3-78 Location of PA-SDTA (SDT) Card in the System

2. Mounting Location/Condition

   This circuit card is mounted in a universal slot next to (either left or right side of) PA-SDTB. When this card is provided in a dual configuration, mount this card on both sides of PA-SDTB.



Mounting conditions are shown below.

- Only the power is supplied from Back Wiring Board (BWB).
- This card is connected to the PA-SDTB card using the following front cables.
  - For single configuration: SDT CABLEB <S>
  - For dual configuration: SDT CABLEA <D>
- Fiber optic cables are connected to this card.
- Time slots used for this circuit card are determined by the cable connection between the PA-SDTB and TSW.

Example: When the PA-SDTA card is mounted in the 1-IMG system

As shown in Figure 3-79, time slots of Module Group 01 are used. AUNT data is required even if PIM2/ PIM3 is not actually mounted.

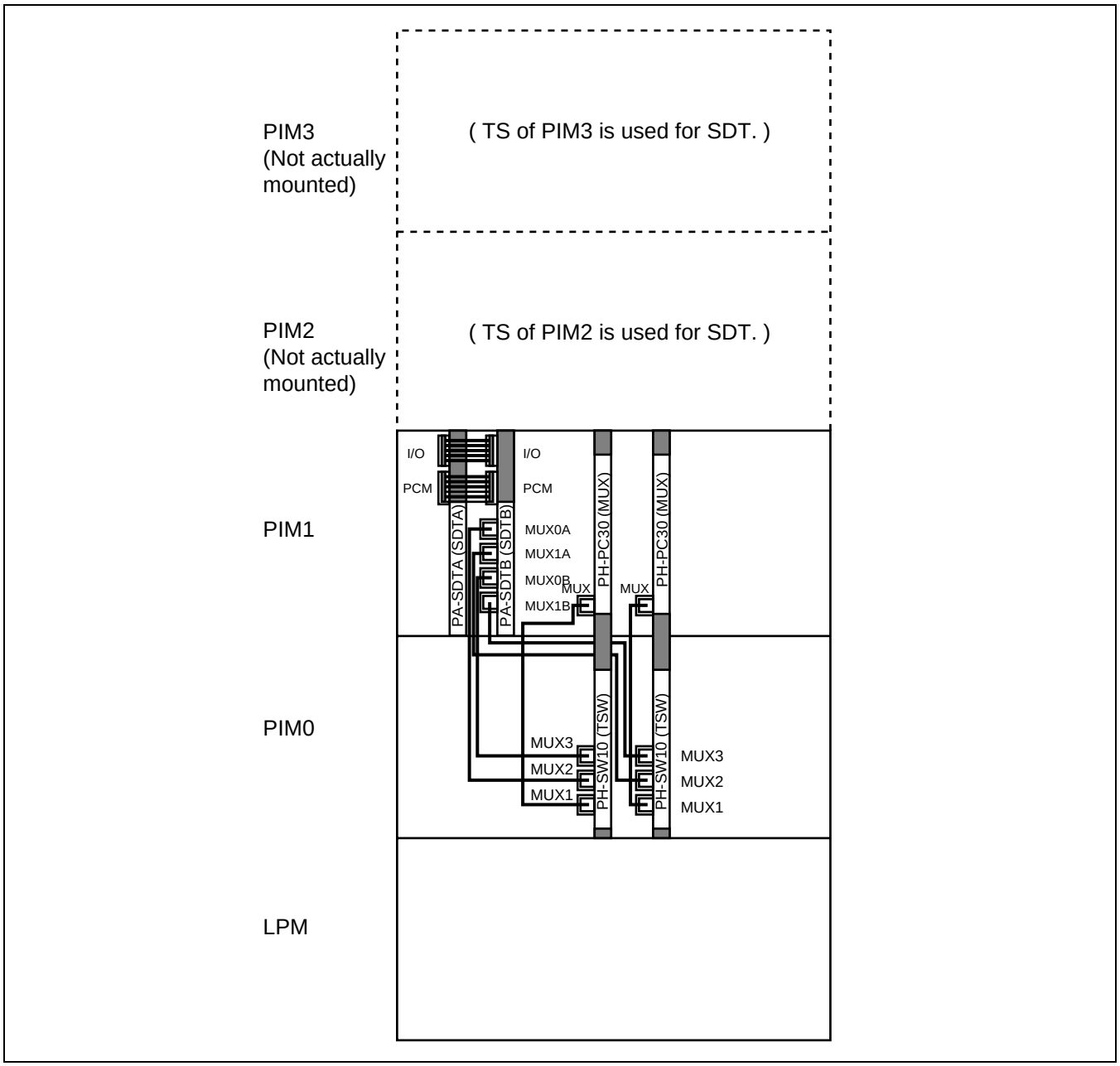


Figure 3-79 PA-SDTA Card Mounted in the 1 IMG System

3. Face Layout of Lamps, Switches, and Connectors

   The face layout for lamps, switches, and connectors are shown in Figure 3-80.

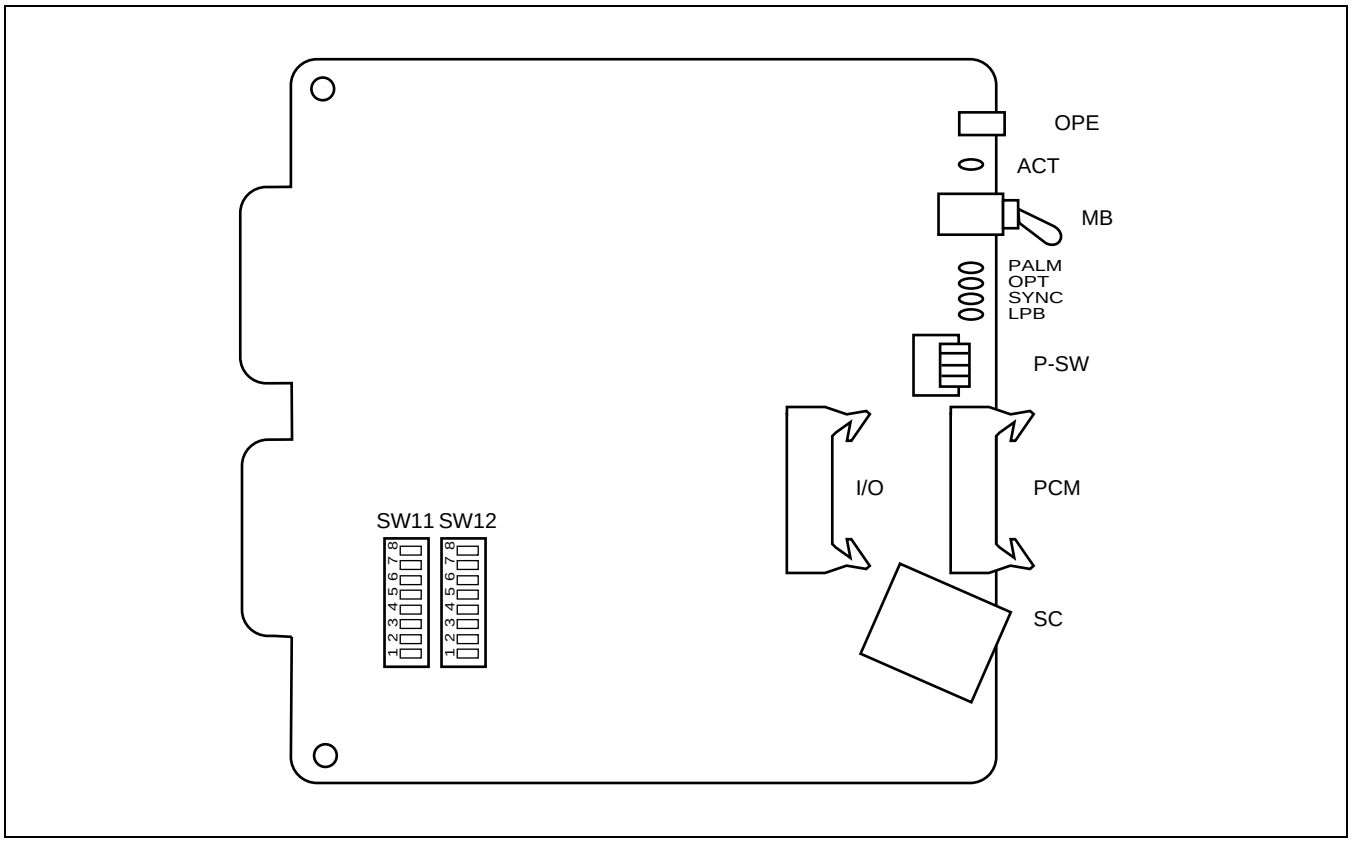


Figure 3-80 Face Layout of PA-SDTA (SDT)

4. Lamp Indications

Lamp indications for this circuit card are shown in the table below.

LAMP NAME	COLOR	STATE
OPE	Green	Remains lit while this circuit card is operating normally.
	Red	Remains lit while this circuit card is in Make-busy state.
PALM	Red	Lights when the OBP in this circuit card is abnormal.
OPT	Red	Lights when the optical input signals are cut off.
SYNC	Red	Lights when receiving 52 Mbps clock synchronization.
LPB	Green	Lights when Loop-back is designated.
ACT	Green	Remains lit while this circuit card is in active state.
	Off	Remains off while this circuit card is in stand-by state.

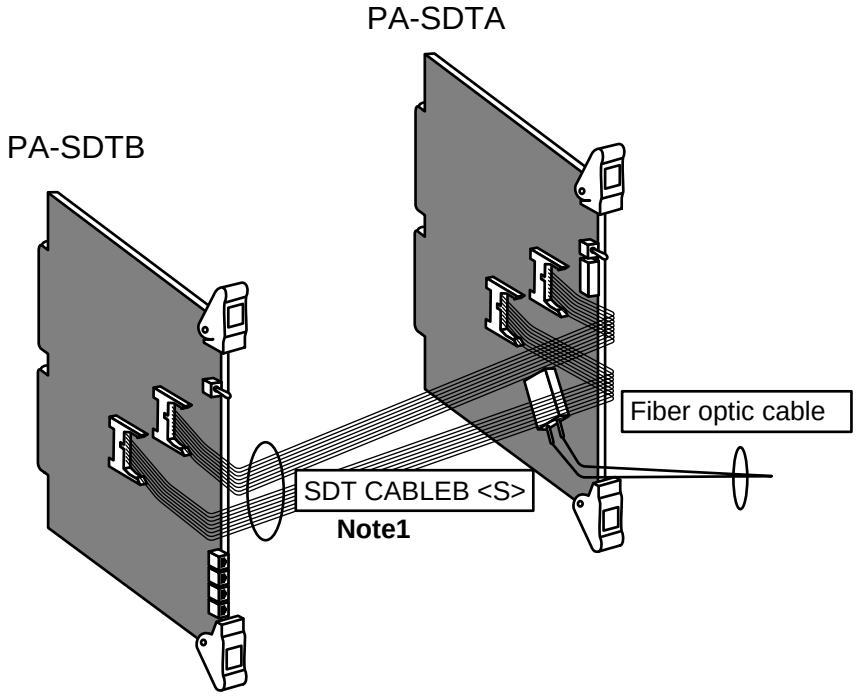
5. Switch Settings

Switch settings on this circuit card are shown in the table below.

SWITCH NAME	SWITCH NO.	SETTING	STANDARD SETTING	MEANING
MB		UP		Circuit card Make-busy
		DOWN	×	Circuit card Make-busy cancel
SW11	1	OFF	×	Fixed
	2	ON	×	Fixed
	3	ON	×	Fixed
	4	OFF	×	Fixed
	5	OFF	×	Not used
	6	ON		PAD function is effective.
		OFF	×	PAD function is not effective.
	7	ON		Setting of A-law
		OFF	×	Setting of μ-law
	8	ON	×	OPT#0 Act (This card is used for System 0)
		OFF		OPT#1 Act (This card is used for System 1)
SW12	1-8	OFF	×	Not used
P-SW	1	ON		Designation of OLLPB (OPT Local Loop-back)
		OFF	×	Designation of OLLPB cancel
	2	ON		Designation of ORLPB (OPT Remote Loop-back)
		OFF	×	Designation of ORLPB cancel.
	3	OFF	×	Not used
	4	ON		Make-busy request
		OFF	×	Make-busy request cancel

6. External Interface

- Cable Connection



Note: *When the PA-SDTA card is provided in a dual configuration, SDT CABLEA (D) is used.*

Figure 3-81 Cable Connection between PA-SDTAand PA-SDTB

- Accommodation for the LT connector leads of this circuit card is shown in Figure 3-82.

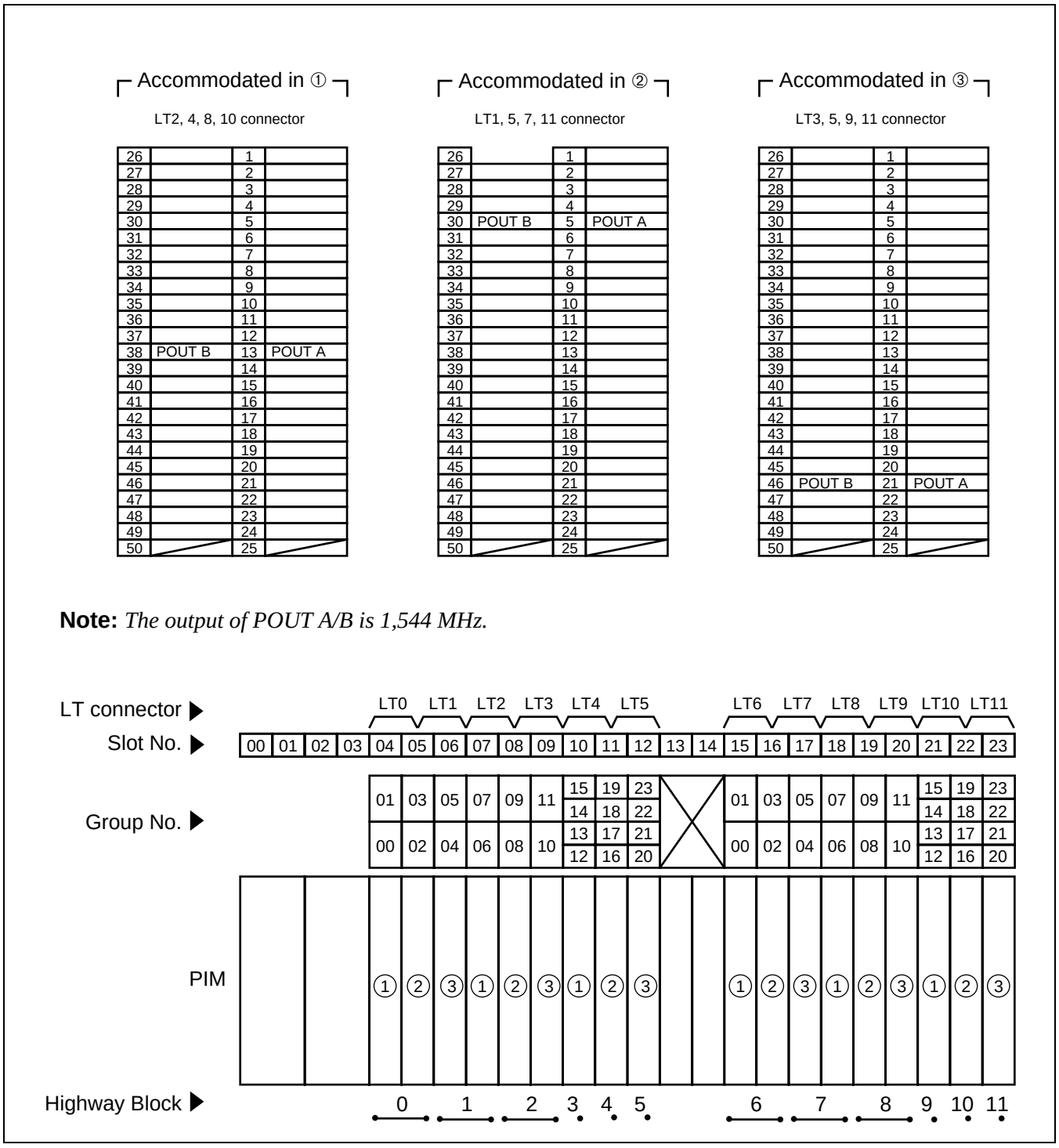
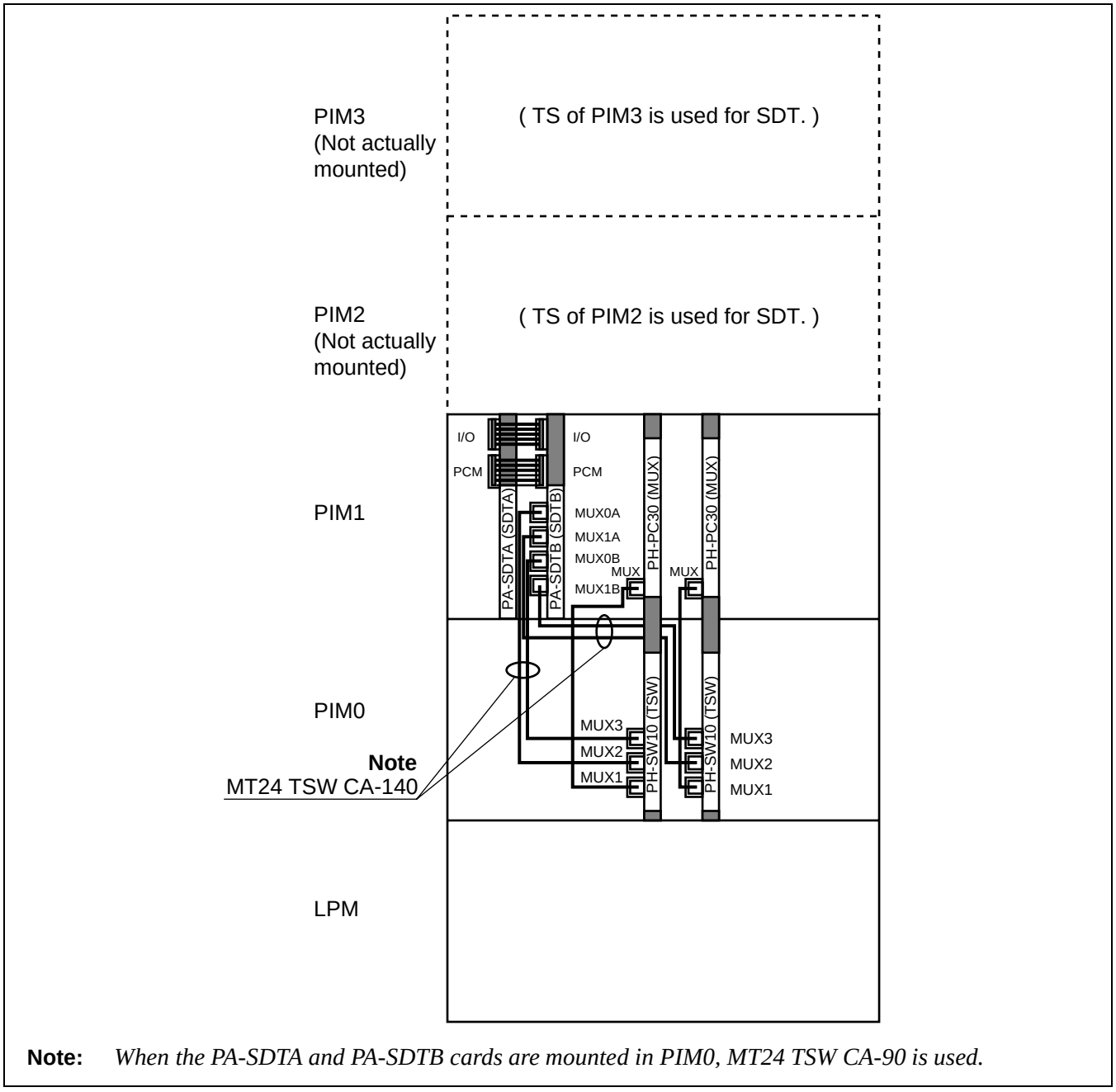


Figure 3-82 LT Connector Lead Accommodation

- When the PA-SDTA/PA-SDTB card is mounted in the 1-IMG system

  As shown in the following figure, time slots of Module Group 01 are used. AUNT data is required even if PIM2/PIM3 is not actually mounted.



Note: *When the PA-SDTA and PA-SDTB cards are mounted in PIM0, MT24 TSW CA-90 is used.*

Figure 3-83 Example of Cable Connection for 1-IMG System

- When the PA-SDTA and PA-SDTB cards are mounted in the 4-IMG system

  (a) When to use the 34PH MT24 TSW CA-x cable:
  When the PA-SDTA and PA-SDTB cards are mounted in the 4-IMG system, the 34PH MT24 TSW CA-x cable is used for connection between the PA-SDTB and TSW. The type of cable varies depending on the mounting location of the PA-SDTA/PA-SDTB card(s).

Table 3-4 Type of 34PH MT24 TSW CA-x Cable

	IMG0	IMG1	IMG2	IMG3
PIM3	34PH MT24 TSW CA-H	34PH MT24 TSW CA-G	34PH MT24 TSW CA-H	34PH MT24 TSW CA-J
PIM2	34PH MT24 TSW CA-H	34PH MT24 TSW CA-F	34PH MT24 TSW CA-H	34PH MT24 TSW CA-I
PIM1	34PH MT24 TSW CA-F	34PH MT24 TSW CA-E	34PH MT24 TSW CA-G	34PH MT24 TSW CA-H
PIM0	34PH MT24 TSW CA-F	34PH MT24 TSW CA-D	34PH MT24 TSW CA-F	34PH MT24 TSW CA-H

  (b) Relationship between the cable connection and the time slot:
  Trunk data for SDT is assigned to an odd-number Module Group. The module group is determined by the connection of the 34PH MT24 TSW CA-x cable as shown in the table below.

Table 3-5 Relationship between Cable Connection and Time Slot

MODULE GROUP Assigned for SDT	TIME SLOTS Assigned for SDT	CABLE CONNECTIONS		REMARKS
		FROM (Connectors on PA-SDTB)	TO (Connectors on BWB of TSWM)	
MG01	PIM2 of IMG0	MUX0A	MUX002	In this case, PIM2 and PIM3 of IMG0 are not actually mounted; However, AUNT data for PIM2/PIM3 is required.
		MUX1A	MUX102	
	PIM3 of IMG0	MUX0B	MUX003	
		MUX1B	MUX103	
MG03	PIM2 of IMG1	MUX0A	MUX012	In this case, PIM2 and PIM3 of IMG1 are not actually mounted; However, AUNT data for PIM2/PIM3 is required.
		MUX1A	MUX112	
	PIM3 of IMG1	MUX0B	MUX013	
		MUX1B	MUX113	
MG05	PIM2 of IMG2	MUX0A	MUX022	In this case, PIM2 and PIM3 of IMG2 are not actually mounted; However, AUNT data for PIM2/PIM3 is required.
		MUX1A	MUX122	
	PIM3 of IMG2	MUX0B	MUX023	
		MUX1B	MUX123	
MG07	PIM2 of IMG3	MUX0A	MUX032	In this case, PIM2 and PIM3 of IMG3 are not actually mounted; However, AUNT data for PIM2/PIM3 is required.
		MUX1A	MUX132	
	PIM3 of IMG3	MUX0B	MUX033	
		MUX1B	MUX133	

Note 1: *MUX1x on PA-SDTB and MUX1xx on BWB of TSWM are used when the system is a dual configuration.*

Note 2: *When half of the time slots are used in a module group, time slots for PIM2 must be used. However, the remaining time slots (for PIM3) cannot be used for other circuit cards.*

Example: When the PA-SDTA and PA-SDTB circuit cards are mounted in PIM3 of IMG0, and MG07 (PIM2 and PIM3 of IMG3) is assigned for the SDT interface, the type of cable and connector locations are as shown in the following figure. The mounting location of PA-SDTA/PA-SDTB circuit card has no relationship to the time slots assigned for the SDT interface so the PA-SDTA and PA-SDTB circuit cards can be mounted in any PIM.

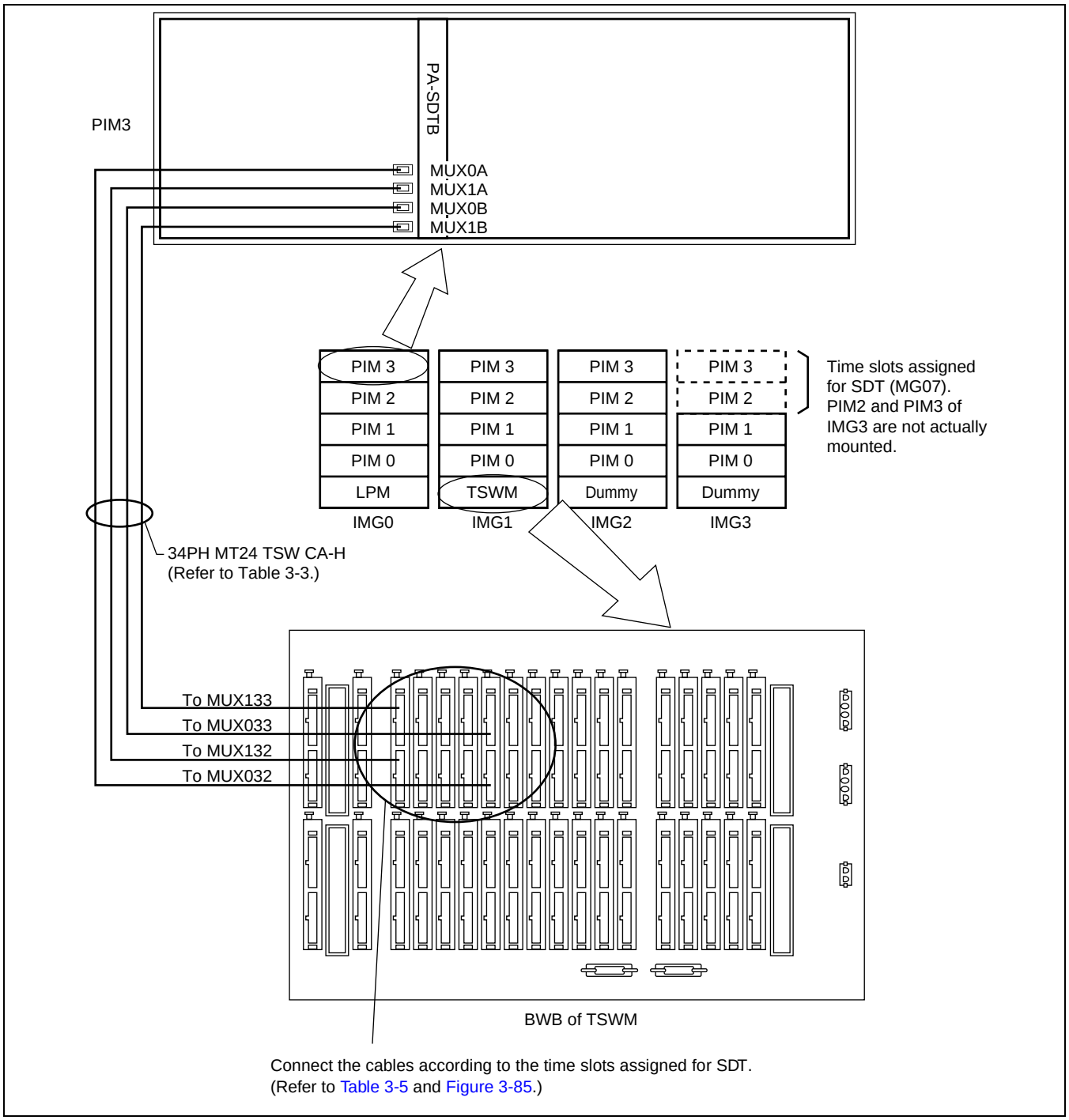


Figure 3-84 Example of Cable Connection for 4-IMG System

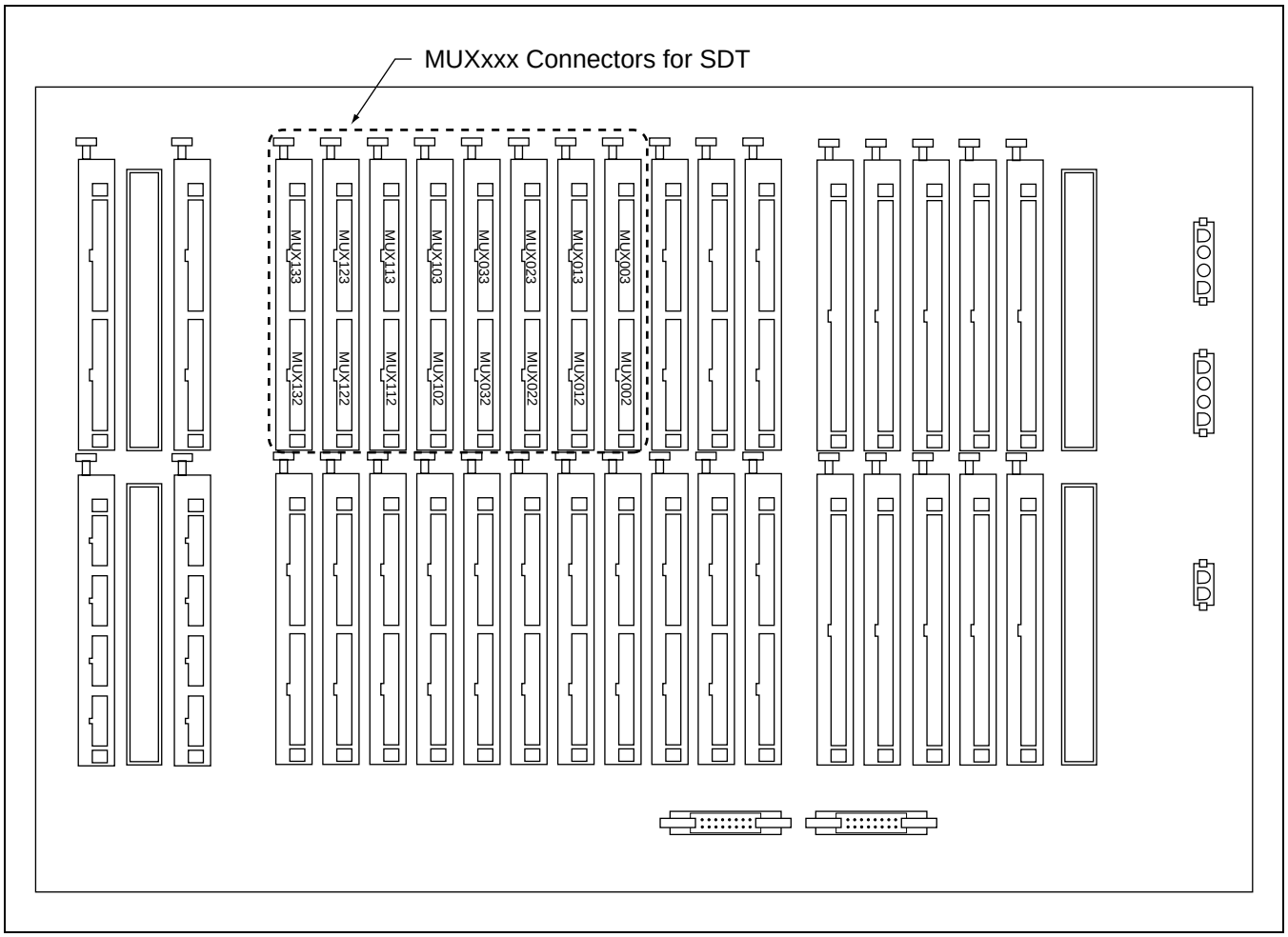


Figure 3-85 Location of MUXxxx Connectors for SDT

(c) Length of Fiber Optic Cable
The maximum length of the fiber optic cable is approximately 15 kilometers (9.3 miles). Figure 3-86 shows the level diagram of the fiber optic interface.

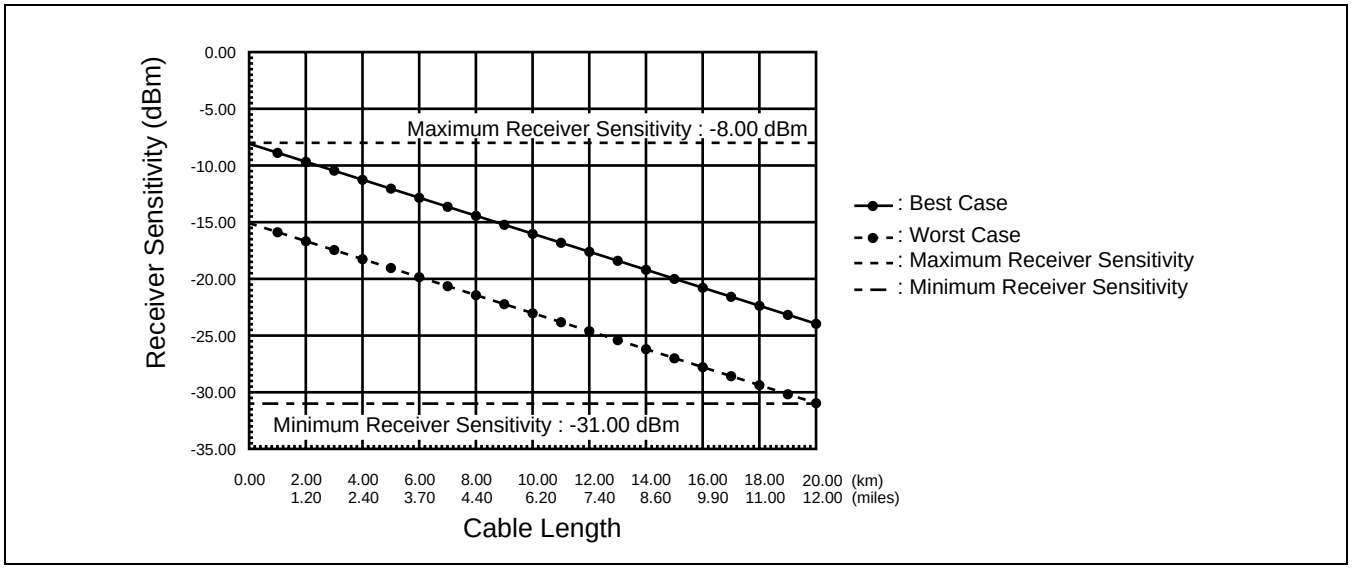


Figure 3-86 Level Diagram

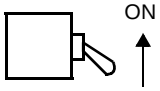
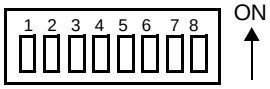
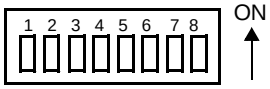
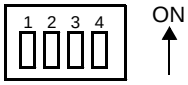
Level margin in the case of 15 kilometers (9.3 miles) is shown in Table 3-6.

Table 3-6 Level Margin

CONDITION	LEVEL MARGIN
Worst case	4.0 dB
Best case	11.0 dB

Note: *Maximum cable length varies depending on the type of cable and the number of connection points.*

7. Switch Setting Sheet

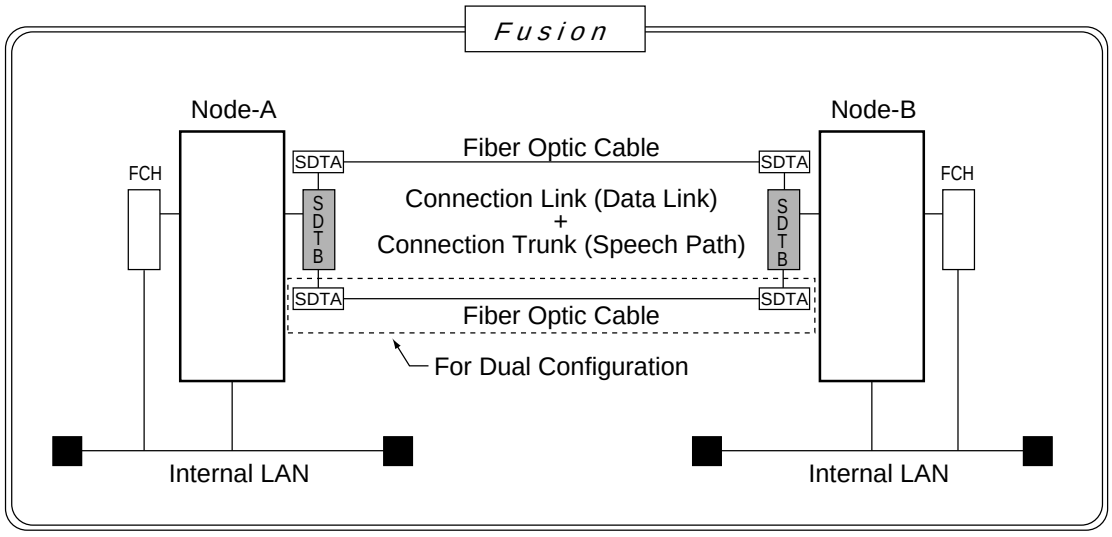
SWITCH NAME	SWITCH SHAPE	REMARKS
MB		
SW11		
SW12		
P-SW		

PA-SDTB
SDH/SONET Digital Trunk

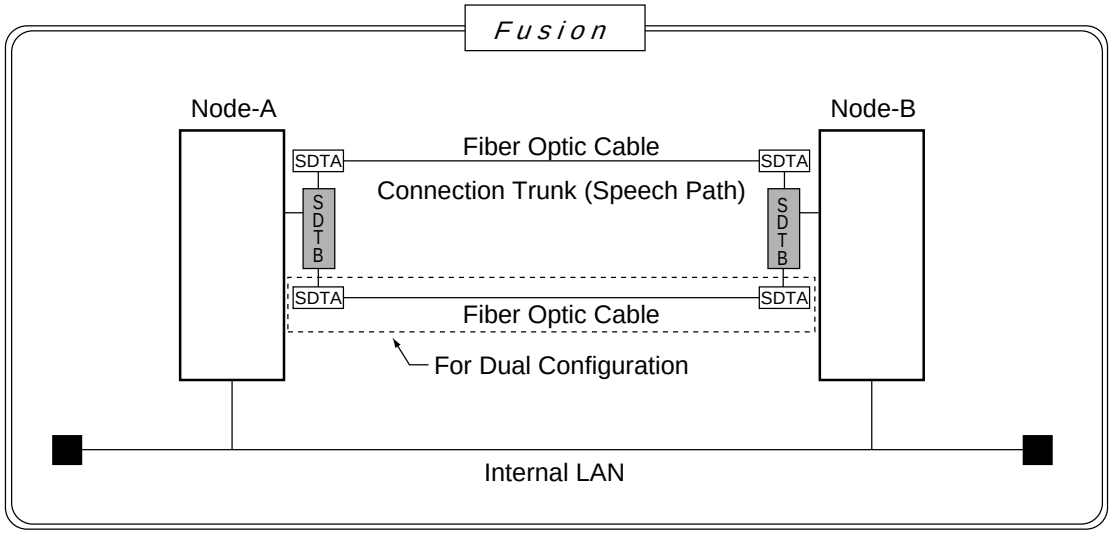
1. General Function

The PA-SDTA circuit card provides a maximum of 28 interface (1.5 Mbps) used with the fiber optic cable. This card also has the MUX function and is connected directly to the TSW card. This card is used with the PA-SDTA card.

Fusion Link with FCCH



Fusion Link without FCCH

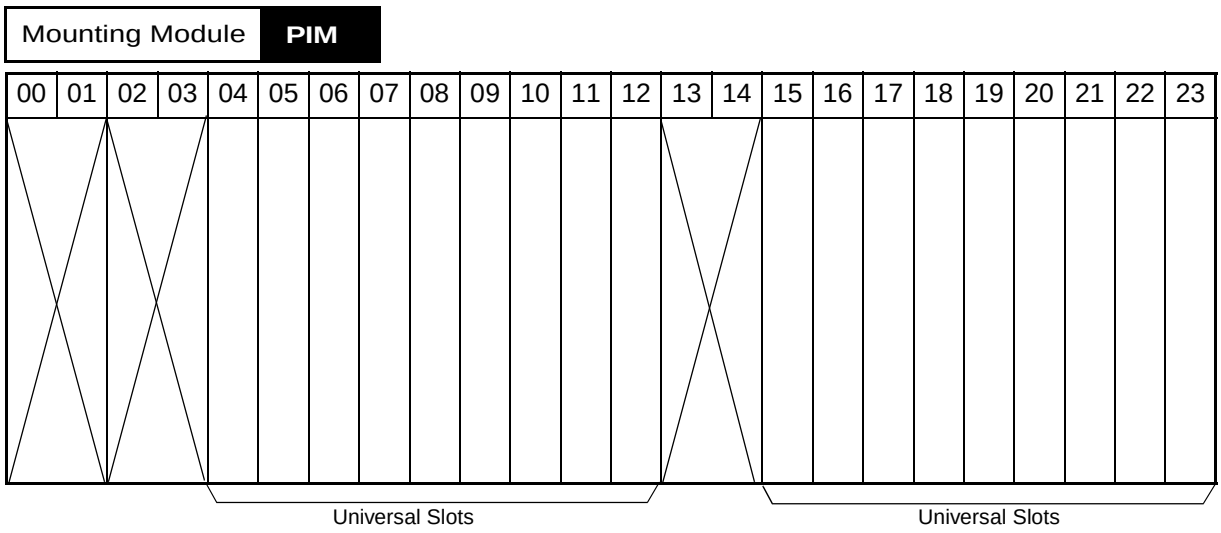


∗) SDT: SDH/SONET Digital Trunk
FCH: Fusion Call Control Handler

Figure 3-87 Location of PA-SDTB (SDT) Card in the System

2. Mounting Location/Condition

   This circuit card can be mounted in any universal slots.



Mounting conditions are shown below.

- Only the power is supplied from Back Wiring Board (BWB).
- This card is connected to the PA-SDTA card using the following front cables.
  - For single configuration: SDT CABLEB <S>
  - For dual configuration: SDT CABLEA <D>
- This card is connected to the TSW card.
- Time slots used for this circuit card are determined by the cable connection between the PA-SDTB and TSW.

3. Face Layout of Lamps, Switches, and Connectors

   The face layout of lamps, switches, and connectors are shown in Figure 3-88.

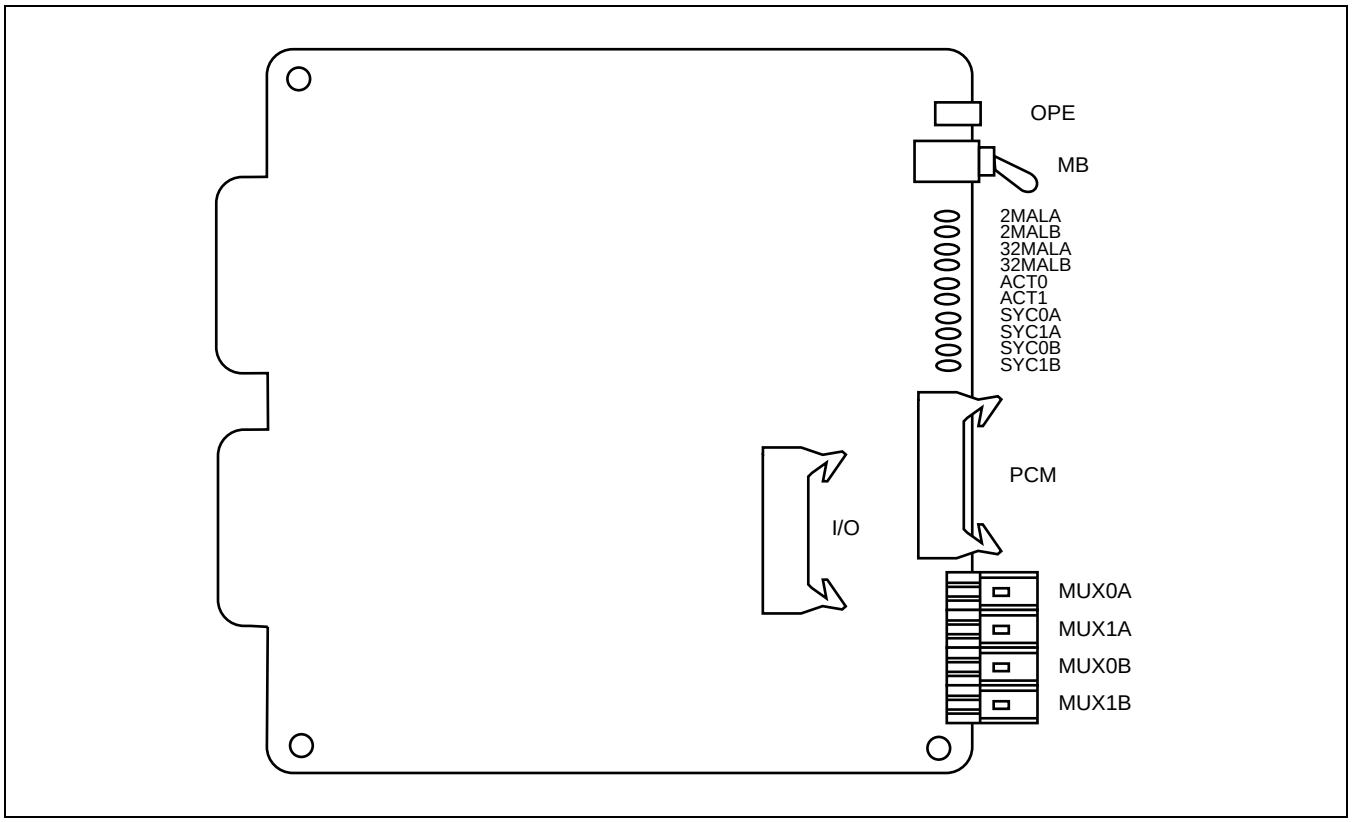


Figure 3-88 Face Layout ofPA-SDTB (SDT)

4. Lamp Indications

Lamp indications for this circuit card are shown in the table below:

LAMP NAME	COLOR	STATE
OPE	Green	Remains lit when this circuit card is in operation.
	Red	Remains lit when this circuit card is in non-operation.
2MALA	Red	Lights when 2 M clock and FH from A-side MUX is abnormal.
2MALB	Red	Lights when 2 M clock and FH from B-side MUX is abnormal.
32MALA	Red	Lights when 32 M clock from A-side MUX is abnormal.
32MALB	Red	Lights when 32 M clock from B-side MUX is abnormal.
ACT0	Green	Remains lit when MUX#0 is operating normally.
	Off	Remains off when MUX#0 is in stand-by state.
ACT1	Green	Remains lit when MUX#1 is operating normally.
	Off	Remains off when MUX#1 is in stand-by state.
SYC0A	Green	Lights when MUX#0 synchronization with TSW is established in A-side.
	Off	Goes off when the synchronization is not established.
SYC1A	Green	Lights when MUX#1 synchronization with TSW is established in A-side.
	Off	Goes off when the synchronization is not established.
SYC0B	Green	Lights when MUX#0 synchronization with TSW is established in B-side.
	Off	Goes off when the synchronization is not established.
SYC1B	Green	Lights when MUX#1 synchronization with TSW is established in B-side.
	Off	Goes off when the synchronization is not established.

Note: *A-side MUX means the card located in UNIT0/1 and B-side MUX means the card located in UNIT 2/3.*

5. Switch Settings

   Switch settings for this circuit card are shown in the table below:

SWITCH NAME	SETTING	STANDARD SETTING	MEANING
MB	UP		Circuit card Make-busy
	DOWN	×	Circuit card Make-busy cancel

6. External Interface

   Refer to the PA-SDTA circuit card.

7. Switch Setting Sheet

SWITCH NAME	SWITCH SHAPE	
MB