NEC

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ISSUE 3
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NEAX® 2400 IMX

Installation Manual

NOVEMBER, 1999

NEC America, Inc.

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The information contained in this document is specific to D^{term} Series E only.

Minimum firmware may be required. Contact NEC Engineering for additional information.

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SAFETY CONSIDERATIONS

IMPORTANT — SAVE THESE INSTRUCTIONS

(1) Never install telephone wiring during a lightning storm.

(2) Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.

(3) Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.

(4) Use caution when installing or moving telephone lines.

When using your telephone equipment, basic safety precautions should always be followed to reduce the risk of fire, electric shock and injury, including the following:

(5) Read and understand all instructions.

(6) Follow all warnings and instructions marked on the product.

(7) Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.

(8) Do not use this product near water; for example, under water pipes near a bath tub, sink, or laundry tub, in a wet basement, or near a swimming pool.

(9) Do not place this product on an unstable cart, stand, or table. The product may fall, causing serious damage to the product.

(10) Slots and openings in the cabinet and the back or bottom are provided for ventilation, to protect it from overheating. These openings must not be blocked or covered. The openings should never be blocked by placing the product on a bed, sofa, rug, or other similar surface. This product should never be placed near or over a radiator or heat register. This product should not be placed in a built-in installation unless proper ventilation is provided.

(11) This product should be operated only from the type of power source indicated on the marking label. If you are not sure of the type of power source available, consult with your local power company.

(12) This product normally connected with a three wire grounding type plug, a plug having a third (grounding) pin. This plug will only fit into a grounding type power outlet. This is a safety feature. If you are unable to insert the plug into the outlet, contact an electrician to replace your obsolete outlet. Do not defeat the safety purpose of the grounding type plug.

(13) Do not allow anything to rest on the power cord. Do not locate this product where the cord will be abused by persons walking on it.

(14) Do not overload wall outlets and extension cords as this can result in the risk of fire or electric shock.

(15) Never push objects of any kind into this product through cabinet slots as they may touch dangerous voltage points or short out parts that could result in a risk of fire or electric shock. Never spill liquid of any kind on the product.

(16) To reduce the risk of electric shock, do not disassemble this product, but take it to a qualified serviceman when some service or repair work is required. Opening or removing covers may expose you to dangerous voltages or other risks. Incorrect reassembly can cause electric shock when the appliance is subsequently used.

(17) Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:

(a) When the power supply cord or plug is damaged or frayed.

(b) If liquid has been spilled into the product.

(c) If the product has been exposed to rain or water.

(d) If the product does not operate normally by following the operating instructions. Adjust only those controls, that are covered by the operating instructions because improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to normal operation.

(e) If the product has been dropped or the cabinet has been damaged.

(f) If the product exhibits a distinct change in performance.

(18) Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electric shock from lightning.

(19) Do not use the telephone to report a gas leak in the vicinity of the leak.

REGULATORY INFORMATION

1. REGULATORY REQUIREMENTS

The Federal Communications Commission (FCC) has established rules that permit the NEAX2400 IMX to be directly connected to the telephone network. A jack is provided on party lines or coin lines.

The telephone company may make changes in its technical operations and procedures. If such changes affect the compatibility or use of the NEAX2400 IMX, the telephone company is required to give adequate notice of the changes.

This equipment complies with the requirements in Part 15 of FCC Rules for a Class A computing device. Operation of this equipment in a residential area may cause unacceptable interference to radio and TV reception requiring the operator to take whatever steps are necessary to correct this interference.

2. FCC PART 15 REQUIREMENTS

In compliance with FCC Part 15 Rules, the following statement is provided:

> WARNING
>
> This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

3. FCC PART 68 REGISTRATION

3.1 Company Notification

Before installing the NEAX2400 IMX to the telephone network, the telephone company must be provided with the following:

- Your telephone number
- The FCC registration numbers:

	JAPAN	USA
• PBX:	AY5JPN-74906-PF-E	AY5USA-74905-PF-E
• Hybrid:	AY5JPN-74904-MF-E	AY5USA-74913-MF-E

The Ringer Equivalence Number is 2.1B; the required USOC jacks are RJ21X, RJ2EX, and RJ2GX.

3.2 Service Requirements

In the event of equipment malfunction, all repairs will be performed by NEC or an authorized distributor of NEC. It is the responsibility of users requiring service to report the need for service to NEC or to one of their authorized distributors.

If the equipment causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. If advance notice is not practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.

The telephone company may make changes in its facilities, equipment, operations, or procedures that affect the operation of the equipment. If this happens, the telephone company will provide advance notice in order for you to make necessary modifications in order to maintain uninterrupted service.

If trouble is experienced with this equipment, please contact NEC America, Inc.'s Oregon plant at (503) 648-5000 for repair and/or warranty information. If the trouble is causing harm to the telephone network, the telephone company may request that you remove the equipment from the network until the problem is resolved.

NO REPAIRS CAN BE DONE BY THE CUSTOMER.

3.3 Location of FCC Compliance Labels

Labels stating the NEAX2400 IMX FCC registration number and compliance with FCC Parts 15 and 68 are attached to the Base Unit. If the unit is in a table-top configuration, the labels are located on the side of the enclosure. The appearance of the labels is as shown below:

COMPLIES WITH PART 68 FCC RULES	
NEAX2400 IMX	
FCC registration numbers:	AY5USA-74905-PF-E AY5USA-74913-MF-E
Ringer Equivalence:	2.1B
NEC NEC America Made In U.S.A.	

4. DIRECT-INWARD DIALING (DID) CALLS

Allowing this equipment to be operated in such a manner as to not provide for proper answer supervision is a violation of Part 68 of the FCC's rules.

PROPER ANSWER SUPERVISION IS WHEN:

(a) This equipment returns answer supervision to the PSTN when DID calls are:

- Answered by the called station
- Answered by the attendant

- Routed to a recorded announcement that can be administered by the CPE user
- Routed to a dial prompt

(b) This equipment returns answer supervision on all DID calls forwarded to the PSTN. Permissible exceptions are:

- A call is unanswered
- A busy tone is received
- A reorder tone is received.

EQUAL ACCESS REQUIREMENTS

This equipment is capable of providing users access to interstate providers of operator services through the use of access codes. Modification of this equipment by call aggregators to block access dialing codes is a violation of the Telephone Operator Consumers Act of 1990.

5. REGULATORY INFORMATION ON SINGLE-LINE ANALOG TELEPHONES

NEC single-line telephones comply with Part 68 of FCC Rules. On the bottom of the equipment is a label that states, among other information, the FCC registration number and ringer equivalence number (REN) for the equipment. If requested, this information should be provided to the telephone company.

The equipment uses the following USOC jacks: RJ11C.

The equipment should be used only behind a PBX or KTS. The REN is used to determine the quantity of devices that may be connected to the telephone line. Excessive RENs on the telephone line may result in the devices not ringing in response to an incoming call. In most, but not all, areas, the sum of RENs should not exceed five (5.0). To be certain of the number of devices that may be connected to the line as determined by the total RENs, contact the telephone company to determine the maximum REN for the calling area.

6. HEARING AID COMPATIBILITY

The D^{term} terminals provided for the NEAX2400 IMX are hearing aid compatible. FCC rules prohibit the use of non-hearing aid compatible telephones.

NEC-type single-line telephone sets used in conjunction with the NEAX2400 IMX are hearing aid compatible. If other than NEC-type single-line telephone sets are to be used with this system, ensure that these are hearing aid compatible.

CAUTION: The act of monitoring or recording telephone conversations under certain circumstances may violate federal or state statutes. Consultation with your legal counsel prior to engaging in such practices would be advisable.

7. INDUSTRY CANADA CS-03

Certification number: 140 5452A

Load Number of the equipment: 100

NOTICE: The Industry Canada label identifies certified equipment. The certification means that the equipment meets certain telecommunications network protective operational and safety requirements. The department does not guarantee the equipment will operate to the user's satisfaction.

Before installing the equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. In some cases, the company's inside wiring associated with a single line individual service may be extended by means of a certified connector assembly (telephone extension cord). The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or installations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request that the user disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines, and internal metallic water pipe system, if present, are connected together. This protection may be particularly important in rural areas.

CAUTION: Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

NOTICE: The Load Number assigned to each terminal device denotes the percentage of the total load to be connected to a telephone loop which is used by the device, to prevent overloading. The termination on a loop may consist of any combination of devices subject only to the requirement that the total of the load numbers of all the devices does not exceed 100.

8. SAFETY LISTING/CERTIFICATIONS

This equipment has been listed by Underwriters Laboratories and found to comply with all the applicable requirements of the standard for telephone equipment U.L. 1459. This equipment complies with Canadian Standards Association standard C 22.2 No. 225.

8.1 Safety Considerations

When using your telephone equipment, basic safety precautions should always be followed to reduce the risk of fire, electric shock and injury, including the following:

1. Never install telephone wiring during a lightning storm.
2. Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
3. Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
4. Use caution when installing or modifying telephone lines.

NOTICE: Also follow the precautionary items listed under "Safety Considerations" on the previous pages.

CHAPTER 1 INTRODUCTION

1. GENERAL

During the period from equipment carry-in of the NEAX2400 IMX – referred to in the remainder of this manual as “the PBX”– till it is placed in service, the following must be performed:

- Installation of the system and its peripheral equipment
- System startup
- Installation test
- Miscellaneous jobs

This manual explains how to proceed with these activities, and related precautions. It is recommended that the installer thoroughly read Section 2., “HOW TO FOLLOW THE MANUAL” before engaging in any phase of the installation.

2. HOW TO FOLLOW THE MANUAL

2.1 Outline

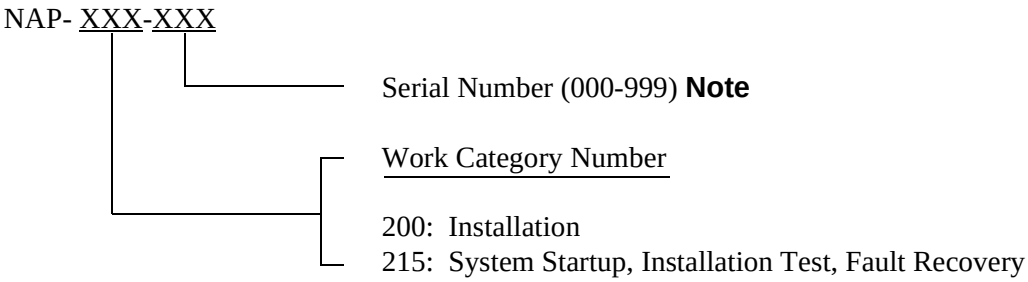
The work required to be performed is divided into the following chapters. Basically, the work is performed in the order of these chapters:

- Chapter 2, “INSTALLATION DESIGN”
  This chapter explains installation design and preparation of the required installation materials.
- Chapter 3, “INSTALLATION PROCEDURE”
  This chapter explains the procedures pertaining to equipment carry-in, installation, power supply (cabling, wiring), etc., of the system, and also explains the installation procedures concerning peripheral equipment (MDF, Rectifier, Terminal Equipment.).
- Chapter 4, “SYSTEM STARTUP”
  This chapter explains the procedures for initial power-on and office data entry upon completion of the system installation.
- Chapter 5, “INSTALLATION TEST PROCEDURE”
  This chapter explains the test procedures to be performed, upon completion of the system startup, to determine:
  - If the system operates as directed by the office data.
  - Whether reinitialization or system changeover can be performed.
  - Whether the interface with the associated distant office is normal.
- Chapter 6, “FAULT RECOVERY DURING TESTS”
  This chapter explains the recovery procedure which the installer needs to follow in case of a fault occurrence while engaging in work pertaining to system startup and basic connections.
- Chapter 7, “WORK AFTER INSTALLATION TESTS”
  This chapter explains various kinds of work and site cleaning, etc. which must be performed after completion of installation tests so that the system can be cut over normally.

2.2 How to Follow NAPs

This manual categorizes the work contents of installation, system startup and installation tests into detailed work items, and an NEC Action Procedure (NAP) number is assigned to each of such work item.

The following shows how to interpret a NAP number.



Note: *Performing NAPs in sequential order by serial numbers is recommended.*

Figure 1-1 shows an example of an NAP.

NAP- 200-004	NAP Number
Sheet 3/3	Sheet Number of NAP
Installation of the Base Unit	Title of NAP

1. INSTALLING THE BASE UNIT USING A SPECIAL STAND

START

- Securing the Base Unit — Secure the Base Unit onto the special stand as per Figure 004-4.
- Level Check — Check the level of the Base Unit. If necessary, adjust the level by inserting spacers beneath the Base Unit.

END

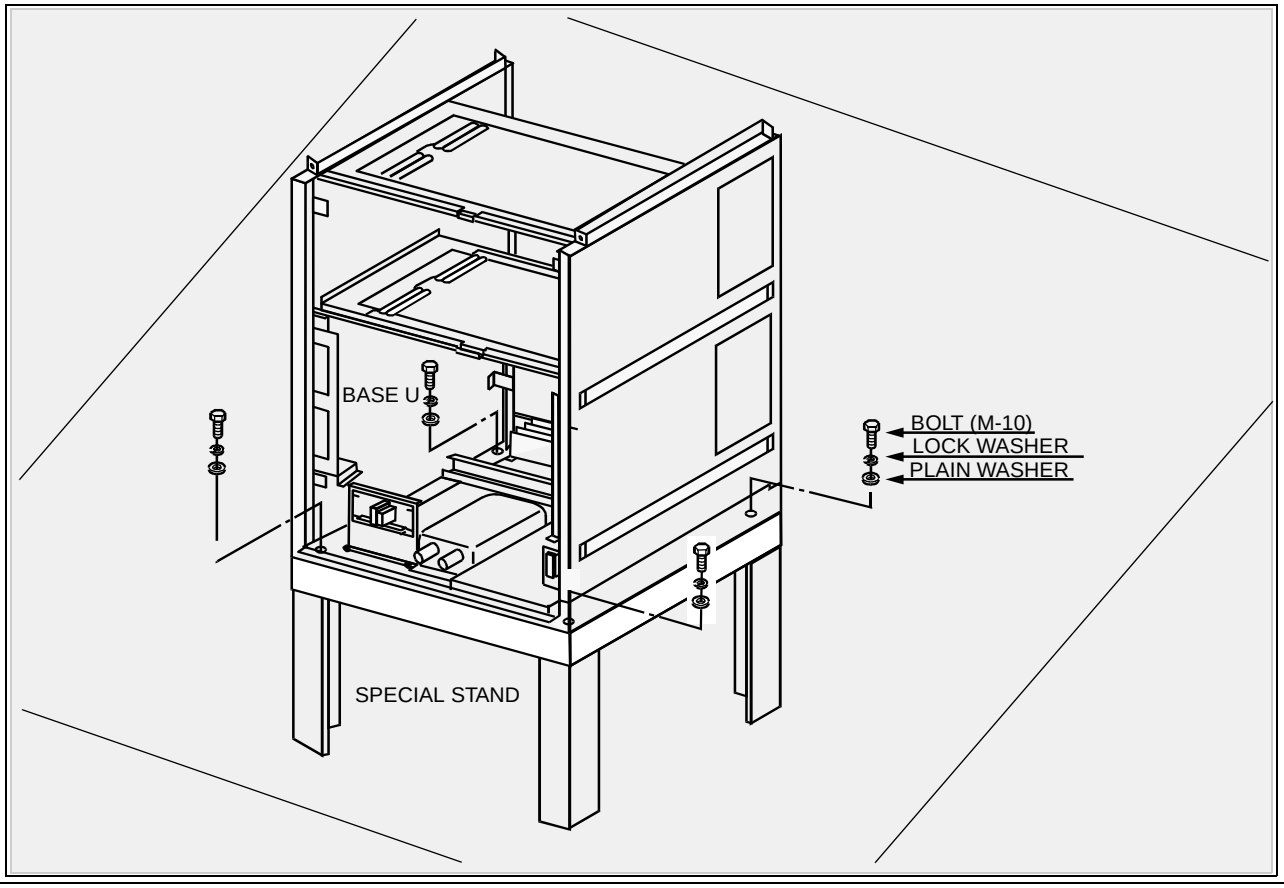


Figure 1-1 Example of NAP

2.3 How To Follow Trees

This manual explains performance of a predetermined procedure (work contents covered in each NAP) in a "Tree" format as shown in Figure 1-2. Before engaging in the intended work, be sure to understand the work contents by tracing the given tree.

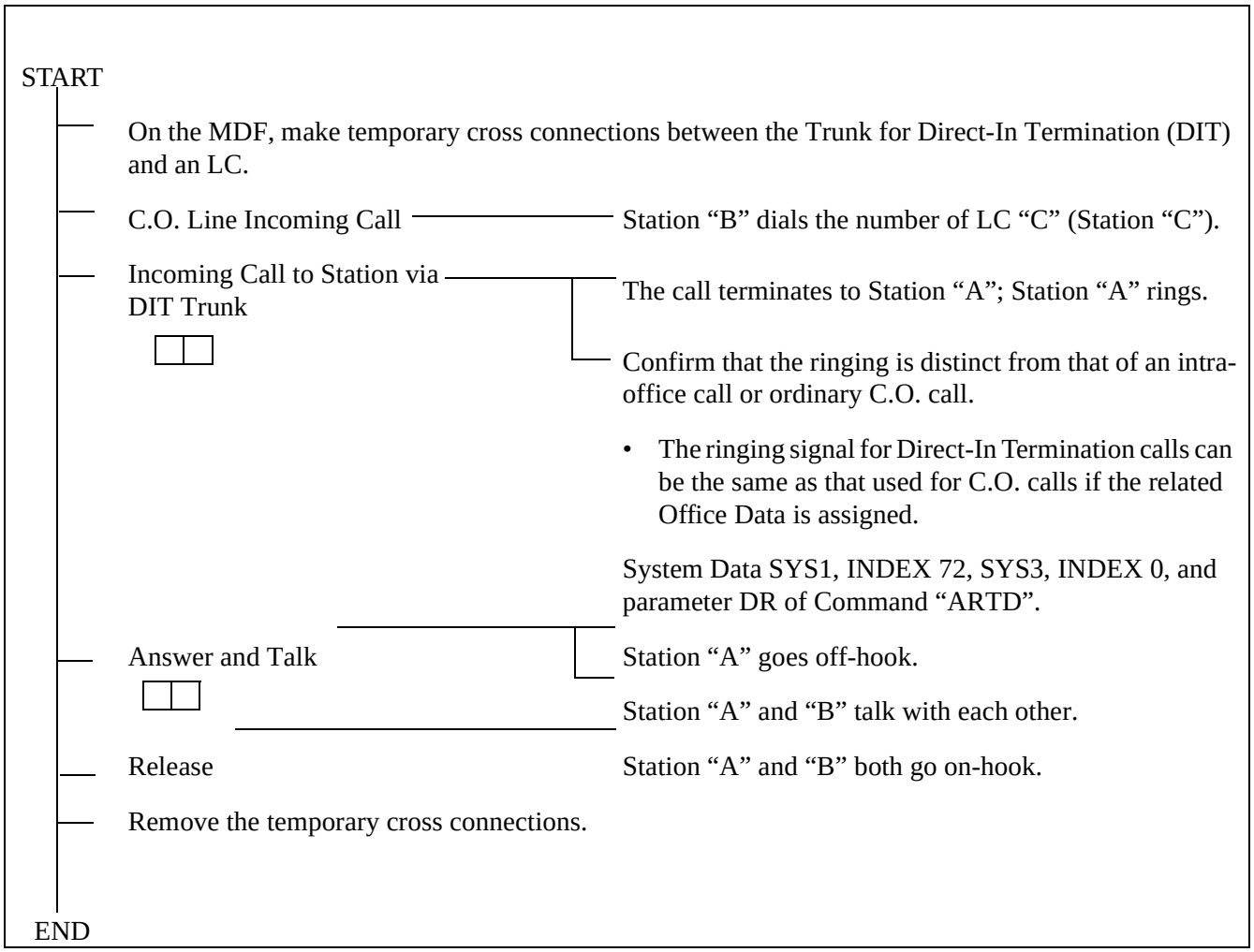


Figure 1-2 Example of a Tree

Figure 1-3 Static Caution Indication

This manual provides “Static Caution” indicators (see Figure 1-3) on pages where work involving static-sensitive components is described.

The 3M® Model 8012 Portable Field Service Kit, shown in Figure 1-4, is recommended as an effective countermeasure against static electricity.

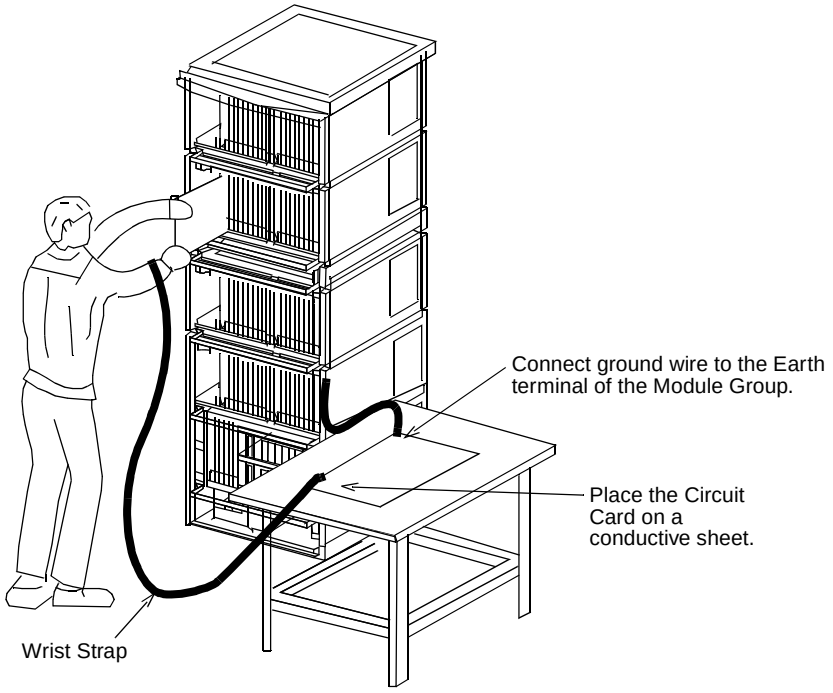


Figure 1-4 3M® Model 8012 Portable Field Service Kit

Note: *3M® is a registered trademark of Minnesota Mining and Manufacturing, Inc.*

2.4 Figure and Table Numbers

Each Figure and Table within this manual are numbered as shown below.

1. Figure and table in NAP

   Figure XXX-X

   - Serial number of Figures in each NAP
   - Serial number (000-999) of the NAP in which the Figure exists.

2. Other figure and table

   Table X-X

   - Serial number of Table in each Chapter
   - Number of the Chapter in which the Table exists.

Understanding this numbering rule will help you when looking for the desired Figure or Table.

2.5 Essential/Critical Information

To prevent accidents or equipment damage from occurring while work is being performed, each manual provides **WARNING**, **CAUTION**, and **Note:** indications to draw the technician's attention to specific matters.

1. Meaning

   WARNING: Personal injury may result if the warning is not heeded.

   CAUTION: Damage to the equipment and/or the system may result if the caution is not heeded.

Note: *Indicates an item which requires special attention.*

2. Locations of Indicators

   WARNING and **CAUTION** indications are located at the top of the page. Notes are included as part of the work procedures on the page.

CHAPTER 2 INSTALLATION DESIGN

1. GENERAL

This chapter provides information pertaining to installation design and preparation of the required installation materials. The following topics are discussed:

- Environmental Requirements
- Floor Space
- Floor Load Requirements
- Equipment Room Requirements
- Power Supply Requirements
- MDF Requirements
- Installation Tools
- System Accommodation
- Installation Cables

2. ENVIRONMENTAL REQUIREMENTS

The PBX is sensitive to the same rises in temperature and humidity as a computer. Air conditioning may be required, depending on the installation environment. The following paragraphs address the following environmental conditions.

- Temperature and Humidity
- Heat Generation from Switching Equipment

2.1 Temperature And Humidity

Table 2-1 shows the environmental conditions required in the switching equipment room.

If the switching system is operated in an environment that does not meet these specifications, the reliability of the switching equipment may be impaired. Improper operating conditions can cause circuit boards, etc., to deteriorate. Therefore, to enable the equipment to operate for the extent of its expected lifetime, careful consideration must be given to the location of the equipment, and to proper ventilation and air conditioning.

If no equipment is provided to remove the heat generated by the system, or if the temperature or humidity fluctuates repeatedly, the system's electronic parts can be adversely affected. Such conditions will promote corrosion of metal parts and deterioration of insulation, thereby lowering the overall reliability of the system.

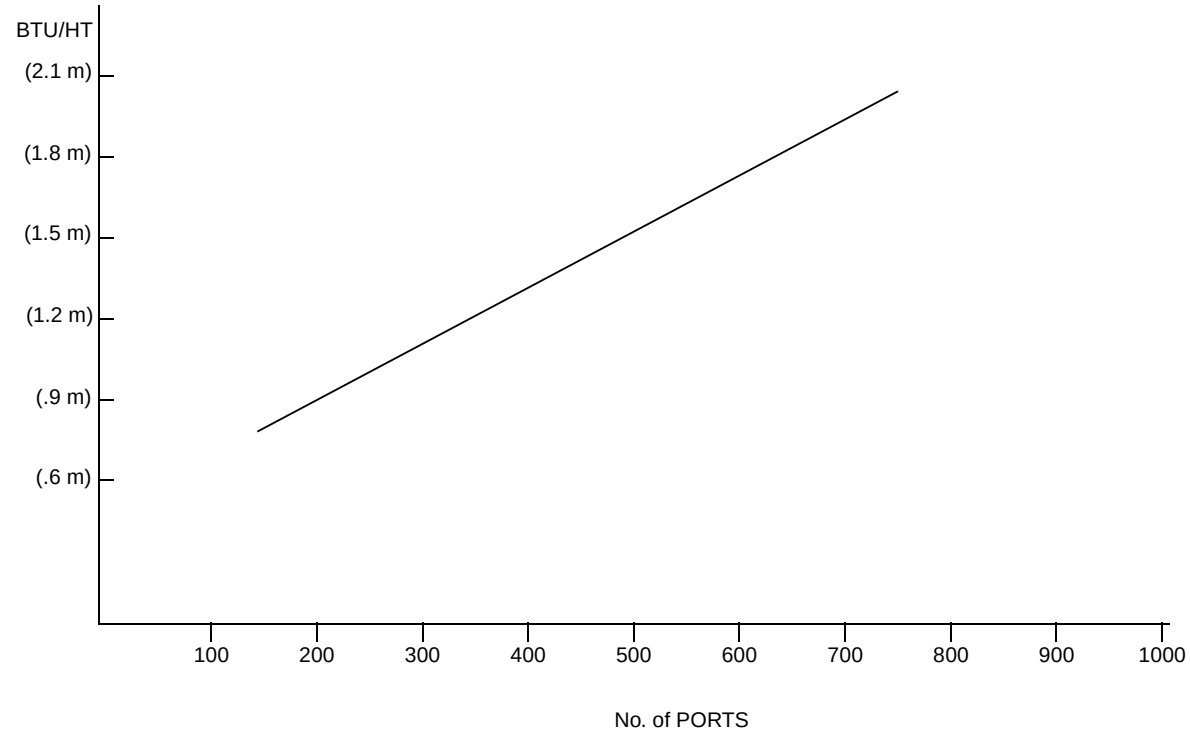
Table 2-1 Temperature and Humidity

		TEMPERATURE	RELATIVE HUMIDITY	REMARKS
During Operations	Normal Operations	5°C - 30°C (41°F -86°F)	15% - 65%	
	Short Period **Note**	0°C - 40°C (32°F-104°F)	15% - 90%	
During Storage & In Transit		–18°C - 50°C (0°F -122°F)	8% - 90%	
Temperature Change		Max. 5°C/30 Min. (9°F/30 Min.)	90%	

Note: *A short period means a period not exceeding three consecutive days (72 hours) or 15 days (360 hours) in a year.*

2.2 Heat Generation From Switching Equipment

Figure 2-1 shows heat generation from the switching equipment with respect to current consumption.



Note: *BTU; British Thermal Unit (1 BTU=1058.4J)*

Figure 2-1 Heat Generation from Switching Equipment for the PBX

3. FLOOR SPACE

1. The PBX requires floor space for the following system equipment:
   - Switching Equipment (Module Group)
   - Maintenance Administration Terminal (MAT)
   - MDF
   - Rectifier
   - Batteries
   - Attendant Console
2. The required floor space for the various equipment rooms is as follows.
   - Switching Equipment Room: For installing the Module Group, MAT, MDF and Rectifier
   - Battery Room: For installing Batteries
   - Operator Room: For installing an Attendant Console with desk and chair
3. Equipment Room: Free Access Floor or Computer Floor

4. FLOOR LOAD REQUIREMENTS

Required floor capacities are as follows:

- Switching Equipment Room: More than 3430 Pa (71.6 pounds per square foot)
- Operator Room: More than 2940 Pa (61.4 pounds per square foot)

5. EQUIPMENT ROOM REQUIREMENTS

The following floor conditions should be considered prior to installation:

5.1 Floor Surface

1. Switching Equipment Room
   - The maximum difference in floor level at each point within the room should be less than +5mm (0.2 inch).
   - An elevated-type floor such as Free Access floor or computer room floor should be constructed.
2. Battery Room
   - It is recommended that the floor have a slope (1/1000) and drain at the end of the slope.
   - The floor surface should be made of acid-resistant materials.

5.2 Wall

Switching Equipment Room

- A Concrete wall is necessary so that cable racks can be installed (unless a free-access floor is used).
- It is recommended that the walls be painted so that the wall materials do not generate dust, etc.
- The maximum difference in level at the wall surface should be less than +5 mm (0.2 inch).

5.3 Ceiling

Switching Equipment Room

- The required ceiling height is more than 2.3 meters (7.5 feet).

5.4 Lighting Facilities

1. Switching Equipment Room
   - Fluorescent lamps are recommended.
   - No less than 200 lux at the floor level is necessary.
2. Operator Room
   - Fluorescent lamps are recommended.
   - No less than 200 lux at the floor level is necessary.
3. Battery Room
   - Anti-explosion type lamps must be utilized.
   - No less than 150 lux at the floor level is necessary.

6. POWER SUPPLY REQUIREMENTS

6.1 Main Source Power

The PBX requires an operating power of -48 V DC ±5V DC. This DC operating power is supplied from the rectifier which receives AC power from the commercial AC power source. For greater system reliability, it is recommended that the PBX be supplied with backup DC operating power for a predetermined duration from the batteries installed as the auxiliary power supply source.

The batteries for the PBX must be connected in parallel with the -48 V DC output of the rectifier. Also, when installing batteries, an EMF panel must be placed in-line (series) with the input -48 V DC supplied to the PBX. This panel is necessary when changing the state of the rectifier from float to equalize and vice versa.

Note 1: *When the rectifier is in the equalize state (charging the batteries), the output DC voltage should be 1.5 to 2 volts higher than the float voltage. For example: the voltages for floating and equalizing are listed below:*

Float: 50.5 V DC
*Equalize: 52 V DC (*Refer to **Note 2.***)*

Note 2: *The Equalize voltage is 1.5 to 2 V higher when an EMF panel (Diode Drop) is utilized. When an EMF panel is not provided, the Float and Equalize Voltage must be the same (50.5 V).*

Note 3: *The main source power is AC input.*

Note 4: *Noise present in the -48 V output from the rectifier should be less than 5 mV.*

6.2 Current Consumption

The PBX operates on -48 V ±5 V DC which is supplied from external power equipment (the rectifier and the battery).

Various DC voltages required within the system are provided by the DC-DC converter in each module. The DC-DC converter, upon receiving the -48 V DC source power, converts it into various DC voltages and supplies them to the associated circuits.

Figure 2-2 shows the current consumption of the PBX.

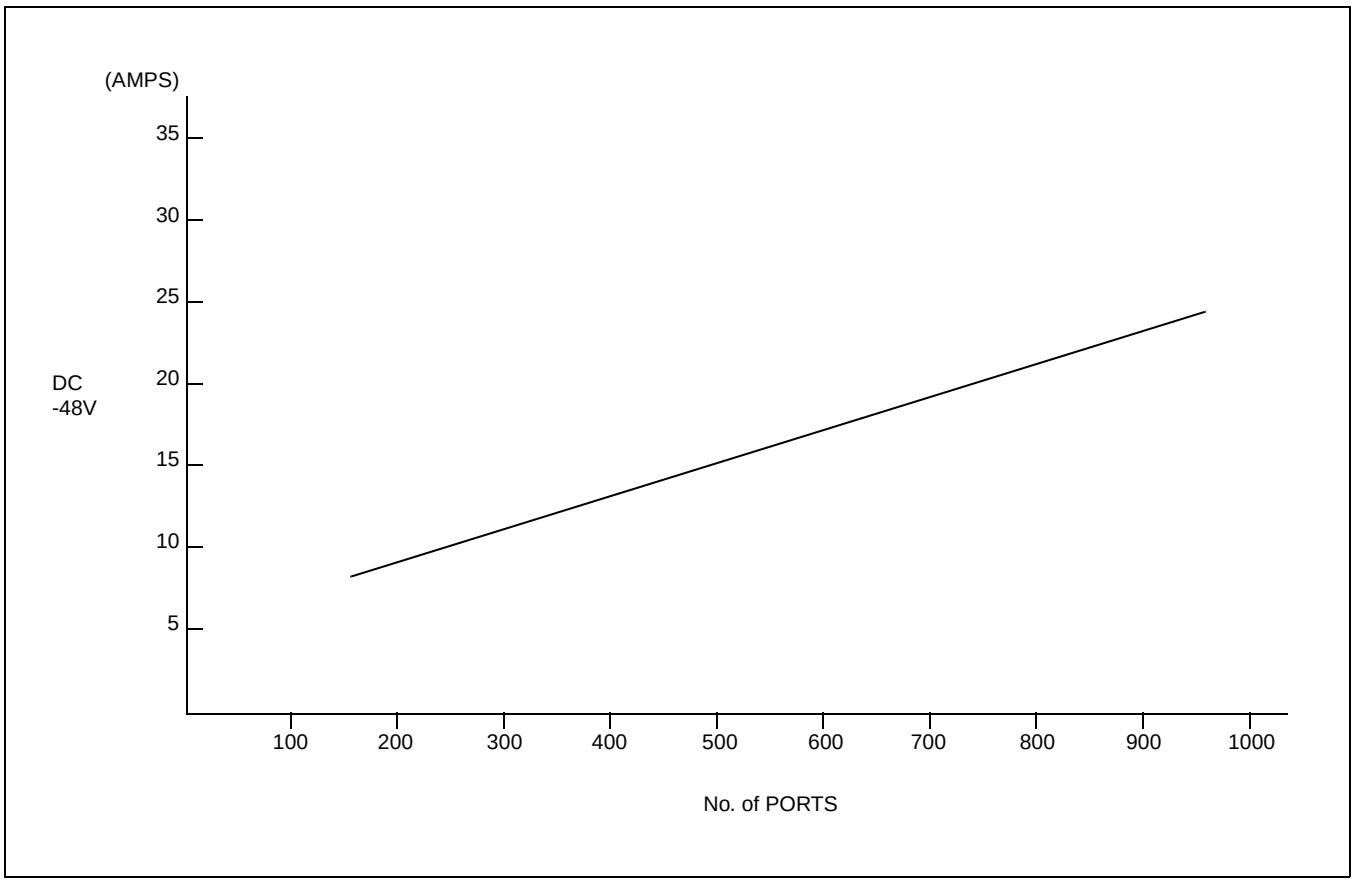


Figure 2-2 Current Consumption of the PBX

6.3 Power Distribution Box Requirements

1. The Power Distribution Box (PDB) should be installed with the following considerations:
2. The AC power source service outlet and the fuse for the junction box should be provided independently of any equipment other than the switching equipment.
3. A warning notice should be attached to be PDB circuit breaker so that it will not be turned off accidentally.
4. The Power Distribution Box should be installed at a location that is easy to reach.
5. The Power Distribution Box should be installed at a location where the connecting cables extending to the switching equipment will not be broken accidentally.
6. The PDB cables should be run in such a way that they do not hamper the technician performing the installation.
7. The Personal Computer (MAT) must have a separate AC service outlet.

6.4 Grounding

System grounding must have a specific ground resistance and AC noise level and is to be connected to a predetermined terminal in the PBX.

Standard grounding requirements are shown below.

- Communication grounding: Less than 1 ohm
- Security ground for Module Group: Less than 1 ohm
- Grounding for the line protector of the MDF: Less than 1 ohm

Note: *The AC ripple of various types of grounding should be less than 1/2 V-pp.*

7. MDF REQUIREMENTS

Either a self-standing or wall-mounted type MDF can be used. The MDF must be equipped with the following types of terminal blocks.

- Arrester board for C.O. lines and external lines
- Test spring terminals for localization tests
- Local Block terminals

The number of terminals is to be determined according to the circuit configuration of the PBX and the number of local lines.

8. INSTALLATION TOOLS

Table 2-2 shows the tools used in a typical NEAX2400 IMX installation.

Table 2-2 Typical Installation Tools

FUNCTION	TOOLS		PURPOSE
Marking	• Steel Tape Measure • L-Square • Iron Square • Iron Level	• Center Punch • Step Ladder • Scriber	For Leveling and Marking Plumb Line
Drilling	• Electric Drill • Electric Vibration Drill • Hammer • Point Drill • Drill Bit for Concrete	• Concrete Chisel • Drill Bit for Metal • Power Cable Drum • Extension Cable	Drilling
Module Group and Rack Installation	• Plump Bob • Jigsaw • Hacksaw Frame • Hacksaw Blade • Flat File • Half Round File • Set File • Adjustable Angle Wrench	• Frame Cart • Cutter • Set Wrench • Socket Wrench Set • Step Ladder • Phillips Screwdriver • Screwdriver • Plastic Hammer	Module Group and Rack Installation
Power Cable Installation	• Clamping Tool (for End Terminal, Branch Terminal)	• Phillips Screwdriver • Screwdriver • Cutter	Power Cable Installation See **Note**.
Miscellaneous	• Circuit Tester • Pocket Measure • Scissors • Wire Clipper • Cable Cutter • Nipper • Wire Stripper • Round Nose Pliers • Non-Metallic Stick • Solder-Helper • Solder Sucker • IC Clip • Mini Test Probe	• Telephone Set • Working Lamp • Wrapping Tool • Unwrapping Tool • Soldering Iron • Soldering Iron Stand • Connector Clamping Tool • Logic Checker and Counter • Pen Light • Precision Screwdriver (+)(-) • IC Buzzer • Tweezer • Portable Field Service Kit	

9. SYSTEM ACCOMMODATION

9.1 System Accommodation

Module Group Configuration and Conditions for Configuration

The module group configuration of the PBX is shown in Figure 2-3, and the conditions for configuration are shown in Table 2-3.

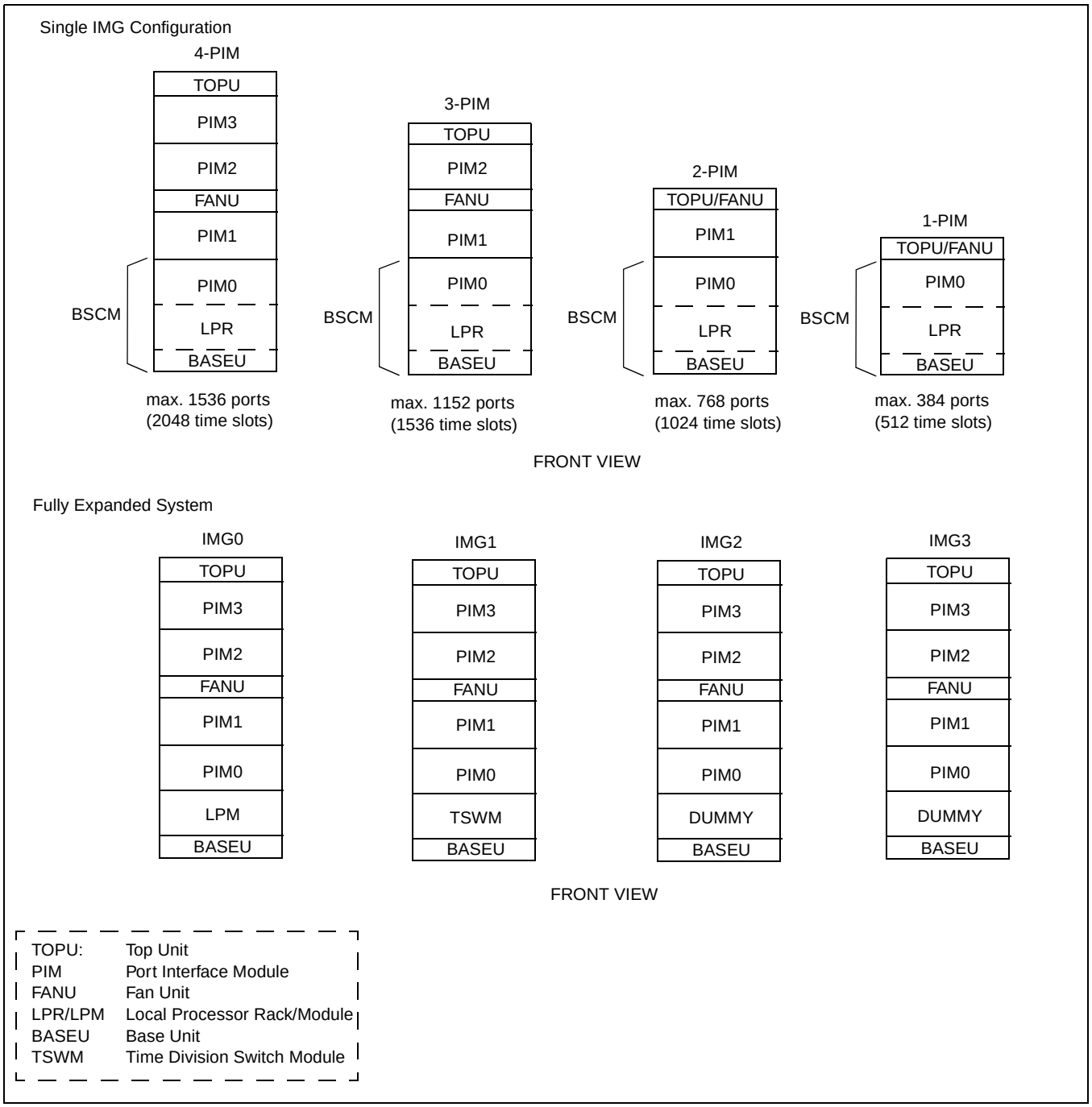


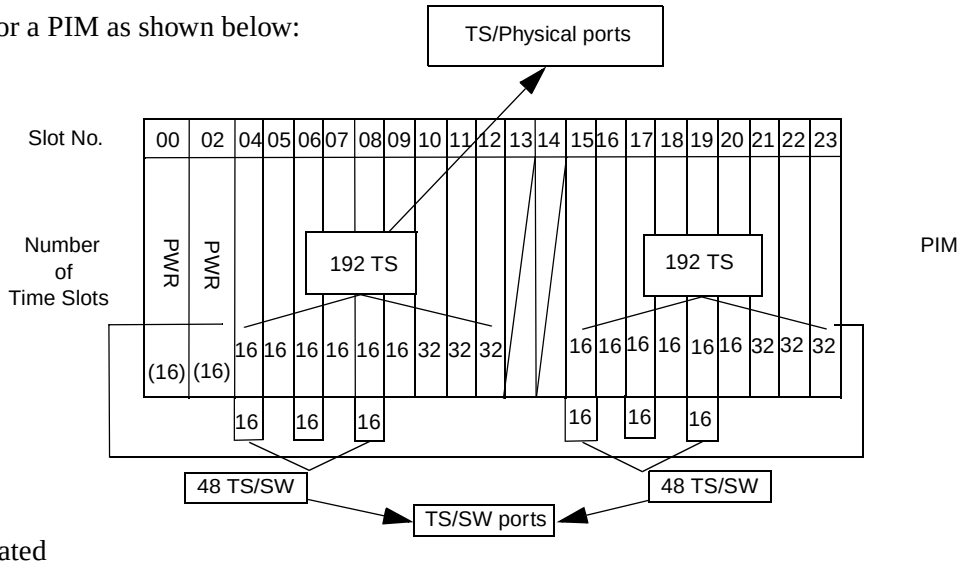
Figure 2-3 System Configuration

Table 2-3 Conditions for Configuration

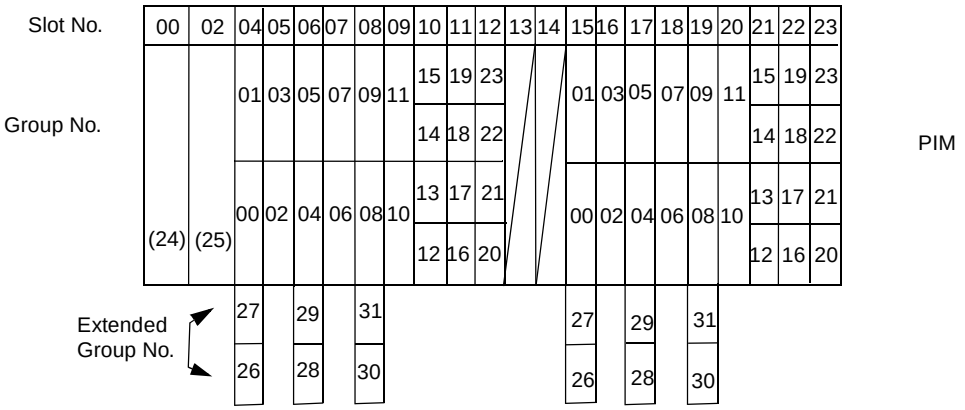
UNIT NAME	NUMBER OF MODULES	CONDITIONS	REMARKS
FANU (Fan Unit)	PIM Less than two modules	Mounted in TOPU	
	PIM Three or more modules	Mounted in between the 2nd PIM and the 3rd PIM	
2nd NFILU (Noise Filter)	Less than two modules	Not required	
	Three or more modules	Mounted in BASEU	
TOPU (Top Unit)		Equipped with PZ-DK222 (KEY) and PZ-DK223 (DSP) Cards	

Note: *A NFILU is mounted in BASEU.*

Time Slots are allocated for a PIM as shown below:



Group Numbers are allocated for a PIM as follows:



Note 1: *Extended Group No. can be used by FCH (PA-FCHA) card. For more detailed information, see the "Fusion Network System Manual."*

Note 2: *A PIM consists of 384 physical ports (512 total ports).*

Figure 2-4 Time Slot, Group Number Assignment

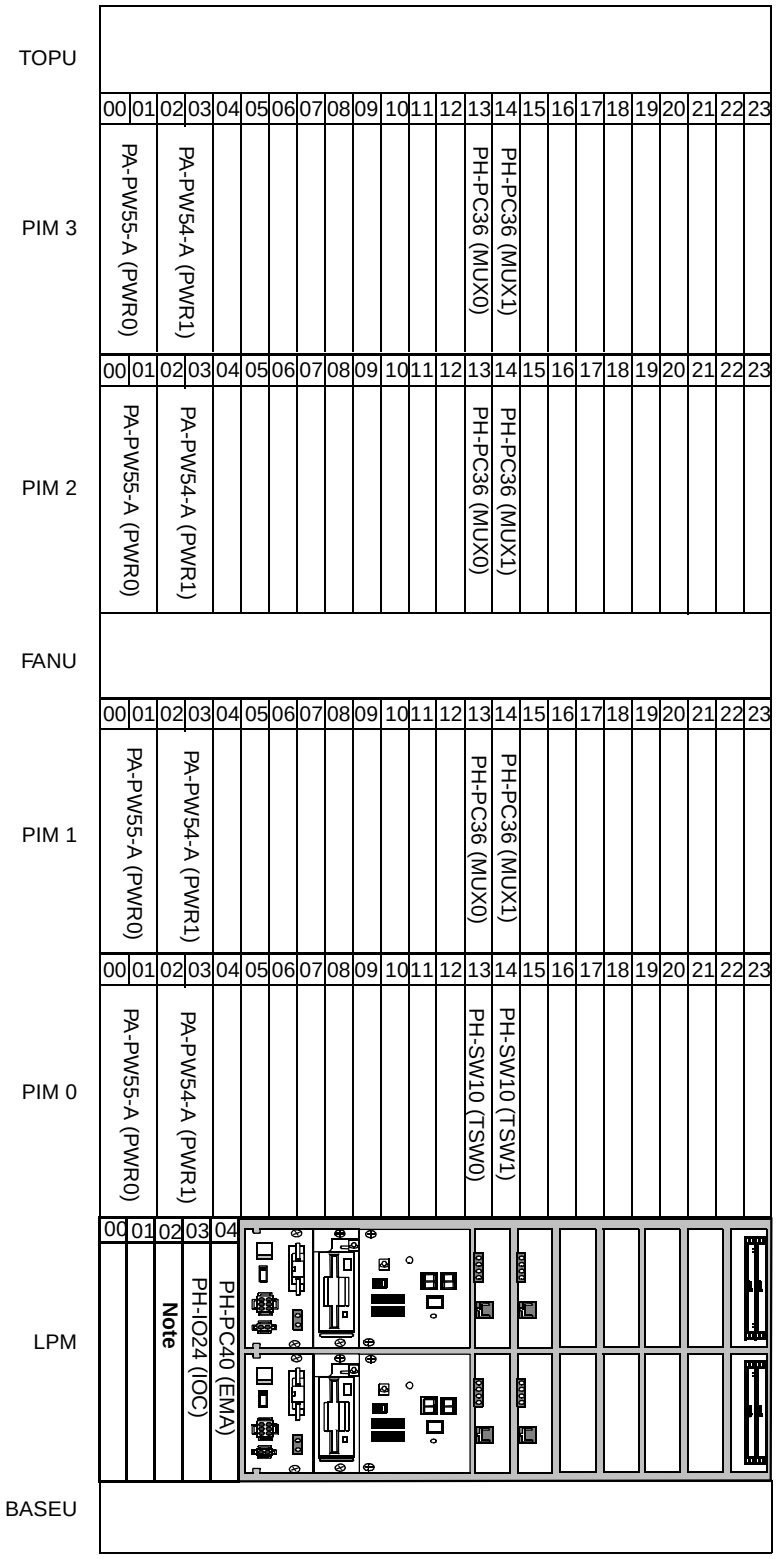


Figure 2-5 Face Layout (Single IMG Configuration)

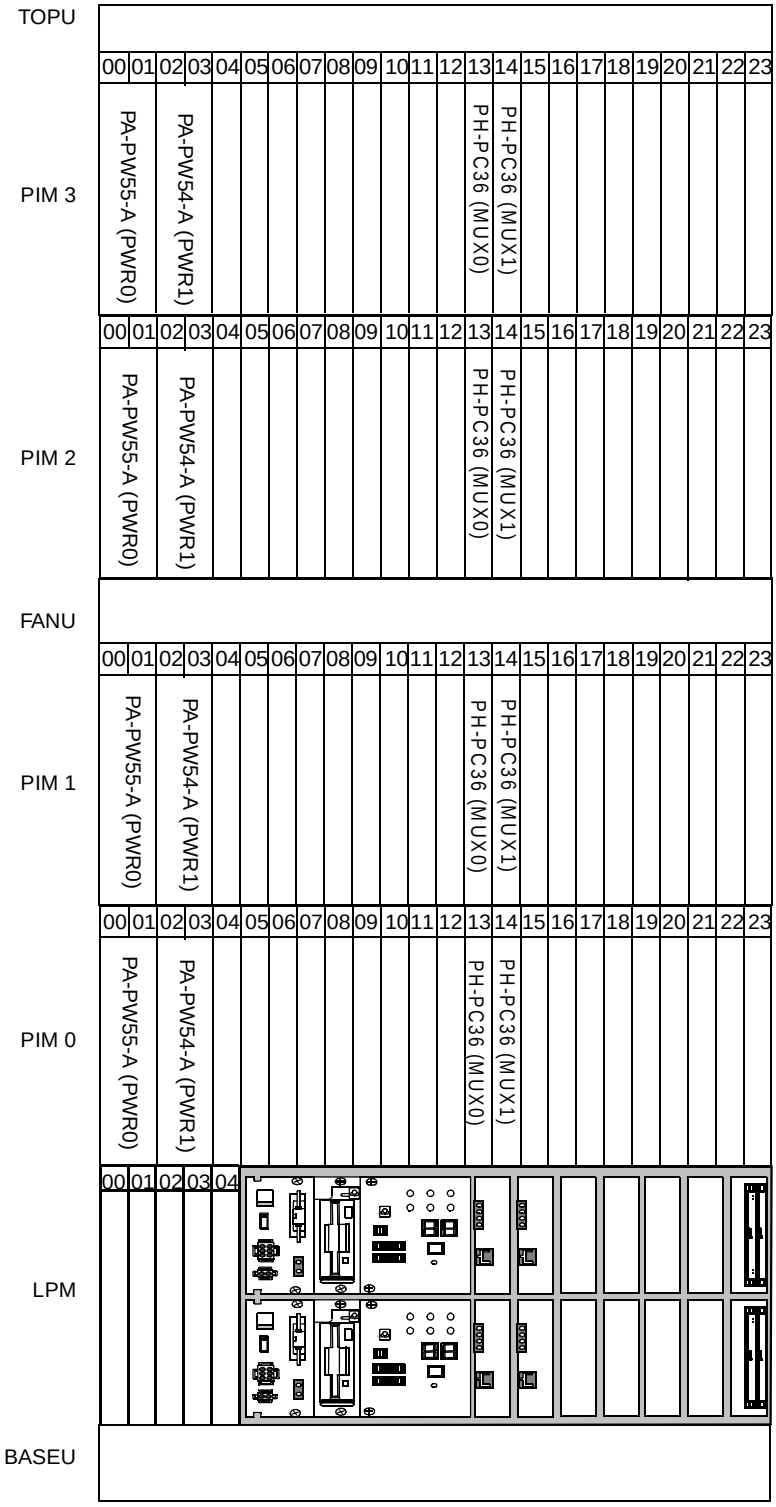


Figure 2-6 Face Layout of IMG0 (Multiple IMG Configuration)

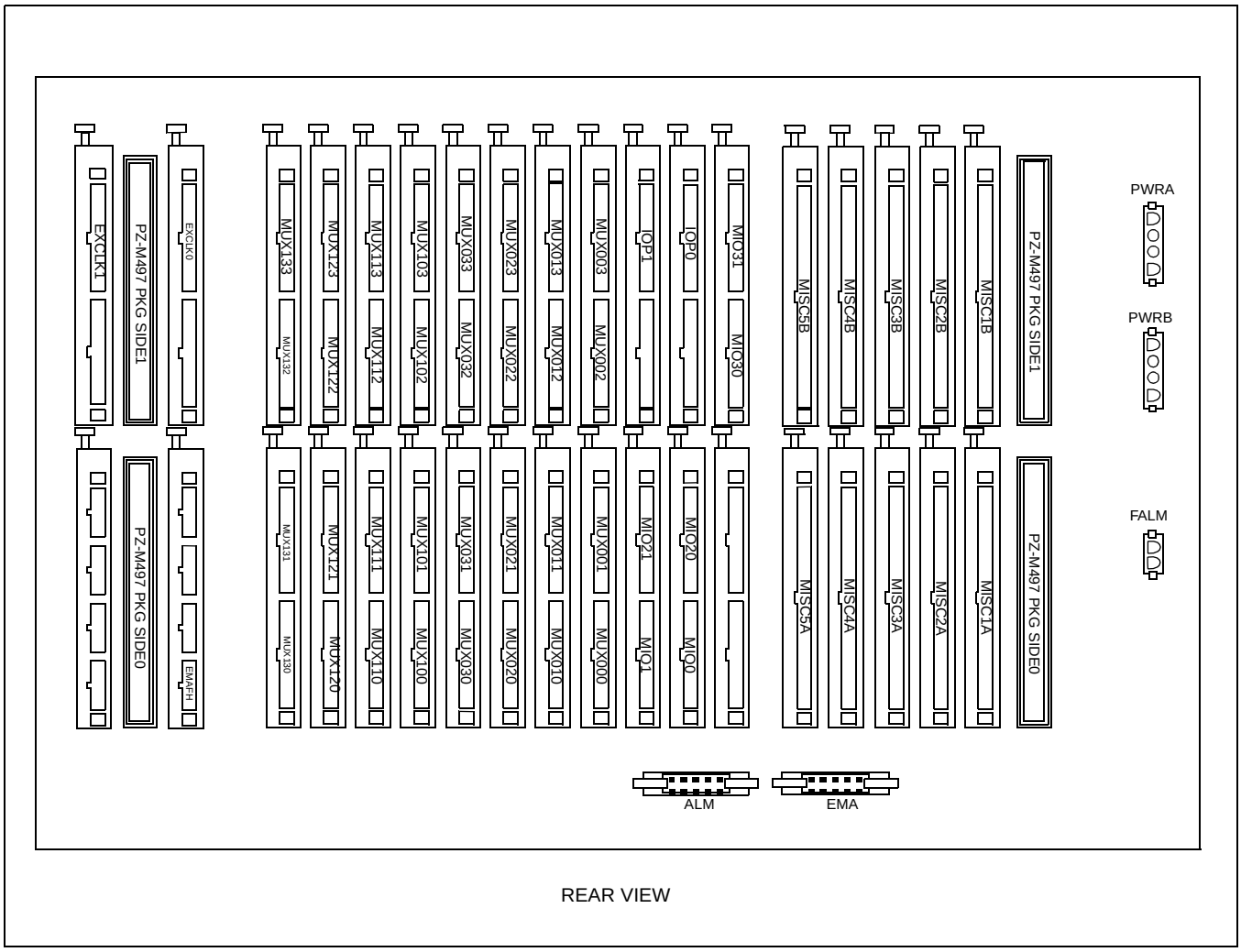
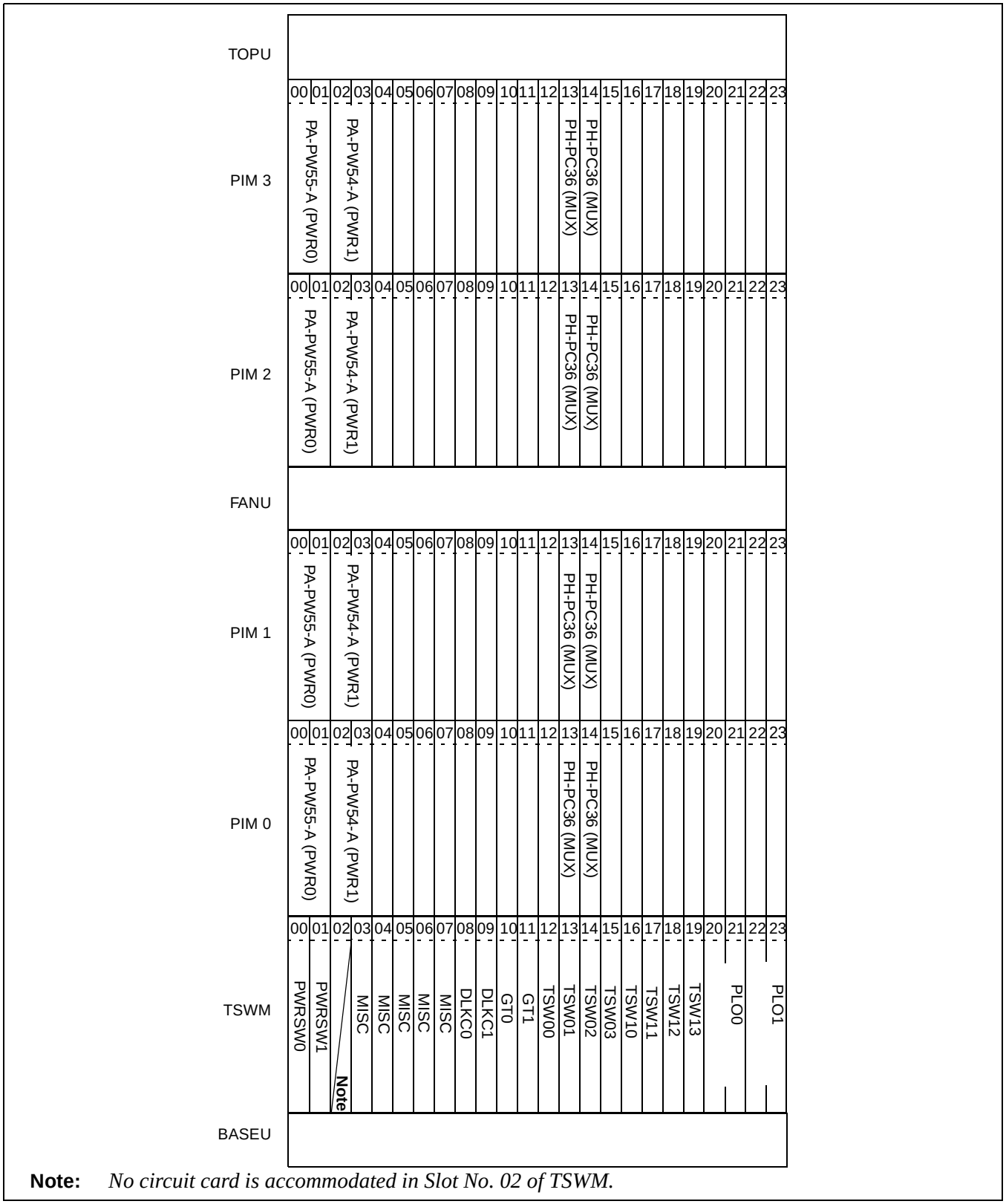


Figure 2-7 Location of Terminating Resistors on the TSWM Back Plane (Multiple IMG Configuration)



Note: *No circuit card is accommodated in Slot No. 02 of TSWM.*

Figure 2-8 Face Layout of IMG1 Front View (Multiple IMG Configuration)

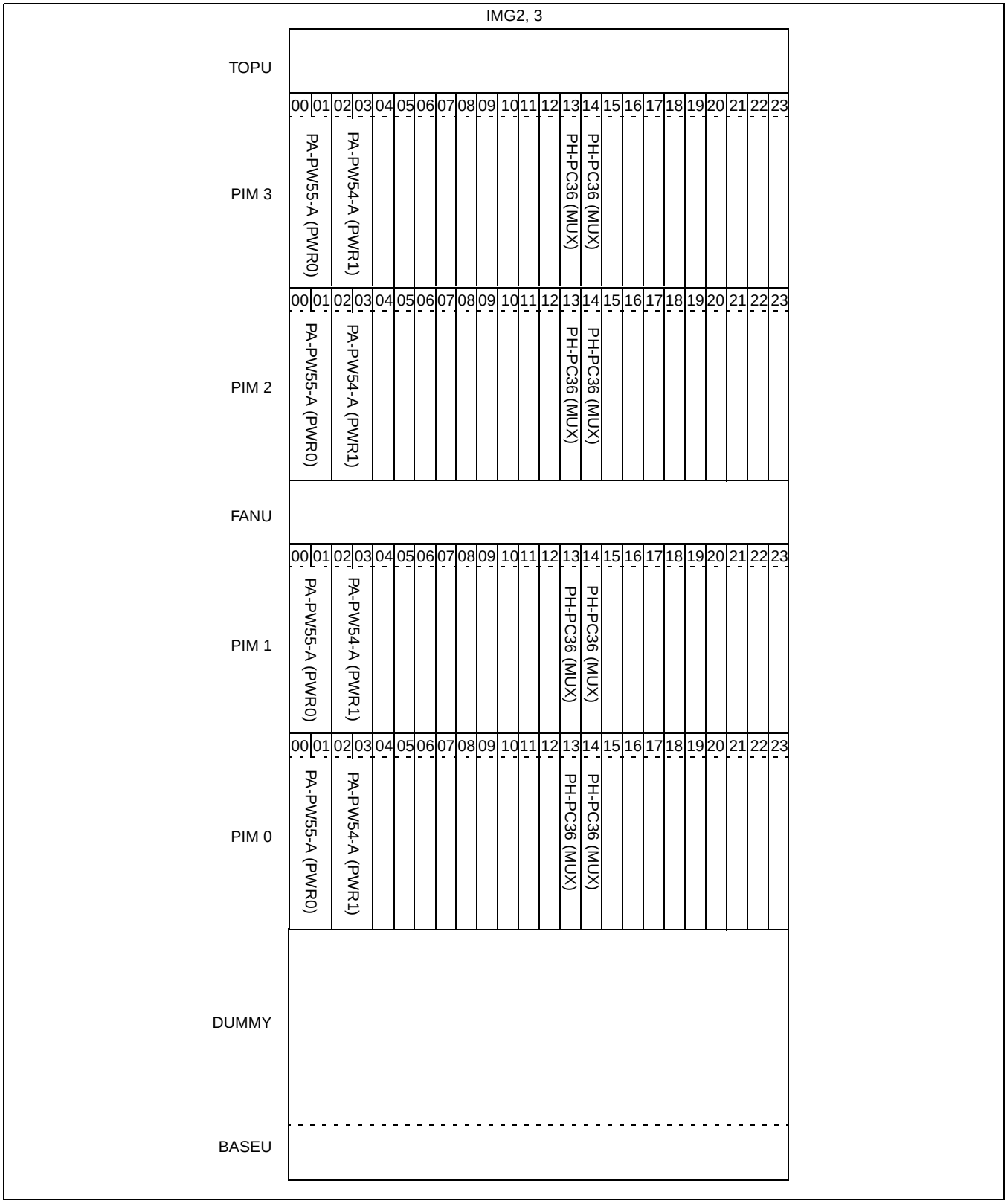
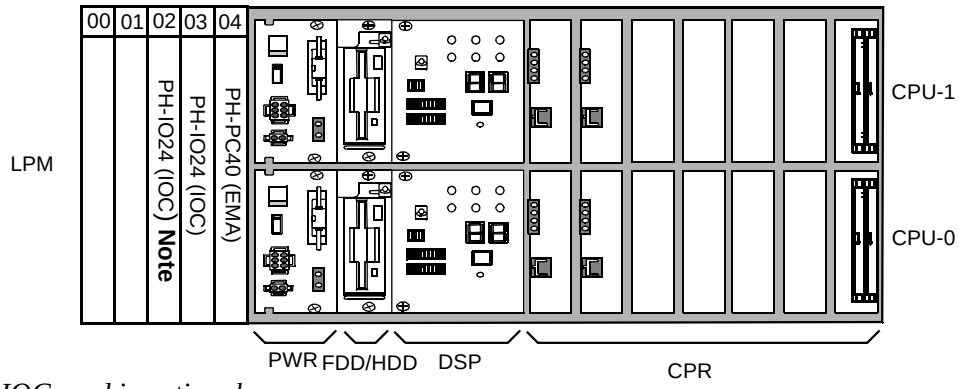


Figure 2-9 Face Layout of IMG2, 3 (Multiple IMG Configuration)

9.2 Circuit Card Locations

This section explains the main function of controlling circuit cards on a module basis. For more detailed information on each card, please refer to the NEAX2400 IMX Circuit Card Manual.



Note: *This IOC card is optional.*

Figure 2-10 Controlling Circuit Cards in LPM

Table 2-4 Controlling Circuit Cards in LPM

Slot No.	Circuit Card	Symbol	Functions, Mounting Conditions
02, 03	PH-IO24	IOC (Input/ Output Controller)	This circuit card supplies the system with a serial interface, which conforms to RS-232C, between external equipment such as the MAT, SMDR, and MCI. One card is equipped with four I/O ports. The system maximum is eight ports (two cards).
04	PH-PC40	EMA (Emergency Alarm Controller)	This card detects various kinds of alarms which might occur in the system, and sends out the information of the detected alarm to the circuits concerned. In addition, this card has the following functions: • Music-On-Hold sending function (Single IMG configuration only) • active/stand-by changeover function
CPR (Central Processor Rack)			CPR consists of the following components. • CPU Board: Includes the Main Processor Unit (MPU), flash ROM, and 64 MB or 128 MB - Random Access Memory (RAM). (128 MB-RAM is used for a system using *FUSION* features.) In addition, the board is equipped with GT (PZ-GT16) (Single IMG Configuration)/ GT (PZ-GT13) (Multiple IMG Configuration) card, and LANI (PZ-PC19) card. • DSP: Equipped with switches and 7-seg LEDs on the panel. • FDD/HDD: Floppy Disk Drive (FDD) and Hard Disk Drive (HDD) • PWR: Supplies the operating power to the LPM.

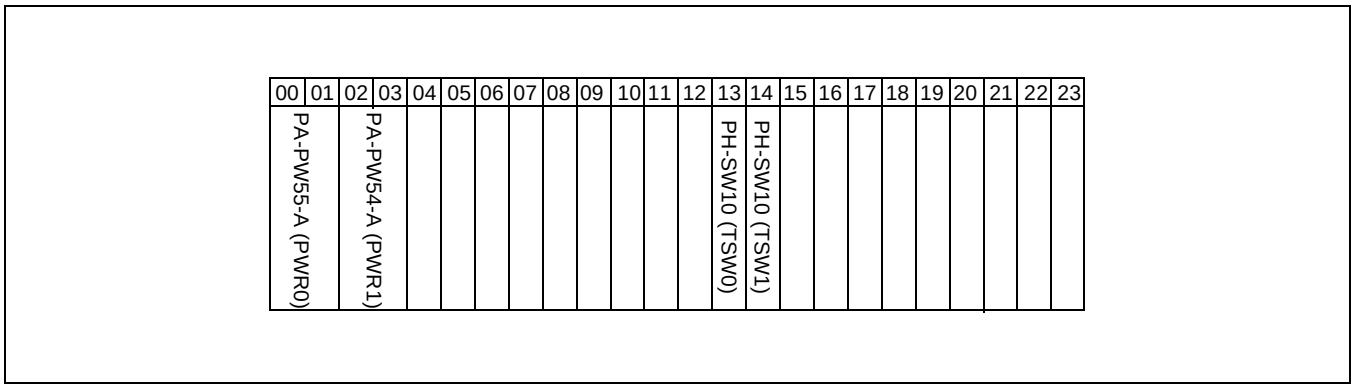


Figure 2-11 Controlling Circuit Cards in PIM 0 (Single IMG Configuration Only)

Table 2-5 Controlling Circuit Cards in PIM 0 (Single IMG Configuration Only)

Slot No.	Circuit Card	Symbol	Functions, Mounting Conditions
01	PA-PW55-A	PWR	This circuit card supplies operating power to circuit cards accommodated in the PIM.
03	PA-PW54-A	DPWR	This circuit card supplies operating power to circuit cards accommodated in the PIM.
13, 14	PH-SW 10	TSW	This circuit card combines the Time Division Switch (TSW) INT, PLO, MUX, and CFT. The TSW capacity is 2048 × 2048 time slots, and it allows non-block switching for the maximum configuration of NEAX2400 IMX. This card is mounted within the PIM0 only.

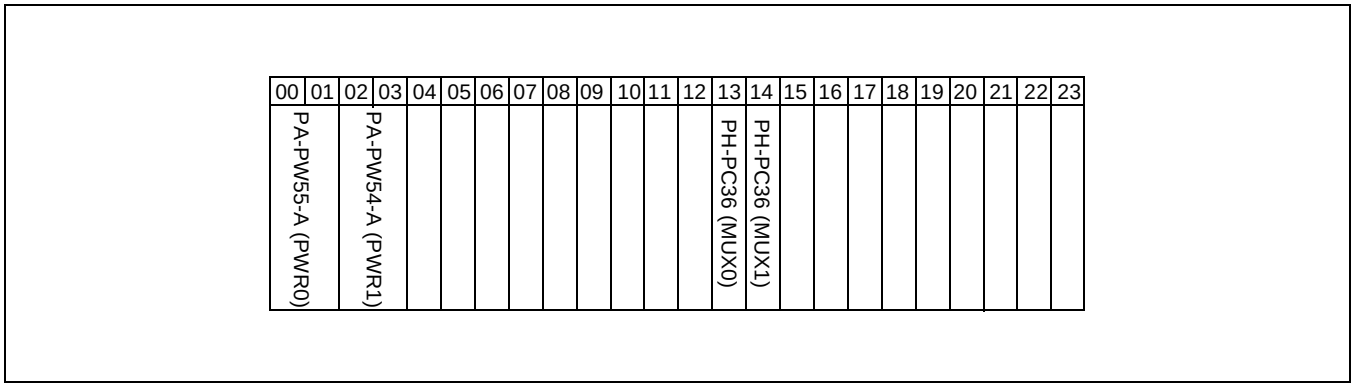


Figure 2-12 Controlling Circuit Cards in PIM

Table 2-6 Controlling Circuit Cards in PIM

Slot No.	Circuit Card	Symbol	Functions, Mounting Conditions
01	PA-PW55-A	PWR	This circuit card supplies operating power to circuit cards accommodated in the PIM.
03	PA-PW54-A	DPWR	This circuit card supplies operating power to circuit cards accommodated in the PIM.
13, 14	PH-PC36	MUX	This 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 card provides an interface for multiplexing/de-multiplexing of voice PCM (Pulse Code Modulation) information and digital data information.

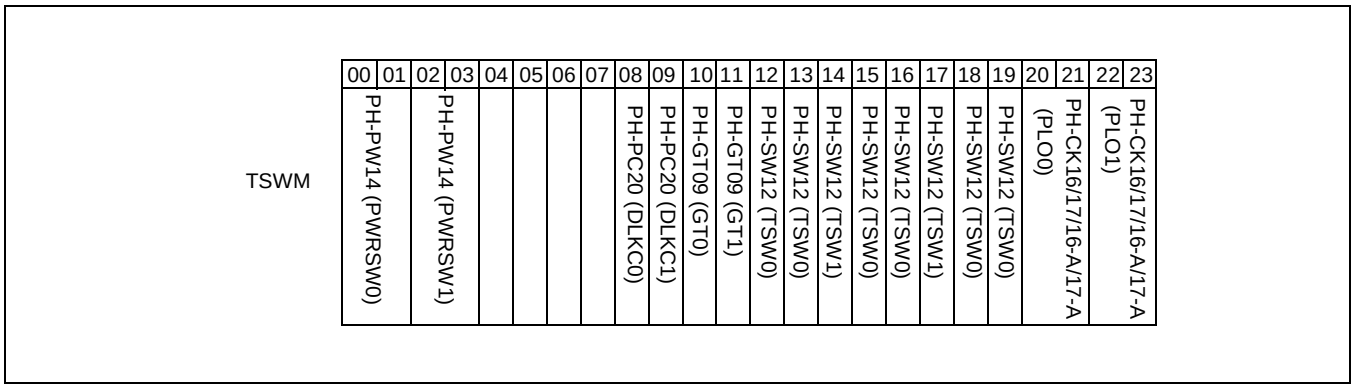


Figure 2-13 Controlling Circuit Cards in TSWM (Multiple IMG Configuration)

Table 2-7 Controlling Circuit Cards in TSWM (Multiple IMG Configuration)

Slot No.	Circuit Card	Symbol	Functions, Mounting Conditions
00, 01	PH-PW14	PWRSW	This circuit card supplies operating power to circuit cards accommodated in the TSWM.
08, 09	PH-PC20	DLKC	This circuit card provides the Attendant Consoles (ATTs) with information such as ATT call termination/answer/release (abandoned call) via the Data Link which is established in the TSW card. In addition, station idle/busy information is sent to the ATTs via the same Data Link.
10, 11	PH-GT09	GT	This circuit card permits the CPU to directly control the TSW, PLO, DLKC, and MISC circuit cards via TSW I/O Bus and MISC I/O Bus.
12-19	PH-SW12	TSW	This circuit card supplies the Time Division Switch (TSW) and INT function for the system. The TSW capacity is 8192 × 2048 TS (time slots) for an IMG, and 4 cards achieves 8192 × 8192 TS switching for 4 IMG configuration.
21, 23	PH-CK16/ 16-A	PLO	This circuit card, used together with a direct digital interface circuit card, sets up network synchronization with the network concerned. With this circuit card, the IMX 4IMG system can be a clock subordinate office of the digital network.
21, 23	PH-CK17/ 17-A	PLO	This circuit card, used together with a direct interface circuit card, sets up network synchronization with the network concerned. Since this circuit card provides high precision base clock oscillator, the IMX 4 IMG system can be a clock source office of the digital network.

9.3 Preparation Of Trunking Diagram

Prepare the trunking diagram according to the customer's specifications. Since there are different kinds of switching offices such as a single office, network offices, etc. are involved, the trunking diagram must be prepared per the customer's specifications.

9.4 Preparation Of Module Group Face Layout And Port Accommodation Diagram

When mounting of various circuit cards in the PBX have been finalized, the installation company concerned should prepare the module group face layout and port accommodation diagram.

9.5 Preparation Of Circuit Card Switch Setting Sheets

Regarding the circuit cards to be mounted in the PBX, prepare the circuit card switch setting sheets. Some of the circuit cards may not properly operate by the initial switch settings arranged at the factory before shipping or may not meet the customer's specifications. Referring to the Circuit Card Manual denote the switch settings in the Switch Setting Sheets provided in the explanations of each of the circuit cards. Make the switch setting entries with respect to all the circuit cards.

It should be remembered that use of a circuit card varies with the switch setting on that card.

10. INSTALLATION CABLES

The following installation cables are required for the PBX:

• DC Power Cable:	For connections between the Rectifier and battery and between the Rectifier and the PBX
• AC Power Cable:	For supplying AC source power to the Rectifier
• Ground Cable:	Communication, Security and Line Protector grounding
• 25P Shielded Cable with CHAMP (Amphenol) connector at one end:	For connections between the MDF and the PBX
• 25P Shielded Cable with CHAMP (Amphenol) connector at both ends:	For connections between the MAT and the PBX, and between peripheral equipment and the PBX
• House Cable:	For connections between terminals (telephone sets, etc.) and the MDF
• Cables for C.O. lines and Tie Lines	
• Others:	For connections between Alarm Indicators and the MDF

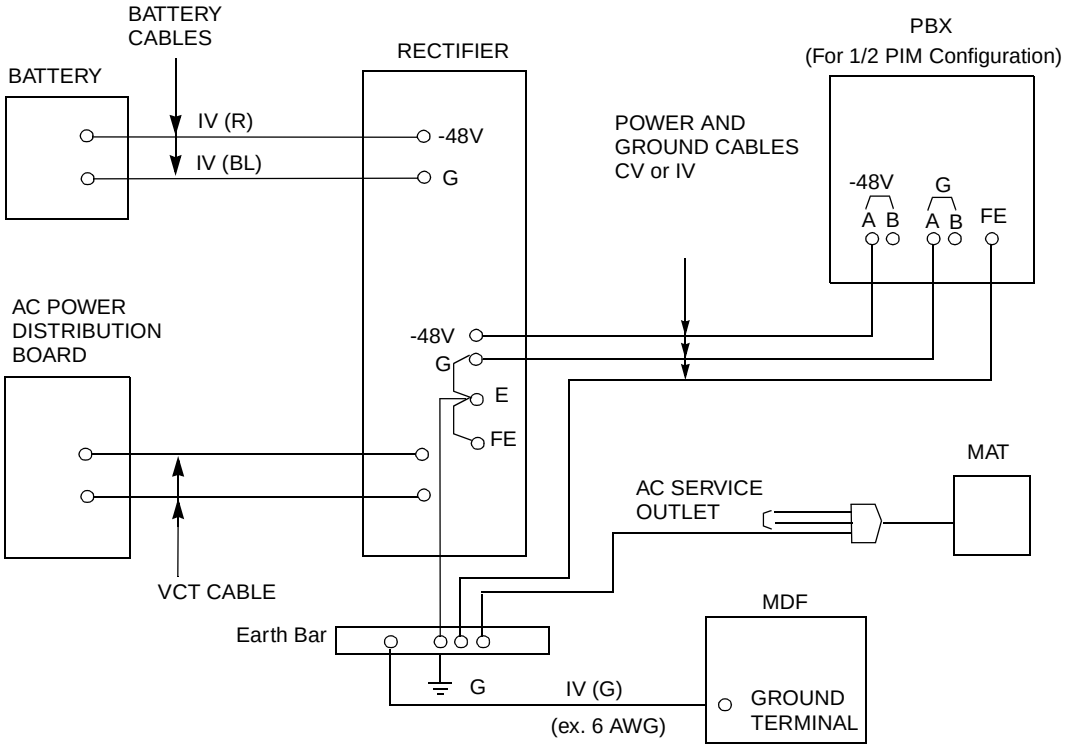
10.1 AC Input, DC Power, And Ground Cables

1. For AC input cable, VCT (Polyvinyl Chloride Cabtyre Cable) is to be used. However, if shielding is necessary, as is the case when the AC input cable is to be installed in parallel with a low-voltage power cable, etc., be sure to use VCT-S (Shielded Polyvinyl Chloride Cabtyre Cable).

2. For the power receiving terminals of the PBX, -48 V and G terminals are provided in dual (A side and B side). For two PIMs or less, the DC main power cable is connected only to A side terminals. For three PIMs or more, the cable is branched out. A side supplies power to LPM/TSWM, PIM0 and PIM1, and B side to PIM2 and PIM3.

3. For the main ground cable, an IV or CV cable of more than 14 mm^2 (6 AWG) is to be used. (See Figures 2-14 through 2-16).

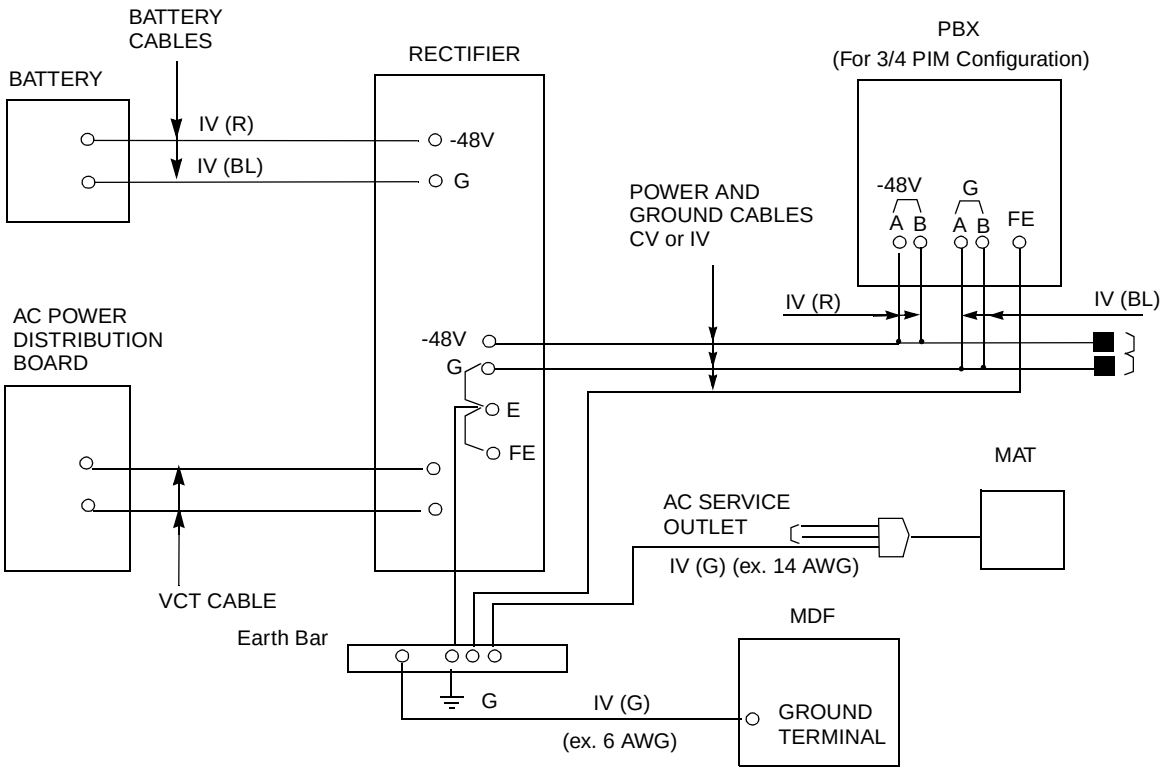
   As the security ground cable for the MAT and externally installed equipment, IV cable of 2 mm^2 (14 AWG) is to be used. For the ground cable for the line protector of the MDF, an IV cable of 14 mm^2 (6 AWG) is to be used.



CABLE	SPECIFICATION
DC Main Power Cable	Calculate the sectional area of cable referring to Figure 2-17.
Main Ground Cable	More than 14 mm^2 (6AWG)

Note: *If the cover of CV Cable to be used is black, use the following clamp cover terminals so they can be easily identified.*
-48V: Red cover G: Black cover E: Green cover

Figure 2-14 DC Main Power Cable and Main Ground Cable (1- or 2-PIM System) (Single IMG Configuration)



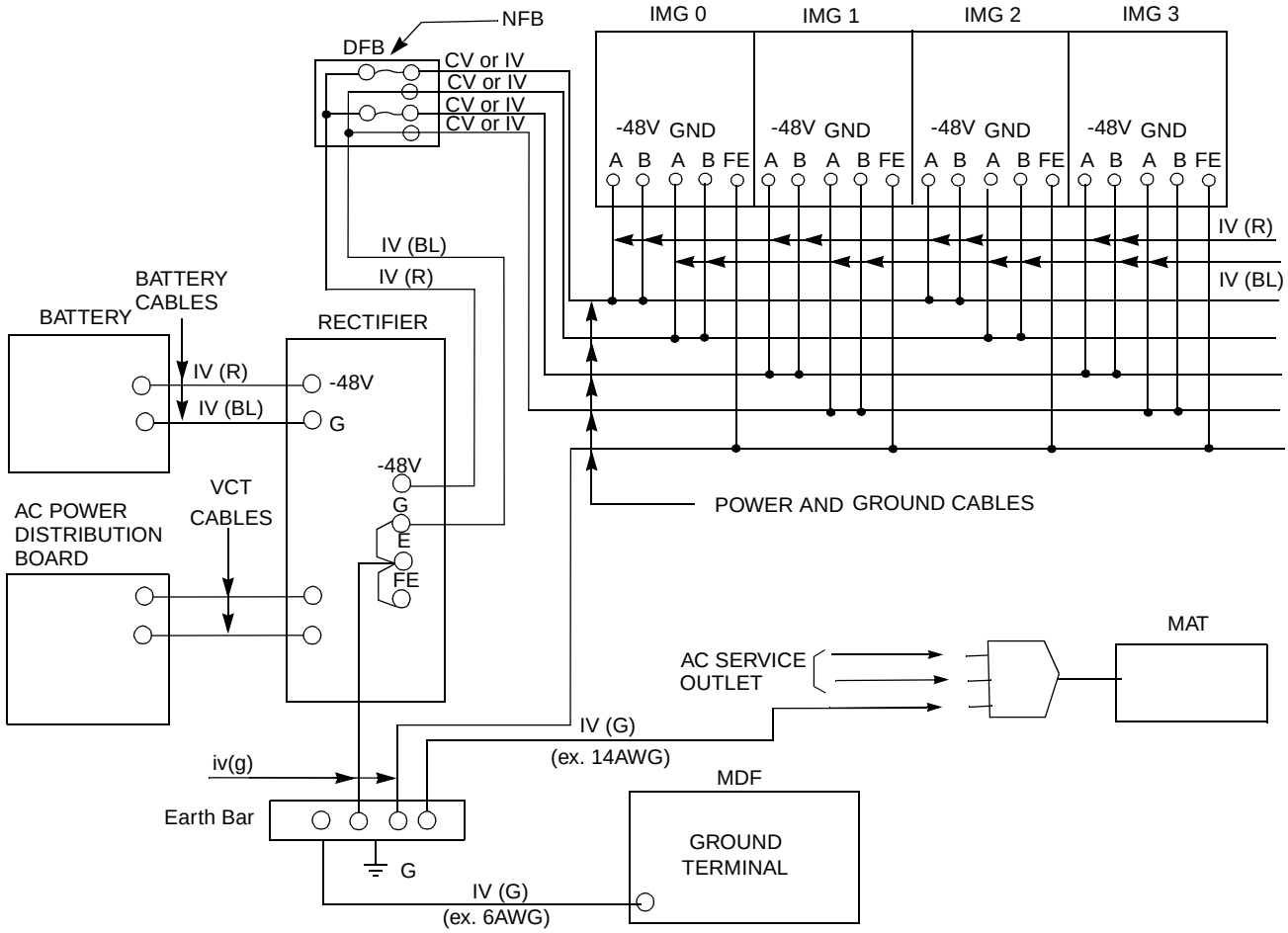
CABLE		SPECIFICATION
DC Main Power Cable	Main Cable	Calculate the sectional area of cable referring to Figure 2-17.
	Branch Cable	IV cable: more than 14 mm^2 (6 AWG)
Main Ground Cable		More than 14 mm^2 (6 AWG)

Note 1: *If the cover of CV Cable to be used is black, use the following clamp cover terminals so they can be easily identified.*
-48V: Red cover
G: Black cover
E: Green cover

Note 2: *Extension jointing is usually performed with a T-type terminal for wires of the same size. Refer to Tables 2-8 through 2-10.*

Note 3: *It is recommended that the -48V leads of A and B be connected to separate circuit breakers at the rectifier.*

Figure 2-15 DC Main Power Cable and Main Ground Cable (3- or 4-PIM System) (Single IMG Configuration)



Note 1: *Do not make a multiple connection across "A" terminal and "B" terminal of -48V. Likewise, do not make a multiple connection across "A" terminal and "B" terminal of GND.*

Note 2: *It is recommended that each -48V lead from the PBX be connected to a separate circuit breaker at the rectifier.*

Figure 2-16 DC Main Power Cable and Main Ground Cable (Multiple IMG Configuration)

Table 2-8 Clamp Terminal Shape and Purpose

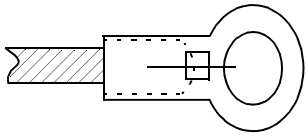
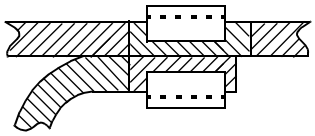
TYPE	SHAPE	PURPOSE	REMARKS
A		End terminal	
T		Branching or extension of power cable	

Table 2-9 Selection of T-type Clamp Terminal

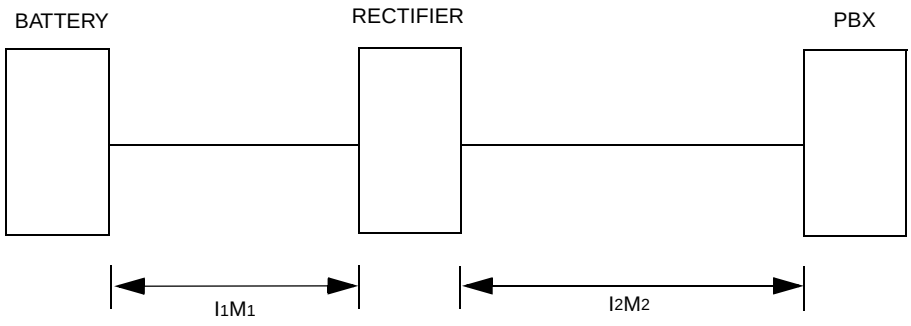
BRANCH / MAIN	14 AWG/ 2 mm^2	12 AWG/ 3.5 mm^2	10 AWG/ 5.5 mm^2	8 AWG/ 8 mm^2	6 AWG/ 14 mm^2	CURRENT	REMARKS
10 AWG	*T-20	*T-20	*T-20	-	-	51A	
8 AWG	*T-20	*T-20	*T-20	T-20	-	63 A	
6 AWG	T-20	T-20	T-20	T-26	T-44	90 A	
3 AWG	T-26	T-26	T-44	T-44	T-44	115A	
2 AWG	*T-44	T-44	T-44	T-44	T-44	139A	
1 AWG	*T-44	*T-44	T-44	T-66	T-60	162A	
1ø	*T-60	T-60	T-60	T-60	T-76	190A	
2ø	*T-76	T-76	T-76	T-76	T-76	217A	
3ø	*T-98	*T-98	*T-98	T-98	T-98	257A	
4ø	*T-122	*T-122	*T-122	*T-122	T-122	298A	
250 mcm	*T-154	*T-154	*T-154	T-154	T-154	344A	
300 mcm	*T-154	*T-190	*T-190	*T-190	T-190	395A	
400 mcm	*T-240	*T-240	*T-240	*T-240	T-240	439A	

Note: *Selection of T-Type Clamp Terminal*

The asterisk (*) in Table 2-9 indicates that an auxiliary conductor is needed when using a main power wire and a branch power wire of a thinner diameter, and the clamp terminal of the type indicated in the selected columns.

Table 2-10 Clamping Tool

*TOOL TYPE	APPLICABLE CROSS SECTION OF WIRE (mm^2)	ACCESSORIES	REMARKS
No. 1	0.25 ~ 6.64		Manual type For A and C type terminal
No. 2	6.64 ~ 10.25		
No. 9	6.64 ~ 42.42	Convex die 2 pieces	Handle type hydraulic tool For A, C, D, type terminal
No. 10	6.64 ~ 117.02	Convex die 4 Convex die 8	
No. 11	6.64 ~ 117.02	Convex die 4 Convex die 8	Pedal type hydraulic tool For all terminal types No. 11 and No. 12 tool are used with No. 13.
No. 12	117.02 ~ 325	Convex die 4 Convex die 4	
No. 13		Rubber hose	
No. 15	14 ~ 122	Convex die 7 pairs	Handle type hydraulic tool For T type terminal
No. 16	123 ~ 365	Convex die 5 pairs	Use with No. 13 for T type terminal



$$S = \frac{0.018x(I_1M_1+I_2M_2)}{V}$$

where,
S : Sectional area required (mm2)
I1 : Max. current passing between battery and rectifier
M1 : Two-way cable length between battery and rectifier
I2 : Max. current passing between rectifier and PBX
M2 : Two-way cable length between rectifier and PBX
V : Voltage drop

Figure 2-17 Calculation Method for Sectional Area

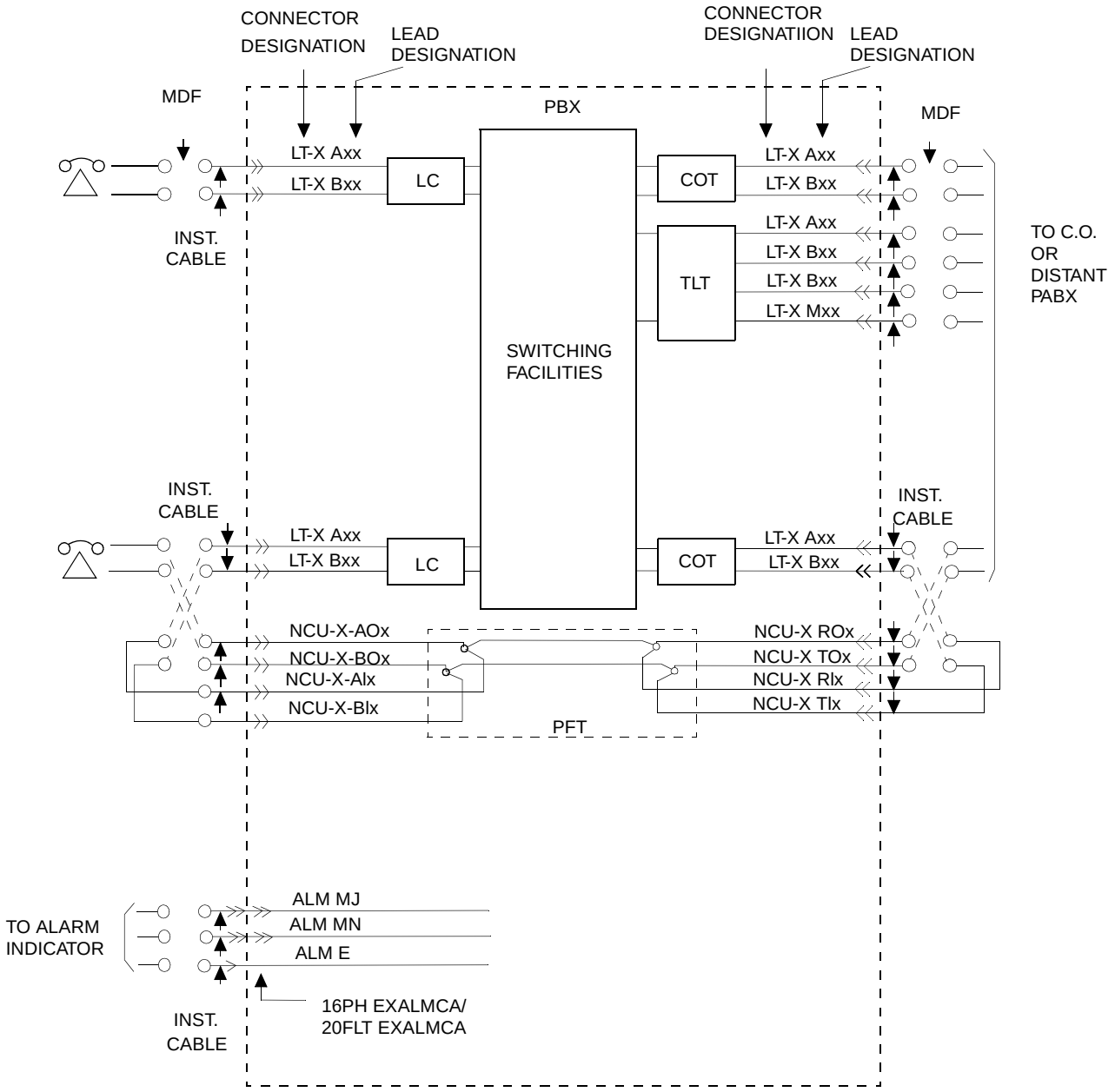
10.2 Cables Between The PBX And MDF

Regarding lines, trunks, and NCU (PFT), 25P shielded the PBX and the MDF are connected using cables with a CHAMP (Amphenol) connector at one end.

Table 2-11 shows the procedure for calculating the required number of cables. Figure 2-18 also shows an outline of cable connections from the Module Group to the outside.

Table 2-11 Calculation of Number of Cables

CABLE NAME	CALCULATION	SUB TOTAL
LT Cable	Number of PIMs × 12	
NCU Cable	Number of PFT Circuit Cards × 2	
16 PH EXALM CA	One cable	
ODT Cable	Number of TLT circuit cards × 1	
	TOTAL	



Note 1: *Legend ◄— : Male CONNECTOR —► : Female CONNECTOR.*

Note 2: ◄—○ *or* ○—► *in the above drawing indicates the CONNECTOR ended. Cable to be connected between module connector and MDF.*

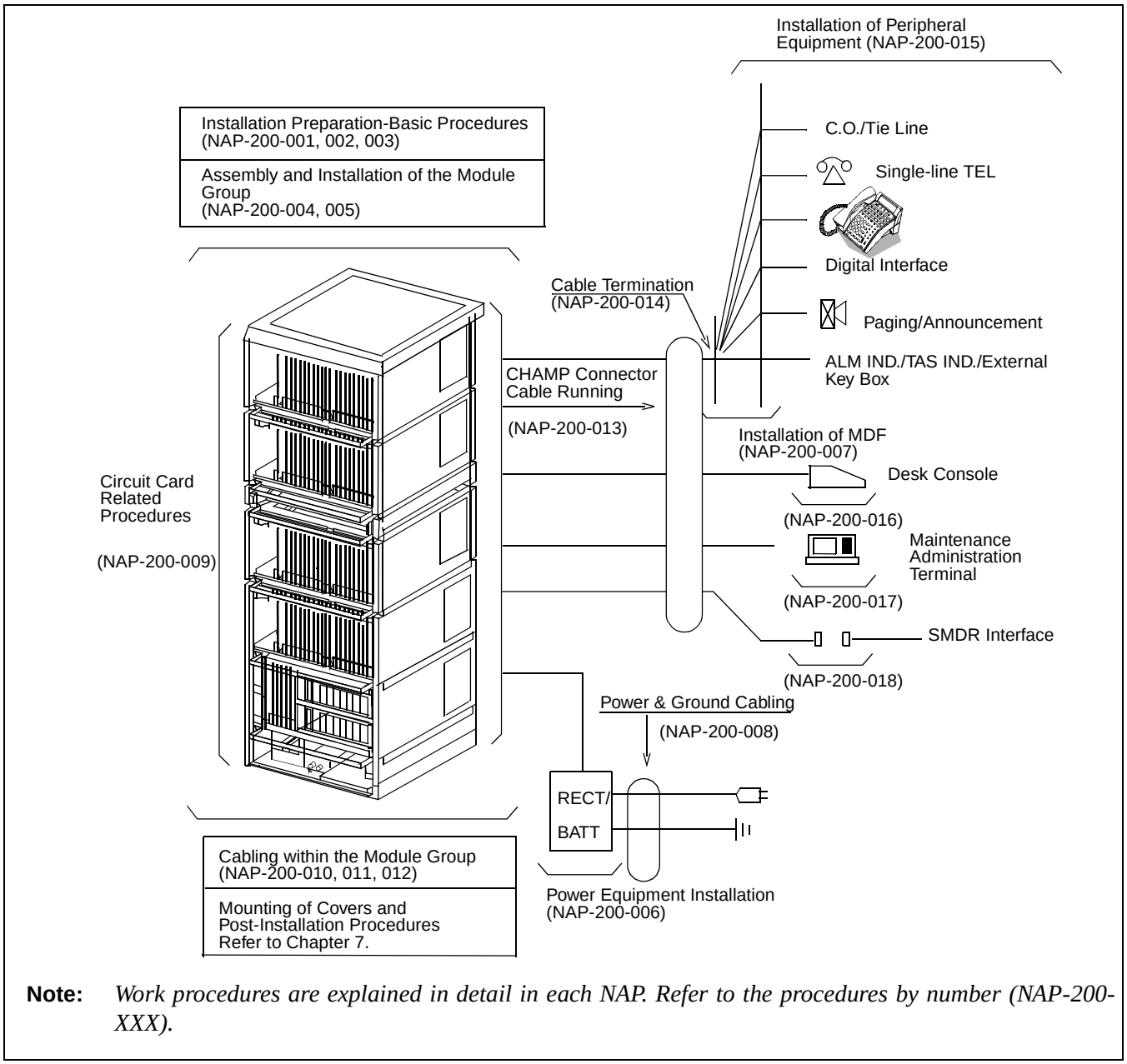
Figure 2-18 Outline of Cables from Module Group to the Outside

CHAPTER 3 INSTALLATION PROCEDURE

1. GENERAL

This chapter explains the procedures for installing the PBX, the Maintenance Administration Terminal (MAT), Desk Consoles, and various types of terminal equipment (single line telephones, D^{term}s, Data Modules, etc.). The procedures explained in this chapter are shown in Figure 3-1.

Before beginning the installation, thoroughly read Section 2., "PRECAUTIONS BEFORE BEGINNING INSTALLATION" and observe the precautions while performing the installation.



Note: *Work procedures are explained in detail in each NAP. Refer to the procedures by number (NAP-200-XXX).*

Figure 3-1 Scope of Installation Procedure

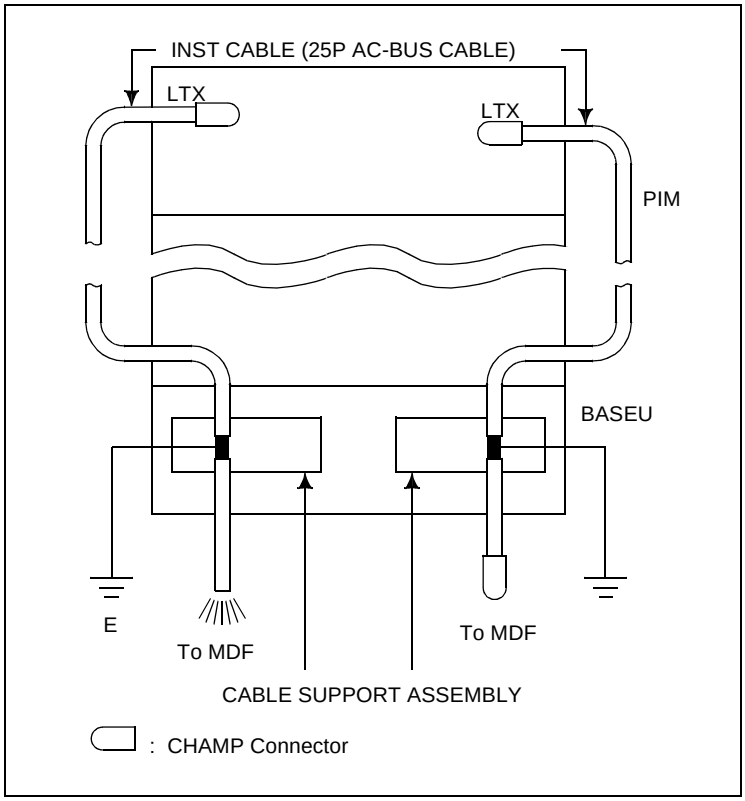
2. PRECAUTIONS BEFORE BEGINNING INSTALLATION

2.1 Outline

1. Before beginning the installation, check to see if the installation requirements (grounding, the quantity and kind of installation cables, etc.) are all present by referring to Chapter 2 of this manual.

2. For a standard installation, the system is installed on a free-access floor, so no explanations are provided pertaining to cable racks and cable ducts.

3. The PBX is connected to the MDF by use of 25-pair shielded cables as the installation cables. Each of these installation cables is grounded at the cable support assembly of the BASEU as shown below. By this arrangement, noise radiation from each cable is prevented. For the installation method, refer to NAP-200-013: “Cable Running from the Module Group to MDF, MAT, and SMDR.”



4. As the cable to be run between the PBX and the Rectifier, use a CV cable (600 V Crosslinked Polyethylene Insulated PVC Sheathed Cable) as the circumstance permits. Compared with an ordinary IV cable (600 V PVC Insulated Cable) the CV cable is stronger because of its thicker cover. Thus, it is suitable to run along the free-access floor where it is difficult to protect the cable from damage.
   Also, for easy identification of different cables, use cables of different colors as follows:
   - –48 V: Blue (White)
   - GND: Red (Black)
   - E: Green

Note: *The color shown in ( ) is applicable to the UL Specification.*

3. INSTALLATION PROCEDURE

The flowchart in Figure 3-2 shows the steps of the installation procedure. Each step is assigned a NAP number. NAPs NAP-200-001 through NAP-200-018 follow Figure 3-2. These NAPs should be followed sequentially when performing the installation. Individual steps, such as installation of SMDR, can be performed independently by referring to the corresponding NAP.

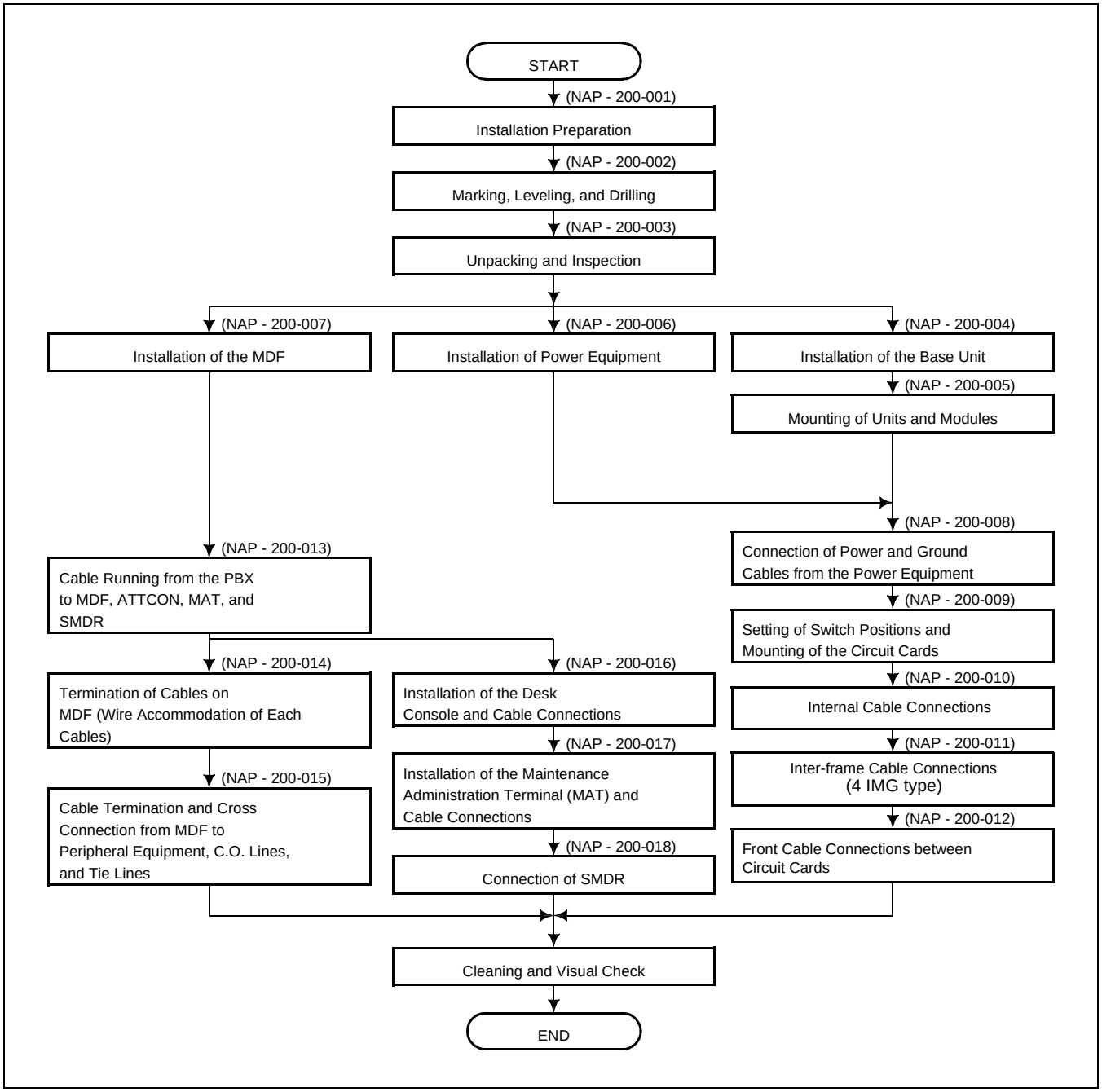


Figure 3-2 Installation Procedure

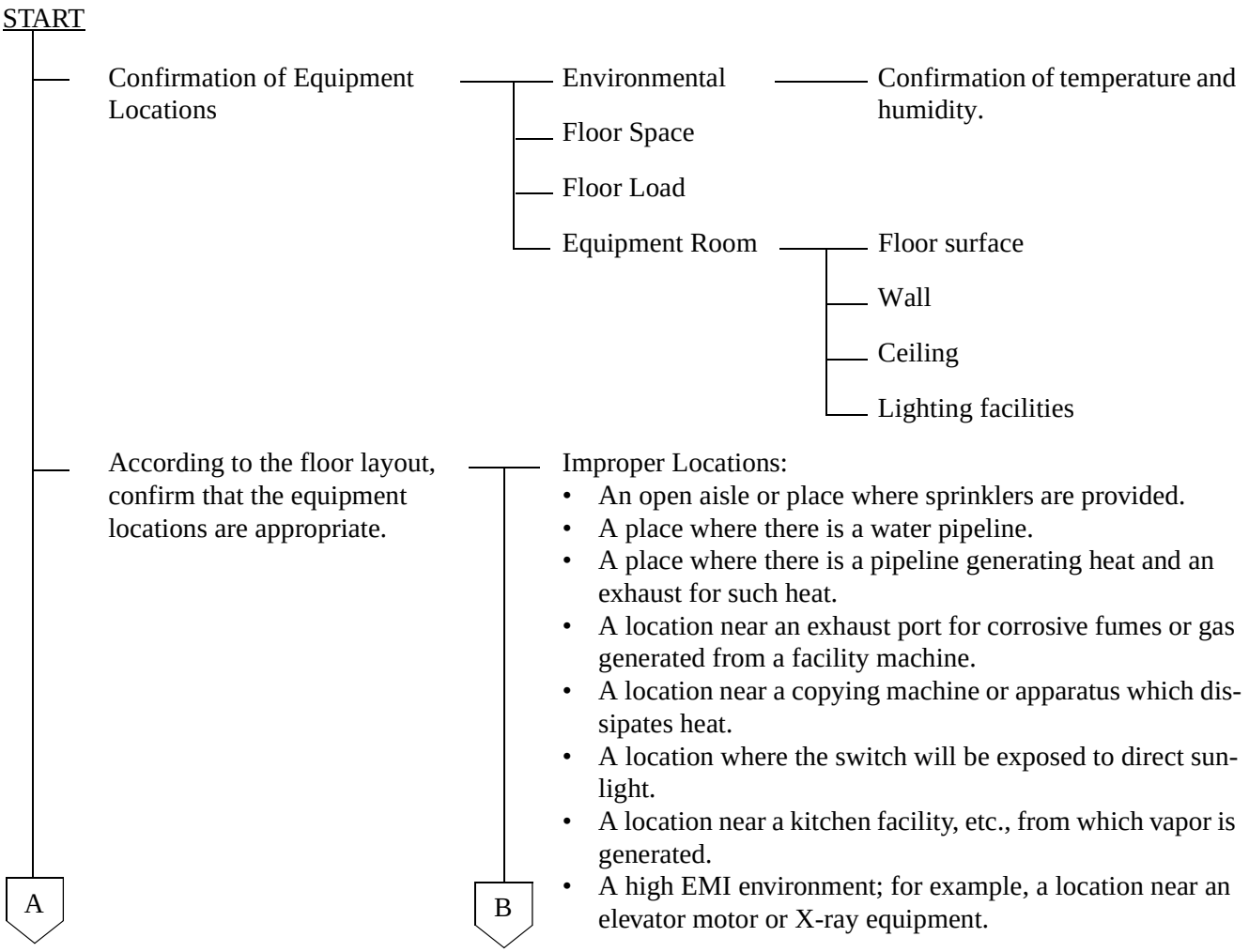
NAP-200-001
Sheet 1/2
Installation Preparation

This NAP explains the following work items:

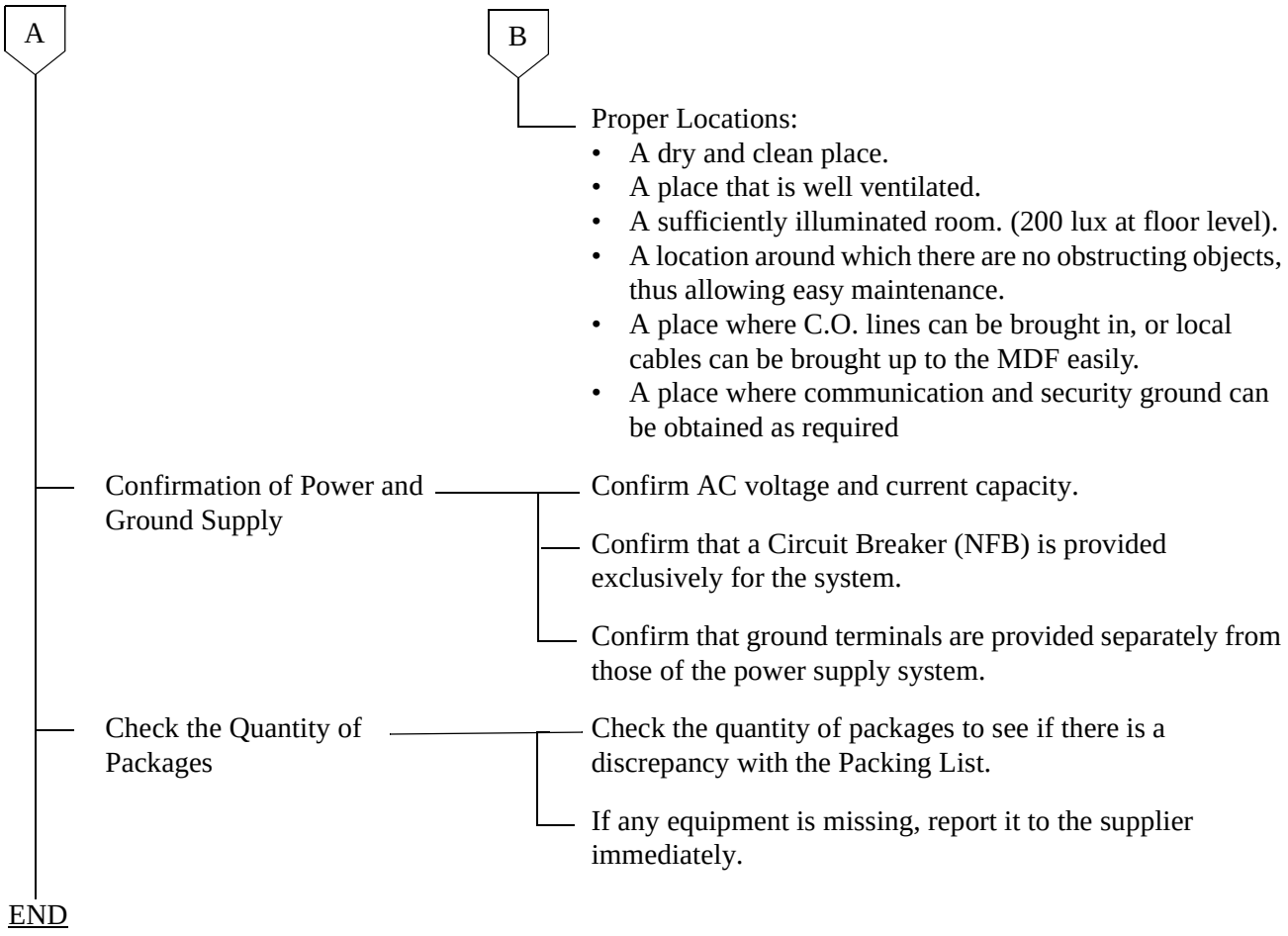
- Confirmation of Equipment Locations
- Confirmation of Floor Layout
- Confirmation of Power and Ground Supply
- Check of Quantity of Equipment Packages

Note 1: *Confirmation procedures are discussed in Chapter 2 of this manual.*

Note 2: *Be sure to correct any abnormal conditions encountered during installation preparation (missing hardware, floor not level, etc.) before proceeding to the next step.*



NAP-200-001
Sheet 2/2
Installation Preparation



NAP-200-002
Sheet 1/8
Marketing, Leveling, and Drilling

This NAP explains the procedures for marking, drilling and other necessary work when the PBX is to be installed on a free-access floor by either one of the following three methods.

- Securing the PBX directly onto the floor
- Securing the PBX with the special stand
- Securing the PBX with the floor elevation

This NAP also explains the procedures for marking, leveling and drilling for MDF, Power Equipment, and Peripheral Equipment (See Section 4.)

Note: *Kinds of Anchor Bolts*

Various types of anchor bolts are available; the type of bolt to be used depends on the application. Sleeve expansion-type anchor bolts are generally preferred for the PBX installation. Table 002-1 shows anchor bolt specifications.

Table 002-1 Specification of Anchor Bolts-Sleeve Expansion Type

SCREW	SLEEVE	BOLT LENGTH		SLEEVE LENGTH		DRILL DIA.	DRILLING DEPTH		MAX. THICKNESS OF ITEM TO BE FIXED	APPLICATION	COMPONENTS
		mm	inch	mm	inch		mm	inch			
M10	Ø17.3	50	2	38	1.5	Ø17.5	50	2	15 mm/0.6 in	For concrete	Bolts, Washers, Nuts
		70	2.8	58	2.3		70	2.8		Concrete + Mortar (20 mm/0.8 in thick)	
		80	3.1	68	2.7		80	3.1		Concrete + Mortar (30 mm/1.2 in thick)	

* *Pull out Strength = 1,900 Kg (4185 lb)*
(Concrete Strength = more than 20, 580, 000 Pa (2984.871 PSI))

NAP-200-002
Sheet 2/8
Marking, Leveling, and Drilling

1. WHEN SECURING THE PBX DIRECTLY ONTO THE FLOOR

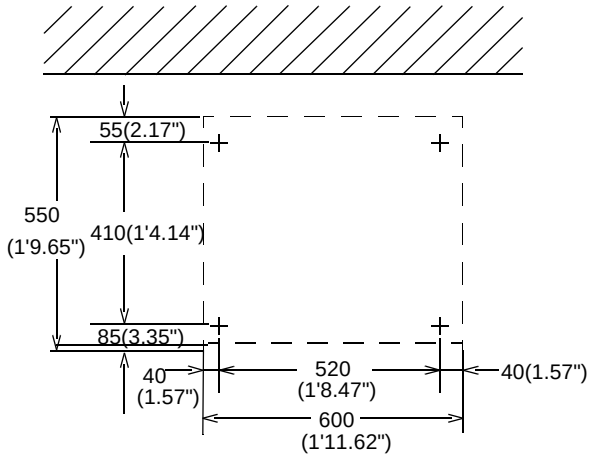
START

- Marking — Referring to Figure 002-1, mark the holes for the anchor bolts of the base unit.
- Drilling — Drill holes at the locations marked for base unit.
- Cutting of Free-Access Floor — Referring to Figure 002-2, cut the free-access floor at the marked cable locations by using a jigsaw.
- Leveling
  - Measure the level of floor surface of the free-access floor.
  - When it is not level, adjust the support of the free-access floor until it is level.

END

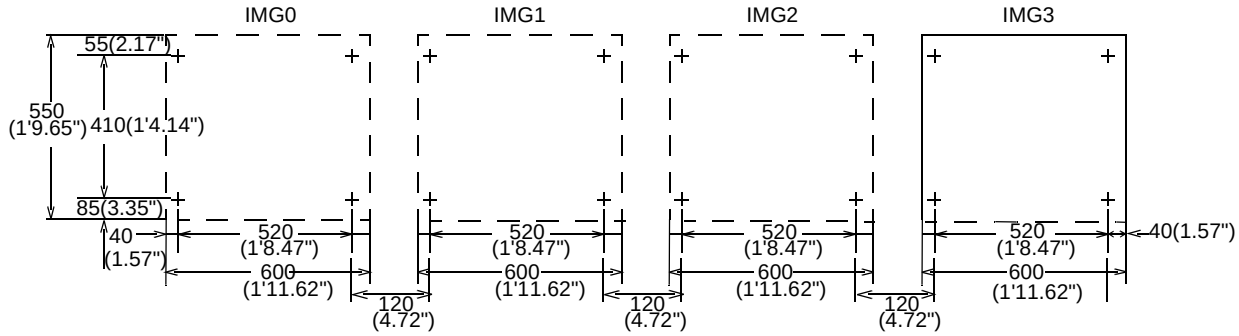
NAP-200-002
Sheet 3/8
Marking, Leveling, and Drilling

Single IMG Configuration



Unit: mm(inch)

Multiple IMG Configuration



Unit: mm(inch)

Figure 002-1 Locations of Base Unit Securing Holes

NAP-200-002
Sheet 4/8
Marking, Leveling, and Drilling

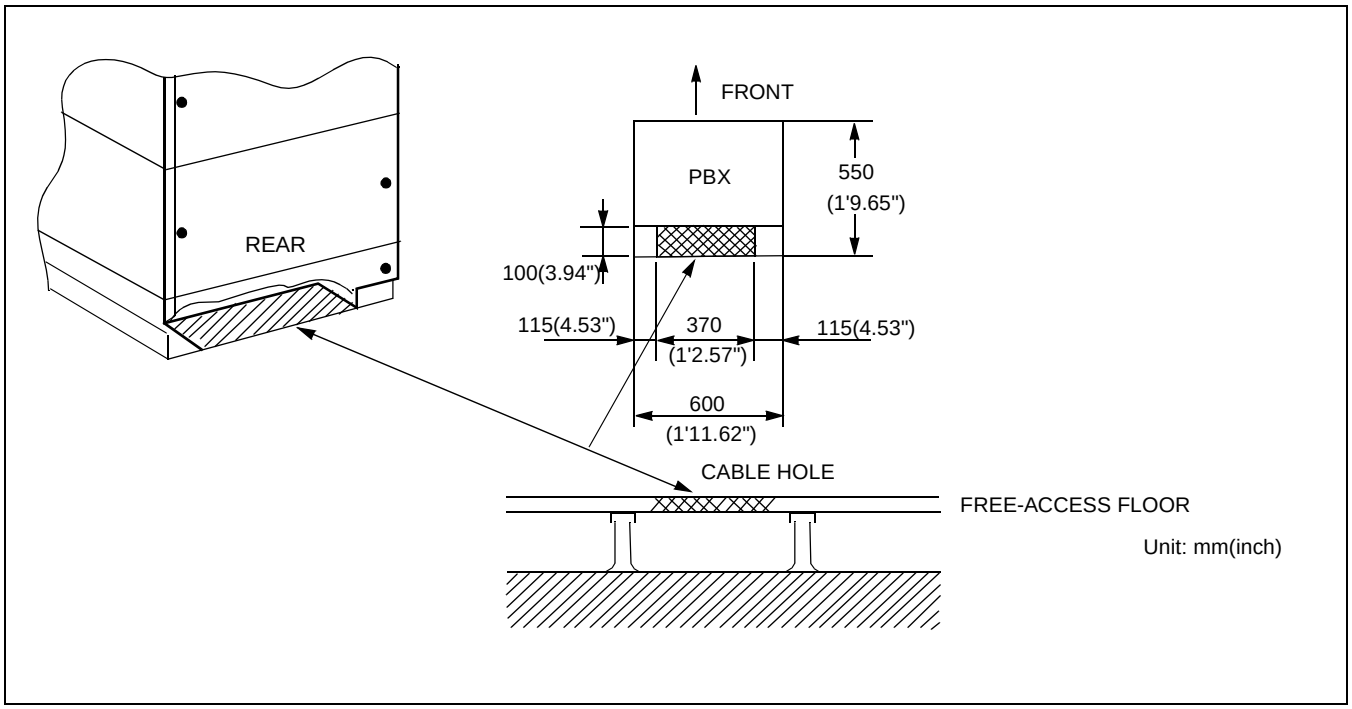


Figure 002-2 Cable Hole on a Free-Access or Computer Floor

NAP-200-002
Sheet 5/8
Marking, Leveling, and Drilling

2. WHEN SECURING THE PBX WITH THE SPECIAL STAND

START

- Marking and Drilling of Special Stand — Drill the Special Stand for securing the PBX. (See Figure 002-3.)
- Marking, Drilling and Cutting of Free-Access Floor — Mark, drill, and cut the free-access floor according to the size of the special stand to be used.
- Installing the Special Stand — Secure the special stand onto the floor. (See Figure 002-4.)
- Level Check — Check the level of the special stand. If necessary, adjust the level by inserting spacers beneath the stand.

END

NAP-200-002
Sheet 6/8
Marking, Leveling, and Drilling

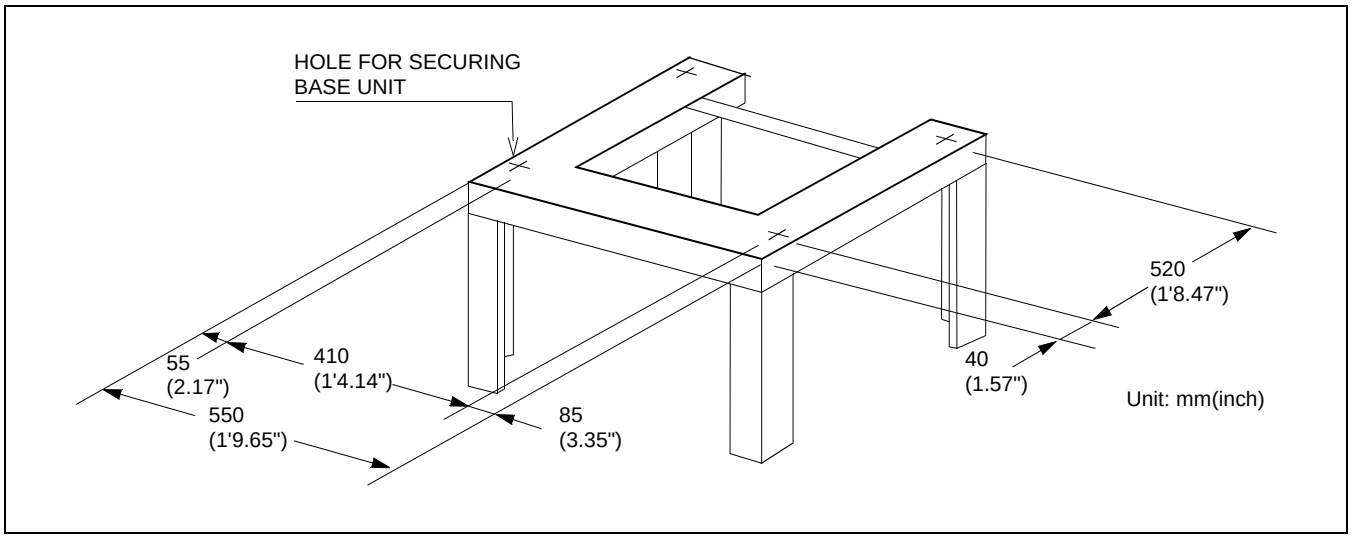


Figure 002-3 Example of Special Stand

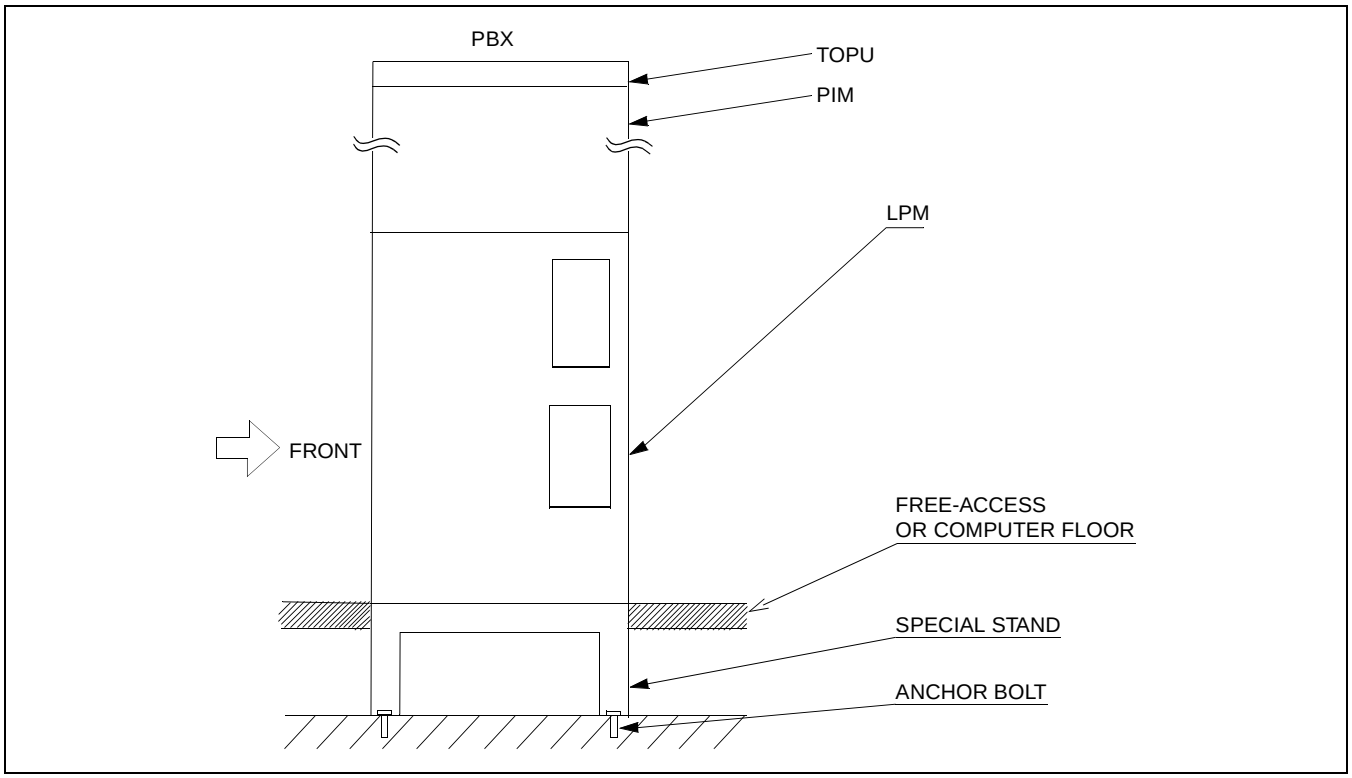


Figure 002-4 Special Stand Installation Method

NAP-200-002
Sheet 7/8
Marking, Leveling, and Drilling

3. WHEN SECURING PBX WITH FLOOR ELEVATIONS

START

- Installing the Floor Elevation — Secure the Floor Elevation on the concrete floor. (See Figure 002-5.)
- Marking — Mark the locations of the anchor bolt holes for the Base Unit. (See Figure 002-1.)
- Drilling — Drill holes in the locations.
- Cutting of Free-Access Floor — Cut the Free-Access Floor with a jigsaw. (See Figure 002-2.)

END

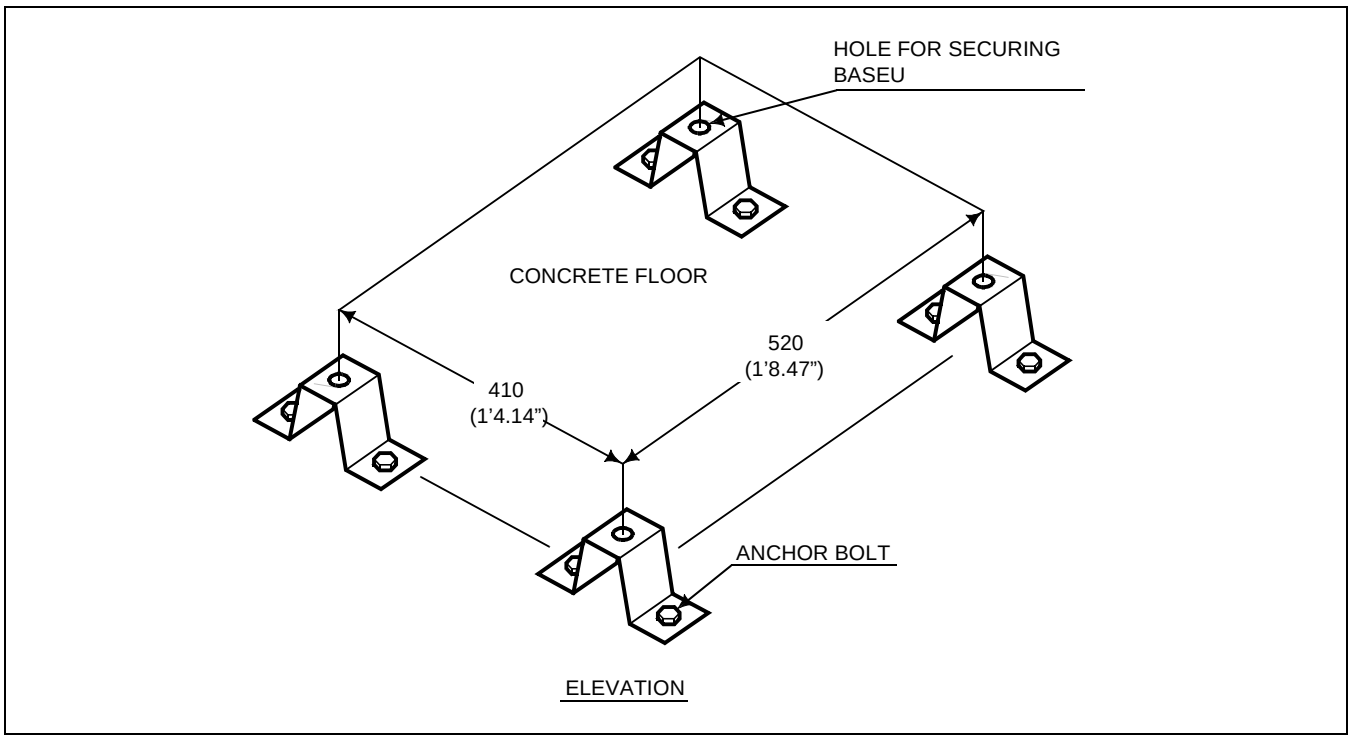


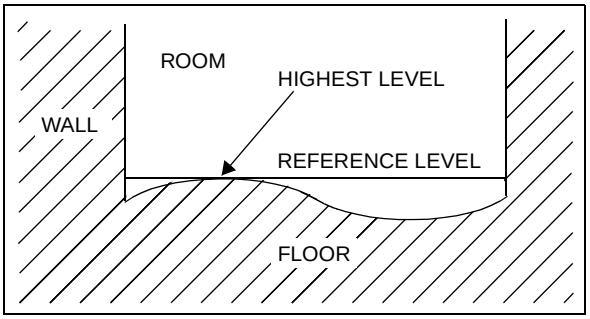
Figure 002-5 Example of Elevation

NAP-200-002
Sheet 8/8
Marking, Leveling, and Drilling

4. MARKING, LEVELING AND DRILLING FOR MDF, POWER EQUIPMENT, AND PERIPHERAL EQUIPMENT

START

- Leveling — Measure the level of floor surface and determine the reference level.



- Marking — Mark the holes for securing equipment
  - Power Equipment
  - MDF
  - Peripheral Equipment
- Drilling — Drill holes locations marked for power equipment, MDF, and peripheral equipment.
  - Secure the anchor bolts to the floor. (Embed nuts and sleeves)
  - Remove the anchor bolts temporarily. (Remove anchor bolts and washers)

END

NAP-200-003
Sheet 1/2
Unpacking and Inspection

CAUTION: *Equipment may become damaged if not handled properly during unpacking and inspection.*

This NAP explains the procedure for unpacking and inspection.

Note 1: *If any equipment is missing or damaged, report it to the supplier immediately.*

Note 2: *Save all packing materials and boxes so that they can be used to return damaged equipment to the supplier.*

1. UNPACKING

START

- Quantity check — Check the quantity of packages received against the Packing List.
- Check for external damage — Check the packaging for external damage.
- Carry-In — Carry the packages containing the Module Group into the switching equipment room.
- Unpacking **Note 2** — Module Group, Modules, and Units
  - Covers
  - Circuit Cards
  - ATTCON
  - Cables

END

NAP-200-003
Sheet 2/2
Unpacking and Inspection

CAUTION: *Equipment may become damaged if not handled properly during unpacking and inspection.*

2. INSPECTION

START

- Visually Inspect Modules and Units
  - Overall distortion.
  - Scratches or dents on the surface.
  - Distortion of shelves.
  - Cracks to connectors on the backplane.
  - Broken or bent pins on the backplane.
- Circuit Cards Provide protection from static electricity.
  - Scratches and cracks.
  - Loose wires and parts.
  - Damage to card puller tabs.
- Desk Console and MAT
  - Scratches and dents on the body.
  - Damage to keys and lamps.

END

NAP-200-004
Sheet 1/3
Installation of the Base Unit

This NAP explains the procedure for securing the Base Unit onto the floor directly or using special stand.

1. INSTALLING THE BASE UNIT DIRECTLY ONTO THE FLOOR

START

- Securing the Base Unit
  - Secure the Base Unit onto the floor as per Figure 004-1 and 004-2.
  - When the floor elevation is in use, secure the Base Unit by referring to Figures 004-1 and 004-3.
- Level Check — Check the level of the Base Unit. If necessary, adjust the level by inserting spacers beneath the Base Unit.

END

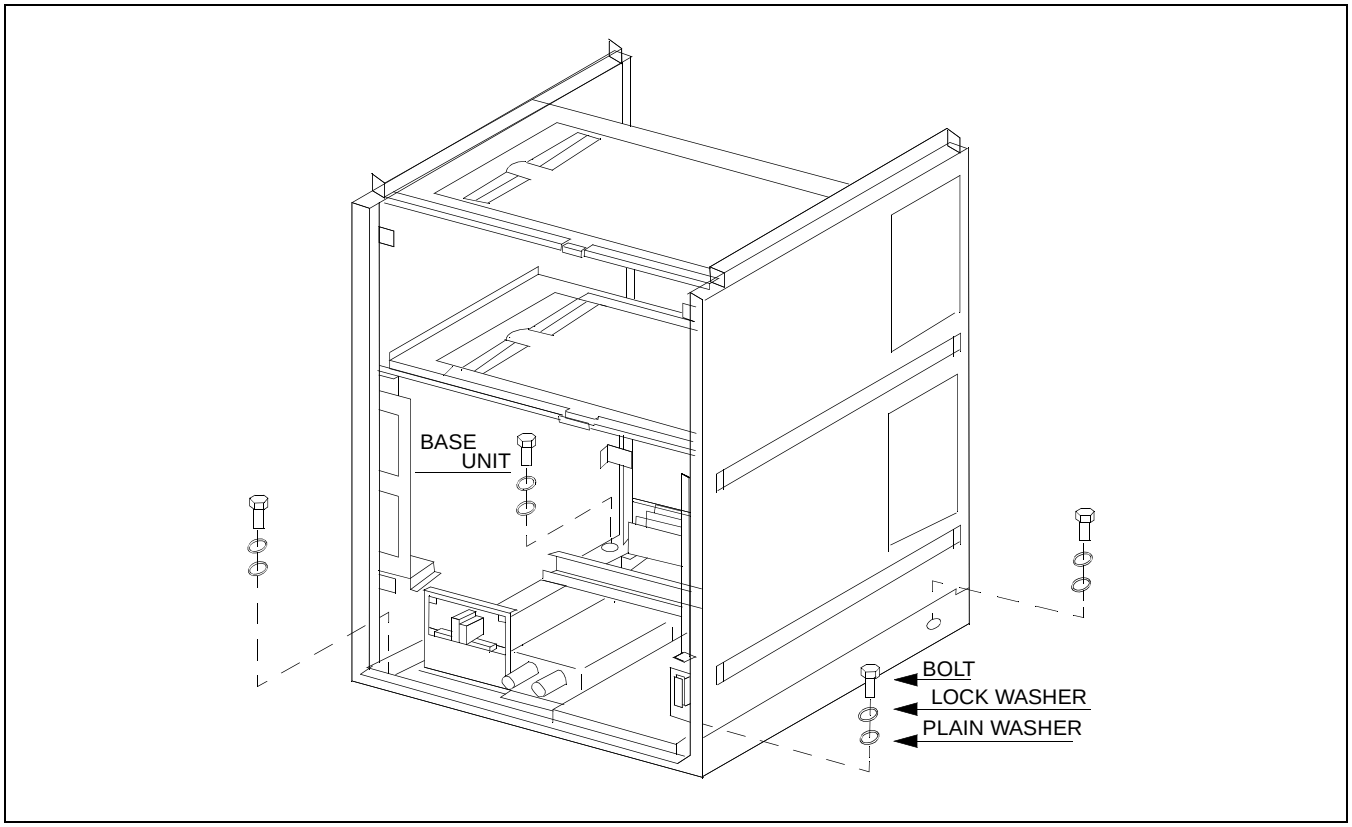


Figure 004-1 Mounting the Base Unit on an Ordinary Floor

NAP-200-004
Sheet 2/3
Installation of the Base Unit

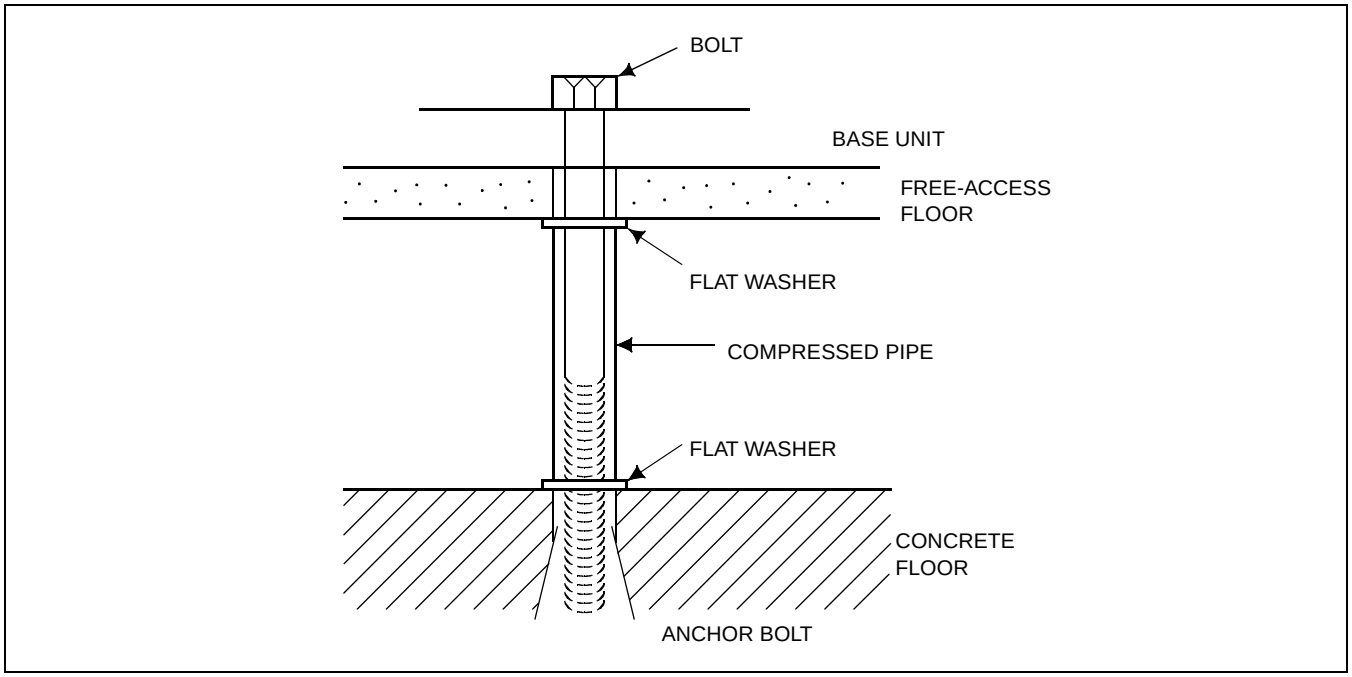


Figure 004-2 Mounting the Base Unit on a Free-Access or Computer Floor

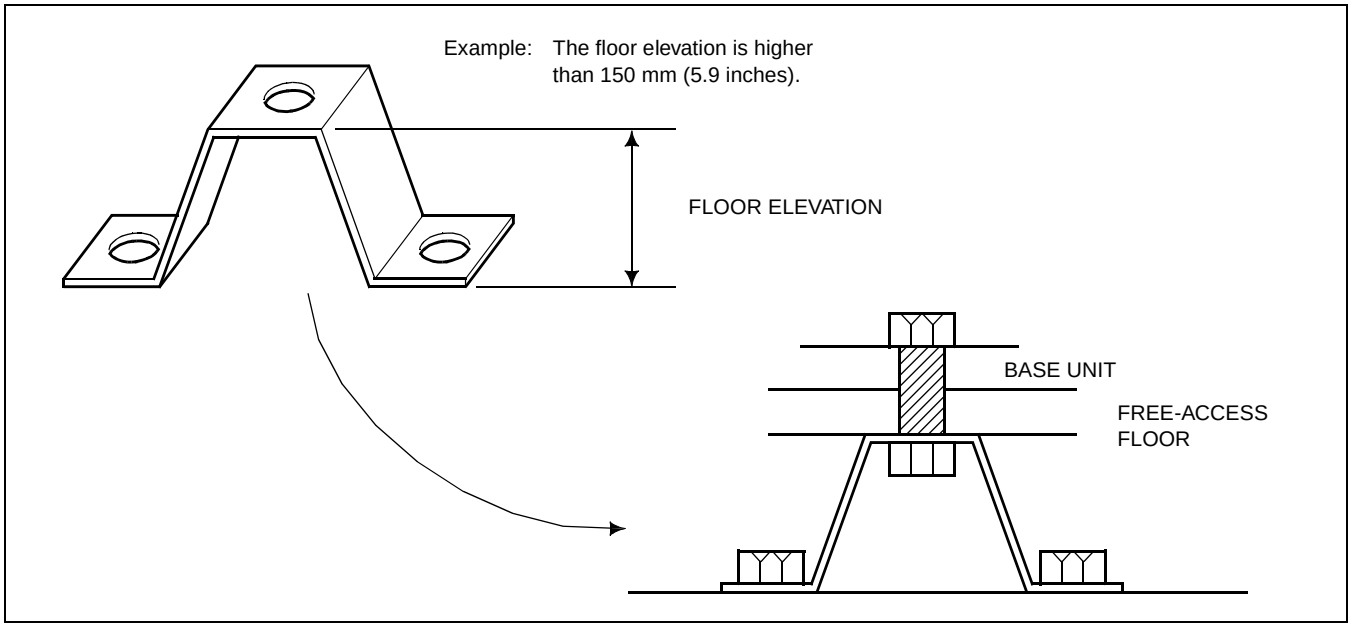


Figure 004-3 Mounting the Base Unit on a Free-Access or Computer Floor via Elevation

NAP-200-004
Sheet 3/3
Installation of the Base Unit

2. INSTALLING THE BASE UNIT USING A SPECIAL STAND

START

- Securing the Base Unit — Secure the Base Unit onto the special stand as per Figure 004-4.
- Level Check — Check the level of the Base Unit. If necessary, adjust the level by inserting spacers beneath the Base Unit.

END

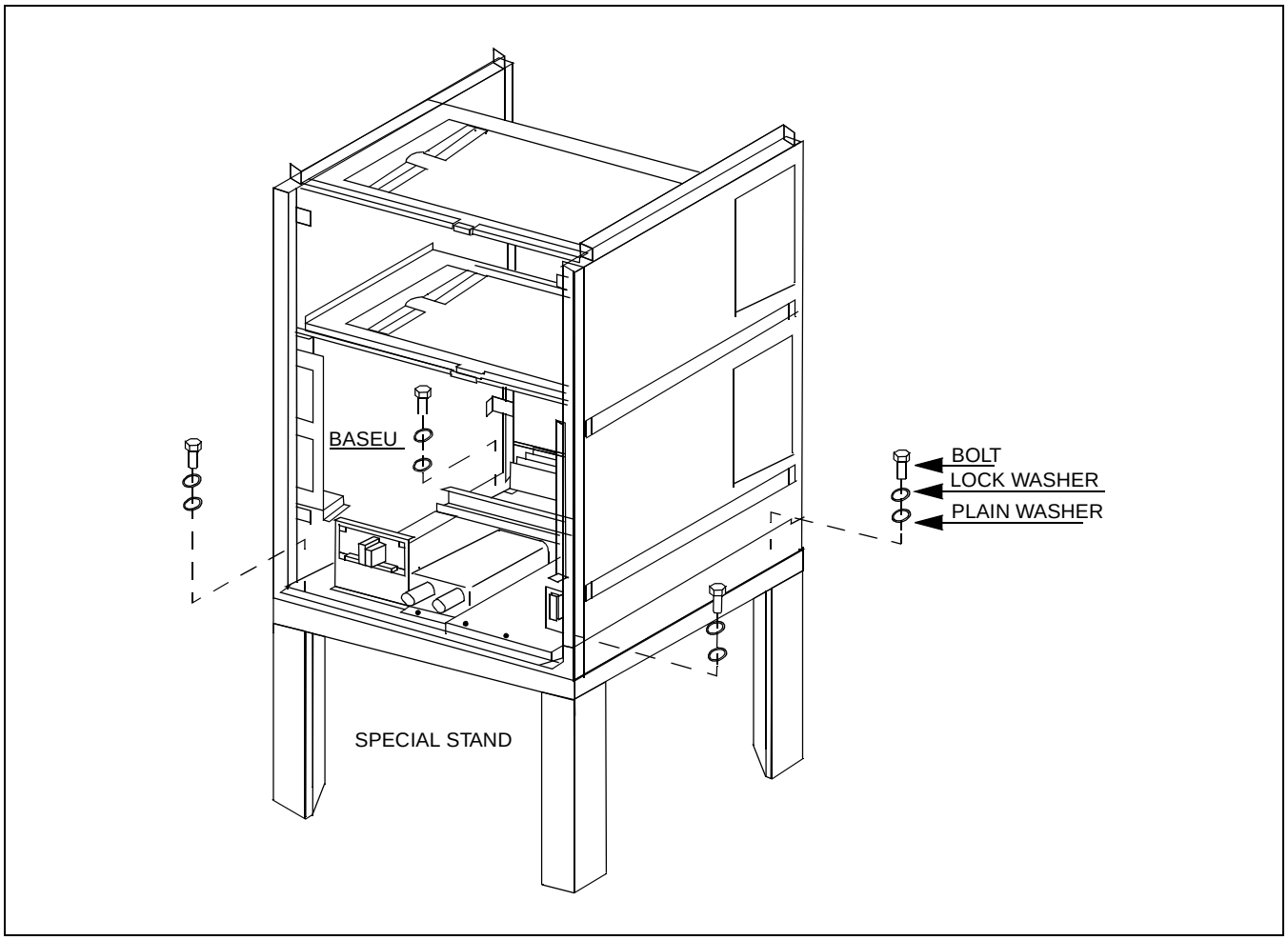


Figure 004-4 Setting the BASEU via Special Stand

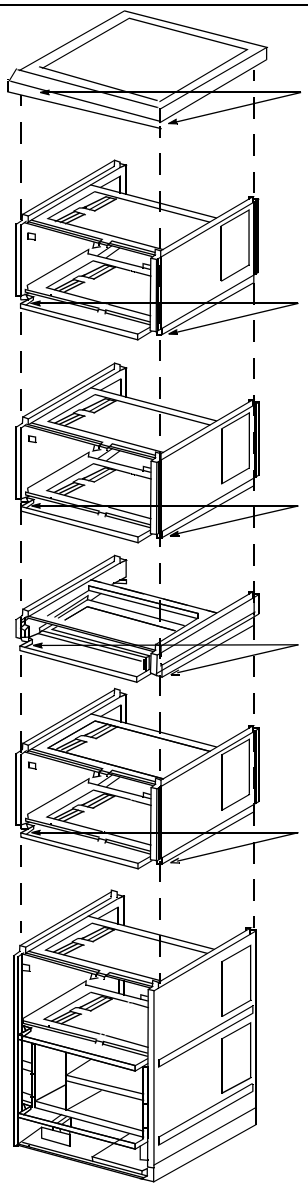
NAP-200-005
Sheet 1/16
Mounting of Units and Modules

1. MOUNTING OF UNITS AND MODULES

START

Mounting of Modules, FAN BOX and TOPU ——— Mount modules, FAN BOX and TOPU for each cabinet, by referring to the Figure 005-1.

END



Note: *FAN Unit (FANU) is mounted either on the TOPU, or inside the FAN BOX. For detailed procedures, refer to Section 2 of this NAP.*

Figure 005-1 Procedure for Mounting Units and Modules

NAP-200-005
Sheet 2/16
Mounting of Units and Modules

2. INSTALLATION OF FANU

Location of FANU (PZ-M369 and three electronic FANs) is shown in Figure 005-2. Depending on your system configuration, mount the FANU in the proper position.

The mounting location of FANU differs depending on the module configuration of each cabinet. When the cabinet consists of a total of two PIMS or fewer, the FANU is mounted on the TOPU. Otherwise, the FANU is housed in the dedicated FAN BOX in the center of the cabinet.

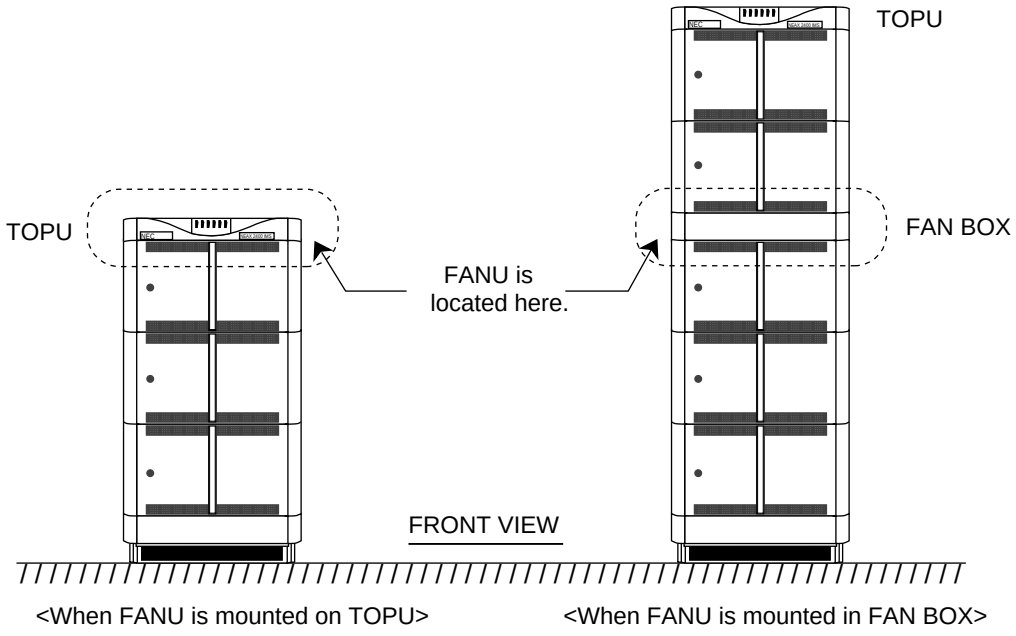


Figure 005-2 Locations of FANU

NAP-200-005
Sheet 3/16
Mounting of Units and Modules

3. PROCEDURE FOR FANU ON THE TOPU

When any IMG is configured by two PIMs or less, the FANU is mounted as shown in Figure 005-3. Because the FANU is already mounted on the TOPU of the cabinet, perform STEP 4 through STEP 7 only, excepting a special case (STEP 1 through STEP 3 are not required in the normal cases).

STEP 1: Referring to Figure 005-3, mount the three FANs onto the FAN Mounting Plate. Then, fasten every four screws.

STEP 2: Accommodate the FAN Mounting Plate (tipped with three FANs) onto the TOPU. Then, tighten the four screws (refer to Figure 005-3).

STEP 3: Mount the PZ-M369 onto the TOPU. Then, fasten the two screws (also refer to Figure 005-3).

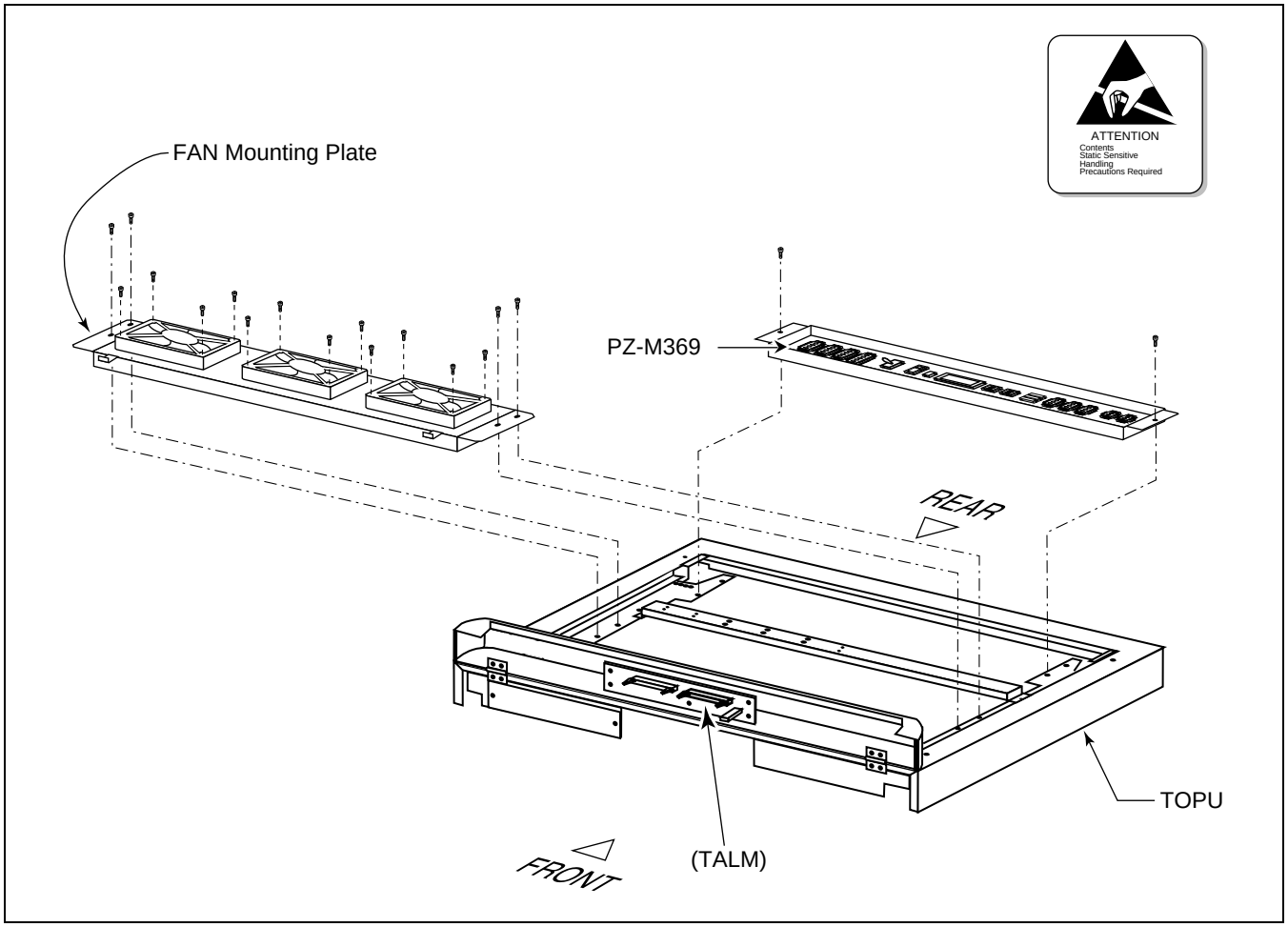
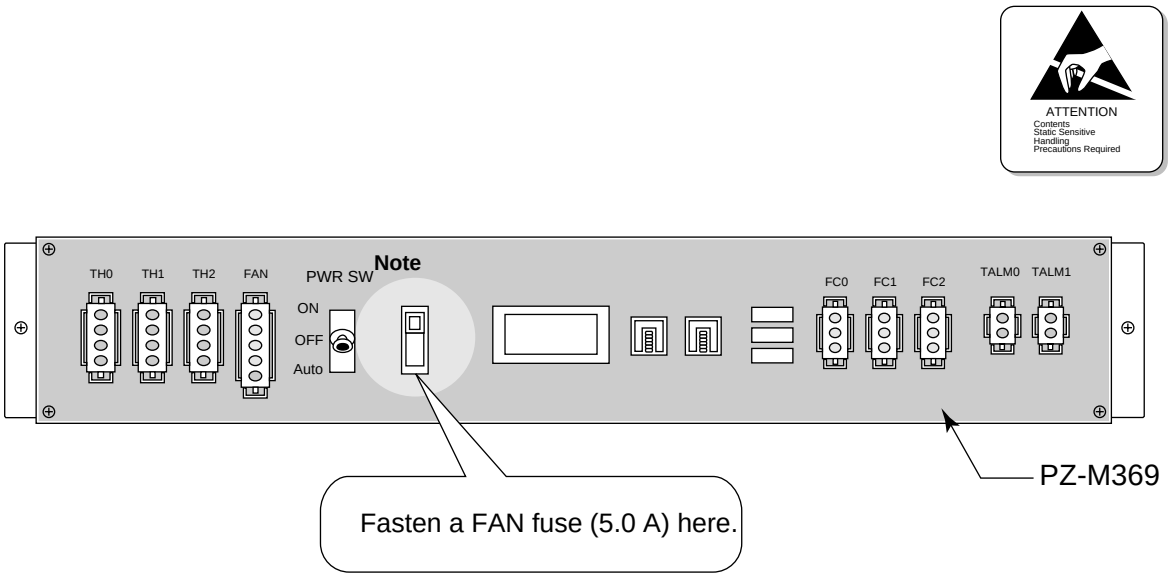


Figure 005-3 Mounting of FANU (on TOPU)

NAP-200-005
Sheet 4/16
Mounting of Units and Modules

STEP 4: Fix a FAN fuse (5.0A) onto the PZ-M369.



Note: *Heat run test of the FANU is shown in Chapter 4, "SYSTEM STARTUP". Therefore, keep the PWR SW key to the center position (= OFF), still at this time.*

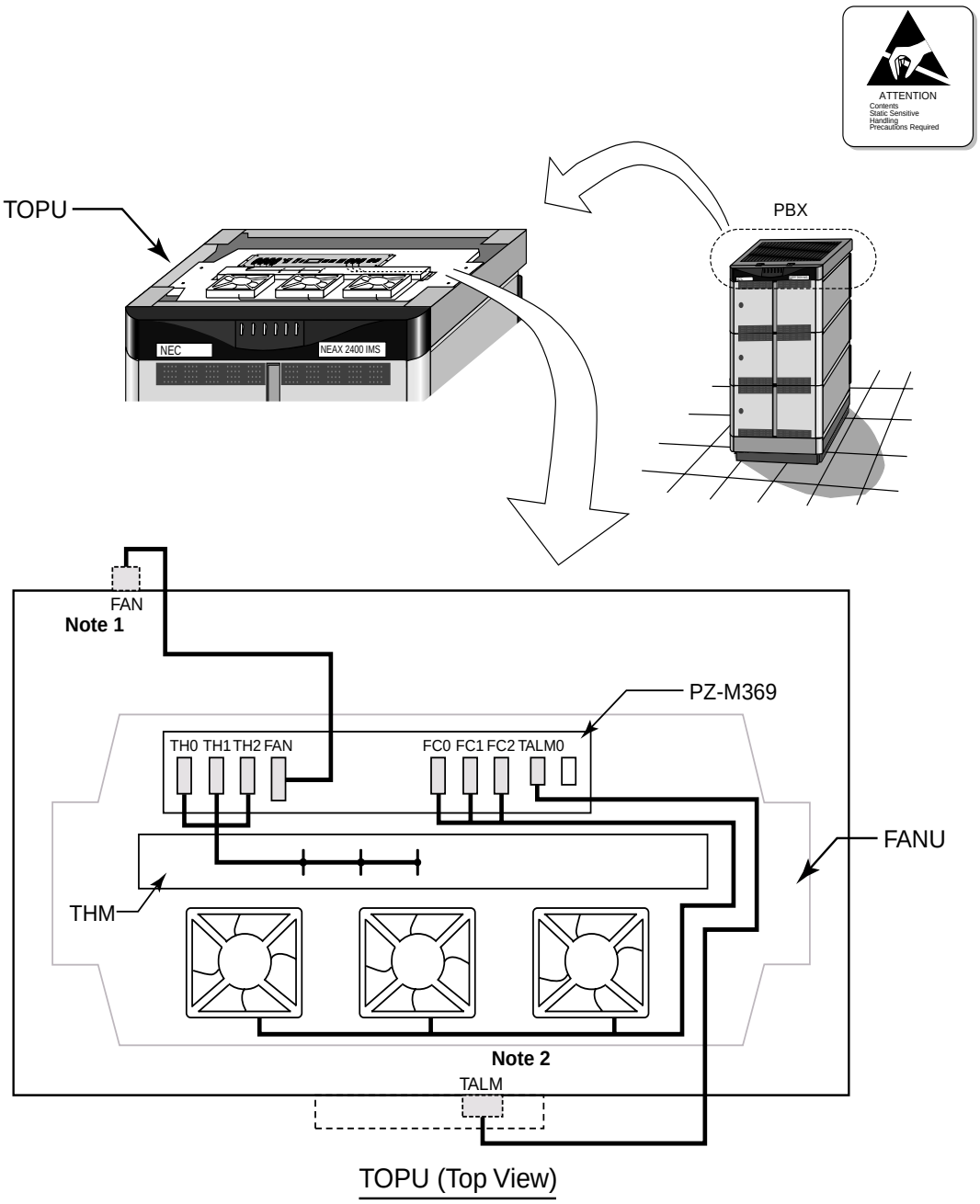
Figure 005-4 Attachment of FAN Fuse (PZ-M369)

STEP 5: Connect the FAN cables as shown in Figure 005-5 and Figure 005-6.

STEP 6: Lastly, attach the Top Cover onto the TOPU of the cabinet. Then, fasten the four screws (refer to Figure 005-7).

Note: *The procedures, STEP 4 through STEP 6, must be performed at each PBX cabinet adopting 1-PIM or 2-PIM configuration.*

NAP-200-005
Sheet 5/16
Mounting of Units and Modules



Note 1: *For details on the "FAN" connector (PIM backplane), refer to Figure 005-6.*

Note 2: *For details on the "TALM" connector (TOPU panel), refer to Figure 005-3.*

Figure 005-5 Cable Connections for FANU on TOPU

NAP-200-005
Sheet 6/16
Mounting of Units and Modules

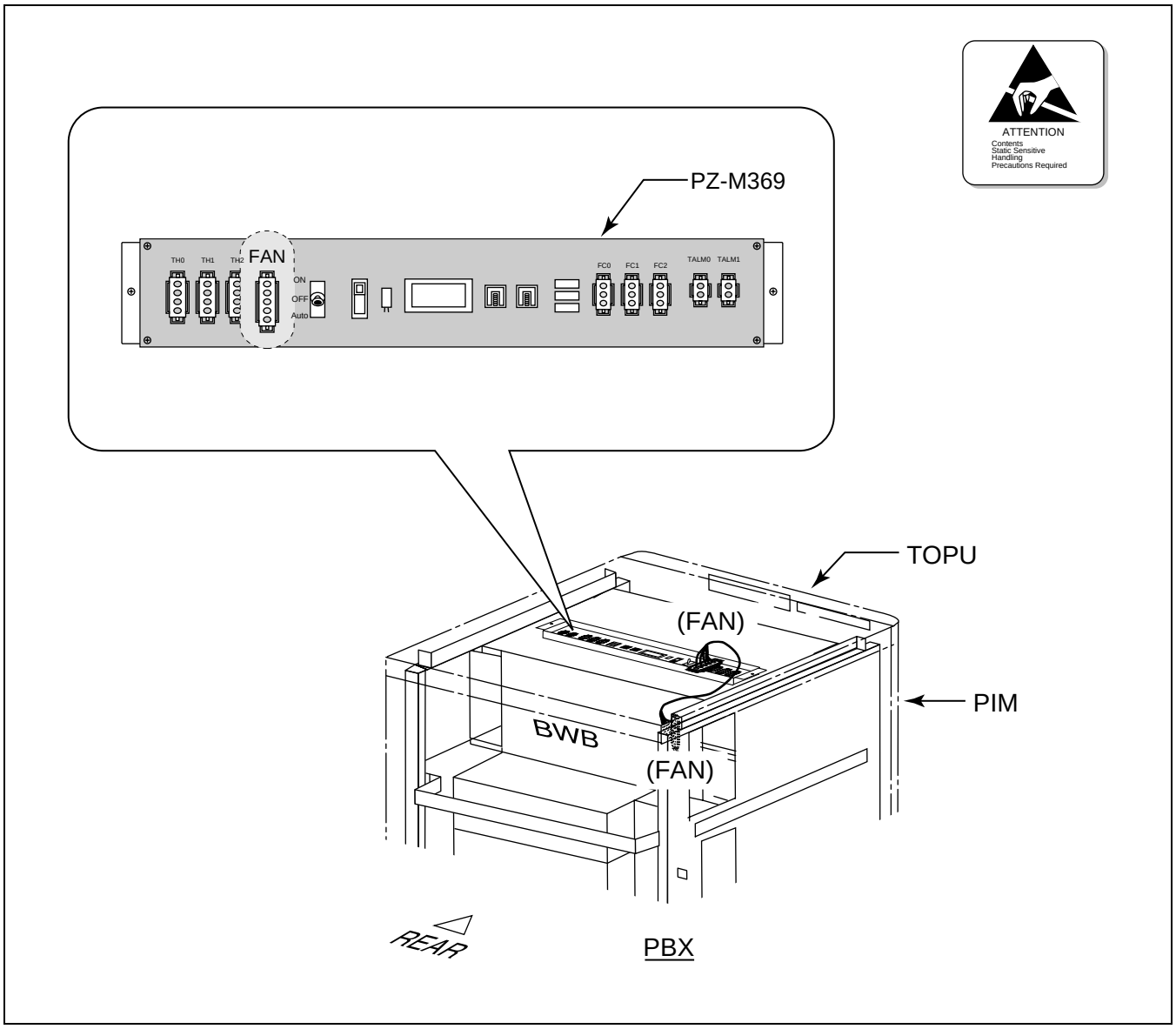


Figure 005-6 Connection of "FAN" Connector Cable (TOPU-PIM)

NAP-200-005
Sheet 7/16
Mounting of Units and Modules

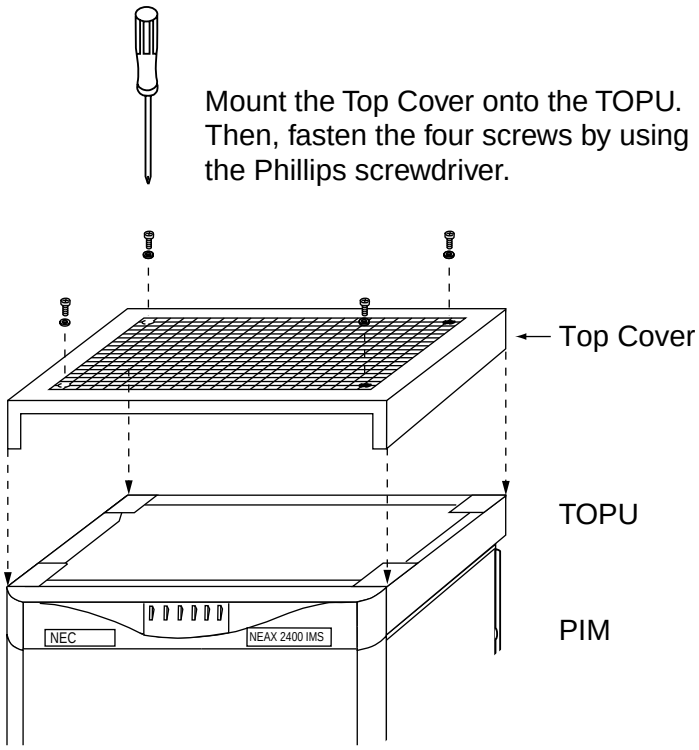


Figure 005-7 Attachment of the Top Cover

NAP-200-005
Sheet 8/16
Mounting of Units and Modules

4. PROCEDURE FOR FANU IN THE FAN BOX

When any IMG is configured by 3 or 4 PIMs, the FANU must be accommodated within the FAN BOX in the center of the cabinet. Because the FANU is originally mounted on the TOPU as shown in Figure 005-3, relocate the FANU into the dedicated FAN BOX as per the STEPs below:

STEP 1: Referring to Figure 005-3, remove the FANU from the TOPU.

- Remove the two screws fastening the PZ-M369. Then, lift away the PZ-M369.
- Remove the four screws fastening the FAN Mounting Plate (tipped with three FANs).
- Then, lift away the FAN Mounting Plate.

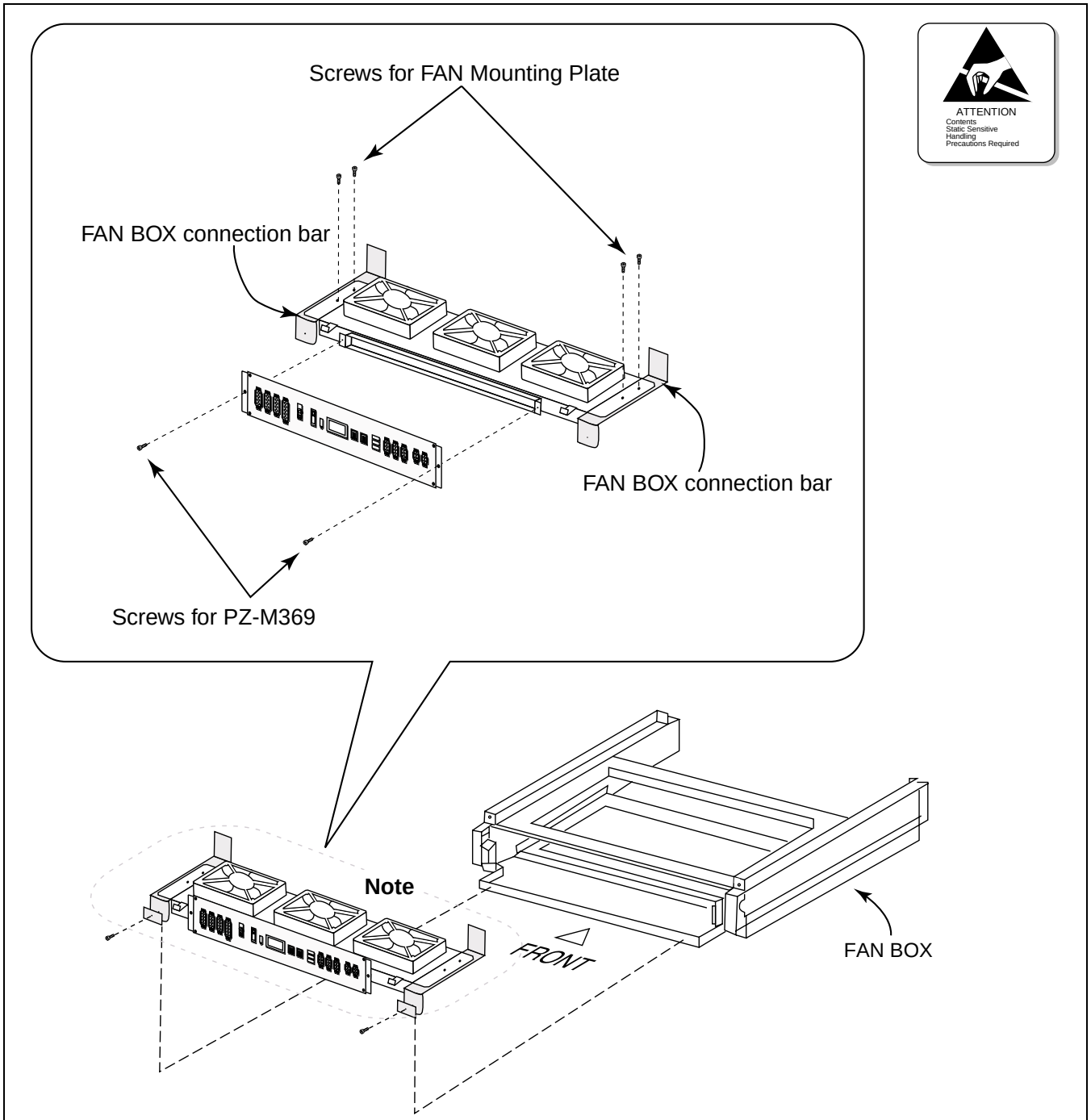
Note: *Retain the removed screws.*

STEP 2: Fasten the PZ-M369 and FAN Mounting Plate onto the FAN BOX connection bar (refer to Figure 005-8). Use two screws (for PZ-M369) and four screws (for FAN Mounting Plate) retained in STEP 1.

STEP 3: Connect the FAN cables for “FC0,” “FC1” and “FC2” connectors on the PZ-M369. Refer to Figure 005-9.

STEP 4: Insert the FANU, prepared in STEP 1 through STEP 3, into the FAN BOX. Then, secure the FANU with the two screws (refer to Figure 005-8).

NAP-200-005
Sheet 9/16
Mounting of Units and Modules

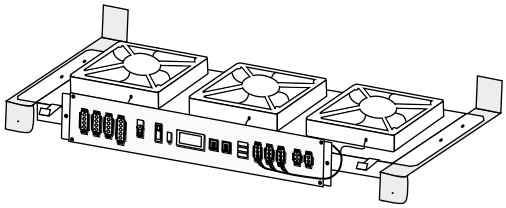


Note: *Before inserting the FANU into the FAN BOX, connect the FAN cables for "FC0," "FC1," and "FC2" connectors on the PZ-M369. Refer to Figure 005-9.*

Figure 005-8 Relocation of FANU and Insertion into FAN BOX

NAP-200-005
Sheet 10/16
Mounting of Units and Modules

Before installing the FANU into the FAN BOX, connect FAN cables as shown below.



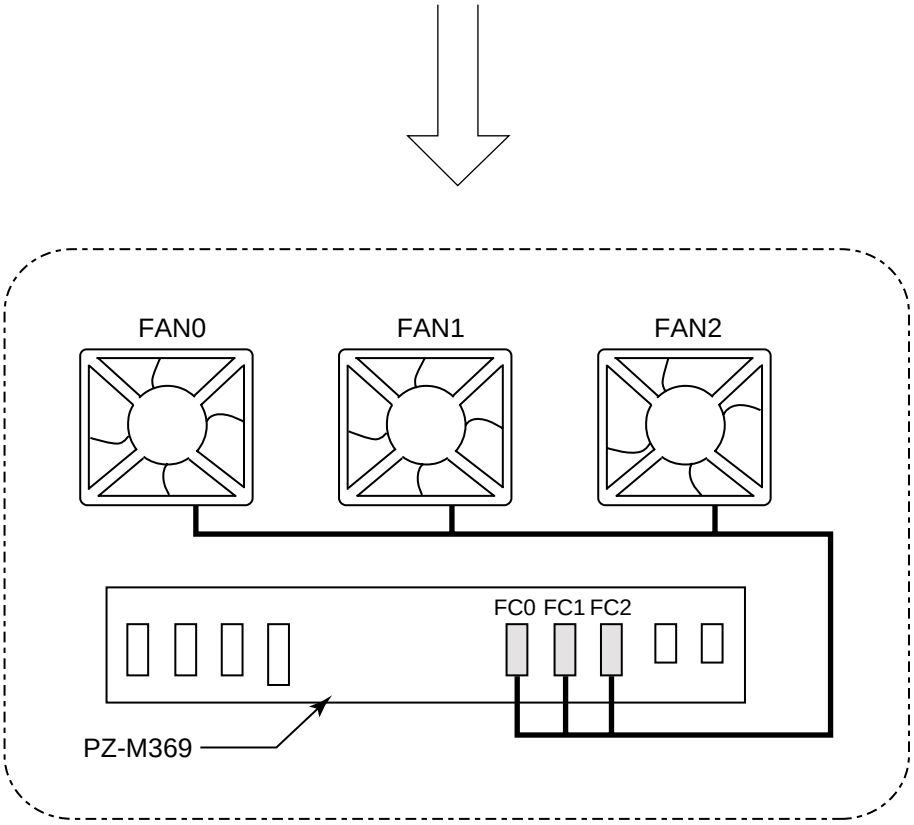


Figure 005-9 FAN Cable Connections for FC0/FC1/FC2 Connectors

NAP-200-005
Sheet 11/16
Mounting of Units and Modules

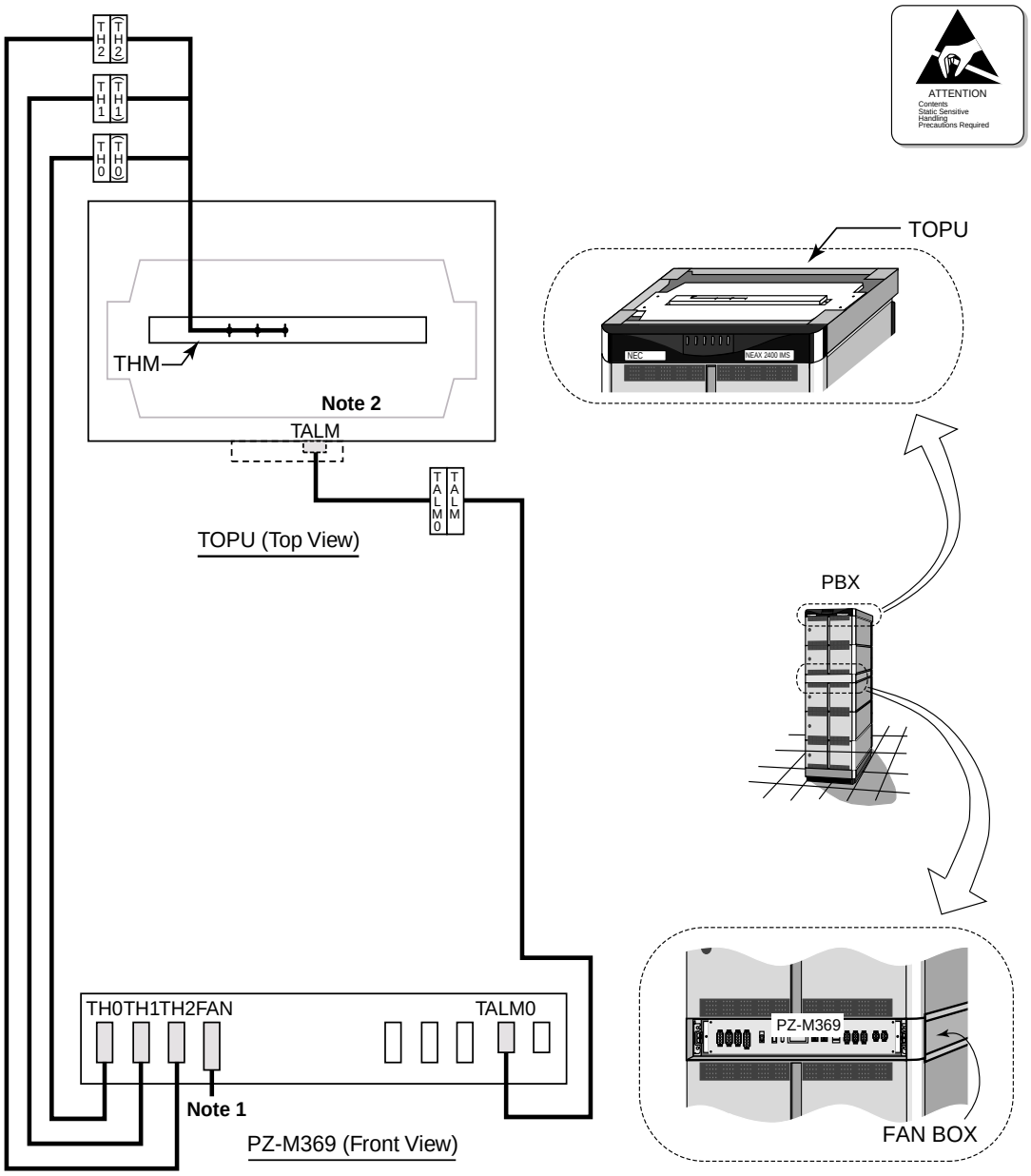
STEP 5: Fix a FAN fuse (5.0A) onto the PZ-M369 by referring to Figure 005-4.

STEP 6: Connect the remaining FAN cables as per Figure 005-10 and Figure 005-11.

STEP 7: Lastly, attach the Top Cover onto the TOPU of the cabinet. Then, fasten the four screws (refer to Figure 005-7).

Note: *The procedures, STEP 1 through STEP 7, must be performed at each PBX cabinet adopting 3-PIM or 4-PIM configurations.*

NAP-200-005
Sheet 12/16
Mounting of Units and Modules



Note 1: *For details on the "FAN" connector (PIM backplane), refer to Figure 005-11.*

Note 2: *For details on the "TALM" connector (TOPU), refer to Figure 005-3.*

Figure 005-10 Cable Connections for FANU in FAN BOX

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Mounting of Units and Modules

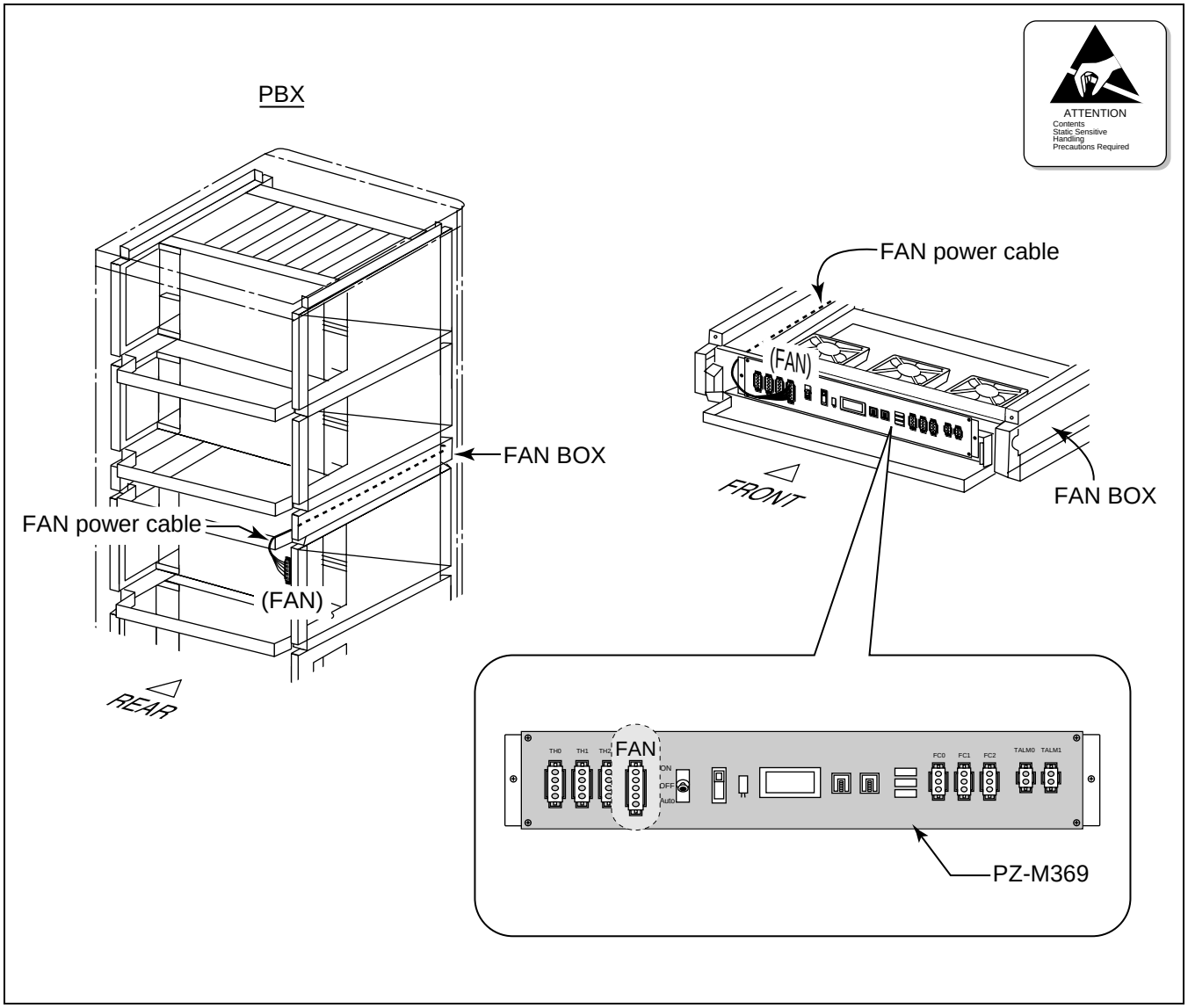

Figure 005-11 Connection of "FAN" Connector Cable (FAN BOX-PIM)

NAP-200-005
Sheet 14/16
Mounting of Units and Modules

5. ATTACHING THE ADDITIONAL NOISE FILTER UNIT (NFILU) TO THE BASEU

The following flowchart shows the procedure for attaching the Additional Noise Filter Unit (NFILU) to the BASEU of the PBX. This work should be performed when the module stack contains 3 or 4 PIMs.

START

- Referring to Figure 005-12 and Figure 005-13, insert the NFILU to BASEU and attach the NFILU with two screws.
- Referring to Figure 005-14, connect the cables equipped with NFILU to the terminals on the BASEU.

END

NAP-200-005
Sheet 15/16
Mounting of Units and Modules

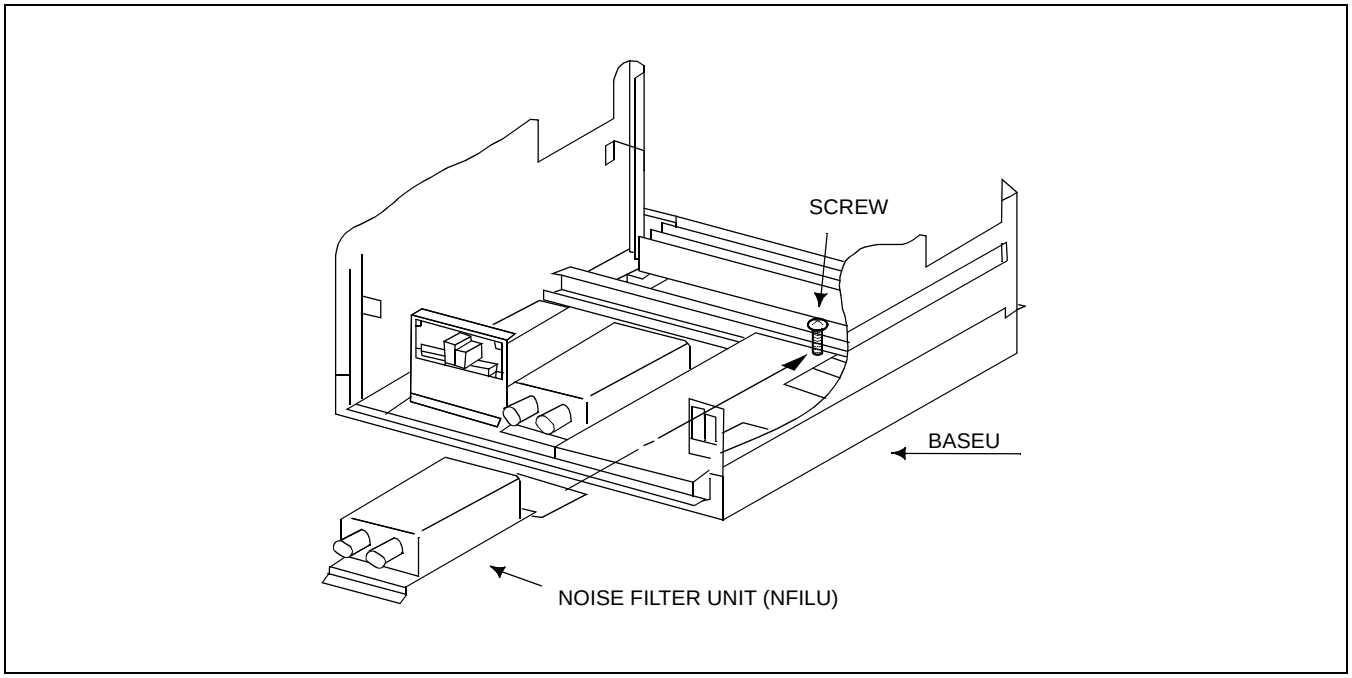

Figure 005-12 Insertion of NFILU

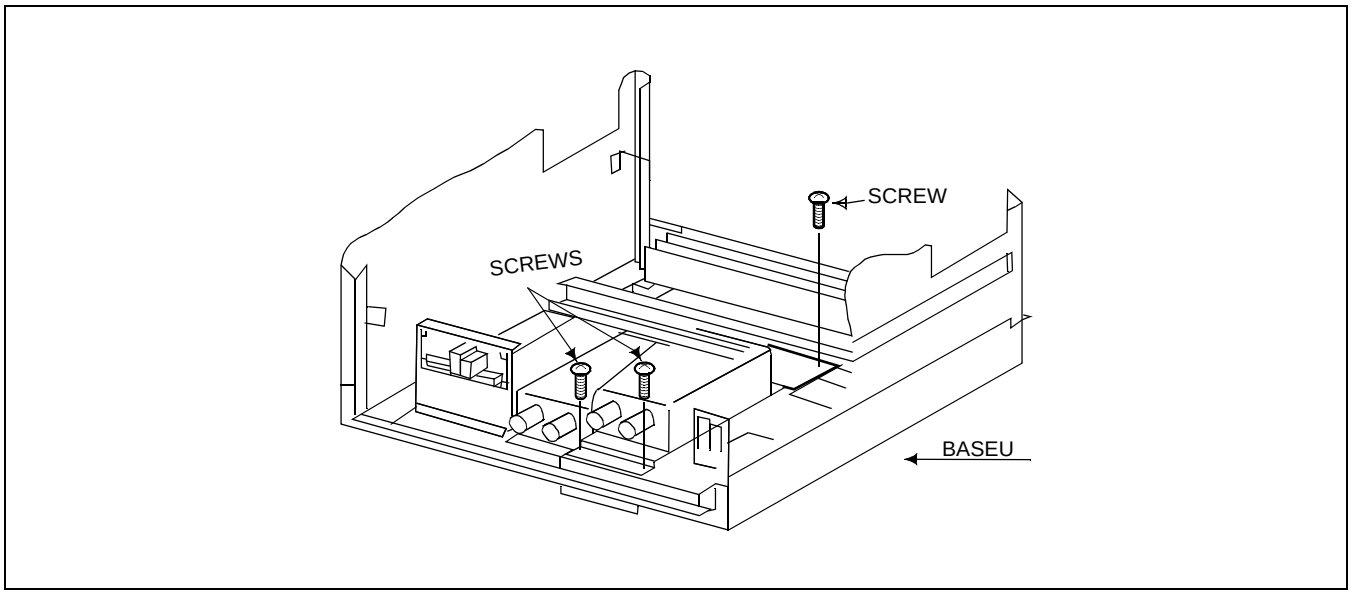

Figure 005-13 Attaching of NFILU

NAP-200-005
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Mounting of Units and Modules

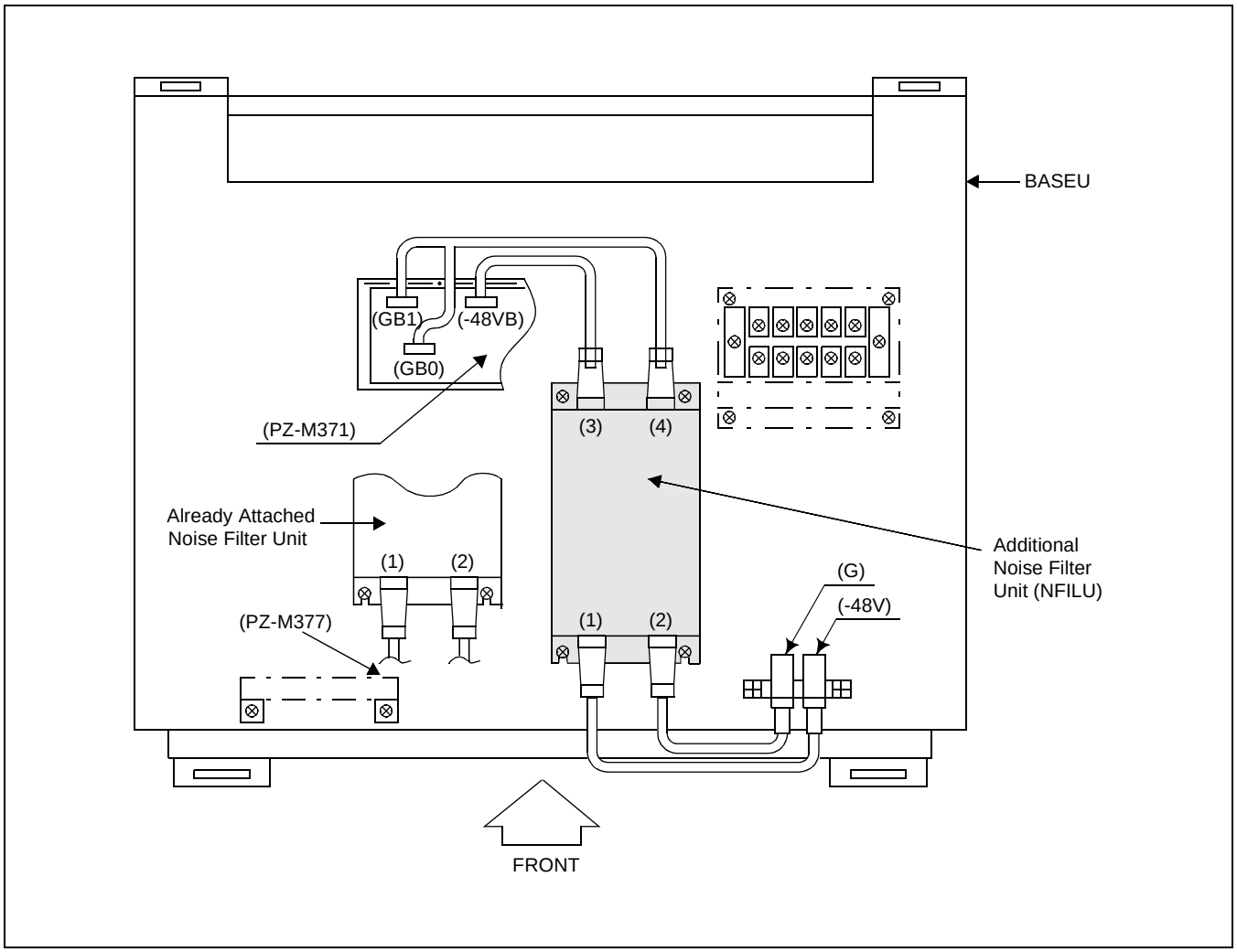


Figure 005-14 Cabling Diagram of NFILU

NAP-200-006
Sheet 1/1
Installation of Power Equipment

This NAP explains the procedures for installing the power equipment.

Note: *The Circuit Breaker (NFB) for the Rectifier's DC output must remain OFF.*

START

- Install the power equipment at the predetermined location using anchor bolts, etc. Install the framework for the batteries to be used for backup. Secure the framework using anchor bolts, etc.
- Check the cabling at the primary and secondary sides of the power equipment, and the cabling to the batteries
- Confirm that the specifications of the customer-installed AC PDB (NFB capacity, voltage, phase, etc.) conform to the specifications of the Rectifier.
- Confirm that the proper communication ground is available.
- Connect the input power cable and grounding cable to the rectifier.
- Supply electrolyte to each battery as per the specifications of the battery.
- Charge the batteries after verifying that the rectifier is operating normally.

END

NAP-200-007
Sheet 1/1
Installation of the MDF

This NAP explains the procedures for installing the MDF.

START

- Install the MDF at the predetermined location on the floor or wall. Be sure to check the quantity of accessory items such as arresters, block terminals, etc.
- Install the MDF, taking into consideration the locations of lead-in holes for Local Cable, C.O. lines, Tie Lines, and Cable Running Routes.
- MDF Line Protector Ground must be separated from the Communication Ground connected to the rectifier.

END

NAP-200-008
Sheet 1/13
Connection of Power and Ground Cables from the Power Equipment

This NAP explains the following work items.

- Connection of Power and Ground Cables
- Connection of DC-DC Converter for Telephone sets equipped with Message Waiting Lamps
- End Jointing of Power and Ground Cables
- Branching of Power Cables

1. CONNECTION OF THE POWER AND GROUND CABLES

CAUTION: *Grounding circuit continuity is vital for safe operation of telecommunication equipment. Never operate telecommunication equipment with grounding conductor disconnected.*

START

- Cable Running — Run the power and ground cables per Figure 008-1 and Figure 008-3.
- Running of power and ground cables to the Power Receiving Terminals in the BASEU — An example of cable running on a free access or computer floor is shown in Figure 008-1.
- Confirm that the Circuit Breaker (NFB) of the Rectifier is OFF.
- Connection of the power and ground cables
  - Connect the power and ground cables to the Power Receiving Terminals on the BASEU per Figure 008-3.
  - Connect the power and ground cables to the output terminals of the Rectifier.
- Check after cable connections — Using a continuity tester, confirm that the -48 V power cable is not shorting to the G power cable or FE ground cable.

END

NAP-200-008
Sheet 2/13
Connection of Power and Ground Cables from the Power Equipment

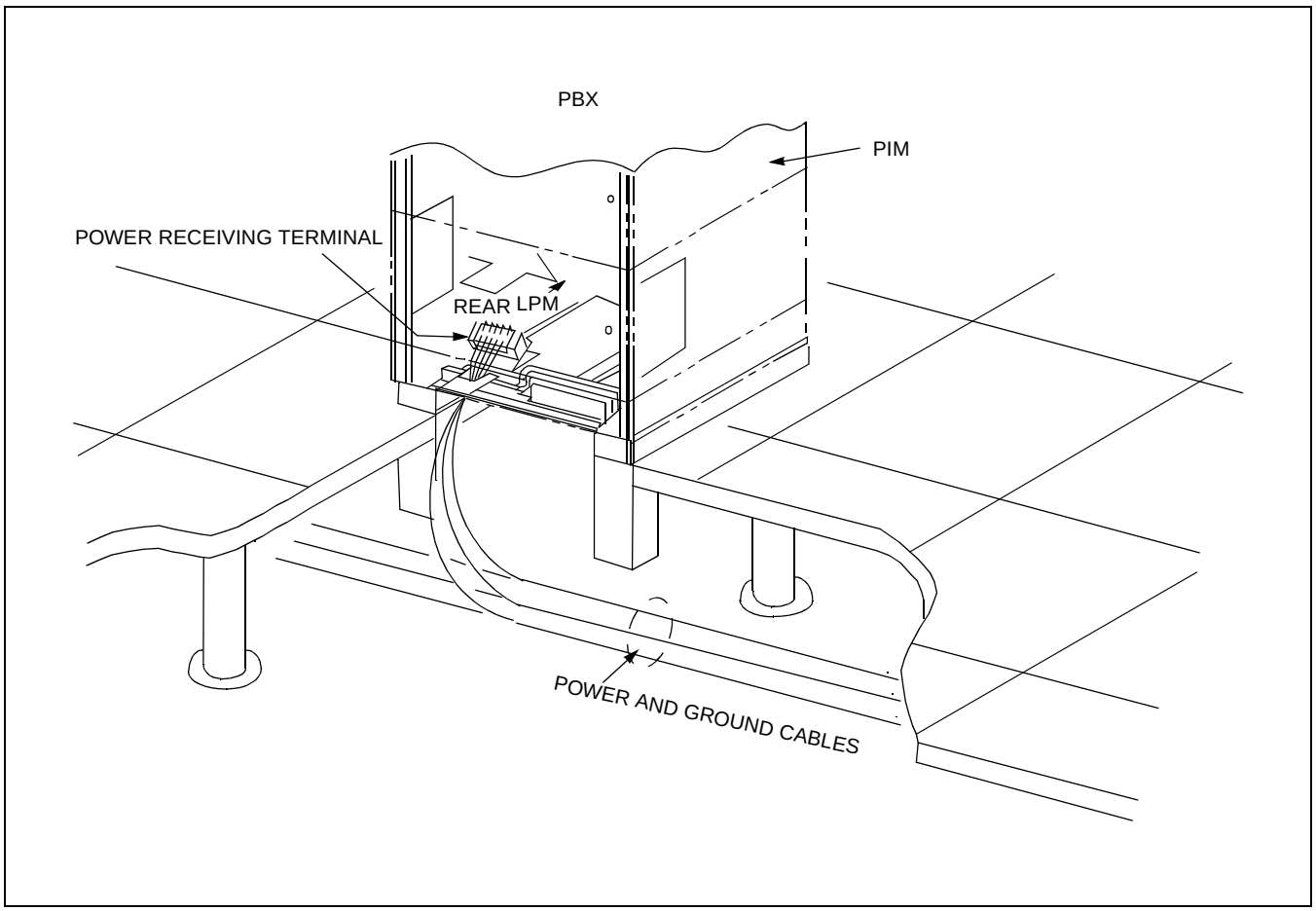


Figure 008-1 Detail of Cable Running

NAP-200-008
Sheet 3/13
Connection of Power and Ground Cables from the Power Equipment

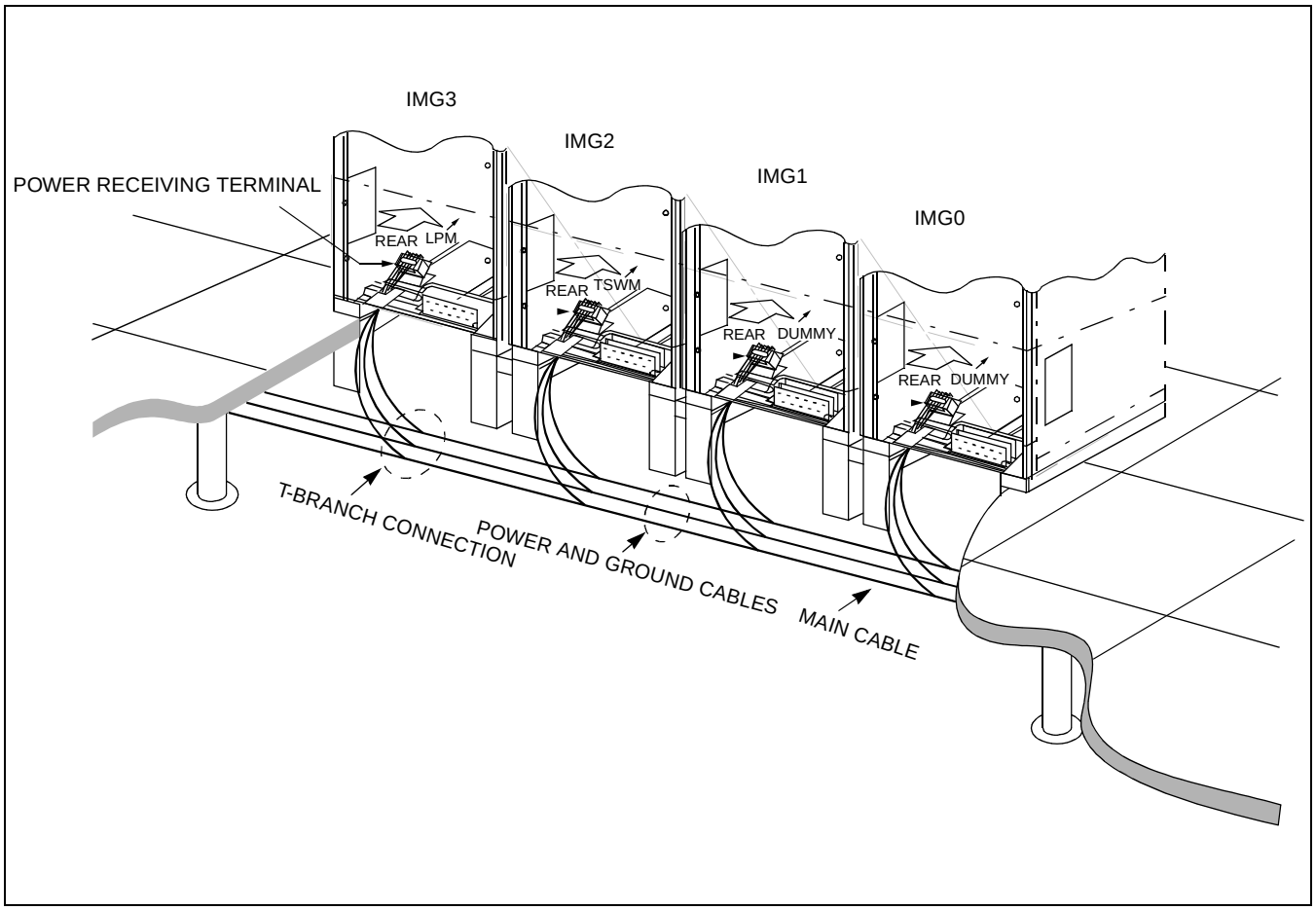
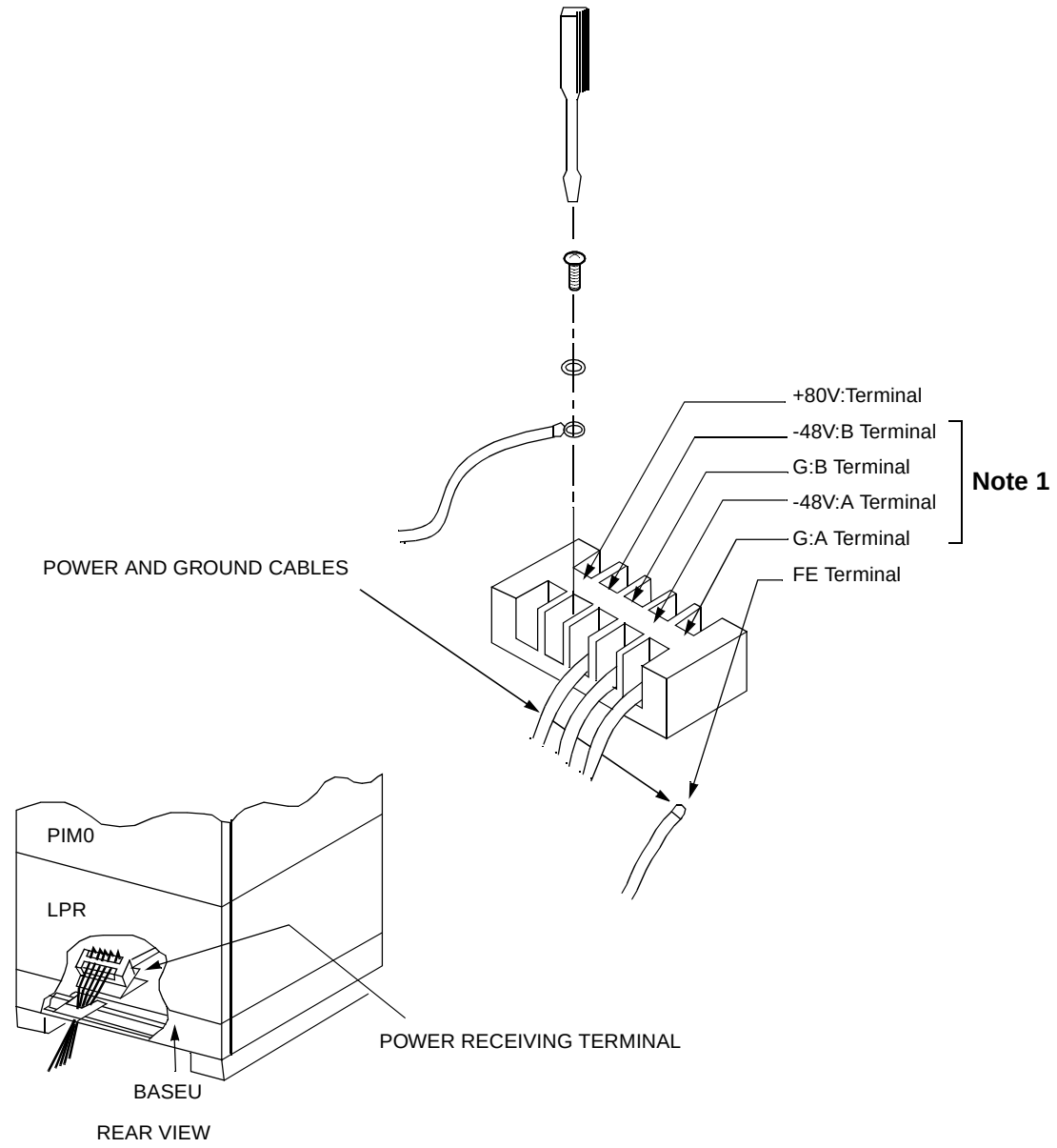


Figure 008-2 Detail of Cable Running (Multiple IMG Configuration)

NAP-200-008
Sheet 4/13
Connection of Power and Ground Cables from the Power Equipment



Note 1: *For 1/2 PIM configuration, connect the cable only to the A terminal.*

Note 2: *An example of End Jointing (using A Type-Clamp terminal) is explained in Section 3 of this NAP.*

Figure 008-3 Connection of Power and Ground Cables to Power Receiving Terminal

NAP-200-008
Sheet 5/13
Connection of Power and Ground Cables from the Power Equipment

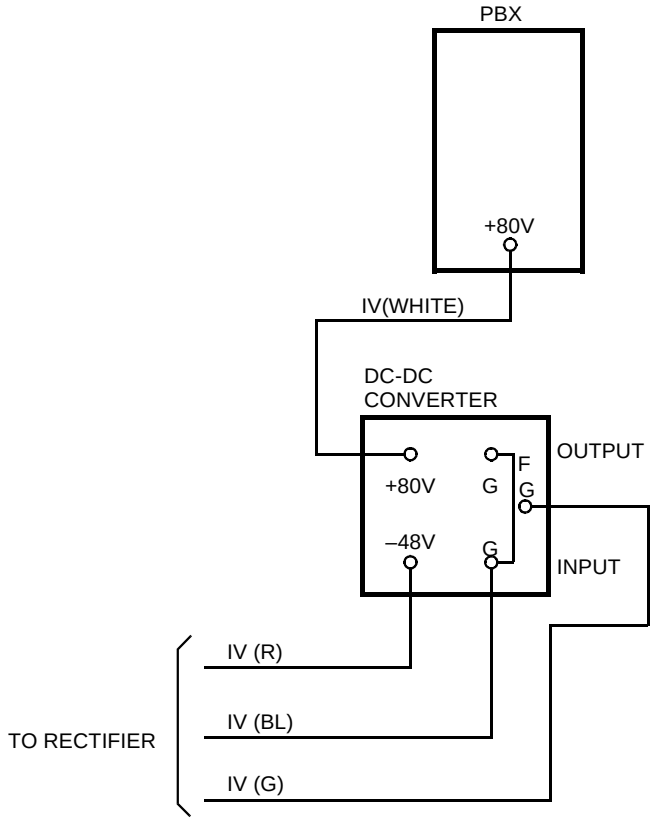
2. CONNECTION OF DC-DC CONVERTER FOR TELEPHONE SETS EQUIPPED WITH MESSAGE WAITING LAMPS

START

- Cable Running — Referring to Figure 008-4, run the power and ground cables.
- Removal of shorting piece and cable connection — Referring to Figure 008-5, remove the shorting piece from the +80 V connector of PZ-M371 card, and then connect the cable provided on the +80 V Power Receiving Terminal Block to the +80 V connector.
- Confirm that the Circuit Breaker (NFB) of the Rectifier is OFF.
- Connection of Power and Ground Cables — Referring to Figures 008-4 and 008-5, connect the power and ground cable to each terminal of the equipment.
- Check after cable connections — Using a continuity tester, confirm that the –48 V and +80 V power cable are not short-circuiting with the G power cable or FE ground cables.

END

NAP-200-008
Sheet 6/13
Connection of Power and Ground Cables from the Power Equipment



Note: *The current capacity of the DC-DC Converter is calculated by multiplying the (current capacity of the message waiting lamp) by the number of telephone sets.*

Figure 008-4 Example Connection Diagram-DC-DC Converter for Message Waiting Lamps

NAP-200-008
Sheet 7/13
Connection of Power and Ground Cables from the Power Equipment

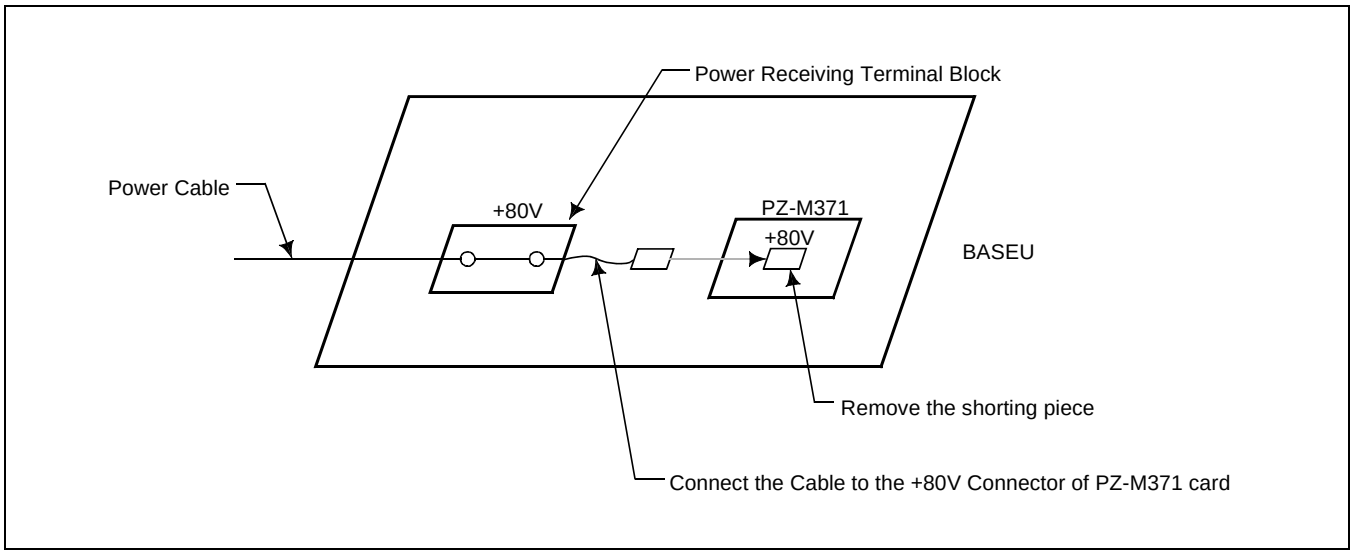


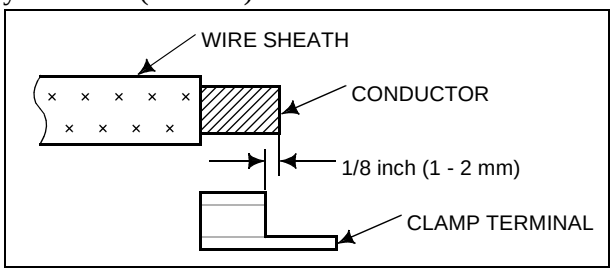
Figure 008-5 Removal of Shorting Piece and Cable Connection

NAP-200-008
Sheet 8/13
Connection of Power and Ground Cables from the Power Equipment

3. END JOINTING OF POWER AND GROUND CABLES

START

- Stripping of Insulation Sheath — Strip the wire to exceed the length of the terminal body by 1 - 2 mm (1/8 inch).



- Clamping
  - Referring to Figure 008-6, place the terminal body on the die with the soldered part facing upward.
  - Referring to Figure 008-7, insert the stripped wire into the terminal body up to the insulation-sheath edge, and clamp the terminal.
  - Wipe the terminal with a dry cloth.

END

NAP-200-008
Sheet 9/13
Connection of Power and Ground Cables from the Power Equipment

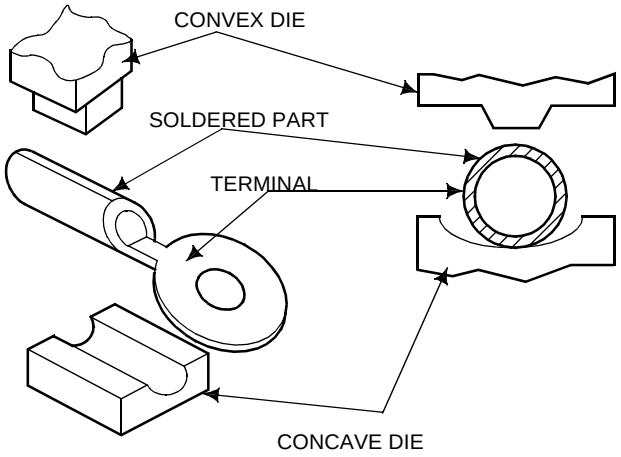


Figure 008-6 Placing the Clamp Terminal on the Die

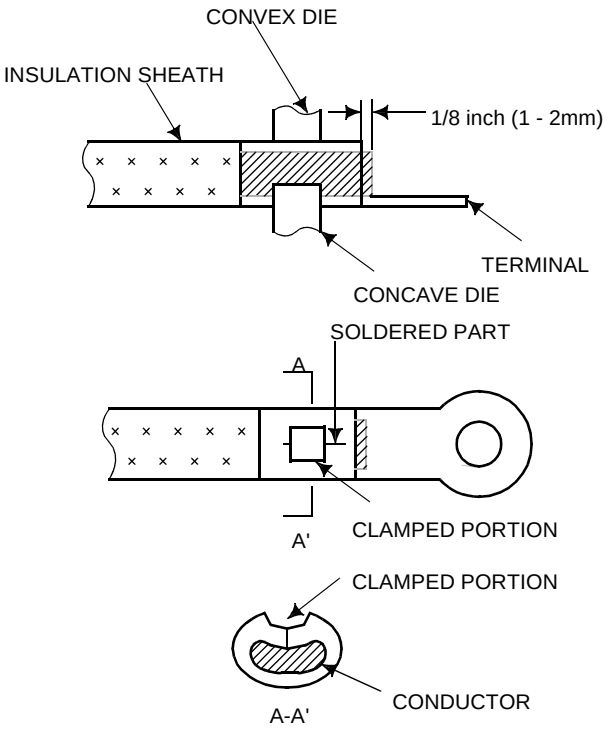


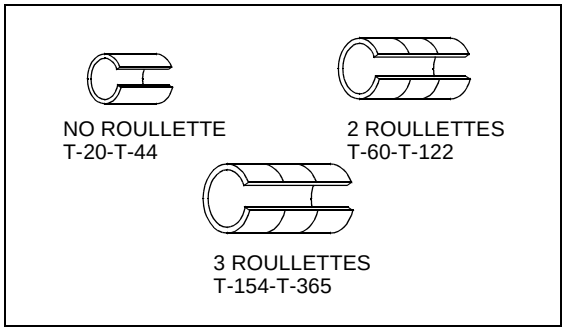
Figure 008-7 Clamping Method

NAP-200-008
Sheet 10/13
Connection of Power and Ground Cables from the Power Equipment

4. BRANCHING OF POWER CABLES

START

- Stripping Main and Branch Cable — Referring to Figure 008-8, strip insulation coating with an electrician's knife. Avoid damage to the conductor during the stripping process.
- Inserting of Cables into Terminal — Insert the stripped main wire and branch wire into the terminal as shown in Figure 008-9.
- Clamping for Branch Jointing — Place T-Type terminal on the die of the clamping tool, T-20 - T-44 terminals should be placed on the center of the die.
  T-60 - T-365 terminals should be placed on the die in such a way that the terminal will be pressed on the part marked with the roulette.



  - Proceed with the operation of the clamping tool referring to Figure 008-10.
  - Clean the terminal with a dry cloth.
- Taping and Covering — Referring to Figures 008-11 and 008-12, put an installation cover over the clamped portion, after taping with installation tape.

END

NAP-200-008
Sheet 11/13
Connection of Power and Ground Cables from the Power Equipment

Table 008-1 Stripped Length

APPLICABLE TERMINAL	STRIPPED MAIN-WIRE LENGTH I[1] [inch (mm)]	STRIPPED MAIN-WIRE LENGTH I[2] [inch (mm)]
T-20	Approx. 1.2 (28)	Approx. 1.0 (24)
T-26	1.3 (32)	1.2 (28)
T-44	1.5 (37)	1.3 (33)
T-60	1.6 (40)	1.5 (36)
T-76	1.7 (42)	1.6 (39)
T-98	1.8 (44)	1.7 (41)
T-122	1.7–1.9 (43–46)	1.6–1.7 (40–43)
T-154	2.0 (49)	1.9 (46)
T-190	2.3 (57)	2.2 (54)
T-240	2.5 (63)	2.4 (60)
T-288	2.8 (69)	2.6 (66)
T-365	3.0 (75)	2.9 (72)

T-98

Sum of the cross sections of the main and branching, or the main and extension cables.

Type of clamp terminal (T type)

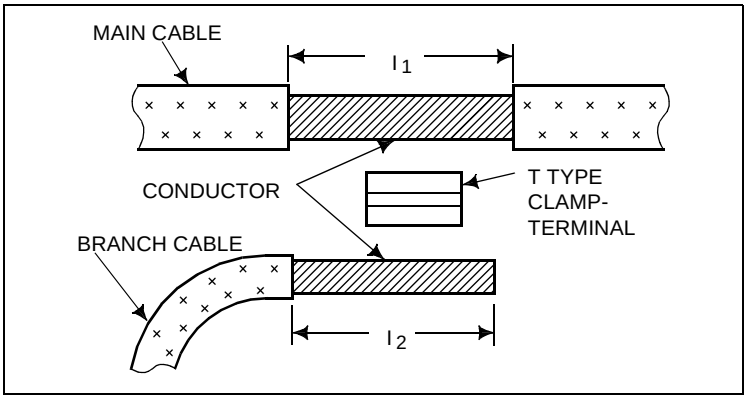


Figure 008-8 Stripped Length of Main and Branch Cable

NAP-200-008
Sheet 12/13
Connection of Power and Ground Cables from the Power Equipment

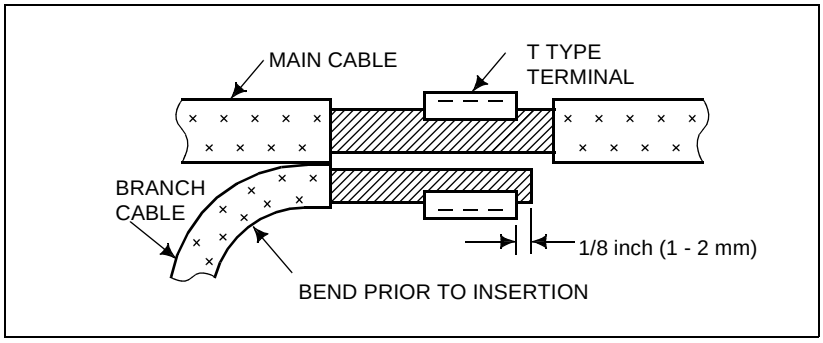
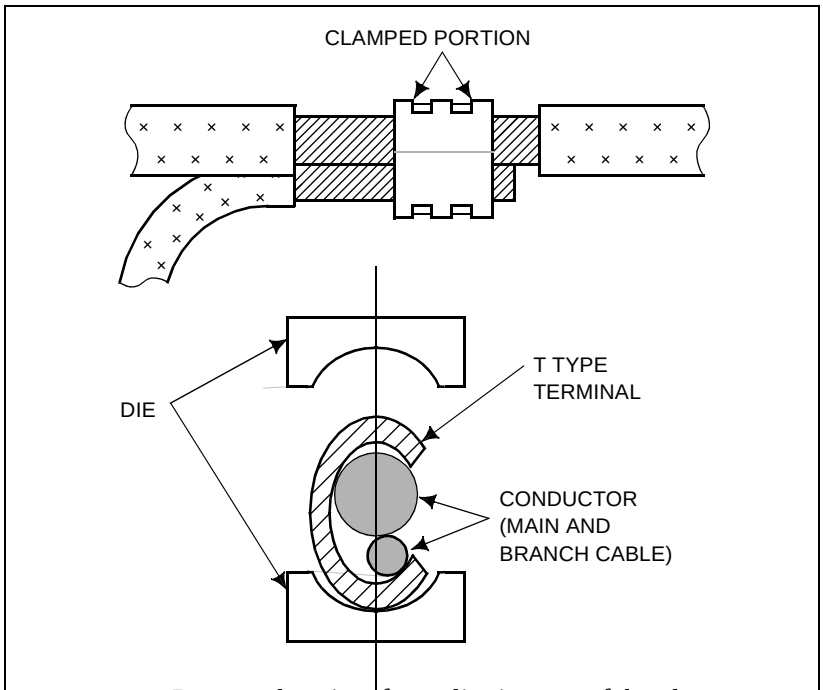


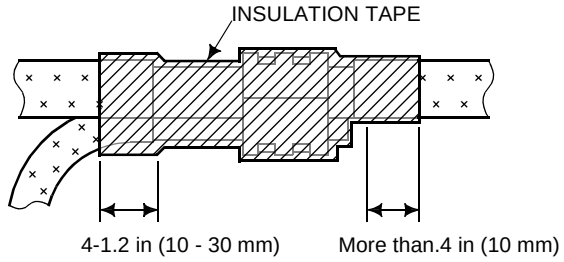
Figure 008-9 Inserting of Cables into Terminal



Note:
- *Prevent the wires from slipping out of the clamp terminal by holding them firmly.*
- *Check the indication of the pressure regulator.*
- *Operate the pressure release lever to release the wires from the die.*

Figure 008-10 Clamping for Branch Jointing

NAP-200-008
Sheet 13/13
Connection of Power and Ground Cables from the Power Equipment



Note: *Taping should be done in two rounds with the tape overlapping half the tape width.*

Figure 008-11 Taping

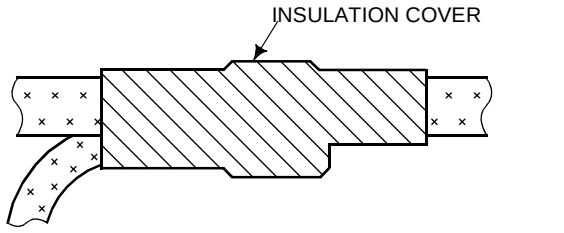


Figure 008-12 Covering

NAP-200-009
Sheet 1/11
Setting of Switch Positions and Mounting of Circuit Cards

This NAP explains the following work items:

- Extraction of Mounted Circuit Cards
- Mounting of Circuit Cards
- Setting of Switch Positions on Circuit Cards
- Installation of CPR

1. PRECAUTIONS

1.1. Protection Against Static Electricity

When setting switches on circuit cards, use a Portable Field Service Grounding Kit in order to prevent damage to static-sensitive components.

Example: 3M Model 8012, consists of:

- 2 × 2 VELOSTAT ® Work Mat
- 15 ft. (4.5 m) Ground Cord
- CHARGE-GUARD ® Wrist Strap with alligator clip

Before handling any circuit cards, first spread out the work mat, then connect the ground cord to the frame or other ground source.

If a CHARGE-GUARD wrist strap is to be used, connect the wrist strap to the frame or other ground using the provided cable.

1.2. Handling Circuit Cards

Whenever possible, do not handle circuit cards with bare hands.

The only portion of the card that can be touched is its edge. Do not touch the surface or the mounted components. Doing so may damage the card.

Handle circuit cards with care. Never bang or drop them.

1.3. Mounting or Removing Circuit Cards when the System Is in Operation

Never mount or remove a circuit card without first setting its MBR and/or MB switch to the UP position.

NAP-200-009
Sheet 2/11
Setting of Switch Positions and Mounting of Circuit Cards

2. EXTRACTION OF MOUNTED CIRCUIT CARDS

START

- Remove the Card Stopper — Referring to Figure 009-1, remove the card stopper from the module.
- Extract Circuit Cards — Referring to Figure 009-2, pull the card puller tabs in the direction indicated by the arrow. The card will release from the connector and can then be removed.
  - Pull the card out about 50 mm (2 inches) from the edge of the module so that it does not contact the backplane connector.

END

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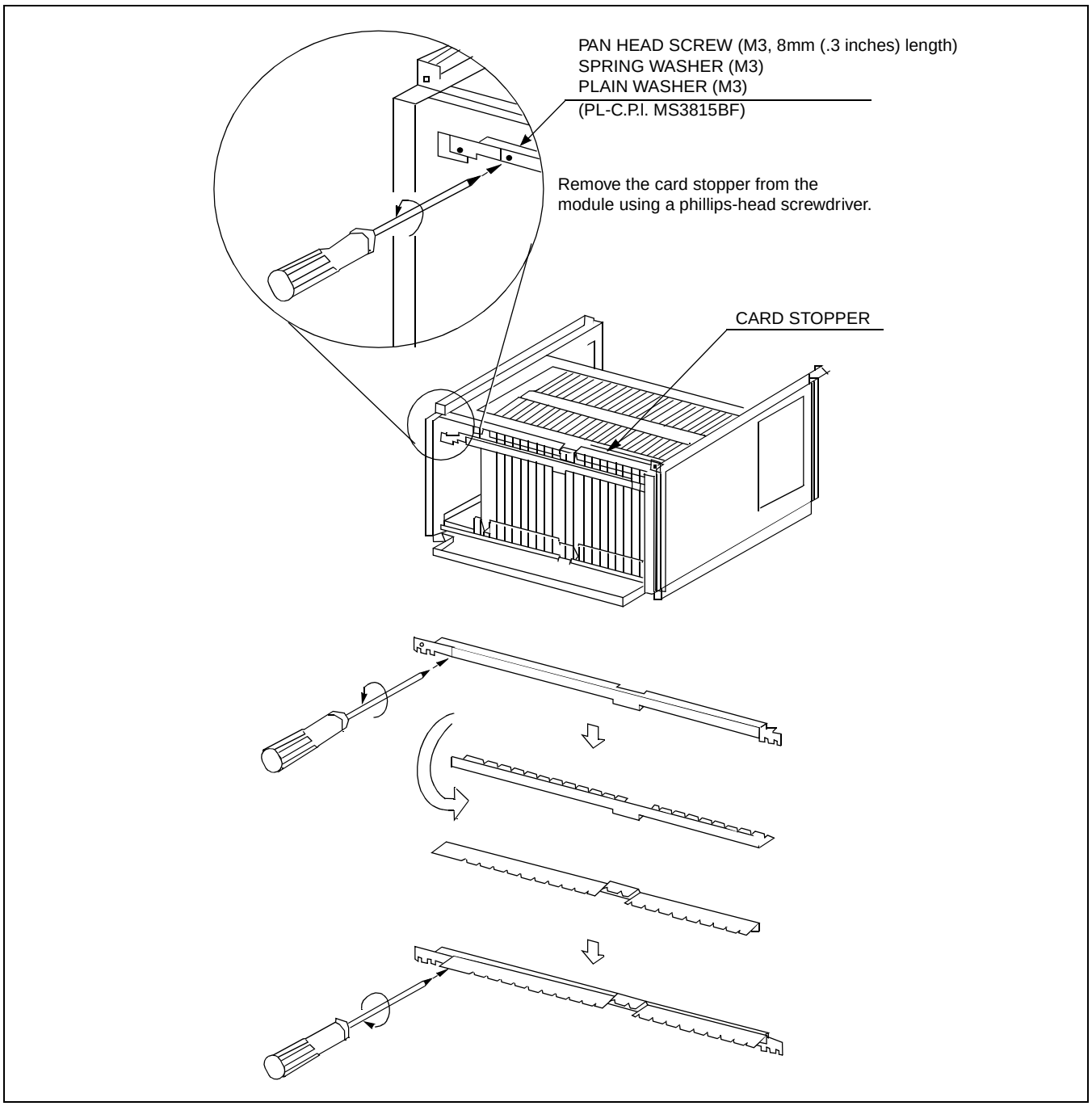

Figure 009-1 Removal of Card Stopper

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Setting of Switch Positions and Mounting of Circuit Cards

3. MOUNTING OF CIRCUIT CARDS

START

- Unpacking the Circuit Cards
  - Unpack each circuit card and remove it from its polyethylene bag.
- Clean the connector portion of the Circuit Cards
  - Wipe the connector portion clean using a soft cloth moistened with pure trichloroethylene or methanol (medical alcohol). Make sure that no lint or dust remains on the connector after cleaning.
  - Circuit cards which are already mounted should be extracted and cleaned as per the above instructions.
- Confirm the mounting positions of the Circuit Cards
  - Confirm the mounting position of each circuit card by referring to the Module Face Layout.
  - Confirm that the color code of the card puller tab coincides with that of the card mounting slot.
  - Confirm the Slot No. on the Module. Slot numbers are indicated at the bottom of each module, and range from 00 to 23.
- Insert the cards into the Module
  - Partially insert the circuit card into the module, making sure that it is correctly aligned at the top and bottom. The card should extend about two inches from the module, and must not contact the backplane connector (see Figure 009-3).

END

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Setting of Switch Positions and Mounting of Circuit Cards

4. SETTING OF SWITCH POSITIONS ON CIRCUIT CARDS

START

- Extracting the Circuit Cards from the Module
  - Extract one circuit card requiring switch setting from the module.
  - Place the extracted card onto the anti-static sheet.
- Perform switch setting — Set the required switches according to the Switch Setting Sheets in the Circuit Card Manual.
- Mounting of Circuit Cards — After the switches have been set, partially insert the card in the module. The card should extend about 50 mm (2 inches) from the module, and must not contact the backplane connector. Refer to Figure 009-3.

END

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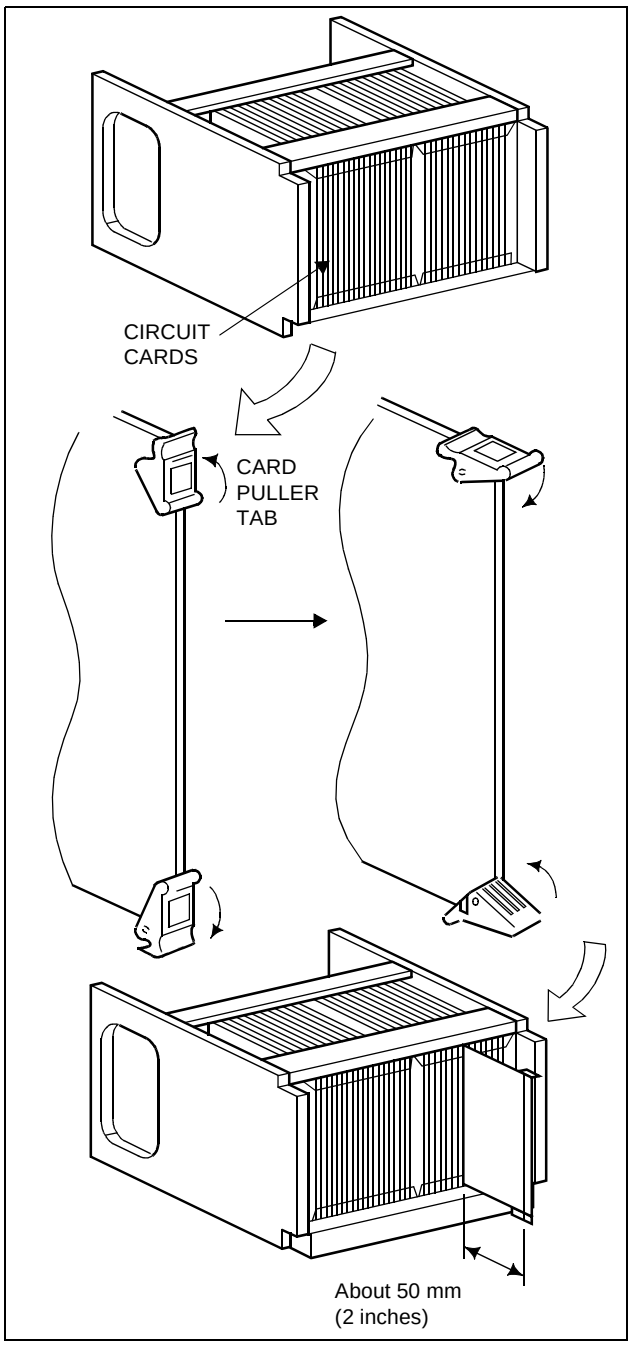

Figure 009-2 Extraction of Circuit Cards

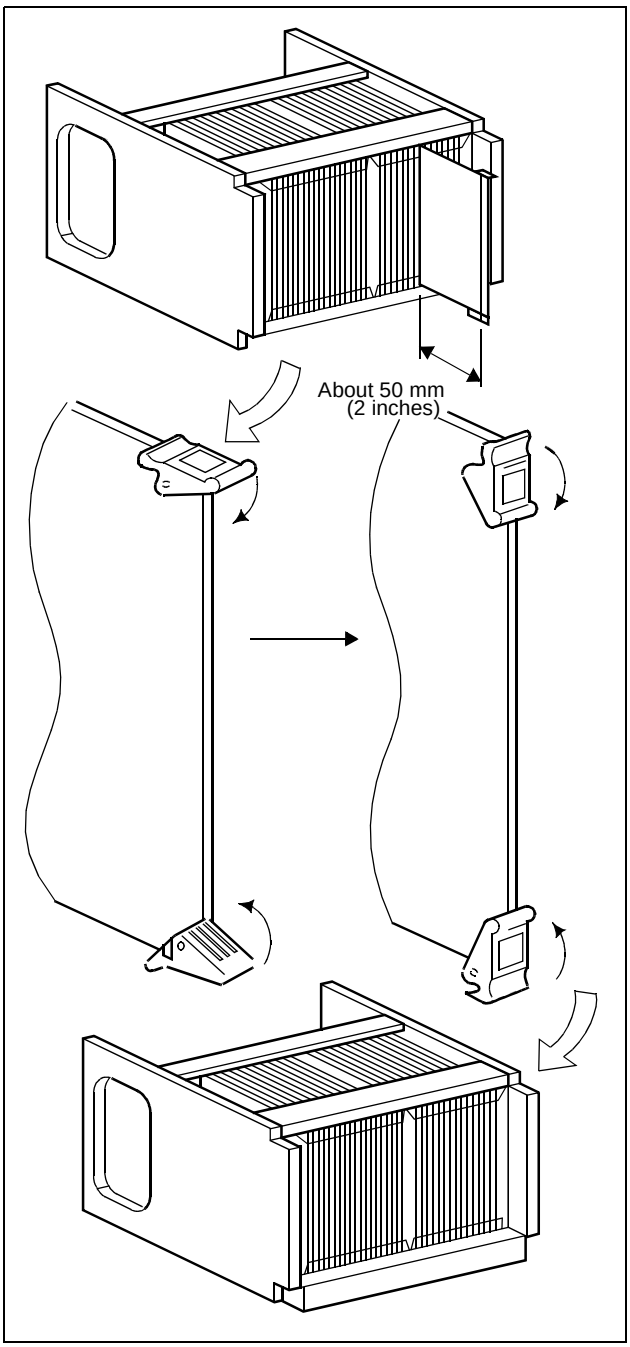

Figure 009-3 Circuit Card Mounting (Partial Insertion)

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5. INSTALLATION OF CPR

This Section explains the procedure to install the CPR into the LPM. Perform the following ([1] through [5]) for both CPR0 and CPR1.

1. Using the Phillips Screwdriver, remove the 4 + 8 screws. Then, detach the front panel and top cover from the CPR. (Refer to Figure 009-4.)

As shown in the figure below, detach the front panel of the CPR by removing the 4 screws. Then, lift away the top cover after removing the 8 screws.

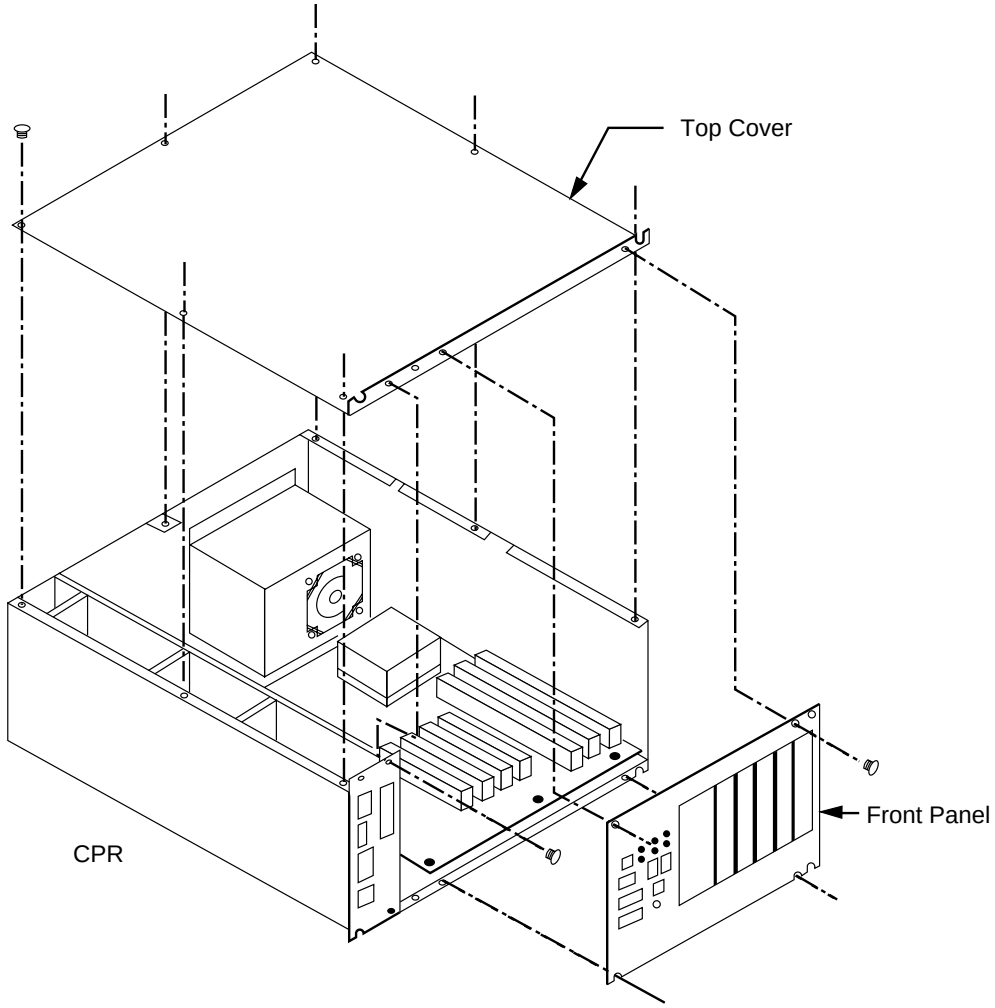

Figure 009-4 Removal of Front Panel and Top Cover from CPR

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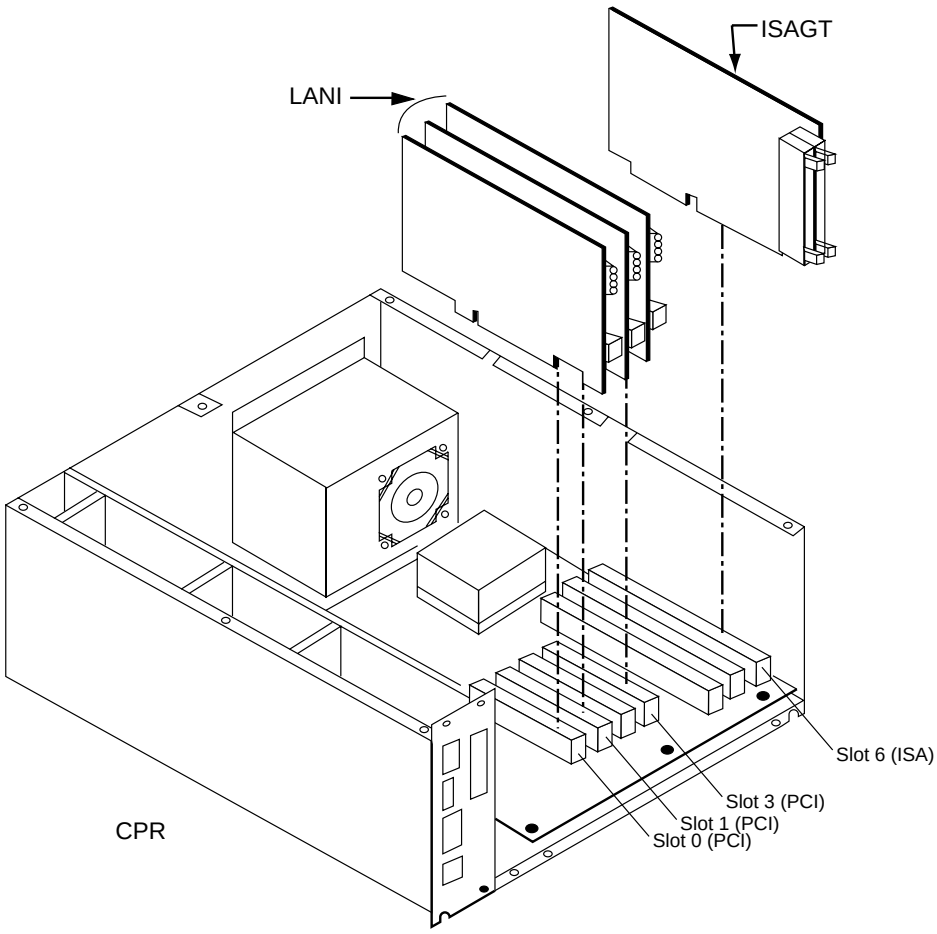
2. Depending on the system configuration, insert the ISAGT (PZ-GT13/16) and LANI (PZ-PC19) cards into the following slots of the CPR (refer to Figure 009-5):

ISAGT (PZ-GT13/16)	→	Slot #6 (ISA) (Fixed)
LANI	→	Slot #0 (PCI) (For Fusion Link)
LANI	→	Slot #1 (PCI) (When connecting MAT via 10-BASE T and PCI buses)
LANI	→	Slot #3 (PCI) (When LANI for Fusion Link is in dual configuration: available for Release 3 or later software)

This figure (example) shows how to insert the ISAGT and LANI cards into CPR Slots #6 (ISA), and #0, #1 and #3 (PCI), respectively.



Note: *The LANI card for PCI Slot 3 is available for Release 3 or later software.*

Figure 009-5 Insertion of ISAGT and LANI Cards into CPR Slots

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3. Attach the top cover and front panel again by fastening the removed screws. (Refer to Figure 009-6.)

After mounting the ISAGT/LANI cards, reattach the top cover by tightening the 8 screws. Then, also attach the Front Panel by fastening the 4 screws.

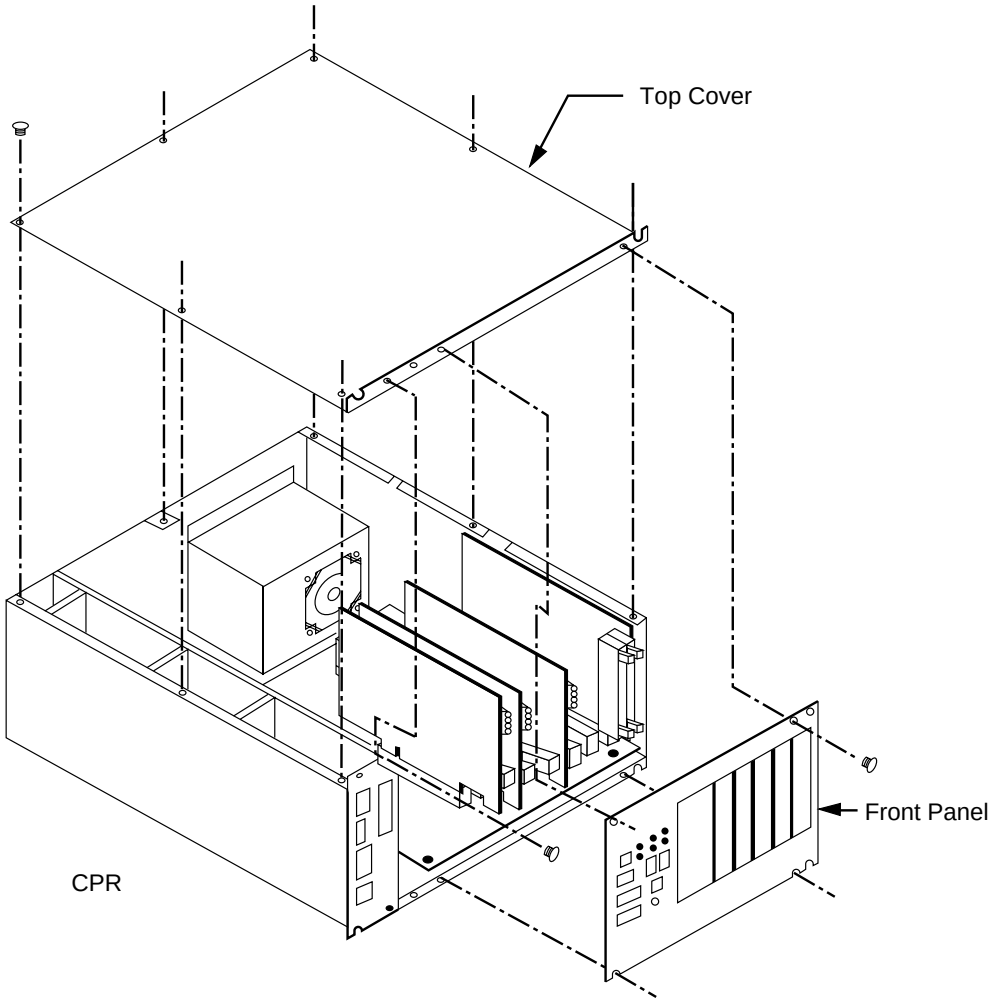

Figure 009-6 Reattachment of CPR Top Cover and Front Panel

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4. After turning “ON” the MBR key on the DSP of the CPR, insert the CPR into the LPM. Then, fasten the four screws. (Refer to Figure 009-7.)

As shown in the figure below, insert the CPR into the LPM. Then, fasten the four screws.

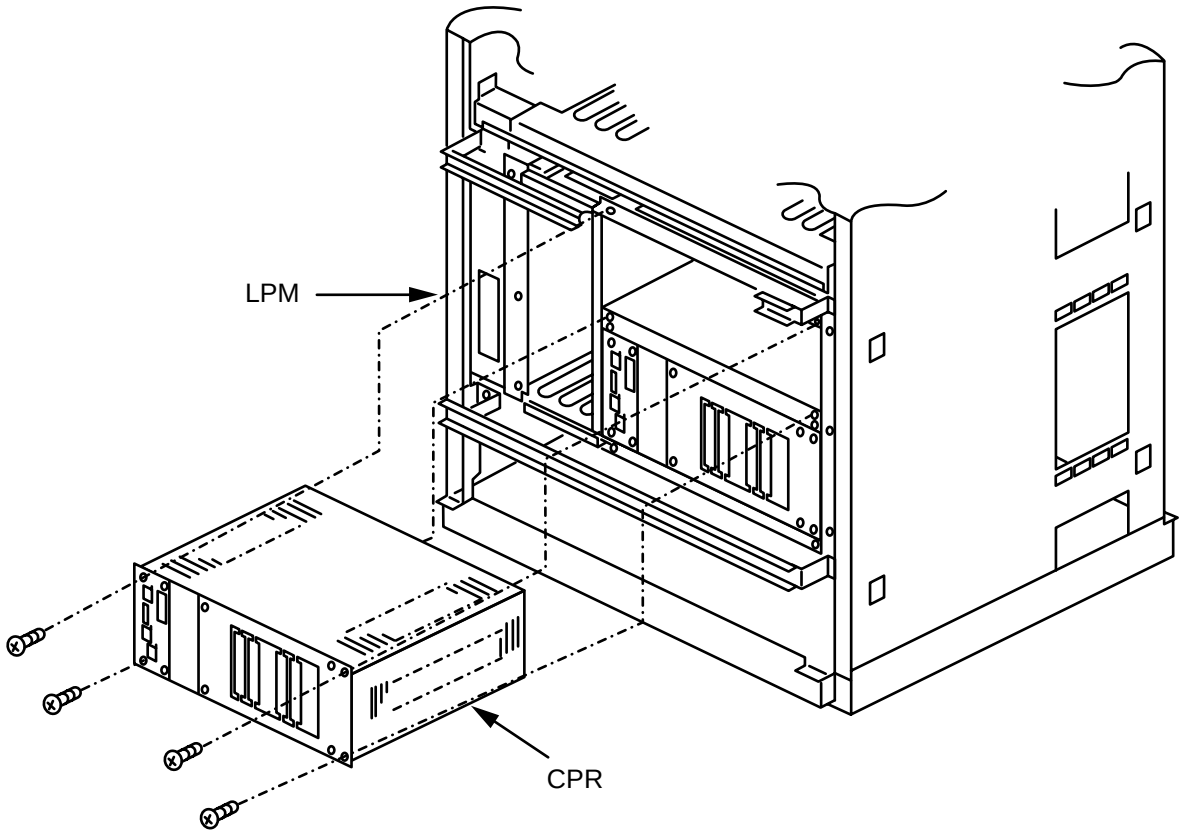

Figure 009-7 Accommodation of New CPR into LPM

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5. Finally, insert the HFD into the CPR. Then, fasten the two screws. (Refer to Figure 009-8.)

By using the two screws, fasten the HFD onto the CPR.

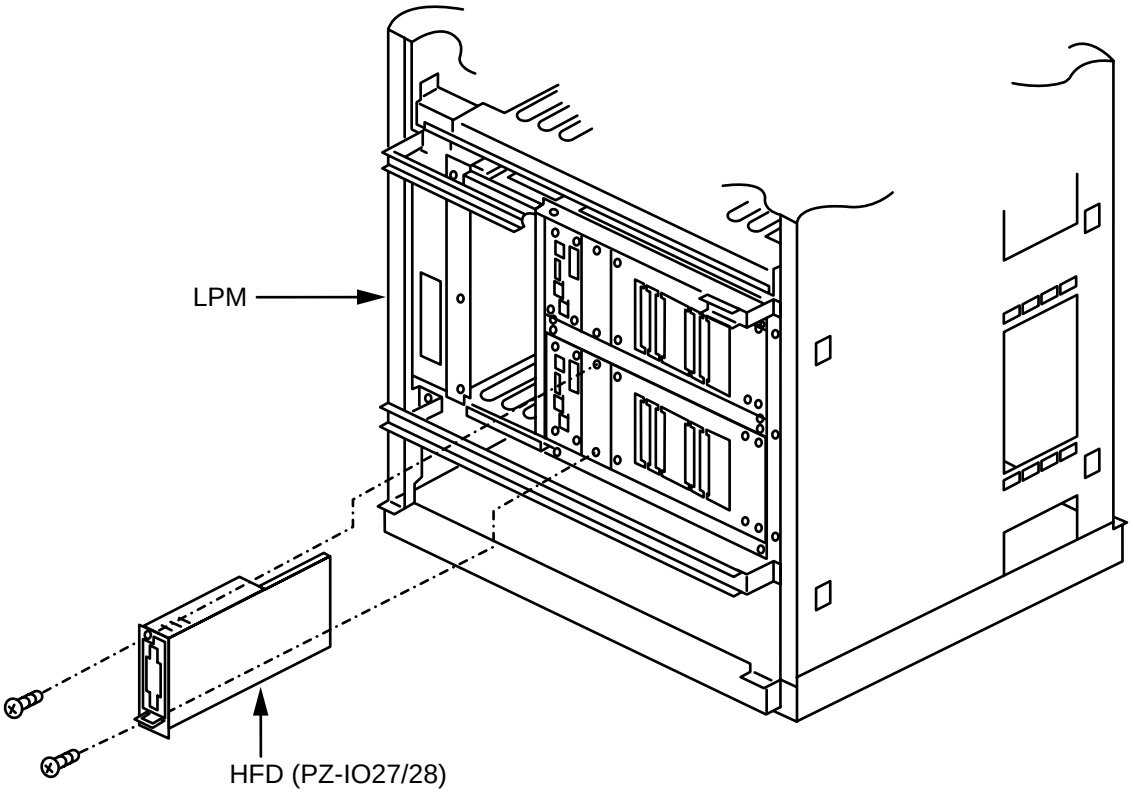

Figure 009-8 Insertion of New HFD into CPR

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Internal Cable Connections

This NAP explains how to run the following internal cables between Modules.

START

- Confirm connector locations — Referring to Figures 010-1 through 010-4, confirm the locations of the connectors into which the internal cables are inserted.
- Connection of FANU cables — Referring to the figures listed in Figures 010-4 through 010-9, connect FANU cables.
- Connection of Internal Power Cables — Referring to the figures shown in Figures 010-18 through 010-26, connect internal power cables.
- Connection of Internal Bus Cables — Referring to figures shown in Figures 010-35 through 010-37, connect internal bus cables.

END

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Internal Cable Connections

Since Cable connections vary depending on the system configuration which includes how many Port Interface Modules (PIMs) are accommodated in the system or whether redundancy is taken into account as to the CPU. Before starting cable connections, find your system in "Quick Reference Table." When you find your system in the table, open the related pages, on which necessary information is provided, and then set about the cable connections.

Table 010-1 Quick Reference Table (1/6)

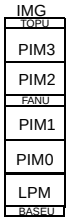
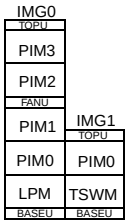
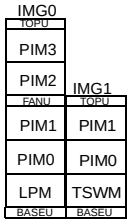
SYSTEM TYPE	KIND OF CABLE	FRAME NAME	FIGURE	TABLE
Single IMG Configuration				
	Power Cable	IMG0	010-5 ~ 010-12	010-2 ~ 010-5
	Internal Cable	IMG0	010-22 ~ 010-29	010-15 ~ 010-18
Multiple IMG Configuration				
 5-PIM System	Power Cable	IMG0	010-13	010-6
		IMG1	010-14	010-7
	Internal Cable	IMG0	010-30	010-19
		IMG1	010-31	010-20
	Inter-Frame Bus Cable	IMG0-IMG1	011-1	011-1
			011-2	011-2
	Inter-Frame Alarm Bus Cable	IMG0-IMG1	011-11	011-11
 6-PIM System	Power Cable	IMG0	010-13	010-6
		IMG1	010-15	010-8
	Internal Cable	IMG0	010-30	010-19
		IMG1	010-32	010-21
	Inter-Frame Bus Cable	IMG0-IMG1	011-1	011-1
			011-2	011-2
	Inter-Frame Alarm Bus Cable	IMG0-IMG1	011-11	011-11

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Table 010-1 Quick Reference Table (2/6)

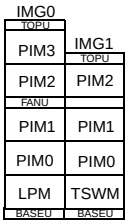
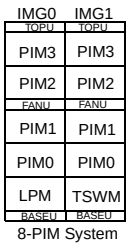
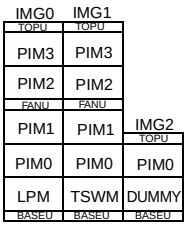
SYSTEM TYPE	KIND OF CABLE	FRAME NAME	FIGURE	TABLE
 7-PIM System	Power Cable	IMG0	010-13	010-6
		IMG1	010-16	010-9
	Internal Cable	IMG0	010-30	010-19
		IMG1	010-33	010-22
	Inter-Frame Bus Cable	IMG0-IMG1	011-1	011-1
			011-2	011-2
	Inter-Frame Alarm Bus Cable	IMG0-IMG1	011-11	011-11
 8-PIM System	Power Cable	IMG0	010-13	010-6
		IMG1	010-17	010-10
	Internal Cable	IMG0	010-30	010-19
		IMG1	010-34	010-23
	Inter-Frame Bus Cable	IMG0-IMG1	011-1	011-1
			011-2	011-2
	Inter-Frame Alarm Bus Cable	IMG0-IMG1	011-11	011-11
 9-PIM System	Power Cable	IMG0	010-13	010-6
		IMG1	010-17	010-10
		IMG2	010-18	010-11
	Internal Cable	IMG0	010-30	010-19
		IMG1	010-34	010-23
	Inter-Frame Bus Cable	IMG0-IMG1	011-1	011-1
			011-2	011-2
		IMG1-IMG2	011-3	011-3
	Inter-Frame Alarm Bus Cable	IMG0-IMG1	011-11	011-11
		IMG0-IMG2	011-12	011-12

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Table 010-1 Quick Reference Table (3/6)

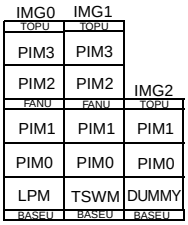
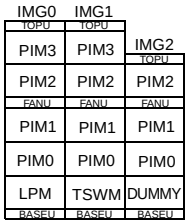
SYSTEM TYPE	KIND OF CABLE	FRAME NAME	FIGURE	TABLE
 10-PIM System	Power Cable	IMG0	010-13	010-6
		IMG1	010-17	010-10
		IMG2	010-19	010-12
	Internal Cable	IMG0	010-30	010-19
		IMG1	010-34	010-23
		IMG2	010-35	-
	Inter-Frame Bus Cable	IMG0-IMG1	011-1	011-1
			011-2	011-2
		IMG1-IMG2	011-4	011-4
	Inter-Frame Alarm Bus Cable	IMG0-IMG1	011-11	011-11
		IMG0-IMG2	011-12	011-12
 11-PIM System	Power Cable	IMG0	010-13	010-6
		IMG1	010-17	010-10
		IMG2	010-20	010-13
	Internal Cable	IMG0	010-30	010-19
		IMG1	010-34	010-23
		IMG2	010-36	-
	Inter-Frame Bus Cable	IMG0-IMG1	011-1	011-1
			011-2	011-2
		IMG1-IMG2	011-5	011-5
	Inter-Frame Alarm Bus Cable	IMG0-IMG1	011-11	011-11
		IMG0-IMG2	011-12	011-12

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Table 010-1 Quick Reference Table (4/6)

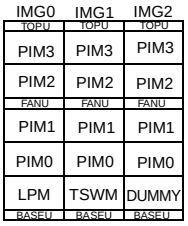
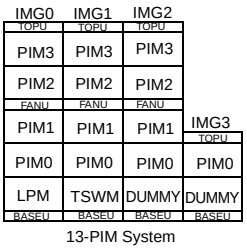
SYSTEM TYPE	KIND OF CABLE	FRAME NAME	FIGURE	TABLE
 12-PIM System	Power Cable	IMG0	010-13	010-6
		IMG1	010-17	010-10
		IMG2	010-21	010-14
	Internal Cable	IMG0	010-30	010-19
		IMG1	010-34	010-23
		IMG2	010-37	-
	Inter-Frame Bus Cable	IMG0-IMG1	011-1	011-1
			011-2	011-2
		IMG1-IMG2	011-6	011-6
	Inter-Frame Alarm Bus Cable	IMG0-IMG1	011-11	011-11
		IMG0-IMG2	011-12	011-12
 13-PIM System	Power Cable	IMG0	010-13	010-6
		IMG1	010-17	010-10
		IMG2	010-21	010-14
		IMG3	010-18	010-11
	Internal Cable	IMG0	010-30	010-19
		IMG1	010-34	010-23
		IMG2	010-37	-
	Inter-Frame Bus Cable	IMG0-IMG1	011-1	011-1
			011-2	011-2
		IMG1-IMG2	011-6	011-6
		IMG1-IMG3	011-7	011-7
	Inter-Frame Alarm Bus Cable	IMG0-IMG1	011-11	011-11
		IMG0-IMG2	011-12	011-12
		IMG0-IMG3	011-13	011-13

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Table 010-1 Quick Reference Table (5/6)

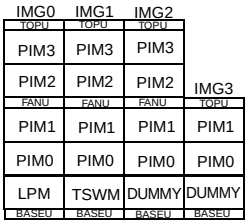
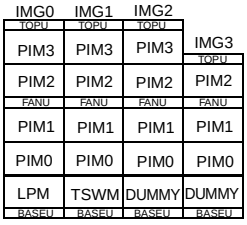
SYSTEM TYPE	KIND OF CABLE	FRAME NAME	FIGURE	TABLE
 14-PIM System	Power Cable	IMG0	010-13	010-6
		IMG1	010-17	010-10
		IMG2	010-21	010-14
		IMG3	010-19	010-12
	Internal Cable	IMG0	010-30	010-19
		IMG1	010-34	010-23
		IMG2	010-37	-
		IMG3	010-35	-
	Inter-Frame Bus Cable	IMG0-IMG1	011-1	011-1
			011-2	011-2
		IMG1-IMG2	011-6	011-6
		IMG1-IMG3	011-8	011-8
	Inter-Frame Alarm Bus Cable	IMG0-IMG1	011-11	011-11
		IMG0-IMG2	011-12	011-12
		IMG0-IMG3	011-13	011-13
 15-PIM System	Power Cable	IMG0	010-13	010-6
		IMG1	010-17	010-10
		IMG2	010-21	010-14
		IMG3	010-20	010-13
	Internal Cable	IMG0	010-30	010-19
		IMG1	010-34	010-23
		IMG2	010-37	-
		IMG3	010-36	-
	Inter-Frame Bus Cable	IMG0-IMG1	011-1	011-1
			011-2	011-2
		IMG1-IMG2	011-6	011-6
		IMG1-IMG3	011-9	011-9
	Inter-Frame Alarm Bus Cable	IMG0-IMG1	011-11	011-11
		IMG0-IMG2	011-12	011-12
		IMG0-IMG3	011-13	011-13

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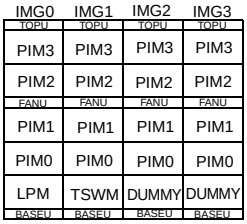
Table 010-1 Quick Reference Table (6/6)

SYSTEM TYPE	KIND OF CABLE	FRAME NAME	FIGURE	TABLE
 16-PIM System	Power Cable	IMG0	010-13	010-6
		IMG1	010-17	010-10
		IMG2	010-21	010-14
		IMG3	010-21	010-14
	Internal Cable	IMG0	010-30	010-19
		IMG1	010-34	010-23
		IMG2	010-37	-
		IMG3	010-37	-
	Inter-Frame Bus Cable	IMG0-IMG1	011-1	011-1
			011-2	011-2
		IMG1-IMG2	011-6	011-6
		IMG1-IMG3	011-10	011-10
	Inter-Frame Alarm Bus Cable	IMG0-IMG1	011-11	011-11
		IMG0-IMG2	011-12	011-12
		IMG0-IMG3	011-13	011-13

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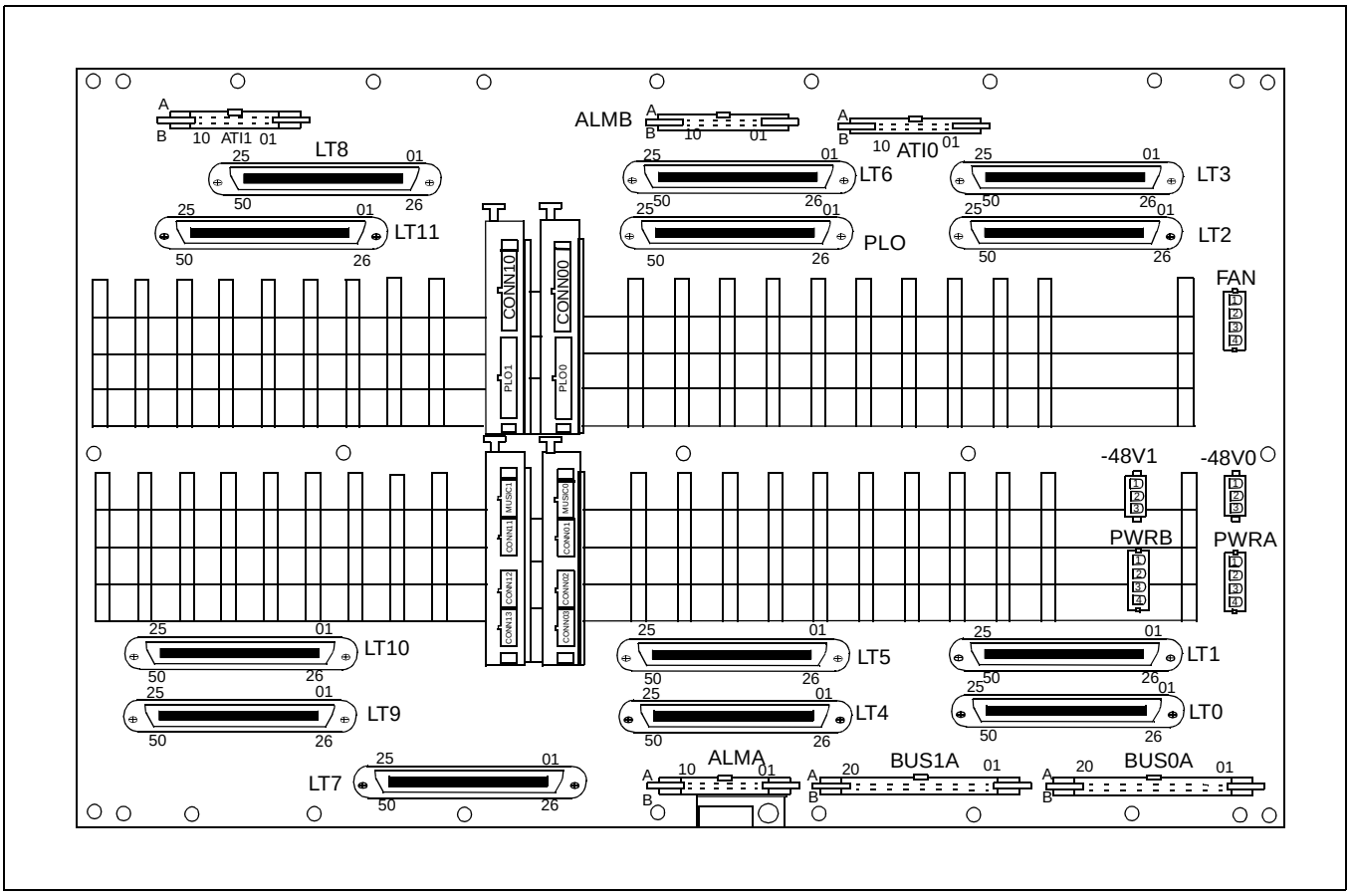

Figure 010-1 Locations of Connectors on the PIM Backplane

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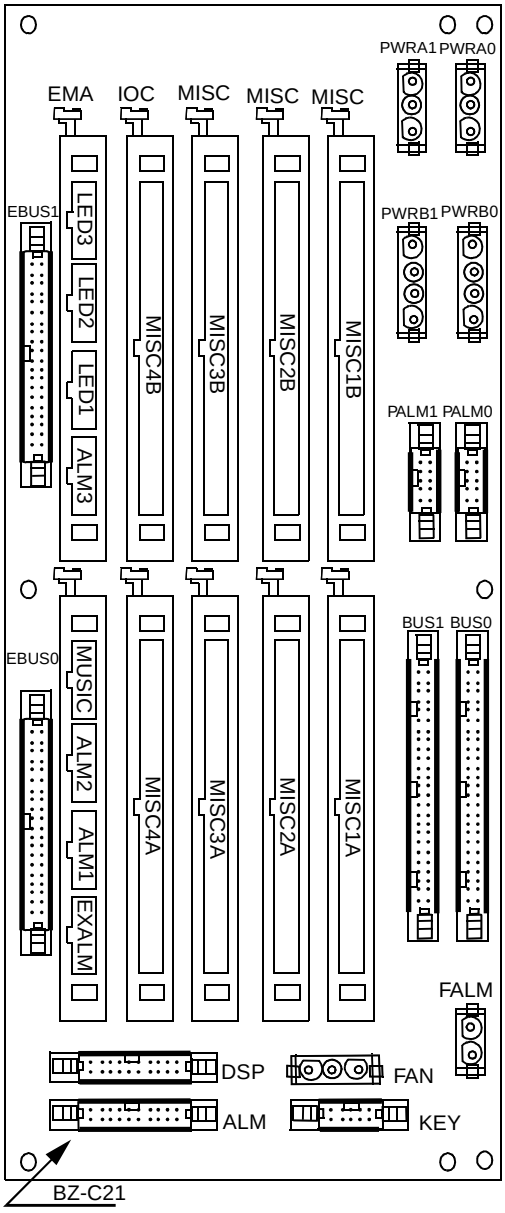

Figure 010-2 Locations of Connectors on the LPM Backplane

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Internal Cable Connections

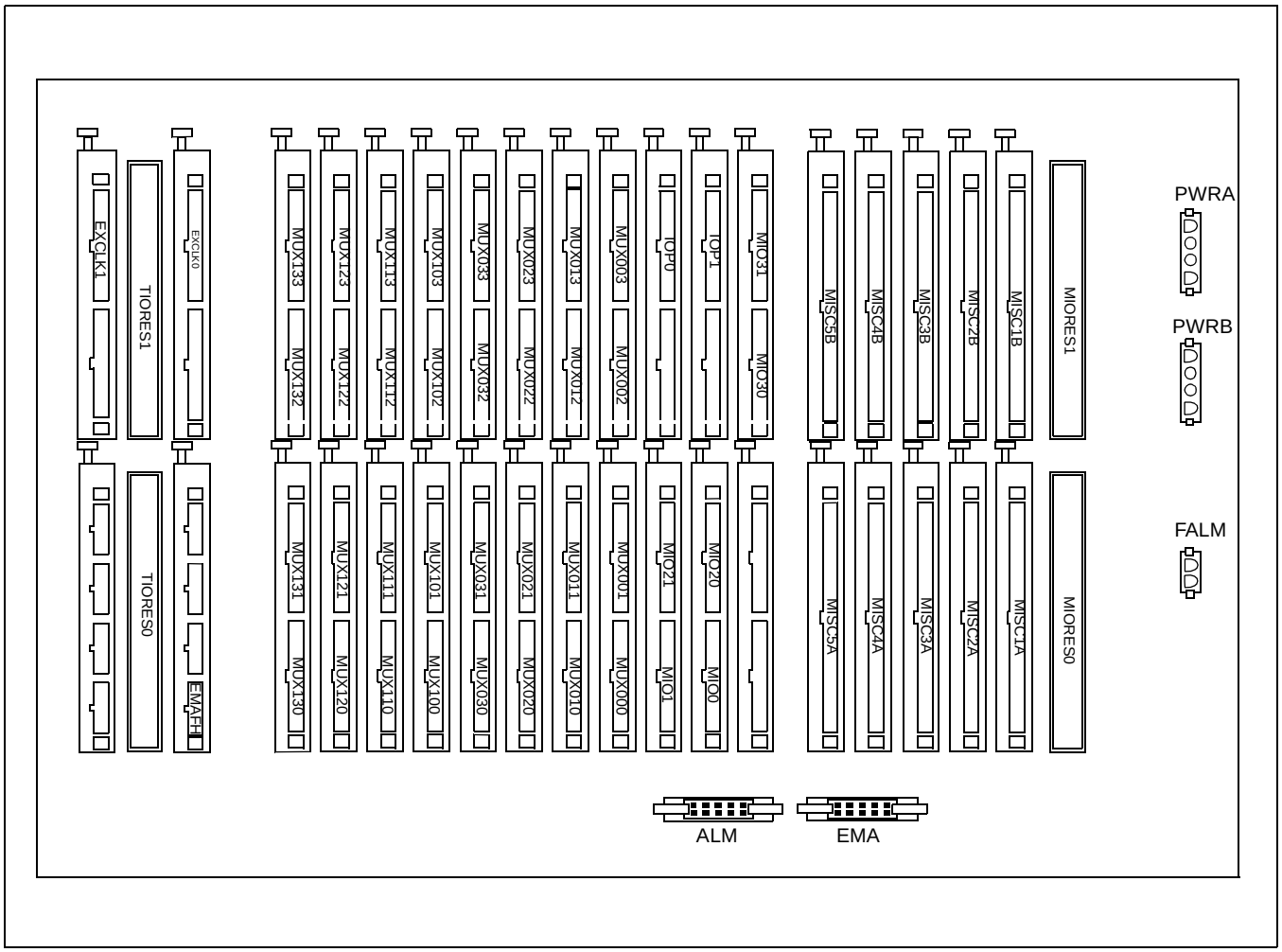

Figure 010-3 Location of Connectors on the TSWM Backplane (Multiple IMG Configuration)

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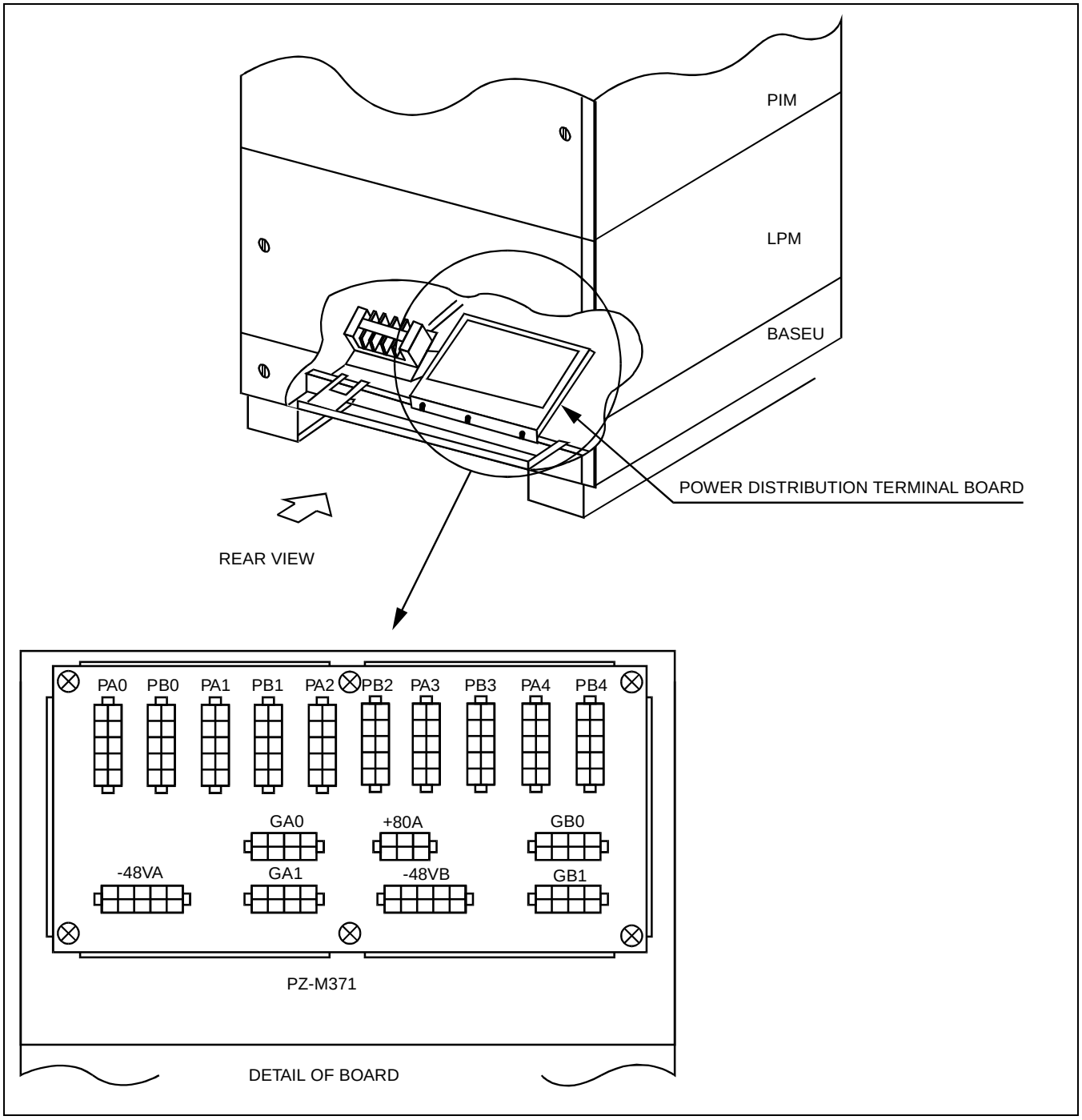

Figure 010-4 Locations of Connectors on the Power Distribution Terminal Board (PZ-M371)

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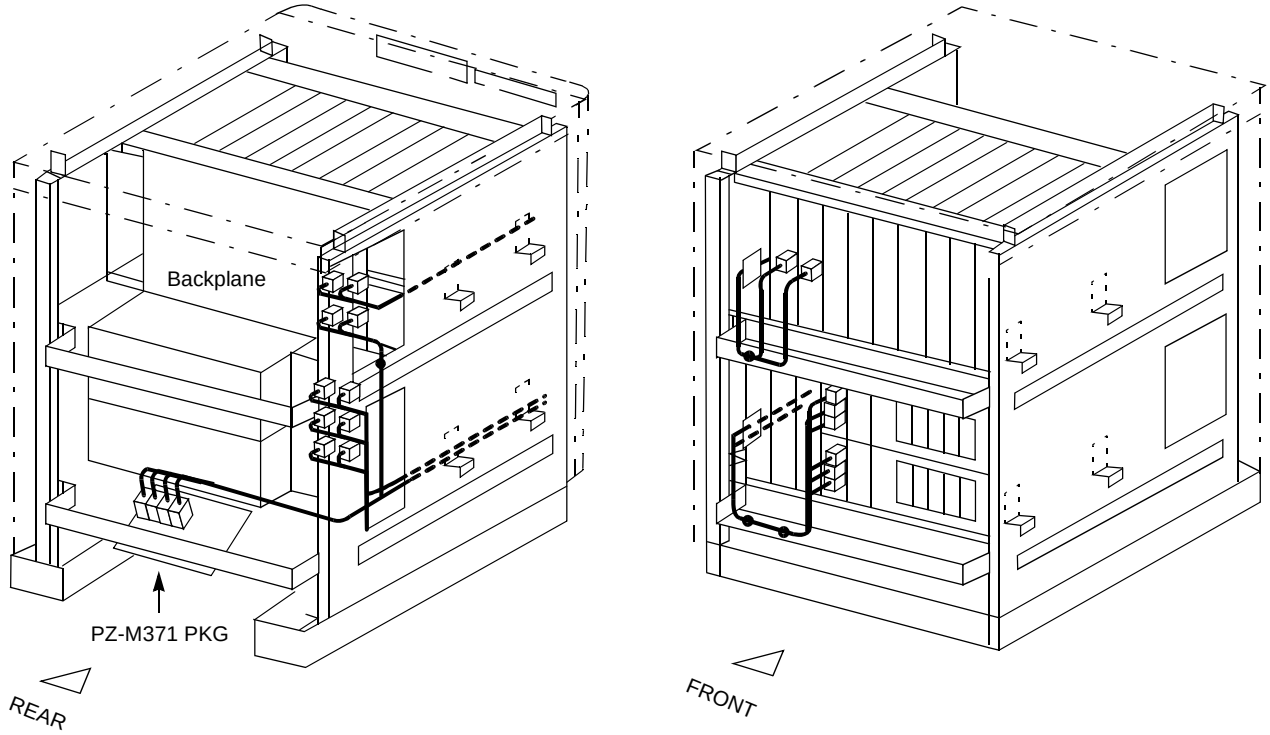
Internal Cable Connections

Run the power cables, referring to Figure 010-6. Then, fasten the cables to the cabinet, referring to Figure 010-5.

Below is the rough sketch of how to run the power cables for the 1-PIM system. For details on actual cable runnings, see Figure 010-6.



Note: *Normally, the cables are fastened onto the cabinet at the proposed locations, where small dots ( ) are provided in this figure.*

Figure 010-5 Power Cable Connections for 1-PIM System (Single IMG Configuration)

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Internal Cable Connections

Connect the power cables as shown below. Cables represented in dotted-lines indicate power cable for a dual-system.

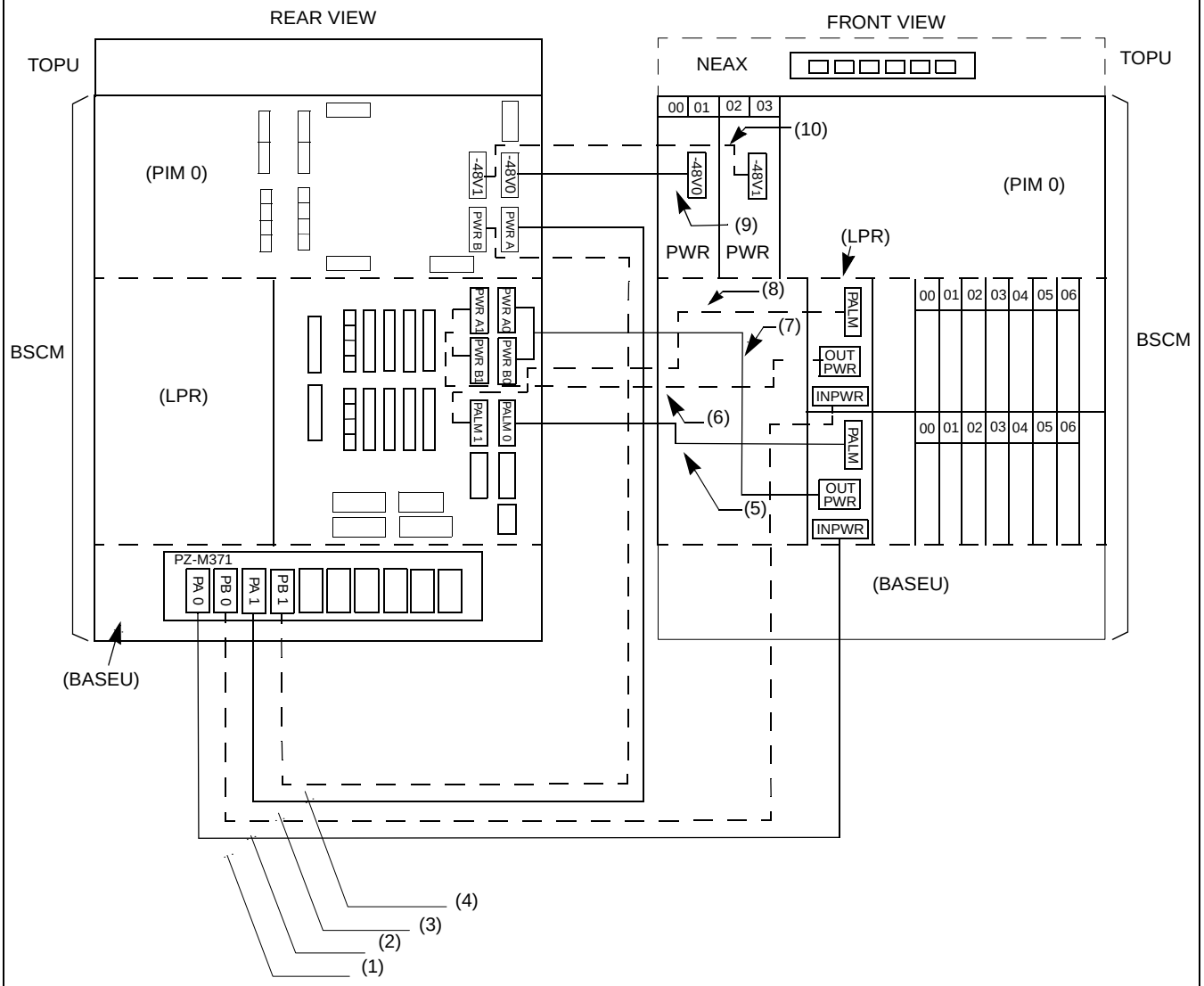

Figure 010-6 Details on Power Cable Connections (for 1-PIM System) (Single IMG Configuration)

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Internal Cable Connections

Table 010-2 Power Cable Connection for IMG0 (Single IMG Configuration)

No.	FROM		TO		CABLE NAME	REMARKS
	UNIT/ MODULE	CONNECTOR NAME	UNIT/ MODULE	CONNECTOR NAME		
1	LPR	INPWR	BASEU	PA0	4P-2P PWR CA-A	
2	LPR	INPWR	BASEU	PB0	4P-2P PWR CA-B	
3	BASEU	PA1	PIM0	PWR A	4P PWR CA-C	
4	BASEU	PB1	PIM0	PWR B	4P PWR CA-D	
5	LPR	PALM	LPR	PALM 0	10AL-(110) FLT CA	
6	LPR	OUT PWR	LPR	PWR A1/PWR B1	6P-(4P-3P) PWR CA-B	
7	LPR	OUT PWR	LPR	PWR A0/PWR B0	6P-(4P-3P) PWR CA-A	
8	LPR	PALM	LPR	PALM 1	10AL-(130) FLT CA	
9	PIM0 (PWR)	-48V IN CONN	PIM0	-48V0	3P PWR CA-A	-48V0
10	PIM0 (PWR)	-48V IN CONN	PIM0	-48V1	3P PWR CA-B	-48V1

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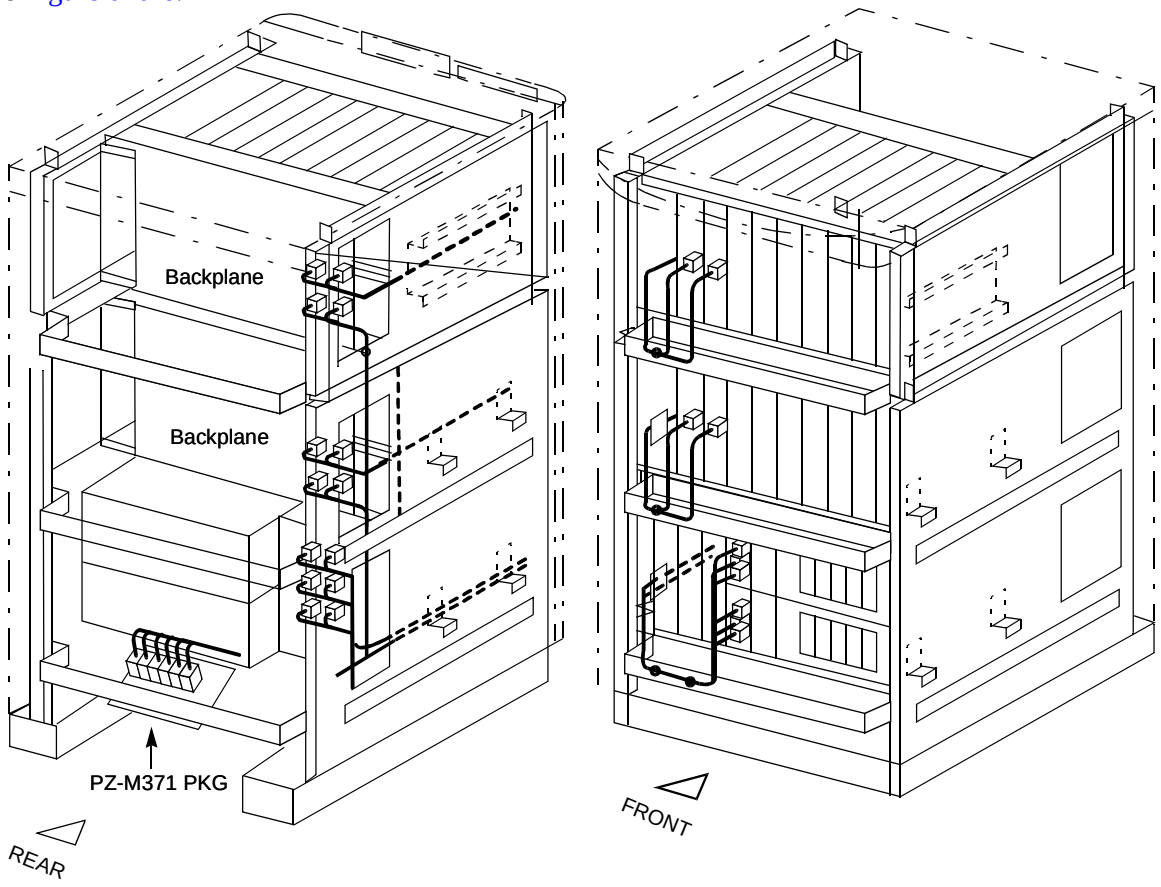
Internal Cable Connections

Run the power cables, referring to Figure 010-6. Then, fasten the cables to the cabinet, referring to Figure 010-7.

Below is the rough sketch of how to run the power cables for the 2-PIM system. For details on actual cable runnings, see Figure 010-6.



Note: *Normally, the cables are fastened onto the cabinet at the proposed locations, where small dots ( ) are provided in this figure.*

Figure 010-7 Power Cable Connections for 2-PIM System (Single IMG Configuration)

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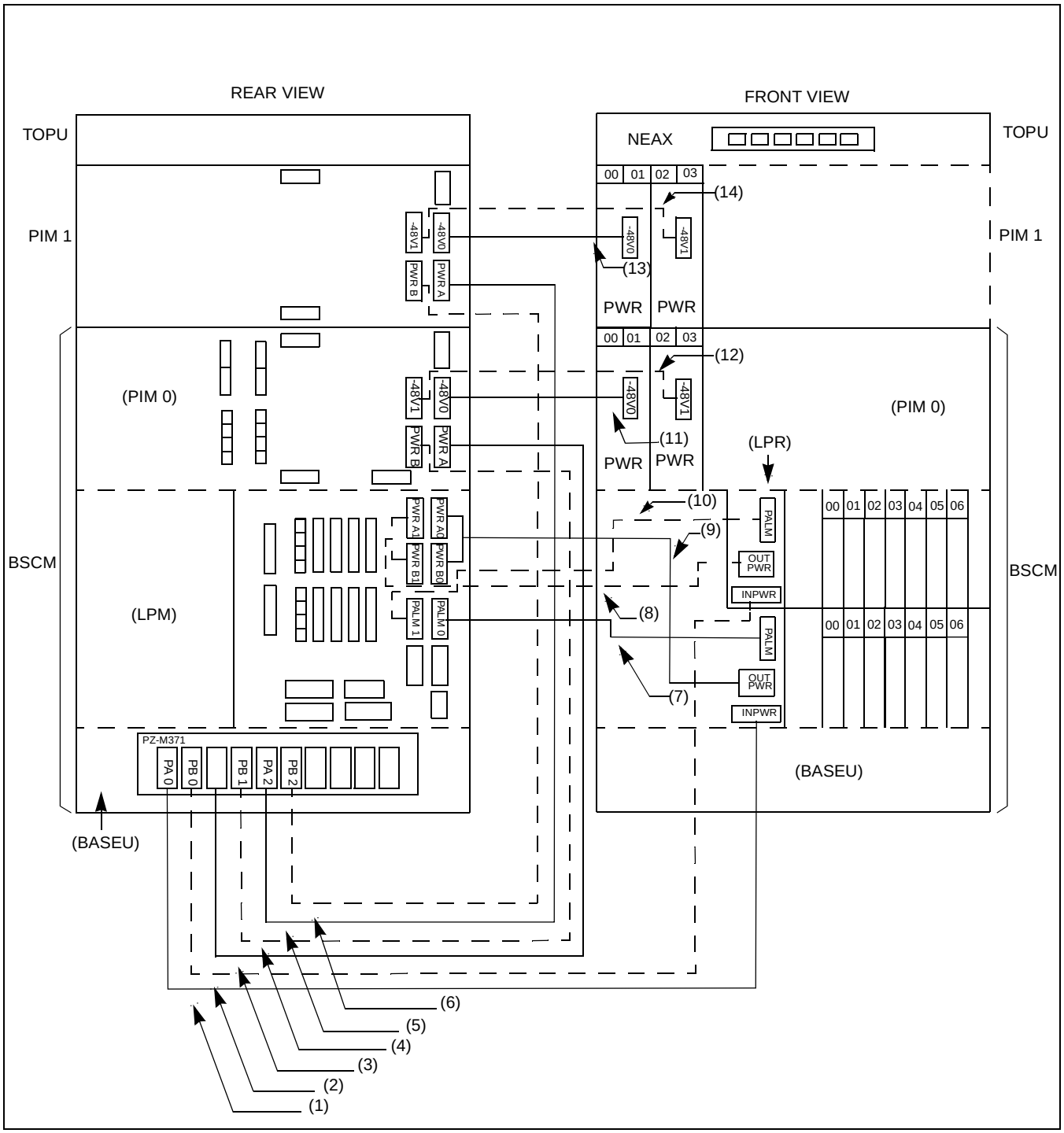

Figure 010-8 Details on Power Cable Connections (for 2-PIM System) (Single IMG Configuration)

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Internal Cable Connections

Table 010-3 Power Cable Connections for 2-PIM System (Single IMG Configuration)

No.	FROM		TO		CABLE NAME	REMARKS
	UNIT/ MODULE	CONNECTOR NAME	UNIT/ MODULE	CONNECTOR NAME		
1	LPR	INPWR	BASEU	PA0	4P-2P PWR CA-A	
2	LPR	INPWR	BASEU	PB0	4P-2P PWR CA-B	
3	BASEU	PA1	PIM0	PWR A	4P PWR CA-C	
4	BASEU	PB1	PIM0	PWR B	4P PWR CA-D	
5	BASEU	PA2	PIM1	PWR A	4P PWR CA-E	
6	BASEU	PB2	PIM1	PWR B	4P PWR CA-F	
7	LPR	PALM	LPR	PALM 0	10AL-(110) FLT CA	
8	LPR	OUT PWR	LPR	PWR A1/PWR B1	6P-(4P-3P) PWR CA-B	
9	LPR	OUT PWR	LPR	PWR A0/PWR B0	6P-(4P-3P) PWR CA-A	
10	LPR	PALM	LPR	PALM 1	10AL-(130) FLT CA	
11	PIM0 (PWR)	-48V IN CONN	PIM0	-48V0	3P PWR CA-A	-48V0
12	PIM0 (PWR)	-48V IN CONN	PIM0	-48V1	3P PWR CA-B	-48V1
13	PIM1 (PWR)	-48V IN CONN	PIM1	-48V0	3P PWR CA-A	-48V0
14	PIM1 (PWR)	-48V IN CONN	PIM1	-48V1	3P PWR CA-B	-48V1

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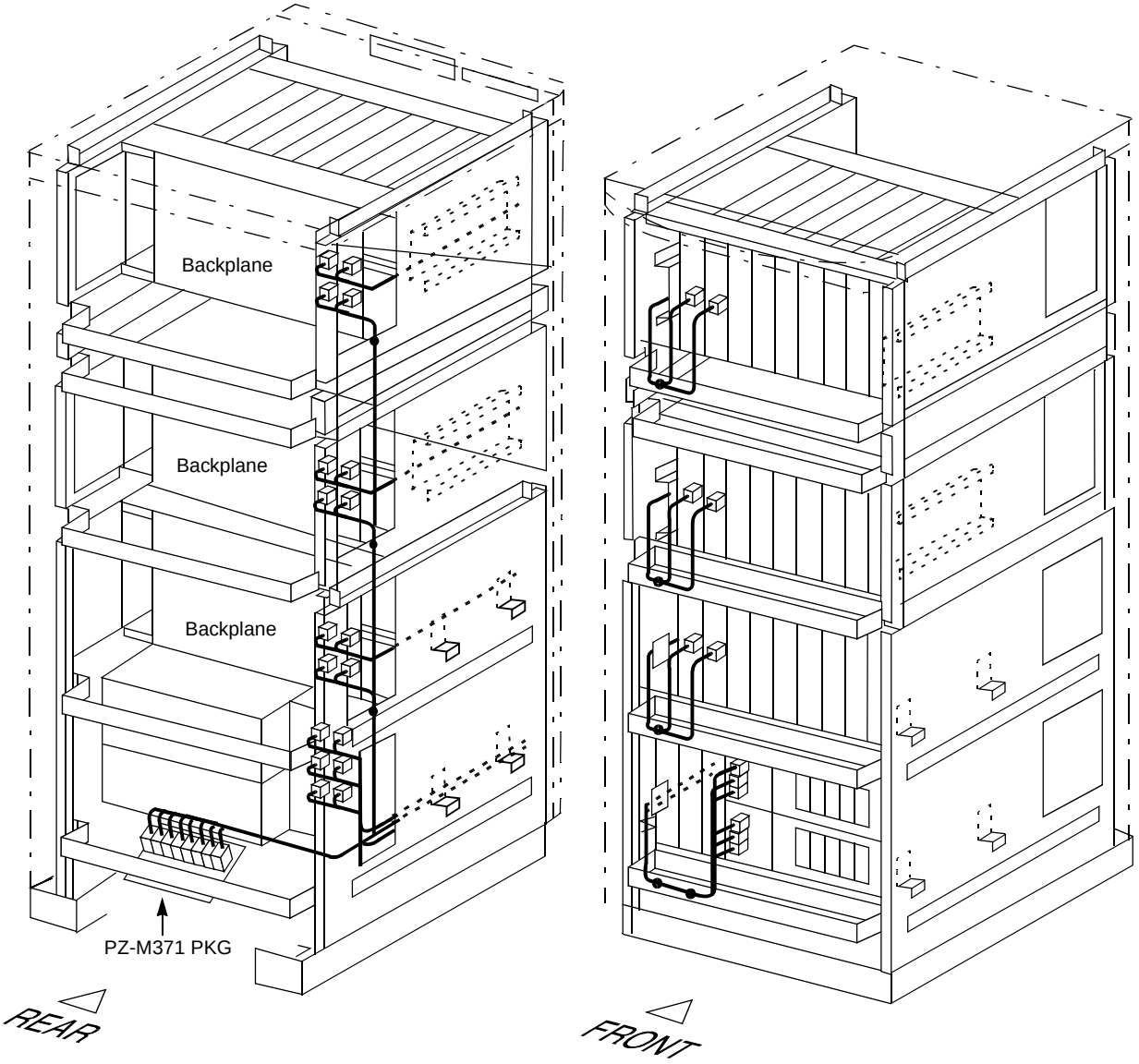
Internal Cable Connections

Run the power cables, referring to Figure 010-10. Then, fasten the cables to the cabinet, referring to Figure 010-9.

Below is the rough sketch of how to run the power cables for the 3-PIM system. For details on actual cable runnings, see Figure 010-10.



Note: *Normally, the cables are fastened onto the cabinet at the proposed locations, where small dots (•) are provided in this figure.*

Figure 010-9 Power Cable Connections for 3-PIM System (Single IMG Configuration)

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Internal Cable Connections

Connect the power cables as shown below. Cables represented in dotted lines indicate power cables for a dual-system.

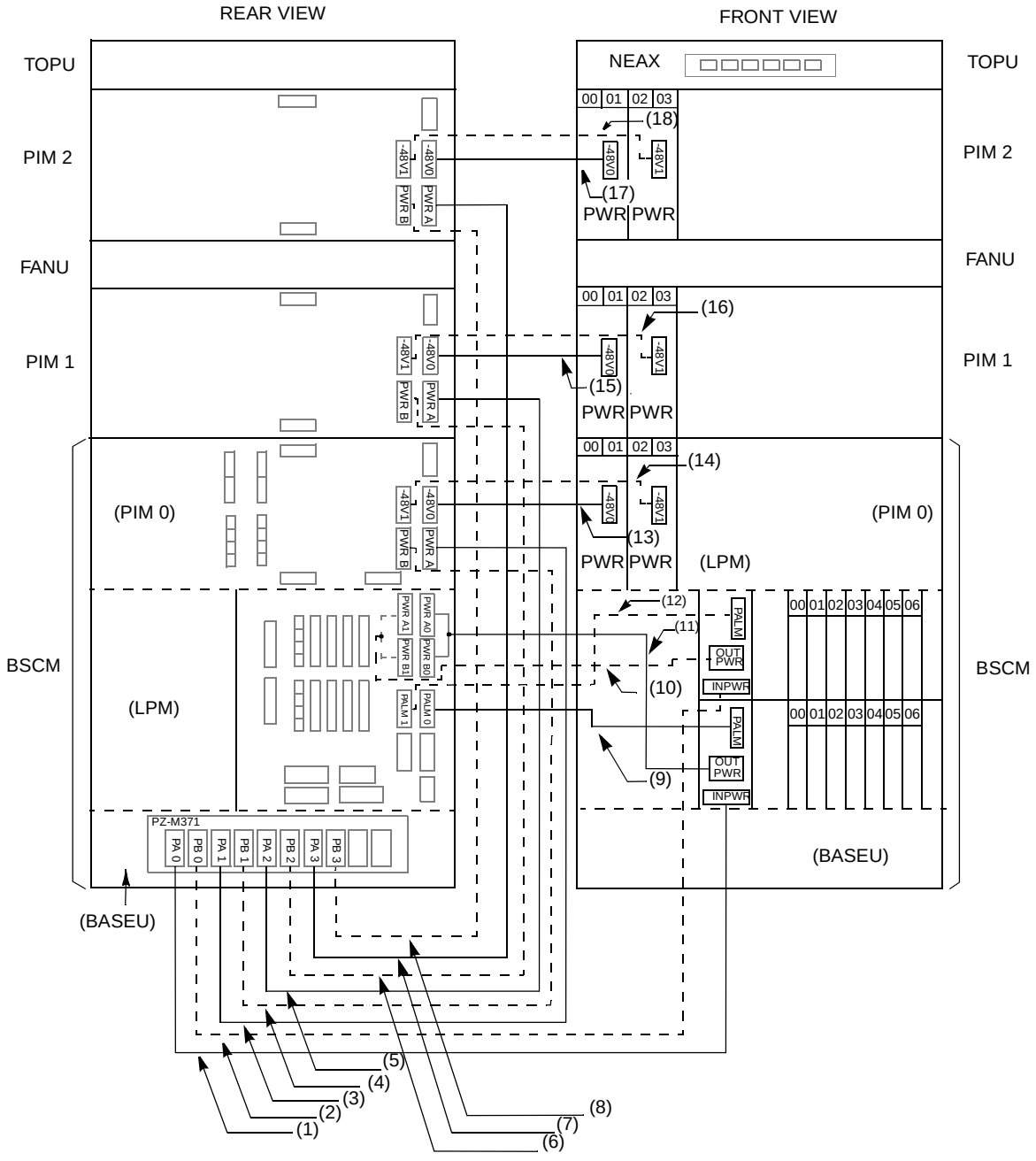

Figure 010-10 Details on Power Cable Connections (for 3-PIM System) (Single IMG Configuration)

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Internal Cable Connections

Table 010-4 Power Cable Connections for 3-PIM System (Single IMG Configuration)

No.	FROM		TO		CABLE NAME	REMARKS
	UNIT/ MODULE	CONNECTOR NAME	UNIT/ MODULE	CONNECTOR NAME		
1	LPR	INPWR	BASEU	PA0	4P-2P PWR CA-A	
2	LPR	INPWR	BASEU	PB0	4P-2P PWR CA-B	
3	BASEU	PA1	PIM0	PWR A	4P PWR CA-C	
4	BASEU	PB1	PIM0	PWR B	4P PWR CA-D	
5	BASEU	PA2	PIM1	PWR A	4P PWR CA-E	
6	BASEU	PB2	PIM1	PWR B	4P PWR CA-F	
7	BASEU	PA3	PIM2	PWR A	4P PWR CA-G	
8	BASEU	PB3	PIM2	PWR B	4P PWR CA-H	
9	LPR	PALM	LPR	PALM 0	10AL-(110) FLT CA	
10	LPR	OUT PWR	LPR	PWR A1/PWR B1	6P-(4P-3P) PWR CA-B	
11	LPR	OUT PWR	LPR	PWR A0/PWR B0	6P-(4P-3P) PWR CA-A	
12	LPR	PALM	LPR	PALM 1	10AL-(130) FLT CA	
13	PIM0 (PWR)	-48V IN CONN	PIM0	-48V0	3P PWR CA-A	-48V0
14	PIM0 (PWR)	-48V IN CONN	PIM0	-48V1	3P PWR CA-B	-48V1
15	PIM1 (PWR)	-48V IN CONN	PIM1	-48V0	3P PWR CA-A	-48V0
16	PIM1 (PWR)	-48V IN CONN	PIM1	-48V1	3P PWR CA-B	-48V1
17	PIM2 (PWR)	-48V IN CONN	PIM2	-48V0	3P PWR CA-A	-48V0
18	PIM2 (PWR)	-48V IN CONN	PIM2	-48V1	3P PWR CA-B	-48V1

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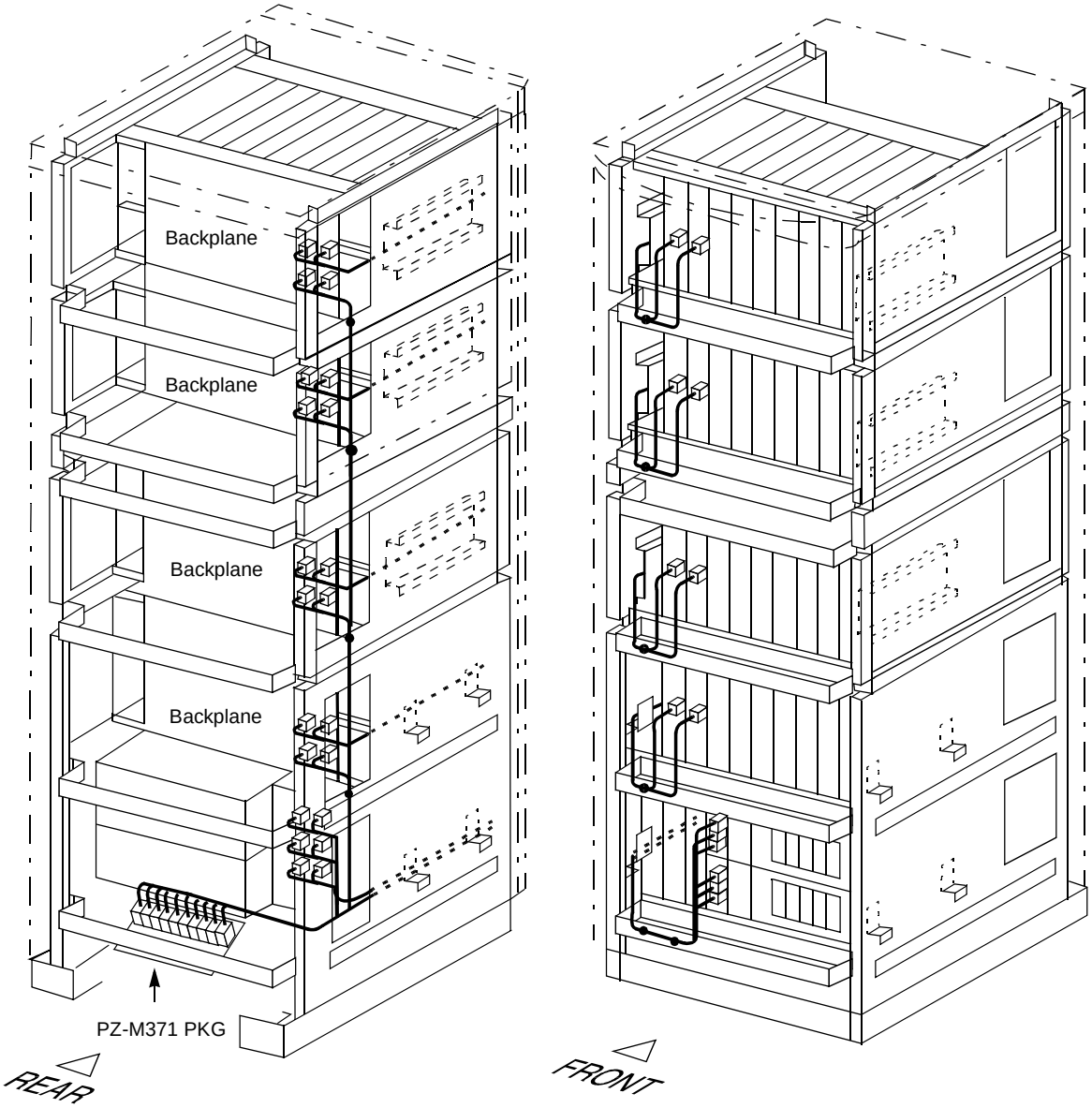
Internal Cable Connections

Run the power cables, referring to Figure 010-12. Then, fasten the cables to the cabinet, referring to Figure 010-11.

Below is the rough sketch of how to run the power cables for the 4-PIM system. For details on actual cable runnings, see Figure 010-12.



Note: *Normally, the cables are fastened onto the cabinet at the proposed locations, where small dots (•) are provided in this figure.*

Figure 010-11 Power Cable Connections for 4-PIM System (Single IMG Configuration)

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Internal Cable Connections

Connect the power cables as shown below. Cables represented in dotted-lines indicate power cables for a dual-system.

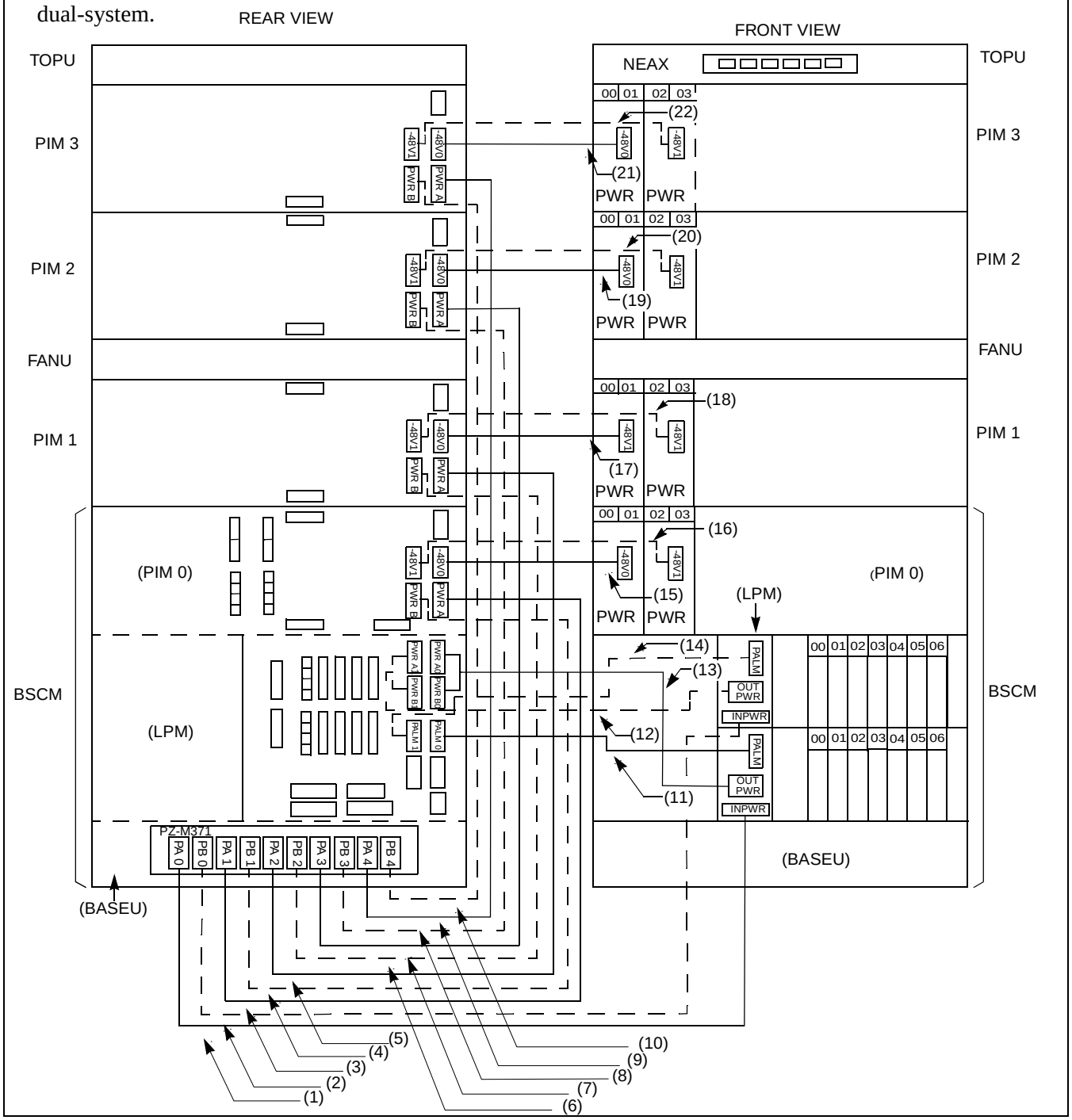

Figure 010-12 Details on Power Cable Connections (for 4-PIM System) (Single IMG Configuration)

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Internal Cable Connections

Table 010-5 Power Cable Connections for 4-PIM System (Single IMG Configuration)

No.	FROM		TO		CABLE NAME	REMARKS
	UNIT/ MODULE	CONNECTOR NAME	UNIT/ MODULE	CONNECTOR NAME		
1	LPR	INPWR	BASEU	PA0	4P-2P PWR CA-A	
2	LPR	INPWR	BASEU	PB0	4P-2P PWR CA-B	
3	BASEU	PA1	PIM0	PWR A	4P PWR CA-C	
4	BASEU	PB1	PIM0	PWR B	4P PWR CA-D	
5	BASEU	PA2	PIM1	PWR A	4P PWR CA-E	
6	BASEU	PB2	PIM1	PWR B	4P PWR CA-F	
7	BASEU	PA3	PIM2	PWR A	4P PWR CA-G	
8	BASEU	PB3	PIM2	PWR B	4P PWR CA-H	
9	BASEU	PA4	PIM3	PWR A	4P PWR CA-I	
10	BASEU	PB4	PIM3	PWR B	4P PWR CA-J	
11	LPR	PALM	LPR	PALM 0	10AL-(110) FLT CA	
12	LPR	OUT PWR	LPR	PWR A1/PWR B1	6P-(4P-3P) PWR CA-B	
13	LPR	OUT PWR	LPR	PWR A0/PWR B0	6P-(4P-3P) PWR CA-A	
14	LPR	PALM	LPR	PALM 1	10AL-(130) FLT CA	
15	PIM0 (PWR)	-48V IN CONN	PIM0	-48V0	3P PWR CA-A	-48V0
16	PIM0 (PWR)	-48V IN CONN	PIM0	-48V1	3P PWR CA-B	-48V1
17	PIM1 (PWR)	-48V IN CONN	PIM1	-48V0	3P PWR CA-A	-48V0
18	PIM1 (PWR)	-48V IN CONN	PIM1	-48V1	3P PWR CA-B	-48V1
19	PIM2 (PWR)	-48V IN CONN	PIM2	-48V0	3P PWR CA-A	-48V0
20	PIM2 (PWR)	-48V IN CONN	PIM2	-48V1	3P PWR CA-B	-48V1
21	PIM3 (PWR)	-48V IN CONN	PIM3	-48V0	3P PWR CA-A	-48V0
22	PIM3 (PWR)	-48V IN CONN	PIM3	-48V1	3P PWR CA-B	-48V1

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Internal Cable Connections

Run the internal power cables, referring to Figure 010-13 through Figure 010-26.

Connect the internal power cables for IMG0 as shown below. Note that the dotted lines indicate power cables for a dual-system.

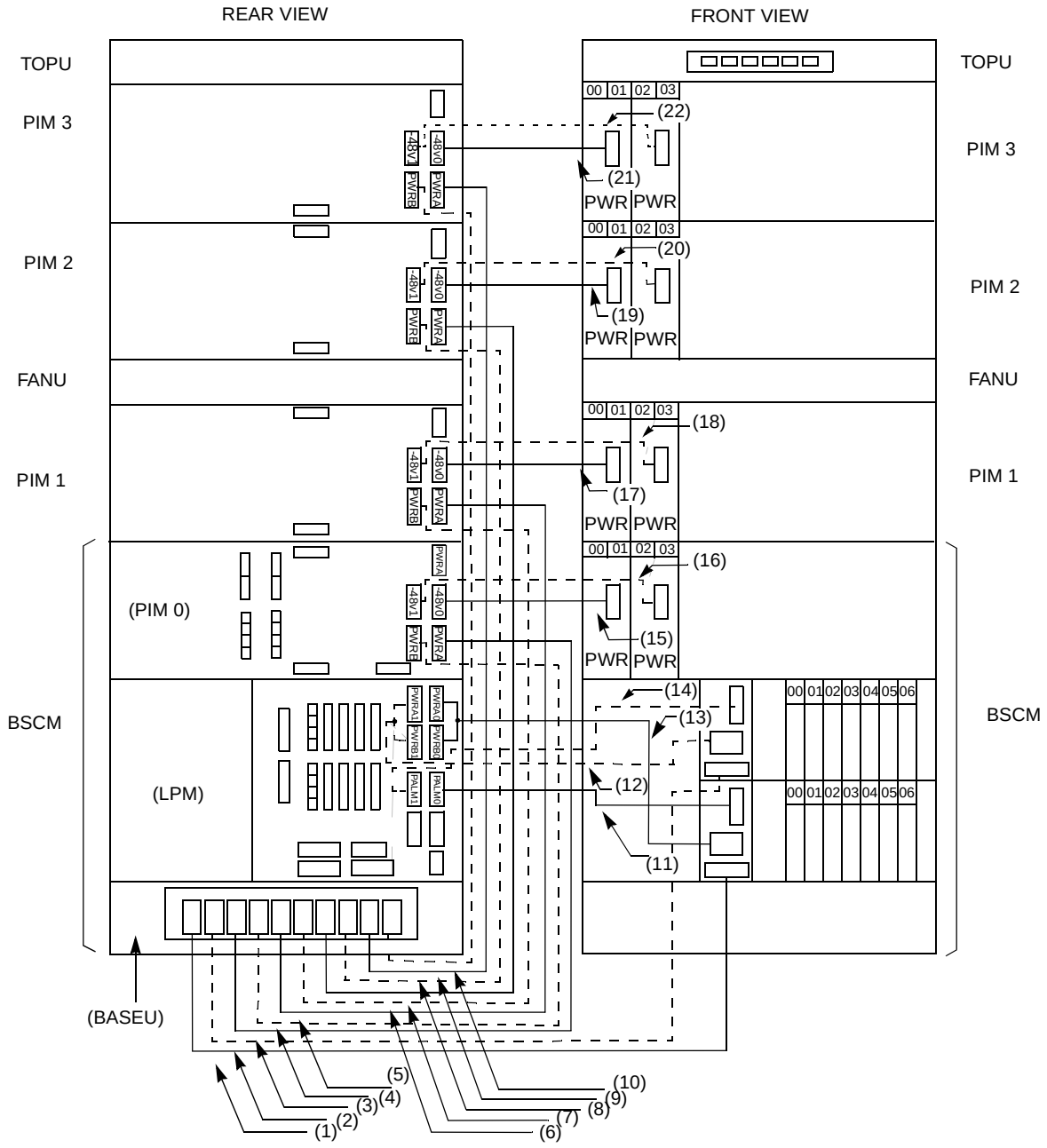

Figure 010-13 Power Cable Connection for IMG0 (Multiple IMG Configuration)

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Internal Cable Connections

Table 010-6 Power Cable Connection for IMG0 (Multiple IMG Configuration)

No.	FROM		TO		CABLE NAME	REMARKS
	UNIT/MODULE	CONNECTOR NAME	UNIT/ MODULE	CONNECTOR NAME		
1	LPM	INPWR	BASEU	PA0	4P-2P PWR CA-A	
2	LPM	INPWR	BASEU	PB0	4P-2P PWR CA-B	
3	BASEU	PA1	PIM0	PWR A	4P PWR CA-C	
4	BASEU	PB1	PIM0	PWR B	4P PWR CA-D	
5	BASEU	PA2	PIM1	PWR A	4P PWR CA-E	
6	BASEU	PB2	PIM1	PWR B	4P PWR CA-F	
7	BASEU	PA3	PIM2	PWR A	4P PWR CA-G	
8	BASEU	PB3	PIM2	PWR B	4P PWR CA-H	
9	BASEU	PA4	PIM3	PWR A	4P PWR CA-I	
10	BASEU	PB4	PIM3	PWR B	4P PWR CA-J	
11	LPM	PALM	LPM	PALM0	10AL-(110) FLT CA	
12	LPM	OUTPWR	LPM	PWR A1/PWR	6P-(4P-3P) PWR CA-B	
13	LPM	OUTPWR	LPM	PWR A0/PWR	6P-(4P-3P) PWR CA-A	
14	LPM	PALM	LPM	PALM1	10AL-(130) FLT CA	
15	PIM0 (PWR)	-48V IN CONN	PIM0	-48V0	3P PWR CA-A	-48V0
16	PIM0 (PWR)	-48V IN CONN	PIM0	-48V1	3P PWR CA-B	-48V1
17	PIM1 (PWR)	-48V IN CONN	PIM1	-48V0	3P PWR CA-A	-48V0
18	PIM1 (PWR)	-48V IN CONN	PIM1	-48V1	3P PWR CA-B	-48V1
19	PIM2 (PWR)	-48V IN CONN	PIM2	-48V0	3P PWR CA-A	-48V0
20	PIM2 (PWR)	-48V IN CONN	PIM2	-48V1	3P PWR CA-B	-48V1
21	PIM3 (PWR)	-48V IN CONN	PIM3	-48V0	3P PWR CA-A	-48V0
22	PIM3 (PWR)	-48V IN CONN	PIM3	-48V1	3P PWR CA-B	-48V1

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Internal Cable Connections

Connect the internal power cables for 1-PIM system of IMG1 as shown below. Note that the dotted lines indicate power cables for a dual-system.

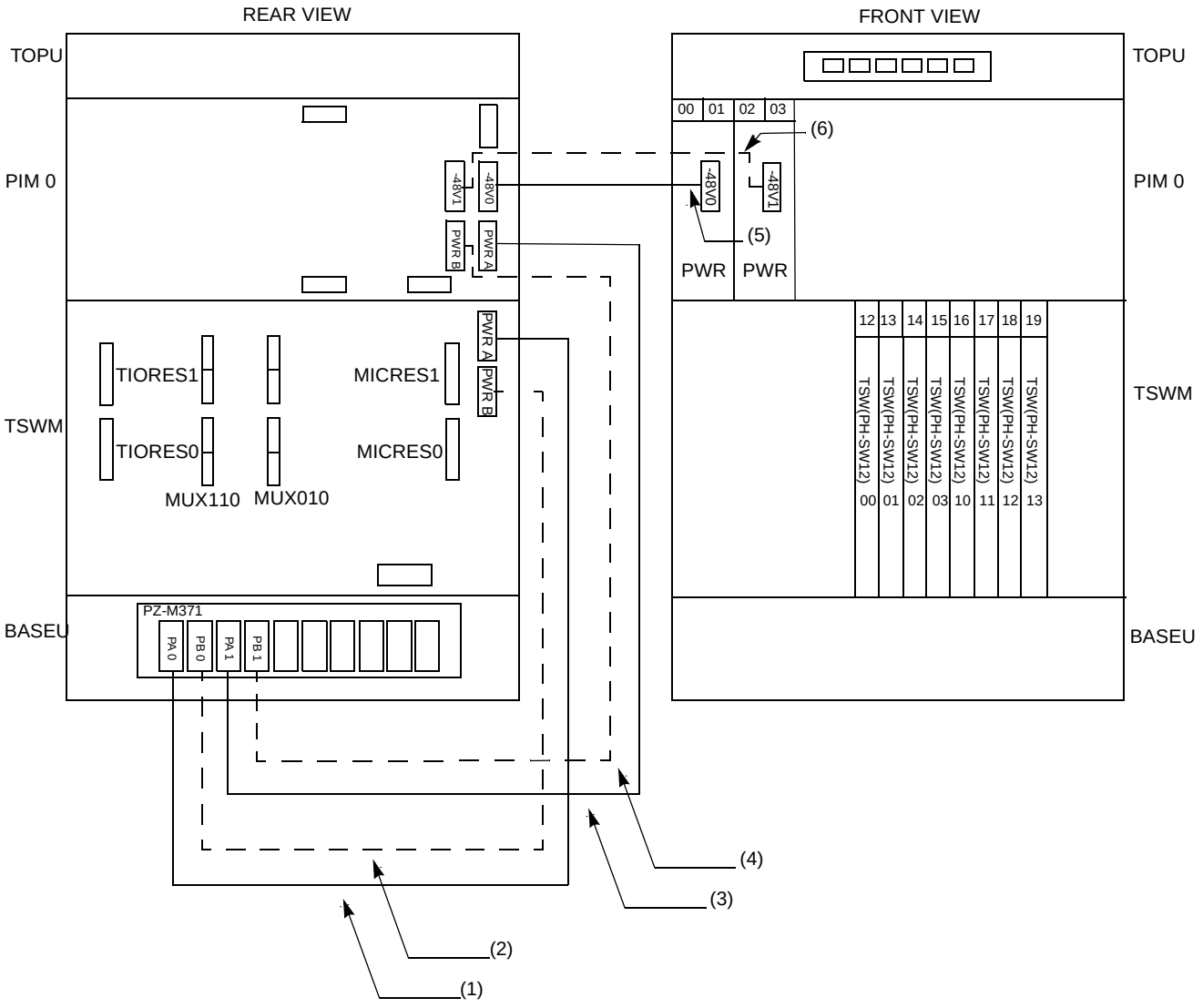

Figure 010-14 Power Cable Connection for IMG1 (1-PIM System) (Multiple IMG Configuration)

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Internal Cable Connections

Table 010-7 Power Cable Connection for IMG1 (1-PIM System) (Multiple IMG Configuration)

No.	FROM		TO		CABLE NAME	REMARKS
	UNIT/MODULE	CONNECTOR NAME	UNIT/ MODULE	CONNECTOR NAME		
1	BASEU	PA0	TSWM	PWR A	4P PWR CA-A	
2	BASEU	PB0	TSWM	PWR B	4P PWR CA-B	
3	BASEU	PA1	PIM0	PWR A	4P PWR CA-C	
4	BASEU	PB1	PIM0	PWR B	4P PWR CA-D	
5	PIM0 (PWR)	-48V IN CONN	PIM0	-48V0	3P PWR CA-A	-48V0
6	PIM0 (PWR)	-48V IN CONN	PIM0	-48V1	3P PWR CA-B	-48V1

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Internal Cable Connections

Connect the internal power cables for 2-PIM system of IMG1 as shown below. Note that the dotted lines indicate power cables for a dual-system.

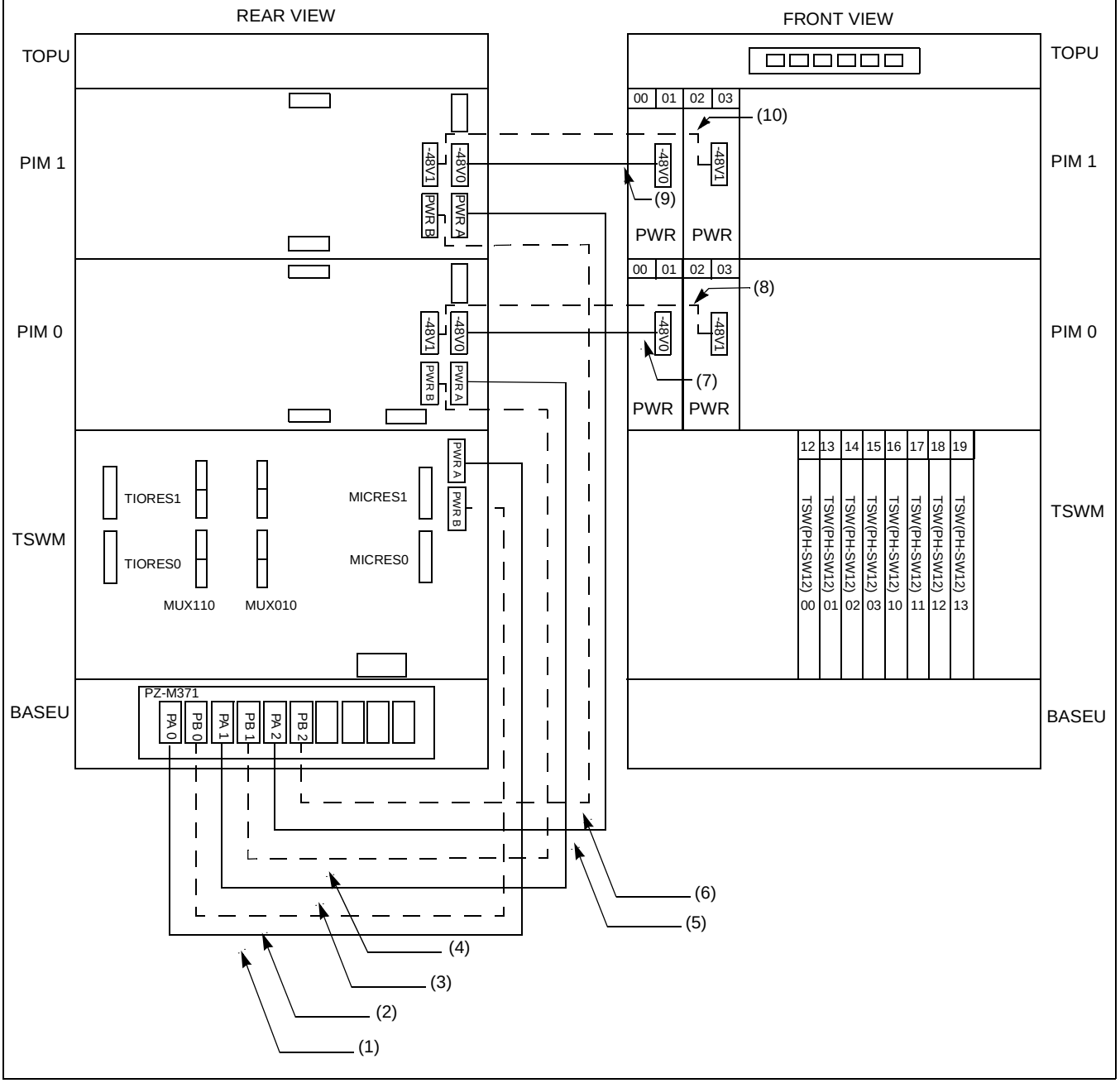

Figure 010-15 Power Cable Connection for IMG1 (2-PIM System) (Multiple IMG Configuration)

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Internal Cable Connections

Table 010-8 Power Cable Connection for IMG1 (2-PIM System) (Multiple IMG Configuration)

No.	FROM		TO		CABLE NAME	REMARKS
	UNIT/MODULE	CONNECTOR NAME	UNIT/ MODULE	CONNECTOR NAME		
1	BASEU	PA0	TSWM	PWR A	4P PWR CA-A	
2	BASEU	PB0	TSWM	PWR B	4P PWR CA-B	
3	BASEU	PA1	PIM0	PWR A	4P PWR CA-C	
4	BASEU	PB1	PIM0	PWR B	4P PWR CA-D	
5	BASEU	PA2	PIM1	PWR A	4P PWR CA-E	
6	BASEU	PB2	PIM1	PWR B	4P PWR CA-F	
7	PIM0 (PWR)	-48V IN CONN	PIM0	-48V0	3P PWR CA-A	-48V0
8	PIM0 (PWR)	-48V IN CONN	PIM0	-48V1	3P PWR CA-B	-48V1
9	PIM1 (PWR)	-48V IN CONN	PIM1	-48V0	3P PWR CA-A	-48V0
10	PIM1 (PWR)	-48V IN CONN	PIM1	-48V1	3P PWR CA-B	-48V1

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Internal Cable Connections

Connect the internal power cables for 3-PIM system of IMG1 as shown below. Note that the dotted lines indicate power cables for a dual-system.

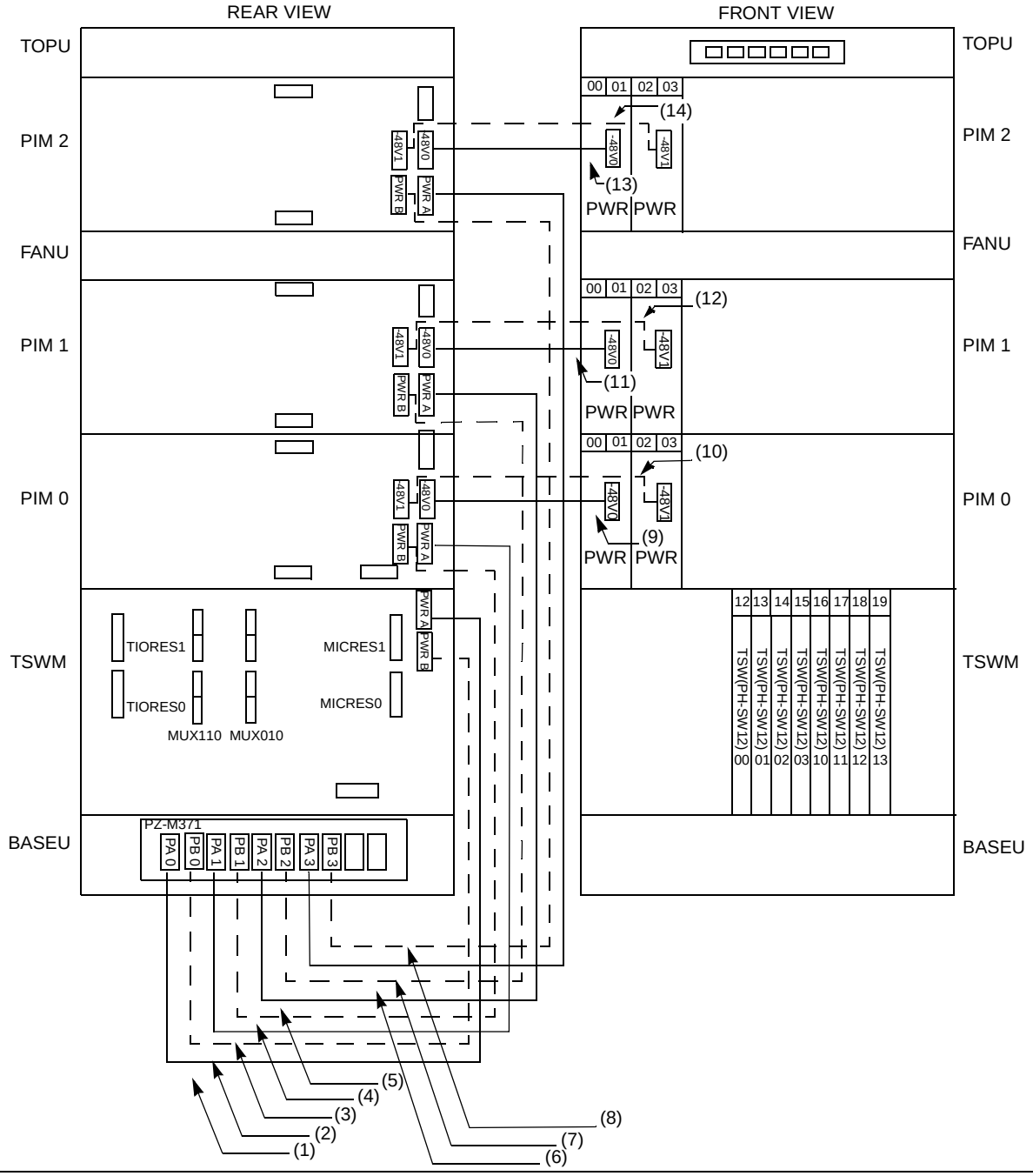

Figure 010-16 Power Cable Connection for IMG1 (3-PIM System) (Multiple IMG Configuration)

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Table 010-9 Power Cable Connection for IMG1 (3-PIM System) (Multiple IMG Configuration)

No.	FROM		TO		CABLE NAME	REMARKS
	UNIT/MODULE	CONNECTOR NAME	UNIT/ MODULE	CONNECTOR NAME		
1	BASEU	PA0	TSWM	PWR A	4P PWR CA-A	
2	BASEU	PB0	TSWM	PWR B	4P PWR CA-B	
3	BASEU	PA1	PIM0	PWR A	4P PWR CA-C	
4	BASEU	PB1	PIM0	PWR B	4P PWR CA-D	
5	BASEU	PA2	PIM1	PWR A	4P PWR CA-E	
6	BASEU	PB2	PIM1	PWR B	4P PWR CA-F	
7	BASEU	PA3	PIM2	PWR A	4P PWR CA-G	
8	BASEU	PB3	PIM2	PWR B	4P PWR CA-H	
9	PIM0 (PWR)	-48V IN CONN	PIM0	-48V0	3P PWR CA-A	-48V0
10	PIM0 (PWR)	-48V IN CONN	PIM0	-48V1	3P PWR CA-B	-48V1
11	PIM1 (PWR)	-48V IN CONN	PIM1	-48V0	3P PWR CA-A	-48V0
12	PIM1 (PWR)	-48V IN CONN	PIM1	-48V1	3P PWR CA-B	-48V1
13	PIM2 (PWR)	-48V IN CONN	PIM2	-48V0	3P PWR CA-A	-48V0
14	PIM2 (PWR)	-48V IN CONN	PIM2	-48V1	3P PWR CA-B	-48V1

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Internal Cable Connections

Connect the internal power cables for 4-PIM system of IMG1 as shown below. Note that the dotted lines indicate power cables for a dual-system.

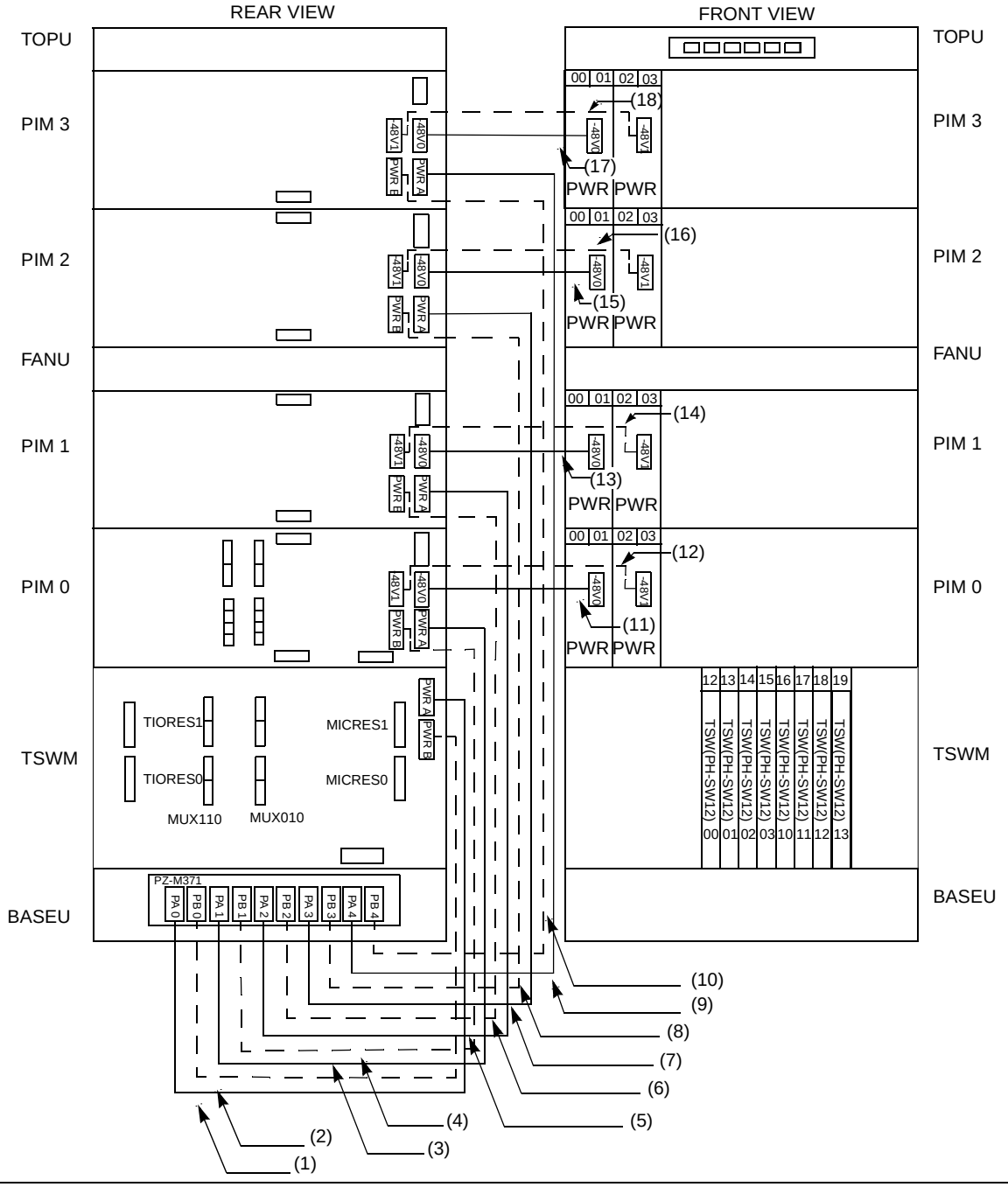

Figure 010-17 Power Cable Connection for IMG1 (4-PIM System) (Multiple IMG Configuration)

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Internal Cable Connections

Table 010-10 Power Cable Connection for IMG1 (4-PIM System) (Multiple IMG Configuration)

No.	FROM		TO		CABLE NAME	REMARKS
	UNIT/MODULE	CONNECTOR NAME	UNIT/ MODULE	CONNECTOR NAME		
1	BASEU	PA0	TSWM	PWR A	4P PWR CA-A	
2	BASEU	PB0	TSWM	PWR B	4P PWR CA-B	
3	BASEU	PA1	PIM0	PWR A	4P PWR CA-C	
4	BASEU	PB1	PIM0	PWR B	4P PWR CA-D	
5	BASEU	PA2	PIM1	PWR A	4P PWR CA-E	
6	BASEU	PB2	PIM1	PWR B	4P PWR CA-F	
7	BASEU	PA3	PIM2	PWR A	4P PWR CA-G	
8	BASEU	PB3	PIM2	PWR B	4P PWR CA-H	
9	BASEU	PA4	PIM3	PWR A	4P PWR CA-I	
10	BASEU	PB4	PIM3	PWR B	4P PWR CA-J	
11	PIM0 (PWR)	-48V IN CONN	PIM0	-48V0	3P PWR CA-A	-48V0
12	PIM0 (PWR)	-48V IN CONN	PIM0	-48V1	3P PWR CA-B	-48V1
13	PIM1 (PWR)	-48V IN CONN	PIM1	-48V0	3P PWR CA-A	-48V0
14	PIM1 (PWR)	-48V IN CONN	PIM1	-48V1	3P PWR CA-B	-48V1
15	PIM2 (PWR)	-48V IN CONN	PIM2	-48V0	3P PWR CA-A	-48V0
16	PIM2 (PWR)	-48V IN CONN	PIM2	-48V1	3P PWR CA-B	-48V1
17	PIM3 (PWR)	-48V IN CONN	PIM3	-48V0	3P PWR CA-A	-48V0
18	PIM3 (PWR)	-48V IN CONN	PIM3	-48V1	3P PWR CA-B	-48V1

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Internal Cable Connections

Connect the internal power cables for 1-PIM system of IMG2/3 as shown below. Note that the dotted lines indicate power cables for a dual-system.

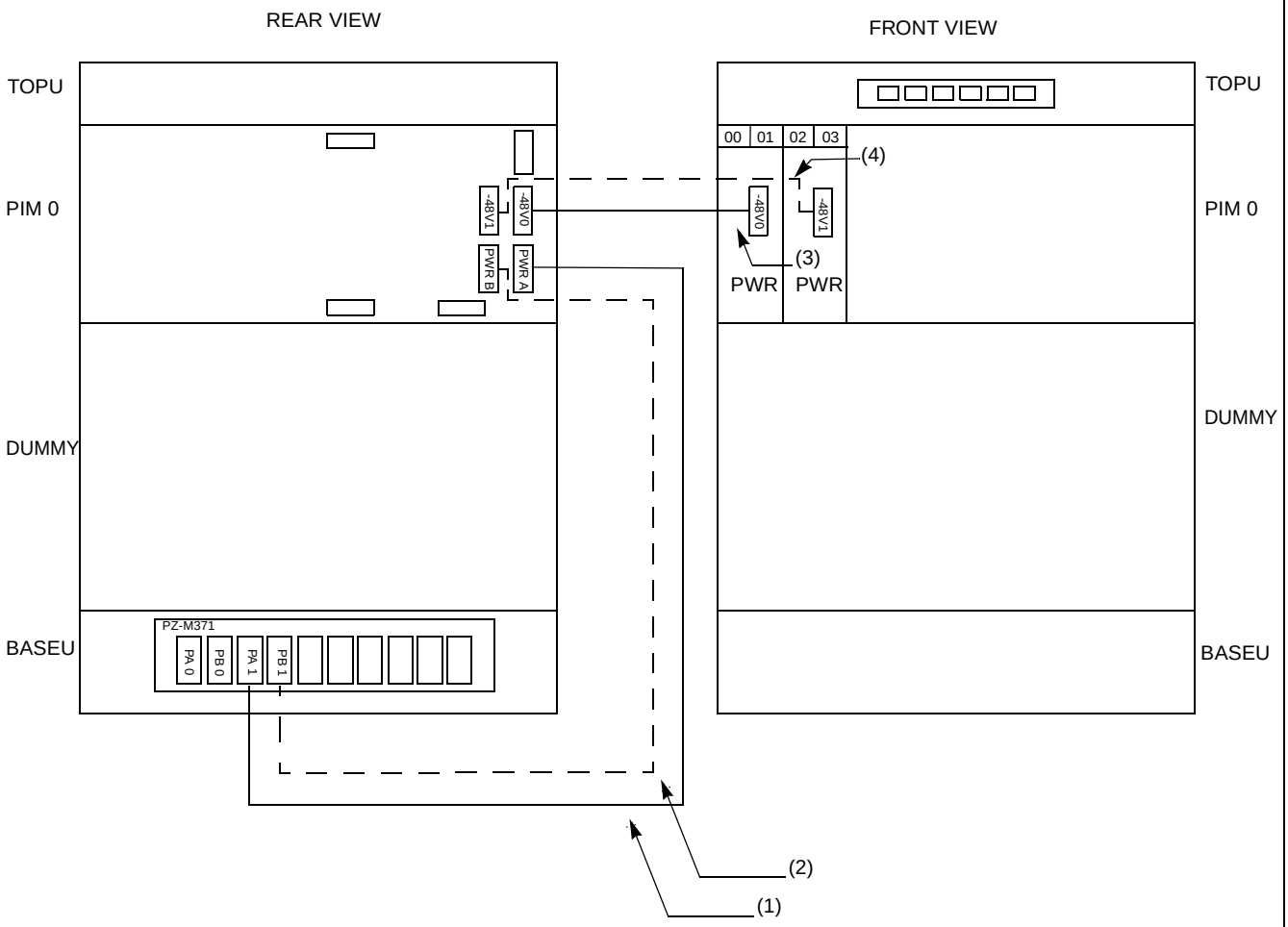

Figure 010-18 Power Cable Connection for IMG2/3 (1-PIM System) (Multiple IMG Configuration)

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Internal Cable Connections

Table 010-11 Power Cable Connection for IMG2/3 (1-PIM System) (Multiple IMG Configuration)

No.	FROM		TO		CABLE NAME	REMARKS
	UNIT/MODULE	CONNECTOR NAME	UNIT/ MODULE	CONNECTOR NAME		
1	BASEU	PA1	PIM0	PWR A	4P PWR CA-C	
2	BASEU	PB1	PIM0	PWR B	4P PWR CA-D	
3	PIM0 (PWR)	-48V IN CONN	PIM0	-48V0	3P PWR CA-A	-48V0
4	PIM0 (PWR)	-48V IN CONN	PIM0	-48V1	3P PWR CA-B	-48V1

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Internal Cable Connections

Connect the internal power cables for 2-PIM system of IMG2/3 as shown below. Note that the dotted lines indicate power cables for a dual-system.

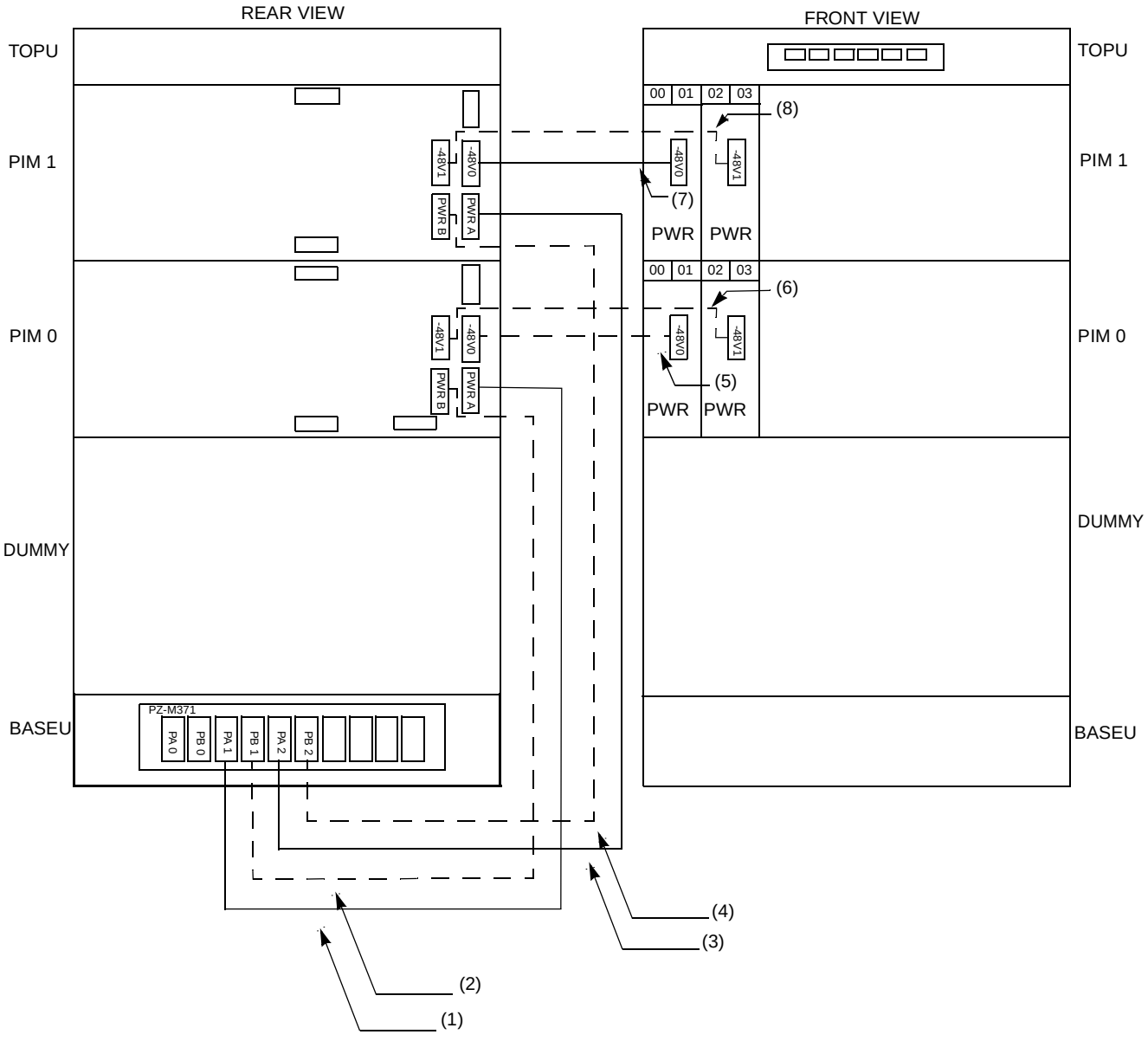

Figure 010-19 Power Cable Connection for IMG2/3 (2-PIM System) (Multiple IMG Configuration)

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Table 010-12 Power Cable Connection for IMG2/3 (2-PIM System) (Multiple IMG Configuration)

No.	FROM		TO		CABLE NAME	REMARKS
	UNIT/MODULE	CONNECTOR NAME	UNIT/ MODULE	CONNECTOR NAME		
1	BASEU	PA1	PIM0	PWR A	4P PWR CA-C	
2	BASEU	PB1	PIM0	PWR B	4P PWR CA-D	
3	BASEU	PA2	PIM1	PWR A	4P PWR CA-E	
4	BASEU	PB2	PIM1	PWR B	4P PWR CA-F	
5	PIM0 (PWR)	-48V IN CONN	PIM0	-48V0	3P PWR CA-A	-48V0
6	PIM0 (PWR)	-48V IN CONN	PIM0	-48V1	3P PWR CA-B	-48V1
7	PIM1 (PWR)	-48V IN CONN	PIM1	-48V0	3P PWR CA-A	-48V0
8	PIM1 (PWR)	-48V IN CONN	PIM1	-48V1	3P PWR CA-B	-48V1

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Internal Cable Connections

Connect the internal power cables for 3-PIM system of IMG2/3 as shown below. Note that the dotted lines indicate power cables for a dual-system.

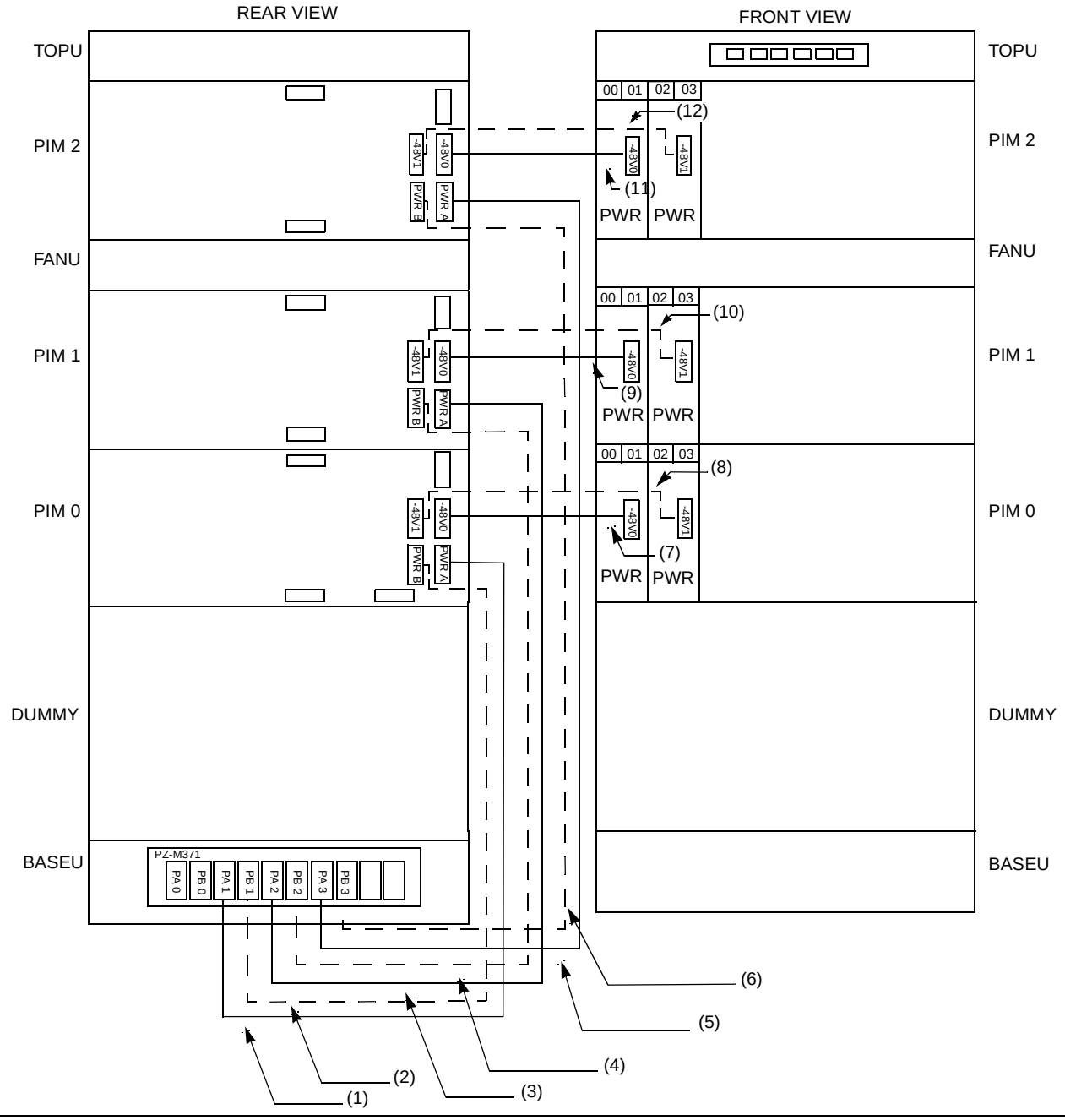

Figure 010-20 Power Cable Connection for IMG2/3 (3-PIM System) (Multiple IMG Configuration)

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Table 010-13 Power Cable Connection for IMG2/3 (3-PIM System) (Multiple IMG Configuration)

No.	FROM		TO		CABLE NAME	REMARKS
	UNIT/MODULE	CONNECTOR NAME	UNIT/ MODULE	CONNECTOR NAME		
1	BASEU	PA1	PIM0	PWR A	4P PWR CA-C	
2	BASEU	PB1	PIM0	PWR B	4P PWR CA-D	
3	BASEU	PA2	PIM1	PWR A	4P PWR CA-E	
4	BASEU	PB2	PIM1	PWR B	4P PWR CA-F	
5	BASEU	PA3	PIM2	PWR A	4P PWR CA-G	
6	BASEU	PB3	PIM2	PWR B	4P PWR CA-H	
7	PIM0 (PWR)	-48V IN CONN	PIM0	-48V0	3P PWR CA-A	-48V0
8	PIM0 (PWR)	-48V IN CONN	PIM0	-48V1	3P PWR CA-B	-48V1
9	PIM1 (PWR)	-48V IN CONN	PIM1	-48V0	3P PWR CA-A	-48V0
10	PIM1 (PWR)	-48V IN CONN	PIM1	-48V1	3P PWR CA-B	-48V1
11	PIM2 (PWR)	-48V IN CONN	PIM2	-48V0	3P PWR CA-A	-48V0
12	PIM2 (PWR)	-48V IN CONN	PIM2	-48V1	3P PWR CA-B	-48V1

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Connect the internal power cables for 4-PIM system of IMG2/3 as shown below. Note that the dotted lines indicate power cables for a dual-system.

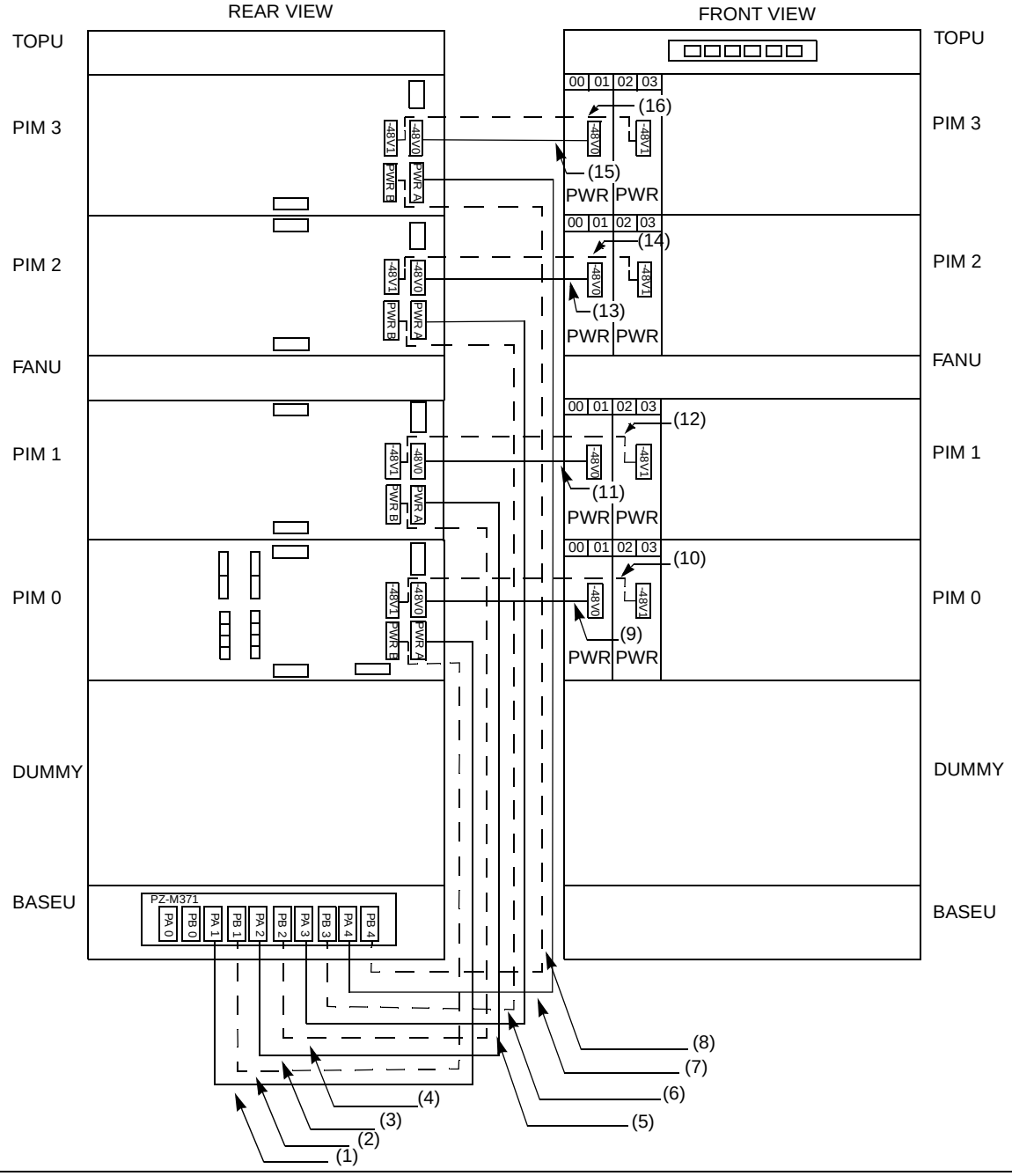

Figure 010-21 Power Cable Connection for IMG2/3 (4-PIM System) (Multiple IMG Configuration)

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Table 010-14 Power Cable Connection for IMG2/3 (4-PIM System) (Multiple IMG Configuration)

No.	FROM		TO		CABLE NAME	REMARKS
	UNIT/MODULE	CONNECTOR NAME	UNIT/ MODULE	CONNECTOR NAME		
1	BASEU	PA1	PIM0	PWR A	4P PWR CA-C	
2	BASEU	PB1	PIM0	PWR B	4P PWR CA-D	
3	BASEU	PA2	PIM1	PWR A	4P PWR CA-E	
4	BASEU	PB2	PIM1	PWR B	4P PWR CA-F	
5	BASEU	PA3	PIM2	PWR A	4P PWR CA-G	
6	BASEU	PB3	PIM2	PWR B	4P PWR CA-H	
7	BASEU	PB4	PIM3	PWR A	4P PWR CA-I	
8	BASEU	PB4	PIM3	PWR B	4P PWR CA-J	
9	PIM0 (PWR)	-48V IN CONN	PIM0	-48V0	3P PWR CA-A	-48V0
10	PIM0 (PWR)	-48V IN CONN	PIM0	-48V1	3P PWR CA-B	-48V1
11	PIM1 (PWR)	-48V IN CONN	PIM1	-48V0	3P PWR CA-A	-48V0
12	PIM1 (PWR)	-48V IN CONN	PIM1	-48V1	3P PWR CA-B	-48V1
13	PIM2 (PWR)	-48V IN CONN	PIM2	-48V0	3P PWR CA-A	-48V0
14	PIM2 (PWR)	-48V IN CONN	PIM2	-48V1	3P PWR CA-B	-48V1
15	PIM3 (PWR)	-48V IN CONN	PIM3	-48V0	3P PWR CA-A	-48V0
16	PIM3 (PWR)	-48V IN CONN	PIM3	-48V1	3P PWR CA-B	-48V1

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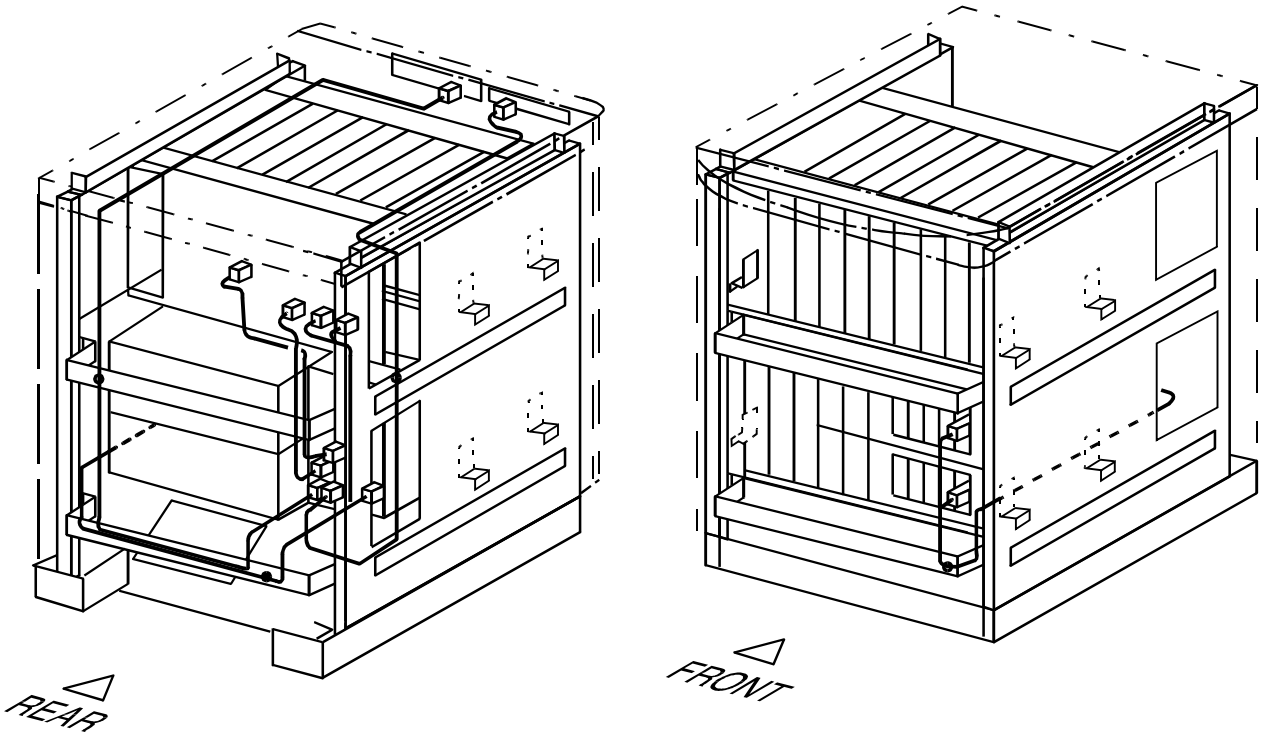
Run the bus cables, referring to Figure 010-23. Then, fasten the cables to the cabinet, referring to Figure 010-22.

The drawing below illustrates how to run the bus cables for the 1-PIM system. For details on actual cable runnings, see Figure 010-23.



Note: *Normally, the cables are fastened onto the cabinet at the proposed locations, where small dots (•) are provided in this figure.*

Figure 010-22 Bus Cable Connections for 1-PIM System (Single IMG Configuration)

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Connect the bus cables as shown below. Note that dotted lines indicate bus cables for a dual system.

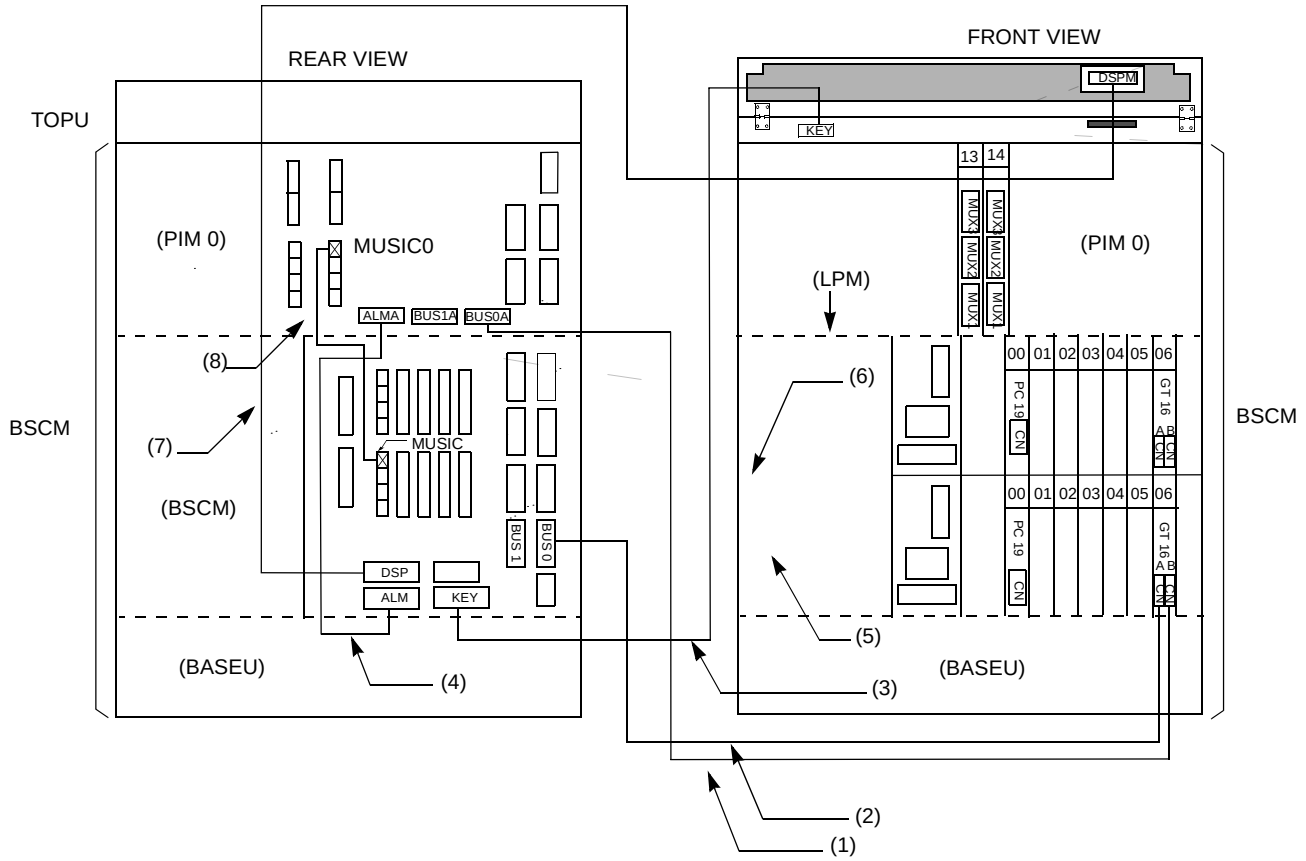

Figure 010-23 Details on Bus Cable Connections (for 1-PIM System) (Single IMG Configuration)

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Internal Cable Connections

Table 010-15 Bus Cable Connections for 1-PIM System (Single IMG Configuration)

No.	FROM		TO		CABLE NAME	REMARKS
	UNIT/ MODULE	CONNECTOR NAME	UNIT/ MODULE	CONNECTOR NAME		
1	LPR (GT 16)	CN-B (Front Connector)	PIM0	BUS0A	50-40 GT BUS CA-A	
2	LPR (GT 16)	CN-A (Front Connector)	LPR	BUS0	EXGT BUS CA-A	
3	LPR	KEY	TOPU	KEY	10AL-(260) FLT CA	
4	LPR	ALM	PIM0	ALMA	20AL-(60) FLT CA	
5	LPR (GT 16)	CN-A (Front Connector)	LPR	BUS1	EXGT BUS CA-A	
6	LPR (GT 16)	CN-B (Front Connector)	PIM0	BUS1A	50-40 GT BUS CA-A	
7	LPR	DSP	TOPU	DSPM	20AL-(270) FLT CA	
8	LPR	MUSIC	PIM0	MUSIC0	16PH MOH CA (1)	

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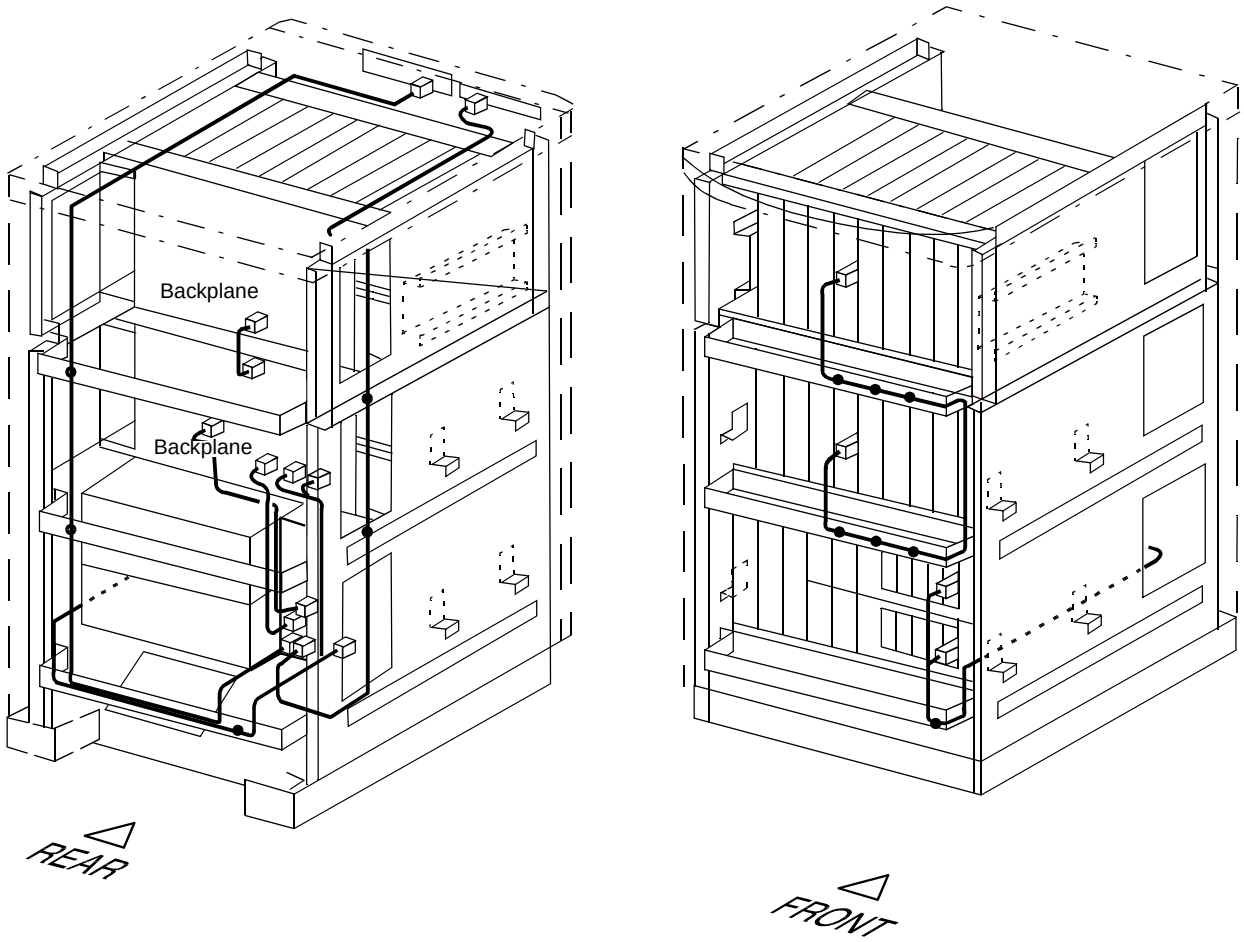
Internal Cable Connections

Run the bus cables, referring to Figure 010-25. Then, fasten the cables to the cabinet, referring to Figure 010-24.

The drawing below illustrates how to run the bus cables for the 2-PIM system. For details on actual cable runnings, see Figure 010-25.



Note: *Normally, the cables are fastened onto the cabinet at the proposed locations, where small dots (•) are provided in this figure.*

Figure 010-24 Bus Cable Connections for 2-PIM System (Single IMG Configuration)

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Connect the bus cables as shown below. Note that dotted lines indicate bus cables for a dual system.

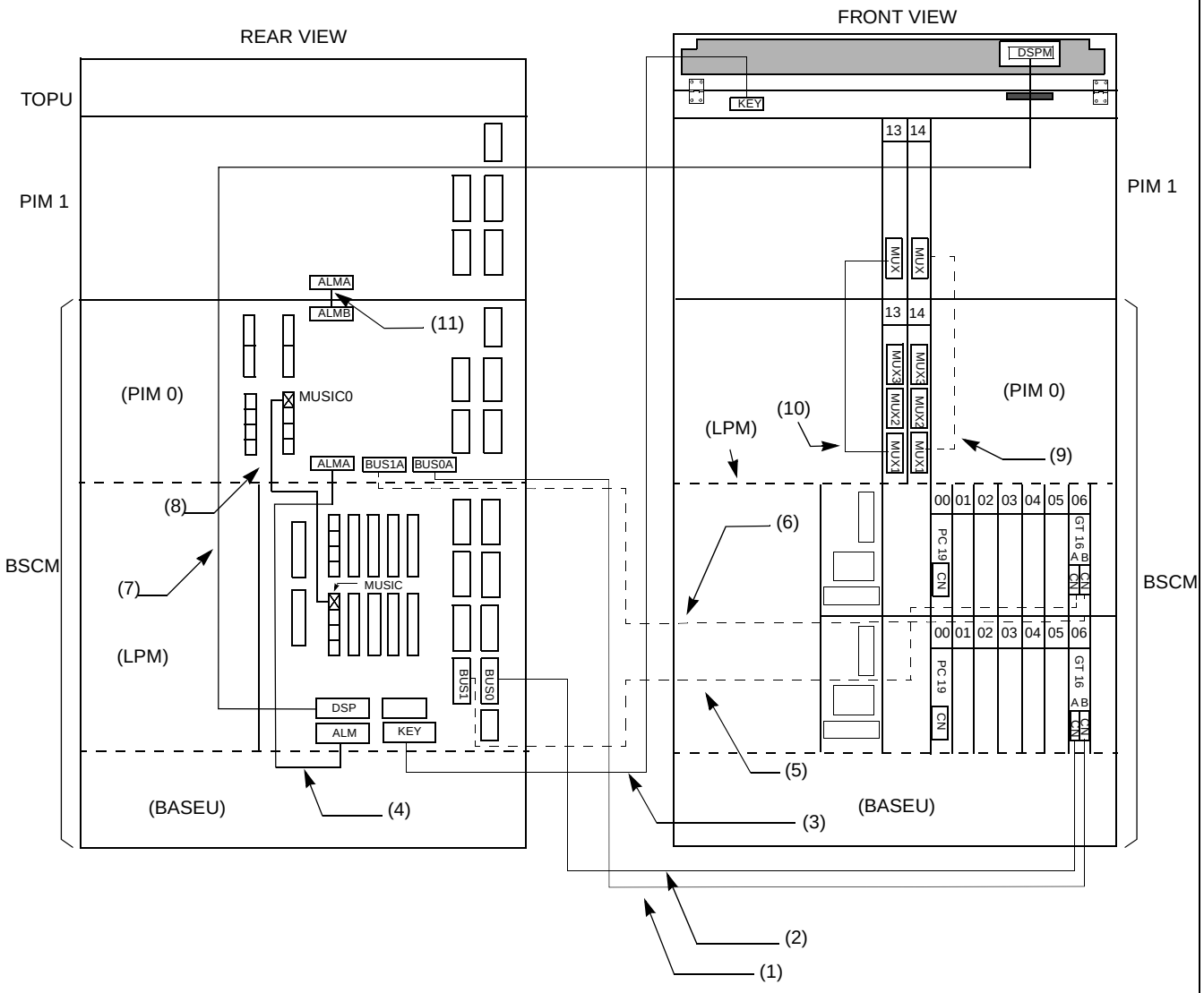

Figure 010-25 Details on Bus Cable Connections (for 2-PIM System) (Single IMG Configuration)

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Internal Cable Connections

Table 010-16 Bus Cable Connections for 2-PIM System (Single IMG Configuration)

No.	FROM		TO		CABLE NAME	REMARKS
	UNIT/MODULE	CONNECTOR NAME	UNIT/ MODULE	CONNECTOR NAME		
1	LPR	CN-B (Front Connector)	PIM0	BUS0A	50-40 GT BUS CA-A	
2	LPR	CN-A (Front Connector)	LPR	BUS0	EXGT BUS CA-A	
3	LPR	KEY	TOPU	KEY	10AL-(260) FLT CA	
4	LPR	ALM	PIM0	ALMA	20AL-(60) FLT CA	
5	LPR (GT 16)	CN-A (Front Connector)	LPR	BUS1	EXGT BUS CA-A	
6	LPR (GT 16)	CN-B (Front Connector)	PIM0	BUS1A	50-40 GT BUS CA-A	
7	LPR	DSP	TOPU	DSPM	20AL-(270) FLT CA	
8	LPR	MUSIC	PIM0	MUSIC0	16PH MOH CA (1)	
9	PIM0	MUX1	PIM1	MUX	MT24 TSW CA-90	
10	PIM0	MUX1	PIM1	MUX	MT24 TSW CA-90	
11	PIM0	ALMB	PIM1	ALMA	20AL-(10) FLT CA	

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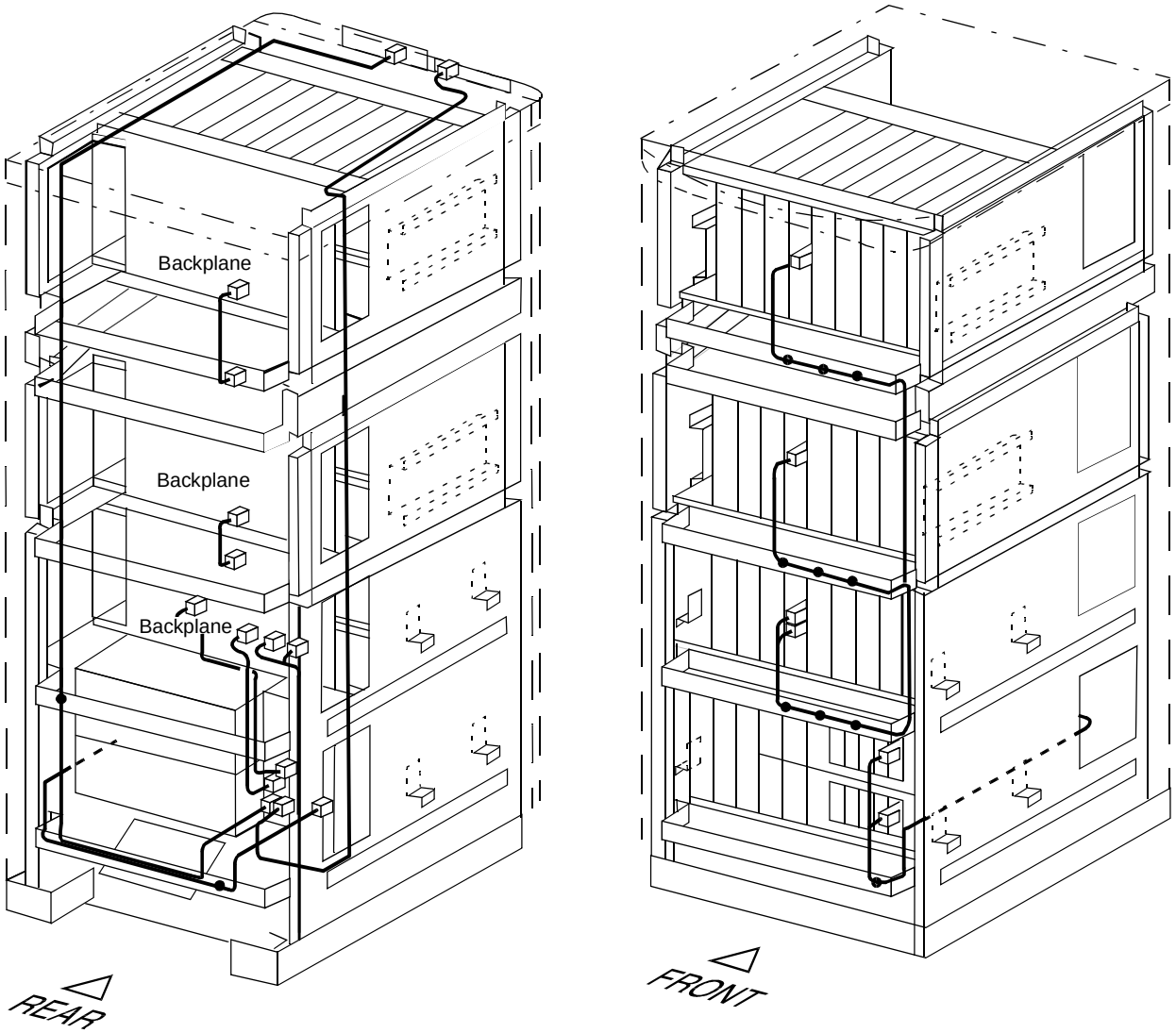
Run the bus cables, referring to Figure 010-27. Then, fasten the cables to the cabinet, referring to Figure 010-26.

The drawing below illustrates how to run the bus cables for the 3-PIM system. For details on actual cable runnings, see Figure 010-27.



Note: *Normally, the cables are fastened onto the cabinet at the proposed locations, where small dots (•) are provided in this figure.*

Figure 010-26 Bus Cable Connections for 3-PIM System (Single IMG Configuration)

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Connect the bus cables as shown below. Note that dotted lines indicate bus cables for a dual system.

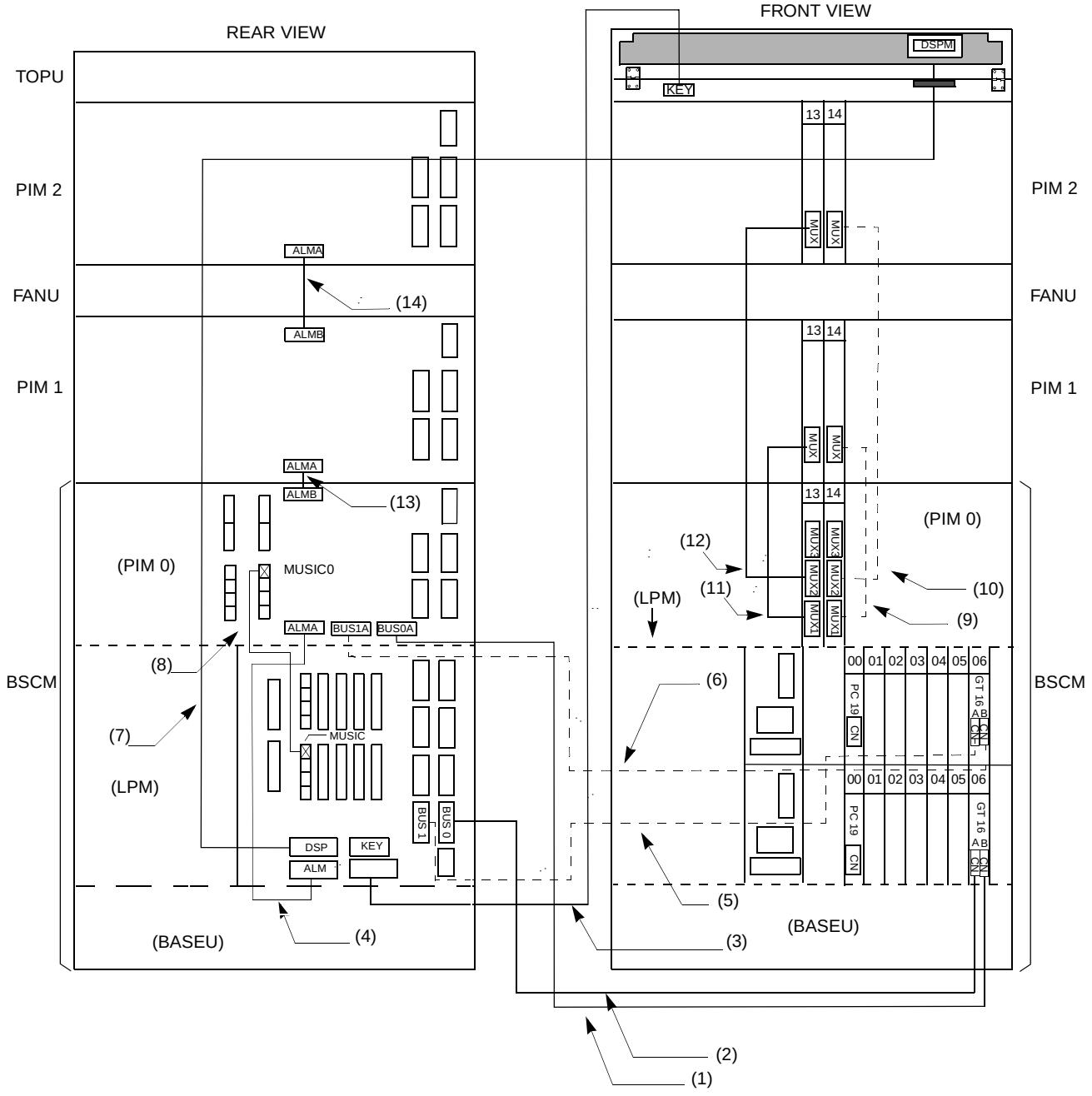

Figure 010-27 Details on Bus Cable Connections (for 3-PIM System) (Single IMG Configuration)

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Internal Cable Connections

Table 010-17 Bus Cable Connections for 3-PIM System (Single IMG Configuration)

No.	FROM		TO		CABLE NAME	REMARKS
	UNIT/MODULE	CONNECTOR NAME	UNIT/ MODULE	CONNECTOR NAME		
1	LPR	CN-B (Front Connector)	PIM0	BUS0A	50-40 GT BUS CA-A	
2	LPR	CN-A (Front Connector)	LPR	BUS0	EXGT BUS CA-A	
3	LPR	KEY	TOPU	KEY	10AL-(260) FLT CA	
4	LPR	ALM	PIM0	ALMA	20AL-(60) FLT CA	
5	LPR (GT 16)	CN-A (Front Connector)	LPR	BUS1	EXGT BUS CA-A	
6	LPR (GT 16)	CN-B (Front Connector)	PIM0	BUS1A	50-40 GT BUS CA-A	
7	LPR	DSP	TOPU	DSPM	20AL-(270) FLT CA	
8	LPR	MUSIC	PIM0	MUSIC0	16PH MOH CA (1)	
9	PIM0	MUX1	PIM1	MUX	MT24 TSW CA-90	
10	PIM0	MUX2	PIM2	MUX	MT24 TSW CA-140	
11	PIM0	MUX1	PIM1	MUX	MT24 TSW CA-90	
12	PIM0	MUX2	PIM2	MUX	MT24 TSW CA-140	
13	PIM0	ALMB	PIM1	ALMA	20AL-(10) FLT CA	
14	PIM1	ALMB	PIM2	ALMA	20AL-(20) FLT CA	

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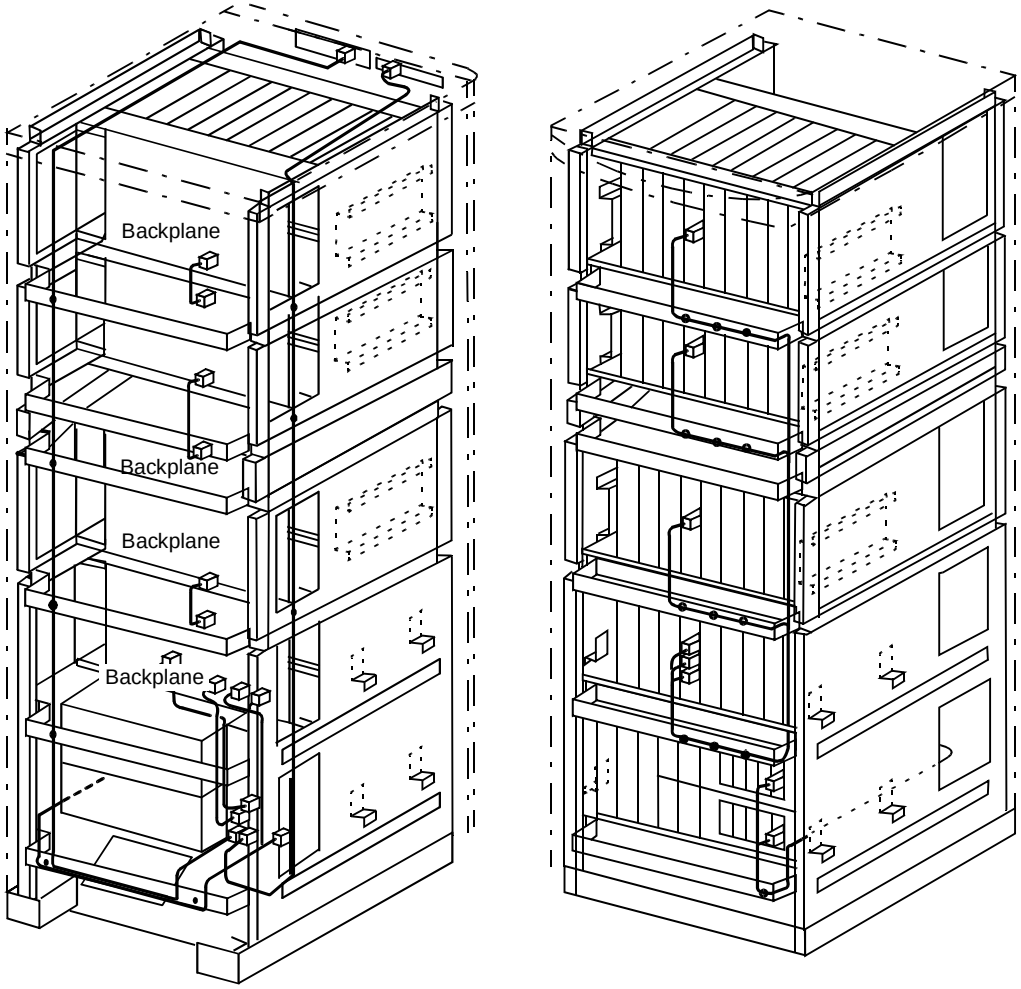
Run the bus cables, referring to Figure 010-29. Then, fasten the cables to the cabinet, referring to Figure 010-28.

The drawing below illustrates how to run the bus cables for the 3-PIM system. For details on actual cable runnings, see Figure 010-29.



Note: *Normally, the cables are fastened onto the cabinet at the proposed locations, where small dots (•) are provided in this figure.*

Figure 010-28 Bus Cable Connections for 4-PIM System (Single IMG Configuration)

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Connect the bus cables as shown below. Note that dotted-lines indicate bus cables for a dual-system.

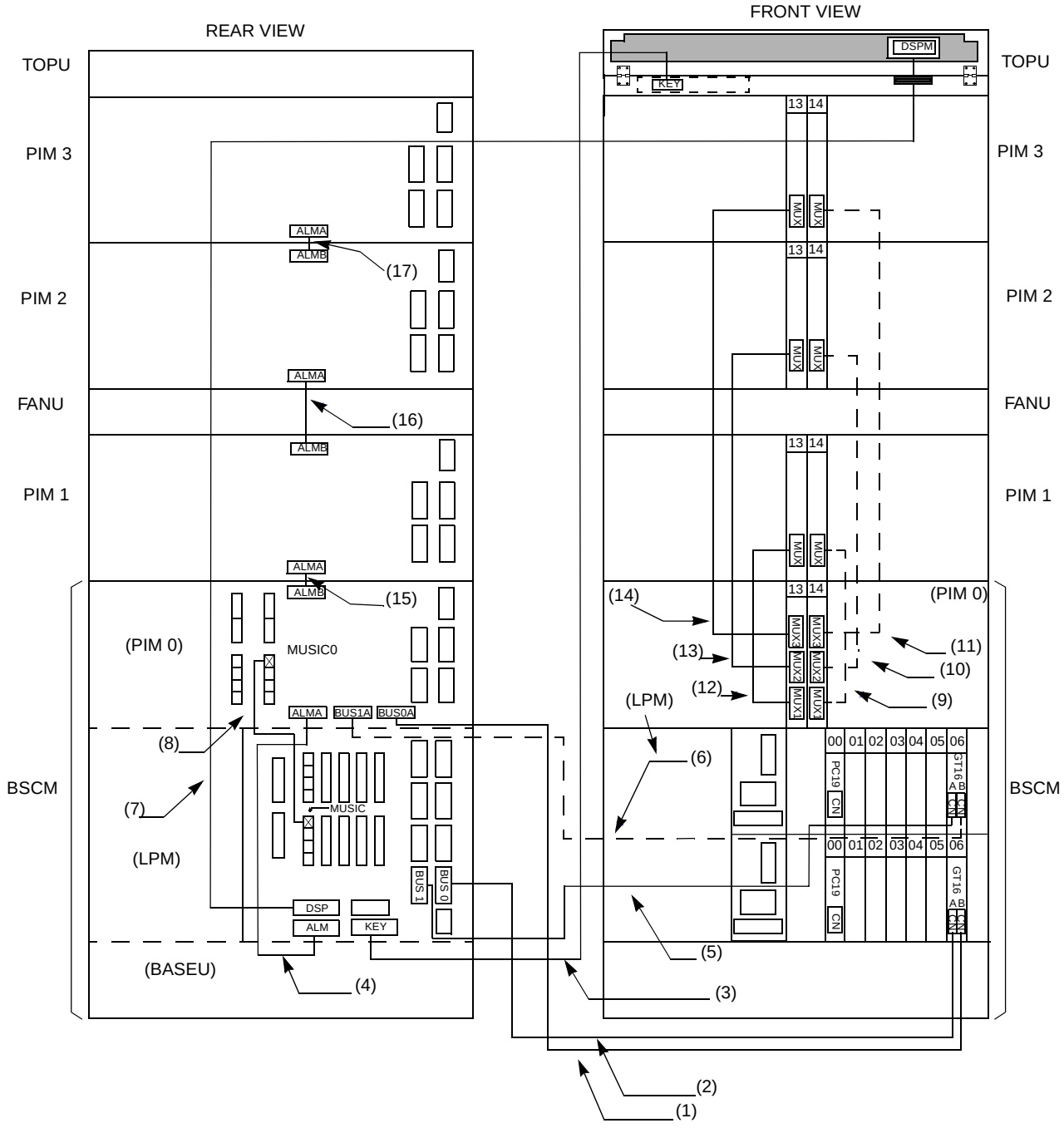

Figure 010-29 Details on Bus Cable Connections (for 4-PIM System) (Single IMG Configuration)

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Table 010-18 Bus Cable Connections for 4-PIM System (Single IMG Configuration)

No.	FROM		TO		CABLE NAME	REMARKS
	UNIT/ MODULE	CONNECTOR NAME	UNIT/ MODULE	CONNECTOR NAME		
1	LPR	CN-B (Front Connector)	PIM0	BUS0A	50-40 GT BUS CA-A	
2	LPR	CN-A (Front Connector)	LPR	BUS0	EXGT BUS CA-A	
3	LPR	KEY	TOPU	KEY	10AL-(260) FLT CA	
4	LPR	ALM	PIM0	ALMA	20AL-(60) FLT CA	
5	LPR (GT 16)	CN-A (Front Connector)	LPR	BUS1	EXGT BUS CA-A	
6	LPR (GT 16)	CN-B (Front Connector)	PIM0	BUS1A	50-40 GT BUS CA-A	
7	LPR	DSP	TOPU	DSPM	20AL-(270) FLT CA	
8	LPR	MUSIC	PIM0	MUSIC0	16PH MOH CA (1)	
9	PIM0	MUX1	PIM1	MUX	MT24 TSW CA-90	
10	PIM0	MUX2	PIM2	MUX	MT24 TSW CA-140	
11	PIM0	MUX3	PIM3	MUX	MT24 TSW CA-180	
12	PIM0	MUX1	PIM1	MUX	MT24 TSW CA-90	
13	PIM0	MUX2	PIM2	MUX	MT24 TSW CA-140	
14	PIM0	MUX3	PIM3	MUX	MT24 TSW CA-180	
15	PIM0	ALMB	PIM1	ALMA	20AL-(10) FLT CA	
16	PIM1	ALMB	PIM2	ALMA	20AL-(20) FLT CA	
17	PIM2	ALMB	PIM3	ALMA	20AL-(10) FLT CA	

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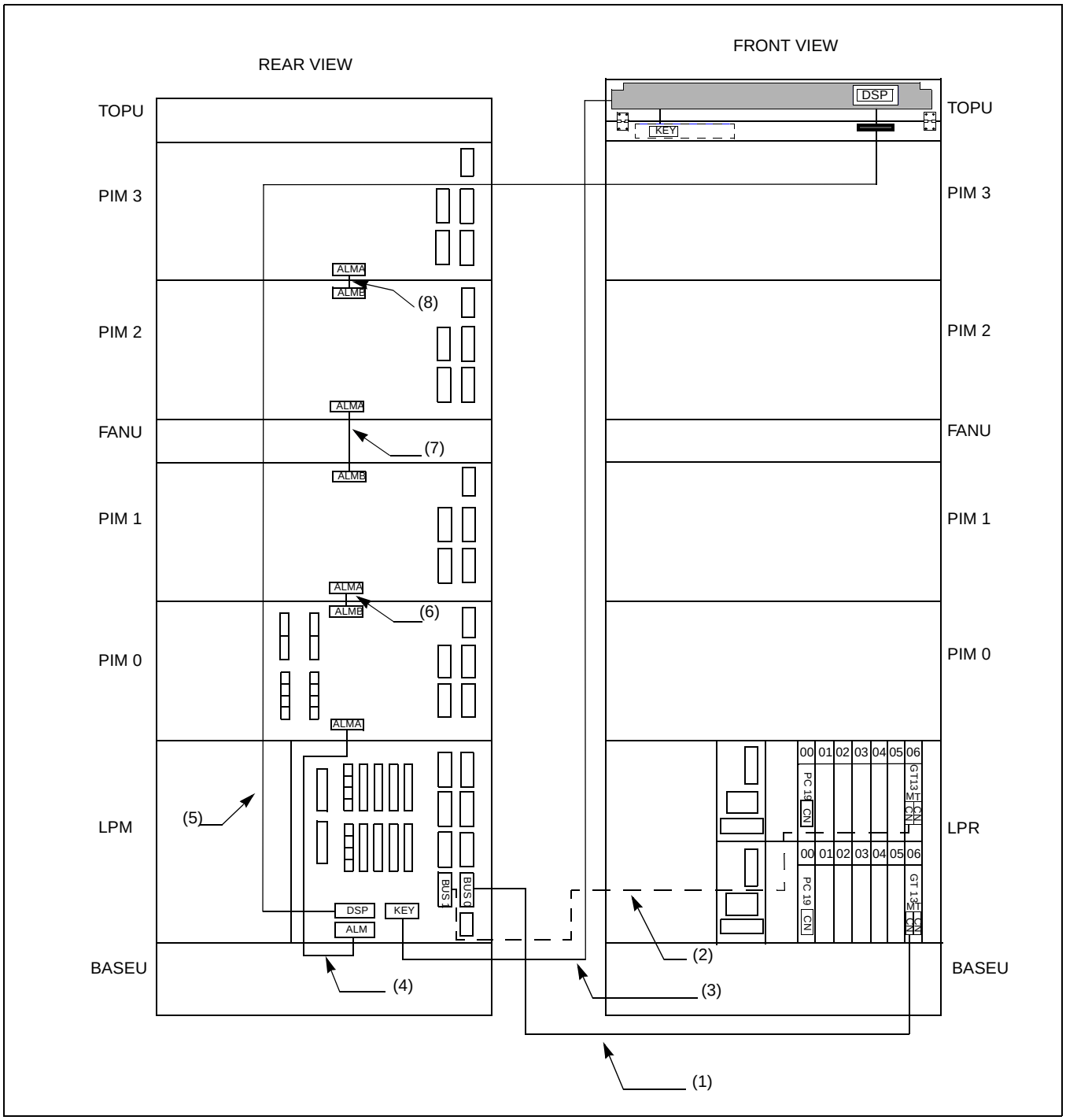

Figure 010-30 Internal Bus Cable Connection for IMG0 (Multiple IMG Configuration)

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Table 010-19 Internal Bus Cable Connection for IMG0 (Multiple IMG Configuration)

No.	FROM		TO		CABLE NAME	REMARKS
	UNIT/MODULE	CONNECTOR NAME	UNIT/ MODULE	CONNECTOR NAME		
1	LPM (CPU0)	CN-M	LPM	BUS0	EXGT BUS CA-A	
2	LPM (CPU1)	CN-M	LPM	BUS1	EXGT BUS CA-A	
3	LPM	KEY	TOPU	KEY	10AL-(260) FLT CA	
4	LPM	ALM	PIM0	ALMA	20AL-(60) FLT CA	
5	LPM	DSP	TOPU	DSPL	20AL-(270) FLT CA	
6	PIM0	ALMB	PIM1	ALMA	20AL-(10) FLT CA	
7	PIM1	ALMB	PIM2	ALMA	20AL-(20) FLT CA	
8	PIM2	ALMB	PIM3	ALMA	20AL-(10) FLT CA	

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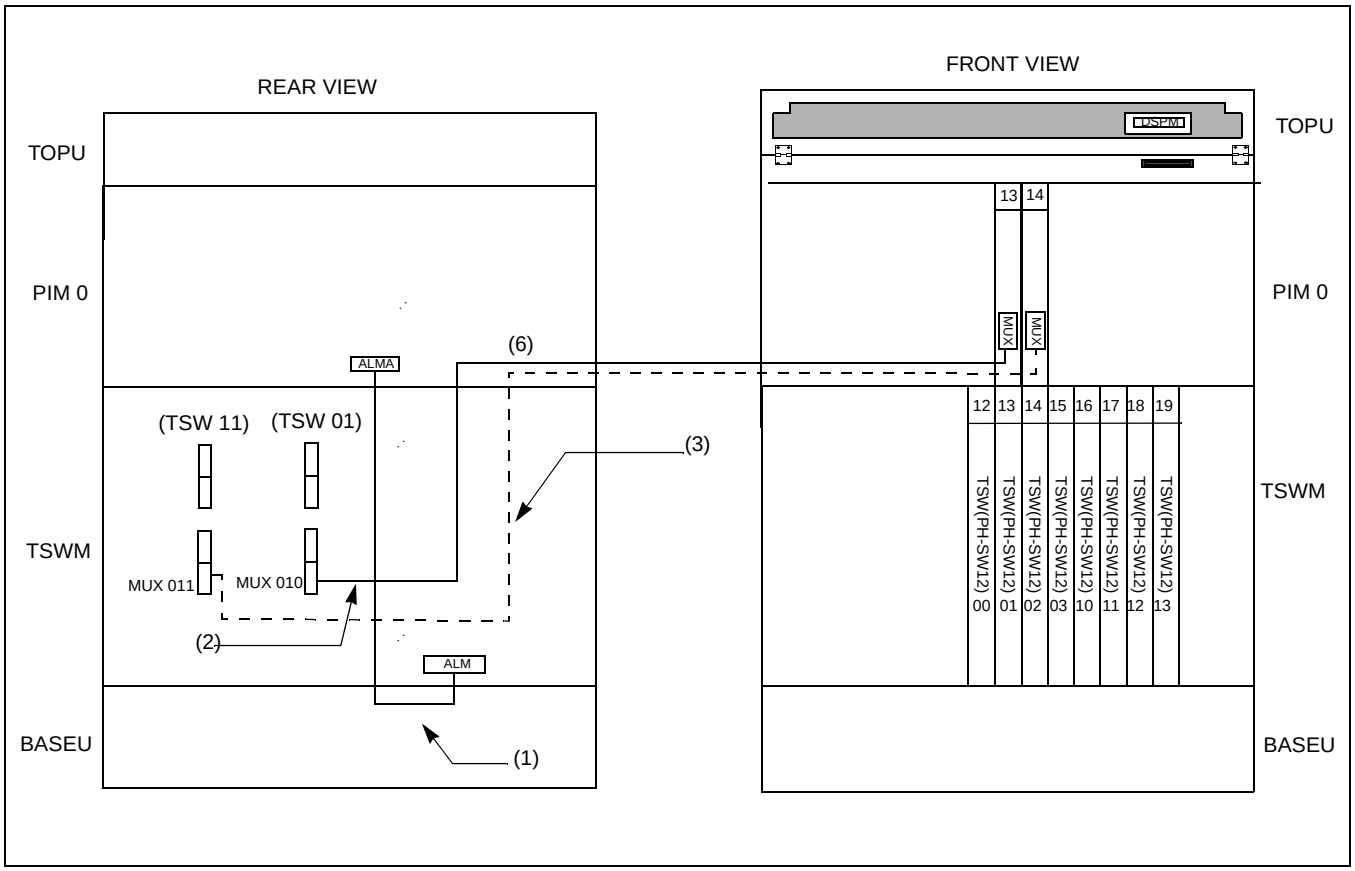

Figure 010-31 Internal Bus Cable Connection for IMG1 (1-PIM System) (Multiple IMG Configuration)

Table 010-20 Internal Bus Cable Connection for IMG1 (1-PIM System) (Multiple IMG Configuration)

No.	FROM		TO		CABLE NAME	REMARKS
	UNIT/MODULE	CONNECTOR NAME	UNIT/ MODULE	CONNECTOR NAME		
1	TSWM	ALM	PIM0	ALMA	20AL-(60) FLT CA	
2	TSWM	MUX010	PIM0	MUX (slot 13)	34PH MT24 TSW CA-D	TSW 01
3	TSWM	MUX110	PIM0	MUX (slot 14)	34PH MT24 TSW CA-D	TSW 11

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Connect the internal bus cables for 2-PIM system of IMG1 as shown below. Note that the dotted lines indicate bus cables for a dual System.

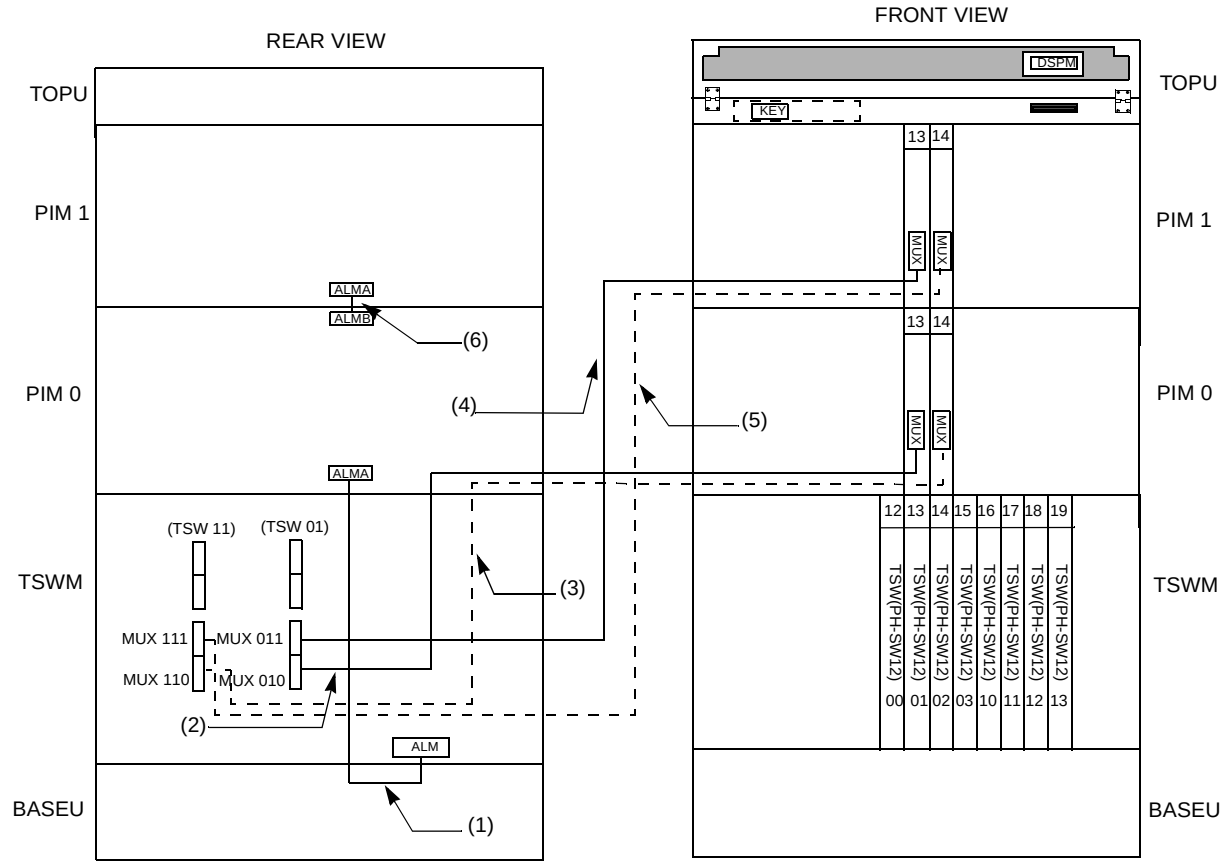

Figure 010-32 Internal Bus Cable Connection for IMG1 (2-PIM System) (Multiple IMG Configuration)

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Table 010-21 Internal Bus Cable Connection for IMG1 (2-PIM System) (Multiple IMG Configuration)

No.	FROM		TO		CABLE NAME	REMARKS
	UNIT/MODULE	CONNECTOR NAME	UNIT/ MODULE	CONNECTOR NAME		
1	TSWM	ALM	PIM0	ALMA	20AL-(60) FLT CA	
2	TSWM	MUX010	PIM0	MUX (Slot 13)	34PH MT24 TSW CA-D	TSW 01
3	TSWM	MUX110	PIM0	MUX (Slot 14)	34PH MT24 TSW CA-D	TSW 11
4	TSWM	MUX011	PIM1	MUX (Slot 13)	34PH MT24 TSW CA-G	TSW 01
5	TSWM	MUX111	PIM1	MUX (Slot 14)	34PH MT24 TSW CA-G	TSW 11
6	PIM0	ALMB	PIM1	ALMA	20AL-(10) FLT CA	

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Connect the internal bus cables for 3-PIM system of IMG1 as shown below. Note that the dotted lines indicate bus cables for a dual-system.

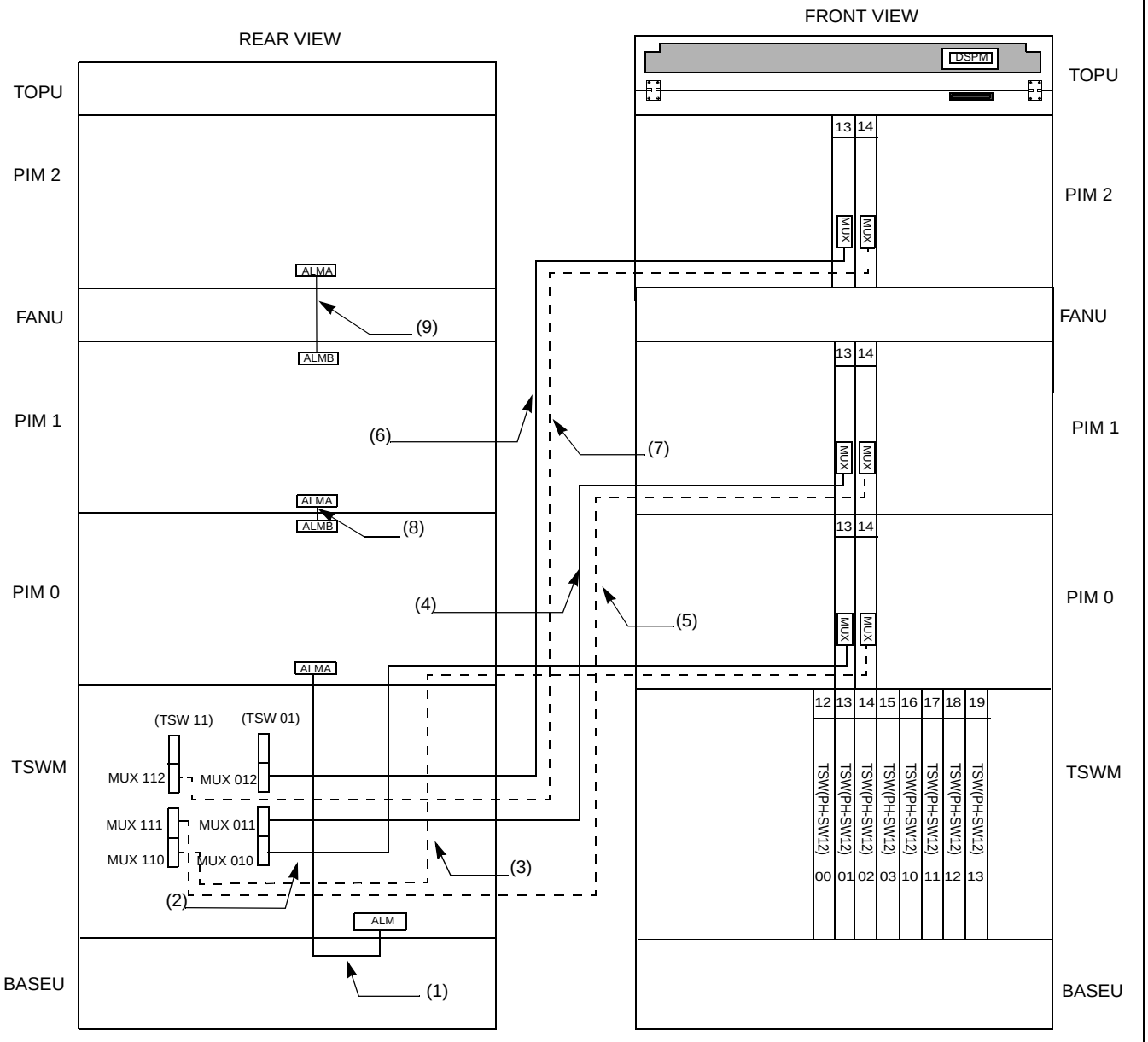

Figure 010-33 Internal Bus Cable Connection for IMG1 (3-PIM System) (Multiple IMG Configuration)

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Table 010-22 Internal Bus Cable Connection for IMG1 (3-PIM System) (Multiple IMG Configuration)

No.	FROM		TO		CABLE NAME	REMARKS
	UNIT/MODULE	CONNECTOR NAME	UNIT/ MODULE	CONNECTOR NAME		
1	TSWM	ALM	PIM0	ALMA	20AL-(60) FLT CA	
2	TSWM	MUX010	PIM0	MUX (Slot 13)	34PH MT24 TSW CA-D	TSW 01
3	TSWM	MUX110	PIM0	MUX (Slot 14)	34PH MT24 TSW CA-D	TSW 11
4	TSWM	MUX011	PIM1	MUX (Slot 13)	34PH MT24 TSW CA-G	TSW 01
5	TSWM	MUX111	PIM1	MUX (Slot 14)	34PH MT24 TSW CA-G	TSW 11
6	TSWM	MUX012	PIM2	MUX (Slot 13)	34PH MT24 TSW CA-F	TSW 01
7	TSWM	MUX112	PIM2	MUX (Slot 14)	34PH MT24 TSW CA-F	TSW 11
8	PIM0	ALMB	PIM1	ALMA	20AL-(10) FLT CA	
9	PIM1	ALMB	PIM2	ALMA	20AL-(20) FLT CA	

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Connect the internal bus cables for 4-PIM system of IMG1 as shown below. Note that the dotted lines indicate bus cables for a dual-system.

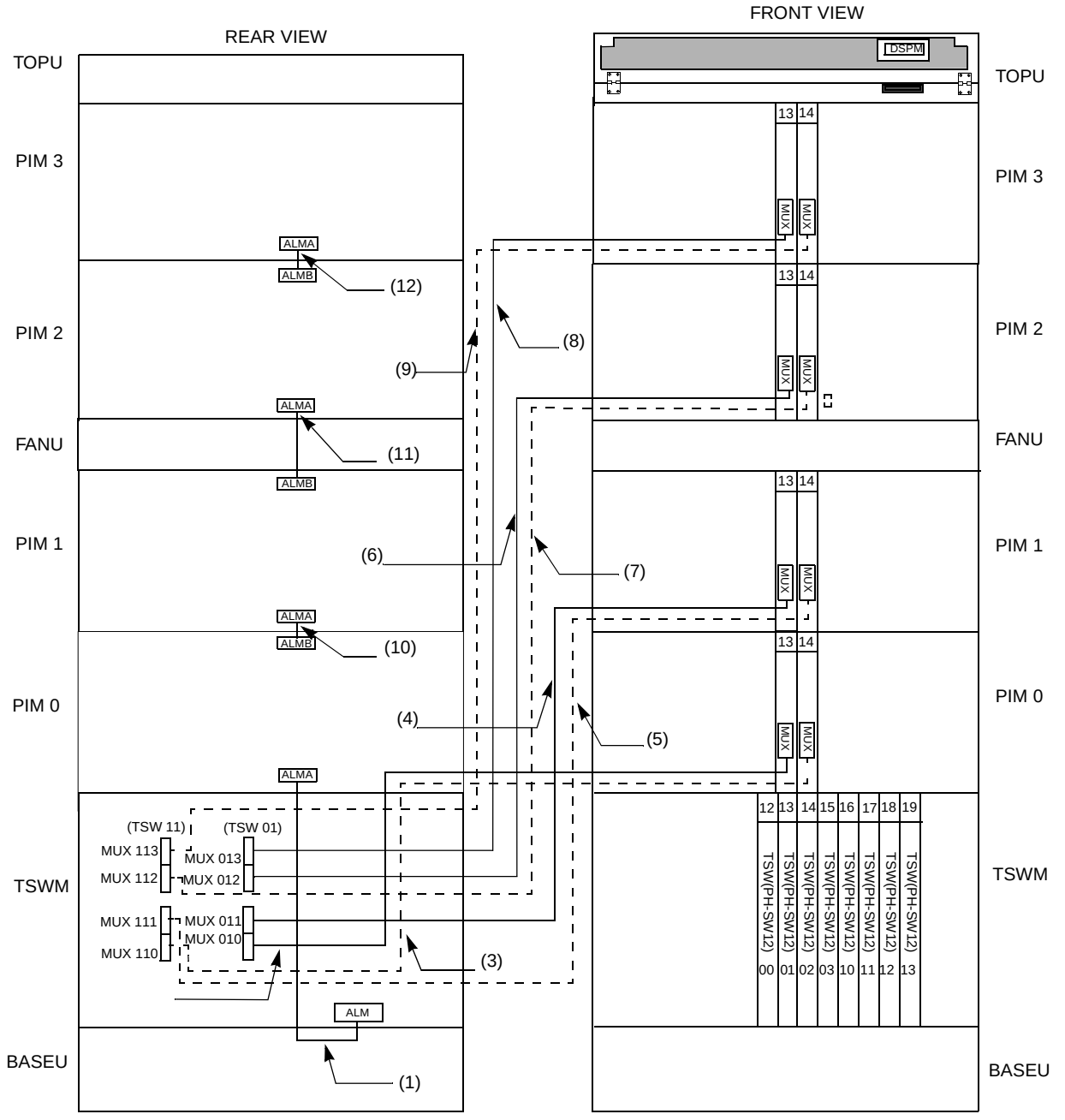

Figure 010-34 Internal Bus Cable Connection for IMG1 (4-PIM System) (Multiple IMG Configuration)

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Table 010-23 Internal Bus Cable Connection for IMG1 (4-PIM System) (Multiple IMG Configuration)

No.	FROM		TO		CABLE NAME	REMARKS
	UNIT/MODULE	CONNECTOR NAME	UNIT/ MODULE	CONNECTOR NAME		
1	TSWM	ALM	PIM0	ALMA	20AL-(60) FLT CA	
2	TSWM	MUX010	PIM0	MUX (Slot 13)	34PH MT24 TSW CA-D	TSW 01
3	TSWM	MUX110	PIM0	MUX (Slot 14)	34PH MT24 TSW CA-D	TSW 11
4	TSWM	MUX011	PIM1	MUX (Slot 13)	34PH MT24 TSW CA-G	TSW 01
5	TSWM	MUX111	PIM1	MUX (Slot 14)	34PH MT24 TSW CA-G	TSW 11
6	TSWM	MUX012	PIM2	MUX (Slot 13)	34PH MT24 TSW CA-F	TSW 01
7	TSWM	MUX112	PIM2	MUX (Slot 14)	34PH MT24 TSW CA-F	TSW 11
8	TSWM	MUX013	PIM3	MUX (Slot 13)	34PH MT24 TSW CA-G	TSW 01
9	TSWM	MUX113	PIM3	MUX (Slot 14)	34PH MT24 TSW CA-G	TSW 11
10	PIM0	ALMB	PIM1	ALMA	20AL-(10) FLT CA	
11	PIM1	ALMB	PIM2	ALMA	20AL-(20) FLT CA	
12	PIM2	ALMB	PIM3	ALMA	20AL-(10) FLT CA	

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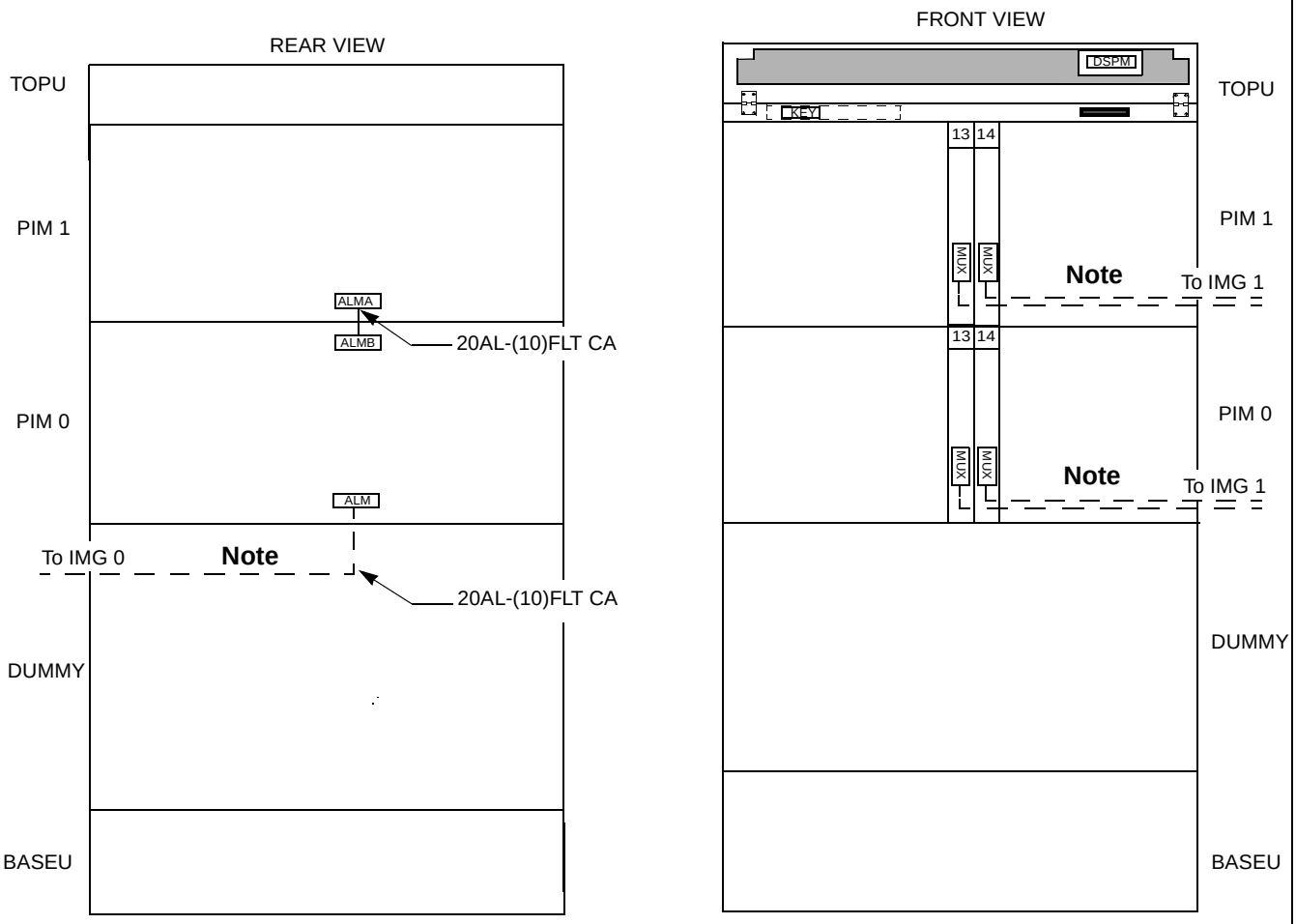
Sheet 63/71
Internal Cable Connections

Figures 010-35 through 010-37 show how to run the internal bus cables for IMG2/3. Because bus cables for the 1-PIM system all adopt inter-frame connections with other cabinets (IMG0 and 1), explanations are given here about the 2-PIM configuration or more. (cf. NAP 200-011: “Inter-frame Cable Connections.”)

When 2-PIM system is adopted in IMG2 or 3, the required connection is as follows:

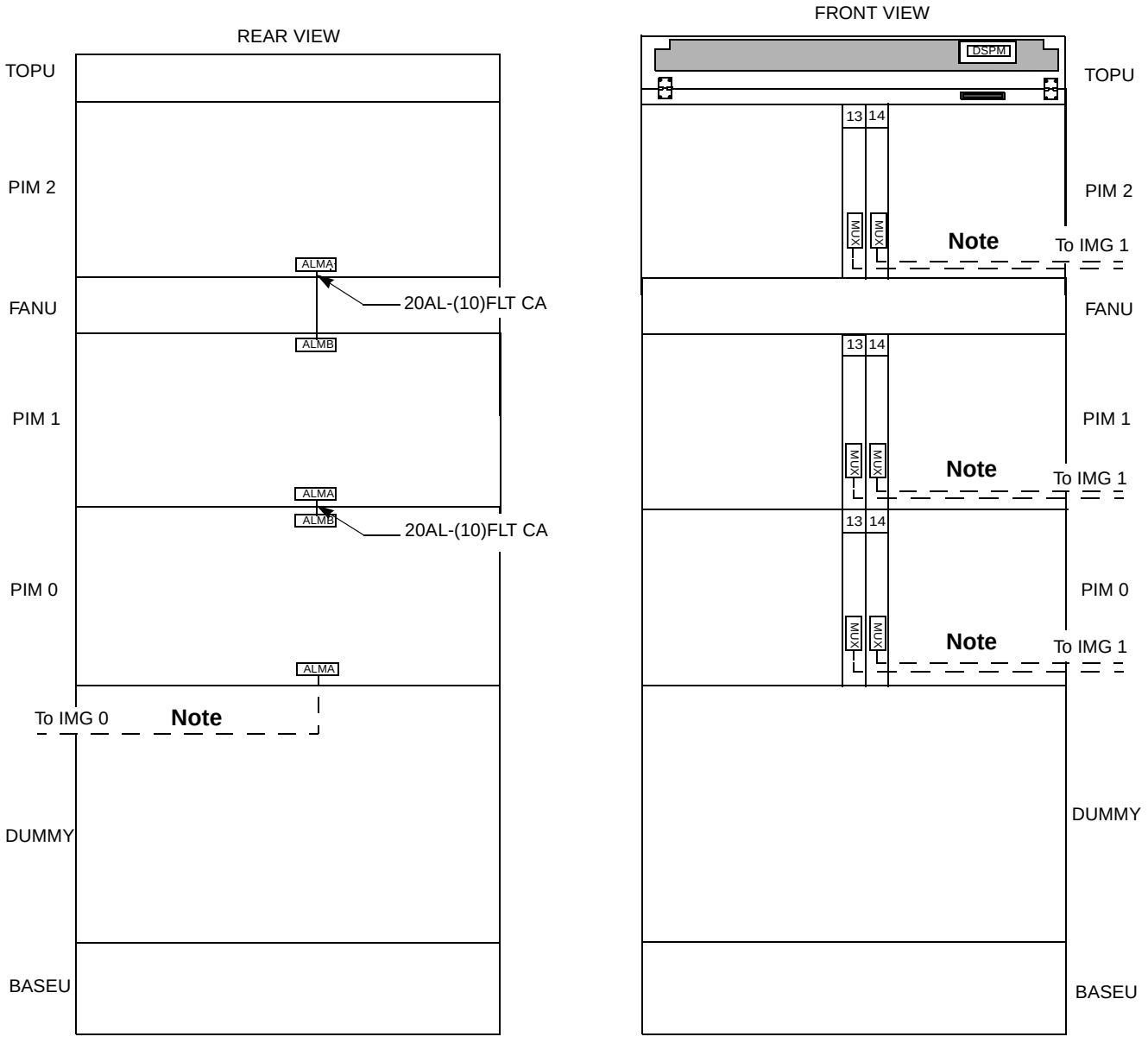


Note: *For these cable runnings, refer to NAP 200- 011: “Inter-frame Cable Connections.”*

Figure 010-35 Internal Bus Cable Connection for IMG2/3 (2-PIM System) (Multiple IMG Configuration)

NAP-200-010
Sheet 64/71
Internal Cable Connections

When 3-PIM system is adopted in IMG2 or 3, the required cable connections are as follows:



Note: *For these cable runnings, refer to NAP 200-011:"Inter-frame Cable Connections."*

Figure 010-36 Internal Bus Cable Connection for IMG2/3 (3-PIM System) (Multiple IMG Configuration)

NAP-200-010
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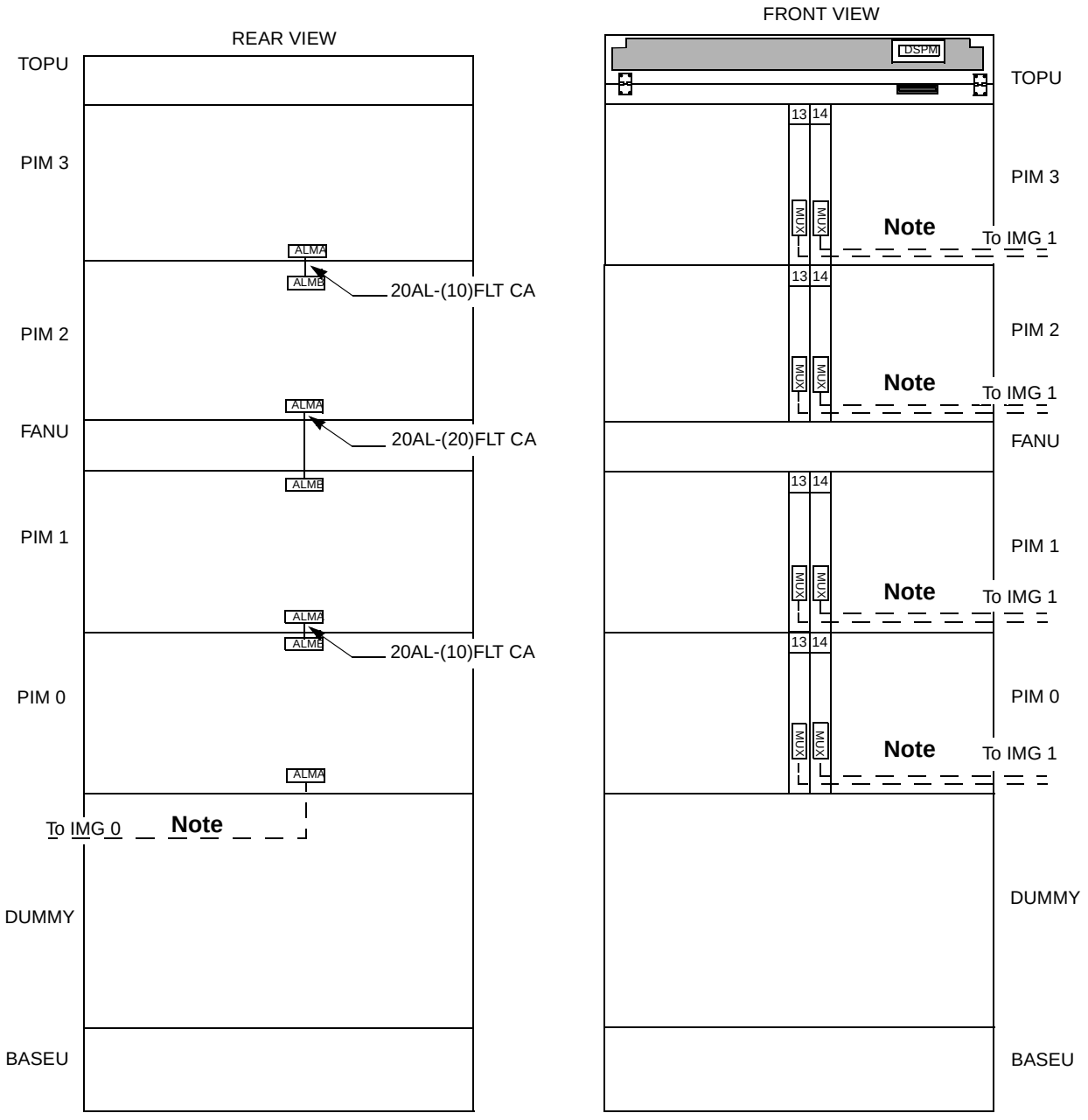
Internal Cable Connections

When 4-PIM system is adopted in IMG2 or 3, the required cable connections are as follows:



Note: *For these cable runnings, refer to NAP 200-011: "Inter-frame Cable Connections."*

Figure 010-37 Internal Bus Cable Connection for IMG2/3 (4-PIM System) (Multiple IMG Configuration)

NAP-200-011	
Sheet 1/24	
Inter-Frame Cable Connections	Multiple IMG Configuration

This NAP explains how to run the frame-to-frame cables for 2/3/4-IMG System.

START

- Connection of Inter-frame ISA Bus Cables ____ Refer to Figure 011-1.
- Connection of Inter-frame Bus Cables ____ Refer to Figures 011-2 through 011-10.
- Connection of Inter-frame Alarm Bus Cables ____ Refer to Figures 011-11 through 011-13.

END

NAP-200-011	
Sheet 2/24	
Inter-Frame Cable Connections	Multiple IMG Configuration

Connect the inter-frame ISA bus cables as shown below. Note that the dotted line indicates the bus cable for a dual system.

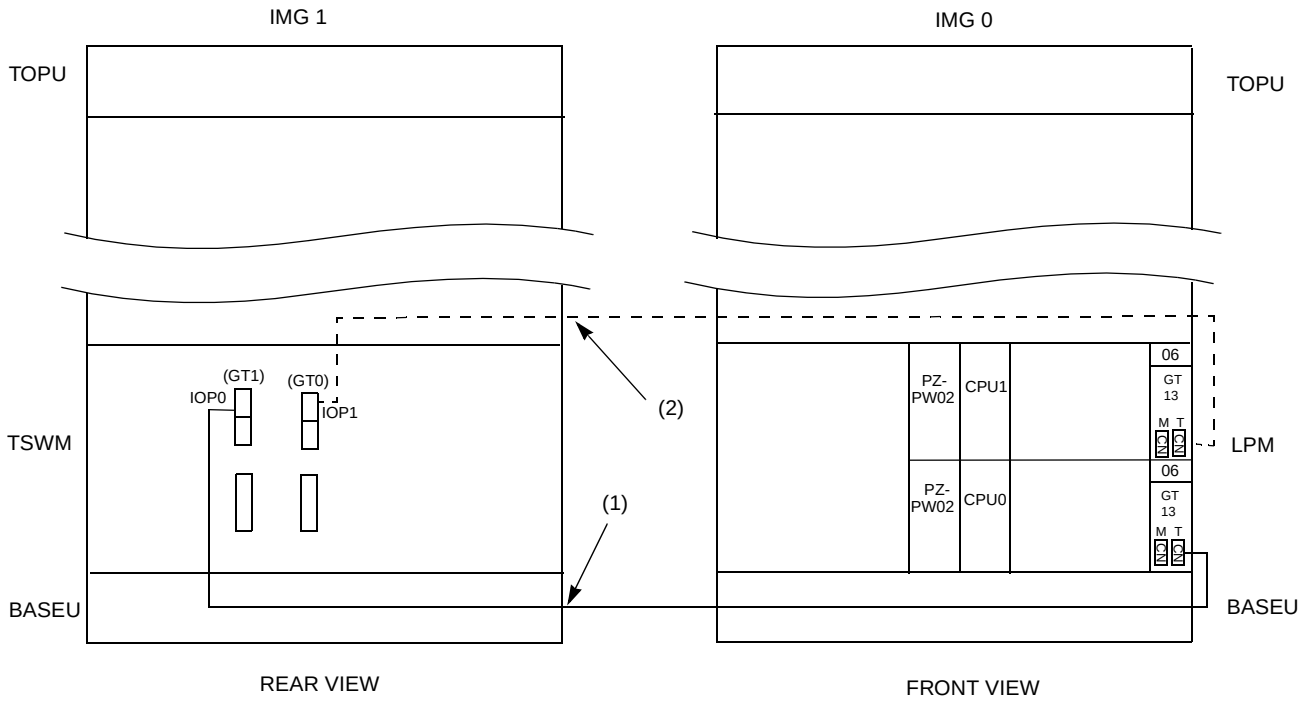


Figure 011-1 Inter-Frame ISA Bus Cable Connection for IMG0-IMG1

Table 011-1 Inter-Frame ISA Bus Cable Connection for IMG0-IMG1

No.	FROM		TO		CABLE NAME	REMARKS
	UNIT/MODULE	CONNECTOR NAME	UNIT/ MODULE	CONNECTOR NAME		
1	LPM (CPU0)	CN-T	TSWM	IOP0 (Slot 11)	34PH 50AL CA-A	GT1
2	LPM (CPU1)	CN-T	TSWM	IOP1 (Slot 10)	34PH 50AL CA-A	GT0

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Sheet 3/24	
Inter-Frame Cable Connections	Multiple IMG Configuration

Connect the inter-frame bus cables between IMG0 and IMG1 as shown below. Note that the dotted lines indicate bus cables for a dual-system.

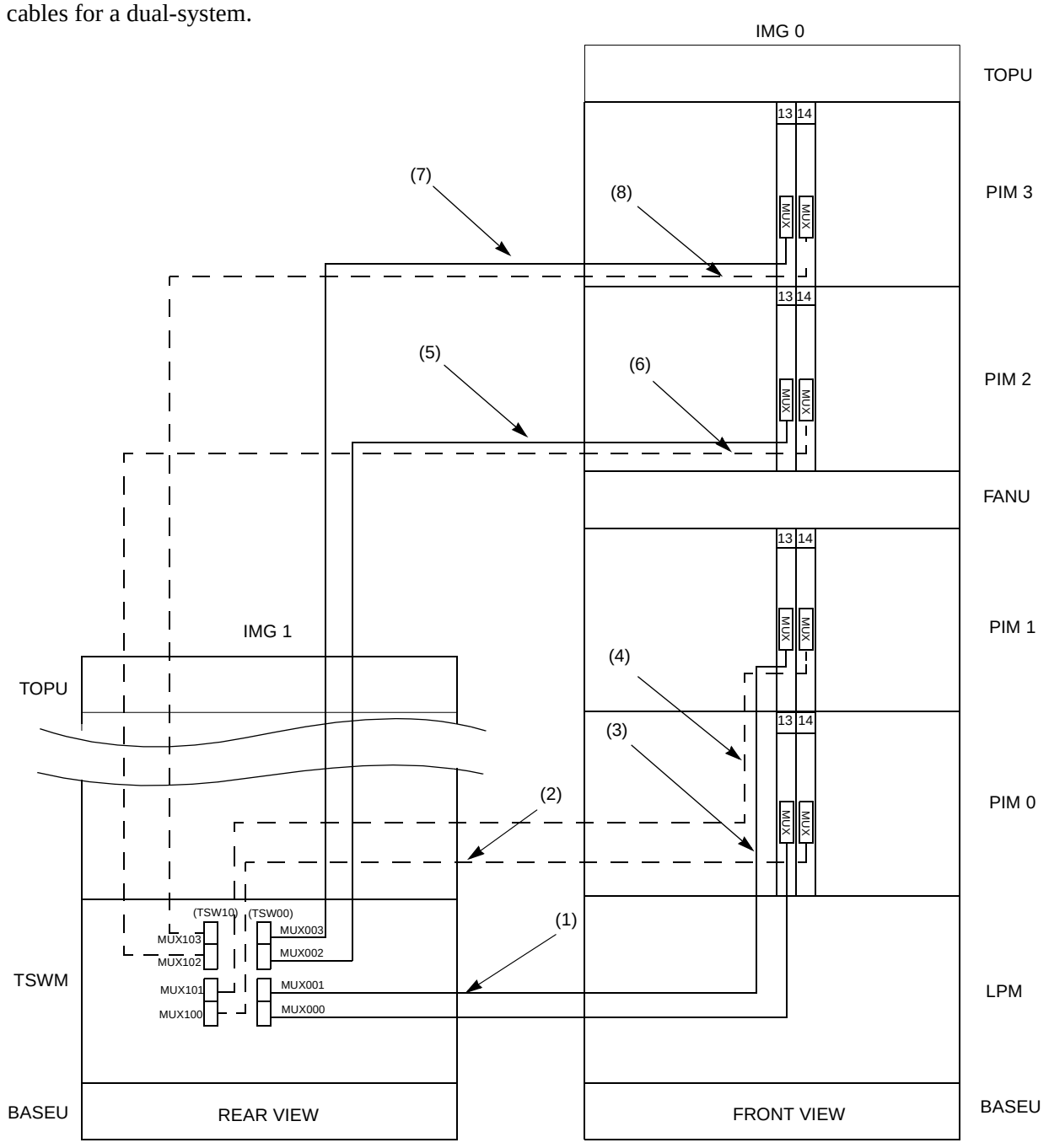

Figure 011-2 Inter-Frame Bus Cable Connection for IMG0-IMG1

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Sheet 4/24	
Inter-Frame Cable Connections	Multiple IMG Configuration

Table 011-2 Inter-Frame Bus Cable Connection for IMG0-IMG1

No.	FROM		TO		CABLE NAME	REMARKS
	UNIT/ MODULE	CONNECTOR NAME	UNIT/ MODULE	CONNECTOR NAME		
1	TSWM	MUX000	PIM0 (IMG0)	MUX (Slot 13)	34PH MT24 TSW CA-F	TSW 00
2	TSWM	MUX100	PIM0 (IMG0)	MUX (Slot 14)	34PH MT24 TSW CA-F	TSW 10
3	TSWM	MUX001	PIM1 (IMG0)	MUX (Slot 13)	34PH MT24 TSW CA-E	TSW 00
4	TSWM	MUX101	PIM1 (IMG0)	MUX (Slot 14)	34PH MT24 TSW CA-E	TSW 10
5	TSWM	MUX002	PIM2 (IMG0)	MUX (Slot 13)	34PH MT24 TSW CA-H	TSW 00
6	TSWM	MUX102	PIM2 (IMG0)	MUX (Slot 14)	34PH MT24 TSW CA-H	TSW 10
7	TSWM	MUX003	PIM3 (IMG0)	MUX (Slot 13)	34PH MT24 TSW CA-H	TSW 00
8	TSWM	MUX103	PIM3 (IMG0)	MUX (Slot 14)	34PH MT24 TSW CA-H	TSW 10

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Sheet 5/24	
Inter-Frame Cable Connections	Multiple IMG Configuration

Connect the inter-frame bus cables between IMG1 and IMG2 (1-PIM system) as shown below. Note that the dotted line indicates the bus cable for a dual-system.

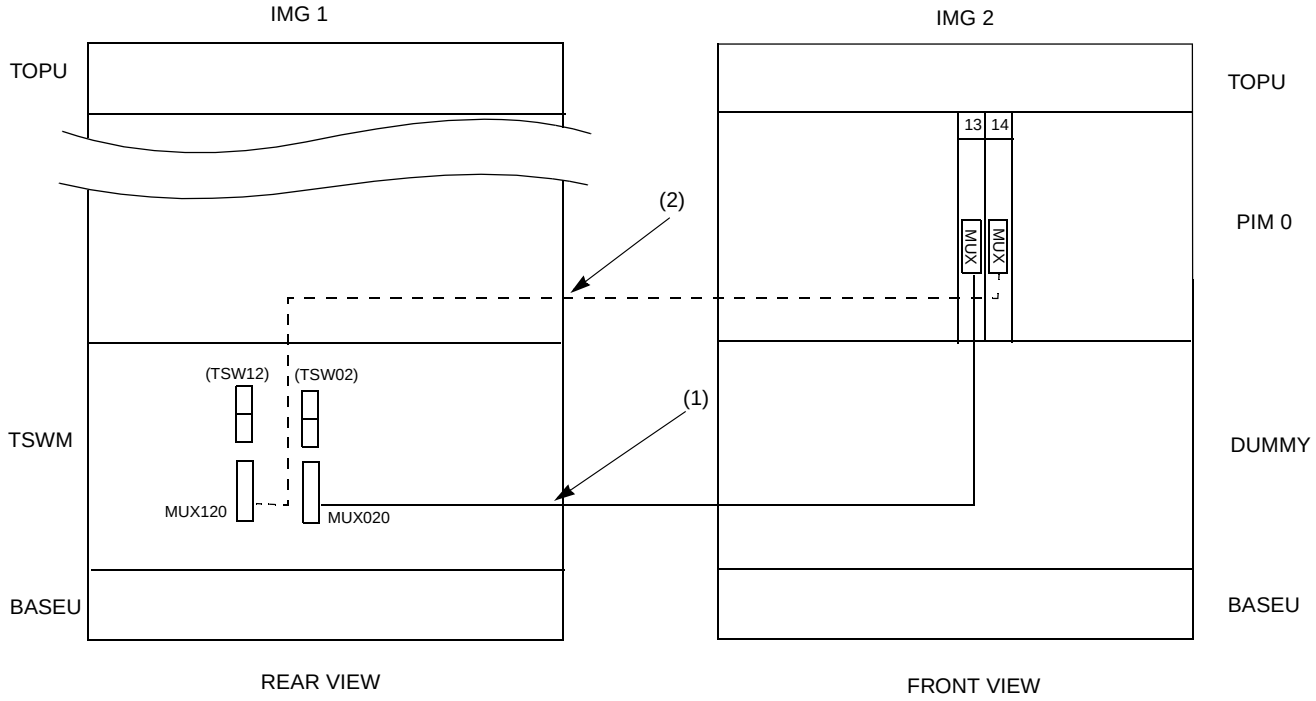

Figure 011-3 Inter-Frame Bus Cable Connection for IMG1-IMG2 (1-PIM System)

Table 011-3 Inter-Frame Bus Cable Connection for IMG1-IMG2 (1-PIM System)

No.	FROM		TO		CABLE NAME	REMARKS
	UNIT/MODULE	CONNECTOR NAME	UNIT/MODULE	CONNECTOR NAME		
1	TSWM	MUX020	PIM0 (IMG2)	MUX (Slot 13)	34PH MT24 TSW CA-F	TSW 02
2	TSWM	MUX120	PIM0 (IMG2)	MUX (Slot 14)	34PH MT24 TSW CA-F	TSW 12

NAP-200-011	
Sheet 6/24	
Inter-Frame Cable Connections	Multiple IMG Configuration

Connect the inter-frame bus cables between IMG1 and IMG2 (2-PIM system) as shown below. Note that the dotted lines indicate bus cables for a dual-system.

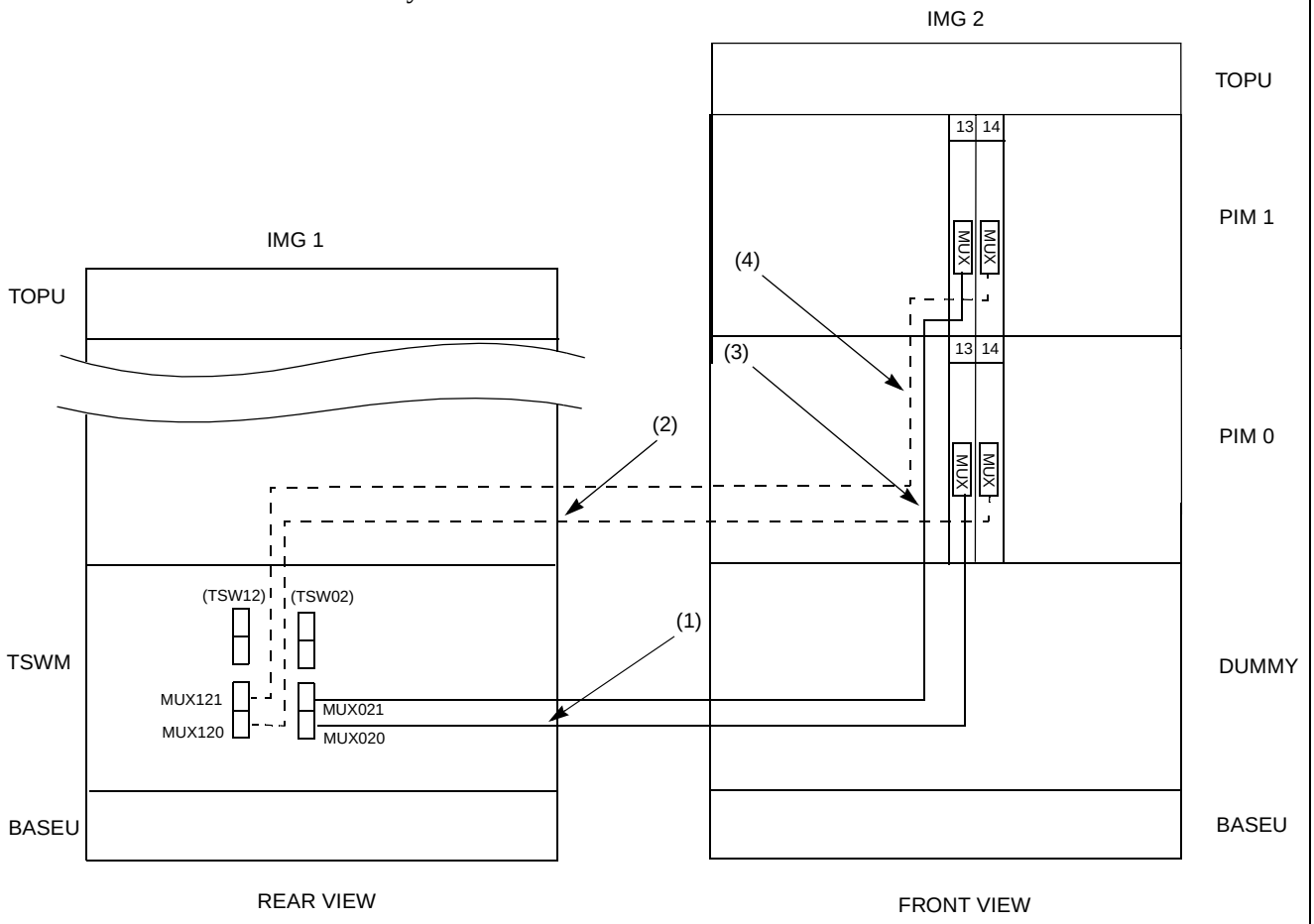

Figure 011-4 Inter-Frame Bus Cable Connection for IMG1-IMG2 (2-PIM System)

NAP-200-011	
Sheet 7/24	
Inter-Frame Cable Connections	Multiple IMG Configuration

Table 011-4 Inter-Frame Bus Cable Connection for IMG1-IMG2 (2-PIM System)

No.	FROM		TO		CABLE NAME	REMARKS
	UNIT/ MODULE	CONNECTOR NAME	UNIT/MODULE	CONNECTOR NAME		
1	TSWM	MUX020	PIM0 (IMG2)	MUX (Slot 13)	34PH MT24 TSW CA-F	TSW 02
2	TSWM	MUX120	PIM0 (IMG2)	MUX (Slot 14)	34PH MT24 TSW CA-F	TSW 12
3	TSWM	MUX021	PIM1 (IMG2)	MUX (Slot 13)	34PH MT24 TSW CA-G	TSW 02
4	TSWM	MUX121	PIM1 (IMG2)	MUX (Slot 14)	34PH MT24 TSW CA-G	TSW 12

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Sheet 8/24	
Inter-Frame Cable Connections	Multiple IMG Configuration

Connect the inter-frame bus cables between IMG1 and IMG2 (3-PIM system) as shown below. Note that the dotted lines indicate bus cables for a dual-system.

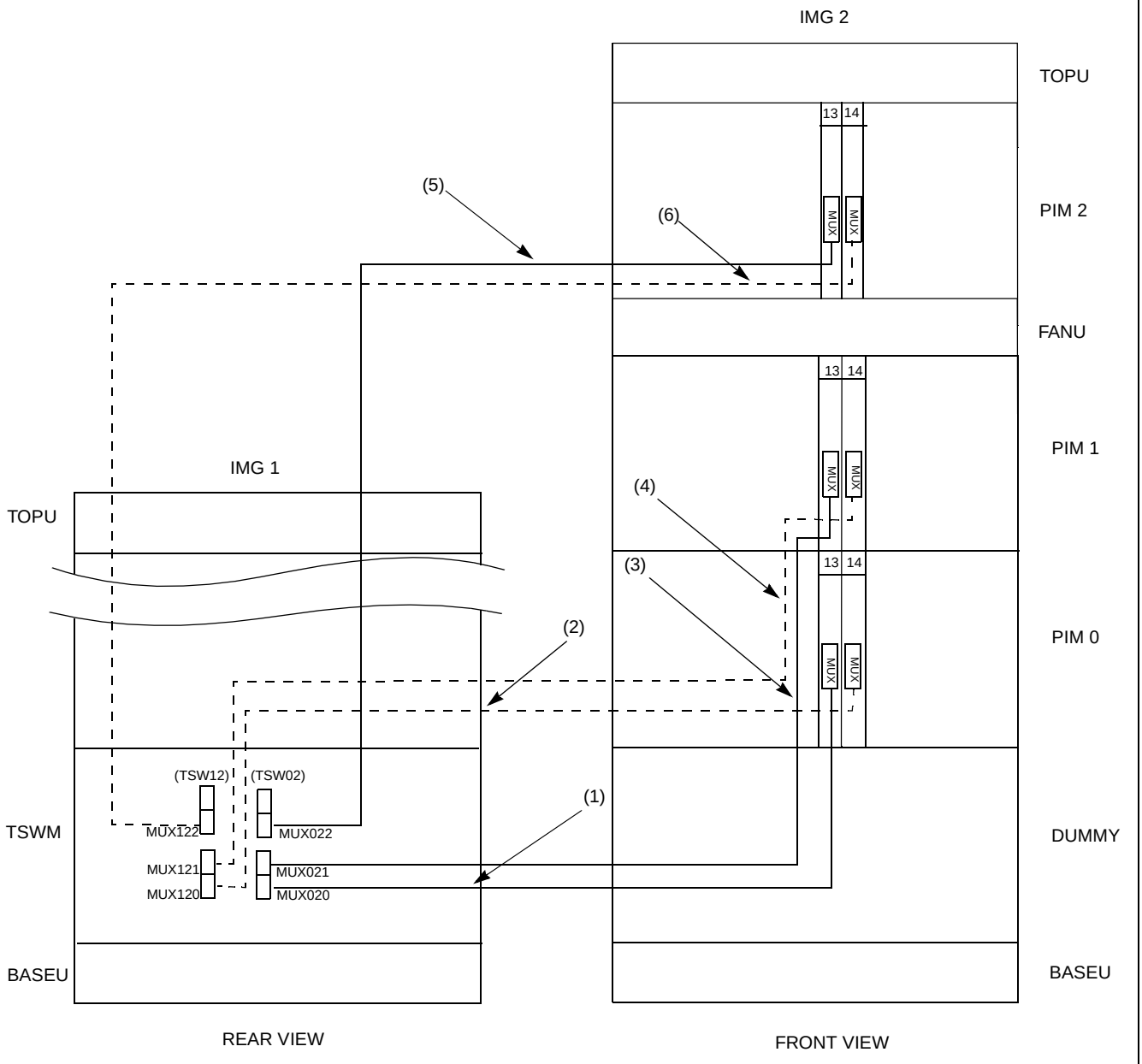

Figure 011-5 Inter-Frame Bus Cable Connection for IMG1-IMG2 (3-PIM System)

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Sheet 9/24	
Inter-Frame Cable Connections	Multiple IMG Configuration

Table 011-5 Inter-Frame Bus Cable Connection for IMG1-IMG2 (3-PIM System)

No.	FROM		TO		CABLE NAME	REMARKS
	UNIT/ MODULE	CONNECTOR NAME	UNIT/MODULE	CONNECTOR NAME		
1	TSWM	MUX020	PIM0 (IMG2)	MUX (Slot 13)	34PH MT24 TSW CA-F	TSW 02
2	TSWM	MUX120	PIM0 (IMG2)	MUX (Slot 14)	34PH MT24 TSW CA-F	TSW 12
3	TSWM	MUX021	PIM1 (IMG2)	MUX (Slot 13)	34PH MT24 TSW CA-G	TSW 02
4	TSWM	MUX121	PIM1 (IMG2)	MUX (Slot 14)	34PH MT24 TSW CA-G	TSW 12
5	TSWM	MUX022	PIM2 (IMG2)	MUX (Slot 13)	34PH MT24 TSW CA-H	TSW 02
6	TSWM	MUX122	PIM2 (IMG2)	MUX (Slot 14)	34PH MT24 TSW CA-H	TSW 12

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Inter-Frame Cable Connections	Multiple IMG Configuration

Connect the inter-frame bus cables between IMG1 and IMG2 (4-PIM system) as shown below. Note that the dotted lines indicate bus cables for a dual-system.

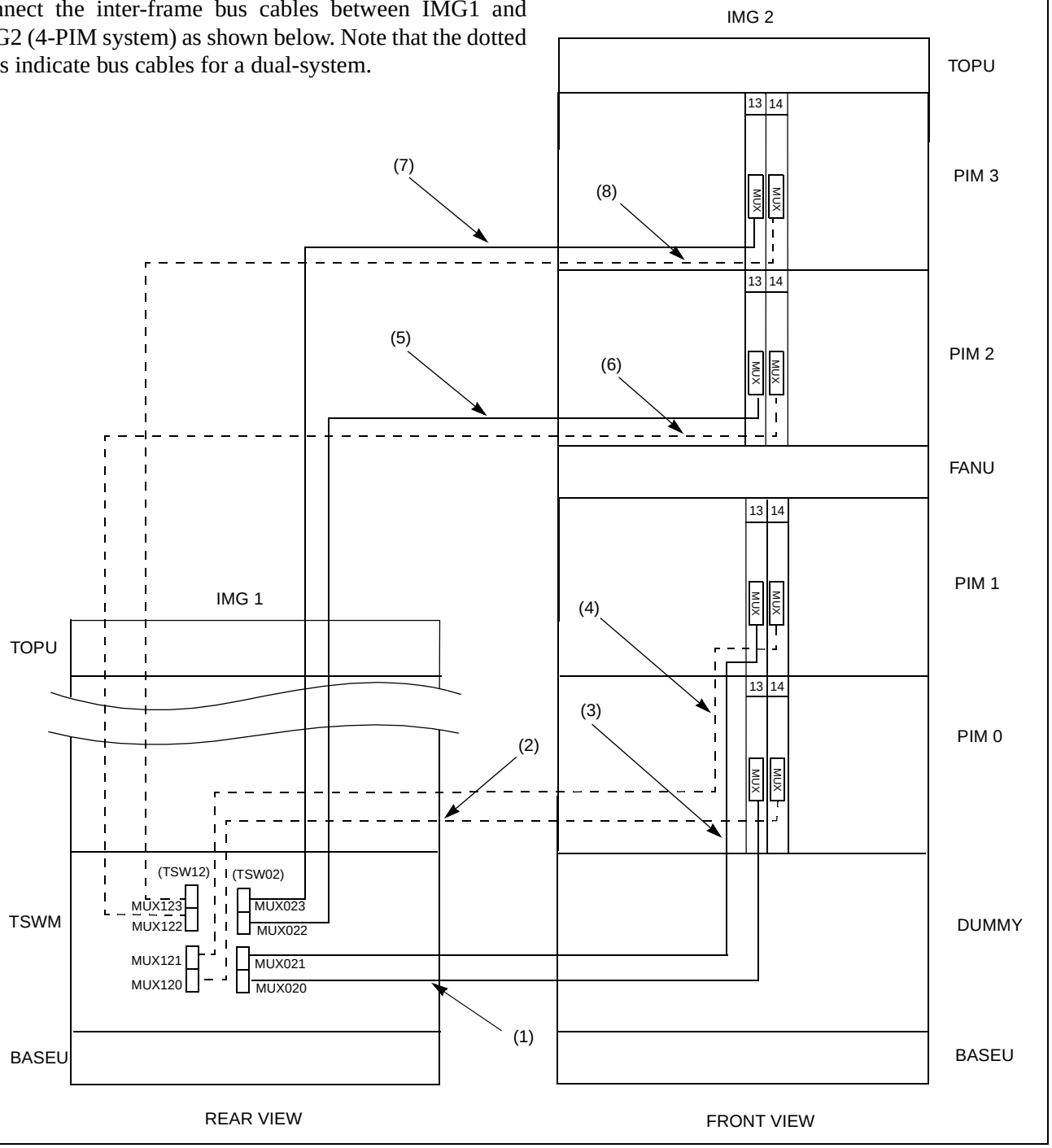

Figure 011-6 Inter-Frame Bus Cable Connection for IMG1-IMG2 (4-PIM System)

NAP-200-011	
Sheet 11/24	
Inter-Frame Cable Connections	Multiple IMG Configuration

Table 011-6 Inter-Frame Bus Cable Connection for IMG1-IMG2 (4-PIM System)

No.	FROM		TO		CABLE NAME	REMARKS
	UNIT/ MODULE	CONNECTOR NAME	UNIT/MODULE	CONNECTOR NAME		
1	TSWM	MUX020	PIM0 (IMG2)	MUX (Slot 13)	34PH MT24 TSW CA-F	TSW 02
2	TSWM	MUX120	PIM0 (IMG2)	MUX (Slot 14)	34PH MT24 TSW CA-F	TSW 12
3	TSWM	MUX021	PIM1 (IMG2)	MUX (Slot 13)	34PH MT24 TSW CA-G	TSW 02
4	TSWM	MUX121	PIM1 (IMG2)	MUX (Slot 14)	34PH MT24 TSW CA-G	TSW 12
5	TSWM	MUX022	PIM2 (IMG2)	MUX (Slot 13)	34PH MT24 TSW CA-H	TSW 02
6	TSWM	MUX122	PIM2 (IMG2)	MUX (Slot 14)	34PH MT24 TSW CA-H	TSW 12
7	TSWM	MUX023	PIM3 (IMG2)	MUX (Slot 13)	34PH MT24 TSW CA-H	TSW 02
8	TSWM	MUX123	PIM3 (IMG2)	MUX (Slot 14)	34PH MT24 TSW CA-H	TSW 12

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Inter-frame Cable Connections	Multiple IMG Configuration

Connect the inter-frame bus cables between IMG1 and IMG3 (1-PIM system) as shown below. Note that the dotted line indicates the bus cable for a dual-system.

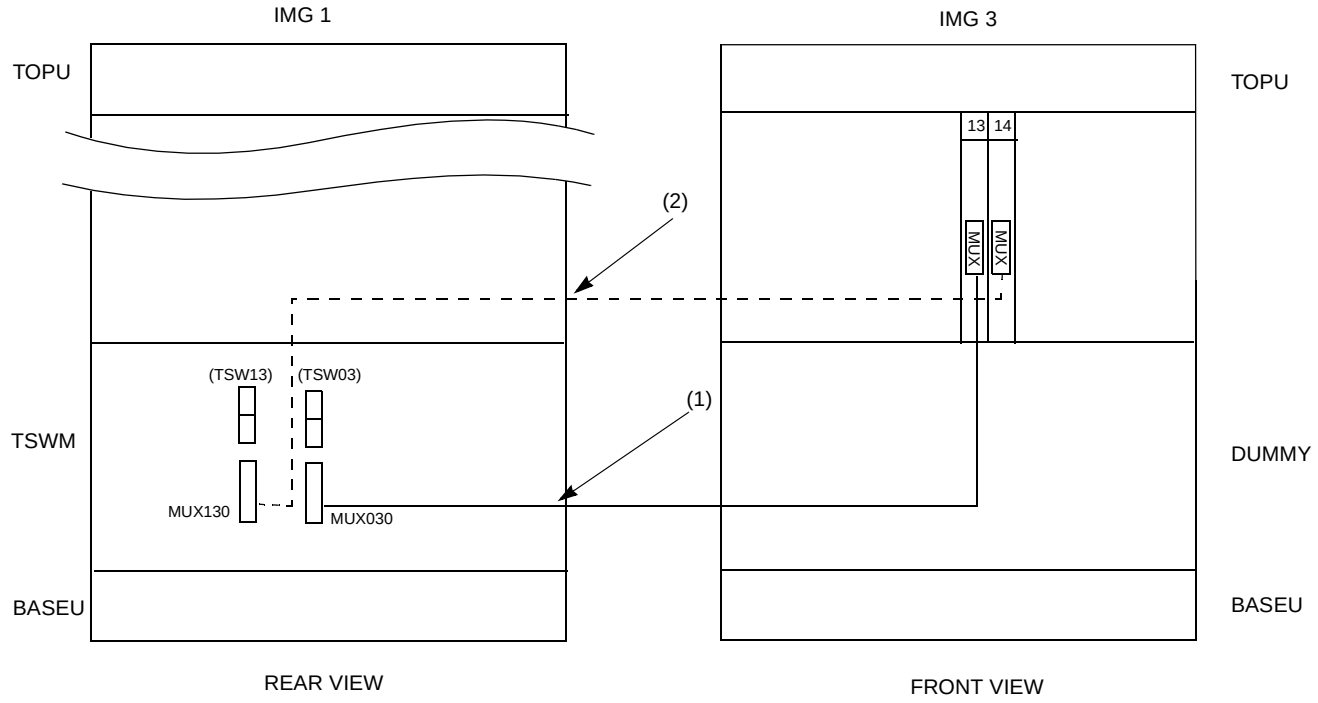

Figure 011-7 Inter-Frame Bus Cable Connection for IMG1-IMG3 (1-PIM System)

Table 011-7 Inter-Frame Bus Cable Connection for IMG1-IMG3 (1-PIM System)

No.	FROM		TO		CABLE NAME	REMARKS
	UNIT/ MODULE	CONNECTOR NAME	UNIT/MODULE	CONNECTOR NAME		
1	TSWM	MUX030	PIM0 (IMG3)	MUX (Slot 13)	34PH MT24 TSW CA-H	TSW 03
2	TSWM	MUX130	PIM0 (IMG3)	MUX (Slot 14)	34PH MT24 TSW CA-H	TSW 13

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Inter-Frame Cable Connections	Multiple IMG Configuration

Connect the inter-frame bus cables between IMG1 and IMG3 (2-PIM system) as shown below. Note that the dotted lines indicate bus cables for a dual-system.

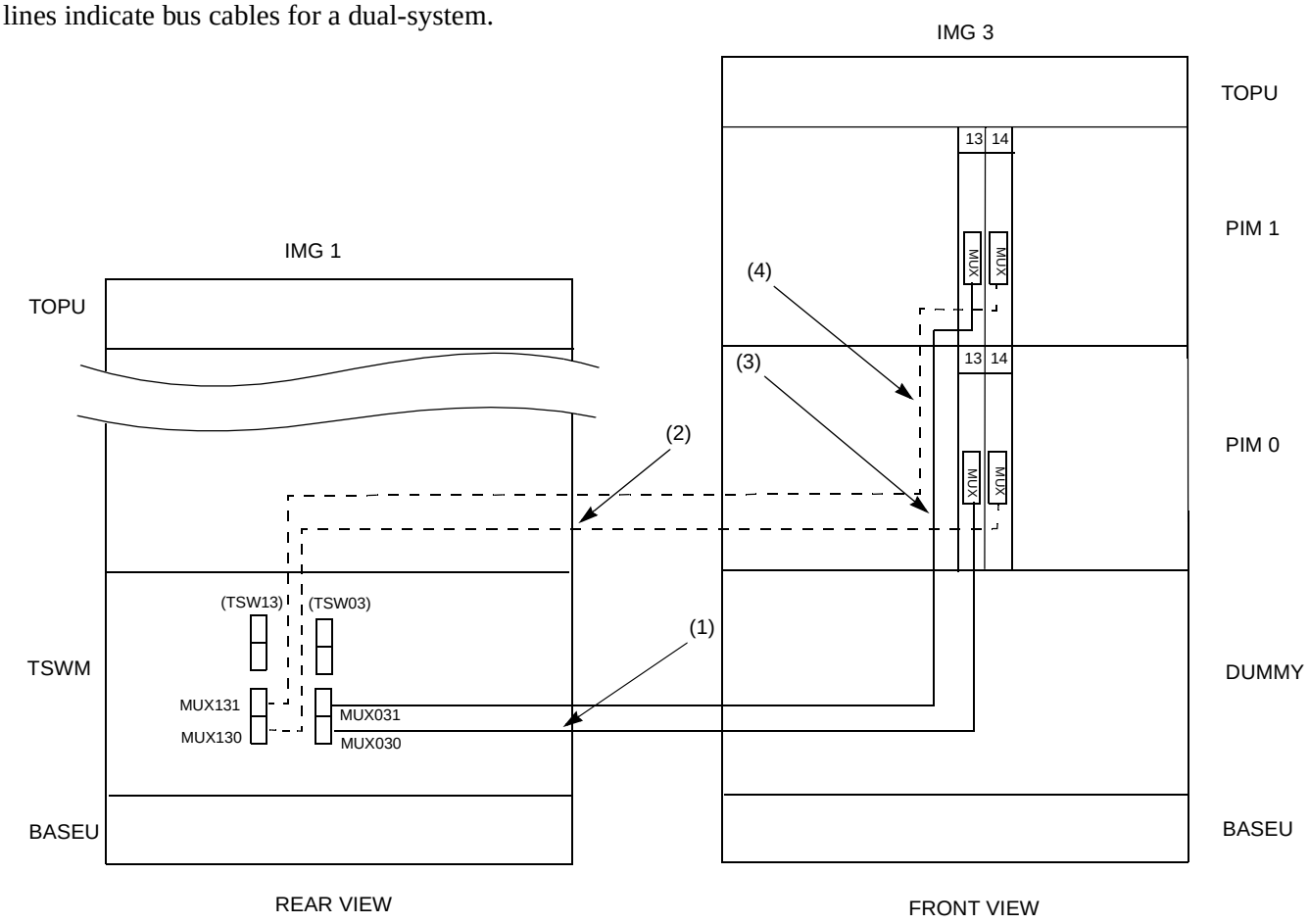

Figure 011-8 Inter-Frame Bus Cable Connection for IMG1-IMG3 (2-PIM System)

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Sheet 14/24	
Inter-Frame Cable Connections	Multiple IMG Configuration

Table 011-8 Inter-Frame Bus Cable Connection for IMG1-IMG3 (2-PIM System)

No.	FROM		TO		CABLE NAME	REMARKS
	UNIT/ MODULE	CONNECTOR NAME	UNIT/MODULE	CONNECTOR NAME		
1	TSWM	MUX030	PIM0 (IMG3)	MUX (Slot 13)	34PH MT24 TSW CA-H	TSW 03
2	TSWM	MUX130	PIM0 (IMG3)	MUX (Slot 14)	34PH MT24 TSW CA-H	TSW 13
3	TSWM	MUX031	PIM1 (IMG3)	MUX (Slot 13)	34PH MT24 TSW CA-H	TSW 03
4	TSWM	MUX131	PIM1 (IMG3)	MUX (Slot 14)	34PH MT24 TSW CA-H	TSW 13

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Inter-frame Cable Connections	Multiple IMG Configuration

Connect the inter-frame bus cables between IMG1 and IMG3 (3-PIM system) as shown below. Note that the dotted lines indicate bus cables for a dual-system.

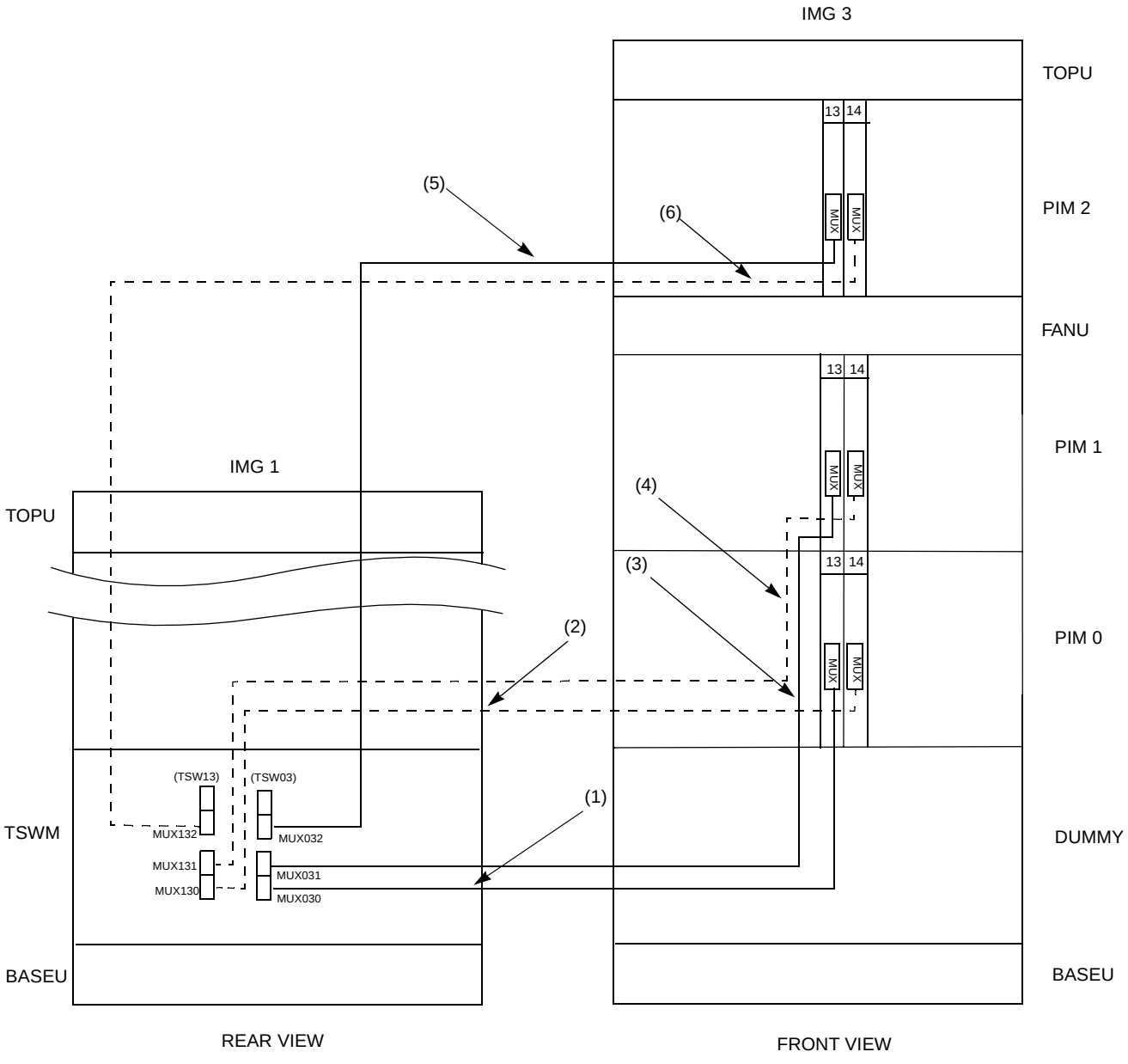

Figure 011-9 Inter-Frame Bus Cable Connection for IMG1-IMG3 (3-PIM System)

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Inter-Frame Cable Connections	Multiple IMG Configuration

Table 011-9 Inter-Frame Bus Cable Connection for IMG1-IMG3 (3-PIM System)

No.	FROM		TO		CABLE NAME	REMARKS
	UNIT/ MODULE	CONNECTOR NAME	UNIT/MODULE	CONNECTOR NAME		
1	TSWM	MUX030	PIM0 (IMG3)	MUX (Slot 13)	34PH MT24 TSW CA-H	TSW 03
2	TSWM	MUX130	PIM0 (IMG3)	MUX (Slot 14)	34PH MT24 TSW CA-H	TSW 13
3	TSWM	MUX031	PIM1 (IMG3)	MUX (Slot 13)	34PH MT24 TSW CA-H	TSW 03
4	TSWM	MUX131	PIM1 (IMG3)	MUX (Slot 14)	34PH MT24 TSW CA-H	TSW 13
5	TSWM	MUX032	PIM2 (IMG3)	MUX (Slot 13)	34PH MT24 TSW CA-I	TSW 03
6	TSWM	MUX132	PIM2 (IMG3)	MUX (Slot 14)	34PH MT24 TSW CA-I	TSW 13

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Inter-Frame Cable Connections	Multiple IMG Configuration

Connect the inter-frame bus cables between IMG1 and IMG3 (4-PIM system) as shown below. Note that the dotted lines indicate bus cables for a dual-system.

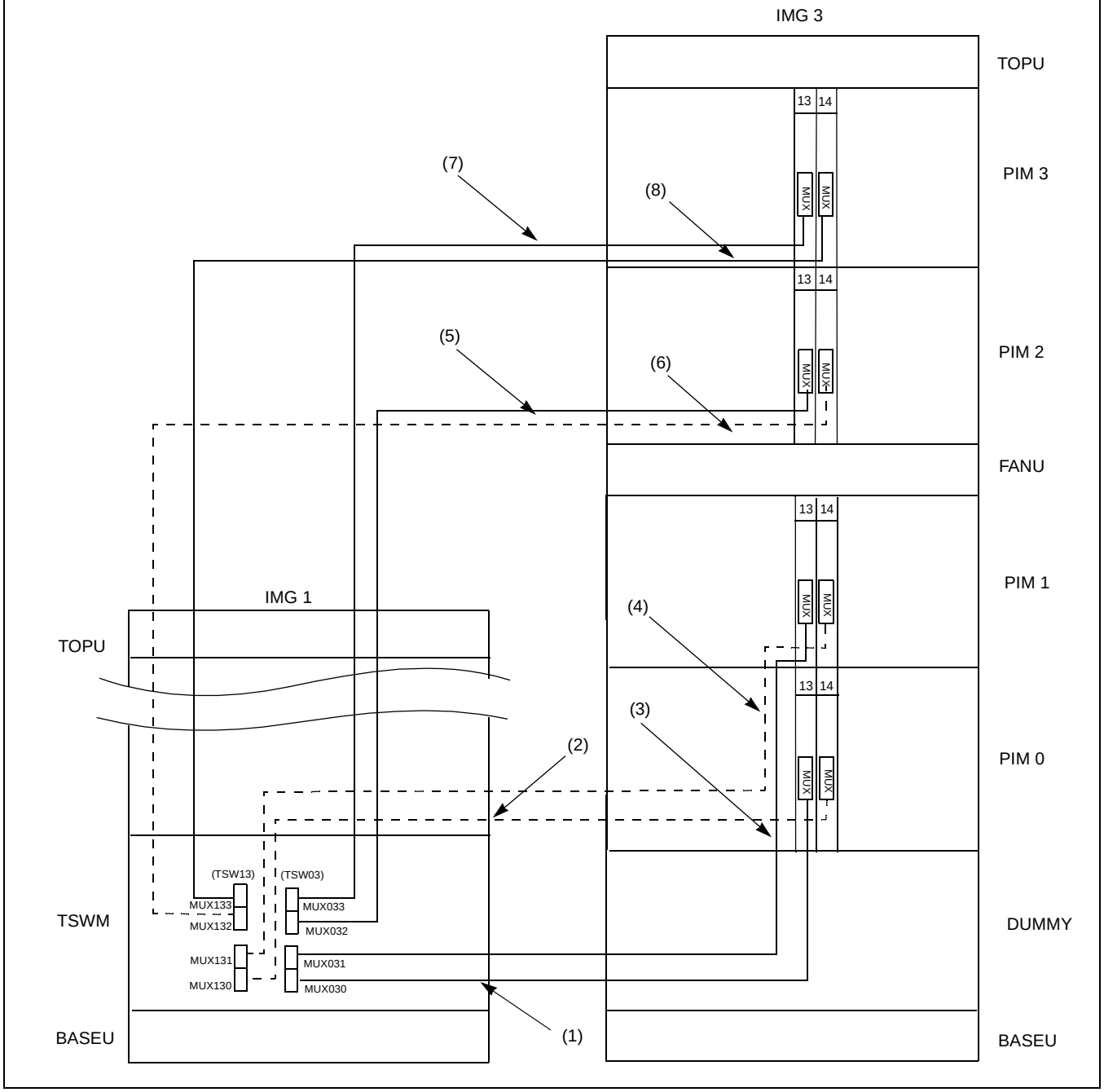

Figure 011-10 Inter-Frame Bus Cable Connection for IMG1-IMG3 (4-PIM System)

NAP-200-011	
Sheet 18/24	
Inter-frame Cable Connections	Multiple IMG Configuration

Table 011-10 Inter-Frame Bus Cable Connection for IMG1-IMG3 (4-PIM System)

No.	FROM		TO		CABLE NAME	REMARKS
	UNIT/ MODULE	CONNECTOR NAME	UNIT/MODULE	CONNECTOR NAME		
1	TSWM	MUX030	PIM0 (IMG3)	MUX (Slot 13)	34PH MT24 TSW CA-H	TSW 03
2	TSWM	MUX130	PIM0 (IMG3)	MUX (Slot 14)	34PH MT24 TSW CA-H	TSW 13
3	TSWM	MUX031	PIM1 (IMG3)	MUX (Slot 13)	34PH MT24 TSW CA-H	TSW 03
4	TSWM	MUX131	PIM1 (IMG3)	MUX (Slot 14)	34PH MT24 TSW CA-H	TSW 13
5	TSWM	MUX032	PIM2 (IMG3)	MUX (Slot 13)	34PH MT24 TSW CA-I	TSW 03
6	TSWM	MUX132	PIM2 (IMG3)	MUX (Slot 14)	34PH MT24 TSW CA-I	TSW 13
7	TSWM	MUX033	PIM3 (IMG3)	MUX (Slot 13)	34PH MT24 TSW CA-J	TSW 03
8	TSWM	MUX133	PIM3 (IMG3)	MUX (Slot 14)	34PH MT24 TSW CA-J	TSW 13

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Inter-frame Cable Connections	Multiple IMG Configuration

Connect the inter-frame alarm bus cables between IMG0 and IMG1 as shown below.

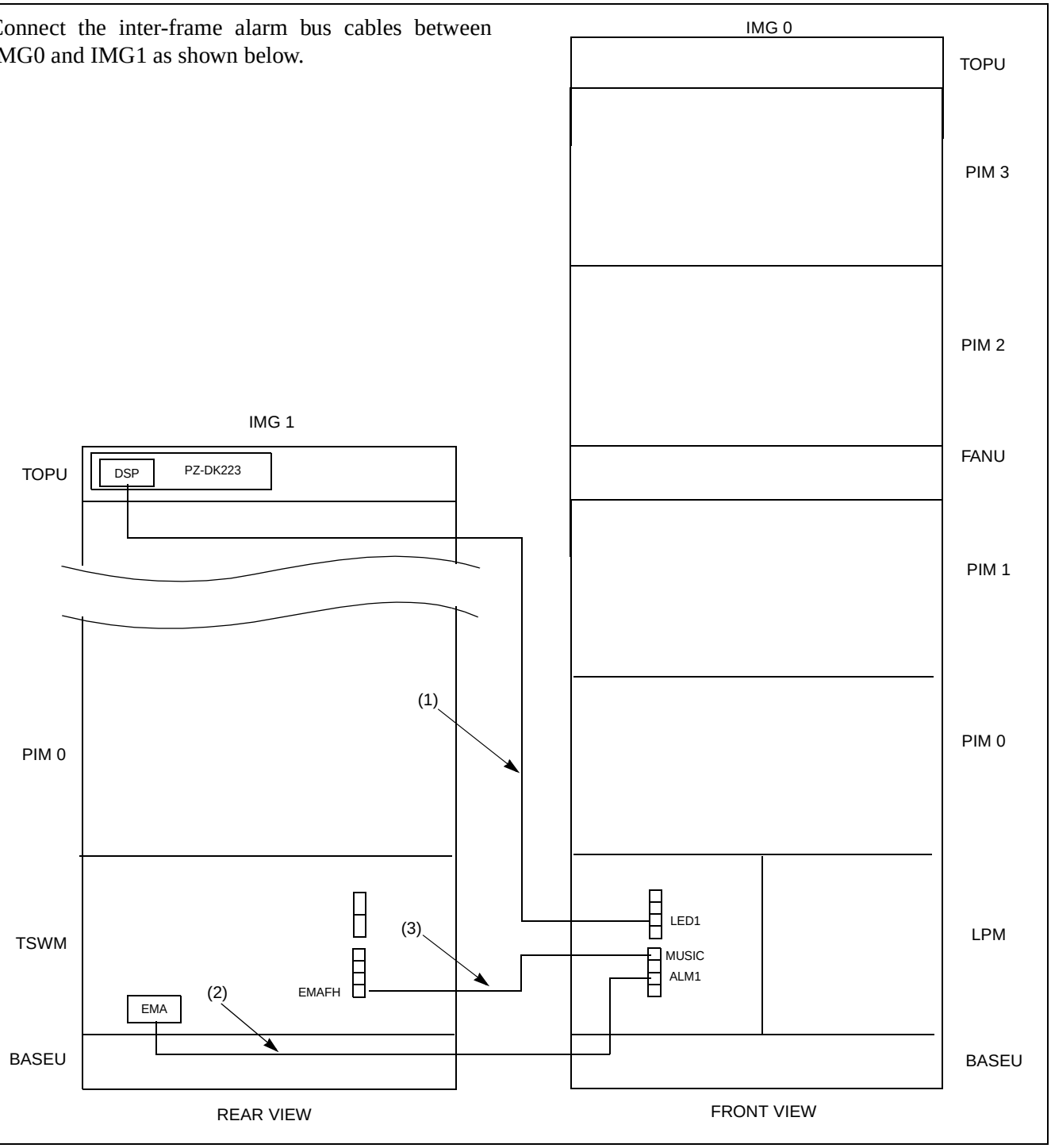

Figure 011-11 Inter-Frame Alarm Bus Cable Connection for IMG0-IMG1

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Inter-frame Cable Connections	Multiple IMG Configuration

Table 011-11 Inter-Frame Alarm Bus Cable Connection for IMG0-IMG1

No.	FROM		TO		CABLE NAME	REMARKS
	UNIT/MODULE	CONNECTOR NAME	UNIT/MODULE	CONNECTOR NAME		
1	LPM	LED1	TOPU(IMG1)	DSPM	16PH LED CA-A	
2	LPM	ALM1	TSWM	EMA	16PH ALM CA-A	
3	LPM	MUSIC	TSWM	EMAFH	16PH STD CA-F	

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Inter-frame Cable Connections	Multiple IMG Configuration

Connect the inter-frame alarm bus cables between IMG0 and IMG2 as shown below.

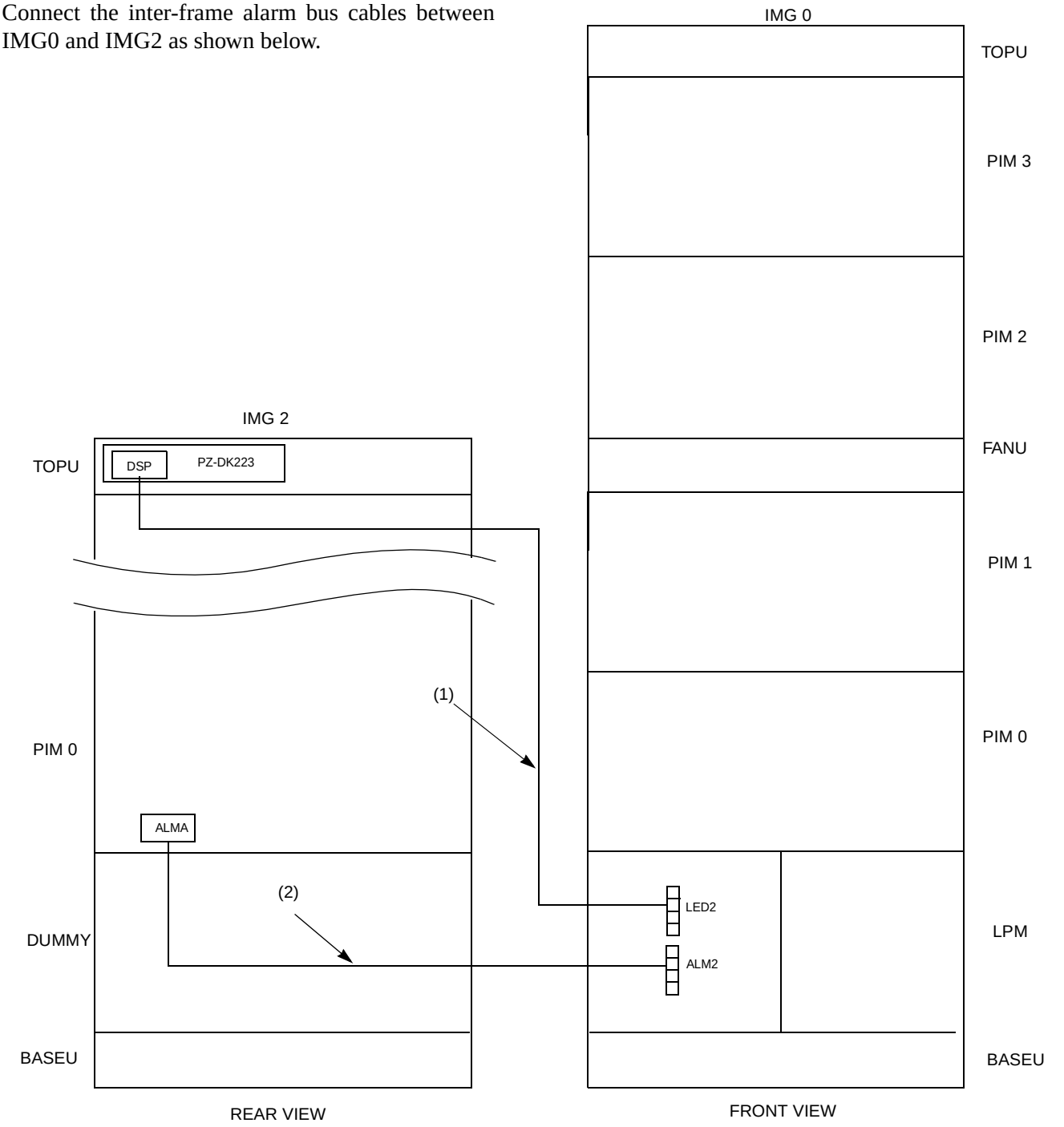

Figure 011-12 Inter-Frame Alarm Bus Cable Connection for IMG0-IMG2

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Inter-Frame Cable Connections	Multiple IMG Configuration

Table 011-12 Inter-Frame Alarm Bus Cable Connection for IMG0-IMG2

No.	FROM		TO		CABLE NAME	REMARKS
	UNIT/MODULE	CONNECTOR NAME	UNIT/MODULE	CONNECTOR NAME		
1	LPM	LED2	TOPU(IMG2)	DSPM	16PH LED CA-B	
2	LPM	ALM2	PIM0 (IMG2)	ALMA	16PH ALM CA-B	

NAP-200-011	
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Inter-frame Cable Connections	Multiple IMG Configuration

Connect the inter-frame alarm bus cables between IMG0 and IMG3 as shown below.

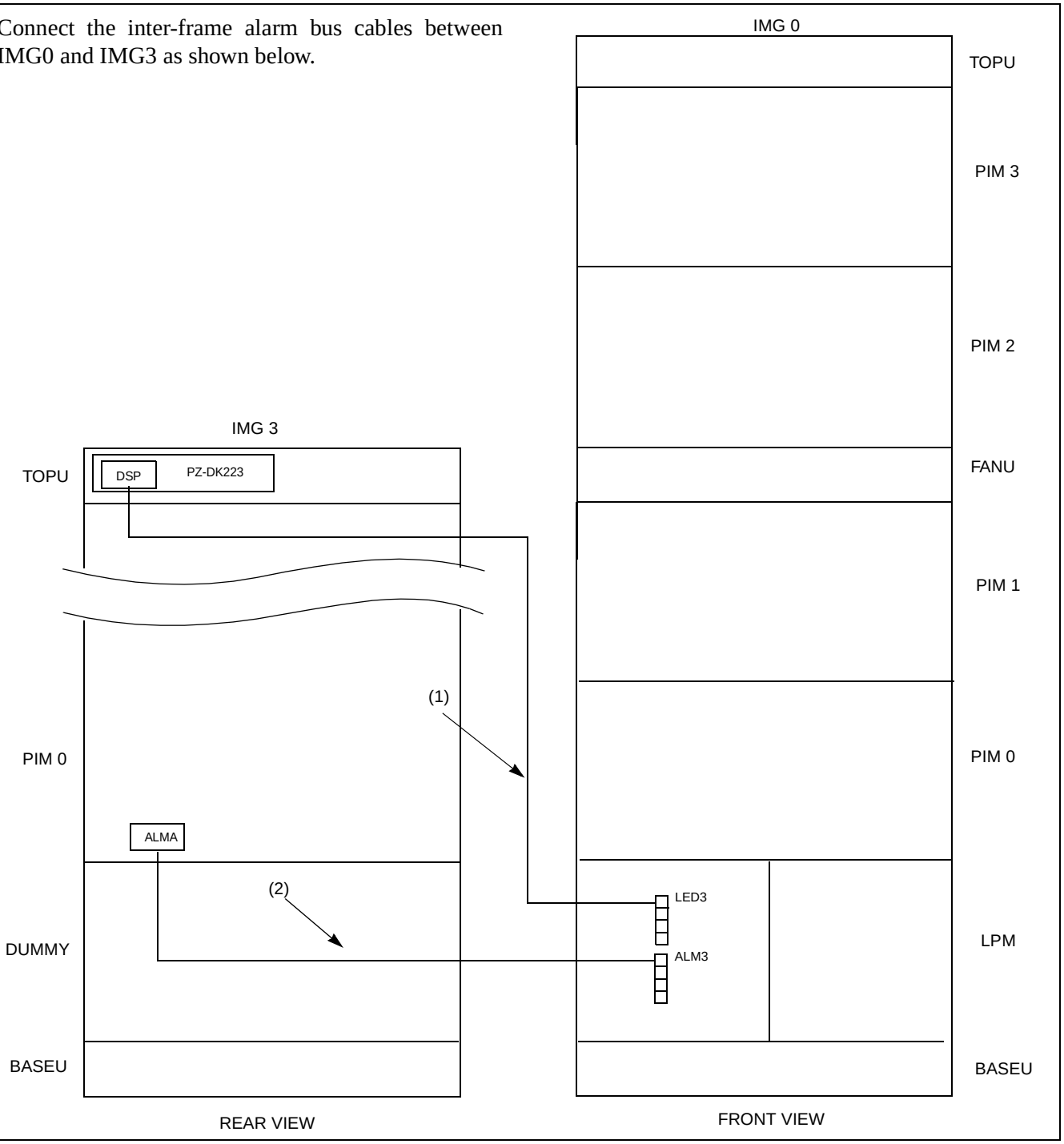

Figure 011-13 Inter-Frame Alarm Bus Cable Connection for IMG0-IMG3

NAP-200-011	
Sheet 24/24	
Inter-frame Cable Connections	Multiple IMG Configuration

Table 011-13 Inter-Frame Alarm Bus Cable Connection for IMG0-IMG3

No.	FROM		TO		CABLE NAME	REMARKS
	UNIT/MODULE	CONNECTOR NAME	UNIT/MODULE	CONNECTOR NAME		
1	LPM	LED3	TOPU(IMG3)	DSPM	16PH LED CA-C	
2	LPM	ALM3	PIM0 (IMG3)	ALMA	16PH ALM CA-C	

NAP-200-012
Sheet 1/1
Front Cable Connections between Circuit Cards

This NAP describes front cable connections between circuit cards.

Note: *Protection against static electricity:*
A Portable Field Service Grounding Kit must be used to protect system components from static discharge.

START

When CCH/DCH and DTI cards are mounted in PIM (For CCIS/ISDN), connect the front cable between CCH/DCH and DTI cards by referring to Figure 012-1.

END

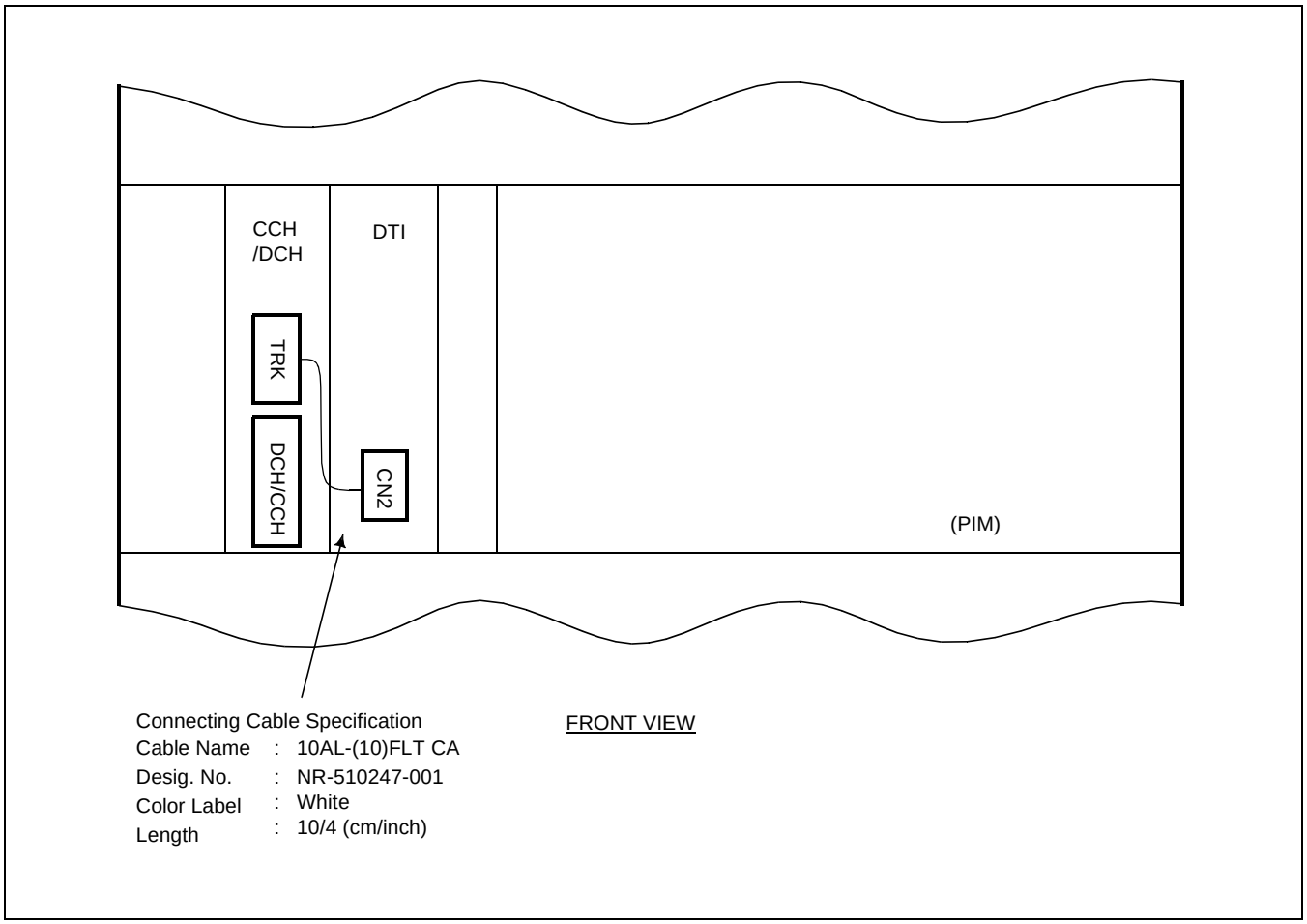

Figure 012-1 Front Cable Connections between Circuit Cards for CCIS/ISDN

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Cable Running from the PBX to MDF, ATTCON, MAT, and SMDR

This NAP explains the following work items:

- Cable Running from the PBX to the MDF and ATTCON (Desk Console)
- Cable Running from the PBX to the MAT and SMDR
- Connections at the PBX Side
- Cable Tying at the Equipment Frame

Note: *Compliance with EMI*

To comply with EMI, Shielded cables with CHAMP connector should be used for the following installation cables:

- *Cable from the PBX to the MDF*
- *Cable from the PBX to Attendant Console*
- *Cable from the PBX to alarm indicating equipment*
- *Cable from the PBX to the external music-on-hold source*
- *Cable for line test (connected to TEST connection)*

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Sheet 2/13
Cable Running from the PBX to MDF, ATTCON, MAT, and SMDR

1. CABLE RUNNING FROM THE PBX TO THE MDF AND ATTCON

START

- Cables (25P) for LT Connectors — At the PBX side, verify the names of the connectors on the PIM backplane, then bring each LT cable up to the corresponding connector position.

  Refer to Figure 013-1.
- Cables for Desk Console Connectors — Referring to NAP 200-016, run the installation cables for the Desk Console to the relevant connector positions.
- Cables (25P) for 16PH EX ALM Connector — At the PBX side, confirm the name of the connectors on the LPR backplane, then bring the 16PH EX ALM CA and installation cable up to the connector position.
- Cables (25P) for NCU Connectors — At the PBX side, bring each NCU cable up to the connector on the front of the PFT cards to be mounted in the PIM. Refer to Figure 015-4.

  At the MDF side, confirm the location of the Terminal Block to which the cable is to be terminated, then bring the cable up to the terminal block.

A

NAP-200-013
Sheet 3/13
Cable Running from the PBX to MDF, ATTCON, MAT, and SMDR

A

Cables for ODT Connectors

- Referring to description of 8TLT card in the Circuit Card Manual, connect each 2400 ODT CABLE/2400 ODT CABLE-A and the corresponding installation cables.
- At the PBX side, bring each 2400 ODT CABLE/2400 ODT CABLE-A up to the connector position on the front of the 8TLT cards to be mounted in the PIM.
- At the MDF side, confirm the location of the Terminal Blocks to which each cable is to be terminated, then bring the cables up to the terminal blocks.

END

NAP-200-013
Sheet 4/13
Cable Running from the PBX to MDF, ATTCON, MAT, and SMDR

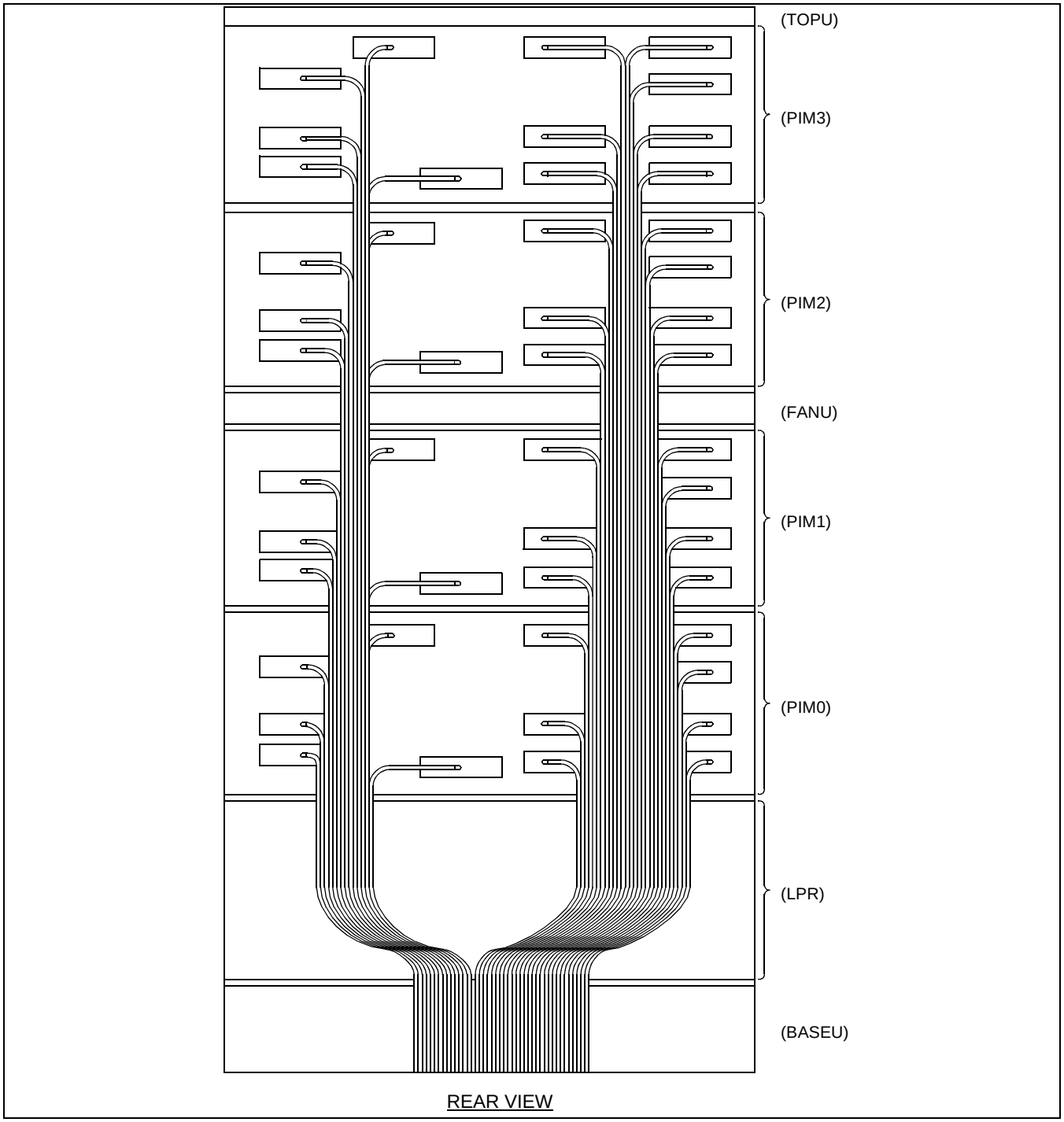


Figure 013-1 LT Cable Routing

NAP-200-013
Sheet 5/13
Cable Running from the PBX to MDF, ATTCON, MAT, and SMDR

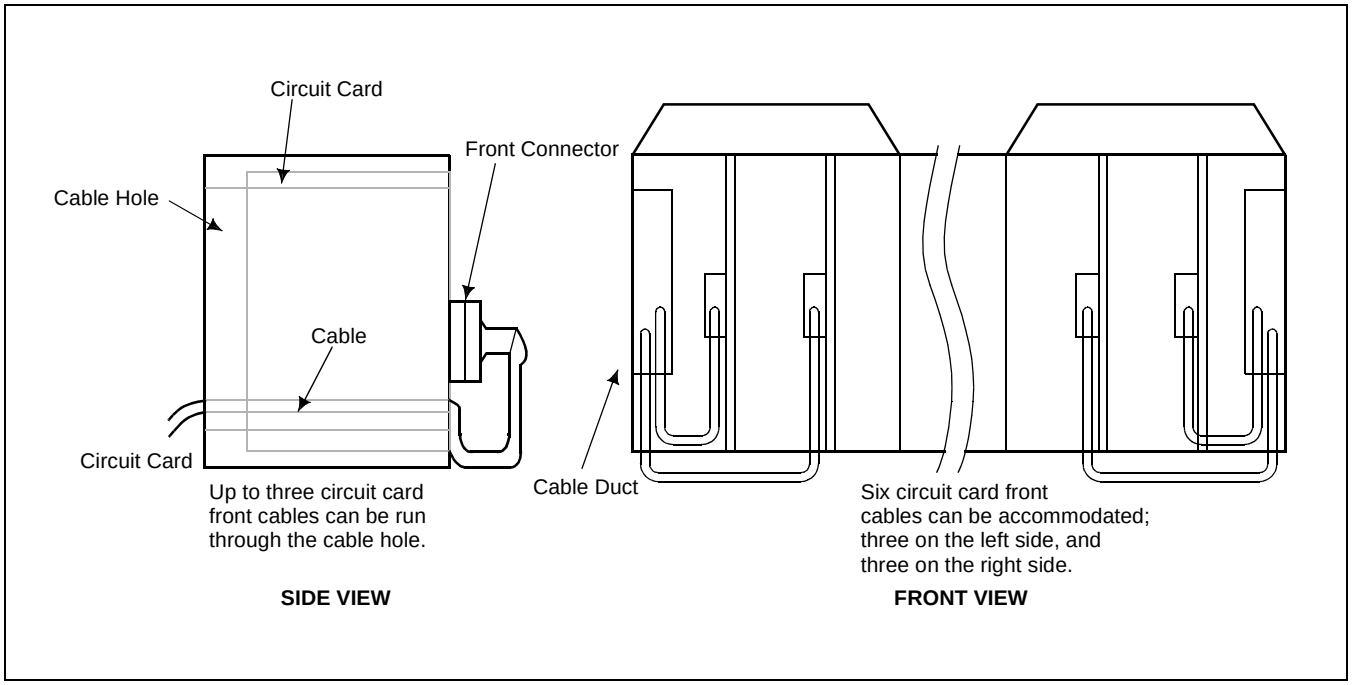


Figure 013-2 Cable Routing of Circuit Card Front Cable

NAP-200-013
Sheet 6/13
Cable Running from the PBX to MDF, ATTCON, MAT, and SMDR

2. CABLE RUNNING FROM THE PBX TO THE MAT AND SMDR

START

- MAT (Refer to NAP-200-017)
  - Referring to NAP-200-017, connect 68PH S 2 PORTS CA-A and the installation cable (25P).
  - At the PBX side, confirm the connector name on the LPR backplane, then run 68PH S 2 PORTS CA-A up to the connector position.
  - At the MAT side, run RS-232-CA “0” up to the MAT.
- SMDR (Refer to NAP-200-018)
  - Referring to NAP-200-018, connect the PBX and the SMDR equipment.
  - At the PBX side, confirm the connector name on the LPR backplane, then run 68PH S 2 PORTS CA-A up to the connector position.
  - At the SMDR equipment side, run the installation cable (25P) up to the SMDR equipment.

END

NAP-200-013
Sheet 7/13
Cable Running from the PBX to MDF, ATTCON, MAT, and SMDR

3. CONNECTIONS AT THE PBX SIDE

START

- LT Connectors — Confirm each connector name on the backplane and the corresponding LT connector, then connect the two.
- 16PH EX ALM — Connect the 16PH EX ALM CA to the EXALM rear connector on the LPR backplane.
- NCU Connectors — Connect the NCU cable to the connector on the front of the PFT card.
- IOC Connectors — Connect 68 PH S 2PORTS CA-A to the MISC connectors on the LPR backplane.

END

4. CABLE TYING AT THE PBX

START

- Referring to Figure 013-3, secure the connector cables to the Module.

END

NAP-200-013
Sheet 8/13
Cable Running from the PBX to MDF, ATTCON, MAT, and SMDR

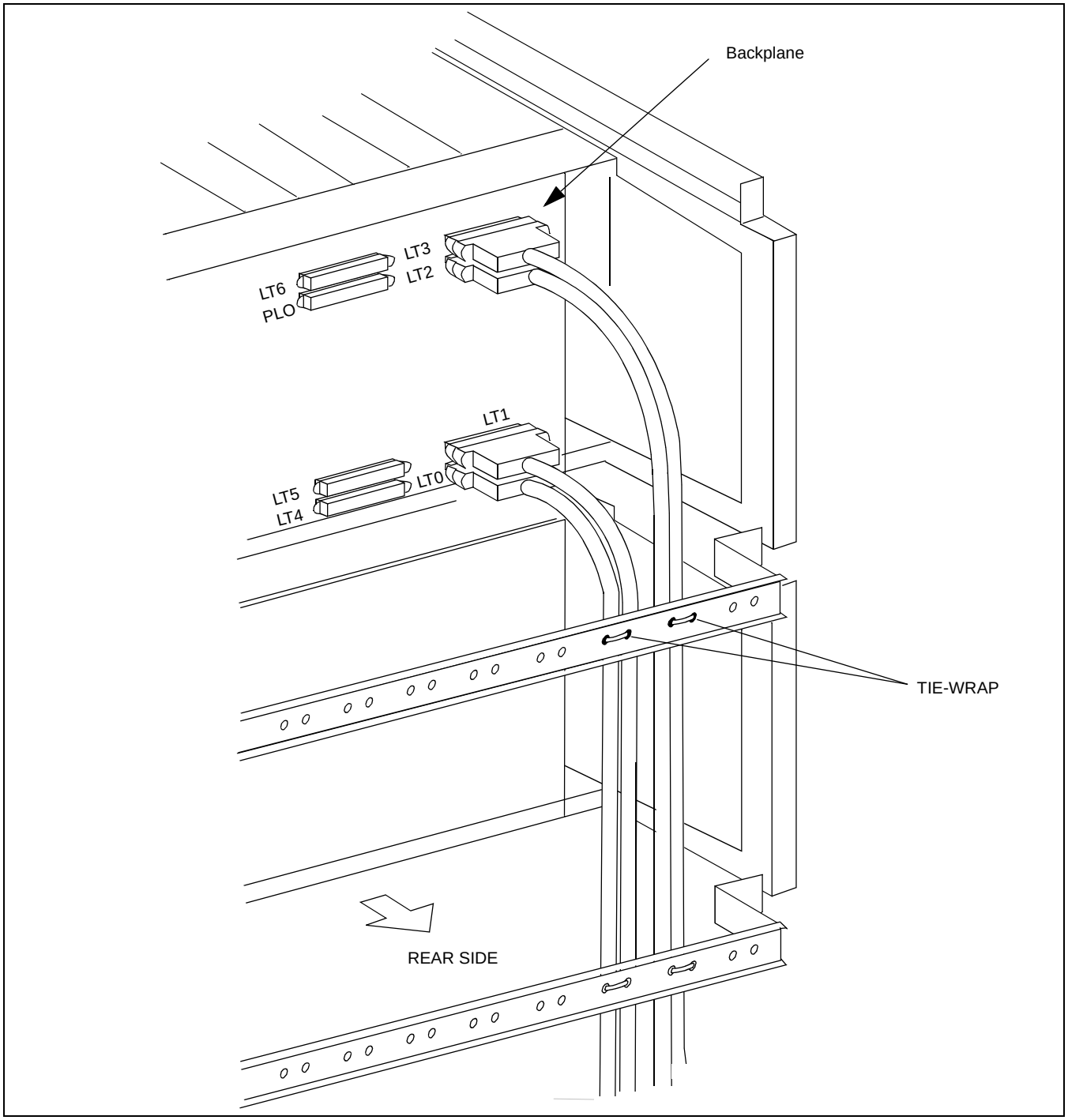


Figure 013-3 Example of Cable Tying Using Tie-Wrap

NAP-200-013
Sheet 9/13
Cable Running from the PBX to MDF, ATTCON, MAT, and SMDR

5. TERMINATION OF THE CABLES BETWEEN THE PBX AND THE MDF OR ATTCON ONTO THE CABLE SUPPORT ASSEMBLY

START

- Remove of the Cable Support Assembly.
  - Remove the Cable Support Assembly from the BASEU. (See Figure 013-4.)
- Peel the cable cover
  - Referring to Table 13-1, confirm the cable terminating locations on the Cable Support Assembly.
  - Per the cable terminating locations, peel the cable cover as shown on Figure 013-5.
- Terminate the cable
  - Referring to Figure 013-5, wind the M-clamp onto the cable portion from which the cover has been peeled off.
  - Referring to Figure 013-6, terminate the cable onto the Cable Support Assembly.
- When all the cables have been terminated to the Cable Support Assembly A, likewise terminate the cables onto the Cable Support Assembly B, C, D, E in the order named.

END

NAP-200-013
Sheet 10/13
Cable Running from the PBX to MDF, ATTCON, MAT, and SMDR

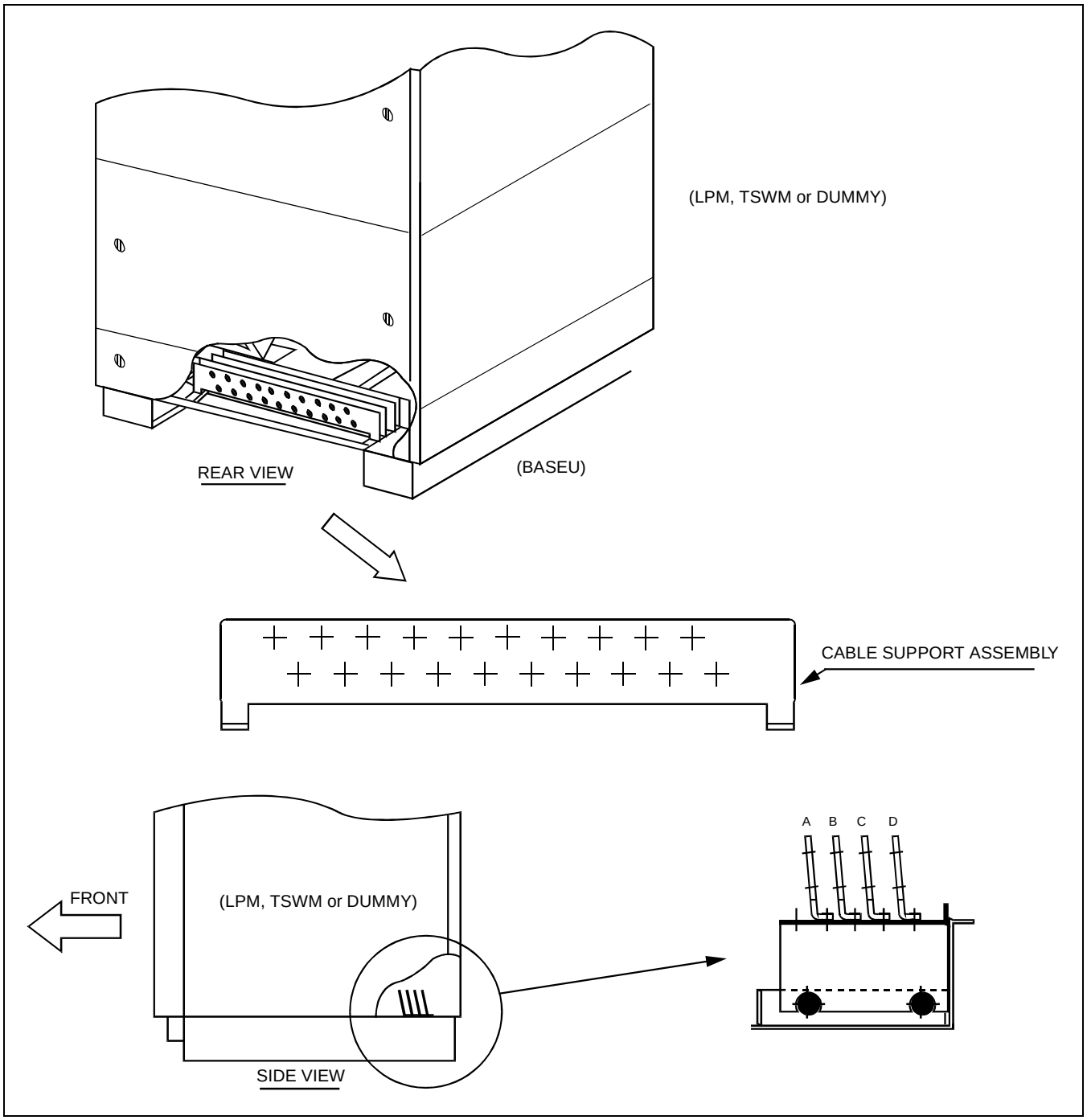


Figure 013-4 Cable Support Assembly

NAP-200-013
Sheet 11/13
Cable Running from the PBX to MDF, ATTCON, MAT, and SMDR

Table 013-1 Cable Support Assembly

BACKPLANE		CABLE SUPPORT No.	USE	REMARKS
MODULE	CONNECTOR NAME			
LPR	MISCnA, MISCnB	A	for I/O Equipment (MAT, Printer, etc.)	Spare cable (15 cables) are to be used as Cable Support Assembly extra cables. The number of cables for the whole system is limited to maximum 100.
	EXALM **Note**	A	for Alarm Indicating Panel, etc.	
		A (Extra)	Spare (15 cables)	
PIM0	Front of Circuit Card	B	The number of cables is limited to three for one side, and six for both sides.	In case the required number of cables exceeds 20, the Cable Support Assembly extra cables should be used.
	LT0 - LT11	B	LT cable	
PIM1	Front of Circuit Card	C	The number of cables is limited to three for one side, and six for both sides.	In case the required number of cables exceeds 20, the Cable Support Assembly extra cables should be used.
	LT0 - LT11	C	LT cable	
PIM2	Front of Circuit Card	D	The number of cables is limited to three for one side, and six for both sides.	In case the required number of cables exceeds 20, the Cable Support Assembly extra cables should be used.
	LT0 - LT11	D	LT cable	
PIM3	Front of Circuit Card	E	The number of cables is limited to three for one side, and six for both sides.	In case the required number of cables exceeds 20, the Cable Support Assembly extra cables should be used.
	LT0 - LT11	E	LT cable	

Note: *For LPM only.*

NAP-200-013
Sheet 12/13
Cable Running from the PBX to MDF, ATTCON, MAT, and SMDR

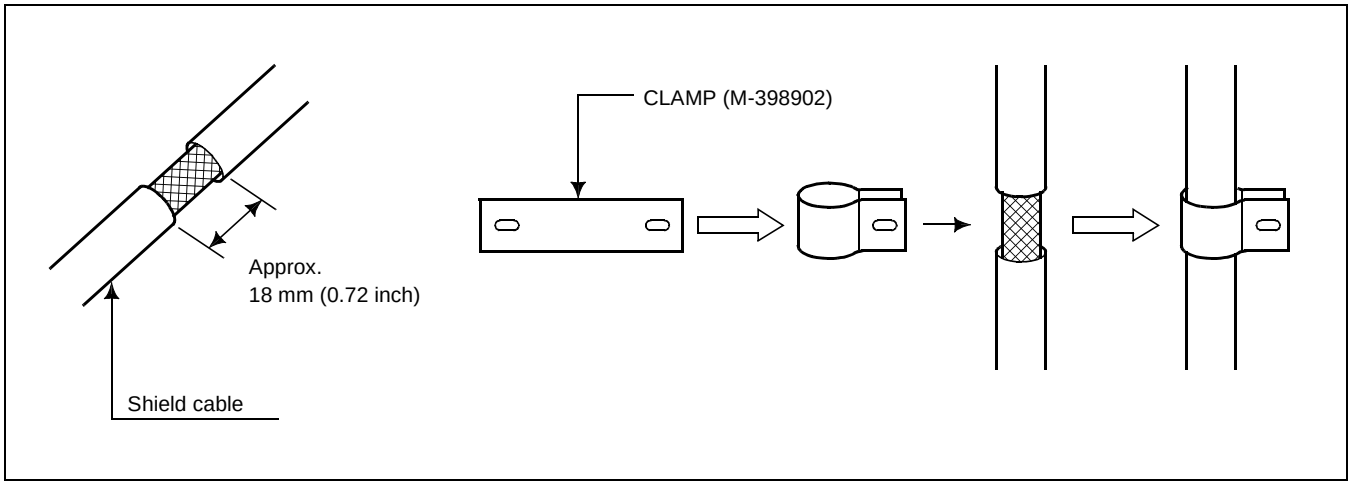


Figure 013-5 Clamp Winding

NAP-200-013
Sheet 13/13
Cable Running from the PBX to MDF, ATTCON, MAT, and SMDR

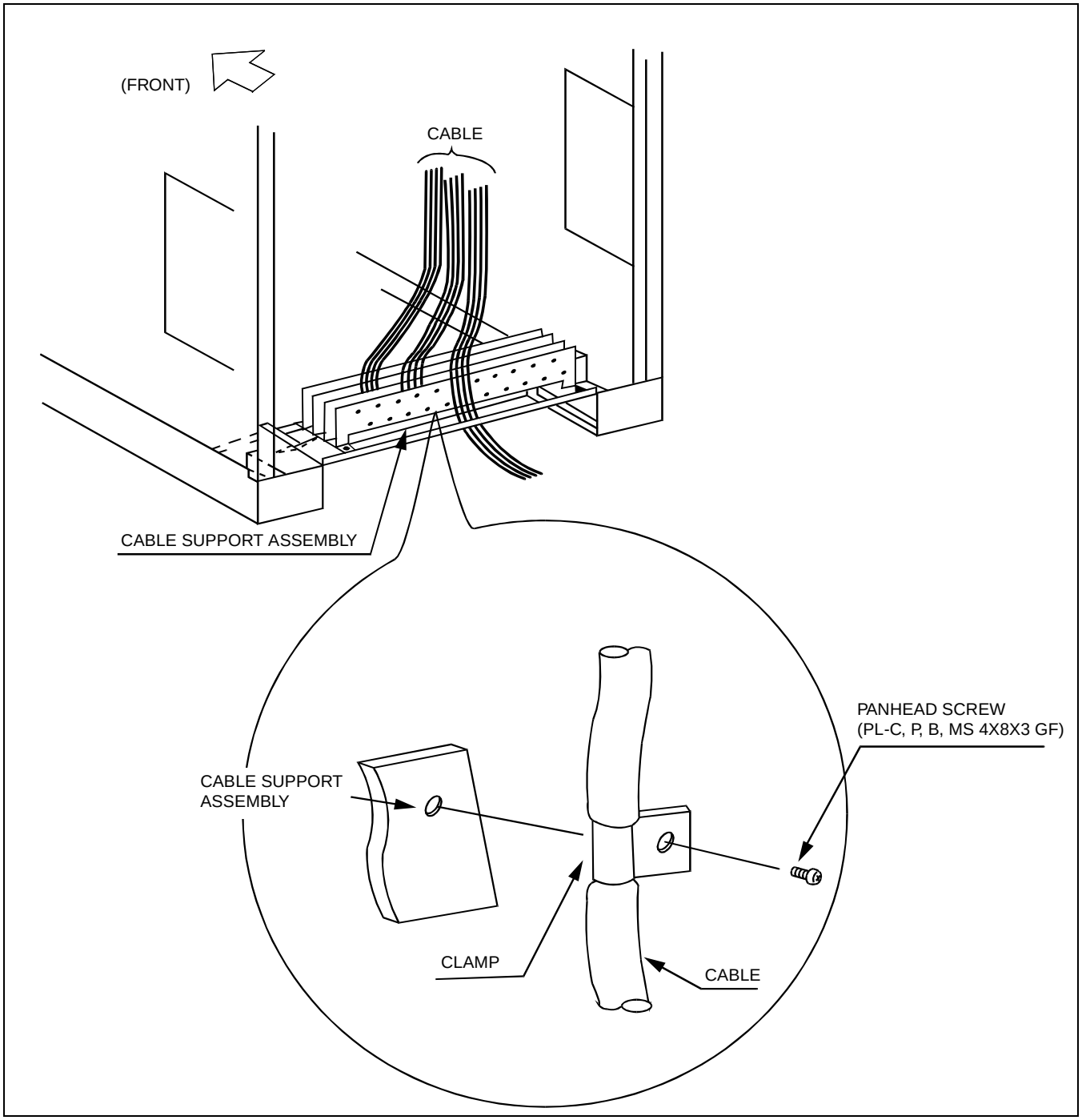


Figure 013-6 Termination of Installation Cables

NAP-200-014
Sheet 1/1
Termination of Cables on MDF (Wire Accommodation of Each Cable)

This NAP explains the procedures for terminating cables at the MDF.

CAUTION: *When terminating Cables to the MDF, the line/trunk circuit card should extend about 50 mm (2 inches) from the module and must not contact the backplane connector.*

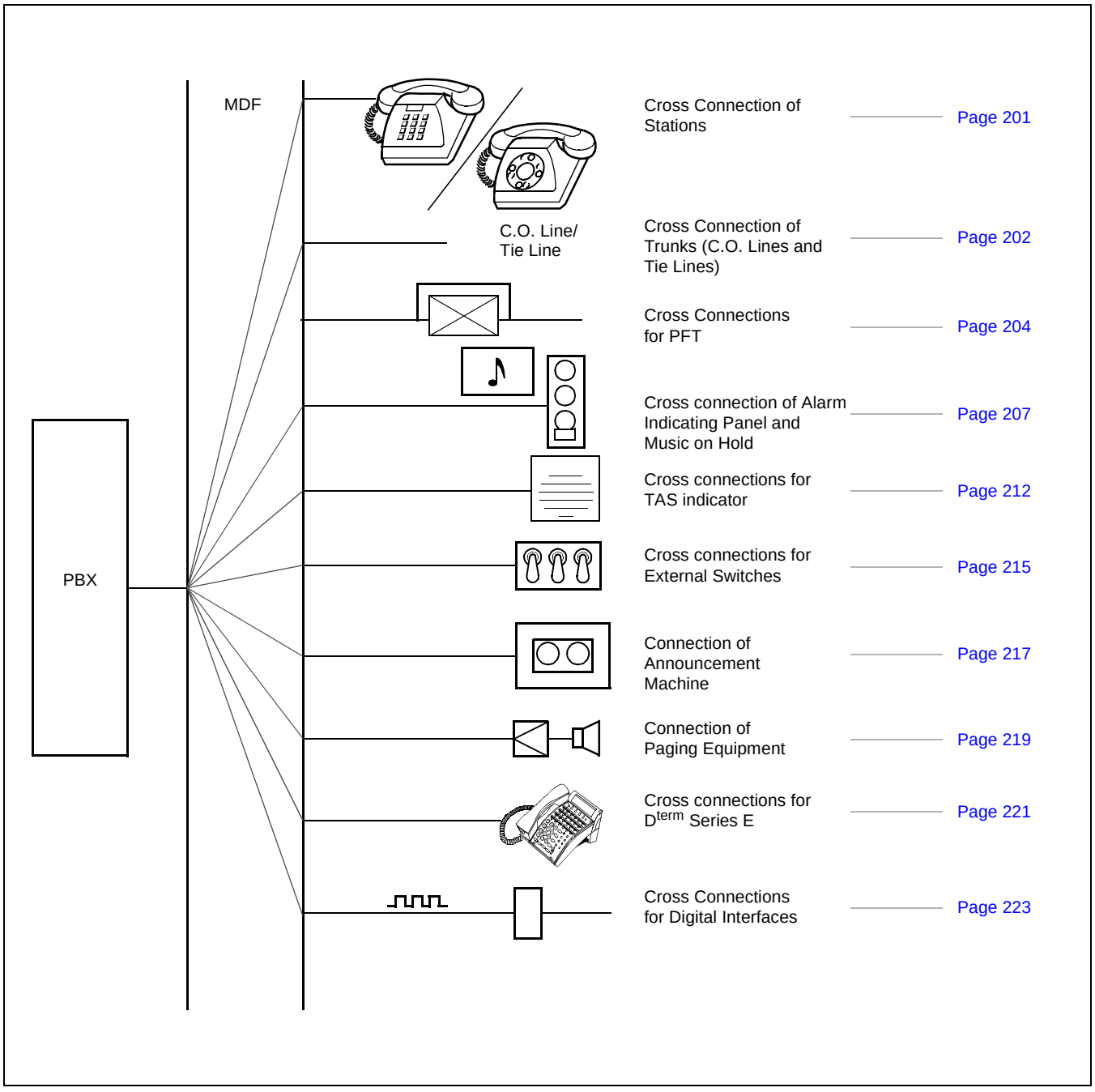
START

- Cable trying at the MDF — Secure the CHAMP Connector cables, which have been extended to the MDF as per NAP-200-012, to the cable supports on the MDF after confirming their positions on the terminal block.
- Cutting of excess cable — Shorten each CHAMP connector cable, leaving enough length so that they can be neatly terminated to the terminal block.
- Cable termination to the MDF — Referring to the Circuit Card Manual, punch down the CHAMP connector cables to the MDF.
- Confirmation of connections — After confirming that no erroneous connections have been made on the Module Group side, use an IC buzzer on similar device to verify the connections at the MDF.

END

NAP-200-015
Sheet 1/30
Cable Termination and Cross Connections from MDF to Peripheral Equipment, C. O. Lines, and Tie Lines

This NAP explains the following work items:



NAP-200-015
Sheet 2/30
Cable Termination and Cross Connections from MDF to Peripheral Equipment, C. O. Lines, and Tie Lines

1. CROSS CONNECTION OF STATIONS

Note 1: *Provide the necessary cross connections at the MDF by using copper wires of 0.5 mm diameter (24 AWG). 2-core twisted wire is used for speech path, and single-core wire is used for control wire. It is recommended that wires of different colors be used for trunks, station lines, PFT, etc., so that they can easily be distinguished.*

Note 2: *For cross connections between stations and C.O. lines for PFT, refer to Section 3., "CROSS CONNECTIONS FOR PFT".*

START

- Check the terminal locations on the Module Group side of the MDF — Referring to Port Accommodation sheet and description of 16LC card in the Circuit Card Manual, identify the lead names for the 16LC card and the terminal locations of the leads.
- Cross Connection — Referring to Figure 015-1, provide the necessary cross connections.

END

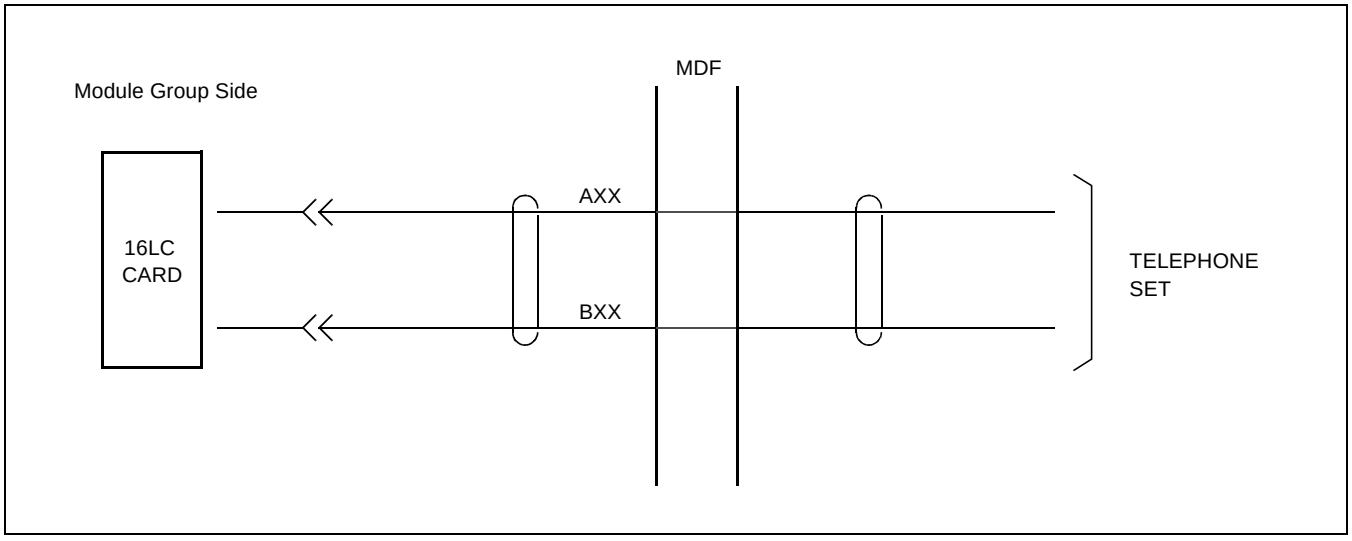


Figure 015-1 Cross Connection of Stations

NAP-200-015
Sheet 3/30
Cable Termination and Cross Connections from MDF to Peripheral Equipment, C. O. Lines, and Tie Lines

2. CROSS CONNECTION OF TRUNKS (C.O. LINES AND TIE LINES)

Note 1: *Provide the necessary cross connections at the MDF by using copper wires of 0.5 mm diameter (24 AWG). 2-core twisted wire is used for speech path, and single-core wire is used for control wire. It is recommended that wires of different colors be used for trunks, station lines, PFT, etc., so that they can easily be distinguished.*

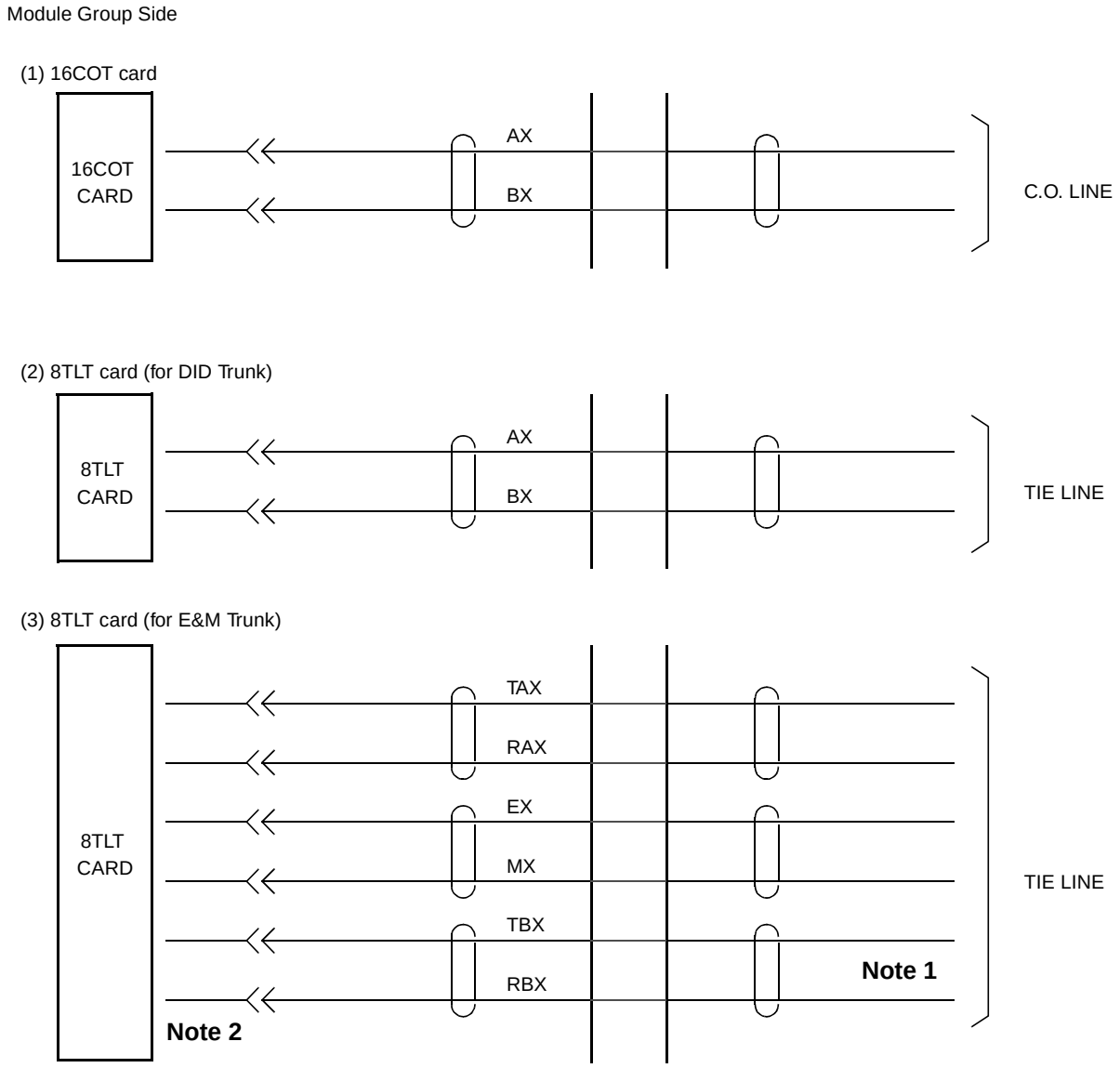
Note 2: *For cross connections between stations and C.O. lines for PFT, refer to Section 3., "CROSS CONNECTIONS FOR PFT" in this NAP.*

START

- Check the terminal locations on the Module Group side of the MDF — Referring to Port Accommodation sheet and description of 16COT card or 8TLT card in the Circuit Card Manual, identify the lead names for the 16COT, or 8TLT card and the terminal locations of the leads.
- Cross Connection — Referring to Figure 015-2, provide the necessary cross connections.

END

NAP-200-015
Sheet 4/30
Cable Termination and Cross Connections from MDF to Peripheral Equipment, C. O. Lines, and Tie Lines



Note 1: *For 2W/4W E&M systems, these leads are not used.*

Note 2: *For No. 4–7 trunks, the leads appear at the front of the card. Refer to the description of the 8TLT card in the Circuit Card Manual.*

Figure 015-2 Cross Connection of Trunks (C.O. Lines and Tie Lines)

NAP-200-015
Sheet 5/30
Cable Termination and Cross Connections from MDF to Peripheral Equipment, C. O. Lines, and Tie Lines

3. CROSS CONNECTIONS FOR PFT

Note 1: *The COT must be accommodated in a universal slot of the same Unit (U) in which the cross-connected PFT is mounted. See the figure below.*

Note 2: *Provide the necessary cross connections at the MDF by using copper wires of 0.5 mm diameter (24 AWG). 2-core twisted wire is used for speech path, and single-core wire is used for control wire. It is recommended that wires of different colors be used for trunks, station lines, PFT, etc., so that they can easily be distinguished.*

The PFT (PA-M53) card is mounted in slot 04 or in slot 15 of each PIM.

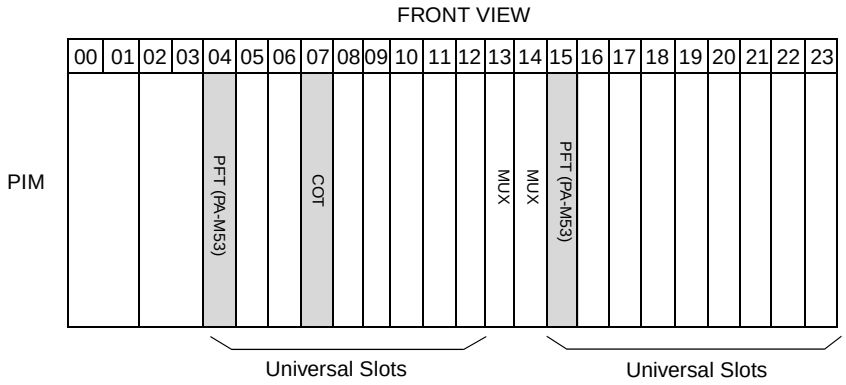


Figure 015-3 Mounting Locations of PFT (PA-M53)

NAP-200-015
Sheet 6/30
Cable Termination and Cross Connections from MDF to Peripheral Equipment, C. O. Lines, and Tie Lines

START

- Check the terminal locations on the Module Group side of the MDF
  - Referring to Section 1., "CROSS CONNECTION OF STATIONS" and Section 2., "CROSS CONNECTION OF TRUNKS (C.O. LINES AND TIE LINES)" in this NAP, identify the lead names of the stations and trunks to be connected to the PFT (NCU) card and the terminal locations of the leads.
  - Referring to description of PFT card in the "NEAX 2400 IMX Circuit Card Manual," identify the lead names for the "NCU" connector, "LT" connector, and the terminal locations of the leads.
- Cross Connection — Referring to Figure 015-4, provide the necessary cross connections.

END

NAP-200-015
Sheet 7/30
Cable Termination and Cross Connections from MDF to Peripheral Equipment, C. O. Lines, and Tie Lines

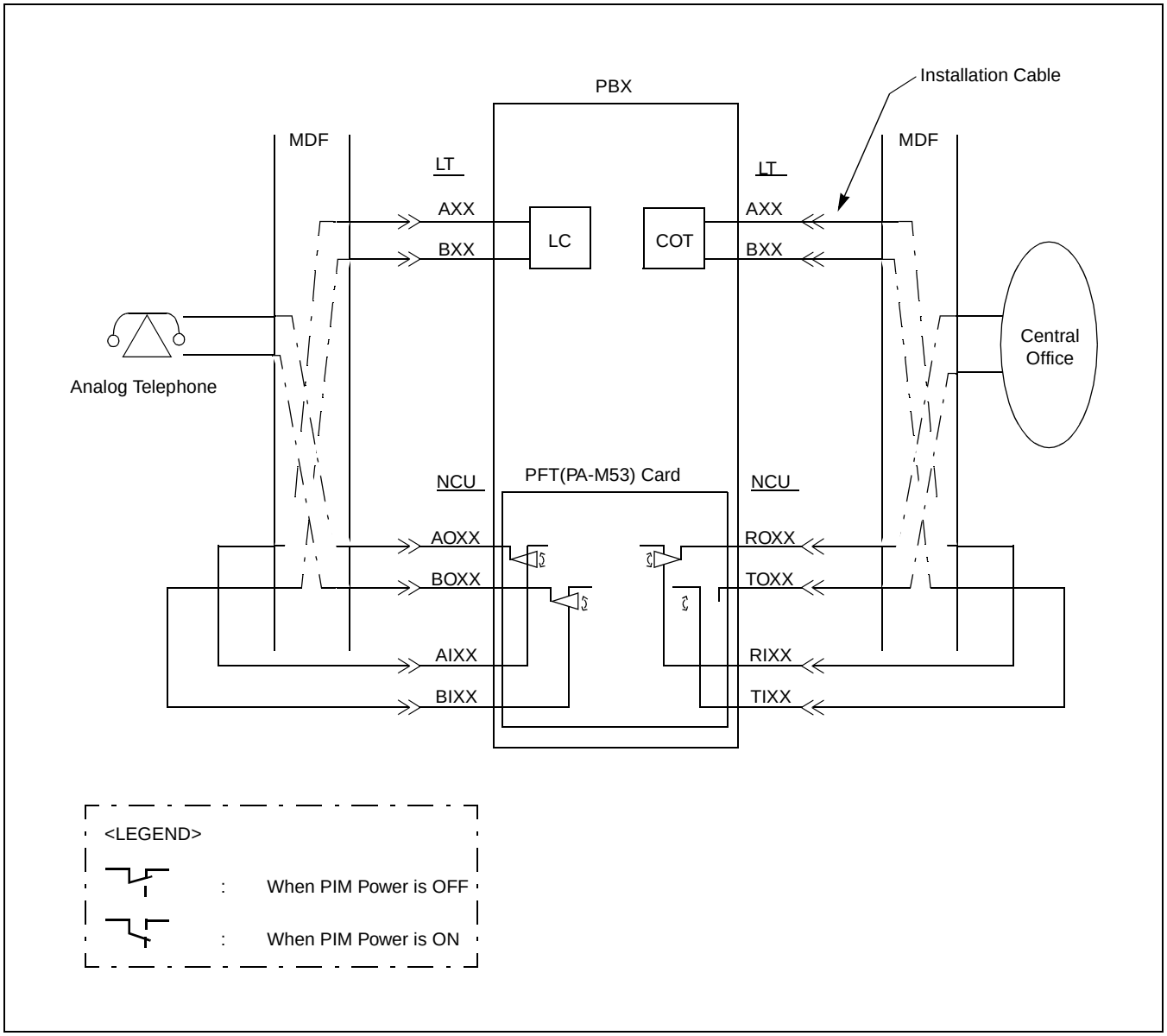


Figure 015-4 Cross Connection for PFT

NAP-200-015
Sheet 8/30
Cable Termination and Cross Connections from MDF to Peripheral Equipment, C. O. Lines, and Tie Lines

4. CROSS CONNECTION OF ALARM INDICATING PANEL AND MUSIC ON HOLD

Note: *Provide the necessary cross connections at the MDF by using copper wires of 0.5 mm diameter (24 AWG). 2-core twisted wire is used for speech path, and single-core wire is used for control wire. It is recommended that wires of different colors be used for trunks, station lines, PFT, etc., so that they can easily be distinguished.*

- Alarm Indicating Panel

START

- Mounting of Alarm Indicating panel
  - Mount the Alarm Indicating Panel using AY plugs, curl plugs, board plugs, etc.
- Cable running
  - Referring to Figure 015-5 or Figure 015-6, run the cables between the Alarm Indicating Panel and the MDF.
  - Referring to Figure 015-5 or Figure 015-6, run the cable between the RPT on BASEU and the MDF.
  - Protect the cables by using cable ducts, etc.
- Termination of cables
  - Terminate the installed cables to the Alarm Indicating Panel, MDF, and RPT terminals.
- Cross connection
  - Referring the Figure 015-5 or Figure 015-6, provide the necessary cross connections at the Alarm Indicating Panel side and Module Group side.

END

- Music On Hold

START

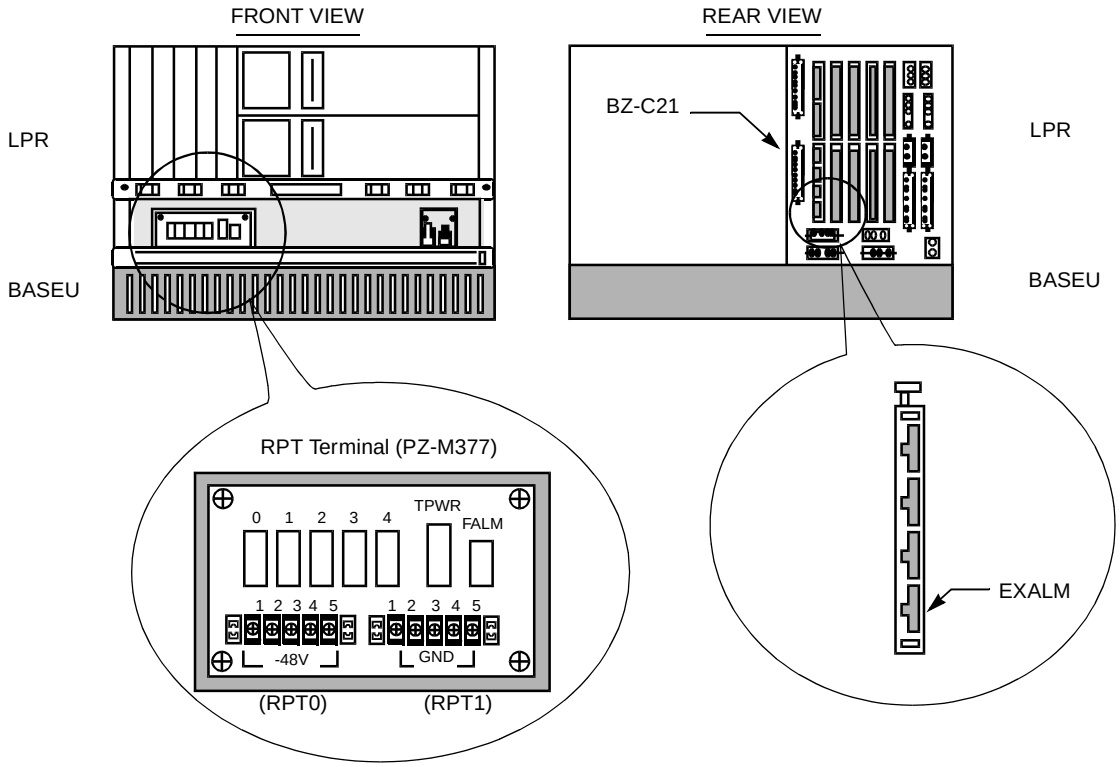
- Cross connection
  - Referring to Figures 015-5 or Figure 015-7, run the cable between the MDF and the music source.
  - Connect the music source to the FM0 and E connections.

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

END

NAP-200-015
Sheet 9/30
Cable Termination and Cross Connections from MDF to Peripheral Equipment, C. O. Lines, and Tie Lines

- Locations of Terminal and Connector



- General Cable Connection for Alarm Indicating Panel

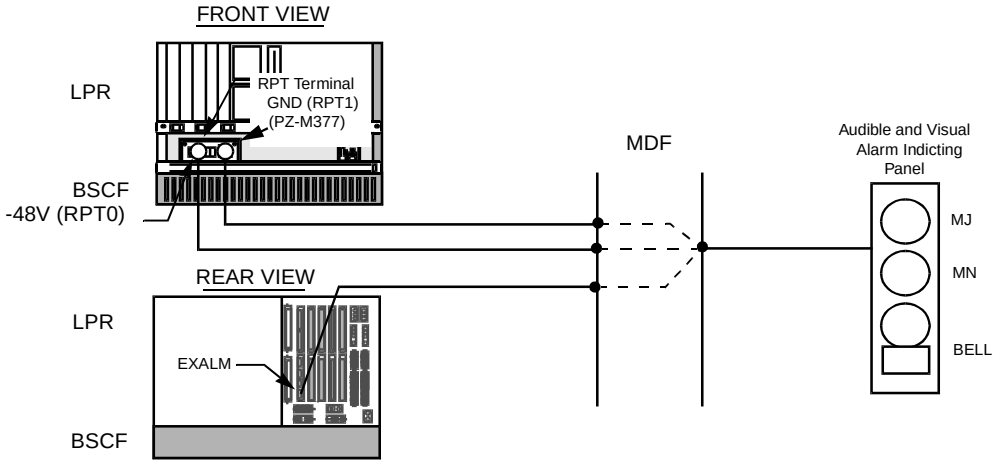
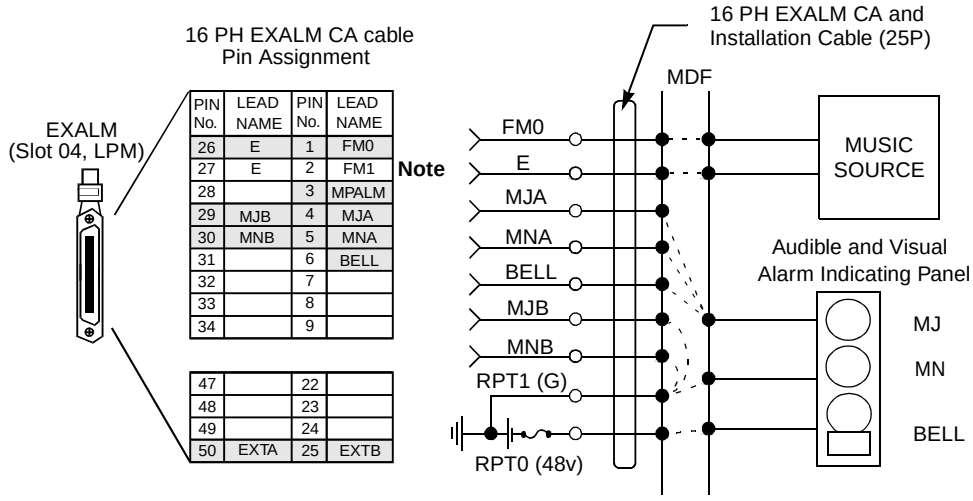


Figure 015-5 Connection of Alarm Indicating Panel and Music on Hold (Single IMG Configuration)

NAP-200-015
Sheet 10/30
Cable Termination and Cross Connections from MDF to Peripheral Equipment, C. O. Lines, and Tie Lines

- Cabling Diagram

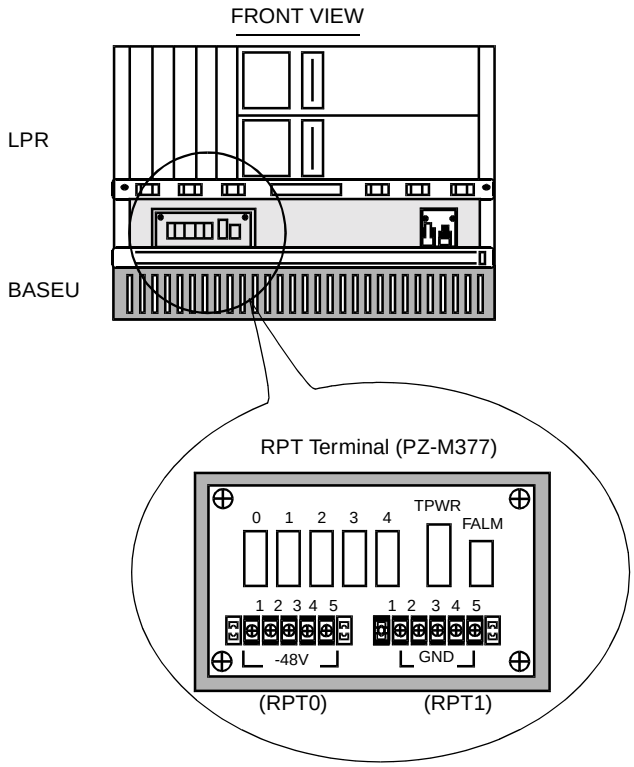


Note: *FM1 is not used.*

Figure 015-5 Connection of Alarm Indicating Panel and Music on Hold (Single IMG Configuration) (2/2)

NAP-200-015
Sheet 11/30
Cable Termination and Cross Connections from MDF to Peripheral Equipment, C. O. Lines, and Tie Lines

- Locations of Terminal and Connector



- General Cable Connection for Alarm Indicating Panel

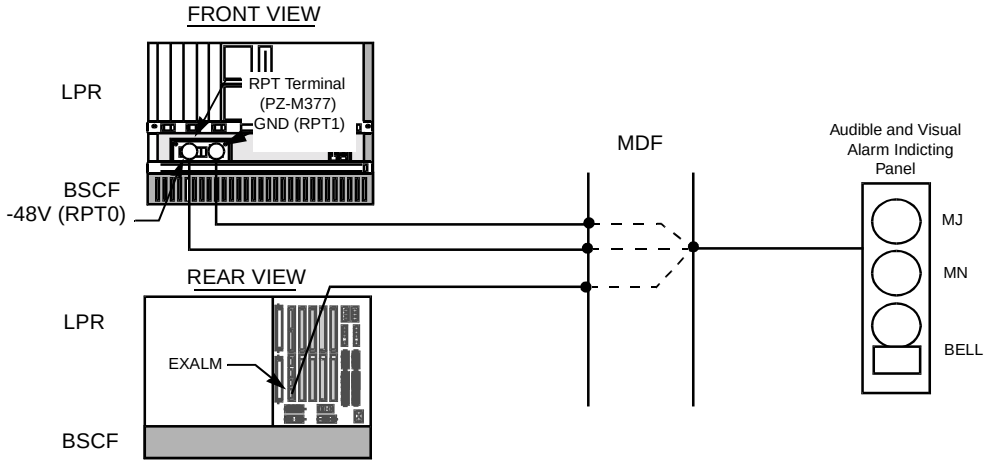


Figure 015-6 Connection of Alarm Indicating Panel (Multiple IMG Configuration) (1/2)

NAP-200-015
Sheet 12/30
Cable Termination and Cross Connections from MDF to Peripheral Equipment, C. O. Lines, and Tie Lines

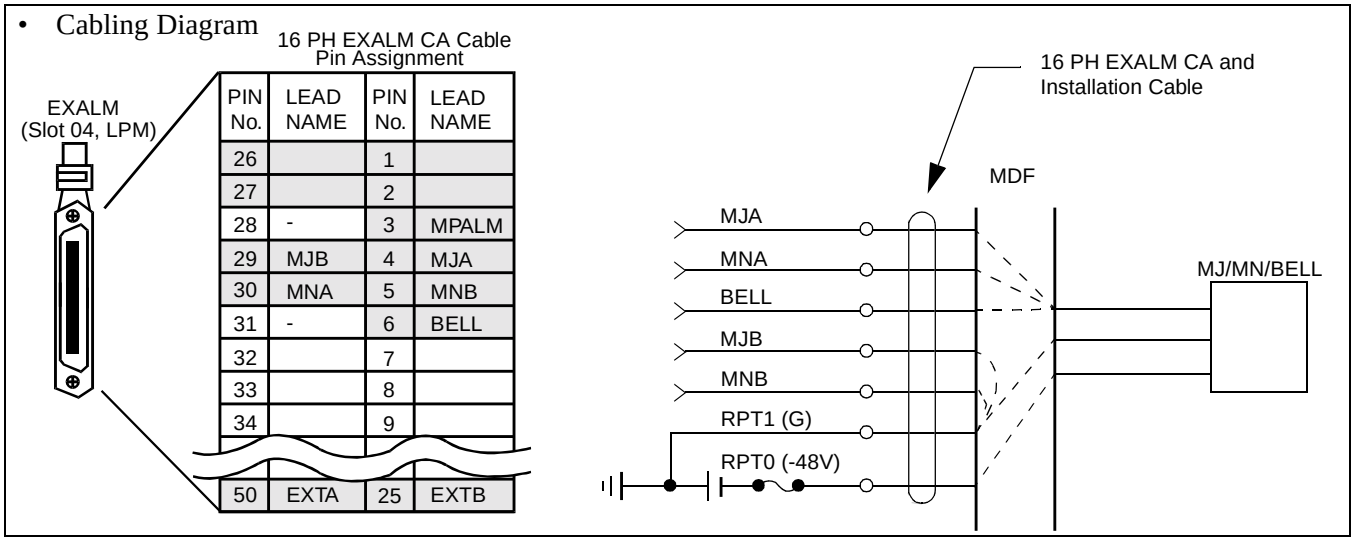
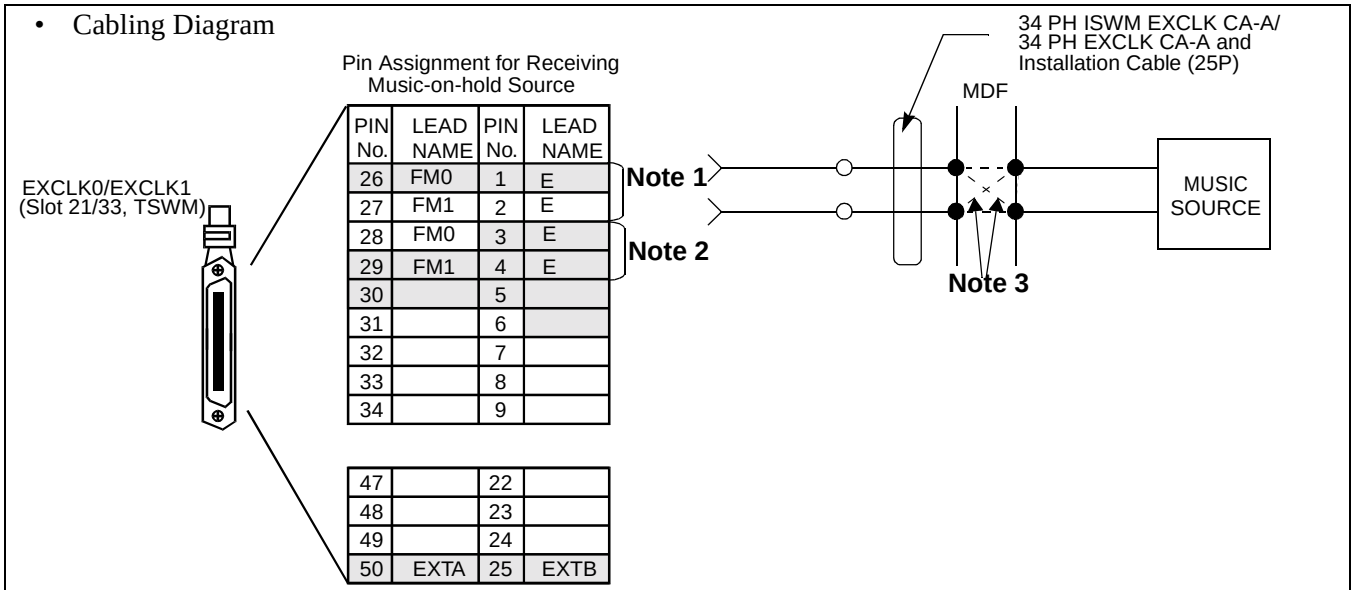


Figure 015-6 Connection of Alarm Indicating Panel (Multiple IMG Configuration) (2/2)



Note 1: *For 34 PH ISWM EXCLK CA-A cable (available when PH-CK16-A/PH-CK-17-A card is used as PLO).*
Note 2: *For 34 PH EXCLK CA-A cable (available when PH-CK16/PH CK-17 card is used as PLO).*
Note 1, Note 2 : *FM1 is not used.*
Note 3: *When PH-CK16-A/17-A is in use, also perform multiple connections between No. 0 and No.1 systems.*

Figure 015-7 Connection of Music on Hold (Multiple IMG Configuration)

NAP-200-015
Sheet 13/30
Cable Termination and Cross Connections from MDF to Peripheral Equipment, C. O. Lines, and Tie Lines

5. CROSS CONNECTIONS FOR TAS INDICATOR

Note: *Provide the necessary cross connections at the MDF by using copper wires of 0.5 mm diameter (24 AWG). 2-core twisted wire is used for speech path, and single-core wire is used for control wire. It is recommended that wires of different colors be used for trunks, station lines, PFT, etc., so that they can easily be distinguished.*

START

- Mounting of TAS Indicator — Mount the TAS Indicator using AY plugs, curl plugs, board plugs, etc.
- Cable running — Referring to Figure 015-8, run the cables between the TAS and the MDF.
  - Protect the cables by using cable ducts, etc.
- Termination of cables — Terminate the installed cables to the TAS Indicator, and MDF.
- Check the terminal locations on the Module Group side of the MDF — Referring to Port Accommodation sheet and description of ATI (PA-CS33) card in the “Circuit Card Manual,” identify the lead names for the ATI card and the terminal locations of the leads.
- Cross Connection — Referring to Figure 015-8, provide the necessary cross connections at the TAS Indicator side and the PBX side.

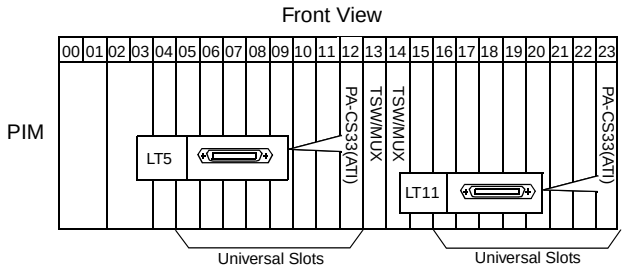
END

NAP-200-015
Sheet 14/30
Cable Termination and Cross Connections from MDF to Peripheral Equipment, C. O. Lines, and Tie Lines

To connect TAS the PA-CS33 card is used as the interface card. The card may be mounted in Slot No. 12 or in Slot No. 23. The leads appear on LT5 and LT11, respectively.

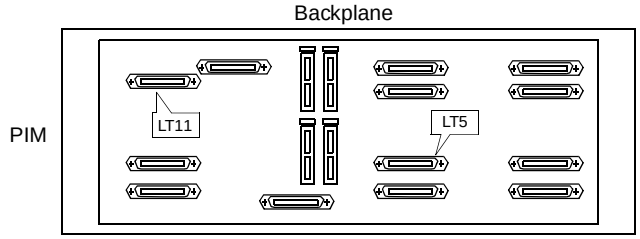
- PA-CS33 (ATI) mounting slots

PA-CS33 (ATI) card may be mounted in Slot 12 and/or 23.



- LT cable connectors

Use LT5 connector when the PA-CS33 card is mounted in Slot 12. When the card is mounted in Slot 23, use LT11 connector.



- LT cable Pin Assignment

Pins are assigned as follows on the LT connector for PA-CS33 card.

PA-CS33 Pin Assignment

PIN No.	LEAD NAME	PIN No.	LEAD NAME
26		1	
27		2	
32		7	
33		8	
34	BN4800	9	BN4801
35		10	
36	BN4820	11	BN4821
37		12	
38	TAS1B	13	TAS1A
39	BN4810	14	BN4811
40	TAS0B	15	TAS0A
41	BN4830	16	BN4831
42		17	
43		18	
44	B2	19	A2
45		20	
46		21	
47		22	
48	B3	23	A3
49		24	
50		25	

for TAS #1 ➡

for TAS #0 ➡

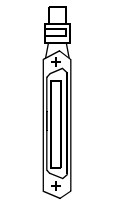


Figure 015-8 Cable Connection Diagram for TAS (1 of 2)

NAP-200-015
Sheet 15/30
Cable Termination and Cross Connections from MDF to Peripheral Equipment, C. O. Lines, and Tie Lines

- Cable Connection Diagram
  Provide the following connections at the MDF.

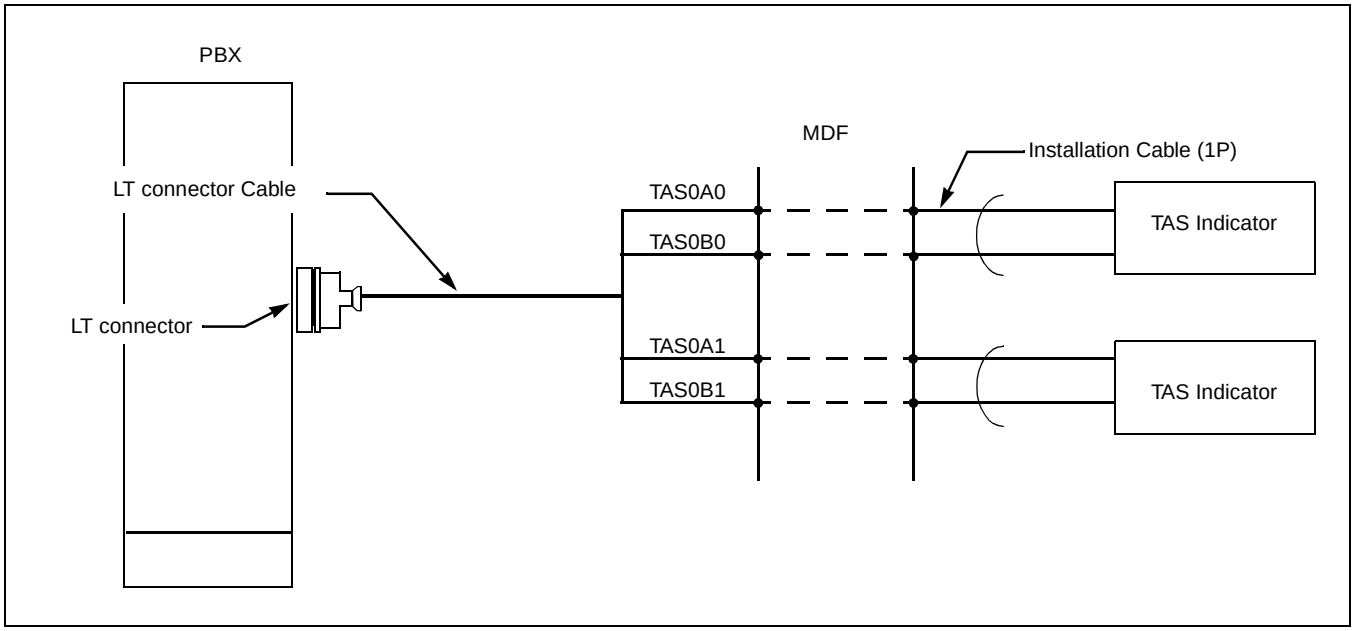


Figure 015-8 Cable Connection Diagram for TAS (2 of 2)

NAP-200-015
Sheet 16/30
Cable Termination and Cross Connections from MDF to Peripheral Equipment, C. O. Lines, and Tie Lines

6. CROSS CONNECTIONS FOR EXTERNAL SWITCHES

Note: *Provide the necessary cross connections at the MDF by using copper wires of 0.5 mm diameter (24 AWG). 2-core twisted wire is used for speech path, and single-core wire is used for control wire. It is recommended that wires of different colors be used for trunks, station lines, PFT, etc., so that they can easily be distinguished.*

START

- Mounting of External Switches — Mount the External Switches using AY plugs, curl plugs, board plugs, etc.
- Cable running
  - Referring to Figure 015-10, run the cables between the External Switches and the MDF.
  - Referring to Figure 015-10, run the cables between the External Switches and RPT on the BASEU.
  - Protect the cables by using cable ducts, etc.
- Termination of cables — Terminate the installed cables to the External Switches, and MDF.
- Check the terminal locations on the Module Group side of the MDF — Referring to Port Accommodation sheet and description of PFT (PA-M53 card in the “Circuit Card Manual”, identify the lead names for the “LT” connector and the terminal locations of the leads.
- Cross connection — Referring to Figure 015-10, provide the necessary cross connections at the External Switch side and the PBX side.

END

When the EFCT key is in the UP position, operations of K0-K7 are effective. To turn on a circuit, set the corresponding key (K0-K7) in the UP position.

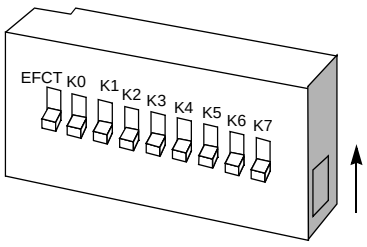
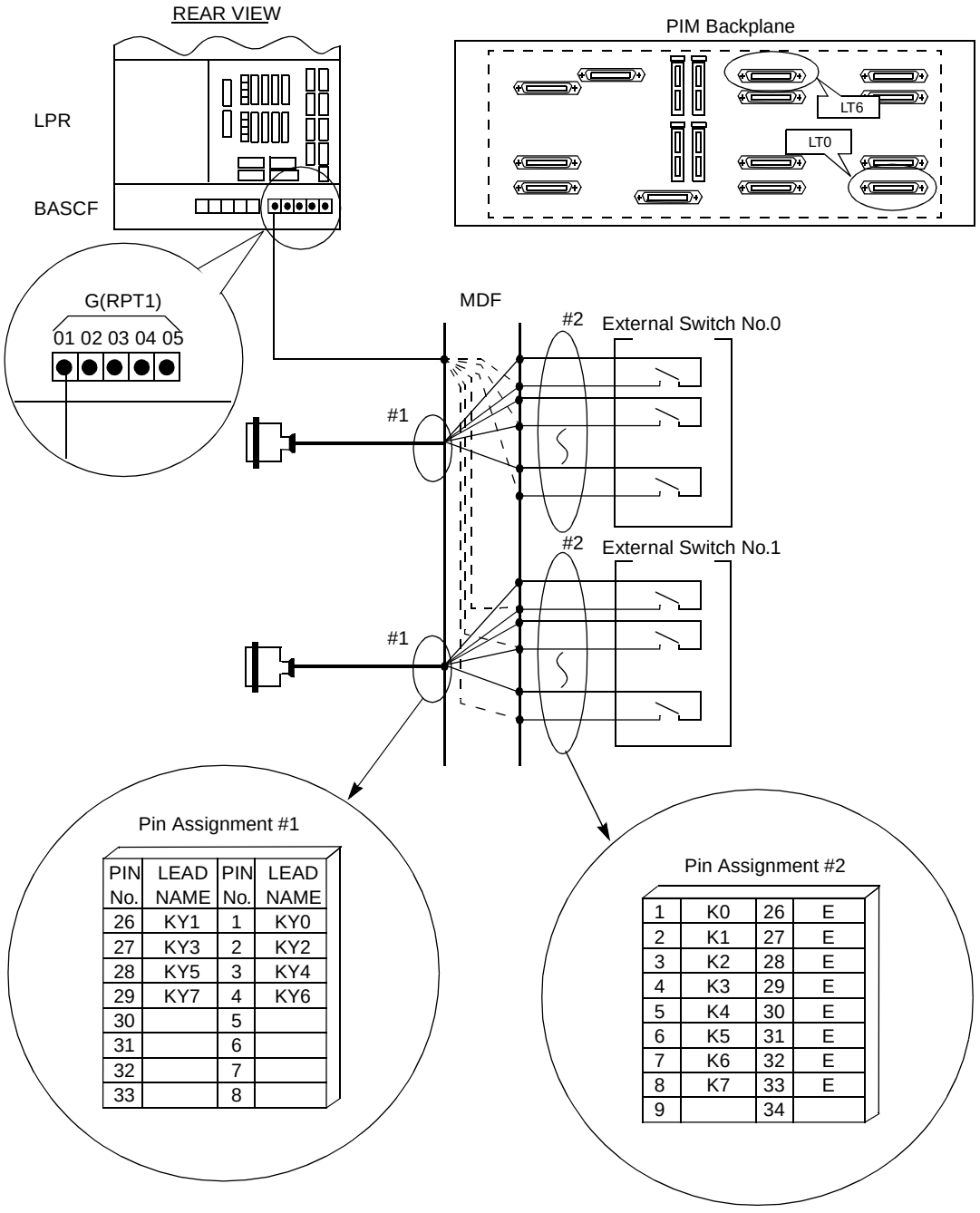


Figure 015-9 Outer View of External Switch

NAP-200-015
Sheet 17/30
Cable Termination and Cross Connections from MDF to Peripheral Equipment, C. O. Lines, and Tie Lines

Provide cable connections at the MDF as shown below.



PIN No.	LEAD NAME	PIN No.	LEAD NAME
26	KY1	1	KY0
27	KY3	2	KY2
28	KY5	3	KY4
29	KY7	4	KY6
30		5	
31		6	
32		7	
33		8	

1	K0	26	E
2	K1	27	E
3	K2	28	E
4	K3	29	E
5	K4	30	E
6	K5	31	E
7	K6	32	E
8	K7	33	E
9		34	

Figure 015-10 Connection of External Switches

NAP-200-015
Sheet 18/30
Cable Termination and Cross Connections from MDF to Peripheral Equipment, C. O. Lines, and Tie Lines

7. CONNECTION OF ANNOUNCEMENT MACHINE

Note: *Provide the necessary cross connections at the MDF by using copper wires of 0.5 mm diameter (24 AWG). 2-core twisted wire is used for speech path, and single-core wire is used for control wire.*

It is recommended that wires of different colors be used for trunks, station lines, PFT, etc., so that they can easily be distinguished.

START

- Mounting of Announcement Machine — Mount the Announcement Machine using AY plugs, curl plugs, board plugs, etc.
- Cable running — Referring to Figure 015-11, run the cable between the Announcement Machine and the MDF.
  - Protect the cables by using cable ducts, etc.
- Termination of cables — Terminate the installed cables to the Announcement Machine and MDF.
- Check the terminal locations on the Module Group side of the MDF — Referring to Port Accommodation sheet and description of 16COT card in the Circuit Card Manual and Figure 015-11, identify the lead names of the Announcement Trunk (ANTK) and the terminal locations of the leads.
- Cross connections — Referring to Figure 015-11, provide the necessary cross connections at the Announcement Machine side and the PBX side.

END

NAP-200-015
Sheet 19/30
Cable Termination and Cross Connections from MDF to Peripheral Equipment, C. O. Lines, and Tie Lines

Configuration of 16COT Lead

No. OF CKT	LEAD	
	B	A
No.0	B0	A0
1	B1	A1
2	B2	A2
3	B3	A3
4	B4	A4
5	B5	A5

When No. 0 circuit is used for COT.

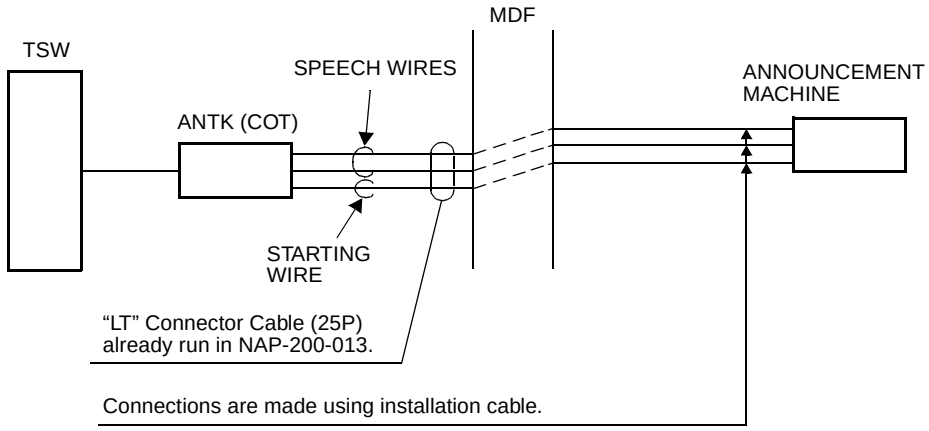
ANTK

No. OF CKT	LEAD	
	B	A
No.0	B0	A0
1	B1 (M)	A1
2	B2	A2
3	B3	A3
4	B4	A4
5	B5	A5

Starting Wire
Speech Wires
When using 16COT-BE, connect to ground

When No. 0 circuit is used for Announcement Trunk.

Announcement Machine Cabling Diagram



A total of three wires are required per line: two wires for speech and one starting wire.
For a loop start system, only two wires are required.

Note: *An ANTK circuit is available only on the No. 0 circuit of the 16COT card. If a starting wire is required, the No. 1 circuit cannot be used for a COT.*

Figure 015-11 Connection of Announcement Machine

NAP-200-015
Sheet 20/30
Cable Termination and Cross Connections from MDF to Peripheral Equipment, C. O. Lines, and Tie Lines

8. CONNECTION OF PAGING EQUIPMENT

Note: *Provide the necessary cross connections at the MDF by using copper wires of 0.5 mm diameter (24 AWG). 2-core twisted wire is used for speech path, and single-core wire is used for control wire.*

It is recommended that wires of different colors be used for trunks, station lines, PFT, etc., so that they can easily be distinguished.

START

- Mounting of Paging Equipment — Mount the Paging Equipment using AY plugs, curl plugs, board plugs, etc.
- Cable running — Referring to Figure 015-12, run the cables between the Paging Equipment and the MDF.
  - Protect the cables by using cable ducts, etc.
- Termination of cables — Terminate the installed cables to the Paging Equipment and the MDF.
- Check terminal locations on the Module Group side of the MDF — Referring to Port Accommodation sheet and description of 16COT card in the Circuit Card Manual and Figure 015-12, identify the lead names for the Paging Trunk (PGT) and the terminal locations of the leads.
- Cross connections — Referring to Figure 015-12, provide the necessary cross connections at the Paging Equipment side and the PBX side.

END

NAP-200-015
Sheet 21/30
Cable Termination and Cross Connections from MDF to Peripheral Equipment, C. O. Lines, and Tie Lines

Configuration of 16 COT Lead

No. OF CKT	LEAD	
	B	A
No.0	B0	A0
1	B1	A1
2	B2	A2
3	B3	A3
4	B4	A4
5	B5	A5

When No. 0 circuit is used for COT.

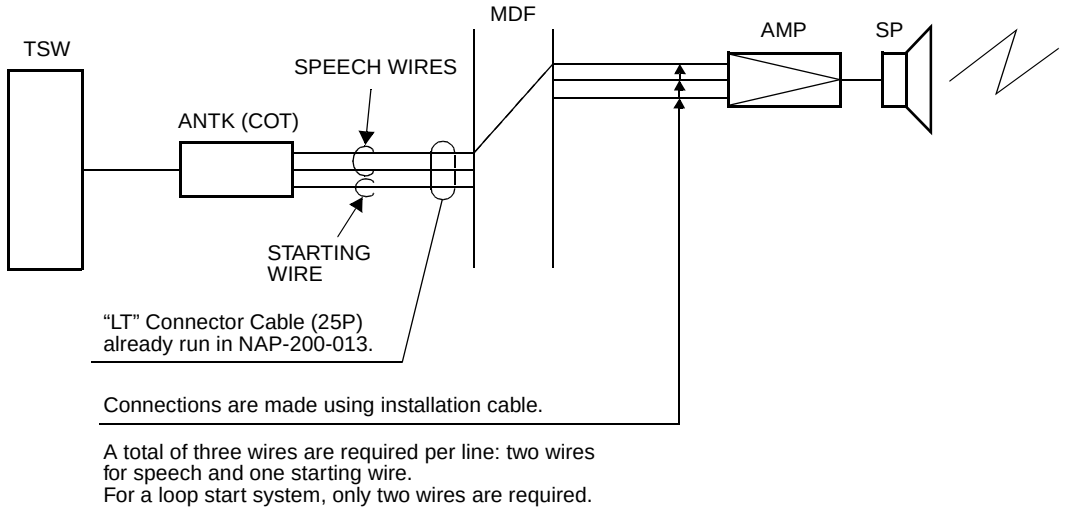
ANTK

No. OF CKT	LEAD	
	B	A
No.0	B0	A0
1	B1 (M)	A1
2	B2	A2
3	B3	A3
4	B4	A4
5	B5	A5

Starting Wire
Speech Wires
When using 16 COT-BE, connect to ground

When No. 0 circuit is used for PGT.

Paging Equipment Cabling Diagram



Note: *A PGT circuit is available only on the No. 0 circuit of the 16COT card. If a starting wire is required, the No. 1 circuit cannot be used for a COT.*

Figure 015-12 Connection of Paging Equipment

NAP-200-015
Sheet 22/30
Cable Termination and Cross Connections from MDF to Peripheral Equipment, C. O. Lines, and Tie Lines

9. CROSS CONNECTIONS FOR D^{term} Series E

Note 1: *Provide the necessary cross connections at the MDF using copper wires of 0.5 mm diameter (24 AWG). 2-core twisted wire is used for speech path, and single-core wire is used for control wire. It is recommended that wires of different colors be used for trunks, station lines, PFT, etc., so that they can easily be distinguished.*

Note 2: *The maximum distance between the Module Group and D^{term} is 850 meters (2459 feet). The installation cable must be 24 AWG (0.5 mm dia.) or larger.*

START

- Cable running
  - Referring to Figure 015-14, run the cables between each D^{term} and its Modular Block (Jack), and between the Modular Blocks and the MDF.
  - Protect the cables by using cable ducts, etc.
- Termination of cables — Referring to Figure 015-14, terminate the installed cables to the MDF and the Modular Blocks.
- Check terminal locations on the Module Group side of the MDF — Referring to Port Accommodation sheet and description of 16ELC card in the "Circuit Card Manual," identify the lead names for the ELC card and the terminal locations of the leads.
- Cross Connection — Referring to Figure 015-14, provide the necessary cross connections at the D^{term} side and the PBX side.

END

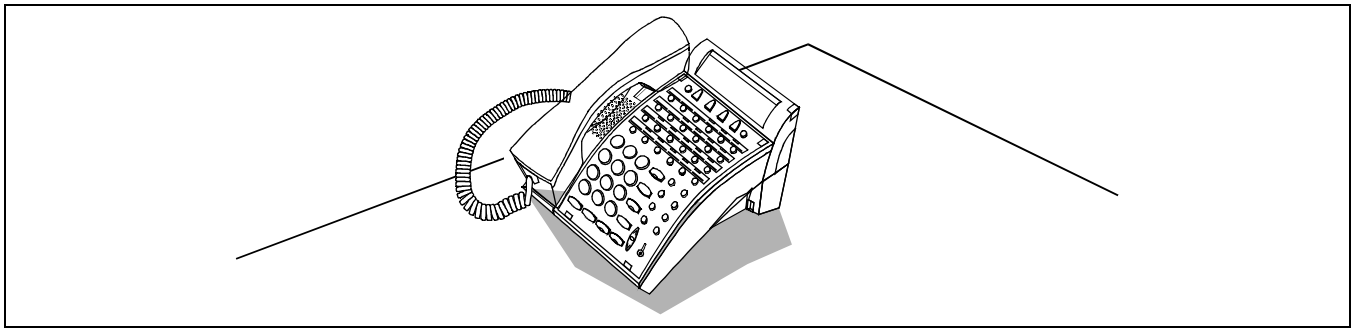


Figure 015-13 Outer View of D^{term} Series E

NAP-200-015
Sheet 23/30
Cable Termination and Cross Connections from MDF to Peripheral Equipment, C. O. Lines, and Tie Lines

Provide the following connections at the MDF.

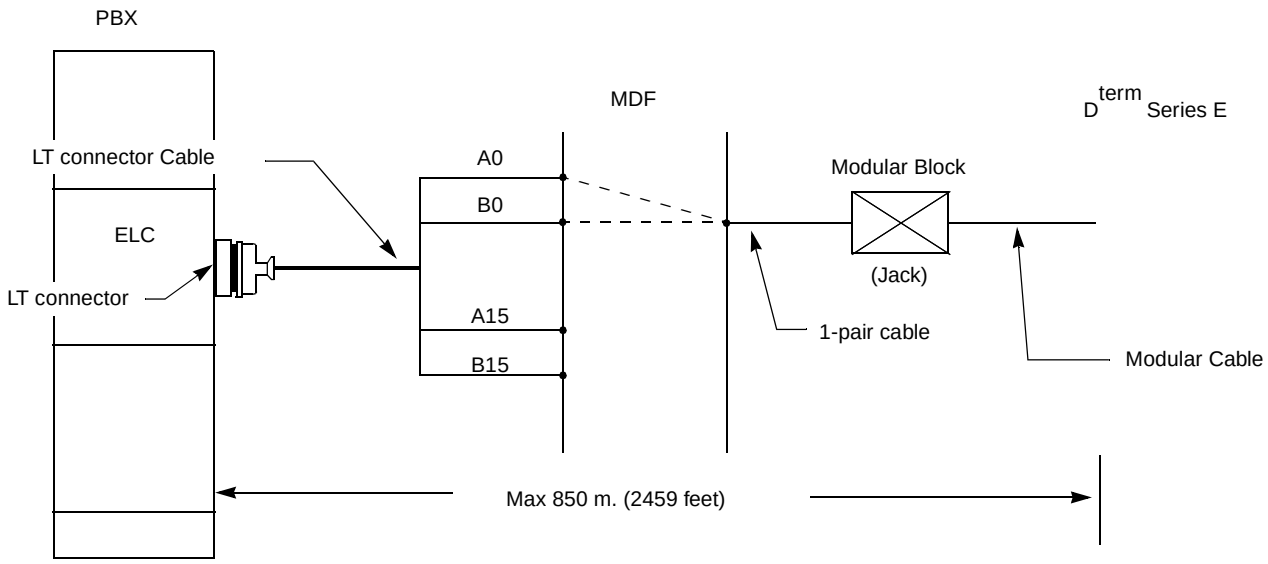


Figure 015-14 Cable Connection for D^{term} Series E

NAP-200-015
Sheet 24/30
Cable Termination and Cross Connections from MDF to Peripheral Equipment, C. O. Lines, and Tie Lines

10. CROSS CONNECTIONS FOR DIGITAL INTERFACES

Perform the cross connections for digital interfaces as shown below:

Note 1: *When your system is single IMG configuration, time division switch (TSW) card is equipped with Phase Lock Oscillator (PLO). Therefore no dedicated PLO card is required to use Digital Interfaces. However, when the system requires a higher-precision oscillator, use the Oscillator (OSC: PA-CK14) card. The cards may be mounted in slots numbered 9, and 17 of PIM0. For the OSC card, no external wiring is required.*

Note 2: *Provide the necessary cross connections at the MDF by using copper wires of 0.5 mm diameter (24 AWG). 2-core twisted wire is used for speech path, and single-core wire is used for control wire. It is recommended that wires of different colors be used for trunks, station lines, PFT, etc., so that they can easily be distinguished.*

WARNING: *Back card out of the module before attempting cross connection. Otherwise, the fuse mounted on the DTI card will blow and the card will become inoperative.*

START

- Check terminal locations on the Module Group side of the MDF
  - Digital Trunk (DTI, CCT, PRT) — Referring to the Port Accommodation sheet and description of Digital Trunk card in the “Circuit Card Manual,” identify the lead names for the Digital Trunk card and the terminal locations of the leads.
  - PLO leads — Referring to Figure 015-15/Figure 015-16 to identify the lead names and the terminal locations for the PLO.
- Cross Connection **Note**
  - When accepting synchronization clocks from other node (master or submaster node) — Referring to Figure 015-17/Figure 015-18, provide the necessary cross connections.
  - When accepting synchronization clocks from External High-Stability Oscillator — Referring to Figure 015-17/Figure 015-18, provide the necessary cross connections.

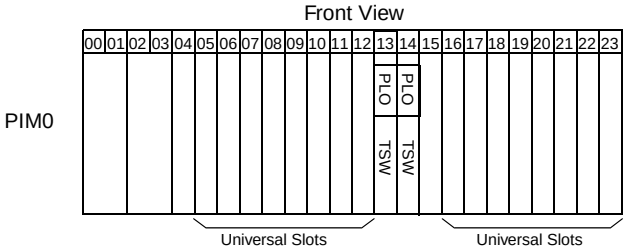
END

NAP-200-015
Sheet 25/30
Cable Termination and Cross Connections from MDF to Peripheral Equipment, C. O. Lines, and Tie Lines

Since PLO circuit is equipped with TSW card, PLO input leads appear on the LT connector labeled PLO.

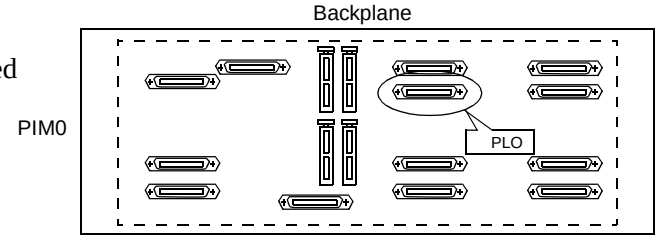
- TSW mounting slots

TSW card is mounted in slots 13 and 14 of PIM0.



- LT cable connector

Connect an LT cable to the connector labeled "PLO" on PIM0 backplane.



- PLO connector Pin Assignment

Pins are assigned as follows on "PLO" connector. When clock is distributed from a digital interface, use one pair of "DIUxxx" leads among a maximum of 4 inputs. DIU leads have the following precedence: DIU0xx(High)-> DIU3xx(Low). To receive clock from an external high-stability oscillator, use "DCSxx" leads.

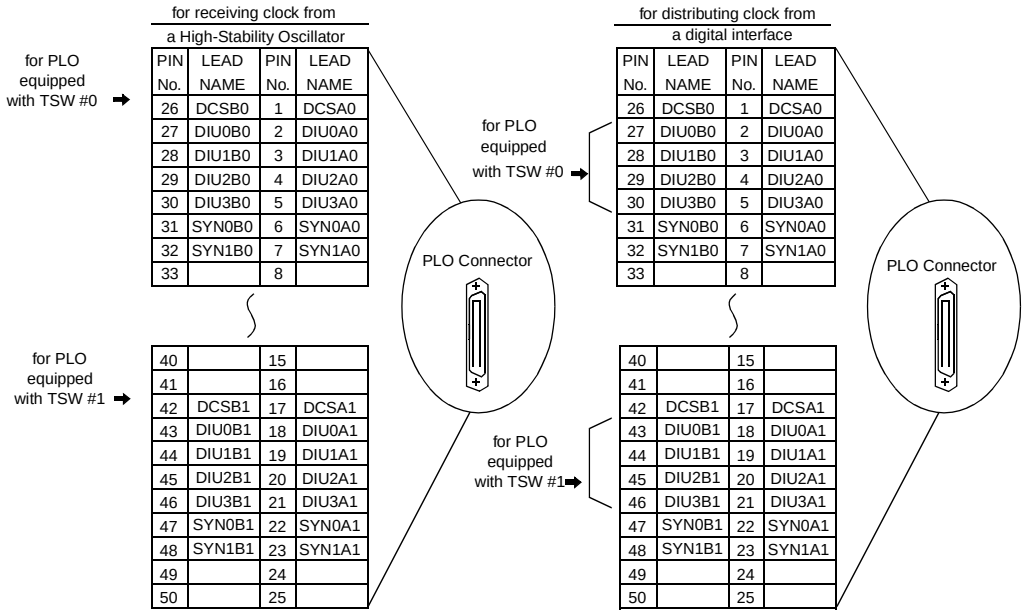


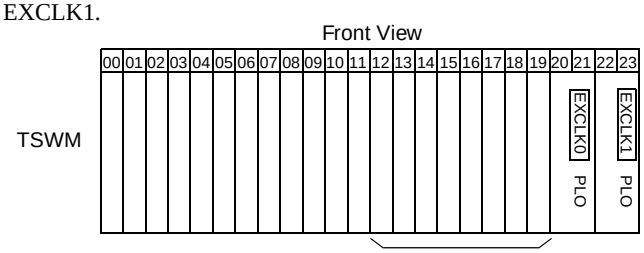
Figure 015-15 PLO Pin Assignments for Receiving Clock (Single IMG Configuration)

NAP-200-015
Sheet 26/30
Cable Termination and Cross Connections from MDF to Peripheral Equipment, C. O. Lines, and Tie Lines

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

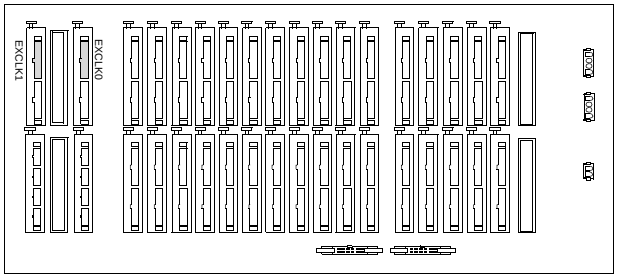
- PLO mounting slots

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



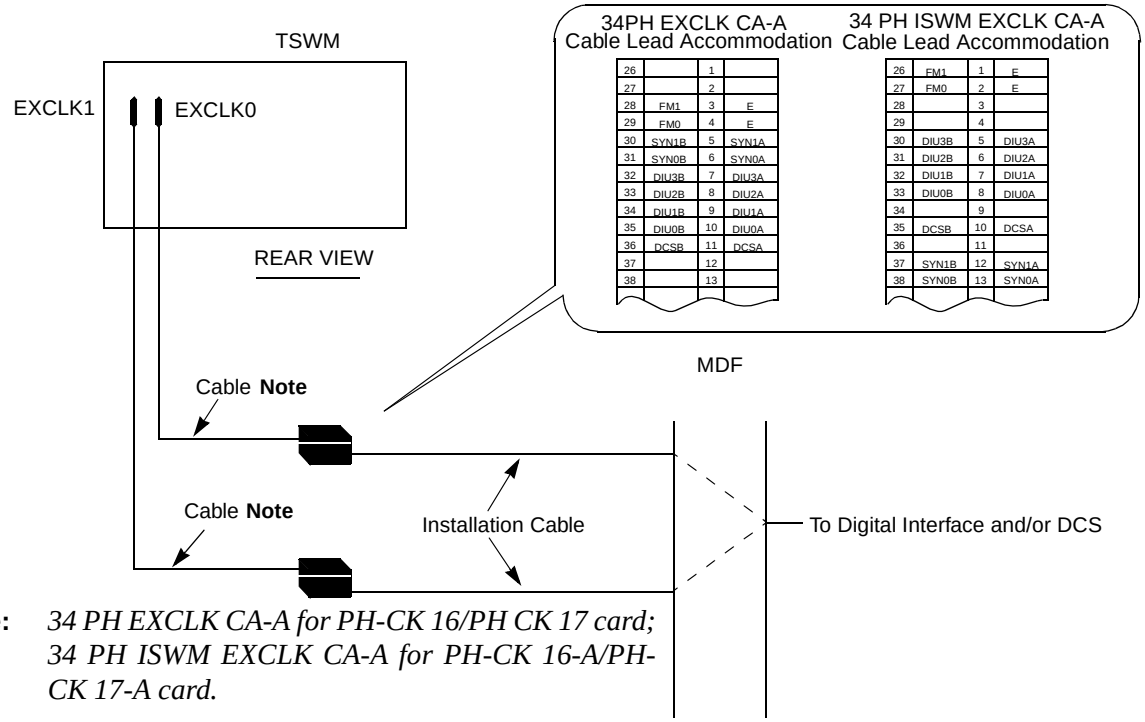
- LT cable connectors

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



- EXCLK0/EXCLK1 connector Pin Assignment

Pins are assigned as follows on “EXCLK0/EXCLK1” connector. When clock is distributed from a digital interface, use one pair of “DIUxxx” leads among a maximum of 4 inputs. DIU leads have the following precedence: DIU0xx (High)-> DIU3xx (Low). On the contrary, to receive clock from an external high-stability oscillator, use “DCSxx” leads.



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

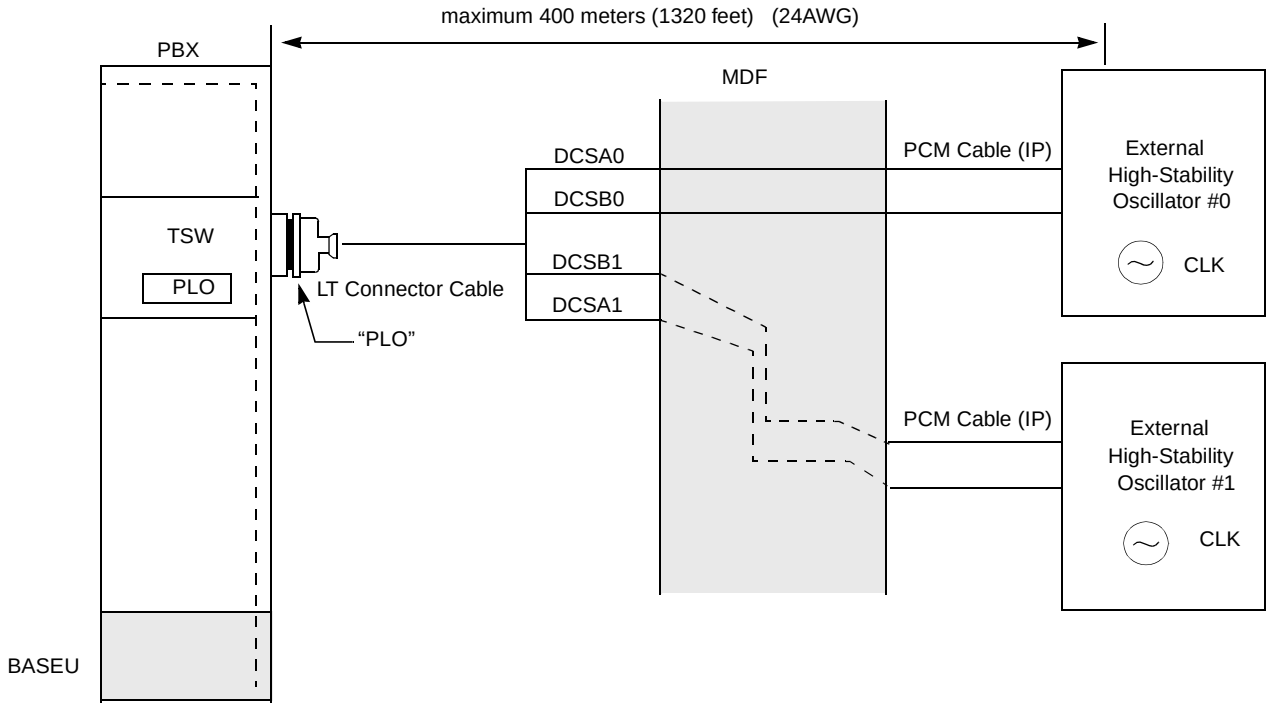
Note: *34 PH EXCLK CA-A for PH-CK 16/PH CK 17 card; 34 PH ISWM EXCLK CA-A for PH-CK 16-A/PH-CK 17-A card.*

Figure 015-16 PLO Pin Assignments for Receiving Clock (Multiple IMG Configuration)

NAP-200-015
Sheet 27/30
Cable Termination and Cross Connections from MDF to Peripheral Equipment, C. O. Lines, and Tie Lines

- Cable Connection Diagram

Provide the following wirings at the MDF. The following connection diagram shows an example where the system has the TSW cards in a dual configuration.



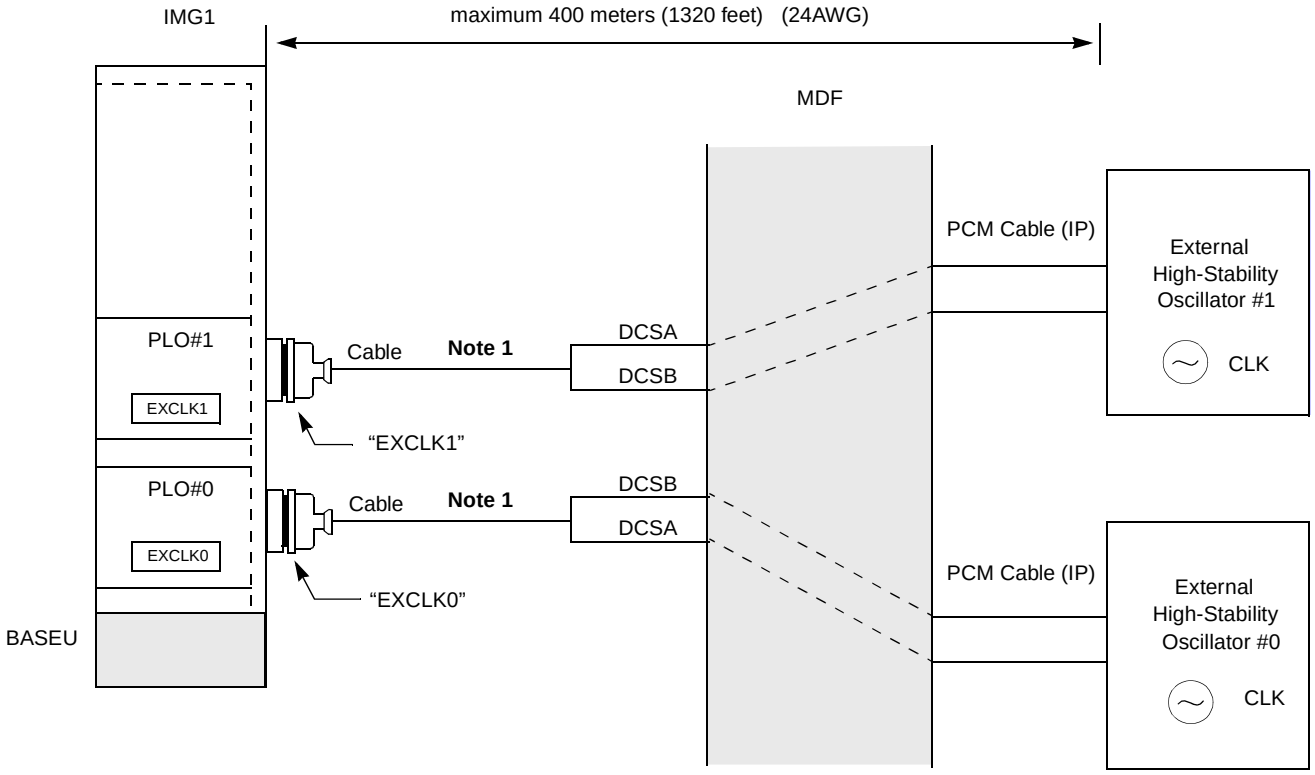
Note: *This diagram shows connections for a system having dual TSWs.*

Figure 015-17 Cable Connection Diagram for Accepting Synchronization Clocks from an External High-Stability Oscillator (Single IMG Configuration)

NAP-200-015
Sheet 28/30
Cable Termination and Cross Connections from MDF to Peripheral Equipment, C. O. Lines, and Tie Lines

- Cable Connection Diagram

Provide the following wirings at the MDF. The following connection diagram shows an example where the system has the PLO cards in a dual configuration.



Note: *This diagram shows connections for a system having dual PLOs.*

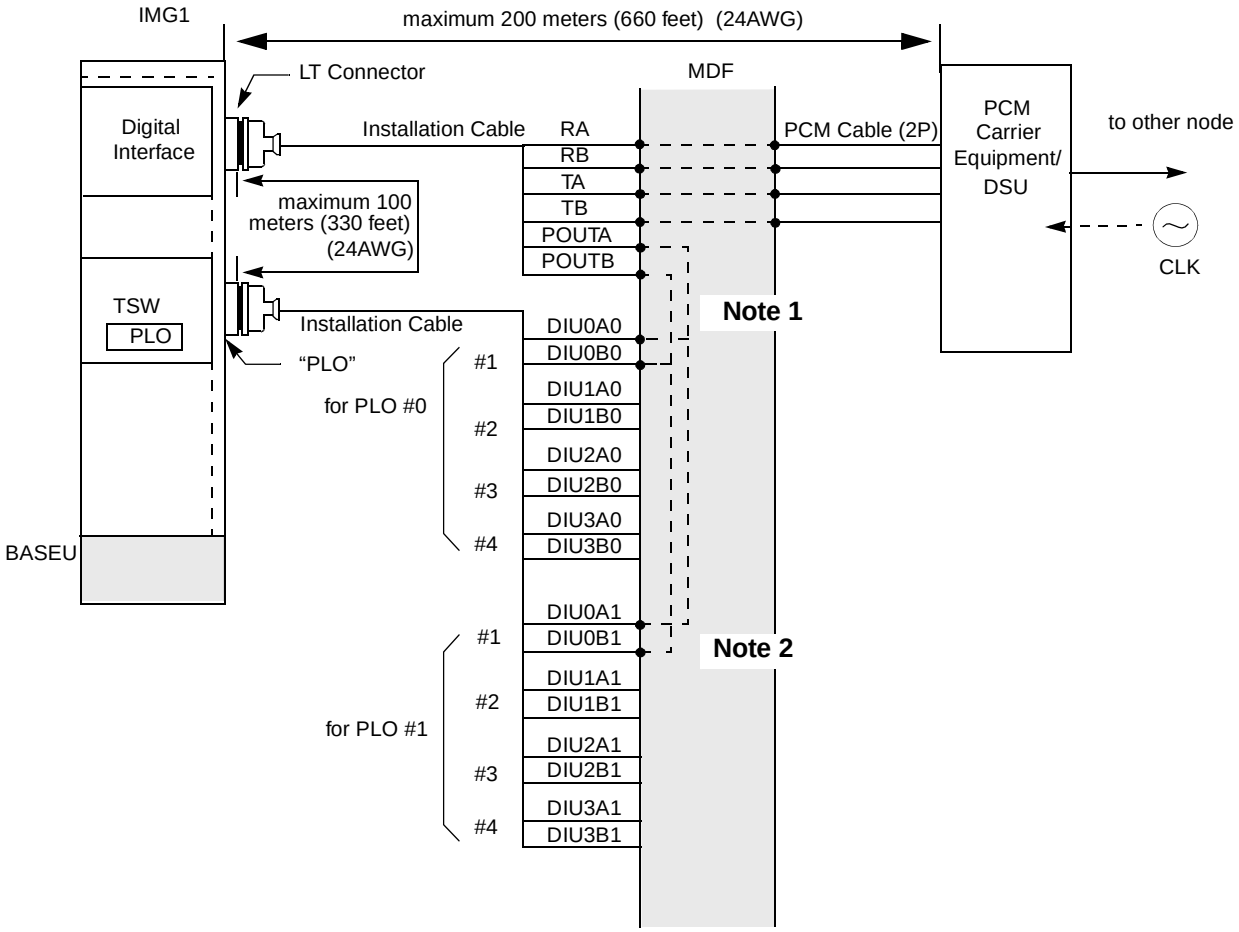
Note 1: *"34PH EXCLK CA-A" for PH-CK16/PH-CK17;*
"34PH ISWM EXCLK CA-A" for PH-CK16-A/PH-CK17-A card.

Figure 015-18 Cable Connection Diagram for Accepting Synchronization Clocks from an External High-Stability Oscillator (Multiple IMG Configuration)

NAP-200-015
Sheet 29/30
Cable Termination and Cross Connections from MDF to Peripheral Equipment, C. O. Lines, and Tie Lines

- Cable Connection Diagram

Perform the following wirings at the MDF. The following connection diagram shows an example where the Digital Trunk POUT leads are used as the 1st clock distribution route.



Note 1: *PLO has a maximum of four inputs. DIU1xx leads are used for the first clock distribution routes. Thus, DIU4xx leads are used for the fourth. The first input has the highest priority.*

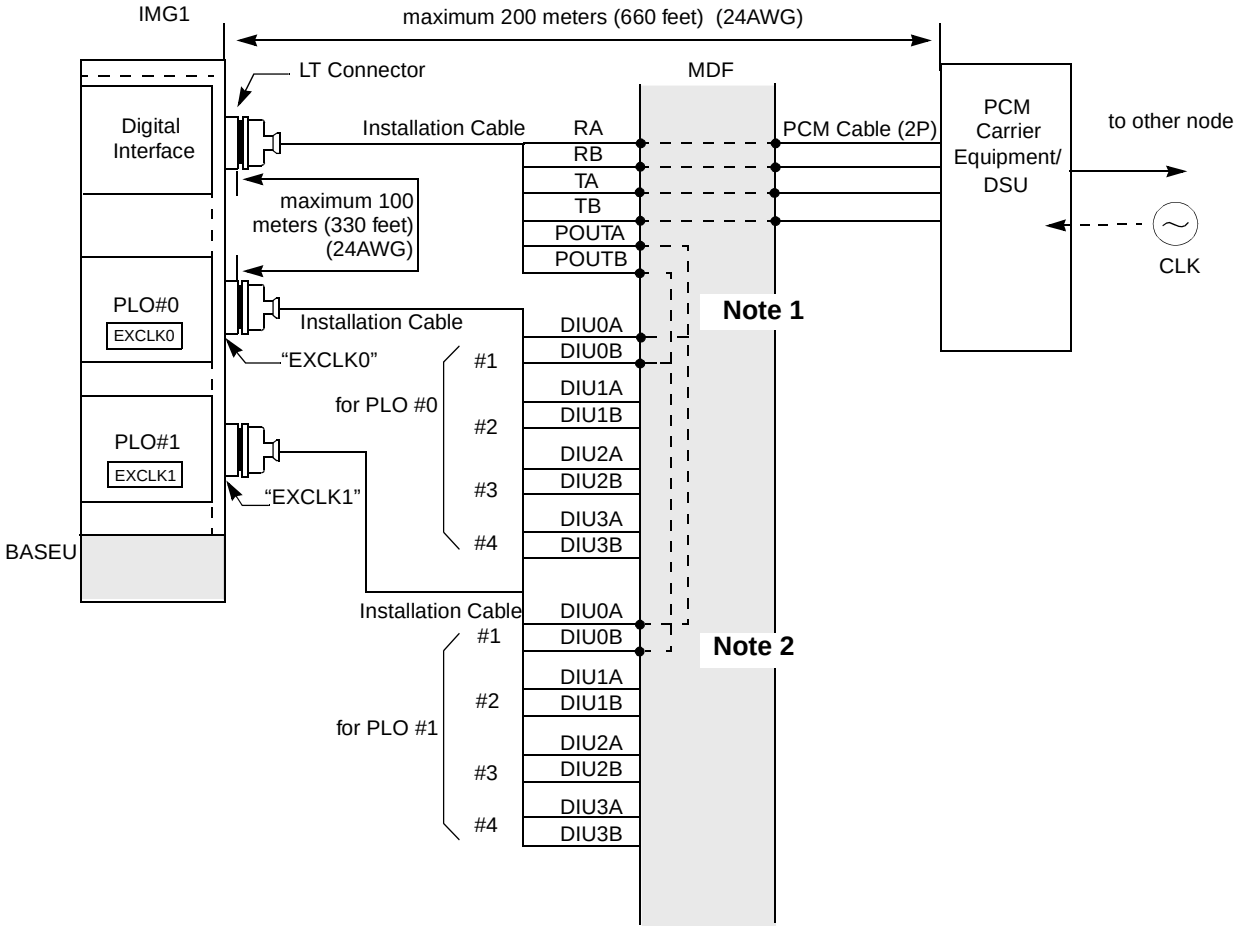
Note 2: *This connection is required for a dual-TSW system.*

Figure 015-19 Cable Connection Diagram for Distributing Clock from a Digital Interface (Single IMG Configuration)

NAP-200-015
Sheet 30/30
Cable Termination and Cross Connections from MDF to Peripheral Equipment, C. O. Lines, and Tie Lines

- Cable Connection Diagram

Perform the following wirings at the MDF. The following connection diagram shows an example where the Digital Trunk POUT leads are used as the 1st clock distribution route.



Note 1: *PLO has a maximum of four inputs. DIU1xx leads are used for the first clock distribution routes. Thus, DIU4xx leads are used for the fourth. The first input has the highest priority.*

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

Figure 015-20 Cable Connection Diagram for Distributing Clock from a Digital Interface (Multiple IMG Configuration)

NAP-200-016
Sheet 1/41
Installation of the DESK CONSOLE and Cable Connection

This NAP explains the installation of the DESK CONSOLE and Cable Connection. Figure 016-1 shows the outer view of the DESK CONSOLE. Use the PA-CS33 (ATI) card as an interface card between the system and the DESK CONSOLE. The card can connect a maximum of two DESK CONSOLEs.

START

- Cable running — While referring to Figure 016-2 through Figure 016-5, run the cables between each DESK CONSOLE and its Modular Block (Jack), and between the Modular Blocks and the MDF.
  - Protect the cables by using cable ducts, etc.
- Termination of cables — While referring to Figure 016-2 through Figure 016-5 terminate the installed cables to the MDF and the Modular Blocks.
- Check the terminal locations on the Module Group side of the MDS — While referring to Port Accommodation sheet and description of PA-CS33 card in the NEAX2400 IMX Circuit Card Manual, identify the lead names for the card and the terminal locations of the leads.
- Cross Connection — While referring to Figure 016-2 and Figure 016-5, provide the necessary cross connection at the DESK CONSOLE side and the PBX side.
- Mounting of Headset (Optional) — While referring to Figure 016-6, mount optional Headset on DESK CONSOLE.
- Mounting of Handset (Optional) — While referring to Figure 016-7 or Figure 016-8, mount optional Handset on DESK CONSOLE.

A

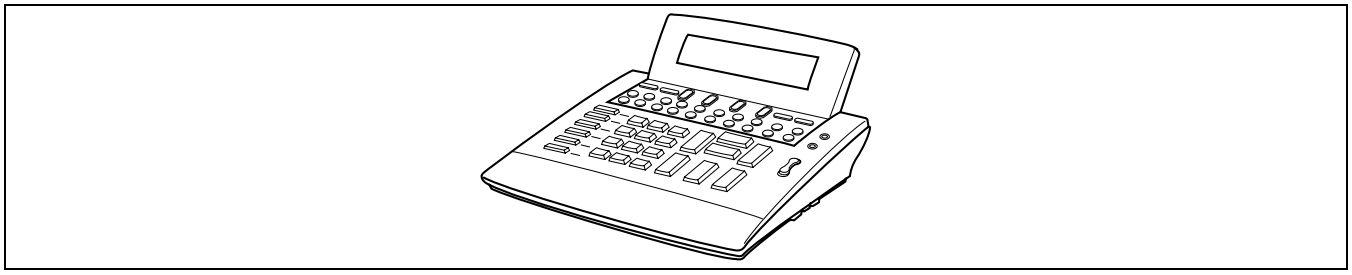


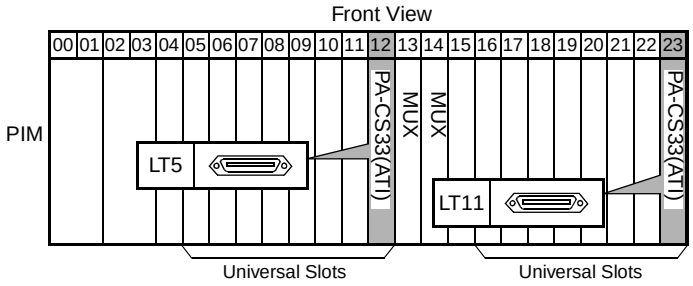
Figure 016-1 Outer View of Desk Console

NAP-200-016
Sheet 2/41
Installation of the Desk Console and Cable Connection

To connect DESK CONSOLE(s), the PA-CS33 card is used as the interface card. The card may be mounted in slot No. 12 or in slot No. 23. The leads appear on LT5 and LT11 respectively. However, when replacing Attendant Console with DESK CONSOLE, the leads appear on the LT connector on the ATT TERM (See **Note** on the next page).

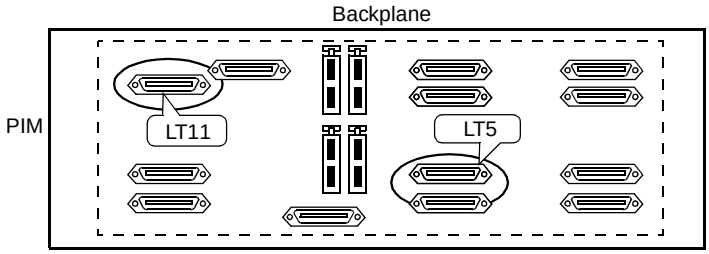
• PA-CS33 (ATI) mounting slots

PA-CS33 (ATI) card may be mounted in slots 12 and/or 23.



• LT cable connectors

Use LT5 connector when the PA-CS33 card is mounted in slot 12. When the card is mounted in slot 23, use LT11 connector.



• LT cable Pin Assignment

Pins are assigned as follows for PA-CS33 card.

PA-CS33 Pin Assignment

		PIN No.	LEAD NAME	PIN No.	LEAD NAME
		26		1	
		27		2	
		33		8	
for ADD-ON CONSOLE #0	→	34	BN4800	9	BN4801
		35		10	
for DESK CONSOLE #0	→	36	BN4820	11	BN4821
		37		12	
		38	TAS1B	13	TAS1A
for ADD-ON CONSOLE #1	→	39	BN4810	14	BN4811
		40	TAS0B	15	TAS0A
for DESK CONSOLE #1	→	41	BN4830	16	BN4831
for ADD-ON CONSOLE #0	→	42	B0	17	A0
		43		18	
for DESK CONSOLE #0	→	44	B2	19	A2
		45		20	
for ADD-ON CONSOLE #1	→	46	B1	21	A1
		47		22	
for DESK CONSOLE #1	→	48	B3	23	A3
		49		24	
		50		25	

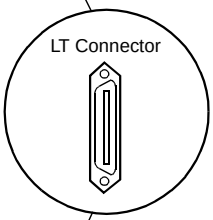


Figure 016-2 Cable Connection Diagram for Desk Console (1 of 2)

NAP-200-016
Sheet 3/41
Installation of the Desk Console and Cable Connection

- Cable Connection Diagram

Provide the following wirings at the MDF and IDF.

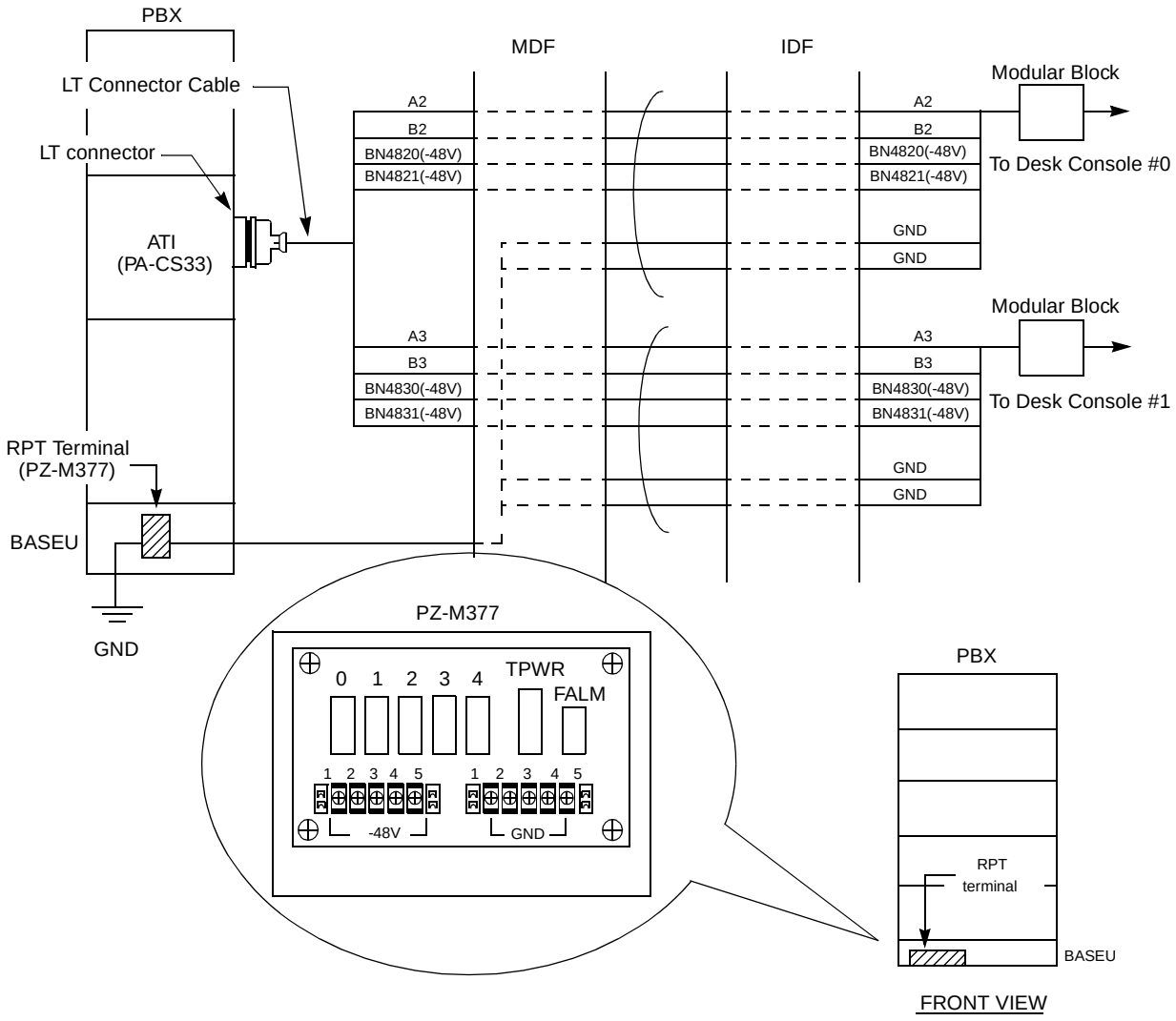


Figure 016-2 Cable Connection Diagram for Desk Console (2 of 2)

NAP-200-016
Sheet 4/41
Installation of the DESK CONSOLE and Cable Connection

Note: *When replacing Attendant Console with DESK CONSOLE, follow the procedure below:*

1 Turn OFF the PWR card in the PIM.

2 Remove installation cables connected to ATT0, ATT1 and LT connectors on the ATT TERM.

3 Remove installation cables connected to the following connectors:

- *RLT connector on the ATT TERM*
- *ATI0 and LT5, ATI1 and LT11 connectors on the PIM*

4 Install DESK CONSOLE using the LT connector on the ATT TERM.

5 Turn ON the PWR card in the PIM.

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Installation of the DESK CONSOLE and Cable Connection

1. CABLE CONNECTION DIAGRAM

(a) When the power is supplied from the PBX

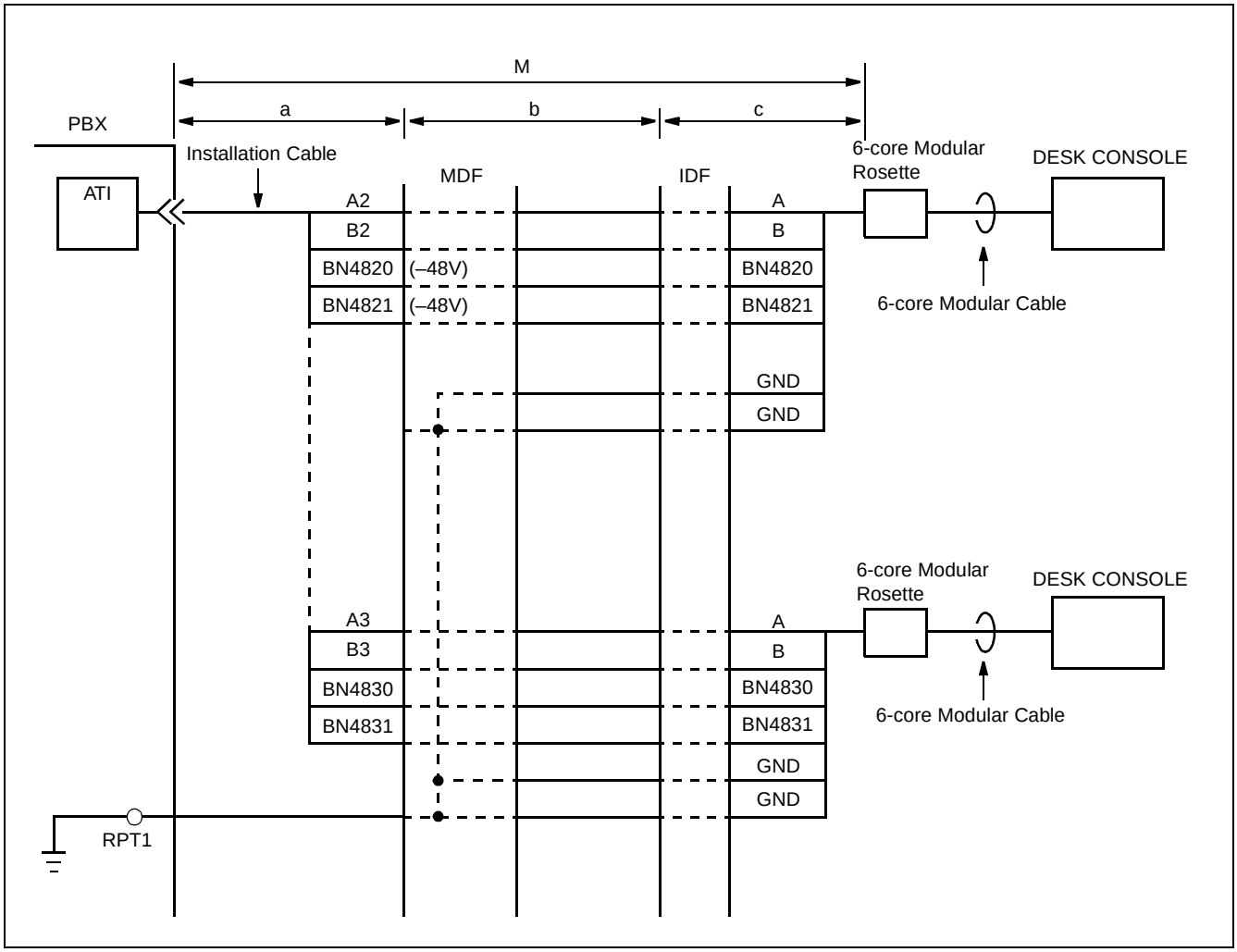

Figure 016-3 Cable Connection Diagram (When the Power Is Supplied from the PBX)

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	350 m (1,148 ft.)	500 m (1,640 ft.)

When exceeding the distance above, calculate the distance referring to the next page.

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Installation of the DESK CONSOLE and Cable Connection

2. CALCULATION OF THE DISTANCE BETWEEN THE ATI CIRCUIT CARD AND MODULAR ROSETTE

The distance M in Figure 016-3 is determined by 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:

$M = a + b + c \leq 26\ \Omega$

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 formula:

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 unit 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.*

$$a = \frac{u\ (\Omega/m) \times x\ (m)}{2} + \frac{u\ (\Omega/m) \times x\ (m)}{1}$$

(2: Number of –48V cables; Resistance of –48V cables; 1: Number of GND cable; Resistance of GND cables)

$$b = \frac{v\ (\Omega/m) \times y\ (m)}{2} + \frac{v\ (\Omega/m) \times y\ (m)}{2}$$

(2: Number of –48V cables; Resistance of –48V cables; 2: Number of GND cables; Resistance of GND cables)

$$c = \frac{w\ (\Omega/m) \times z\ (m)}{2} + \frac{w\ (\Omega/m) \times z\ (m)}{2}$$

(2: Number of –48V cables; Resistance of –48V cables; 2: Number of GND cables; Resistance of GND cables)

u: Direct-Current resistance per meter in the range of A (Ω/m)
v: Direct-Current resistance per meter in the range of B (Ω/m)
w: Direct-Current 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

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Installation of the DESK CONSOLE and Cable Connection

(b) When using Local Power Supply **Note**

Note: *When using local power supply, DESK CONSOLE cannot be used in case of power failure.*

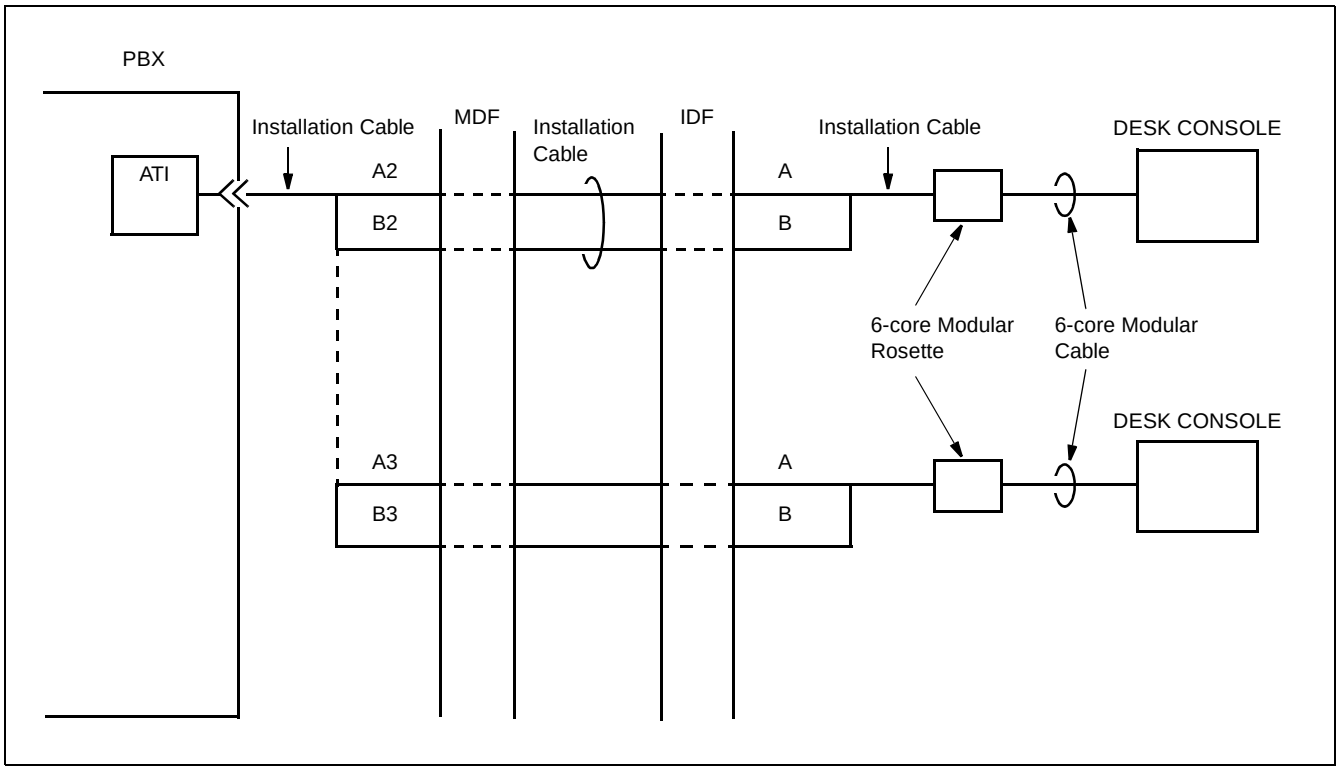

Figure 016-4 Cable Connection Diagram (When Using Local Power Supply)

The maximum distance between the ATI circuit card and DESK CONSOLE is as shown below.

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

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Installation of the DESK CONSOLE and Cable Connection

Wire the cables to the Modular Block as shown below.

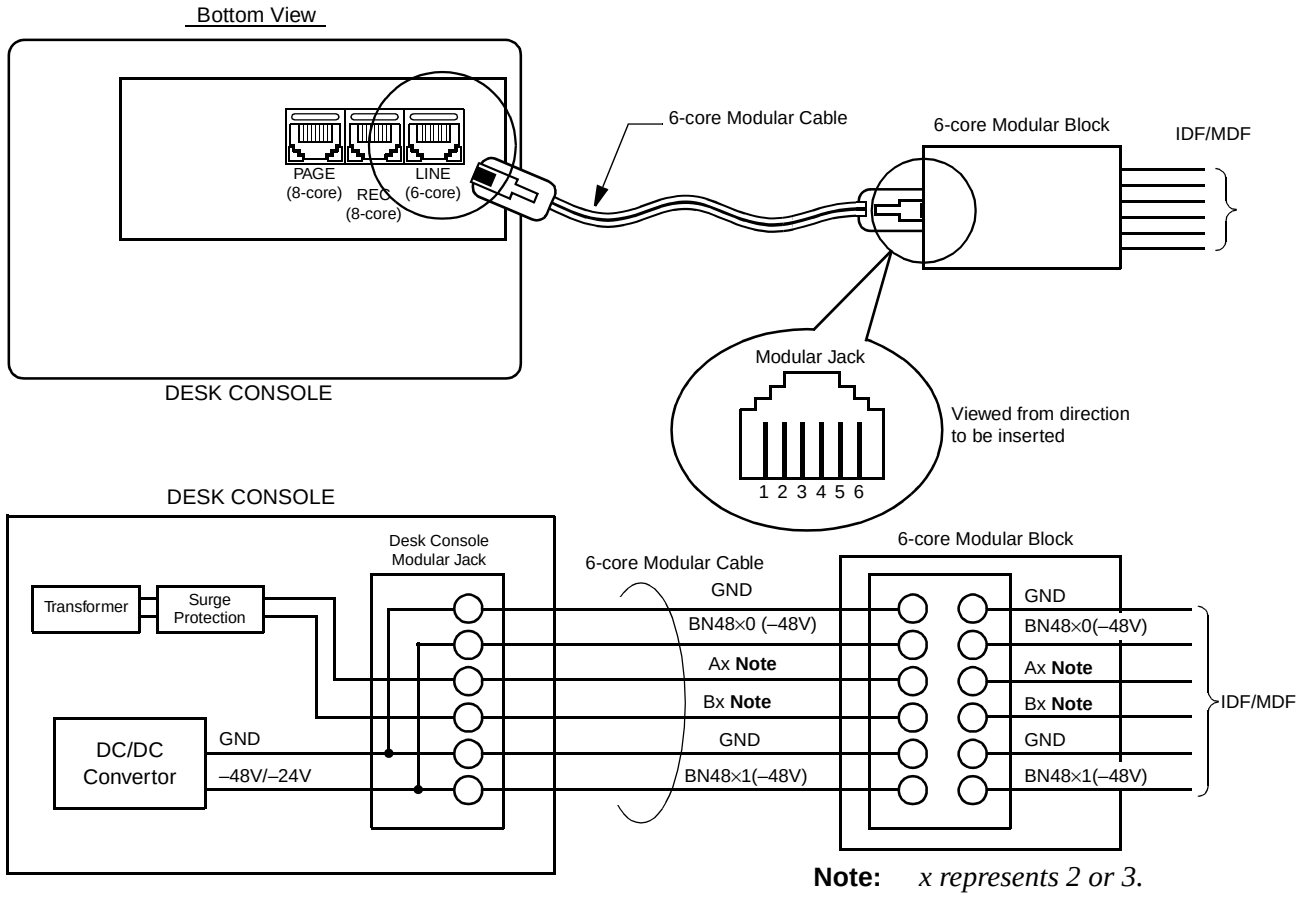

Figure 016-5 Cable Connection Diagram for DESK CONSOLE Modular Block

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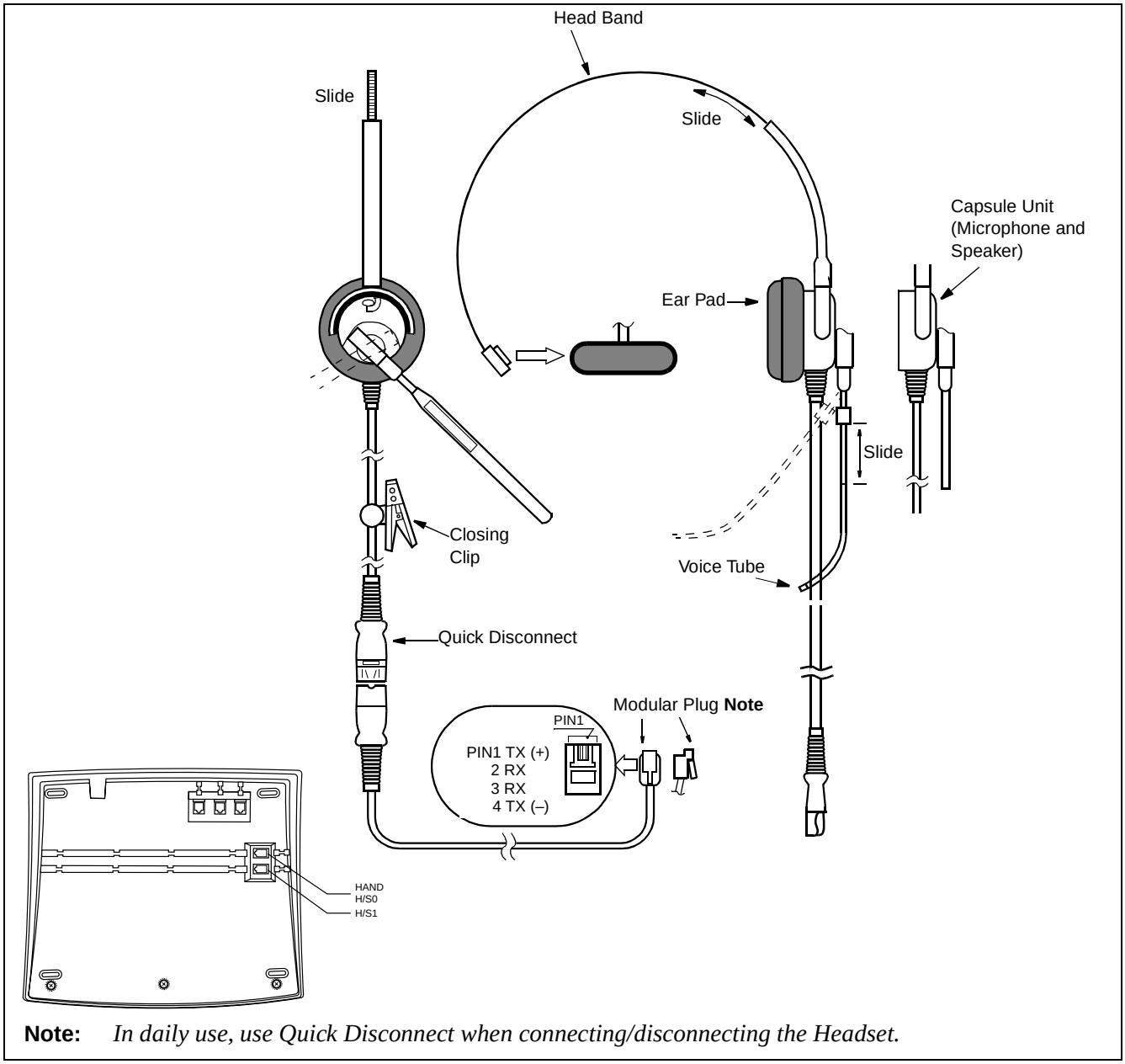
Installation of the DESK CONSOLE and Cable Connection

3. MOUNTING OF HEADSET (OPTIONAL)

The Headset cable is connected to one of the modular jacks (HAND H/S 0 or H/S 1) on the bottom of DESK CONSOLE.



Note: *In daily use, use Quick Disconnect when connecting/disconnecting the Headset.*

Figure 016-6 Headset

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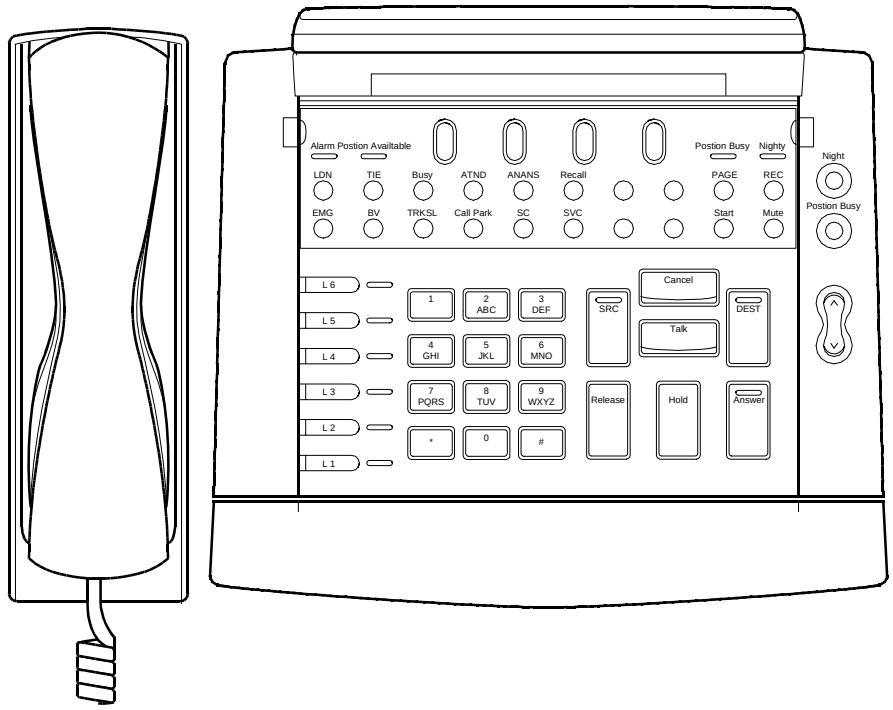
Installation of the DESK CONSOLE and Cable Connection

4. MOUNTING OF HANDSET (OPTIONAL)

The Handset cable is connected to the modular jack (HAND H/S 0) on the bottom of DESK CONSOLE.

(a) When mounting at the left side of DESK CONSOLE (Standard)



6. Put the Handset code through the hole as shown below.

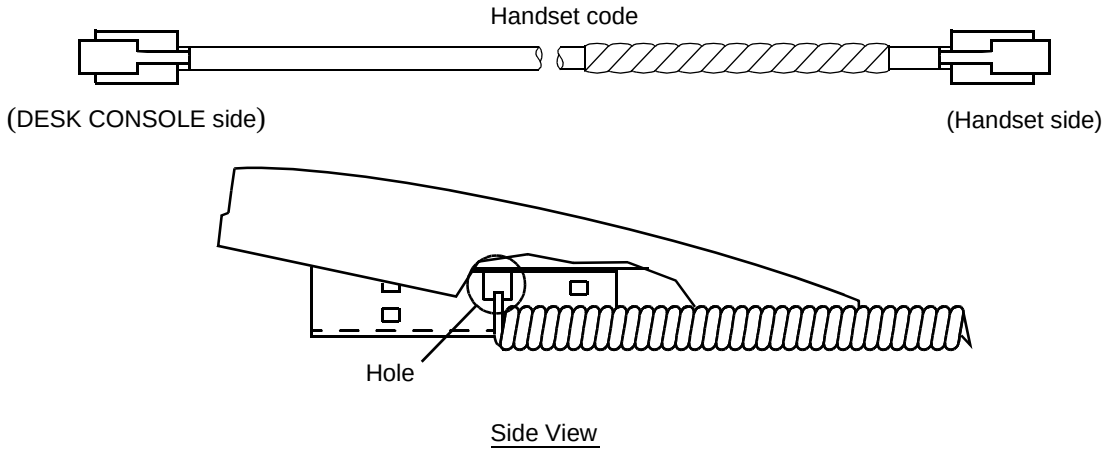


Figure 016-7 Mounting of Handset (Left Side of DESK CONSOLE)

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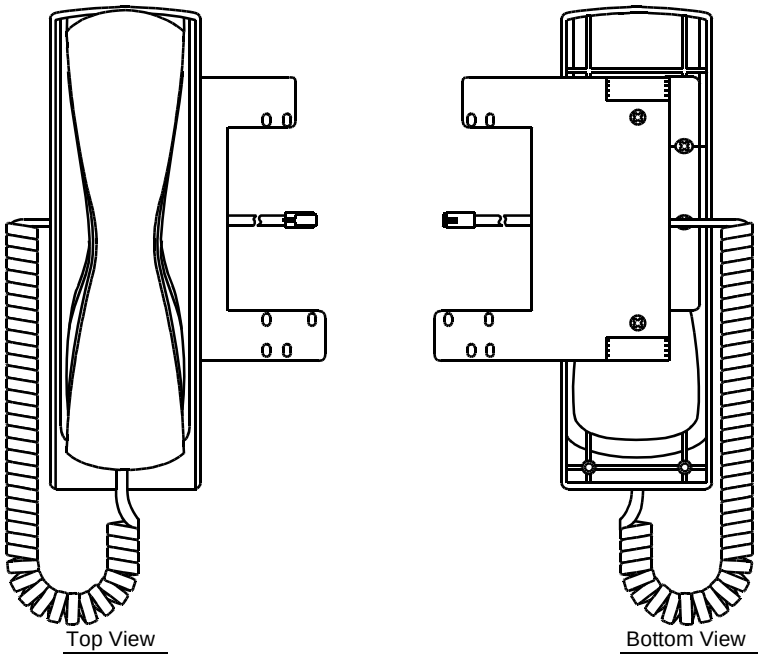
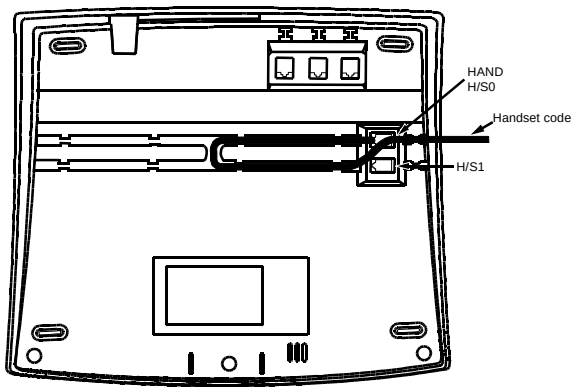
Installation of the DESK CONSOLE and Cable Connection



7. Connect the Handset code to HAND H/S0 connector as shown below (H/S1 is not used for the Handset).



Bottom View of DESK CONSOLE

Figure 016-7 Mounting of Handset (Left Side of DESK CONSOLE) (Continued)

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Installation of the DESK CONSOLE and Cable Connection

Mount the Handset Support to DESK CONSOLE with 3 screws as shown below.

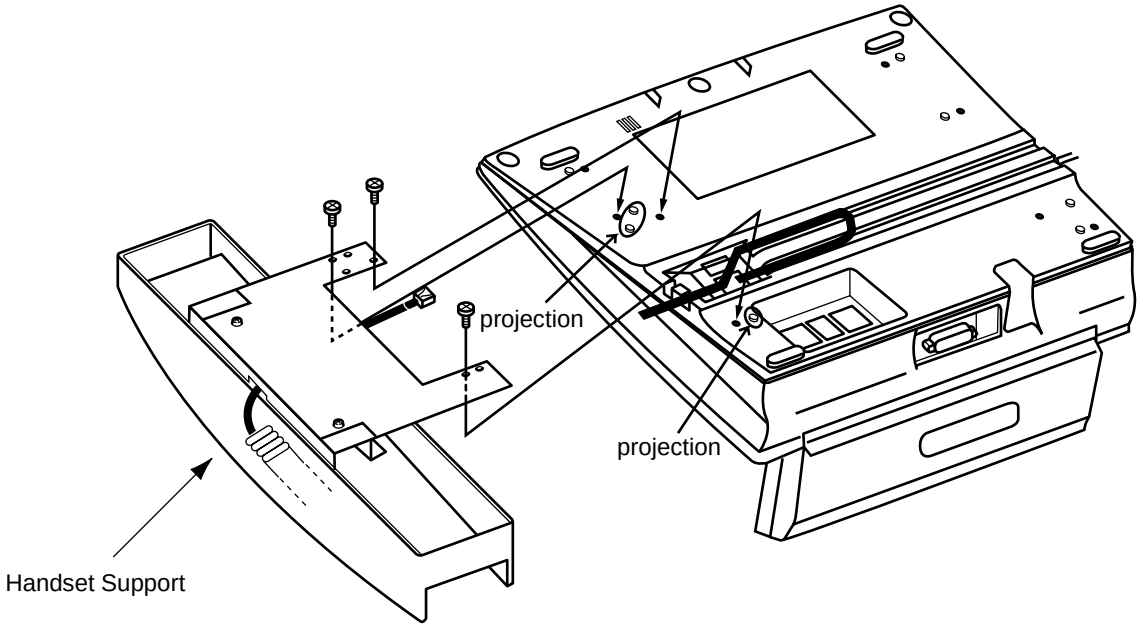

Figure 016-7 Mounting of Handset (Left Side of DESK CONSOLE) (Continued)

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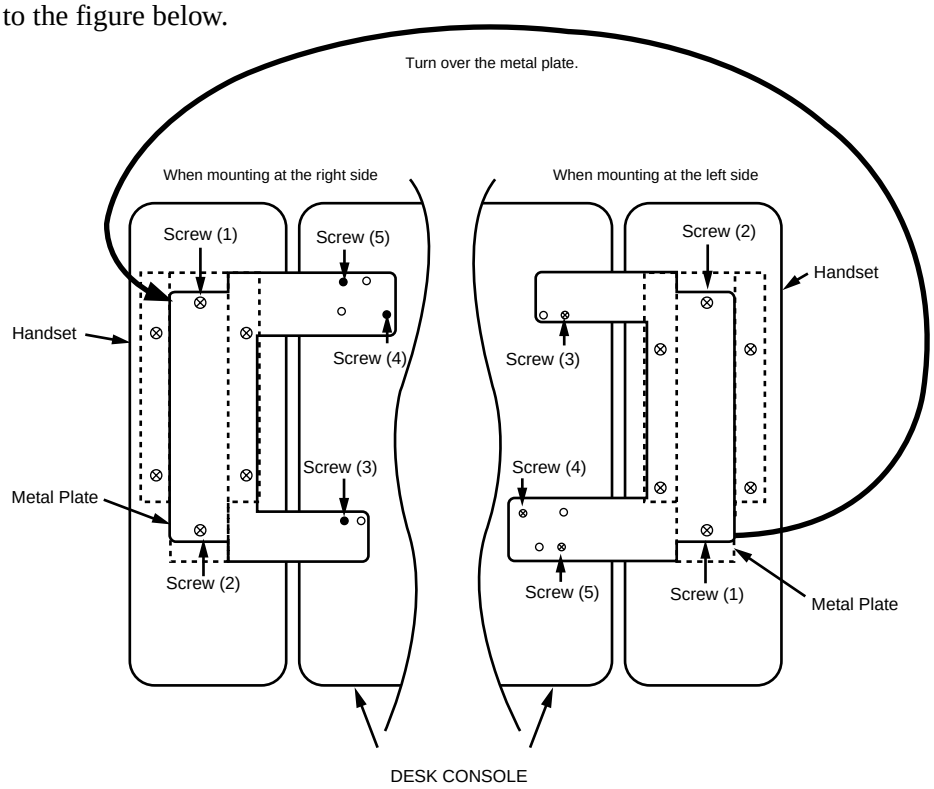
Installation of the DESK CONSOLE and Cable Connection

(b) When mounting at the right side of DESK CONSOLE

1. Remove the metal plate from the Handset, turn it over, and mount it to the Handset again. Refer to the figure below.



2. Put the Handset code through the hole as shown below.

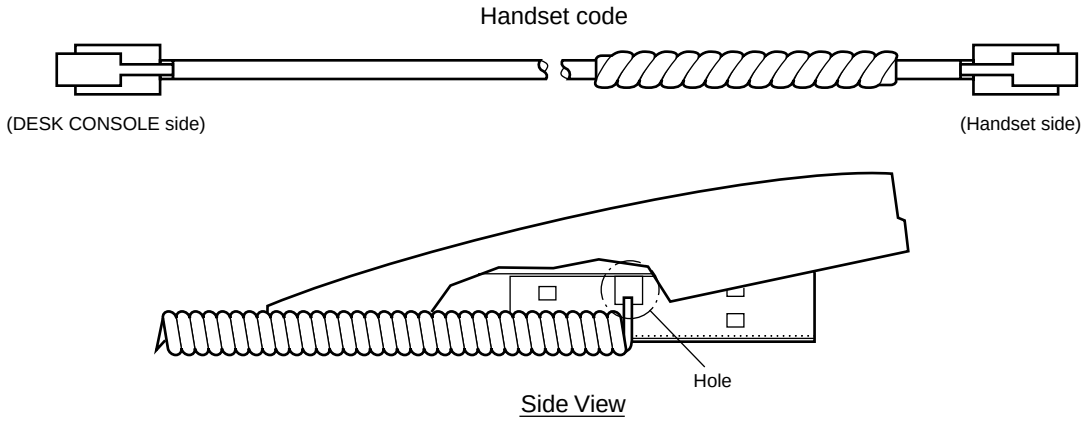


Figure 016-8 Mounting of Handset (Right Side of DESK CONSOLE)

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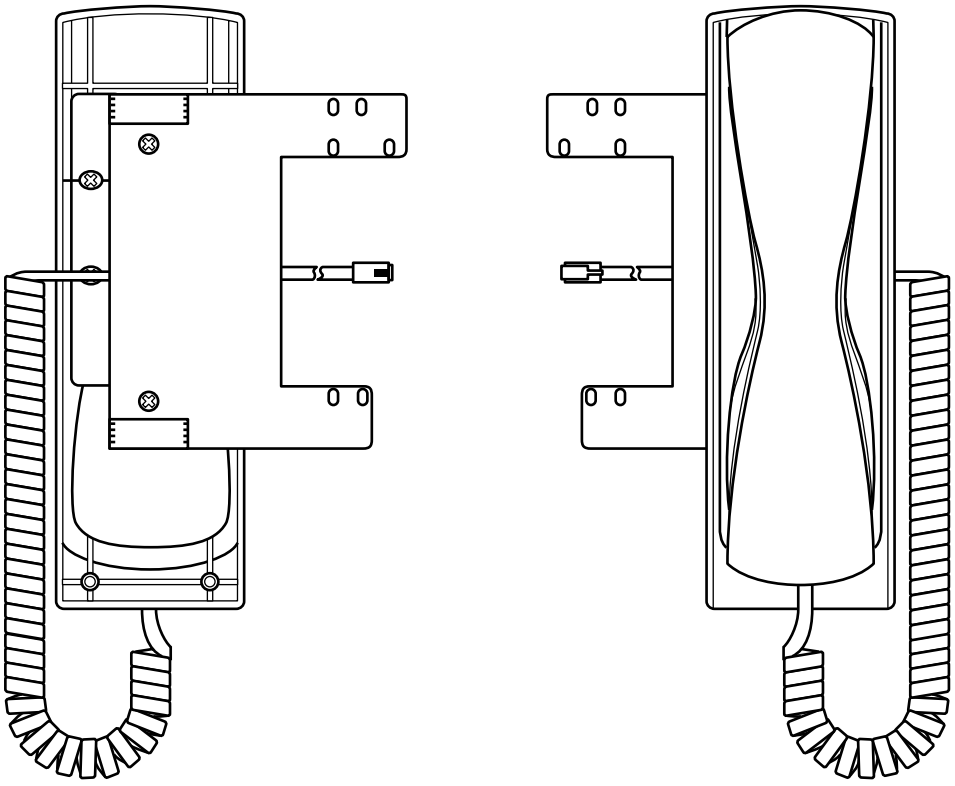
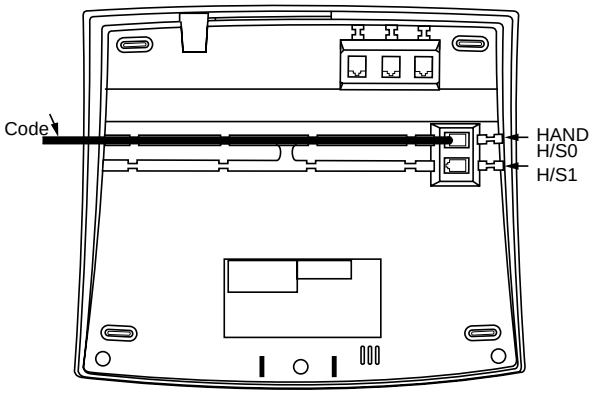
Installation of the DESK CONSOLE and Cable Connection



Bottom view　　Top View

3. Connect the Handset code to HAND H/S0 connector as shown below (H/S1 is not used for the Handset).



Bottom View of DESK CONSOLE

Figure 016-8 Mounting of Handset (Right Side of DESK CONSOLE) (Continued)

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Installation of the DESK CONSOLE and Cable Connection

Mount the Handset Support to DESK CONSOLE with 3 screws as shown below.

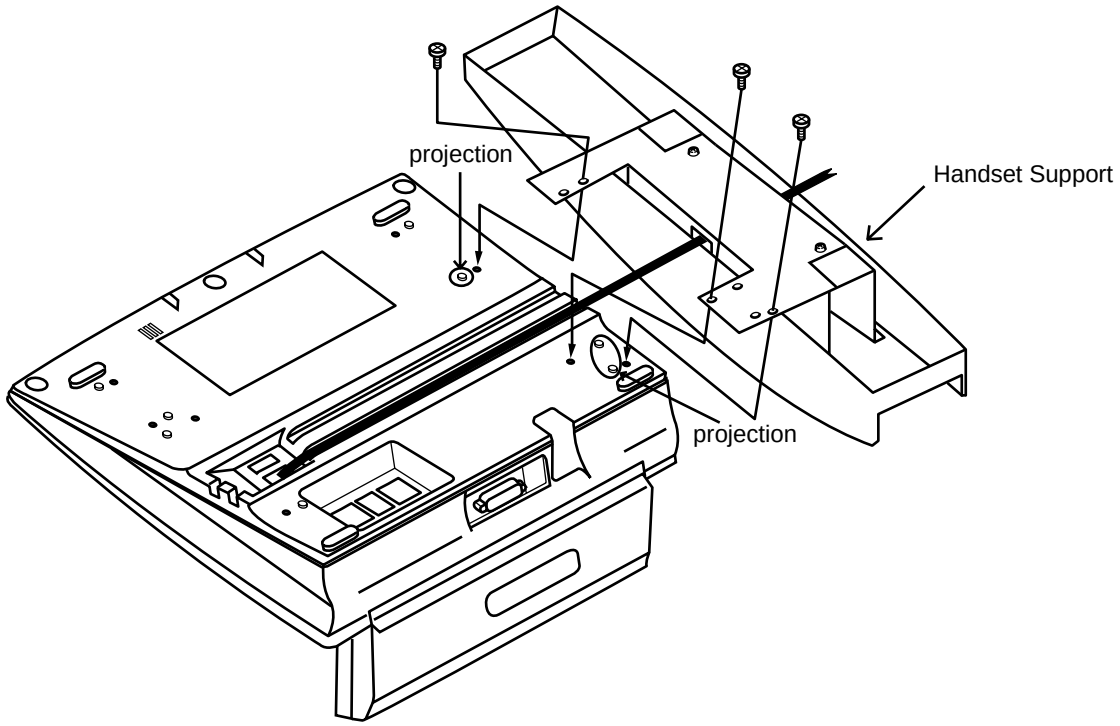

Figure 016-8 Mounting of Handset (Right Side of DESK CONSOLE) (Continued)

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Installation of the DESK CONSOLE and Cable Connection

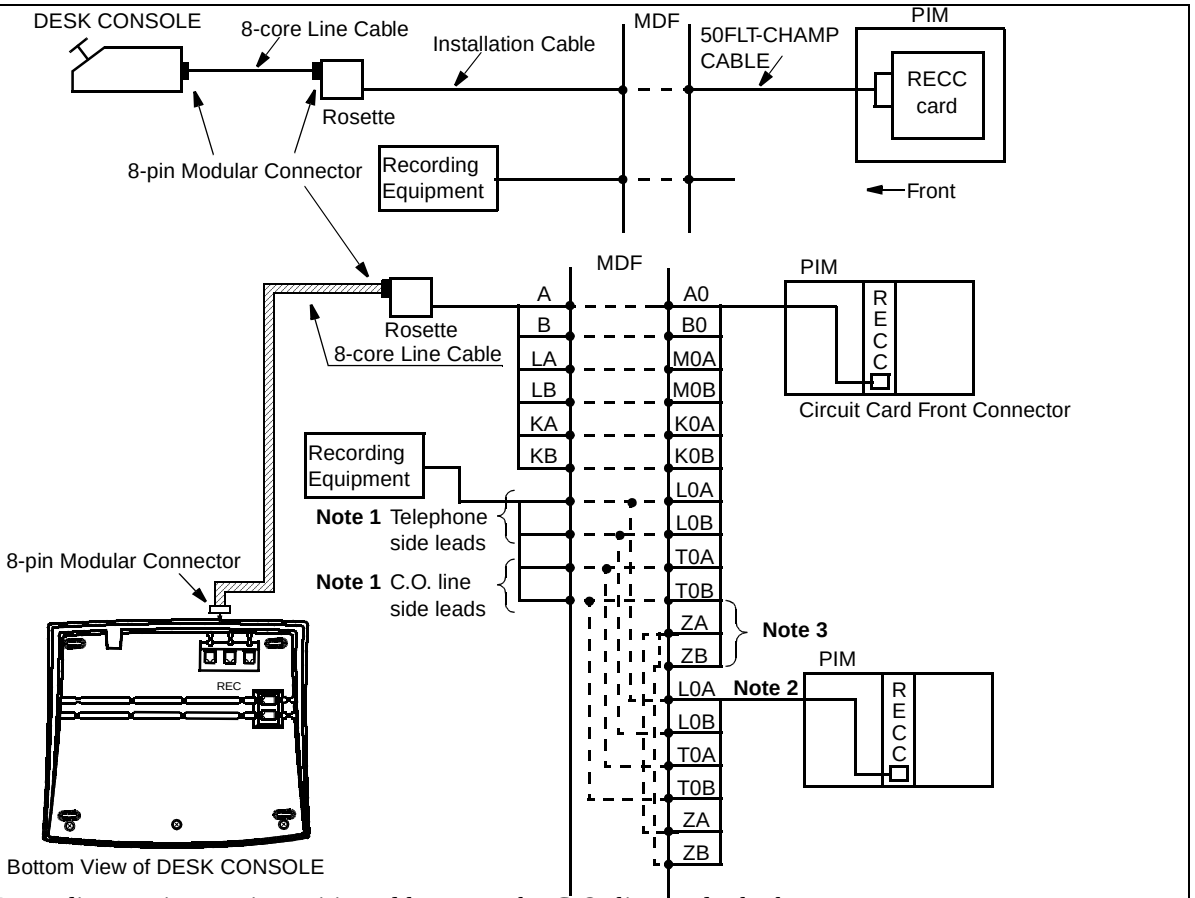
5. CONNECTION OF RECORDING EQUIPMENT

The following are required for using recording function:

- The RECC circuit card
- Recording Equipment
- 8-core Line Cable
- Rosette

An RECC card (PA-M87) connects DESK CONSOLEs and recording equipment in the following combinations:

- Six DESK CONSOLEs and one recording equipment × 1 set
- Three DESK CONSOLEs and one recording equipment × 2 set



Note 1: *Recording equipment is positioned between the C.O. line and telephones.*

Note 2: *One recording equipment can be shared with multiple RECC cards.*

Note 3: *When sharing one recording equipment with multiple RECC cards, multiple connection of ZA and ZB terminals is required.*

Figure 016-9 RECC Card Cable Connection Diagram

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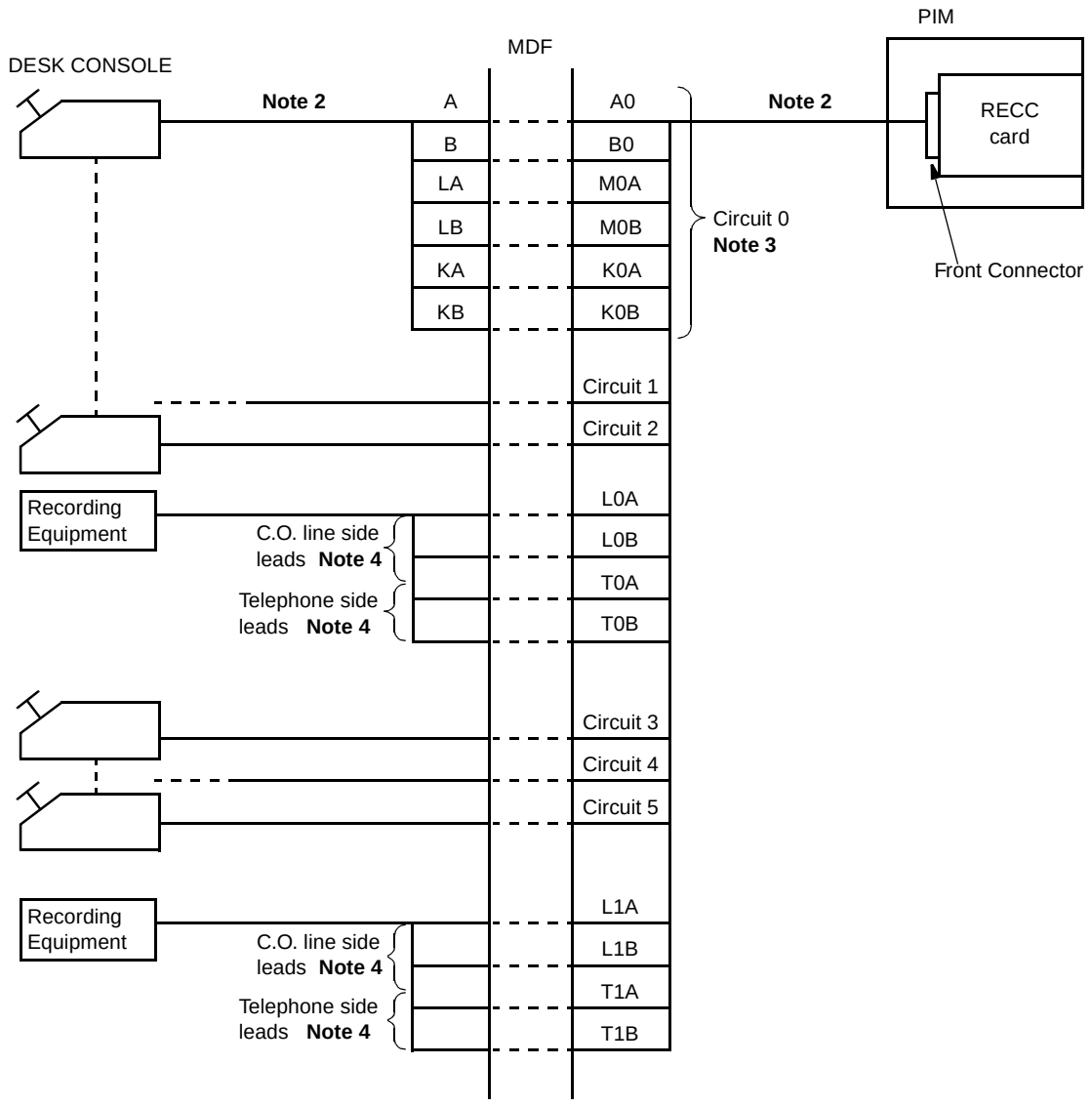
Installation of the DESK CONSOLE and Cable Connection

(a) When using three DESK CONSOLEs and one recorder **Note 1**

Note 1: *Switch settings of SW10, SW12 and SW13 on the PA-M87 card are required. For switch setting and connector lead accommodation, refer to the NEAX2400 IMX Circuit Card Manual.*



Note 2: *Refer to Figure 016-9"RECC Card Cable Connection Diagram" for cable connection.*
Note 3: *Connections of Circuit 1 through 5 are the same as those of Circuit 0.*
Note 4: *Recording equipment is positioned between the C.O. line and telephones.*

Figure 016-10 Three DESK CONSOLEs and One Recording Equipment

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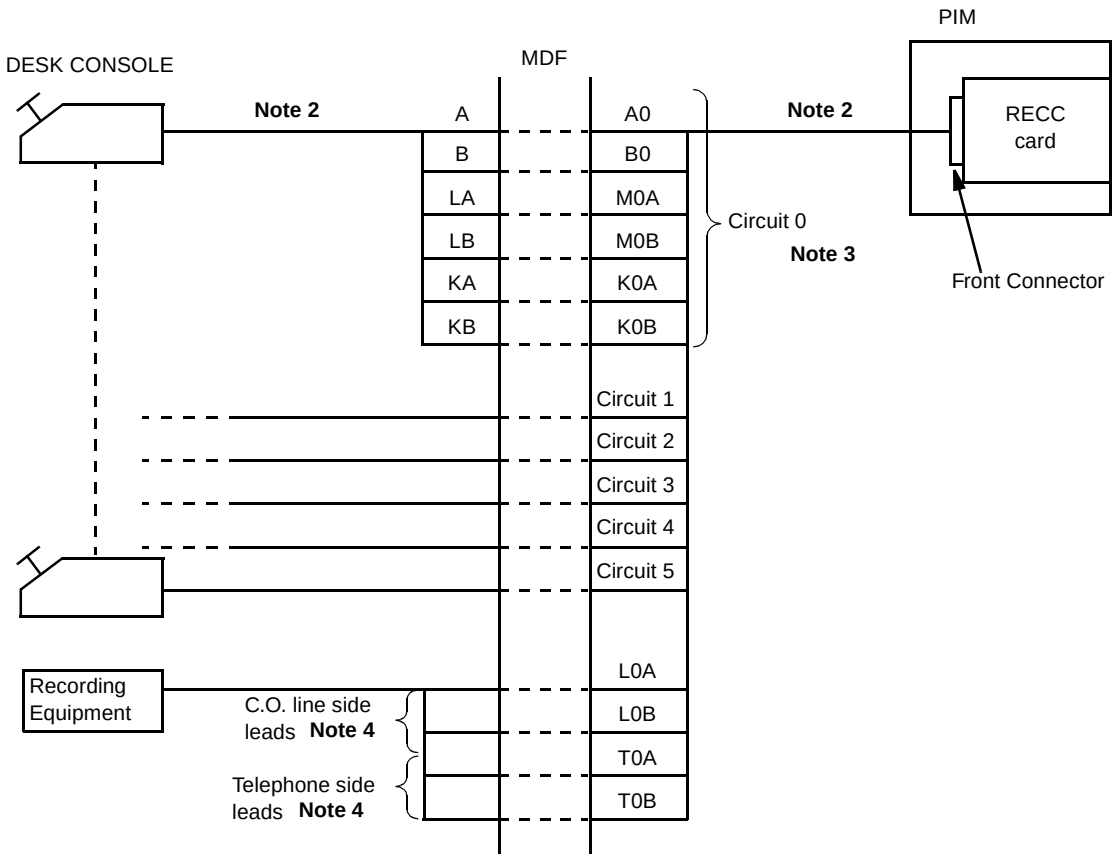
Installation of the DESK CONSOLE and Cable Connection

(b) When using six DESK CONSOLEs and one recording equipment **Note 1**

Note 1: *Switch settings of SW10, SW12 and SW13 on the PA-M87 card are required. For switch setting and connector lead accommodation, refer to the NEAX2400 IMX Circuit Card Manual.*



Note 2: *Refer to Figure 016-9 "RECC Card Cable Connection Diagram" for cable connection.*

Note 3: *Connections of Circuit 1 through 5 are the same as those of Circuit 0.*

Note 4: *Recording equipment is positioned between the C.O. line and telephones.*

Figure 016-11 Six DESK CONSOLEs and One Recording Equipment

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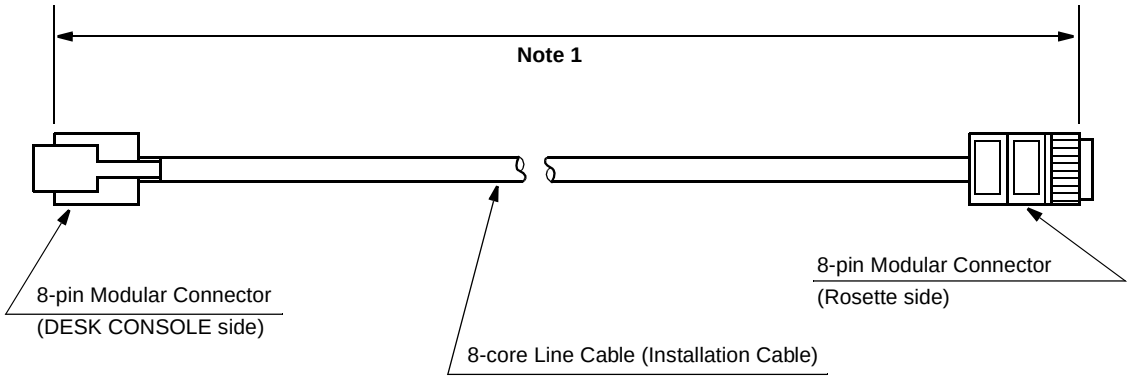
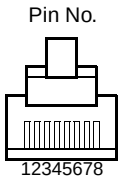
Installation of the DESK CONSOLE and Cable Connection

6. 8-CORE LINE CABLE (INSTALLATION CABLE)





Pin No.	LEAD NAME	MEANING
1	A	Speech
2	B	Speech
3	–	Not used
4	–	Not used
5	KA	Recording Start Signal (Relay Contact)
6	KB	Recording Start Signal (Relay Contact)
7	LA (**Note 2**)	Recording Lamp Signal (+)
8	LB (**Note 2**)	Recording Lamp Signal (–)

Note 1: *Cut the cable in proper length. Attach the modular connector to both sides of the 8-core line cable using installation tool.*

Note 2: *Be sure to check the polarity of pin numbers 7 (LA) (+) and 8 (LB) (–).*

Figure 016-12 8-core Line Cable

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Installation of the DESK CONSOLE and Cable Connection

7. CONNECTION OF AC-DC ADAPTER (OPTIONAL)

The AC-DC adapter is required when the power supply from the distant PBX is not available.

The connector for the AC-DC adapter is on the rear side of DESK CONSOLE.

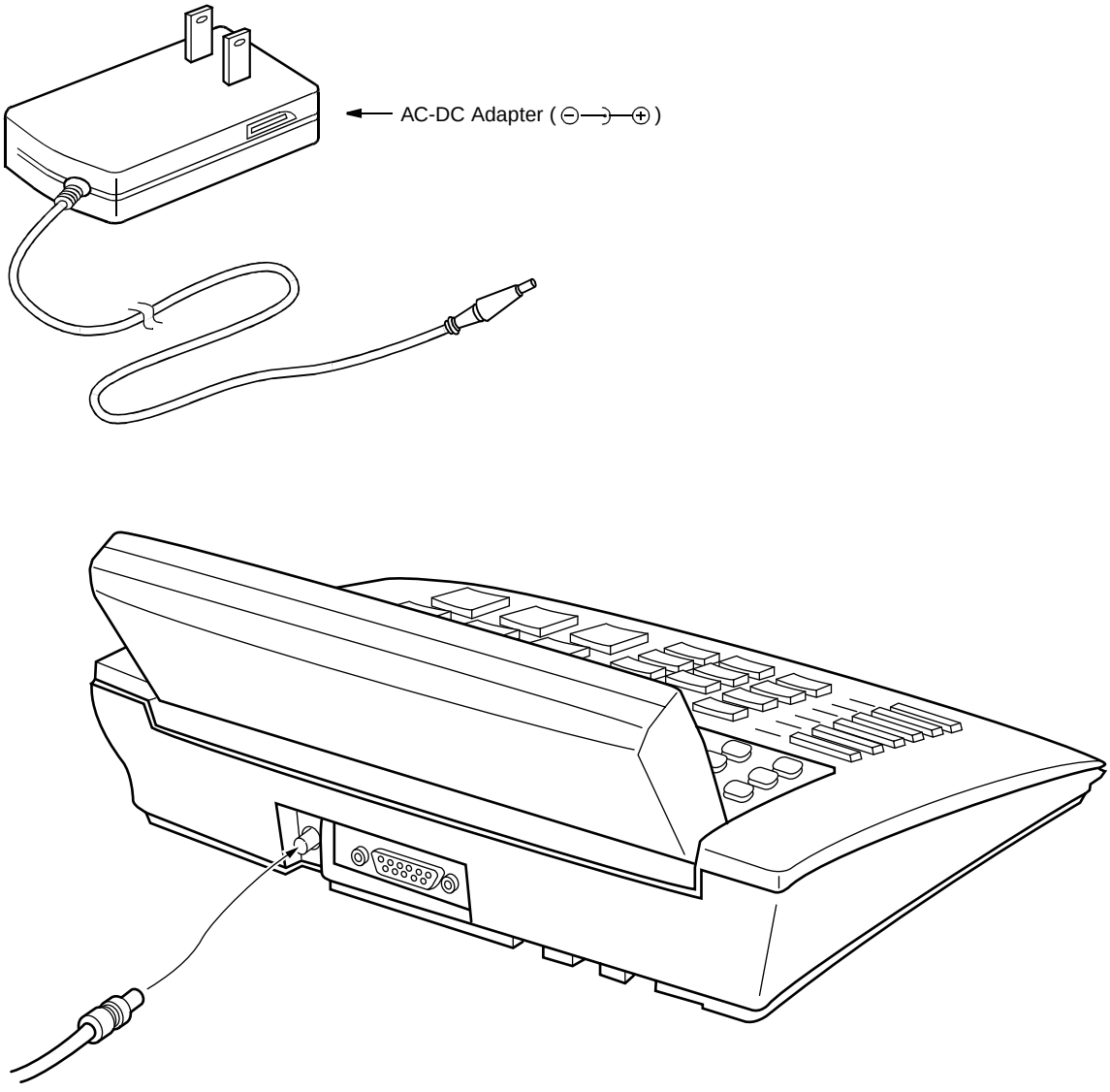

Figure 016-13 Connection of AC-DC Adapter

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Installation of the DESK CONSOLE and Cable Connection

8. MOUNTING OF ADD-ON CONSOLE (FOR HOTEL SYSTEM)

ADD-ON CONSOLE is used in the Hotel System.

1. Cable Connection Diagram

   (a) Cable Connection Diagram of Add-On Console (When the power is supplied from the PBX)

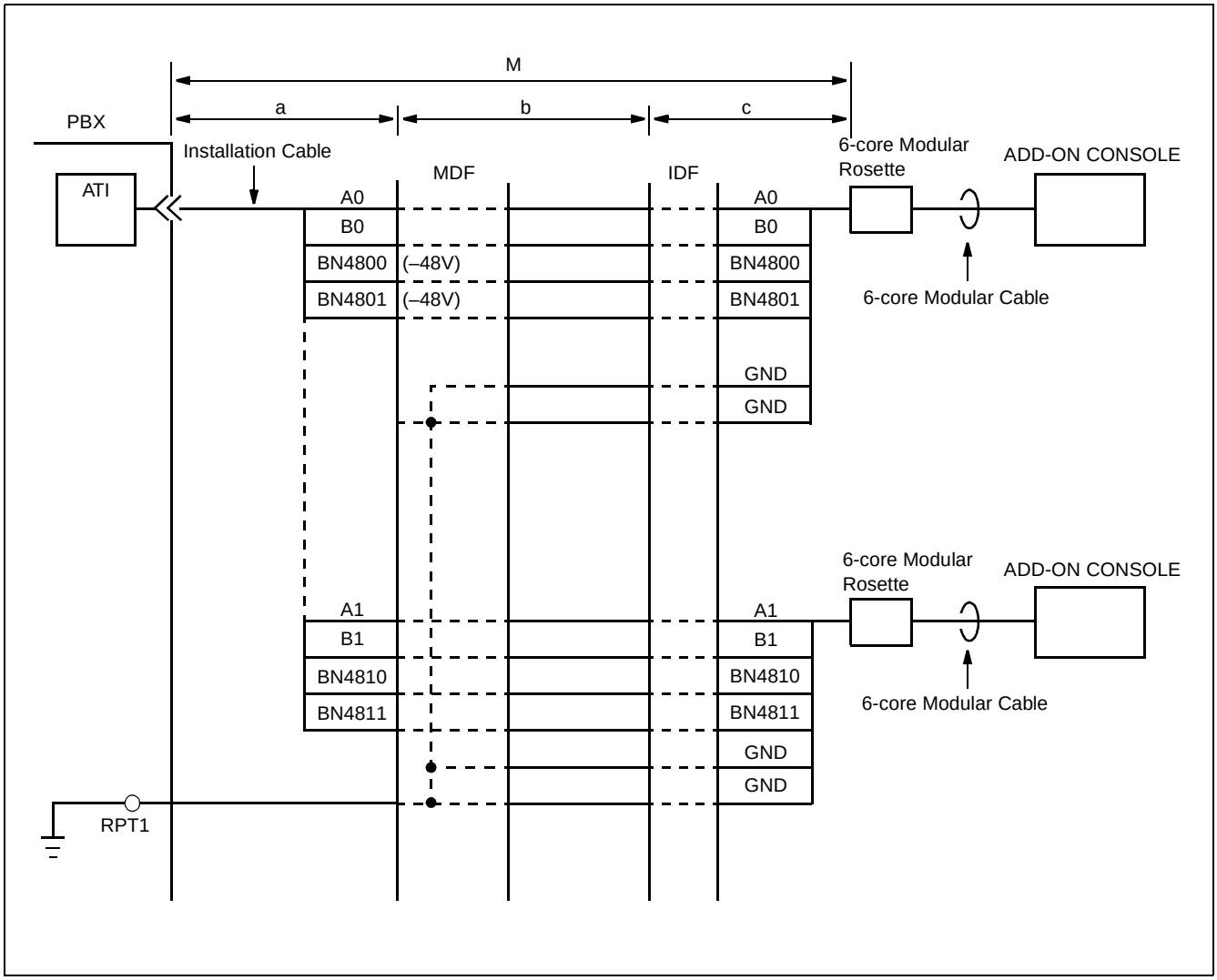

Figure 016-14 Add-On Console Cable Connection Diagram (When the Power Is Supplied from the PBX)

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Installation of the DESK CONSOLE and Cable Connection

(b) Cable Connection Diagram of Add-On Console (When using Local Power Supply) **Note**

Note: *When using local power supply, DESK CONSOLE cannot be used in case of power failure.*

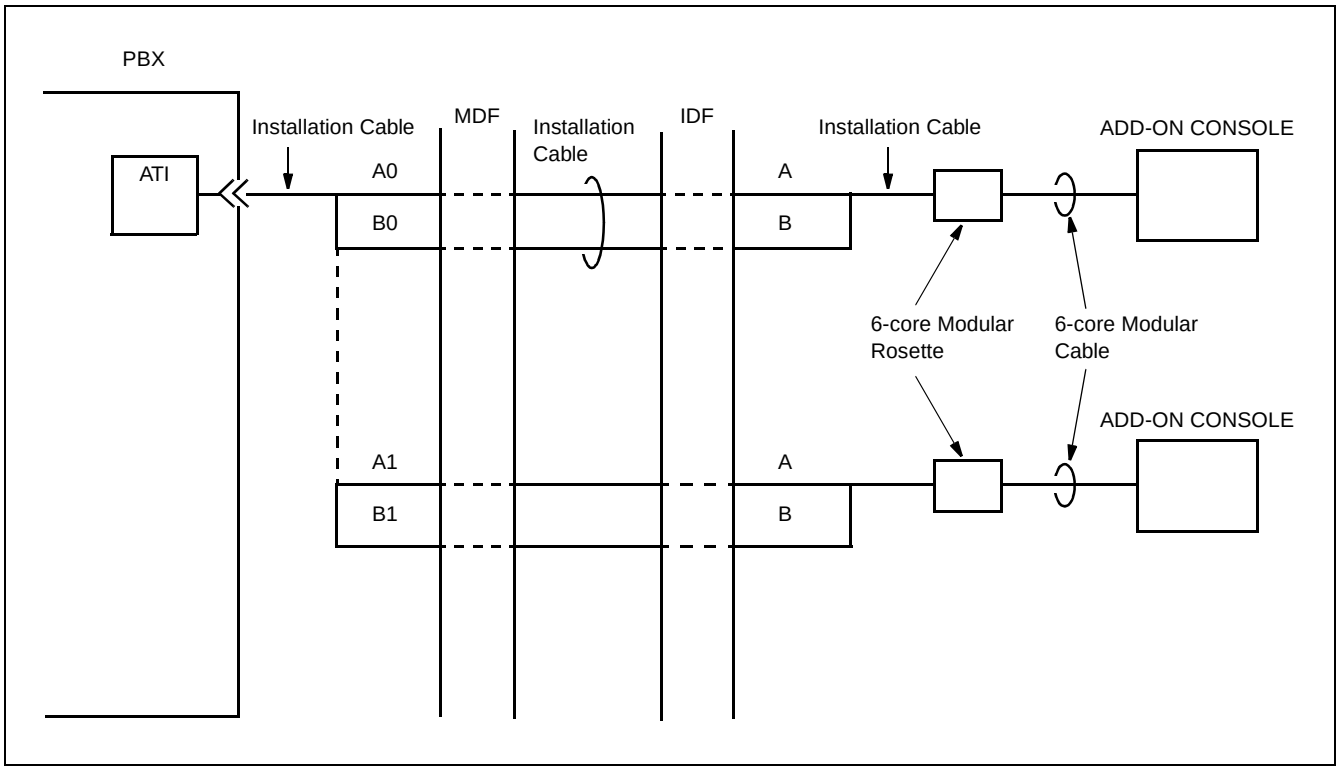

Figure 016-15 Add-On Console Cable Connection Diagram (When Using Local Power Supply)

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Installation of the DESK CONSOLE and Cable Connection

Wire the cables to the Modular Block as shown below.

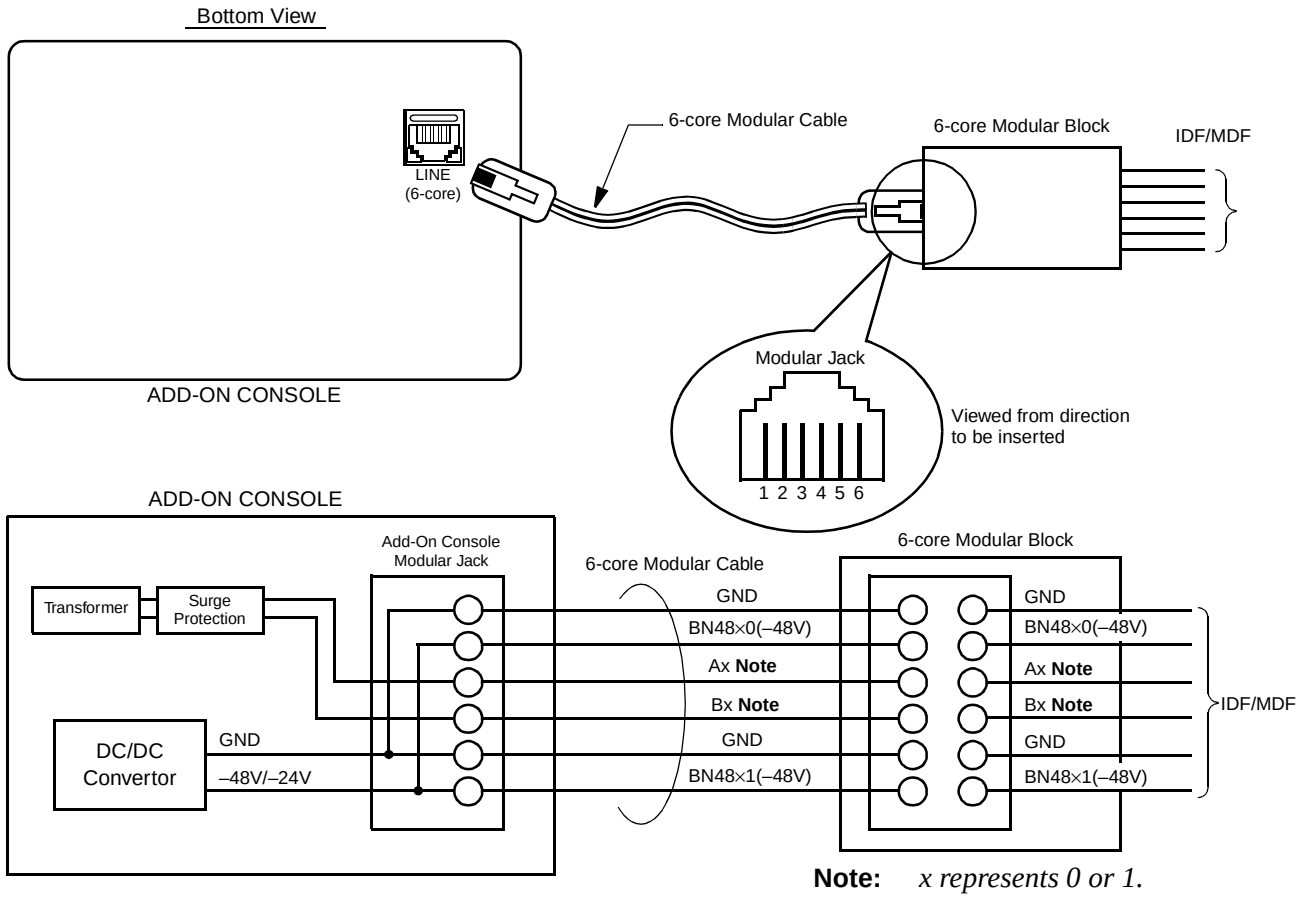

Figure 016-16 Cable Connection Diagram for Add-On Console Modular Block

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Installation of the DESK CONSOLE and Cable Connection

9. MOUNTING OF ADD-ON CONSOLE

(a) When mounting at the right side of DESK CONSOLE

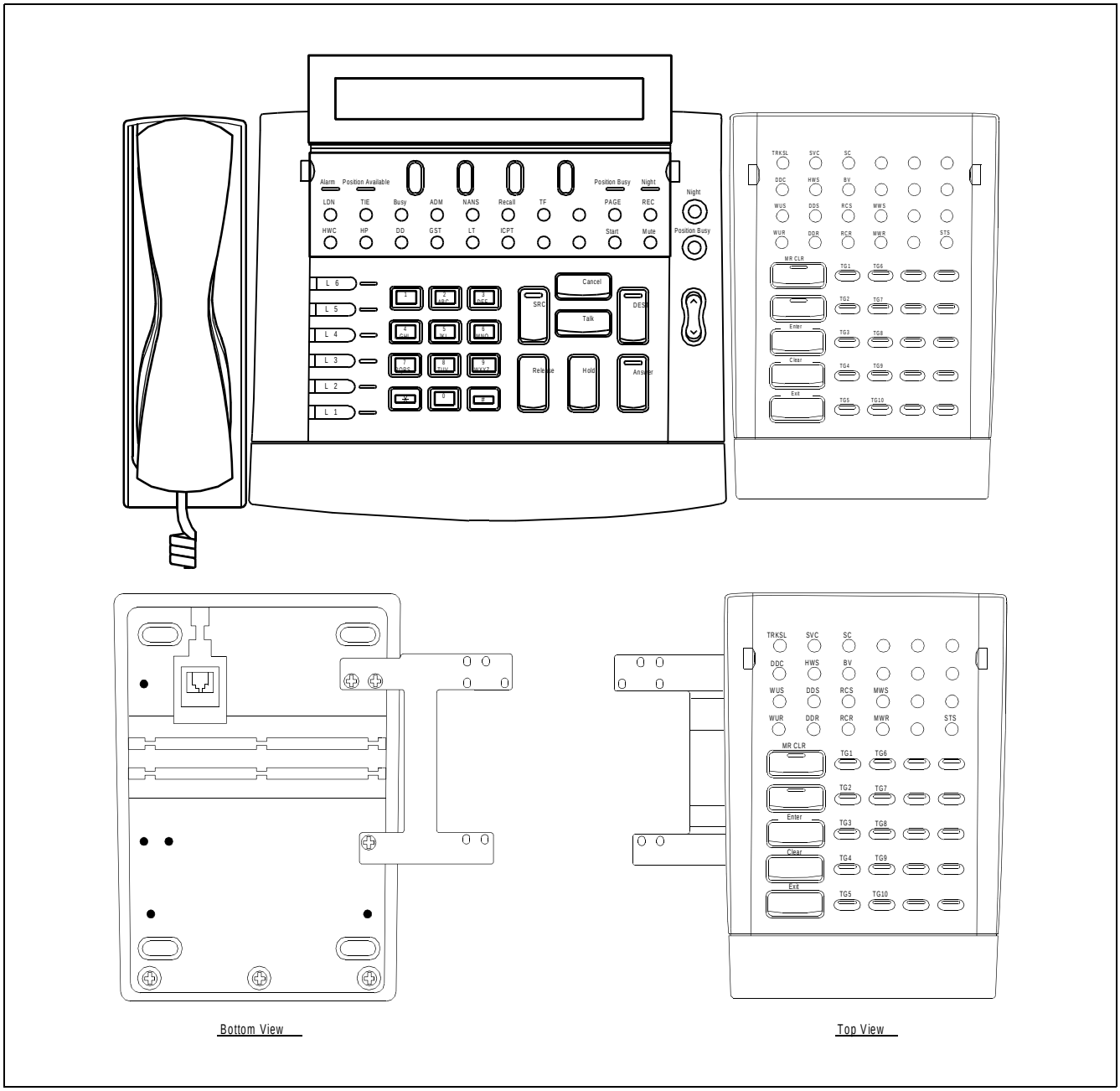

Figure 016-17 Mounting of Add-On Console (Right Side of DESK CONSOLE)

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Installation of the DESK CONSOLE and Cable Connection

Mount the ADD-ON CONSOLE to DESK CONSOLE with 3 screws as shown below.

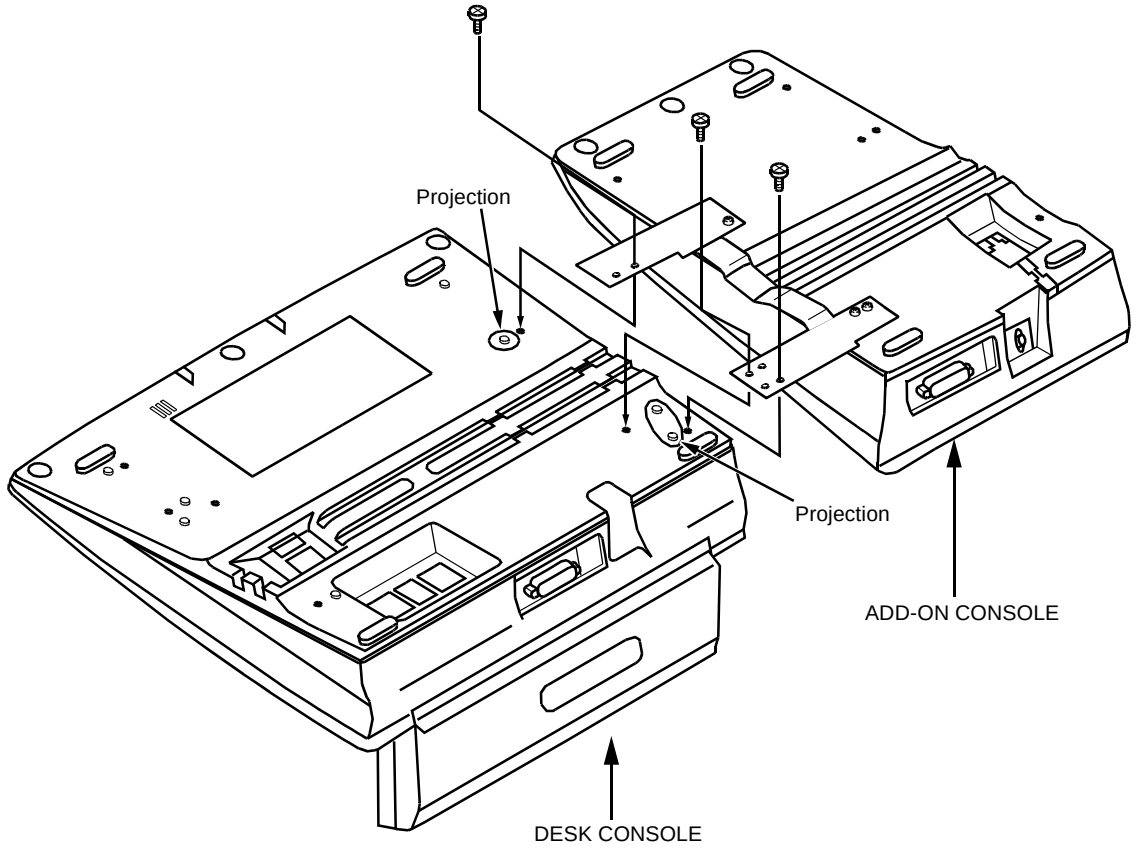

Figure 016-17 Mounting of Add-On Console (Right Side of DESK CONSOLE) (Continued)

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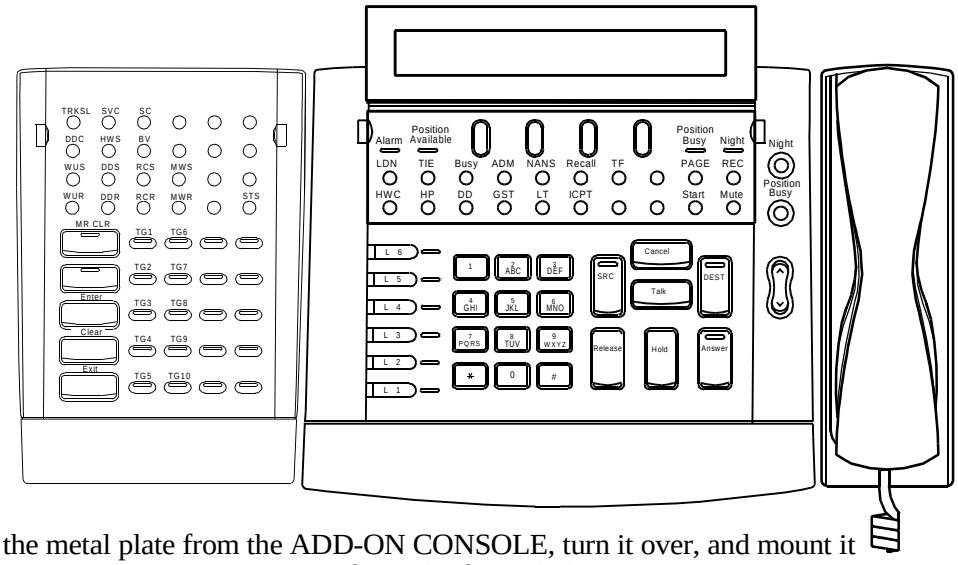
Installation of the DESK CONSOLE and Cable Connection

(b) When mounting at the left side of DESK CONSOLE



1. Remove the metal plate from the ADD-ON CONSOLE, turn it over, and mount it to the ADD-ON CONSOLE again. Refer to the figure below.

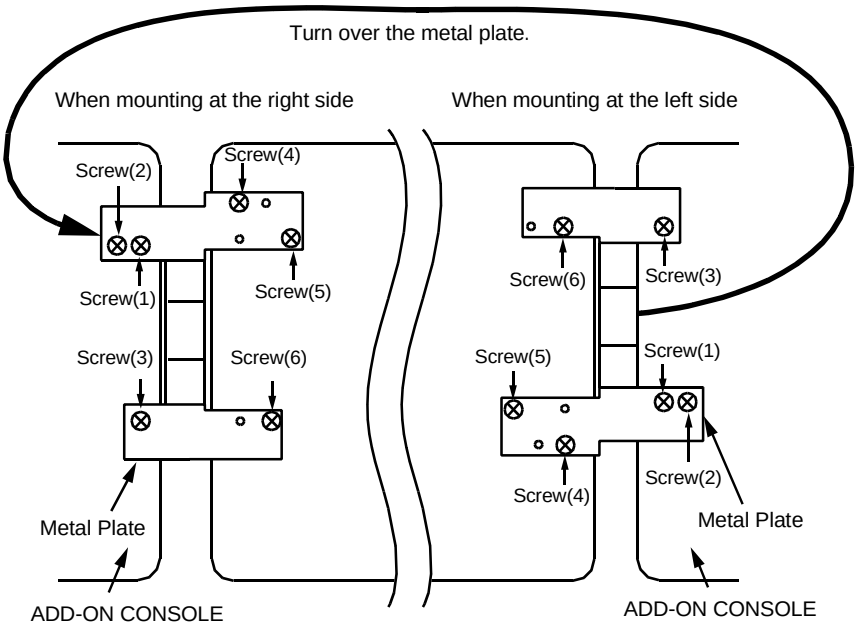


Figure 016-18 Mounting of Add-On Console (Left Side of DESK CONSOLE)

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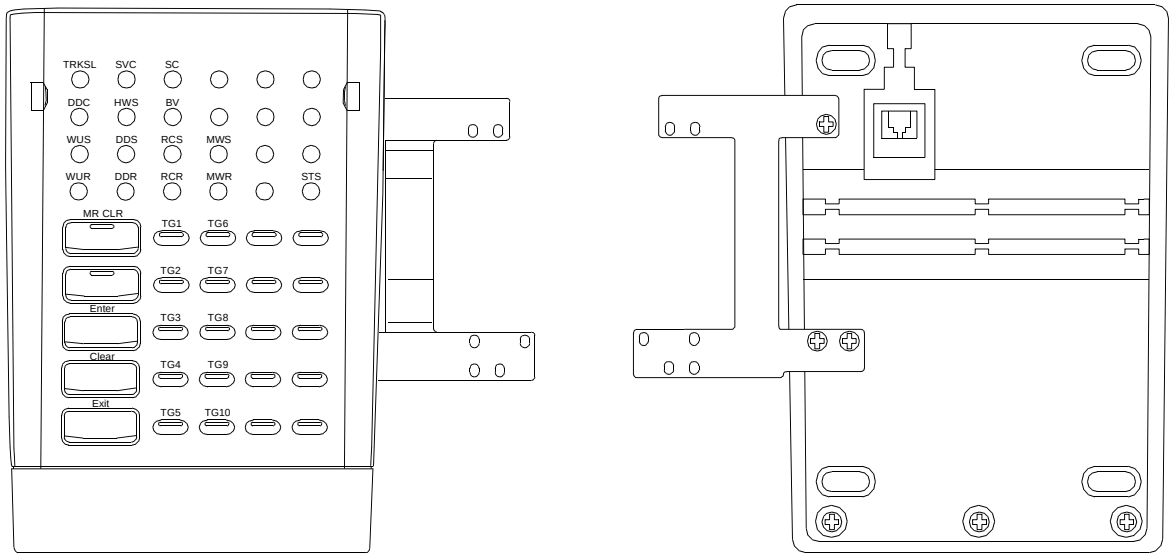
Installation of the DESK CONSOLE and Cable Connection



Top View

Bottom View

2. Mount the ADD-ON CONSOLE to DESK CONSOLE with 3 screws as shown below.

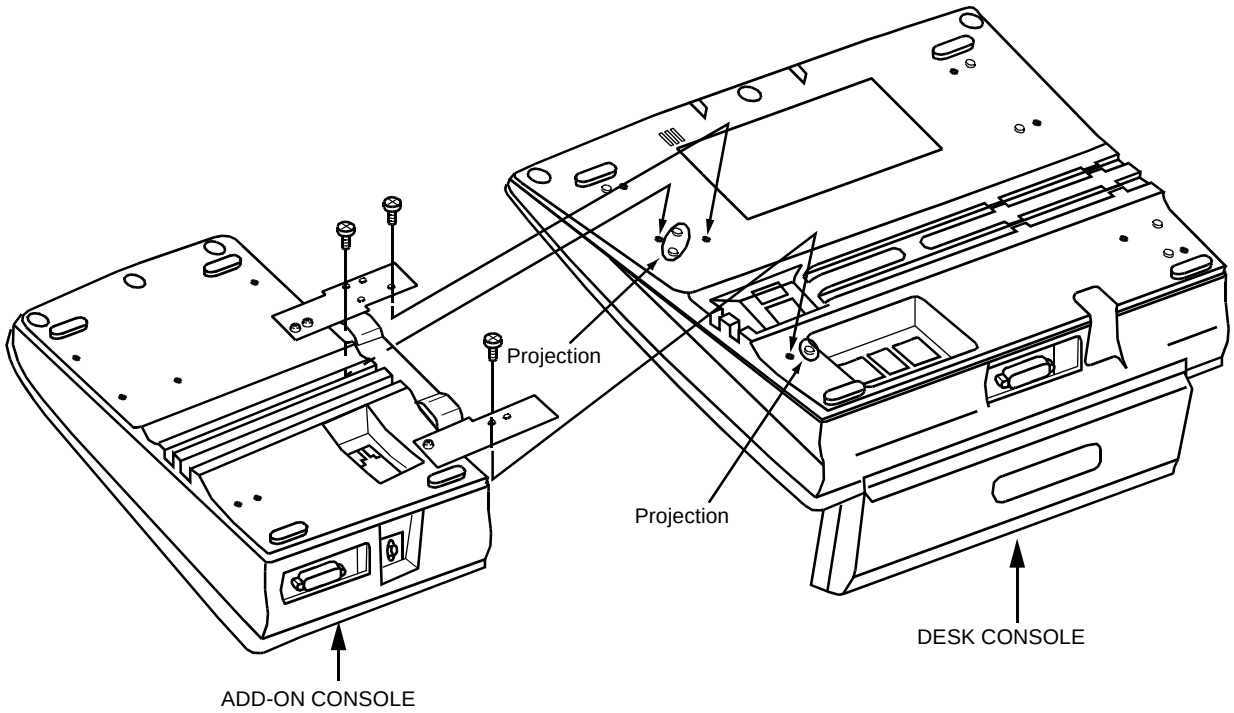


Figure 016-18 Mounting of Add-On Console (Left Side of DESK CONSOLE) (Continued)

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Installation of the DESK CONSOLE and Cable Connection

10. CONNECTION OF AC-DC ADAPTER FOR ADD-ON CONSOLE (OPTIONAL)

The AC-DC adapter is required when the power supply from the distant PBX is not available.

The connector for the AC-DC adapter is on the rear side of ADD-ON CONSOLE.

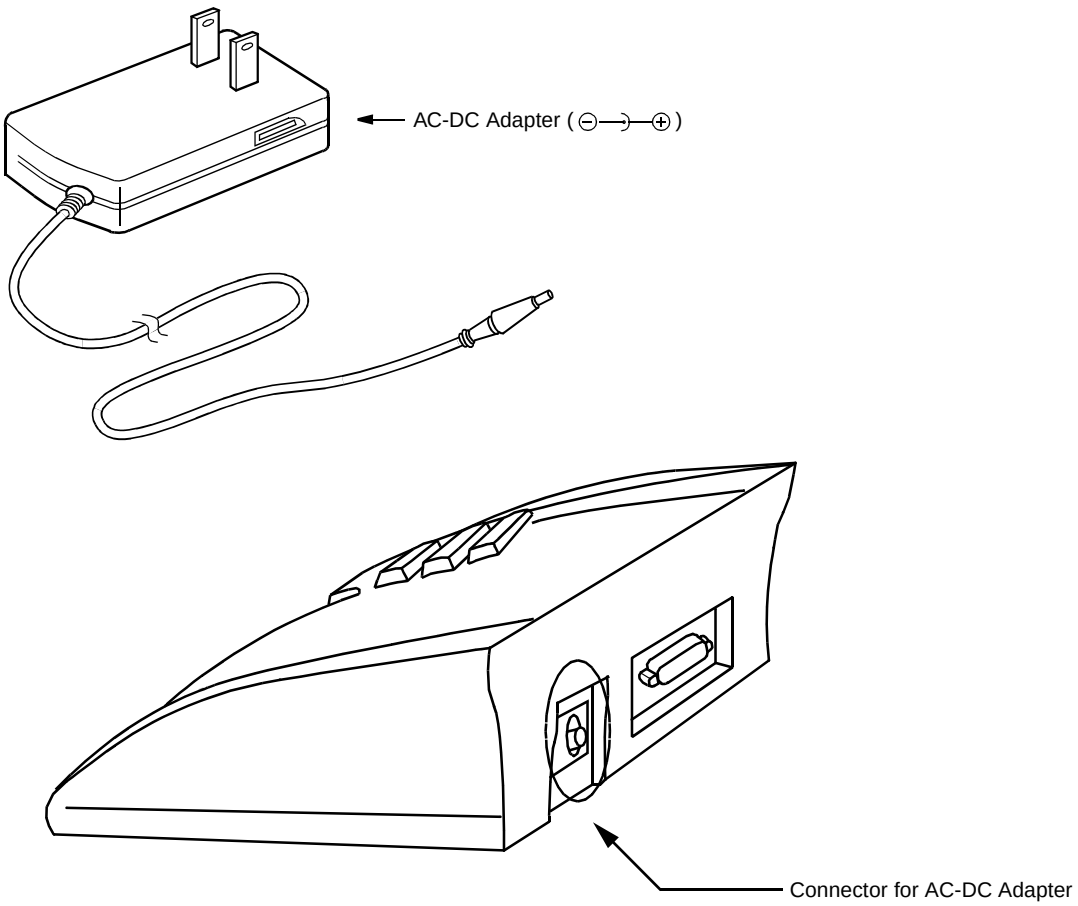

Figure 016-19 Connection of AC-DC Adapter for Add-On Console

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Installation of the DESK CONSOLE and Cable Connection

11. CONFIGURATION MENU

11.1. General

Configuration Menu is used for assigning configuration data for DESK CONSOLE. The menu has the following items:

1. HEADSET/HANDSET
2. HEADSET TYPE
3. MUTE
4. REC CONTROL
5. PAGE CONTROL
6. SUP CONNECTION
7. REC VOLUME
8. BLF
9. HOLD/START/RELEASE/SWAP

11.2. Selection of Configuration Item

1. Displaying Configuration Menu

(a) While pressing the L3 and L6 keys simultaneously, turn on the power.

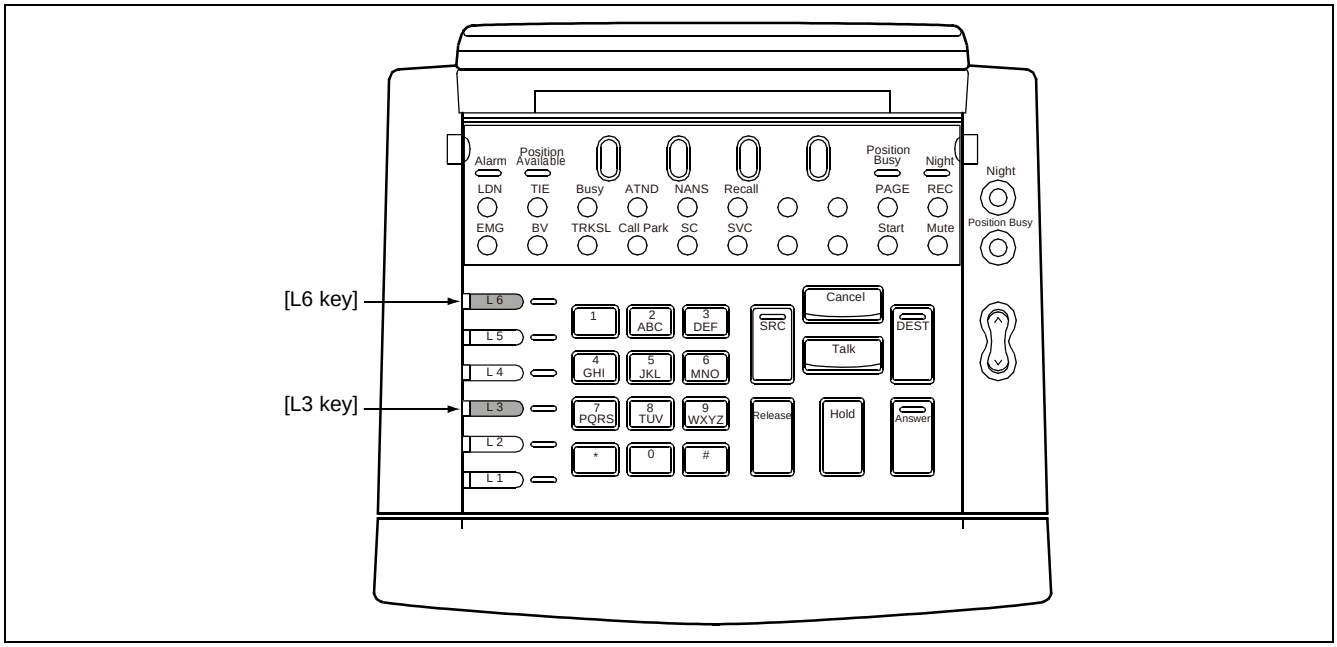

Figure 016-20 Displaying the Configuration Menu

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Installation of the DESK CONSOLE and Cable Connection

The first page of Configuration Menu appears on the LCD. Configuration Menu has a total of three pages.

- 1st Page

[CONFIG MENU P1] VER x	DEST: next page
1: HEADSET/HANDSET	Release: exit
2: HEADSET TYPE	Answer: update
3: MUTE	

- 2nd Page

[CONFIG MENU P2] VER x	SRC: prev page
1: REC CONTROL	DEST: next page
2: PAGE CONTROL **Note**	Release: exit
3: SUP CONNECTION	Answer: update

Note: *Do not change this data.*

- 3rd Page

[CONFIG MENU P3] VER x	SRC: prev page
1: REC VOLUME	Release: exit
2: BLF	Answer: update
3: HOLD/START/RELEASE/SWAP	

(b) When the DEST key is pressed, the display changes to the next page. When returning to the previous page, press the SRC key.

(c) When the Release key is pressed, Configuration Menu disappears and the DESK CONSOLE returns to normal operation.

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Installation of the DESK CONSOLE and Cable Connection

12. SELECTION OF CONFIGURATION ITEM

Using a numeric key, press the desired number in Configuration Menu. A menu for assigning configuration data appears. Assign configuration data referring to “Assignment of Configuration Data” on the next page.

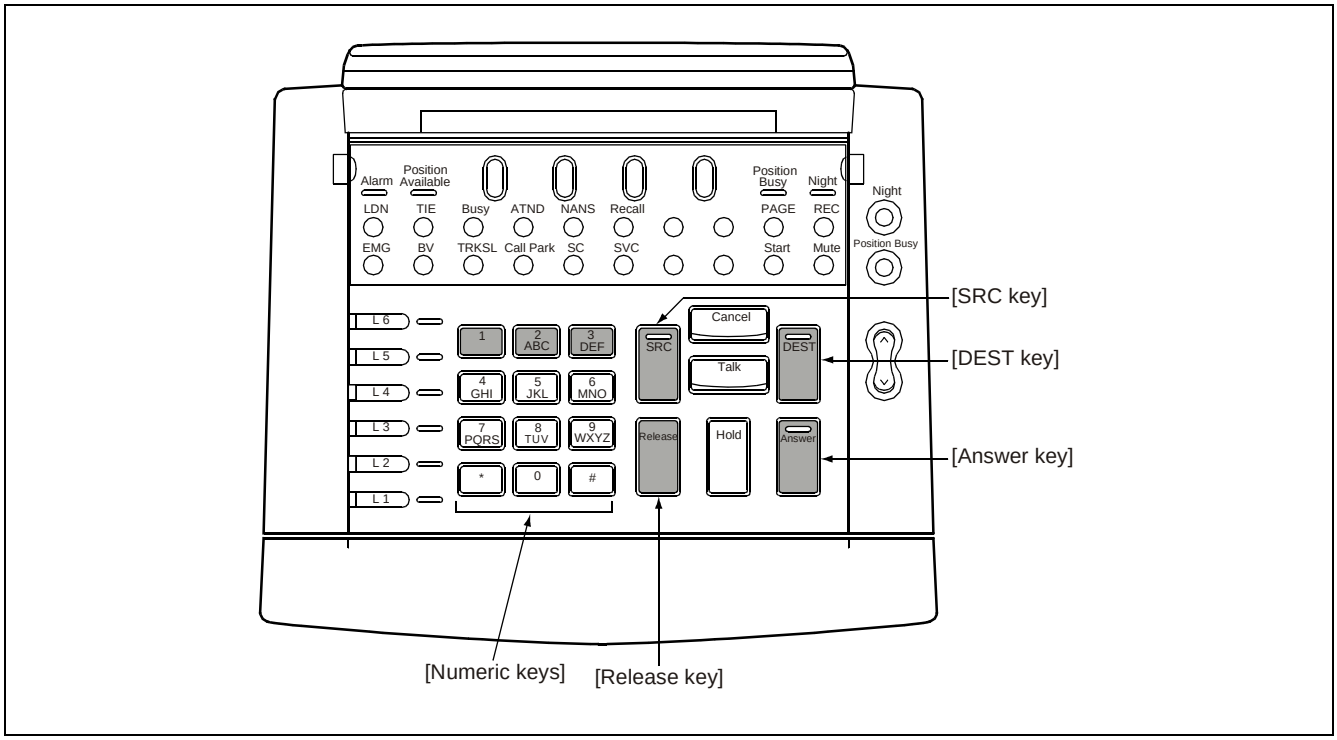

Figure 016-21 Selecting a Configuration Item

NAP-200-016
Sheet 32/41
Installation of the DESK CONSOLE and Cable Connection

13. ASSIGNMENT OF CONFIGURATION DATA

This section explains how to assign each configuration data. When assigning configuration data, the following shaded keys are used.

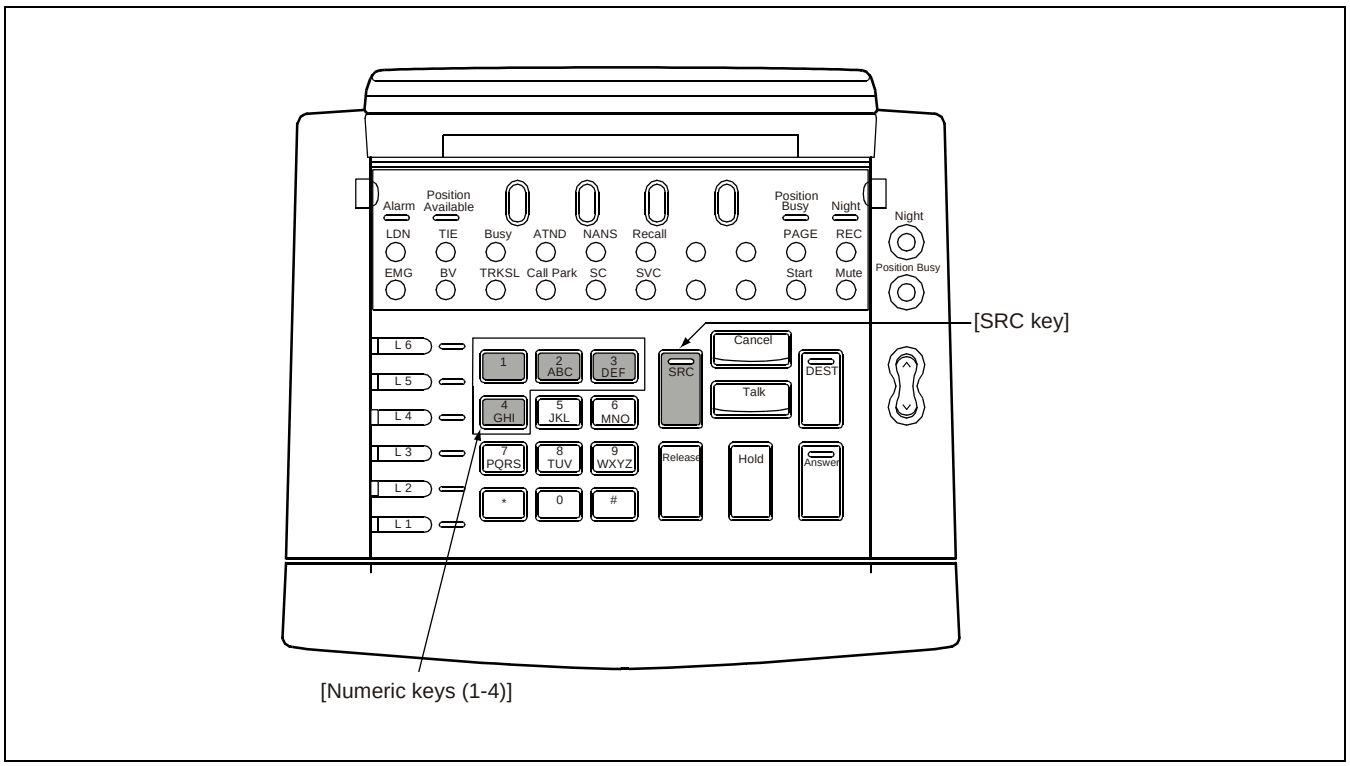

Figure 016-22 Assigning Configuration Data

NAP-200-016
Sheet 33/41
Installation of the DESK CONSOLE and Cable Connection

14. HEADSET/HANDSET

This item specifies an optional device connected to the HAND H/S0 connector.

Note: *With regard to the H/S1 connector, only the Headset is connected. Accordingly, data assignment for H/S1 connector is not required.*

(d) Press the desired number. An asterisk shows the selected number.

[HEADSET/HANDSET]	SRC: menu
*1: HEADSET	
2: HANDSET	

1. Headset is connected to the HAND H/S0 connector
2. Handset is connected to the HAND H/S0 connector

SRC: Return to Configuration Menu

Note: *Default setting is "1: HEADSET".*

(b) Press the SRC key. The display returns to Configuration Menu.

[CONFIG MENU P1] VER x	DEST: next page
1: HEADSET/HANDSET	Release: exit
2: HEADSET TYPE	Answer: update
3: MUTE	

(c) When configuration data assignment is finished, proceed to UPDATING CONFIGURATION DATA. When the other item is also specified, return to SELECTION OF CONFIGURATION ITEM.

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Installation of the DESK CONSOLE and Cable Connection

15. HEADSET TYPE

This item specifies the type of Headset connected to the H/S1 connector.

(d) Press the desired number. An asterisk shows the selected number.

[HEADSET TYPE]	SRC: menu
*1: SUPRA	
2: COROLLE	

1. The type of Headset is “SUPRA”
2. The type of Headset is “COROLLE”

SRC: Return to Configuration Menu

Note: *Default setting is “1: SUPRA”.*

(b) Press the SRC key. The display returns to Configuration Menu.

[CONFIG MENU P1] VER x	DEST: next page
1: HEADSET/HANDSET	Release: exit
2: HEADSET TYPE	Answer: update
3: MUTE	

(c) When configuration data assignment is finished, proceed to UPDATING CONFIGURATION DATA. When the other item is also specified, return to SELECTION OF CONFIGURATION ITEM.

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Sheet 35/41
Installation of the DESK CONSOLE and Cable Connection

16. MUTE

This item specifies On/Off setting of the mute function for the HAND H/S0 or H/S1 connector. While the mute function is set to On, if the Mute key is pressed, the voice at the DESK CONSOLE side is not sent to the other party.

(a) Press the desired number. An asterisk shows the selected number.

[MUTE]	SRC: menu
*1: H/S0 ON, H/S1 ON	
2 : H/S0 ON, H/S1 OFF	
3 : H/S0 OFF, H/S1 ON	

1. Both H/S0 and H/S1 are set to On
2. Only H/S0 is set to On
3. Only H/S1 is set to Off

SRC: Return to Configuration Menu

Note: *Default setting is "1: H/S0 ON, H/S1 ON".*

(b) Press the SRC key. The display returns to Configuration Menu.

[CONFIG MENU P1] VER x	DEST: next page
1: HEADSET/HANDSET	Release: exit
2: HEADSET TYPE	Answer: update
3: MUTE	

(c) When configuration data assignment is finished, proceed to UPDATING CONFIGURATION DATA. When the other item is also specified, return to ASSIGNMENT OF CONFIGURATION DATA.

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Installation of the DESK CONSOLE and Cable Connection

17. REC CONTROL

This item specifies the operation mode of a recording device. The following two types of modes are available:

Manual mode

Manual mode is available when the REC circuit card is mounted in the system. When the REC key is pressed, the system starts recording and the REC lamp lights. When the REC key is pressed again, the recording stops and the REC lamp goes off.

Automatic mode

In Automatic mode, a dedicated recording device is directly connected to the REC connector. When a call is connected/disconnected, the system starts/ends recording automatically. Note that the REC key is not effective in Automatic mode.

(a) Press the desired number. An asterisk shows the selected number.

[REC CONTROL]	SRC: menu
*1: MANUAL	
2 : AUTO	

1. Manual mode
2. Automatic mode

SRC: Return to Configuration Menu

Note: *Default setting is "1: MANUAL".*

(b) Press the SRC key. The display returns to Configuration Menu.

[CONFIG MENU P2] VER x	DEST: next page
1: REC CONTROL	Release: exit
2: PAGE CONTROL **Note**	Answer: update
3: SUP CONNECTION	

Note: *Do not change this data.*

(c) When configuration data assignment is finished, proceed to UPDATING CONFIGURATION DATA. When the other item is also specified, return to SELECTION OF CONFIGURATION ITEM.

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Sheet 37/41
Installation of the DESK CONSOLE and Cable Connection

18. SUP CONNECTION

This item specifies whether the supervisory console is connected or not.

(a) Press the desired number. An asterisk shows the selected number.

[SUP CONNECTION]	SRC: menu
*1: NONE	
2 : CONNECTED	

1. Supervisory Console is connected
2. Supervisory Console is not connected

SRC: Return to Configuration Menu

Note: *Default setting is "1: NONE".*

(b) Press the SRC key. The display returns to Configuration Menu.

[CONFIG MENU P2] VER x	SRC: prev page
1: REC CONTROL	DEST: next page
2: PAGE CONTROL **Note**	Release: exit
3: SUP CONNECTION	Answer: update

Note: *Do not change this data.*

(c) When configuration data assignment is finished, proceed to UPDATING CONFIGURATION DATA. When the other item is also specified, return to SELECTION OF CONFIGURATION ITEM.

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Sheet 38/41
Installation of the DESK CONSOLE and Cable Connection

19. REC VOLUME ADJUSTMENT

This item specifies the recording level of the received voice from the other party. Note that the voice level at the operator side cannot be adjusted.

(a) Press the desired number. An asterisk shows the selected number.

[REC VOLUME ADJUSTMENT]	SRC: menu
1: +2dB	4: -8dB
*2: 0dB	
3: -4dB	

1. +2dB Up
2. 0dB (Standard level)
3. -4dB Down
4. -8dB Down

SRC: Return to Configuration Menu

Note: *Default setting is "2: 0dB".*

(b) Press the SRC key. The display returns to Configuration Menu.

[CONFIG MENU P3] VER x	SRC: prev page
1: REC VOLUME	Release: exit
2: BLF	Answer: update
3: HOLD/START/RELEASE/SWAP	

(c) When configuration data assignment is finished, proceed to UPDATING CONFIGURATION DATA. When the other item is also specified, return to SELECTION OF CONFIGURATION ITEM.

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Sheet 39/41
Installation of the DESK CONSOLE and Cable Connection

20. BLF

This item specifies On/Off setting of the BLF function. When using BLF function, system data assignment is also required.

(a) Press the desired number. An asterisk shows the selected number.

[BLF]	SRC: menu
1: ENABLE	
*2: DISABLE	

1. BLF Available
2. BLF Not available

SRC: Return to Configuration Menu

Note: *Default setting is "2: DISABLE".*

(b) Press the SRC key. The display returns to Configuration Menu.

[CONFIG MENU P3] VER x	DEST: next page
1: REC VOLUME	Release: exit
2: BLF	Answer: update
3: HOLD/START/RELEASE/SWAP	

(c) When configuration data assignment is finished, proceed to UPDATING CONFIGURATION DATA. When the other item is also specified, return to SELECTION OF CONFIGURATION ITEM.

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Installation of the DESK CONSOLE and Cable Connection

21. HOLD/START/RELEASE/SWAP

This item specifies the locations of HOLD, START and RELEASE key.

(a) Press the desired number. An asterisk shows the selected number.

```
[HOLD/START/RELEASE/SWAP]     SRC: menu
*1: ORIGINAL
 2: SWAPPED
```

1. Original setting
2. Swapped setting

Note: *The locations of each key changes as shown below.*

ORIGINAL SETTING	SWAPPED SETTING
RELEASE	START
HOLD	RELEASE
START	HOLD

SRC: Return to Configuration Menu

Note: *Default setting is "1: ORIGINAL".*

(b) Press the SRC key. The display returns to Configuration Menu.

```
[CONFIG MENU P3] VER x          DEST: next page
1: REC VOLUME                   Release: exit
2: BLF                          Answer: update
3: HOLD/START/RELEASE/SWAP
```

(c) When configuration data assignment is finished, proceed to UPDATING CONFIGURATION DATA. When the other item is also specified, return to SELECTION OF CONFIGURATION ITEM.

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Installation of the DESK CONSOLE and Cable Connection

22. UPDATING CONFIGURATION DATA

When configuration data assignment is complete, update configuration data according to the procedure below.

When the RELEASE key is pressed, update is cancelled.

While one of the Configuration Menu is displayed on the LCD, press the ANSWER key.

Configuration data is updated and the DESK CONSOLE is automatically restarted.

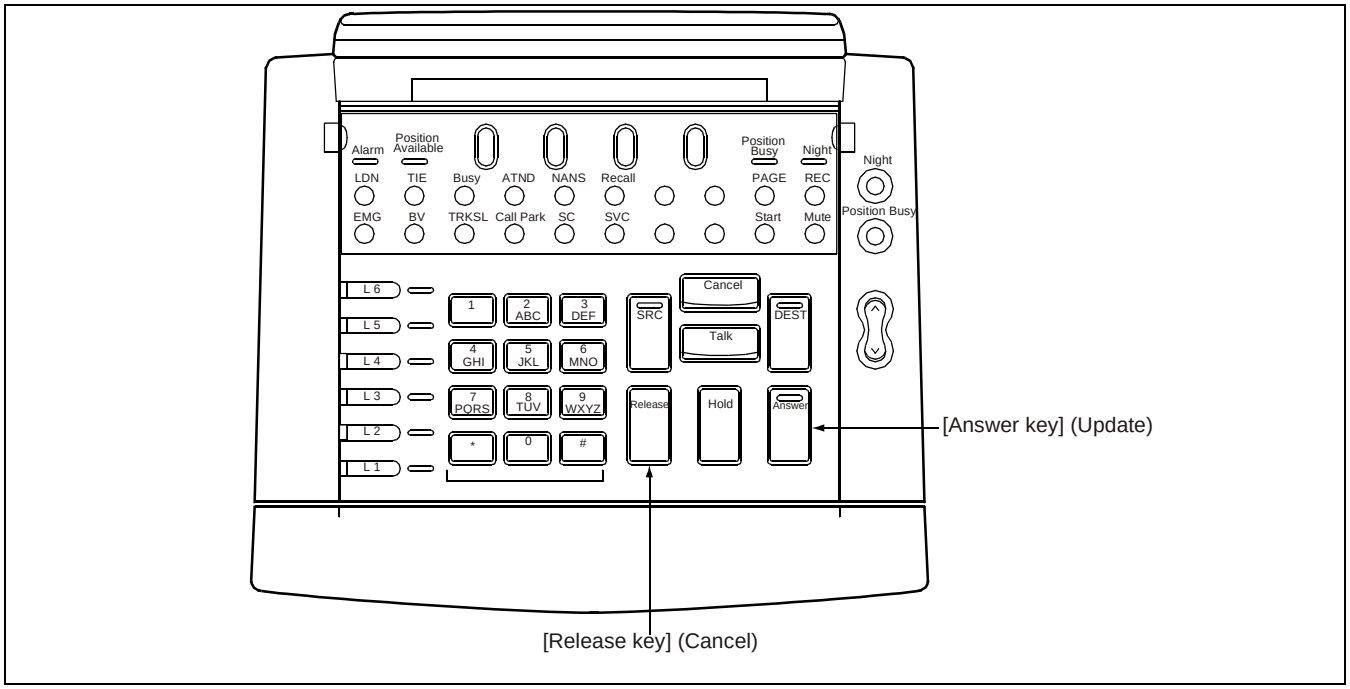


Figure 016-23 Updating Configuration Data

NAP-200-017
Sheet 1/9
Installation of Maintenance Administration Terminal (MAT) and Cable Connections

This NAP explains the installation of the Maintenance Administration Terminal (MAT) and the System Message Printer focusing on their cable connections.

1. INSTALLATION OF MAT AND CABLE CONNECTIONS

START

- Preparation of the MAT — Set up the Personal Computer, CRT Display, Printer, and so on.
- Cable Connection — Connect the cables between the MAT and the PBX referring to Figure 017-2.

END

NAP-200-017
Sheet 2/9
Installation of the Maintenance Administration Terminal (MAT) and Cable Connections

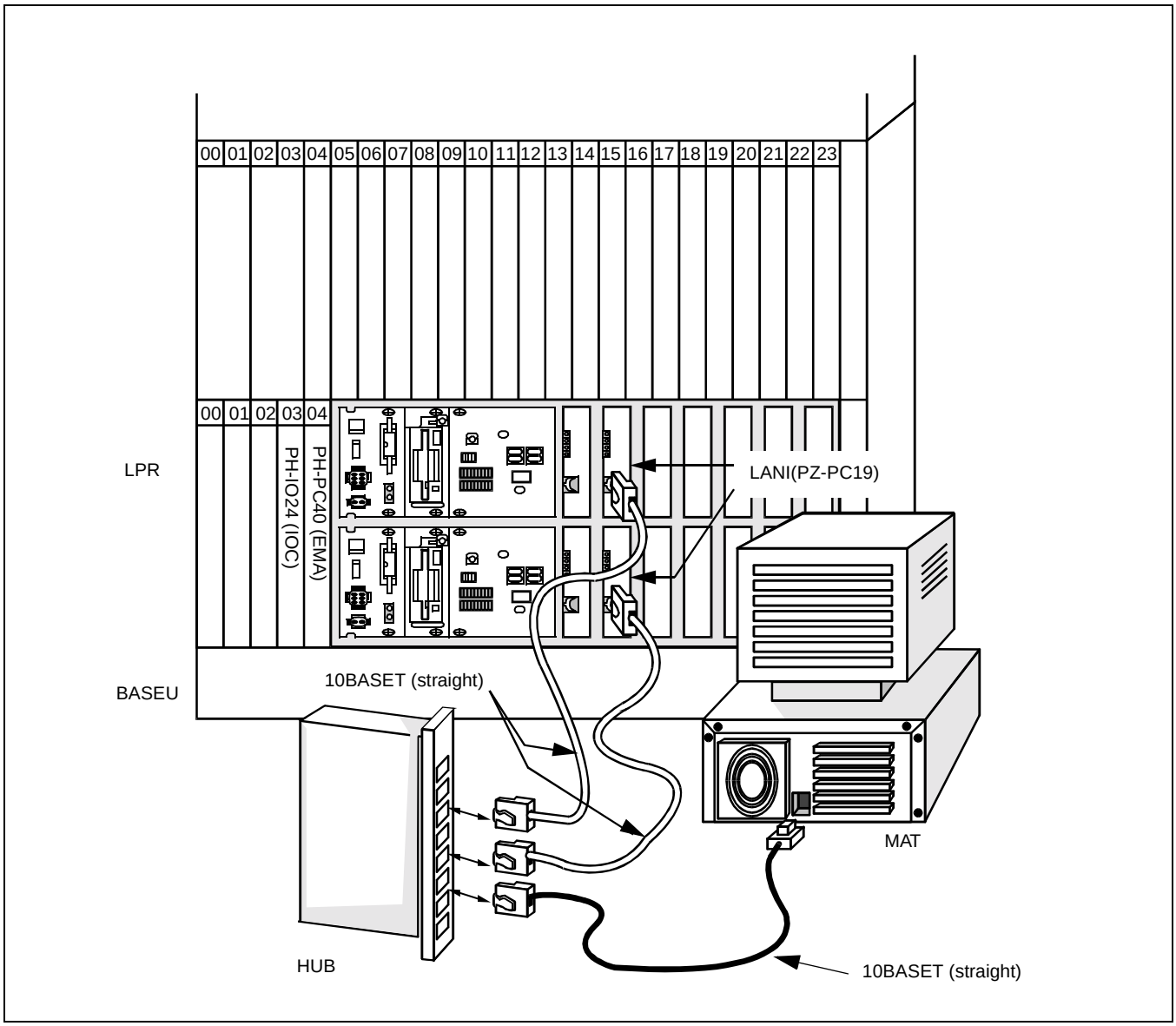
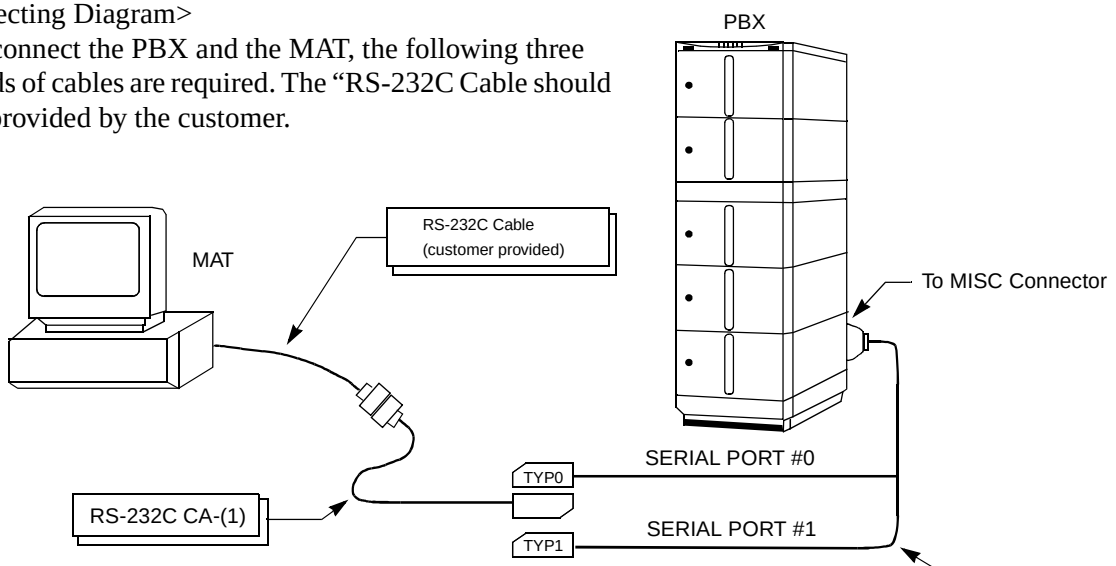


Figure 017-1 Cabling of MAT when Using Ethernet

NAP-200-017
Sheet 3/9
Installation of the Maintenance Administration Terminal (MAT) and Cable Connections

<Connecting Diagram>

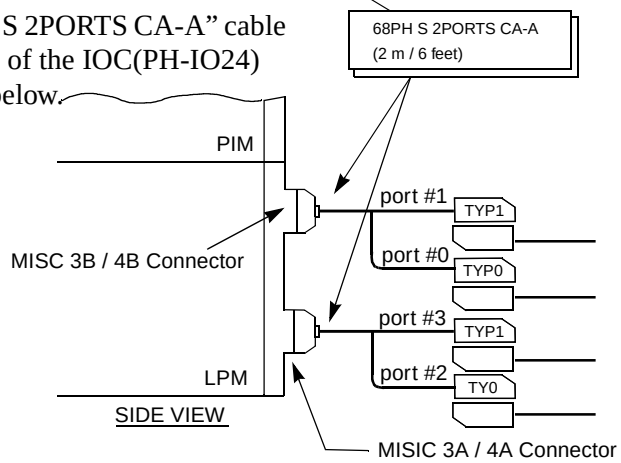
- To connect the PBX and the MAT, the following three kinds of cables are required. The "RS-232C Cable should be provided by the customer.

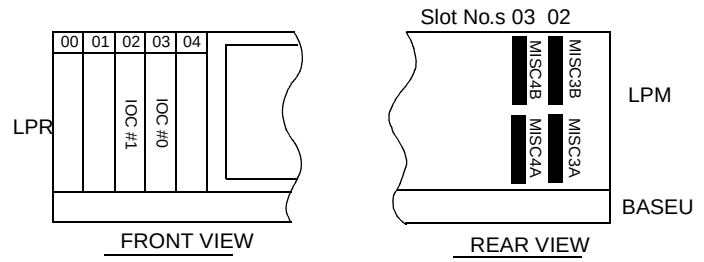


<Location of MISC Connector>

- The location of the MISC connector to which the "68PH S 2PORTS CA-A" cable is connected varies depending on the mounting location of the IOC(PH-IO24) card and the IOC port number (#0 ~ #3). See the table below.

Slot No.	Port No.	MISC Connector
02	IOC Port #0	MISC 3B
	IOC Port #1	
	IOC Port #2	MISC 3A
	IOC Port #3	
03	IOC Port #0	MISC 4B
	IOC Port #1	
	IOC Port #2	MISC 4A
	IOC Port #3	





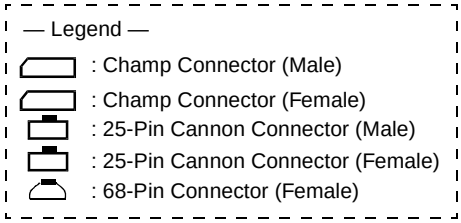


Figure 017-2 Cable Connection Diagram for the MAT

NAP-200-017
Sheet 4/9
Installation of the Maintenance Administration Terminal (MAT) and Cable Connections

2. INSTALLATION OF MAT AND CABLE CONNECTION BY USING MODEM

Note: *When the distance between the PBX and the MAT (Maintenance Administration Terminal) exceeds 15 meters (50 feet), connect them with Modems as shown in Figure 017-3.*

START

- Preparation of the MAT — Set up the Personal Computer, CRT Display, Printer, and so on.
- Preparation of the modems — Set up the modems referring to its instruction book.
- Cable connection — Connect the cables referring to Figure 017-3.

END

NAP-200-017
Sheet 5/9
Installation of the Maintenance Administration Terminal (MAT) and Cable Connections

- To connect the PBX and the MAT, the following three kinds of communication cables are required. The “RS-232C Cable” should be provided by the customer.

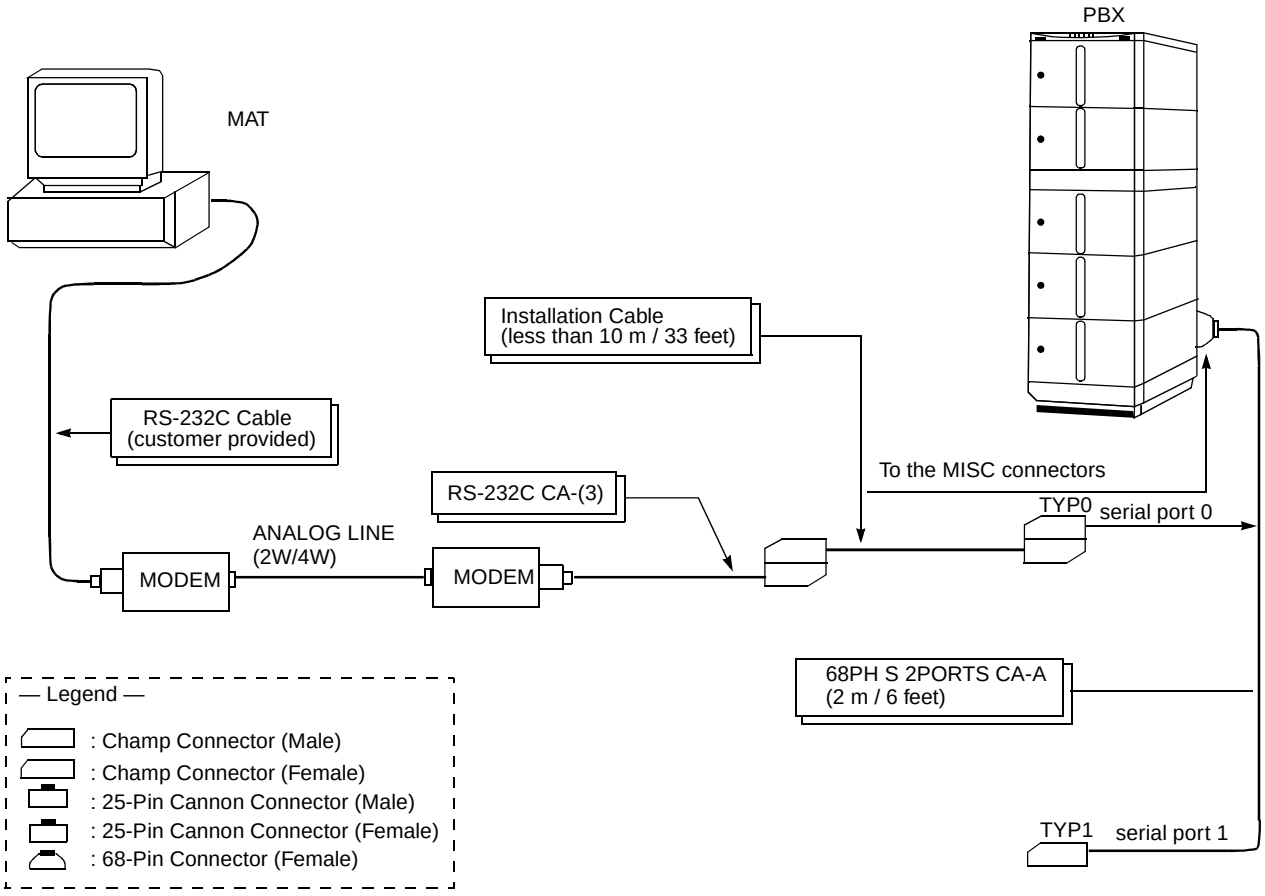


Figure 017-3 Cabling of MAT Using Modems

NAP-200-017
Sheet 6/9
Installation of the Maintenance Administration Terminal (MAT) and Cable Connections

3. INSTALLATION OF SYSTEM MESSAGE PRINTER AND CABLE CONNECTIONS

START

- Installing printer — Install printer according to its instructions.
- Cable connection — Connect the cable between the PBX and the dedicated System Message Printer which is equipped with a parallel port referring to Figure 017-4.

END

- To connect the PBX and the dedicated SYSTEM MESSAGE PRINTER, the following three kinds of communication cables are required. The “RS-232C Cable” should be provided by the customer.

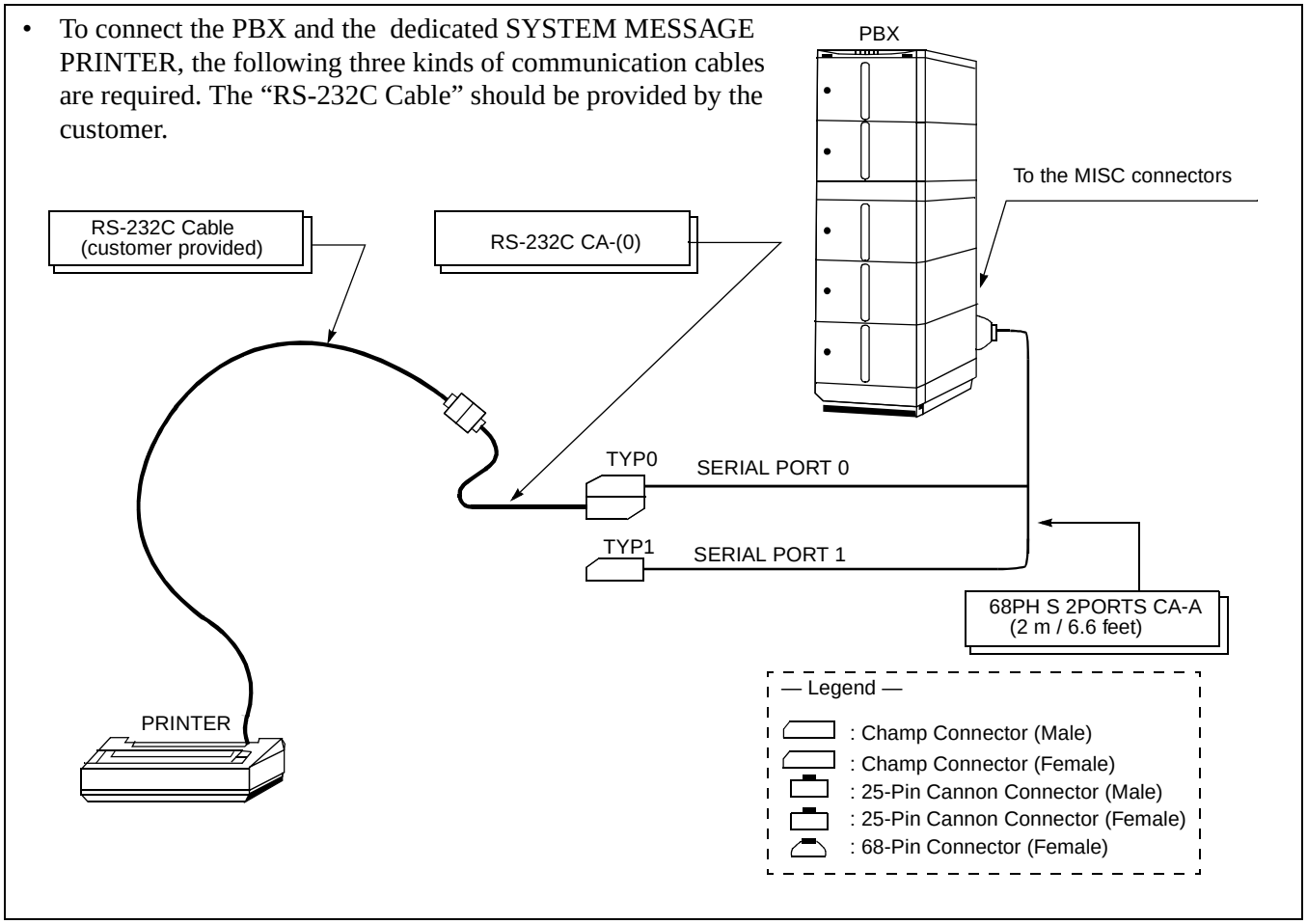


Figure 017-4 Connection of System Message Printer

NAP-200-017
Sheet 7/9
Installation of the Maintenance Administration Terminal (MAT) and Cable Connections

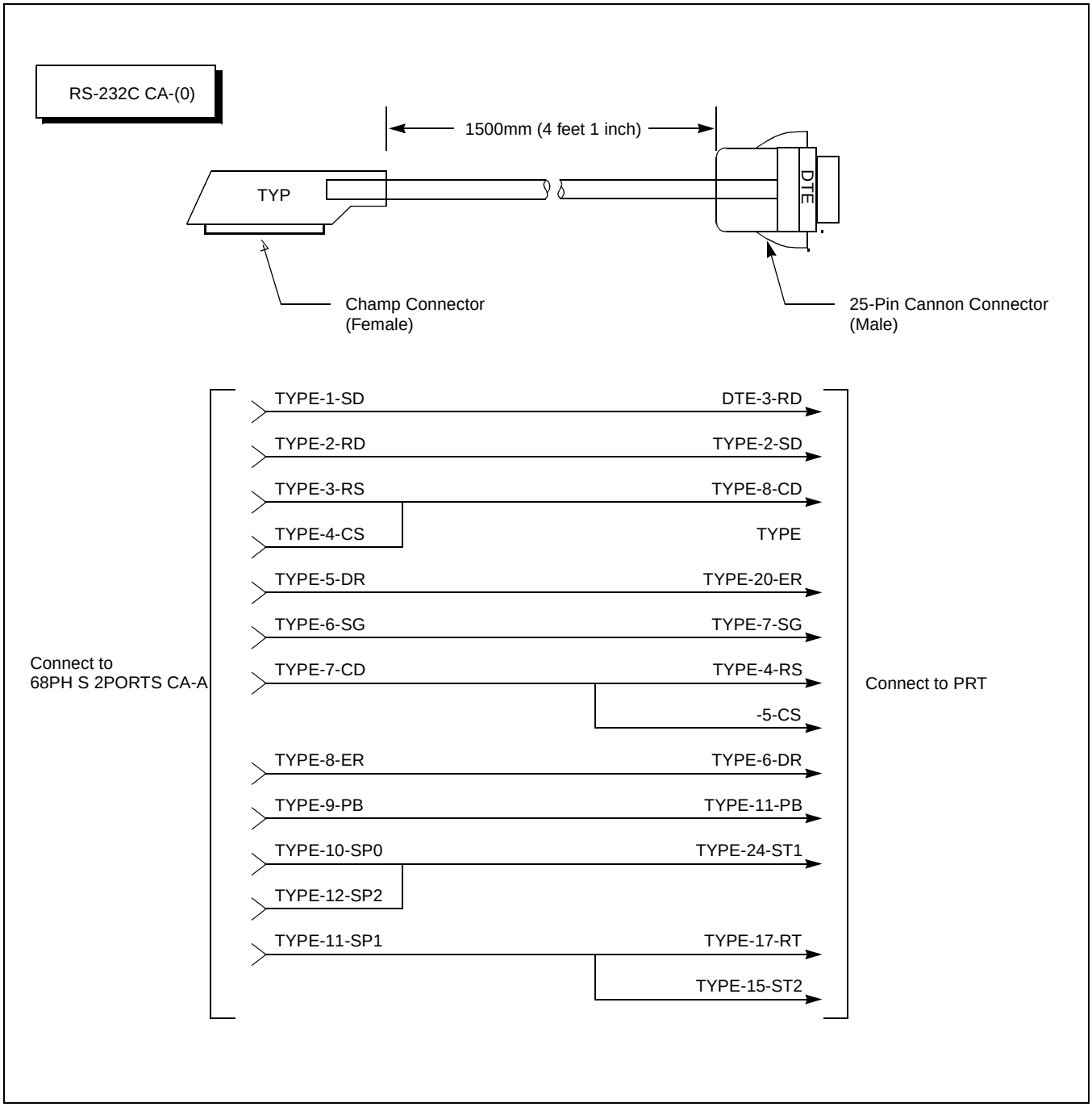


Figure 017-5 Detail of RS-232C CA-(0)

NAP-200-017
Sheet 8/9
Installation of the Maintenance Administration Terminal (MAT) and Cable Connections

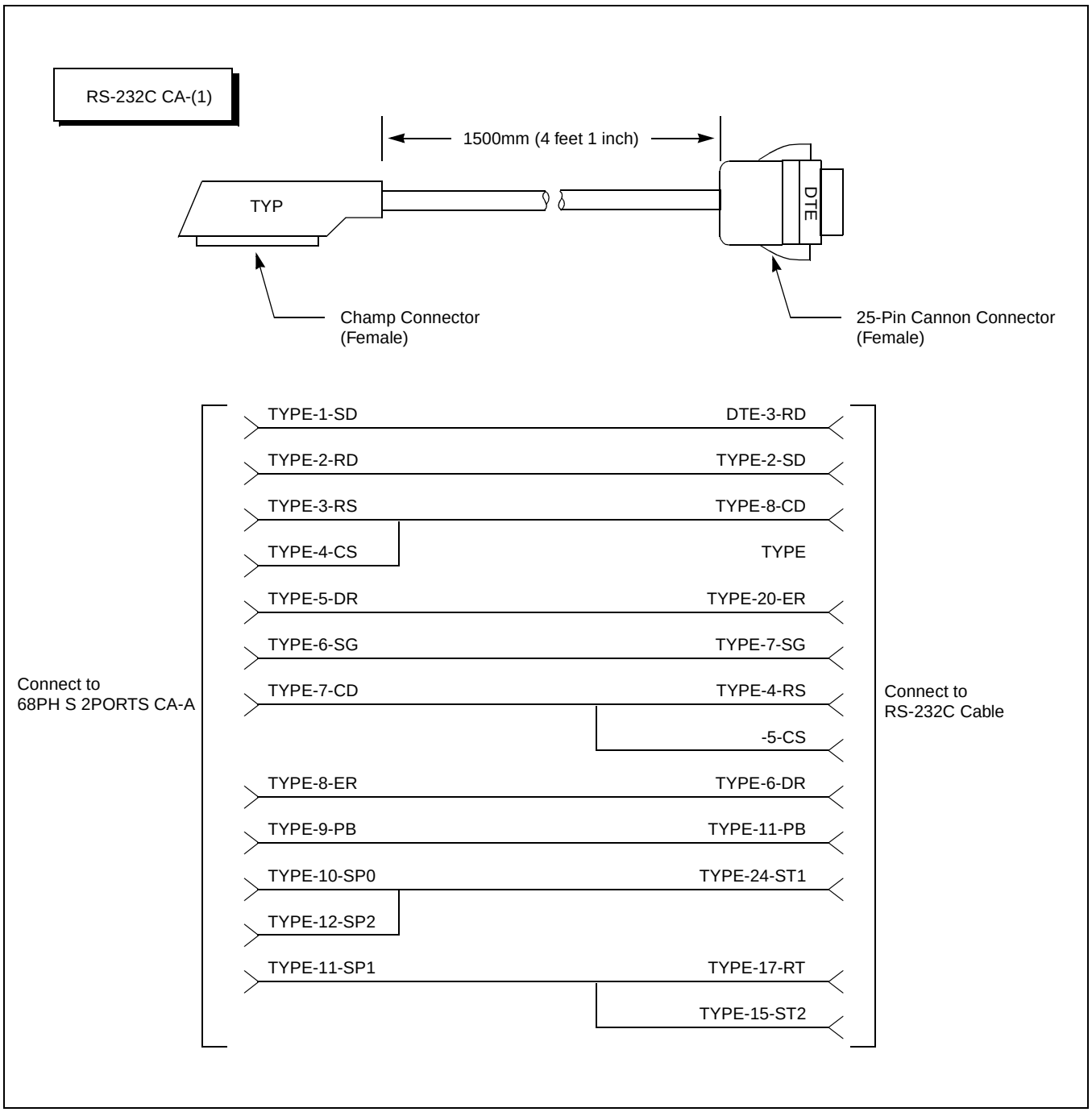


Figure 017-6 Detail of RS-232C CA-(1)

NAP-200-017
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Installation of the Maintenance Administration Terminal (MAT) and Cable Connections

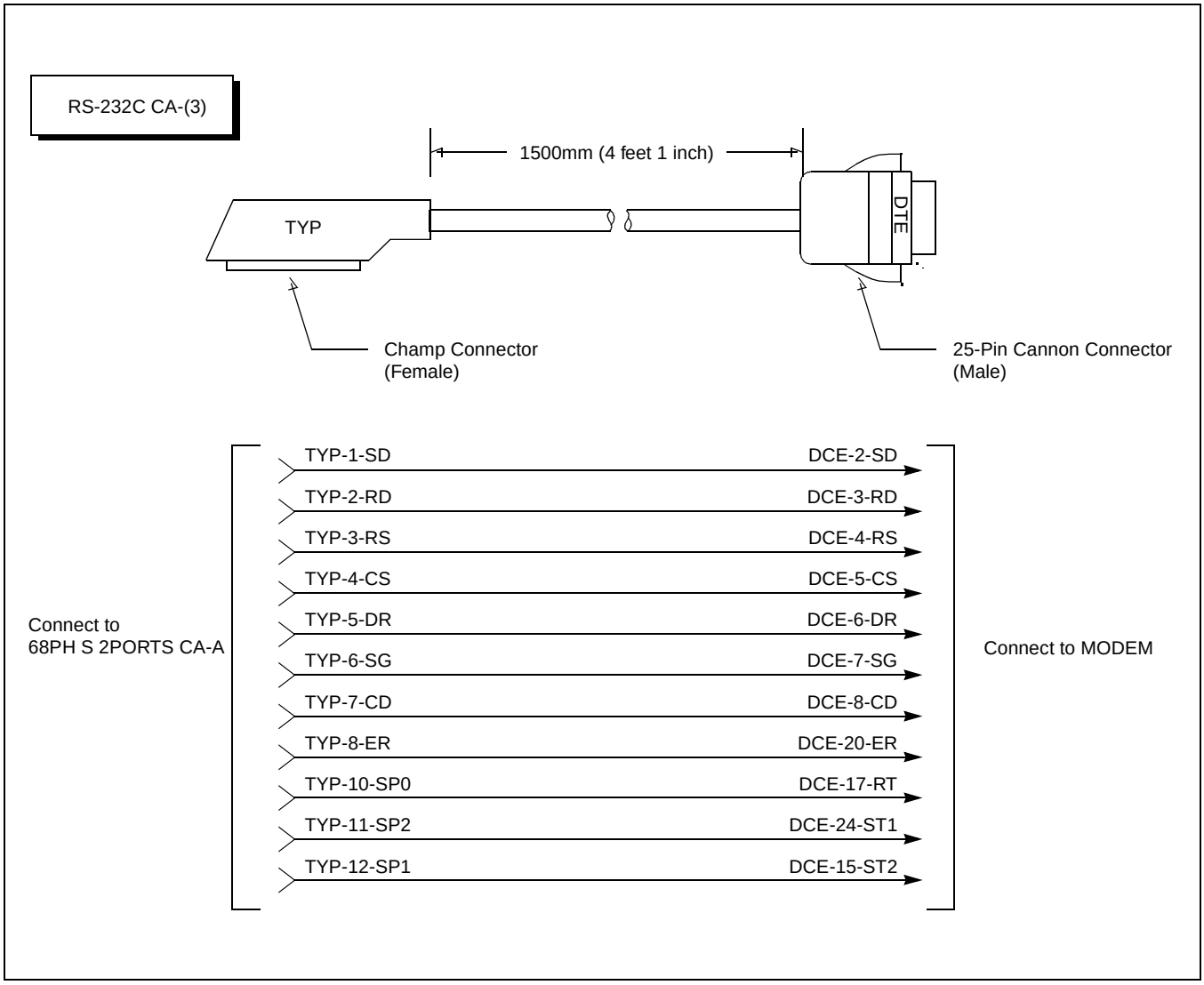


Figure 017-7 Detail of RS-232C CA-(3)

NAP-200-018
Sheet 1/3
Connections of SMDR

This NAP explains the cable connection of SMDR equipment.

Note: *The IOC circuit card (PH-IO24), which has four RS-232C interfaces, can be mounted in the slot Number 3 and/or 2 of the LPR. Consequently, the system can have maximum eight ports for the RS232C terminals.*

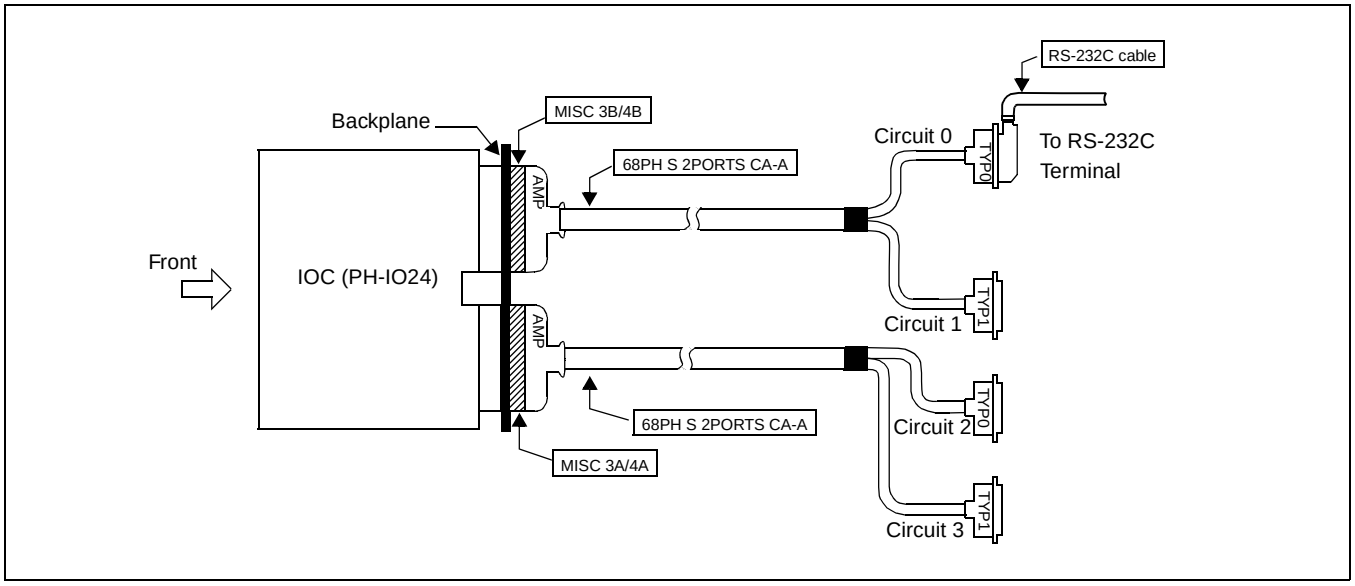


Figure 018-1 I/O Port Interface

The SMDR RS-232C interface specifications are:

- *Synchronization — Asynchronous*
- *Data Speed — 9600 bps (maximum)*
- *Code — ASCII 7-bit + Parity Bit*
- *Maximum Distance — 15 meters (50 feet) without Modems.*

START

Installation of SMDR equipment

Cable connection ——— Connect the cables by referring to Figure 018-2.
- Refer to Figure 018-3 when the length of the cables exceeds 15 meters (49.5 feet).

END

NAP-200-018
Sheet 2/3
Connections of SMDR

- The location of MISC connector to which “68PH S 2PORTS CA-A” cable is connected varies depending on the mounting location of the IOC (PH-IO24) card and the designated IOC port number (#0~#3).

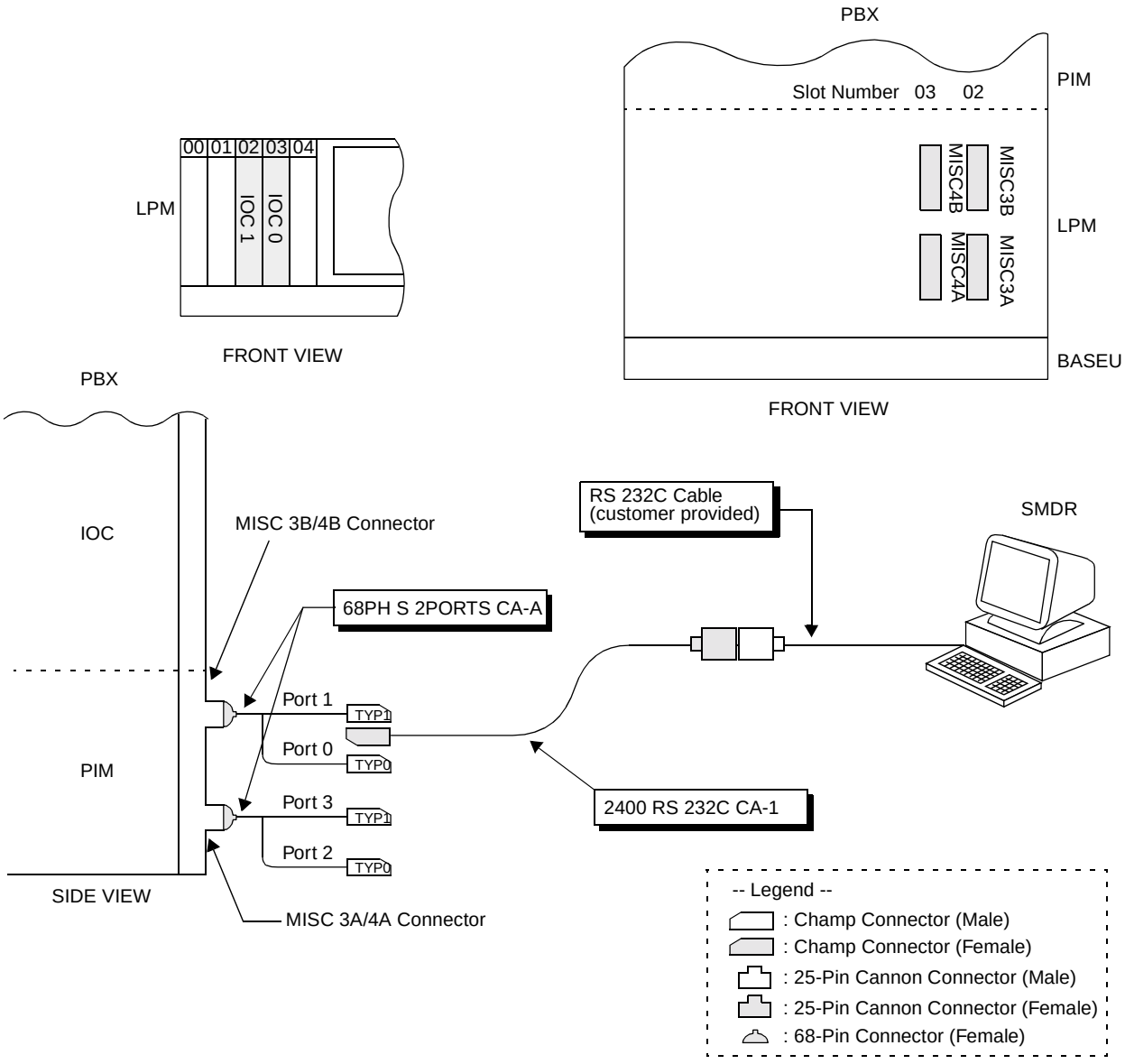


Figure 018-2 Cable Connection Diagram for the SMDR Equipment

NAP-200-018
Sheet 3/3
Connections of SMDR

- The location of MISC connector to which “68PH S 2 PORTS CA-A” cable is connected varies depending on the mounting location of the IOC (PH-IO24) card and the designated IOC number (#0~#3).

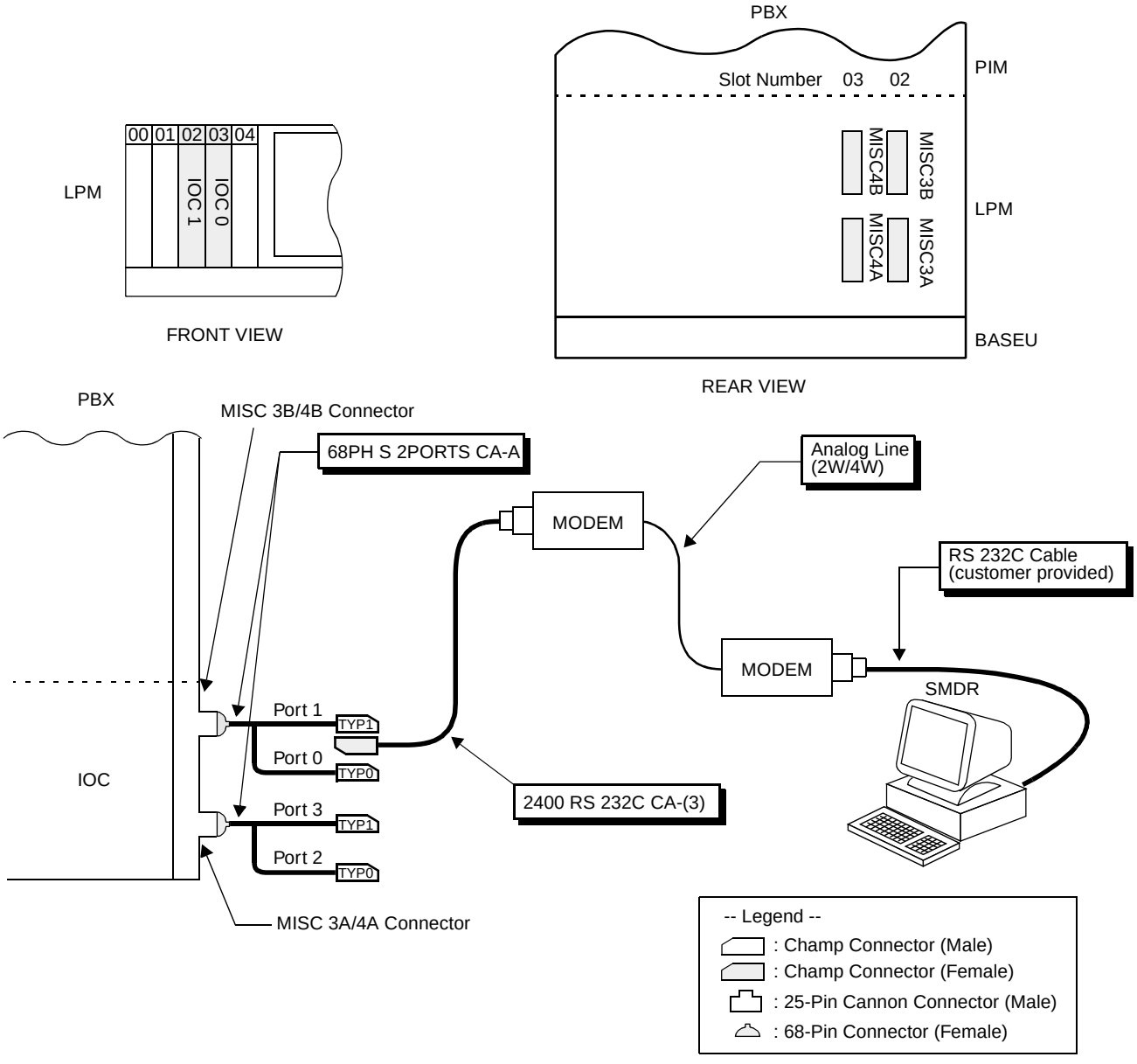


Figure 018-3 Connection of SMDR by Using MODEM

This page is for your notes.

CHAPTER 4 SYSTEM STARTUP

1. GENERAL

This Chapter describes the method to start up the system initially after completion of the installation of the PBX, and the method to check as to whether the system has started up normally. Before beginning the system startup, thoroughly read Section 2., "PRECAUTIONS BEFORE BEGINNING SYSTEM STARTUP" of this Chapter, and observe the precautions while performing the system startup. Failure to so may delay the system cutover or may result in damage to the system equipment.

2. PRECAUTIONS BEFORE BEGINNING SYSTEM STARTUP

1. The system is to be started up using the basic system data.
2. When starting up the system, it is necessary to start up the MAT.
3. The following preparatory steps must be completed before the tests are begun:
   - All circuit card switches should be correctly set.
   - Flat cables should be securely connected.
   - CHAMP connectors should be securely connected.
   - All connector-ended cables should be secured at both ends.
   - The –48 V (Blue) and G (Red) power supply leads must be correctly connected.
   - An earth lead (less than 10 ohms) must be connected to the communication ground.
   - The installer should confirm at this point that all installation steps have been completed.
4. Do not place any object (a tool, manual, etc.) on top of the Module Group or within a unit (module).
   - An object such as a book, when placed on top of the Module Group, will adversely affect heat dissipation from the Module Group.
   - If an object placed on top of the Module Group or left within a unit (module) falls out, it may cause backplane pins, circuit cards, etc. to short-circuit.
5. Before initially turning ON power to the system, read the Power On Procedure (NAP-200-019).
   - Until the normal operation of all circuit cards has been confirmed, leave power ON only during testing.
6. Observe the temperature in the switch room.
   - Does the air-conditioning function properly at night?
   - Does the temperature fluctuate constantly because people go in and out frequently, or rise above the recommended level due to excessive heat being generated by any single piece of equipment?
   - The fan should be left ON constantly until the installation tests are completed.
7. A floppy disk (FD) copy of the programmed Office Data should be created. If a backup is not made, and the contents of the Data Memory are accidentally altered or destroyed, all the Office Data will have to be programmed again.

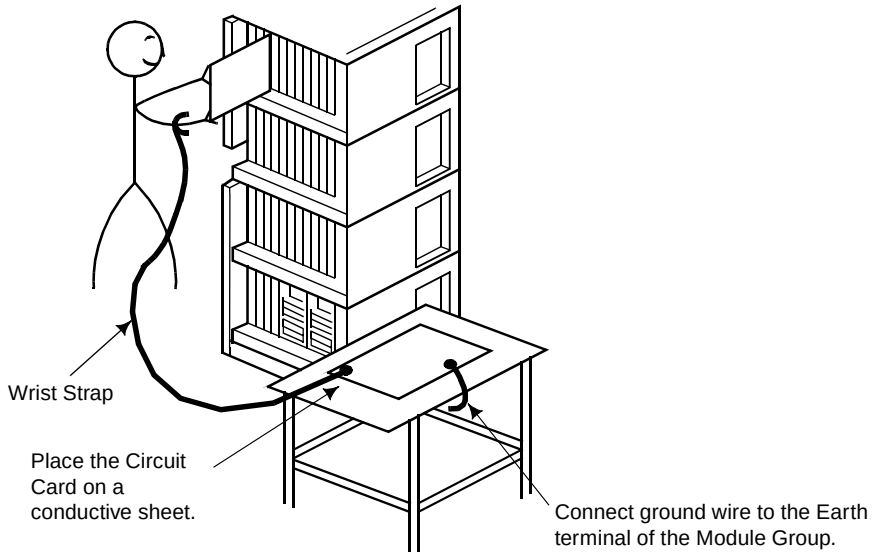
8. If any portion of the Office Data (especially data related to ringing patterns) has been changed via commands “ARTD”, “AKYD”, or “ASYD”, the system must be initialized and tests involving the changed data must be performed.

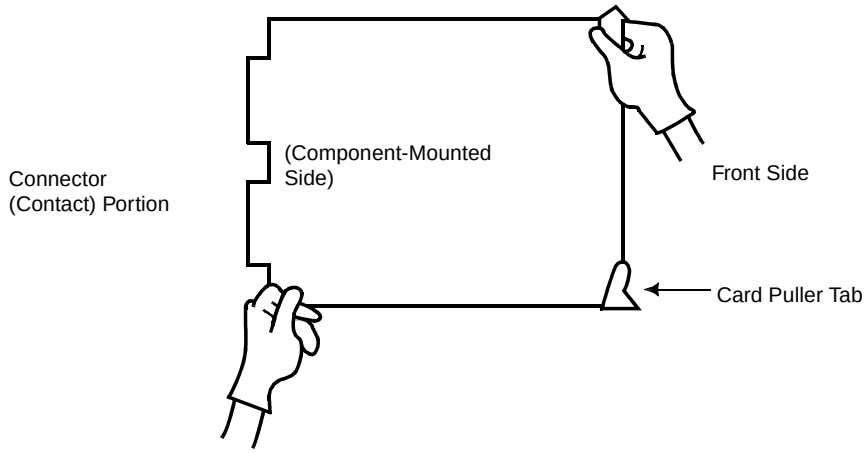
9. After the system is initialized, perform the following.
   - Set the current date and time using MAT command “ATIM”.
   - When the system is initialized, the system begins operating in Day Mode. To change over to Night Mode, depress the NITE key on the Attendant Console.
   - If no Attendant Console is equipped, the system begins operating in night mode.

10. The following cross connections must be made at the MDF:
    - Complete necessary cross connections by extracting the related circuit cards from their mounting slots or by disconnecting the circuits with a cut plug if test springs are in use.
    - If the connection to a D^{term} is made incorrectly, the electronic fuse of the circuit card will blow out. (Repair Method: Correct the cross connections and flip the MB switch on the card Down-Up-Down).
    - While a test is in progress, do not perform cross connections without first consulting with the person conducting the test (Ringing signal: AC 20 Hz, effective value 90 V, may be flowing through the terminals).
    - Remove all temporary cross connections after the tests have been performed (If Office Data was assigned for test purposes, restore the original Office Data).

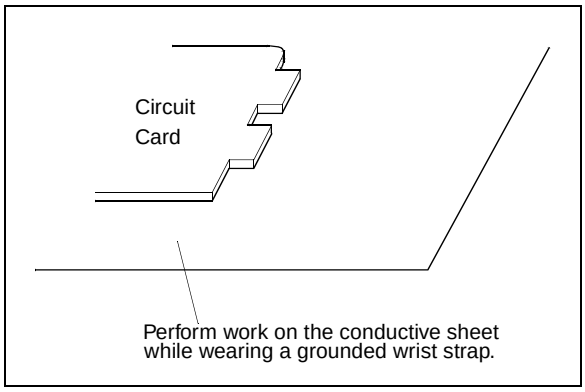
11. Observe the following when connecting cables:
    - Before connecting or disconnecting the control cable (Front & Backplane), turn OFF the power to the Module Group (LPM / PIM etc.).
    - Before connecting or disconnecting a CHAMP connector, turn OFF the power to the Module Group. This will prevent an accident from occurring in the event that a metal object such as a screw, screwdriver, etc. accidentally contacts the backplane circuitry or pins.
    - When connecting or disconnecting the connector cable of the Attendant Console, first set the MB switch on the ATI circuit card to the UP position, then connect/disconnect the cable.

12. Precautions when Handling Circuit Cards
    - When handling a circuit card, use a Field Service Kit to protect against static discharge (example: 3M No. 8012 Portable Field Service Kit; available from NEC).
    - When touching a circuit card, be sure to wear the grounded wrist strap provided with the Portable Field Service Kit.
    - Set the MB switch to the UP position and extract the circuit card from its mounting slot.
    - When holding a circuit card with bare hands, do not touch the component mounted side of the card or the connector portion.


Wrist Strap
Place the Circuit Card on a conductive sheet.
Connect ground wire to the Earth terminal of the Module Group.


Connector (Contact) Portion
(Component-Mounted Side)
Front Side
Card Puller Tab

- When placing a circuit card on a table or other flat surface, spread out a conductive sheet and set the card on the sheet.



- Set the MB switch of the circuit card to the UP position and confirm its mounting slot **(Note)**. Then insert the card into its mounting slot.

Note: *Confirm that the color of the card puller tab is the same as the color of the label showing the Slot Number.*

3. SYSTEM STARTUP PROCEDURE

The NAPs indicated in the following flowchart describe the procedures for powering on, starting up the system, assigning Office Data, and checking the startup conditions.

START

Power On:	NAP-200-019
Program Install/Load:	NAP-200-020
Office Data Assignment:	NAP-200-021
Check of Lamp Indication and System Messages:	NAP-200-022
Check of Alarm Lamps of the TOPU:	NAP-200-023

END

NAP-200-019
Sheet 1/2
Power ON

START

- Visual Inspection
  - Check whether any pins are shorting on the backplane of each Module.
  - Check whether any foreign matter such as a cleaning fluid residue is present on the connector portion of the circuit cards.
  - On each circuit card equipped with ROM (CPU, etc.), check whether any pins of the ROM are bent or improperly seated.
- Leave all circuit cards inserted halfway
  - Mount all circuit cards (including PWR Supplies) in the Module, leaving them inserted only halfway. (They should not be inserted into their connectors.)
- Check input voltage
  - Check insulation across the -48 V and G terminals on the power receiving terminal of the Base Unit.
  - Turn power to the rectifier ON and check the voltage (DC -48V ± 5V) and its polarity on the power receiving terminal of the Base Unit.
- Turn ON Fan Units
  - Turn FAN UNIT ON.
    Verify that air is blown upwards.
    If the Fuse blows, the input polarity is reversed.
    Turn OFF the FAN UNIT.
    Correct polarity, replace the fuse and turn FAN UNIT ON.
    Verify that the FAN blows air upwards.
- Check PWR Supply
  - Check the Power Supplies for each Module one at a time.
    Check Steps:
    1. Turn circuit breaker OFF and insert the PWR Supply.
    2. Turn circuit breaker ON (See Note).
    3. Various lamps (Green) illuminate.
    4. Observe the PWR Supply for a while and confirm that nothing abnormal (unusual smell, smoke, etc.) occurs.
    5. Turn the circuit breaker ON/OFF a few times and observe the condition.
    6. Turn the circuit breaker OFF and remove the PWR Supply.

Note: *If a Module is equipped with dual PWR Supplies, they must be turned ON/OFF simultaneously.*

A

NAP-200-019
Sheet 2/2
Power ON

A

- Insert all PWR Supplies — Insert all PWR Supplies into their positions.
  Insertion Steps:
  1. Turn each Power Supply's circuit breaker OFF and insert them one at a time.
  2. Turn circuit breakers ON.
  3. Confirm that there are no abnormal indications (unusual smell, smoke, alarm, etc.)
- Insert and check Line/Trunk circuit cards — Insert Line (16LC, etc.) and Trunk (16COT, etc.) circuit cards into their backplane connectors one at a time and confirm that no fuses are blown in the process.
  Check Steps:
  1. Set MB switch UP and insert the card.
  2. Set MB switch DOWN.
  3. Confirm that there are no abnormal indications.
  4. Set MB switch UP and remove the card.
- Insert and check control system cards — Insert control system circuit cards (TSW, MUX, etc.) one at a time and confirm that no fuses are blown in the process.
  Check Steps:
  1. Set MB switch UP and insert the card.
  2. Set MB switch DOWN.
  3. Confirm that there are no abnormal indications.
  4. Set MB switch UP and remove the card.

Note: *If a module contains dual PWR Supplies, they must be turned ON or OFF simultaneously.*

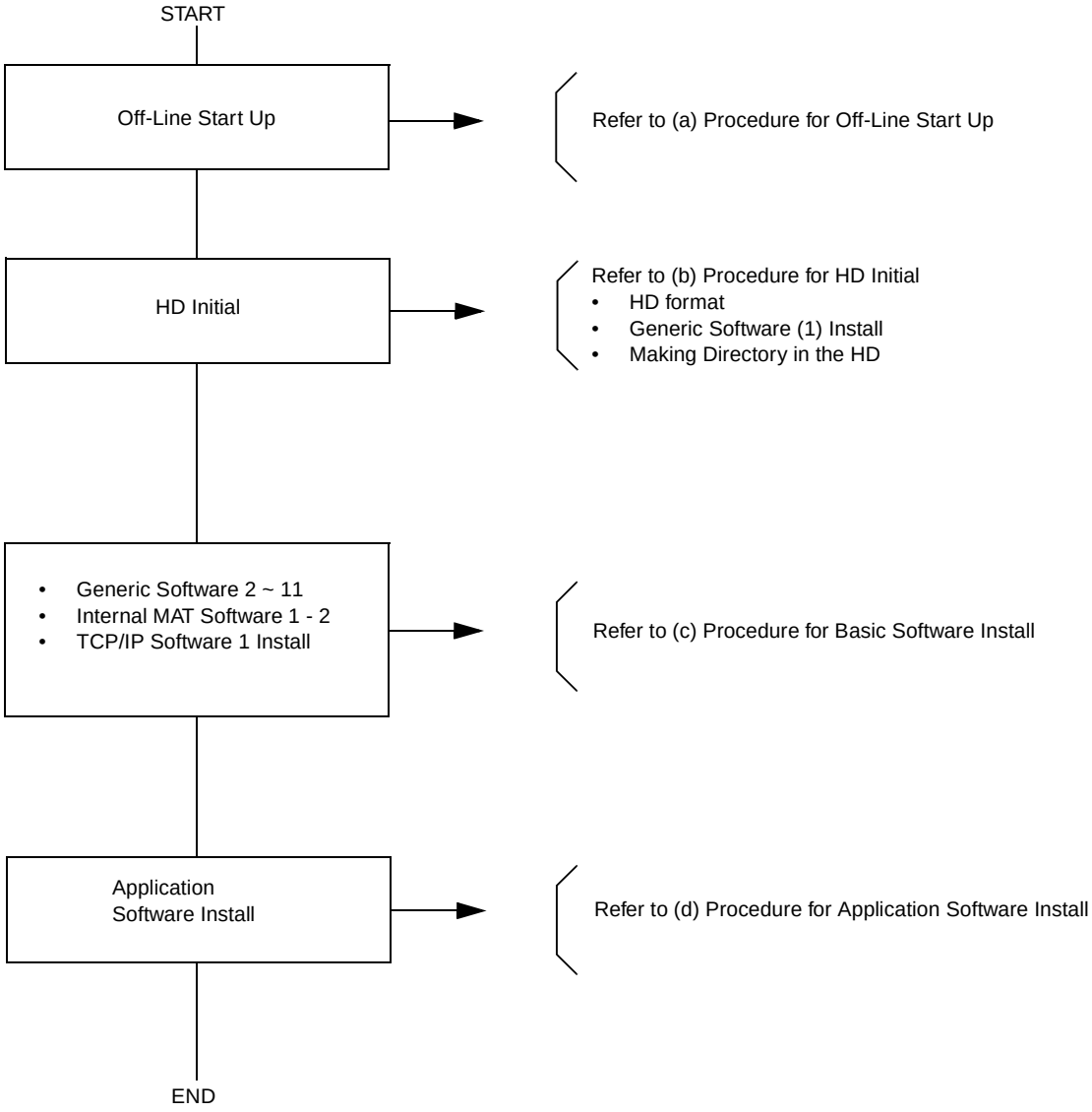
Power ON Procedure	**IMG3 →**	**IMG2 →**	**IMG1 →**	**IMG0**			
	IMG3:	PIM0 →	PIM1 →	PIM2 →	PIM3		
	IMG2:	TSWM1 →	PIM0 →	PIM1 →	PIM2 →	PIM3	
	IMG1:	TSWM0 →	PIM0 →	PIM1 →	PIM2 →	PIM3	
	IMG0:	CPR0 →	CPR1 →	PIM0 →	PIM1 →	PIM2 →	PIM3

Power OFF Procedure:	**IMG3 →**	**IMG2 →**	**IMG1 →**	**IMG0**			
	IMG3:	PIM3 →	PIM2 →	PIM1 →	PIM0		
	IMG2:	PIM3 →	PIM2 →	PIM1 →	PIM0 →	TSWM1	
	IMG1:	PIM3 →	PIM2 →	PIM1 →	PIM0 →	TSWM0	
	IMG0:	PIM3 →	PIM2 →	PIM1 →	PIM0 →	CPR1 →	CPR0

END

NAP-200-020
Sheet 1/6
Program Install and Load

Procedure for Program Install consists of the following items.



Note: *The control of 7-seg LED is the next page.(Case of program install and restart processing)*

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Sheet 2/6
Program Install and Load

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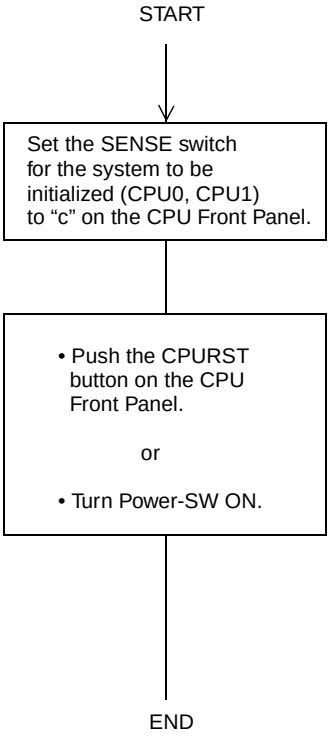
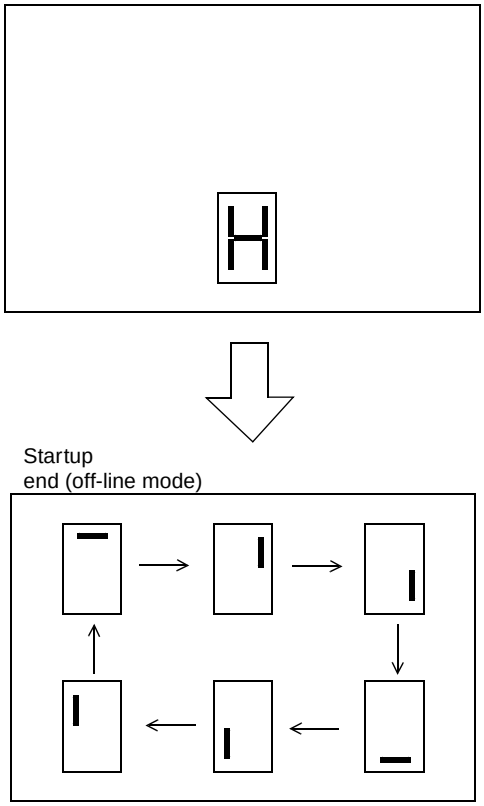
(a) Procedure for off-line start-up



Status change of 7 Segment LED on the EMA card



NAP-200-020
Sheet 3/6
Program Install and Load

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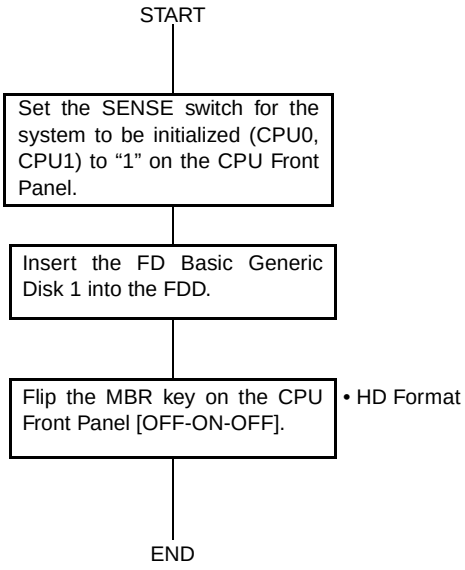
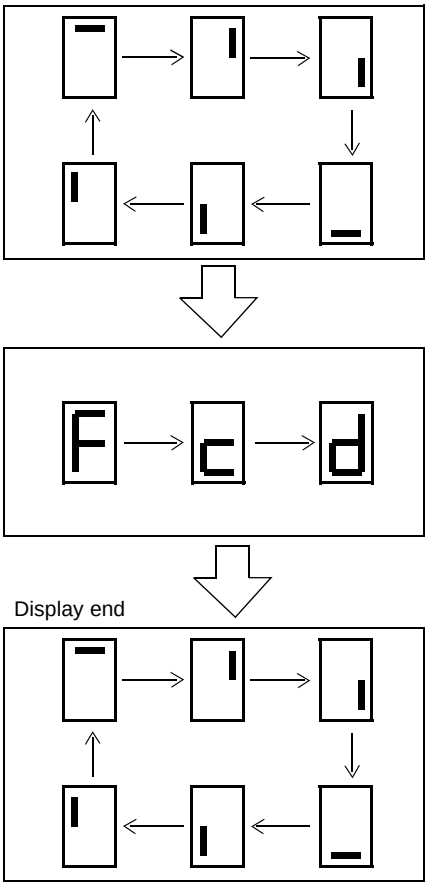
(b) Procedure for HD Initial

Status change of 7 Segment LED on the CPU Front Panel.



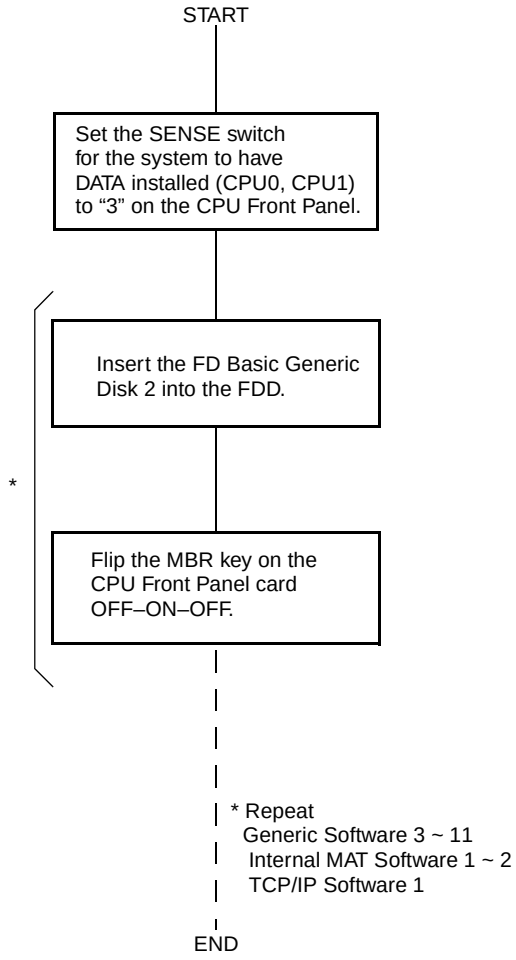


Note:

SENS SW	7SEG LED	FUNCTION
1	F → c → d	FORMAT → COPY → MAKING DIRECTORY

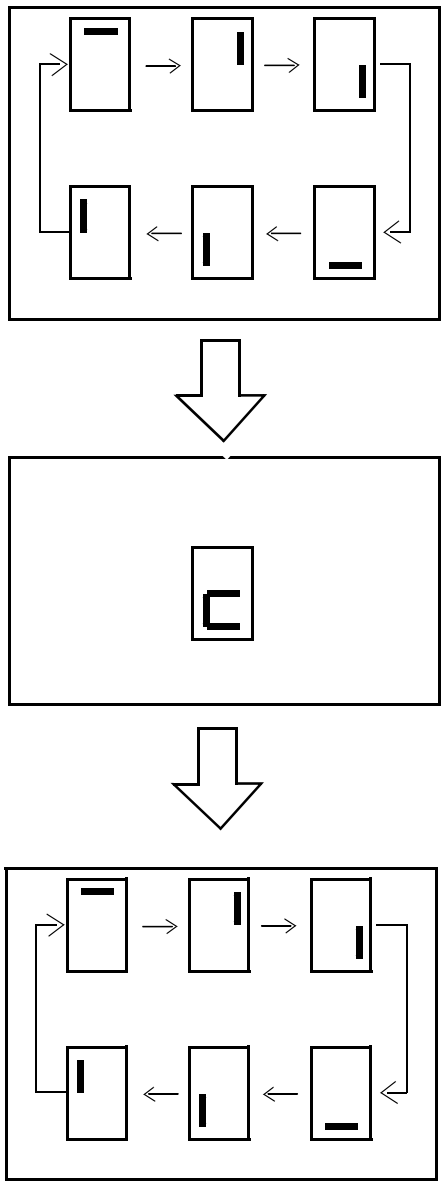
NAP-200-020
Sheet 4/6
Program Install and Load

(c) Procedure for Generic Software (#2 ~ #11) Internal MAT Software (1 ~ 2), TCP/IP Software (1) Install



WARNING: *Removal or Make Busy of the HFD card is not allowed while the Floppy Disk or Hard Disk is being accessed.*

Status change of 7 Segment LED on the CPU Front Panel.



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Sheet 5/6
Program Install and Load

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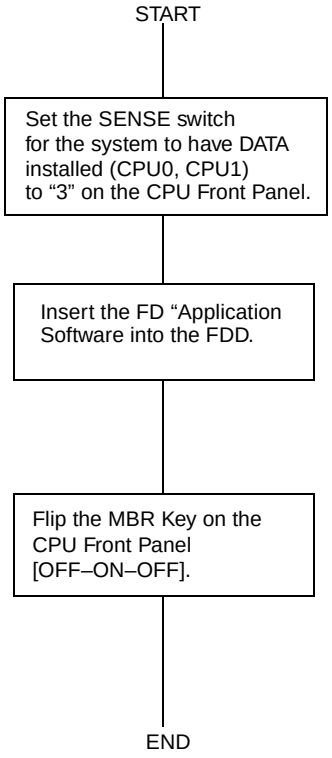
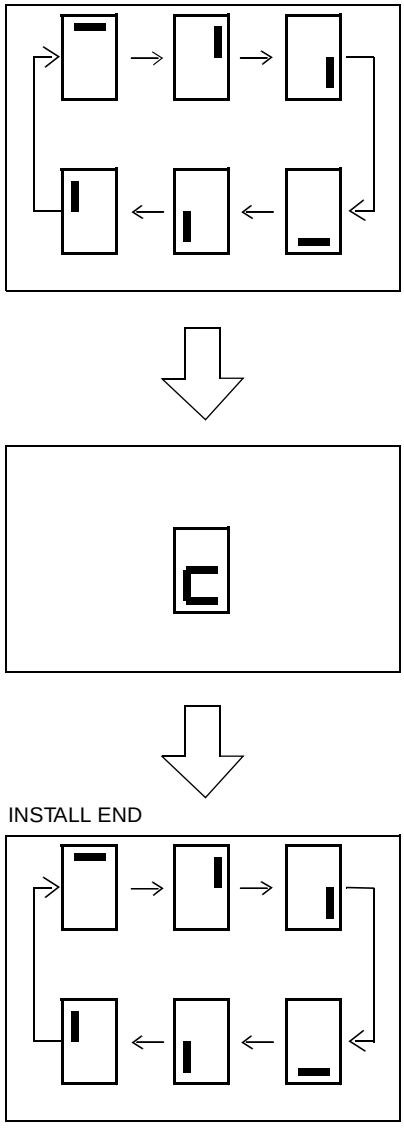
(d) Procedure for Application Software Install



WARNING: *Removal or Make Busy of the HFD card is not allowed while the Floppy Disk or Hard Disk is being accessed.*

Status change of 7 Segment LED on the CPU Front Panel.



NAP-200-020
Sheet 6/6
Program Install and Load

- Procedure for Program Load

  This section describes system start-up procedure in which a program is loaded from the HD to the MEM and the data memory is cleared.

START

- Program Load
  - Set the SENSE switch to “1” (restart with data memory clear) on the CPU Front Panel and press the CPURST button.
  - The system is initialized when LOADING from the HD to the MEM is completed.
    Verify that the OPE lamp on the CPU Front Panel starts flashing.
- Set On-Line mode
  - Set the SENSE switch to “2” (restart without data memory clear) on the CPU Front Panel.

END

NAP-200-021
Sheet 1/2
Assignment of Office Data

START

- Start up the MAT
- Enter basic data — Assign the following data via the MAT per the office data programming sheet.
  - "ATIM": Assignment of Date and Time
  - "ASYD" (SYS 1, 2, & 3) /ASYDL (SYS 1 & 2): System Data assignment
  - "AUNT": Unit Data assignment
- Save basic data — Save the above data onto the hard disk (HD) using the "MEM_HDD" Command.
- Initialize — Make sure that the SENSE switch on the CPU Front Panel has been set to "2".
  - Press the CPURST button on the CPU Front Panel.
  - Clear the alarm by pressing the ALM RST button on the TOPU.
- Assign Office Data — Assign data according to the office data programming sheet.

A

NAP-200-021
Sheet 2/2
Assignment of Office Data

A

- Save Office Data onto HD — Save the Office Data onto the hard disk (HD) from the MEM using the “MEM_HDD” command.
- Save Office Data onto FD — Save the Office Data onto a floppy disk (FD) from the HD using the “HDD_MAT” command.

END

NAP-200-022
Sheet 1/5
Check of Lamp Indications and System Messages

START

- Check lamp indications on Line/ Trunk circuit cards
  - Check lamp indications on each of the assigned Line/ Trunk circuit cards.
    - OPE lamp (G): ON
    - BL lamp (R): OFF
  - If the lamp indications are other than above, investigate per Chapter 6: “FAULT RECOVERY DURING TESTS.”
- Check lamp indications on control system circuit cards
  - The OPE lamps (G) are shown in Figure 022-1 through Figure 022-4.
  - If any alarm lamp illuminates, check switch settings on the circuit card, mounting positions of the cards within that module, control cable connections (Front & Backplane), and Office Data assignments.
- Confirm that no alarm lamps (R) / (Y) are illuminating on the TOPU
  - For explanations of the TOPU (Top Unit) lamp indications, refer to the System Operations and Maintenance Manual.
- Check System Messages
  - Display System Messages using MAT command “DFTD.”
  - If a System Message which indicates a fault is displayed, investigate and recover the fault referring to the System Operations and Maintenance Manual.

END

START

This figure shows the LED indications for a fully expanded system as an example.

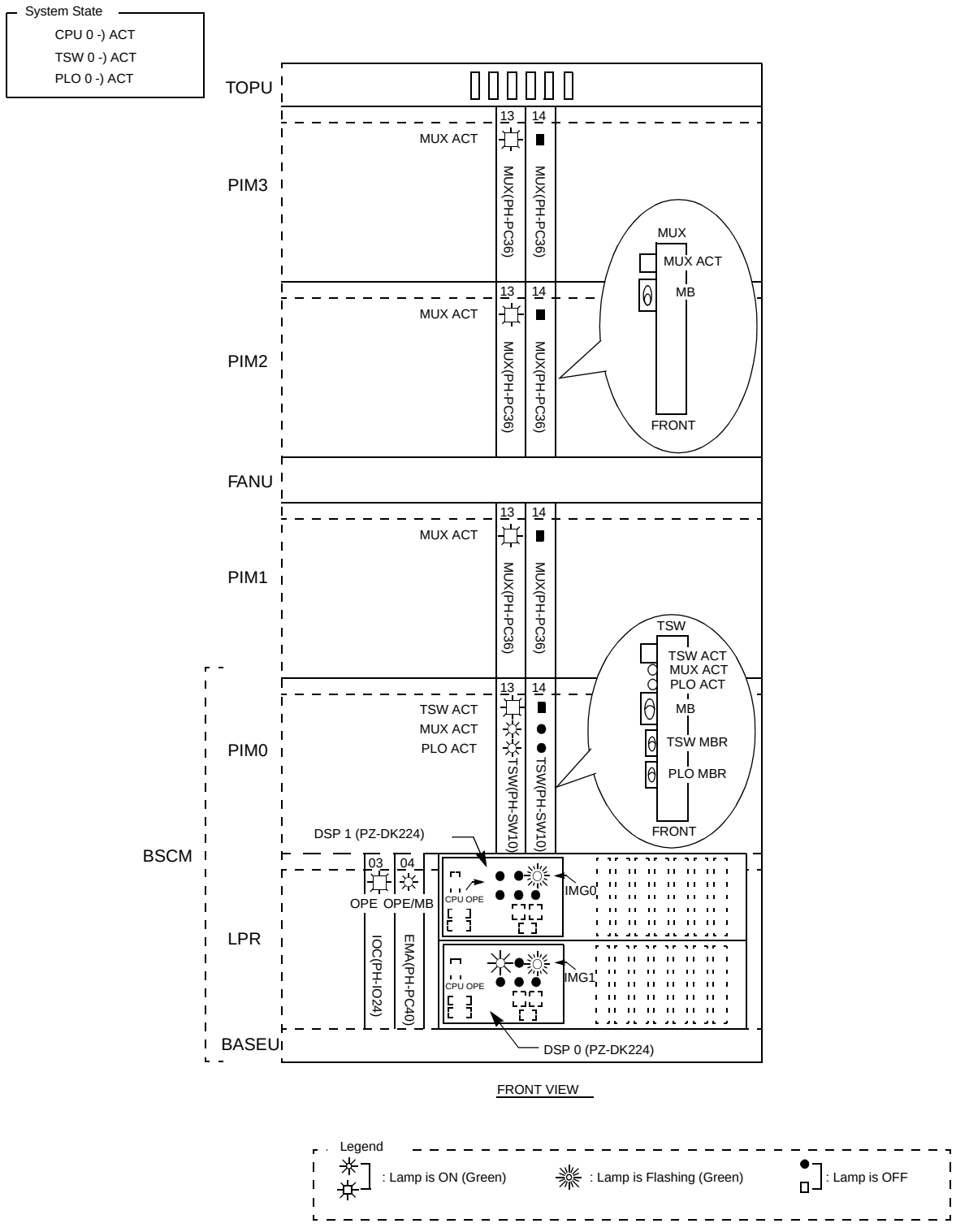


Figure 022-1 LED Indications in Normal Operation (Single IMG Configuration)

This figure shows the LED indications (example) for a fully expanded IMG0 system.

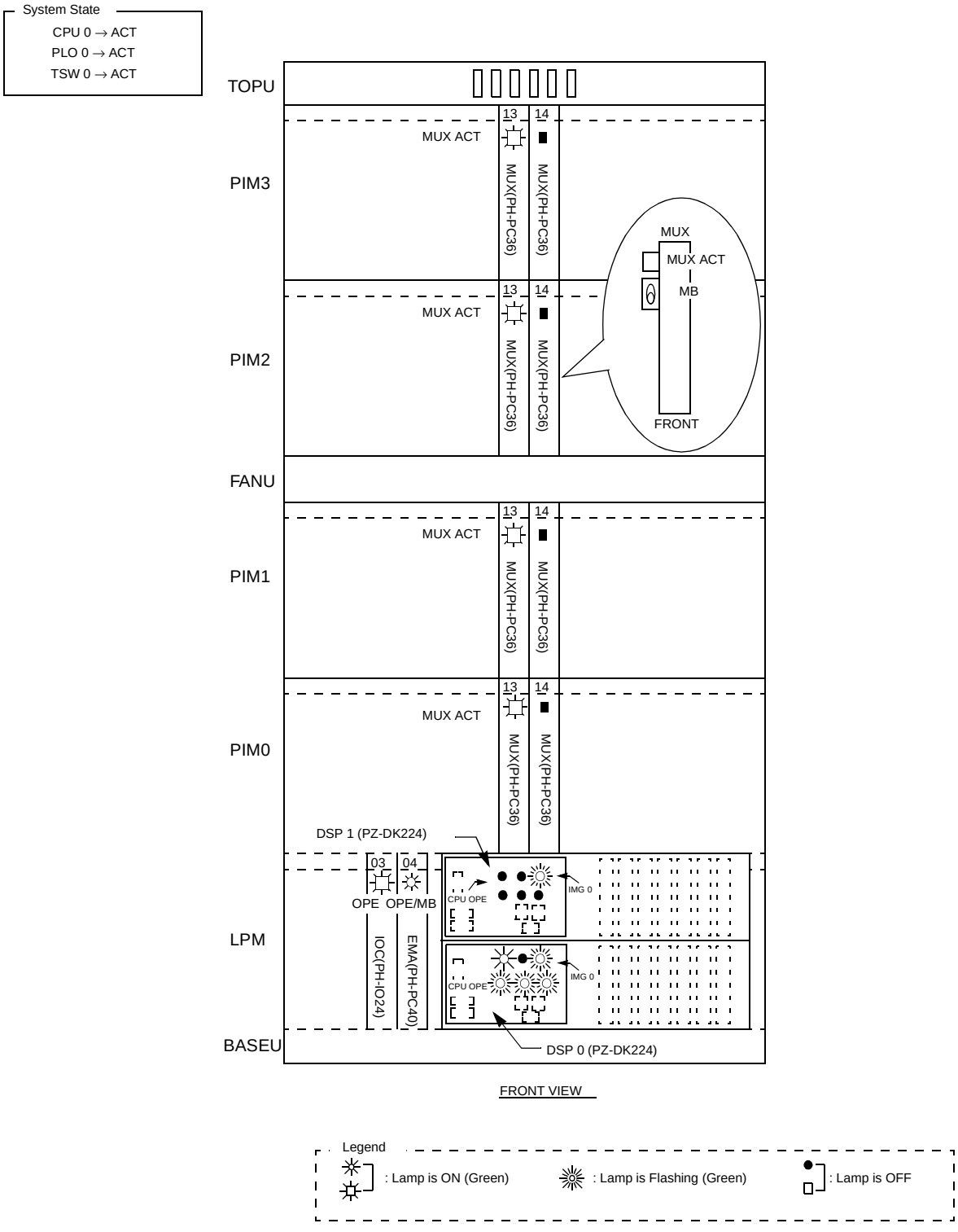
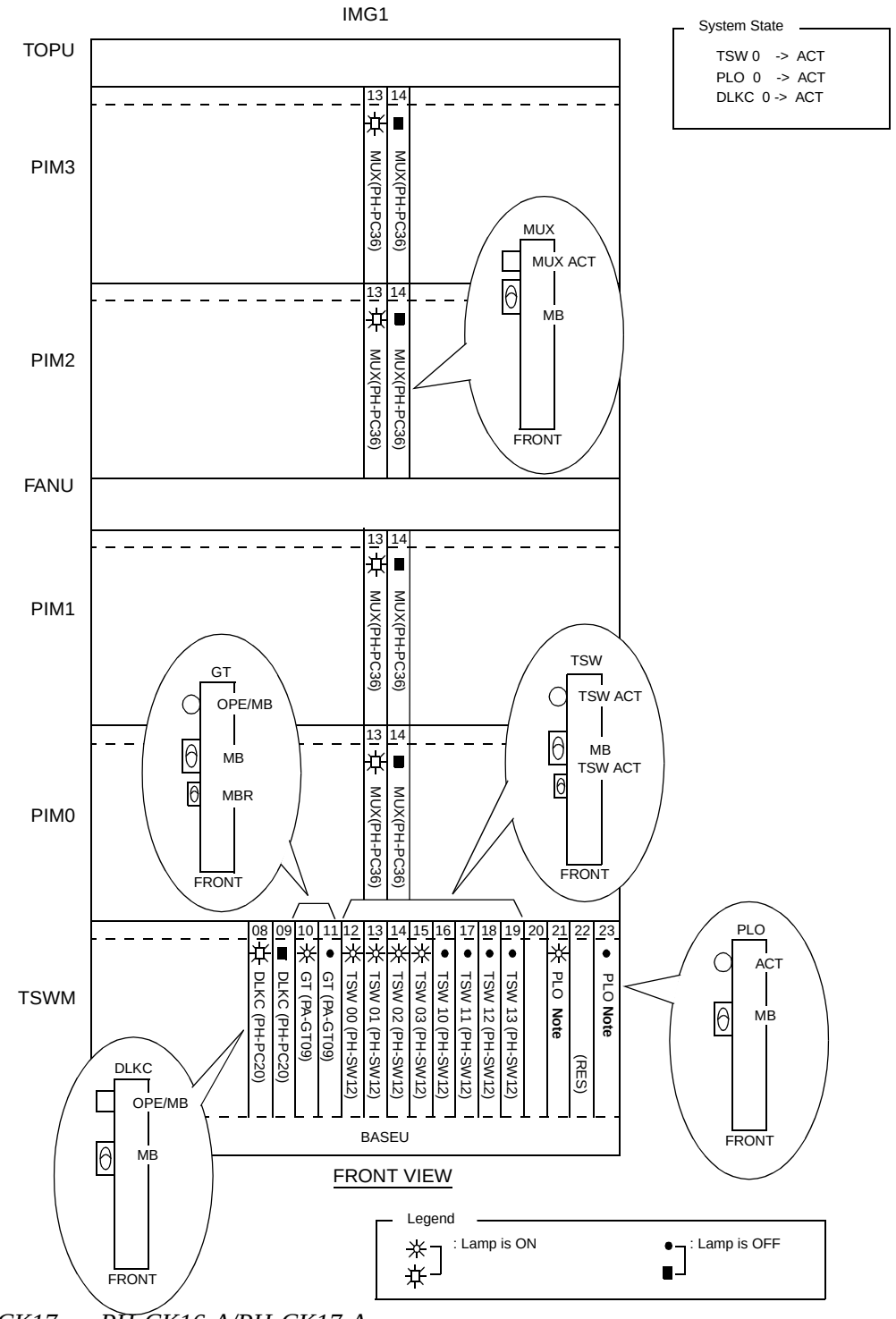


Figure 022-2 LED Indications of IMG0 in Normal Operation (Multiple IMG Configuration)

This figure shows the LED indications (example) for a fully expanded IMG1 system. Note that this example assumes that all of the four IMGs are used in an integrated multimedia exchange service.



Note: *PH-CK16/PH-CK17, or PH-CK16-A/PH-CK17-A*

Figure 022-3 LED Indications of IMG1 in Normal Operation (Multiple IMG Configuration)

This figure shows the LED indications (example) of a fully expanded system of IMG 2/3.

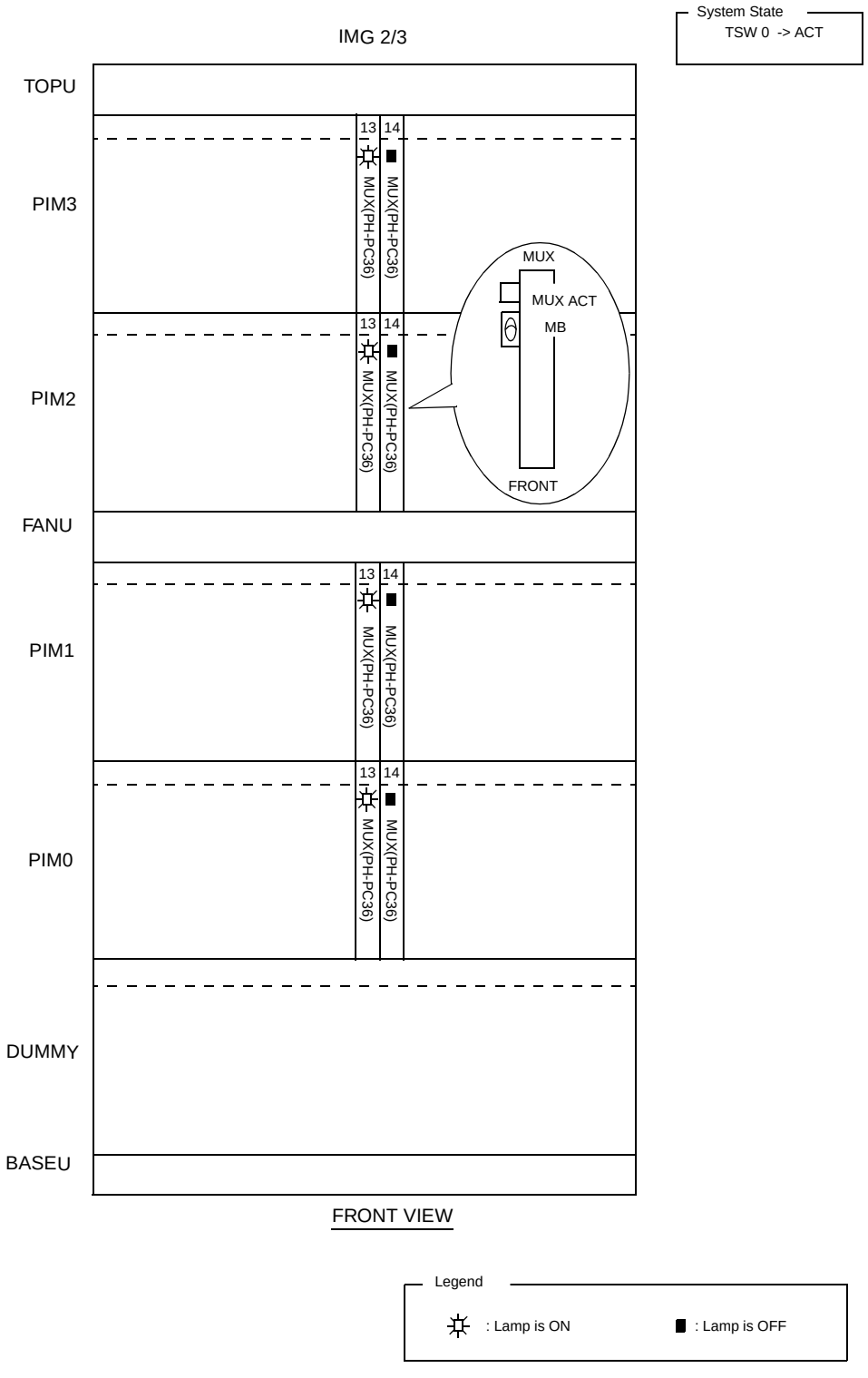


Figure 022-4 LED Indications of IMG 2/3 in Normal Operation (example) (Multiple IMG Configuration)

NAP-200-023
Sheet 1/2
Check of Alarm Lamps of the TOPU

Test Outline: The System has Alarm Lamps on the TOPU. Figure 023-1 shows the Alarm Lamps on the TOPU. For more information about each lamp, see the NEAX2400 IMX System Operations and Maintenance Manual.

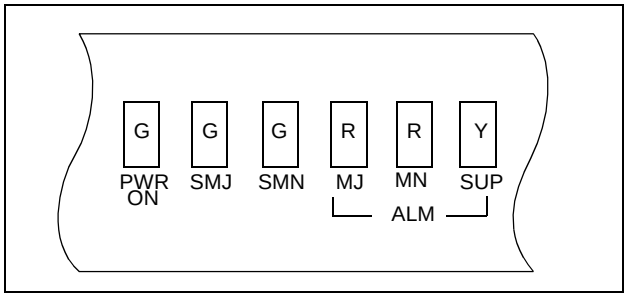


Figure 023-1 Alarm Lamps on the TOPU

Note: *SMJ and SMN are used in multiple IMG configuration only.*

NAP-200-023
Sheet 2/2
Check of Alarm Lamps of the TOPU

START

- Test of MJ (MAJOR) Lamp
  - Set the circuit breakers of the Power Supplies (PWR0, 1) in a PIM to OFF (About 10 seconds later, set the circuit breaker(s) back ON.
  - Confirm that the MJ lamp (red) on the TOPU turns ON.
  - Cancel the alarm indicating by pressing the ALM RST button on the TOPU.
- Test of MN (MINOR) Lamp
  - Take an act side RGU Fuse out of the PWR card.
  - Confirm that the MN lamp (red) on the TOPU turns ON.
  - Cancel the alarm indication by pressing the ALM RST button on the TOPU.
- Test of SUP (SUPERVISORY) Lamp
  - On the EMA Circuit card, flip the MB switch DOWN-UP-DOWN
  - Confirm that the SUP lamp (yellow) on the TOPU turns ON.
  - Cancel the alarm indication by pressing the ALM RST button on the TOPU.

END

This page is for your notes.

CHAPTER 5 INSTALLATION TEST PROCEDURE

1. HOW TO ENTER DATA IN THE TEST CHECK COLUMN

Each NAP in this Chapter has check column for test result entry for each test item (see Figure 5-1). This paragraph explains the method of entering test result into the check column concerned using Figure 5-1 as an example.

1. Method of Entry

   Each check column consists of two sections of “PROVIDED” and “CHECK”. If the equipment or service feature pertaining to the test item is provided in the system, enter “*” in the PROVIDED section. At the time of performing installation tests, the test item with “*” marked in the PROVIDED section must be tested without exception.

   In the “CHECK” column, enter the results of each test as follows:

   - When the test result is good: “OK”
   - When the test result is no good: “×”

2. Fault Recovery

   If a fault is discovered as a result of an installation test, enter “√” into the related check sheet. After finishing all tests in the same category, be sure to repair the detected fault before proceeding to the next test.

3. Entry into Check Column after Fault Recovery

   After fault recovery work has been completed, a test must be performed to confirm that the fault has been completely corrected. If the result of this confirmation indicates that the fault has been corrected, enter “OK” next to the “×” entered previously. This entry should appear as: “× OK”.

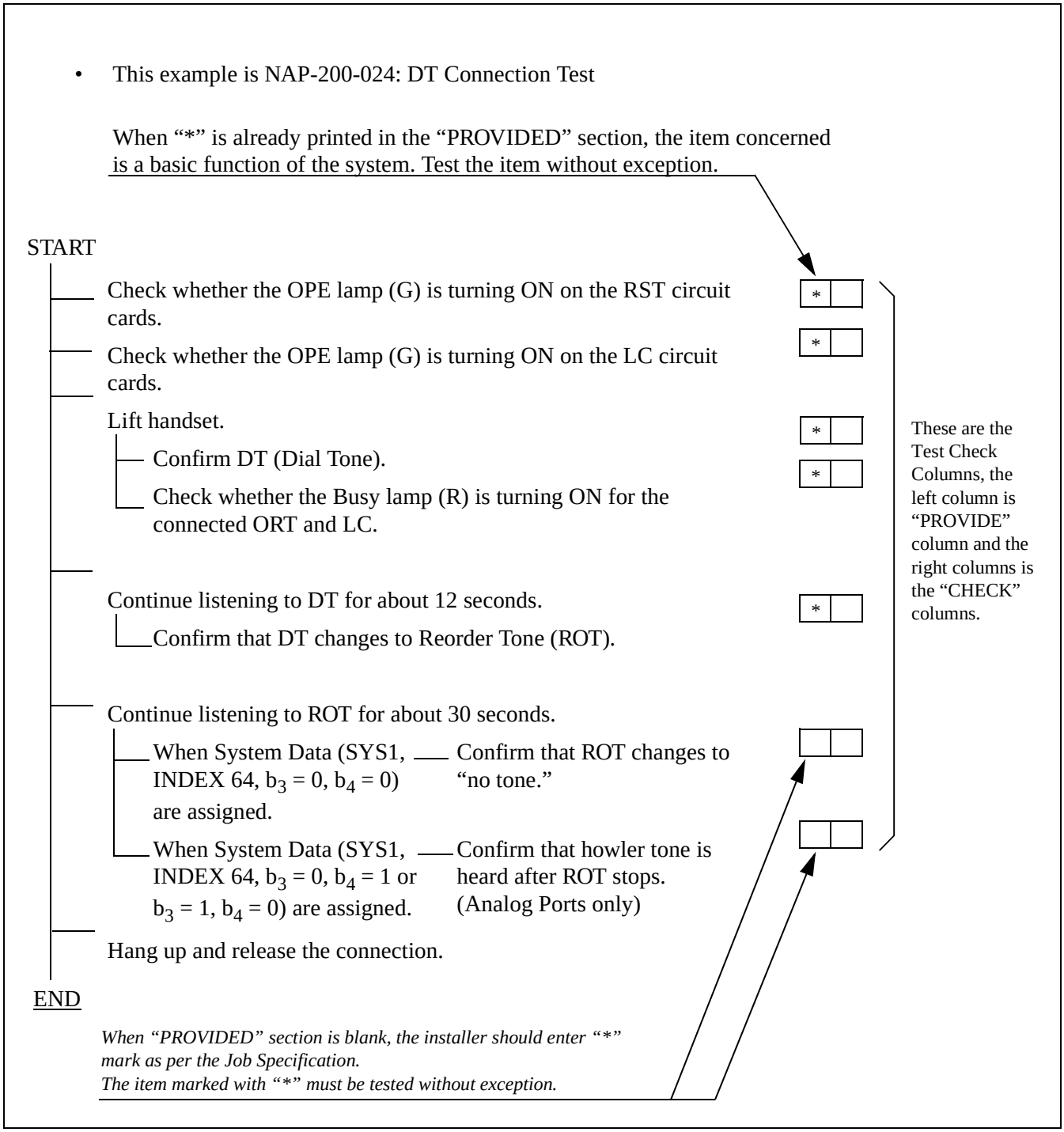


Figure 5-1 Example of Entry to Test Check Column

2. BASIC CONNECTION TEST

2.1 Outline

After the system has been started up, establish some basic connections and verify that the system operates normally.

2.2 Basic Connection Test Procedure

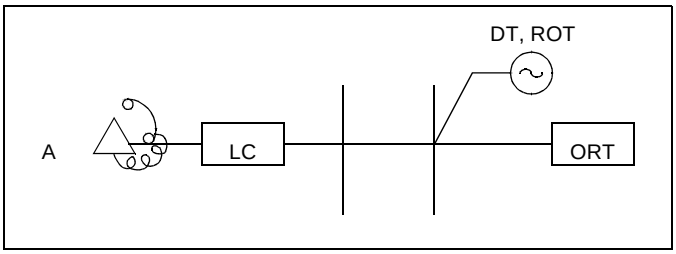
Perform tests on the operations of the processors and the system by referring to the NAP Number indicated to the right of each item in the following flowchart. If an operation cannot be performed satisfactorily, perform the necessary repair procedure(s) based on Chapter 6, "FAULT RECOVERY DURING TESTS".

START

- DT (Dial Tone) Connection Test: NAP-200-024
- Station-to-Station Connection Test: NAP-200-025

END

NAP-200-024
Sheet 1/1
DT (Dial Tone) Connection Test

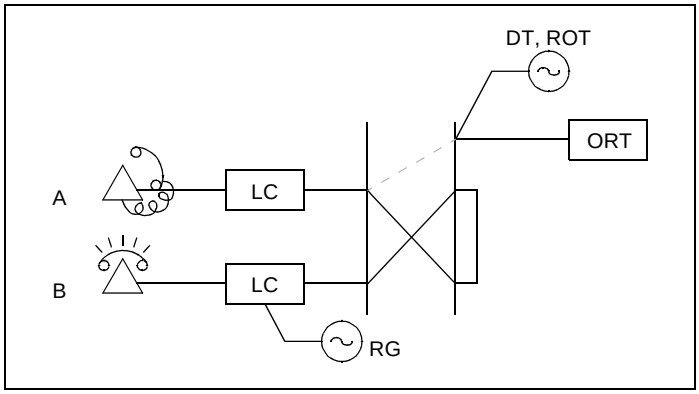


START

- Check whether the OPE lamp (G) is turning ON on the RST circuit cards. *
- Check whether the OPE lamp (G) is turning ON on the LC circuit cards. *
- Lift handset.
  - Confirm DT (Dial Tone). *
  - Check whether the Busy lamp (R) is turning ON for the connected ORT and LC. *
- Continue listening to DT for about 12 seconds.
  - Confirm that DT changes to Reorder Tone (ROT). *
- Continue listening to ROT for about 30 seconds.
  - When System Data (SYS1, INDEX 64, $b_3 = 0$, $b_4 = 0$) are assigned. Confirm that ROT changes to “no tone”.
  - When System Data (SYS1, INDEX 64, $b_3 = 0$, $b_4 = 1$ or $b_3 = 1$, $b_4 = 0$) are assigned. Confirm that howler tone is heard after ROT stops. (Analog Ports only)
- Hang up and release the connection.

END

NAP-200-025
Sheet 1/1
Station to Station Connection Test



START

- Confirm that a connection can be established between Station “A” and Station “B.”
- Station “A” goes off-hook.
  - Station “A” hears DT. *
- Station “A” dials the station number of Station “B.”
  - Station “A” confirms that DT stops when the first digit has been dialed. *
  - Station “A” confirms that RBT (Ring Back Tone) is heard after dialing ends. *
- Station “B” hears ringing on the telephone set. *
- Station “B” lifts handset and answers the call.
  - After answering, both Stations “A” and “B” confirm that they can talk with each other. *
- Stations “A” and “B” hang up. The connection is released.

END

3. SYSTEM INITIALIZED TEST

3.1 Outline

Tests are to be performed on the restart processing (reinitialization) and system changeover functions which enable the system to restart its operations and services.

3.2 System Initialized Test Procedure

The System Changeover Test and Initialization Tests are to be performed per the NAP Numbers indicated to the right of each item in the following flowchart.

START

- System Changeover Test: NAP-200-026
- System Initialization Test: NAP-200-027
- Circuit Card Initialization Test: NAP-200-028

END

NAP-200-026	
Sheet 1/7	
System Changeover Test	Single IMG and Multiple IMG Configuration

Test Outline:

Tests are performed to see if a changeover of the dual systems (Control Systems and Speech Path Systems) of the PBX can be executed.

START

Perform a Control System Changeover test by switch operations

- Control System changeover via MBR switch on the DSP (PZ-DK224) card
  - On the DSP card of which OPE lamp is turning ON, flip the "MBR" switch DOWN→UP→DOWN (OFF→ON→OFF).
  - The lamp indication of the DSP changes to "DSP in ST-BY mode" shown in Figure 026-1.
  - System message "7-C" and "7-D" are displayed in succession.
- CPU changeover via switch (Forced Changeover)
  - Designate CPU changeover via the "CPU SEL" switch on the EMA (PH-PC 40) card.
    - CPU SEL SW UP Position: No. 0 ACT
    - CPU SEL SW DOWN Position: No. 1 ACT
  - System Messages "7-C" and "7-D" are displayed in succession.

A

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Sheet 2/7	
System Changeover Test	Single IMG and Multiple IMG Configuration

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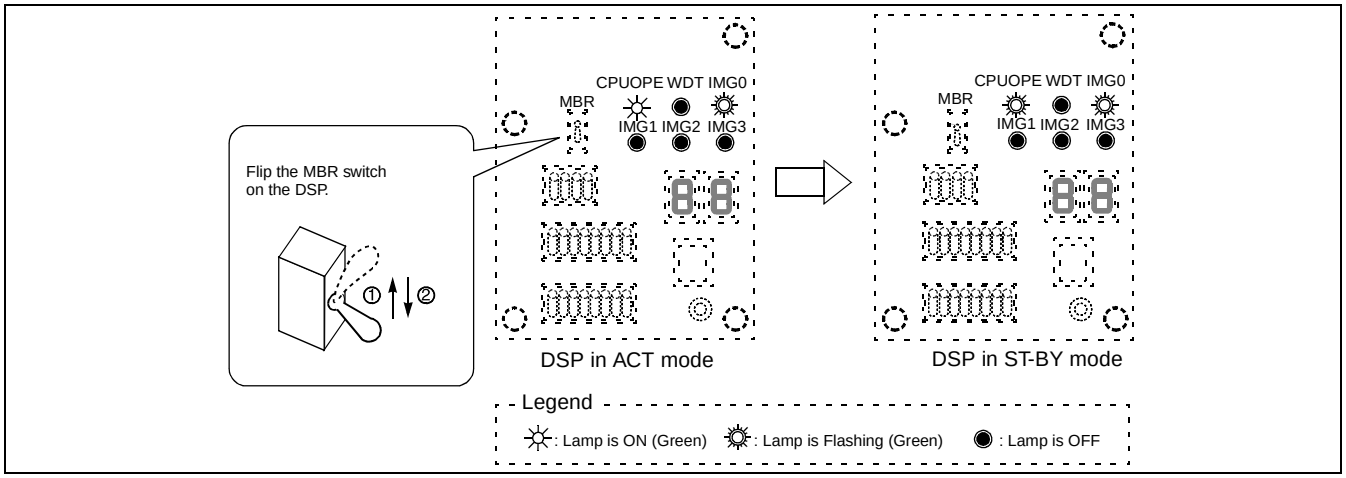

Figure 026-1 How to Perform a Control System Changeover (Single IMG Configuration)

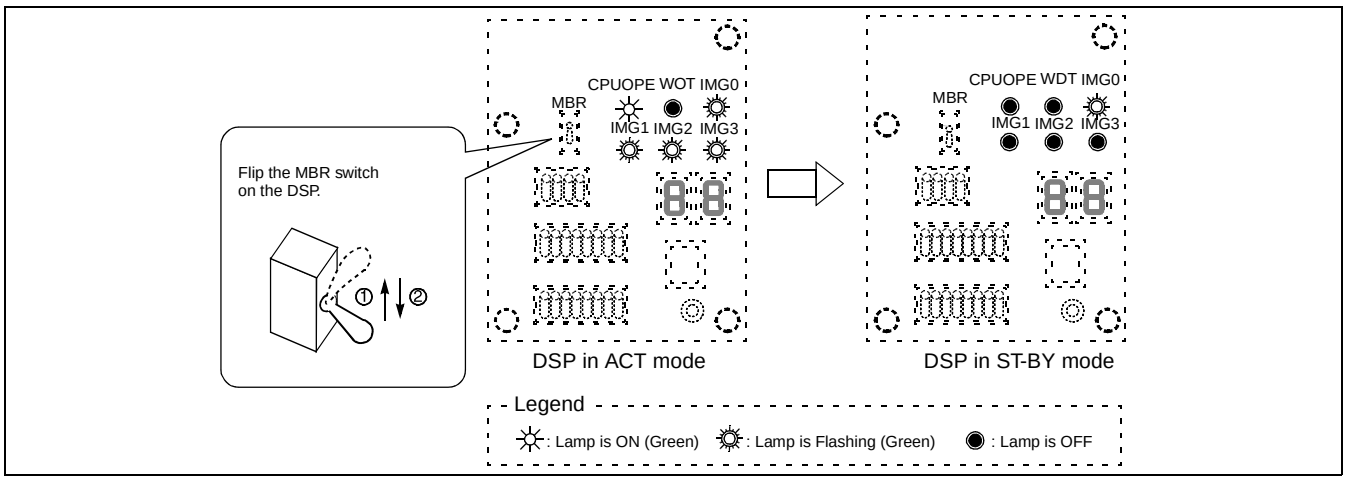

Figure 026-2 How to Perform a Control System Changeover (Multiple IMG Configuration)

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Sheet 3/7	
System Changeover Test	Single IMG Configuration

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Perform a TSW system changeover test by means of switch operations. (Refer to Figure 026-3)

TSW changeover via switch.

On the TSW (PH-SW10) card on which the "TSW ACT" lamp is turning ON, flip the "TSW MBR" switch DOWN-UP-DOWN.

System Messages "7-E," "7-F" and "1-T" are displayed in succession.

Perform a PLO system changeover test, if TSW (PH-SW10) is provided in dual.

On the TSW card of which PLO ACT lamp is turning ON, flip the "PLO MBR" switch DOWN-UP-DOWN.

System message "7-G" and "7-H" are displayed in succession.

END

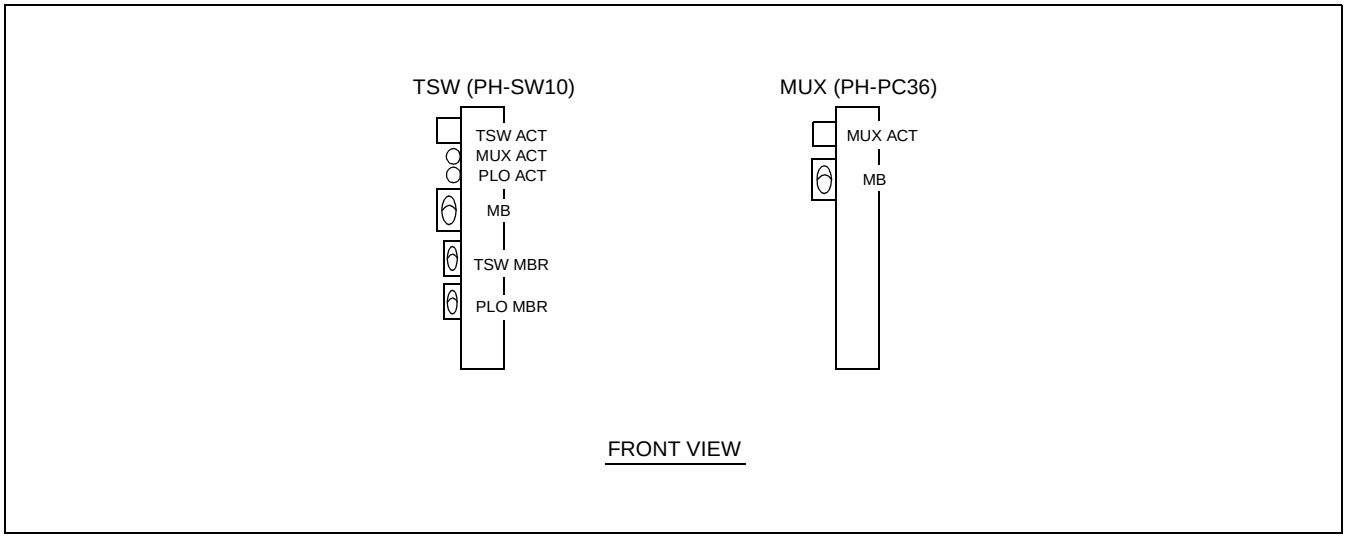


Figure 026-3 LEDs and Switches on TSW/MUX

NAP-200-026	
Sheet 4/7	
System Changeover Test	Multiple IMG Configuration

A

Perform a Speech Path system changeover test by switch operations. (Refer to Figure 026-4)

TSW changeover via switch

On the active GT (PA-GT09) card on which the "OPE/MB" lamp is illuminating, flip the "MBR" switch DOWN-UP-DOWN.

Make sure that the active Speech Path system has been changed over to the ST-BY mode. (Check all the related circuit cards, which were formerly active, have been totally changed over to the ST-BY mode.

Circuit Cards to be affected
- TSW (PH-SW12)
- DLKC (PH-PC20)
- MUX (PH-PC36)

Note: *Refer to Figure 026-4.*

Analyze the system messages "7-E," "7-F" and "1-T" to be displayed automatically.

Perform a PLO system changeover test by switch operations. (Refer to Figure 026-3)

PLO changeover via switch.

On the PLO card on which the "ACT/OPE" lamp is illuminating, flip the "MB" switch DOWN-UP-DOWN.
Note

Make sure that the active PLO system has been changed over to the ST-BY mode ("ACT/OPE" lamp goes OFF).

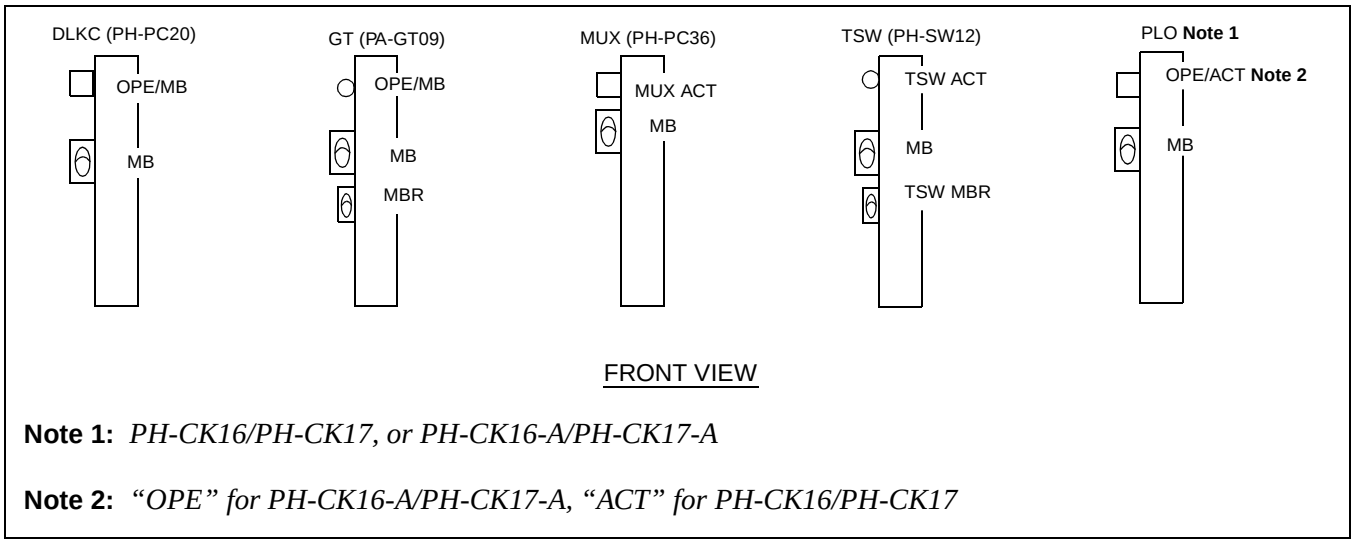
Analyze the system messages "7-U" and "7-V" to be displayed automatically.

Note: *As the PLO, any of the following cards can be used:*

- *PH-CK16*
- *PH-CK17*
- *PH-CK16-A*
- *PH-CK17-A*

END

NAP-200-026	
Sheet 5/7	
System Changeover Test	Multiple IMG Configuration



Note 1: *PH-CK16/PH-CK17, or PH-CK16-A/PH-CK17-A*

Note 2: *"OPE" for PH-CK16-A/PH-CK17-A, "ACT" for PH-CK16/PH-CK17*

Figure 026-4 LEDs and Switches for System Changeover (Multiple IMG Configuration)

NAP-200-026	
Sheet 6/7	
System Changeover Test	Single IMG Configuration

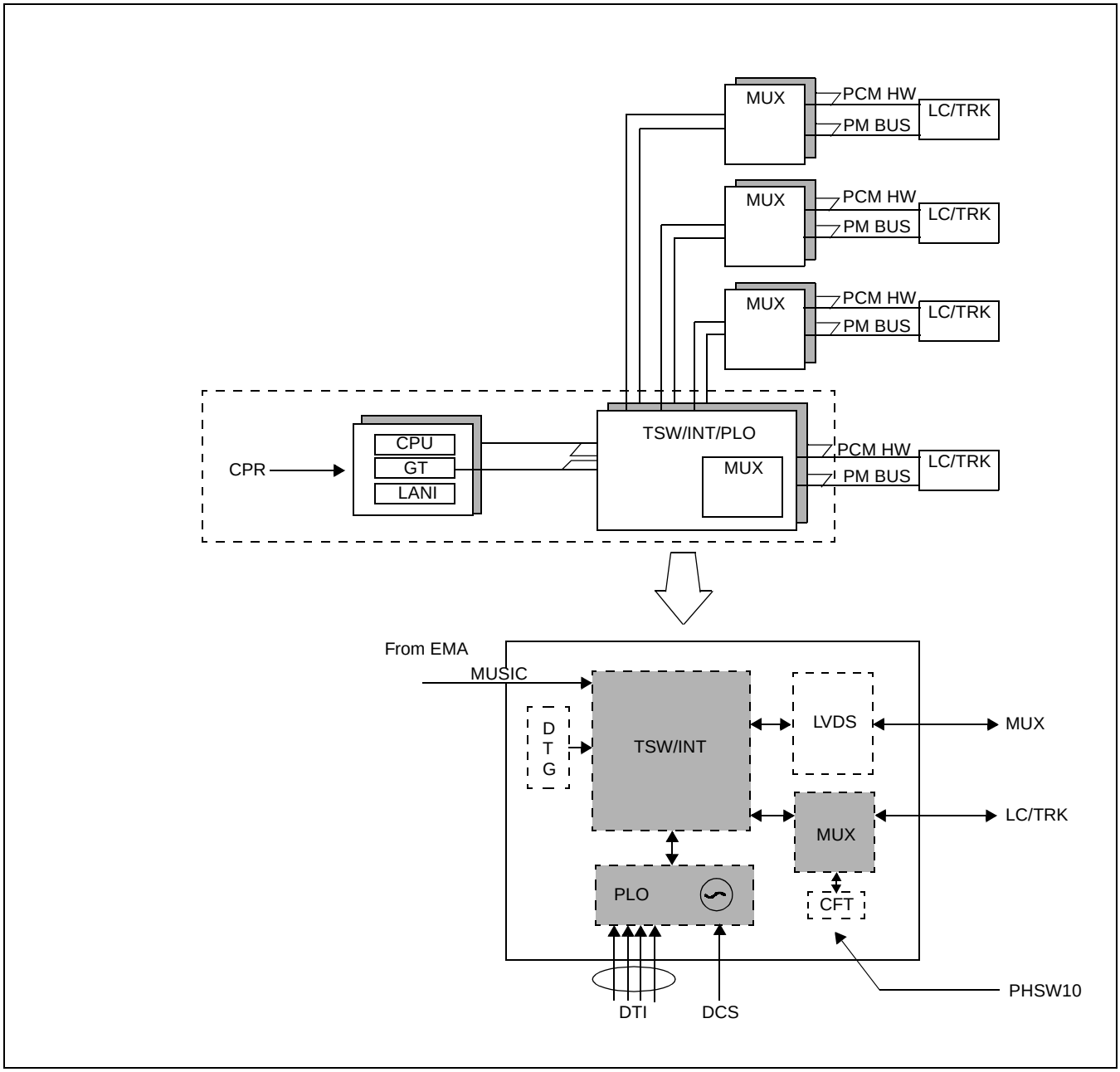
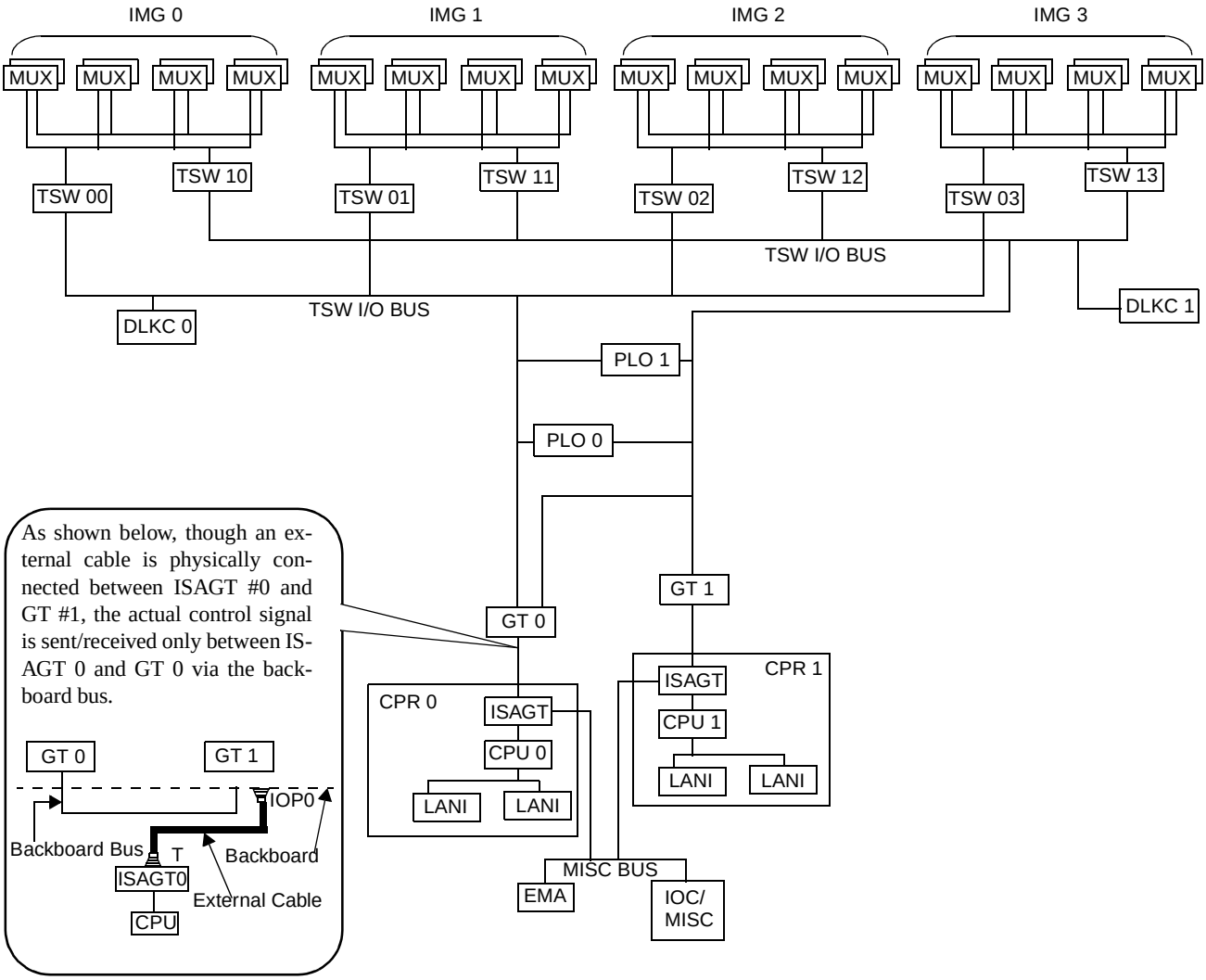


Figure 026-5 System Block Diagram (TSW and MUX) (Multiple IMG Configuration)

NAP-200-026	
Sheet 7/7	
System Changeover Test	Multiple IMG Configuration

This figure shows a system block diagram centering on the CPU and its controlling GT. Although each side appears to have complicated connections, the controlling route of CPU 0 goes directly to GT 0, and that of CPU 1 to GT 1. Therefore, if the system of CPU is once changed over, the ACT/ST-BY of GT is also changed over.



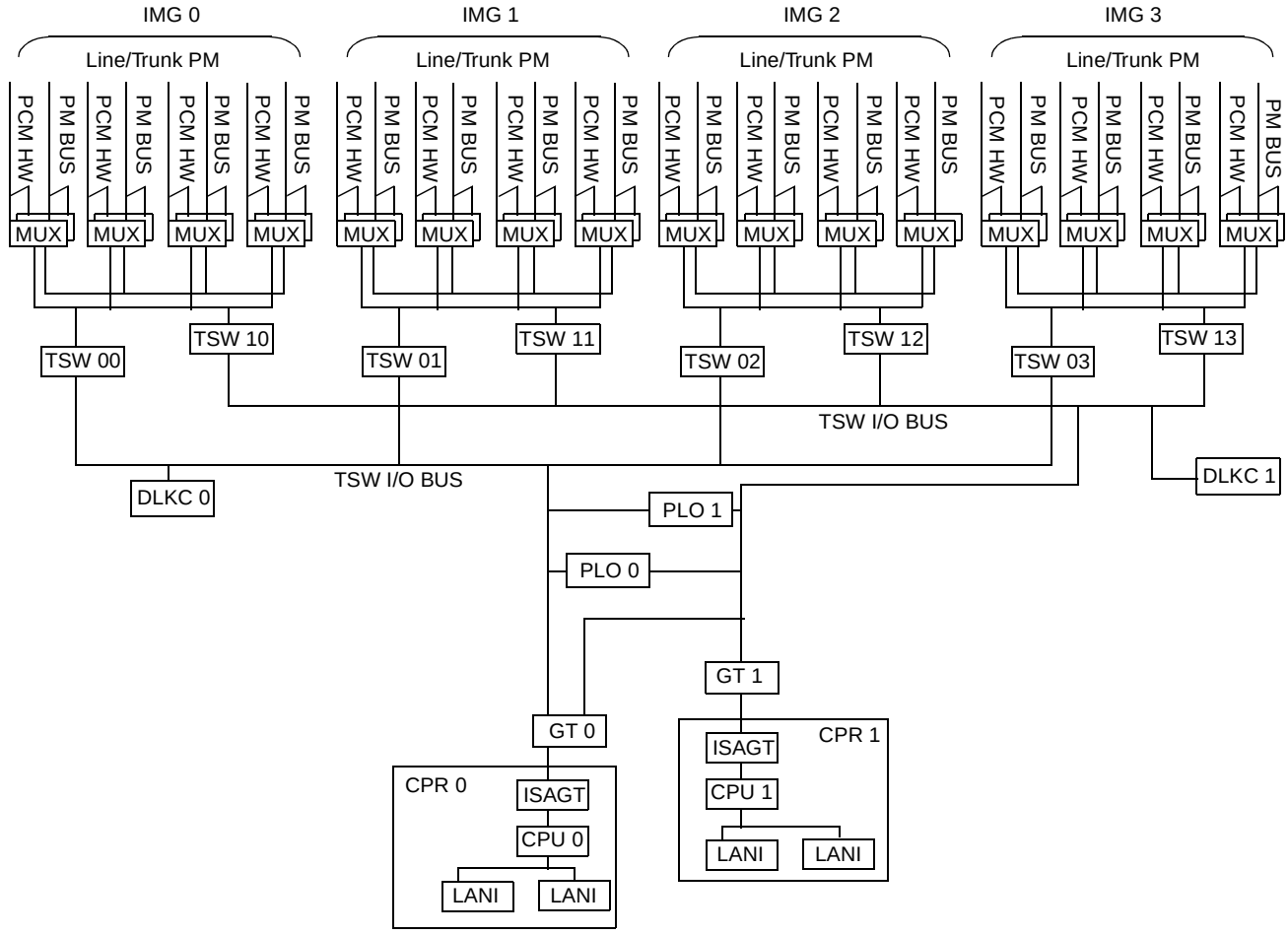
ISAGT: PZ-GT13 LANI: PZ-PC19 GT: PH-GT09 TSW: PH-SW12 MUX: PH-PC36
DLKC: PH-PC20 EMA: PH-PC40 IOC: PH-IO24 PLO: PH-CK16/17, or PH-CK16-A/17A

Note: *Because the ACT/ST-BY changeover of CPU also affects the GT status, the MBR key on the GT card is not used for GT system changeover. The key is used to switch over the Speech Path System, involving the TSW, DLKC, and MUX circuit cards. (See the next page.)*

Figure 026-6 System Block Diagram (GT and Other Controlling Blocks) (Multiple IMG Configuration)

NAP-200-026	
Sheet 8/8	
System Changeover Test	Multiple IMG Configuration

This figure shows a system block diagram centering on the GT and its controlling Speech Path System. By changing over the ACT/ST-BY of the Speech Path System, all the related systems, such as TSW/INT, DLKC, and MUX, are totally switched over. The changeover can be executed by a key operation on the active GT card.



ISAGT: PZ-GT13 LANI: PZ-PC19 GT: PH-GT09 TSW: PH-SW12 MUX: PH-PC36
DLKC: PH-PC20 PLO: PH-CK16/17, or PH-CK16-A/17A

Note: *If the MBR key is once flipped on the active GT card, all the Speech Path related systems (TSW/INT, DLKC, and MUX) in the same switching block are totally changed over. However, the ACT/ST of GT and PLO is not affected.*

Figure 026-7 System Block Diagram (Speech Path) (Multiple IMG Configuration)

NAP-200-027
Sheet 1/2
System Initialization Test

ATTENTION
Contents
Static Sensitive
Handling
Precautions Required

Test Outline:

Tests are performed to see if system initialization can be executed. There are two kinds of test method; test by using START button on the TOPU, and test by Power ON/OFF.

START

- Perform system initialization (via “START” button) [*]
  - Set the SYSTEM DATA key on the TOPU to NON LOAD side, and set the PROGRAM key to NON LOAD side.
  - Perform system initialization by pressing the “START” button on the TOPU.
  - Confirm
    - When the system is initialized, the “CPU OPE” lamp (Green) on the DSP circuit card lights.
    - When the system is initialized, System Message “7-B” is displayed on the MAT.

A

To perform system initialization, set the switch keys on the TOPU as shown below, then press the START button.

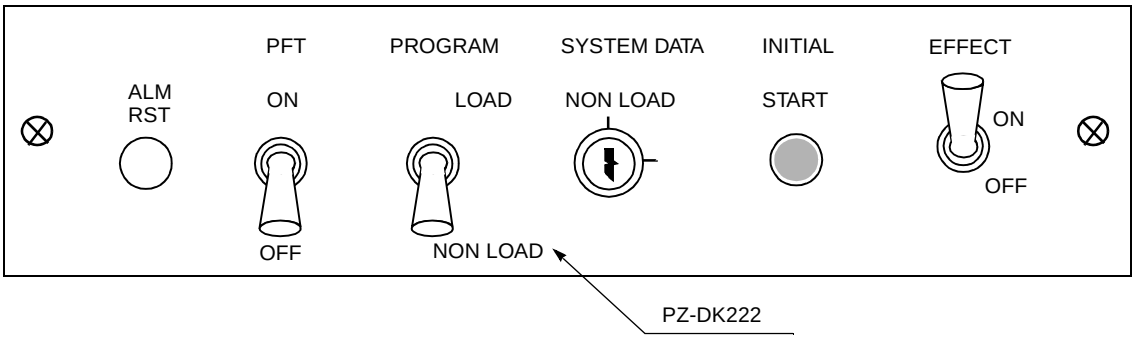


Figure 027-1 System Initialization via ‘Start’ Button

NAP-200-027
Sheet 2/2
System Initialization Test

A

Perform system initialization (by powering ON/OFF). | * |

- Initialization by powering ON/OFF.
  - On all PWR Supplies, set the circuit breaker OFF (Down). If a module contains two PWR Supplies, they must be turned ON/OFF simultaneously.
  - Turn ON the PWR Supplies in each module in the following order. If a module contains two PWR Supplies, they must be turned ON/OFF simultaneously.
    - LPM→PIM0→PIM1→PIM2 →PIM3
- Confirm
  - When the system is initialized, the CPU OPE lamp (Green) on the DSP turns ON.
  - When the system is initialized, System Message “7-B” is displayed on the MAT.
- Assignment of Date and Time
  - Upon completion of all the initialization tests, assign data and time via MAT command “ATIM.”

END

NAP-200-028
Sheet 1/1
Circuit Card Initialization Test

START

- Make the No. 0 CPU the ACT system.
- In each PIM, initialize any Line/Trunk circuit card.

  - On the selected Line/Trunk circuit card, set the MB switch UP.
    - The OPE lamp goes out.
    - System Message “7-K” is displayed.
  - Set the MB switch DOWN.
    - The OPE lamp turns ON.
    - System Message “7-L” is displayed.
- Clear the alarm — Clear the alarm indication by pressing the “ALM RST” button on the TOPU.
- Make the No. 1 CUP the ACT system.
- In each PIM, initialize any Line/Trunk circuit card.

  - On the selected Line/Trunk circuit card, set the MB switch UP.
    - The OPE lamp goes out.
    - System Message “7-K” is displayed.
  - Set the MB switch DOWN.
    - The OPE lamp turns ON.
    - System Message “7-L” is displayed.
- Clear the alarm — Clear the alarm indication by pressing the “ALM RST” button on the TOPU.

END

4. PORT CONNECTION TEST

4.1 Outline

Tests are to be performed on all the circuits of LC and Trunk circuit cards and PWR Supplies. LC and Trunk circuit cards are tested with respect to their operations and speech path conditions. PWR Supplies are tested with respect to howler tone and ringing signal.

While tests are in progress, the No. 0 CPU and TSW systems must be ACT (active).

4.2 Port Connection Test Procedure

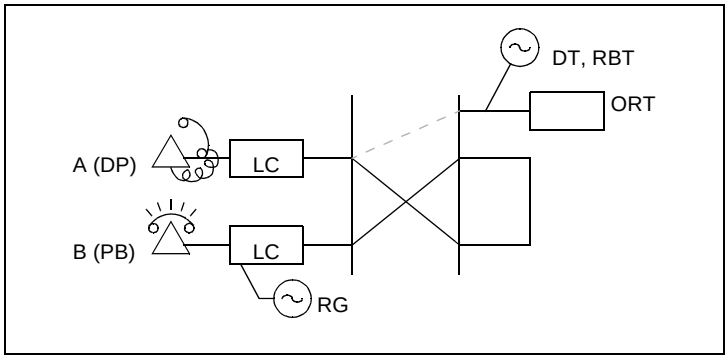
The connection test procedure for each type of circuit card is described in the NAP indicated to the right of each item in the following flowchart.

START

- ORT (RST Card) Connection Test: NAP-200-029
- ATTCON (ATI Card) Connection Test: NAP-200-030
- Line (LC, ELC Card) Connection Test: NAP-200-031
- Outgoing Trunk (COT, TLT, DTI Card) Connection Test: NAP-200-032
- Incoming Trunk (COT, TLT, DTI Card) Connection Test: NAP-200-033
- Direct-In Termination Trunk (COT Card) Connection Test: NAP-200-034
- SND (RST Card) Connection Test: NAP-200-035
- 3-Party Conference Trunk Function Test: NAP-200-036
- Connection Test - Announcement Trunk for Announcement Service: NAP-200-037
- Connection Test - Digital Announcement Trunk for Announcement Service: NAP-200-038
- Connection Test - Paging Trunk for Paging Access Service: NAP-200-039
- Connection Test - Paging Trunk for Paging Transfer Service: NAP-200-040
- Radio Paging Trunk (COT Card) Connection Test: NAP-200-041
- Howler and Ringing Signal Test: NAP-200-042

END

NAP-200-029
Sheet 1/2
ORT (RST Card) Connection Test



START

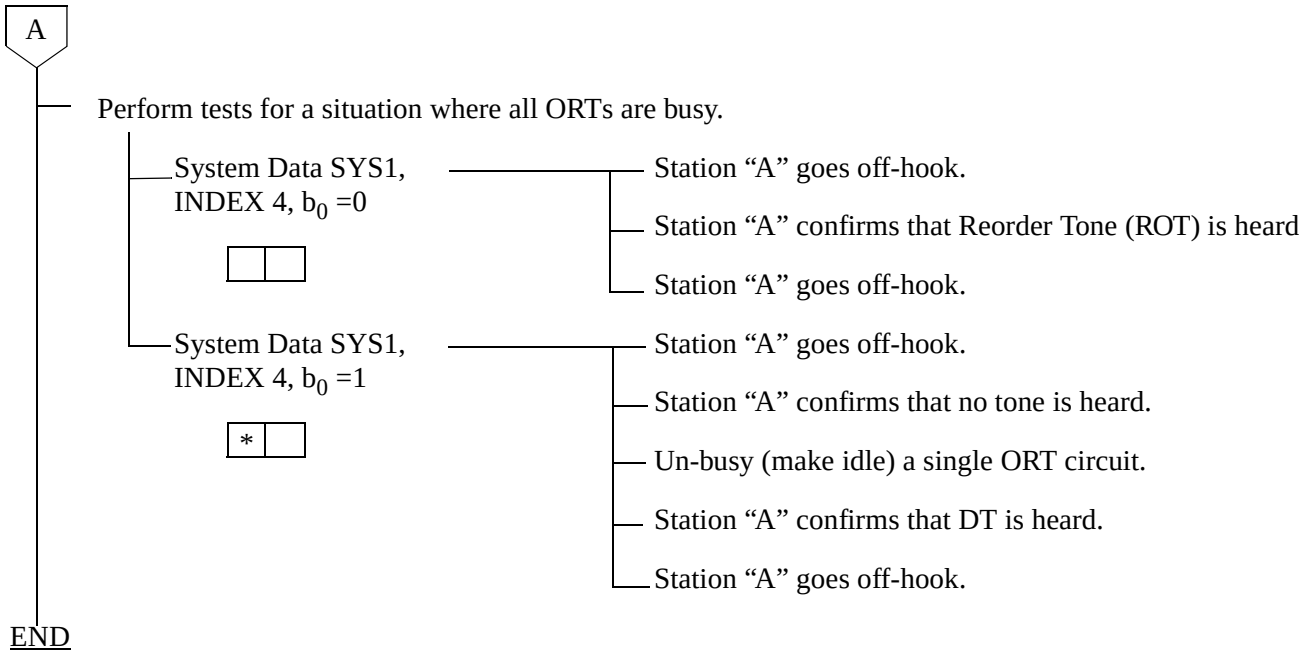
- Make busy all ORTs
  - On the front of the RST card, set all MBR switches (0-7) to the OFF position, making all ORTs busy.
- From Station “A” (DP), test ORTs one circuit at a time.
  - Un-busy (make idle) only the ORT to be tested.
  - Station “A” goes off-hook and after hearing DT, dials the station number of Station “B.”
  - Station “A” confirms ringing to Station “B” and Station “B” answers.
  - Stations “A” and “B” go on-hook.

  [*][ ]
- From Station “B” (PB), test ORTs on circuit at a time.
  - Un-busy only the ORT to be tested.
  - Station “B” goes off-hook and after hearing DT, dials the station number of Station “A.”
  - Station “B” confirms ringing to Station “A” and Station “A” answers.
  - Stations “A” and “B” go on-hook.

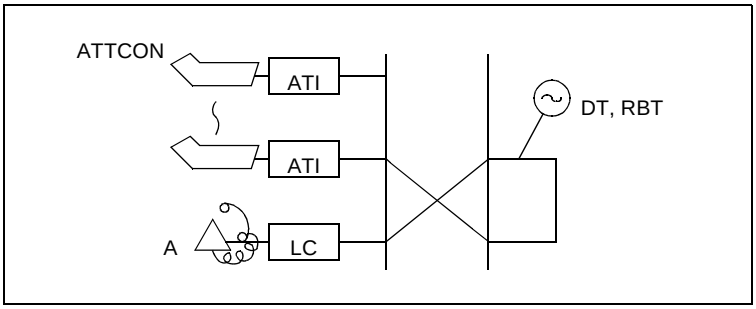
  [*][ ]

A

NAP-200-029
Sheet 2/2
ORT (RST Card) Connection Test



NAP-200-030
Sheet 1/1
ATTCON (ATI Card) Connection Test



START

- A station repeats an ATTCON call. Each ATTCON answers the call.

*	

  - Station “A” dials the operator access code (normally, “0”).
  - At each ATTCON, the operator confirms that the ATT lamp flashes and the ringer sounds.
  - At each ATTCON, the operator answers the call by pressing the ATND key.
  - Station “A” confirms speech with each ATTCON.
  - The operator at each ATTCON releases by pressing the CANCEL key.
  - Station “A” goes on-hook.

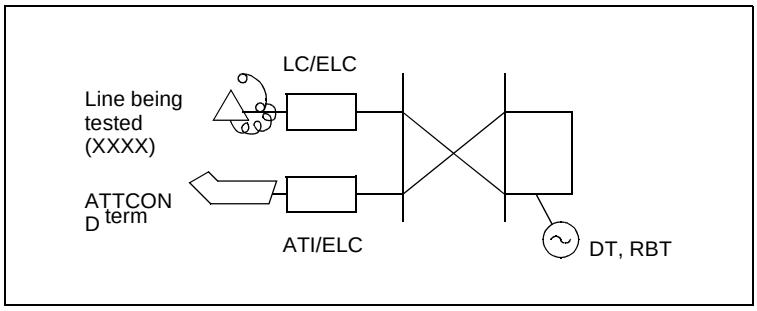
- Each ATTCON calls a station by pressing LOOP keys one at a time.

*	

  - At each ATTCON, the operator dials the number of Station “A” by using LOOP keys (L1-L6) one at a time.
  - Ringing at Station “A” is confirmed.
  - Station “A” answers the call and confirms speech.
  - The operator at the ATTCON releases by pressing the CANCEL key.
  - Station “A” goes on-hook.

END

NAP-200-031
Sheet 1/1
Line (LC, ELC, DLC, Card) Connection Test



A

An ATTCON or D^{term} is called from each station. The called party confirms the station number.

*

- On the MDF, a telephone set is connected to the line circuit to be tested
- The station (XXXX) to be tested goes off-hook and confirms DT (Dial Tone).
- The station (XXXX) calls an ATTCON or D^{term}.
- The called ATTCON or D^{term} answers the call, and confirms speech and the station number of the calling station.
- The call is released.

The ATTCON or D^{term} calls a station being tested.

*

- The ATTCON or D^{term} dials the station number of the station being tested.
- The called station answers and confirms speech.
- The ATTCON or D^{term} confirms that the number dialed and the number of the station being tested are the same.
- The call is released.

The test conducted when the station involved is assigned as a Hot Line/House Phone.

- The station being tested goes off-hook and confirms Ring Back Tone (RBT).
- The station checks whether the call is routed to the predetermined station/ATTCON or that a call is originated to a predetermined trunk.
- The called side answers the call and confirms speech.
- The call is released.

END

NAP-200-032
Sheet 1/3
Outgoing Trunk (COT, TLT, DTI Card) Connection Test

Test Outline:

The purpose of this test is to confirm, by setting up an outgoing connection test for each outgoing trunk, that speech can be made and that the call can be released.
Outgoing trunks must be tested one at a time using the sequence of Routes and Trunk Numbers assigned at each office

START

- When a C. O. Line or Tie Line is not connected with a trunk circuit, temporary cross connections between the Outgoing trunk being tested and the terminating trunk should be set up on the MDF as a loop-back circuit.
  - Referring to Figures 032-1 through 032-3, make temporary cross connections on the MDF for a loop-back circuit.
  - Temporarily assign Office Data from the MAT so that a loop-back connection from the trunk can be established.
- Make busy all Outgoing Trunks.
  - On the front of the Trunk circuit card, set the MB switch to the OFF position, making the trunk busy.
- Test the trunk circuits one at a time by establishing access from a station.
  - Un-busy (make idle) only the trunk to be tested.
  - The station dials the Access Code of the trunk being tested and the number for the call destination.
  - The called side answers.
  - The station confirms speech.
  - The call is released.
  - Make temporary cross connections for the next trunk to be tested.
- Restore the temporary connections, temporary Office Data, etc. to the original.

END

NAP-200-032
Sheet 2/3
Outgoing Trunk (COT, TLT, DTI Card) Connection Test

- Set up a loop-back connection between the COT (C.O. Trunk) to be tested and a station line.

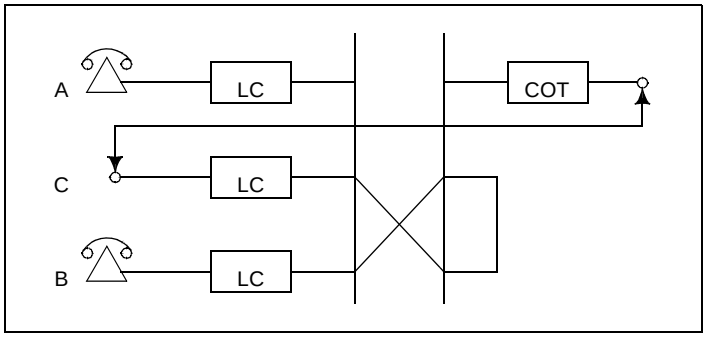


Figure 032-1 COT Test Configuration

- The trunk route must be assigned for Loop Start.

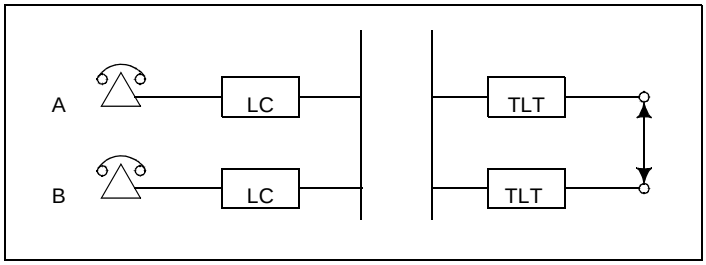
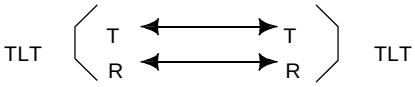
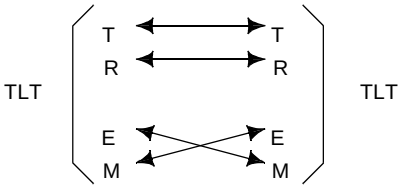


Figure 032-2 TLT Test Configuration

- Set up a loop-back connection between the TLT (Tie Line Trunk) to be tested and another EMT.
- If the TLT is a DID (Direct Inward Dialing) Trunk, connected the related leads as shown below.

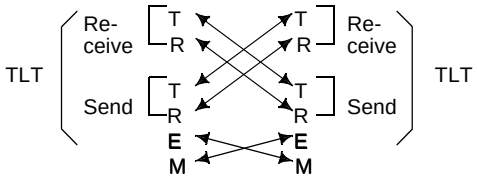


- If the TLT is a 2W E&M System, connect the related leads as shown below.



NAP-200-032
Sheet 3/3
Outgoing Trunk (COT, TLT, DTI Card) Connection Test

- If the TLT is a 4W E&M System, connect the related leads as shown below.



- Set up a loop-back connection between the DTI Trunk to be tested and another DTI Trunk as shown below:

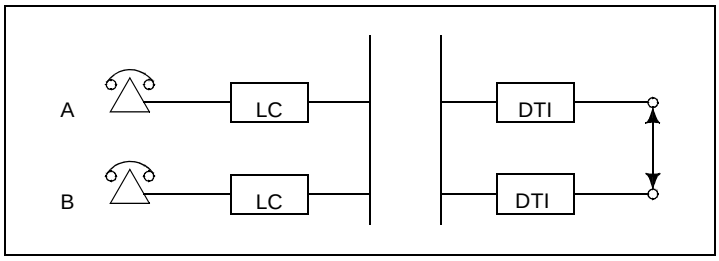
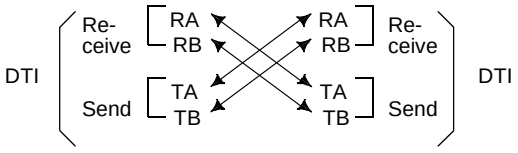


Figure 032-3 DTI Test Configuration



- If the office is the primary office (Clock-Source-Office), perform the tests by disconnecting the PLO and the M-OSC. (The mode of the PLO becomes “Self Operation Mode.”)

NAP-200-033
Sheet 1/2
Incoming Trunk (COT, TLT, DTI Card) Connection Test

Test Outline:

The purpose of this test is to confirm, by setting up an incoming trunk connection test for each incoming trunk, that speech can be made with the ATTCON when a Ringdown Signal Interface is used, or with a station when a Dial-In Signal Interface is used. This test also confirms that the call can be released. Incoming trunks must be tested one at a time using the sequence of Route and Trunk Numbers assigned at each office.

START

- On the MDF, make temporary cross connections between the Incoming Trunk to be tested and an outgoing trunk as a loop-back circuit.
  - Referring to Figures 032-1 through 032-3 in NAP-200-032, make temporary cross connections on the MDF for a loop-back circuit.
  - Temporarily assign Office Data from the MAT so that a loop-back connection from the trunk can be established.
- Make busy all outgoing trunks other than the cross-connected trunk.
- Test Incoming trunk circuits one at a time.
  - For Ringdown Signal Interface.
    - Station “A” dials the station number of Station “C”.
    - The call terminates to an Attendant Console.
    - The Attendant Console answers the call and confirms speech.
    - The call is released.
    - Make temporary connections for the next trunk to be tested.

B

A

NAP-200-033
Sheet 2/2
Incoming Trunk (COT, TLT, DTI Card) Connection Test

A

B

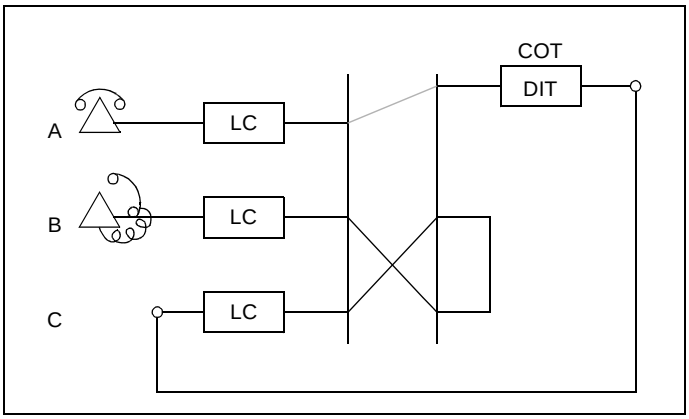
For a Dial-In Signal Interface.

- Station “A” dials the access code for the outgoing trunk and the number of Station “B”.
- Station “B” answers the call and confirms speech.
- The call is released.
- Make temporary cross connections for the next trunk to be tested.

Restore the temporary cross connections, temporary Office Data, etc. to the original.

END

NAP-200-034
Sheet 1/1
Direct-In Termination Trunk (COT Card) Connection Test

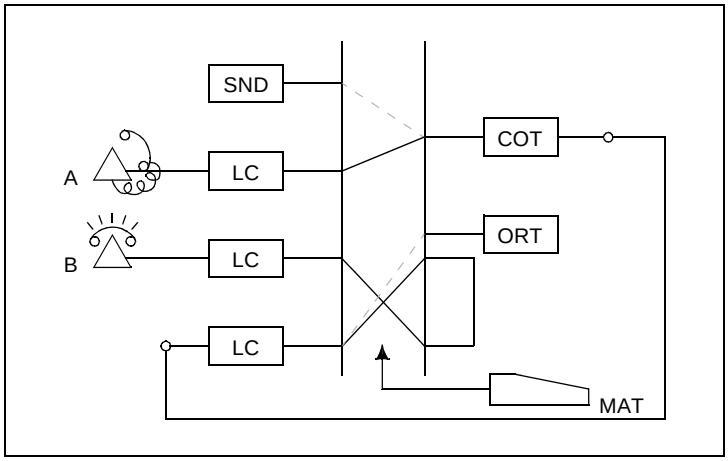


START

- On the MDF, make temporary cross connections between the Trunk for Direct-In Termination (DIT) and an LC.
- C.O.Line Incoming Call — Station “B” dials the number of LC “C” (Station “C”).
- Incoming Call to Station via DIT Trunk. — The call terminates to Station “A”; Station “A” rings.
  - Confirm that the ringing is distinct from that of an intra-office call or ordinary C.O. call.
    - The ringing signal for Direct-In Termination calls can be the same as that used for C.O. calls if the related Office Data is assigned.
      System Data SYS1, INDEX 72, SYS3, INDEX 0, and parameter DR of Command “ARTD”.
- Answer and Talk — Station “A” goes off-hook.
  - Stations “A” and “B” talk with each other.
- Release — Station “A” and “B” both go on-hook.
- Remove the temporary cross connections.

END

NAP-200-035
Sheet 1/1
SND (RST Card) Connection Test



START

When a C.O. Line or Tie Line is not connected with the trunk, make an arrangement for trunk loop-back as illustrated above.
- On the MDF, make temporary cross connections for a loop back circuit.
- Temporarily assign Office Data from the MAT so that a connection can be set up with Station “B” via a SND.

Make busy all SNDs
- On the front of the RST circuit card, set all MBS switches (0-7) to the OFF position, thereby making all SNDs busy.

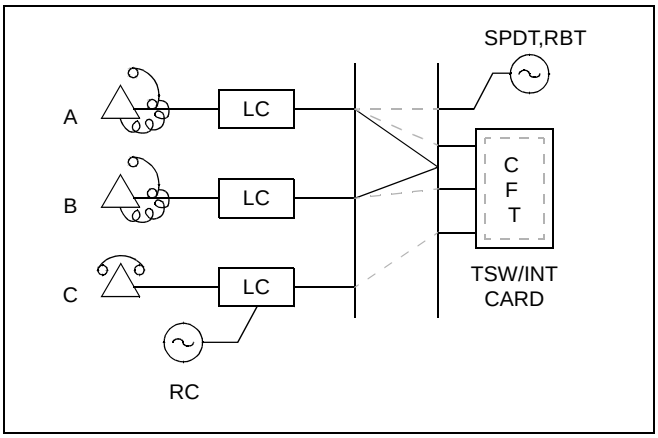
Test SNDs one after another

- Un-busy (make idle) only the SND to be tested.
- Station “A” dials the access code of the trunk and the station number of Station “B”.
- Station “B” answers and talks
- The call is released.

Restore the temporary cross connections, temporary Office Data etc. to the original.

END

NAP-200-036
Sheet 1/1
3-party Conference Trunk Function Test

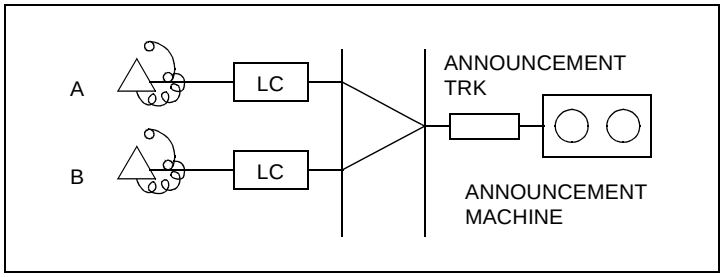


START

- Made busy all CFTs — Made busy all CFTs using MAT command “MBTK”.
- Test CFTs one at a time — Un-busy (make idle) only the CFT to be tested.
  - Stations “A” and “B” are engaged in a station to station connection.
  - Station “A” makes a Switch Hook Flash (SHF) and after hearing DT, dials the station number of Station “C”.
  - Station “C” answers the call.
  - Station “A”, after having talked with Station “C”, makes a SHF and confirms that a three-way connection has been set up.
  - The call is released.
- Cancel the Make Busy of the CFT — Un-busy (make idle) the CFT using the “MBTK” command.

END

NAP-200-037
Sheet 1/1
Connection Test-Announcement Trunk for Announcement Service

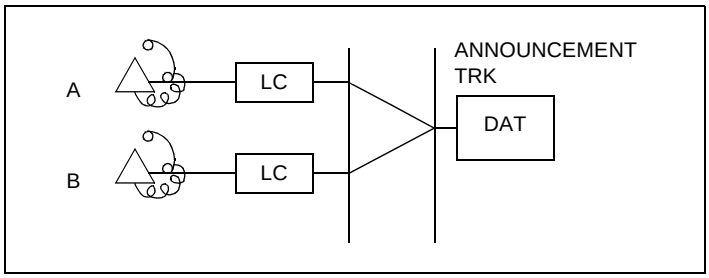


START

- Dial the announcement service code — Station “A” dials the announcement service code.
- Check the contents of the announcement — Station “A” is connected to the announcement machine and hears the announcement.
- Dial the announcement service code — Station “B” dials the announcement service code.
- Check the contents of the announcement — Station “B” is connected to the announcement machine and hears the announcement.
- Release — Confirm that the announcement machine stops when both Stations “A” and “B” goes on-hook.

END

NAP-200-038
Sheet 1/1
Connection Test-Digital Announcement Trunk for Announcement Service

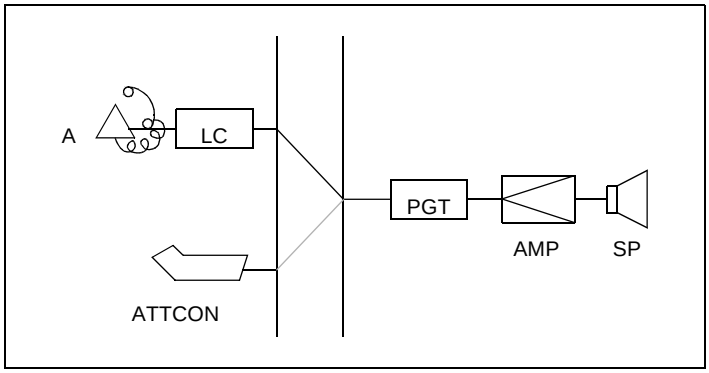


START

Dial the announcement service code	Station “A” dials the announcement service code.
Check the contents of the announcement	Station “A” is connected to the announcement trunk and hears the announcement.
Dial the announcement service code	Station “B” dials the announcement service code.
Check the contents of the announcement	Station “B” is connected to the announcement trunk and hears the announcement.
Release	Confirm that the announcement stops when both Stations “A” and “B” goes on-hook.

END

NAP-200-039
Sheet 1/1
Connection Test-Paging Trunk for Paging Access Service

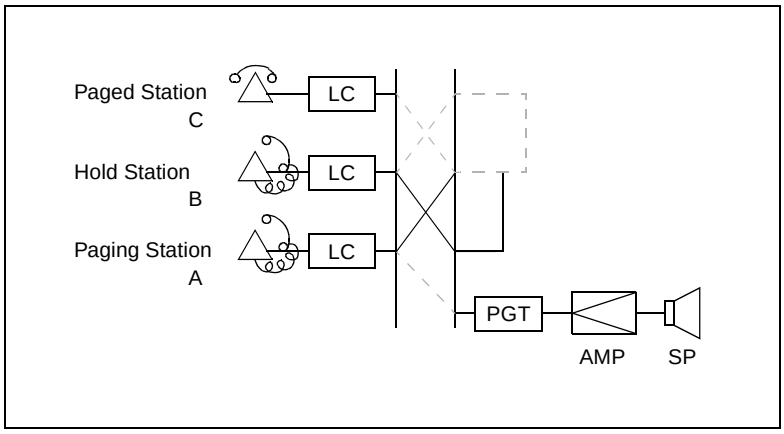


START

- Dial the paging access code
  - Station “A”/ATTCON dials the paging access code and hears CRBT (Continuous Ringback Tone).
  - In about 1 second, CRBT stops.
- Speaker Paging — Check whether speaker paging is possible after CRBT has stopped.
- Release — Station “A” goes on-hook or the ATTCON depresses the CANCEL key.

END

NAP-200-040
Sheet 1/2
Connection Test-Paging Trunk for Paging Transfer Service



- Paging Transfer Service can be selected according to System Data (SYS1, INDEX 73).
  1. Non-Delay System
  2. Delay and Non-Delay System
  3. Paging Transfer Supervision

START

Call the Paging Trunk

- Stations “A” and “B” are engaged in a station to station connection.
- Station “A” makes a Switch Hook Flash (SHF) and hears SPDT. Station “B” is held on the line.
- Station “A” dials the paging access code and hears CRBT. In about 1 sec., CRBT is no longer heard and Station “A” is able to page through the loudspeaker.

The paging party

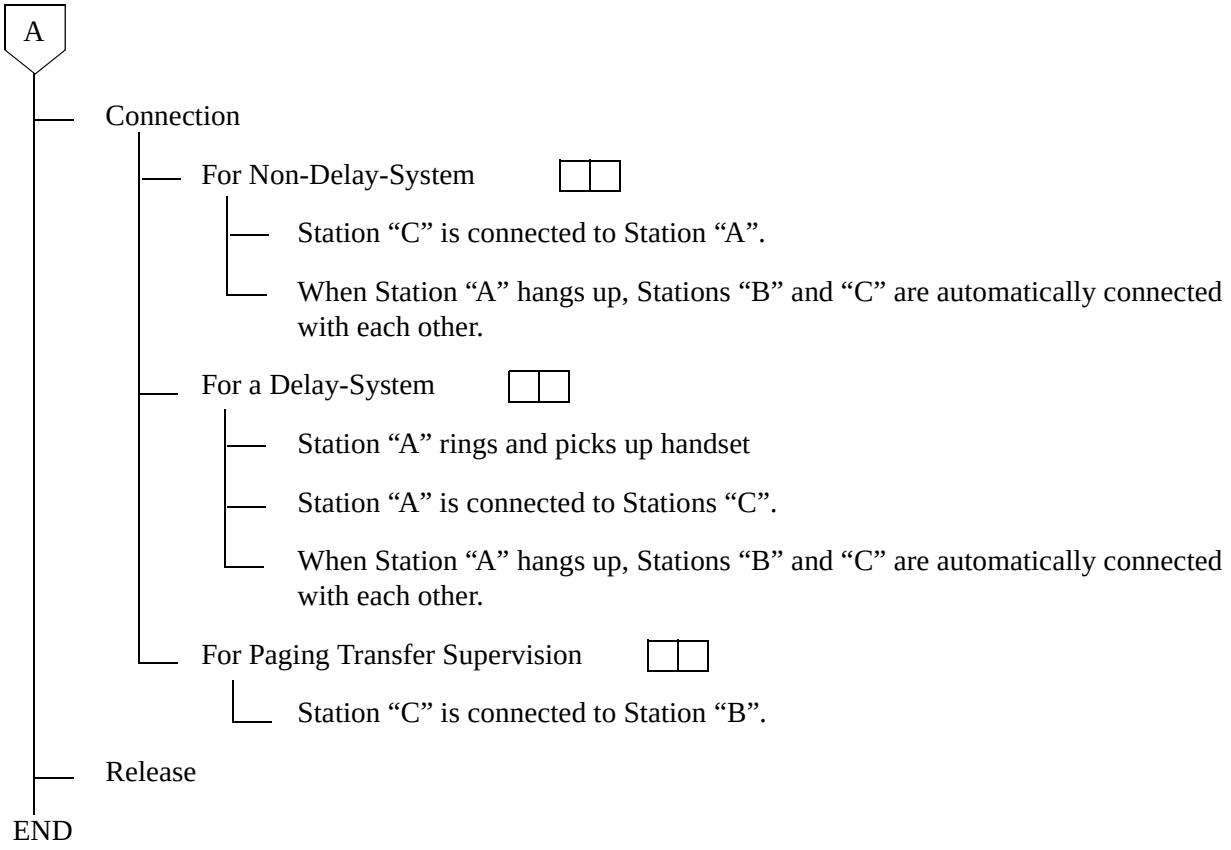
- For a Non-Delay System:
  Station “A” remains on hold.
- For a Delay System with Paging Transfer Supervision:
  Station “A” hangs up.

The paged party answers

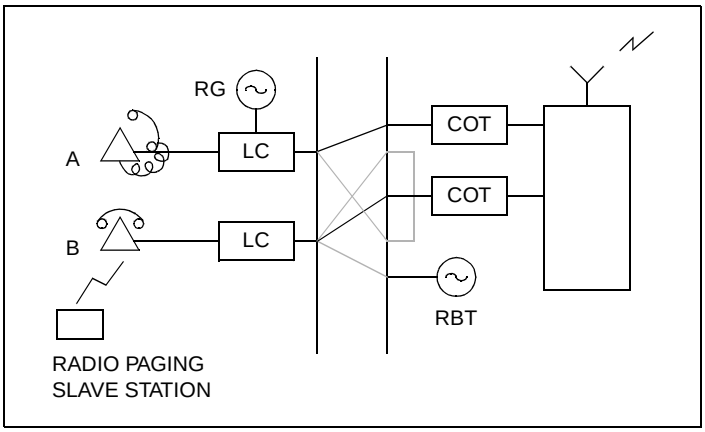
- Station “C” (the paged party) dials the paging access code (answer).

A

NAP-200-040
Sheet 2/2
Connection Test-Paging Trunk for Paging Transfer Service



NAP-200-041
Sheet 1/1
Radio Paging Trunk (COT Card) Connection Test

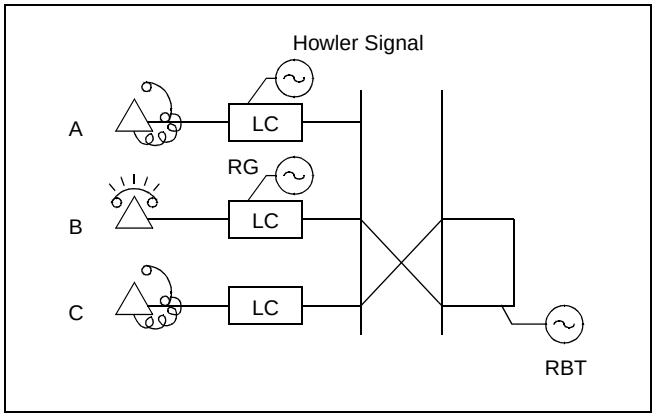


START

- Call the Radio Paging Equipment
  - Station “A” dials the radio paging access code and hears Special Dial Tone from the Radio Paging Equipment, then dials the slave station number.
  - The paging radio of the slave station starts ringing.
  - By hearing CRBT (Continuous Ring Back Tone) from the Radio Paging Equipment, Station “A” confirms that the slave station is being paged, then goes on-hook.
- The paged party answers
  - The slave station (the radio-pages party) dials the paging answer code at the nearby Station “B”, hears SPDT through the Radio Paging Equipment, then dials the paging answer code.
  - Station “A” rings and picks up the handset.
  - Confirm that Stations “A” and “B” can talk with each other.
- Release
  - Stations “A” and “B” both go on-hook.

END

NAP-200-042
Sheet 1/2
Howler & Ringing Signal Test



Test Outline:

The Howler Tone Generator and the Ringing Generator are equipped on the PWR Supply.
The purpose of the test is to confirm ringing signal by setting up a station to station connection and a howler tone connection from a station accommodated in any PIM.

START

- Check PWR0 in each PIM.
  - While both PWR Supplies are OFF, turn power to PWR0 ON. Leave PWR1 OFF.
  - Check howler tone. [*]
    - A station accommodated in the PIM for which the PWR Supply is to be tested goes off-hook. (analog port only)
    - The station hears DT.
    - In about 12 seconds, the station hears ROT.
    - About 30 seconds later, the station should confirm hearing howler tone.
  - Check ringing signal. [*]
    - Set up a station-to-station connection between two stations accommodated in the IM inm which the PWR Supply is to be tested. (analog port only)
    - Confirm that ringing signal is sent out.

A

NAP-200-042
Sheet 2/2
Howler & Ringing Signal Test

A

- Check PWR1 in each PIM.
  - While both PWR Supplies are OFF, turn power to PWR1 ON. Leave PWR0 OFF.
  - Check howler tone. * ☐
    - A station accommodated in the PIM for which the PWR Supply is to be tested goes off-hook. (analog port only)
    - The station hears DT.
    - In about 12 seconds, the station hears ROT.
    - About 30 seconds later, the station should confirm hearing howler tone.
  - Check ringing signal. * ☐
    - Set up a station-to-station connection between two stations accommodated in the IM inm which the PWR Supply is to be tested. (analog port only)
    - Confirm that ringing signal is sent out.

END

5. OVERALL TEST

5.1 Outline

Tests are to be performed to check C.O. Lines and/or Tie Lines by connecting them to a trunk on an individual basis.

The speech path conditions (speech level, presence of noise, one-way speech, no speech, etc.) over the connection to the distant office will be checked. Release of the trunk used will also be checked.

5.2 Overall Test Procedure

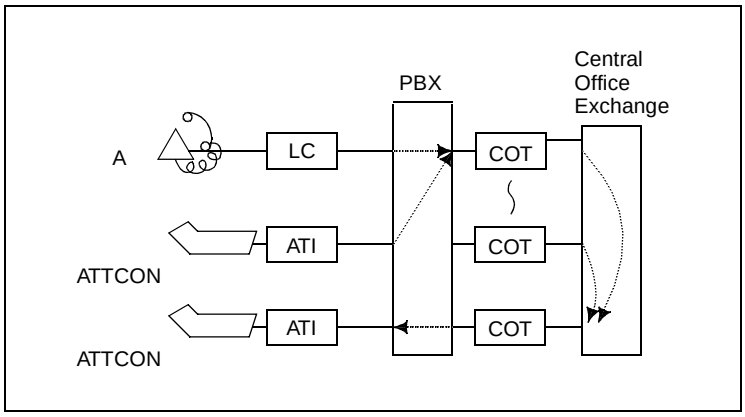
The procedure for performing the Overall Test is described in the NAPs indicated to the right of each item in the following flowchart.

START

- Overall Test of C.O. Line Outgoing Call: NAP-200-043
- Overall Test of C.O. Line Incoming Call: NAP-200-044
- Overall Test of CCIS Tie Line Outgoing Call: NAP-200-045
- Overall Test of CCIS Tie Line Incoming Call: NAP-200-046
- Test of Connection Alternate Routing to All Tie Lines: NAP-200-047
- Test of Tandem Connection to Tie Line: NAP-200-048
- PAD Setting: NAP-200-049

END

NAP-200-043
Sheet 1/1
Overall Test for C.O. Line Outgoing Call

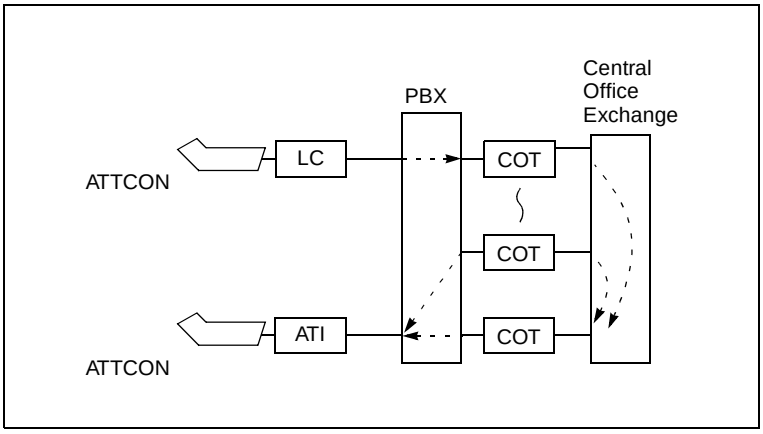


START

- Seizure of trunk to be tested
  - When seizing from a station
    - Place the trunk to be tested into idle state, and make all other trunks busy.
    - Station “A” dials the trunk access number.
    - Station “A”, after hearing dial tone from the C.O., dials the pilot number for the local office and allows the call to be terminated to that office via loop-back at the C.O.
  - When seizing from an ATTCON
    - An ATTCON sets up the connection with a specific trunk designated via Individual Trunk Access service.
    - The ATTCON, after hearing dial tone from the C.O., dials the pilot number for the local office and allows the call to be terminated to that office via loop-back at the C.O.
- Call termination to ATTCON
  - The call looped back at the C.O. terminates to the ATTCON.
- Check of speech conditions
  - After the call has been answered at the ATTCON, check the speech conditions including speech level, presence of noise, and one-way speech state.
- Release
- When all COTs have been checked and a fault is detected.
  - Perform a trunk loop-back test at the C.O., and determine whether the trunk side or the C.O. Line side is faulty.
  - If the C.O. Line is faulty, make a request to the C.O. for repair.

END

NAP-200-044
Sheet 1/1
Overall Test for C.O. Line Incoming Call



Test Outline:

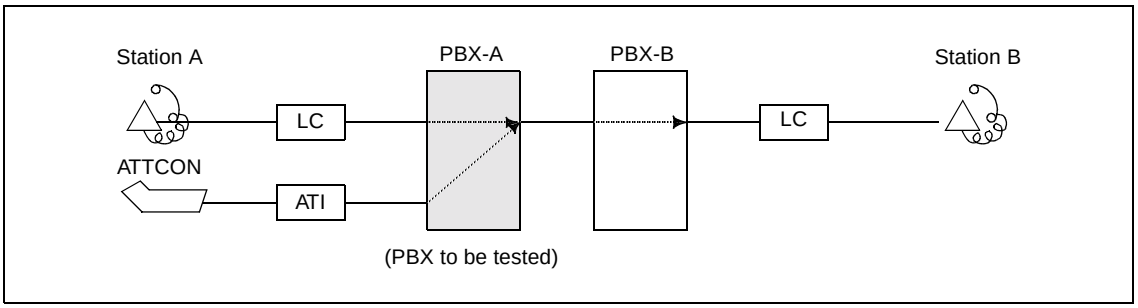
The tests comprising this NAP are to be performed according to the C.O. Line Number Table provided by the C.O. If the C.O. Line Numbers are not known, tests cannot be performed because loop-back cannot be performed at the C.O.
In addition, tests cannot be performed which involve Direct Inward Dialing. Under such circumstances, the C.O. must be asked to perform an incoming test.

START

- Seizure of trunk to be tested
  - From the ATTCON, set up a connection with a specific trunk designated via Individual Trunk Access.
  - After hearing dial tone from the C.O., dial the C.O. Line number of the trunk being tested from the ATTCON.
- Call termination to ATTCON
  - The call looped back at the C.O. terminates to the ATTCON.
- Speech Condition Check
  - After the call has been answered at the ATTCON, check the speech conditions including speech level, presence of noise, and one-way speech.
- Release
- When all COT trunks have been checked and a fault is detected.
  - Perform a trunk loop-back test at the C.O. and identify whether the trunk side or the C.O. Line side is faulty.
  - If the C.O. Line side is faulty, make a request to the C.O. for repair.

END

NAP-200-045
Sheet 1/2
Overall Test of CCIS Tie Line Outgoing Call



START

- Seizure of trunk to be tested
  - When seizing from a station
    - Place the trunk to be tested into idle state, and make busy all other trunks.
    - Station “A” dials the number for station “B” in the PBX-B
  - When seizing from an ATTCON
    - An ATTCON sets up the connection with a specific trunk designated by Individual Trunk Access for CCIS TRK service and dials the number for Station “B” in the PBX-B.
- Call termination to Station “B” in the PBX-B
  - The call terminates to Station “B” via a CCIS Tie Line.
- Check of speech conditions
  - After the call has been answered at the ATTCON, check the speech conditions including speech level, presence of noise and one-way speech state.
- Release
- When all CCIS Tie Line Trunks have been checked and a fault has been detected
  - Perform fault localization procedure when a fault has occurred to CCIS Tie Line (See Procedure A).
  - If the distant office is faulty, make a request to the distant office for repair.

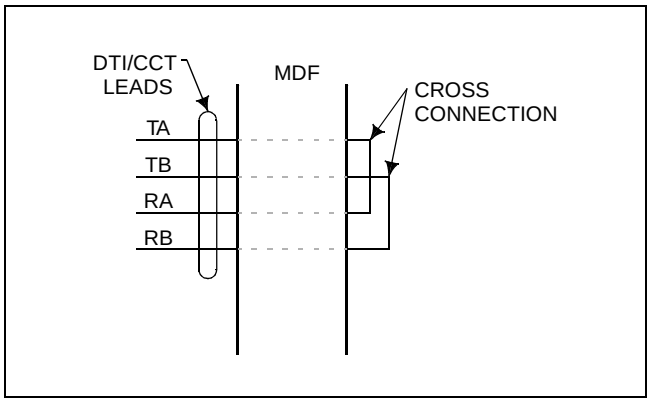
END

NAP-200-045
Sheet 2/2
Overall Test of CCIS Tie Line Outgoing Call

(Procedure A)

START

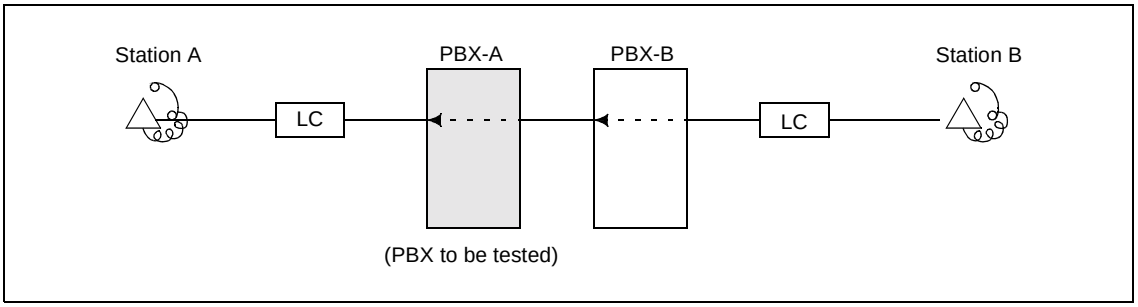
- On the DTI/CCT card, set its MB switch UP.
- In any office other than the Primary Office (Clock-Source-Office), disconnect the DTI/CCT cable connector at the DTI/CCT side (Backplane of PIM)
  - PLO alarm is generated, but ignore it.
  - The PLO starts running by itself.
- Make the following connection at the MDF using a paired wire.



- The DTI does not recover. (CCH/CCT Link Failure may occur, but ignore it.)
  - System message “3-J” is not displayed.
  - The DTI/CCT is faulty.
- The DTI recovered. (CCH/CCT Link Failure may occur, but ignore it.)
  - System message “3-J” is displayed.
  - The DTI/CCT is normal.
  - Call the distant office and ask for repair.

END

NAP-200-046
Sheet 1/1
Overall Test of CCIS Tie Line Incoming Call



START

- Seizure of trunk to be tested — Place the trunk to be tested into idle state, and make busy all other trunks.
- Termination of incoming call to station “A” in the self office — An incoming call from the distant office terminates to Station “A”.
- Check of speech — After the call has been answered at Station “A”, check the speech conditions including speech level, presence of noise and one-way speech state.
- Release
- When all CCIS Tie Line Trunks have been checked and a fault has been detected
  - Perform fault localization procedure when a fault has occurred to CCIS Tie Line. (See Procedure A of NAP-200-045.)
  - If the distant office is faulty, make a request to the distant office for repair.

END

NAP-200-047
Sheet 1/2
Test of Connection and Alternate Routing to All Tie Lines

START

- Test the trunks in the primary route one at a time.
  - Make busy all trunks in the primary route except the trunk to be tested.
  - Station “A” calls Station “B” via the primary route.
  - After Station “B” answers, check the normality of the speech condition including the speech level, presence of noise, and one-way speech.
  - Release.
- Make all the trunks in the primary route busy.
- Test the trunks in the alternate route one at a time.
  - Make busy all trunks in the alternate route except the trunk to be tested.
  - Station “A” calls Station “B” via the alternate route.
  - After Station “B” answers, check the normality of the speech condition including the speech level, presence of noise, and one-way speech.
  - Release.
- Cancel the Make Busy condition of the trunks.

END

NAP-200-047
Sheet 2/2
Test of Connection and Alternate Routing to All Tie Lines

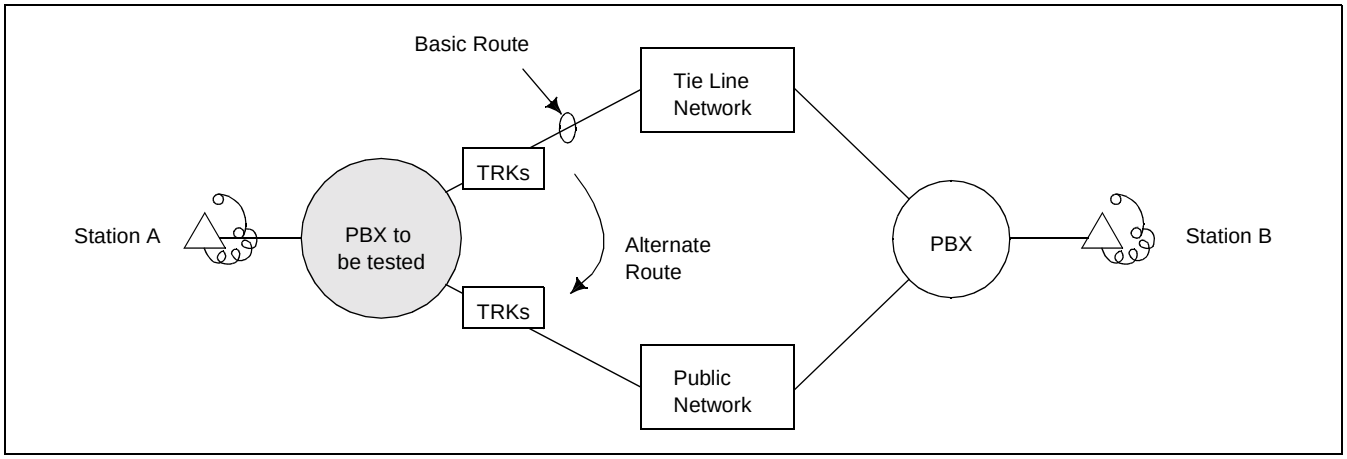


Figure 047-1 Combination of Tie Line Network and Public Network

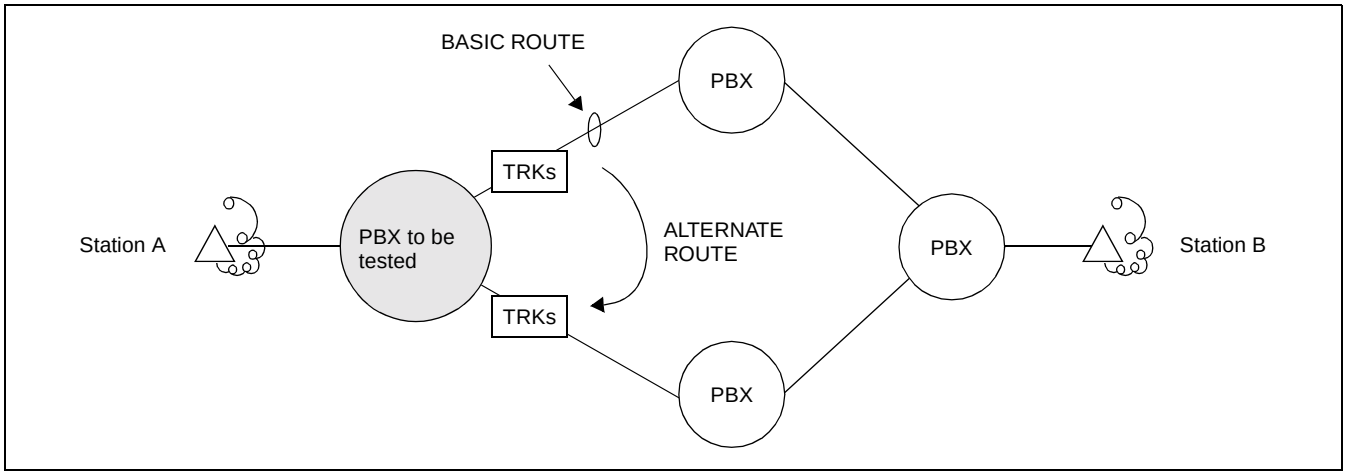


Figure 047-2 Tie Line Network

NAP-200-048
Sheet 1/2
Test of Tandem Connection to Tie Line

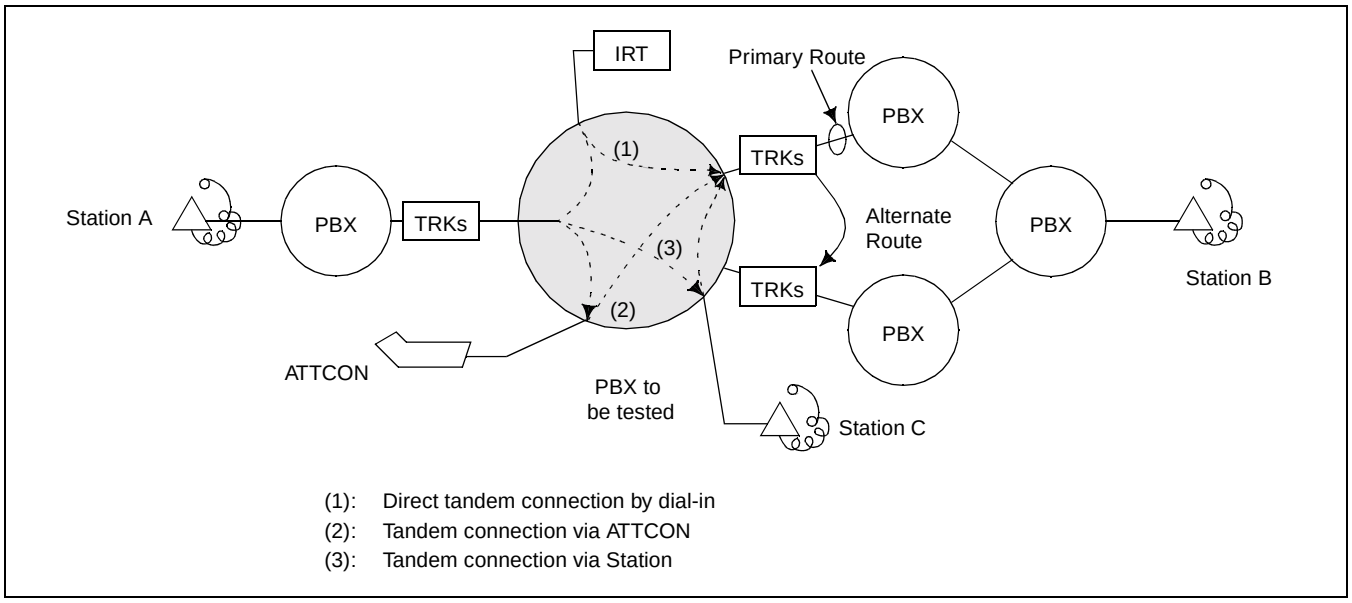


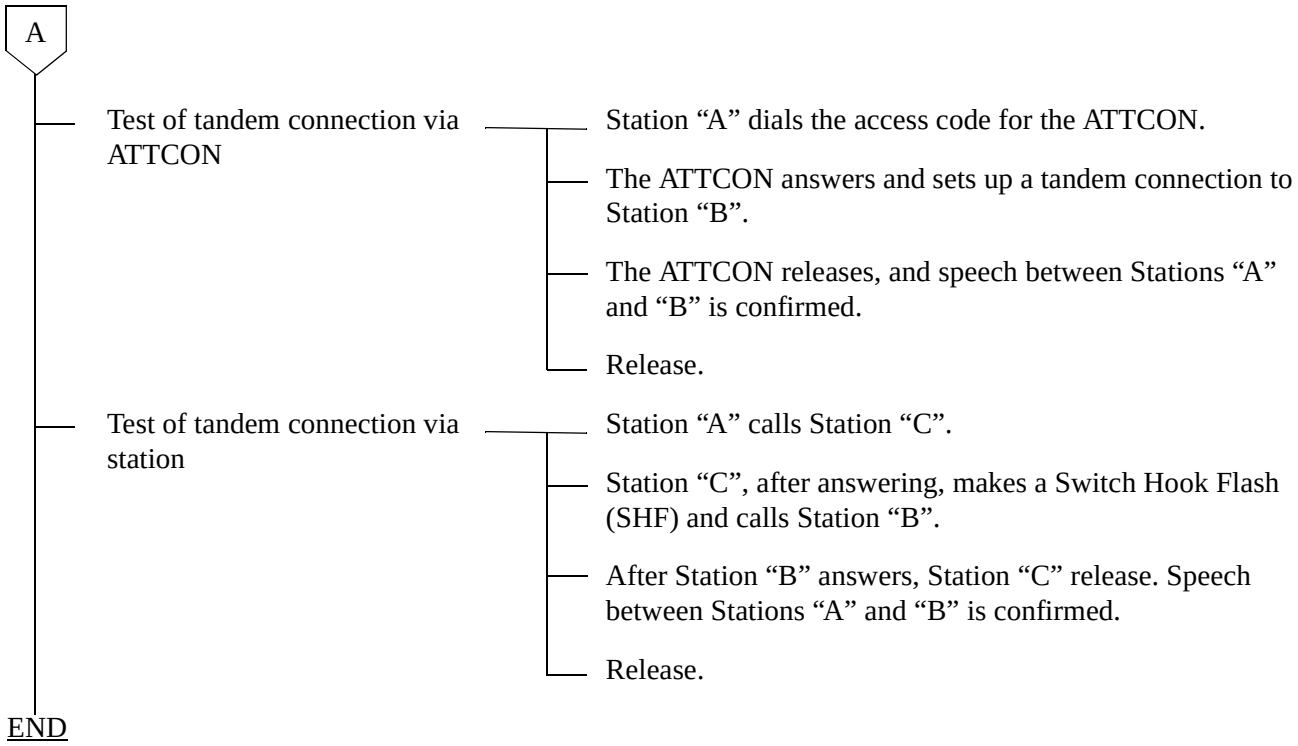
Figure 048-1 Test of Tandem Connection to Tie Line

START

- Test of direct dial-in tandem connection
  - Test of Primary Route
    - Station “A” calls Station “B”.
    - Confirm speech between Stations “A” and “B”.
    - Release.
  - Test of Alternate Route
    - Make busy all the trunks in the primary route.
    - Station “A” calls Station “B”.
    - Confirm speech between Stations “A” and “B”.
    - Release.
    - Un-busy (make idle) all the trunks.

A

NAP-200-048
Sheet 2/2
Test of Tandem Connection to Tie Line



NAP-200-049
Sheet 1/2
PAD Setting

For the PBX, PADs can be set according to the connecting status of the Tie Line involved.

(a) For an outgoing/incoming call via a Tie Line:

- Via MAT command “ARTD” and switch settings on the TLT circuit card.

(b) For a tandem Tie Line connection:

- Via command “APAD” or switch settings on the TLT circuit card(s).

At both the originating and terminating offices, an 8 dB PAD is set for the EMT route via the “ARTD” command or switch settings. At the tandem office, a 4 dB PAD is set for the terminating and originating sides of each EMT route via command “APAD”.

Through this arrangement, an 8 dB PAD is in service for outgoing and incoming connections, and 4 dB PADs are in service for each line in a tandem connection (total: 8 dB). This arrangement is shown in Figure 049-1

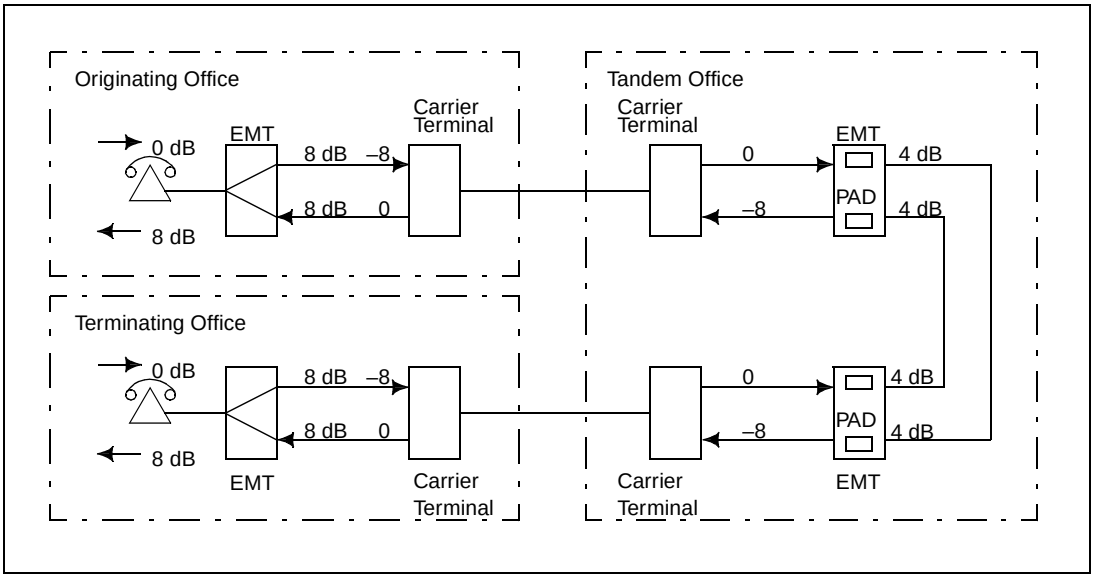


Figure 049-1 Example of PAD Setting

NAP-200-049
Sheet 2/2
PAD Setting

When setting up a No. 7 CCIS Network, PAD setting differs from that in the analog network.

(c) For an outgoing call to/incoming call from a Tie Line:

- Via “ARTD” command.

(d) For a tandem Tie Line connection:

- Via “APAD” command.

At both the originating and terminating offices, 0 dB is set to the outgoing side and 8 dB is set to the terminating of the DTI/CCT route via “ARTD” command.

At the tandem office, 0 dB is set for both the terminating and originating sides of each DTI/CCT route via “APAD” command.
This arrangement is shown in Figure 049-2.

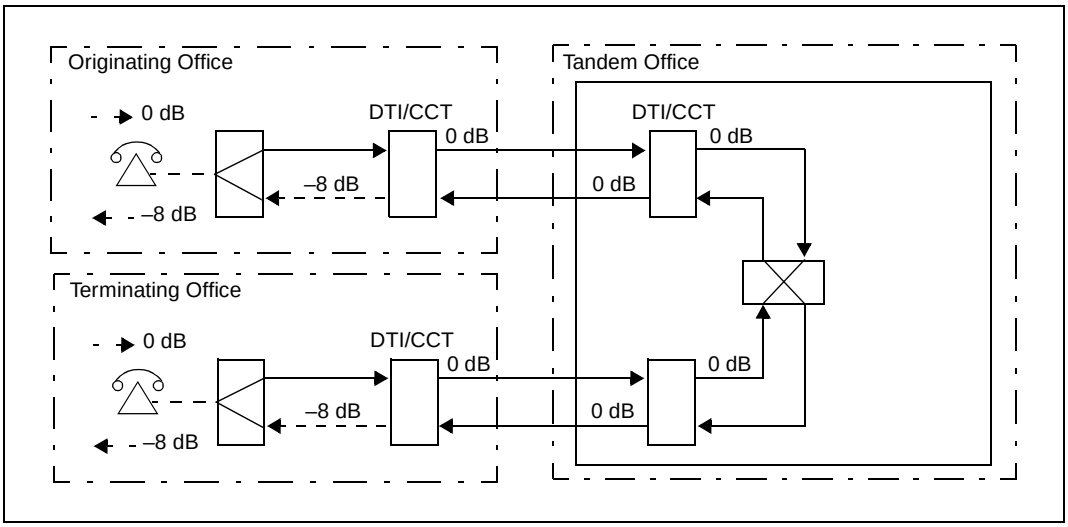


Figure 049-2 Example of PAD Setting for CCIS

CHAPTER 6 FAULT RECOVERY DURING TESTS

1. GENERAL

The fault recovery procedures described in this Chapter are used when a connection cannot be established in the normal manner or an abnormal connection is discovered as a result of the tests designated in Chapter 4, "SYSTEM STARTUP", and Section 2., "BASIC CONNECTION TEST" of CHAPTER 5.

2. OUTLINE OF PROCEDURE FOR FAULT RECOVERY

The procedures for performing fault recovery are described in the NAPs indicated to the right of each item in the following flowchart.

START

- Abnormal Lamp Indication After System Startup: NAP-200-050
- Faulty DT (Dial Tone) Connection: NAP-200-051
- Faulty Station To Station Connection: NAP-200-052

END

NAP-200-050
Sheet 1/2
Abnormal Lamp Indications After System Startup

START

- Check conducted when the OPE lamp (Green) does not turn ON on any circuit cards mounted in a PIM
  - Using MAT command “AUNT”, check whether UNIT data has been assigned.
  - Replace the TSW/MUX card in the PIM with a spare.
  - Check whether the flat cable connected to the “BUSXX” terminal on the PIM backplane is securely connected.
  - A PIM will occasionally malfunction due to a single circuit card mounted in the PIM. Therefore, check the circuit cards via the following steps:
    - Extract all circuit cards from the PIM other than the TSW/MUX and the PWR Supplies.
    - Insert one circuit card into its mounting slot and see if its OPE lamp turns ON. Repeat this procedure for the remaining circuit cards.
- Check conducted when the OPE lamp (Green) does not turn ON on a Line Circuit card
  - Confirm that the MB switch of the circuit card is DOWN.
  - Using command “ASDT”, check whether station data is assigned to the circuits on the card.
  - Replace the card with a spare.
- Check conducted when OPE lamp of a Line Circuit card illuminates, but the BL lamp (Red) for an individual line flashes
  - Using command “MBST”, confirm that the specific line is not in Make Busy state.
  - Using command “ASDT”, check whether station data has been assigned to the line circuit.
  - Replace the circuit card with a spare.

A

NAP-200-050
Sheet 2/2
Abnormal Lamp Indications After System Startup

A

- Check conducted when the OPE lamp (Green) does not turn ON on a Trunk circuit card.
  - Confirm that the MB switch of the circuit card is DOWN.
  - Using command “ATRK”, check whether Trunk data has been assigned for the circuits on the card.
  - Replace the circuit card with a spare.
- Check conducted when the OPE lamp of a Trunk circuit card turns ON, but the BL lamp (Red) for an individual circuit flashes.
  - Confirm that the MB switch for each circuit of the card is OFF.
  - Using command “MBTK”, confirm that the trunk circuit is not in Make Busy state.
  - Using command “ATRK”, check whether trunk data has been assigned for the trunk circuit.
  - Replace the circuit card with a spare.
- Perform the following check before replacing a circuit card which is considered defective with a spare.
  - Confirm the switch settings on the circuit card.
  - Poor contact at the connector portion of the circuit card may be responsible for the malfunction. Check the circuit card once again by inserting and extracting it two or three times.

END

NAP-200-051
Sheet 1/1
DT (Dial Tone) Connection Fault

START

- Dial tone is not heard.
  - On the MDF, check the cross connections between the telephone and the corresponding line circuit.
  - Check whether the LT cable is securely connected to the PIM.
  - Replace the LC card with a spare.
- DT cannot be heard from one or more lines of the same circuit card.
  - Replace the LC card with a spare.
- DT cannot be heard from the lines accommodated by a specific PIM.
  - Check the switch settings on the TSW/MUX circuit card.
  - Replace the TSW/MUX card with a spare.
  - Check the switch settings on the TSW circuit card.
  - Replace the TSW card with a spare.
  - Check whether the “MT24 TSW” cable is securely inserted to the connectors on the front edge of TSW and MUX cards.

END

NAP-200-052
Sheet 1/2
Station to Station Connection Fault

START

- Dial Tone (DT) is still heard after a digit is dialed (cannot break dial tone)
  - A specific RST card is involved
  - A specific LC card is involved
  - A specific UNIT card is involved
  - Entire System is involved
- Reorder Tone (ROT) is heard after a station number is dialed.
  - Using MAT command “ANPD/ANPDL/ANPDN,” check “Necessary Number of Digits” data.
  - Using command “ASPA/ASPAL/ASPAN,” check “Special Number” data.
  - Using command “ASDT,” check “Station” data.
  - Using command “ATNR,” check “Tenant Restriction Class” data.
- Ring Back Tone (RBT) is heard, but the bell at the called station remains silent.
  - Check whether the called station is assigned the correct LENS data in command “ASDT.”
  - When all the stations accommodated in a specific PIM do not ring, replace the PWR circuit card with a spare.
  - If the fault involves one or more lines within the same LC circuit card, replace the LC card with a spare.

A

NAP-200-052
Sheet 2/2
Station to Station Connection Fault

A

After the call has been answered, noise is heard or the speech path is one-way.

- If the fault involves one or more lines within the same LC circuit card, replace the card with a spare.
- If the fault involves a specific PIM, replace either the MUX or TSW circuit card with a spare.
- If noise is heard throughout the entire system, replace the TSW circuit card with a spare.

END

CHAPTER 7 WORK AFTER INSTALLATION TESTS

This Chapter explains various kinds of work and site cleaning, etc. which the installer must perform after completion of installation tests so that the system can be cut over normally.

Upon completion of all the required tests, the technician must confirm or perform the following.

1. Office Data Management
2. Preparation of Test Result Reports
3. Mounting of the Front and Rear Covers
4. Attachment of Inter-frame Brackets
5. Site Cleaning

1. OFFICE DATA MANAGEMENT

This paragraph explains the method of creating backup of the Office Data and the method of protecting the Office Data.

The PBX executes various kinds of processing according to the results of access by the CPU to the Data Memory in which the Office Data are stored. If the contents of Data Memory become faulty. It may result in erroneous operation of the system or in a system down. If any part of the Office Data has been illegally changed, it may also bring about a trouble the same as in the case of a fault occurrence to the Data Memory.

Thus, upon completion of the installation tests, ensure to create backup of the Office Data and provide a proper measure of office data protection.

1.1 Preservation of Office Data

The following items be kept at the job site after the installation test has been completed for preservation of office data.

1. Office Data Programming Sheets

   Since the office data programming sheets should reflect the most up-to-date data at all times, entries into the office data programming sheets must be made in pencil.

2. Floppy Disks for Storing Data

   If a major change is made to the office data, especially a change involving System Data (command “ASYD/ASYDL/ASYDN”), the system may not function as expected afterward. To prepare for such an occurrence, an FD containing the office data before the change and one containing the data after the change should be kept on hand. The FD containing the data before the change allows the technician to restore the previous (running) condition if the system will not operate properly with the new data.

Note: *Cautions pertaining to Floppy Disks.*

(1) Do not place a heavy object on an FD or the FD will be damaged.

(2) When taking an FD out of its protective envelope, hold the top edge of the disk and gently pull it out.

(3) Do not expose the FD to direct sunlight or to a high temperature (above 65°C (150°F)).

(4) Do not pinch the FD with a clip.

(5) Do not touch the recorded surface of the floppy disk with bare hands; fingerprints left by bare hands will attract dust.

(6) Avoid cleaning of the floppy disk.

(7) Do not place the floppy disk near a magnet, etc. If an FD is exposed to a magnetic field of more than 50 Oe, the data on the disk is likely to be altered or destroyed.

(8) Do not bend the floppy disk.

(9) Do not apply force to outer edge of the floppy disk.

2. PREPARATION OF TEST RESULT REPORT

When submitting a report of test results to the end user or when performing test with customer's representatives attending, prepare Test Result Report and record the test results into the prepared Test Result Report.

3. MOUNTING OF THE FRONT AND REAR COVERS

When mounting the front cover and the rear cover of the PBX, follow the procedure below.

START

- Inspection — Set all MB switches back to their positions prior to the installation tests. Confirm that all circuit cards are mounted in the proper slots according to the Bayface Layout.
- Mounting of Side Covers — Referring to Figure 7-1 through Figure 7-3, mount the side covers onto the Modules and the Fan Unit.
- Mounting of Rear Covers
  - Modules — Referring to Figure 7-4 and Figure 7-5, mount the rear covers.
  - Fan Unit — Referring to Figure 7-6 mount the rear covers.
- Mounting of Front Covers
  - Modules — Referring to Figure 7-7 through Figure 7-9, mount the front cover (A).
- Check — Confirm that the mounted covers do not contact any of the cables, circuit cards, etc.

END

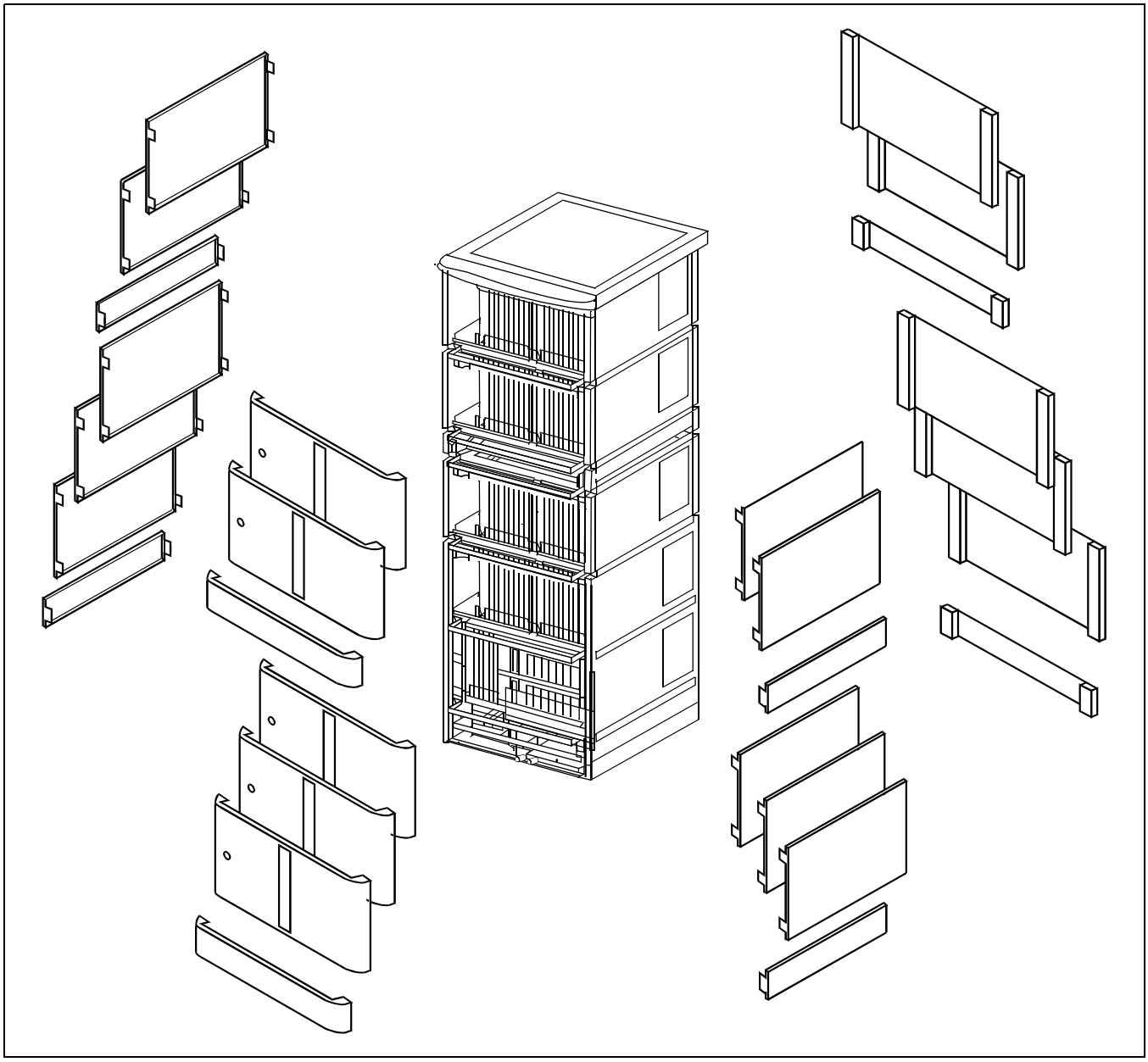


Figure 7-1 Mounting of the Covers

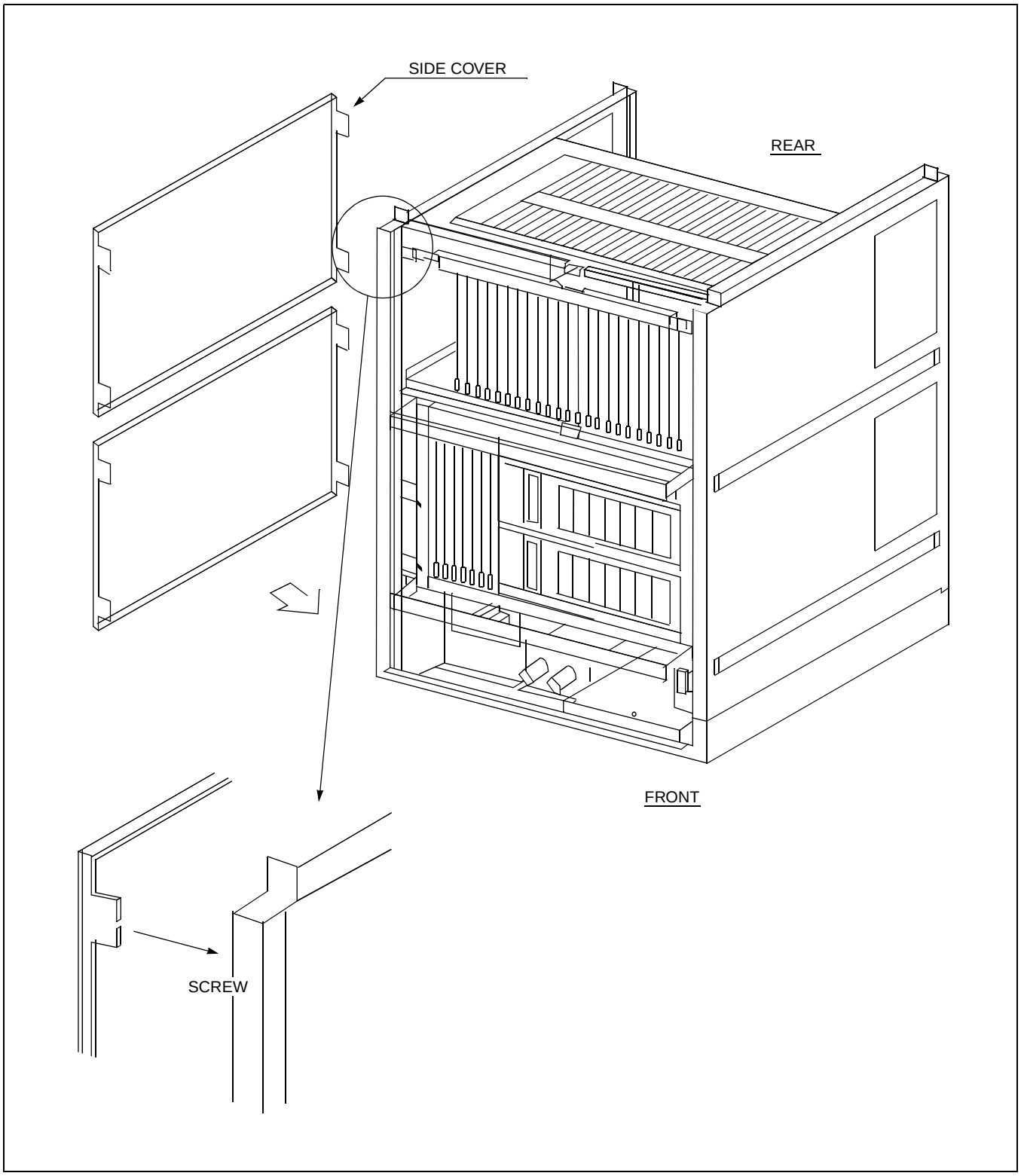


Figure 7-2 Side Cover Mounting Method (BASEU+LPR+PIM0)

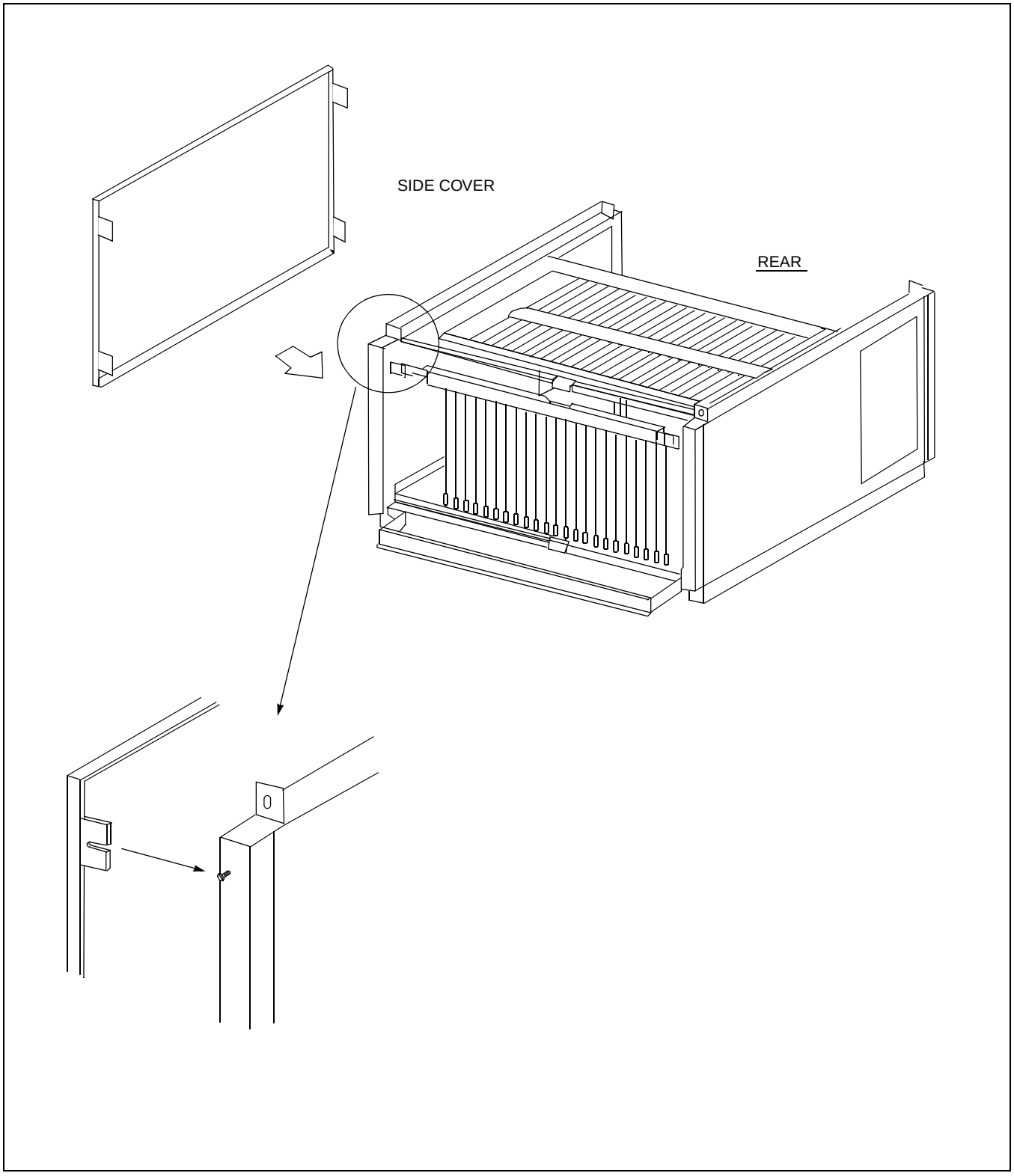


Figure 7-3 Side Cover Mounting Method (PIM)

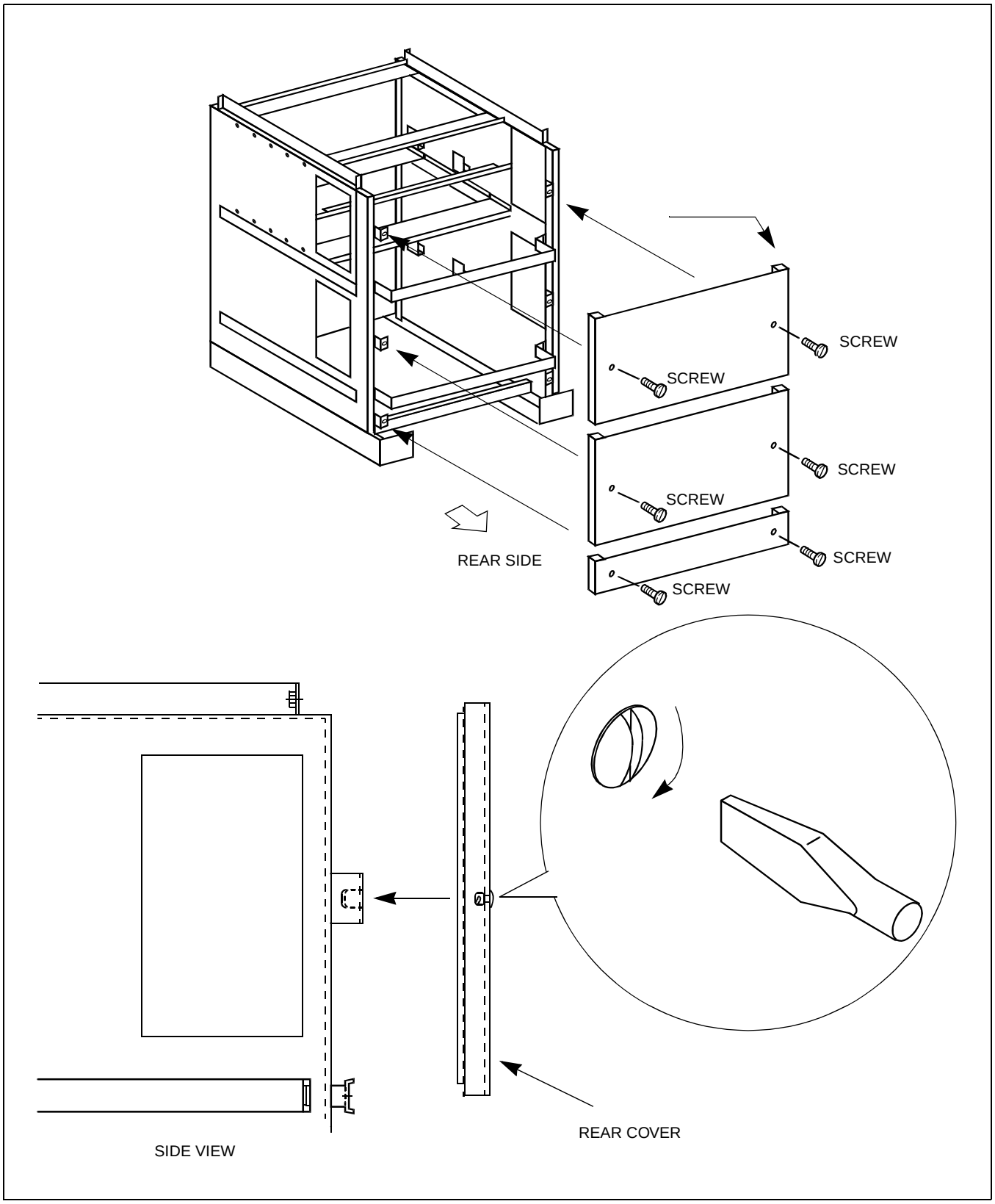


Figure 7-4 Rear Cover Mounting Method (BASEU+LPR+PIM0)

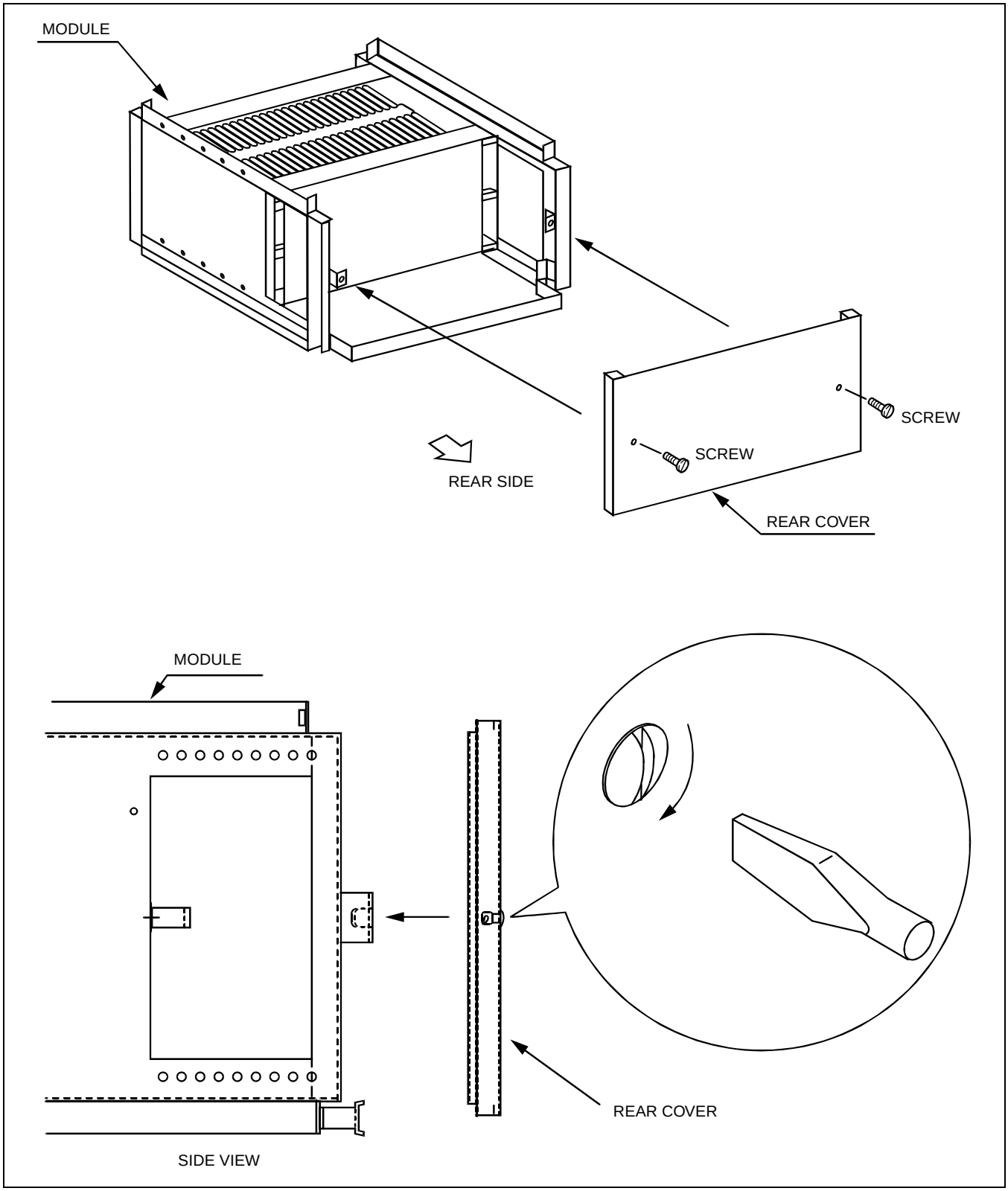


Figure 7-5 Rear Cover Mounting Method (PIM)

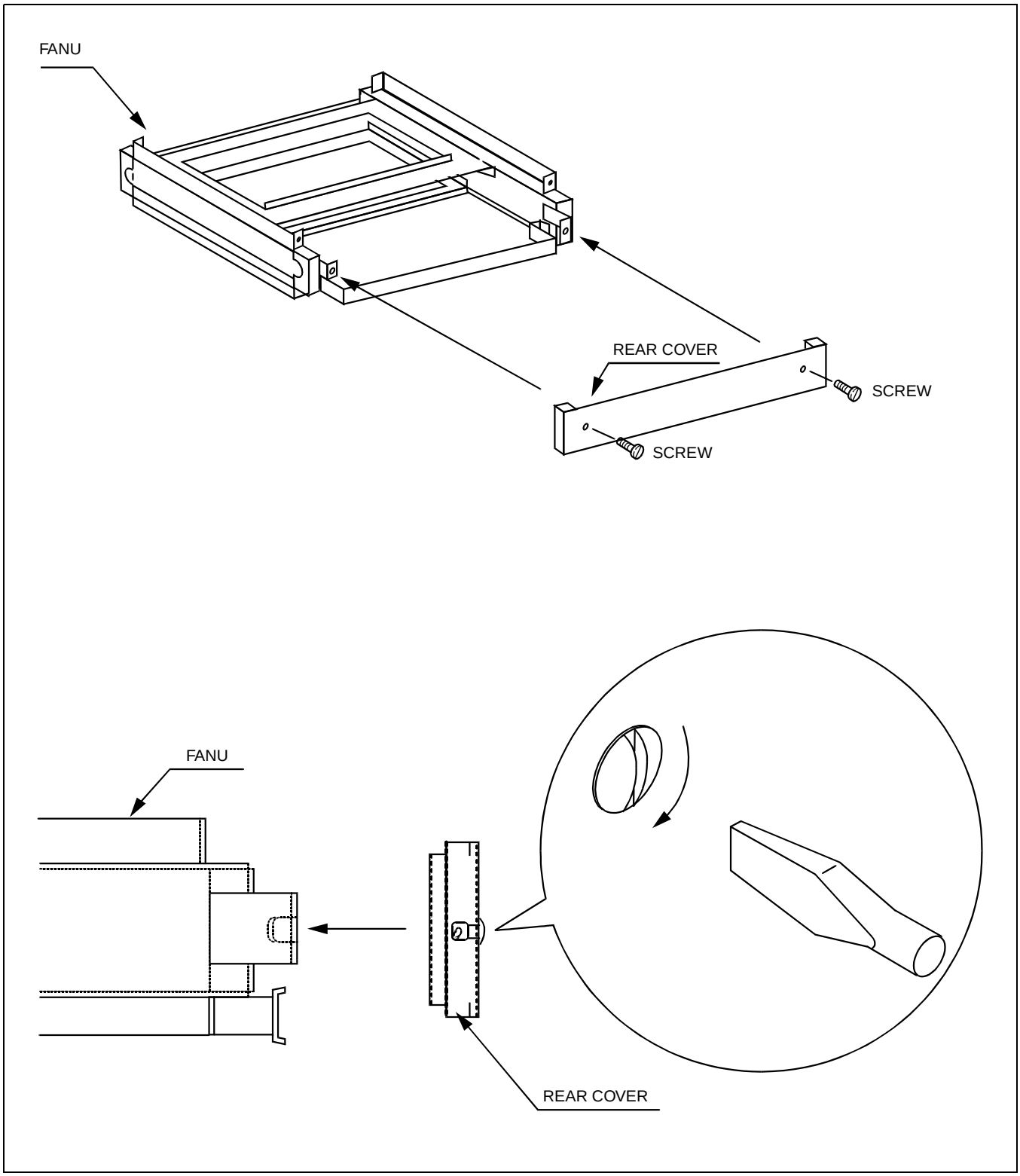


Figure 7-6 Rear Cover Mounting Method (FANU)

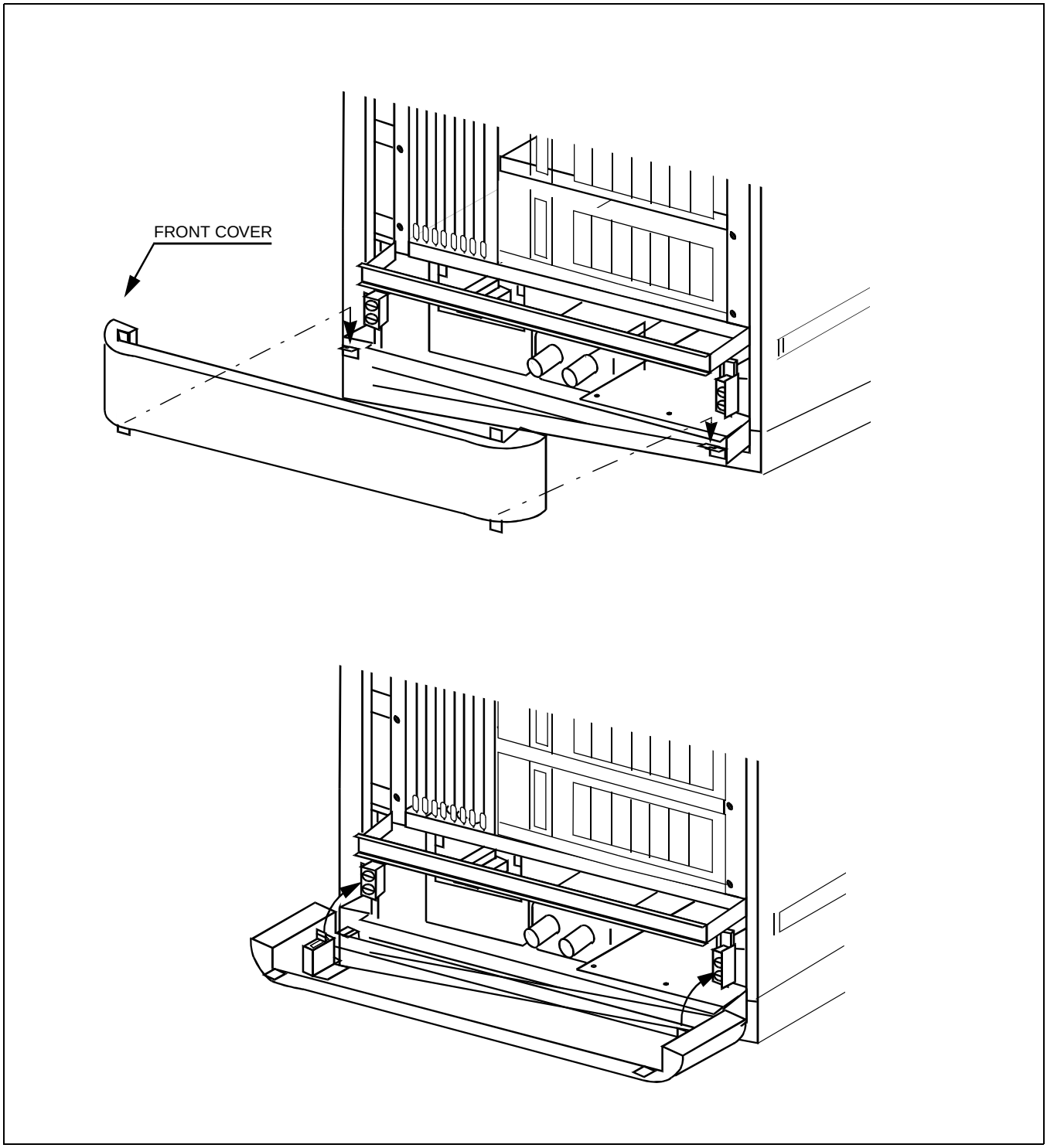
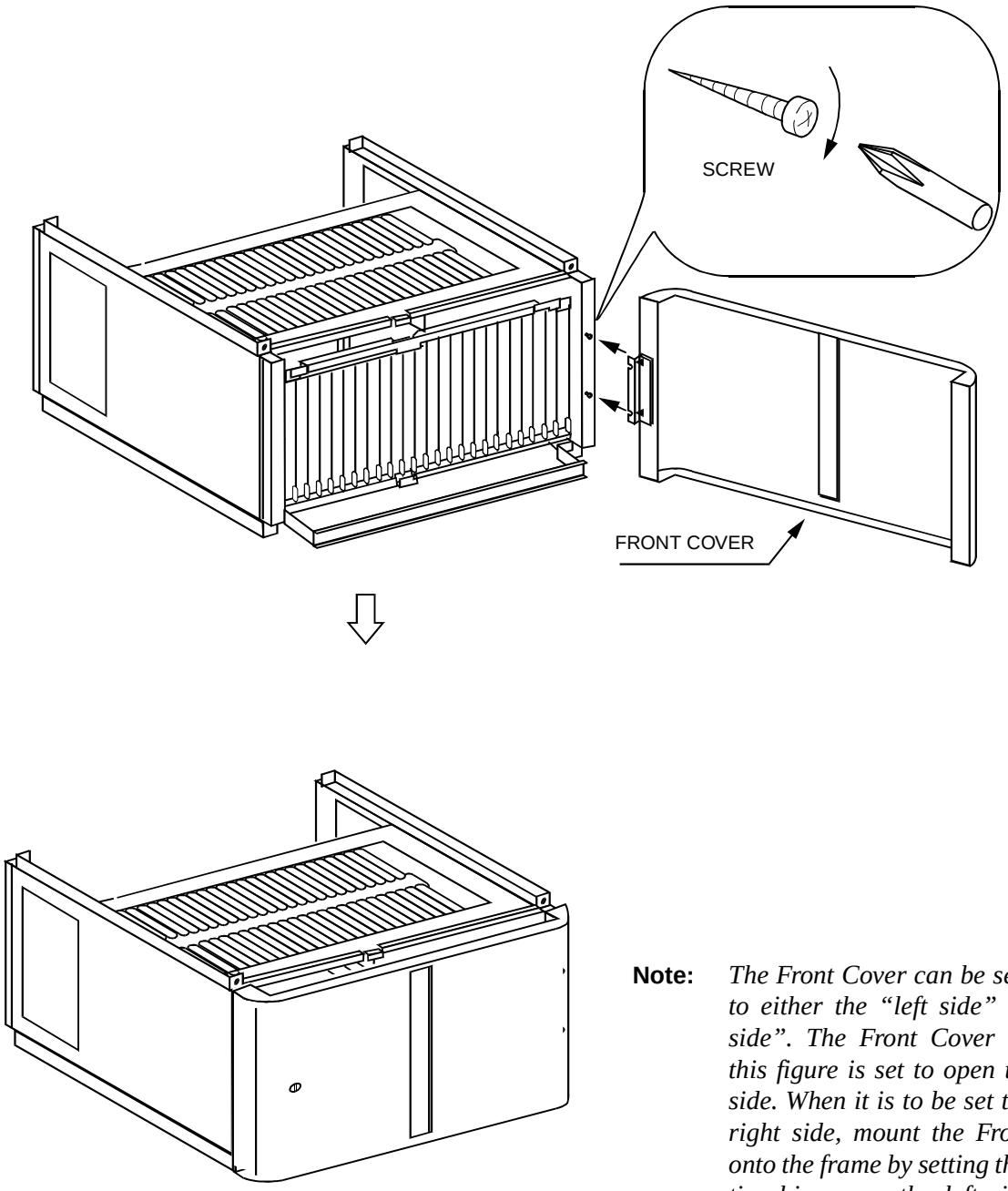


Figure 7-7 Front Cover Mounting Method (BASEU+LPR+PIM0)

Mount the Front Cover onto the module using screws.



Note: *The Front Cover can be set to open to either the "left side" or "right side". The Front Cover shown in this figure is set to open to the left side. When it is to be set to open to right side, mount the Front Cover onto the frame by setting the respective hinges on the left side of the frame and the Front Cover.*

Figure 7-8 Front Cover Mounting Method (PIM)

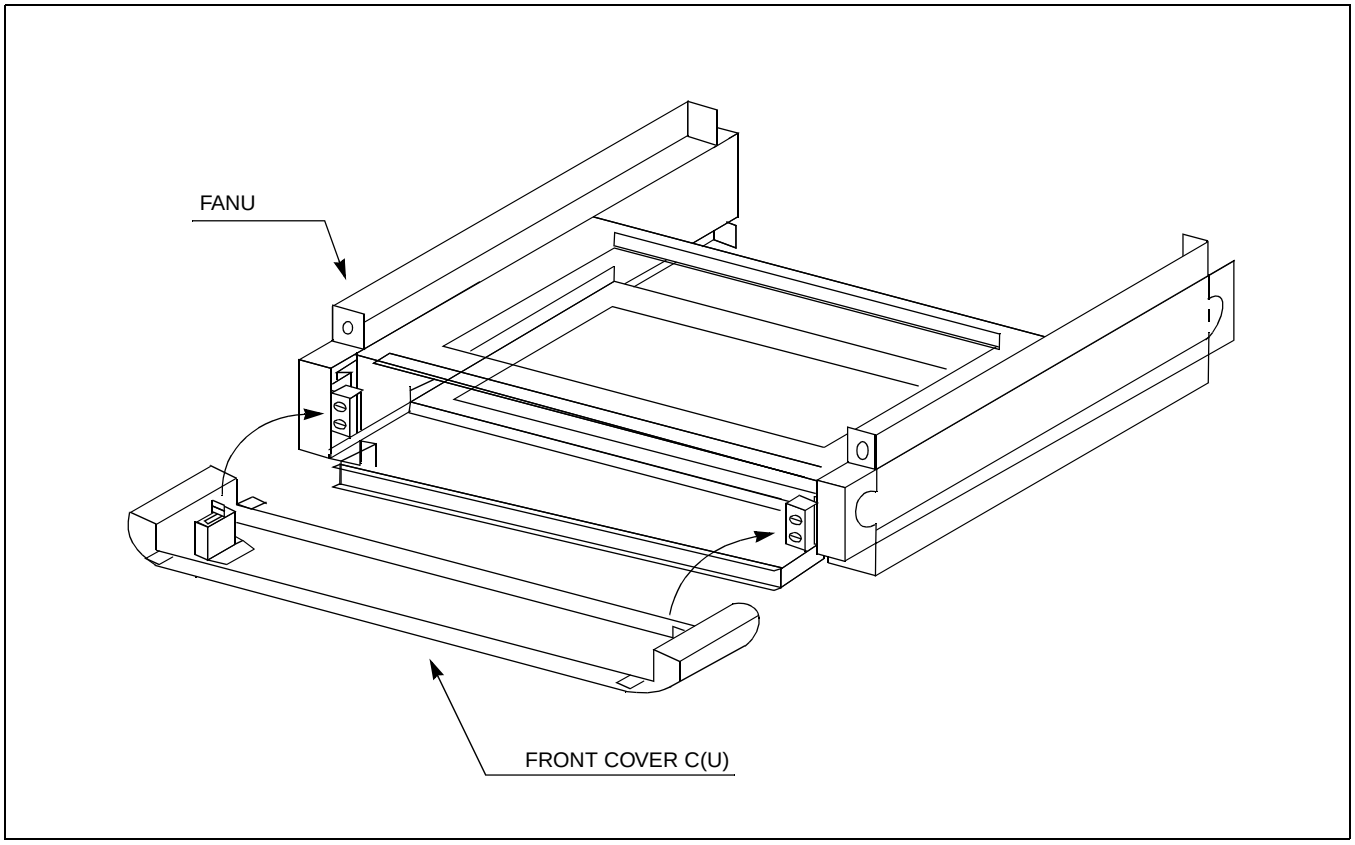


Figure 7-9 Front Cover Mounting Method (FANU)

4. ATTACHMENT OF INTER-FRAME BRACKETS

This section covers how to attach inter-frame brackets between the cabinets.

When the maximum four-IMG configuration is adopted, the inter-frame brackets should be attached in the following locations.

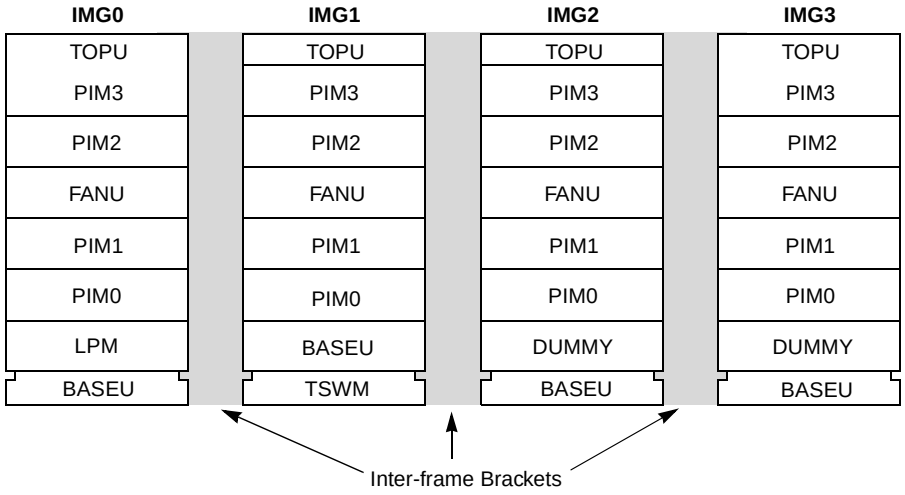
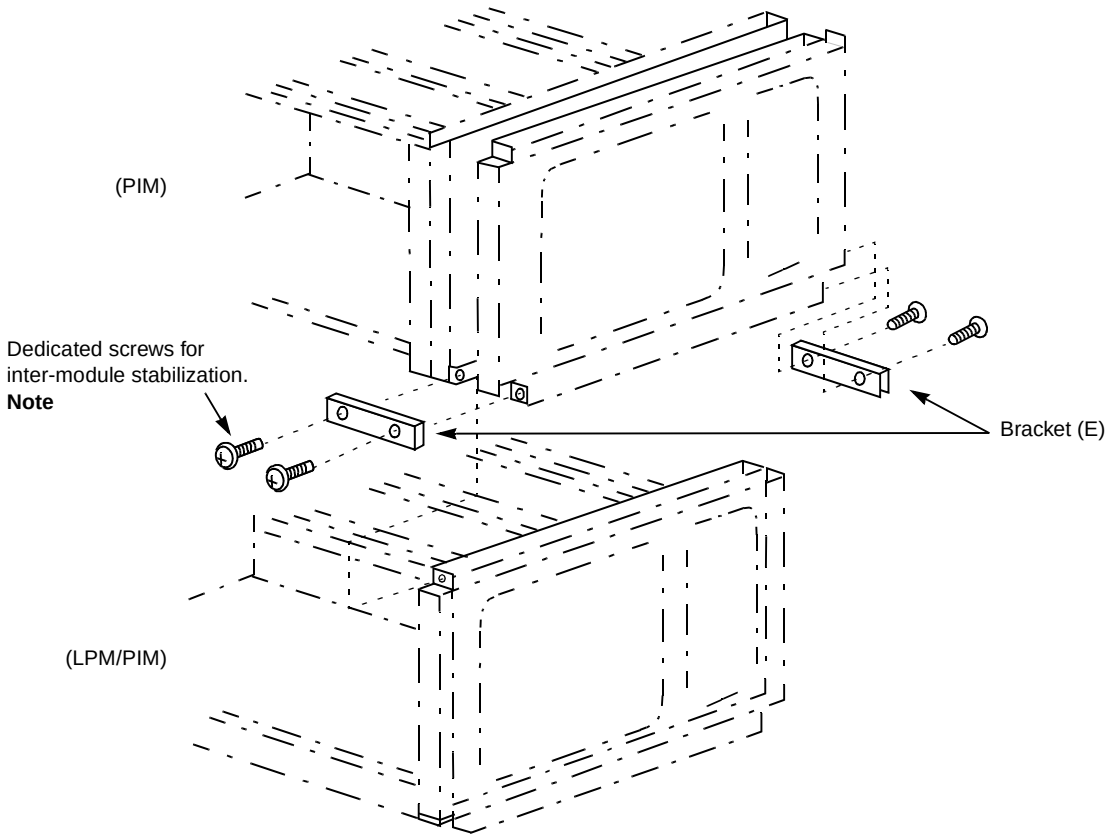


Figure 7-10 Locations of Inter-frame Brackets

<Attachment Procedure>

STEP 6: Referring to the Figure 7-11 through Figure 7-11, fix the brackets (E) between the modules.



Note: *These screws are appended when obtaining the module components from NEC.*

Figure 7-11 How to Attach Inter-frame Brackets

STEP 7: Referring to Figure 7-11 and Figure 7-11, fix the brackets (A) with the screws.

STEP 8: Referring to Figure 7-11 and Figure 7-11, fix the brackets (B) with the screws.

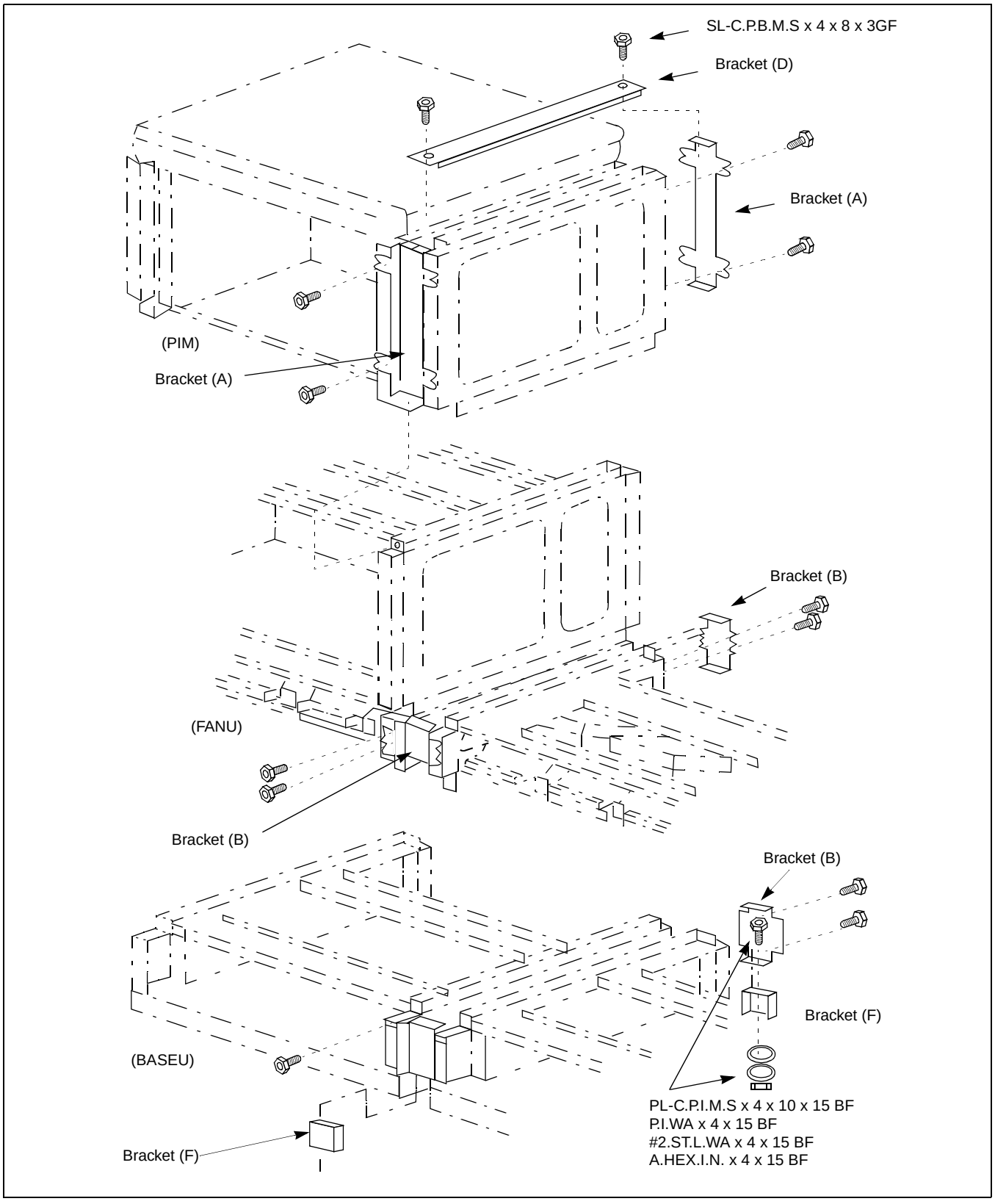


Figure 7-11 How to Attach Inter-frame Brackets (Continued)

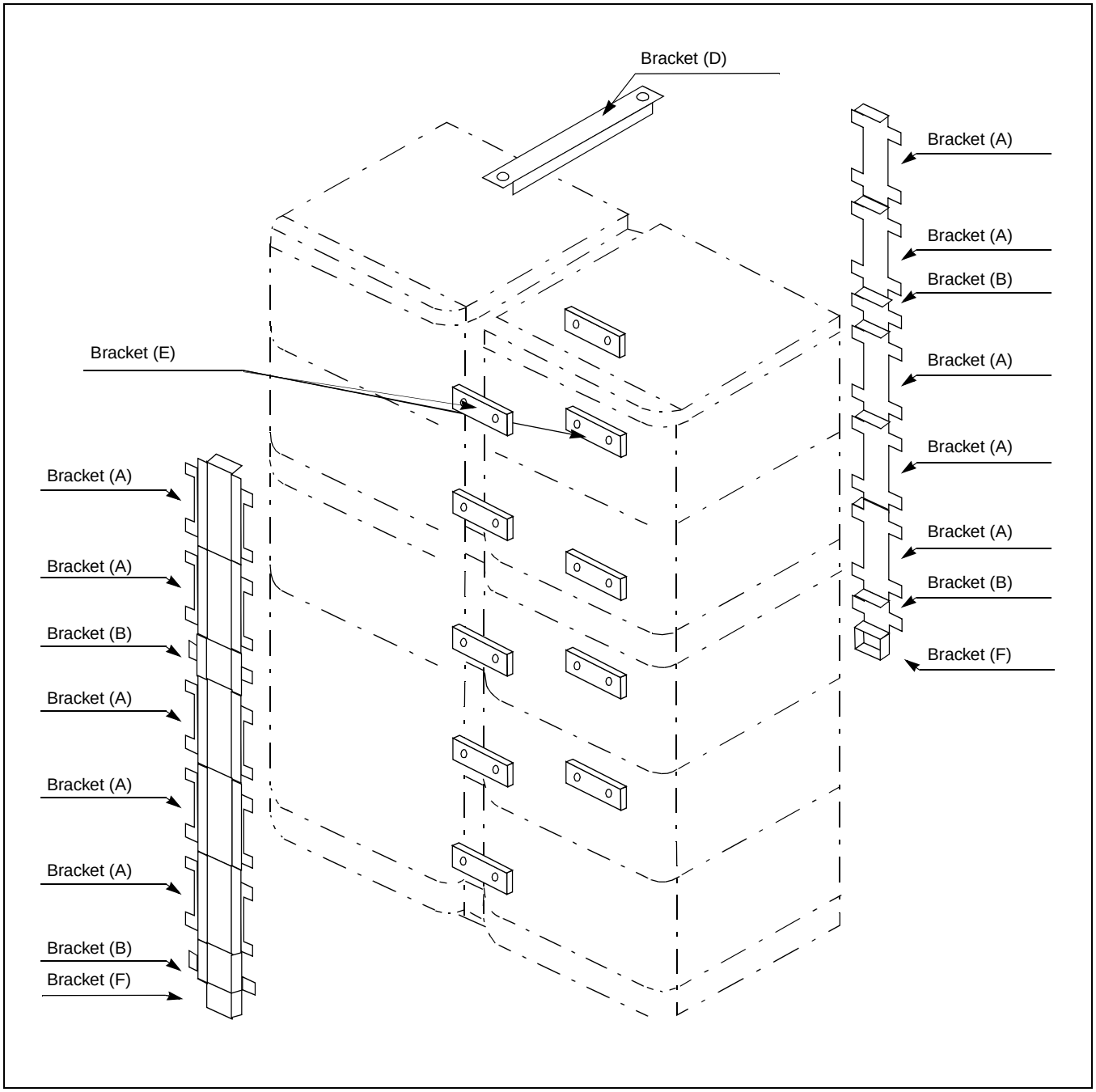


Figure 7-11 How to Attach Inter-frame Brackets (Continued)

STEP 9: Referring to Figure 7-11 and Figure 7-11, fix the brackets (D) with the screws.

STEP 10: Referring to Figure 7-11 and Figure 7-11, fix the brackets (F) with the screws.

5. SITE CLEANING

Upon completion of the works described in Section 1 to 4 of this Chapter, execute or confirm the following items.

- Restore the cross connections arranged for test purposes to their original conditions.
- Clean around the Module Group and the MDF.
- Collect and organize all test equipment, tools, etc. used during the installation tests.
- Dispose of dust, trash, etc.

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