PASOLINK NEO
6-52 GHz PDH/SDH DIGITAL RADIO SYSTEM

Section III INSTALLATION AND INITIAL LINE UP

CONTENTS

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1. GENERAL

This section provides installation and initial line up information on the PASOLINK NEO used for 6-52 GHz PDH/SDH microwave radio system.

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2. INSTALLATION

The standard installation is summarized in this section. Included herein is information on typical installation work flow and guides for IDU installation, ODU installation, Antenna (ANT) installation, waveguide connection and coaxial cable connections. The installation flow diagram is shown below.

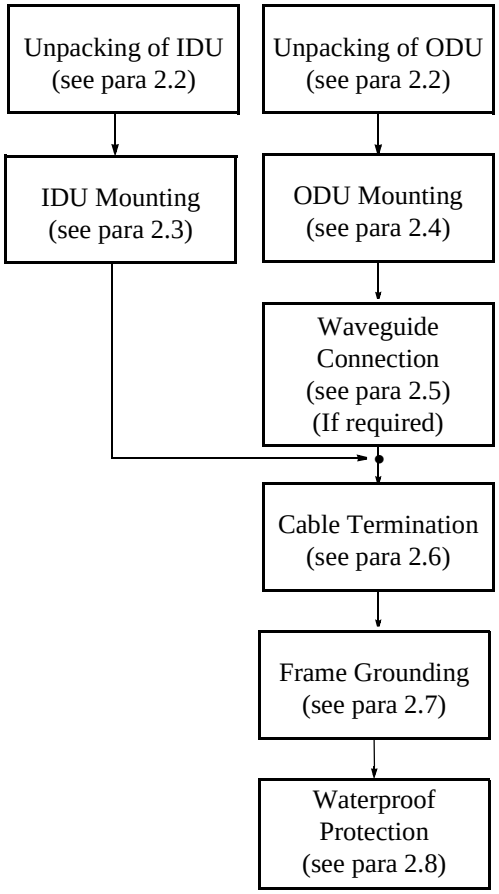
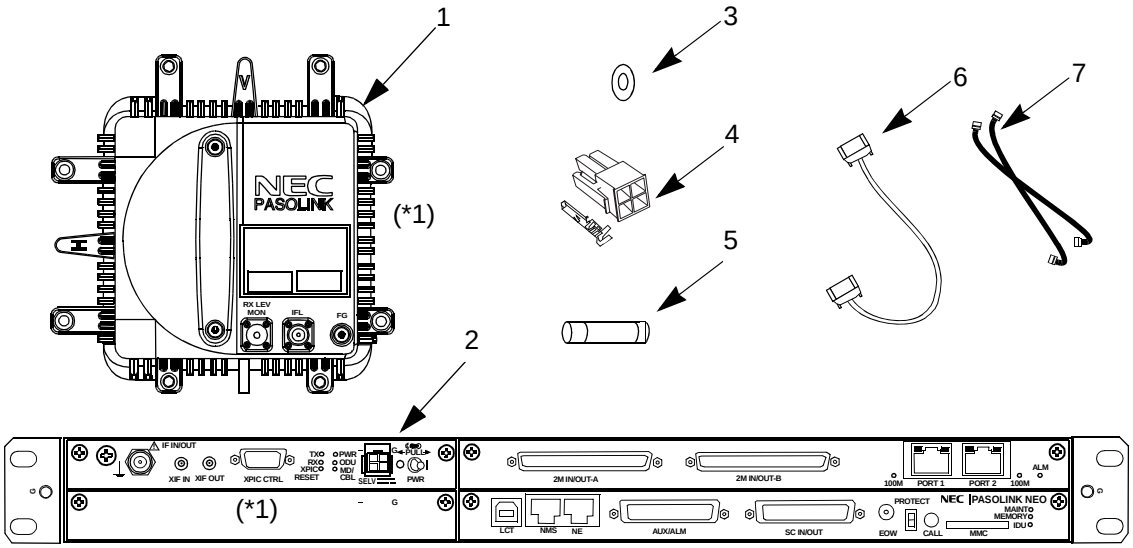


Fig. 2-1 Typical Installation Flow Diagram

2.1 Packages

Each unpacked component of the [ ] GHz [ ] MB digital radio system must be checked as shown below.

CONTENS LIST	DRAWING NO.
IDU and ODU	Fig. 2-2
Mounting Bracket	Fig. 2-3
Installation Kit	Fig. 2-4 and Fig. 2-5

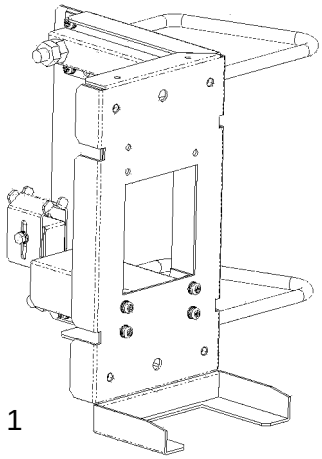


No.	DESCRIPTION
1	TRP-( )G-1B (ODU)
2	MDP-150MB-1AA (IDU)
3	O-Ring (Attached to the waveguide type ODU)
4	Power Connector (Molex Housing M5557-4R (x1ea) and Socket Contact (5556TL (x4 each))
5	Cylindrical Fuse ((RKS-F91000-0107) (6.3A) (x1ea) *2)
6	XPIC CTRL Cable (×1) (apply for XPIC configuration only)
7	X-IF Coaxial Cable (×2) (apply for XPIC configuration only)

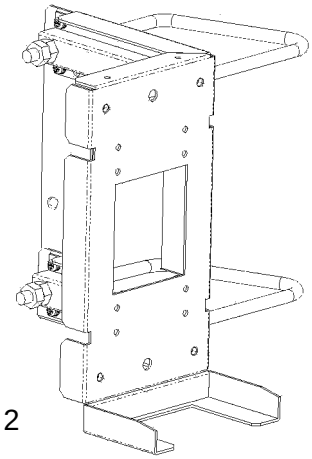
*Note: *1 One more ODU and MODEM module are provided for HS/Twinpath configuration .*

**2 One spare fuse is provided in the MODEM module.*

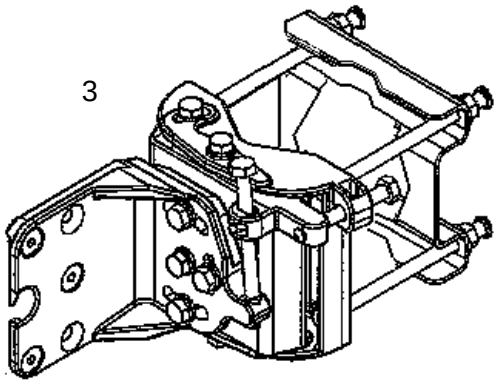
Fig. 2-2 Packing



1



2

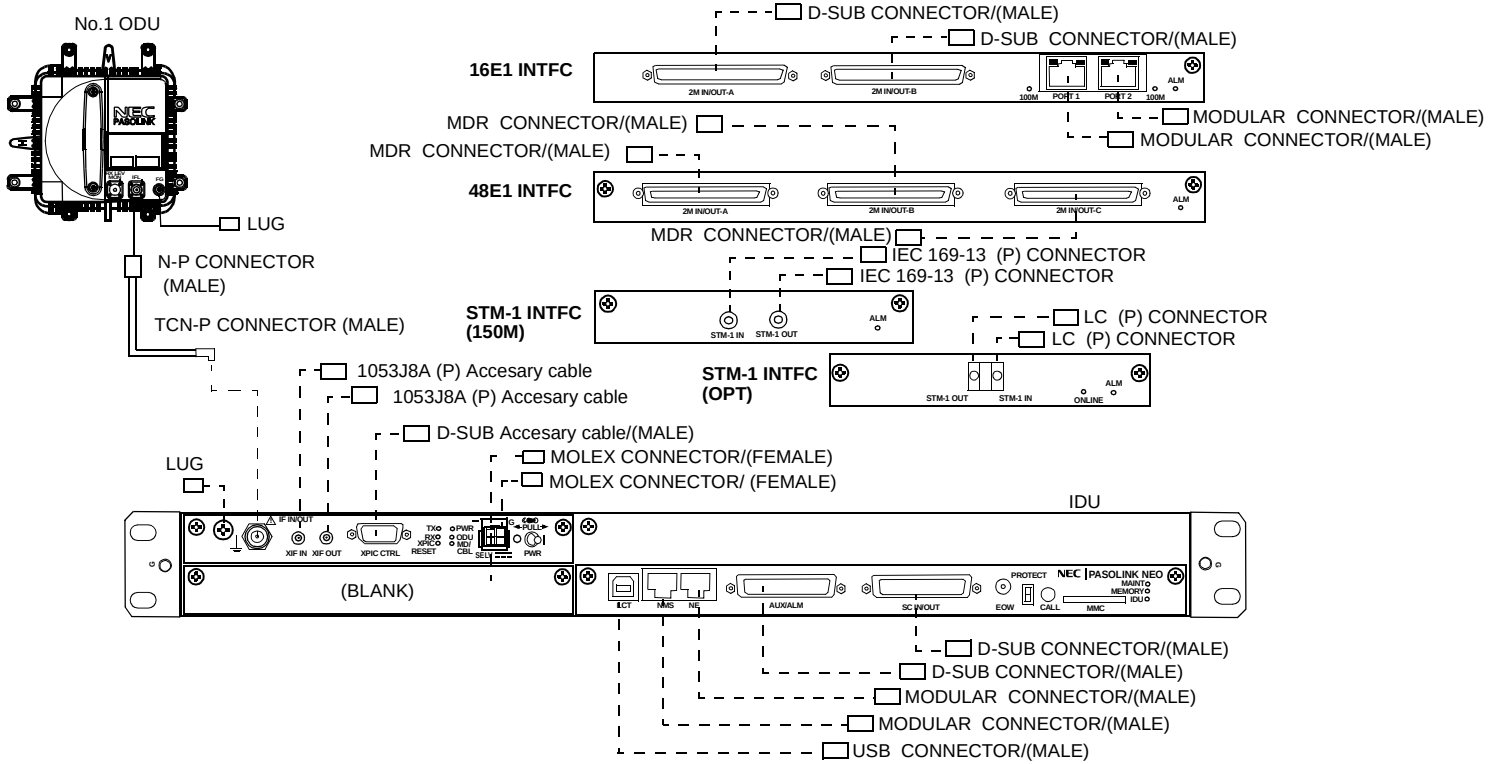


3

(Supplied with antenna)

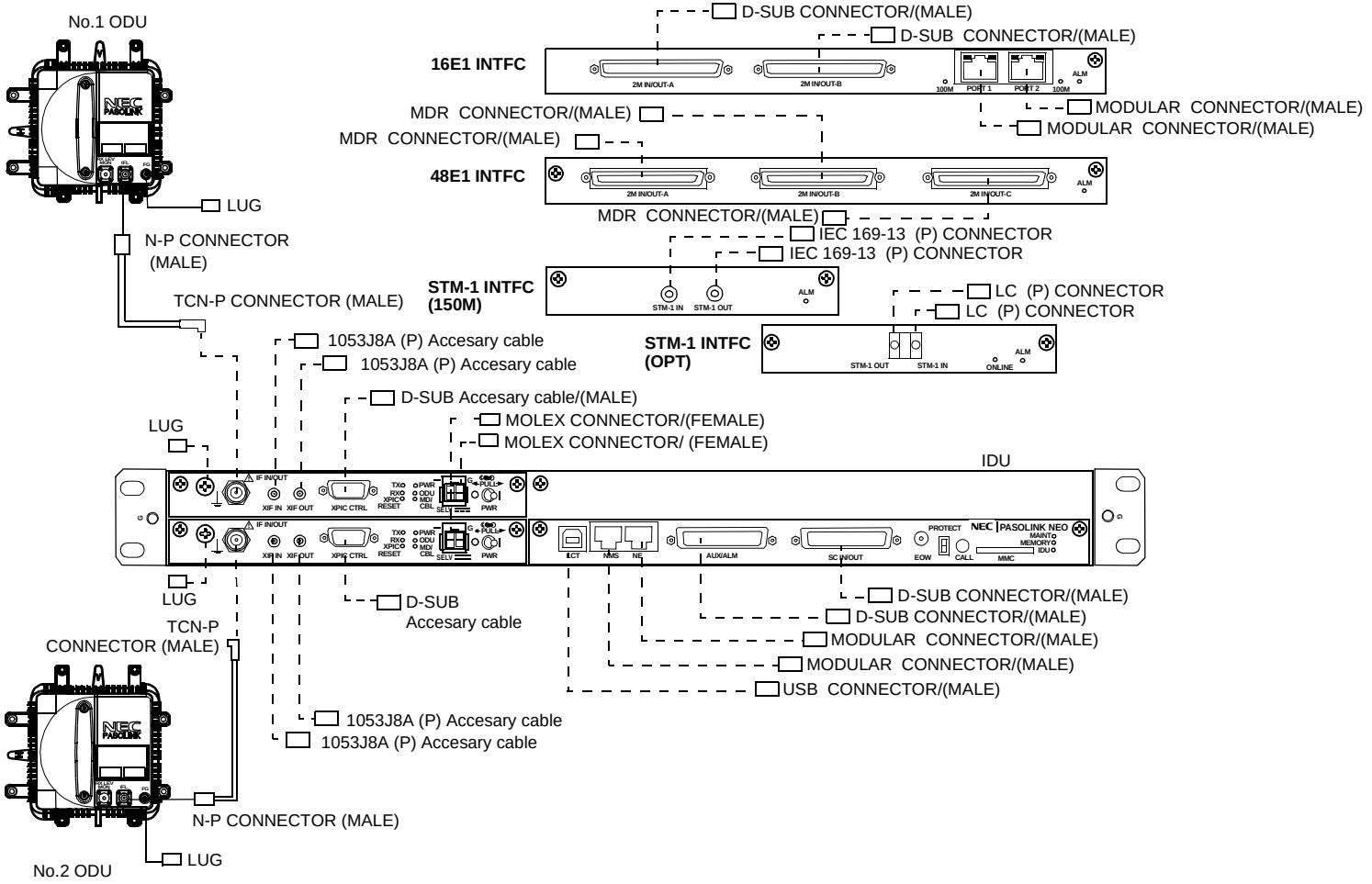
No.	DESCRIPTION
1	Pole Mounting Bracket for Coaxial Cable Connection Type (6/7/8 GHz)
2	Pole Mounting Bracke for Wave Guide connection Type
3	Pole Mounting Bracket for Antenna direct Mounting Type

Fig. 2-3 Packing of Mounting Bracket



Note: It is recommended that TNC (Male) L-angle connector for the 8D-FB IF cable is used to connect it to the IDU. When the N (Male) straight connector is attached to the 5D-FB or 10D-FB IF cable, use of the TNC (Male) - N (Female) (NJ-TNCP-LA) L-angle adapter is needed.

Fig. 2-4 Installation Kit Packing List of IDU and ODU for 1+0 System



Note: It is recommended that TNC (Male) L-angle connector for the 8D-FB IF cable is used to connect it to the IDU. When the N (Male) straight connector is attached to the 5D-FB or 10D-FB IF cable, use of the TNC (Male) - N (Female) (NJ-TNCP-LA) L-angle adapter is needed.

Fig. 2-5 Installation Kit Packing List of IDU and ODU for 1+1 System

2.2 Unpacking of IDU and ODU

The unpacking procedures for the IDU and ODU are shown in following chart.

- IDU : Chart 2-1
- ODU : Chart 2-2

Note: When conveying the IDU or ODU to another place, the original packing should be used to avoid damage.

Chart 2-1 Unpacking Method for IDU

Step	Procedure
1	Cut the p.p. tape at top of the carton (1 to 3). Then open the carton,

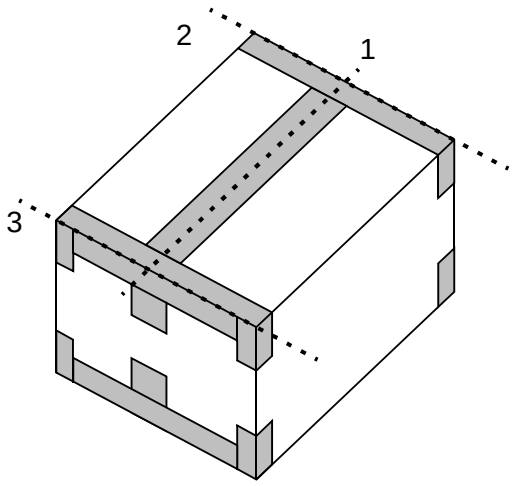


Chart 2-1 (Cont'd)

Step	Procedure
2	Take out the accessories, IDU carton and cushioning materials,

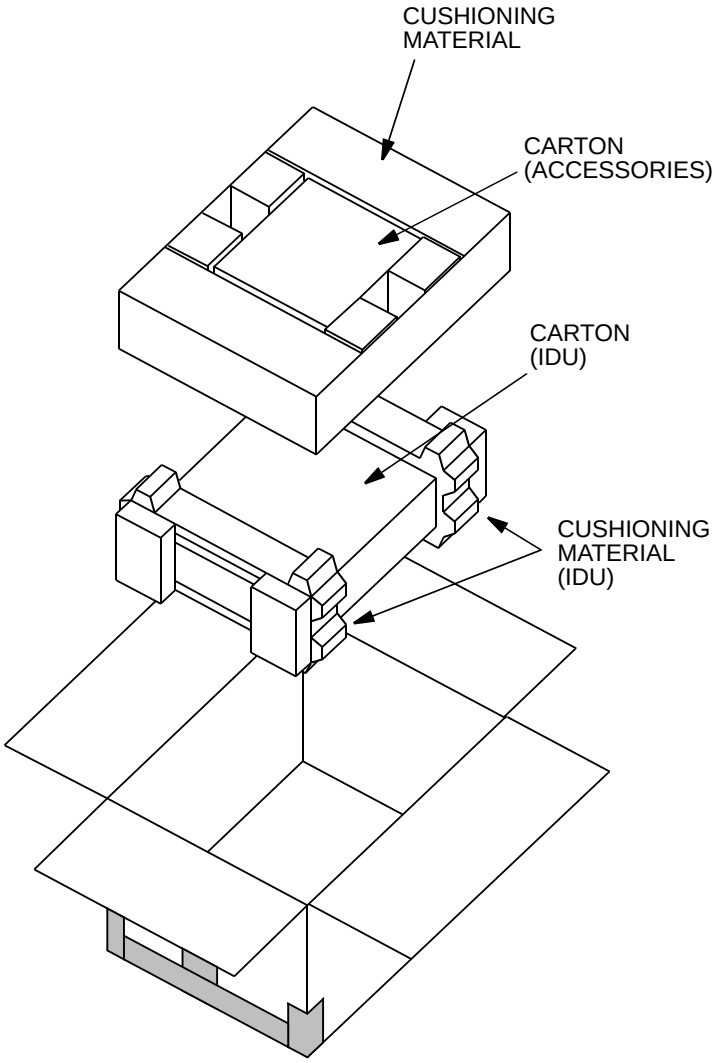
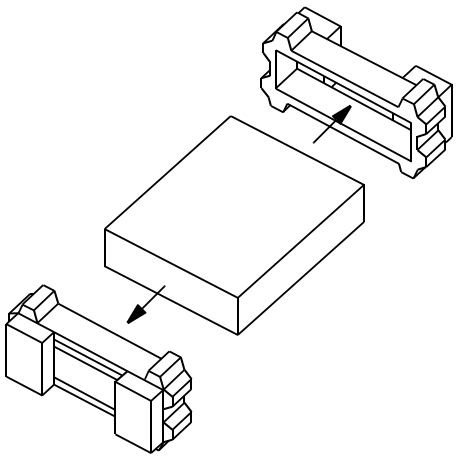
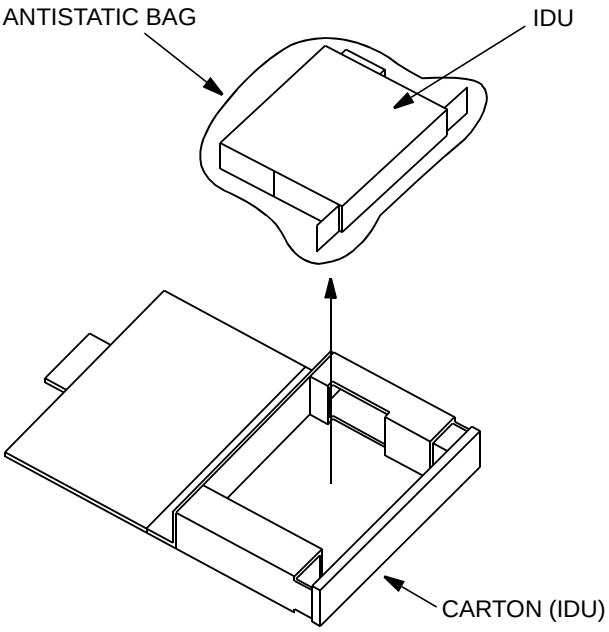


Chart 2-1 (Cont'd)

Step	Procedure
3	Remove the cushioning materials from the carton (IDU),



4	Take out the IDU wrapped with antistatic bag from the carton,



5	Take out the IDU from the antistatic bag,
6	Inspect the IDU.

Chart 2-2 Unpacking Method for ODU

Step	Procedure
1	Take off the hook of a cover as shown below. Then, open the top cover,

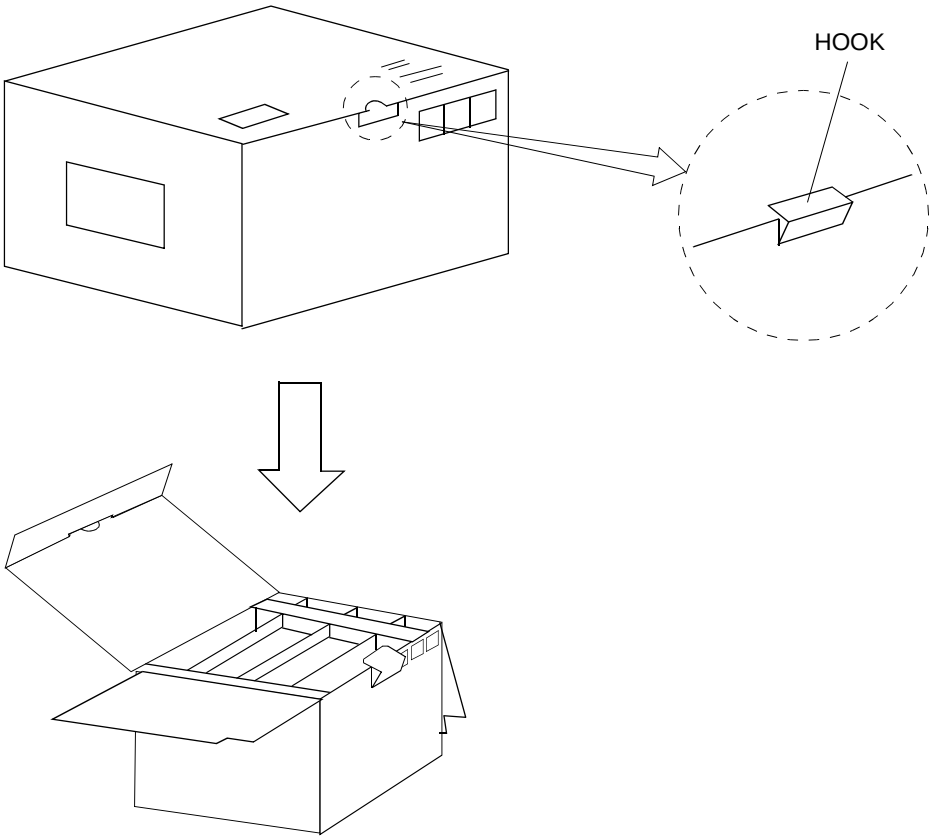
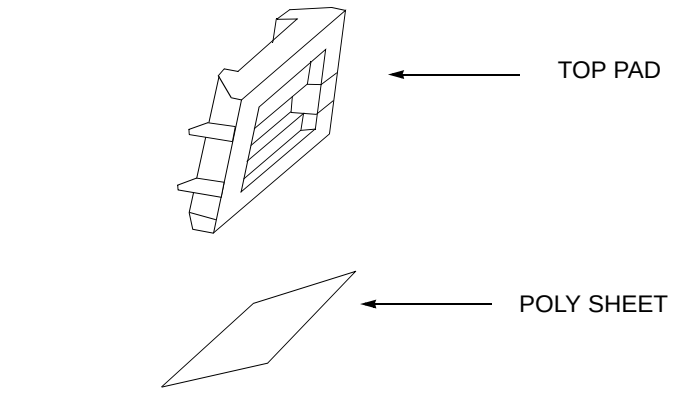
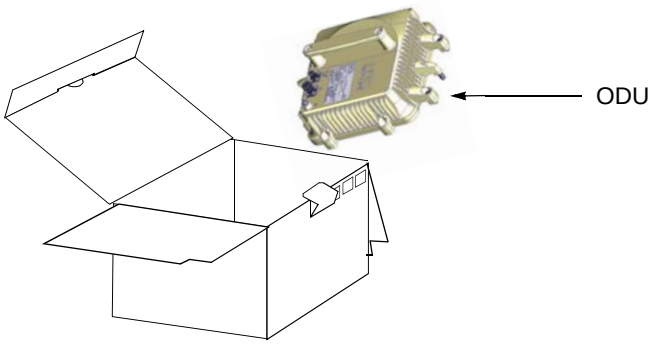


Chart 2-2 (Cont'd)

Step	Procedure
2	Take out cushioning material, buffer material and poly sheet,





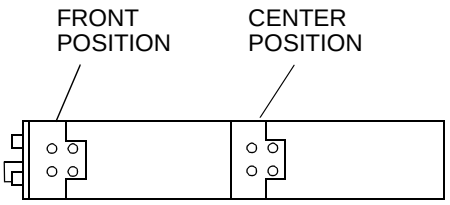
3	Take out the ODU from carton,
4	Inspect the ODU.

2.3 IDU Mounting

The installation procedure for IDU explaing in Chart 2-3. The IDU should be installed in the radio station.

Chart 2-3 Mounting Methods of IDU

Step	Procedure
1	Change the two brackets to desired position on the IDU, if necessary,



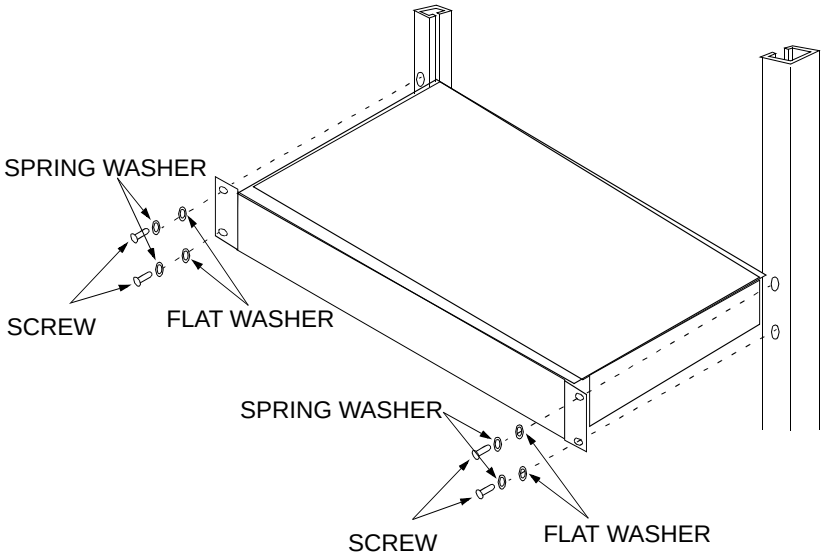
SIDE VIEW

1+0/1+1 SYSTEM

Chart 2-3 (Cont'd)

Step	Procedure

2 Align the IDU to the mounting position on the 19-inch rack,



3 Fix each side of the IDU to the 19-inch rack with the two screws,

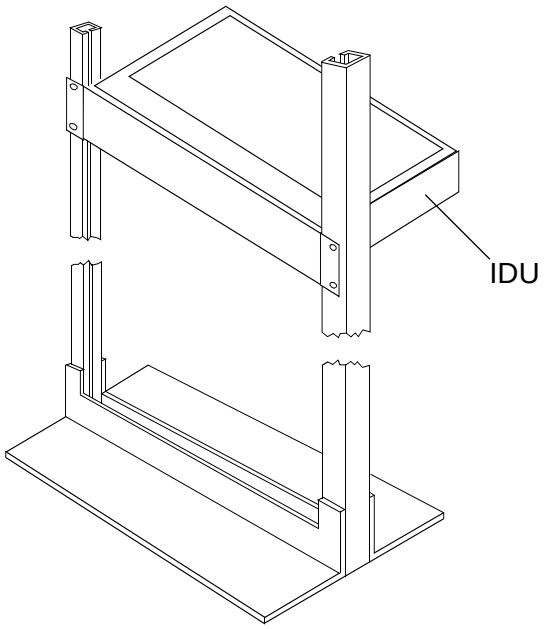
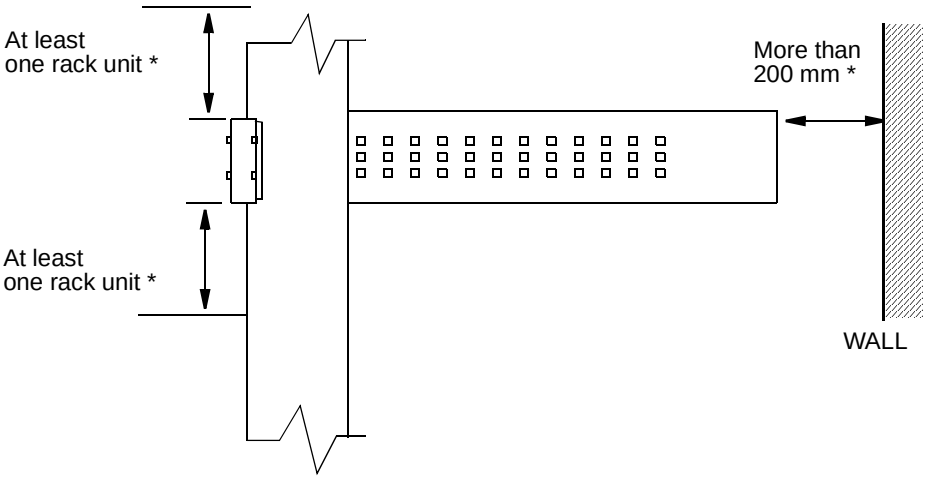


Chart 2-3 (Cont'd)

Step	Procedure
4	To mount the IDU in a 19-inch rack, take a space more than 200 mm to the rear section and space for one unit to the top and bottom.



*Note: * Normal setting for free space. When free space is closed within one rack unit, keep the environment temperature is lower than +40℃.*

2.4 ODU Mounting

The procedures for mounting and demounting the ODU are described here. There are two types of mounting for the antenna direct mounting type and waveguide connecting type. The ODU should be installed in the radio station. The tools for installation are listed in Table 2-1.

Table 2-1 Tools

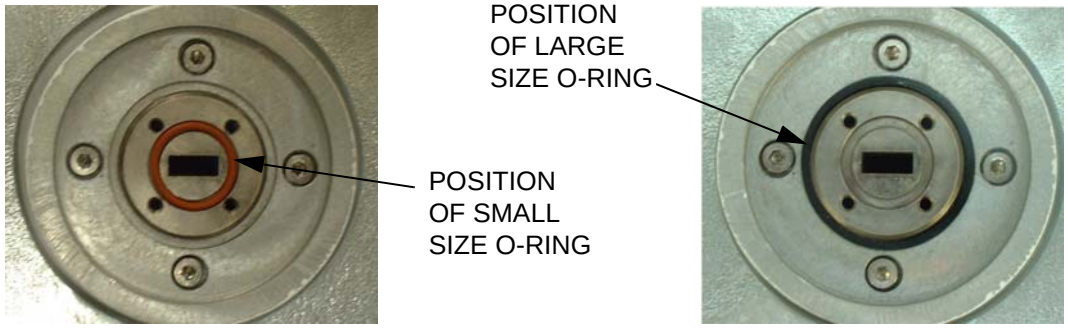
TOOLS
Wrench or Monkey wrench
Screwdriver
Torque Wrench

Caution 1. How to use small and large O-rings are shown in following table. Two (small and large) O-rings are attached in 18 to 38 GHz band Andrew/RFS direct mount antenna. 11/13/15 GHz band antenna does not have small O-ring (Small O-ring is not used for Andrew/RFS direct mount antenna). If the small O-ring is used for ODU direct mount installation, a gap may occur between ODU and antenna for RF interface. Therefore it may happen transmit or receive level down.

Caution 2. Do not apply silicon grease at O-ring.

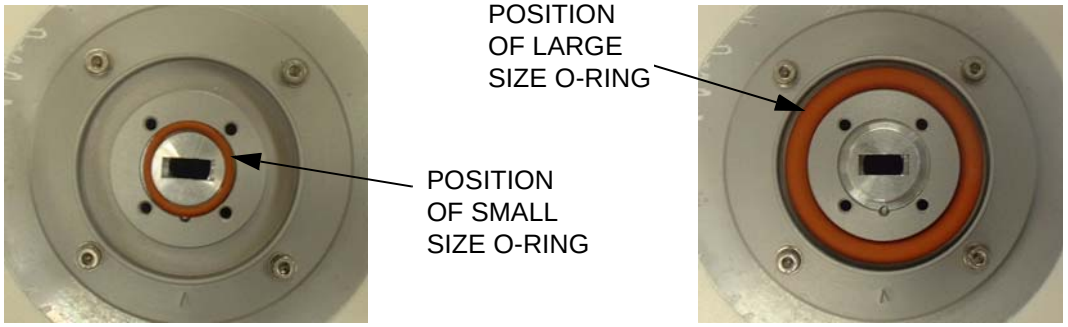
SYSTEM	ATTACHENENT POSITION OF O-RING (BETWEEN:)	O-RING		REMARKS
		SMALL SIZE	LARGE SIZE	
1+0	ANT — ODU	Not used	Used	Antenna direct mounting
	ANT — WG/ODU (18-38 GHz BAND)	Used	Not used	Waveguide connection
1+1	ANT — HYB	Not used	Used	Antenna direct mounting
	ANT — WG/HYB (18-38 GHz BAND)	Used	Not used	Waveguide connection

Note: 11/13/15 GHz antenna for direct mount is not possible to connect the ordinary waveguide flanges.



FOR WAVEGUIDE CONNECTION FOR ANTENNA DIRECT MOUNTING

ANDREW ANTENNA

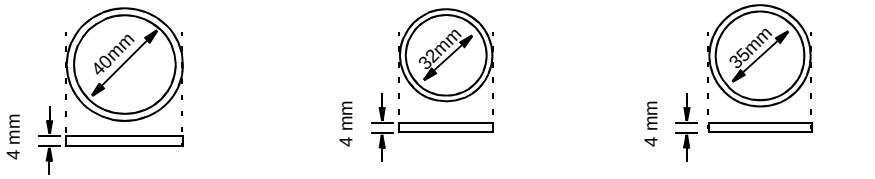


FOR WAVEGUIDE CONNECTION FOR ANTENNA DIRECT MOUNTING

RFS ANTENNA

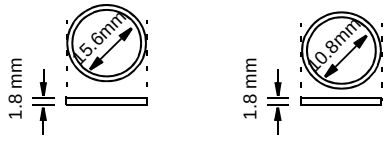
Notes: 1. Do not use both small O-ring and large O-ring simultaneously.

2. O-ring size is different with frequency band as follows:



10-11 GHz BAND 13-23 GHz BAND 26-38 GHz BAND

LARGE SIZE O-RING FOR ANTENNA DIRECT MOUNTING



18/23 GHz BAND 32/38 GHz BAND

SMALL SIZE O-RING FOR WAVEGUIDE CONNECTION

2.4.1 Mounting

The method of mounting is listed in Table 2-2 to Table 2-4.

Table 2-2 Antenna Direct Mounting

Change of Polarization	TX SPAN ATT	ODU and Bracket	OMT
Chart 2-4 ANT/ODU/HYB/TX SPAN ATT	Chart 2-7	Chart 2-5	Chart 2-9

Table 2-3 Waveguide Connection

Using 1+1 HYB	1+0 or Connecting Two Antennas
Chart 2-8	Chart 2-10

Table 2-4 Coaxial Cable

With/Without HYB
Chart 2-11

Chart 2-4 Change of Polarization (Antenna Direct Mounting)

Step	Procedure

CHANGE OF POLARIZATION

ODU DIRECT MOUNTING TYPE ANTENNA
(Example (ANDREW) 1/2)

Note: The details are referred to the installation manual which is attached to the antenna. The installation or removal of the antenna requires qualified experienced perrsonnel.

Note: The antenna is set to V-polarization when shipped from the factory.

1 Keep the antenna stand horizontally,

2 If you change to H polarization, loosen the four screws with the Allen key wrench and then rotate the Transition hub of feed, keeping the antenna stand horizontal.

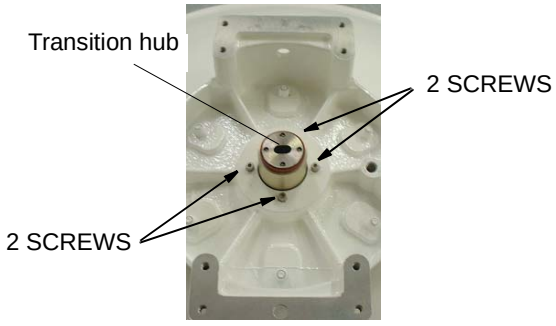


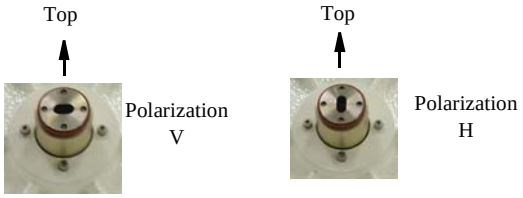
Chart 2-4 (Cont'd)

Step	Procedure

Note: Do not remove the screw complete from the screw hole. Hold the feed horn with hand.

3 Holding the feed with hand, rotate the feed 90 degrees,

Check that the aperture part of the Transition hub is rotated 90 degrees, then fix it with the screws that were loosened in step 2,



4 Check that the aperture part of the Transition hub is rotated 90 degrees, then fix it with the screws that were loosened in step 2

Note: When a large and a small gasket are included in the antenna package. Please use the large one (The small gasket is not used in antenna mount)

Chart 2-4 (Cont'd)

Step	Procedure

CHANGE OF POLARIZATION

ODU DIRECT MOUNTING TYPE ANTENNA
(Example (ANDREW) 2/2)

Note: The details are referred to the installation manual which is attached to the antenna. The installation or removal of the antenna requires qualified experienced perrsonnel.

Note: The antenna is set to V-polarization when shipped from the factory.

1. Keep the antenna stand horizontally,

2. Loosen six screws with Allen wrench until transition can rotate freely,

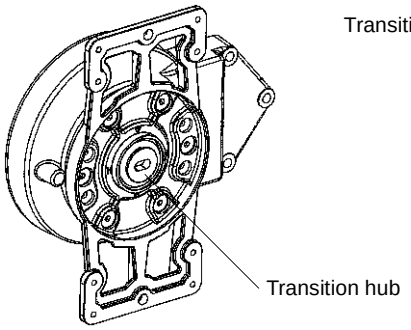
Note: Do not remove the screw complete from the screw hole.

Note: Because of the screwtight is applied, the strength to loosen screw is necessary.

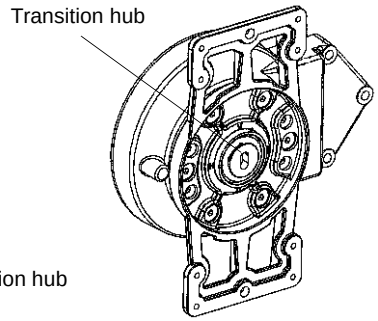
3 Rotate the transition hub 90 degrees until timing pin locates in timing concavity,

Chart 2-4 (Cont'd)

Step	Procedure



Vertical Polarized Application



Horizontally Polarized Application

Tighten six screws when transition hub is located. (Tightening torque is 5.0 N·m ± 10%.)

Chart 2-4 (Cont'd)

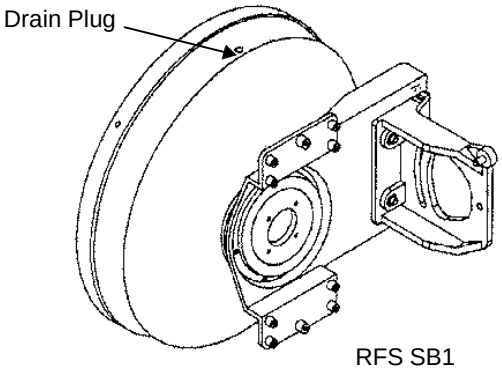
Step	Procedure

CHANGE OF POLARIZATION

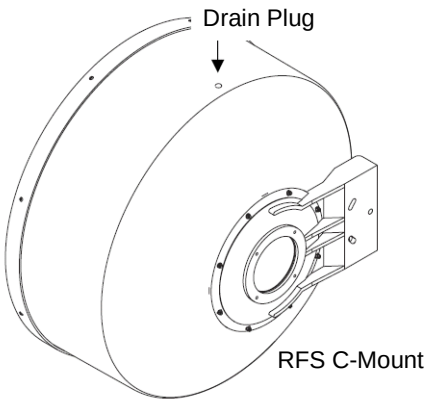
ODU DIRECT MOUNTING TYPE ANTENNA
(Example (RFS))

Note: The details are referred to the installation manual which is attached to the antenna. The installation or removal of the antenna requires qualified experienced personnel.

Note: The antenna is set to V-polarization when shipped from the factory.



1. Unscrew the 4 screws M3 at the refined steel ring,
2. Hold the feed tightly at the waveguide,
3. Rotate carefully the feed 90 degrees,
4. Mount the feed to the refined steel ring and lock the 4 screws M3.



1. Loosen the 4 screws M3,
2. Hold the feed tightly at the waveguide,
3. Rotate the casting plate carefully the feed 90 degrees,
4. Lock the 4 screws M3.

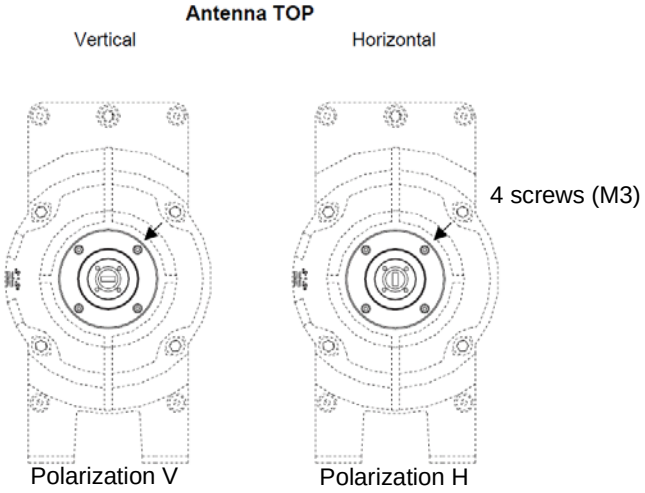


Chart 2-4 (Cont'd)

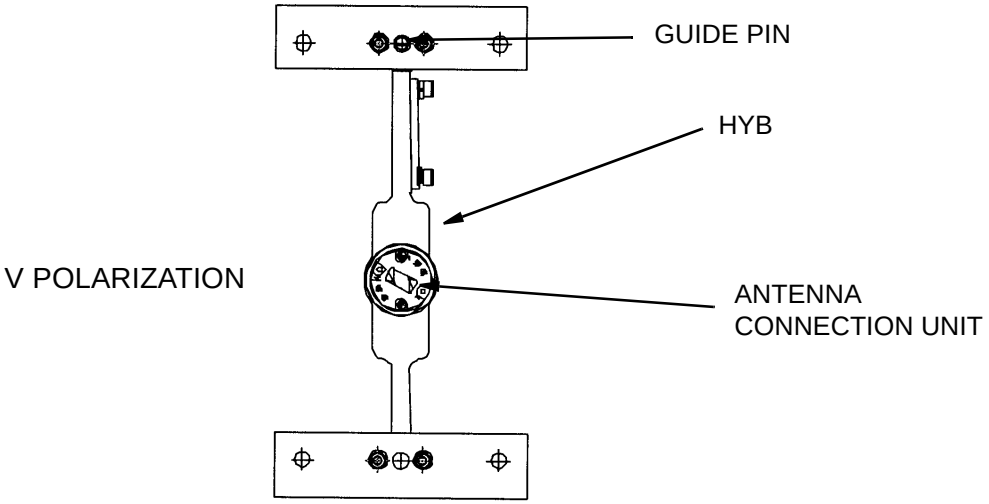
Step	Procedure

CHANGE OF POLARIZATION OF THE HYB

NEC HYBRID

Note: The hybrid is set to V-polarization when shipped from the factory.

1 If you change to H polarization, loosen two screws, rotate the Transition hub and put the HYB horizontally.



2 Check that aperture of the connection unit is rotated as shown below, then fix it with the two screws that were loosened in step 1.

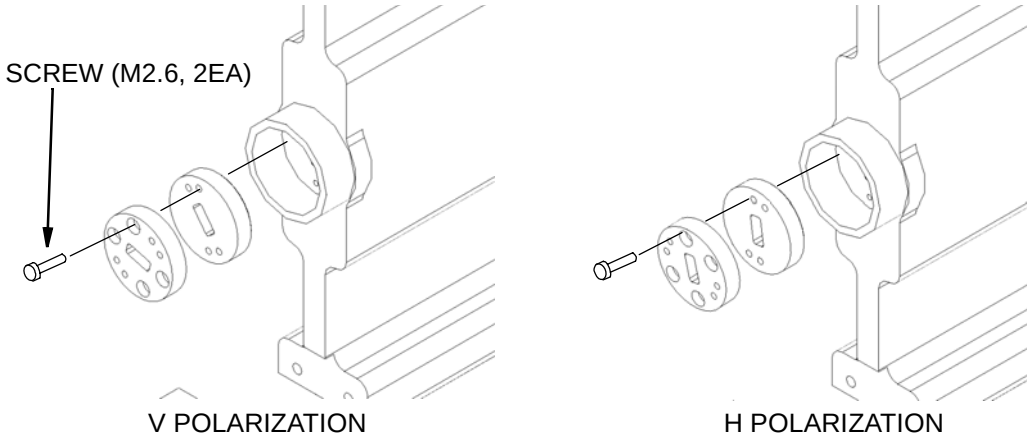


Chart 2-4 (Cont'd)

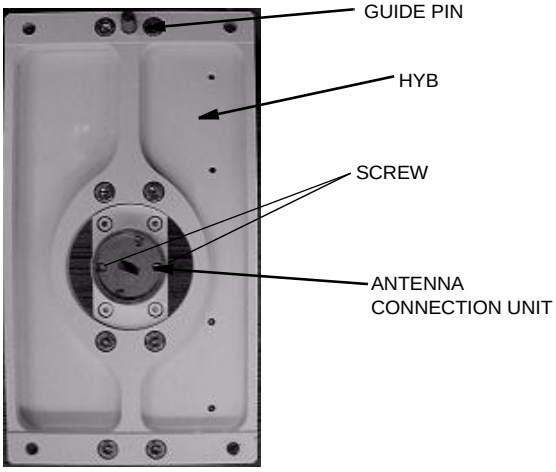
Step	Procedure

Quasar HYBRID

Note: The hybrid is set to V-polarization when shipped from the factory.

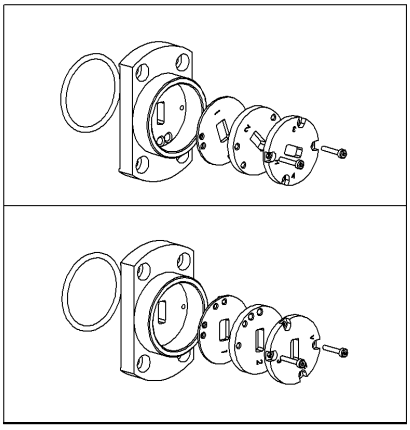
1 If you change to H polarization, loosen two screws, rotate the antenna connection unit and put the HYB horizontally.

Quasar HYB



V POLARIZAION

2 Check that the aperture of the connection unit is rotated as shown below, then fix it with the two screws that were loosened in step 1.



V POLARIZATION

H POLARIZATION

Chart 2-4 (Cont'd)

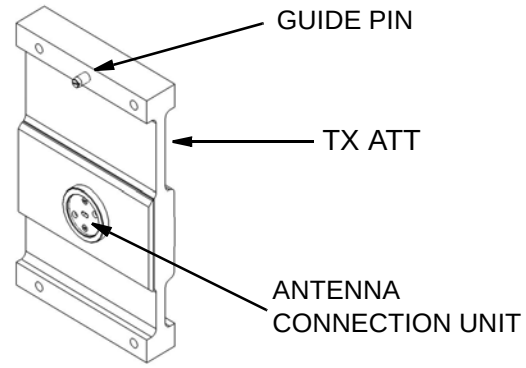
Step	Procedure

CHANGE OF POLARIZATION OF THE TX SPAN ATT

TX SPAN ATT

Note: The TX ATT is set to V-polarization when shipped from the factory.

1 If you change to H polarization, loosen two screws, rotate the antenna connection unit and put the TX ATT horizontally.



V POLARIZATION

2 Check that aperture of the connection unit is rotated as shown below, then fix it with the two screws that were loosened in step 1.

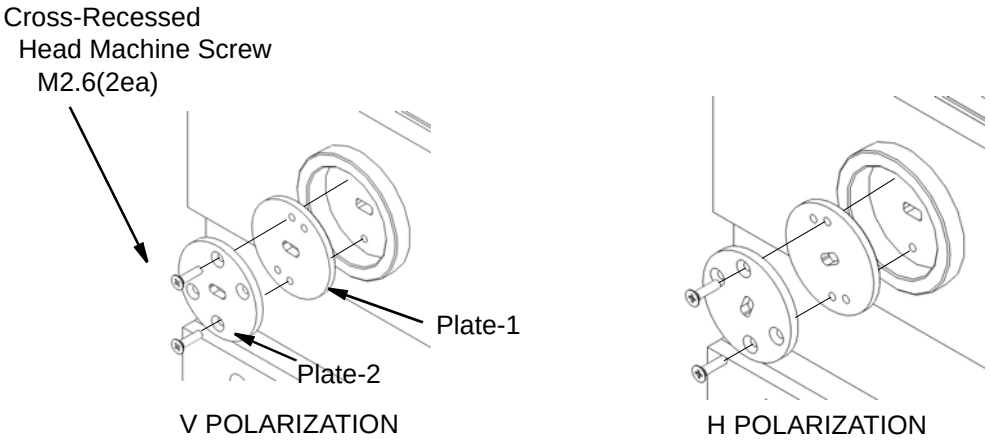


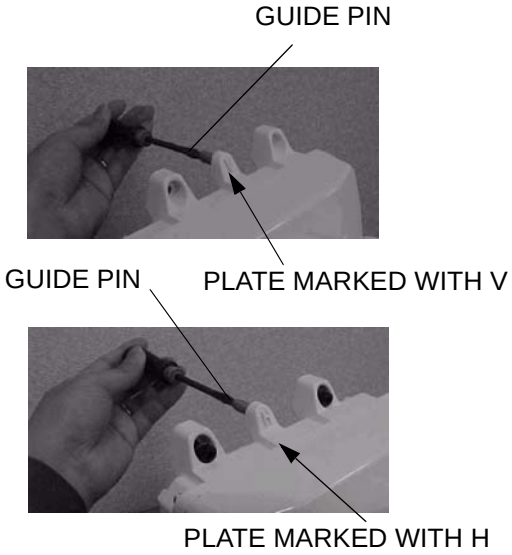
Fig. 2-6 38 GHz Band TX SPAN ATT Polarization Change

Chart 2-4 (Cont'd)

Step	Procedure

CHANGE OF POLARIZATION OF THE ODU

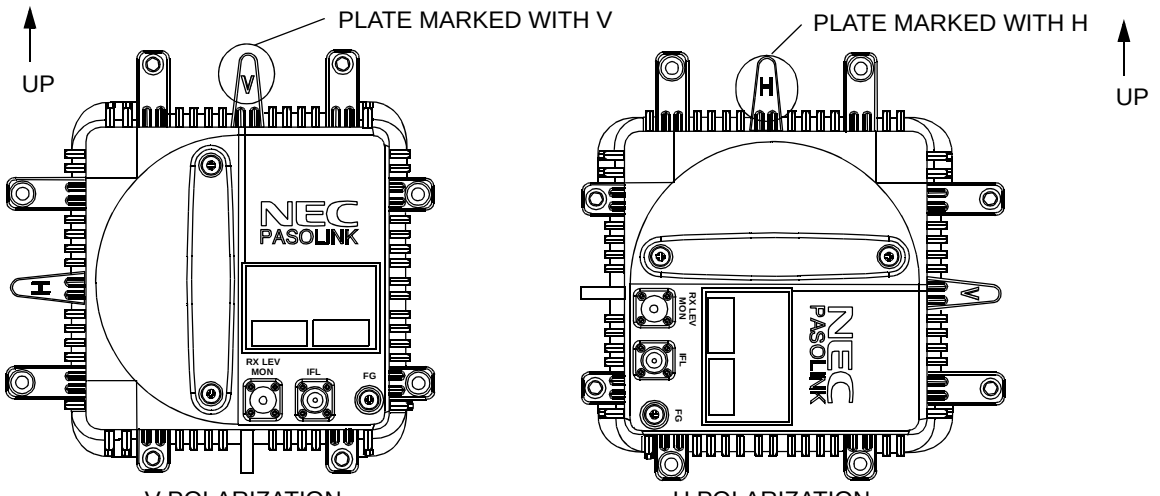
Antenna Mounting ODU (11-38 GHz Band)



1. When vertical polarization is required, rotate the ODU so as to go up the plate marked V,
2. When horizontal polarization is required, remove the guide pin fixed on the plate marked with V,
3. Screw in the guide pin removed in step 2 to the screw hole of the plate marked H,
4. Rotate the ODU so as to go up the plate marked H,

Note: When the ODU is mounted on to the NEC HYB, only V polarization is applied.

Note: When the Waveguide or coaxial cable is connected between the ODU and antenna, the ODU in V polarization for up position is recommended for installtion.



10-38 GHz ODU
V/H Polarization Conversion

Chart 2-5 ODU Antenna Direct Mounting (11 - 38 GHz)

Step	Procedure

ANTENNA DIRECT MOUNTING (10-38 GHz Band ODU)

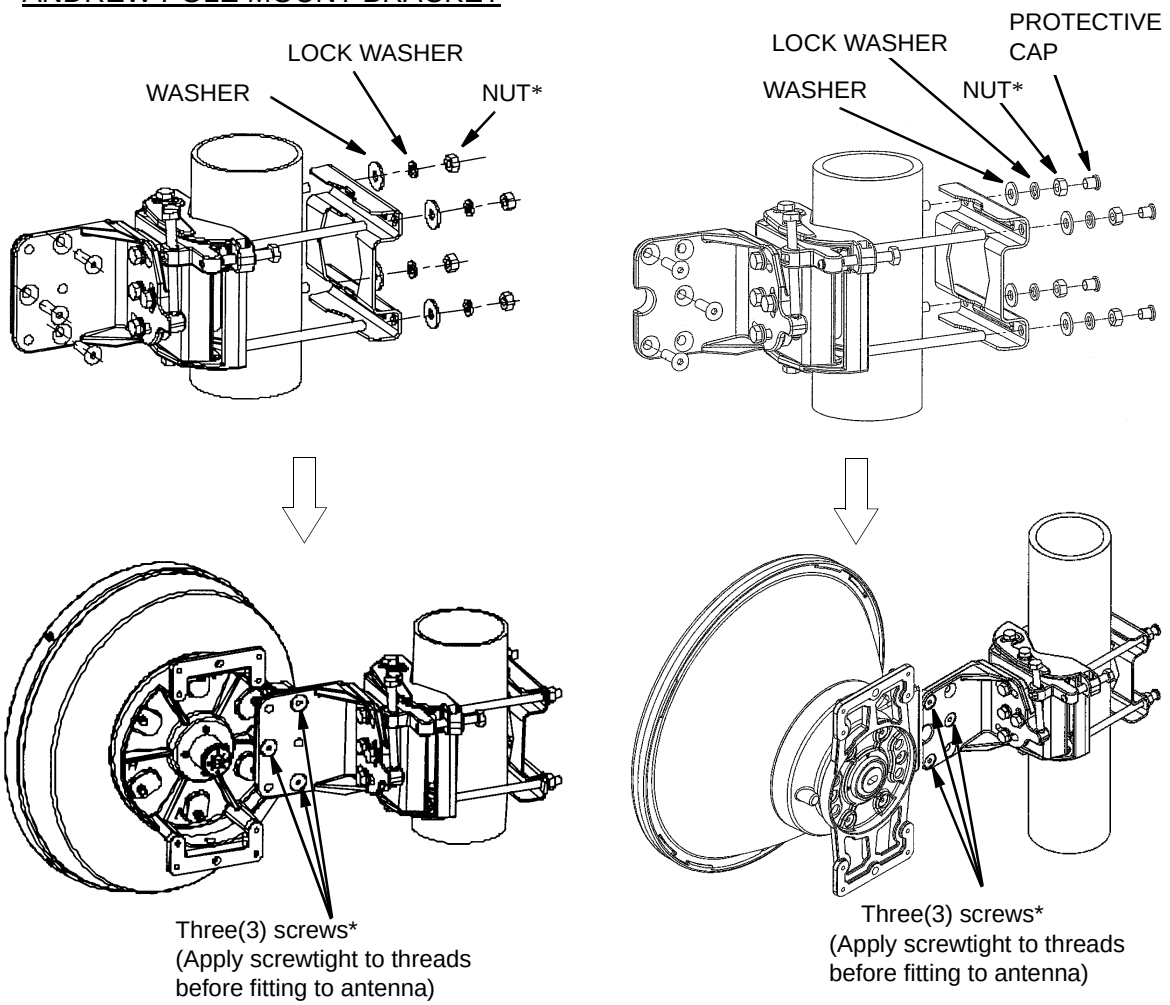
Note: The details are referred to the installation manual which is attached to the antenna.

INSTALLATION OF BRACKET

1 Install the bracket to the antenna pole,

2 Mount antenna to the bracket,

ANDREW POLE MOUNT BRACKET

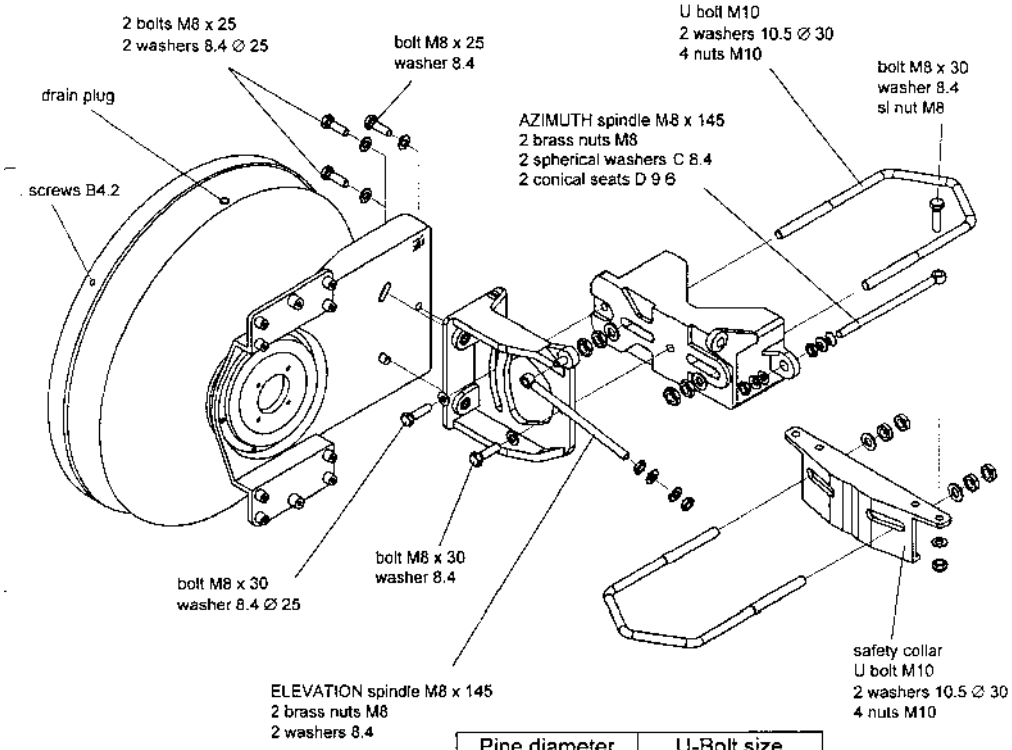


* *Tightening torque of 22 N·m for M10.*

Chart 2-5 (Cont'd)

Step	Procedure

ANTENNA DIRECT MOUNTING (10-38 GHz Band ODU)



RFS SB1 TYPE BRACKET

Pipe diameter [mm]	U-Bolt size [mm]
51 - 89	89
90 - 115	115

Chart 2-5 (Cont'd)

Step	Procedure

Note: The values in the following table are valid for screws and bolts which have been greased according to the installation instructions.

Torques for RFS			
Bolt	M5	5	Nm
	M6	8	Nm
	M8	17	Nm
	M10	35	Nm
	M12	50	Nm
U-Bolt, V-Bolt (Pipe mount & safety collar)	M10	20	Nm
Hexagonal brass nut of fine adjustment (Azimuth, Elevation)	M8	5	Nm
	M10	10	Nm
	M12	17	Nm
Hexagonal socket stainless steel screws (Feed systems install on aluminium mounting plate)	M3	0.2	Nm
	M4	0.4	Nm
Exceptions			
Fixing screw of the azimuth fine adjustment spindle	M8 x 30	8	Nm
	M12 x 55	17	Nm

Special application: NOT greased

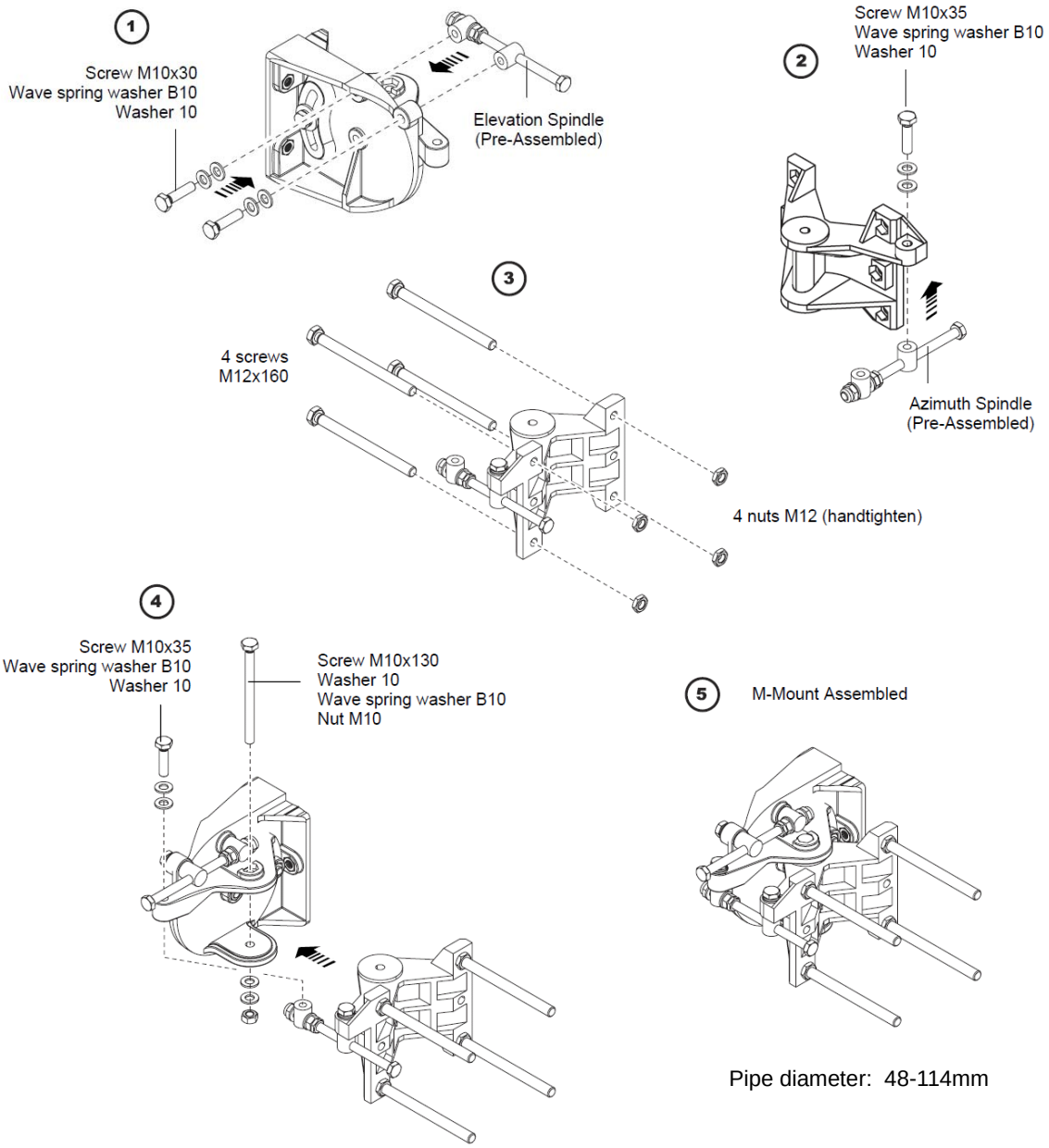
Fixing screw of the plastic radome	B4.2	3	Nm

Chart 2-5 (Cont'd)

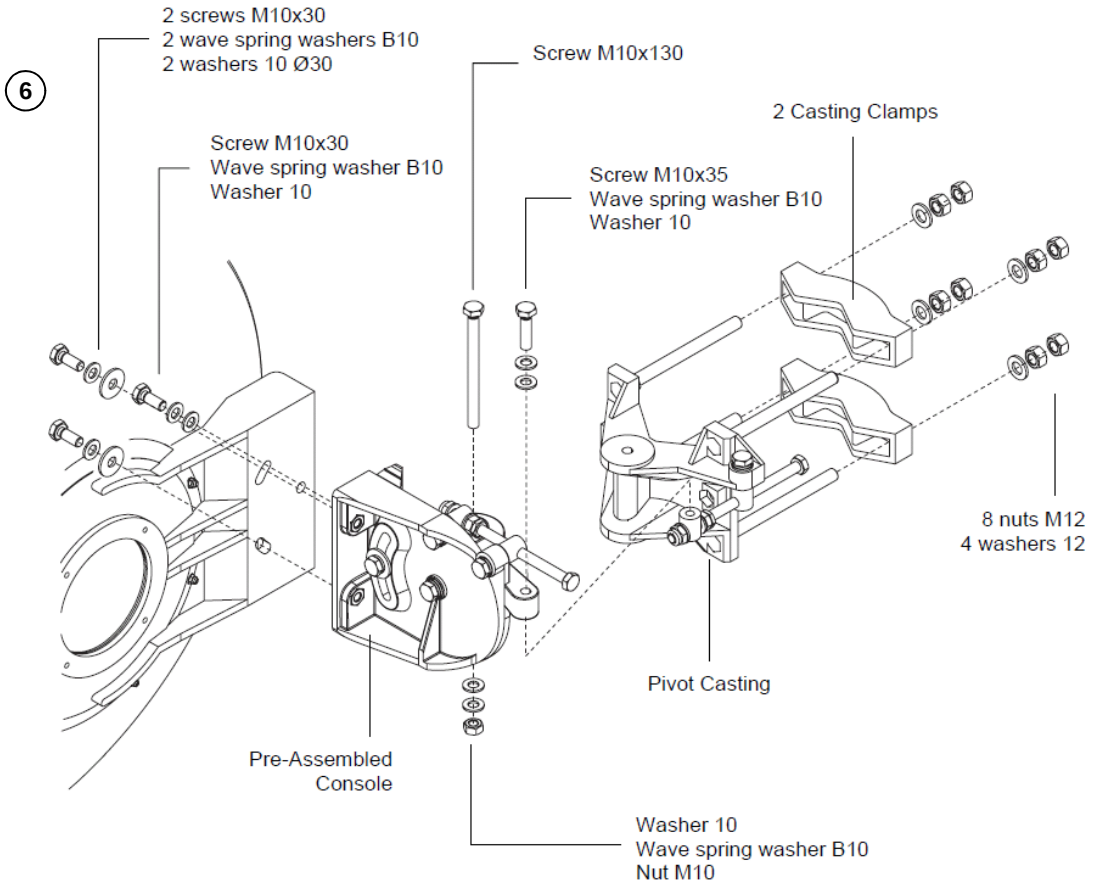
Step	Procedure

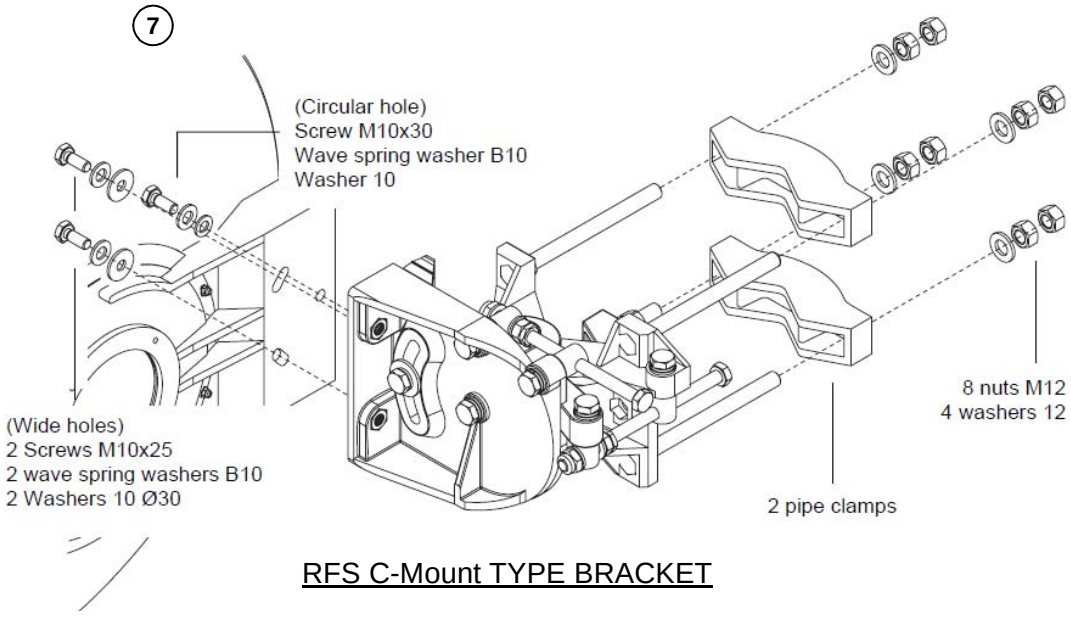
ANTENNA DIRECT MOUNTING (10-38 GHz Band ODU)

MOUNT ASSEMBLY (RFS C-Mount Type)



RFS C-Mount TYPE BRACKET





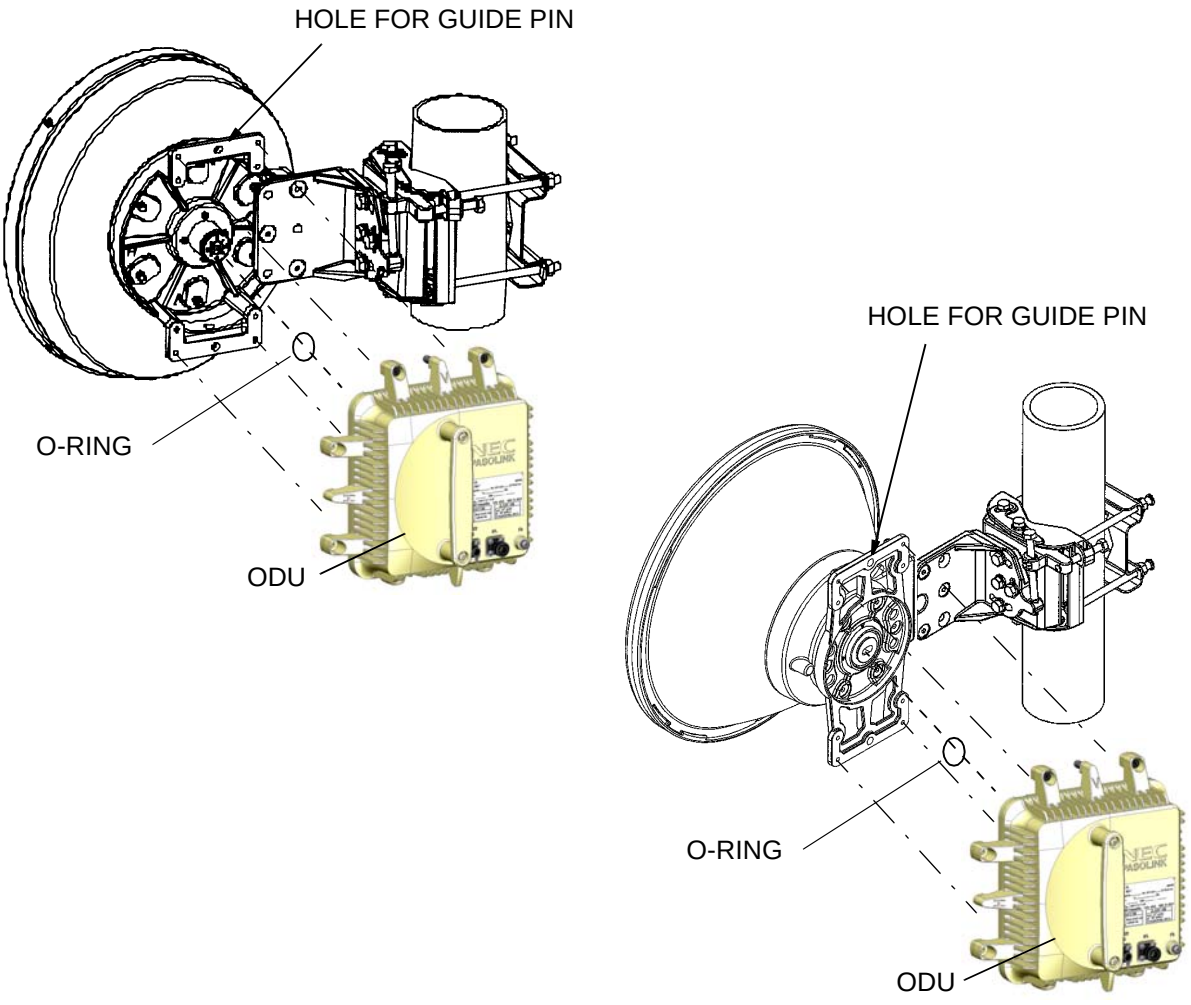
RFS C-Mount TYPE BRACKET

Chart 2-5 (Cont'd)

Step	Procedure

3 Fix the ODU to the bracket by tightening the M6 screws (four locations),

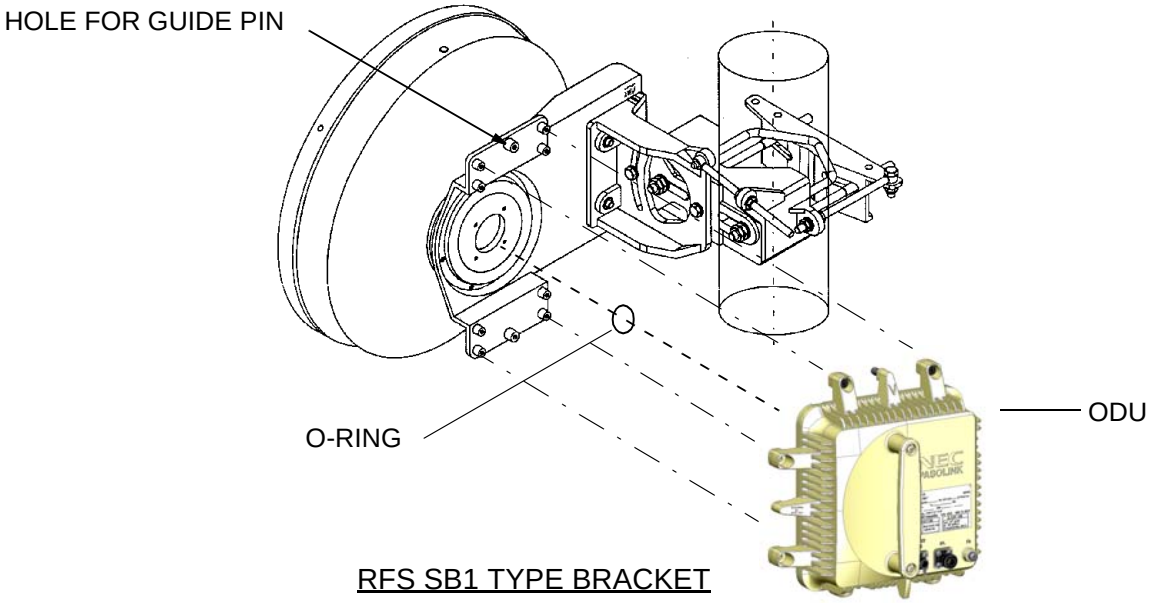
Notes: 1. Figure shows V polarization.
2. Be careful not to damage the O-ring (Antenna).
3. The tightening torque is 4.0 N·m ± 10%.



ANDREW VHLP TYPE BRACKET

Chart 2-5 (Cont'd)

Step	Procedure

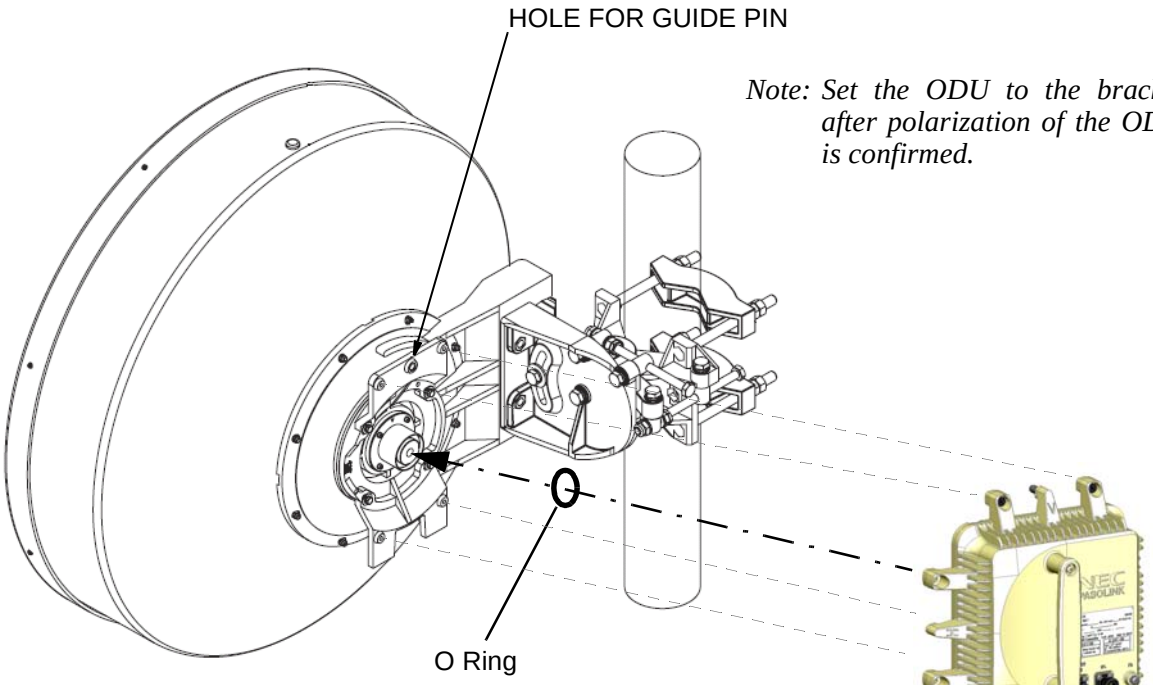


RFS SB1 TYPE BRACKET

Notes: 1. Figure shows V polarization.
2. Be careful not to damage the O-ring (Antenna).
3. The tightening torque is 4.0 N·m ± 10%.

Chart 2-5 (Cont'd)

Step	Procedure



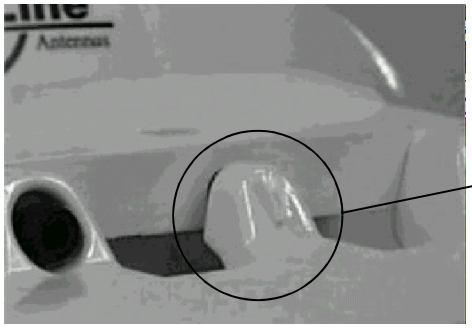
Note: Set the ODU to the bracket after polarization of the ODU is confirmed.

RFS C-Mount TYPE BRACKET

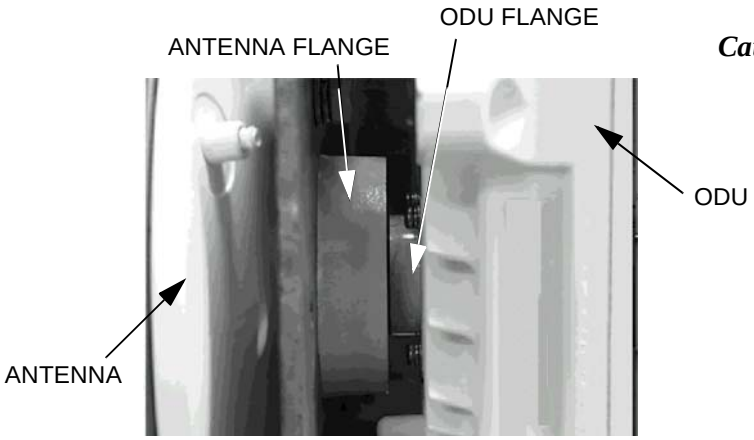
Notes: 1. Figure shows V polarization.
2. Be careful not to damage the O-ring (Antenna).
3. The tightening torque is 4.0 N·m ± 10%.

Chart 2-5 (Cont'd)

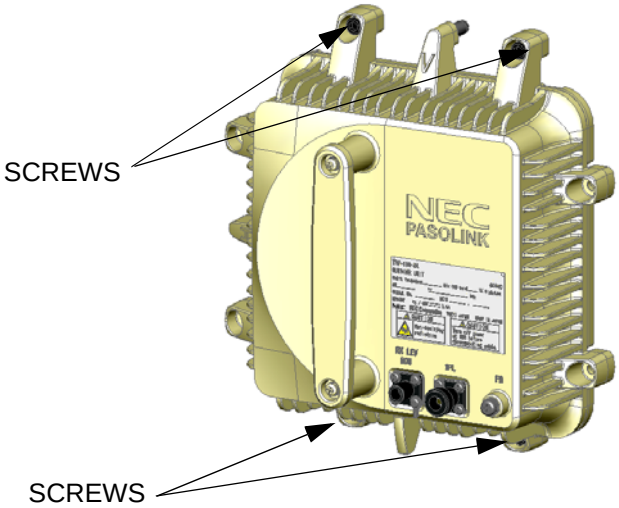
Step	Procedure



4. Insert guide pin on the hole of bracket to set the position of screws,



Caution: Align flanges on antenna and ODU correctly, and fix the ODU with four screws.



5. Fix the ODU to the bracket with four screws.

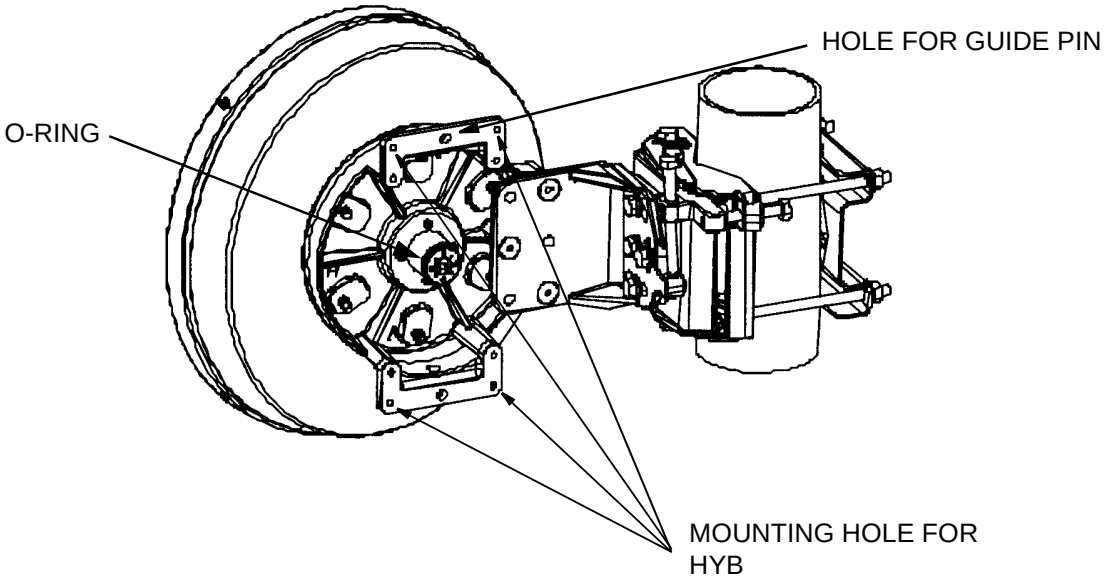
Note: Torque: 4.0 N·m ± 10%

Chart 2-6 Antenna Direct Mounting Using HYB

Step	Procedure

MOUNTING

Note: The details are referred to the installation manual which is attached to the antenna.

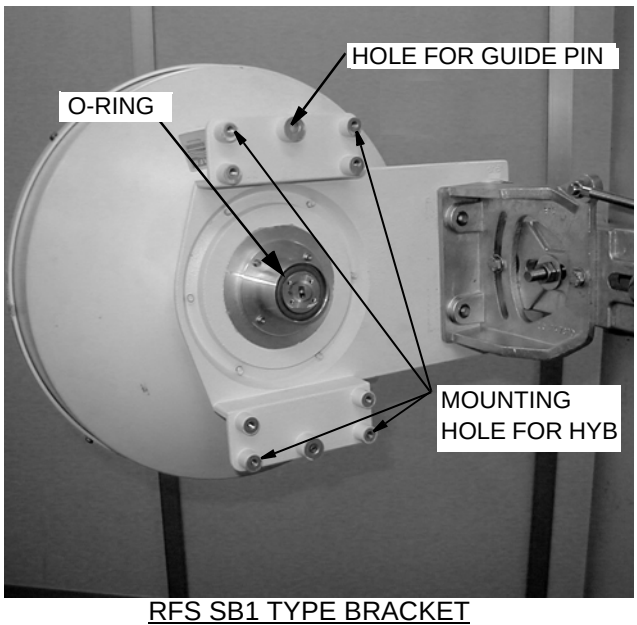


The tightening torque is 4.0 N·m ± 10%.
Be careful not to damage the O-ring(Antenna).

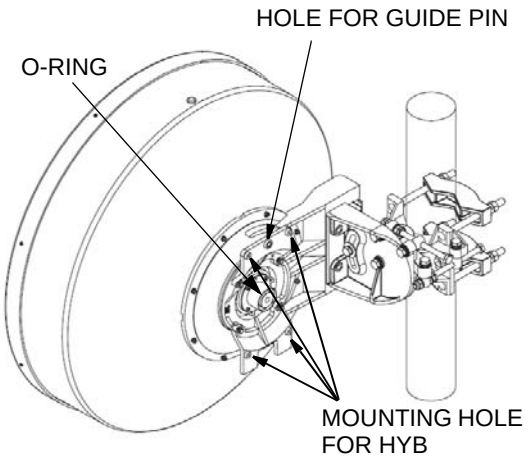
ANDREW VHLP TYPE BRACKET

Chart 2-6 (Cont'd)

Step	Procedure



RFS SB1 TYPE BRACKET



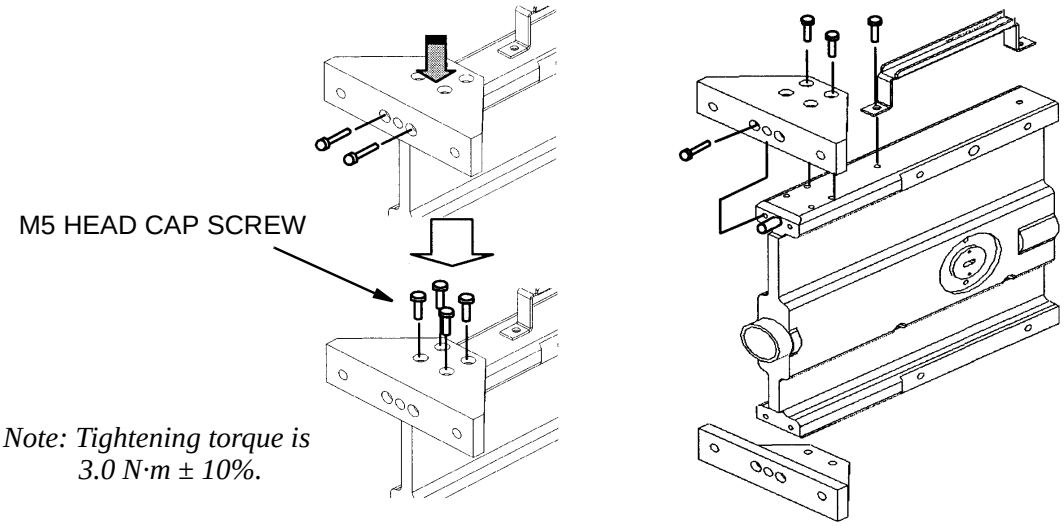
RFS C-Mount TYPE BRACKET

Note: The tightening torque is 4.0 N·m ± 10%.
Be careful not to damage the O-ring (Antenna).

Chart 2-6 (Cont'd)

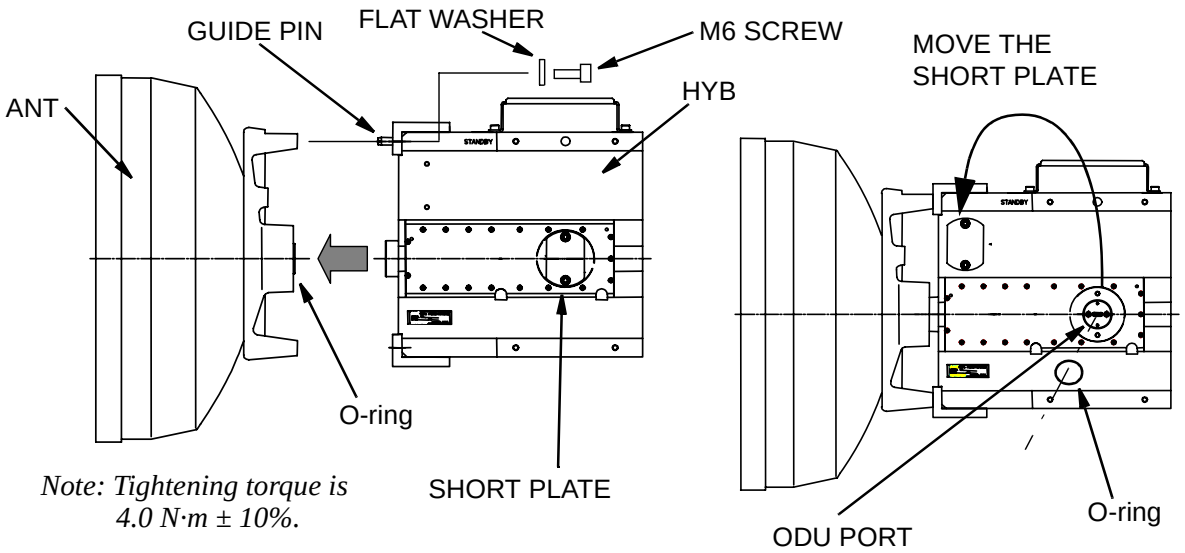
Step	Procedure

1 Fix the bracket and handle to the HYB used for 11-52 GHz ODU.



Note: Tightening torque is 3.0 N·m ± 10%.

2 Check the polarization and install the HYB to the antenna by tightening the M6 screws (four locations).



Note: Tightening torque is 4.0 N·m ± 10%.

Note: Be careful not to damage the O-ring.

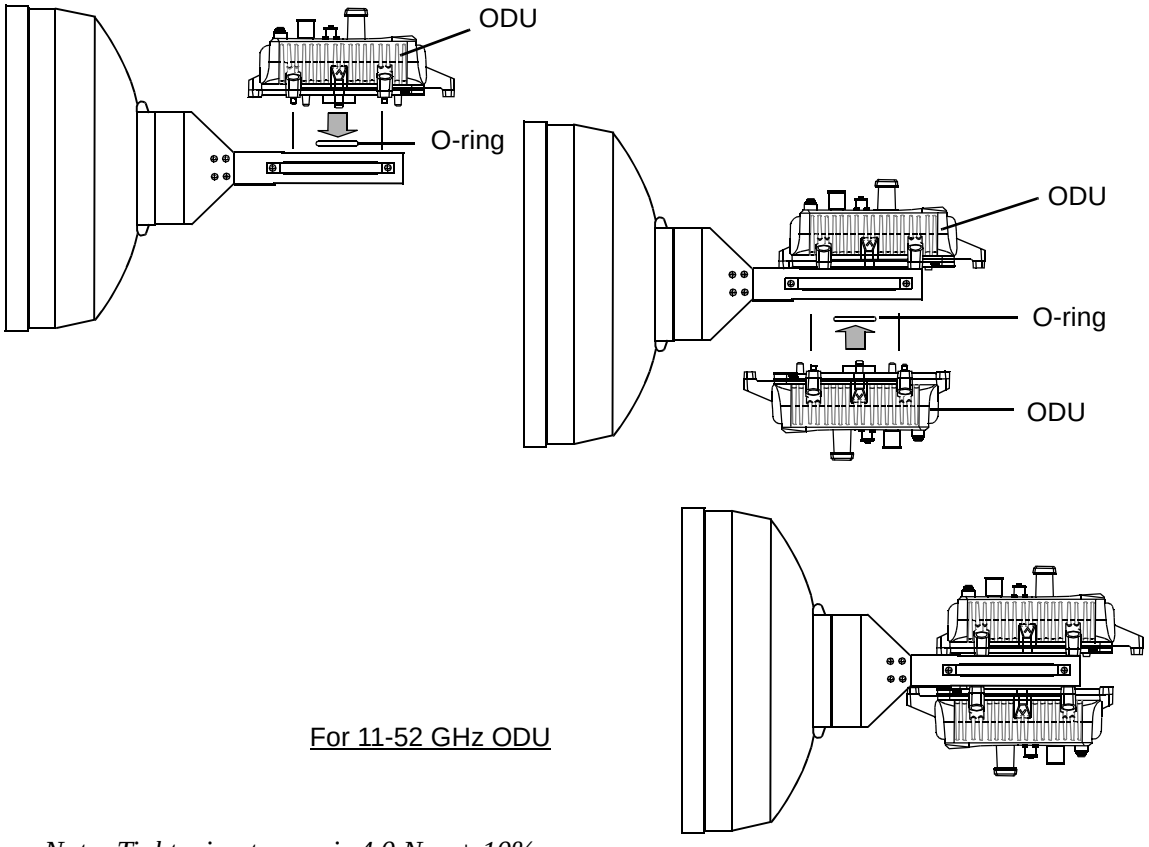
Chart 2-6 (Cont'd)

Step	Procedure

3 Insert the O-rings to the two ODU ports of the HYB.

4 Install the two ODUs with hex screws (four locations) using the Allen key wrench.

Note: Be careful not to damage the O-rings (Hybrid).



For 11-52 GHz ODU

Note: Tightening torque is 4.0 N·m ± 10%.

Chart 2-6 (Cont'd)

Step	Procedure

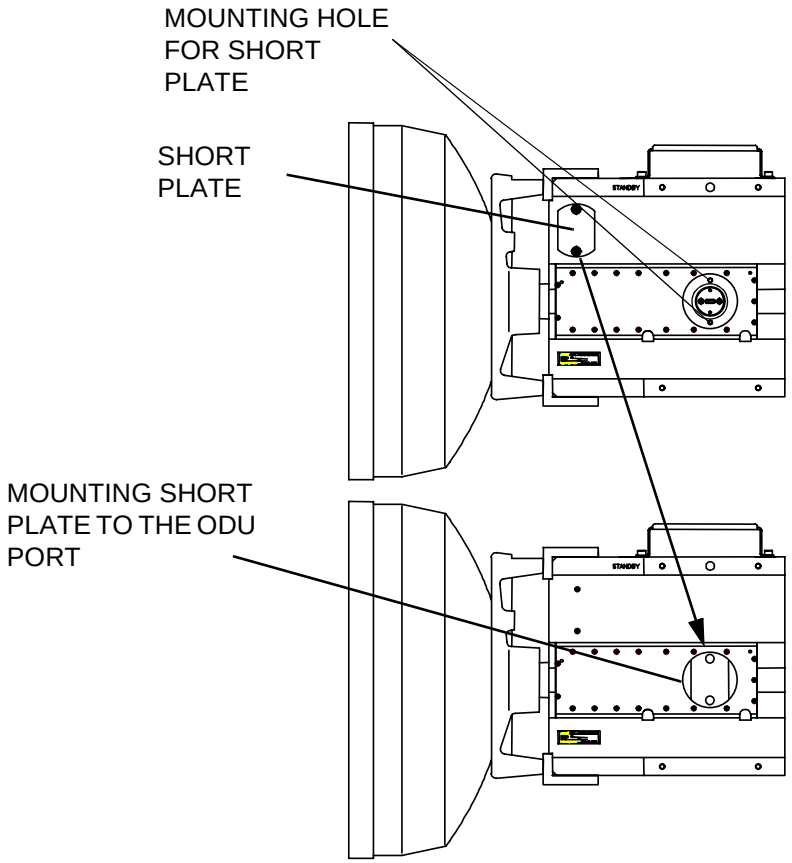
DEMOUNTING

FROM HYB

1 Remove the four (or six) fixed bolts from the ODU.

2 Then demount the ODU.

Note: When demounting the ODU from HYB, mount the attached SHORT PLATE to the demounted port of the HYB to avoid RF power leaking from the hybrid and for waterproofing.



Note: Tightening torque is 3.0 N·m ± 10%.

Chart 2-7 Antenna Direct Mounting Using TX SPAN ATT

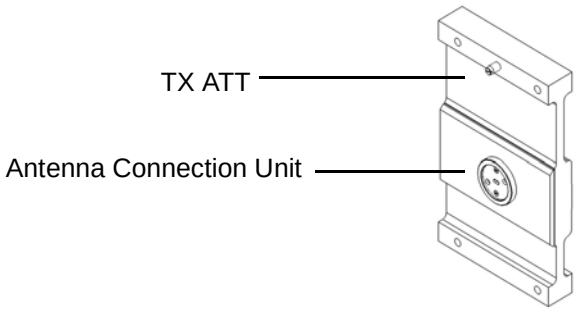
Step	Procedure

MOUNTING

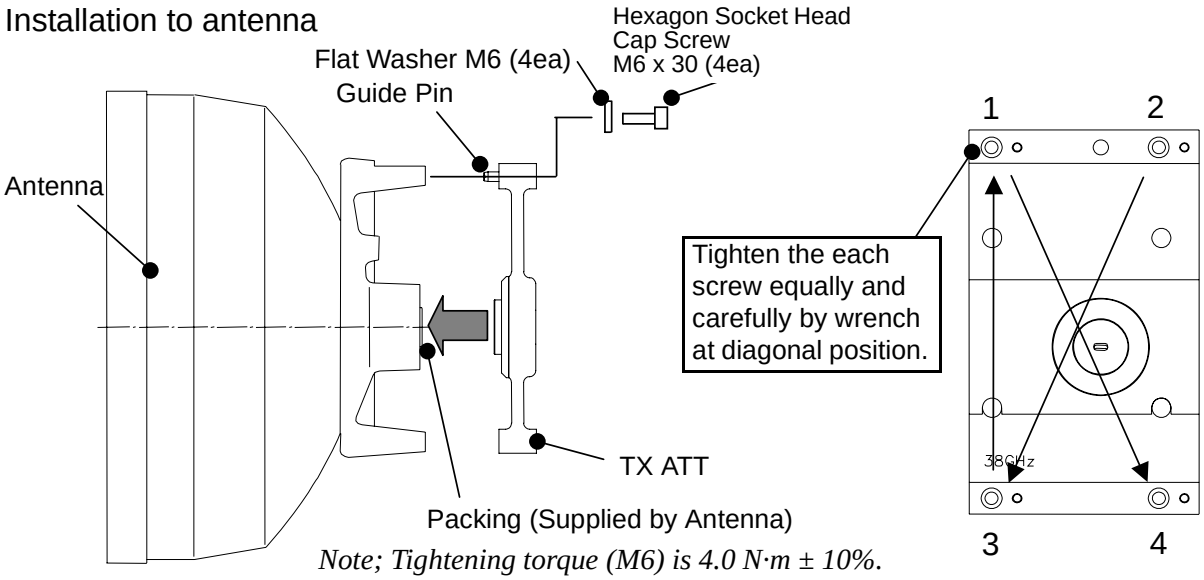
TX SPAN ATT

Step	Procedure

1 Check the polarization of the antenna connection unit of the TX ATT (Refer to CHANGING POLARIZATION description for the TX ATT.)



2 Fix the TX ATT to the antenna by tightening the M6 screws (four locations).



Note; Tightening torque (M6) is 4.0 N·m ± 10%.

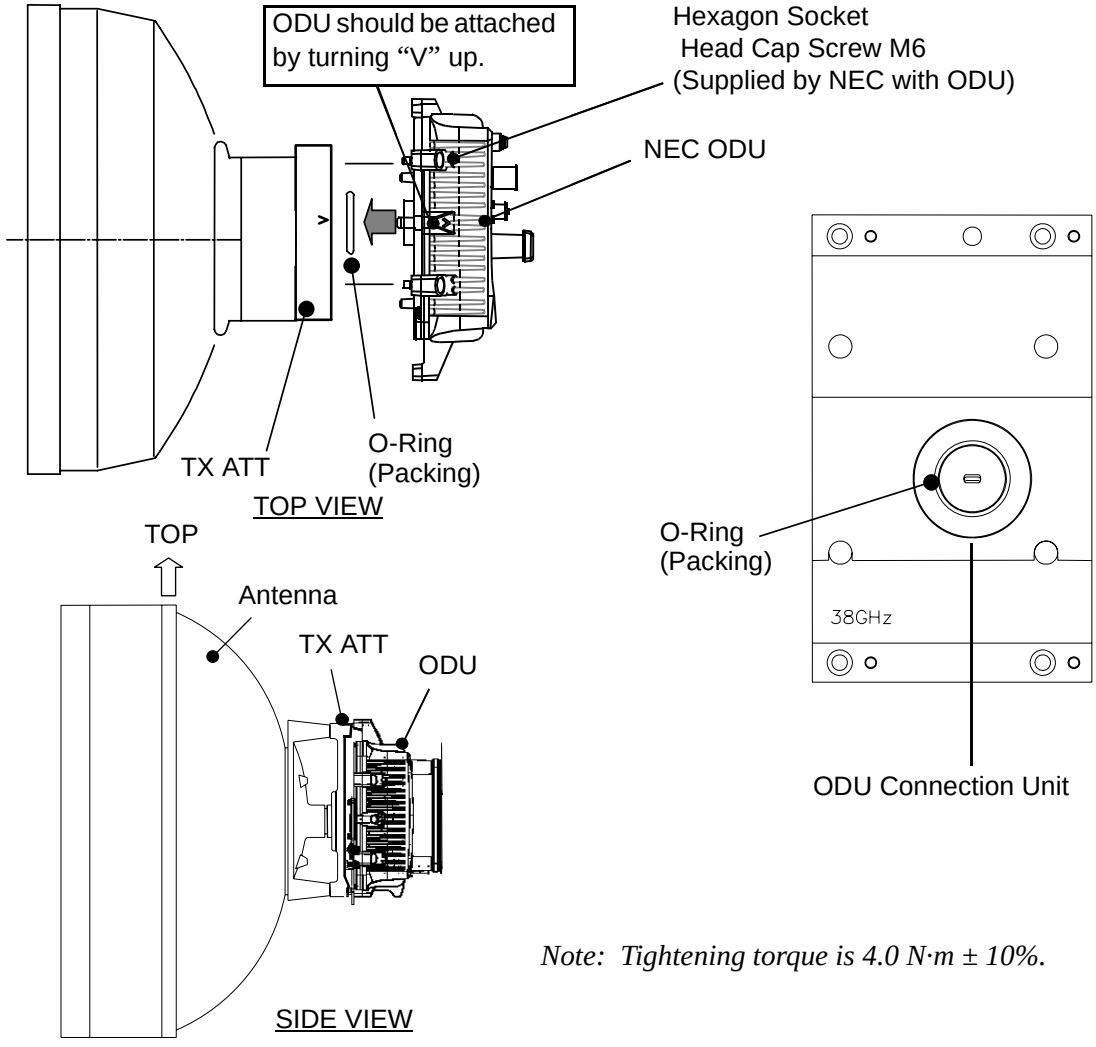
Fig. 2-7 38 GHz Band ODU Mounting Using NEC TX SPAN ATT (1/2)

Chart 2-7 (Cont'd)

Step	Procedure
3	Insert the O-rings to port of the ODU.
4	Fix the ODU with hex screws (four locations) using the Allen key wrench.

Note: Be careful not to damage the O-rings (TX ATT).

Attachment of ODU



Note: Tightening torque is 4.0 N·m ± 10%.

Fig. 2-7 38 GHz Band ODU Mounting Using NEC TX SPAN ATT (2/2)

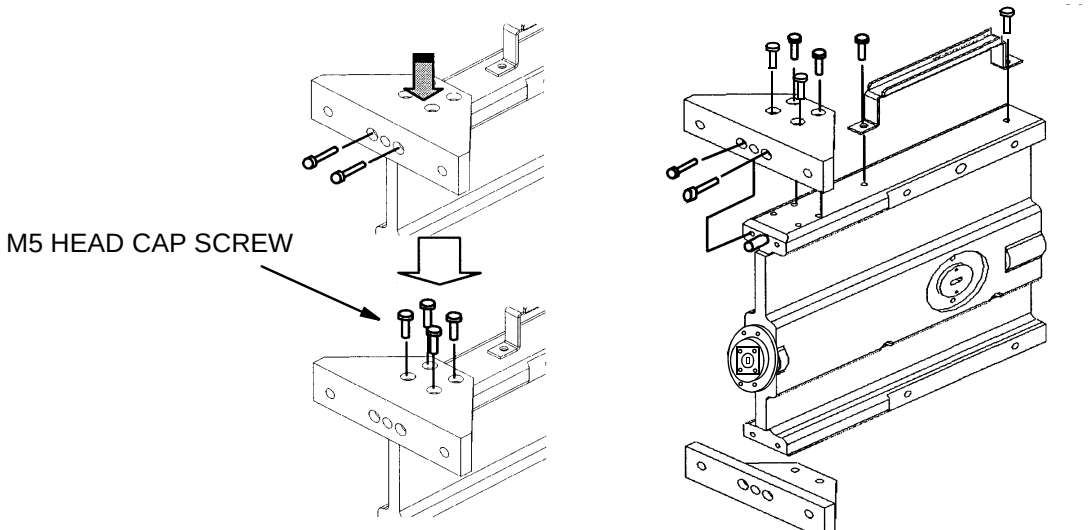
Chart 2-8 11-38 GHz Band ODU Mounting with HYB (Waveguide Connection)

Step	Procedure

WAVEGUIDE CONNECTION FOR 1+1 HYB

No.	Parts Name	Q'ty
1	Hybrid (Waveguide Flange Interface Type)	1
2	Bracket	2
3	Handle	1
4	O-ring (for ODU)	2
5	O-ring (for Waveguide)	1
6	M5 × 12 Hexagon Socket Head Cap Screw (SS)	14
7	M3 ×10 Hexagon Head Screw with Washer (×4) (SS)	4

1 Assemble the bracket and handle to the HYB.



Note: Tightening torque is 3.0 N·m ± 10%.

Chart 2-8 (Cont'd)

Step	Procedure

2 Assemble parts of the pole mounting bracket used to mount the HYB,

No.	Parts Name	Q'ty
1	Mount Arm	2
2	Mount Holder	2
3	Truss	1
4	M12 × 200 Hexagon Head Screw with Nut (×2), Flat Washer (×2)(ST)	4
5	M6 ×25 Hexagon Head Screw with Nut (x1), Flat Washer (×2), Spring Washer (SS)	4
6	M6 × 35 Hexagon Head Screw with Nut (×2), Flat Washer (×2)(SS)	4

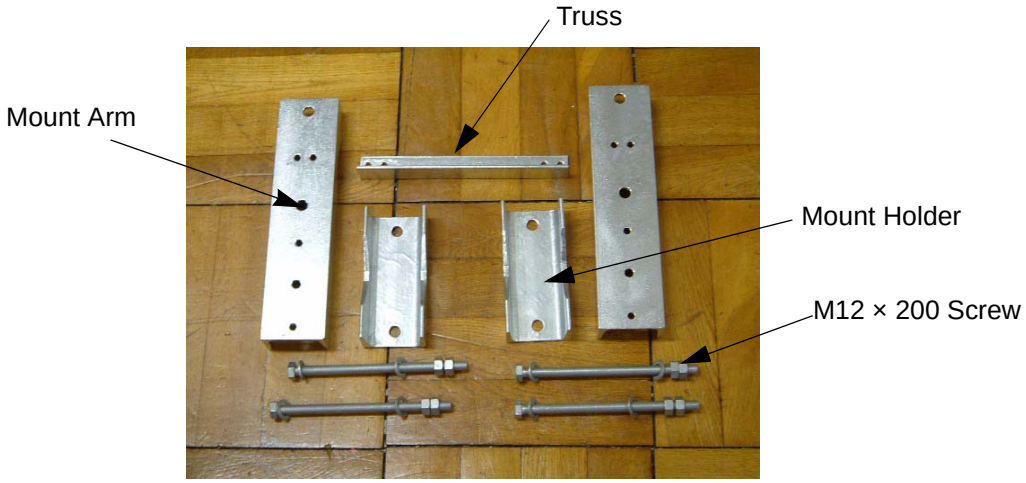
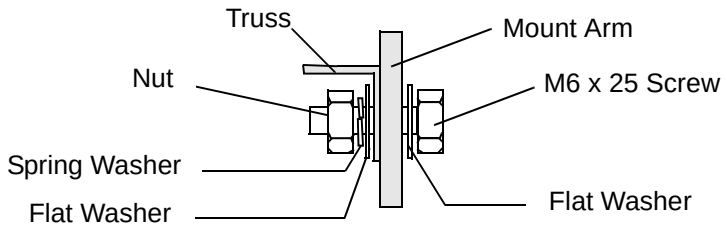


Chart 2-8 (Cont'd)

Step	Procedure

3 Screw the Mount Arm and the Truss with the M6 × 25 Screw, Flat Washer (×2), Spring Washer (1), Nut, at four positions,

	Tightening Torque
M6	4.0 N·m ± 10%
M12	47 N·m ± 10%



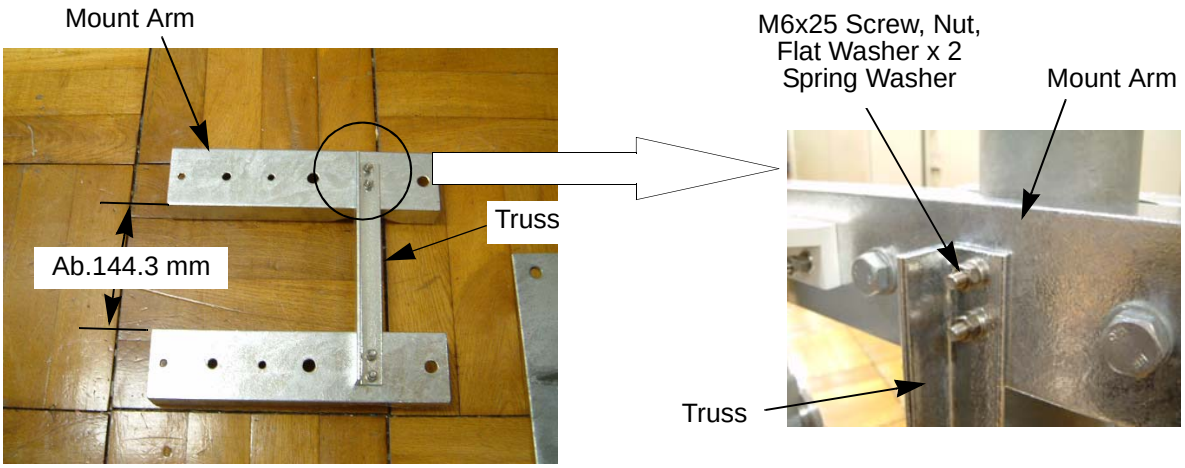
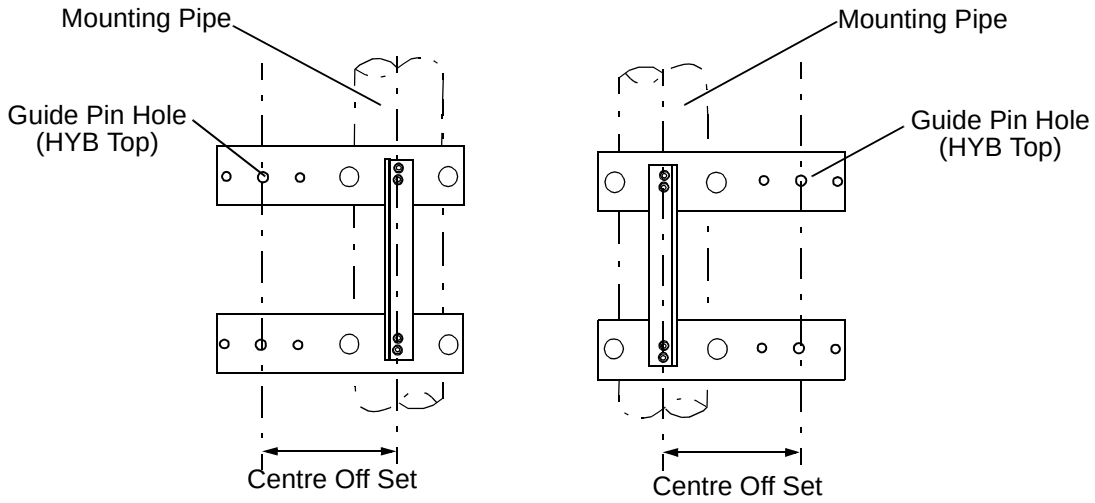


Chart 2-8 (Cont'd)

Step	Procedure

4 Determine centre off set,

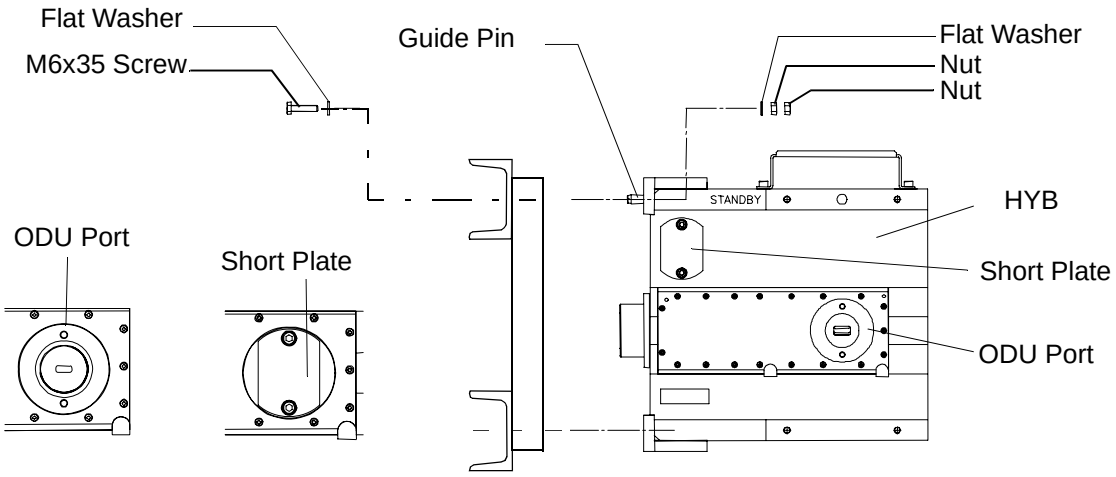


5 Fit the guide pin of the HYB to the Guide Pin Hole of the Mount Arm,

6 Install the HYB onto the bracket with the M6 × 35 Screw, Flat Washer (×2), Nut (×2), at four positions,

Chart 2-8 (Cont'd)

Step	Procedure



Note: When either Main or Standby ODU is removed, attach the short plate over the ODU port. Tightening torque is 3.0 N·m ± 10%.

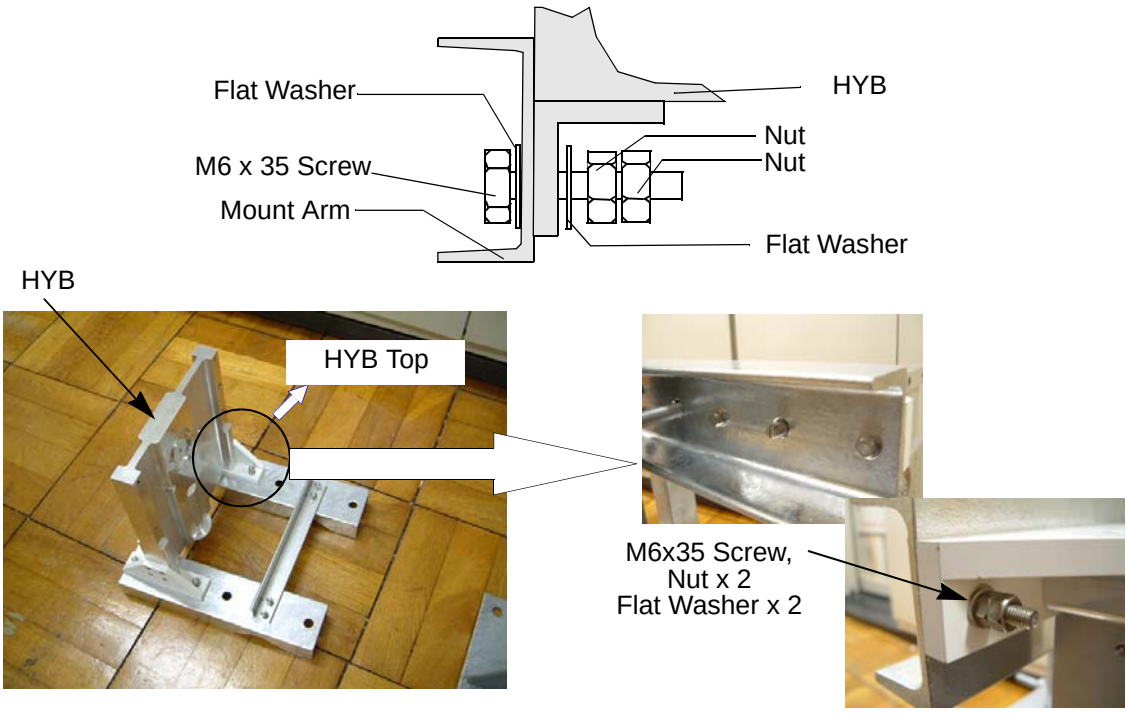
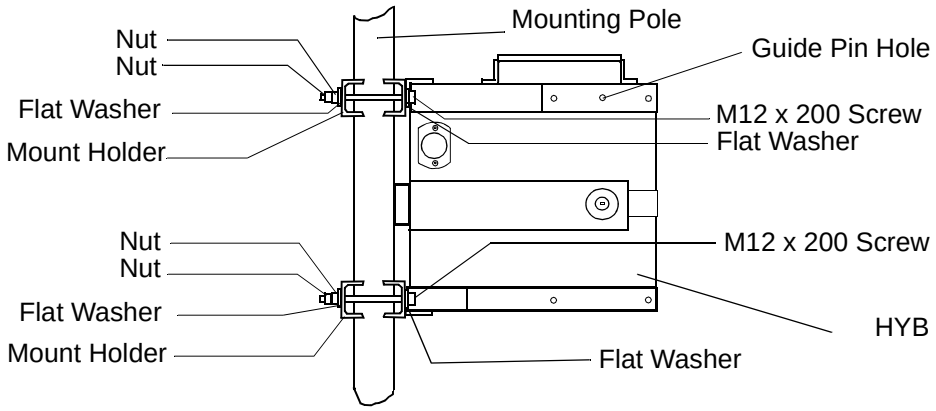
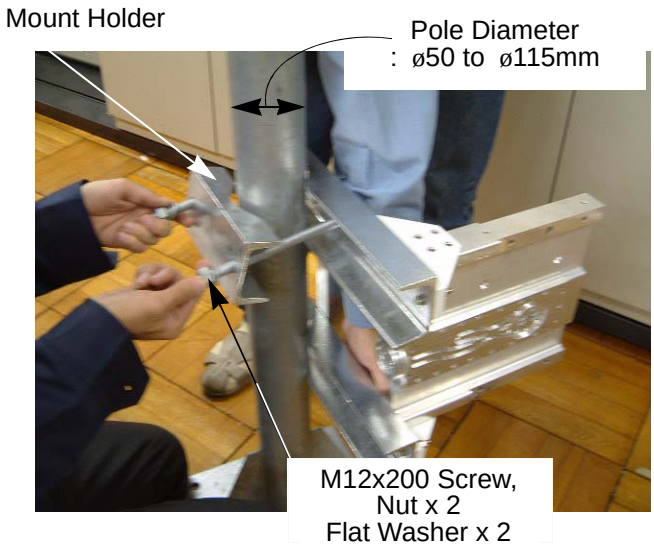


Chart 2-8 (Cont'd)

Step	Procedure

7 Install the HYB to the mounting pole using the M12 × 200 Screw, Flat Washer, Nut,





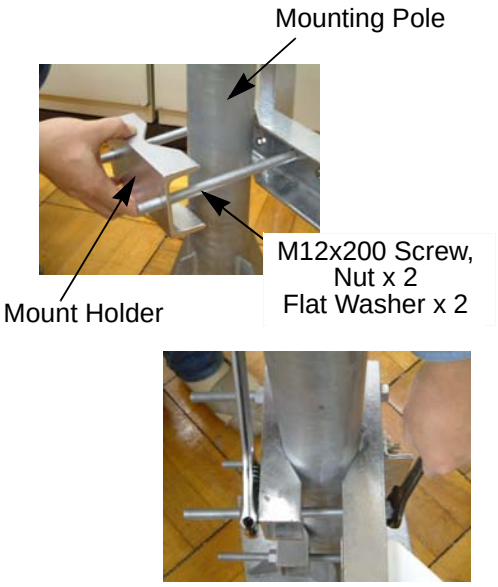


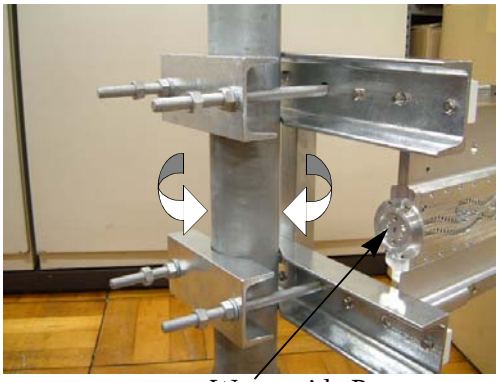
Chart 2-8 (Cont'd)

Step	Procedure

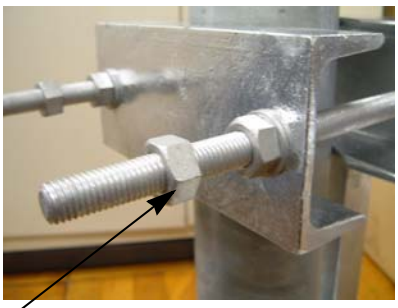
8 Adjust direction of the Bracket for Waveguide Port of the HYB orientation,

Double Nut tightening

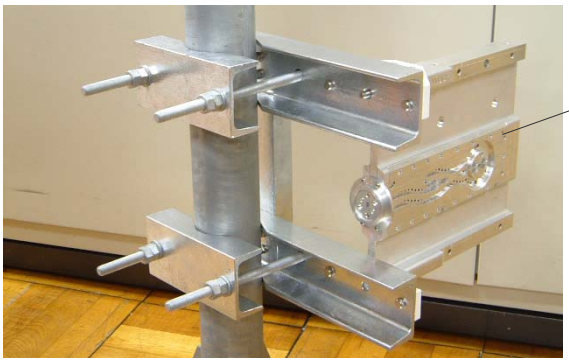
Determination of the attachment direction.



Waveguide Port



Tighten double nut after orientation for waveguide connection has been decided.



HYB

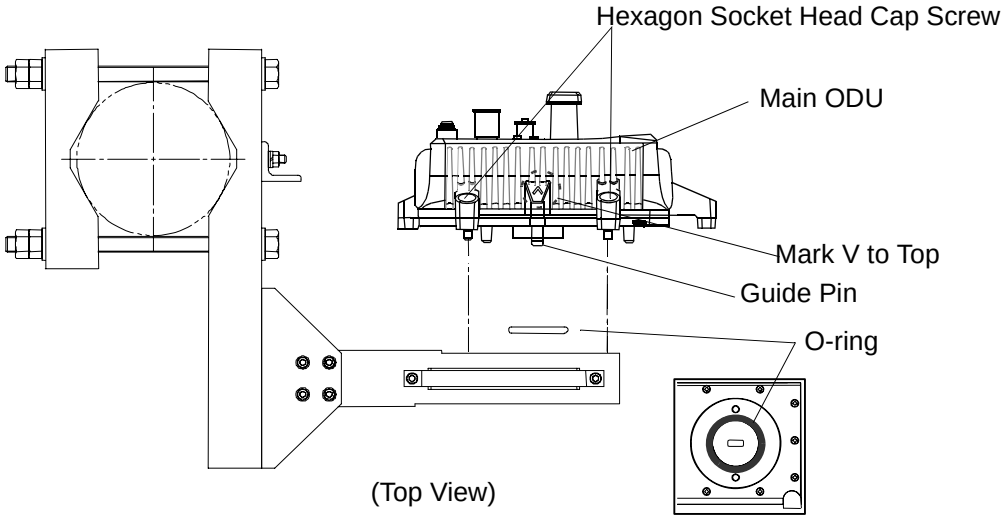
9 Confirm the ODU Type, which is Master or Slave,

Caution: The same type must be installed onto the HYB.

Chart 2-8 (Cont'd)

Step	Procedure

10 Install the ODU onto the HYB,



Note: The ODU should be attached by turning the plate marked "V" up position for both Main ODU and Standby ODU.

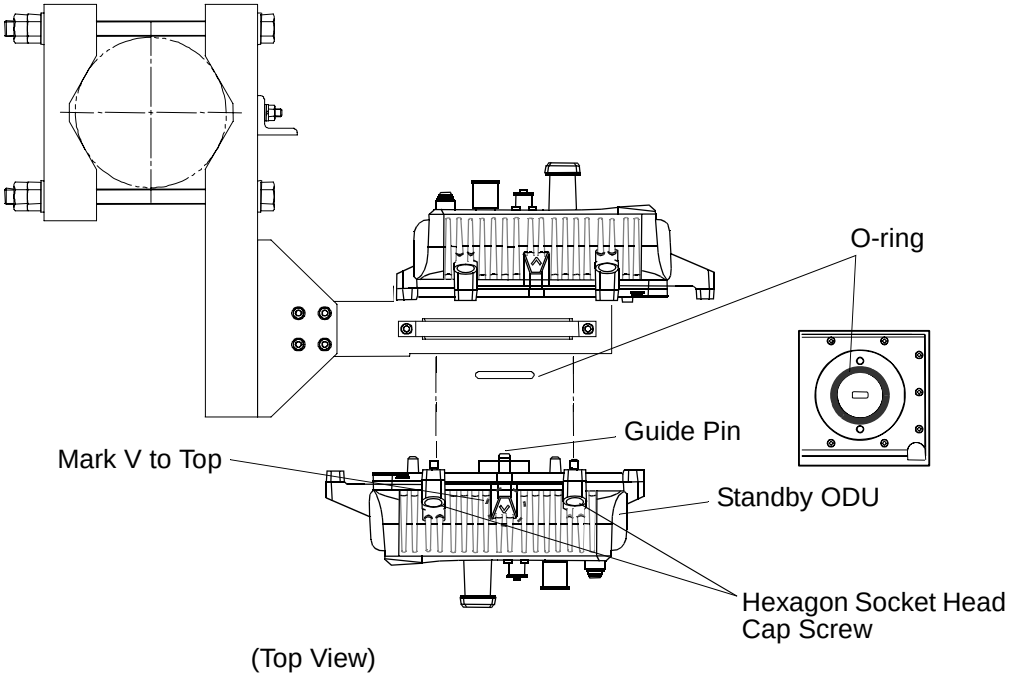
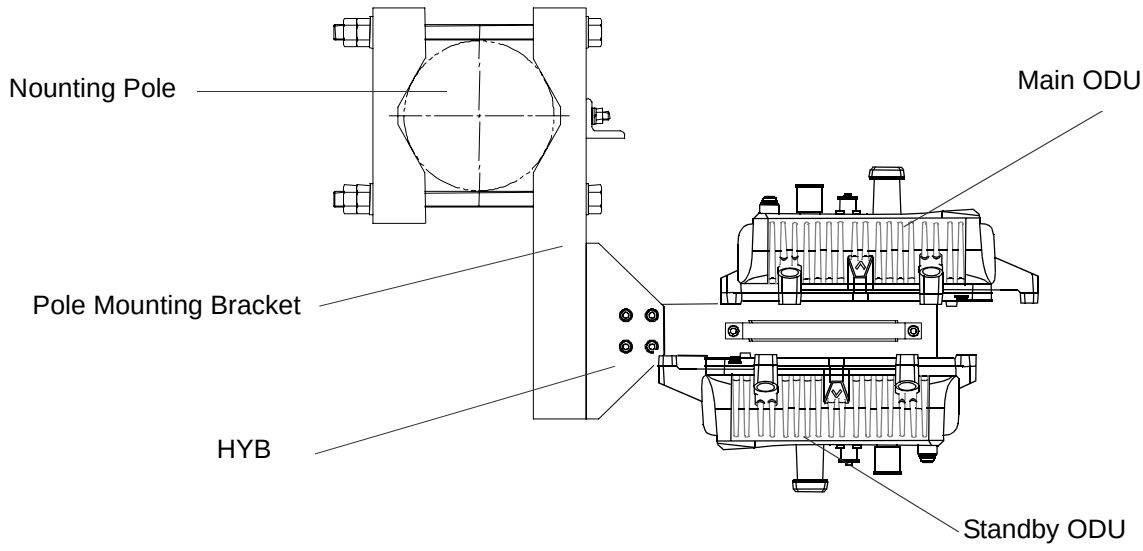
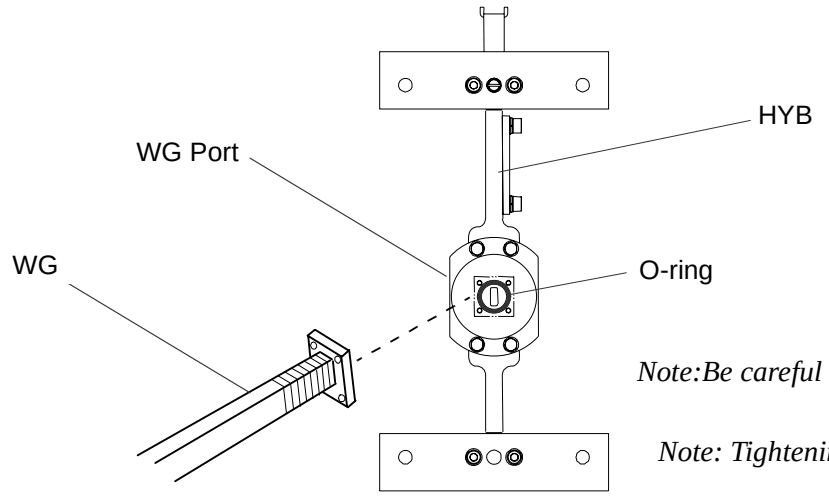


Chart 2-8 (Cont'd)

Step	Procedure
11	Connect the flexible waveguide (WG) to the ODU and fix the waveguide to the ODU with four (4) bolts. *Note: Before connecting the WG to the antenna, confirm which polarization is applied to the Master and Slave ODU.*





Note:Be careful not to damage the O-ring.

Note: Tightening torque is 1.4 N·m ± 10%.

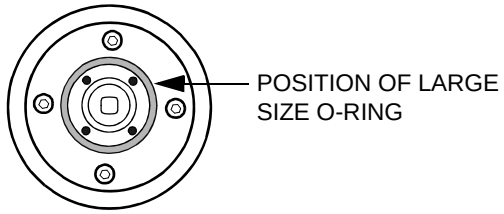
Chart 2-9 11-38 GHz Band ODU Mounting with OMT (Antenna Direct Mounting)

Step	Procedure

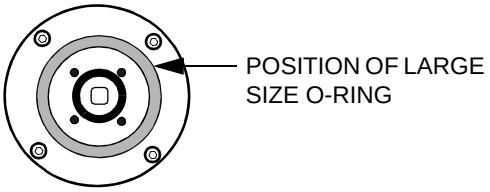
This section explains the installation of the OMT for XPIC system.

There are two types of O-rings for antenna mounting to the OMT depending on the frequency band.

Caution : Do not apply silicon grease to O-ring.

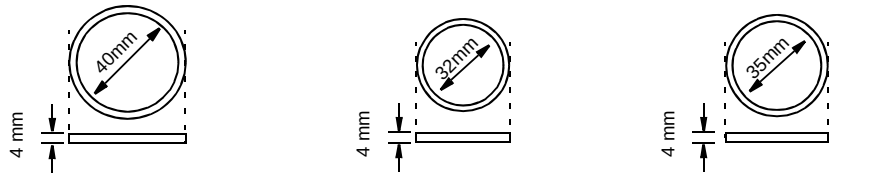


FOR ANTENNA DIRECT MOUNTING
ANDREW ANTENNA



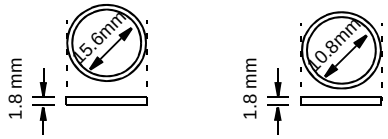
FOR ANTENNA DIRECT MOUNTING
RFS ANTENNA

Notes: 1. O-ring size is different with frequency band as follows:



10-11 GHz BAND 13-23 GHz BAND 26-38 GHz BAND

LARGE SIZE O-RING FOR ANTENNA DIRECT MOUNTING



13-23 GHz BAND 38 GHz BAND

SMALL SIZE O-RING FOR WAVEGUIDE CONNECTION

Chart 2-9 (Cont'd)

Step	Procedure

For the antenna direct mounting of the ODU, following OMT is used in the XPIC system.

FREQUENCY BAND	FREQUENCY RANGE (GHz)	OMT CODE No.	INTERFACE WG INNER DIA.(mm) (ANT Side)	INTERFACE (ODU Side)
11G	10.7 –11.7 GHz	G9380A	18.0	R100
13G	12.75 –13.25 GHz	G9381A	15.0	R140
15G	14.5 –15.35 GHz	G9382A	13.5	R140
18G	17.7 –19.7 GHz	G9383A	10.5	R220
23G	21.2 –23.6 GHz	G9384A	9.0	R220
26G	24.5 –26.5 GHz	G9385A	8.0	R260
32G	31.8 –33.4 GHz	G9387A	6.5	R320
38G	37 –39.5 GHz	G9388A	5.5	R320

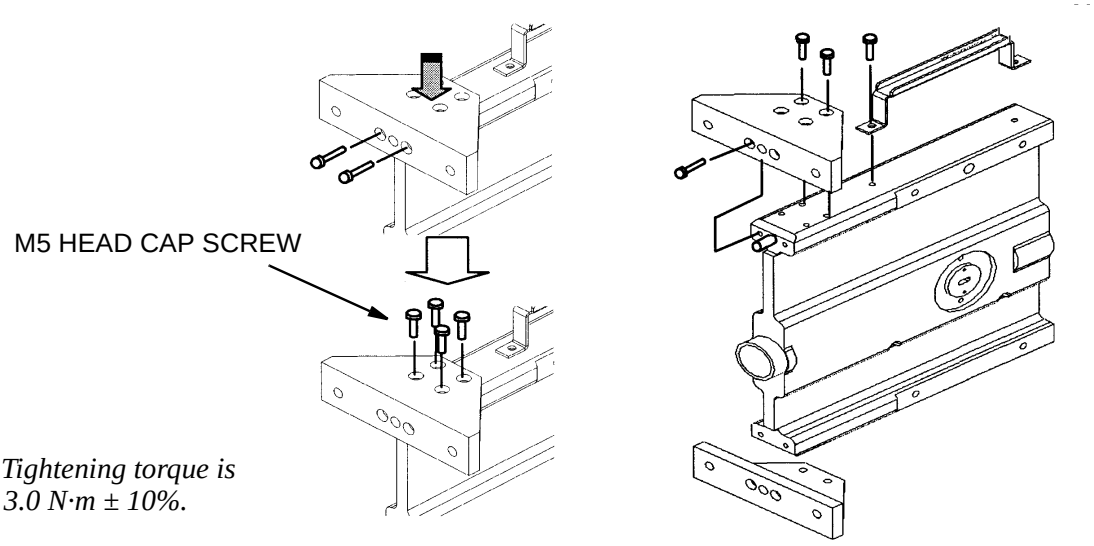
Caution : For connecting the OMT to the antenna, the circular type waveguide flange of the antenna is applied to the XPIC system. When the V/H flange is mounted to the antenna, it must be changed to a circular type.

Caution : When mounting the ODU to the OMT, confirm the polarization for Main Master and SUB Master ODU. The installation of the corresponding ODUs in the opposite station must have the same polarization in order to make into line Main Master and SUB Master MODEMs.

Chart 2-9 (Cont'd)

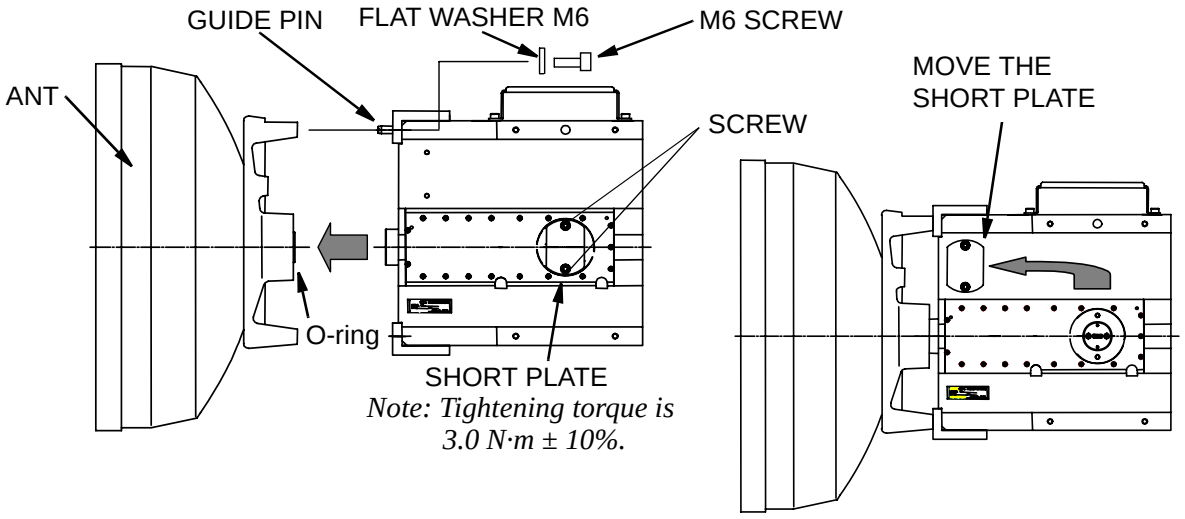
Step	Procedure

1 Fix the bracket and handle to the OMT.



Note: Tightening torque is 3.0 N·m ± 10%.

2 Fix the OMT to the antenna by tightening them with M6 screws (four locations),



Note: Tightening torque is 3.0 N·m ± 10%.

Note: Tightening torque is 4.0 N·m ± 10%.

Note: Be careful not to damage the O-ring.

Chart 2-9 (Cont'd)

Step	Procedure

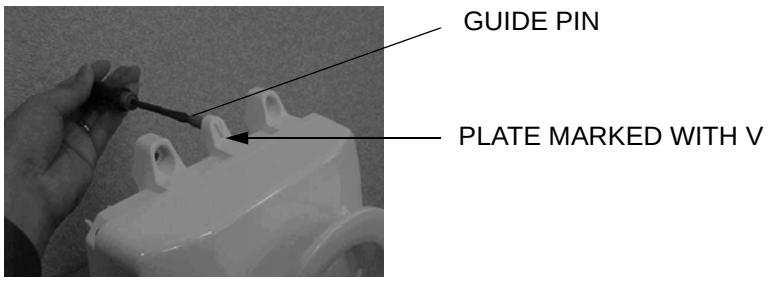
3 Loosen the two screws and move the short plate if it is fixed to the ODU port. (see figure in step 9),

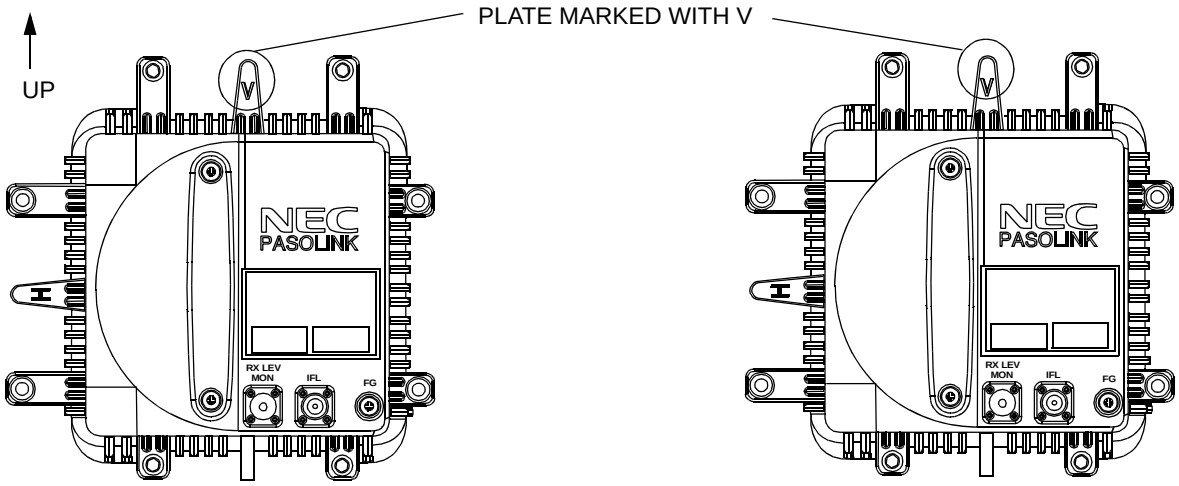
4 Set the two ODUs to vertical polarization for OMT mounting. If the guide pin behind the plate marked H is mounted, remove the guide pin,

Note: The ODU should be attached by turning the plate marked "V" up position for both Main Master ODU and SUB Master ODU.

5 Insert the guide pin removed in step 4 behind the plate marked V,

Note: Remove the protection metallic plate covering the waveguide hole on ODU.





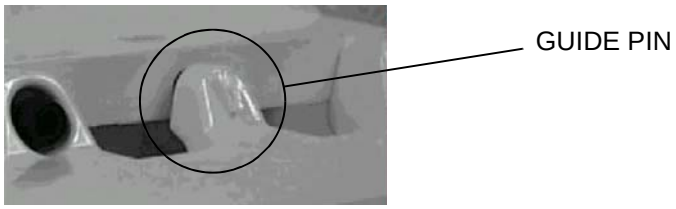
Main Master SUB Master

Chart 2-9 (Cont'd)

Step	Procedure

6 Insert the O-rings to the two ODU ports of the OMT (see figure in step 9),

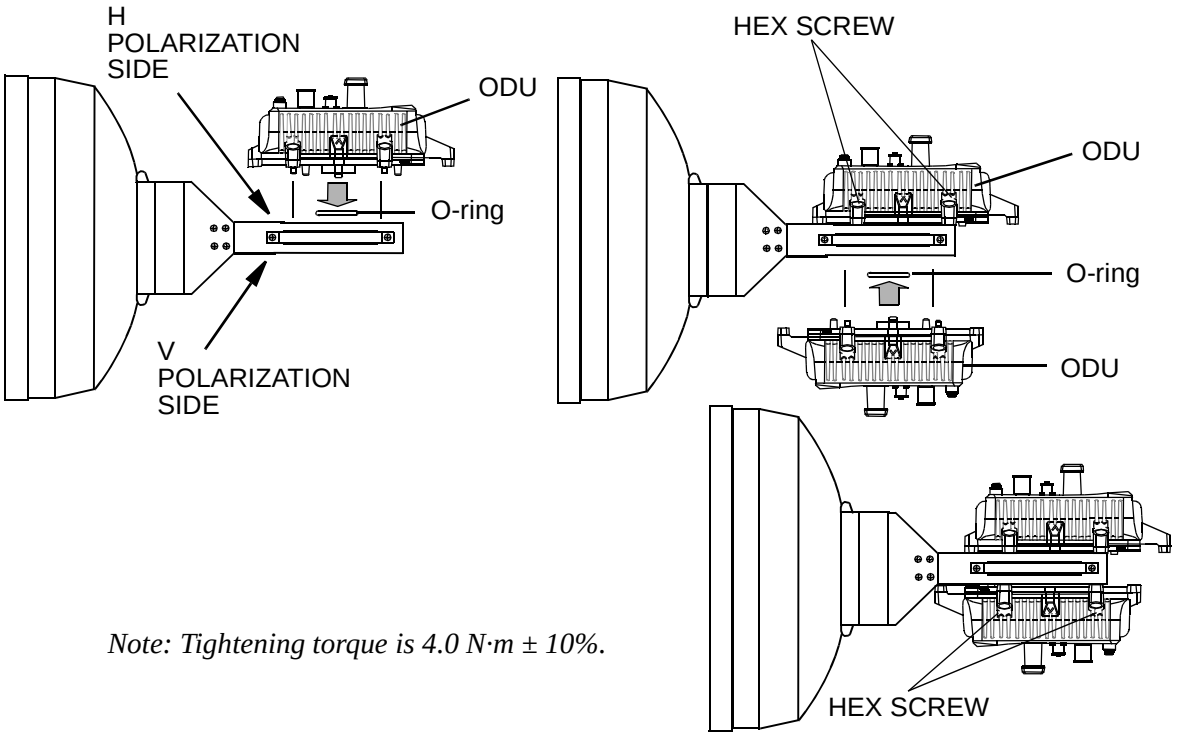
7 Insert the guide pin into the hole of the OMT and set the position of screws,



8 Confirm which polarization is applied to the Master ODU. Check the indication of polarization on the upper side of OMT.

9 Fix the two ODUs with hex screws (four locations) using the allen key wrench,

Note: Be careful not to damage the O-rings.



Note: Tightening torque is 4.0 N·m ± 10%.

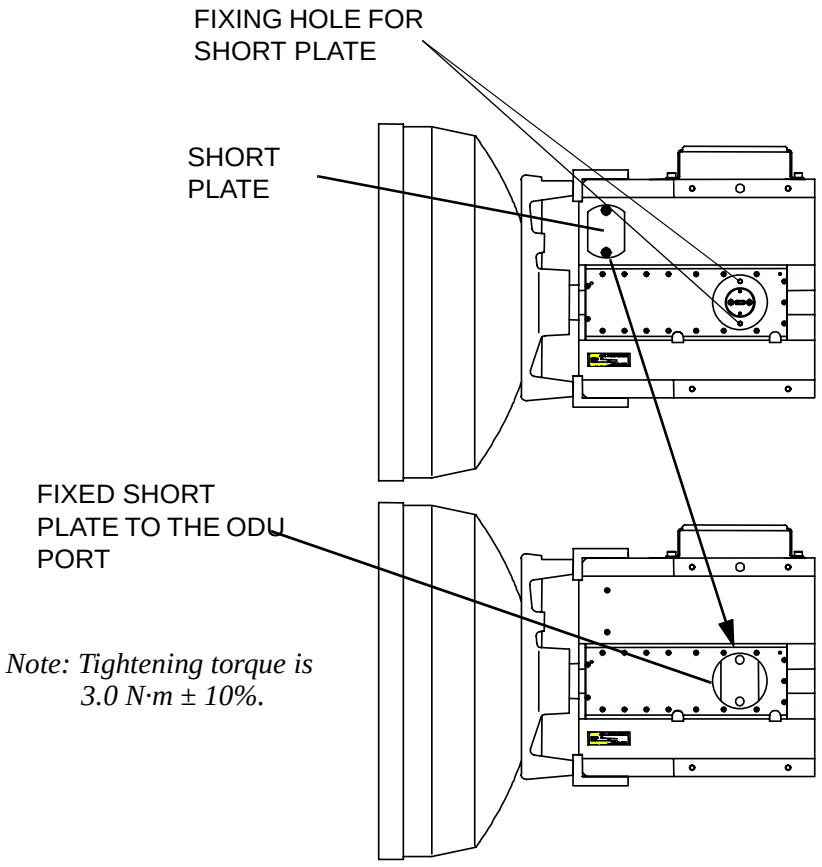
Chart 2-9 (Cont'd)

Step	Procedure

Cautions: ***1. Tighten all screws with lighter torque at first, then full torque as specified.***

2. When either ODU is demounting for ODU replacing or other reasons, fix the attached short plate to the demounted port of the OMT to avoid leaking of RF power from the OMT and for waterproof.

3. To avoid occurrence of bit errors due to microphonic properties, when installing the SUB Master ODU, protect the Main Master ODU from mechanical knocks.



Note: Tightening torque is 3.0 N·m ± 10%.

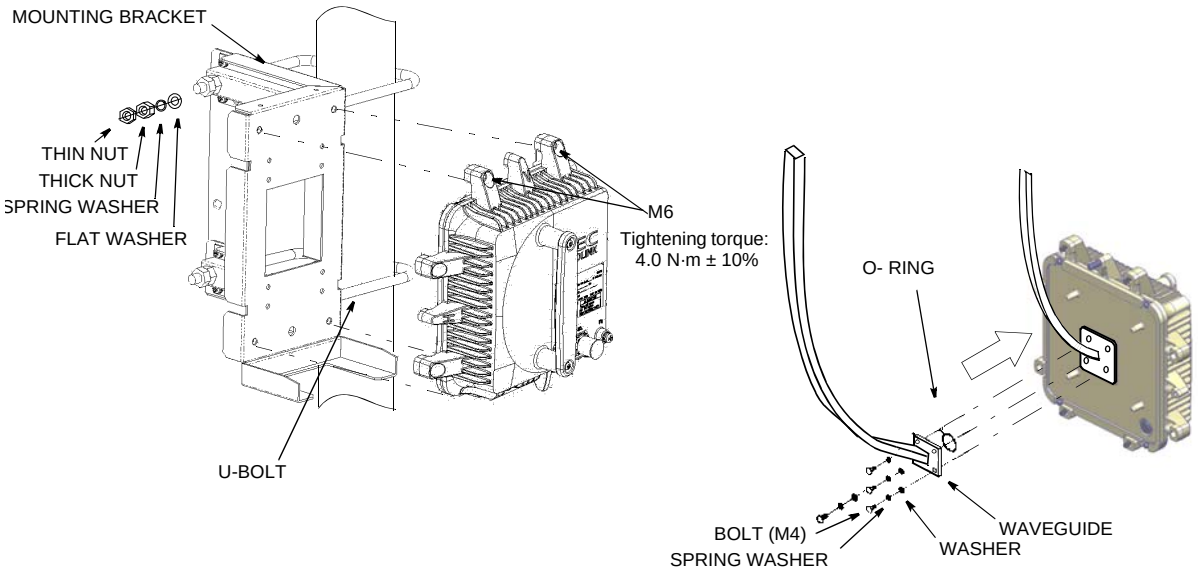
2.5 Waveguide Connection

The connection method of the waveguide type ODU is described in following procedure.

Chart 2-10 Wave Guide Connection

Step	Procedure
1	Mount a waveguide to the ODU, fix the waveguide to the ODU with four bolts.

Note: Be careful not to damage the O-ring.



Note: Tightening torque is 1.4 N·m ± 10%.

Notes: 1. Use suitable flange adapter between ODU and waveguide depending on the waveguide type.

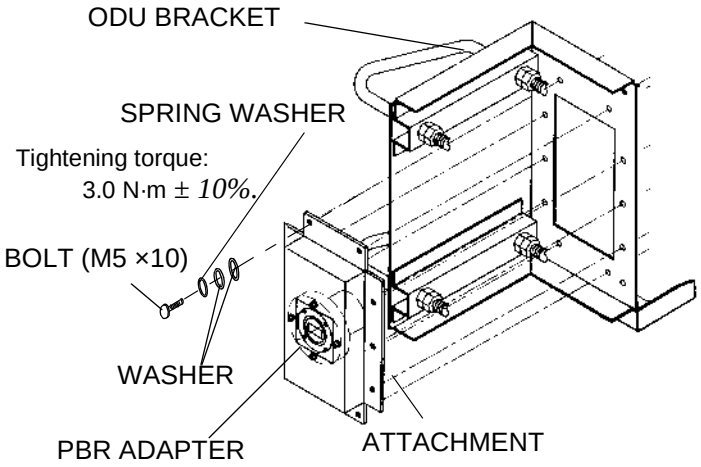
2. Connection of the waveguide is the same way as ODU is wall mounted or 19-inch rack mounted.

The wave guide for the antenna direct mounting type ODU is flange adapter is required. Refer to the following procedure.

Chart 2-10 (Cont'd)

Step	Procedure

1 Mount the attachment with adapter to the ODU bracket using ten bolts,



Note: Color of adapter is white.

2 Loosen eight nuts and remove the two U-bolts from the ODU bracket,

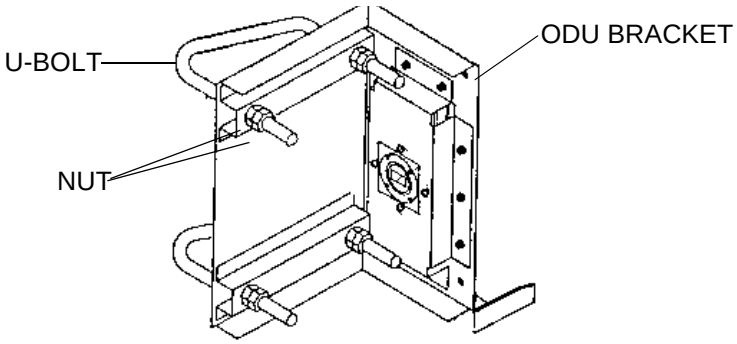
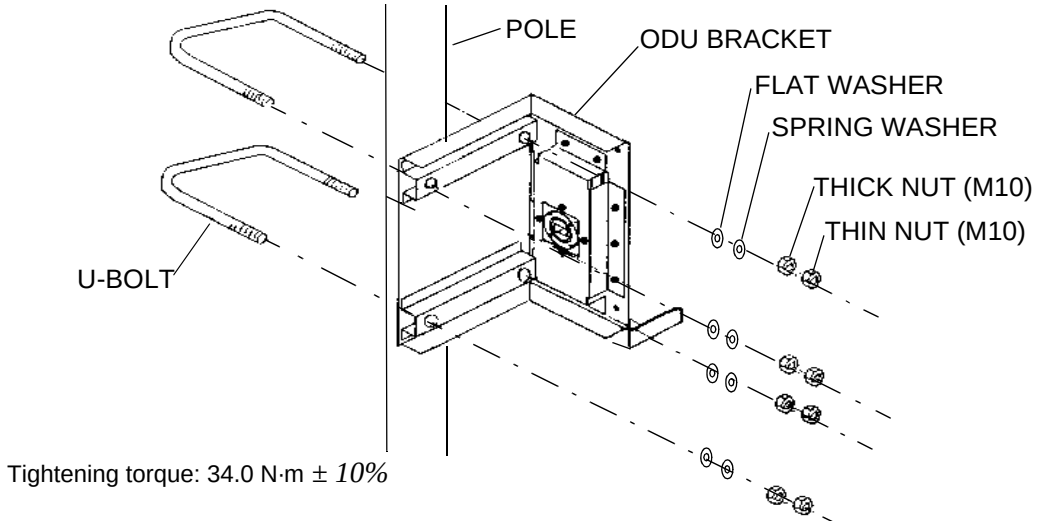


Chart 2-10 (Cont'd)

Step	Procedure

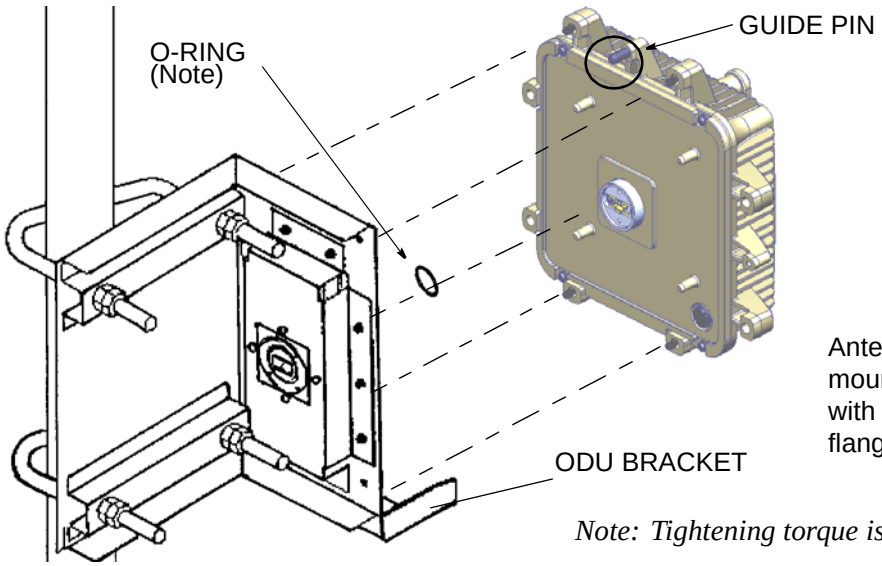
3 Mount the ODU bracket to the pole with two U-bolts,

Note: The diameter of the pole is from 48.5 to 114.5 millimeters.



4 Mount the ODU to the ODU bracket with attached four bolts (Align the guide pins on the ODU and the guide holes on the bracket),

Note: Be careful not to damage the O-ring.



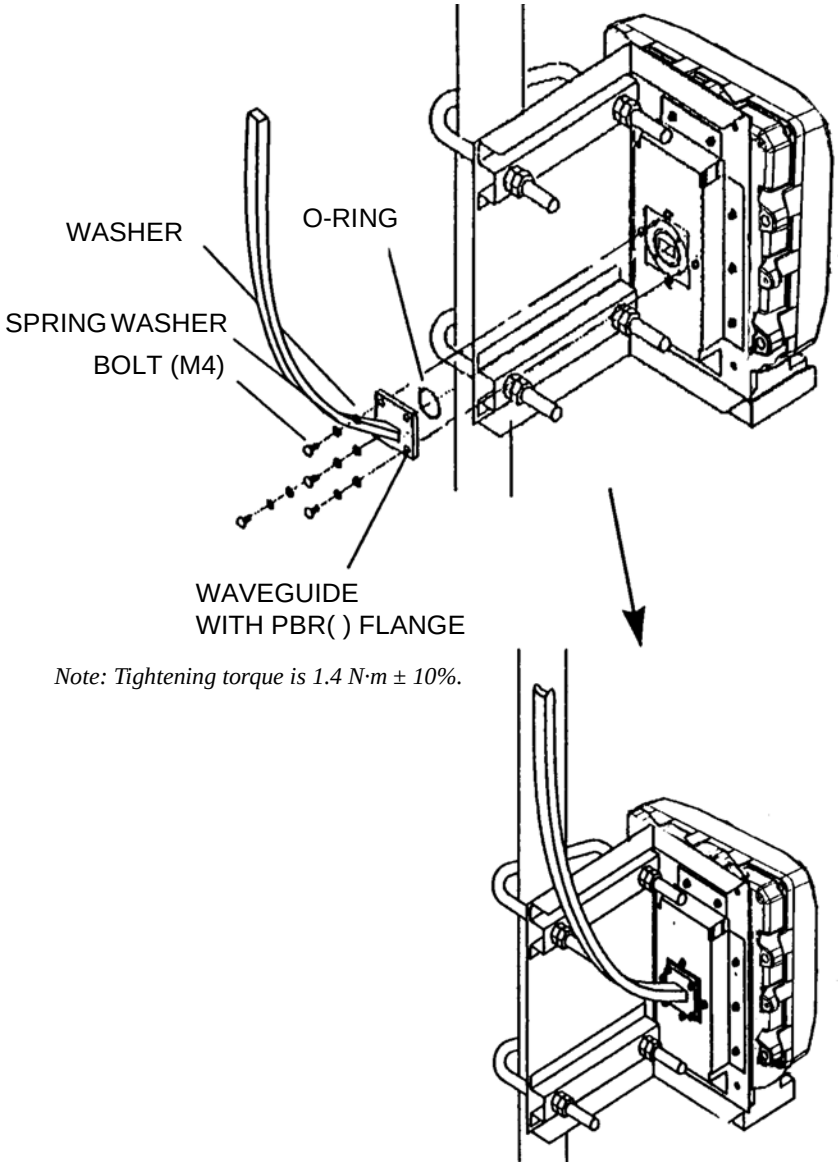
Antenna direct mounting type ODU with NEC special flange.

Note: Tightening torque is 4.0 N·m ± 10%.

Chart 2-10 (Cont'd)

Step	Procedure
5.	Make sure that the ODU and the ODU bracket are fixed at specified values.
6	Mount the waveguide to the ODU with four bolts.

Note: Be careful not to damage the O-ring attached to the PBR adapter.

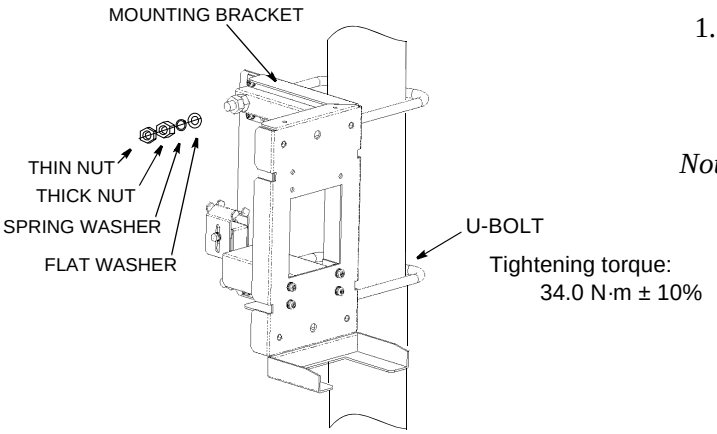


Note: Tightening torque is 1.4 N·m ± 10%.

Chart 2-11 ODU Mounting for Connecting Coaxial Cable

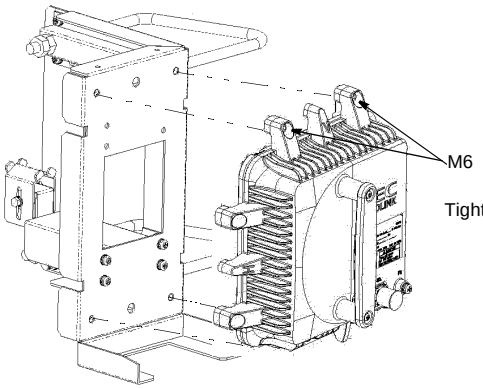
Step	Procedure

6/7/8 GHz ODU MOUNTING (Connecting Coaxial Cable)

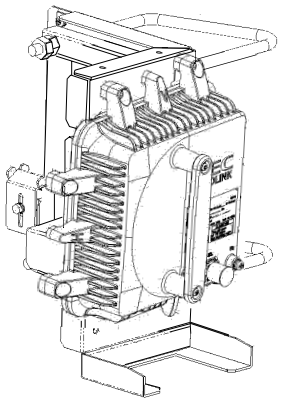


1. Mount the bracket to the pole, point to the opposite station and tighten it with two U-bolts,

Note:The diameter of pole is from 48.5 to 114.5 millimeters.



2. Mount the ODU on to the bracket and tighten four bolts (M6) at upper and lower parts of the ODU,

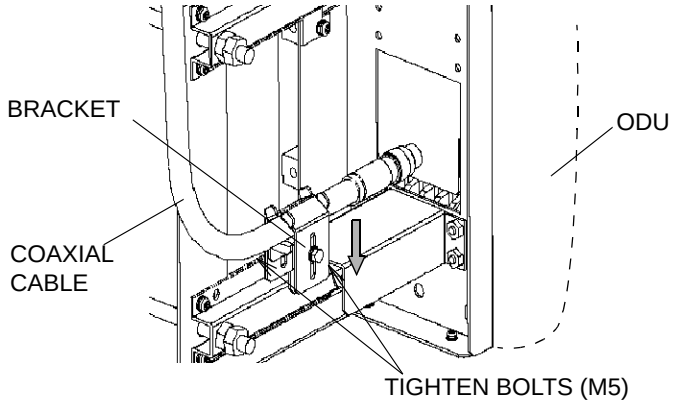


3. Check that the ODU and the bracket are fixed firmly,

Chart 2-11 (Cont'd)

Step	Procedure

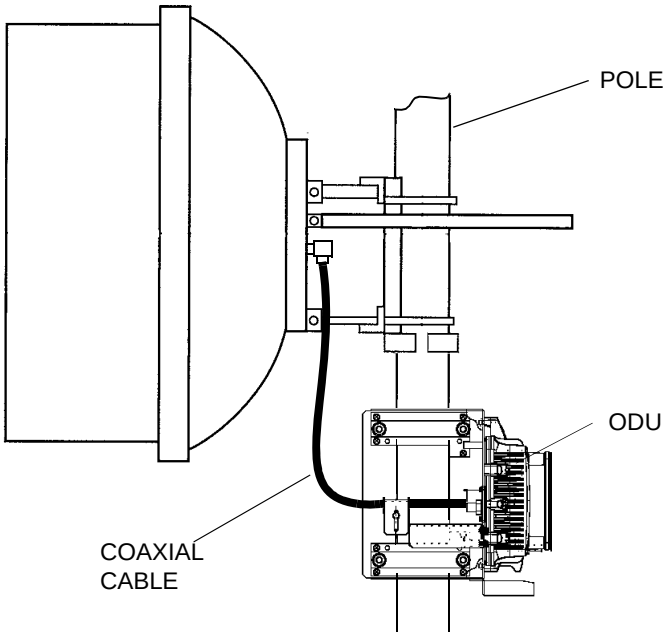
6/7/8 GHz ODU MOUNTING (Connecting Coaxial Cable)



Tightening torque: 3.0 N·m± 10%

4. Connect the Coaxial cable to the RF IN/OUT connector of the ODU,

5. Down the cable fix bracket to fix the Coaxial cable, then tighten the two bolts,



6. Install the Coaxial cables between the antenna and ODU.

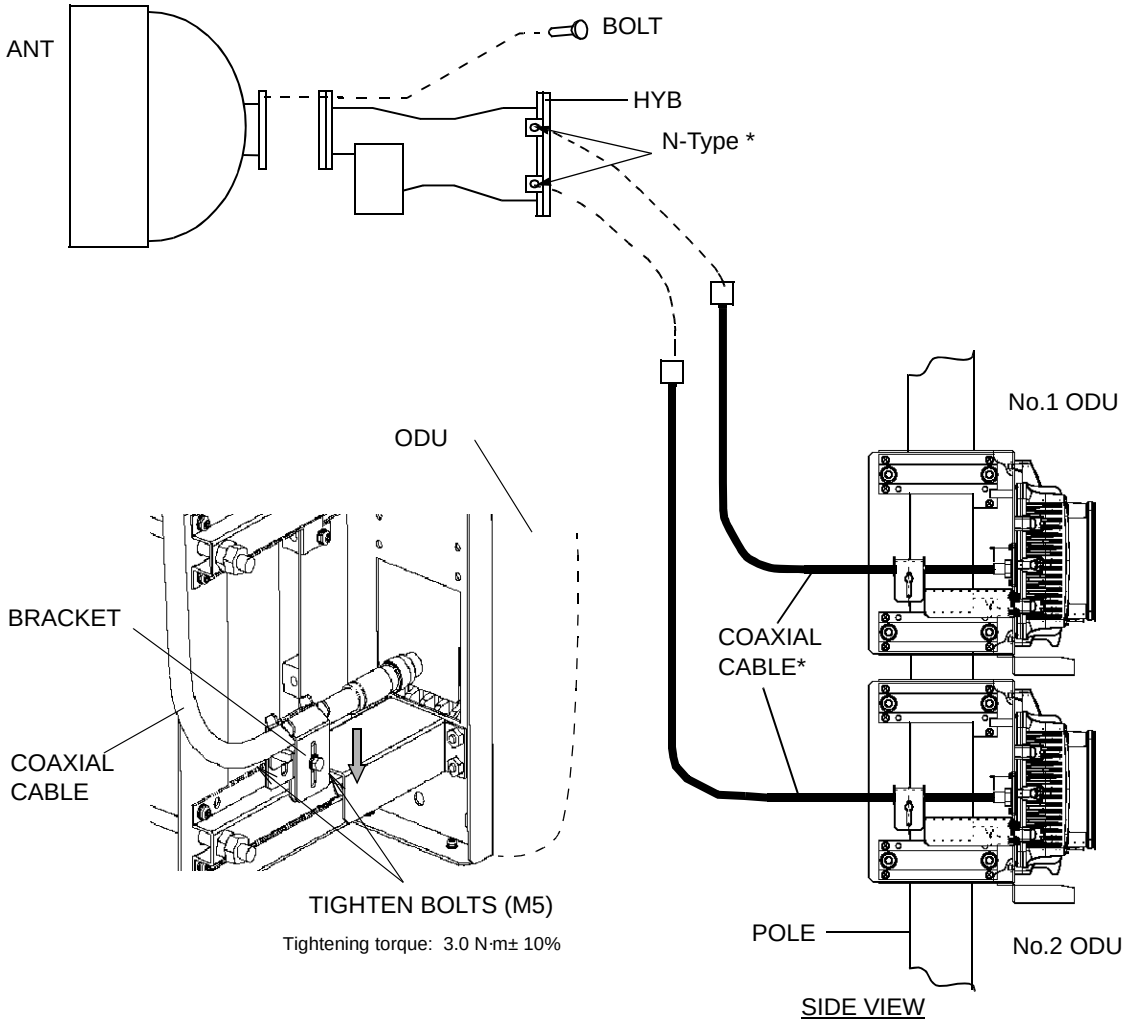
Note: Fix the coaxial cable to the pole or member with cable hanger or cable ties after antenna orientation has been completed.

Caution: Wrap the coaxial cable connection points with a self-bonding tape for waterproof.

Chart 2-11 (Cont'd)

Step	Procedure

6/7/8 GHz ODU MOUNTING (Connecting Coaxial Cable)



*Note: * When coaxial cable with SMA connector is used, the connectors are supplied by NEC.*

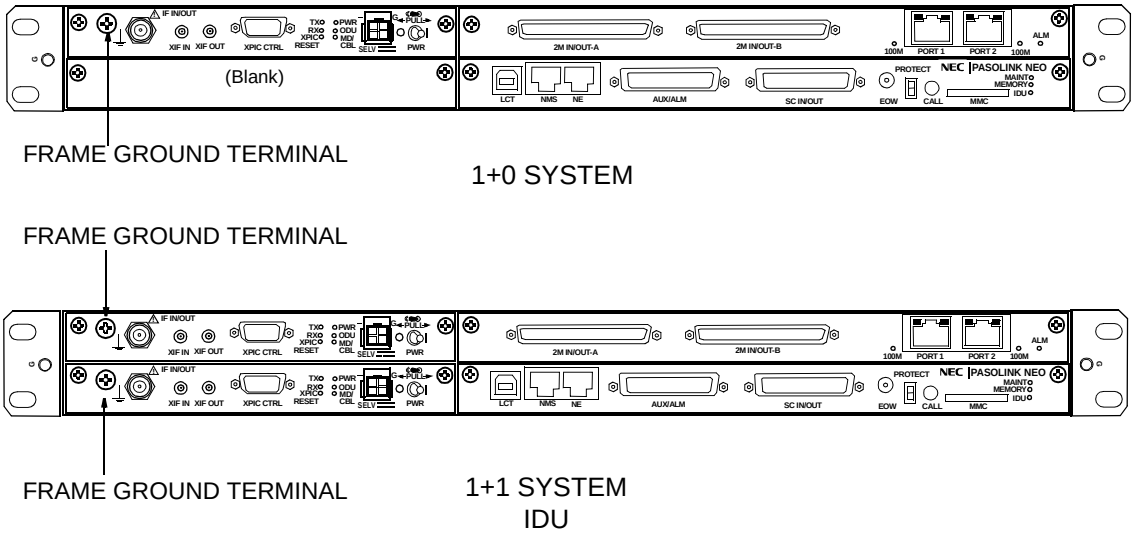
Caution: Wrap the coaxial cable connection points with a self-bonding tape for waterproof.

USING HYB FOR 1+1 SYSTEM

2.6 Frame Grounding

In mounting the IDU and ODU, perform frame grounding. The location of the frame grounding in each IDU and ODU is shown in Fig. 2-8, and the connection for frame grounding is shown in Fig. 2-9.

Note: Connect the Frame Ground (G) terminal on the IDU 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 G terminal on the ODU to the ground (refer to Fig. 2-9).



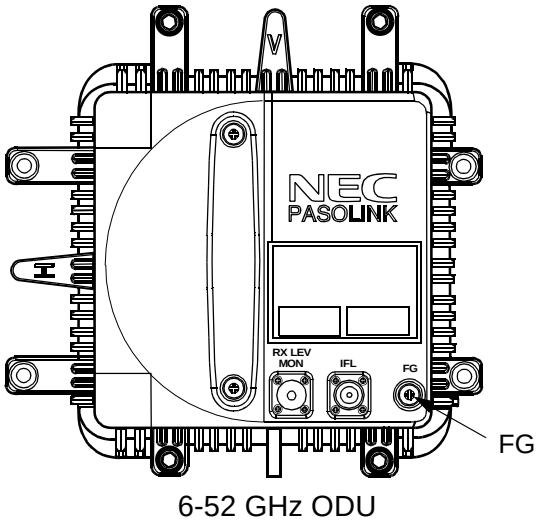
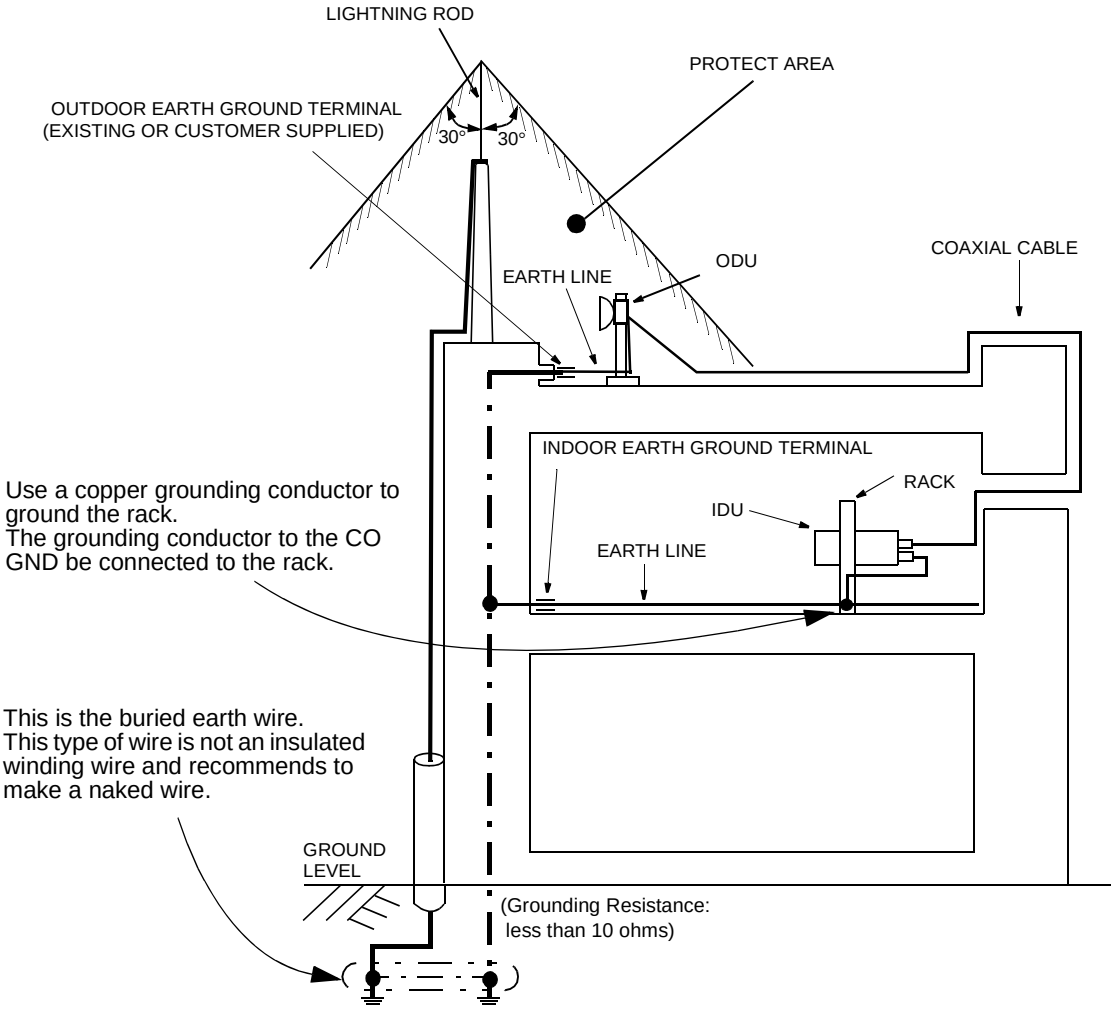


Fig. 2-8 Location of Frame Ground



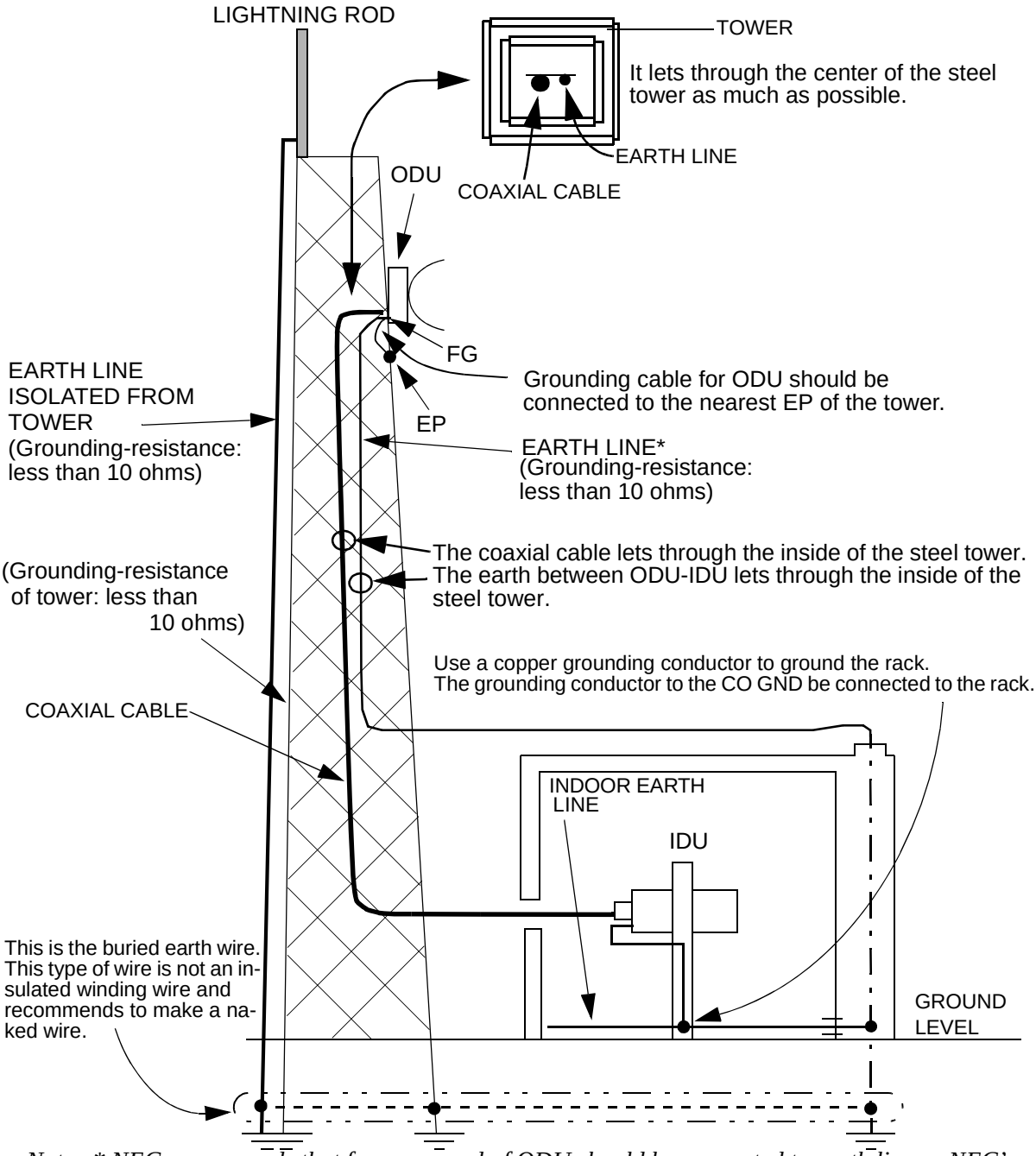
Cautions: 1. Install the ODU within the area protected by lightning rod.

2. 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.

Note:Frame Ground terminal of the IDU (5 mm square cable (means more than 2.5 mm diameter cable (AWG #10) is recommended to apply for the earth grounding. The proper press fix terminal toolshall be used.)

This connection is an example.

Fig. 2-9 Connection for Frame Grounding (1/2)



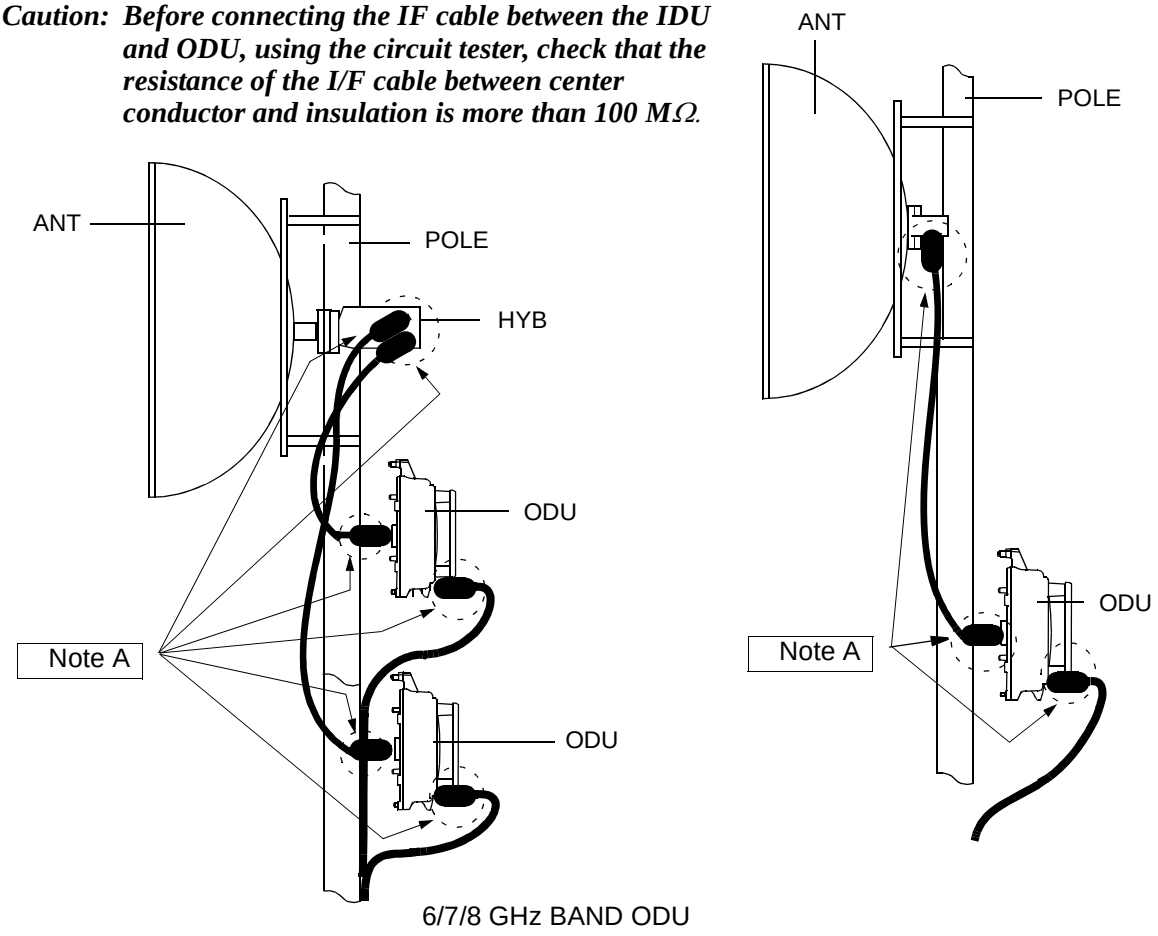
Notes: NEC recommends that frame ground of ODU should be connected to earth line as NEC's standard installation.*
EP : Earth Ground Point of tower
FG : Frame Ground terminal of the IDU (5 mm square cable (means more than 2.5 mm diameter cable (AWG #10) is recommended to apply for the earth grounding. The proper press fix terminal tool shall be used.)
This connection is an example.

Fig. 2-9 Connection for Frame Grounding (2/2)

2.7 Waterproof Protection

After cable connection, the following parts should be wrapped by self-bonding tape for waterproof (see Fig. 2-10).

Caution: ***Before connecting the IF cable between the IDU and ODU, using the circuit tester, check that the resistance of the I/F cable between center conductor and insulation is more than 100 MΩ.***



Note A

These parts should be wrapped the self-bonding tape tightly, twice or more around the IF cable connector and IF IN/OUT connector of the ODU for waterproof.

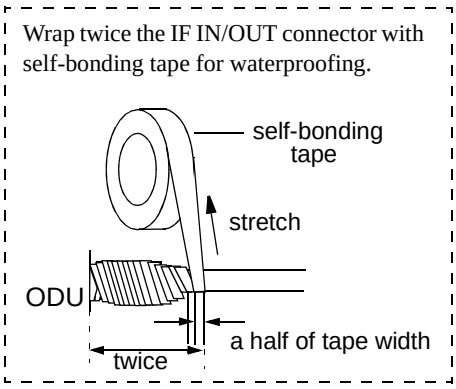
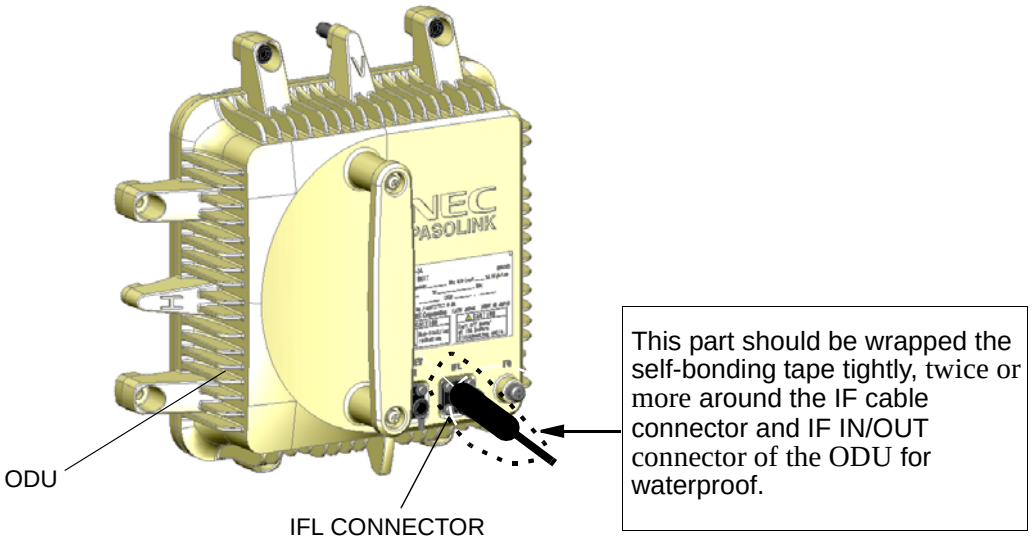
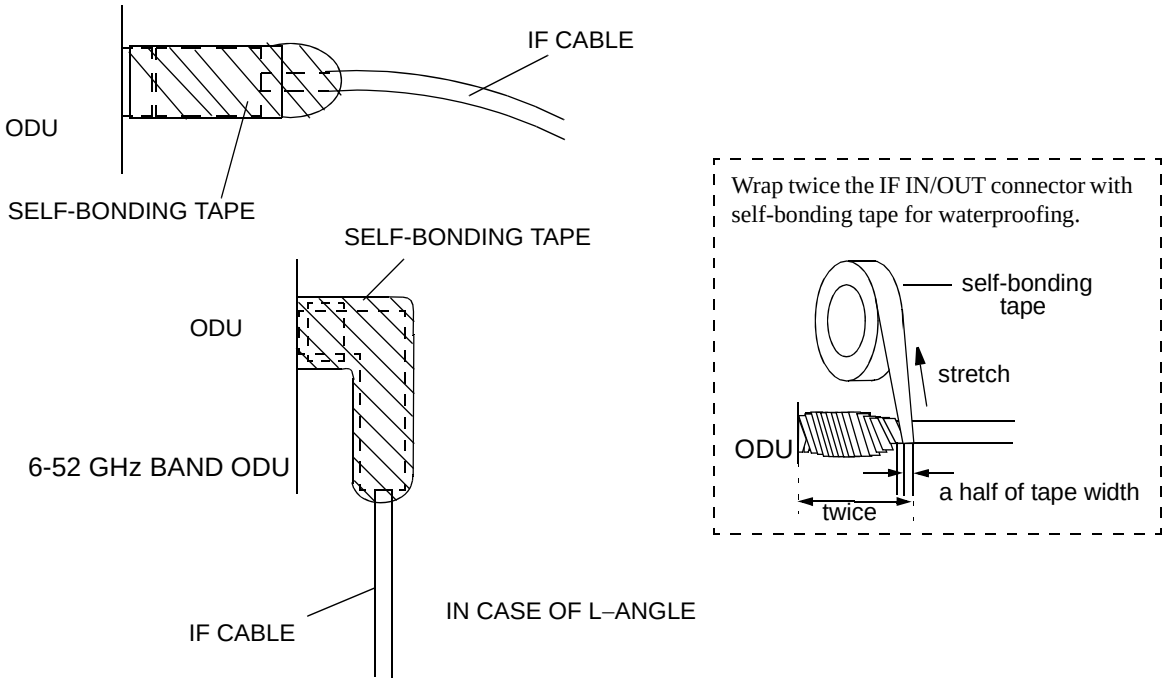


Fig. 2-10 Location of Connector for Waterproof (1/2)



Caution: Before connecting the IF cable between the IDU and ODU, using the circuit tester, check that the resistance of the I/F cable between center conductor and insulation is more than 100 MΩ.



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

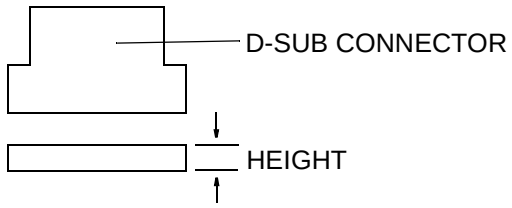
Fig. 2-10 Location of Connector for Waterproof (2/2)

2.8 Cable Termination

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

- D-sub connector (refer to Chart 2-12)*
- TNC-P connector of the L angle type for IDU (refer to Chart 2-13)**
- N-P connector of the L angle type for ODU (refer to Chart 2-14)**
- N-P connector of the straight type for ODU (refer to Chart 2-15)**
- Molex 5557-04R connector (refer to Chart 2-16)
- BNC connector soldering type (refer to Chart 2-17)
- BNC connector crimping type (refer to Chart 2-18)

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



*2. **In 1+1 system, the difference between the No.1 channel IF cable length and the No.2 channel IF cable length should be within 100m. (differential absolute delay time : within 500 as).*

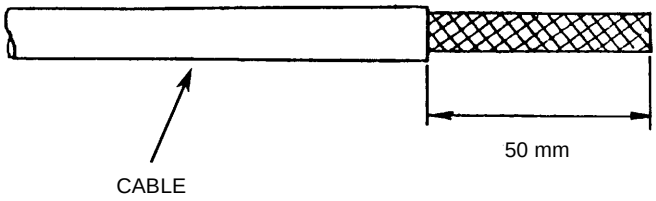
The tools and materials summarized in Table 2-5 are necessary.

Table 2-5 Tools and Material List

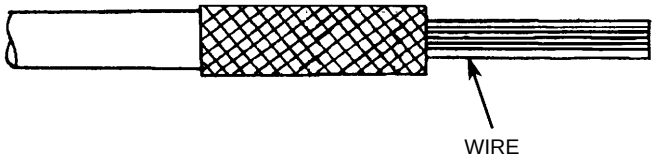
No.	NAME		REMARKS
1	Soldering Iron		
2	Solder		
3	Knife		
4	Measure/Ruler		
5	Wire Stripper		
6	Adjustable Wrench		
7	Hand Crimping Tool	CL250-0012-2/ CL250-0013-5	For D-Sub connector
		57026-5000/ 57027-5000	For Molex connector

Chart 2-12 Terminating Supervisory Cables with D-Sub Connector

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



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

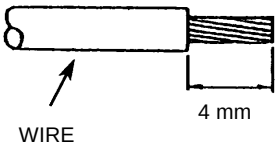
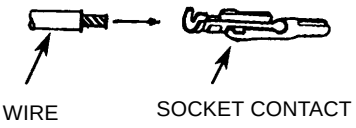
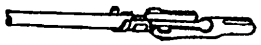


Chart 2-12 (Cont'd)

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

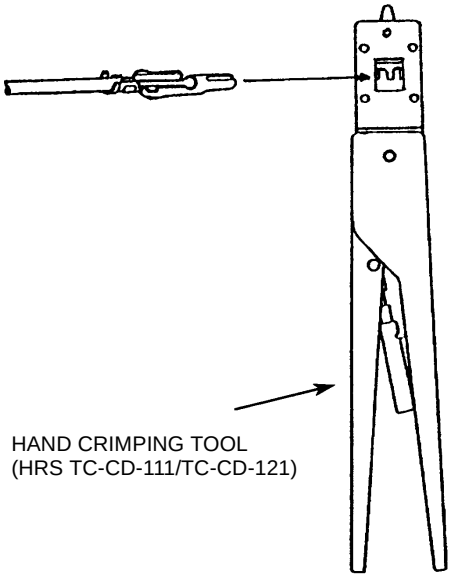
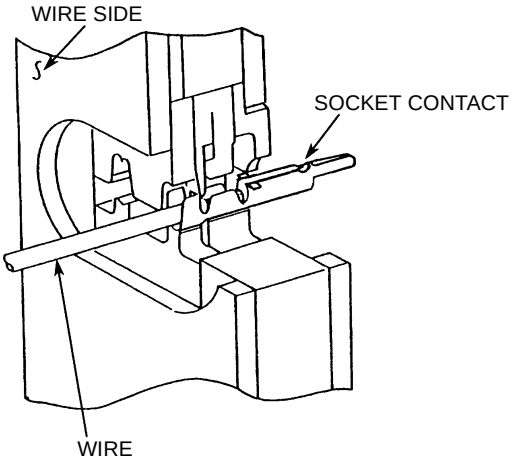


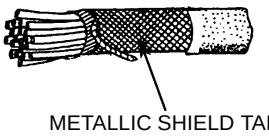
Chart 2-12 (Cont'd)

Step	Procedure

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



8 Wind the metallic shield tape over the braided shield.



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

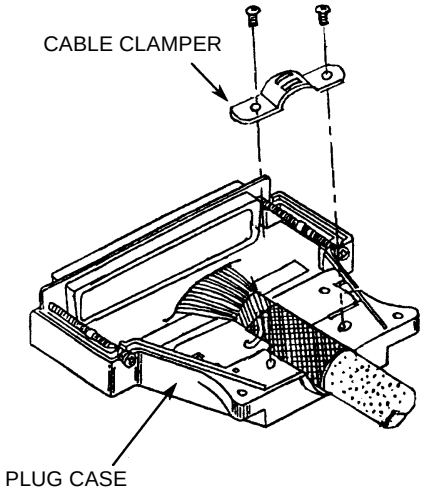


Chart 2-12 (Cont'd)

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 (Refer Interface Terminals and Jacks for IDU in Section II OPERATING EQUIPMENT.). Insert the socket contacts into the upper and lower row positions while taking care that the socket contacts are inserted the right way.

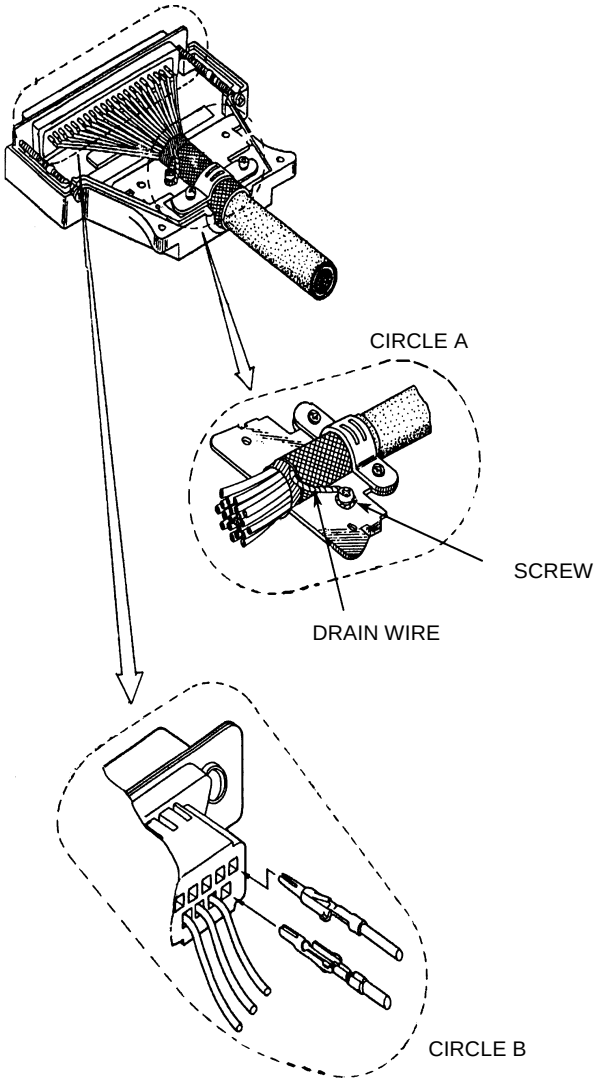


Chart 2-12 (Cont'd)

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

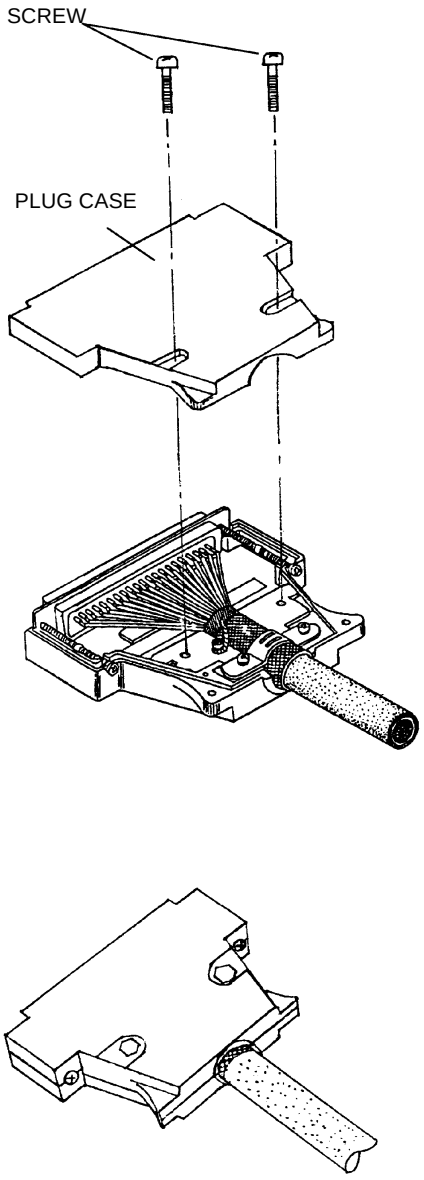


Chart 2-13 Terminating IF Coaxial Cable with TNC-P Connector (L Angle Type) (HIROSE made) used for IDU IF IN/OUT

Step	Procedure

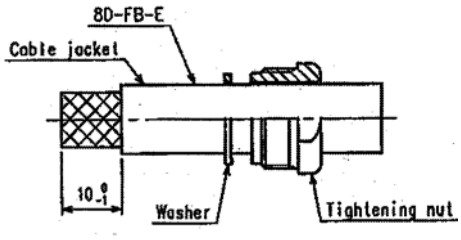
Note: It is recommended that TNC (Male) L-angle connector for the 8D-FB IF cable is used to connect it to the IDU. When the N (Male) straight connector is attached to the 5D-FB or 10D-FB IF cable, use of the TNC (Male) - N (Female) (NJ-TNCP-LA) L-angle adapter is needed.

1 Pass the tightening nut, the washer and the gasket on the cable in the order shown in the figure.
Then, strip the cable jacket in the diameter shown in the figure.
[Applicable cable : 8D-FB-E]

Note: Be careful of insertion direction for the gasket and the tightening nut.

Note: Be careful not to damage the outer conductor.

Note: Do not reuse the gasket because the clamp deforms it after tightening.



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 to open the hole of about ϕ9. No gap is allowed in between the clamp, the outer conductor and the hood.

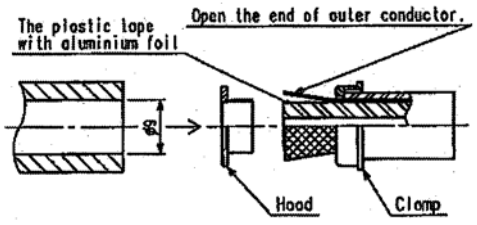


Chart 2-13 (Cont'd)

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.

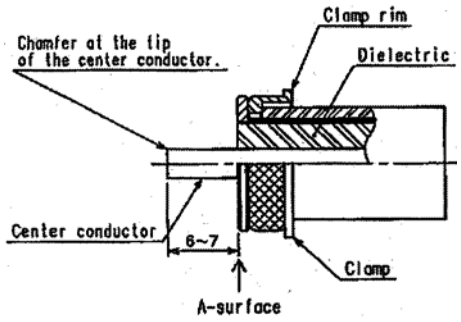


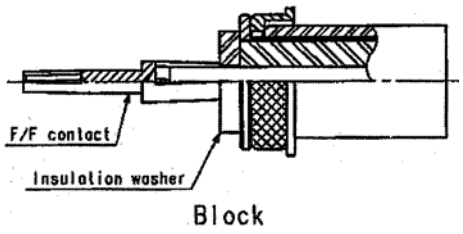
Chart 2-13 (Cont'd)

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".



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.

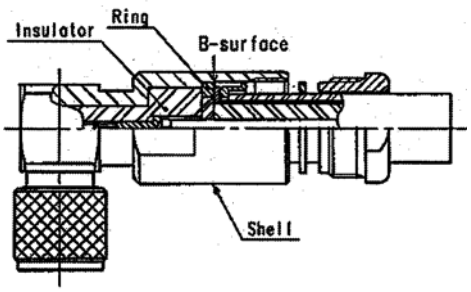


Chart 2-13 (Cont'd)

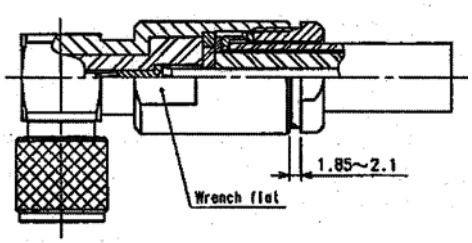
Step	Procedure

9 Tighten the tightening nut sufficiently until the gasket is cut by the clamp and the tip of the clamp hits the washer,

Note: Torque for the tightening nut shall be 8 to 30N•m.

Note: When tightening the nut, tighten with wrench at the wrench at the wrench flat.

Note: Distance between the tightening nut and the LP shell is 1.85 to 2.1 mm for reference.
Tighten the nut sufficiently.



L-type dimension and cutting length of the cable.

Specified length L: Cutting length L–25.

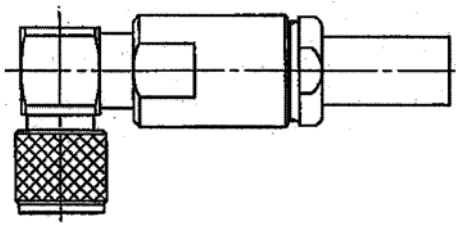
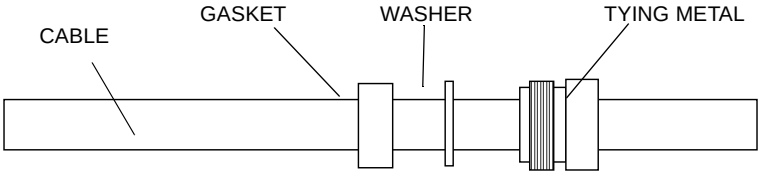


Chart 2-14 Terminating Coaxial (IF Signal) with N-P Connector (L Angle Type) used for ODU IF IN/OUT (KOMINE made)

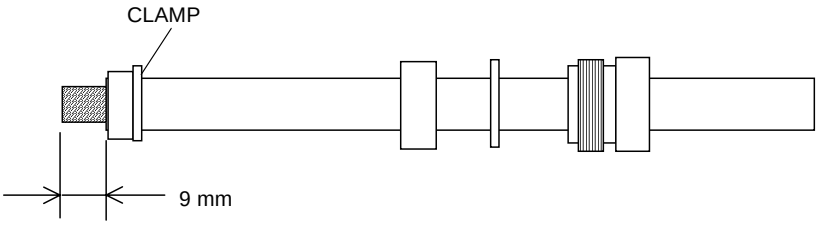
Step	Procedure

Note: It is recommended that TNC (Male) L-angle connector for the 8D-FB IF cable is used to connect it to the IDU. When the N (Male) straight connector is attached to the 5D-FB or 10D-FB IF cable, use of the TNC (Male) - N (Female) (NJ-TNCP-LA) L-angle adapter is needed.

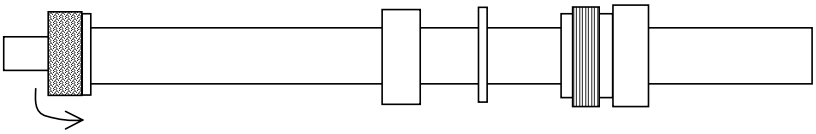
1 First fit the tying metal, washer and gasket on the cable.



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.

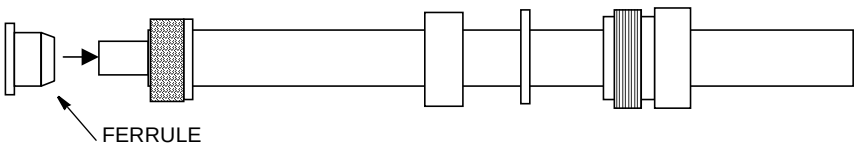
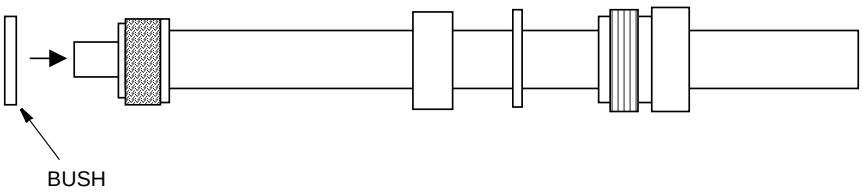


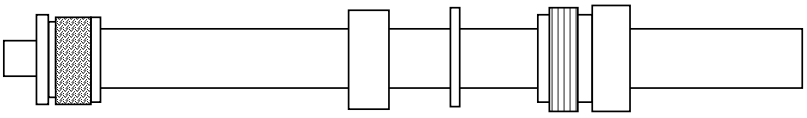
Chart 2-14 (Cont'd)

Step	Procedure

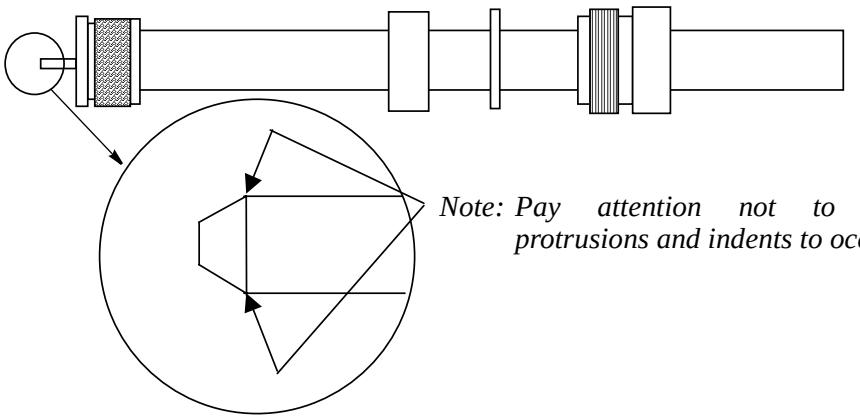
5 Fit the bushing.



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



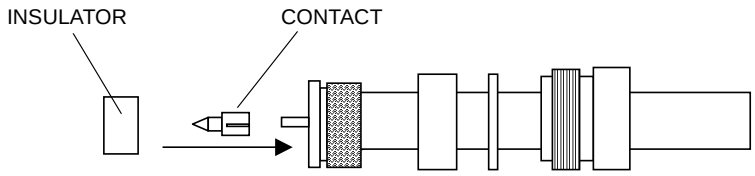
7 Taper the edge of the center conductor using a file as shown in the enlarged view below.



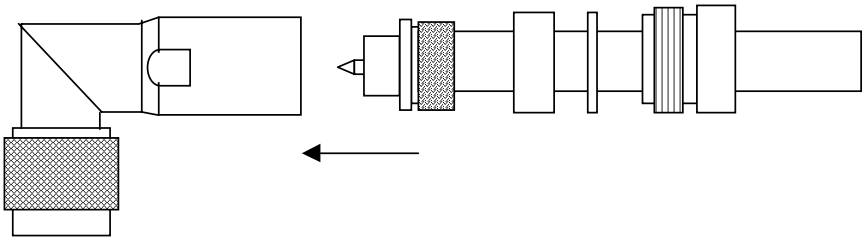
Note: Pay attention not to let protrusions and indents to occur.

Chart 2-14 (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)

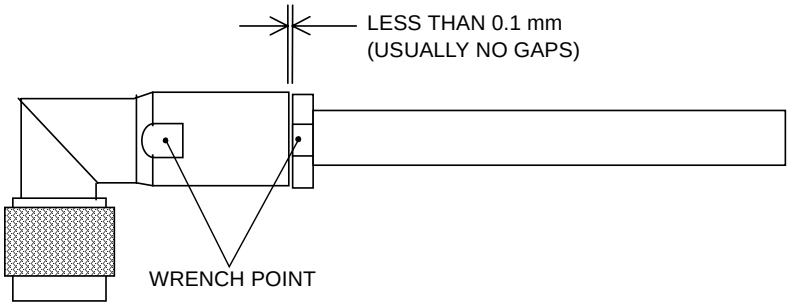


Chart 2-15 Terminating IF Coaxial Cable with N-P Connector (L Angle Type) used for the ODU IF IN/OUT (HIROSE made)

Step	Procedure

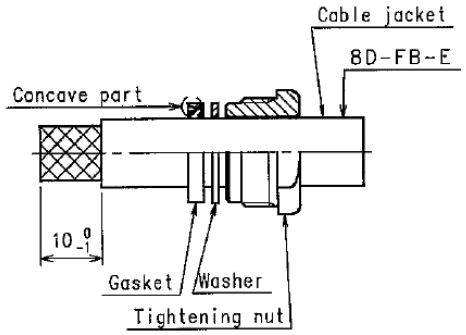
Note: It is recommended that TNC (Male) L-angle connector for the 8D-FB IF cable is used to connect it to the IDU. When the N (Male) straight connector is attached to the 5D-FB or 10D-FB IF cable, use of the TNC (Male) - N (Female) (NJ-TNCP-LA) L-angle adapter is needed.

1 Pass the tightening nut, the washer and the gasket on the cable in the order shown in the figure.
Then, strip the cable jacket in the diameter shown in the figure.
[Applicable cable : 8D-FB-E]

Note: Be careful of insertion direction for the gasket and the tightening nut.

Note: Be careful not to damage the outer conductor.

Note: Do not reuse the gasket because the clamp deforms it after tightening.



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 to open the hole of about ϕ9. No gap is allowed in between the clamp, the outer conductor and the hood.

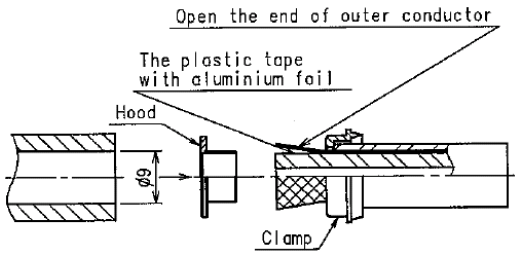


Chart 2-15 (Cont'd)

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.

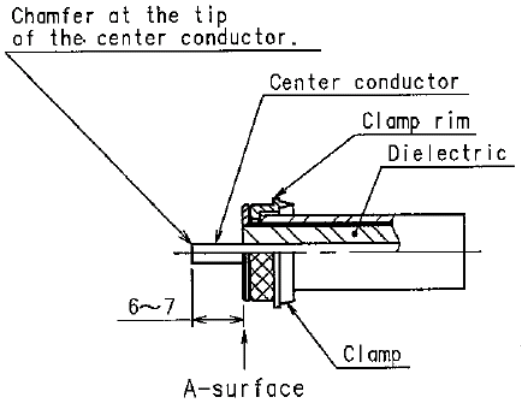


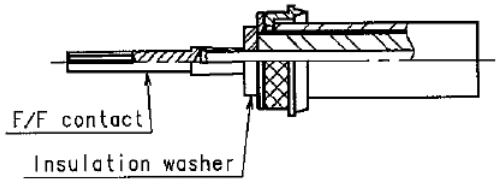
Chart 2-15 (Cont'd)

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.

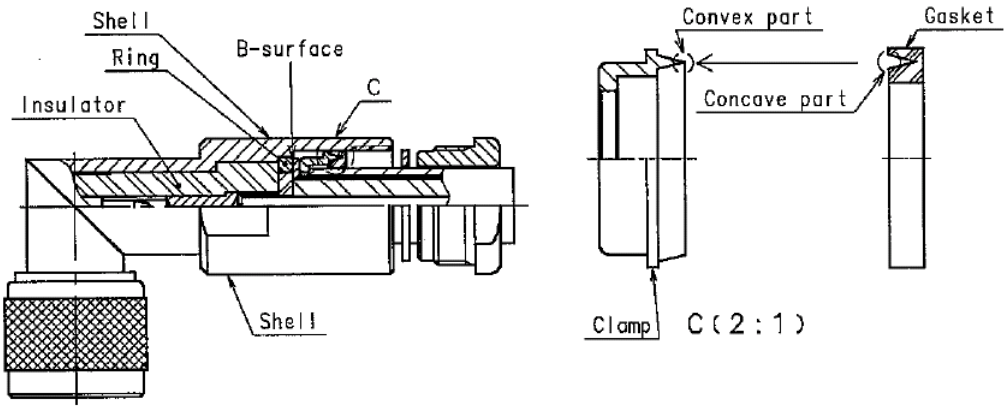


Chart 2-15 (Cont'd)

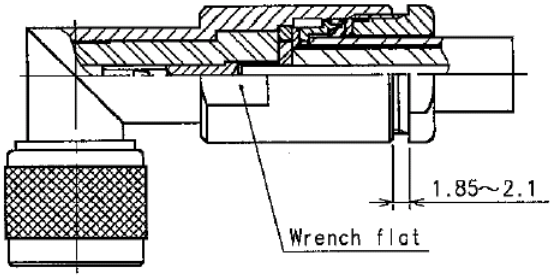
Step	Procedure

9 Tighten the tightening nut sufficiently until the gasket is cut by the clamp and the tip of the clamp hits the washer,

Note: Torque for the tightening nut shall be 8 to 30N•m.

Note: When tightening the nut, tighten with wrench at the wrench at the wrench flat.

Note: Distance between the tightening nut and the LP shell is 1.85 to 2.1 mm for reference.
Tighten the nut sufficiently.



L-type dimension and cutting length of the cable.

Specified length L: Cutting length L–25.

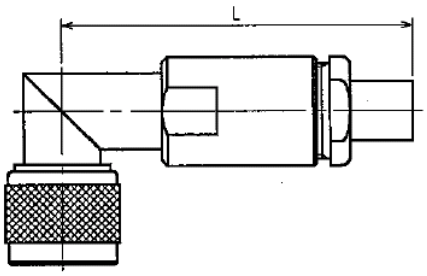


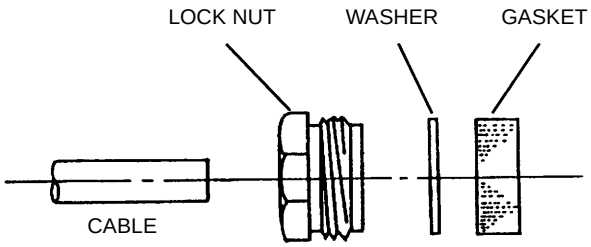
Chart 2-16 Terminating IF Coaxial Cable with N-P Connector (Straight Type) used for ODU IF IN/OUT

In case of marking “NDK” on connector, please contact NEC for cable process.

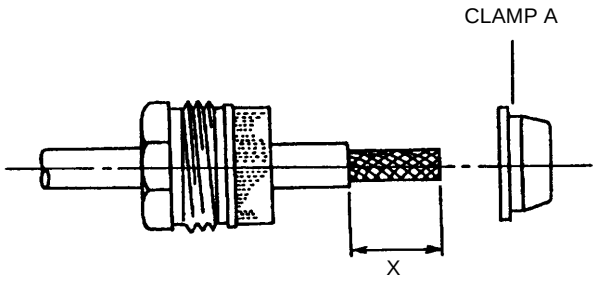
Note: When the N (Male) straight connector is attached to the IF coaxial cable for the IDU IF IN/OUT, use of the TNC (Male) - N (Female) (NJ-TNCP-LA) L-angle adapter is needed.

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.



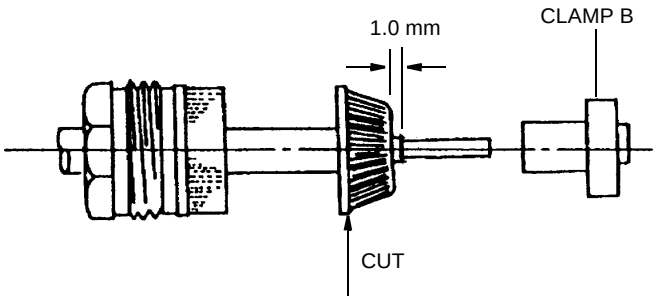
CONNECTOR	CABLE	X
N260	5D-FB	25 mm
N227	8D-FB	25 mm
N228	10D-FB	27 mm
N229	12D-FB	27 mm

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

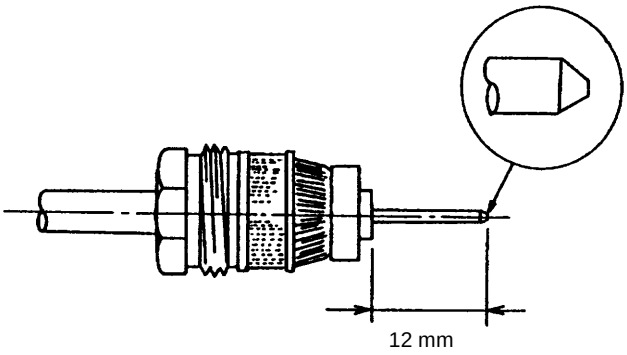
Chart 2-16 (Cont'd)

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).

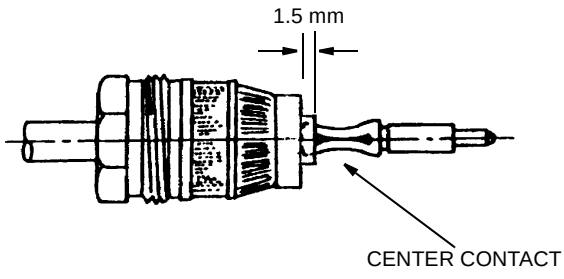
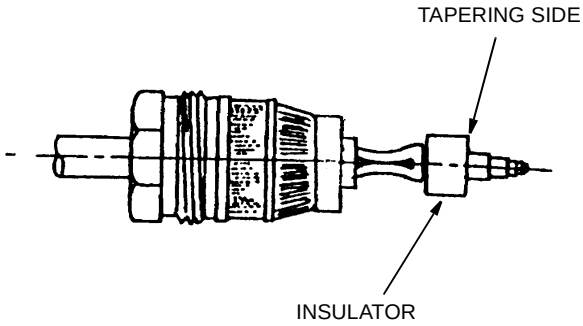


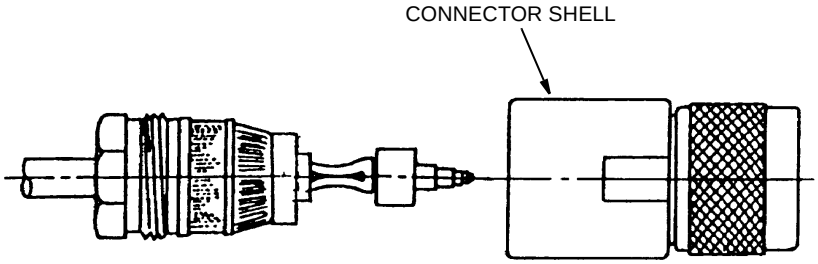
Chart 2-16 (Cont'd)

Step	Procedure

7 Mount the insulator onto the center contact.



8 Insert the cable into the connector shell.



9 Tighten the lock nut.

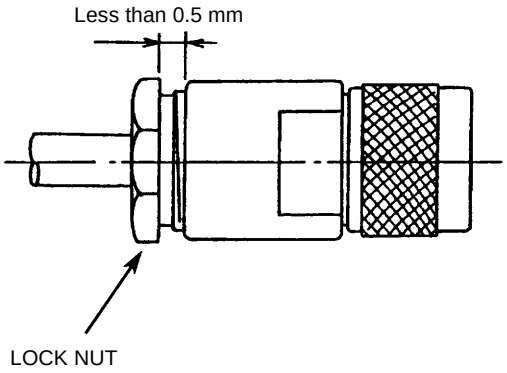
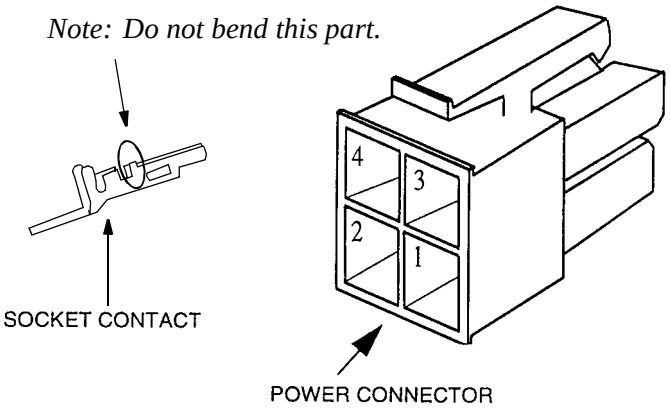


Chart 2-17 Terminating Power Supply Cables with Molex Connector

Step	Procedure

Note: Do not bend this part.



1 Remove 3.0 to 3.5 mm of insulation.

CABLE

AWG#16

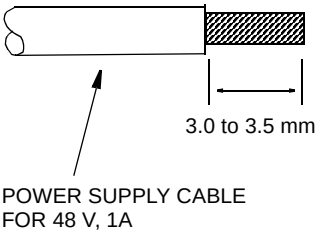
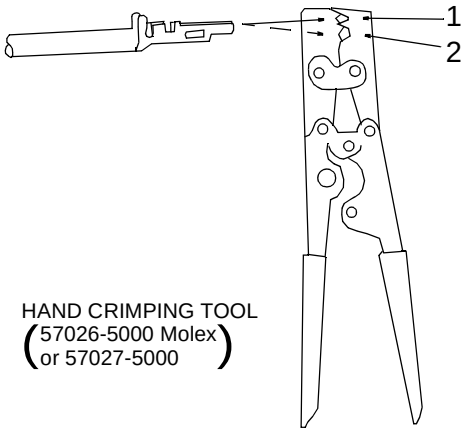


Chart 2-17 (Cont'd)

Step	Procedure

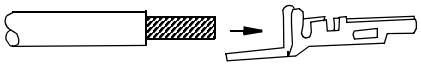
2 Set the socket contact to position 1 or 2 of the hand crimping tool.



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 insulation and bare wire are arranged as shown.

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

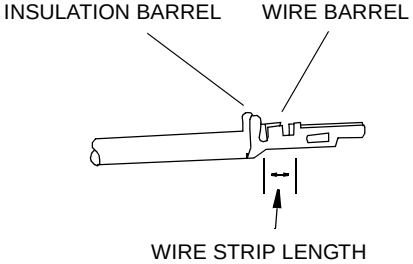
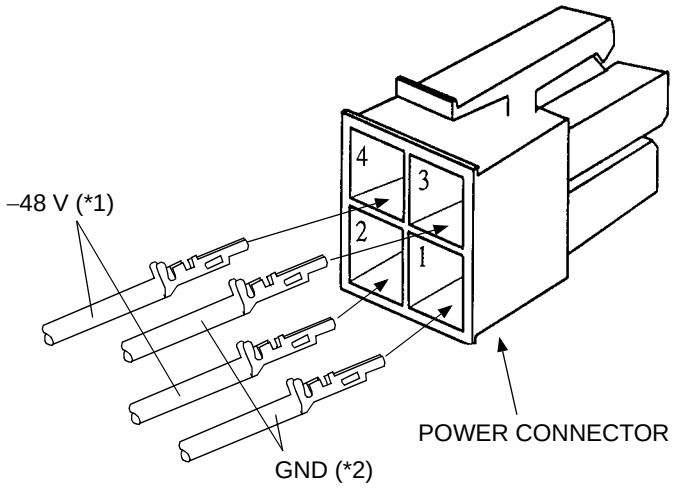


Chart 2-17 (Cont'd)

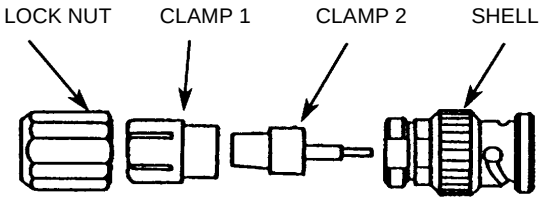
Step	Procedure
6	Insert the socket contacts into the power connector until they lock.

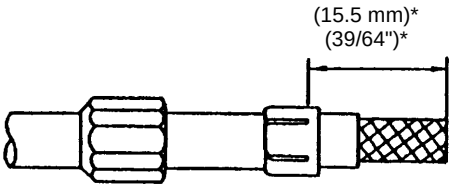


Note : For H3040 DC-DC CONV,
*(*1):–20 to –60 V (or 0 V)*
*(*2):0 V (or +60 to +60V)*

Chart 2-18 BNC Connector for 3C-2V Coaxial Cable Assembling, Solder Type

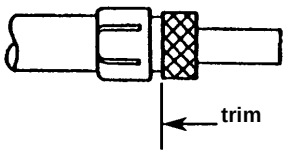
The following explains how to assemble BNC solder type as an example.



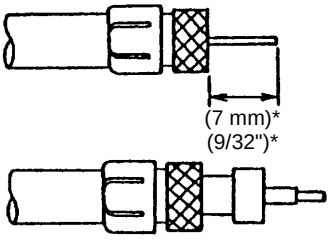


Step 1. Slide the lock nut onto the cable. Strip the cable sheath, taking care not to damage the braided shield wires, and fit CLAMP 1.

*Note *:Stripping measurements vary depend on the BNC*

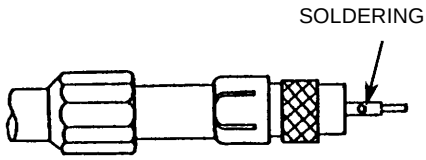


Step 2. Fold back the braided shield wire around the CLAMP 1 (without separating the strands of the braid) and trim it.

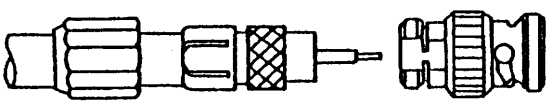


Step 3. Cut away the insulator from the centre conductor and fit CLAMP 2. (Be sure not to cut or scratch the conductor while stripping the insulation.)

*Note *:Stripping measurements vary depend on the BNC*



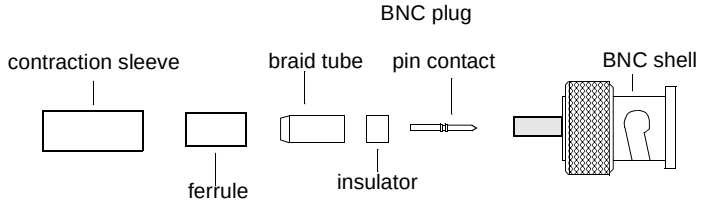
Step 4. Solder the pin contact to center conductor. Use a knife to remove excess solder.

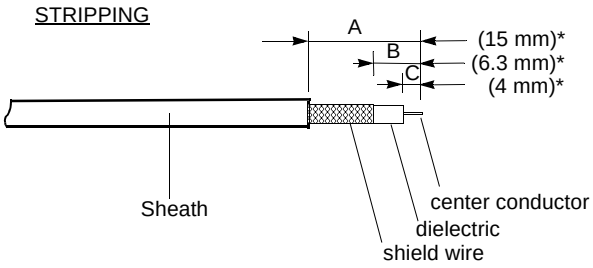


Step 5. Insert the connectorized cable into the BNC shell and fasten the lock nut with a wrench.

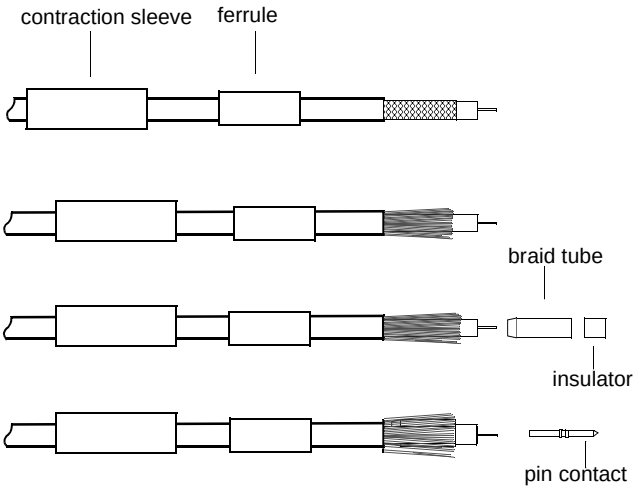
Chart 2-19 BNC Connector for 3C-2V Coaxial Cable Assembling, Crimping Type

The following explains how to assemble BNC crimping type as an example.





Note: Stripping measurements vary depending on the BNC type.*



Step 1. Strip coaxial cable as illustrated left, (taking care not to damage braided shield wire),

Step 2. Cut braided shield wire (without unravel the strands of braid) and trim it,

Step 3. Cut dielectric, (be sure not to cut or scratch the centre conductor while stripping the dielectric),

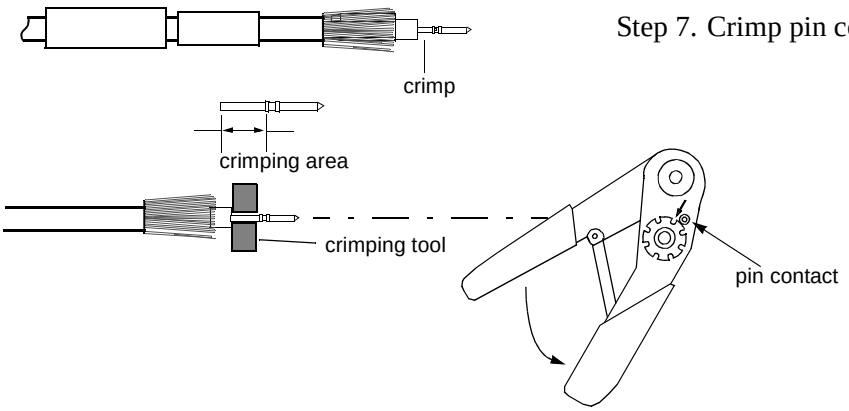
Step 4. Slide contraction sleeve and ferrule onto the cable,

Step 5. Fan braided shield wire,

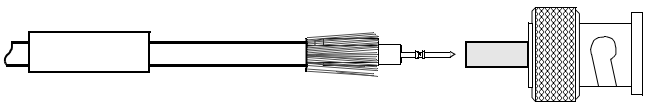
Step 6. Slide braid tube and insulator among braided shield wire and dielectric,

Step 6. Slide pin contact until it bottoms against the centre conductor,

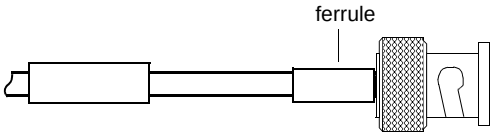
Chart 2-19 (Cont'd)



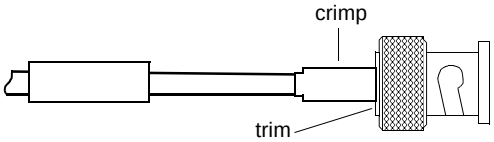
Step 7. Crimp pin contact,



Step 8. Slide carefully the cable into BNC shell until insulator butts against BNC body,



Step 9. Slide ferrule over shield wire until it bounds against the BNC shell body,



Step 10.Crimp ferrule as close as possible to the BNC shell body and trim the excess of braid,

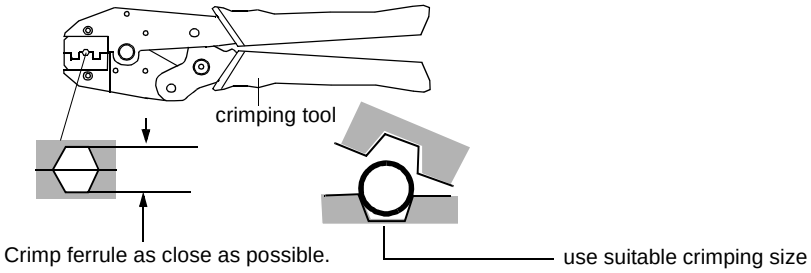
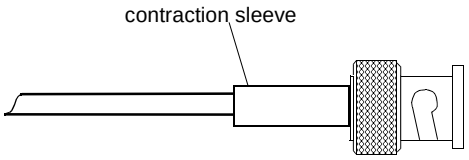
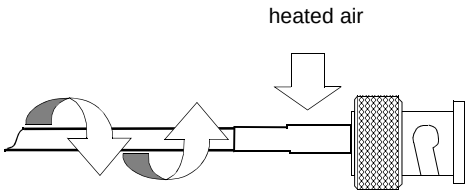


Chart 2-19 (Cont'd)



Step 11.Position contraction sleeve over ferrule and BNC,



Step 12.Heat contraction sleeve until it contracts.

2.9 Wiring and Forming

Chart 2-20 Wiring and Forming

1 Connect cables for, signal interface, power supply, IF IN/OUT and ground to the proper connector of the IDU.

(1) Connect ground cable to the ground terminal

(2) Connect IF cable to IF IN/OUT connector.

(3) Connect power supply cable to SEL V connector.

(4) Connect 16/48E1, STM-1, Aux. signal cables to proper connector.

(5) Connect XIF coaxial cables to opposite IDU. (XPIC configuration only.)

(6) Connect XPIC CTRL cables to opposite IDU. (XPIC configuration only.)

Note: When disconnect cables, perform it in revers steps.

2 Fix the cables using cable binder to the rack as like as indicated psition.

Notes: 1. Do not cross the cables on front of indicators and power switch used for maintenance.

2. Take suitable bend radius to wiring the IF cable. (e.g. 10D-FB: 70 cm)

3. For the IF cable connection, it is recommended to use adapter. (Applicable adapters are listed table below).

Table 2-6 IF Cable Adopter

IF Cable	Adapter	
	TCN (P) - N(J)	TCN(P) - TCN(J)
5D-FB	√	
8D-FB	√	√
10D-FB	√	

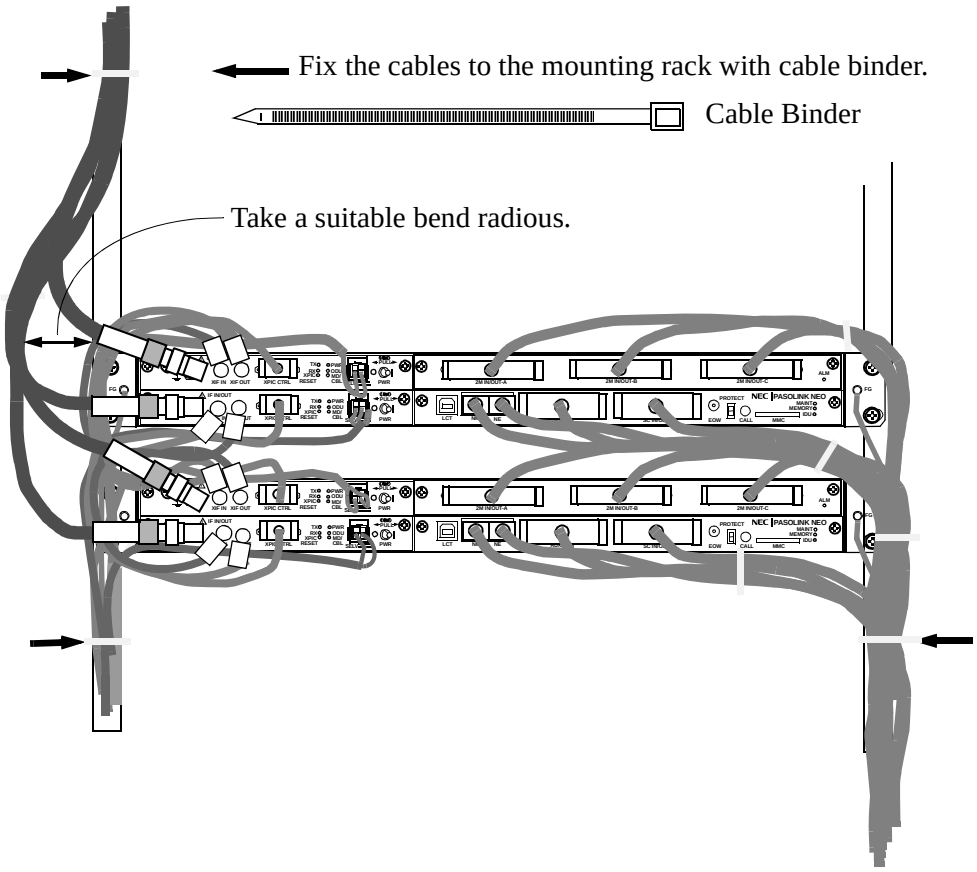


Fig. 2-11 Cable Wiring and Forming

3. INITIAL LINE UP

This section explains instructions for the initial lineup of the equipment. Included is information on start-up, shut-down, IDU and ODU equipment setting, antenna orientation and lineup test between two stations.

When the PASOLINK Monitor is used for RX LEV monitoring, connect the X0818 PASOLINK Monitor to the ODU. The PASOLINK Monitor operates on a dry battery (6F22/9V).

Notes: 1. *Insert the battery with correct polarity.*

2. *When the PASOLINK Monitor will not be used for extended periods of time, remove the battery to avoid damage from battery leakage and corrosion.*

3. *When the PASOLINK Monitor will be connected to the ODU, control corresponding ODU to Antenna Alignment mode using LCT in Maintenance ON.*

3.1 Start-up

The procedure for starting the equipment is shown in Chart 3-1.

Warning:

1. ***The –48 V DC is superimposed on the centre conductor of the IF coaxial cable between the MODEM and the ODU. 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 IF cable between the MODEM and the ODU in operating condition, to avoid damaging the PASOLINK NEO, turn the IDU power OFF before connecting/disconnecting the IF cable.***
3. ***Do not allow open or short circuit of ODU 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 IDU before disconnecting cable or feeder from the ODU TX output.***
4. ***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 PASOLIN NEO to fail.***

Caution:

1. ***In a system using the OPTICAL STM-1 INTFC, do not stare at the laser beam or look at it directly with optical instruments. Otherwise, it may hurt your eyes (Class 1 Laser Product).***
2. ***Be careful top surface above MODEM of the IDU is hot in operation.***
3. ***When dismounting the MODEM, turn off the PWR switch and disconnect all cables connected to the MODEM.***
4. ***When dismounting the ( ) INTFC, turn off the PWR switch on the MODEM and disconnect all cables connected to the ( ) INTFC.***

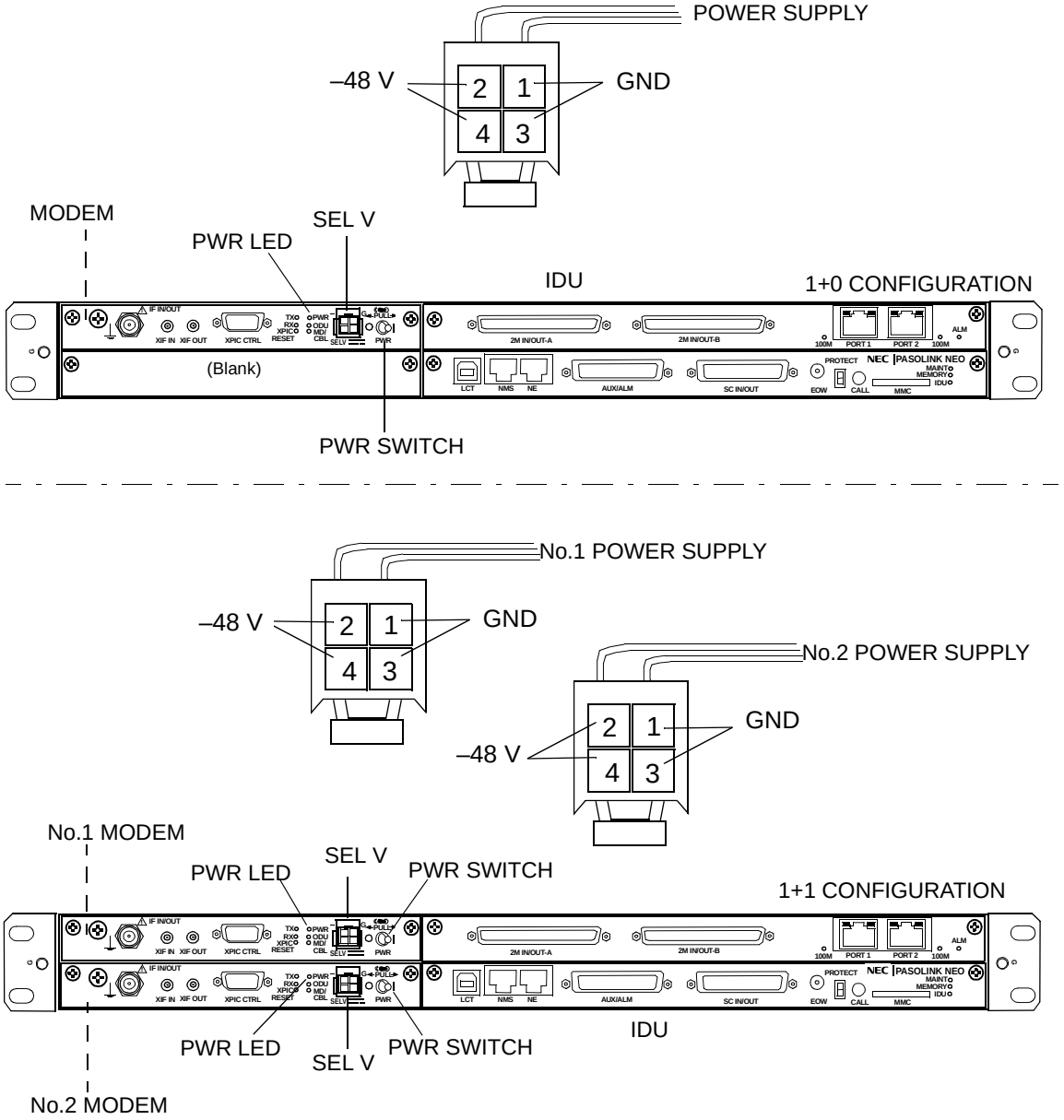
Chart 3-1 Start-up

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

Caution: Do not remove/connect the IF cable with the IDU power ON. Turn the IDU power OFF before connecting/ disconnecting the IF cable, or equipment may be damaged.

Apparatus:
Suitable Screwdriver
Digital Multimeter

Step	Procedure
	Note: The ODU power is supplied from the IDU.
	1+0 SYSTEM
1	Check that the IF cable between the MODEM and the ODU is firmly connected,
2	Before connecting the power cable connector to the MODEM, check that the SEL V input voltage is –48V (allowable range; within –40.5 to –57 V) with the digital multimeter, (see Fig. 3-1),
3	Pull out the PWR switch lever and turn on,
4	Confirm that the PWR indicator on the MODEM is ON.
	1+1 SYSTEM
1	Check that the IF cable between the No.1 MODEM and the No. 1 ODU is connected,
2	Before connecting the power cable connector to the No.1 MODEM, check that the SEL V input voltage is –48V (allowable range, within –40.5 to –57 V) with the digital multimeter, (see Fig. 3-1),
3	Pull out the PWR switch lever and turn on, (see Fig. 3-1),
4	Confirm that the PWR indicator on the No.1 MODEM is ON.
5	Repeat steps 1 to 3 for No.2 MODEM,
6	Confirm that PWR indicator on the No.2 MODEM is ON.



Caution: ***The PASOLINK NEO operates only negative voltage (–48 V). Therefore, the power supply system for the existing equipment which is used floating power supply (–20 to –60 V/+20 to +60 V) must not be connected to the PASOLINK NEO.***

When the IDU NEO is used with another type ODU (e.g. PASOLINK$^+$), optional DC-DC CONV module must be installed to the IDU NEO. The ODU will be shorten it's life or may be damaged if not used optional DC-DC CONV module.

Fig. 3-1 DC Power cable Connection and Power ON/OFF

3.2 Shut-down

The shut-down procedures 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 IDU/ ODU to fail.

Chart 3-2 Shut-down

Step	Procedure
	1+0 SYSTEM
1	Pull out the PWR switch lever on the MODEM and turn off the PWR switch (see Fig. 3-1),
2	Confirm that all LED indicators on the IDU are OFF.
	1+1 SYSTEM
	Note: When turn OFF the IDU and ODU in 1+1 configuration, turn OFF power for standby side first, then working side.
	When turn OFF the IDU and ODU in working channel only, switchover the working to standby channel with TX and RX SW using LCT. (see Chart 3-8)
1	Pull out the PWR switch lever on the corresponding MODEM is to be shut down, then turn off (see Fig. 3-1).
2	Confirm that the PWR indicator on the MODEM is OFF.
3	Pull out the PWR switch lever on the other MODEM, then turn off the PWR switch. (see Fig. 3-1).
4	Confirm that all LED indicators on the IDU are OFF.

3.3 Initial Setting

The initial setup of the IDU/ODU is performed using the PC according to Table 3-1.

For the details operation of the PC setup for connecting LCT, refer to the PASOLINK NEO LCT Operation Manual in Section IV Appendix.

Table 3-1 Initial Setup Items

Setup Order	Setup Item	LCT
1.	Equipment Setup	Chapter 3
2.	Date and Time	Chapter 6.3
3.	Provisioning	Chapter 7
4.	Relay/House Keeping	Chapter 7

Note: The "Equipment Setup" must be set properly every items before "Provisioning" setup.

The "Provisioning" setup must be performed based on the "Equipment Setup".

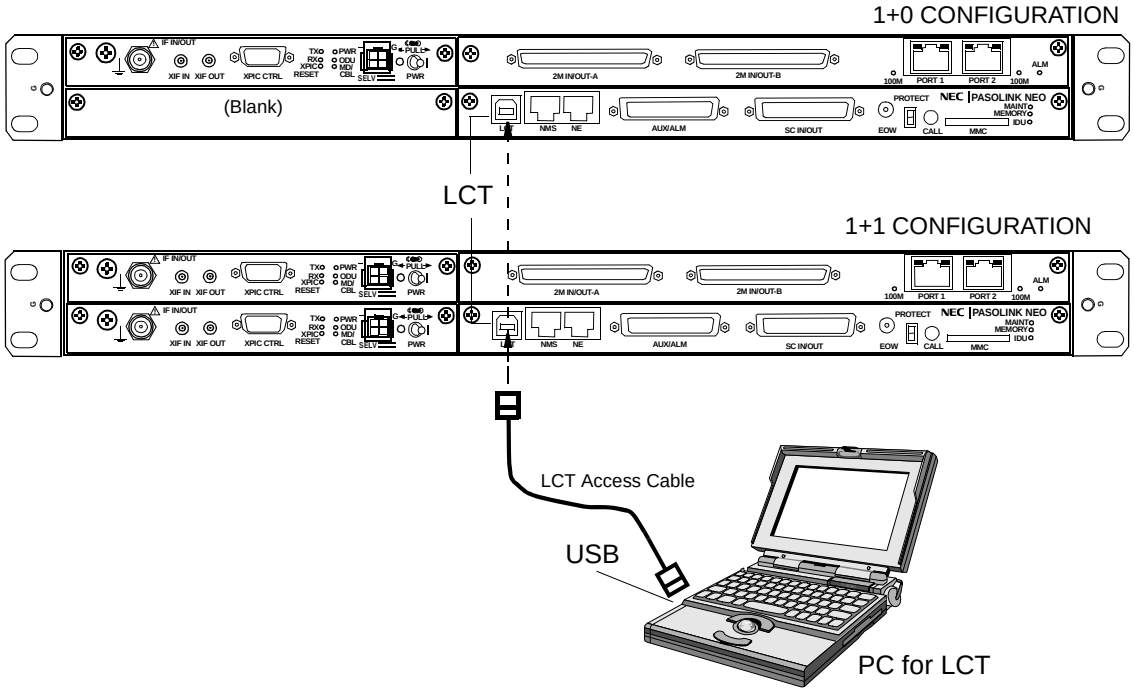


Fig. 3-2 LCT Connection

3.3.1 Equipment Setup

In initial lineup, the “Equipment Setup” must be performed using LCT.

Chart 3-3 Equipment Setup

Refer to the PASOLINK NEO LCT Operation Manual in Section IV Appendix. for the details of “3. Equipment Setup”.

The Equipment Setup items to be setup for the PDH/SDH systems are as follows:

Equipment Setup Items for PDH/SDH Systems

- User Interface
- Redundancy
- Main (WORK)
- SUB (PROT)
- APS Function *
- Modulation Schema
- Transmission Capacity
- TX Start Frequency
- TX Stop Frequency
- Frequency Step
- Shift Frequency
- Upper/Lower
- SUB BAND
- TX RF Frequency
- RX RF Frequency
- Frame ID
- TX Power Control
- LAN Port Usage **
- LAN Capacity **

*Note: * For SDH APS only.*
*** For LAN transmission only.*

3.3.2 Provisioning Setup for PDH

In initial lineup, the “Provisioning” Setup must be performed using LCT.

Chart 3-4 Provisioning Setup (PDH)

Refer to the PASOLINK NEO LCT Operation Manual in Section IV Appendix. for the details of “7. Provisioning Setup”.

The provisioning items to be setup in initial lineup are as follows:

Provisioning Setup items for PDH system

- CH Setting1
- CH Setting2
- BER Threshold Setting
- SC Assignment
- LAN Port Setting *1
- TX Power Control*2
- Condition for TX/RX SW
- Relay Setting
- TCN Threshold(15min)
- TCN Threshold(1day)
- PMON Select
- Others *3

*Note: *1:For LAN transmission only.*
2:Set to MTPC mode when it is going to perform the Antenna Orientation.
3:Optional items

3.3.3 Provisioning Setup for SDH

In initial lineup, the “Provisioning” Setup must be performed using LCT.

Chart 3-5 Provisioning Setup (SDH)

Refer to the PASOLINK NEO LCT Operation Manual in Section IV Appendix. for details of the “7. Provisioning Setup”.

The Provisioning Setup items to be setup for SDH systems are as follows:

Provisioning Setup for SDH system

- BER Threshold Setting
- SUB Interface *1
- SC Assignment
- STM-1 Setting
- TX Power Control*2
- Condition for TX/RX SW
- Condition for APS
- Relay Setting
- TCN Threshold(15min)
- TCN Threshold(1day)
- PMON Select
- Others *3

*Note: *1:For WS/LAN transmission only.*

**2:Set to required TX power level in MTPC mode when it is going to perform the Antenna Orientation.*

**3:Optional items*

3.4 Antenna Orientation

After the initial setup has been completed, an antenna orientation will be performed between two stations according to the procedures in Chart 3-6.

Chart 3-6 Antenna Orientation

Apparatus :

Digital Multimeter with test leads or X0818 PASOLINK Monitor

Wrench

Headset

Step	Procedure

1 Connect the PC to the LCT port on the PASOLINK NEO IDU using USB cable**,** (see Fig. 3-2)

2 At each station, set “Maintenance1” from Maintenance in LCT Menu,

LCT MENU

Alarm/Status
Equipment Setup
Inventory
AUX I/O
Maintenance
Provisioning
Metering
PMON(Current)
PMON(History)

Maintenance1
Maintenance2

Note: In Maintenance “On” condition, every external Alarm outputs, excluding Maintenance/PS/CPU (IDU) ALM, are masked and remote control can not be performed.

3 Click and select for the following control items in “Maintenance1”,

Note: Retain the present status for other control items.

Note: When the TX power control mode is set to ATPC, set it to MTPC and required level for the PASOLINK link on the “Equipment Setup” and “Provisioning”.

Chart 3-6 (Cont'd)

Step	Procedure

- TX SW Manual Control: Fix No.1 or No.2 (in 1+1 configuration)
- RX SW Manual Control: Fix No.1 or No.2 (which is the same side fixed by TX SW in 1+1 configuration)
- TX Power Control: (at opposite site) MTPC in Equipment Setup / Required level in Provisioning
- Antenna Alignment Mode: Select On (in 1+0 configuration) (Set No.1 or No.2 which is the same side fixed by TX SW and RX SW in 1+1 configuration)

--- Maintenance 1 ---

Item	Value	Setting	
Maintenace	On	○Off ●On	Set
TX SW Manual Control	No.1	○Auto ● No.1 ○No.2	Set
RX SW Manual Control	No.1	○Auto ● No.1 ○No.2	Set
MTPC Manual Control(No.1)	On	○Off ●On	Set
MTPC Manual Control(No.2)	On	○Off ●On	Set
TX Mute Control(No.1)	Off	●Off ○On	Set
TX Mute Control(No.2)	Off	●Off ○On	Set
Antenna Alignment Mode(No.1)	On	○Off ●On	Set
Antenna Alignment Mode(No.2)	On	○Off ●On	Set

Note: In Antenna Alignment Mode "*On*" *condition, controls between IDU and ODU are restricted.*

4 At each station connect the digital multimeter or PASOLINK Monitor to the RX LEV MON jack on the ODU,

Chart 3-6 (Cont'd)

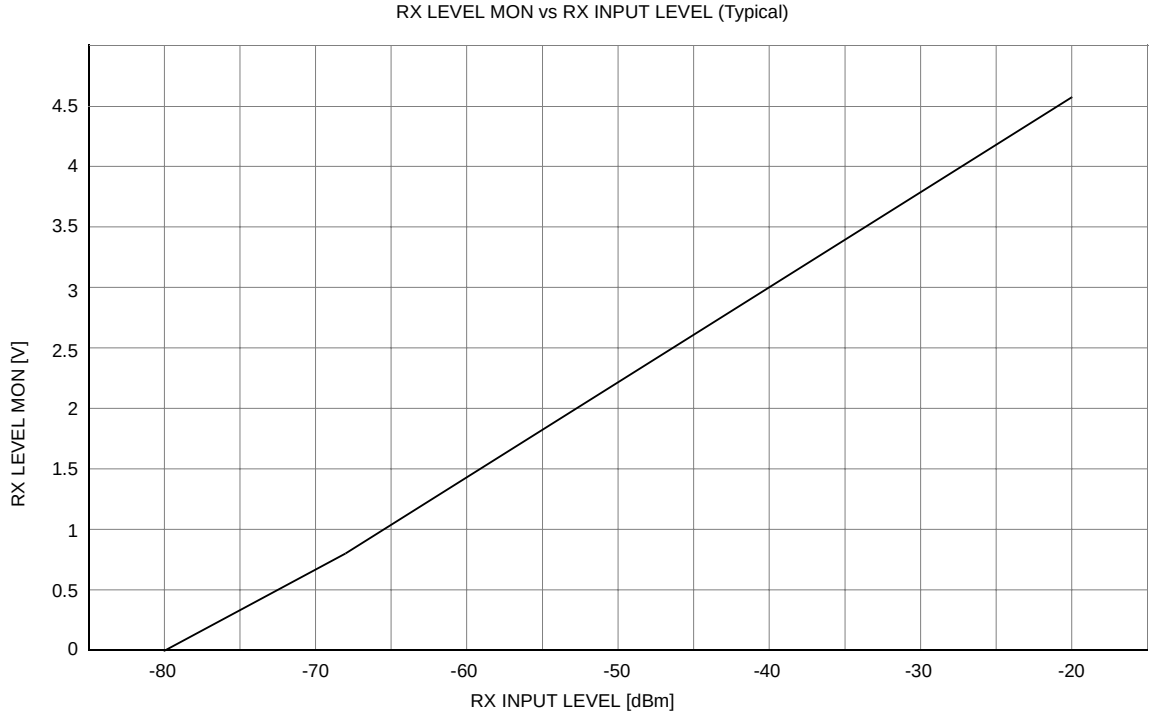
Step	Procedure

Note: In order to measure exact performance of AGC V, it is mandatory required to set Antenna Alignment Mode to ON. The AGC voltage indication is not guaranteed outside Antenna Alignment Mode.

It is necessary to set to Antenna Alignment Mode when monitor the RX level with the PASOLINK Monitor unit.

5 At each station, adjust the azimuth and elevation angle of the antenna alternately so that the measured voltage becomes maximum,

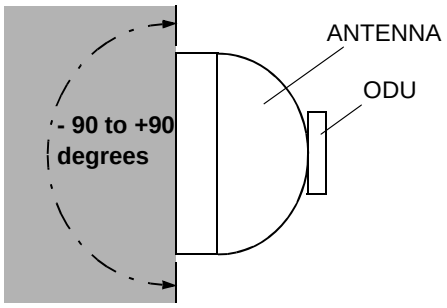
Note: The relation of the RX INPUT LEVEL versus RX LEVEL MON(V) is shown below.



Safety Guideline for Microwave Radiation Hazard

The Microwave and Millimetre-wave that PASOLINK NEO series are treating is very small radiation level and never been reported to effect human health. But advanced countries about health hazard have started to regulate the radiation levels. In case of EU country, it is specified by EN50385. In order to keep the regulation, the operator shouldn't work at near parabolic antenna during transmitter activating. Especially the area in side to front of antenna shows higher radiation level. (please see below figure and calculation sample 1).

On the other hand, in case of front side of antenna, the power density becomes high level along antenna beam. Therefore the user of this system should pay attention not to radiate the beam against humans any time. (Please refer below calculation sample 2)



Hazard Area of Radiation

In addition, the Power density and Field strength level is calculated by equation below.

$$\text{Power density S (mW/cm}^2\text{)} = \frac{10^{\left(\frac{P+G-30}{10}\right)} \times K}{40 \times \pi \times R^2}$$

Where:

P = Output power of ODU (dBm),
G = Antenna Gain (dBi),
(in consideration of the angle from antenna)
K = Reflection factor =2.56 (given),
R = Distance between Human and Antenna (m)

Calculation example 1, (90 degree side of antenna)

PASOLINK = 18 GHz/+23 dBm,
Antenna diameter = 0.6 m,
0 degree antenna gain = 39 dBi,
90 degrees side antenna gain = –24 dBi, (90 degrees attenuation = –63 dB),
Distance = 0.1 m

Power density S (mW/cm^2) = 0.0016 ≤ 0.01 (European safety guideline)

Calculation example 2, (0 degree, front side of antenna)

PASOLINK = 7 GHz/+27 dBm,
Antenna diameter = 1.8 m,
0 degree antenna gain = 40 dBi,
Distance = 100 m

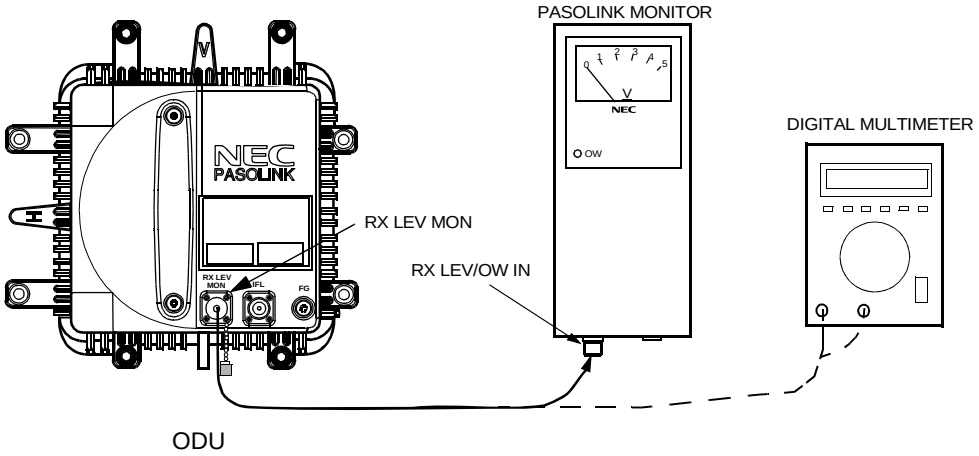
Power density S (mW/cm^2) = 0.01 => Equal to European safety guideline

Chart 3-6 (Cont'd)

Step	Procedure
	A. USING ANDREW VHLP TYPE BRACKET
	Azimuth Angle Adjustment
6-1	Loosen bolts (1 in Fig. 3-4-A),
6-2	Adjust the azimuth angle by adjusting bolt (2 in Fig. 3-4-A),
6-3	Secure bolts loosened in step 11-1,
	Elevation Angle Adjustment
6-4	Loosen bolts (3 in Fig. 3-4-A),
6-5	Adjust the elevation angle by adjusting bolt (4 in Fig. 3-4-A)
6-6	Secure bolts loosened in step 11-4,
	B. USING RFS SB1 TYPE BRACKET
	Azimuth Angle Adjustment
6-7	Loosen nuts (1 in Fig. 3-4-B),
6-8	Adjust the azimuth angle by adjusting the nuts (2 in Fig. 3-4-B),
6-9	Secure nuts loosened in step 4-7,
	Elevation Angle Adjustment
6-10	Loosen bolt(s) (3 in Fig. 3-4-B),
6-11	Adjust the elevation angle by adjusting the nuts (4 in Fig. 3-4-B),
6-12	Secure nut loosened in step 4-10,
6-13	Secure nuts loosened in step 4-11.
6-14	At each station, disconnect the digital multimeter or PASOLINK Monitor from the RX LEV MON connector,
6-15	At each station, reconnect the cap removed in step 9,
	Note: The RX LEV MON connector must be capped for waterproof.

Chart 3-6 (Cont'd)

Step	Procedure
	C. USING RFS C-Mount TYPE BRACKET
	Azimuth Angle Adjustment
6-16	Loosen 3 bolts (1 in Fig. 3-4 (2/2)),
6-17	Adjust azimuth angle by adjusting bolt (2 in Fig. 3-4 (2/2)),
6-18	Secure nuts loosened in step 6-16,
	Elevation Angle Adjustment
6-19	Loosen 4 bolts (3 in Fig. 3-4 (2/2)),
6-20	Adjust elevation angle by adjusting bolt (4 in Fig. 3-2 (2/2)),
6-21	Secure bolts loosened in step 6-19,
6	At each station, restore the "Antenna Alignment Mode" to "off" using the LCT,
7	At each station, reset control items to original using LCT,
8	At each station, restore the "MAINT Mode" to "off" position using the LCT,

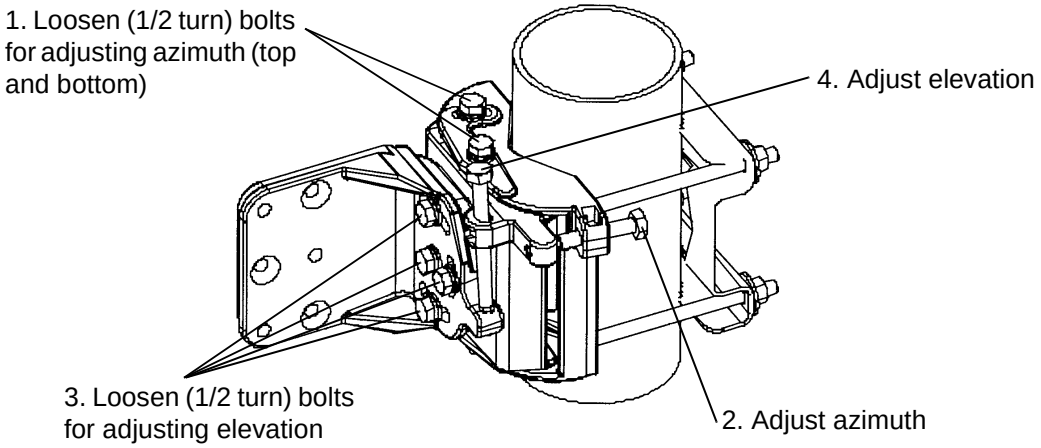


Notes 1: It is necessary to set to the Antenna Alignment Mode using PC for LCT when monitor the RX level with the PASOLINK MONITOR unit.

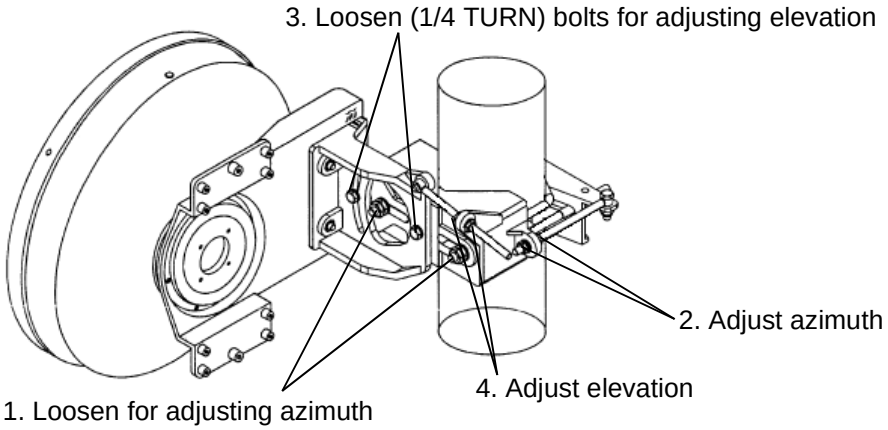
2: The RX LEV MON terminal on the ODU (conformed to IEC61169-24).

3: The RX LEV MON terminal must be capped for waterproof.

Fig. 3-3 Antenna Orientation Test Setup



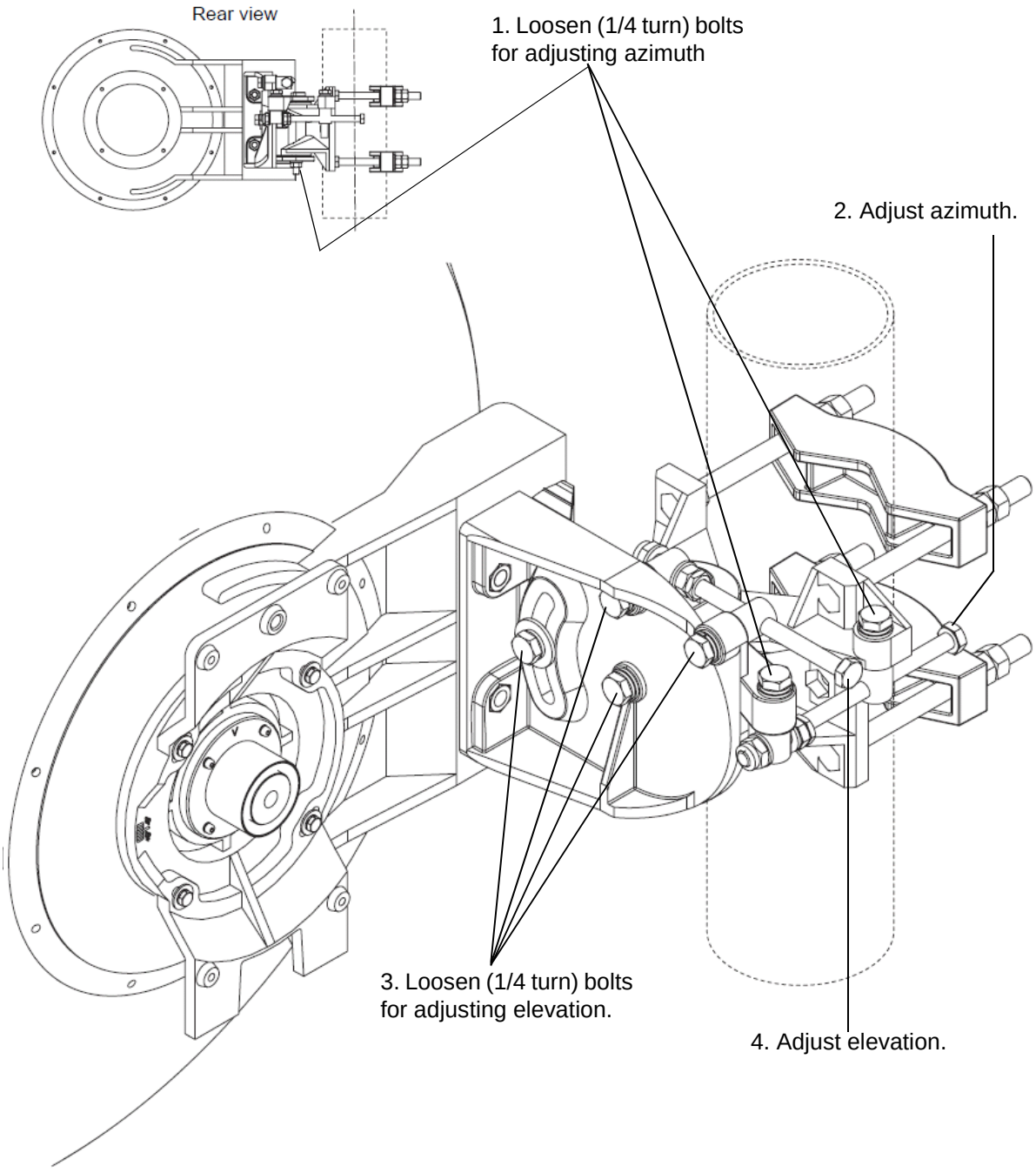
A. ANDREW VHLP TYPE BRACKET



0.3 ϕ m Antenna

B. RFS SB1 TYPE BRACKET

Fig. 3-4 Location of Adjusting Nuts (1/2)



0.6 ϕ m Antenna

C. RFS C-Mount TYPE BRACKET

Fig. 3-4 Location of Adjusting Nuts (2/2)

3.5 Lineup Test

Line up test items for between two stations are listed in Table 3-2.

Table 3-2 Lineup Test Items

Item	Chart No.
Orderwire Test	Chart 3-7
TX/RX SW Switchover Operation	Chart 3-8 *1
DADE Adjust	Chart 3-9 *2
BER Measurement	Chart 3-10
Meter Reading	Chart 3-11

*Note: *1 Chart 3-8 is described about Manual Switchover Operation.*

**2 Chart 3-10 is needed only when INTFC is Out-phase in 1+1 configuration.*

Chart 3-7 Orderwire Test

Step	Procedure
1	Connect headset to the EOW jack on the IDU,
2	Press the CALL button on the IDU, Requirement: At the opposite station, the buzzer on the IDU sounds,
3	Check that the orderwire can be used between two stations with headsets,
4	Disconnect headset from EOW jack on the IDU at each station.

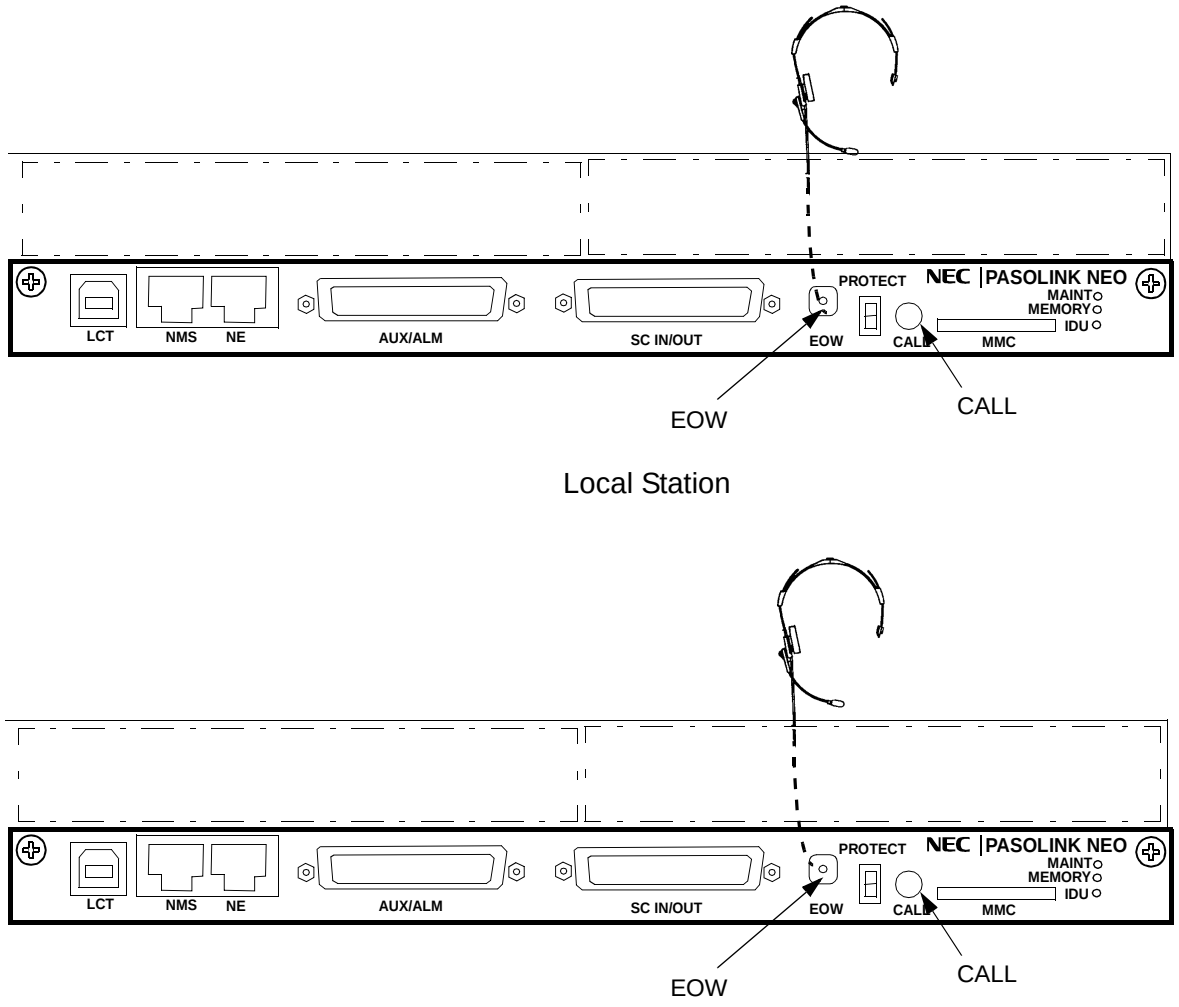


Fig. 3-5 OW Test Setup for IDU

Chart 3-8 TX/RX SW Switchover Operation

Step	Procedure

The TX/RX SW switchover operation is performed only in 1+1 configuration.

1 Connect the PC to the LCT port on the PASOLINK NEO IDU using USB cable**,** (see Fig. 3-2)

2 Enter Login name “Admin”, enter Admin password and press the “Login” button,

3 LCT Open window will be displayed, then click “Maintenance” button in the LCT MENU, select “Maintenance1” on background menu,

LCT MENU

Alarm/Status
Equipment Setup
Inventory
AUX I/O
Maintenance
Provisioning
Metering
PMON(Current)
PMON(History)

Maintenance1
Maintenance2

4 Select “On” of the Maintenance setting button and click on “Set” button,

5 Select “No.1” or “No.2” of the TX SW setting button and click on “Set” button,

6 Select “No.1” or “No.2” of the RX SW setting button and click on “Set” button,

--- Maintenance 1 ---

Item	Value	Setting	
Maintenance	On	○ Off ● On	Set
TX SW Manual Control	No.1	○ Auto ● No.1 ○ No.2	Set
RX SW Manual Control	No.1	○ Auto ● No.1 ○ No.2	Set

7 Check that the “Value” box for each item turned to the required status.

Chart 3-9 DADE Adjustment

Step	Procedure

Note: The DADE control applies in 1+1 configuration to adjust delay time for RX hitless switching when the INTFC status is indicated Outphase.

1 Connect the USB cable to the USB port of PC and the LCT port of the IDU (see Fig. 3-2),

2 Login to LCT using Internet Explorer,

3 Enter Login name “Admin”, enter Admin password and press the “Login” button,

4 LCT Open window will be displayed, then click “Maintenance” button in the LCT Menu area, select “Maintenance1” on background menu,

5 Select “DADE Adjust” on the “Maintenance1” table,

6 Click on setting button “DADE”, “Off set DADE” or “DADE Off” and click on “Set” button,

---Maintenance1---

Item	Value	Setting	
Maintenance	On	○ Off ● On	Set
DADE Adjust	---	● DADE ○ Offset DADE ○ DADE Off	Set

Note: The DADE adjustment is needed in initial lineup or when the IF CABLE is replaced. It is not needed readjustment when the INTFC status is indicated In-phase. The setting conditions are as follows:

DADE: Automatically adjust delay time based on either No.1 signal or No.2 signal which it is selected by RX SW under the Outphase condition of the INTFC status. The DADE control is processed assuring no interruption of traffic.

Offset DADE: Automatically adjust delay time based on either No.1 signal or No.2 signal which it is selected by RX SW under the Outphase condition of the INTFC status. Since the offset memory minimizes the latency delay, traffic interruption occurs at that moment. This Offset DADE controls the delay time difference to a minimum than DADE control.

DADE off: Set when DADE function is not used. For particularly, when low bit rate (10 to 20 MB) transmission is applied to the system, the DADE control is not required.

Chart 3-10 BER Measurement

In 1+1 system, BER measurement of both No.1 and No.2 channels should be performed between terminal stations.

Apparatus :

Digital Multimeter with test leads

Screwdriver

SDH/SONET Analyzer (for SDH)/PDH Analyzer (for PDH)

Optical Variable Attenuator

Headset

Step	Procedure

A. 16E1/48E1 INTERFACE

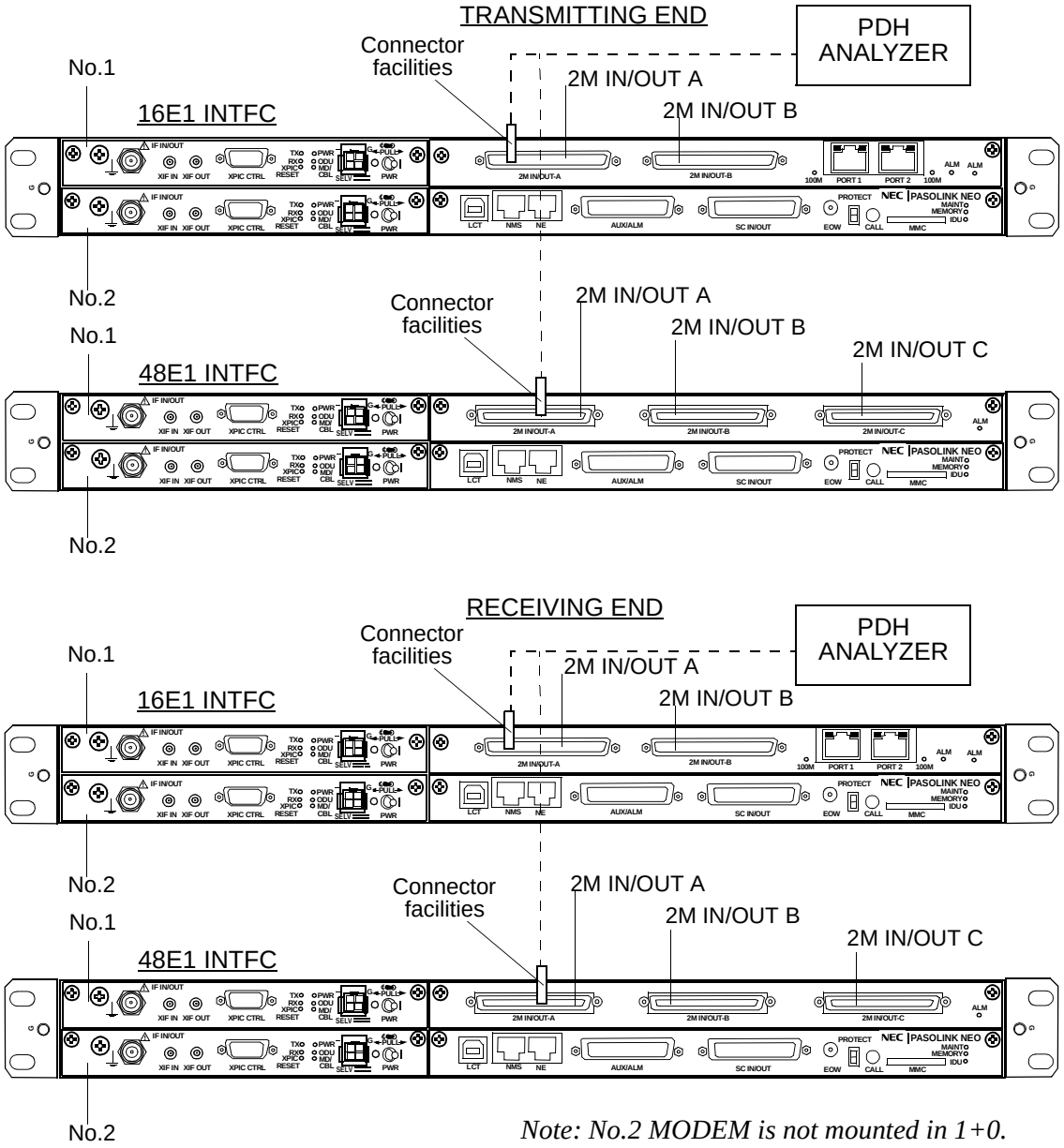
Note: Pin connector facilities are necessary to connect the PDH analyzer signal cable to D-sub or MDR connector.

1 At the transmitting end, disconnect 2M IN/OUT A, B on the 16E1 INTFC or 2M IN/OUT A, B, C connector on the 48E1 INTFC (see Fig. 3-6),

2 At the receiving end, disconnect 2M IN/OUT A, B on the 16E1 INTFC or 2M IN/OUT A, B, C connector on the 48E1 INTFC (see Fig. 3-6),

Chart 3-10 (Cont'd)

Step	Procedure



Note: No.2 MODEM is not mounted in 1+0.

Fig. 3-6 BER Measurement for E1 Signal

Chart 3-10 (Cont'd)

Step	Procedure
3	At both transmitting and receiving ends, set the BER test set as follows: • Bit rate: 2.048 Mbps • Code format: HDB3 • Level/Impedance: 2.37 Vo-p (75 ohms, unbalanced) or 3.0 Vo-p (120 ohms, balanced) *Note: Operation of the TX SW and RX SW are not required in 1+0 system for the following.*
4	In HS system, set the TX SW to No.1 or No.2 to "On" condition at transmitting end (refer to Chart 3-8),
5	At receiving end, set the RX SW to either No.1 or No.2 to "On" condition,
6	Measure BER at required E1 CH and confirm that the values are indicated as follows: Requirement: 1×10^{-12} or less *Note: It can be measured only E1 CHs which are assigned to "Used (E1)" in provisioning.*
7	At receiving end, change setting of the RX SW to opposite No.1 or No.2 from it in step 5 and confirm that the measured value satisfies requirement as in step 6,
8	Change setting of the TX SW to opposite No.1 or No.2 from it in step 4 and confirm that the measured value satisfies requirement given in step 6,
9	At receiving end, change setting of the RX SW to opposite No.1 or No.2 from it in step 7 and confirm that the measured value satisfies requirement given in step 6,
10	Restore all connections and controls to normal.

Chart 3-10 (Cont'd)

Step	Procedure

B. STM-1 ELECTRICAL INTERFACE

1 At the transmitting end, disconnect STM-1 signal cable from the STM1 IN connector on the STM-1 INTFC (see Fig. 3-7),

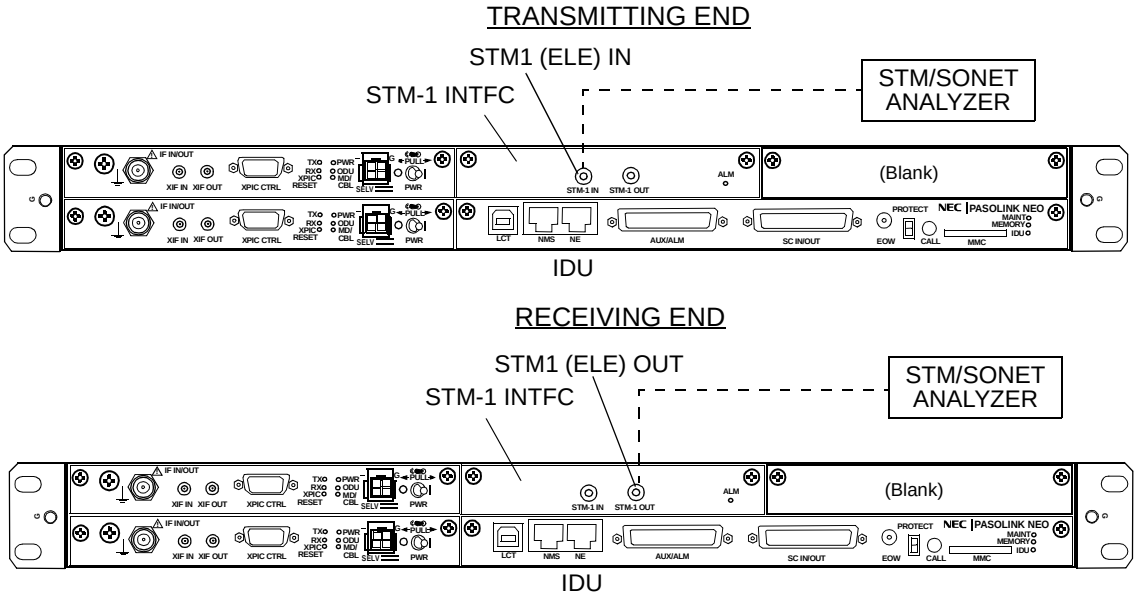


Fig. 3-7 BER Measurement for STM-1 Signal

2 At the receiving end, disconnect the STM-1 signal cable from the STM1 OUT connector on the STM-1 INTFC (see Fig. 3-7),

3 At both transmitting and receiving ends, set the STM/SONET Analyzer as follows:

STM-1 INTFC (ELECTRICAL)

- Bit rate : 155.52 Mbps
- Code format : STM-1, CMI
- Level : 1.0 Vp-p
- Impedance : 75 ohms, unbalanced

Chart 3-10 (Cont'd)

Step	Procedure
	Note: Operation of the TX SW and RX SW are not required in 1+0 system.
4	In HS system, set the TX SW to No.1 or No.2 to On condition at transmitting end,
5	At receiving end, set the RX SW to either No.1 or No.2 to On condition, (refer to Chart 3-8)
6	Measure BER and confirm that the values are indicated as follows: Requirement: 1×10^{-12} or less
7	At receiving end, change setting of the RX SW to opposite No.1 or No.2 from it in step 5 and confirm that the measured value satisfies requirement given in step 6,
8	Change setting of the TX SW to opposite No.1 or No.2 from step 4 and confirm that the measured value satisfies requirement given in step 6,
9	At receiving end, change setting of the RX SW to opposite No.1 or No.2 from step 7 and confirm that the measured value satisfies requirement given in step 6,
10	Restore all connections and control status to normal.

Chart 3-10 (Cont'd)

Step	Procedure

C. OPTICAL INTERFACE

Caution: Do not stare into laser beam or view directly with optical instruments. Otherwise, it may hurt eyes (Class 1 Laser Product).

1 At the transmitting end, disconnect OPT cable from the STM1 IN connector on the STM-1 INTFC (see Fig. 3-8),

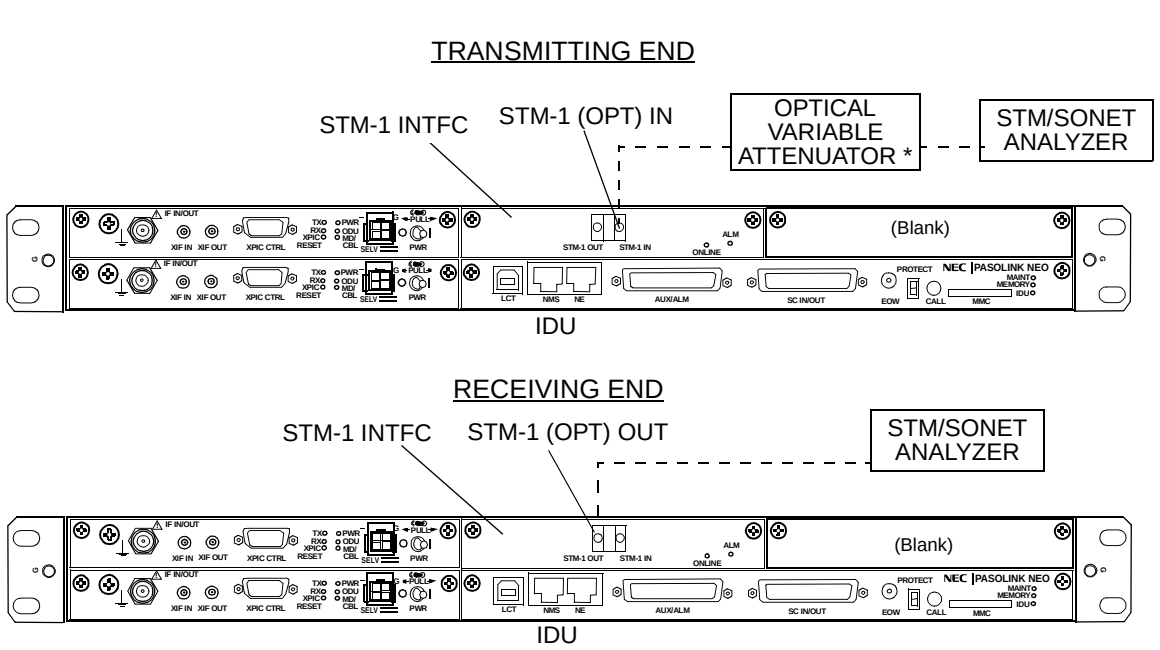


Fig. 3-8 BER Measurement for STM-1 Signal

2 At the receiving end, disconnect the OPT cable from the STM1 OUT connector on the STM-1 INTFC (see Fig. 3-8),

3 At both transmitting and receiving ends, set the STM/SONET Analyzer as follows:

Chart 3-10 (Cont'd)

Step	Procedure

STM-1 INTFC(OPTICAL)

- Bit rate : 155.52 Mbps
- Code format : STM-1, NRZ
- Level

	S-1.1	L-1.1
IN	: –8 to –28 dBm/	–10 to –34 dBm
OUT	: –8 to –15 dBm/	0 to –8 dBm

- Wave length
  IN : 1310 nm
  OUT : 1310 nm

Note: Operation of the TX SW and RX SW are not required in 1+0 system.

4 In HS system, set the TX SW to No.1 or No.2 to On condition at transmitting end, (refer to Chart 3-8)

5 At receiving end, set the RX SW to either No.1 or No.2 to On condition,

6 Measure BER and confirm that the values are indicated as follows:

Requirement: 1×10^{-12} or less

7 At receiving end, change setting of the RX SW to opposite No.1 or No.2 from it in step 5 and confirm that the measured value satisfies requirement given in step 6,

8 Change setting of the TX SW to opposite No.1 or No.2 from it in step 4 and confirm that the measured value satisfies requirement given in step 6,

9 At receiving end, change setting of the RX SW to opposite No.1 or No.2 from it in step 7 and confirm that the measured value satisfies requirement given in step 6,

10 Restore all connections and controls to normal.

Chart 3-11 Meter Reading

Step	Procedure

1 Connect the PC to the LCT port on the PASOLINK NEO IDU using USB cable**,** (see Fig. 3-2)

2 Enter Login name “Admin”, enter Admin password and press the “Login” button,

3 Click “Metering” button in LCT Menu,

LCT MENU

Alarm/Status
Equipment Setup
Inventory
AUX I/O
Maintenance
Provisioning
Metering
PMON(Current)
PMON(History)

4 Then, the values of Metering items are displayed as follows:

1+1 Configuration

----Metering---

	No.1	No.2
TX Power [dBm]*1	+19	+19
RX Level [dBm] *2	-49.5	-49.7
Power Supply [V] *3	-45	-45
BER *4	0.0E-10	Calculating

1+0 Configuration

----Metering---

TX Power [dBm]*1	+19
RX Level [dBm] *2	-50
Power Supply[V] *3	-45
BER *4	1.10E-10

Chart 3-11 (Cont'd)

Step	Procedure

*Notes: *1:TX POWER Level is indicated in 1 dB step.*
The TX Power varies depending on the propagation condition within setup ATPC range in provisioning, therefore, TX Power may be displayed within limited values listed in Table 3-3. Add attenuation value for Max. and Min. level when additional attenuator is used.

**2:Power supply voltage of the ODU input varies depending on the IF cable length.*

3: During total number of erroneous bits and total number of correctly received bits are calculating, "Calculating" and *E- are displayed.*

Table 3-3 TX Power Output Level

Modulation Mode	Frequency Band (GHz)	6	7-8	10-11	13	15	18	23	26	28	32	38	52
QPSK	Output Power Max. (dBm) (at ATPC 0 dB)	+29		+25		+23	+24		+22	+22		+18	+3
	Output Power Min. (dBm)	+4		0		–2	–1		–3	–3		–7	–7
	Additional attenuator (dB)	0 to 5								NA			
16QAM	Output Power Max. (dBm) (at ATPC 0 dB)	+26		+21.5	+22.5		+22		+20	+18	+17	+14.5	-
	Output Power Min. (dBm)	+2		–2.5	–1.5		–2		–4	–6	–7	–6.5	-
	Additional attenuator (dB)	NA											
32QAM	Output Power Max. (dBm) (at ATPC 0 dB)	+25		+21			+19		+18		+17	+14.5	–3
	Output Power Min. (dBm)	+2		–2			–4		–5		–6	–6.5	–7
	Additional attenuator (dB)	0 to 5											
128QAM	Output Power Max. (dBm) (at ATPC 0 dB)	+25		+21			+19		+18		+17	+14.5	-
	Output Power Min. (dBm)	+5		+1			–1		–2		–3	–5.5	-
	Additional attenuator (dB)	0 to 5								NA			
Tolerance	(dB)	+/–3											

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