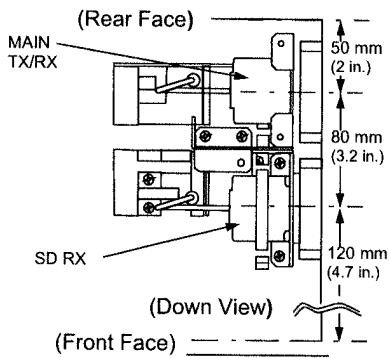


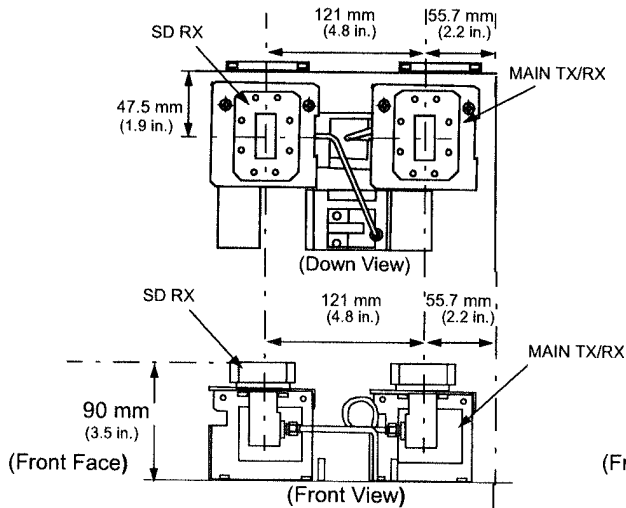
Chart 2-13 (Cont'd)

Step	Procedure
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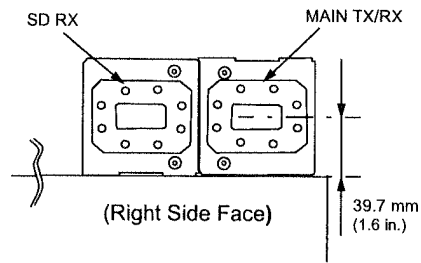
15	Connect the waveguide feeder between the RF IN/OUT and antenna. (RF IN/OUT port position varies depending on the waveguide connecting direction with three types as shown below.)
----	---



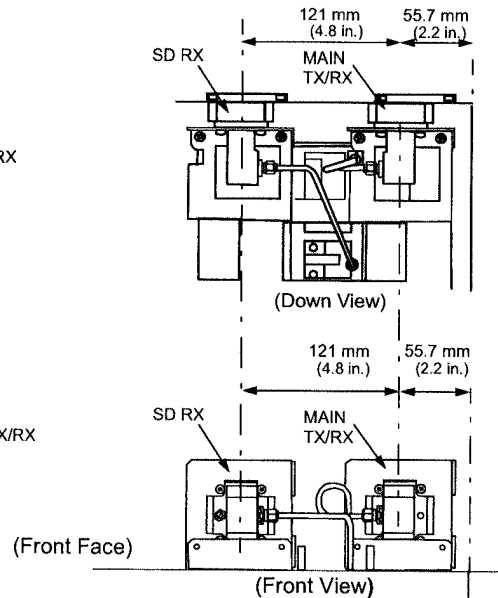
Wave guide Connection for the Left side of the equipment.



Wave guide Connection for the Upper side of the equipment.



Wave guide Connection for the Rear side of the equipment.

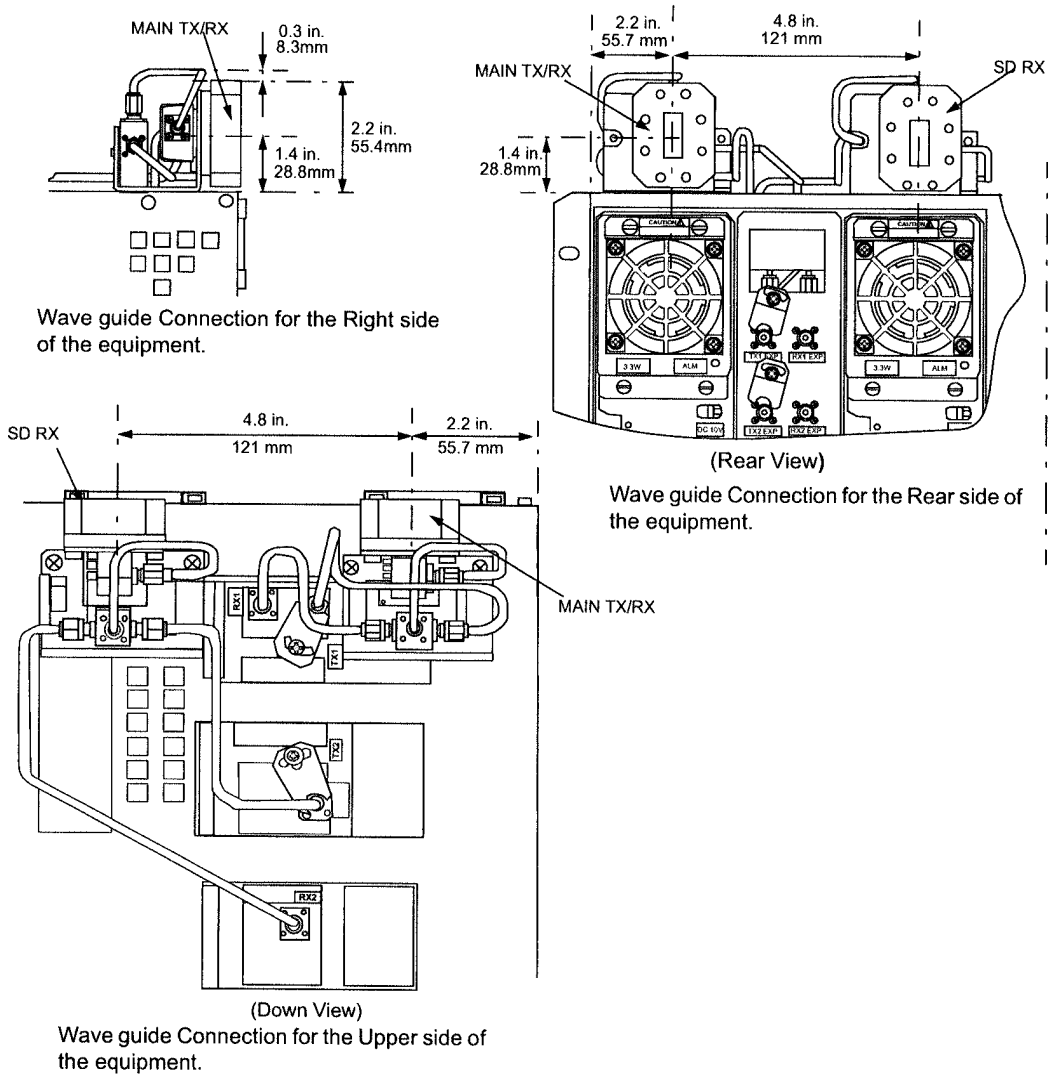


Note: Position of the RF IN/OUT port varies depending on the waveguide connecting direction. For the upper side and rear side direction of the antenna port, the SJ cable(s) can be used compatibly.

Chart 2-13 (Cont'd)

Step	Procedure
------	-----------

When rear side connection type BR CKT is used, RF IN/OUT port position are shown below.

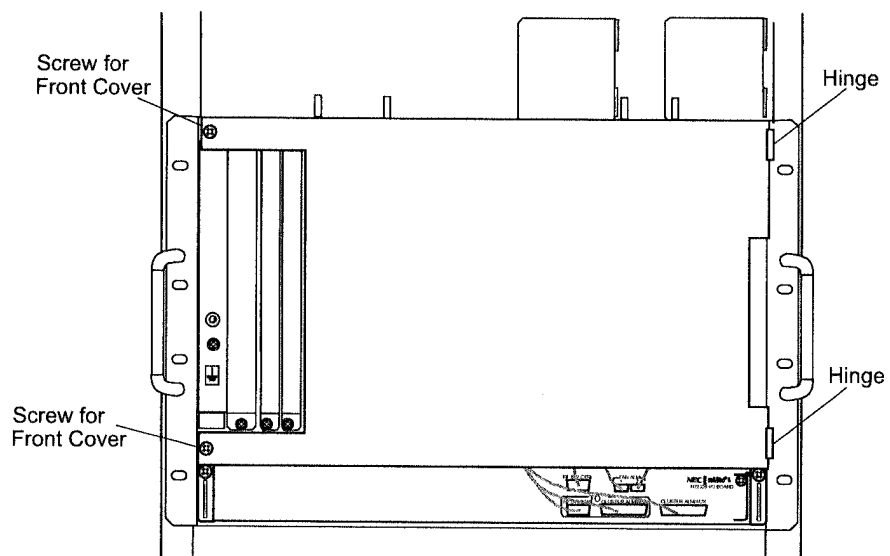


*Note: Position of the RF IN/OUT port varies depending on the waveguide orientation.
For the upper side and rear side direction of the antenna port, the SJ cable(s) connected to the BR CKT can be used compatibly.*

Chart 2-13 (Cont'd)

Step	Procedure
------	-----------

- | | |
|----|---|
| 16 | Attach the front cover to the equipment with two hinges and tighten two screws. |
|----|---|

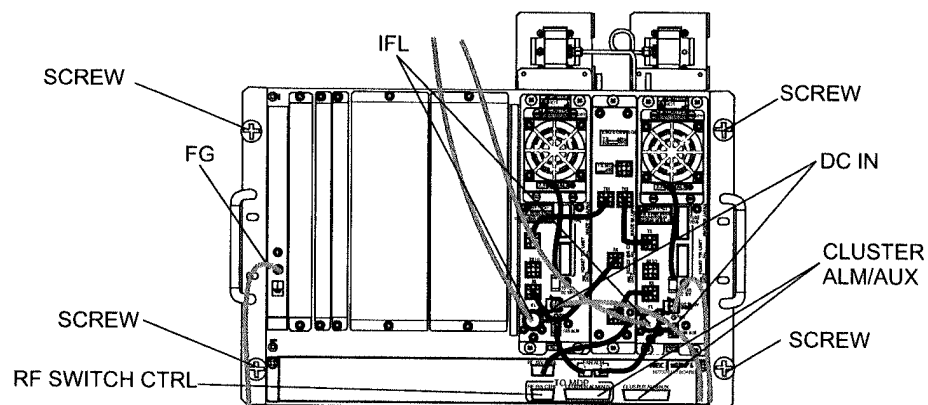


2.5.1 TRP Demounting (All Indoor e/w FAN Type)

For demounting the TRP (if necessary), use the following procedure.

Chart 2-14 TRP Demounting

Step	Procedure
1	Remove front cover from the TRP,
2	Turn off the power switch of the MD UNIT No.1 and No.2,.
3	Turn off the DC power to the TRP and disconnect power supply cables from the DC IN jack on the TR UNIT No.1 and No.2,
4	Disconnect IFL cables from the TR UNIT No.1 and No.2,
5	Disconnect a cable from the RF SW CTRL connector on the I/O BOARD,
6	Disconnect a cable from the CLUSTER ALM/AUX connector on the I/O BOARD,
7	Disconnect waveguide feeder from the transducer,
8	Disconnect ground cables from "FG" terminal on the TRP,
9	Remove the four (or eight) holding bolts from both sides of the TRP,
10	Remove the TRP from the rack.



Note: Before demounting the TRP equipment from the 19 inch rack, wait for a while until cool down the TRP.

2.6 TRP Mounting/Demounting (All Indoor w/o FAN Type)

Install the equipment in the place where it is not restricted access location regulated with UL60950-1.

The installation procedure for TRP is shown in Chart 2-15. The TRP should be installed in the radio station indoor.

Chart 2-15 Mounting Methods of TRP (w/o FAN Type)

Step	Procedure
------	-----------

The TRP which contains of two TR UNIT is heavy (approximately 27 kg), remove two TR UNIT (8 to 8.5 kg/each) from the shelf before mounting the TRP.

Caution *As the TRP is considerably heavy, utmost care should be taken when replacing or handling the TRP.*

- 1 Loosen two screws and remove front cover.

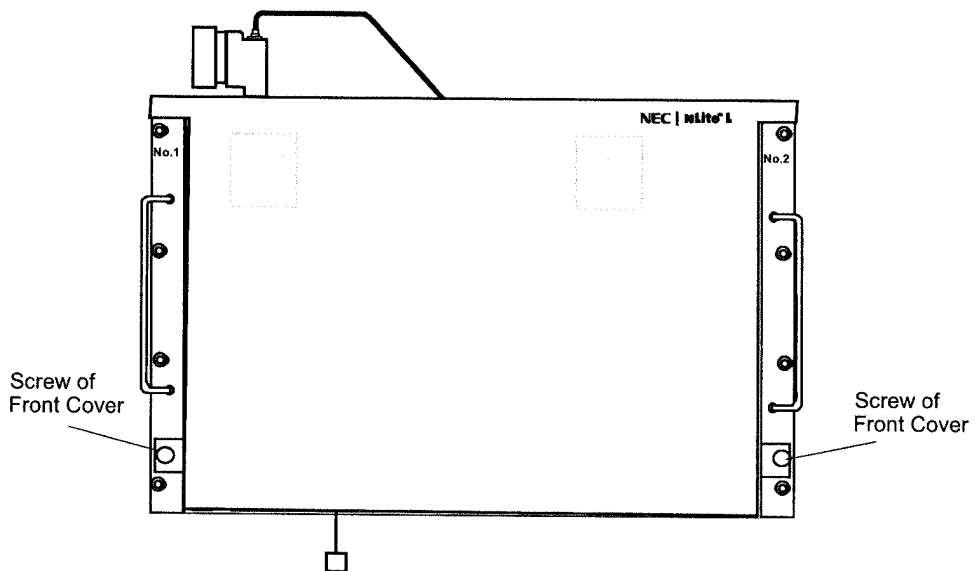
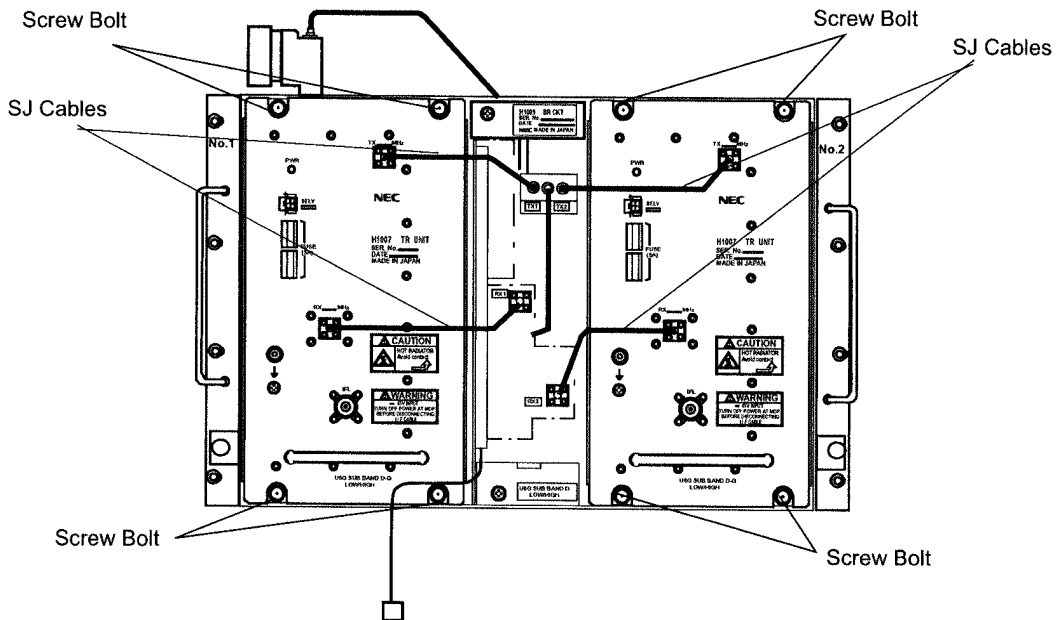


Chart 2-15 Mounting Methods of TRP (Cont'd)

Step	Procedure
------	-----------

- Using torque wrench, loosen connectors of SJ cable and remove the SJ cables from the TR UNIT.

Note: Carefully, loosen alternately and gradually two connectors of the SJ cable.

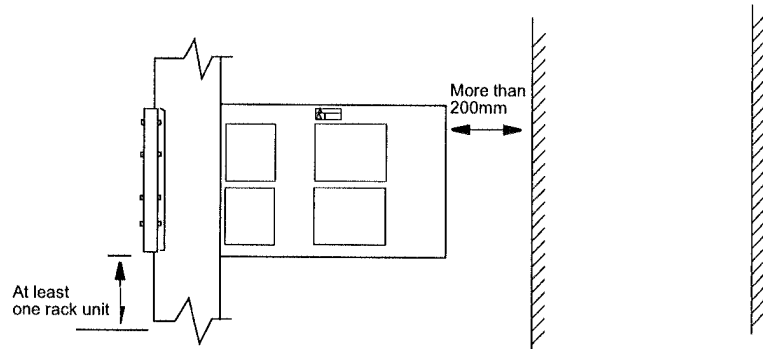


Note: Use torque wrench for connecting/disconnecting SJ cable

- Using a screw driver, loosen four screw bolts of the TR UNIT.
- Draw out the two TR UNIT from the equipment.

Chart 2-15 Mounting Methods of TRP (Cont'd)

Step	Procedure
5	Align the TRP to the mounting position on the 19-inch rack.
6	To mount the TRP in a 19-inch rack, leave space for one unit at the bottom to allow heat from the TRP to radiate.



7 Fix each side of the TRP to the 19-inch rack with the eight screws.

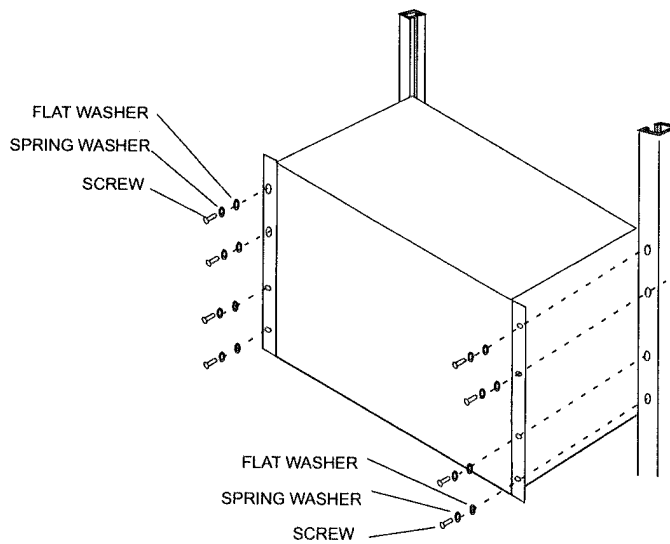
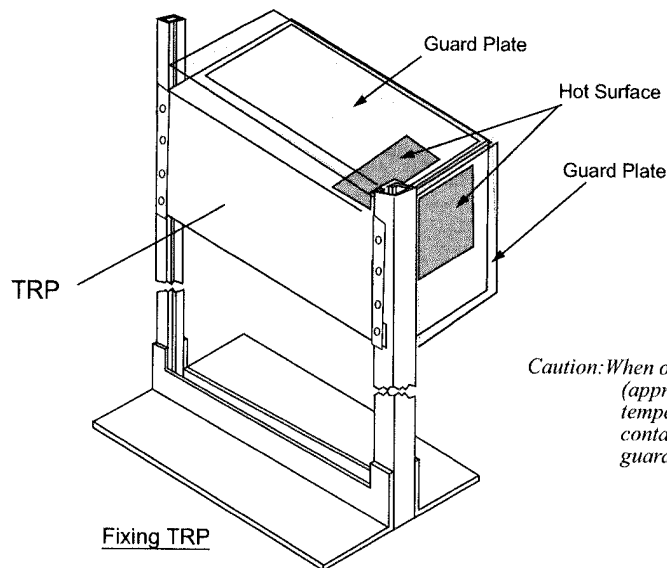


Chart 2-15 Mounting Methods of TRP (Cont'd)

Step	Procedure
------	-----------



Caution: When open space above TRP is more than one rack unit (approximately 45 mm), besides the environment temperature is higher than +104°F (+40°C), to avoid contact with the hot surface of the TRP, install a guard plate as shown in figure left.

- 8 Holding the handle of the TR UNIT, mount the TR UNIT into the TRP.
- 9 Using a screw driver, tighten four screw bolts to fix the TRP UNIT.
- 10 Connect the IF cable to the IFL connector on the TR UNIT,
- 11 Connect the power supply cable to the SEL V connector on the TR UNIT.
- 12 Using torque wrench, fasten connectors of SJ cable of TX jack and RX jack of the TR UNIT.

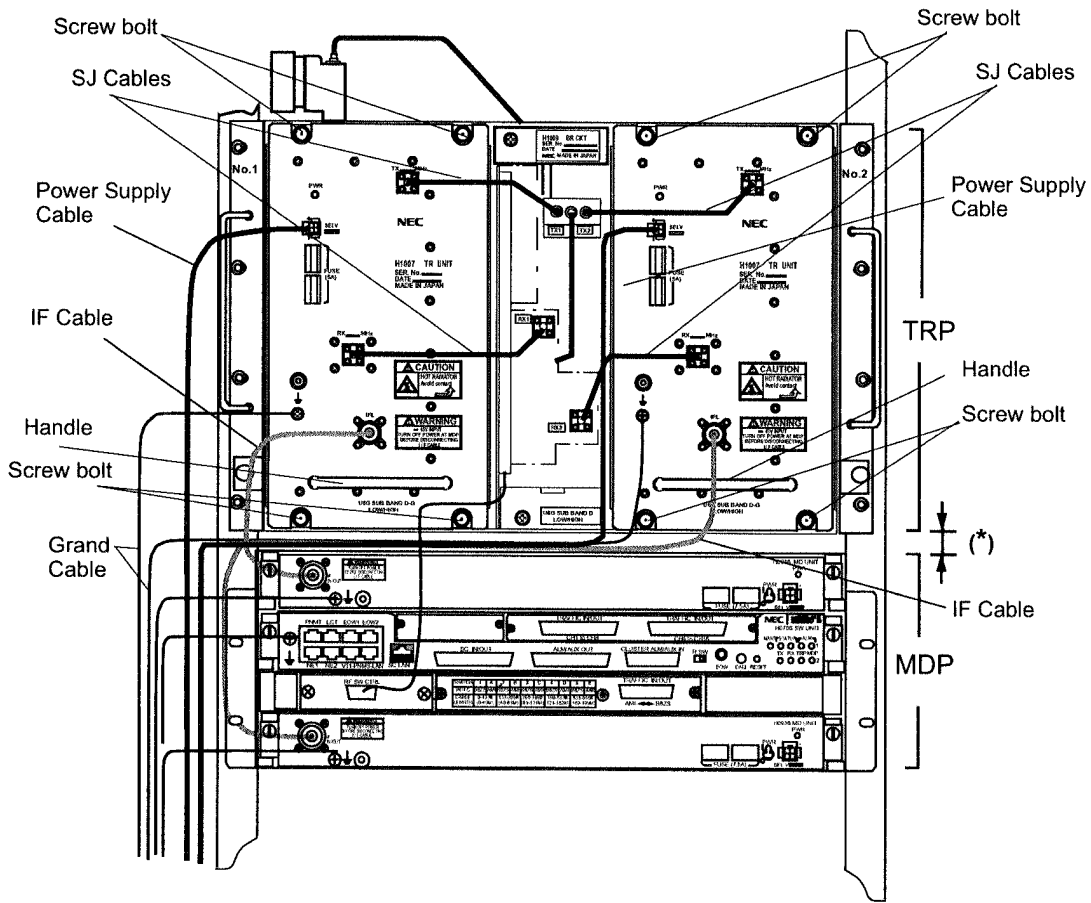
Note: Being careful, fasten alternately and gradually two connectors of the SJ cable.

Tightening torque: 0.6 N·m.

- 13 Connect ground cable to the ground terminal of the TR UNIT.

Chart 2-15 Mounting Methods of TRP (Cont'd)

Step	Procedure
------	-----------

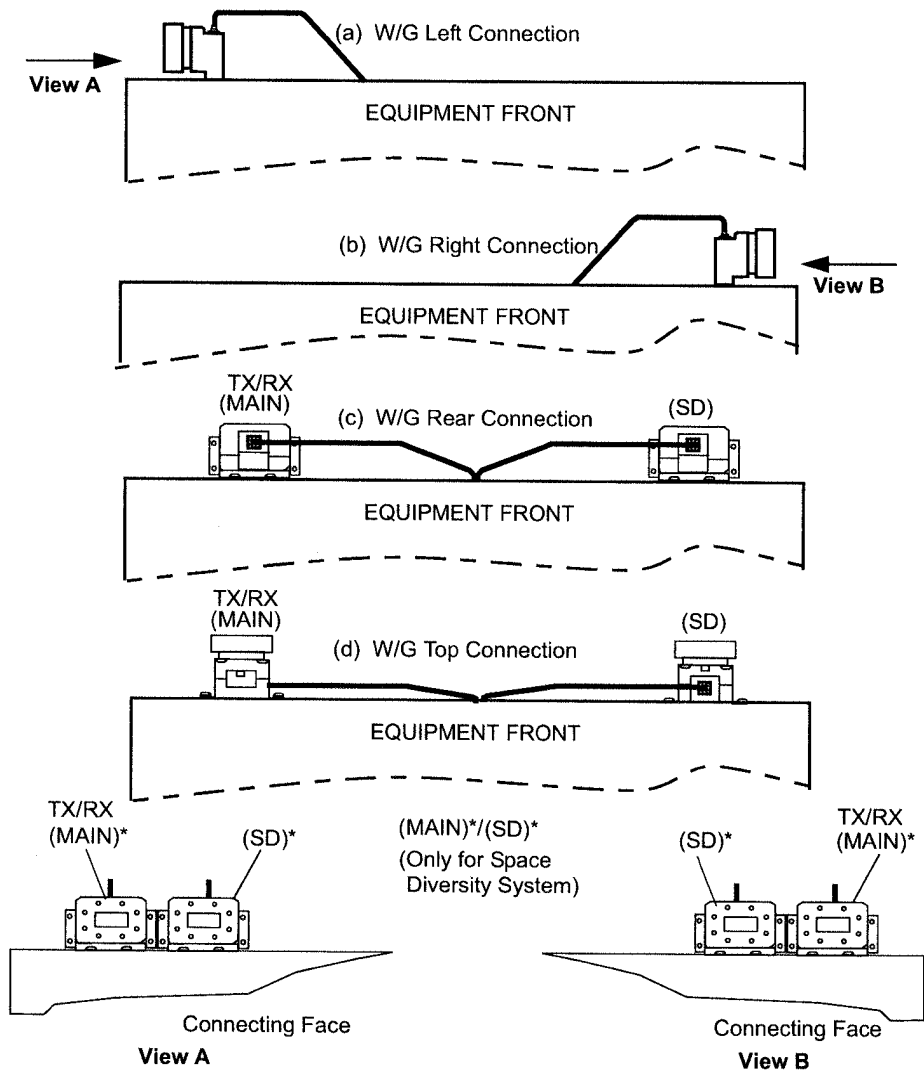


Note: Use torque wrench for connecting/disconnecting SJ cable.
 Tightening torque: 0.6 N·m.
 (*) Open one unit space or more above the MDP when 1+0 MDP (2 Unit size) is installed.

- 14 Connect a waveguide between the RF IN/OUT and antenna. (RF IN/OUT port position varies depending on the waveguide laying with four types as shown below.)

Chart 2-15 Mounting Methods of TRP (Cont'd)

Step	Procedure
------	-----------



*Note: Position of the RF IN/OUT port varies depending on the waveguide laying.
When change the RF IN/OUT port position from original, the SJ cable which is connected between the transducer and BR CKT is changed with proper type.*

2.6.1 TRP Demounting (All Indoor w/o FAN Type)

For demounting the TRP, use the following procedure.

Chart 2-16 TRP Demounting

Step	Procedure
1	Remove the four (or six) fixed bolts from the TRP.
2	Then demount the TRP.

Note: Before demounting the TRP equipment from the 19 inch rack, remove two TR UNITS from the equipment. Refer to mounting TRP procedure.

2.7 System Expansion (All Indoor e/w FAN Type)

The expansion procedure for the TRP is explained in Chart 2-17. The TRP may be expanded in the SYS2.

Chart 2-17 Expansion Method for TRP (All Indoor e/w FAN Type)

Step	Procedure
1	Loosen screws of the blank panels of the SYS2 of the TRP to be expanded,

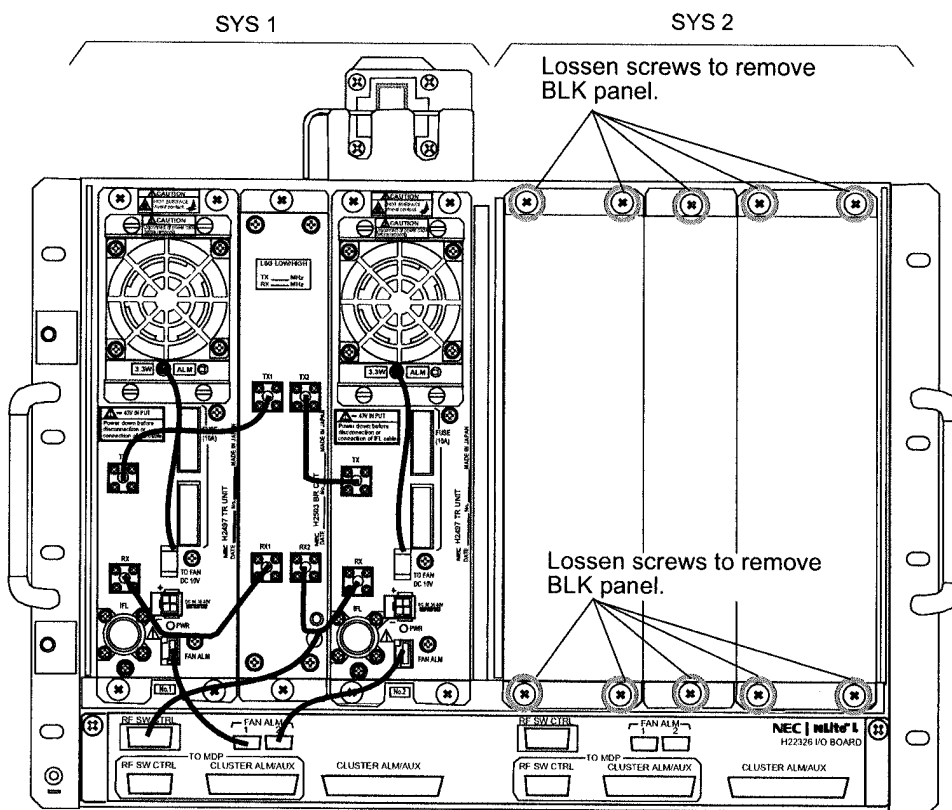
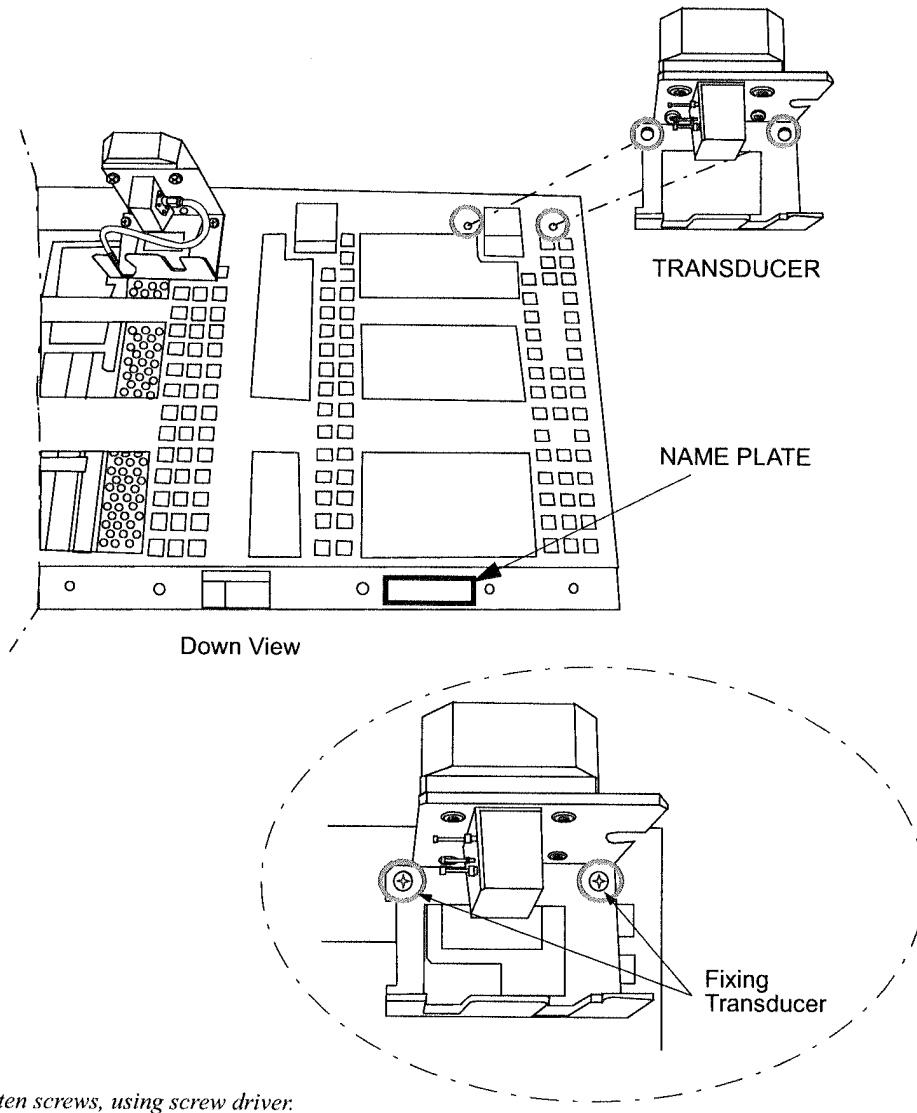


Chart 2-17 (Cont'd)

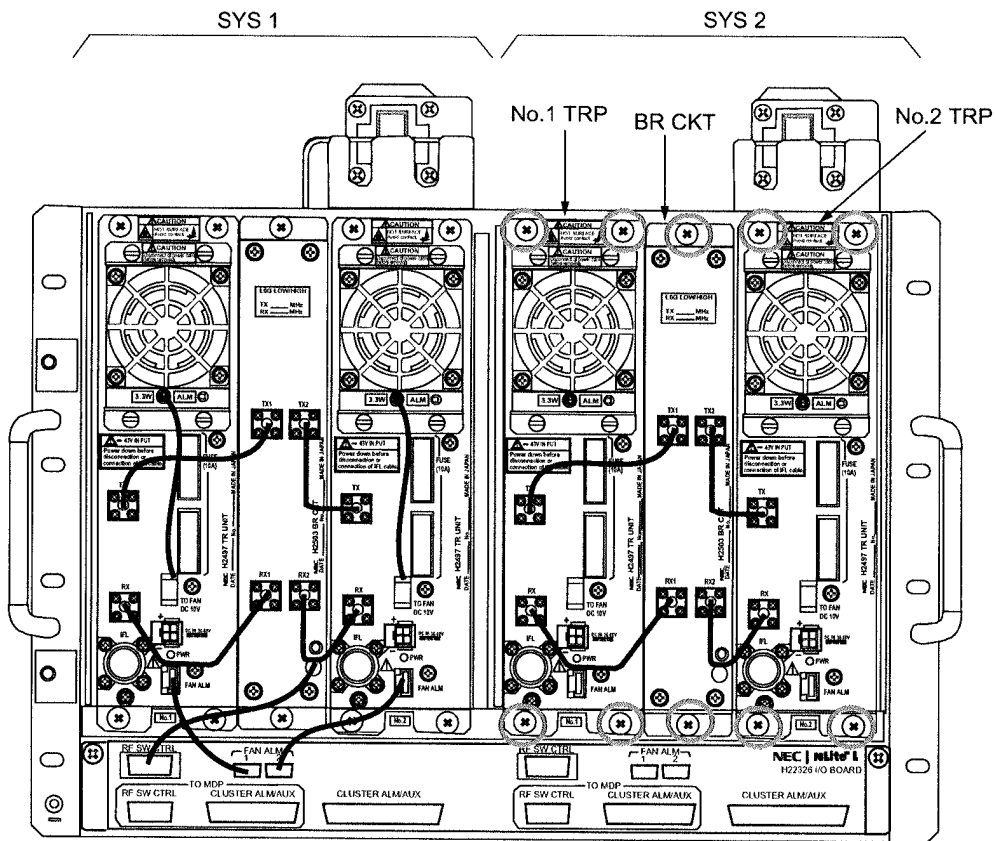
Step	Procedure
2	Using a screw driver, tighten two screws to fix the transducer for SYS2 at the rear side of the shelf,
3	Put the name plate on the shelf as shown in figure below,



⊙ : Tighten screws, using screw driver.

Chart 2-17 (Cont'd)

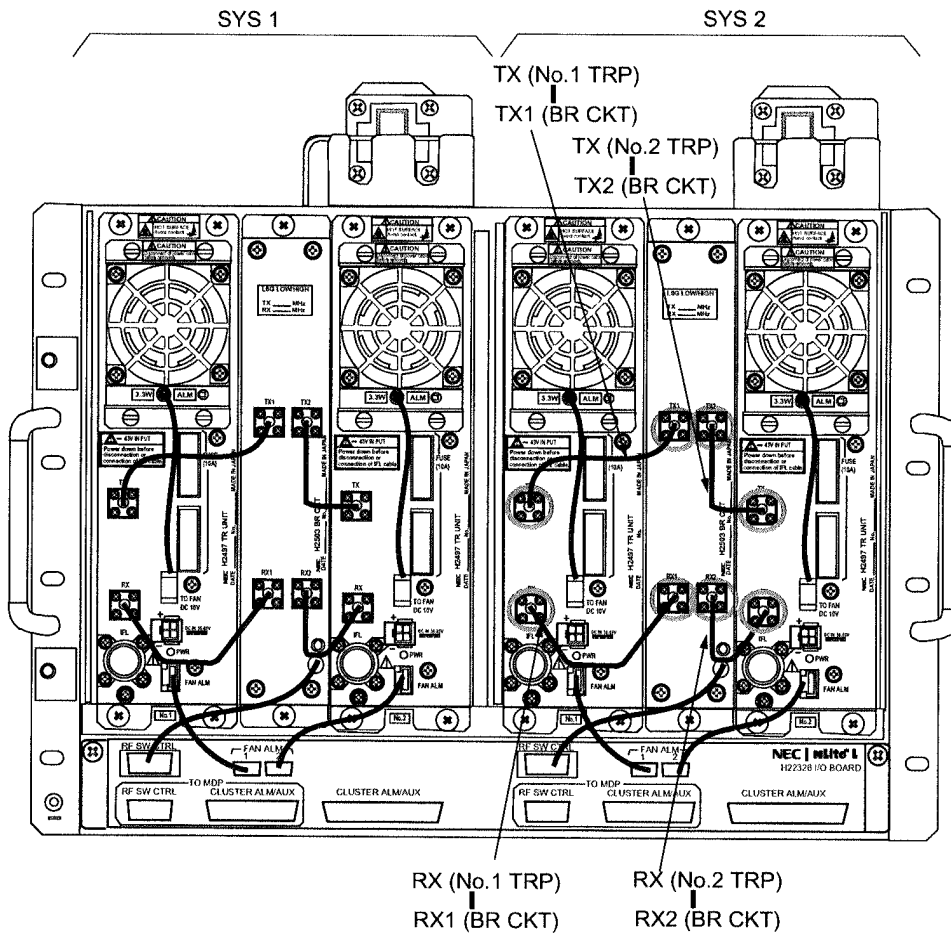
Step	Procedure
4	Align the TR unit and BR CKT to the mounting position in the SYS 2,
5	Using a screw driver, tighten screws at the upper position and lower position of the unit,



⊗ : Tighten screws, using screw driver.

Chart 2-17 (Cont'd)

Step	Procedure
6	Connect SJ cables between TR unit and BR CKT as shown in figure below,
7	Using torque wrench, thighten SJ cable connectors,



⊙ : Tighten connectors, using torque wrench.

Note: Being careful, tighten alternately and gradually either end connectors of the SJ cable. Tightening torque: 0.6 N·m.

Chart 2-17 (Cont'd)

Step	Procedure
------	-----------

- | | |
|---|---|
| 8 | Connect FAN power supply cable, FAN ALM cable and RF SW CTRL cable to corresponding connector as shown in figure below, |
|---|---|

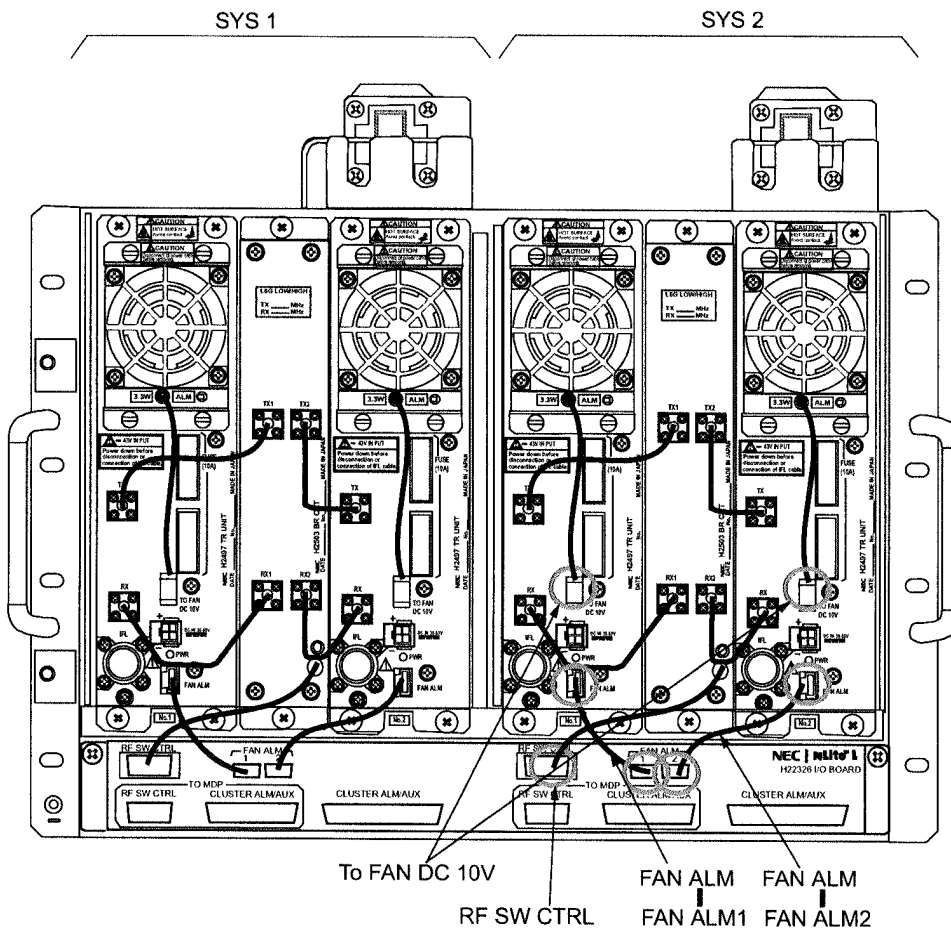
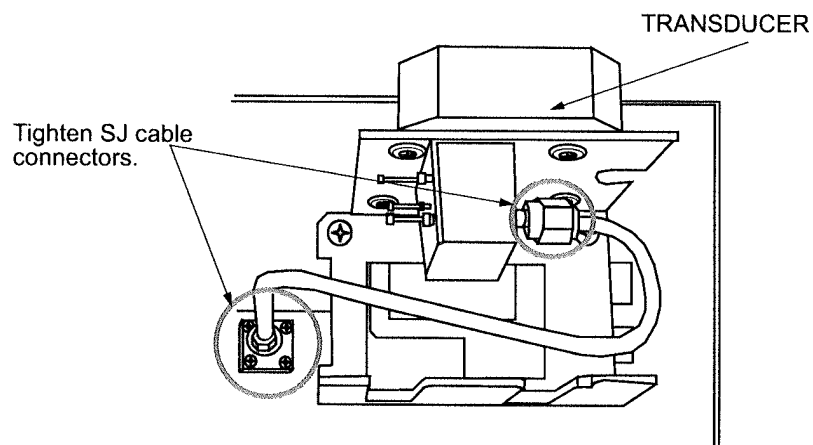


Chart 2-17 (Cont'd)

Step	Procedure
9	Connect SJ cable between transducer and BR CKT,
10	Using torque wrench, thighten SJ cable connectors,



○ : Tighten connectors, using torque wrench.

Note: Being careful, tighten alternately and gradually either end connectors of the SJ cable. Tightening torque: 0.6 N·m.

When SYS2 w/o SD.

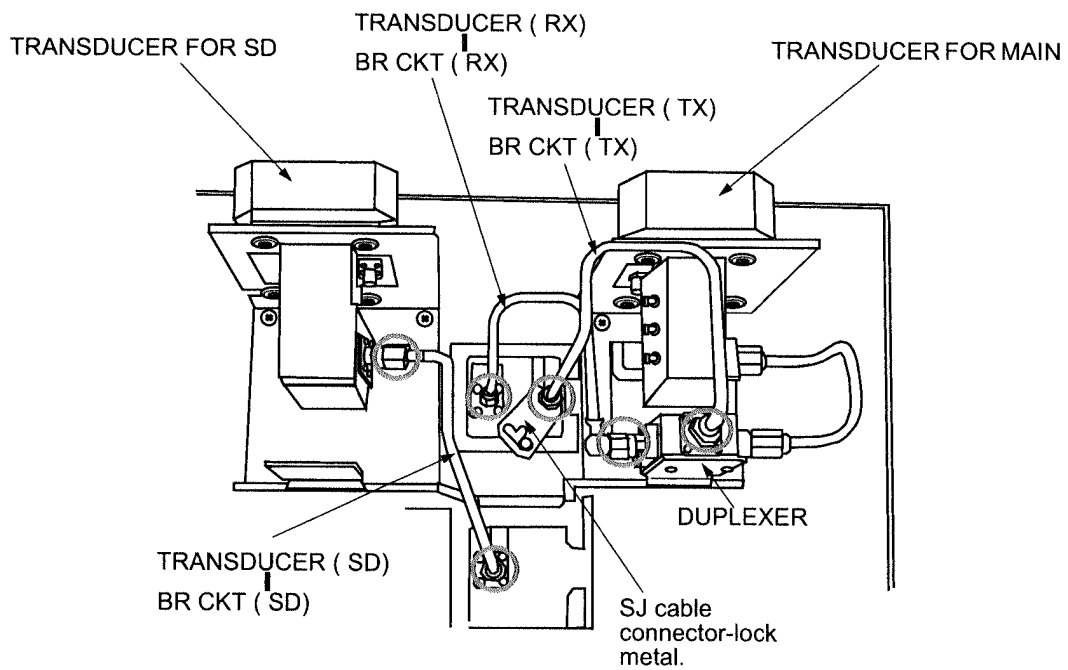
(Down View)

Chart 2-17 (Cont'd)

Step	Procedure
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When the SD configuration applies to the system, connect SJ cables shown in figure below,

When the EXP PORT applies to the system, the Duplexer and the SJ cable connector-lock metal are provided,



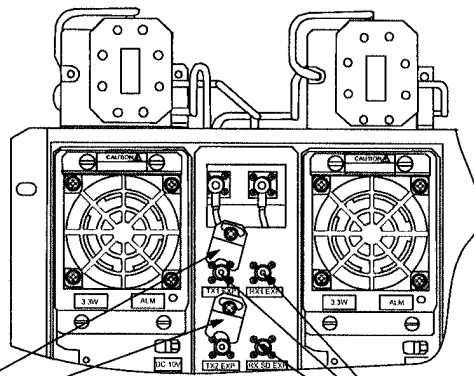
Note: Being careful, tighten alternately and gradually either end connectors of the SJ cable. Tightening torque: 0.6 N-m.

○ : Tighten connectors, using torque wrench.

When SYS2 e/w optional SD and EXP PORT.
(Down View)

Chart 2-17 (Cont'd)

Step	Procedure
11	Connect 50-ohm terminator to the EXP PORT on the BR CKT which has EXP PORT, when the EXP PORT is not used,
12	Put on the SJ cable connector-lock metal when the BR CKT which has EXP PORT is provided.



(Rear View)

Put on the SJ cable connector-lock metal when the BR CKT which has EXP PORT is provided.

Terminate EXP PORT on the BR CKT which has EXP PORT is provided when the EXP PORT is not used.

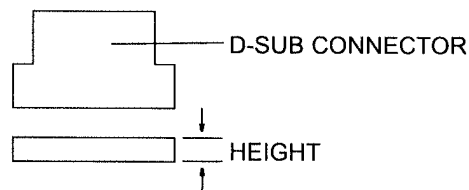
2.8 Cable Termination

In this section, the list of tools and material and the method for cable termination are described. The following cables are described for reference.

- D-sub connector (refer to Chart 2-18)*
- N-P connector of the L angle type (refer to Chart 2-19 or Chart 2-20)**
- N-P connector of the straight type (refer to Chart 2-21 or 2-22)**
- Molex 5557-04R connector (refer to Chart 2-23)***
- BNC connector of the 3C-2V coaxial cable (refer to Chart 2-24)

Notes: 1. * Use D-sub connectors of less than 16 mm (0.63 in.) in height as illustrated below.

2. * Use shielded cables which are connected to the D-Sub/RJ-45 connector to suppress interference from affecting the signal and to reduce electromagnetic radiation which may interfere with other signal cables.



3. ** The IFL cable length difference between the No.1 and the No.2 must not exceed 100 m (328 feet) (differential absolute delay time: within 500 ns) in 1+1 system.

4. ** Twist power cables to suppress inductive interference signals.

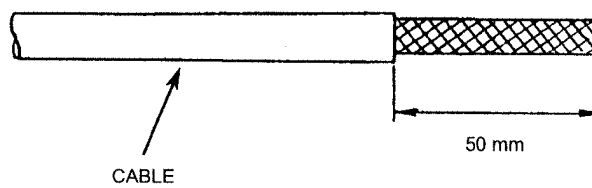
The necessary tools and materials are summarized in Table 2-2.

Table 2-2 Tools and Material List

No.	NAME		REMARKS
1	Soldering Iron		
2	Solder		
3	Knife		
4	Measure		
5	Wire Stripper		
6	Adjustable Wrench		
7	Hand Crimping Tool	CL250-0012-2/ CL250-0013-5	For D-Sub connector
		57026-5000/ 57027-5000	For Molex connector

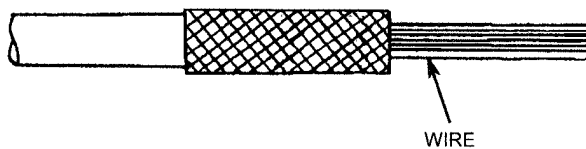
Chart 2-18 Terminating Supervisory Cables with D-Sub Connector

Step	Procedure
1	Strip back the cable sheath, taking care not to damage the braided shield.



Note: Use shielded cables which are connected to the D-Sub connector to suppress interference from affecting the signal and to reduce electromagnetic radiation which may interfere with other signal cables.

2	Fold back the braided shield (do not separate the strands) and trim it as shown.
---	--



3	Remove 4 mm of insulation from the end of the wire.
---	---

CONFORMABLE
WIRE SOCKET CONTACT

AWG#20-24 :CD-PC-111

AWG#24-28 :CD-PC-121

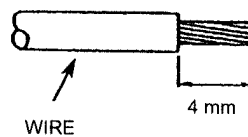
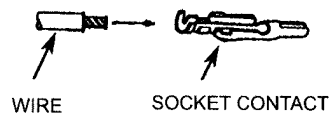


Chart 2-18 Terminating Supervisory Cables with D-Sub Connector
(Cont'd)

Step	Procedure
------	-----------

- 4 Insert the cable into the socket contact.



- 5 The cable should be fitted so that insulation and bare wire are arranged as shown.



- 6 Insert the socket contact into the hand crimping tool.

CONFORMING
WIRE SOCKET CONTACT

AWG#20-24 :TC-CD-111

AWG#24-28 :TC-CD-121

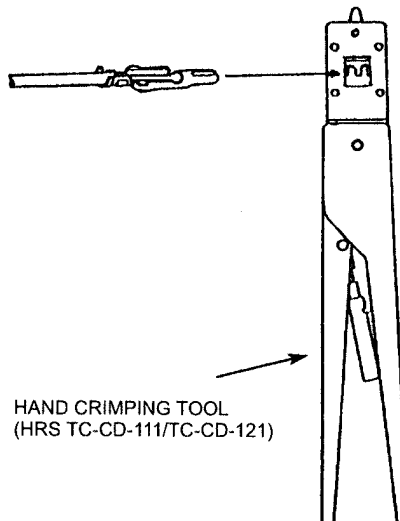
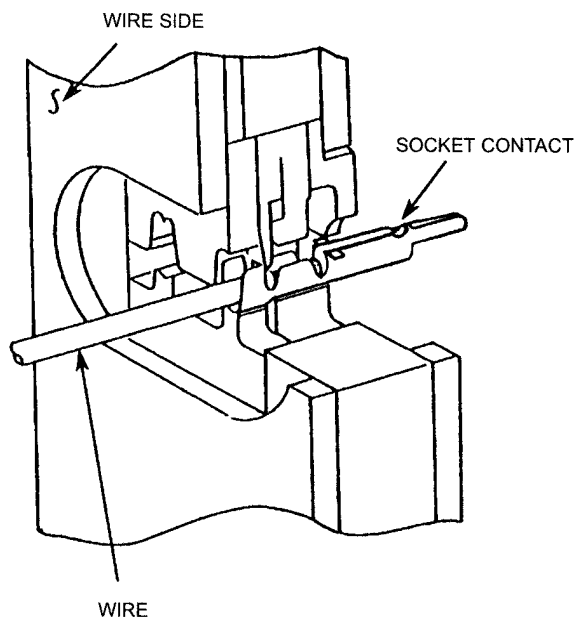
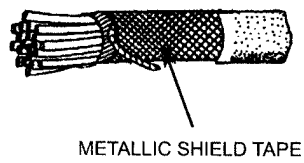


Chart 2-18 Terminating Supervisory Cables with D-Sub Connector
(Cont'd)

Step	Procedure
7	Recheck that the wire position is as shown in step 5 before crimping the socket contact (see illustration at below).

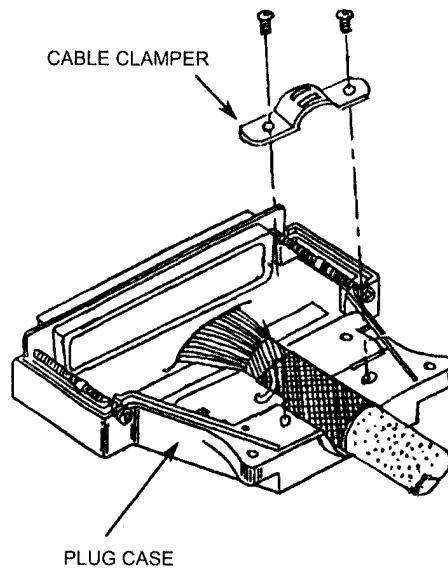


- 8 Wind the metallic shield tape on the braided shield.



**Chart 2-18 Terminating Supervisory Cables with D-Sub Connector
(Cont'd)**

Step	Procedure
9	Set the cable into the plug case as shown in figure below. Then, fix the cable using the cable clumper and two screws.



**Chart 2-18 Terminating Supervisory Cables with D-Sub Connector
(Cont'd)**

Step	Procedure
10	Referring to circle A, fix the drain wire with screw.
11	Referring to circle B, insert each wire to the specified position of corresponding interface terminal. Insert the socket contacts into the upper and lower row positions while taking care that the socket contacts are inserted the right way round.

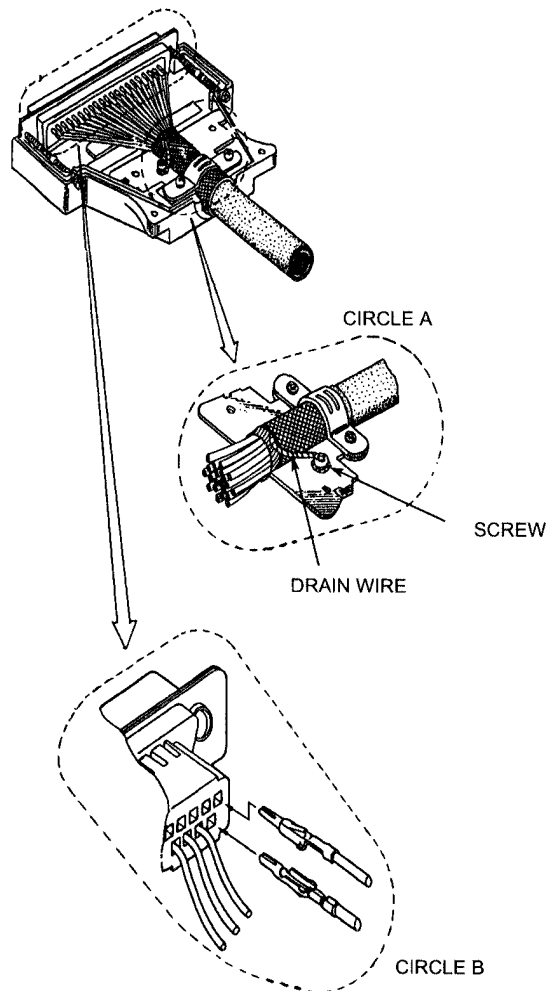


Chart 2-18 Terminating Supervisory Cables with D-Sub Connector
(Cont'd)

Step	Procedure
------	-----------

12	Fix the plug case with two screws, as shown in the figure.
----	--

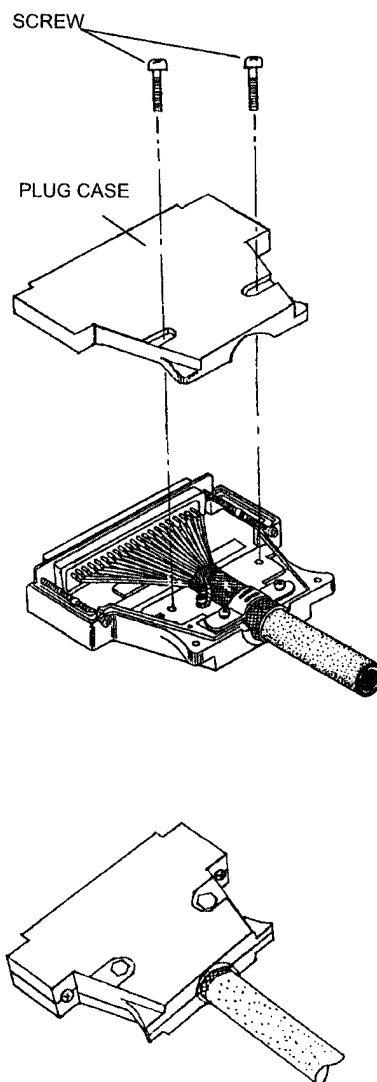
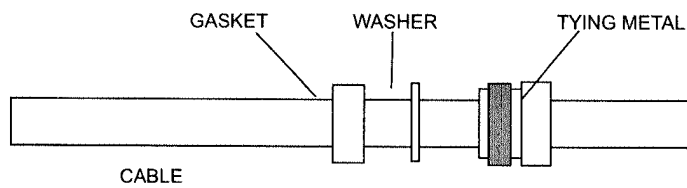


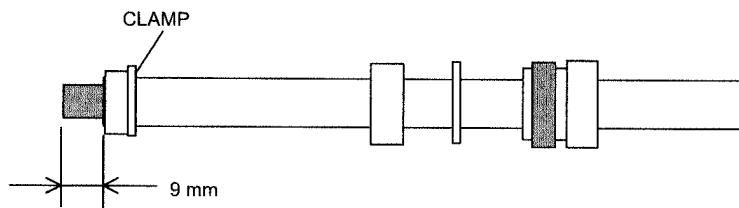
Chart 2-19 Terminating Coaxial (IF Signal) with N-P Connector (L Angle Type) KOMINE made

Step	Procedure
------	-----------

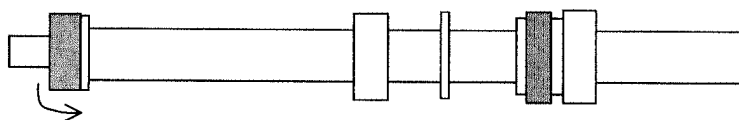
- 1 First fit the tying metal, washer and gasket on the cable.



- 2 Strip back the cable sheath, taking care not to damage the braided shield, and fit the clamp.



- 3 Fold back the braided shield (separating the strands of the braid) and trim it.



Note: Pay attention not to damage the plait.

- 4 Insert the ferrule.

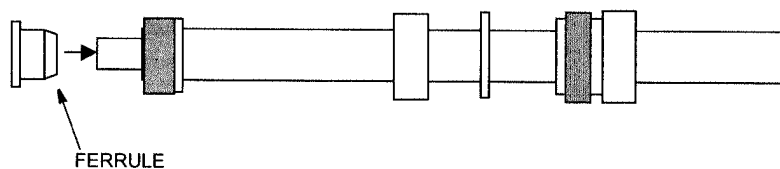
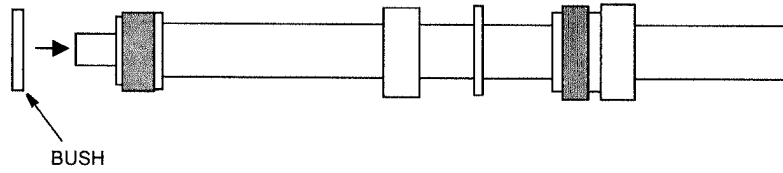


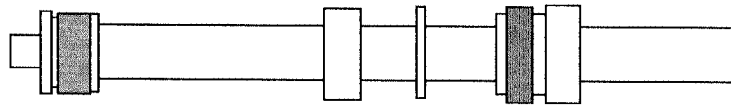
Chart 2-19 Terminating Coaxial (IF Signal) with N-P Connector
(L Angle Type) KOMINE made (Cont'd)

Step	Procedure
------	-----------

5	Fit the bushing.
---	------------------



6	Cut the aluminium foil and inner insulator away along the bushing and retain the inner conductor.
---	---



7	Taper the edge of the center conductor using a file as shown in the enlarged view below.
---	--

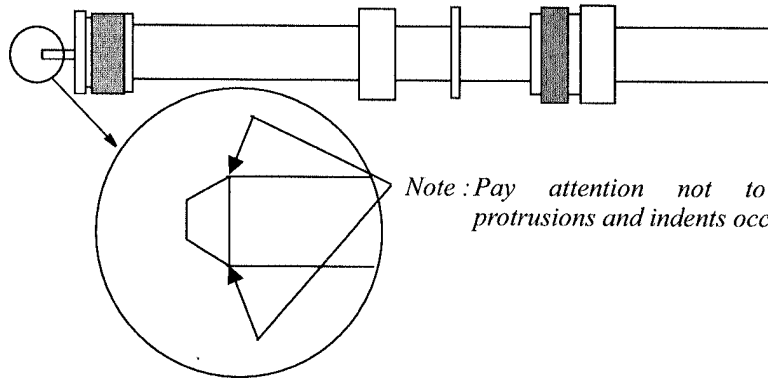
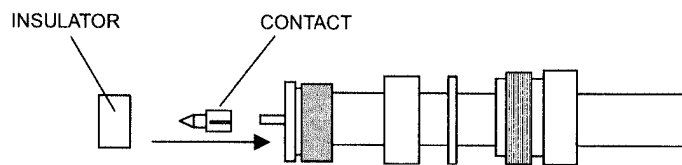


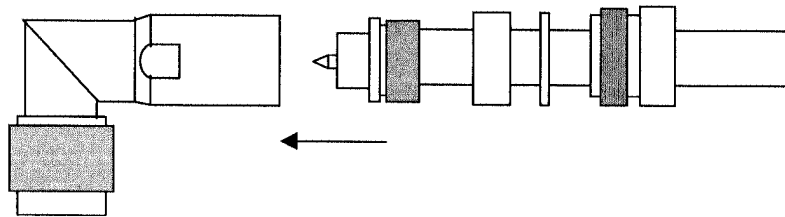
Chart 2-19 Terminating Coaxial (IF Signal) with N-P Connector (L Angle Type) KOMINE made (Cont'd)

Step	Procedure
------	-----------

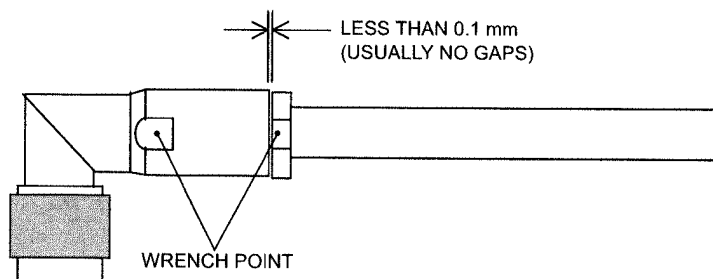
- | | |
|---|---|
| 8 | Mount the contact onto the center conductor and mount the insulator onto the contact. |
|---|---|



- | | |
|---|----------------------------------|
| 9 | Insert the cable into the shell. |
|---|----------------------------------|

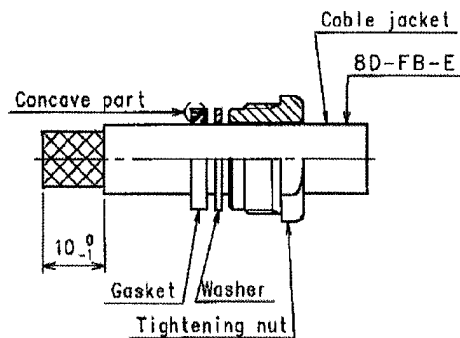


- | | |
|----|--|
| 10 | Tighten the tying metal by wrench using the wrench points (Tighten with torque of 4 to 10 N·m) |
|----|--|



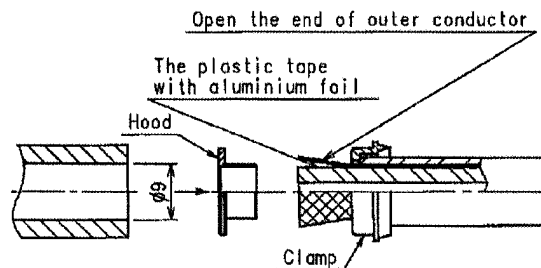
**Chart 2-20 Terminating Coaxial (IF Signal) with N-P Connector
(L Angle Type) HIROSE made**

Step	Procedure
1	<p>Pass the tightening nut, the washer and the gasket on the cable in the order shown in the figure.</p> <p>Then, strip the cable jacket in the diameter shown in the figure.</p> <p><i>[Applicable cable : 8D-FB-E]</i></p> <p><i>Note: Be careful of insertion direction for the gasket and the tightening nut.</i></p> <p><i>Note: Be careful not to damage the outer conductor.</i></p> <p><i>Note: Do not reuse the gasket because the clamp deforms it after tightening.</i></p>



- 2 Insert the clamp to clamp the stripped cable jacket end. Open the end of the outer conductor a little,
- 3 Insert the hood between the plastic tape with aluminium foil and the outer conductor,

Note: Use the insertion stick which open the hole of about $\phi 9$. No gap is allowed in between the clamp, the outer conductor and the hood.



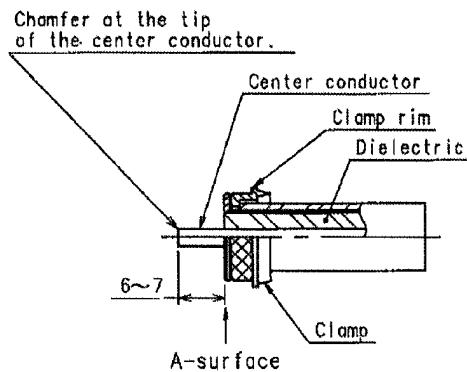
**Chart 2-20 Terminating Coaxial (IF Signal) with N-P Connector
(L Angle Type) HIROSE made (Cont'd)**

Step	Procedure
4	After inserting the hood, cut off the plastic tape with aluminium foil and the dielectric at A-surface,
5	Cut off the part of the outer conductor exceeding the clamp rim with a knife,
6	Check that distance between the tip of the center conductor and A-surface is 6 to 7 mm, If it is more than 7 mm, cut the center conductor to correct length,

Note: Be careful not to damage the center conductor,

Note: Chamfer at the tip of the center conductor,

Note: There shall be no evidence of deviation or deformation or burr at the tip of the center conductor.



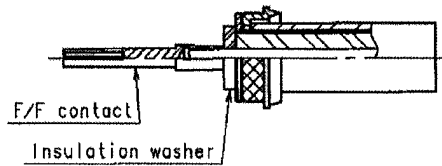
**Chart 2-20 Terminating Coaxial (IF Signal) with N-P Connector
(L Angle Type) HIROSE made (Cont'd)**

Step	Procedure
------	-----------

7 Insert the insulation washer over the center conductor, and engage it with the F/F contact,

Note: No gap is allowed in between the F/F contact, the insulation washer, and the dielectric.

Note: The assembly unit after the completion of this process is called "block".



Block

8 Combine the convex part of the clamp to the concave part of the gasket, Then insert this block to the shell,

Note: Insert the hood until it hits the B-surface.

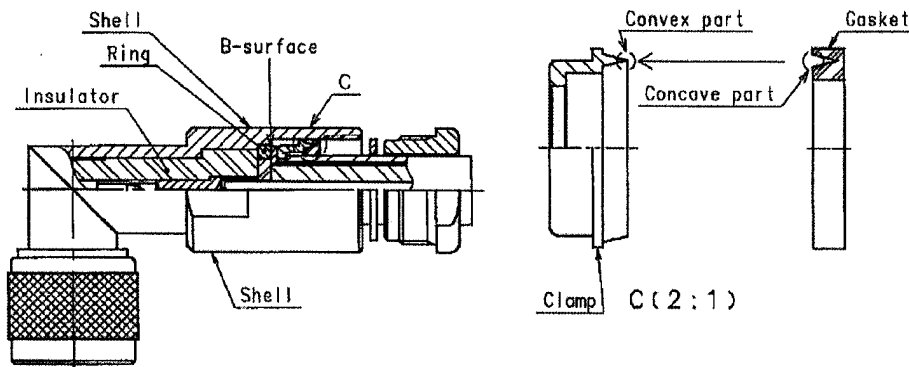
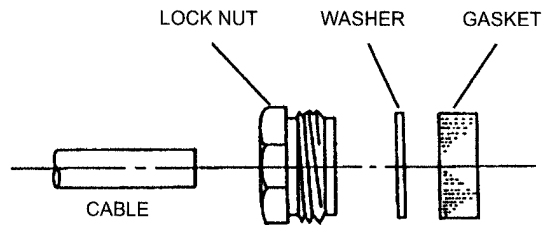


Chart 2-21 Terminating Coaxial (IF Signal) Cables with N-P Connector (Straight Type)

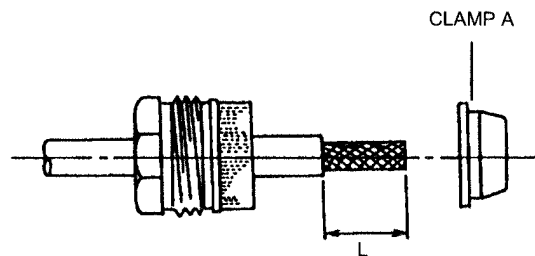
In case of marking "NDK" on connector, please ask NEC for cable process.

Step	Procedure
------	-----------

- 1 First fit the lock nut, washer and gasket on the cable as shown.



- 2 Strip back the cable sheath, taking care not to damage the braided shield, and fit clamp A.



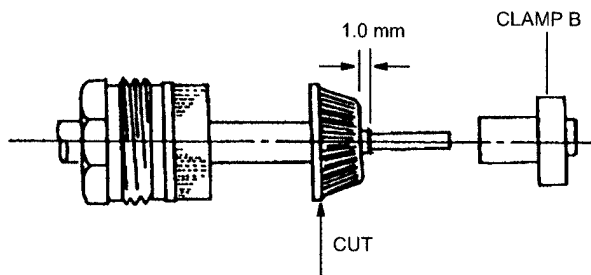
CONNECTOR	CABLE	L
N260	5D-FB	25 mm
N227	8D-FB	25 mm
N228	10D-FB	27 mm
N229	12D-FB	27 mm

- 3 Fold back the braided shield (separating the strands of the braid) and trim it.

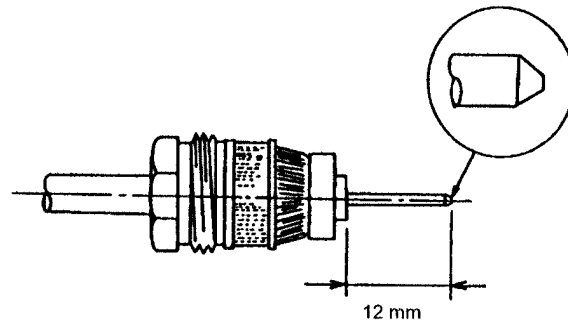
Chart 2-21 Terminating Coaxial (IF Signal) Cables with N-P Connector (Straight Type) (Cont'd)

Step	Procedure
------	-----------

- 4 Cut away the insulation from the center conductor and fit clamp B. Be sure not to cut or scratch the conductor while stripping the insulation.



- 5 Cut the center conductor. Taper the end of the center conductor using a file as shown in the enlarged view below.



- 6 Mount the center contact onto the center conductor as shown.

Note: Insert the center contact into insulator (1.5 mm).

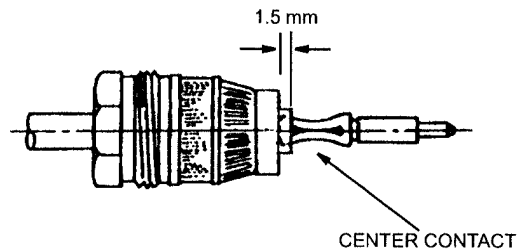
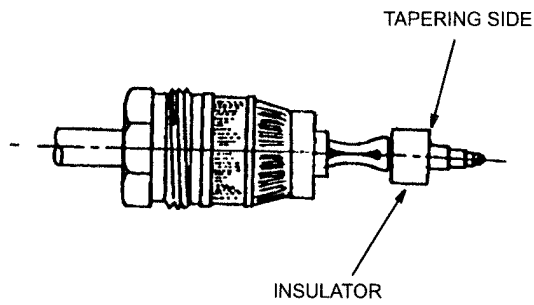


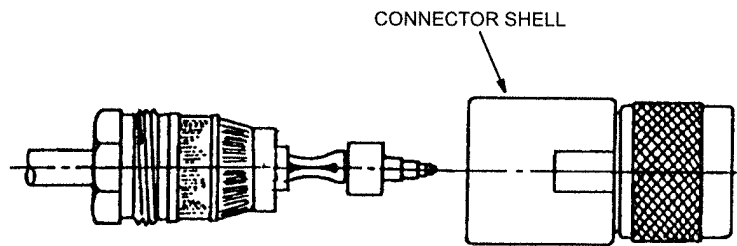
Chart 2-21 Terminating Coaxial (IF Signal) Cables with N-P Connector (Straight Type) (Cont'd)

Step	Procedure
------	-----------

- 7 Mount the insulator onto the center contact.



- 8 Insert the cable into the connector shell.



- 9 Tighten the lock nut.

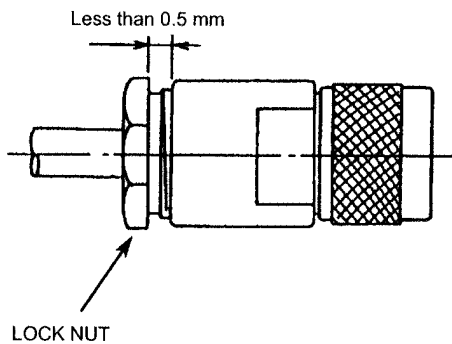
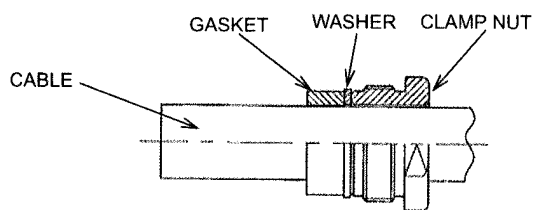


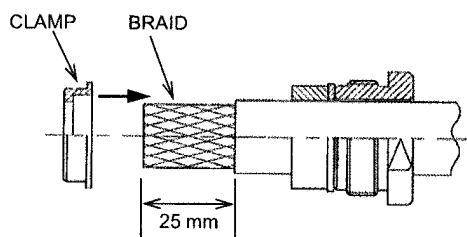
Chart 2-22 Terminating Coaxial (IF Signal) Cables with N-P Connector (Straight Type) (KOMINE)

Step	Procedure
------	-----------

In case of marking "NDK" on connector, please ask NEC for cable processing.

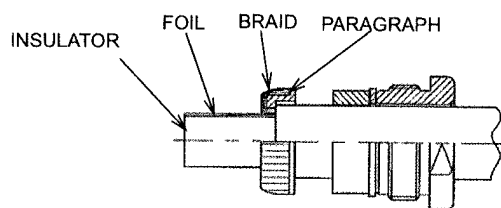


Step 1. The clamp nut, the washer and the gasket are inserted in the cable,

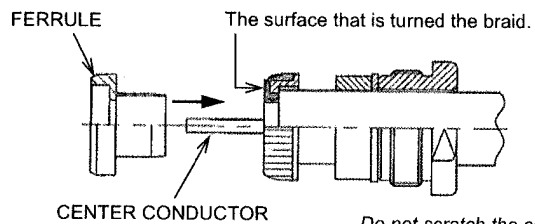


Step 2. Strip the cable as below and disentangle the braid and insert the clamp in the cable,

Do not scratch the braid wire.



Step 3. Turn the braid on the clamp inserted and cut the braid according to the paragraph,

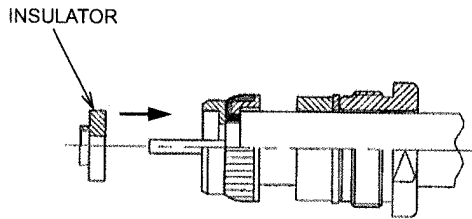


Step 4. Cut the cable-insulator according to the surface that is turned the braid and insert the ferrule,

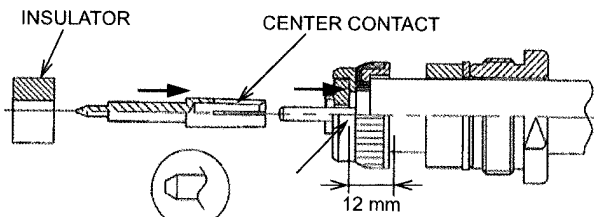
Do not scratch the center conductor.

Chart 2-22 Terminating Coaxial (IF Signal) Cables with N-P Connector (Straight Type) (KOMINE) (Cont'd)

Step	Procedure
------	-----------

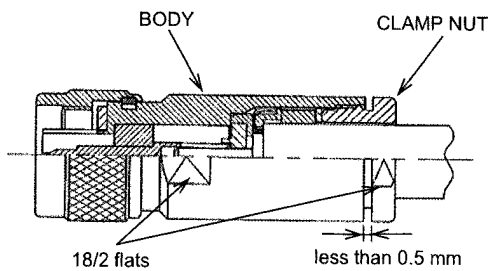
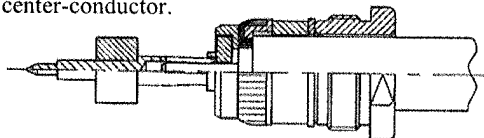


Step 5. Insert the insulator,



Processing chart of the tip of the center-conductor.

Step 6. Cut the center-conductor as following size. Process the tip of center-conductor like a taper with a file. (*Do not have a curve and burr.*) Insert the center-contact and insert the insulator in the center-contact,



Tightening torque is more than 9.8 N·m (100kgf·cm)

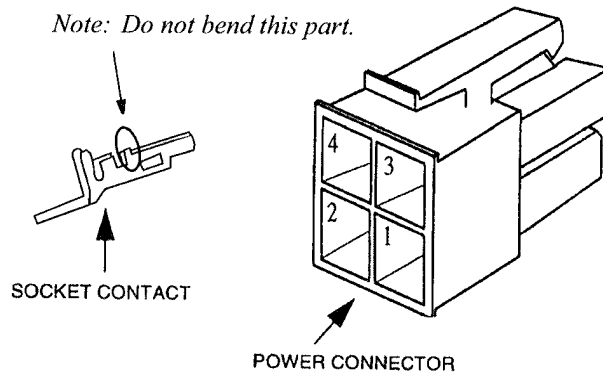
Note: Use torque wrench.

Step 6. Connector body is fit to the cable. Fit in the cable end into the body and screw the clamp nut by your hand first and tighten it with a torque wrench.

Confirm the space that it is less than 0.5 mm between the body and the clamp nut.

Chart 2-23 Terminating Power Supply Cables with Molex Connector

Step	Procedure
------	-----------



- 1 Remove 3.0 to 3.5 mm of insulation.

CABLE

AWG#18-24

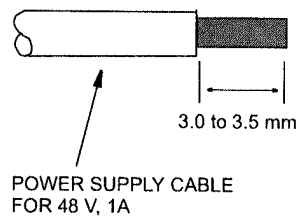
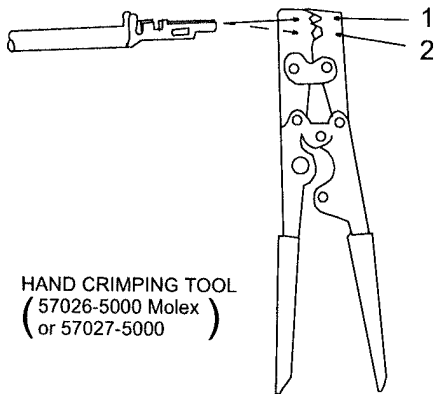


Chart 2-23 Terminating Power Supply Cables with Molex Connector (Cont'd)

Step	Procedure
------	-----------

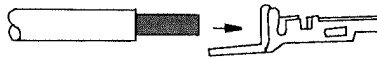
2 Set the socket contact to position 1 or 2 of the hand crimping tool.



HAND CRIMPING TOOL
(57026-5000 Molex
or 57027-5000)

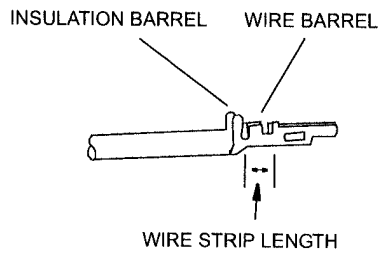
HAND CRIMPING TOOL TYPE	OUTSIDE DIAMETER OF CABLE	SET POSITION
57026-5000	φ 1.5 to 1.8	1
	φ 1.8 to 2.2	2
57027-5000	φ 2.3 to 2.6	1
	φ 2.6 to 3.1	2

3 Squeeze the handle of the hand crimping tool, insert cable into socket contact.



4 The cable should fit, so that insulation and bare wire are arranged as shown.

5 Squeeze the handle of the hand crimping tool until the ratchet is released.



**Chart 2-23 Terminating Power Supply Cables with Molex Connector
(Cont'd)**

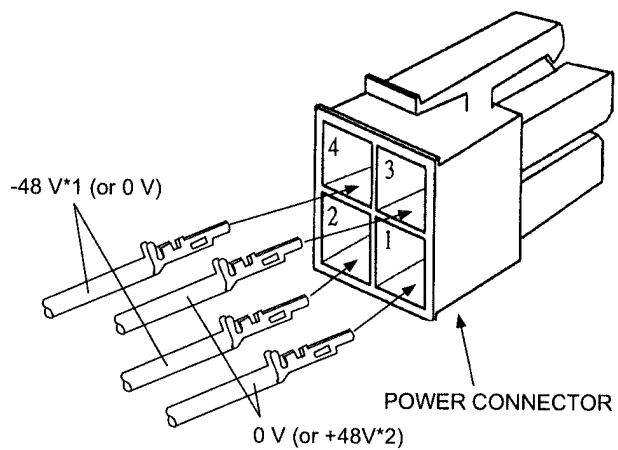
Step	Procedure
------	-----------

6	Twist cables for the power supply,
---	------------------------------------



Note: Twist power cables (+)/(-) to suppress inductive interference signals.

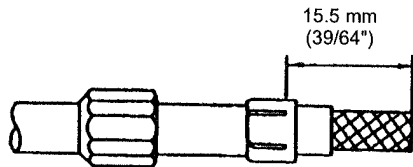
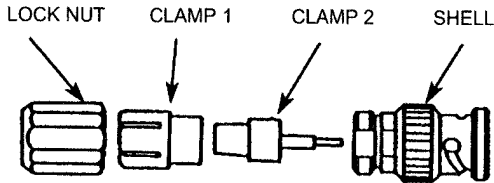
7	Insert the socket contacts into the power connector till they lock.
---	---



*Note: *1. -32 to -60 V or -20 to -60 V
2. +32 to +60 V or +20 to +60 V

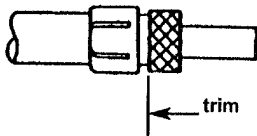
Chart 2-24 Instruction of 3C-2V Coaxial Cable Assembling for BNC Connector

Prepare following tools for 3C-2V cable termination assembling.

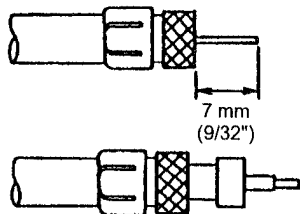


Step 1. Slide the lock nut onto the cable. Strip the cable sheath, taking care not to damage the braided shield wires, and fit CLAMP 1.

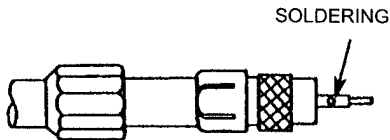
Note: Stripping measurements depend on the BNC type.



Step 2. Fold back the braided shield wire around the CLAMP 1 (without separating the strands of the braid) and trim it.



Step 3. Cut away the insulator from the centre conductor and fit CLAMP 2. (Be sure not to cut or scratch the conductor while stripping the insulation.)



Step 4. Solder the pin contact to center conductor. Use a knife to remove excess solder.



Step 5. Insert the connectorized cable into the BNC shell and fasten the lock nut with a wrench.

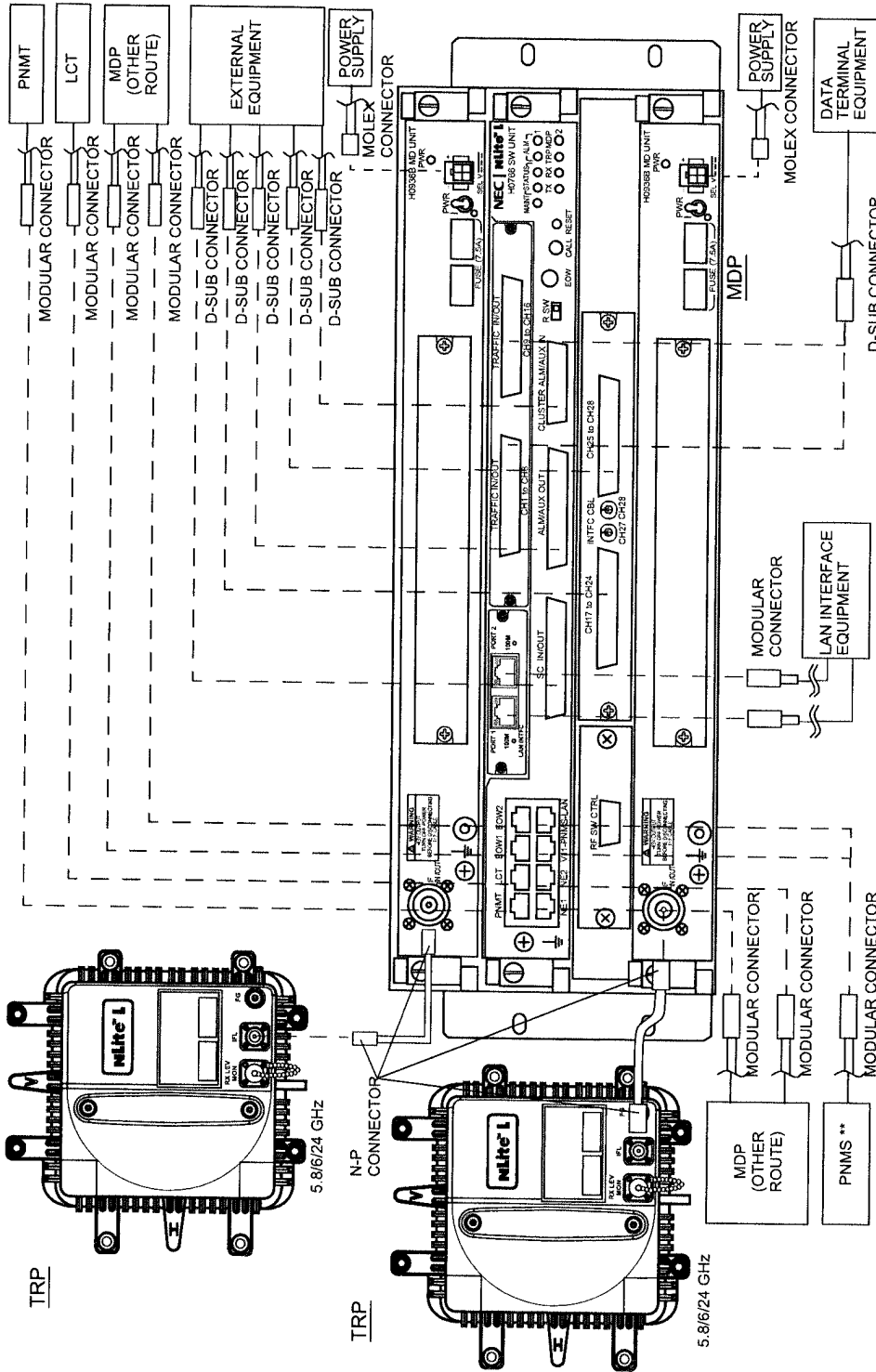
2.9 Cable and Terminal Connections

Set up as in Fig. 2-5 referring to the following connecting method.

- (a) IF signal cable
Connect the connector correctly and tighten it by turning the tightening ring clockwise.
- (b) Data signal cable and supervisory cable
Connect the D-sub connector correctly and fix it with two screws (#4-40).
- (c) Modular cable
Insert the Modular connector correctly.
- (d) Baseband signal cable for 45 MB system
Align the BNC connector guide groove to the other connector guide ridge and turn the connector cap clockwise fully until it is locked firmly.
- (e) Power supply cable
Insert the Molex connector correctly.

Note: The DC power for the TRP is supplied from the DC IN jack on the TR UNIT and also from the MD UNIT through the IFL cable. Therefore, apply DC power to the DC IN jack on the TR UNIT and SEL V jacks on the MD UNIT before turn on the PWR switch on the MDP. (Refer to Fig. 2-4 for the POWER SUPPLY.)

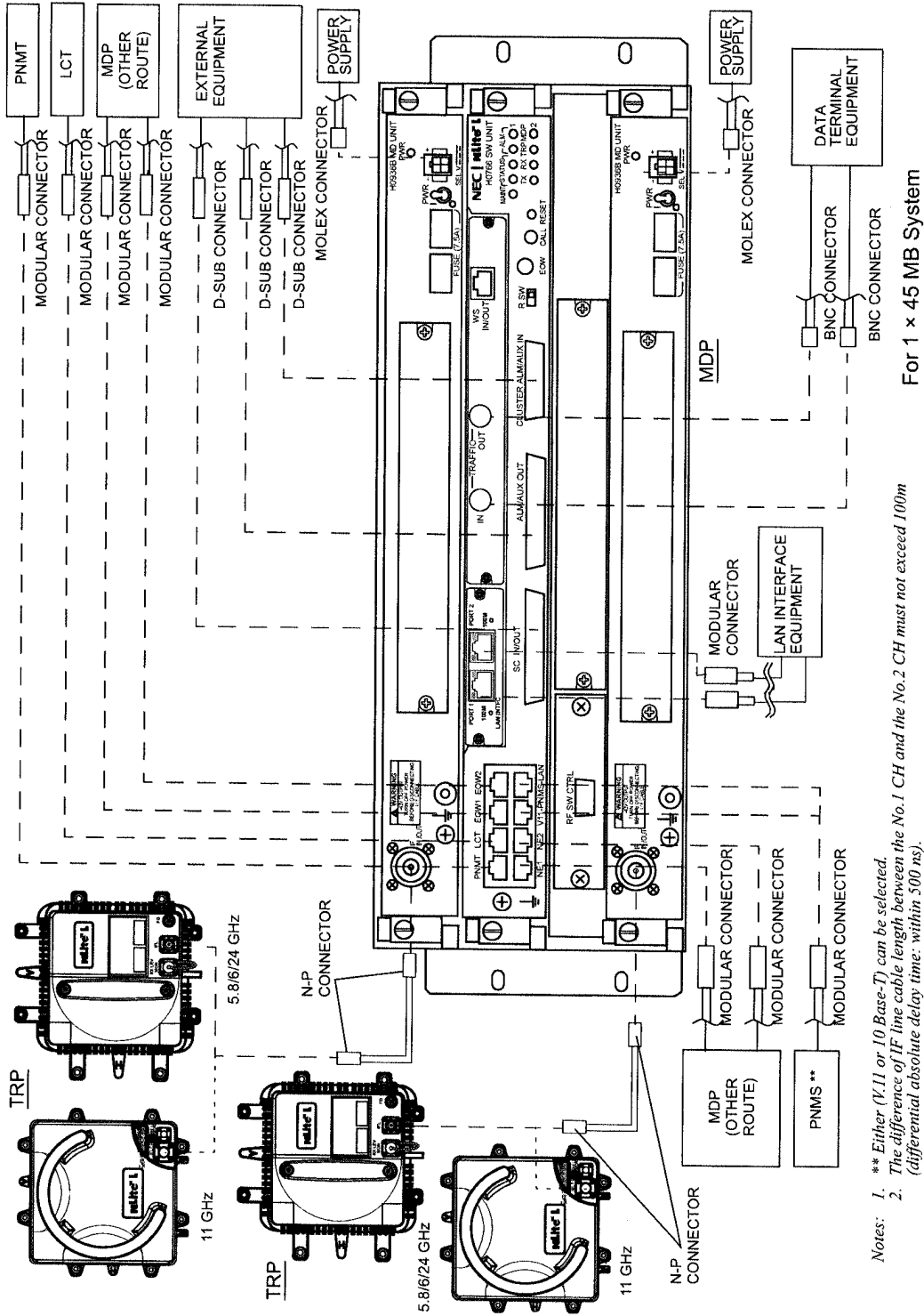
Table 2-1 for MDP, Table 2-3 for TRP e/w FAN and Table 2-4 for TRP w/o FAN in Section II OPERATION show pin assignment in the MDP and TRP.



Notes: 1. ** Either (V11 or 10 Base-T) can be selected.
 2. The difference of IF line cable length between the No.1 CH and the No.2 CH must not exceed 100m (differential absolute delay time: within 500 ns).

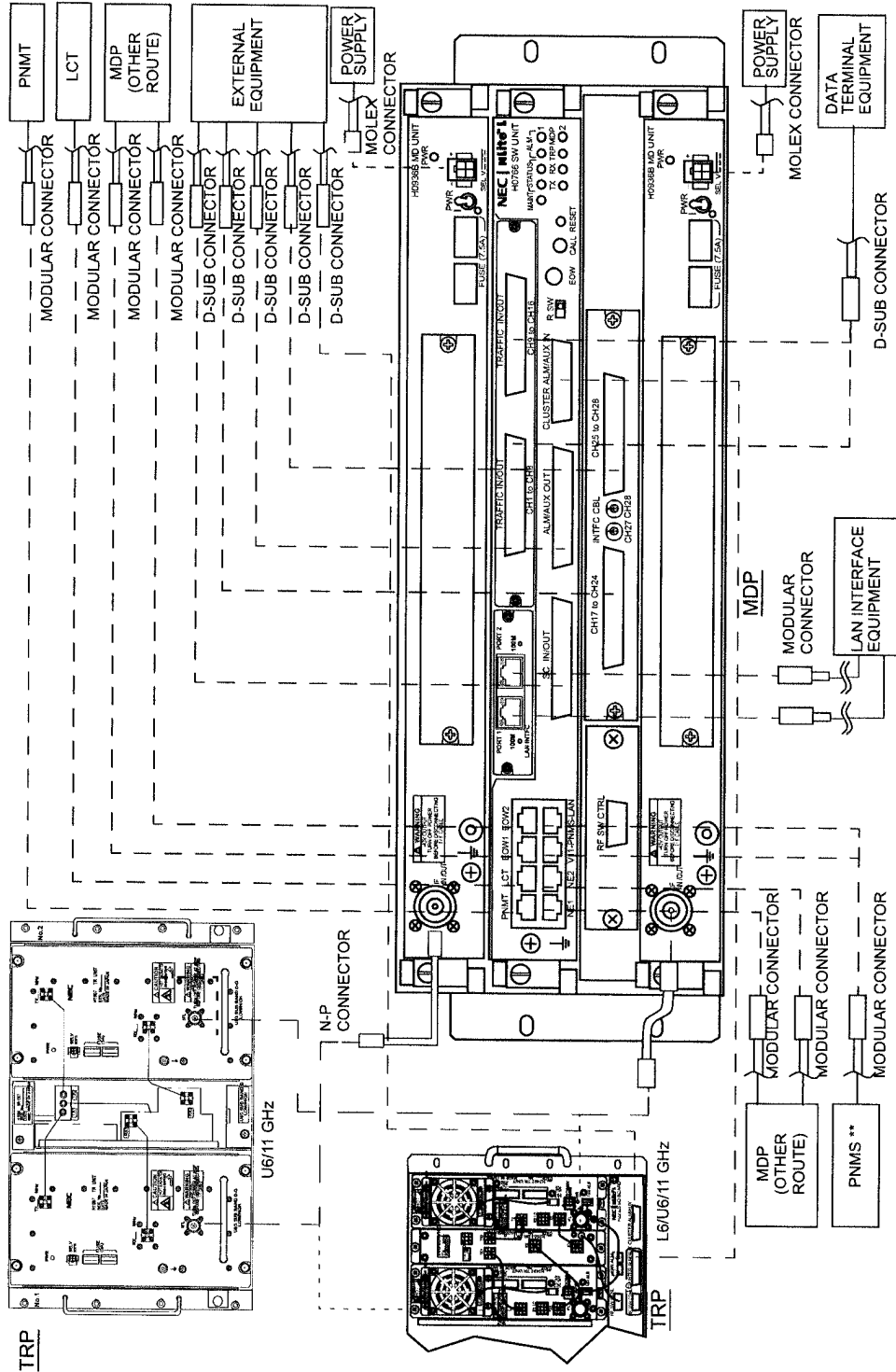
For 28 x 1.5 MB System

Fig. 2-5 Cable and Terminal Connections of MDP and TRP (2/6)



Notes: 1. ** Either (V.11 or 10 Base-T) can be selected.
 2. The difference of IF line cable length between the No.1 CH and the No.2 CH must not exceed 100m (differential absolute delay time: within 500 ns).

Fig. 2-5 Cable and Terminal Connections of MDP and TRP (3/6)



Notes: 1. ** Either (V11 or 10 Base-T) can be selected.
 2. The difference of IF time cable length between the No.1 CH and the No.2 CH must not exceed 100m (differential absolute delay time: within 500 ns).

For 28 x 1.5 MB System
Fig. 2-5 Cable and Terminal Connections of MDP and TRP (5/6)

2.10 Frame Grounding

In mounting the MDP and TRP, perform frame grounding. The location of the frame grounding in each MDP and TRP is shown in Fig. 2-6, and the connection for frame grounding is shown in Fig. 2-7.

Note: Connect the Frame Ground (FG) terminal on the MDP to the mounting rack with the earth cable. In addition, connect the mounting rack to the indoor earth terminal with the earth cable and connect the FG terminal on the TRP to the ground (refer to Fig. 2-7).

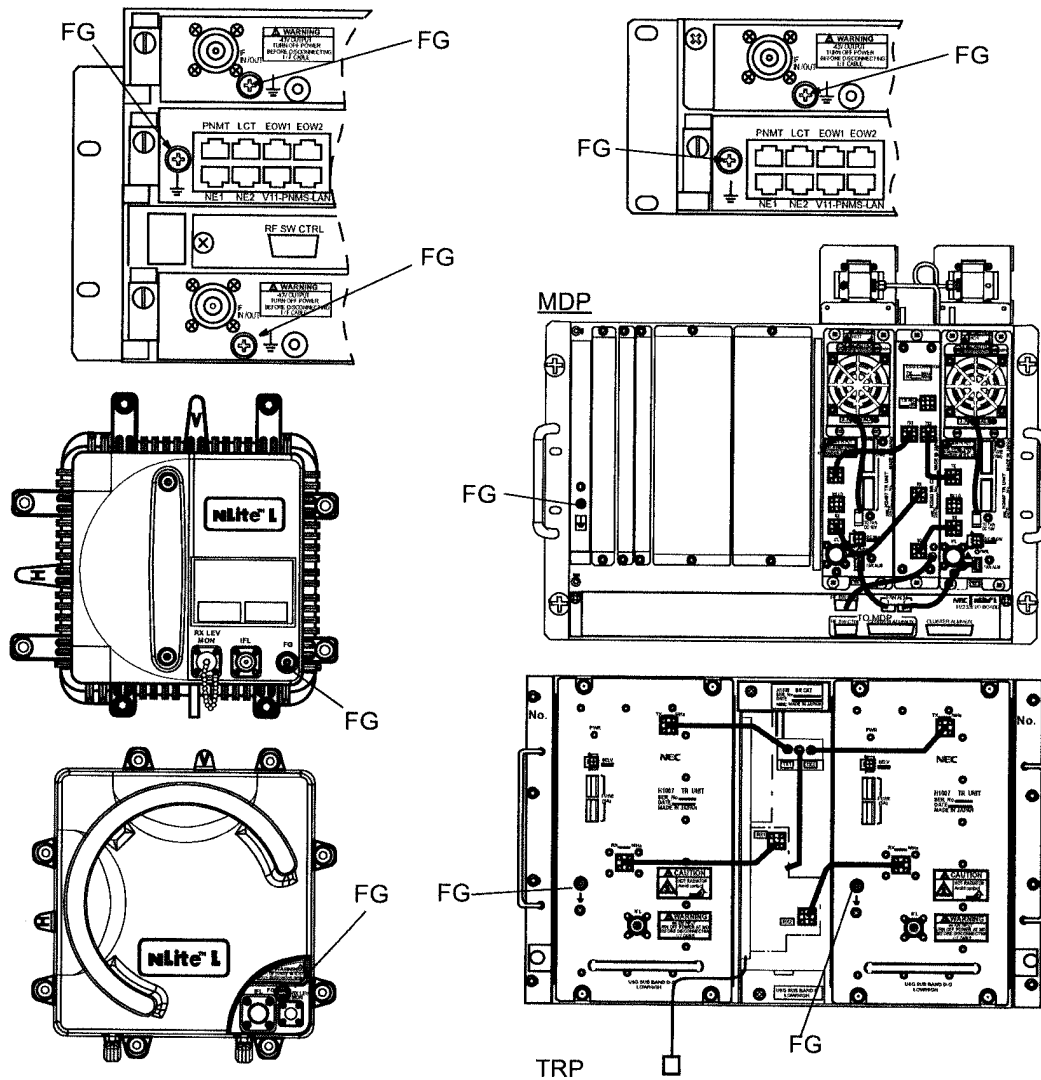
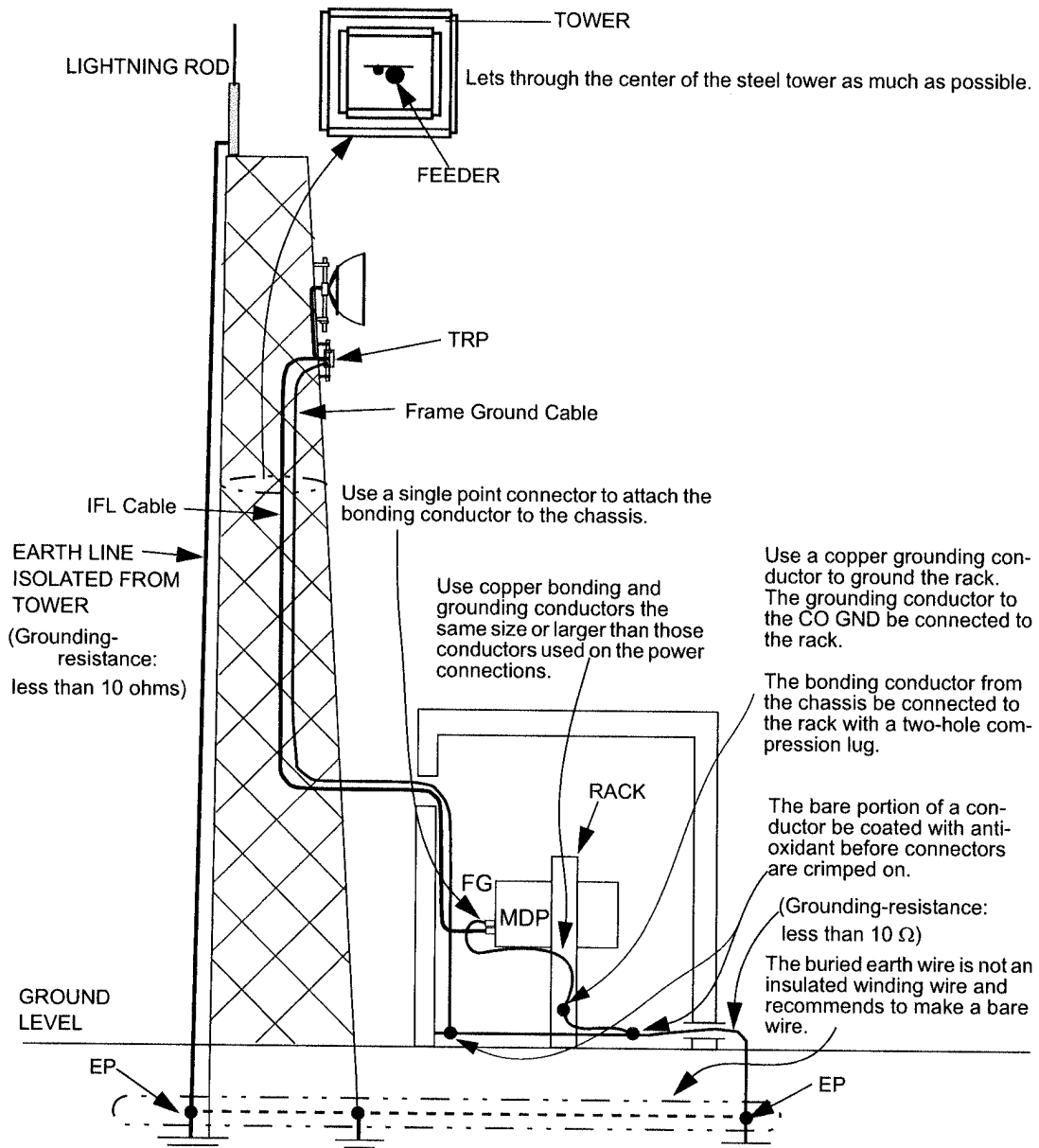


Fig. 2-6 Location of Frame Ground



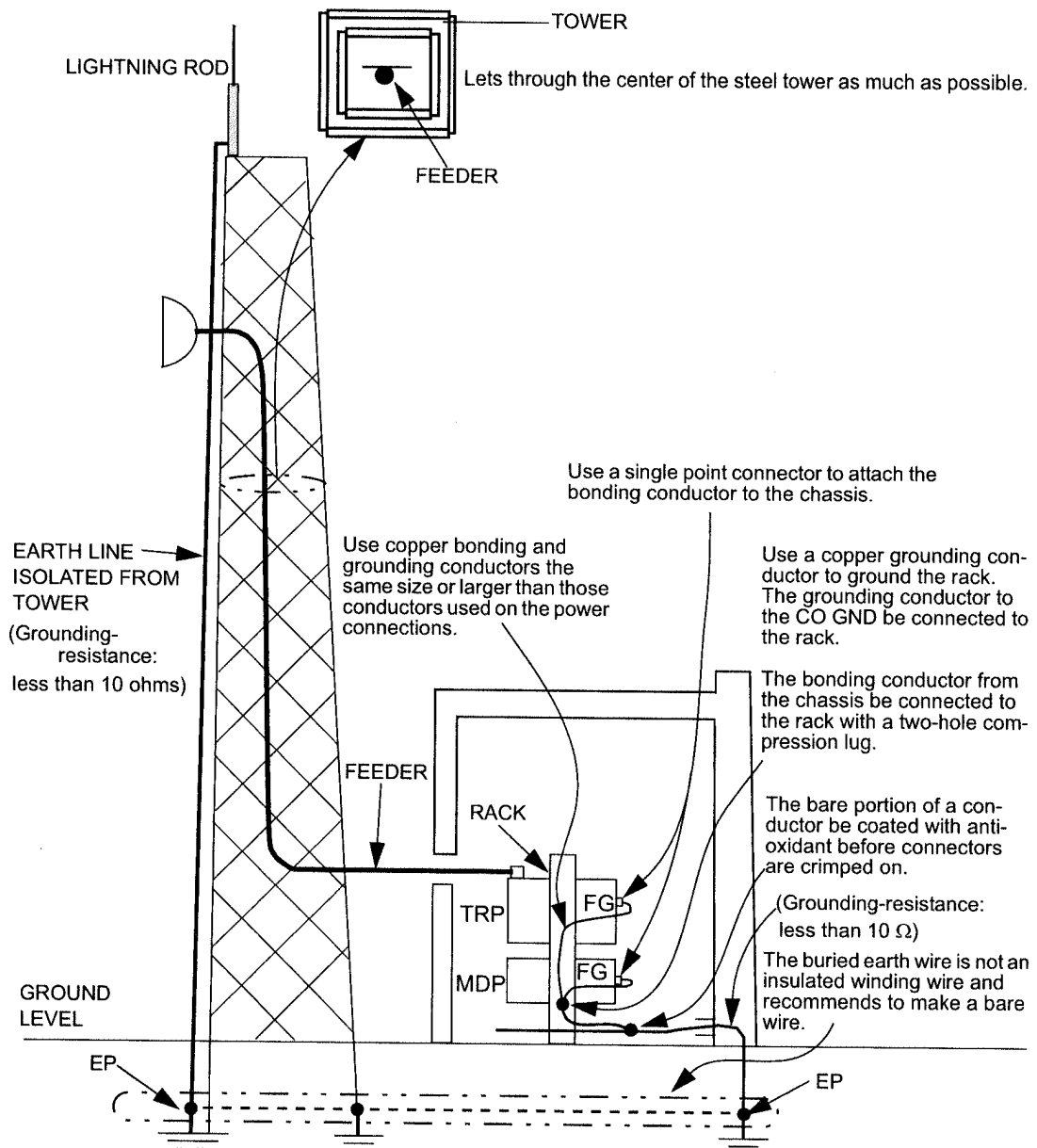
Note: * NEC recommends that the earth line should be connected to the frame ground of TRP and installed as shown above. (This connection is an example).

EP : Earthing Point of tower

FG : Frame Ground terminal

Unplated connectors and connection surfaces be brought to a bright finish and coated with antioxidant before being connected.

Fig. 2-7 Connection for Frame Grounding (1/2)



Note: * NEC recommends that the earth line should be connected to the frame ground of TRP and installed as shown above. (This connection is an example).
 EP : Earthing Point of tower
 FG : Frame Ground terminal
 Unplated connectors and connection surfaces be brought to a bright finish and coated with antioxidant before being connected.

Fig. 2-7 Connection for Frame Grounding (2/2)

2.11 Waterproof Protection

After cable connection, the following part should be wrapped by self-bonding tape for waterproof (see Fig. 2-8),

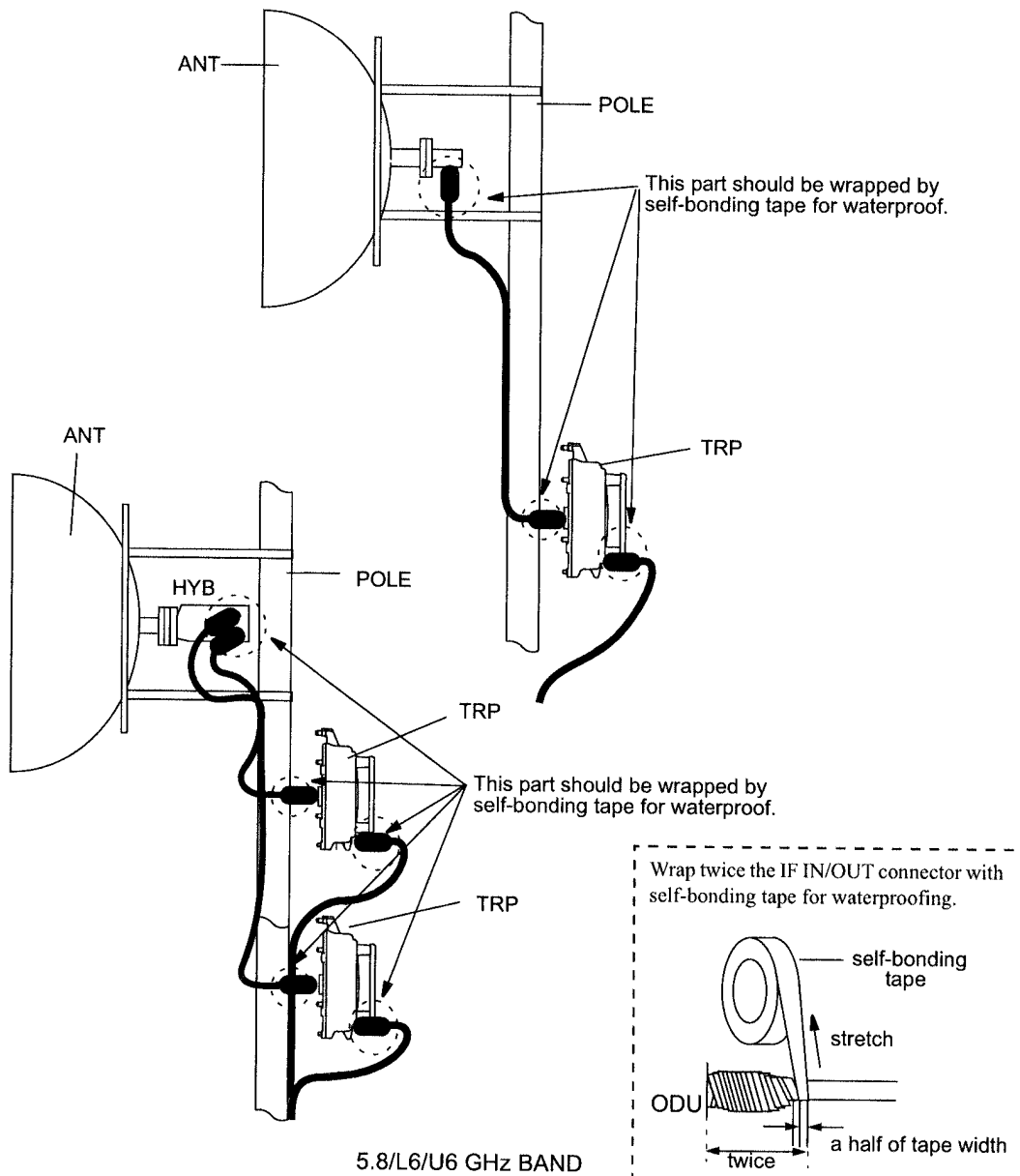
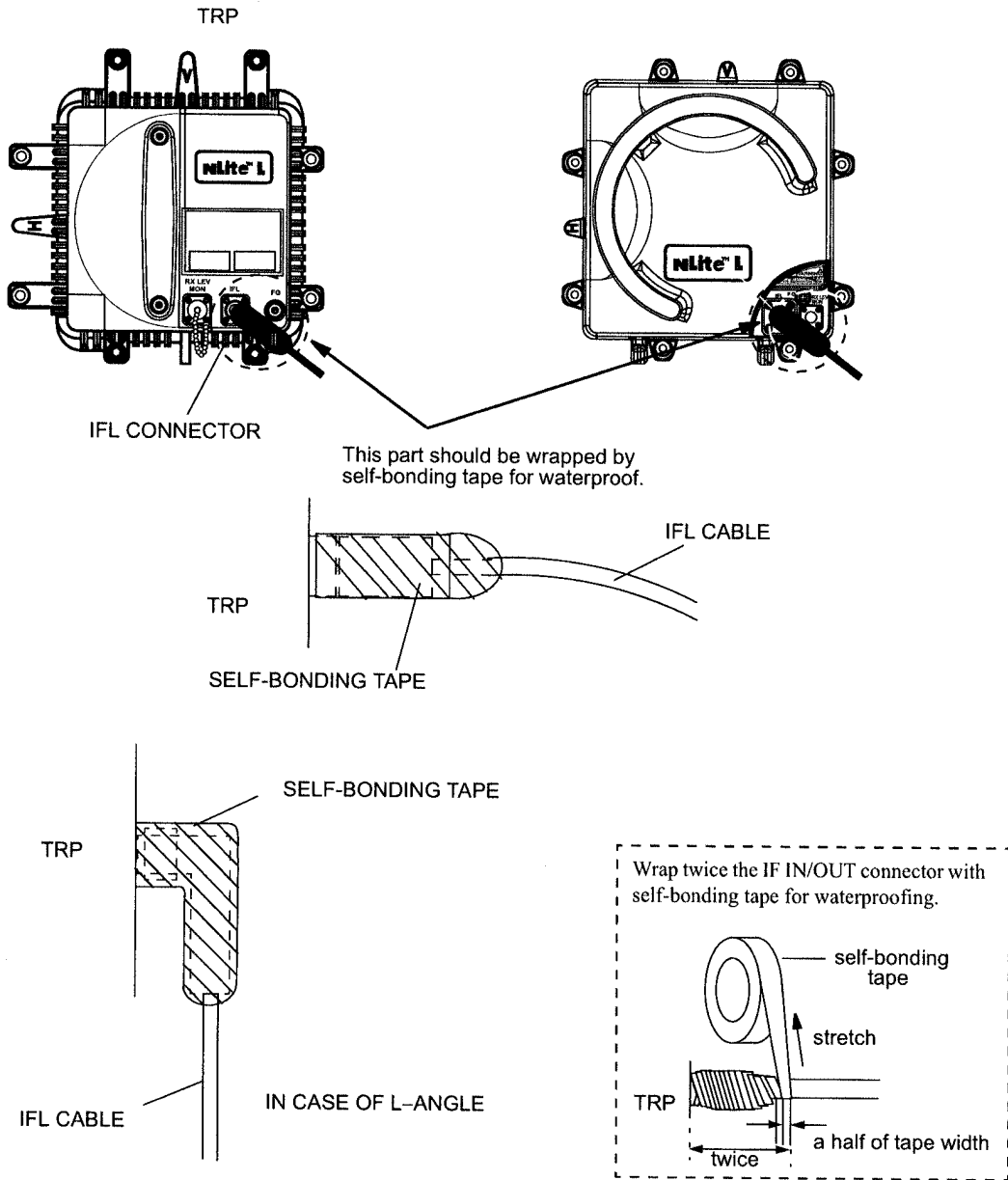


Fig. 2-8 Location of Connector for Waterproof (1/2)



Note: The self-bonding tape should be prepared by customer.

Fig. 2-8 Location of Connector for Waterproof (2/2)

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3. INITIAL LINE UP

This chapter provides instructions for the initial lineup of the equipment. Included is information on start-up, shut-down, MDP and TRP equipment setting, antenna orientation and lineup test for the equipment.

3.1 Start-up

Referring Chart 3-1 Check the polarity and voltage of the power supply cable before connecting the cable to the MDP and TRP.

- 1. The -43 V DC power is superimposed on the center conductor of the IF coaxial cable between the MDP and the TRP. Connecting test equipment directly to this terminal may damage it and touching the coaxial cable core may cause electrical shock.*
- 2. Do not disconnect the IFL cable between the MD UNIT and the TR UNIT in operating condition, to avoid damaging the NLite L. Do not remove/connect the IFL cable with the MD UNIT power ON, turn the MD UNIT power OFF before connecting/disconnecting the IFL cable.*
- 3. Do not allow open circuit of TX output with the TX power on conditions. Perform the TX Mute control in the Maintenance mode or turn the PWR switch off at the MD UNIT before disconnecting cable or feeder from the TX output.*
- 4. Engineers performing servicing must take necessary steps to avoid electro-static discharge which may damage the modules on the MDP or cause error. Wear a conductive wrist strap connected to the grounded (FG) jack on the front of the equipment shelf. This will minimize static build-up during servicing.*
- 5. After turning ON the equipment, wait at least 1 minute before turning it OFF again. Repeatedly turning the power ON and OFF within a short interval may cause the MDP to fail.*
- 6. Contact NEC before program download on the LCT is performed. Equipment may not function correctly with improper operation.*
- 7. Be careful top surface of the MD UNIT/TR UNIT is hot in operation.*
- 8. To prevent accidental MDP power switch lever movement, the power switch lever is locked. When set the power switch to on/off, it must be pulled out power switch lever knob to unlock the switch lever.*

Note: Before turn on the PWR switch of the MDP, power supply for the SEL V on the TRP is necessary.

Chart 3-1 Power Turn ON

Caution: *Do not apply a voltage to the equipment that varies sharply. The equipment may operate improperly.*

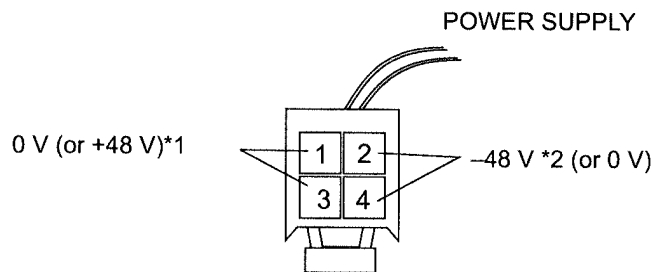
Apparatus:
 Suitable Screwdriver
 Digital Multimeter

Step	Procedure
------	-----------

Note: The TRP power is also supplied through the MDP power switch.

- 1 Check that the No.1 CH SEL V and DC IN in voltage is between -36 to -60 V/+36 to +60 V (or -20 to -60 V/+20 to +60 V) with the digital multimeter, before connecting the power cable as shown below to the No.1 CH MD UNIT and TR UNIT,

Note: Power for the DC IN of the TRP is necessary supplied before turn on the PWR switch on the MD UNIT.



*Note: *1. +36 to +60 V or +20 to +60 V
 2. -36 to -60 V or -20 to -60 V

- 2 Check that the IFL cable between the MD UNIT and the TR UNIT is connected.
- 3 Turn on the No.1 PWR switch on the MD UNIT (see Fig. 3-1).
- 4 Confirm that PWR indicator on the No.1 MD UNIT and No.1 TR UNIT are lit.
- 5 Repeat steps 1 to 4 for No.2 in 1+1 system.

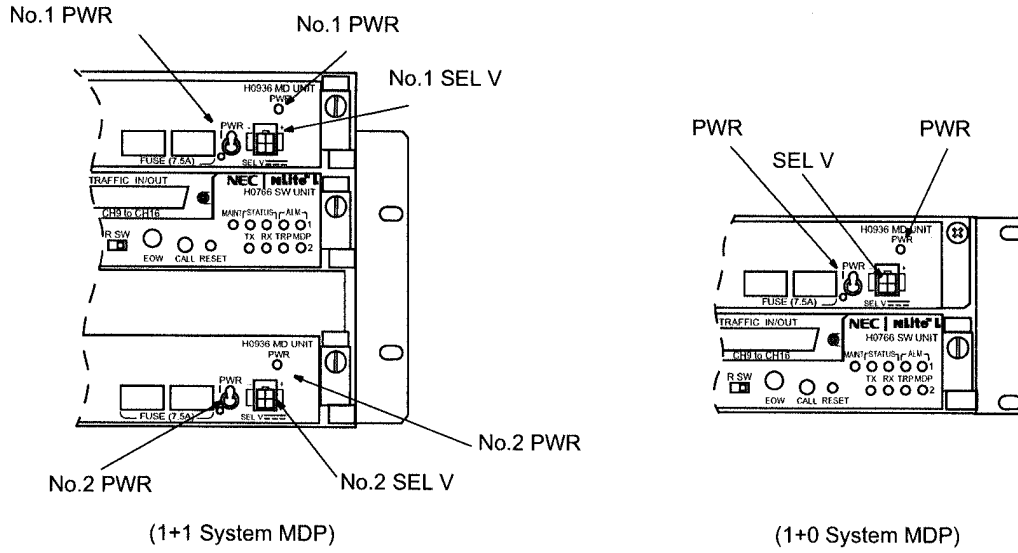


Fig. 3-1 Connector, Power Switch and Indicator Location

3.2 Shut-down

The shut-down procedure for the equipment is shown in Chart 3-2.

Warning: *After turning ON the equipment, wait at least 1 minute before turning it OFF again. Repeatedly turning the power ON and OFF with in a short interval may cause the MDP to fail.*

Chart 3-2 Shut-down

Step	Procedure
1	Turn off the PWR switch on the MDP of No.1 (or No.2 in 1+1 system) (see Fig. 3-1).

3.3 Initial Setting

The initial setting of the MDP/TRP is performed by the LCT according to Table 3-1.

Table 3-1 Initial Setting Items

	Item	Remarks
1.	System Configuration Setting	Chart 5-1 in Section II
2.	Date and Time Setting	Chart 5-2 in Section II
3.	Provisioning Setting	Chart 5-3 in Section II
4.	Relay/House Keeping Setting	Chart 5-4 in Section II

The details of the setting with LCT, refer to chapter 5 in Section II.

3.4 Antenna Orientation

After the initial setting has been completed, an antenna orientation is performed between two stations according to the procedures in Chart 3-3.

Chart 3-3 Antenna Orientation

Apparatus :

Wrench

Step	Procedure
------	-----------

- 1 Connect the RS-232C cable between the LCT and MDP (see Fig. 2-2 in Chart 2-1 in Section IV MAINTENANCE),
- 2 Open the Terminal software (e.g; HyperTerminal),
- 3 Enter Login name "Admin" and press the "Enter" key, enter the password "12345678" and press the "Enter" key,

At each station, when the TX power control is operated in ATPC, change the setting from "ATPC" to "MTPC" on the TX Power Control item of System Configuration using the LCT.

Note: In Antenna Alignment Mode, since ATPC control stops, it should be set to MTPC mode and TX power is fixed. When the OW/RX LEV Monitor is used, Antenna Alignment Mode must be set with LCT.

- 4 Press the "3" key and "Enter" key to display provisioning data,

```

--- NEC PDH RADIO VER. X.XX.XX ---
0. Logout
1. Alarm / Status
2. Performance Monitor
3. Provisioning Data
4. System Configuration
5. Inventory Data
6. Relay / House Keeping
7. Maintenance
Enter Selection :
    
```

At each station, TX power is set to the value calculated by the system design, but while antenna orientation, TX power should be set to 0 dB in MTPC TX PWR mode so that TX power becomes the maximum (TX power setting can be performed by MTPC TX PWR item of "Provisioning Data" using LCT).

Note: The MTPC TX PWR is the item which sets up the quantity of attenuation of transmitter power, and adjusts transmitter power with the quantity of this attenuation.

Chart 3-3 Antenna Orientation (Cont'd)

Step	Procedure
------	-----------

	<p>--- Provisioning Data ---</p> <ol style="list-style-type: none"> 1. Display Current Data 2. Set Provisioning Data <p>Enter Selection : 2</p> <p>--- Set Provisioning Data ---</p> <ol style="list-style-type: none"> 1. Main / LAN Signal configuration 2. BER Threshold 3. Wayside Interface 4. SC Assignment 5. MTPC TX PWR *1 6. ATPC Range *2 8. RX Threshold 9. Additional ATT 10. TRP ALM Mode 11. TXSW Priority *3 12. RXSW Priority *3 13. Channel Usage Error 16. AIS Activation Condition 17. AIS Activation Delay Time 18. AIS Generated Report 19. AIS Received Report <p>Enter Selection :</p>
--	--

*Note: *1 MTPC TX PWR is indicated when the "Manual" is selected in ATPC Manual Control item by the LCT.*

**2 ATPC is indicated when the "Auto" is selected in ATPC Manual Control item by the LCT.*

**3 TXSW Priority and RXSW Priority are indicated with the Hot Standby configuration.*

5 Press the "ESC" key to go back to the following main menu,

	<p>--- NEC PDH RADIO VER. X.XX.XX ---</p> <ol style="list-style-type: none"> 0. Logout 1. Alarm / Status 2. Performance Monitor 3. Provisioning Data 4. System Configuration 5. Inventory Data 6. Relay / House Keeping 7. Maintenance <p>Enter Selection :</p>
--	---

6 Press the "2" key for Performance Monitor and press the "Enter" key,

Chart 3-3 Antenna Orientation (Cont'd)

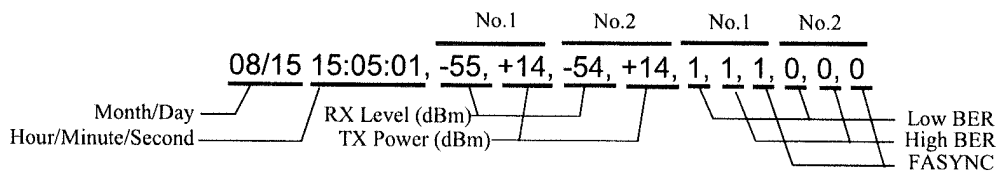
Step	Procedure
------	-----------

--- Performance Monitor --- 1. Display Metering / BER 2. Display Performance Monitor 3. Display Threshold Data 4. Set Threshold Data 5. RSL Monitor Enter Selection : 5

7	Press the “5” key to select RSL Monitor and press the “Enter” key,
---	--

--- RSL Monitor --- 08/15 15:05:01,-55,+14,-54,+14,1,1,1,0,0,0 08/15 15:05:02,-55,+14,-54,+14,1,1,1,0,0,0 08/15 15:05:03,-55,+14,-54,+14,1,1,1,0,0,0 08/15 15:05:04,-55,+14,-54,+14,1,1,1,0,0,0 08/15 15:05:05,-55,+14,-54,+14,1,1,1,0,0,0 08/15 15:05:06,-55,+14,-54,+14,1,1,1,0,0,0 08/15 15:05:07,-55,+14,-54,+14,1,1,1,0,0,0

Notes: 1. Indication values are as follows.



Status of High BER/Low BER/ FASYNC

1: ALM, 0: Normal

Values for No.2 in 1+0 are indicate by “***” and status is indicated by “0”.

When the TRP is not conected or alarm occurs, monitoring values are indicated by “***”. Exceeded values for indication are indicated by “.*”

RSL Monitor allows indication of the receiving level and transmission power status in “dBm” at intervals of 1 second. Because of the sampling system with 1-sec cycle, indication of rapid level change is impossible. In addition, LOW BER ALM, HIGH BER ALM and FASYNC are indicated to facilitate analysis of system condition, therefore, they are indicated whether alarm is present or not during the 1 second of sampling.

Chart 3-3 Antenna Orientation (Cont'd)

Step	Procedure
8	At each station, adjust the azimuth and elevation angle of the antenna alternately so that the indicated RX LEV level becomes maximum,
9	Reset the control from MTPC to ATPC if required,
10	Continue to Chart 3-4,

3.5 Lineup Test

Procedure for line up test between two stations are listed in Table 3-2.

Table 3-2 Lineup Test Items

	Item	Remarks
1	Meter Reading	Chart 3-4
2	Orderwire Test	Chart 3-4
3	BER Measurement	Chart 3-5

Chart 3-4 Meter Reading and OW Test

Step	Procedure
1	Connect the RS-232C cable between the LCT and MDP (see Fig. 2-2 in Chart 2-1 in Section IV MAINTENANCE),
2	Open the Terminal software (e.g; HyperTerminal),
3	Enter Login name "Admin" and press the "Enter" key, enter the specified password and press the "Enter" key,

```

Login : Admin
Password : *****

--- NEC PDH RADIO VER. X.XX.XX ---
0. Logout
1. Alarm / Status
2. Performance Monitor
3. Provisioning Data
4. System Configuration
5. Inventory Data
6. Relay / House Keeping
7. Maintenance
Enter Selection :
    
```

- 4 Press the "2" key for Performance Monitor and press the "Enter" key,

Chart 3-4 Meter Reading and OW Test (Cont'd)

Step	Procedure
5	Press the "1" key for Display Metering /BER and press the "Enter" key. Verify the all items listed in Table 3-2.

```

--- NEC PDH RADIO VER. X.XX.XX ---
0. Logout
1. Alarm / Status
2. Performance Monitor
3. Provisioning Data
4. System Configuration
5. Inventory Data
6. Relay / House Keeping
Enter Selection : 2

--- Performance Monitor ---
1. Display Metering / BER
2. Display Performance Monitor
3. Display Threshold Data
4. Set Threshold Data
5. RSL Monitor
Enter Selection : 1

--- Display Metering / BER ---
TX POWER    +10dBm
RX LEVEL    -60dBm
TRP PS MON  -43V
BER         0.0E-10 (Calculating)

--- Performance Monitor ---
1. Display Metering / BER
2. Display Performance Monitor
3. Display Threshold Data
4. Set Threshold Data
5. RSL Monitor
Enter Selection :

```

Notes: 1. In the 1+1 system, metering/BER values for No.1 CH is displayed in the left side and for No.2 CH is displayed in the right side.

2. "3.0E-4" indicates the bit error rate of 3×10^{-4} .
3. * BER (BER between radio) is calculated every one minute. "Calculating" is displayed till the value is fixed.
4. *If the performance data from the TRP are not received, **dBm and ***V are displayed.
5. TX POWER/RX LEVEL is indicated in 1 dB step.

Chart 3-4 Meter Reading and OW Test (Cont'd)

Step	Procedure
------	-----------

Table 3-3 Meter Reading

Check Item	Type	Normal Indication		Allowable Range
TX POWER *1	Split	5.8/L6/U6 GHz	+5 to +25 dBm (Standard Type)	Normal Indication ± 3 dB (8/16/28DS1/DS3)
		10.5 GHz	+1 to +21 dBm (Standard Type)	Normal Indication ± 3 dB (8/16DS1)
		11 GHz	+1.5 to +21.5 dBm (Standard Type)	Normal Indication ± 3 dB (DS3)
		24 GHz	-2 to +18 dBm (Standard Type)	Normal Indication ± 3 dB (28 DS1/DS3)
	All Indoor (e/w FAN)	L6 GHz	+10.5 to +30.5 dBm (Standard Type)	Normal Indication ± 3 dB (8/16/28DS1/DS3)
			+13.5 to +33.5 dBm (High Power Type)	Normal Indication ± 3 dB (8/16/28DS1/DS3)
		U6 GHz	+9.5 to +29.5 dBm (Standard Type)	Normal Indication ± 3 dB (8/16/28DS1/DS3)
			+12.5 to +32.5 dBm (High Power Type)	Normal Indication ± 3 dB (8/16/28DS1/DS3)
		10.5 GHz	+9 to +29 dBm (High Power Type)	Normal Indication ± 3 dB (8/16DS1)
		11 GHz	+10 to +30 dBm (High Power Type)	Normal Indication ± 3 dB (DS3)
All Indoor (w/o FAN)	U6 GHz	+8.5 to +28.5 dBm (Standard Type)	Normal Indication ± 3 dB (8/16/28DS1/DS3)	
	11 GHz	+5.5 to +25.5 dBm (Standard Type)	Normal Indication ± 3 dB (8/16/28DS1/DS3)	
RX LEVEL		-30 dBm *2		
TRP PS MON		-43 V *3		-32 to -46 V DC

Notes: 1* When ATPC/MTPC range is set to 0 to 20 dB.

2* Varies in proportion to the receiving RF signal level.

3* Varies with cable length between the MDP and TRP.

- 6 Press the "ESC" key to go back to Main menu, and press the "Enter",
- 7 Press the "0" key to Logout,

Chart 3-4 Meter Reading and OW Test (Cont'd)

Step	Procedure
<u>ORDERWIRE TEST</u>	
8	Connect headset(s) to the EOW jack on the front panel of the MDP (see Figs. 3-2),
9	Press the CALL button switch on the front panel of the MDP, Requirement: At opposite station, the buzzer on the MDP is activated,
10	Check that orderwire telephone between stations can be connected by using headsets,
11	Disconnect headset from EOW jack on the front panel of the MDP,

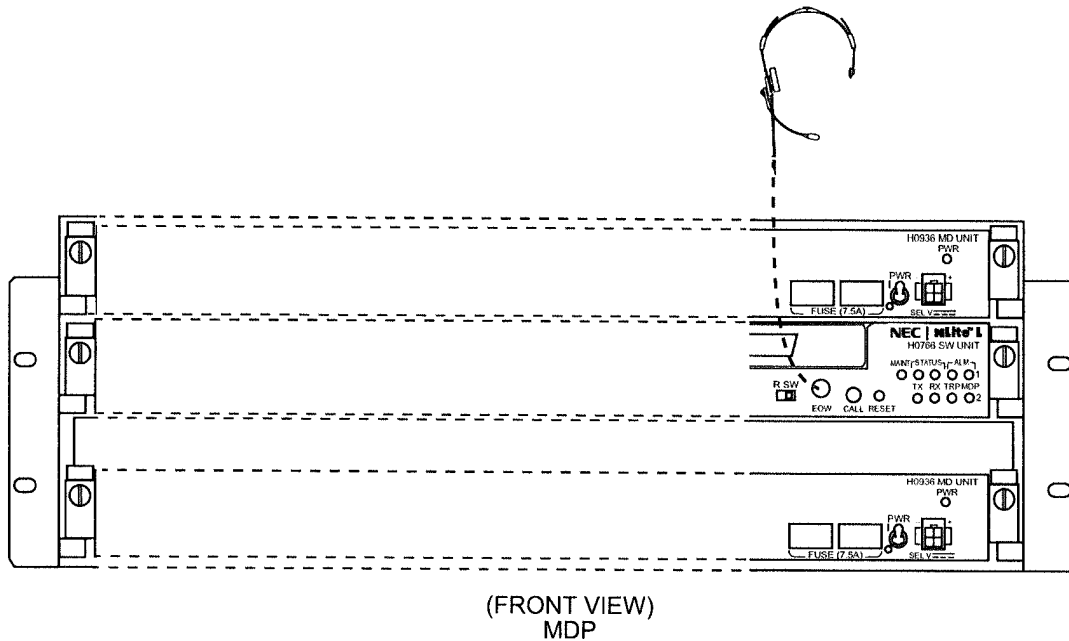


Fig. 3-2 Lineup Test Setup for MDP

Chart 3-5 BER Measurement

BER measurement is performed between terminal stations.

Apparatus :

Digital Multimeter (or equivalent) with test leads
 Screwdriver
 PDH Analyzer
 Headset

Step	Procedure
1	<p>Disconnect the D-sub connectors from the CH1-CH8 TRAFFIC IN/OUT or CH9-CH16 TRAFFIC IN/OUT on the MDP (see Fig. 3-3) (For 8/16/28 x DS1 System),</p> <p>Disconnect the coaxial cable from the TRAFFIC IN/OUT on the MDP (see Fig. 3-3) (For 1 x DS3 System),</p>
2	<p>Set the PDH Analyzer as follows:</p> <p><u>For 8/16/28 x DS1 system</u></p> <ul style="list-style-type: none"> • Bit rate : 1.544 Mbps (ANSI T1.107) • Code format : B8ZS or AMI • Impedance : 100 ohms, balanced <p><u>For 1 x DS3 system</u></p> <ul style="list-style-type: none"> • Bit rate : 44.736 Mbps (ANSI T1.107) • Code format : B3ZS • Impedance : 75 ohms, unbalanced
3	Set up as in Fig. 3-3,
4	Measure the BER for each channel,
5	Check that the measured BER is within values of system calculation,
6	Restore all connections used test to normal.

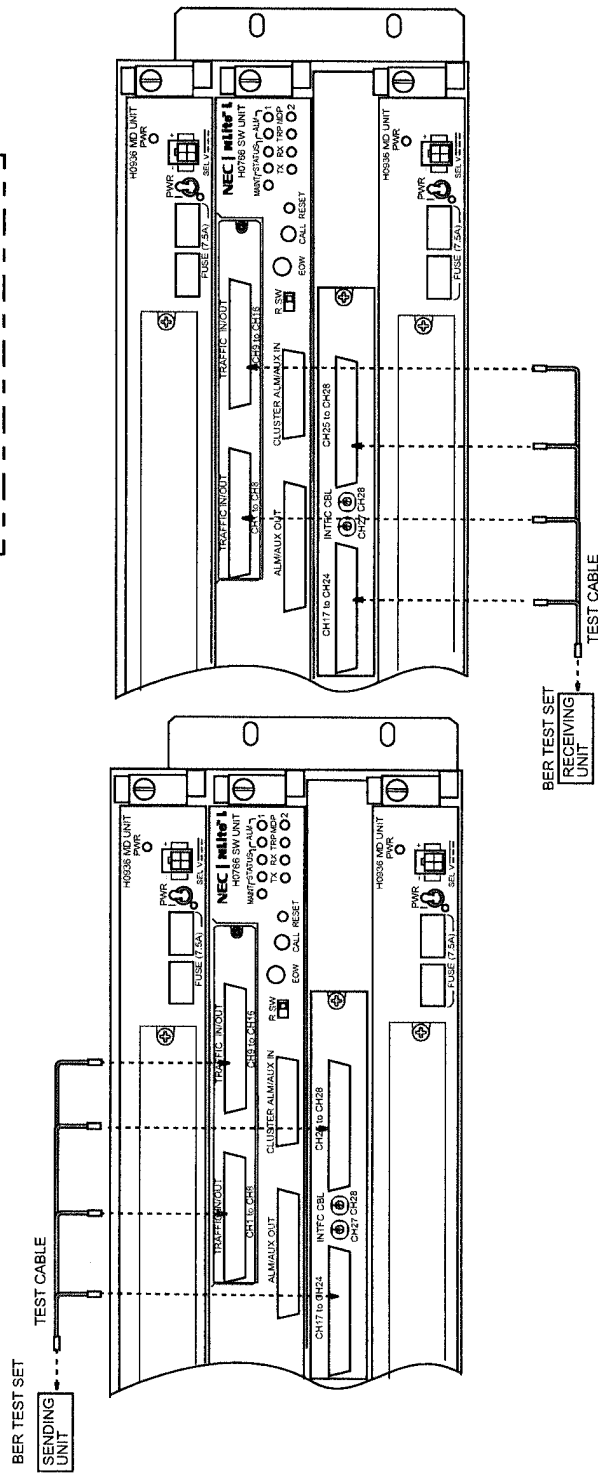
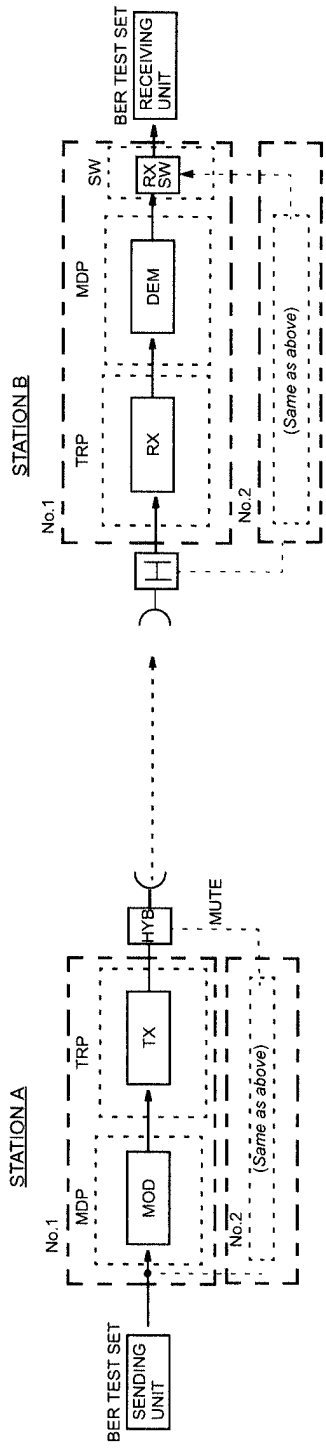


Fig. 3-3 Lineup Test Setup for BER Measurement (1/2)

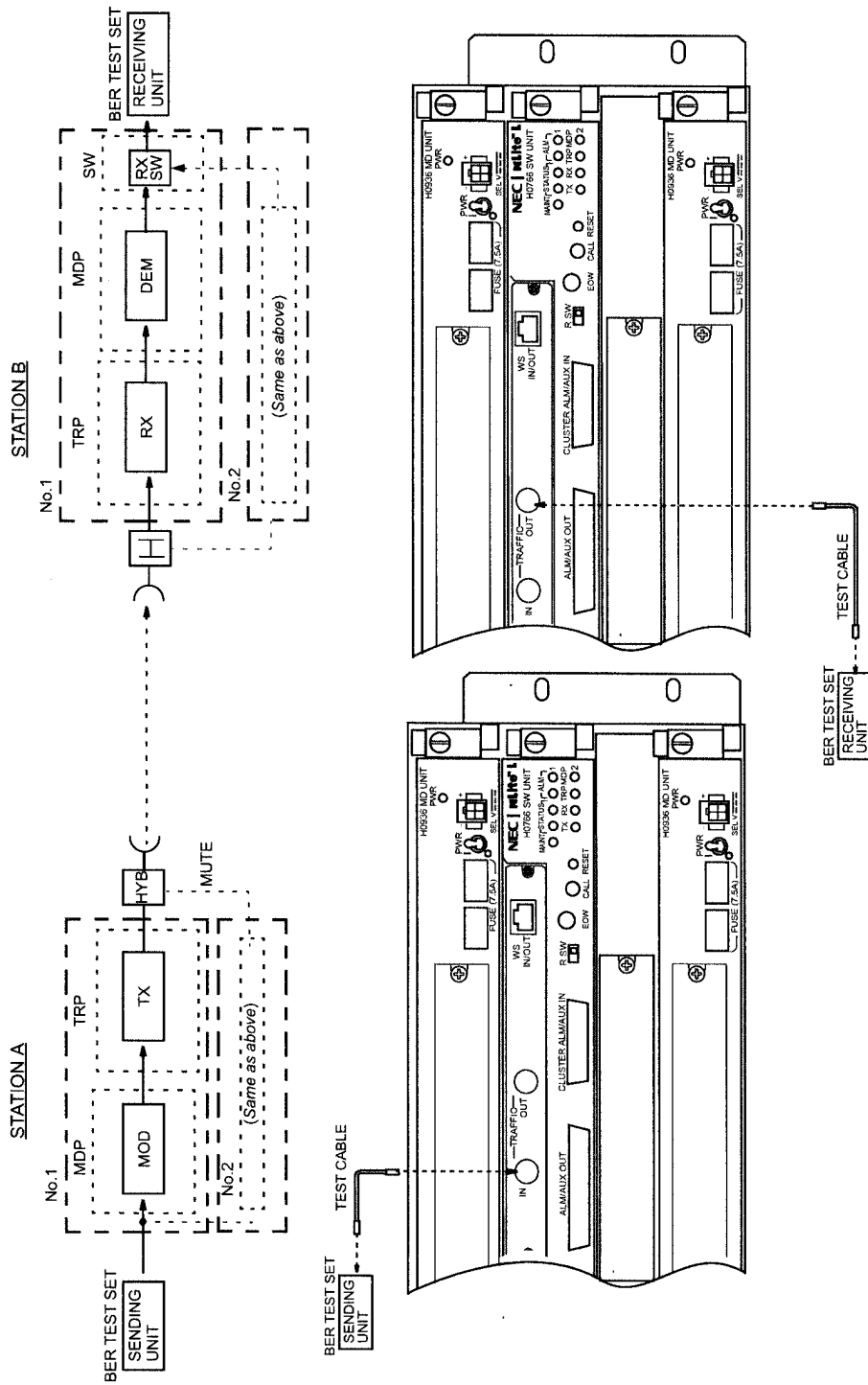


Fig. 3-3 Lineup Test Setup for BER Measurement (2/2)

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**APPENDIX (NLite L)
LAN INTERFACE (10/100BASE-T(X))
Application and Setting
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1. OUTLINE

The NLite L (PDH) provides two ports interface of 10BASE-T/100BASE-TX which are adapted to various applications. By easy setting, besides each port can be used independently separated, a signal can share the bandwidth with two ports. Through put capacities can be set 64 kbps to 42 Mbps (When WS domain is used).

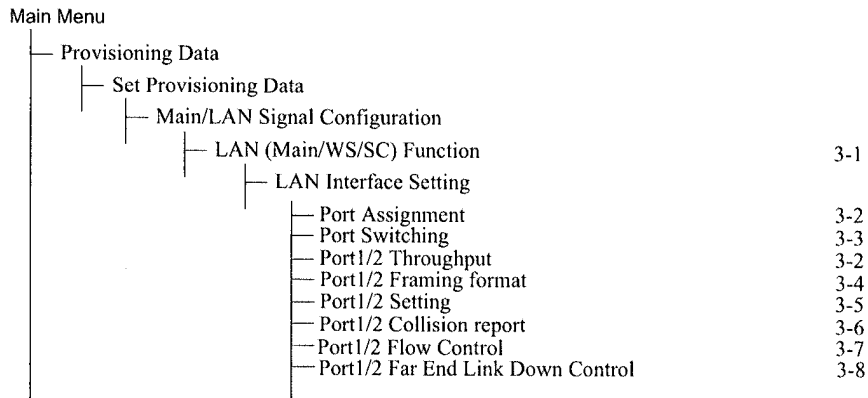
2. MODULE INFORMATION

2Port LAN Interface (LAN INTFC)

Module	Features
H0934B LAN INTFC	• 10BASE-T/100BASE-TX x 2 port
	• Auto Negotiation / Auto MDI/MDIX, effective
	• 1K MAC Address Table, automatically learning and aging.
	• Maximum frame size 1548 bytes
	• Conformed to IEEE 802.3x, Pause Frame Flow Control, effective (Full Duplex)
	• Half Duplex Back Pressure, effective
	• Link Loss Forwarding function

3. SETUP OF THE MODULE

(Description)



For the 2Port LAN & 1.5M (45M) Capacity setup, it is necessary to set to the same mode between local and opposite equipments.

3.1 Setup of Port Usage

Setup the LAN port for used or unused.

No.	Setup	Descriptions
1	<i>Used</i>	Port is used.
2	<i>Not Used (Default)</i>	Port is not used.

* When *Not Used* is selected, link of port is compulsorily released.

3.2 Port Assignment

The LAN applies to either transmission domain of Main signal, SC or WS.

The bandwidth of each transmission domain is Main signal: 1.5 Mbps to 42 Mbps, SC signal: 64 kbps/128 kbps and WS signal: 1.5 Mbps and bandwidth of the Main signal varies depending on the used system. Applicable signal assignment of the Port1 and Port2 is listed in Table 3-1 and bandwidth and assignable CH are listed in Table 3-2.

Setup of the LAN INTFC is performed with LCT, PNMT or PNMS. The menu items on the LCT are as follows.

Table 3-1 Port Assignment

Port1	Port2	Description
SC	N/A	Selectable bandwidth, 64 kbps or 128 kbps
WS	N/A	Applicable system is only 28DS1 or DS3. Port1 is fixed at 1.5 Mbps.
MAIN	N/A	Assignable values of Port1 are listed in Table 3-2.
SC	SC	64 kbps is fixed in each Port1 and Port2.
SC	WS	Applicable system is only 28DS1 or DS3. Selectable bandwidth in Port1 is 64 kbps or 128 kbps 1.5 Mbps is fixed in Port2.
MAIN	SC	Assignable values of Port1 are listed in Table 3-2. Selectable bandwidth in Port2 is 64 kbps or 128 kbps
MAIN	WS	Applicable system is only 28DS1 or DS3. Selectable bandwidth in Port1 is 64 kbps or 128 kbps 1.5 Mbps is fixed in Port2.
MAIN	MAIN	Assignable values of Port1 are listed in Table 3-2. Assignable values of Port2 are listed in Table 3-2.
SC (Shared)	N/A	64 kbps or 128 kbps is shared in Port1 and Port.
WS (Shared)	N/A	1.5 Mbps is shared in Port1 and Port.
MAIN (Shared)	N/A	Bandwidth is accordance with the assigned CH domain. Assignable values are listed in Table 3-2

Table 3-2 LAN Port Assignment in MAIN DATA CH

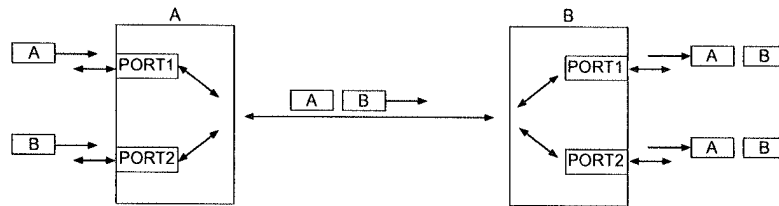
System	LAN Capacity [Mbps]	PORT	LAN Assignment CH (DS1/DS3 Domain)																											
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
8DS1	1.5 M	Port 1	○																											
		Port 2																												
	3 M	Port 1	○																											
		Port 2																												
16DS1	6 M	Port 1	○																											
		Port 2																												
	12 M	Port 1	○																											
		Port 2																												
28DS1	1.5 M	Port 1	○																											
		Port 2																												
	3 M	Port 1	○																											
		Port 2																												
DS3	6 M	Port 1	○																											
		Port 2																												
	12 M	Port 1	○																											
		Port 2																												
DS3	24 M	Port 1	○																											
		Port 2																												
	30 M	Port 1	○																											
		Port 2																												
DS3	42 M	Port 1	○																											
		Port 2																												
	22 M	Port 1	○																											
		Port 2																												
DS3	44 M	Port 1	○																											
		Port 2																												
		Port 1	○																											
		Port 2																												

Note:
 1.5 Mbps per CH in 8/16/28DS1 system and 45 Mbps per CH in DS3 system.
 ○ : Assigned CH to LAN
 Blank □ : CH is not assigned to LAN in Port 1 and/or Port 2 is available to apply 1.5 Mbps (45 Mbps) bipolar signal.

3.2.1 Multiplexing Mode

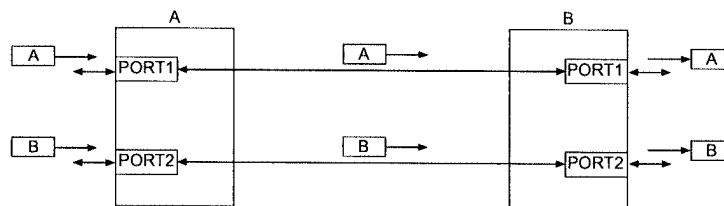
There are two modes, two ports shares signal domain in a radio section (Shared Mode) and independently separated domain is secured for each port (Separated Mode).

a. Shared Mode



* When the shared mode is setup, it is recommended that using switching mode together. (Refer to 4-3 Port Switching)

b. Separated Mode



3.2.2 Service Channel Domain (SC)

When SC channel domain is used for LAN, select transmission bandwidth to 64 kbps or 128 kbps. Depending on the transmission bandwidth selection, the RS-232C interface to use the SC1/SC2 can not be of use.

Table 3-3 Service Channel Assignment

Port1/Port2 Assignment		Port () Throughput	CH Assonant for LAN
Port1	Port2		
SC	N/A	Port1: 1. 64 kbps	LAN Port1 is assigned to DSC1.
		Port1: 2. 128 kbps	LAN Port1 is assigned to DSC1+ DSC2.
SC	SC	-	LAN Port1 is assigned to DSC1 and LAN Port2 is assigned to DSC2.
SC	WS	Port1: 1. 64 kbps	LAN Port1 is assigned to DSC1.
		Port1: 2. 128 kbps	LAN Port1 is assigned to DSC1+ DSC2.
MAIN	SC	Port2: 1. 64 kbps	LAN Port2 is assigned to DSC2.
		Port2: 2. 128 kbps	LAN Port2 is assigned to DSC1+ DSC2.
SC (Shared)	N/A	Port1+Port2: 1. 64 kbps	LAN Port1+LAN Port2 is assigned to DSC1.
		Port1+Port2: 2. 128 kbps	LAN Port1+LAN Port2 is assigned to DSC1+ DSC2.

3.3 Setup of Switching Mode (Port Switching)

Setup of the switching mode between Port1 and Port2 on the shared mode.

No.	Setup	Descriptions
1	<i>Enable</i>	Enables data communication between local Port1 and Port2.
2	<i>Disable (Default)</i>	Disables data communication between local Port1 and Port2.

* This setup is available on the Shared Mode only.

3.4 Setup of DS1 Framing

When the LAN bandwidth is set to 1.5 Mbps, DS1 framing corresponded to ANSI T1.403 is available in the transmission data in the radio link.

No.	Setup	Descriptions
1	<i>UF (Unframed)</i>	Framing is not effected. All 1.5 Mbps are used for LAN signal bandwidth.
2	<i>SF (ANSI T1.107)</i>	Framing is effected for Superframe frame.
3	<i>ESF (ANSI T1.107)</i>	Framing is effected for Extended Superframe frame.

3.5 Setup of Port Speed & Duplex

Setup the operation mode of LAN port.

No.	Mode	Descriptions
1	AUTONEG (AUTO-MDI/MDIX) <i>Auto-Negotiation (Auto-MDI/MDIX)</i> <i>(Default)</i>	Depending on the connecting device, the setting of 10M / 100M, Half / Full and STRAIGHT / CROSS are decided automatically.
2	10M - HALF (MDI) <i>10BASE-T HALF Duplex (MDI)</i>	For 10M Half-Duplex (MDI), set to fixed mode.
3	10M - HALF (MDIX) <i>10BASE-T HALF Duplex (MDIX)</i>	For 10M Half-Duplex (MDIX), set to fixed mode.
4	10M - FULL (MDI) <i>10BASE-T FULL Duplex (MDI)</i>	For 10M Full-Duplex (MDI), set to fixed mode.
5	10M - FULL (MDIX) <i>10BASE-T FULL Duplex (MDIX)</i>	For 10M Full-Duplex (MDIX), set to fixed mode.
6	100M - HALF (MDI) <i>100BASE-TX HALF Duplex (MDI)</i>	For 100M Half-Duplex (MDI), set to fixed mode.
7	100M - HALF (MDIX) <i>100BASE-TX HALF Duplex (MDIX)</i>	For 100M Half-Duplex (MDIX), set to fixed mode.
8	100M - FULL (MDI) <i>100BASE-TX FULL Duplex (MDI)</i>	For 100M Full-Duplex (MDI), set to fixed mode.
9	100M - FULL (MDIX) <i>100BASE-TX FULL Duplex (MDIX)</i>	For 100M full-Duplex (MDIX), set to fixed mode.

3.5.1 Setup for External Connection

According to the port conditions of the connected equipment, setup of the LAN INTFC port is performed. The port settings are available as follows.

		External Equipment				
		Auto Negotiation	10BASE-T/ Half Duplex	10BASE-T/ Full-Duplex	100BASE-TX/ Half-Duplex	100BASE-TX / Full-Duplex
Port Setting	Auto Negotiation (Auto MDI/MDIX)	○	○	—	○	—
	10BASE-T/ Half Duplex	○	○	—	—	—
	10BASE-T/ Full-Duplex	—	—	○	—	—
	100BASE-TX/ Half-Duplex	○	—	—	○	—
	100BASE-TX / Full-Duplex	—	—	—	—	○

○ : Effective — : Invalid

3.5.2 Setup of MDI / MDIX

MDI : Straight Port Setting

Select MDI when the cross cable is connected to the straight port of the external equipment or straight cable is connected to the cross port of the external equipment.

MDIX : Cross Port Setting

Select MDIX in other conditions than above MDI.

3.6 Port Collision Report

In HALF-Duplex mode, select reporting function about collision conditions at each port.

No.	Setup	Descriptions
1	<i>Enable</i>	Collision condition is reported.
2	<i>Disable</i> (Default)	Collision condition is not reported.

* When the flow control is operated in HALF-Duplex mode, a collision condition occurs while the Back Pressure control, therefore, apply "Not Reported" mode in this case.

3.7 Setup of Port Flow Control

Setup the flow control function to ON/OFF for each port.

No.	Setup	Descriptions
1	<i>Enable</i> (Default)	Flow control is operated.
2	<i>Disable</i>	Flow control is not operated.

3.7.1 Flow Control

According to Half/Full-Duplex mode, this module corresponds to following two flow control systems.

No.	Mode	Description of Flow Control System
1	<i>Half-Duplex</i>	Back Pressure : Sends a collision to make the transmitting equipment to wait.
2	<i>Full-Duplex</i>	PAUSE frame Flow Control : By sending PAUSE frame (conformed to IEEE 802.3x), request to the opposite equipment for stopping/starting the frame sending. It is required that the opposite equipment also has this function.

3.8 Port Link Loss Forwarding

This function provides the detection of opposite link failure to release compulsorily the local link. The selection for effect/no effect control of each port is applicable.

No.	Setup	Descriptions
1	<i>Enable</i>	Enables release function of local link by information from the opposite link.
2	<i>Disable</i> (Default)	Disables release function of local link by information from the opposite link.

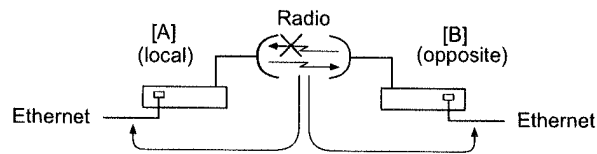
- * When LOF/High BER alarm occurs in a radio section, regardless of above setup, link is compulsorily released.
- * When the Port Switching is set to *Enabled*, this function is not operated.

3.8.1 Disconnecting Port Link Control

This function provides a control for the port link release at both terminals when radio channel failure or LAN port link failure occurs.

a. Release Control by Radio Channel Failure

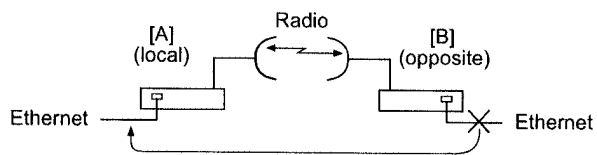
When radio channel failure occurs, port link is compulsorily released for both end terminals. This function operates regardless of setting of the Loss Forwarding function.



* The control is performed in accordance with the setting conditions of the AIS Activation Condition. (Default: LOF + High BER Alarm)

b. Release Control by the Opposite Link Failure

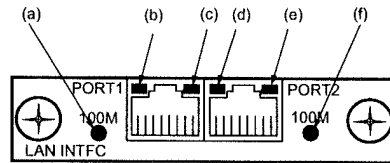
When the Link Loss Forwarding function is set to Enabled, detecting the link failure of the opposite station, local link is compulsorily released.



4. ALARM/STATUS INDICATION AND REPORTING

4.1 LED Indication

This module provides LED indicators on the front of module.



	Name of LED	Color	Indication	Descriptions
(a)	Port1 100M LED	green	lighting	Lights when Port 1 is linked in 100M mode.
(b)	Port1 Collision / Full Duplex LED	amber	lighting	Lights when Port 1 is linked in Full-Duplex mode.
			blinking	Blinks when Port 1 is linked in Half-Duplex mode and collision condition occurs.
(c)	Port1 LINK / TX/RX Activity LED	green	lighting	Lights when Port 1 is linked.
			blinking	Blinks when Port 1 is linked and data is sending and receiving.
(d)	Port2 Collision / Full Duplex LED	amber	lighting	Lights when Port 2 is linked in Full-Duplex mode.
			blinking	Blinks when Port 2 is linked in Half-Duplex mode and collision condition occurs.
(e)	Port2 LINK / TX/RX Activity LED	green	lighting	Lights when Port 2 is linked.
			blinking	Blinks when Port 2 is linked and data is sending and receiving.
(f)	Port2 100M LED	green	lighting	Lights when Port 2 is linked in 100M mode.

4.2 Alarm/Status Reporting

This module reports following alarm/status informations to the equipment.

No.	Alarm/Status	Condition	Message	Description
1	<i>Port1 Link</i>	Alarm	<i>Link</i> <i>Alarm</i>	Report link condition of Port 1. Surveillance object as alarm item of the IDU. * <i>It is not reported when Port1 Usage is set to Not Used.</i>
2	<i>Port1 Collision</i>	Status	<i>Normal</i> <i>Collision</i>	Report collision occurrence of Port1. By the Port1 Collision Report setup, the function of Report/Not Report selection is available.
3	<i>Port1 Mode</i>	Status	<i>100BASE-TX</i> <i>10BASE-T</i>	Report established link mode of Port 1.
4	<i>Port1 Duplex</i>	Status	<i>Full Duplex</i> <i>Half Duplex</i>	
5	<i>Port1 Link Down Control</i>	Status	<i>Normal</i> <i>Under Execution</i>	Report operating situation of the compulsive release of Port1. *Refer to 3.8 Port Link Loss Forwarding for compulsive release of Port link.
6	<i>Port2 Link</i>	Alarm	<i>Link</i> <i>Alarm</i>	Report link condition of Port 2. Surveillance object as alarm item of the IDU. * <i>It is not reported when Port2 Usage is set to Not Used.</i>
7	<i>Port2 Collision</i>	Status	<i>Normal</i> <i>Collision</i>	Report collision occurrence of Port2. By the Port2 Collision Report setup, the function of Report/Not Report selection is available.
8	<i>Port2 Mode</i>	Status	<i>100BASE-TX</i> <i>10BASE-T</i>	Report established link mode of Port 2.
9	<i>Port2 Duplex</i>	Status	<i>Full Duplex</i> <i>Half Duplex</i>	
10	<i>Port2 Link Down Control</i>	Status	<i>Normal</i> <i>Under Execution</i>	Report operating situation of the compulsive release of Port2. *Refer to 3.8 Port Link Loss Forwarding for compulsive release of Port link.

5. MAINTENANCE

5.1 LAN Device Reset

Reset control can be performed via LCT.

No.	Item	Descriptions
1	<i>Port1</i>	Perform reset control for Port 1.
2	<i>Port2</i>	Perform reset control for Port 2.

- * Not performed under normal conditions.
- * Link failure occurs when reset control is performed.

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SAFETY INFORMATION

This safety information is prepared to protect the maintenance personnel and NLite L equipment. To avoid hazardous conditions, read this Instruction manual thoroughly before equipment operation. The signal words (Danger, Warning and Caution) are used in the Instruction manual and explained as follows:

GENERAL SAFETY



DANGER

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.



WARNING

Indicates an imminently hazardous situation which, if not avoided, could result in serious injury or physical damage.



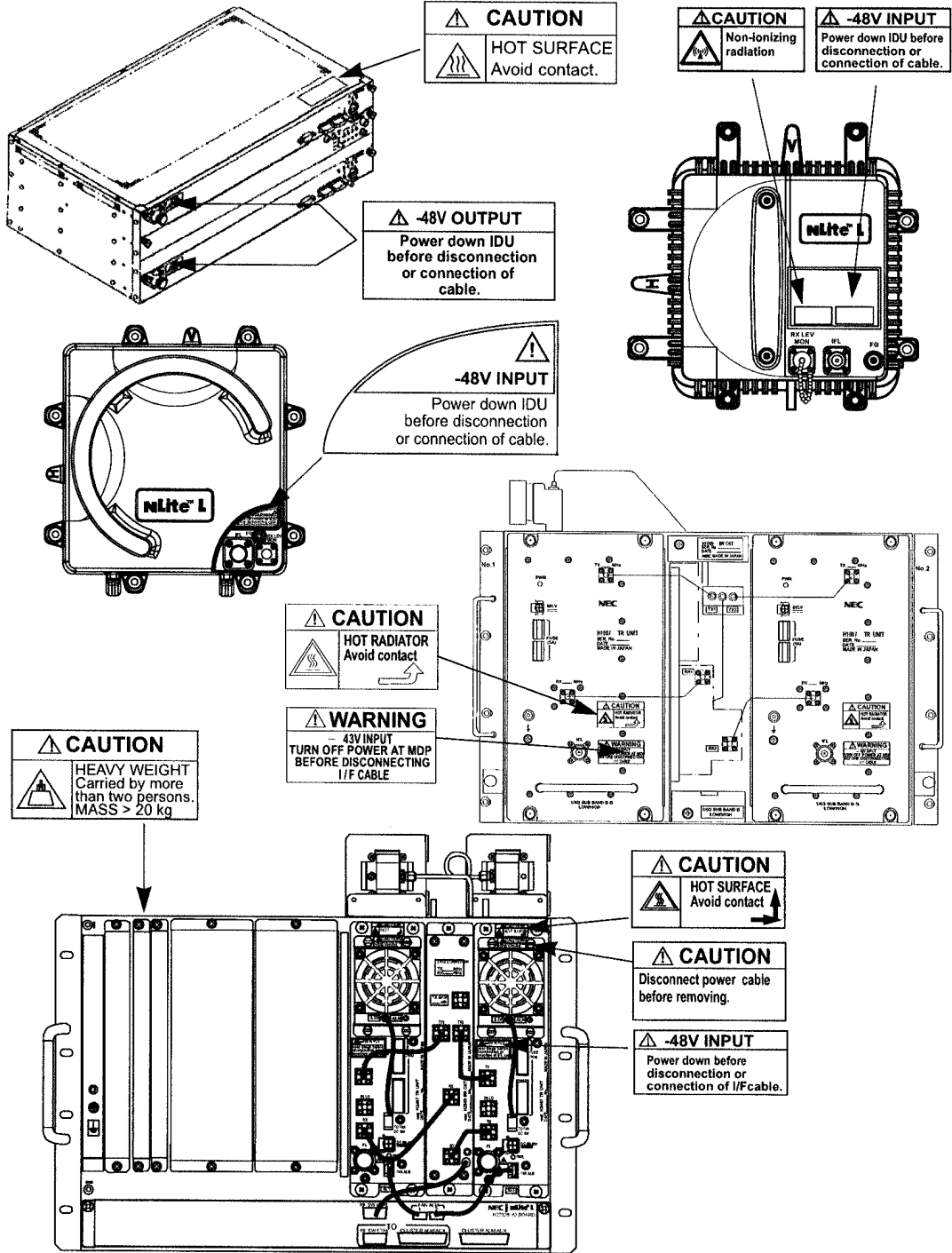
CAUTION

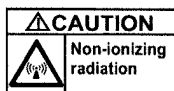
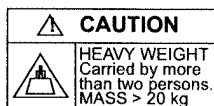
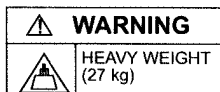
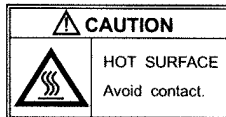
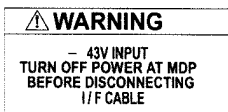
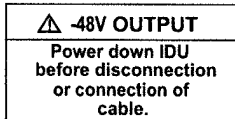
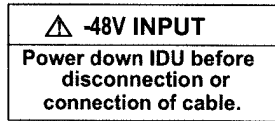
Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or physical damage. It is also said to alert against inappropriate practice.

To avoid hazardous conditions, notes on the handling of equipment are provided in the Instruction manual in places considered necessary, adhere rigidly to the notes. And also the Caution and Warning labels are attached to the MDP and TRP. And the meaning of each label is described as follows:

SAFETY INFORMATION

NLite L
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Do not disconnect IFL coaxial cable between the MDP and the TRP in powering condition, to avoid damaging the MDP and the TRP.

The IFL coaxial cable between the MDP and the TRP is not only used for IF/control signal connection but also supply power for the TRP, connecting a test equipment directly to this terminal may damage it or touching the cable core may cause electrical shock.

Be careful that top surface of the MDP, shelf or radiator of the TRP is hot.

Be careful handling, the TRP is heavy weight 27 kg.

Be careful handling, the TRP is heavy weight more than 20 kg.

Caution that the Non-ionizing radiation from the equipment may effect on health.

WARNING



WARNING

The -43 V DC power is superimposed on the center conductor of the coaxial cable between the MDP and the TRP. Connecting a test set equipment directly to this terminal may damage it and touching the coaxial cable core may cause electrical shock.



WARNING

Do not touch the IFL cable jack core before turning off the power switch. If touching the coaxial cable core may cause electrical shock.

CAUTION



CAUTION

While the power supply is ON, do not connect/disconnect the power supply connector. Otherwise, the DC-DC CONV may break down.



CAUTION

Locate the TRP within the area protected by lightning rod. To avoid surge currents caused by lightning circulating in the equipment earth system, connect the equipment earth system (frame ground) to ground of the lightning rod at ground level.



CAUTION

Interrupt operation and turn off the power switch on the MDP, if in the event of an emergency situation with appearance such as smoking, burning smell, and strange sound. Continuation of operation may cause burning or resulting in electric shock. As there is risk, do not attempt to repair.



CAUTION

Introduction of spilling liquid, piece of metal, smoke, corrosive gas or dust into the equipment, or approach of birds or animals may cause burning or break-down.



CAUTION

Do not perform overhaul, modification or repairing of the equipment. As it may cause burning or resulting in electric shock.

NOTICE (PLACING)

1. *When the TRP is installed in the indoor, as the TRP generates Non-ionizing radiation and it may cause health effect, then, it is required to take adequate measures.*

2. *Do not block the vents of the equipment. It may cause break down due to heating up of inner equipment in stuffy condition. Ensure to follow the set up and usage rules as follows.*

Do not set up the equipment on the carpet, heating floor or bare concrete.

Do not cover or wrap the equipment with table cloth, lace, rubber or plastic material.

Do not set up the equipment in the bookshelves or rocker or in a stuffy place.

Do not put anything like books or paper on and against the equipment.

3. *The equipment must be installed in correct place. Do not install turning sideways or slanting. If not properly installed, it may cause break down due to rise of inner temperature.*

4. *Do not install the equipment in the following locations. If installed, it may cause harmful influence for the equipment.*

The equipment must be installed and maintained in a clean, and dry place where temperature and humidity remain stable, non-condensing into dew and within the ranges specified by the manufacturer.

5. *Because of the equipment is an indoor type, do not install the equipment in the location where it could be caused harm influence by salt-air, sand-dust, sulphuric acid gas etc..*

If the equipment will be installed necessarily in such location, the following must be heeded.

(a) *Construction of the Equipment Room*

Install the equipment in the airtight room or shelter where it could not be suffered by external influence mentioned above.

(b) Environmental Temperature Impact for the Equipment

In the airtight room, it may be caused rising in temperature with the heat generation of the equipment.

Furnish an air-conditioner for industrial use in accordance with the situation.

Do not apply air directly from the air-conditioner to the equipment. When the equipment is located in face of the air from the air-conditioner, it could be condensed into dew by temperature variation.

(c) In the case of using at marine and coastal areas (within 3 km from the seaside), it is necessary to make measures against the damage from salt water. For measures against the damage from salt water to an TRP, request them to NEC.

6 Install the equipment in the place where it is not restricted access location regulated with UL60950-1.

When open space above MDP is more than one rack unit (approximately 45 mm), besides the environment temperature is higher than +104°F (+40°C), to avoid contact with the hot surface of the MDP, install a guard plate over the MDP.

NOTICE (PLACING)

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ABBREVIATIONS

The following abbreviations are used in the manual for the NLite L/NLite Lx equipment.

ABBREVIATION	DESCRIPTION
A	
ACAP	Adjacent Channel Alternate-Polarization
ACCP	Adjacent Channel Co-Polarization
AIS	Alarm Indication Signal
ALM	Alarm
ALS	Automatic Laser Shutdown
AMI	Alternate Mark Inversion
ANT	Antenna
APC	Automatic Phase Control
ASYNC	Asynchronization
ATPC	Automatic Transmitter Power Control
ATT	Attenuator
AUX	Auxiliary
B	
B8ZS	Bipolar with 8 Zeros Substitution
BBE	Background Block Error
BER	Bit Error Rate
BNC	Bayonet Navy Connector
BPF	Band Pass Filter
C	
CBL	Cable
CH	Channel
CKT	Circuit
CLK	Clock
CMI	Coded Mark Inversion
COM	Common

ABBREVIATIONS

NLite L/NLite Lx
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ABBREVIATION	DESCRIPTION
COMB	Combiner
CONN	Connection
CONT	Control
CONV	Converter
CPU	Central Processing Unit
CTRL	Control
CW	Carrier Wave
D	
DC	Direct Current
DCK	Drop Clock
DDT	Drop Data
DEM	Demodulator
DFP	Drop Frame Pulse
DMR	Digital Microwave Radio
DS n	Digital Signal Level n
DSC	Digital Service Channel
E	
E/O	Electrical/Optical
E-BER	Excessive-Bit Error Rate
EMC	Electro Magnetic Compatibility
EOW	Engineering Orderwire
EP	Earthing Point
EQL	Equalizer
ERR	Error
ES	Errored Seconds
EXT	External
F	
FEC	Forward Error Correction
FG	Frame Ground
FIL	Filter
FREQ	Frequency

ABBREVIATIONS

ABBREVIATION	DESCRIPTION
G G GND	Ground Ground
H HK	House Keeping
I ICK ID IDT IDU IEEE IF I/F IFL IN INTFC ITU	Insert Clock Identification Insert Data Indoor Unit Institute of Electrical and Electronic Engineers Intermediate Frequency Inter Facility Inter Facility Link Input Interface International Telecommunication Union
L LAN LB LCT LED LEV LO LOF LOS	Local Area Network Loop Back Local Craft Terminal Light Emitting Diode Level Local Loss of Frame Loss of Signal
M MAC MAINT MD MDI	Media Access Control Maintenance Modulator Demodulator Media Dependent Interface

ABBREVIATIONSNLite L/NLite Lx
ROI-S05464

ABBREVIATION	DESCRIPTION
MDIX	Media Dependent Interface with Crossover
MIX	Mixer
MII	Media Independent Interface
MLC	Multi-Level Coding
MOD	Modulator
MODEM	Modulator-Demodulator
MON	Monitor
MPX	Multiplexer
MTPC	Manual Transmitter Power Control
MUX	Multiplexer
N	
NC	Normal Closed
NMS	Network Management System
NO	Normal Open
NORM	Normal
NRZ	Nonreturn to Zero
O	
OC-3	Optical Carrier 3
ODU	Outdoor Unit
OFS	Out of Frame Second
OPT	Optical
OUT	Output
OW	Orderwire
P	
PC	Personal Computer
PH	Phase
PM	Pasolink Management
PNMS	Pasolink Network Management System
PNMT	Pasolink Network Management Terminal
PS	Power Supply
PWR	Power

ABBREVIATIONS

ABBREVIATION	DESCRIPTION
Q QAM	Quadrature Amplitude Modulation
R RF RL RS RSL RX	Radio Frequency Relay Reed Solomon Received Signal Level Receive
S SC SD SEL V SES SEP SV SW SYNC SYNTH SYS	Service Channel Signal Degrade Safety Extra-Low Voltage Severely Errored Seconds Separation Supervisory Switch Synchronizer Synthesizer System
T TRP TX	Transmitter-Receiver Equipment Transmit
U UAS UHG	Unavailable Second Ultra High Grade
V VF V/H VOL Vo-p	Voice Frequency Vertical/Horizontal Volume Volt zero (0) to Peak

ABBREVIATIONS

NLite L/NLite Lx
ROI-S05464

ABBREVIATION	DESCRIPTION
W WG WS	Waveguide Wayside
X XPIC	Cross Polarization Interference Canceller

APPENDIX

FCC STATEMENT INFORMATION

1-1

1.0 FCC INFORMATION

The device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference. (2) This device must accept any interference received. This device must be professionally installed.

MADE IN JAPAN

The NLite E 5.8 GHz radios will be used for fixed Point to Point applications. The NLite L radio utilizes a parabolic antenna that requires professional installers for path alignment.

The maximum RF transmit power of the NLite E 5.8 GHz radios is less than 0.3162 watts (+25 dbm).

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

The peak RF transmit power of the NLite E 5.8 GHz radios is less than 1.0 watts (+30 dbm).

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