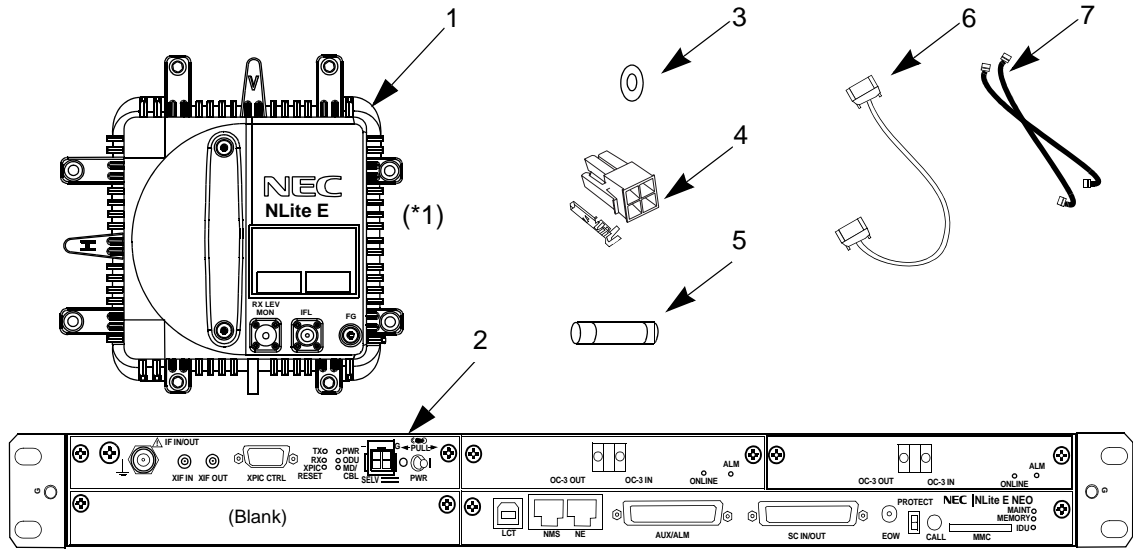


**2.1 Packages**

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

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

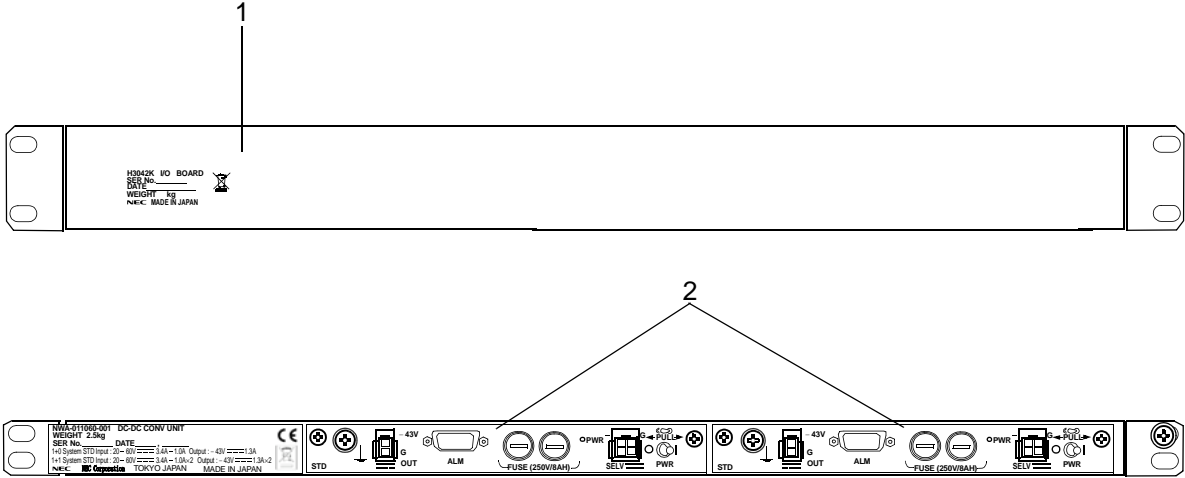


No.	DESCRIPTION
1	TRP-( )G-1B / TRP-52G-5A (ODU)
2	MDP-150MB-1AA (IDU)
3	O-Ring (Attached to the waveguide type ODU)
4	Power Connector (Molex Housing M5557-4R (x1ea) and Socket Contact (5556TL (x4 each))
5	Cylindrical Fuse ((RKS-F91000-0107) (6.3A) (x1ea) *2)
6	XPIC CTRL Cable (x1) (apply for XPIC configuration only)
7	X-IF Coaxial Cable (x2) (apply for XPIC configuration only)

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

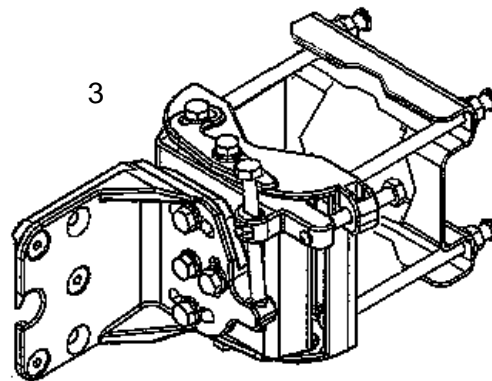
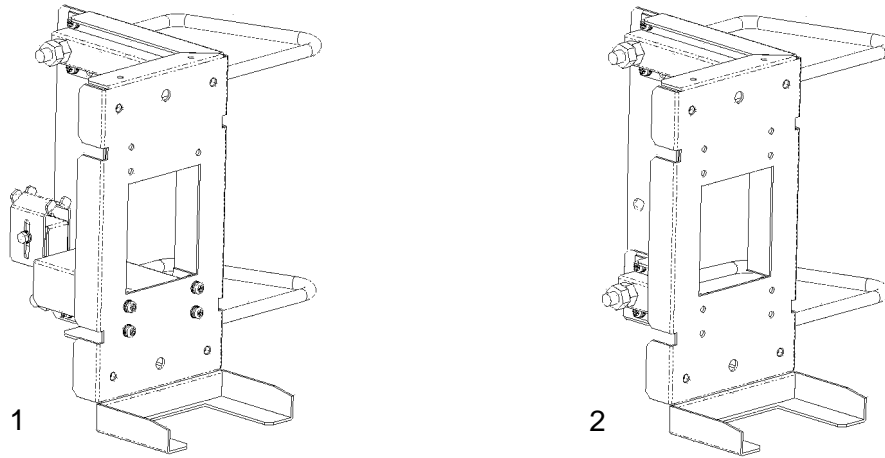
\*2 One spare fuse is provided in the MODEM module.

Fig. 2-2 Contents of Basic Unit Package



No.	DESCRIPTION
1	H3042K I/O BOARD Bracket
2	NWA-011060-001 DC-DC CONV UNIT (see Fig. 2-7 for details)

Fig. 2-3 Contents of Optional Unit Package

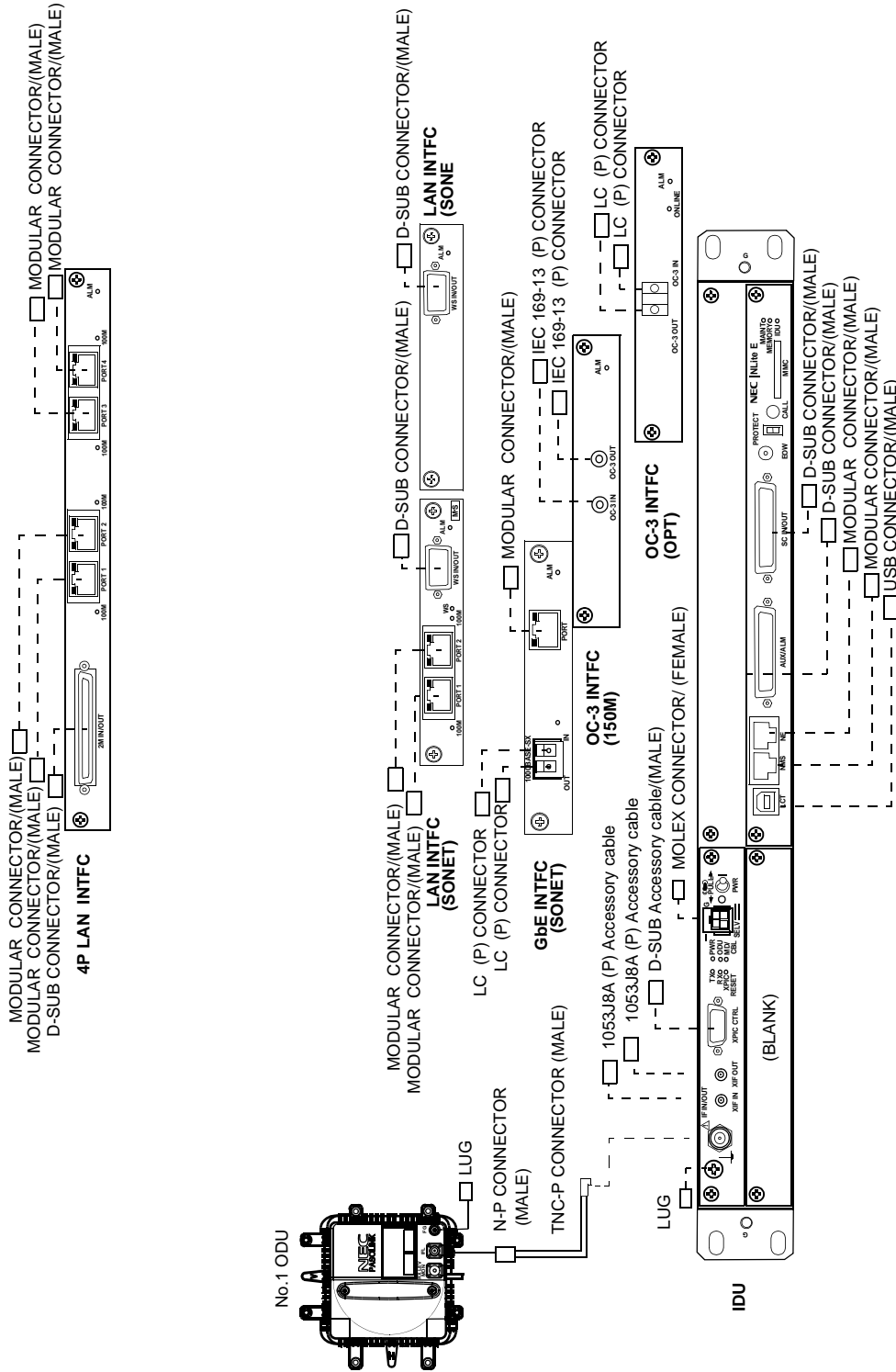


(Supplied with antenna)

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

Fig. 2-4 Pole Mounting Bracket

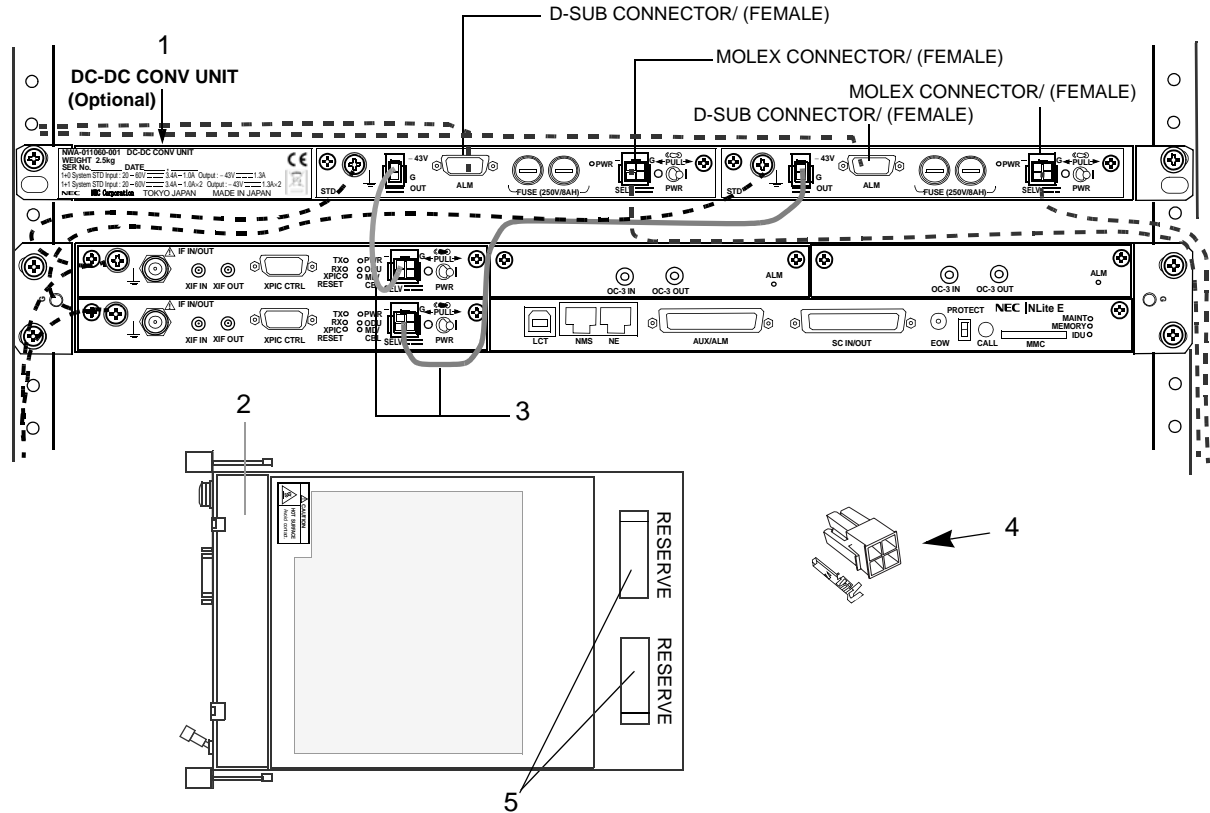
NLite E



*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) (N1-TNCP-LA) L-angle adapter is needed.*

*Note: The LAN/WS INTFC which is put a [M.S] label may be installed into either Slot1 or Slot2 on the IDU in the SONET system.*

**Fig. 2-5 Installation Kit Packing List of IDU and ODU for 1+0 System**



No.	DESCRIPTION
1	NWA-011060-001 DC-DC CONV UNIT
2	H3040 DC-DC CONV
3	Power Cable (NWM-005773-001, attached to the DC-DC CONV)
4	Power Connector (Molex Housing M5557-4R (x1ea) and Socket Contact (5556TL (x4 each))
5	Cylindrical Fuse ((CBE-006255-001) (8A) (x2 ea) *2)

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

\*2 Two spare fuses are provided in the DC-DC CONV module.

Fig. 2-6 Installation Kit Packing List of DC-DC CONV UNIT 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,

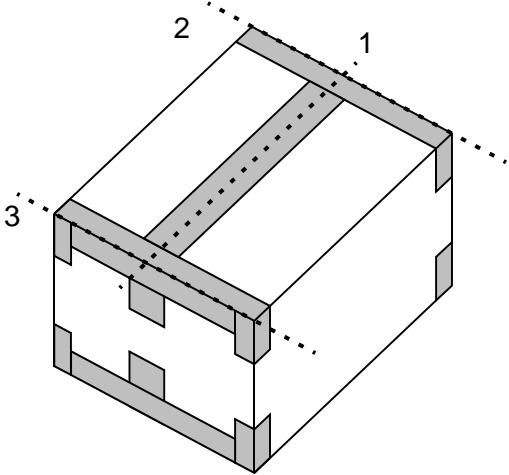


Chart 2-1 (Cont'd)

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

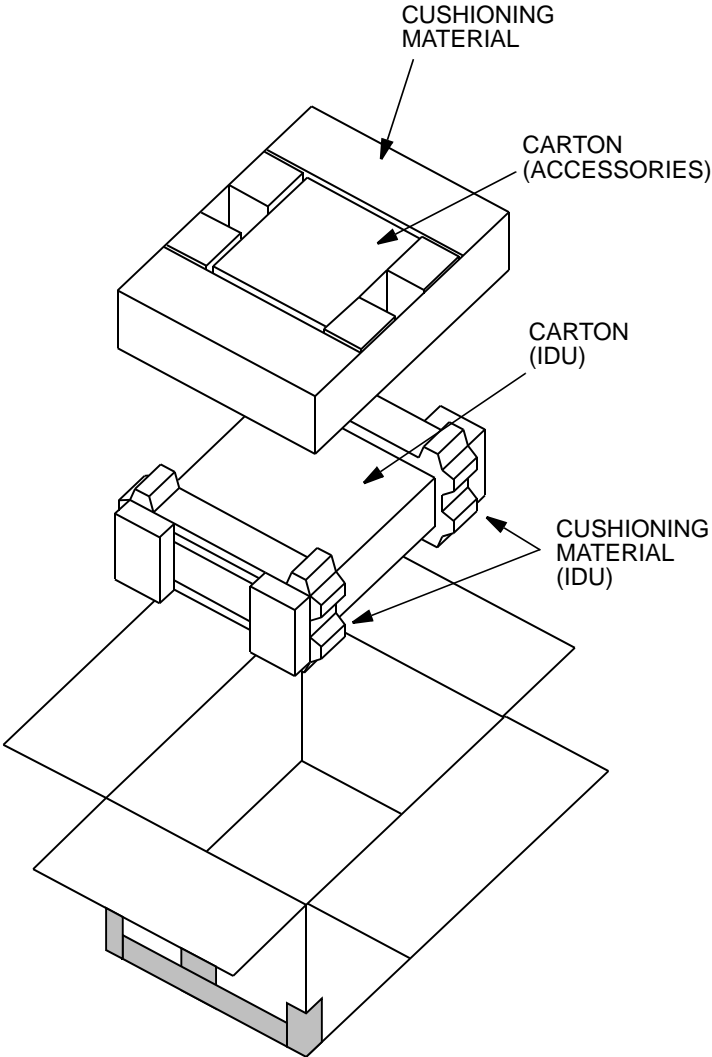


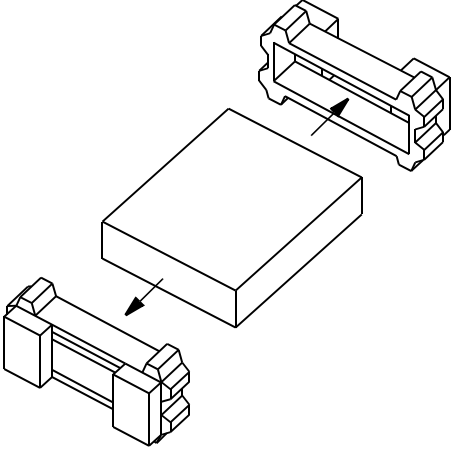


Chart 2-1 (Cont'd)

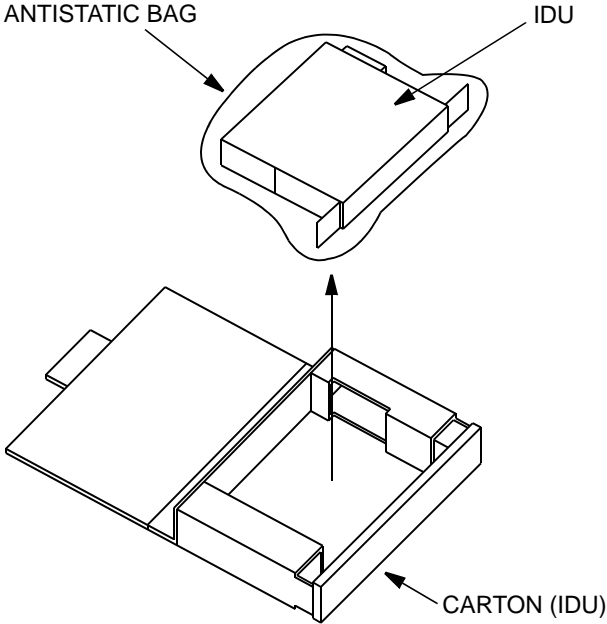
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Step	Procedure
3	Remove the cushioning materials from the carton (IDU),

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4	Take out the IDU wrapped with antistatic bag from the carton,
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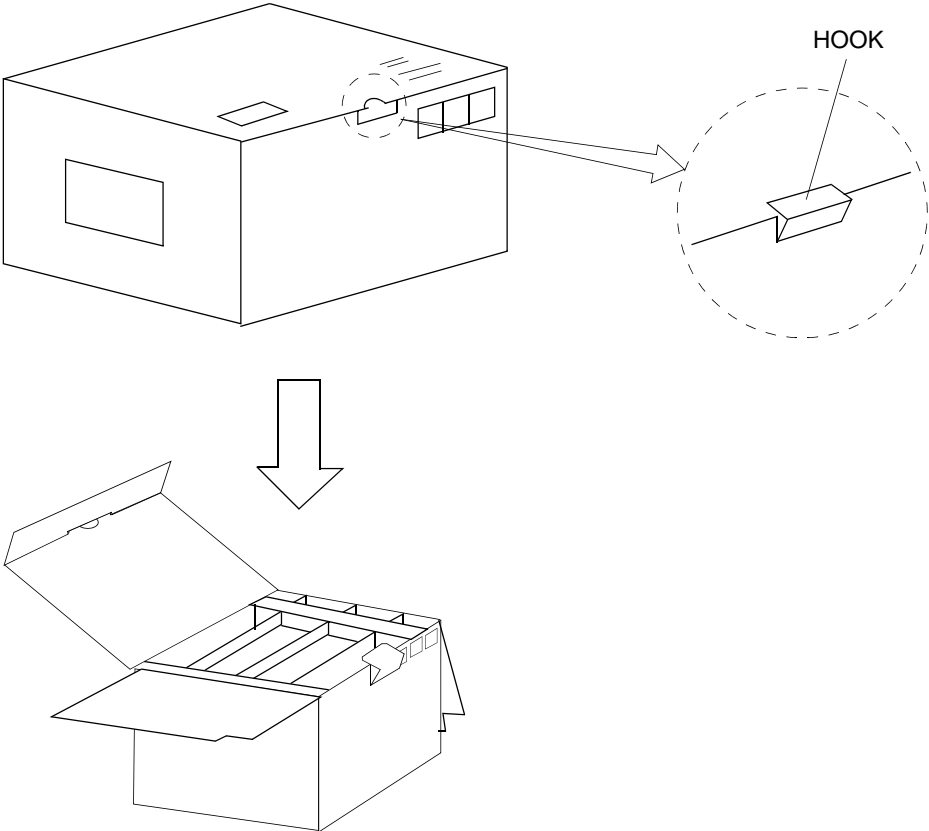
5	Take out the IDU from the antistatic bag,
6	Inspect the IDU.

---

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,

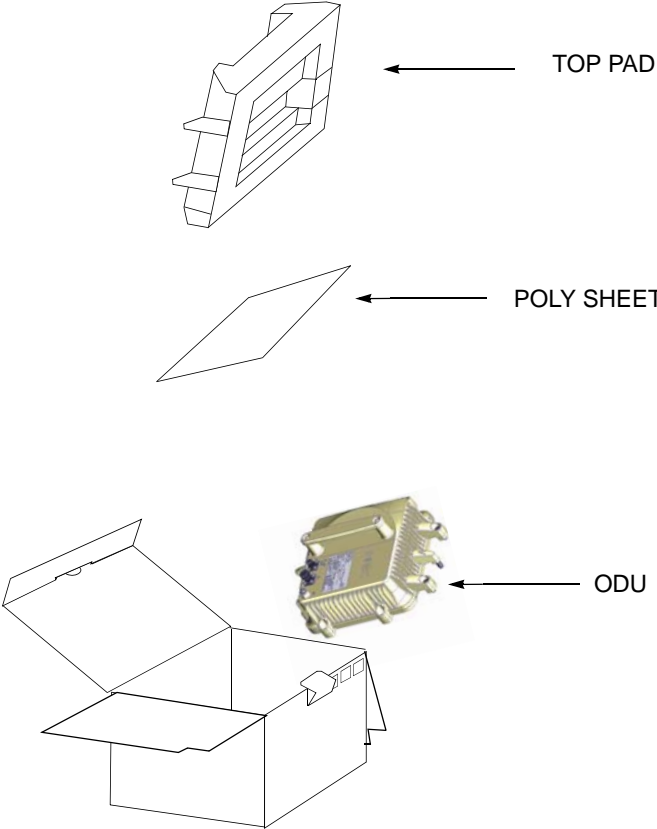


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Chart 2-2 (Cont'd)

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



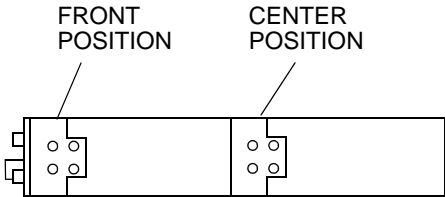
- 3 Take out the ODU from carton,
  - 4 Inspect the ODU.
-

### 2.3 IDU Mounting

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

**Chart 2-3 Mounting Methods of the IDU**

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



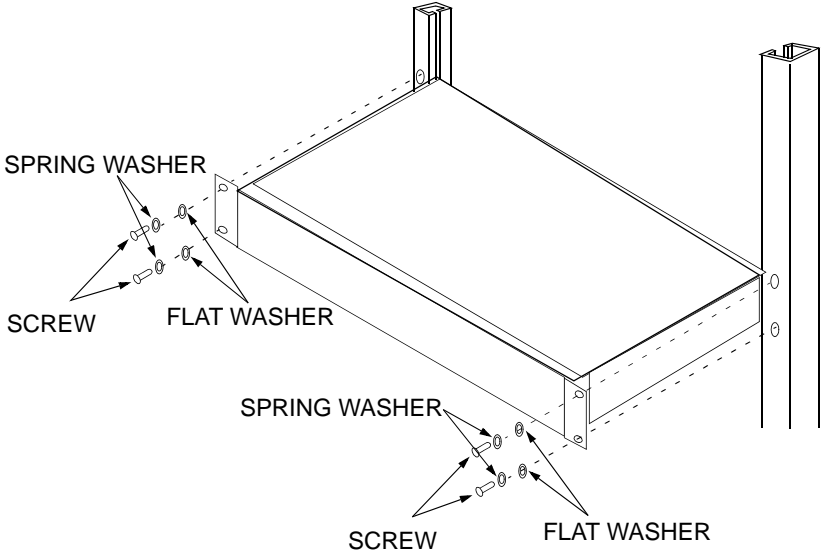
SIDE VIEW

1+0/1+1 SYSTEM

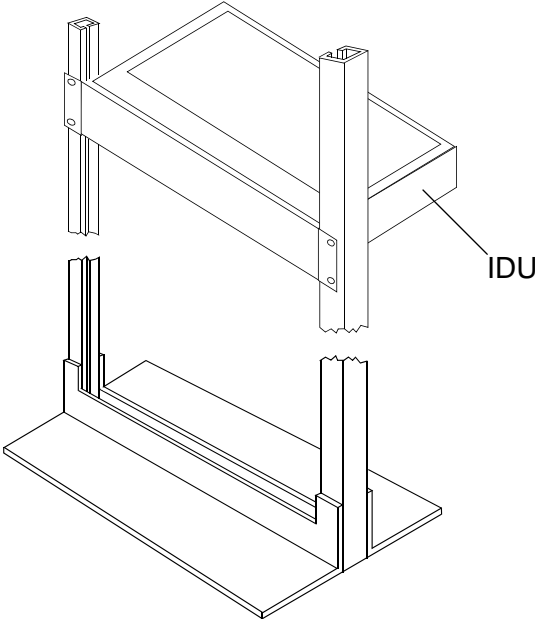
Chart 2-3 (Cont'd)

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,

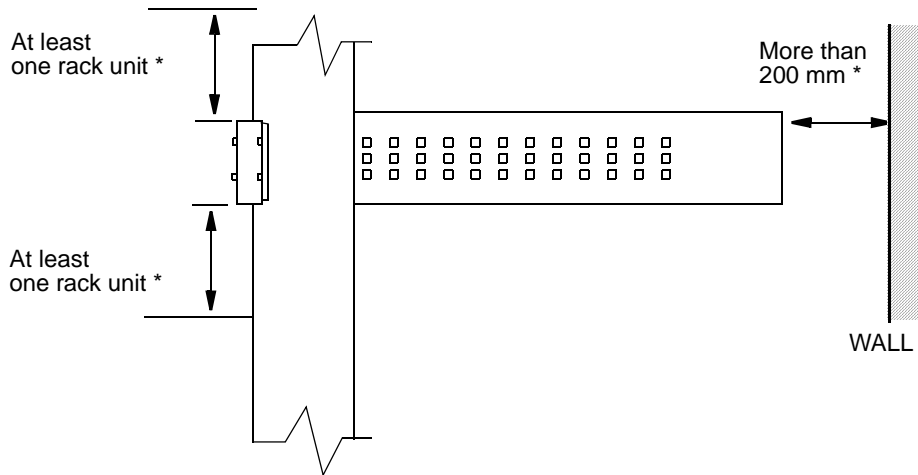


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Chart 2-3 (Cont'd)

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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 °C.*

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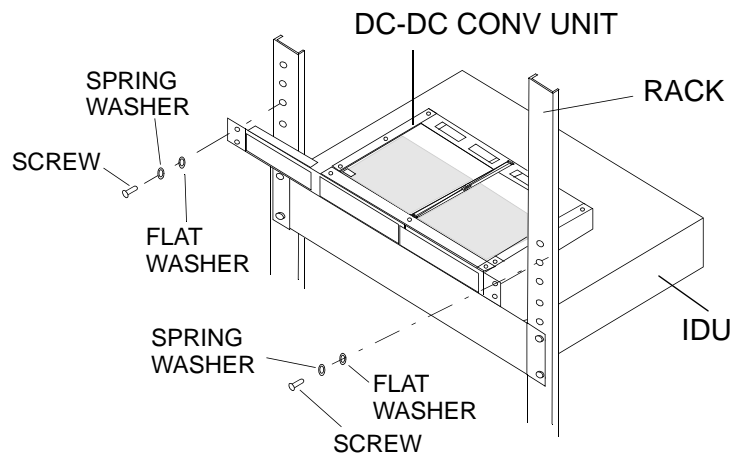
## 2.4 DC-DC CONV UNIT Mounting (Optional)

The installation procedure for the DC-DC CONV UNIT (optional) explains in Chart 2-5. The DC-DC CONV UNIT(optional) should be installed in the radio station.

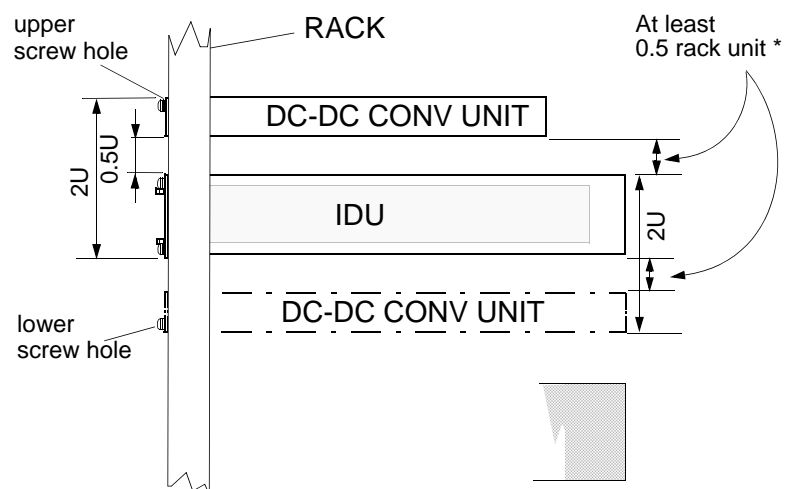
**Chart 2-4 Mounting Methods of the DC-DC CONV UNIT**

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

- 1 Fix the DC-DC CONV UNIT to the 19-inch rack using the two screws.



*Note: \* Space 0.5 rack unit in the upper or lower DC-DC CONV UNIT.*



## 2.6 NLite E SONET OC-3ODU 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

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

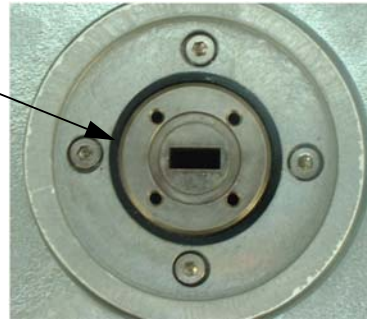




FOR WAVEGUIDE CONNECTION

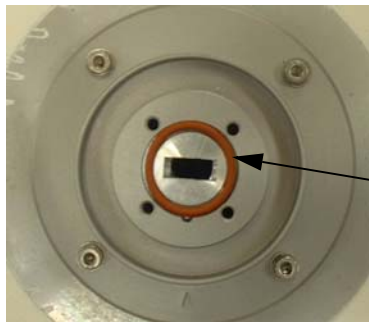
POSITION OF LARGE SIZE O-RING

POSITION OF SMALL SIZE O-RING



FOR ANTENNA DIRECT MOUNTING

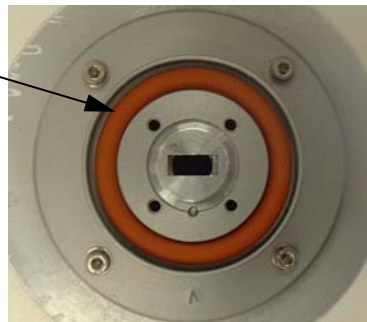
ANDREW ANTENNA



FOR WAVEGUIDE CONNECTION

POSITION OF LARGE SIZE O-RING

POSITION OF SMALL SIZE O-RING

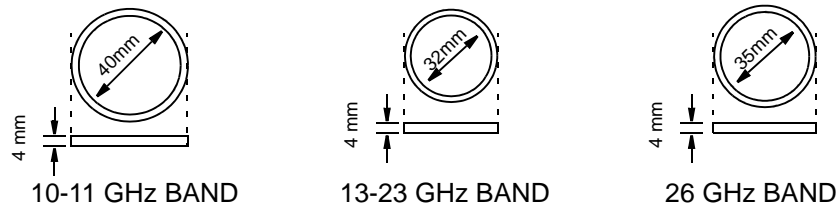


FOR ANTENNA DIRECT MOUNTING

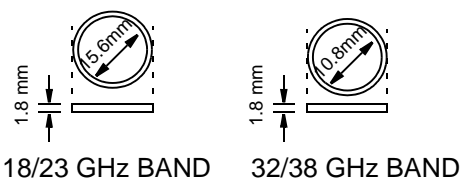
RFS ANTENNA

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:



LARGE SIZE O-RING FOR ANTENNA DIRECT MOUNTING



SMALL SIZE O-RING FOR WAVEGUIDE CONNECTION

### 2.6.1 Mounting

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

**Table 2-2 Antenna Direct Mounting**

<b>Change of Polarization</b>	<b>ODU/ Bracket</b>	<b>HYB</b>	<b>TX SPAN ATT</b>	<b>OMT</b>
Chart 2-6 ANT/ODU/HYB/TX SPAN ATT	Chart 2-7	Chart 2-8	Chart 2-9	Chart 2-11

**Table 2-3 Waveguide Connection**

<b>Using 1+1 HYB</b>	<b>1+0 or Connecting Two Antennas</b>
Chart 2-10	Chart 2-12

**Table 2-4 Coaxial Cable Connection**

<b>With/Without HYB</b>
Chart 2-13

---

**Chart 2-6 Change of Polarization (Antenna Direct Mounting)**

---

<b>Step</b>	<b>Procedure</b>
-------------	------------------

---

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 personnel.*

*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.

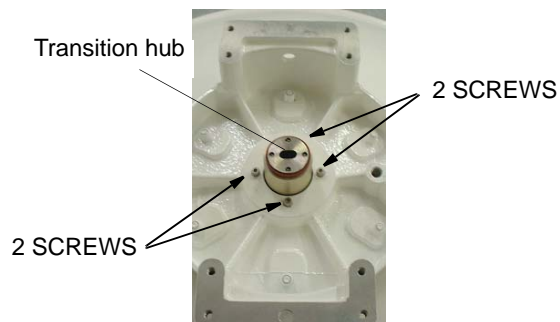
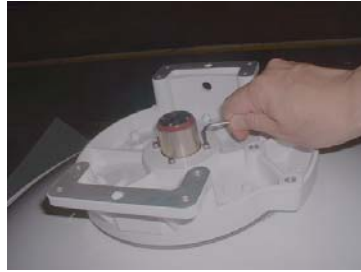


Chart 2-6 (Cont'd)

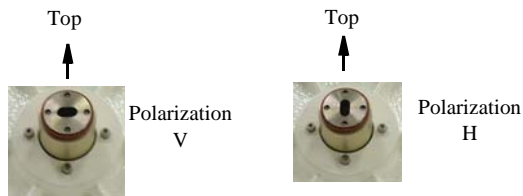
Step	Procedure
------	-----------

*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 2-6 (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 personnel.*

*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.*

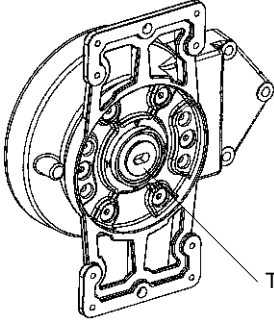
3. Rotate the transition hub 90 degrees until timing pin locates in timing concavity,

Chart 2-6 (Cont'd)

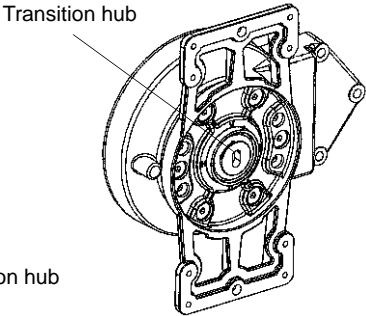
Step	Procedure
------	-----------



Transition Hub      Timing Pin



Vertical Polarized Application



Horizontally Polarized Application

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

Chart 2-6 (Cont'd)

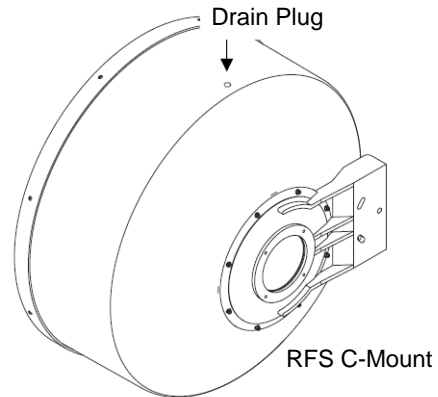
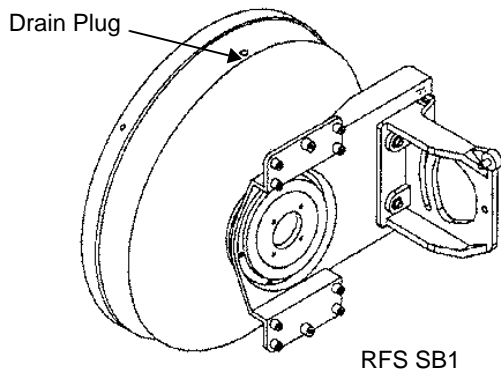
Step	Procedure
------	-----------

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.



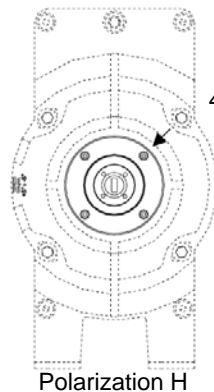
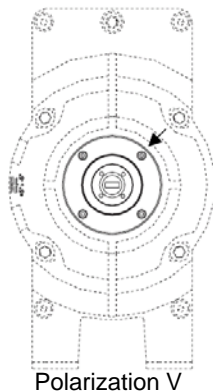
1. Unscrew the 4 screws M3 at the refined steel ring,
2. Hold the feed tightly at the waveguide,
3. Rotate carefully the feed 90 degrees,
4. Mount the feed to the refined steel ring and lock the 4 screws M3.

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.

Antenna TOP

Vertical

Horizontal



4 screws (M3)

Chart 2-6 (Cont'd)

Step	Procedure
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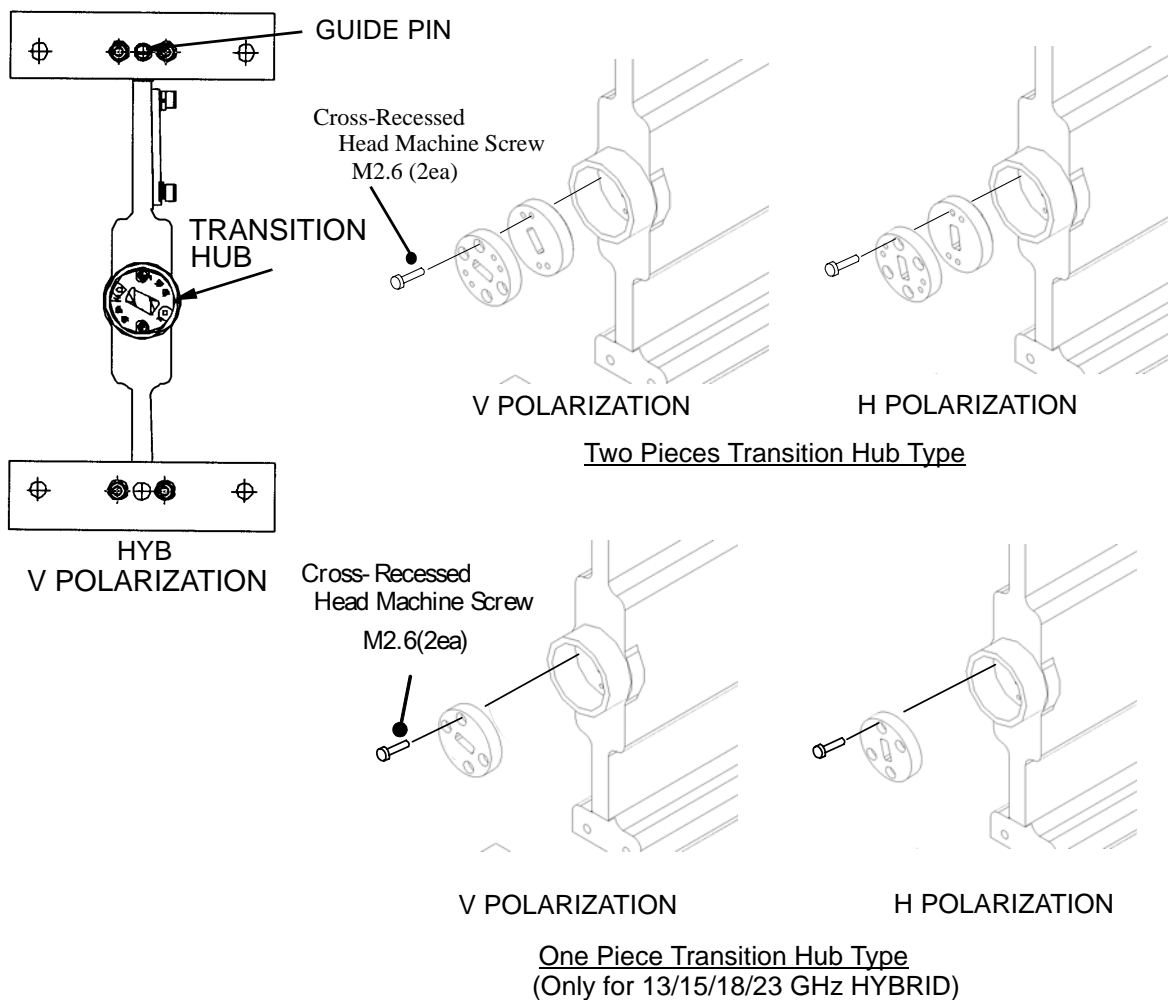
CHANGE OF POLARIZATION OF THE HYB

**NEC HYBRID**

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

- 1 If you change the polarization from V to H, loosen two screws, rotate the transition hub and put it to the HYB.

*Note: There are two types NEC HYBRID. One uses two pieces transition hubs and another uses one piece.*



- 2 Then fix it with the two screws that were loosened in step 1.



Chart 2-6 (Cont'd)

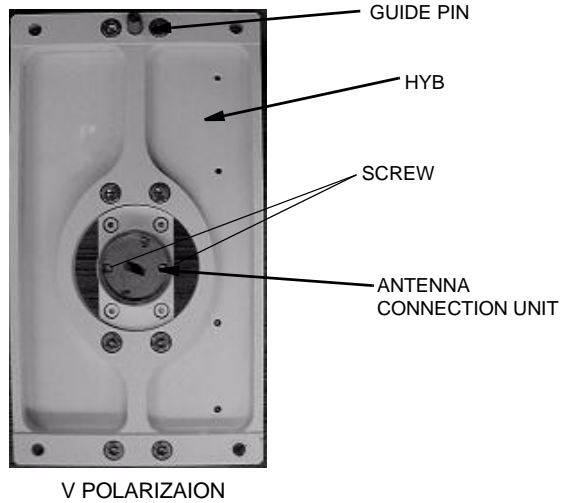
Step	Procedure
------	-----------

**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**



- 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.

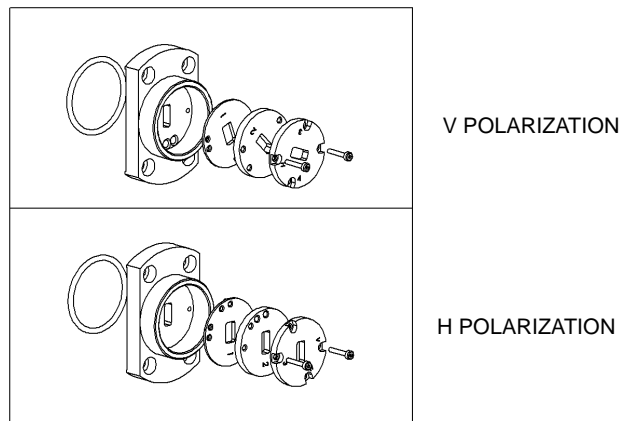


Chart 2-6 (Cont'd)

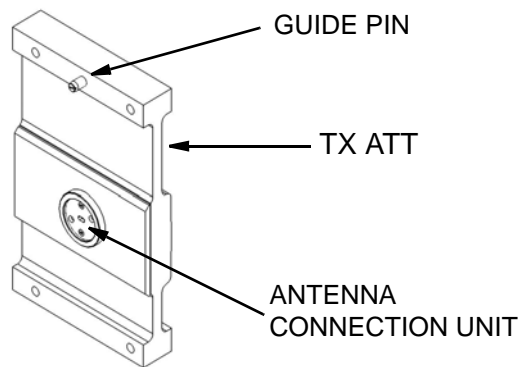
Step	Procedure
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CHANGE OF POLARIZATION OF THE TX SPAN ATT

**TX SPAN ATT**

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

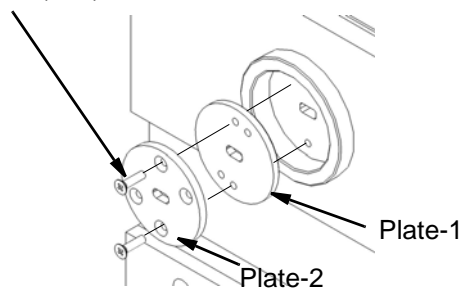
- 1 If you change to H polarization, loosen two screws, rotate the antenna connection unit and put the TX ATT horizontally.



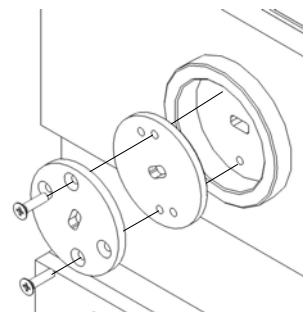
V POLARIZATION

- 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.

Cross-Recessed  
Head Machine Screw  
M2.6(2ea)



V POLARIZATION



H POLARIZATION

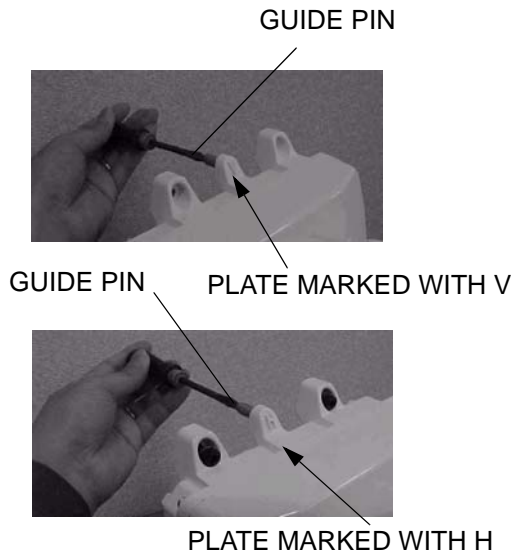
38 GHz Band TX SPAN ATT Polarization Change

NLite EStep

Procedure

CHANGE OF POLARIZATION OF THE ODU

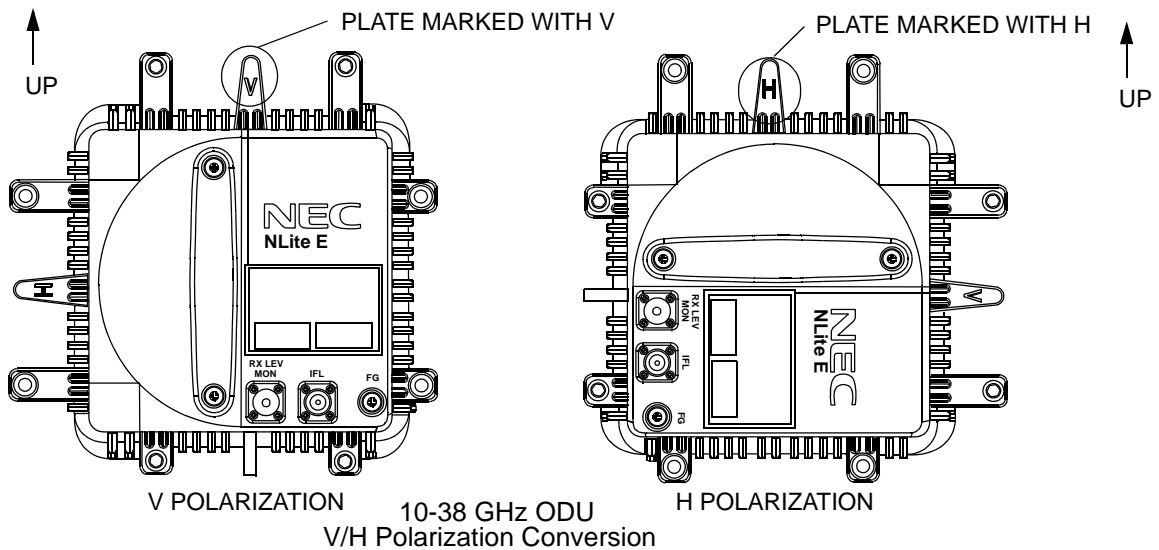
Antenna Mounting ODU (11-38 GHz Band)



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 installation.*



**Chart 2-7 ODU Antenna Direct Mounting (11 - 38 GHz)**

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

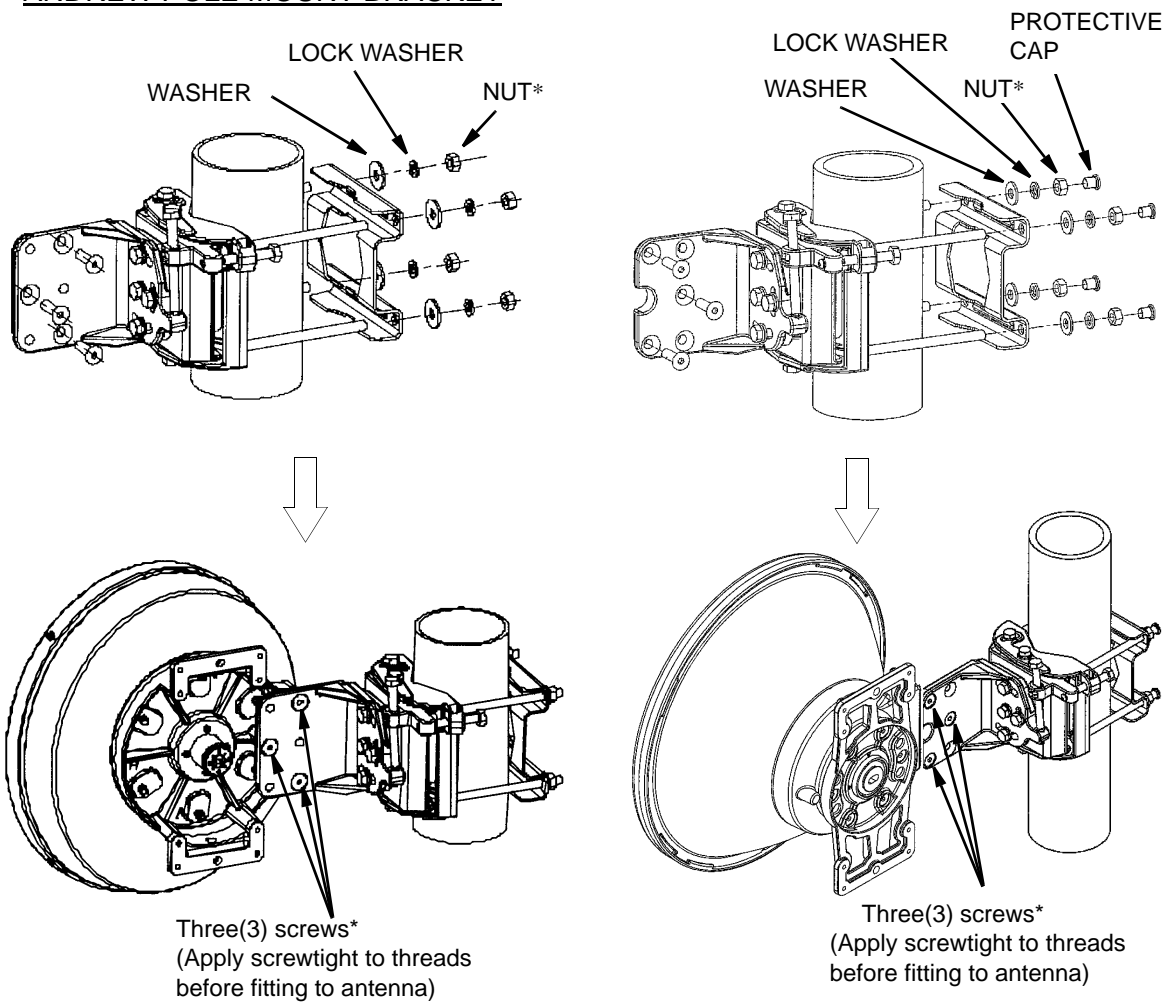
ANTENNA DIRECT MOUNTING (10-38 GHz Band ODU)

*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

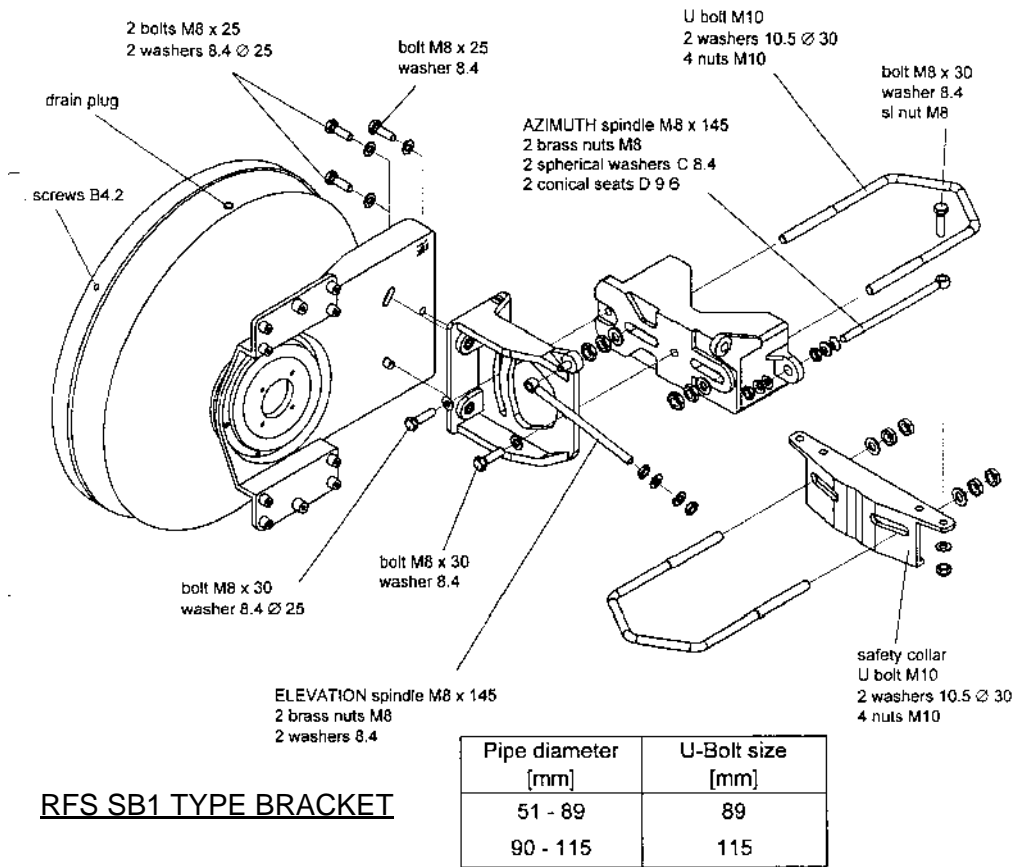


\* Tightening torque of 22 N·m for M10.

Chart 2-7 (Cont'd)

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

ANTENNA DIRECT MOUNTING (10-38 GHz Band ODU)



**Chart 2-7 (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.*

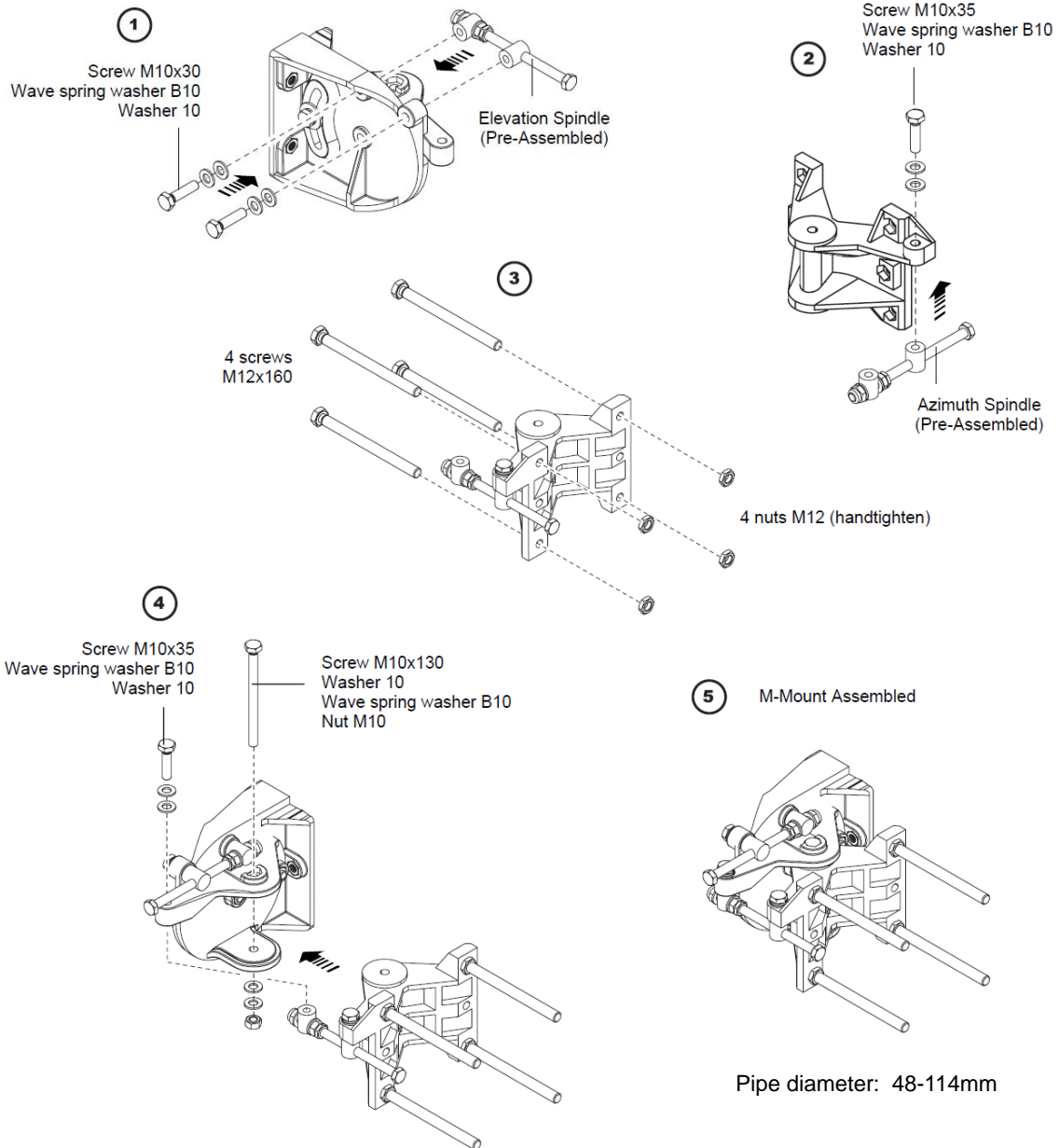
<b>Torques for RFS</b>			
Bolt	M5	5	Nm
	M6	8	Nm
	M8	17	Nm
	M10	35	Nm
	M12	50	Nm
U-Bolt, V-Bolt (Pipe mount & safety collar)	M10	20	Nm
Hexagonal brass nut of fine adjustment (Azimuth, Elevation)	M8	5	Nm
	M10	10	Nm
	M12	17	Nm
Hexagonal socket stainless steel screws (Feed systems install on aluminium mounting plate)	M3	0.2	Nm
	M4	0.4	Nm
<b>Exceptions</b>			
Fixing screw of the azimuth fine adjustment spindle	M8 x 30	8	Nm
	M12 x 55	17	Nm
<b>Special application: NOT greased</b>			
Fixing screw of the plastic radome	B4.2	3	Nm

Chart 2-7 (Cont'd)

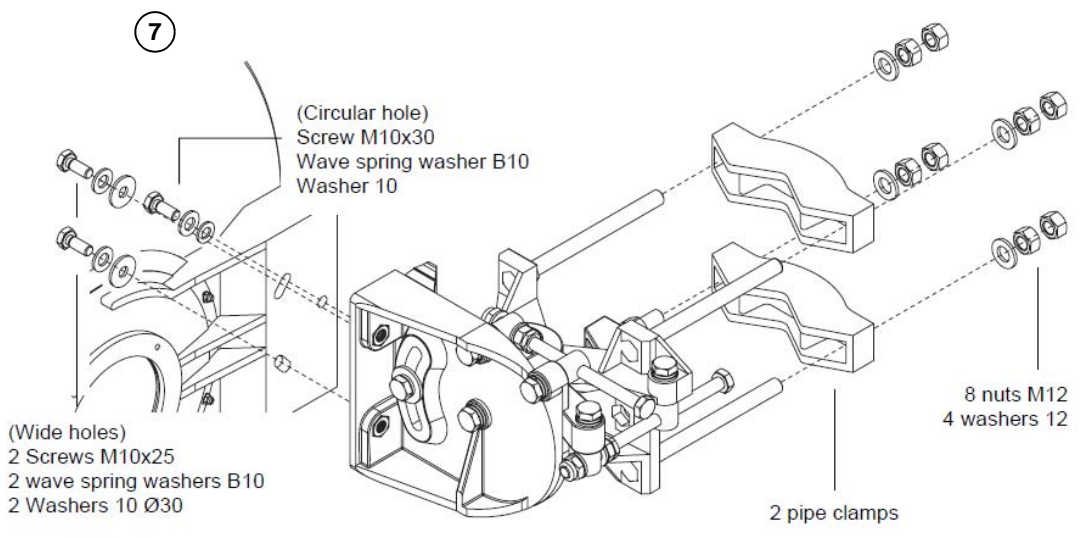
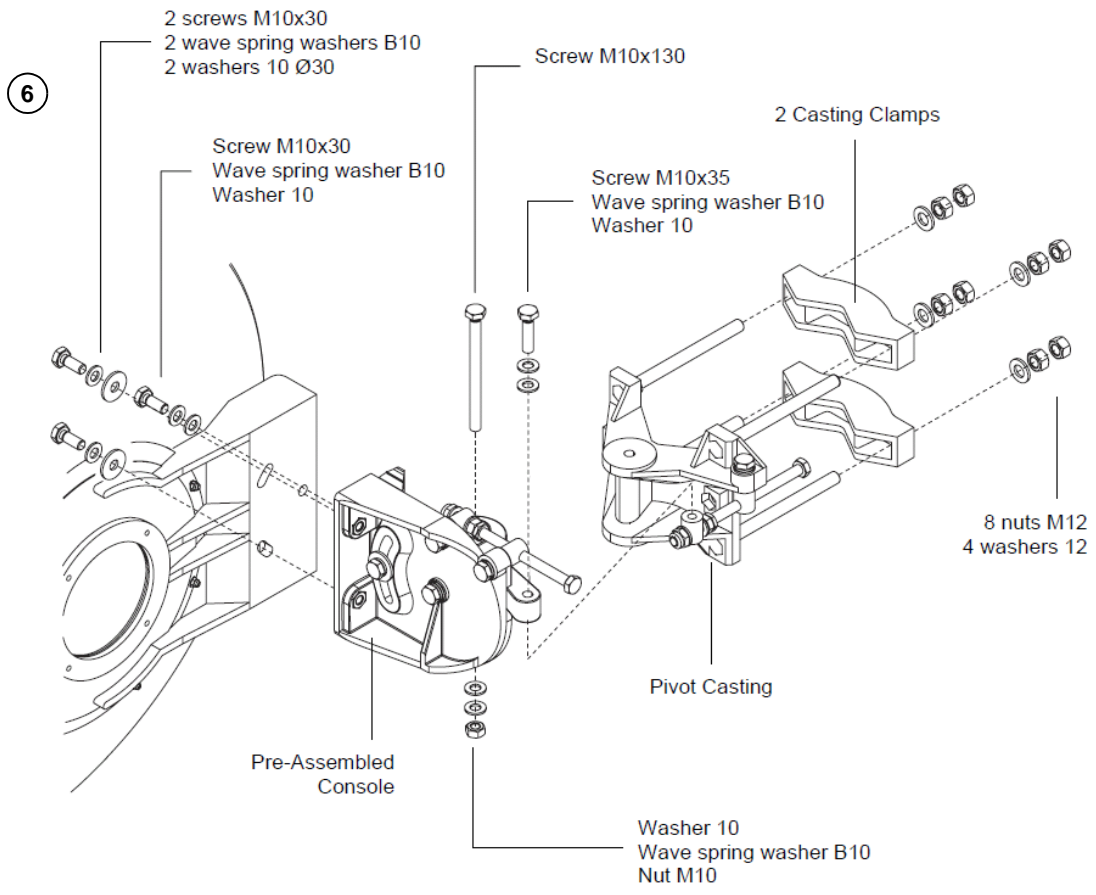
Step	Procedure
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ANTENNA DIRECT MOUNTING (10-38 GHz Band ODU)

**MOUNT ASSEMBLY (RFS C-Mount Type)**



RFS C-Mount TYPE BRACKET



**RFS C-Mount TYPE BRACKET**

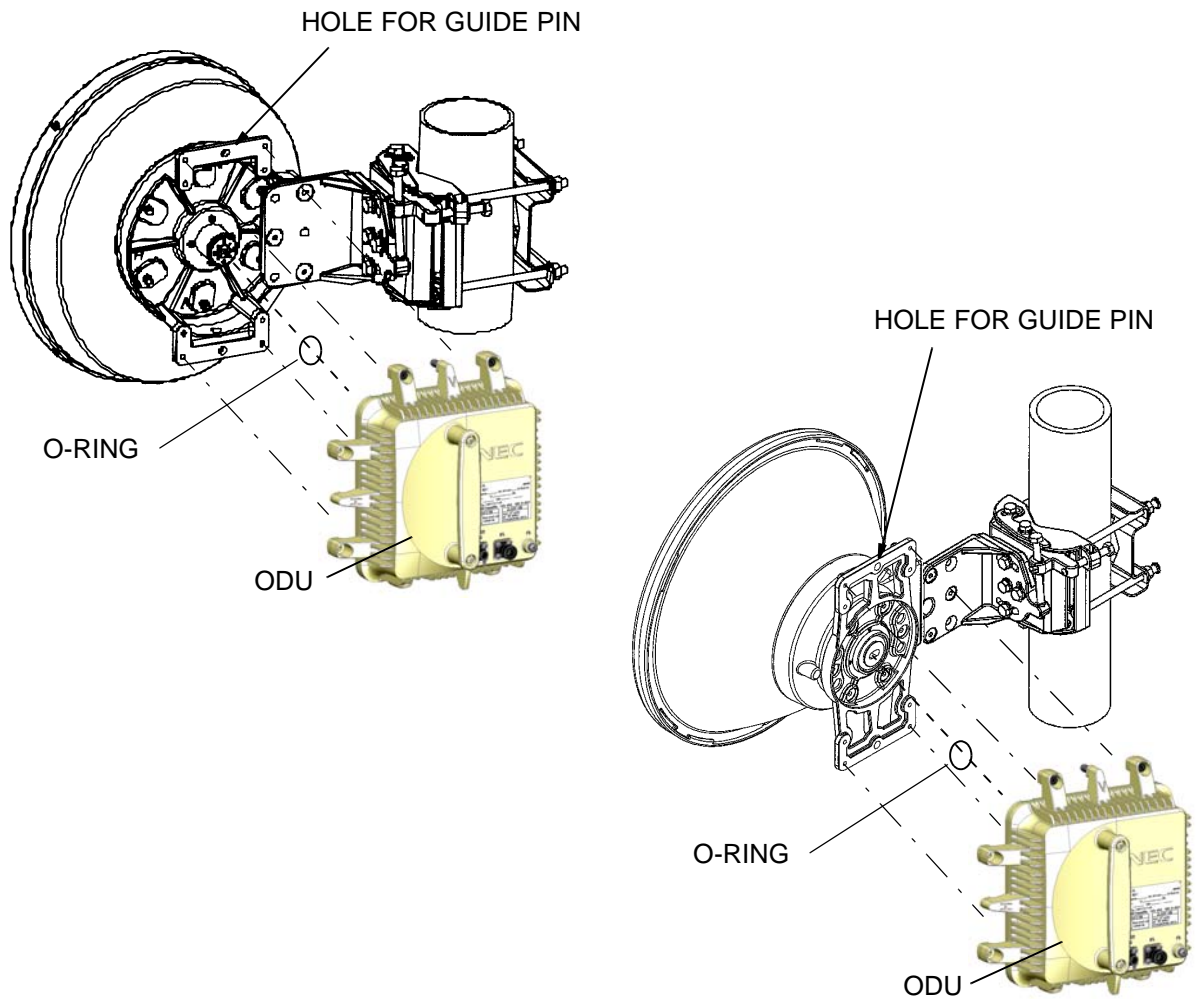


Chart 2-7 (Cont'd)

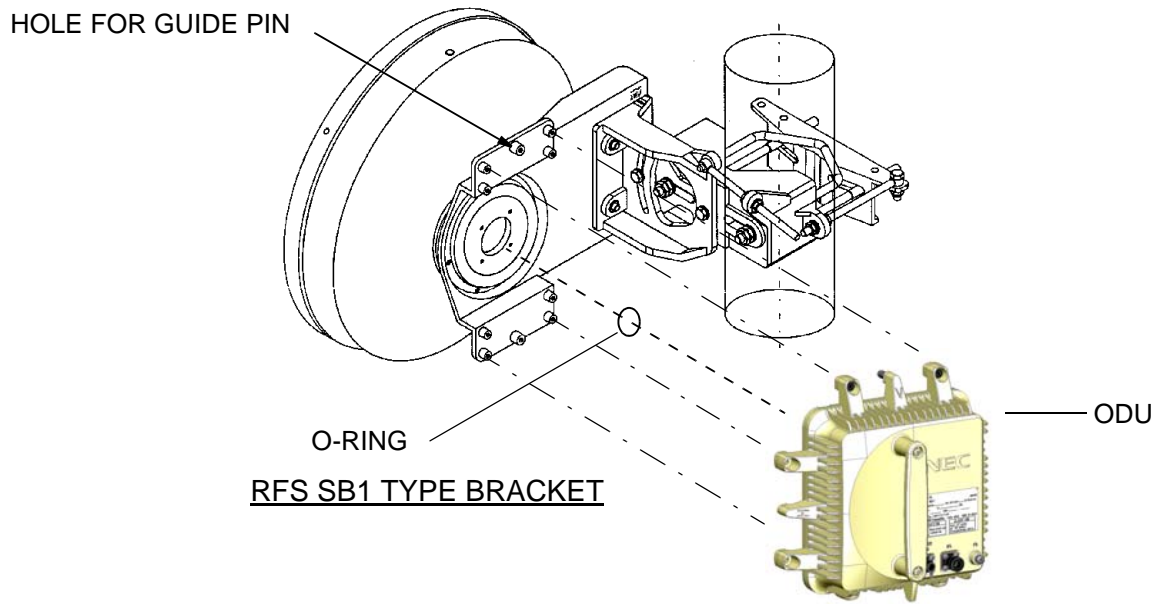
Step	Procedure
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3 Fix the ODU to the bracket by tightening the M6 screws (four locations),

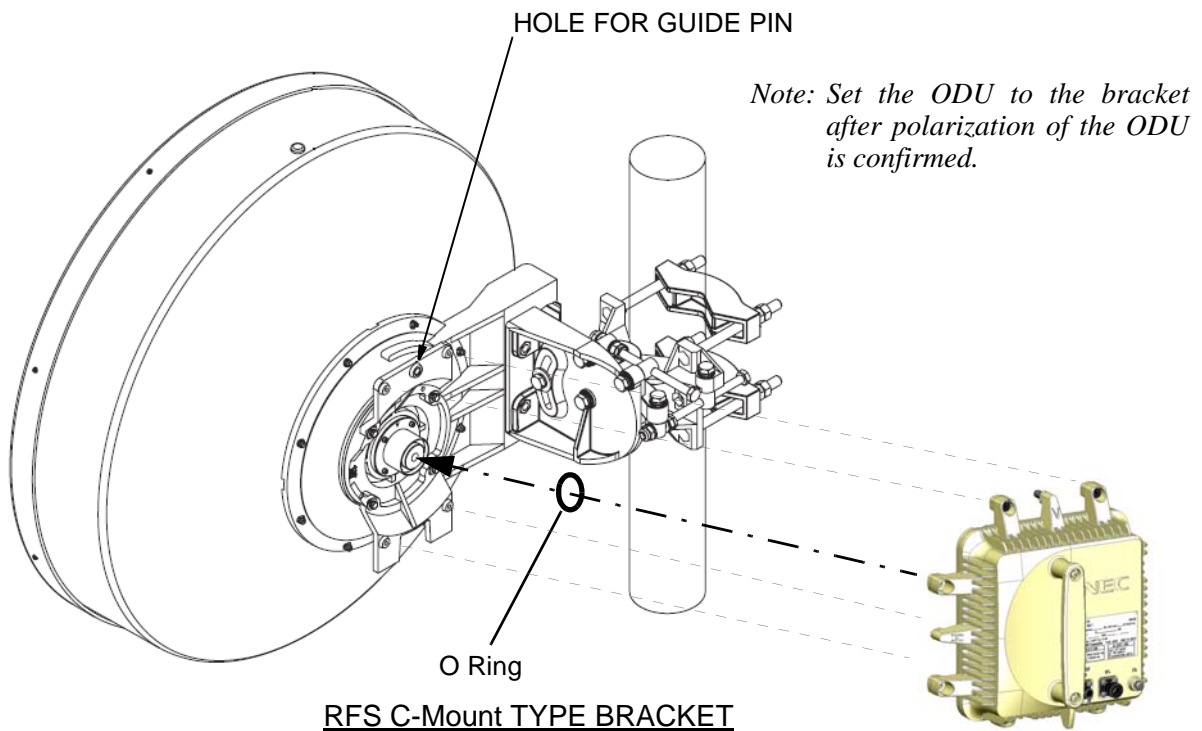
- Notes: 1. Figure shows V polarization.  
 2. Be careful not to damage the O-ring (Antenna).  
 3. The tightening torque is 4.0 N-m ± 10%.



ANDREW VHLP TYPE BRACKET



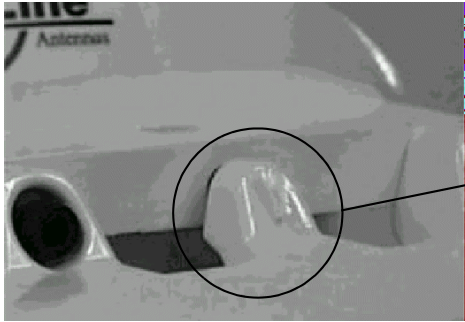
- Notes: 1. Figure shows V polarization.  
 2. Be careful not to damage the O-ring (Antenna).  
 3. The tightening torque is 4.0 N-m ± 10%.



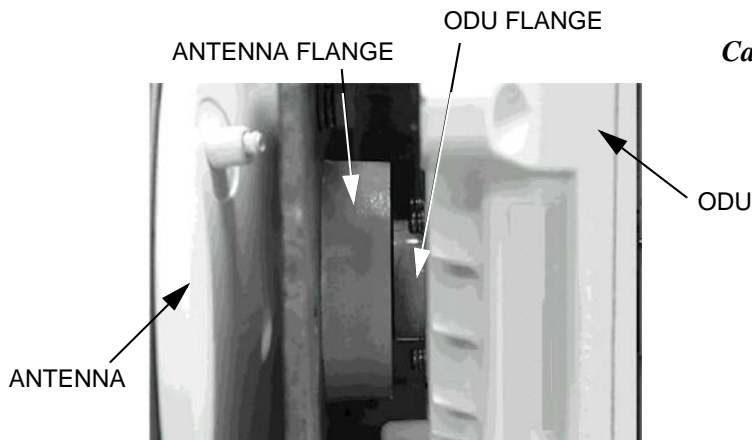
- Notes: 1. Figure shows V polarization.  
 2. Be careful not to damage the O-ring (Antenna).  
 3. The tightening torque is 4.0 N-m ± 10%.

Chart 2-7 (Cont'd)

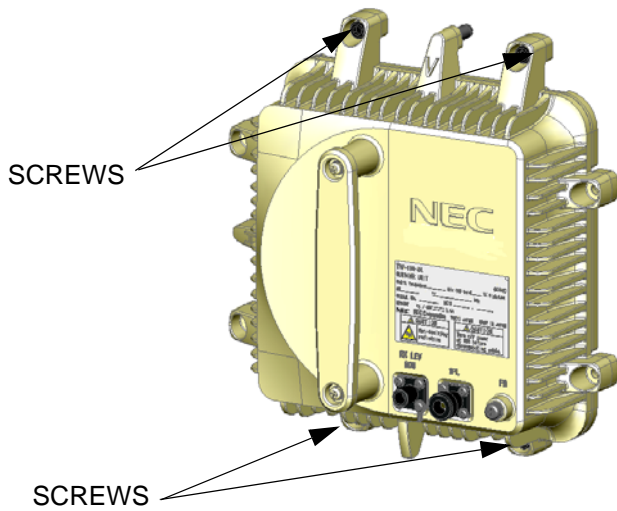
Step	Procedure
------	-----------



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%*

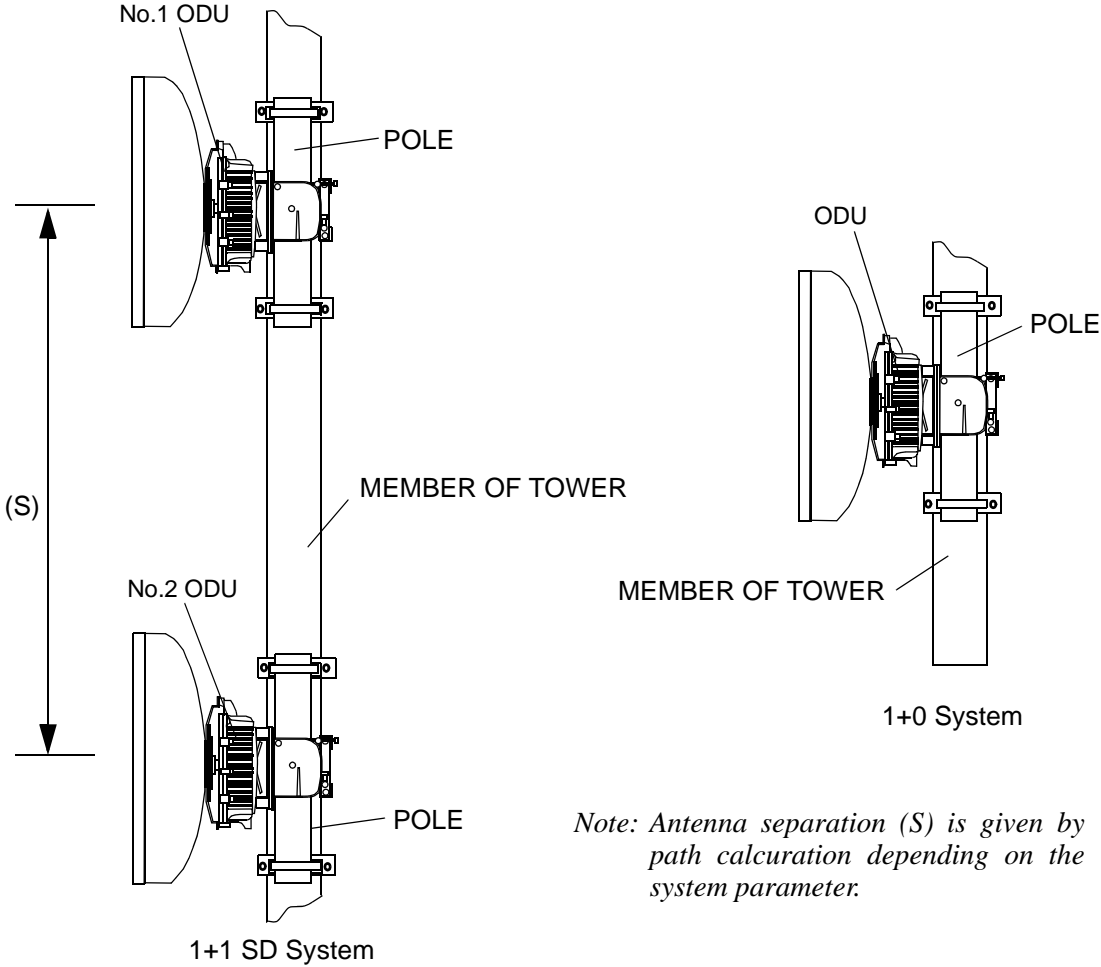
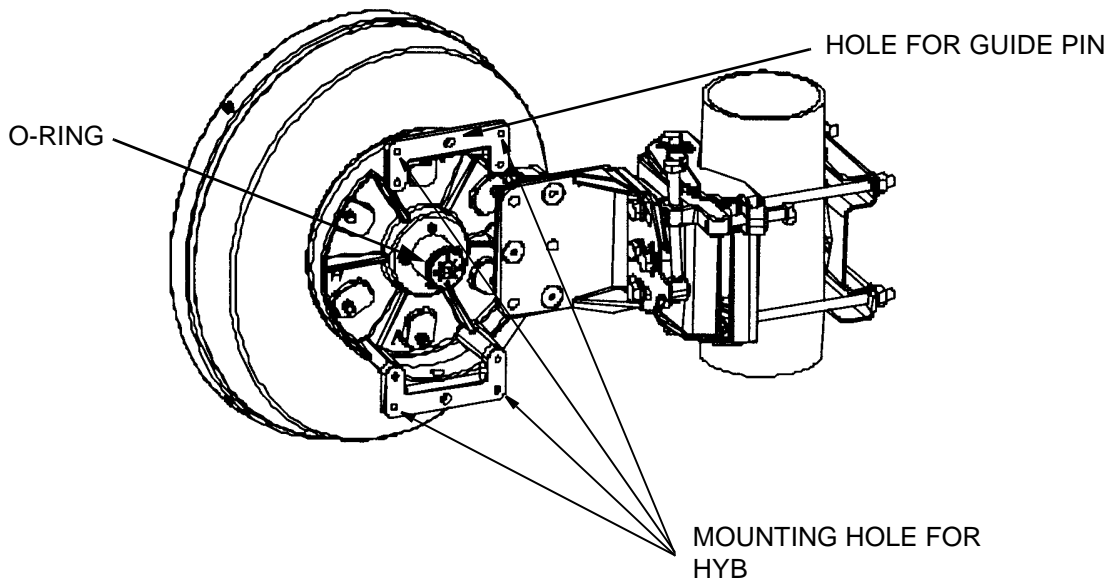


Chart 2-8 NLite E SONET OC-3Antenna Direct Mounting  
Using HYBRID

Step	Procedure
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MOUNTING

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

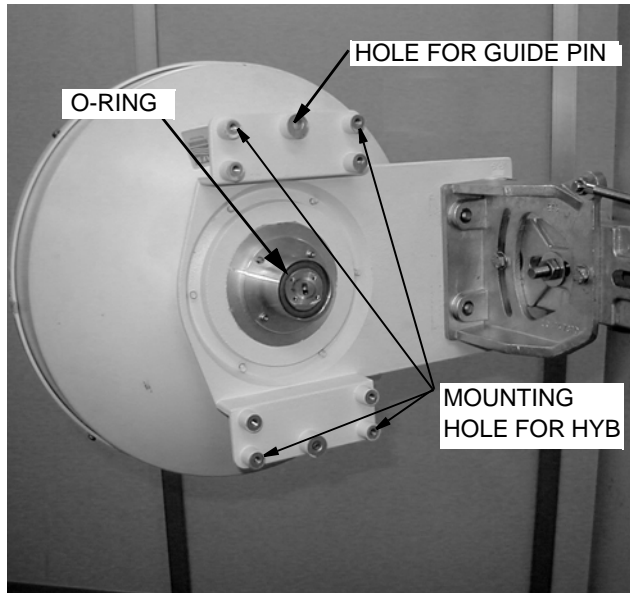


*The tightening torque is 4.0 N·m ± 10%.  
Be careful not to damage the O-ring(Antenna).*

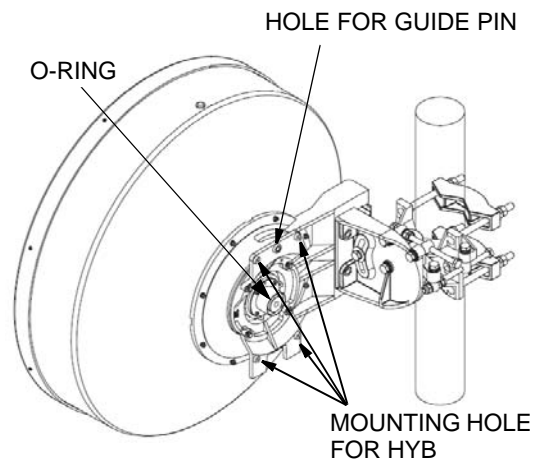
ANDREW VHLP TYPE BRACKET

Chart 2-8 (Cont'd)

Step	Procedure
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RFS SB1 TYPE BRACKET



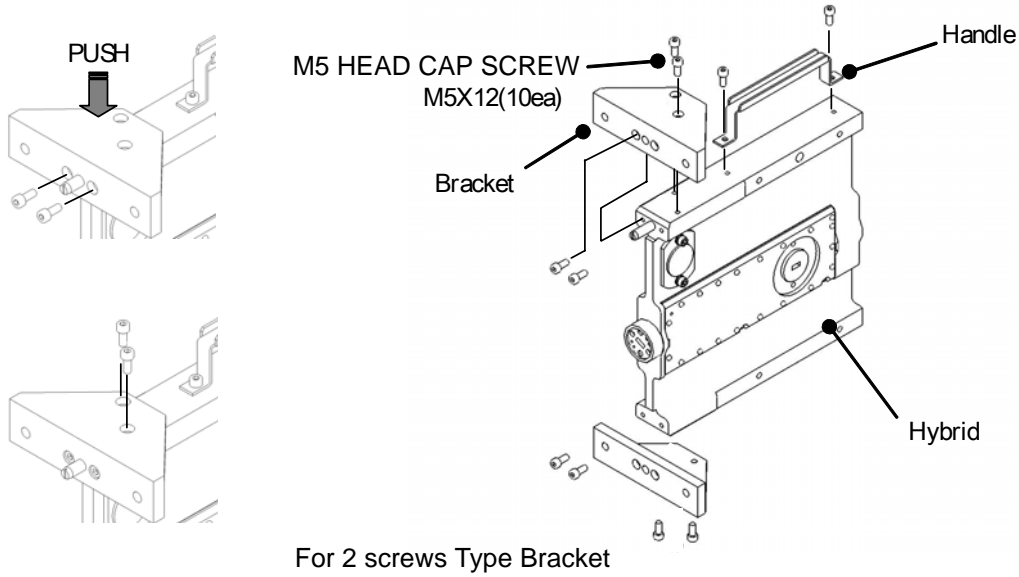
RFS C-Mount TYPE BRACKET

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

Chart 2-8 (Cont'd)

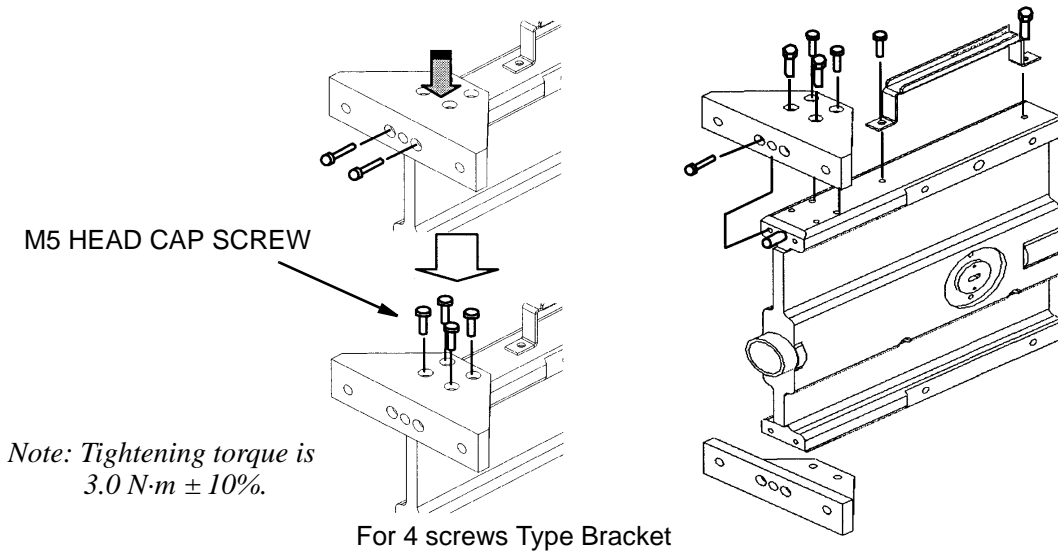
Step	Procedure
------	-----------

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



For 2 screws Type Bracket

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

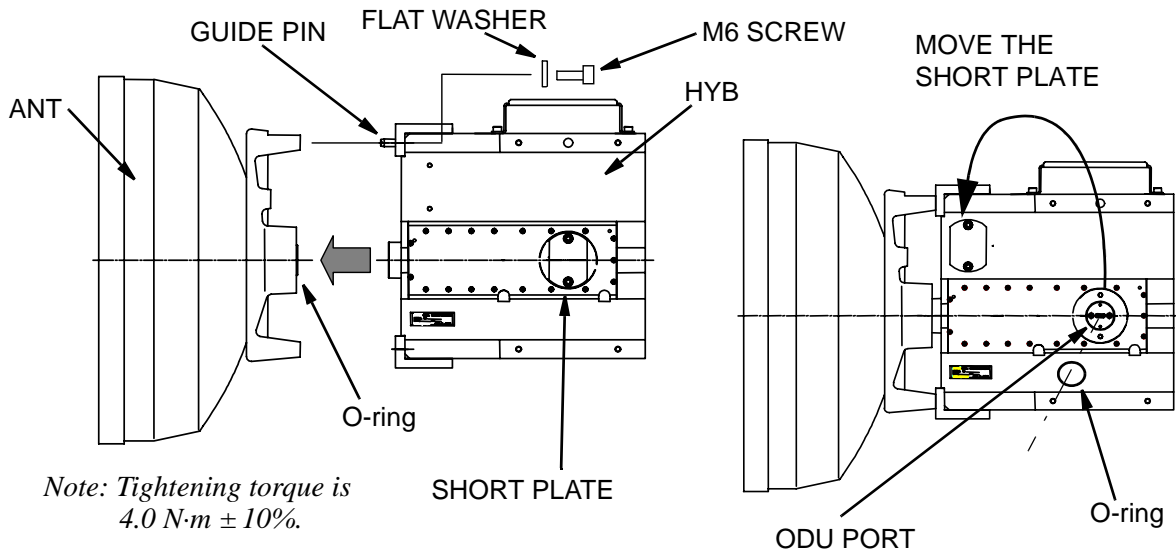


For 4 screws Type Bracket

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

Chart 2-8 (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).*

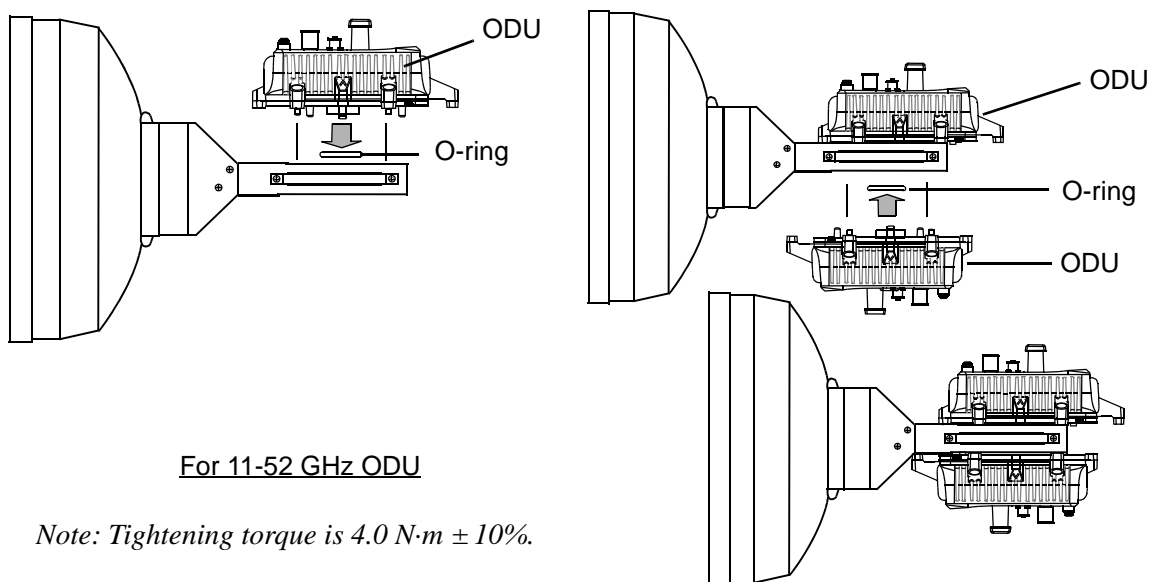




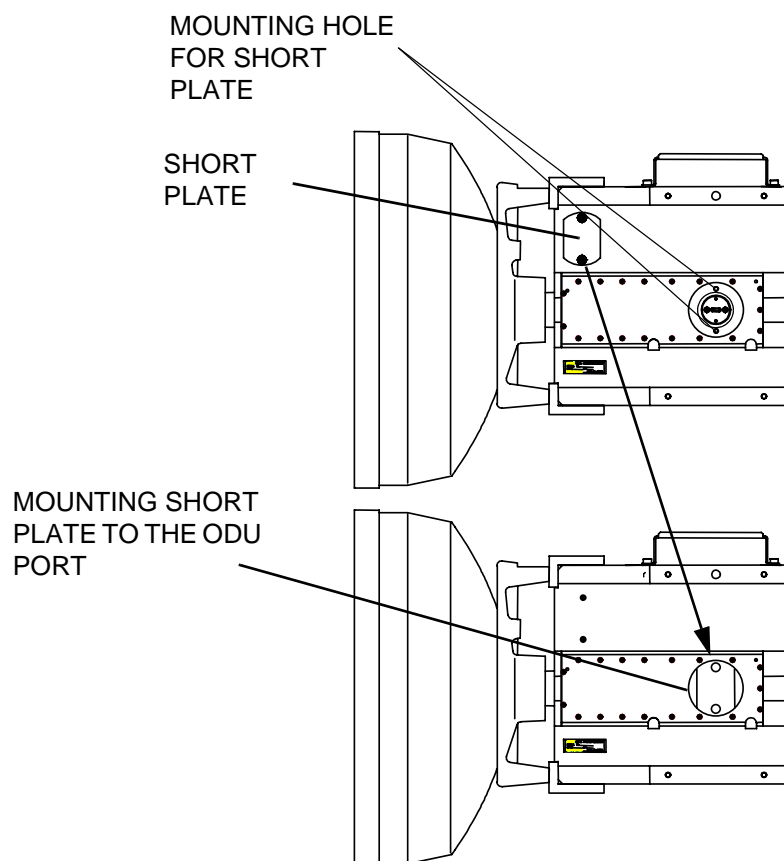
Chart 2-8 (Cont'd)

Step	Procedure
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DEMOUNTINGFROM 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 2-9 Antenna Direct Mounting Using TX SPAN ATT**

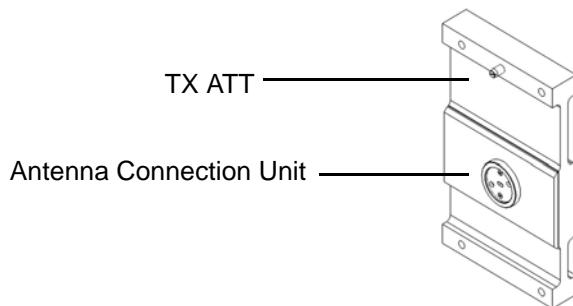
Step	Procedure
------	-----------

MOUNTING

TX SPAN ATT

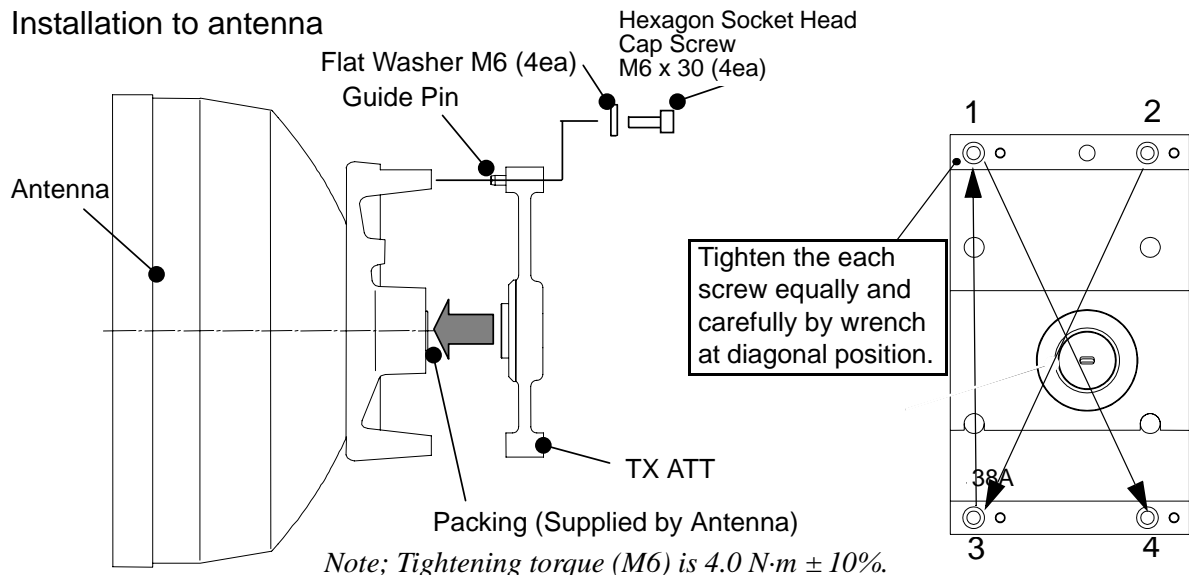
Step	Procedure
------	-----------

- 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).

Installation to antenna

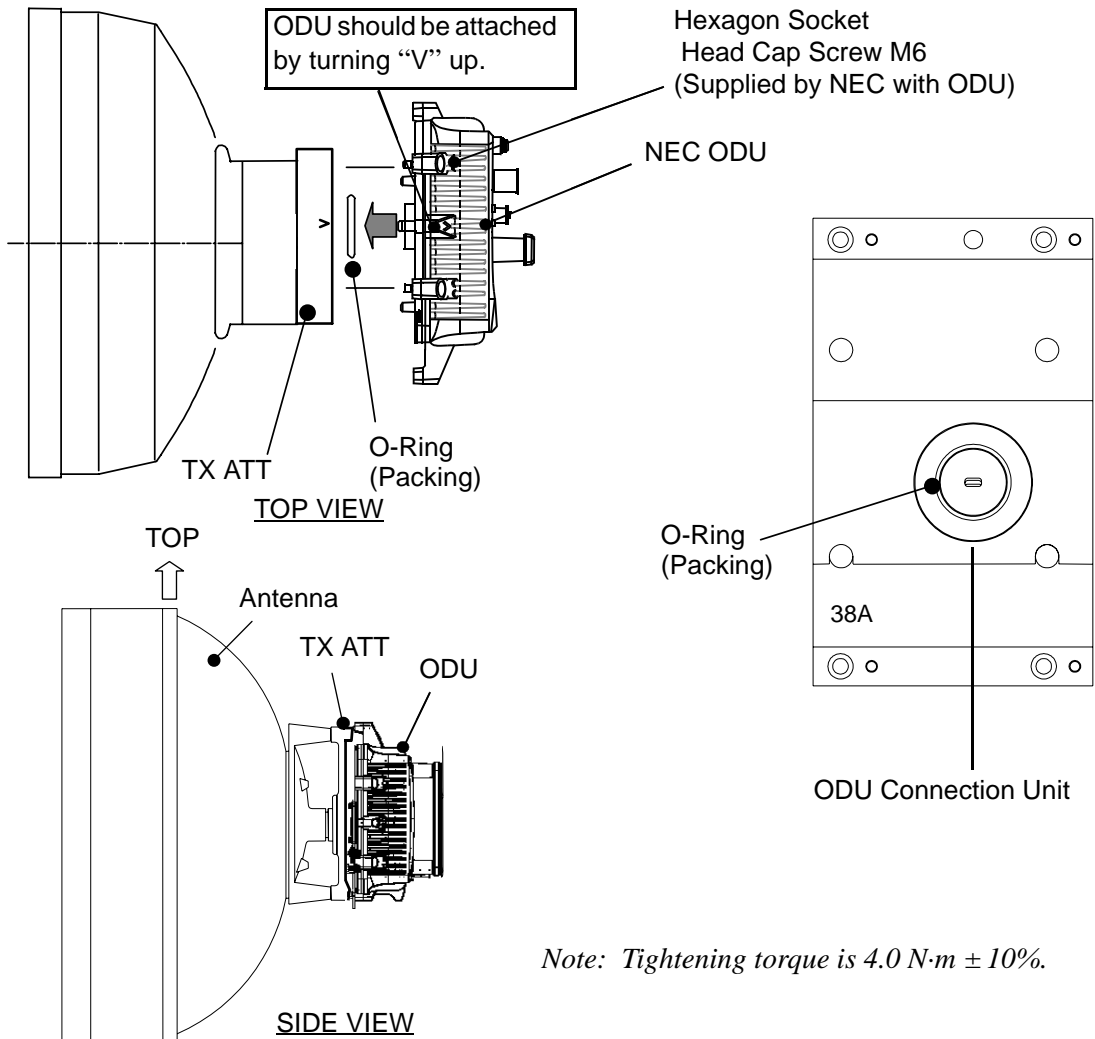


38 GHz Band ODU Mounting Using NEC TX SPAN ATT (1/2)

Chart 2-9 (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.
<i>Note: Be careful not to damage the O-rings (TX ATT).</i>	

Attachment of ODU



38 GHz Band ODU Mounting Using NEC TX SPAN ATT (2/2)

**Chart 2-10 11-38 GHz Band ODU Mounting with HYB  
(Waveguide Connection)**

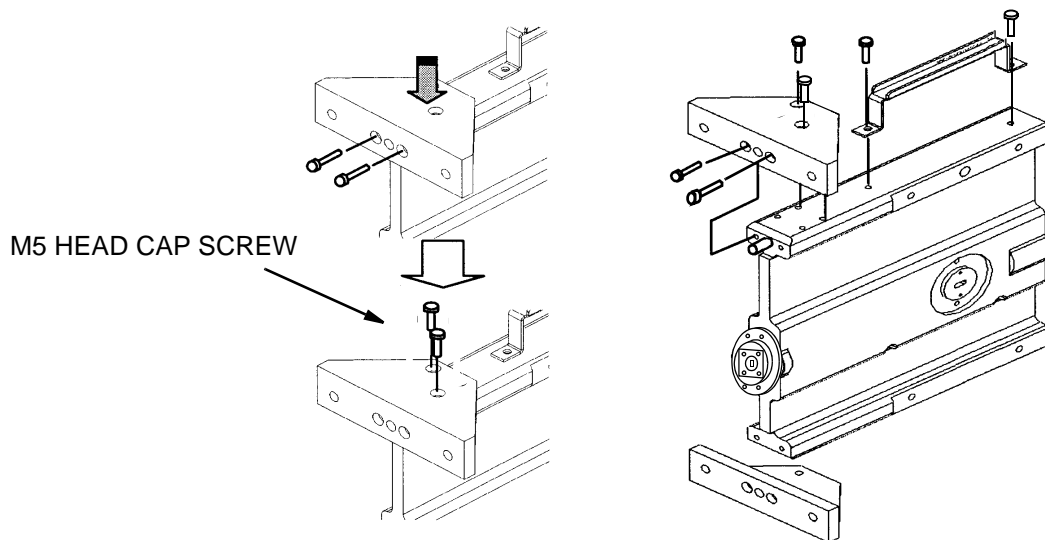
Step	Procedure
------	-----------

**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)	10(14)*
7	M3 × 10 Hexagon Head Screw with Washer (×4) (SS)	4

*Notr: \*For 4 screws Type Bracket*

- 1 Assemble the bracket and handle to the HYB.



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

Chart 2-10 (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 x 200 Hexagon Head Screw with Nut (x2), Flat Washer (x2)(ST)	4
5	M6 x 25 Hexagon Head Screw with Nut (x1), Flat Washer (x2), Spring Washer (SS)	4
6	M6 x 35 Hexagon Head Screw with Nut ( x2), Flat Washer (x2)(SS)	4

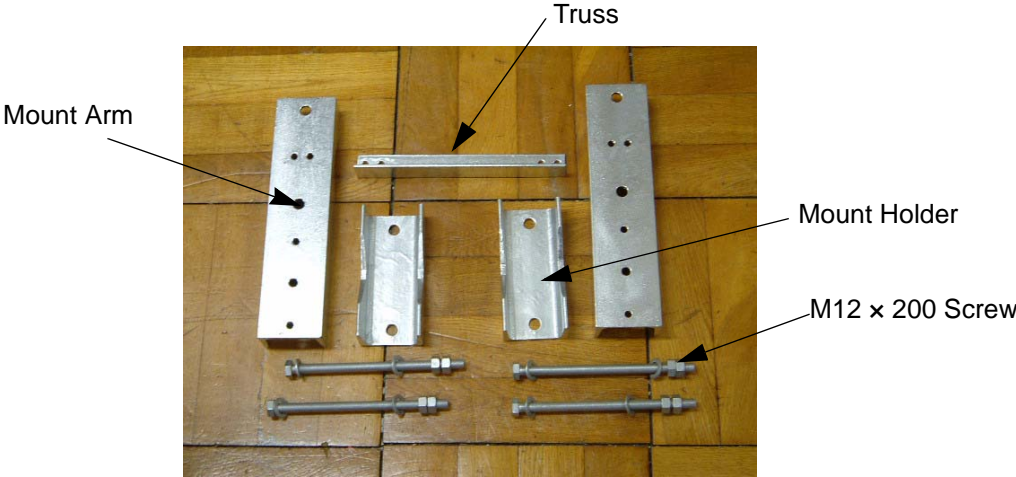


Chart 2-10 (Cont'd)

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

- 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%

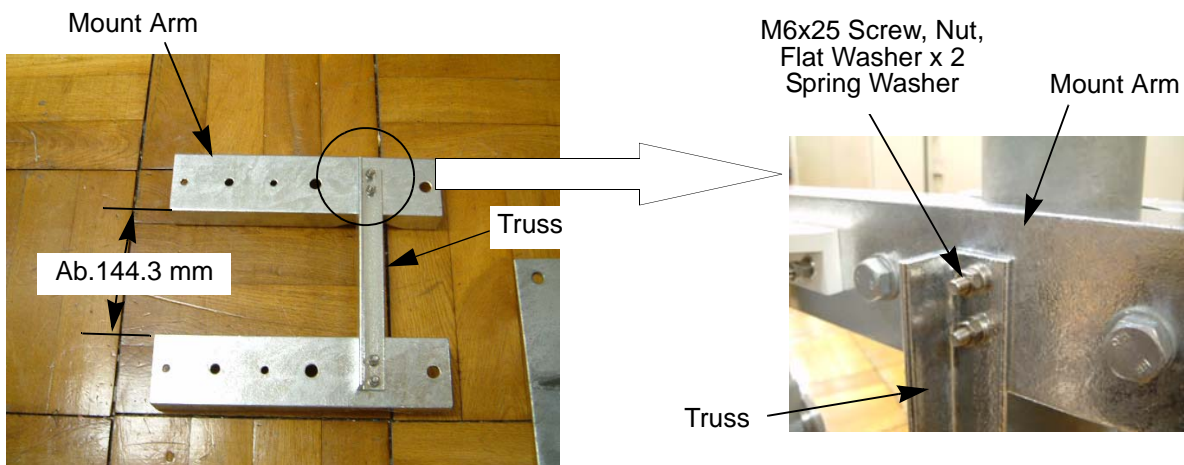
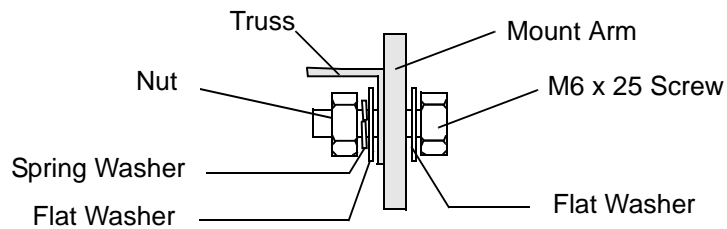
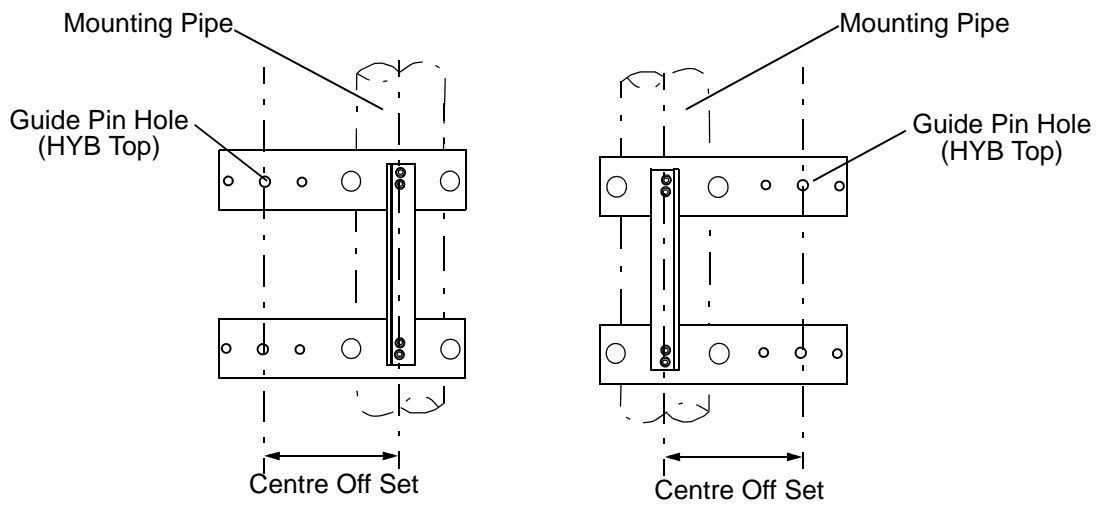


Chart 2-10 (Cont'd)

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

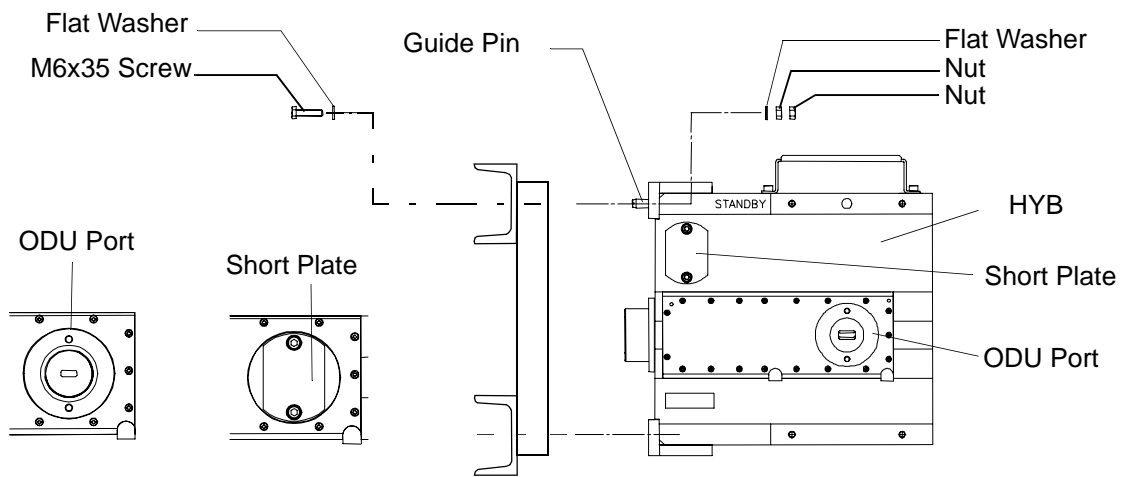
4	Determine centre off set,
---	---------------------------



- |   |   |
|---|---|
| 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 2-10 (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%.*

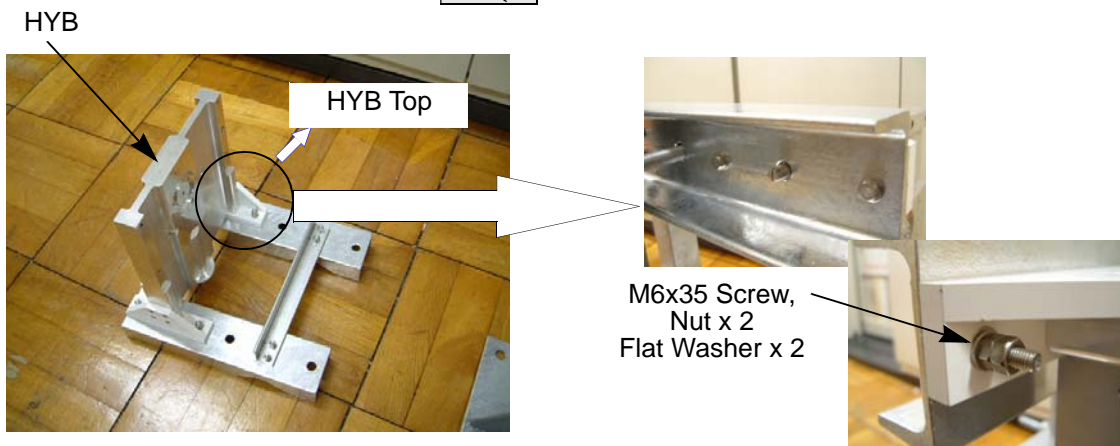
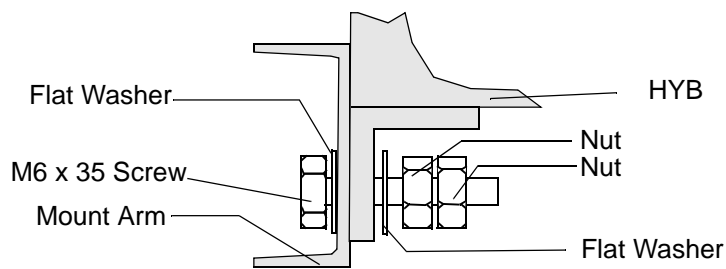




Chart 2-10 (Cont'd)

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

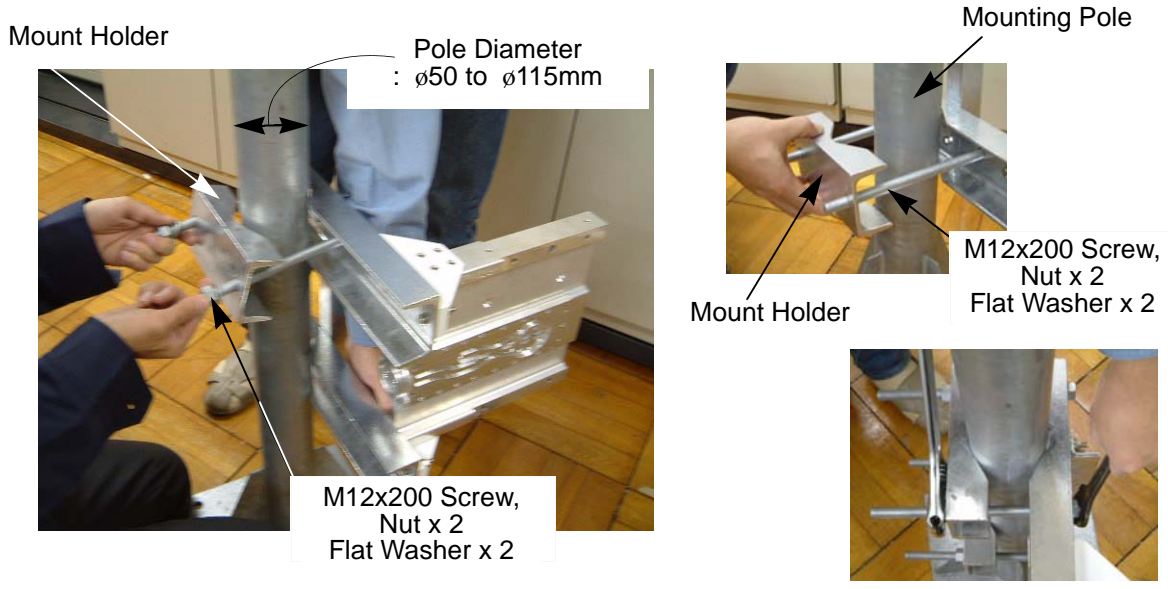
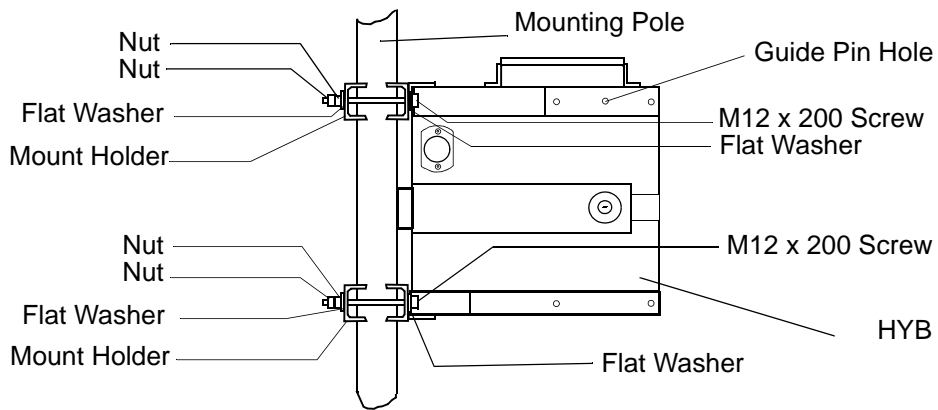
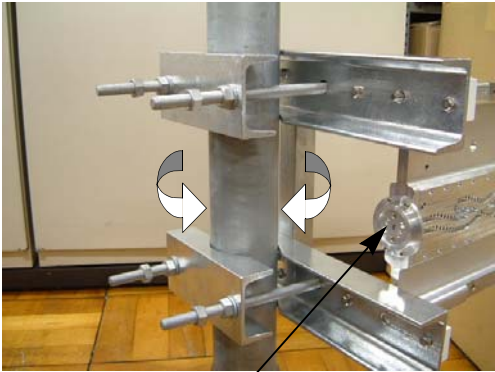


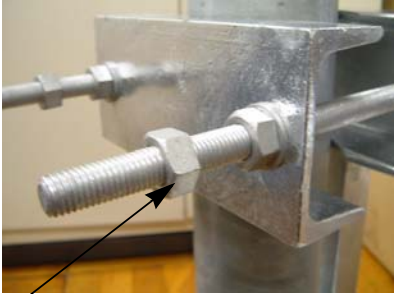
Chart 2-10 (Cont'd)

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

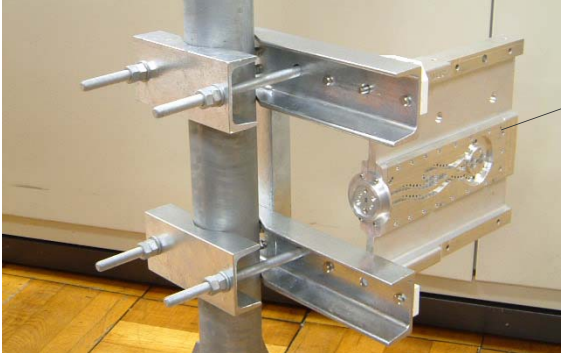
Double Nut tightening  
Determination of the attachment direction.



Waveguide Port



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



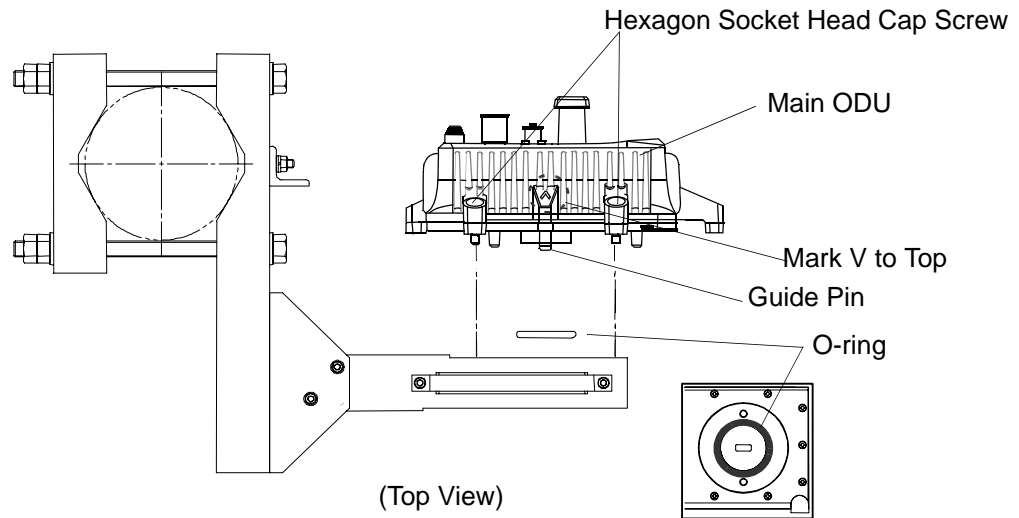
HYB

- 9 Confirm the ODU Type, which is Master or Slave,  
**Caution: The same type must be installed onto the HYB.**

Chart 2-10 (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.*

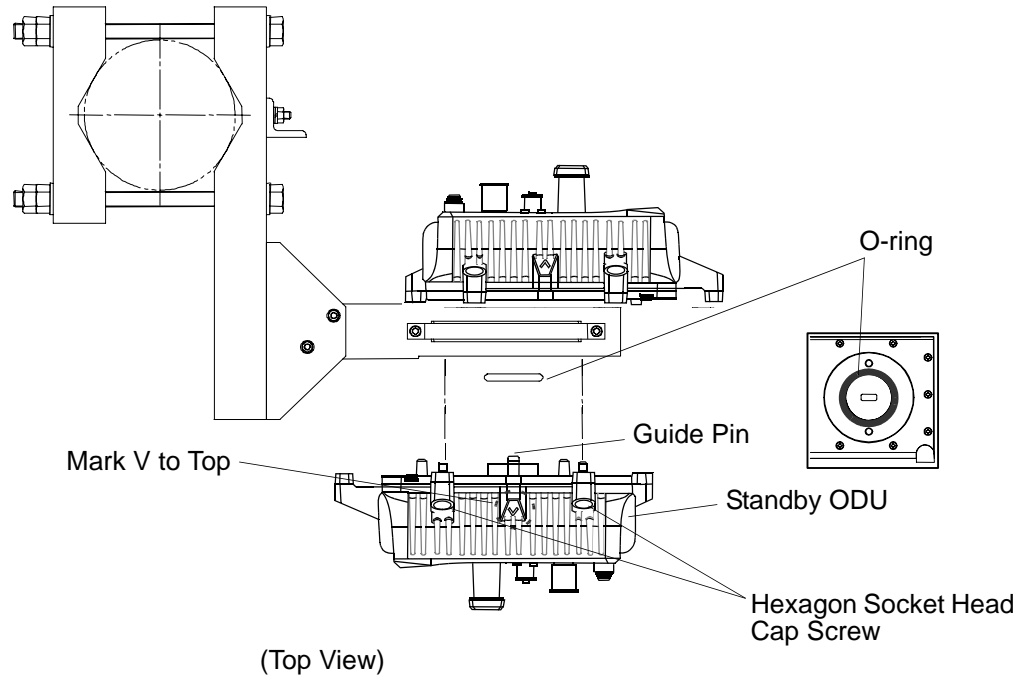
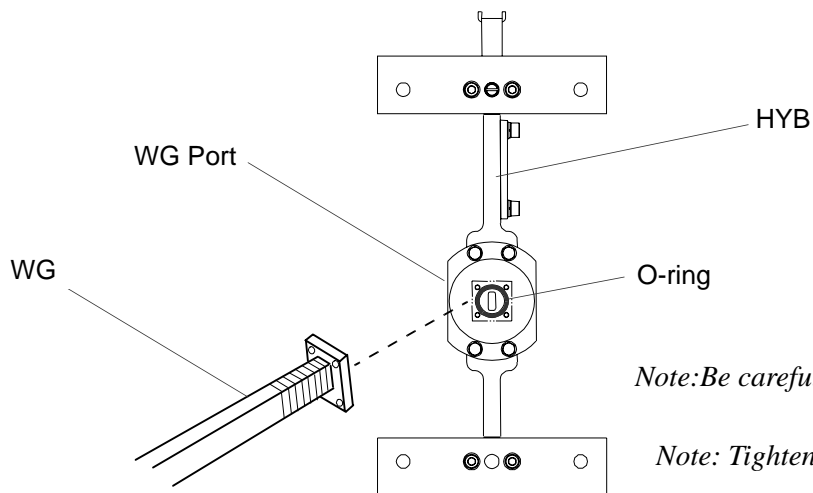
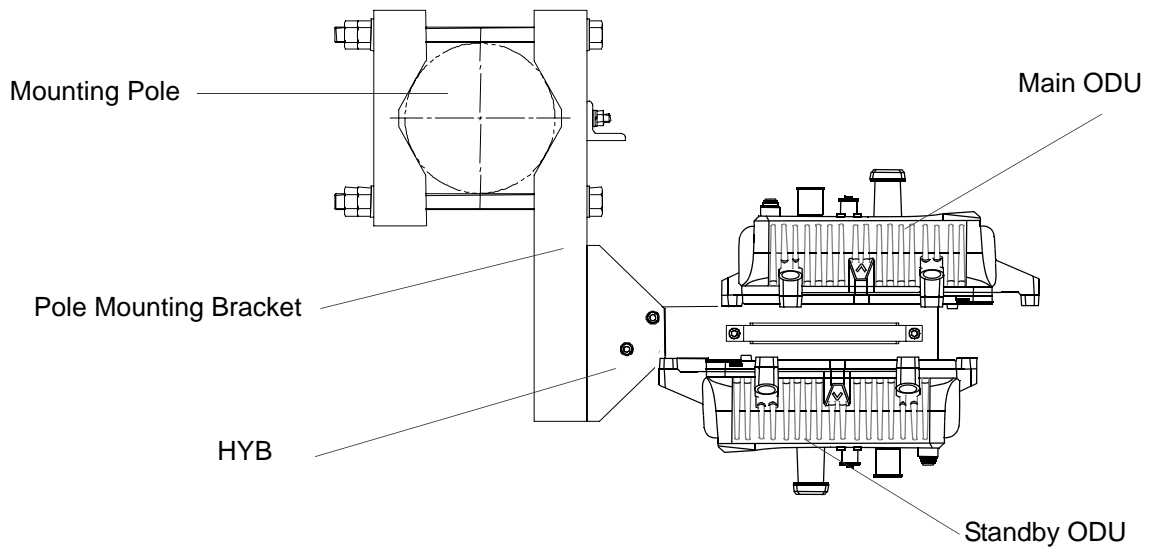


Chart 2-10 (Cont'd)

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



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

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

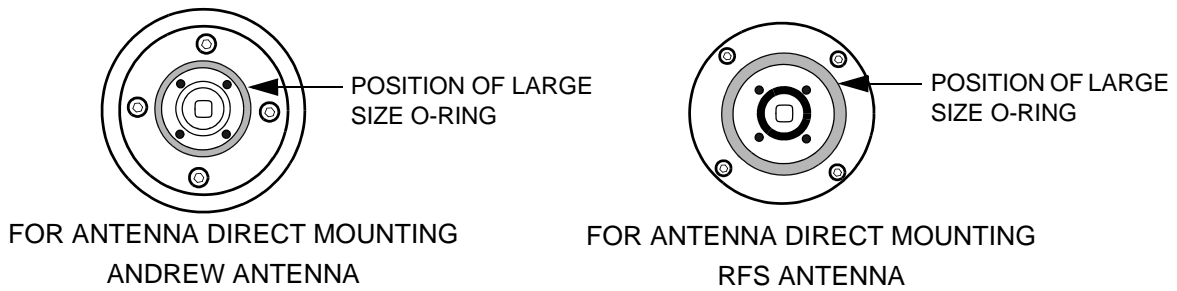
**Chart 2-11 11-38 GHz Band ODU Mounting with OMT  
(Antenna Direct Mounting)**

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.**



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

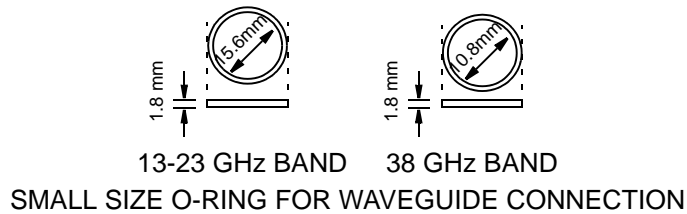


Chart 2-11 (Cont'd)

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

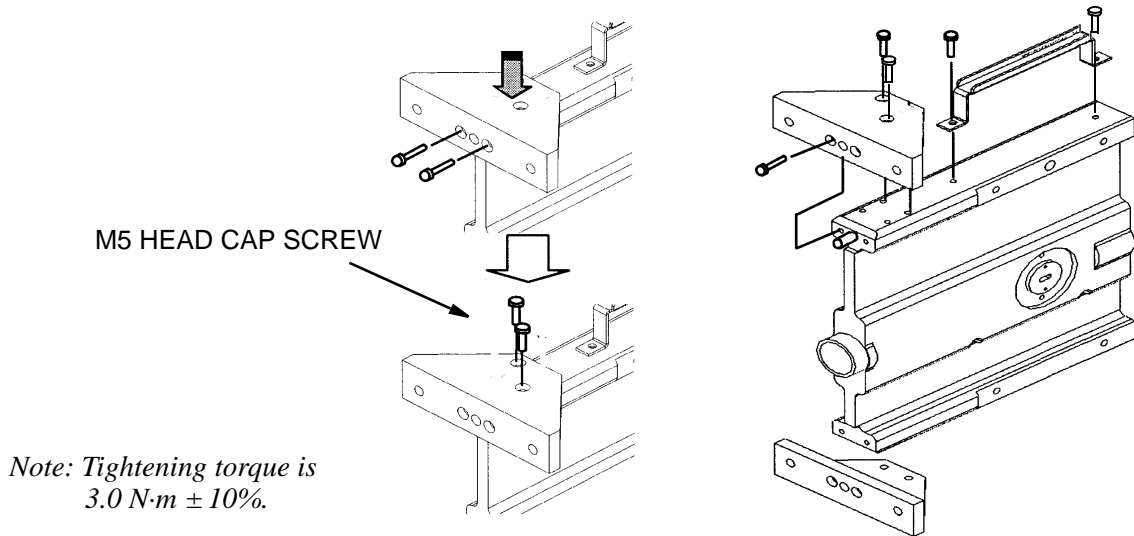
*Caution : For connecting the OMT to the antenna, the circular type waveguide flange of the antenna is applied to the XPIC system. When the V/H flange is mounted to the antenna, it must be changed to a circular type.*

*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.*

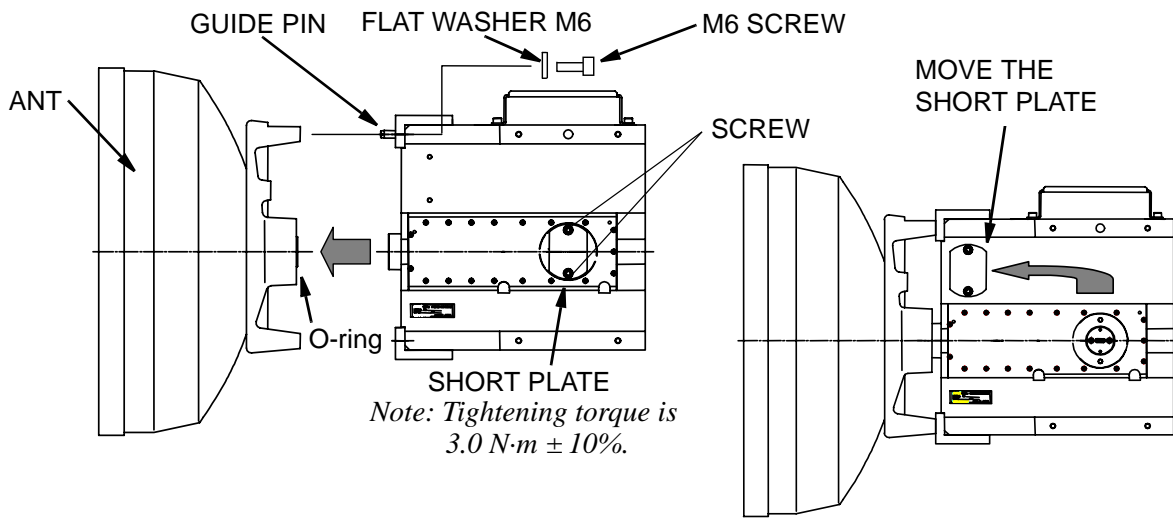
Chart 2-11 (Cont'd)

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

- 1 Fix the bracket and handle to the OMT.



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



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

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

Chart 2-11 (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,  <i>Note: The ODU should be attached by turning the plate marked "V" up position for both Main Master ODU and SUB Master ODU.</i>
5	Insert the guide pin removed in step 4 behind the plate marked V,  <i>Note: Remove the protection metallic plate covering the waveguide hole on ODU.</i>

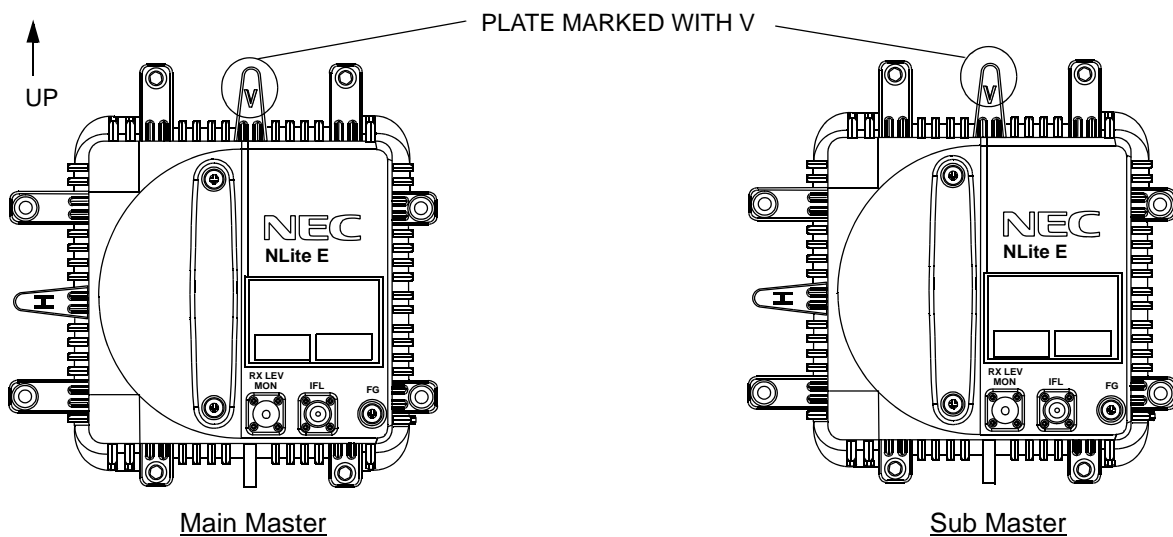
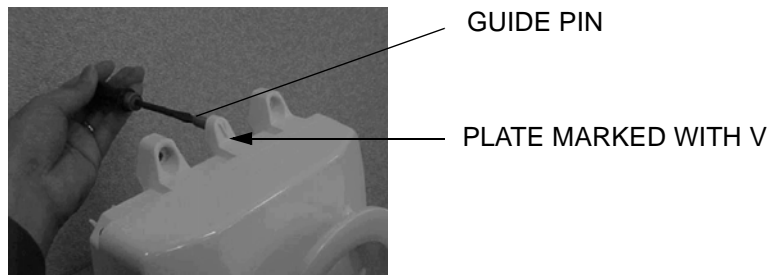


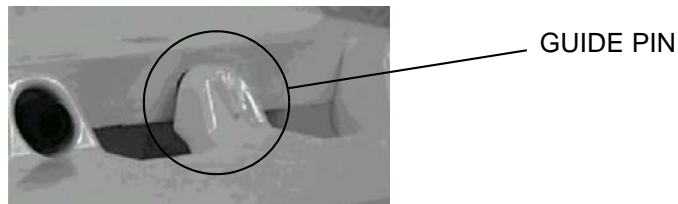


Chart 2-11 (Cont'd)

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

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

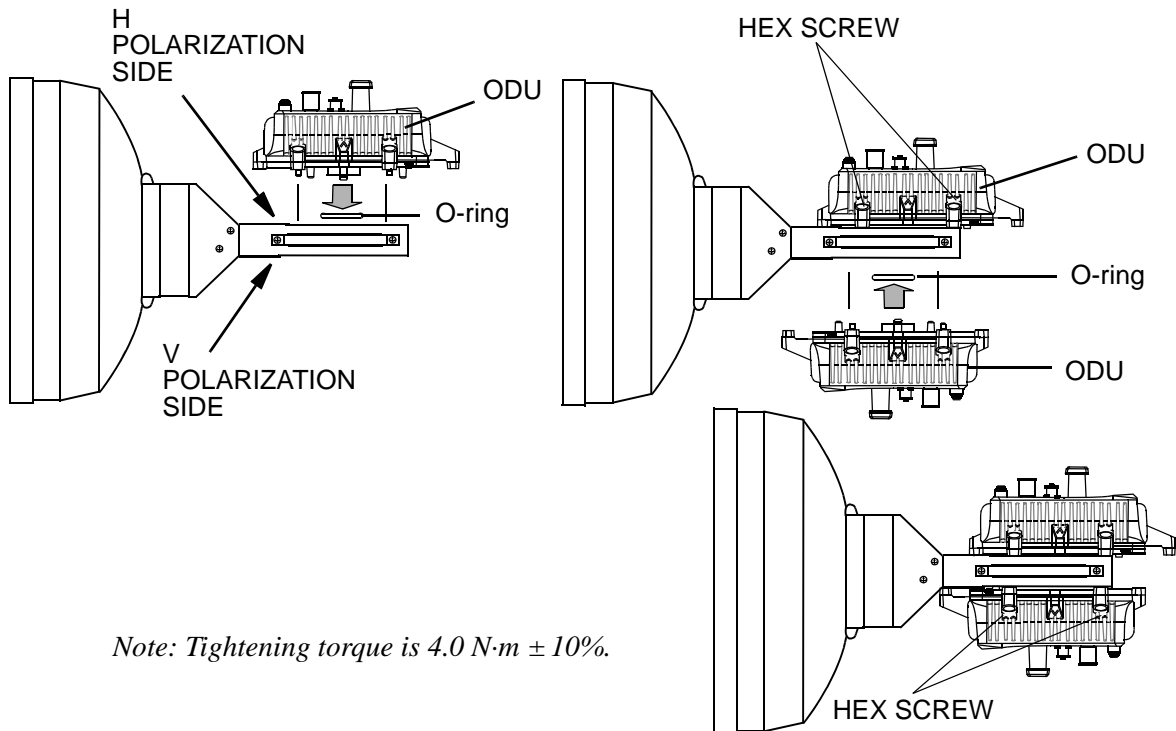
7 Insert the guide pin into the hole of the OMT and set the position of screws,



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%.*

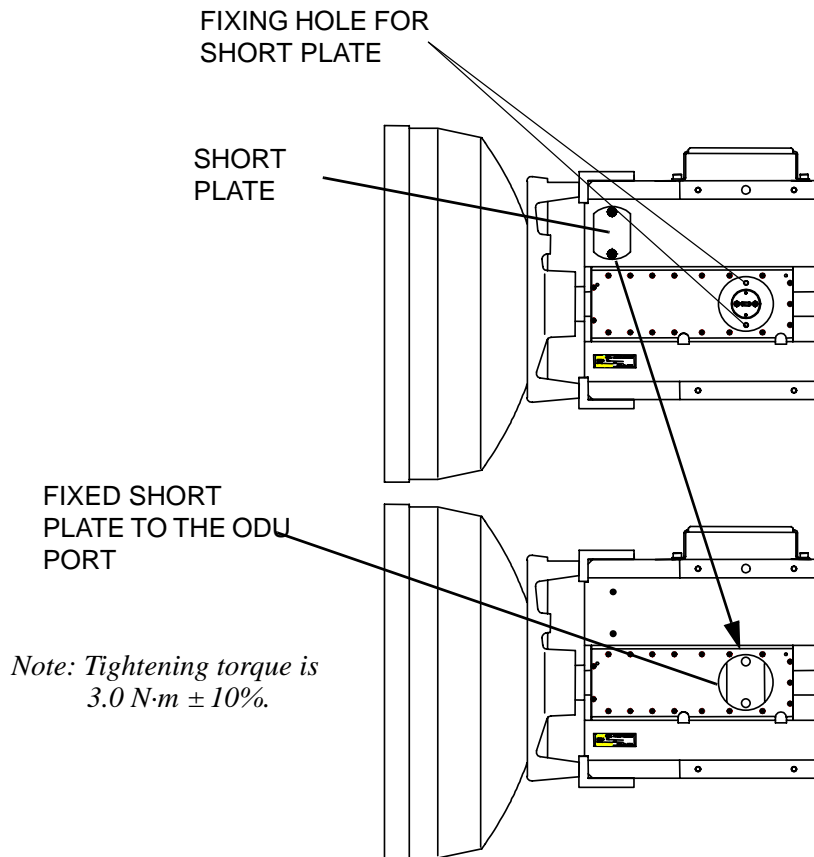
Chart 2-11 (Cont'd)

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.*



## 2.7 Feeder Connection

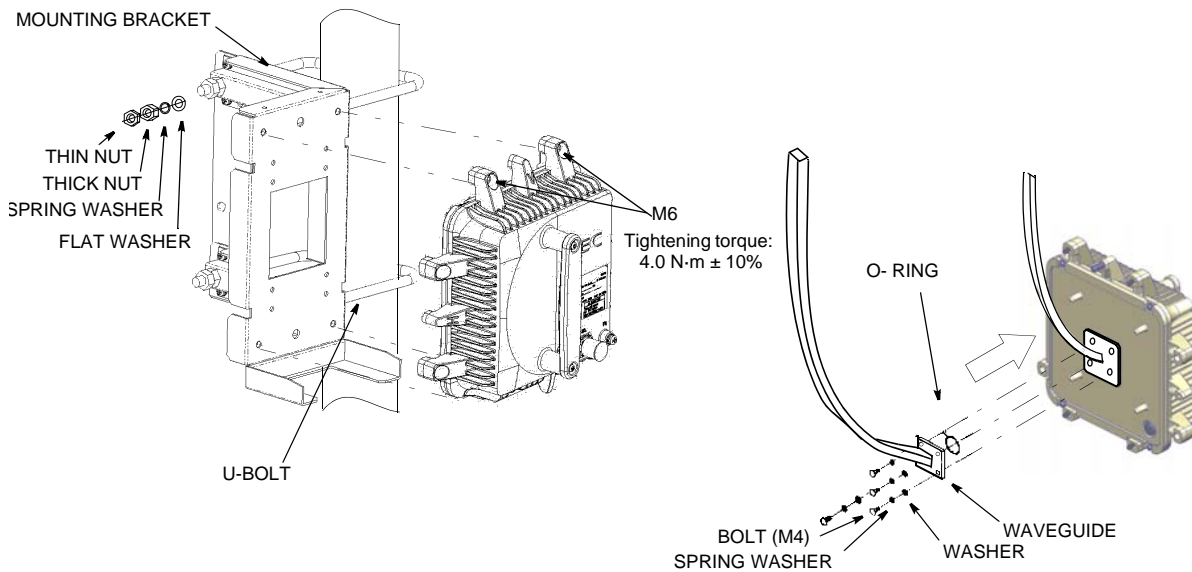
The connection method of the waveguide type ODU is described in following procedure.

**Chart 2-12 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.*

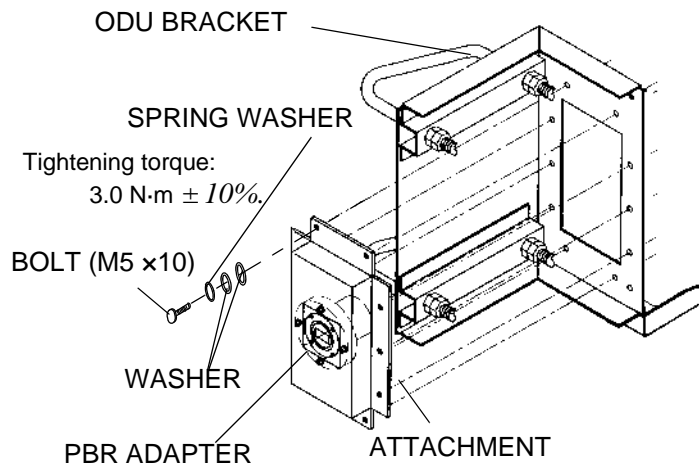
*2. Connection of the waveguide is the same way as ODU is wall mounted or 19-inch rack mounted.*

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

Chart 2-12 (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,

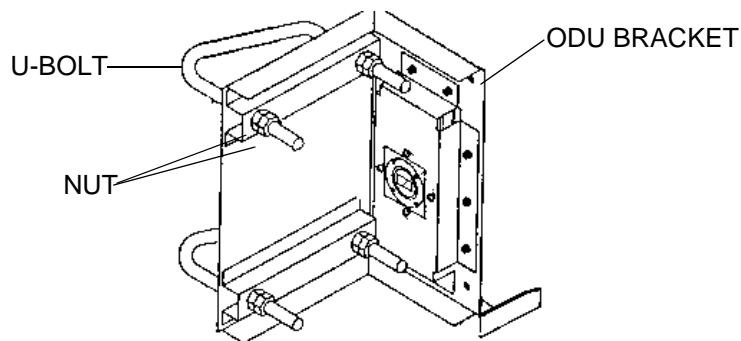
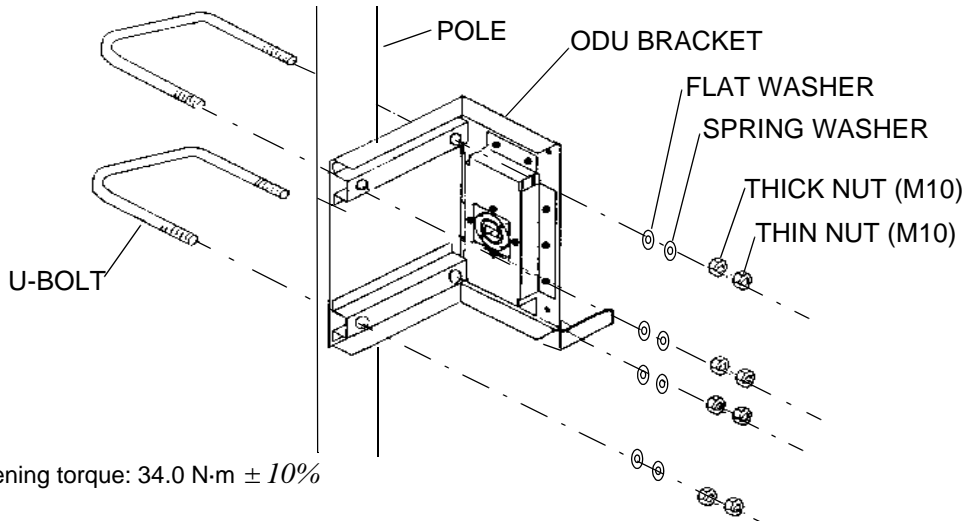


Chart 2-12 (Cont'd)

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.*

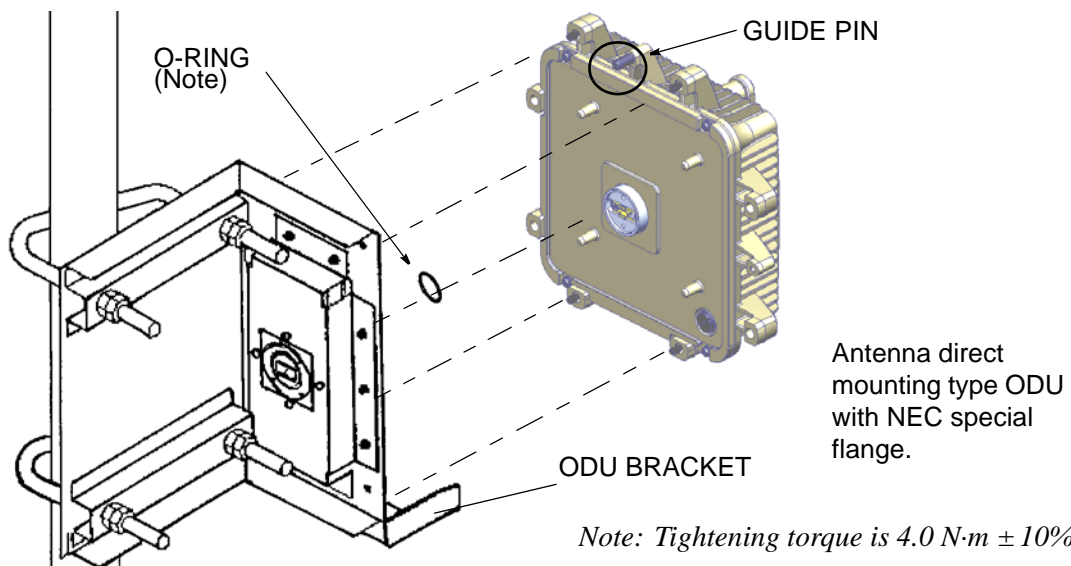


Chart 2-12 (Cont'd)

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.*

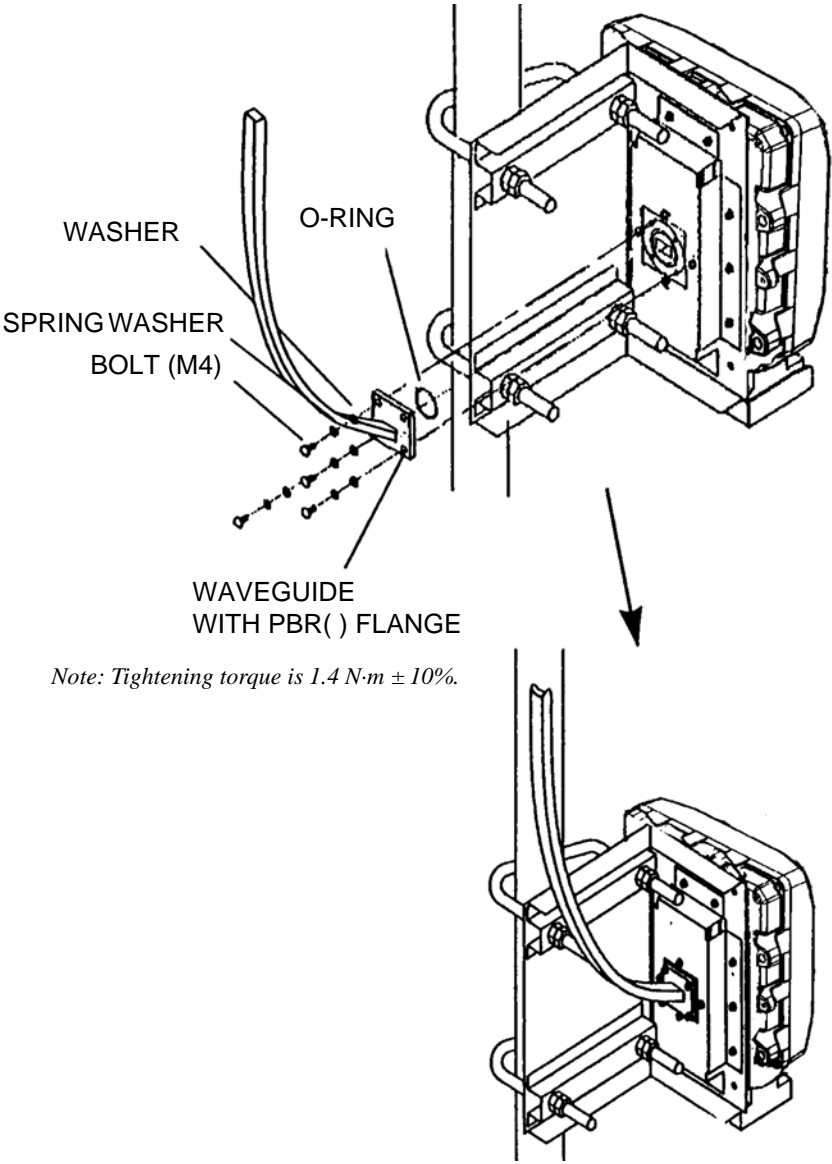
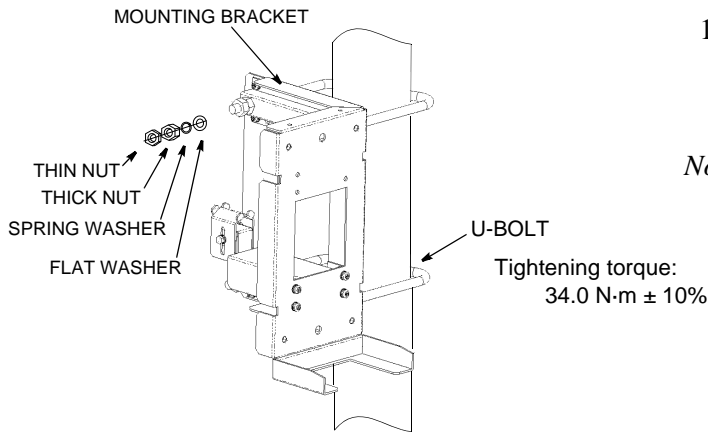


Chart 2-13 ODU Mounting for Connecting Coaxial Cable

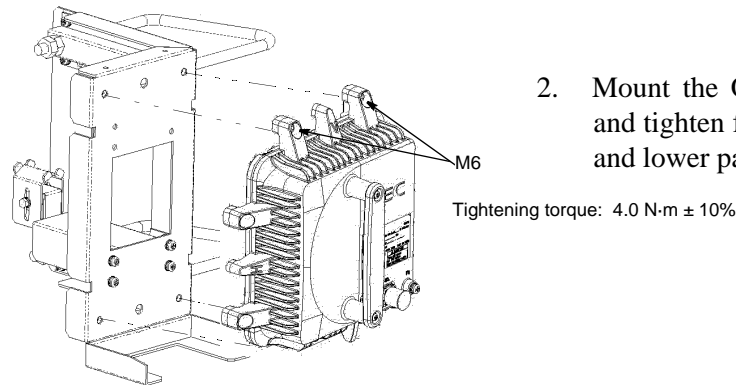
Step	Procedure
------	-----------

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

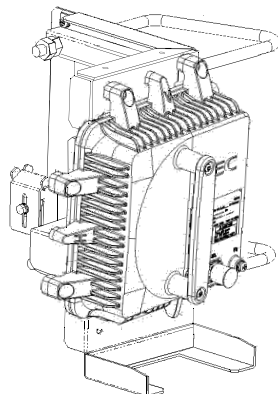


1. Mount the bracket to the pole, point to the opposite station and tighten it with two U-bolts,

*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,

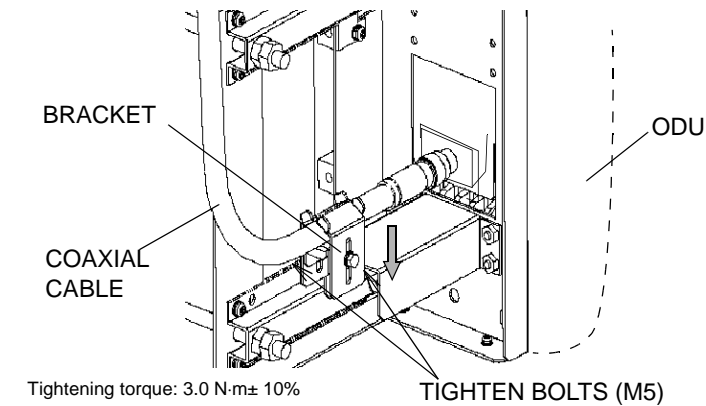


3. Check that the ODU and the bracket are fixed firmly,

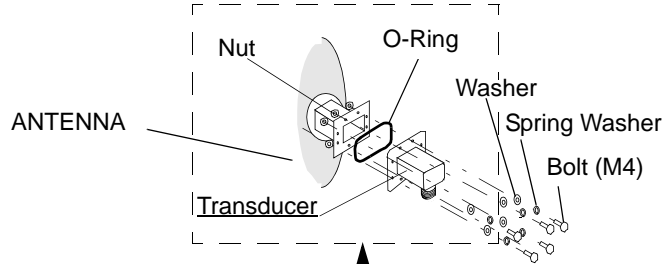
Chart 2-13 (Cont'd)

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

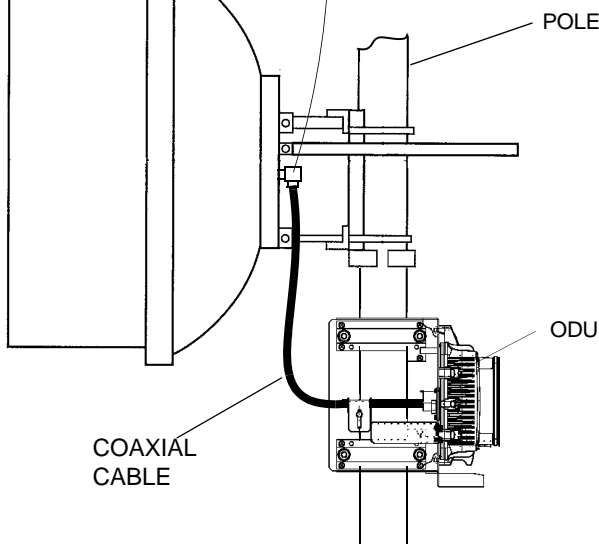


4. Connect the Coaxial cable to the RF IN/OUT connector of the ODU,
5. Down the cable fix bracket to fix the Coaxial cable, then tighten the two bolts,



(When the wave guide flange is provided to the antenna port, fit the transducer with eight bolts.)

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

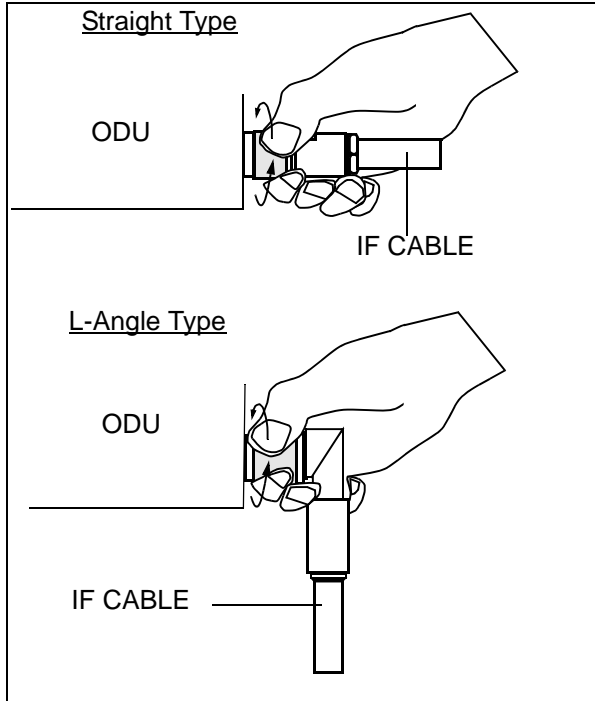


6. Install the Coaxial cables between the antenna and ODU.

*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.*



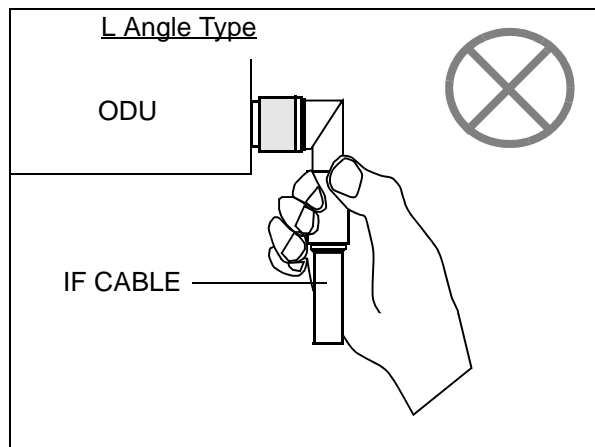


**Caution**

*When connecting the IF cable to the ODU, tighten the N-male connector with engage connector nut only using fingers and holding the cable with another hand.*

*Tighten the engage connector nut only for the L-angle connector also.*

*(Tightening Torque : 0.7 to 1.2 N•m  
(7 to 12 kg•cm))*

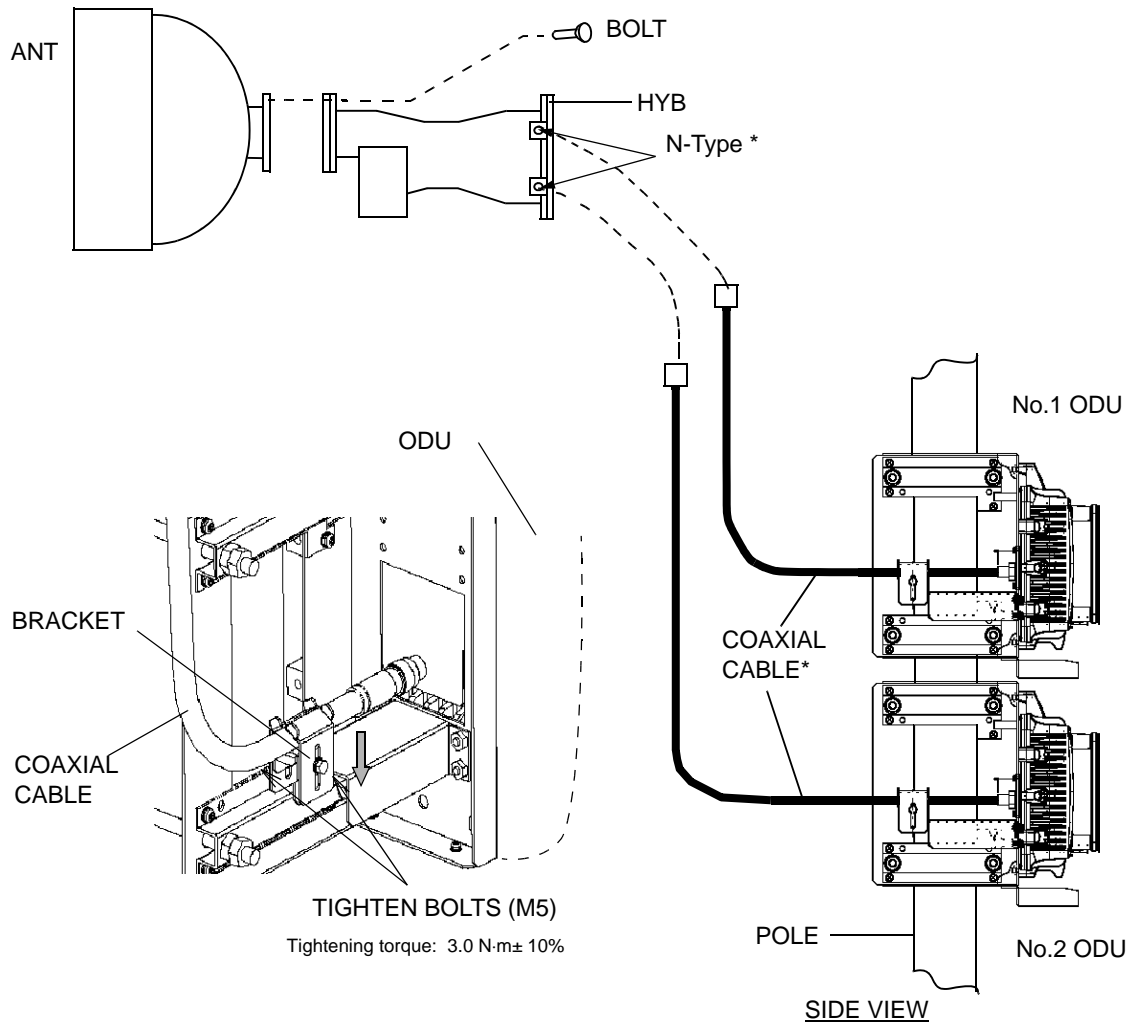


*If rotate other parts of the L-angle connector as illustrated left, it can cause connector damage.*

Chart 2-13 (Cont'd)

Step	Procedure
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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.

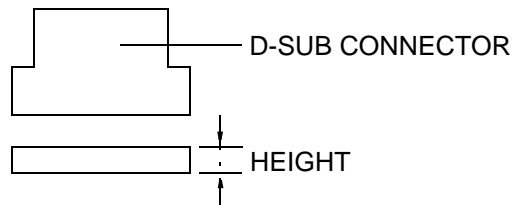
USING HYB FOR 1+1 SYSTEM

## 2.8 Cable Termination

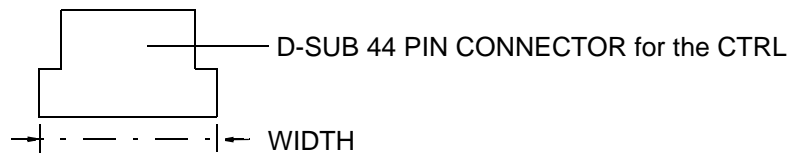
In this section, list of tools and material and the method for cable termination method are described. The following cables are described for reference.

- D-sub connector (refer to Chart 2-14)\*
- TNC-P connector of the L angle type for IDU (refer to Chart 2-15)\*\*
- N-P connector of the L angle type for ODU (KOMINE made) (refer to Chart 2-16)\*\*
- N-P connector of the L angle type for ODU (HIROSE made) (refer to Chart 2-17)\*\*
- N-P connector of the straight type for ODU (HIROSE made) (refer to Chart 2-18)\*\*
- N-P connector of the straight type for ODU (KOMINE made) (refer to Chart 2-19)\*\*
- Molex 5557-04R connector (refer to Chart 2-20)
- BNC connector soldering type (refer to Chart 2-21)
- BNC connector crimping type (refer to Chart 2-22)
- D-Sub High Density Crimp Contacts assembly (refer to Chart 2-23)\*

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



2. \*Use D-sub 44-pins connector for the CTRL of less than 57 mm in width as illustrated below.



3. \*\*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 ns).

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

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

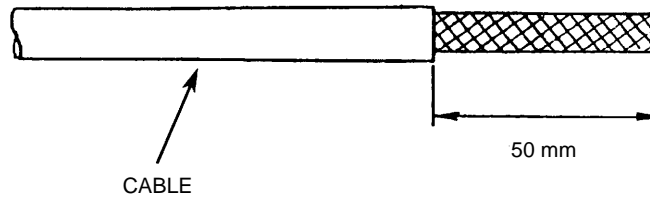
Table 2-5 Tools and Material List

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
		09 99 000 0596/ 09 99 000 0513	For D-Sub High density connector

**Chart 2-14 Terminating Supervisory Cables with D-Sub Connector**

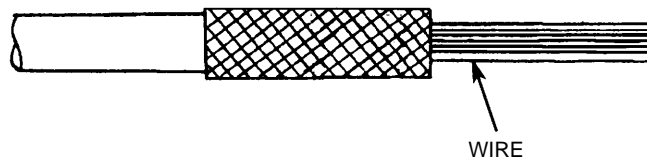
Step	Procedure
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- 1 Strip back the cable sheath, taking care not to damage the braided shield.



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

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



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

CONFORMABLE  
WIRE SOCKET CONTACT

AWG#20-24 :CD-PC-111

AWG#24-28 :CD-PC-121

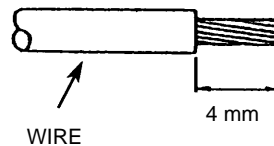
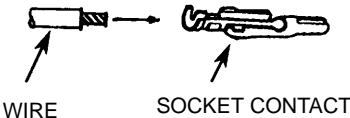


Chart 2-14 (Cont'd)

Step	Procedure
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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.

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