Chapter 3

Installation

3.1. General

This chapter explains how to install and set up the FibeAir 1500 system. For best results, perform all operations in the sequence in which they are presented in this chapter.

3.2. Unpacking Equipment

The FibeAir 1500 is shipped in 5 crates. Upon delivery, make sure that the following items are included:

■ Two indoor units and accessories

■ Two outdoor units

■ Two antennas and pole mounts

■ One user manual

■ One management software (CD).

Unpack the contents and check for damaged or missing parts. Should there be any parts that are damaged or missing, contact Giganet's local distributor.

3.3. Site Requirements

The first and most important consideration when choosing a prospective site for the ODU is that the point can provide an acceptable "line of sight" with the opposing ODU. A site with a clear, unobstructed view is required.

When considering a site, it is important to check for current and future obstacles. Possible future obstacles are: trees, new buildings, window cleaners on the roof, snow that may accumulate in front of the antenna, etc. The site should be accessible to certified personnel only.

As with any type of construction, a local permit may be required before installing an antenna. It is the owner's responsibility to obtain any and all permits.

3.4. Before Installing the ODU

!\
DANGER | **WATCH FOR WIRES!** Installation of this product near power lines is dangerous. For your own safety, follow these important safety rules.

- Perform as many assembly functions as possible on the ground.

- Watch out for overhead power lines. Check the distance to the power lines before starting installation.

- Do not use metal ladders.

- If you start to drop the antenna or mast assembly, move away from it and let it fall.

- If any part of the antenna or mast assembly comes in contact with a power line, call your local power company. DO NOT TRY TO REMOVE IT YOURSELF! They will remove it safely.

- Make sure that the mast assembly is properly grounded.

!\
WARNING! | Assembling antennas on windy days can be dangerous. Because of the antenna surface, even slight winds create strong forces. Be prepared to safely handle these forces at unexpected moments. Giganet Ltd. is not responsible or liable for damage or injury resulting from antenna installation.

3.5. Required Components and Equipment

3.5.1. Required System Components

The following FibeAir 1500 components are needed to install one radio link:

- Antenna mount and accessories

- Antenna

- ODU

- Cable

- Headset

- BNC headset adaptor

- BNC DVM adaptor.

3.5.2. Required Tools

The following tools and equipment are needed to install an ODU:

- 4 x N-type connectors (according to cable type)
- Coaxial cable
- Insulation tape
- Ratchet wrench (3/8" Drive)
- 10mm nut driver
- 13mm socket (3/8" Drive)
- 13mm open/box end wrench
- Phillips screwdriver
- Sharp cutting knife
- Compass (optional)
- Torque wrench
- Digital voltmeter
- Giganet optical view finder (optional)

3.5.3. Local Management PC Hardware Requirements

Before you install the GiganetView software, verify that your PC has the minimum requirements as follows:

Processor	Pentium (200 MHz minimum)
Memory (RAM)	32 MB minimum
Operating System	Windows 95/98/NT
Display Monitor	800 x 600 minimum, 16,384 colors maximum
Keyboard	
Mouse	
Serial Port	RS-232

3.6. Suggested Pole Installation

The antenna can be installed on a ground tube, roof, or wall mount. The ground tube or roof/wall mount should be assembled and in place before installing the antenna mount.
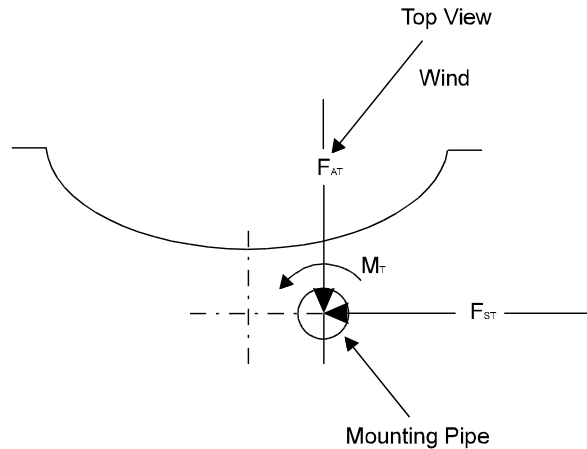

Figure 3-1 Calculating Required Pipe Diameters

Use the following table to determine the pipe diameters:

Table 3-1   Wind Loading

Antenna Size	1 ft. (30 cm)	2 - 2$^1/_2$ ft. (60 - 75 cm)	4 ft.(120 cm)
Minimum Pipe Diameter	50 mm	65 mm	115 mm
Wind Velocity	200 km/h	200 km/h	200 km/h
$F_{AT, max.}$ [N]	303	929	2821
$F_{ST, max.}$ [N]	150	460	1398
$M_{T, max.}$ [Nm]	47	283	894

After determining the pole size, verify that you have the required bolt for the antenna mount.

Table 3-2   Required Bolt size

Pipe Diameter [mm]	Bolt size [mm]
48 - 51	51
52 - 89	89
90 - 115	115

3.7.   Flow of Operations

The installation and setup procedure for the FibeAir 1500 consists of the following operations (to be performed in the order listed below):

GiganetView Management Software:

- Installing the Management Software
- Installing a PPP/SLIP Driver
- Setting the Baud Rate

IDU:

- Installing the IDU
- Turning IDU On
- Connecting to a PPP/SLIP or Ethernet Port
- Setting the IP addresses
- Setting Local Tx Frequency Channel
- Activating Engineering Order Wire (EOW)
- Setting Antenna Diameter and Distance
- Determining the Expected Signal Level

ODU:

- Installing the antenna assembly
  — Azimuth adjustment
  — Elevation adjustment
- Initial antenna alignment – using a compass, Giganet's optical view finder and headset.
- Alignment – checking actual receive level
- Performing an Initial Check
- Verifying Installation.

3.8. Installing the IDU - Rack Mount Assembly

The IDU may be installed in a 19" rack (1U) using the rack mount kit. The mount braces are attached to each side of the IDU using the three holes on each side. To attach the rack mount to the IDU follow these steps:


Figure 3-2 Rack Mount Assembly

1. Attach mount braces to each side of the IDU, and using the screws supplied attach them to the holes in the IDU side panel (see illustration).

2. Install the IDU unit in the 19" rack as shown in the lower part of the illustration.

3. To power on the unit, connect the WV-0001-0 cable supplied to the **DC Input** interface on the front of the IDU and connect the other side of the cable to the DC voltage supply:
   White – GND
   Green – +48v
   Brown – 0v

4. When more than one unit is installed, it is recommended to keep a gap of 1U between the units in the rack.

3.9.   Installation Instructions

3.9.1. IDU Power On

1. Turn the IDU power switch to ON.
    The LED display should appear as described below:
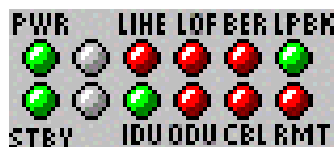
LED	Color	Explanation
PWR	Green	Power on
STBY	Green	Normal operation
LINE	Red	No input to main channel/High Ber
IDU	Green	IDU operating and no IDU alarm
LOF	Red	Loss of Frame detected (no radio connection)
ODU	Red	No communications to ODU
BER	Red	Excessive bit error rate detected
CBL	Red	RF cable open/short
LBK	Green	Loopback not operated
RMT	Red	Remote unit not connected.

If the LED display is not as described above, refer to *Chapter 6 - Troubleshooting & Diagnostics.*

3.9.2. IDU Initialization

The IDU initialization and basic configuration is made via the **Terminal** interface on the IDU front panel using the standard Windows HyperTerminal at 19200 bits per second. The basic configuration includes setting IP addresses for the Ethernet and serial ports. These are needed for running the Gigaview software.

The system configuration can be completed either by using the HyperTerminal or by using the Gigaview application. The recommended way to start is by running the Quick Setup Procedure using the HyperTerminal as described in section 4.2.3, and continues to install the Gigaview software.

3.9.3. Setting IP addresses for the Ethernet and serial ports

Refer to *Chapter 4. System Setup*, paragraph *4.2.1. Setting IP addresses for the Ethernet and serial ports*.

For general guidance concerning network management configuration, refer to Appendix D.

3.9.4. Installing the GiganetView Management Software

1. Insert the "GiganetView" CD into your CD drive.

2. Via Windows Explorer or the File Manager, double-click on the "setup.exe" file.
    The installation program begins installation.

3. Follow the instructions displayed.

The full installation procedures are included in the Appendix A.

Note   *The recommended resolution is 1024 x 768.*

3.9.5. Connecting to the Ethernet Port

1. Connect a crossed Ethernet cable from your PC to the Ethernet Port. If the connection is to a LAN (wall connection) use the standard Ethernet cable.

Tx ——————— Tx   Tx ——————— Tx

Rx ——————— Rx   Rx ——————— Rx

Straight Cable   **Cross Cable**

Figure 3-3 Crossed and Straight Cable

2. Make sure the IP address on your PC is on the same sub-net as you defined in the FibeAir indoor unit (i.e. in most cases, the first three numbers of the IP address must be identical, depending on the sub-net mask).

3. Run the GiganetView software from your computer.

3.9.6. Connecting to a PPP/SLIP Port

Remove the IDU cable from the TERMINAL port and connect it to the SERIAL port (RS-232).

3.9.7. Installing a PPP/SLIP Driver

Install a PPP/SLIP driver in your computer. Refer to Appendix A for details of installation in Windows 95 and NT.

The installation of the PPP/SLIP driver is needed only for the first time that you operate the computer.

3.9.8. Setting the Baud Rate (for serial connections)

1. Double-click on the **My Computer** icon of the Windows Program Manager. **My Computer** window is displayed.
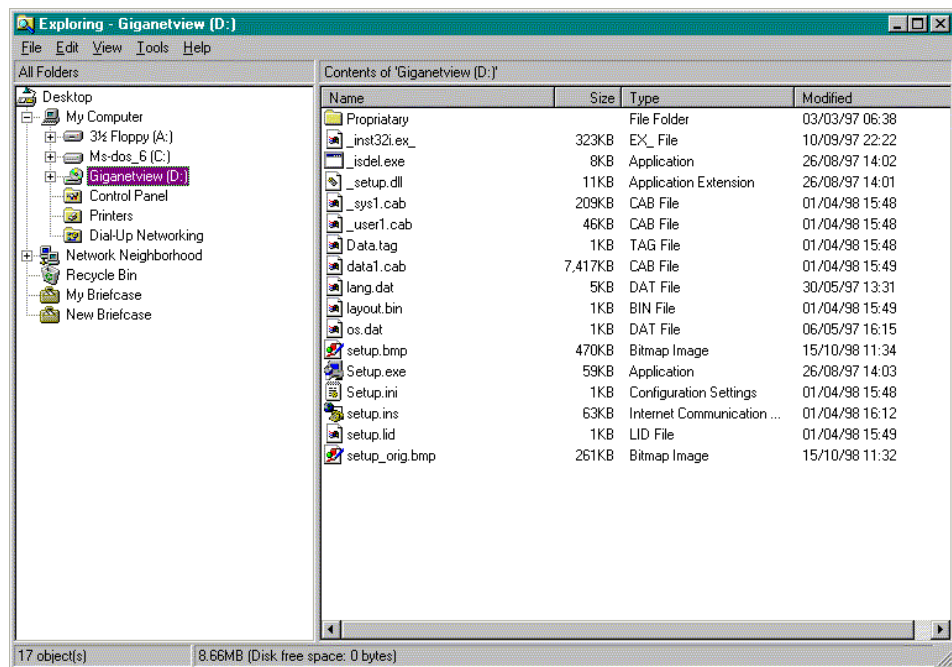

Figure 3-4 The My Computer Window

2. Double-click on Dial-Up Networking.
   The Dial-Up Networking window is displayed.

3. On the icon, which was added after performing the steps detailed in *Appendix A. SLIP Driver Installation*, click the right mouse button and select the Properties option.
   The Properties window is displayed.

4. In the Connect Using section of the Properties window, click on **Direct Connection** and click on the **Configure** push-button.
   The Configure window is displayed.

5. Select the **General** tab.
   The General window is displayed.

6. Set the Maximum Speed to 19,200.

7. Click **OK**.
   The Configure window is closed.

3.9.9. Connecting to the IDU using the serial port

1. Double-click on the icon which was added after performing the steps detailed in Appendix A (My Computer≻Dial-up Networking).
   The **Connect To** window is displayed.

Figure 3-5 The Connect To Window

Note   *At this time, there is no importance to the values of fields in the Connect To window.*

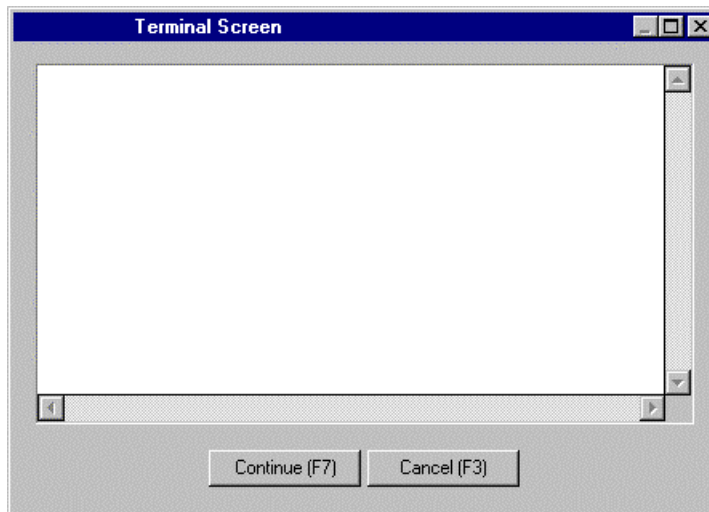2. Click **Connect**.
   The Terminal window is displayed.

Figure 3- 6 The Terminal Screen Window

3. Click **Continue**.
   The Connected To window is displayed.

4. Select **Start ≻ Program ≻ GiganetView**.
   The RunEnv Parameters window is displayed.

Figure 3-7 RunEnv Paramaters Window

5. In the RunEnv Parameters window, leave the *Window Name* field unchanged.

6. In the *Agent Address* field, enter the IP address of the FibeAir 1500 serial port.

7. Leave the *Protocol* field unchanged.

8. In the *Read Community* field, enter the Read community.
    The default value is **public**.

9. In the *Write Community* field, enter the Write community.
    The default value is **netman**.

10. Leave the *Source Address* field unchanged.

11. Click **OK**.
    The Login window is displayed.

Figure 3-8 Login Window

12. To log in, enter your password and click **OK**.
    By default, your read/write password is **giganet**.
    After logging in, the Work Area and Physical View windows are displayed (see Chapter 5 for details).

3.9.10. Setting Local Tx Frequency Channel

If the Tx frequency was previously defined using the Hyperterminal, use this screen only to verify that the correct frequency was set.

1. Select **Configuration** ➢ **Set frequency**.
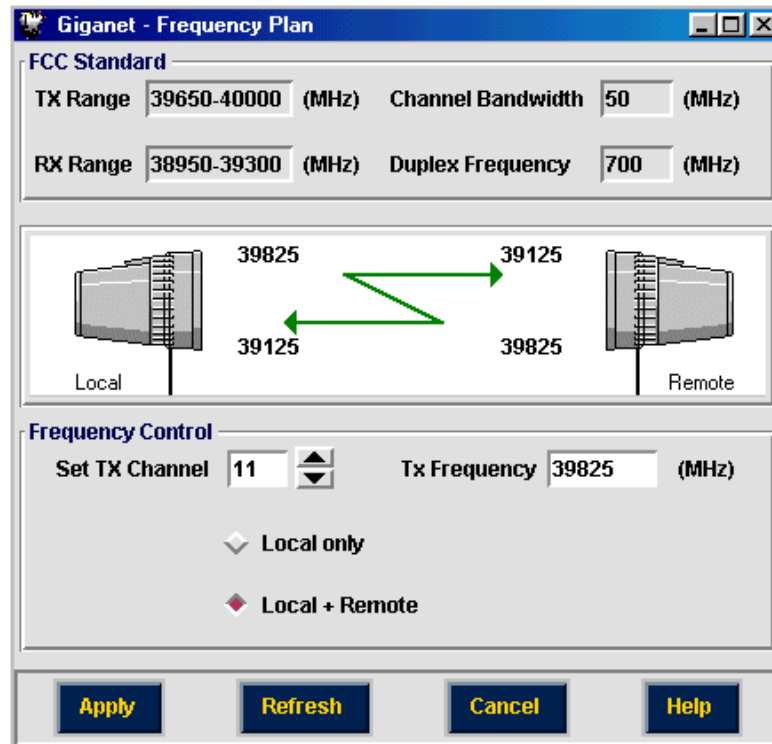   The Frequency Plan window is displayed.

Figure 3-9 Frequency Plan Window

At the top of the window, the system displays Tx/Rx ranges, the gap between them according to the appropriate standard (FCC or ETSI) and the channel bandwidth.

2. In the Frequency Control section, set the Tx Channel to the required channel. By default it is set to the first channel. If you are unsure of the required channel, refer to Appendix E for FCC or ETSI channel allocations.
    The frequency of the selected Tx channel appears in the Tx Frequency field.

3. If you prefer, you may set the Tx frequency by entering a frequency in MHz In the Tx Frequency section. If a channel is available for this frequency, it will appear in the Set Tx Channel field. If not, a warning message appears to enable the entered frequency or to change it to the next available channel.

4. Select the Local Only option (radio button should be filled ♦).
    By default, the Local + Remote option is selected.
    However, since there is no connection to the remote unit at this time, the Local + Remote option is not available.

5. Click **Apply**.
    The settings are saved in the IDU configuration. From this point on, the ODU is set to the desired frequency.

6. Click **Cancel** to close the window.
    The Frequency Plan window is closed and you are returned to the Work Area window.

3.9.11. Setting Transmitted Power, Antenna Diameter and Operating Distance

If the Tx power level was previously defined using the HyperTerminal, use this screen only to verify that the correct power was set.

You can perform the following in the ODU configuration window:

■   Set transmitter power levels or mute it.

■   View the current received level (RSL).

■   Set antenna size and link distance to determine the expected RSL (in RSL graph and radio performance monitoring window).

■   View ODU temperature graph.

After setting the link, you can set the parameters in ODU configuration window, for both local and remote ODU's.

1. Select **Configuration** ➢ **ODU**.
    The ODU Configuration window is displayed.
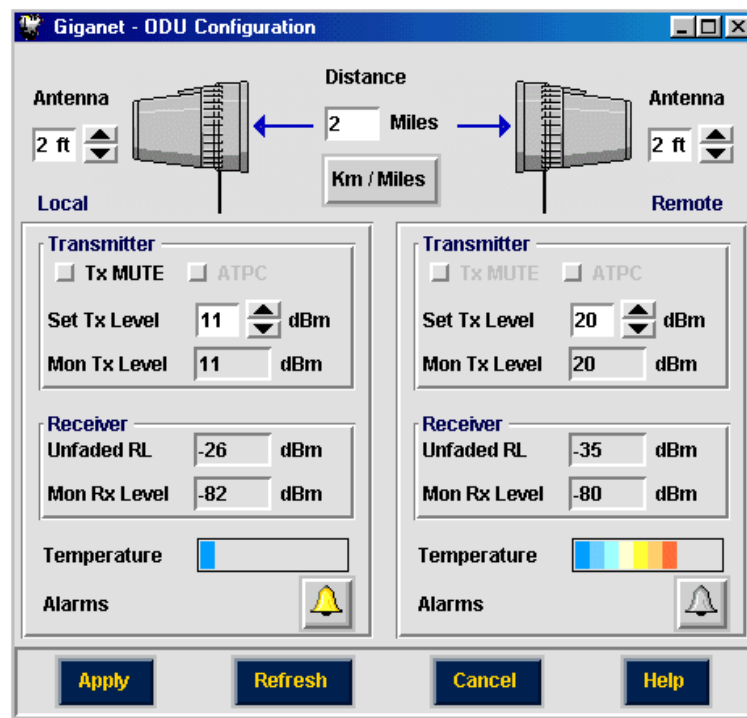
Figure 3-10 ODU Configuration window

Note *Since there is no connection with the remote terminal, you can change only Local Unit parameters at this stage.*

2. In the top of the window, select the diameter of the Local Antenna from the drop-down list (1, 2, 3, 4, or 6 foot). The default value is 1 foot.

3. In the top center of the window, select the distance using the ▲ ▼ buttons.

4. In the top right of the window, select the diameter of the Remote Antenna from the Antenna drop-down list (1, 2, 4, or 6 ft.).

5. In the Transmitter section, set Tx Level of the Local Unit to the maximum allowed Tx level to facilitate the alignment process.
   Note that the Transmit Level should be adjusted following antenna alignment (see Chapter 4 for details).

6. In the Transmitter section, set Tx Level of the Remote Antenna to the maximum setting to facilitate the alignment process.

7. Click **Apply**.

8. Make a note of the expected signal level displayed in the Unfaded RL field.
   For example, in the window shown above the expected value is -35 dBm for the remote side and −26dBm for the local receiver.

9. Click **Cancel**.
   The ODU Configuration window is closed and you are returned to the Work Area window.

3.9.12. Exiting GiganetView Management Software

1. In the Work Area window, select **File** ➢ **Exit** to exit the Management software.
   The Work Area and Physical Area and Physical View windows are closed.

2. Turn off the IDU.

The following sections describe the installation procedures for 1 foot and 2 foot antennas which are the most frequently used. For procedures on installing other antennas, see the Antenna Information appendix.

3.9.13. Installing a One Foot Antenna Assembly

For site requirements and pole installation, refer to sections 3.3 and 3.6.

3.9.13.1.   General

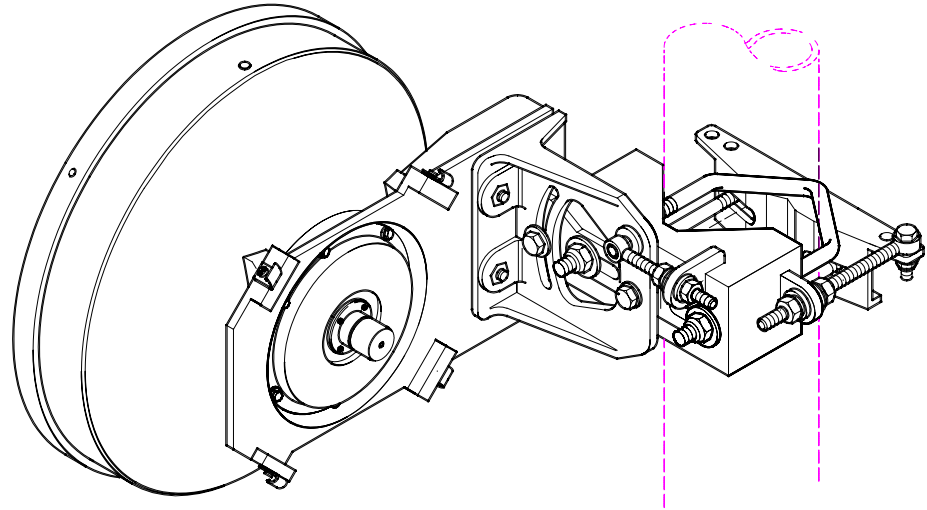The following figure shows a one foot antenna mounted on a pole.

Figure 3-11 A Mounted One Foot Antenna

3.9.13.2.   One Foot Antenna Assembly − **Installation Instruction**

⚠ *Warning*

It is important to mount the antenna exactly as described in this installation instruction. Giganet disclaims any responsibility for the result of improper or unsafe installation. These installation instructions have been written for qualified, skilled personnel.

Refer to the following figure, while performing the installation instructions given.

2 bolts M8 x 25
2 washers 8.4 ⌀ 25

Bolt M8 x 25

U bolt M10
2 washers 10.5 ⌀ 30
4 nuts M10

Drain plug

4 screws B4.2

Bolt M8 x 30
Washer 8.4
SL nut M8

Bolt M8 x 30

Bolt M8 x 30

*Safety collar ***
U bolt M10
2 washers 10.5 ⌀ 30
4 nuts M10

ELEVATION *spindle M8 x 145*
2 brass nuts M8
2 washers 8.4

*AZIMUTH spindle M8 x 145 ***
2 brass nuts M8
2 spherical washers C 8.4
2 conical seats D 9.6

* safety collar and azimuth spindle
(on request)

Figure 3-12 Antenna Assembly - One Foot Antenna

1. Place U bolt **(A)** and safety collar **(B)** around the pole at the desired height, connect them and tighten in place at a 90° angle to the opposing site direction.
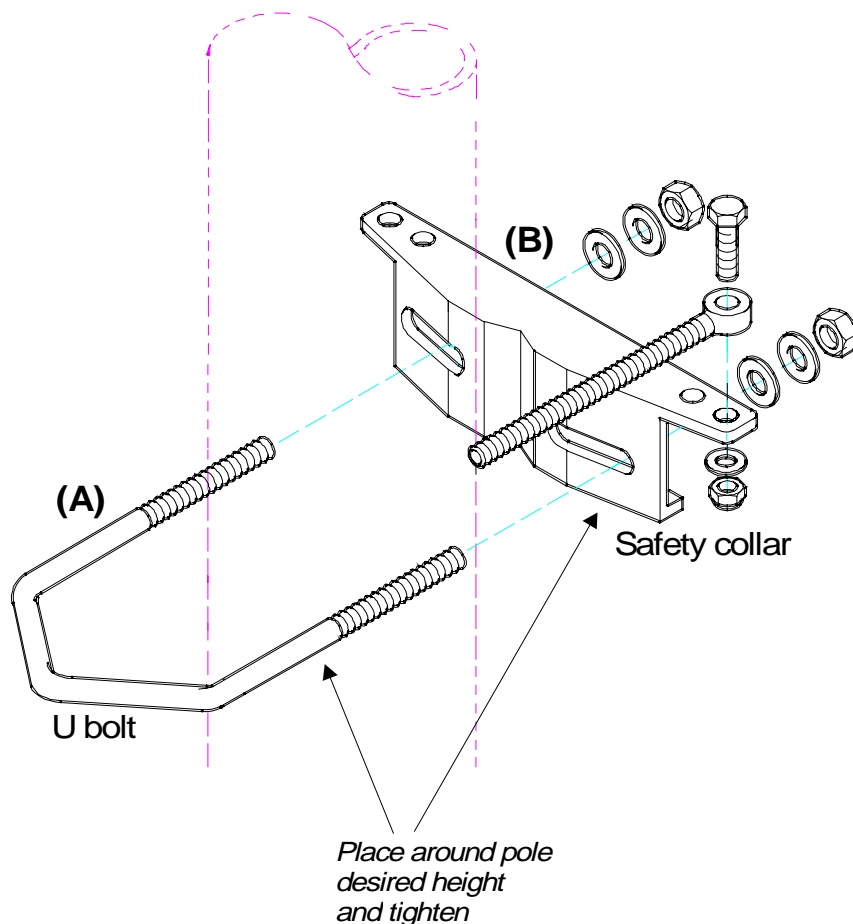
Figure 3-13 Antenna Assembly (cont.)

Note   *The safety collar assembly shown in Figure 3-14 above ((**A**) and (**B**)) is used to align and support the antenna mount during installation and antenna alignment. Once the mount is in place and alignment is completed, all bolted joints of the antenna mount are tightened and there is no further need for the support provided by the safety collar assembly. It may then be removed for use in future installations.*

2. Connect **(C)** to **(D)** at the approximate elevation needed to face the
    opposing ODU (determined by the bolts fastened to part **(C)**).

Connect (C) to (D)

(D)

*Set angle before tightening
bolts to determine elevation*

(C)

*Tighten after desired
elevation angle is set*
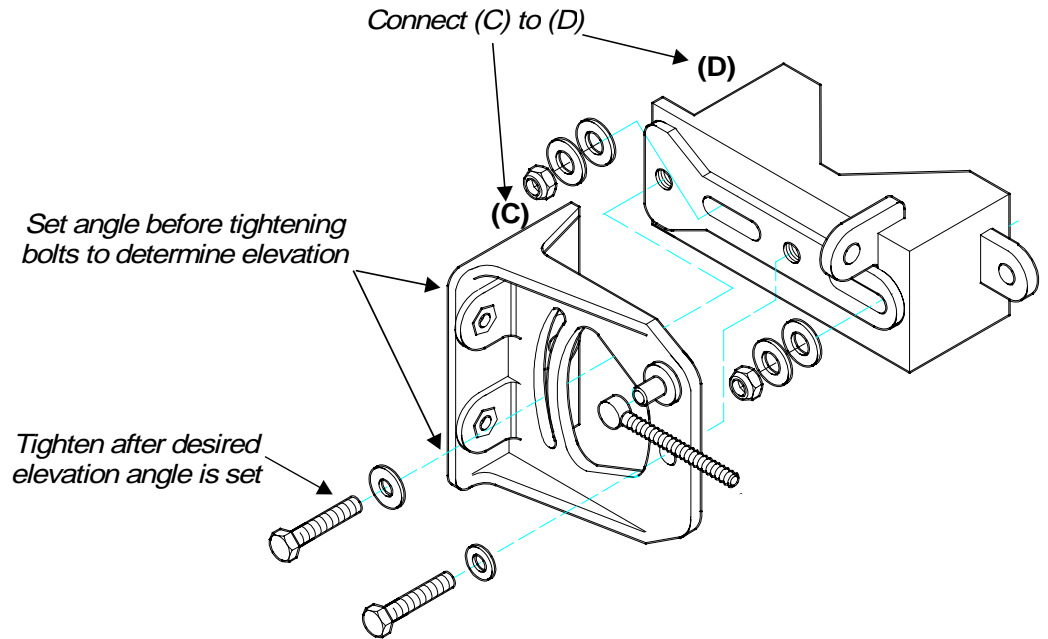
Figure 3-14 Antenna Assembly (cont.)

3. Place the assembly constructed above (**(C)** and **(D)**) and U bolt **(E)** around the pole on the safety assembly (attached in Step 1) and connect the two. Before doing this, make sure that the elevation spindle **(F)** is in hole **(G)** and loosen the screws on both sides to grant freedom of movement.
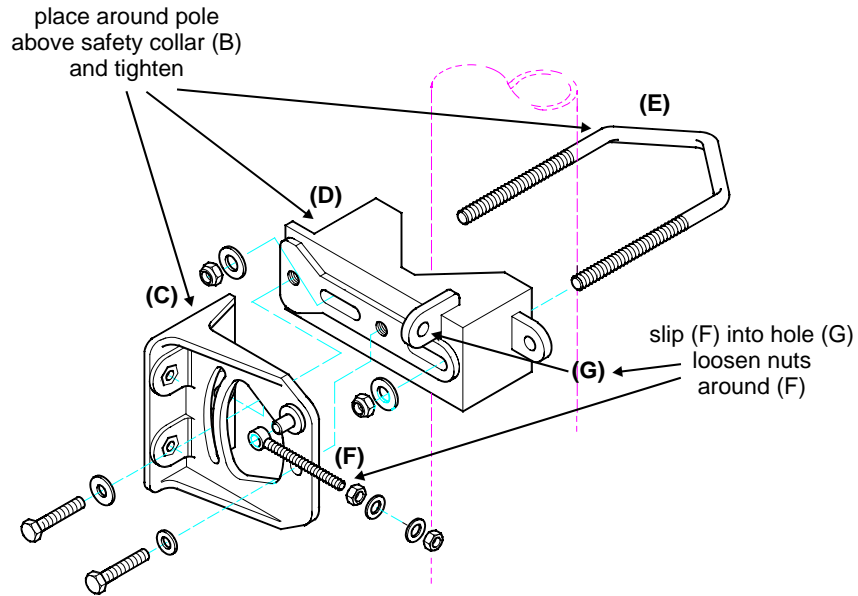
Figure 3-15 Antenna Assembly (cont.)

Following step 3 the assembly should be as illustrated in the follwing figure.
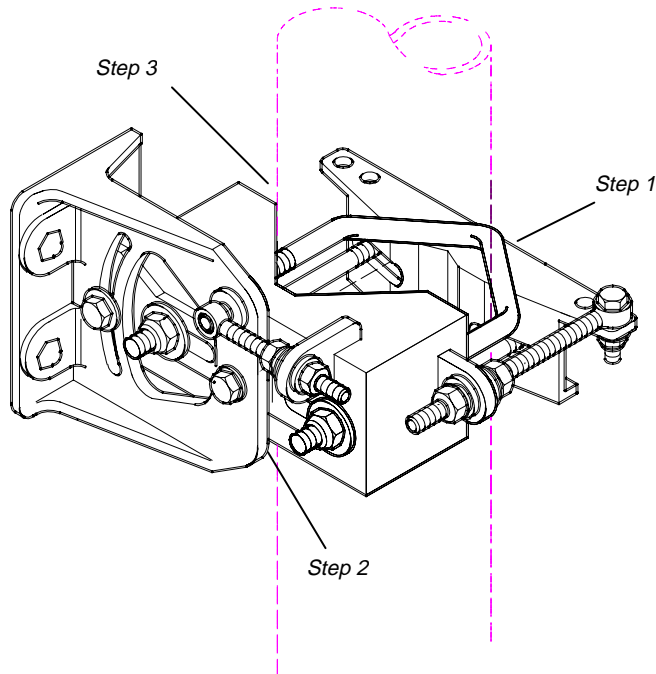
Figure 3-16 Antenna Assembly (cont.)

4. Attach the antenna **(H)** to the antenna mount **(I)**.

antenna
(H)

(I)

attach antenna (H)
to mount (I)

attach to
antenna mount (I)
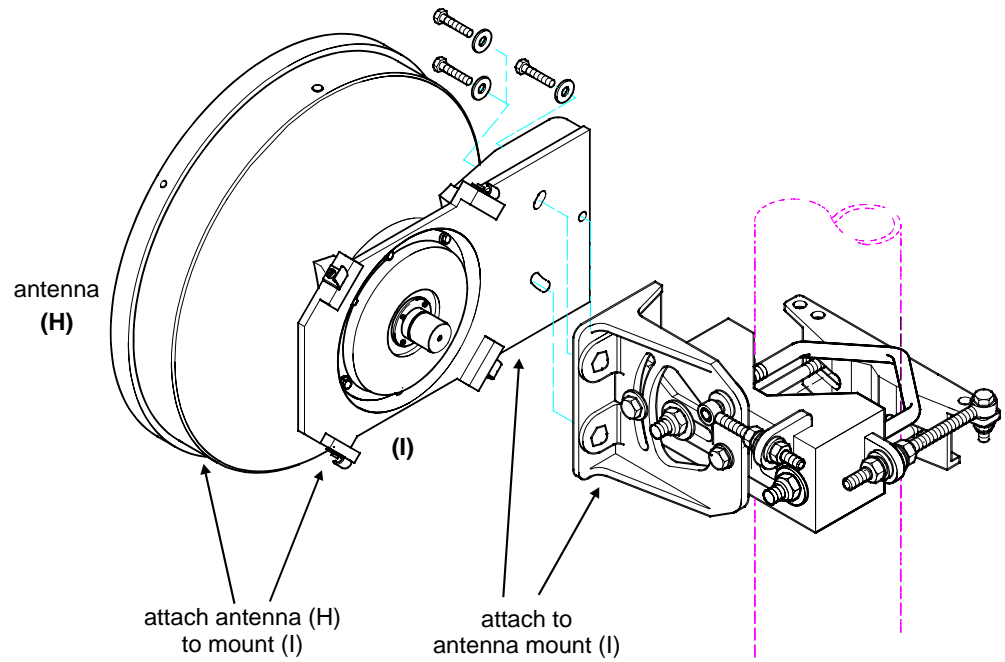
Figure 3-17 Antenna Assembly (cont.)

Make sure to install the antenna with the drain plug side up as shown in the following figure.

Drain plug

Drain hole at the bottom of the reflector
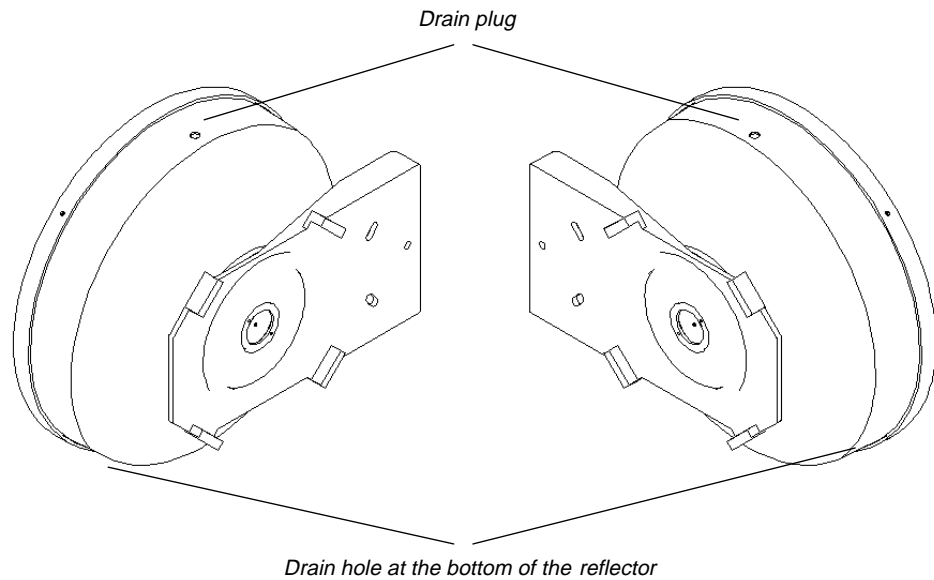
Figure 3-18 Correct Orientation of Antenna

5. Roughly align the antenna with the opposing site. This may be done by eyesight, using a compass or with the aid of Giganet's Optical Viewfinder (optional).

Tip   *It is sometimes difficult to identify the opposing site. For this reason, it is sometimes helpful to have someone at the opposing site use a reflecting device, such as a hand-held mirror, to reflect sunshine towards you. The Giganet optical viewfinder can help in initial antenna alignment.*

6. Insert the azimuth spindle **(J)** into hole **(K)** and tighten in place.
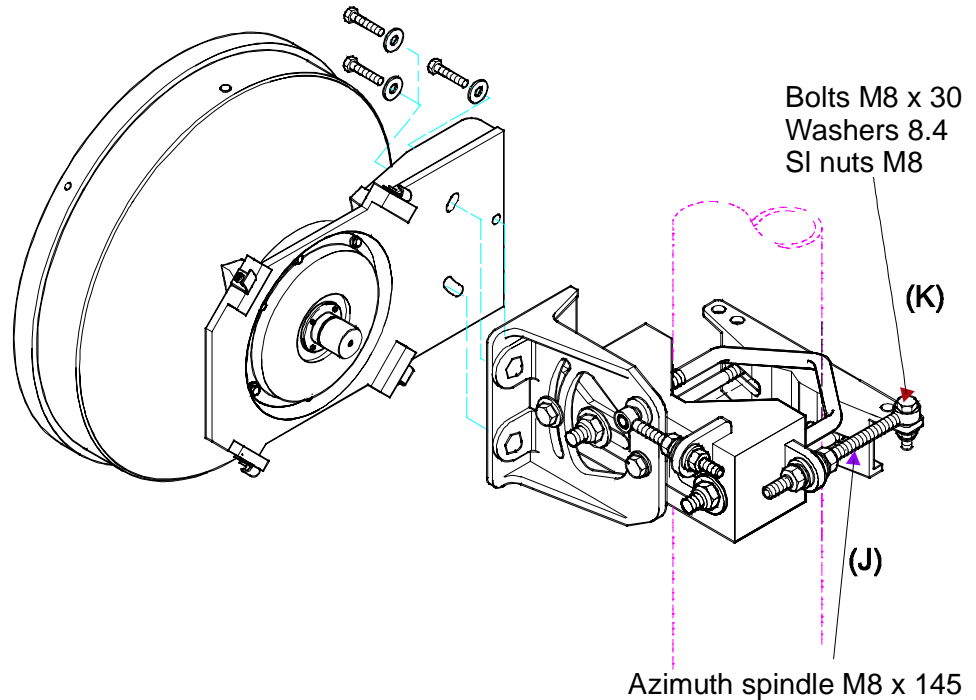
Figure 3-19 Antenna Assembly (cont.)

7. Mount Giganet optical viewfinder on the antenna (optional). Locate the opposite site through the viewfinder and loosely tighten the bolts.

8. Attach the ODU to the mount assembly using the four latches on the ODU **(L)**. See the following figure.

⚠ *Warning*

To verify proper sealing, confirm existence of a rubber O-ring on the antenna, as shown in the following figure.

Setting Polarization

Polarization is determined by the orientation of the ODU. If the handle of the ODU is facing up or down then the polarity is vertical. If the handle of the ODU is to the side then the polarization is horizontal.

Tip   *For easy installation and best weather immunity, mount the ODU so that the connectors are facing down.*

(L)

Rubber O-ring

attach ODU to
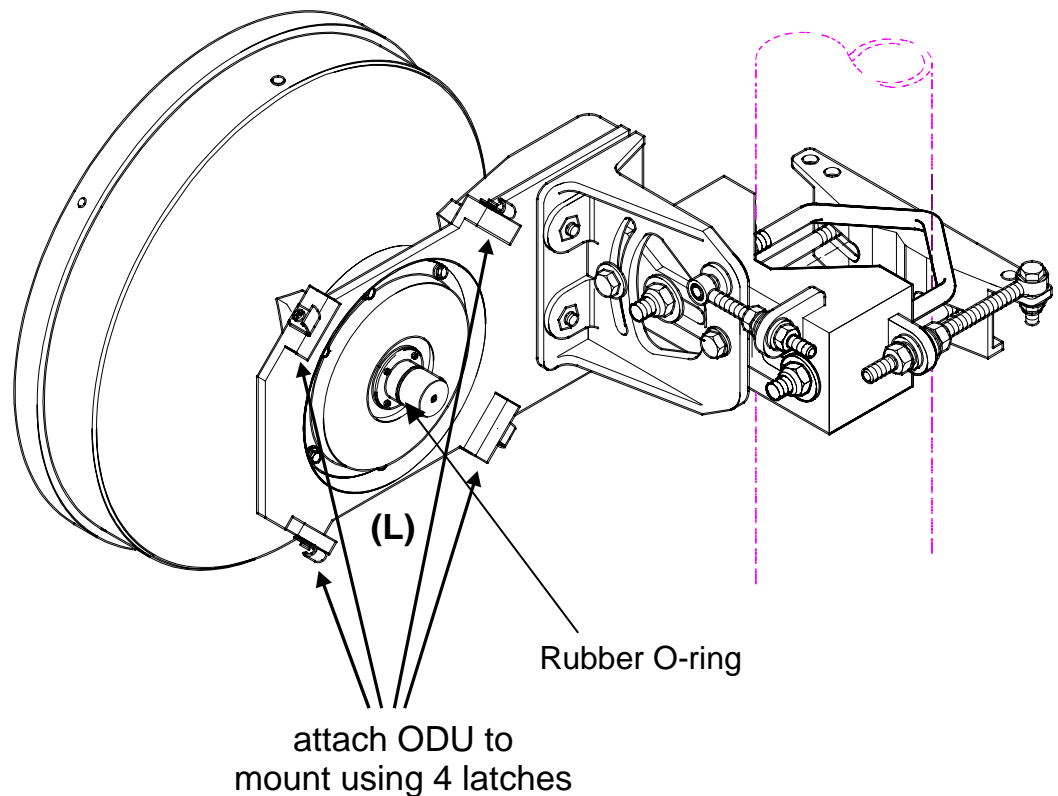mount using 4 latches

Figure 3-20 Antenna Assembly (cont.)

9. Connect the coaxial cable between the IDU and ODU using the
    N-Type connector on the IDU and the ODU.

10. Make sure that the fittings and the coax cable are clean and dry.

11. Peel approximately 6 inches of COAX-SEAL from the paper backing.

12. Wrap isolation tape over the coax cover. Start winding from coax cover
    towards fitting with one half overlap with each winding making sure all
    joints are well covered.
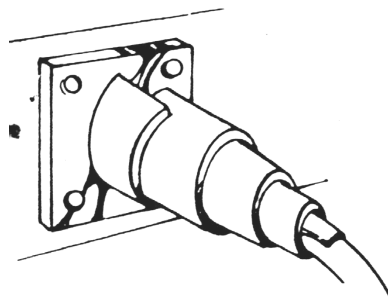
Figure 3-21 Steps 1, 2 & 3

13. After entire fitting and coax cable are covered with approximately 3/16"
    thick layers, mold and form COAX-SEAL with fingers to make a smooth
   surface and force out any air.
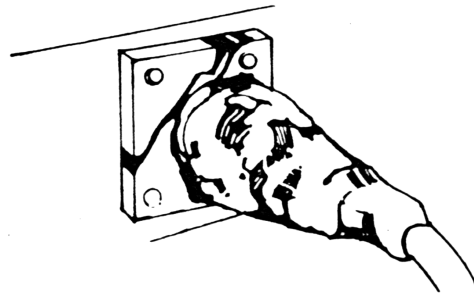
Figure 3- 22 Step 4

14.   If more COAX-SEAL is necessary to complete seal, simply cut the needed amount and add to existing COAX-SEAL, molding and press into the other material. COAX-SEAL adheres to itself with slight pressure. Carefully inspect seal to make certain that all joints are covered

Tip   *Connect and disconnect the IDU from the ODU only when power is off.*

15. Turn the IDU power switch to ON.
The LED display should appear as described below to indicate normal operation of the FibeAir 1500.
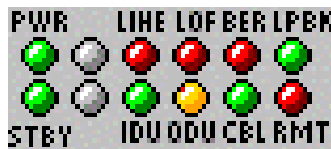
LED	Color	Explanation
PWR	Green	Power on
STBY	Green	Normal operation
LINE	Red	No input to main channel/High Ber
IDU	Green	IDU operating and no IDU alarm
LOF	Red	Loss of Frame detected (no radio connection)
ODU	Yellow	Rx/Tx out of range
BER	Red	Excessive bit errors detected
CBL	Green	Cable between IDU and ODU properly connected
LBK	Green	Loopback not operated
RMT	Red	Remote unit not connected

If the LED display is not as described above, refer to *Chapter 6. Troubleshooting & Diagnostics.*

3.9.14.   *Initial Antenna Alignment – Using the Headset*

■   Connect the headset BNC adapter to the ODU.

■   Connect the headset to the adapter and put it on.

If a tone is heard, your initial alignment is OK. Now you can adjust the aim to find the highest tone pitch and proceed to the final alignment as described in section 3.9.18.

If no tone is heard, the initial alignment is not satisfactory. It is recommended to use the Giganet's optical viewfinder for initial alignment. In this case, loosen the azimuth bolts, adjust azimuth and tighten in the position where the highest tone is heard. If this does not help, adjust elevation and then azimuth. See directions below.

Tip   *We recommend that two people perform this installation and alignment procedure, one at each ODU site, with some method of communications between them.*

3.9.14.1.   Azimuth Alignment

- Loosen the nuts shown in the following figure and rotate the antenna and mount, pointing it to the location of the opposing antenna.

- Slowly sweep the antenna in azimuth using the azimuth adjustment nuts.

- If the desired signal is not found, increase or decrease elevation setting and repeat the azimuth sweep.
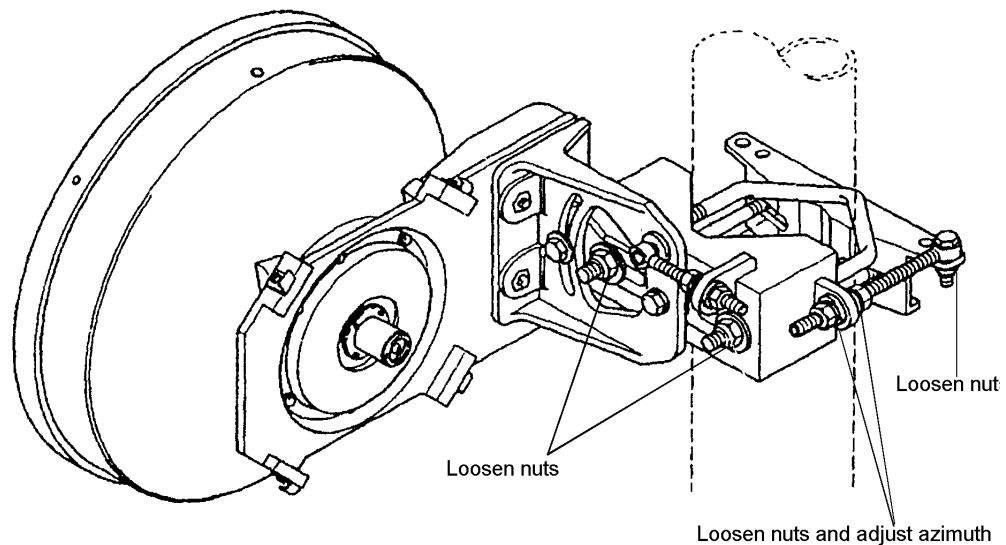

Loosen nut

Loosen nuts

Loosen nuts and adjust azimuth

Figure 3-23 Adjusting Azimuth - One Foot Antenna (with safety collar)

3.9.14.2.   Elevation Alignment

- Loosen elevation adjustment bolts and nuts to adjust elevation (refer to the following figure).

- Align pointer or edge of clamp with appropriate mark at the desired elevation reading.

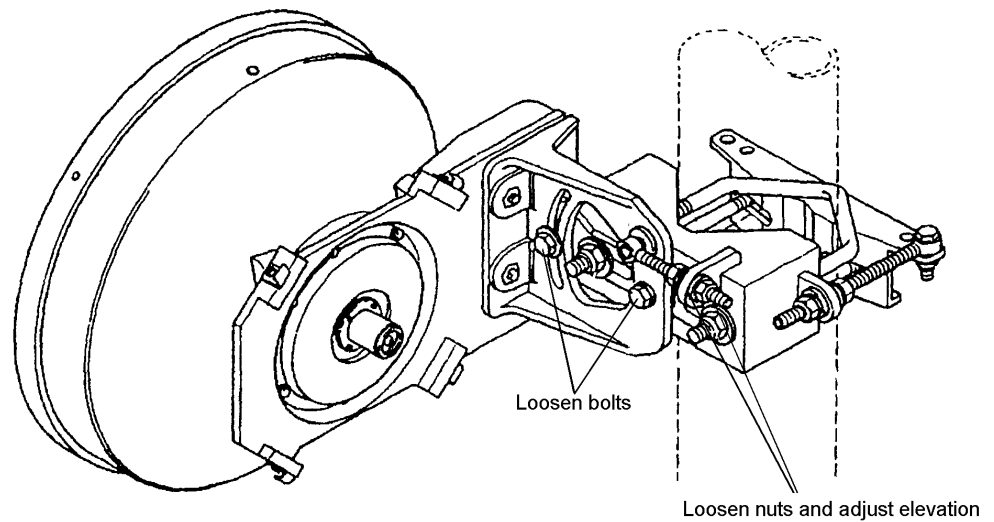- Make an approximate setting. Temporarily tighten elevation bracket nuts.

Loosen bolts

Loosen nuts and adjust elevation

Figure 3-24 Adjusting Elevation - One Foot Antenna

16. Once you attain the highest audible tone, disconnect the BNC headset adapter.

This completes initial alignment of the system.

3.10. Two Foot Antenna Assembly

3.10.1. Installing a Two Foot Antenna Assembly

For site requirements and pole installation, refer to sections 3.3 and 3.6.

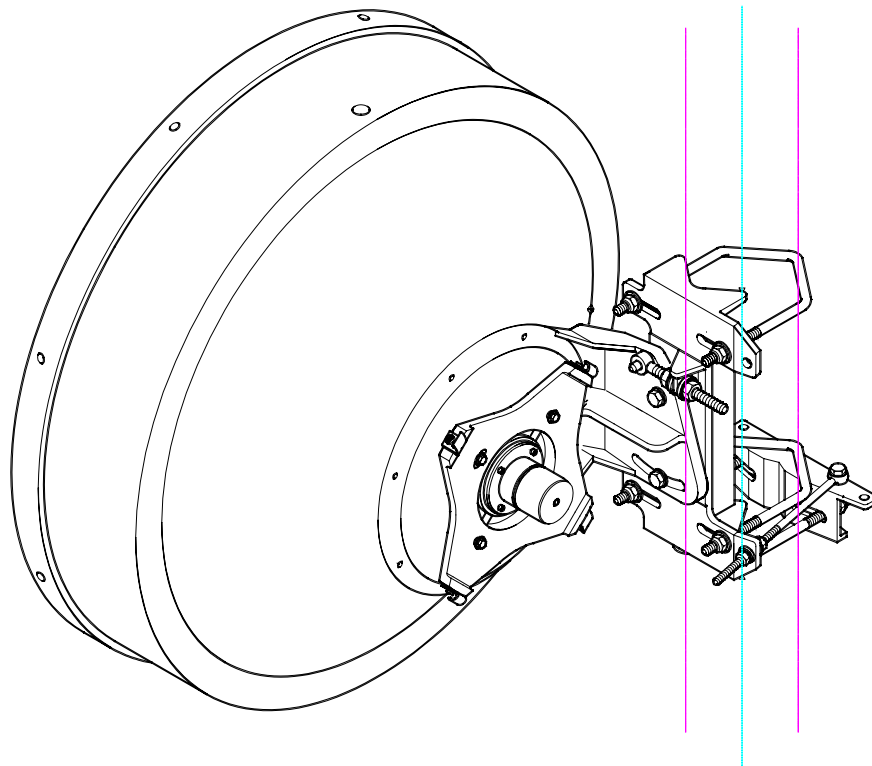### 3.10.1.1.   General

The following figure shows a two-foot antenna mounted on a pole.

Figure 3- 25 A Mounted Two Foot Antenna

3.10.1.2.   Two Foot Antenna Assembly − Installation Instruction

⚠
Warning

It is important to mount the antenna exactly as described in this installation instruction. Giganet disclaims any responsibility for the result of improper or unsafe installation. These installation instructions have been written for qualified, skilled personnel.

Perform the installation instructions according to the following figure.
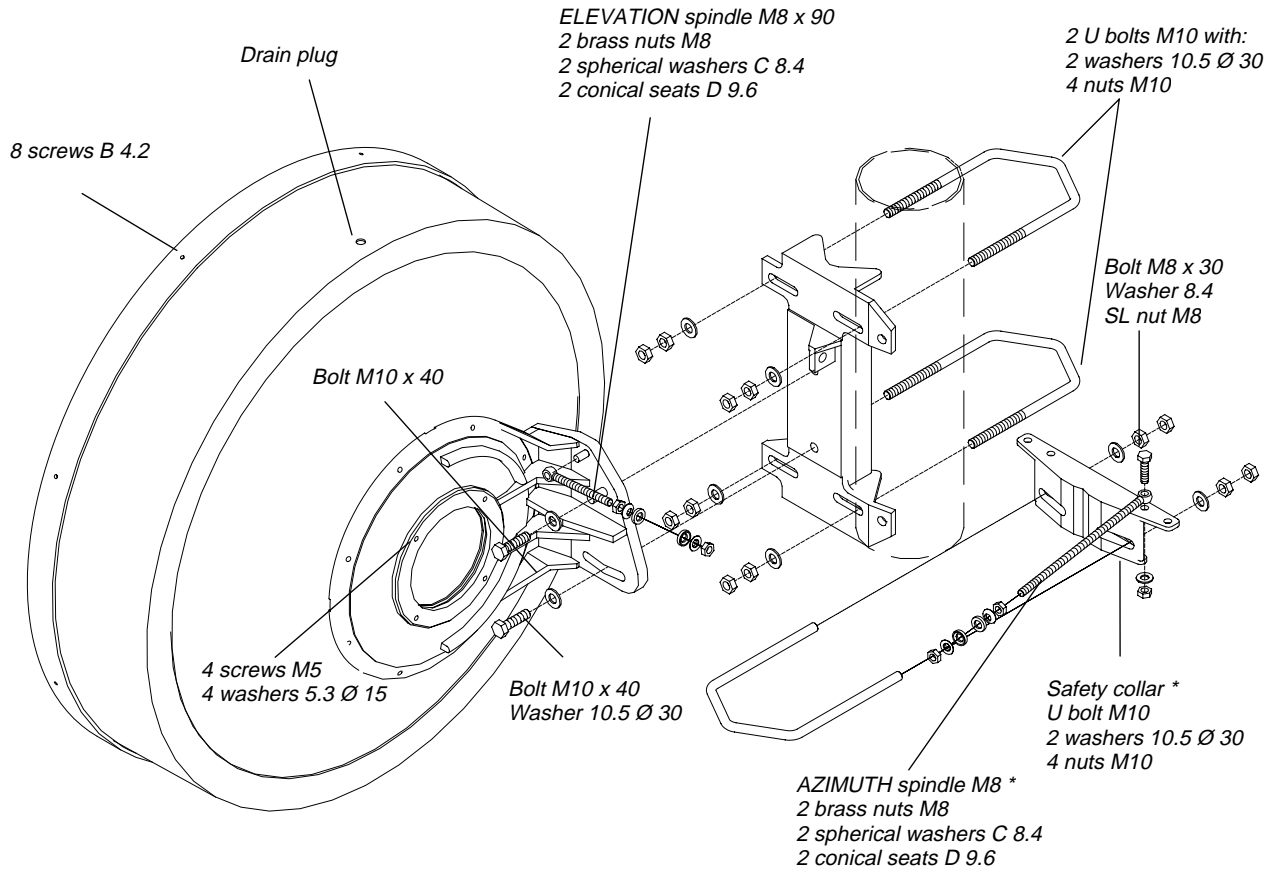

Figure 3- 26 Antenna Assembly - Two Foot Antenna

1. Place U bolt **(A)** and safety collar **(B)** around the pole at the desired height, connect them and tighten in place at a 90° angle to the opposing site.
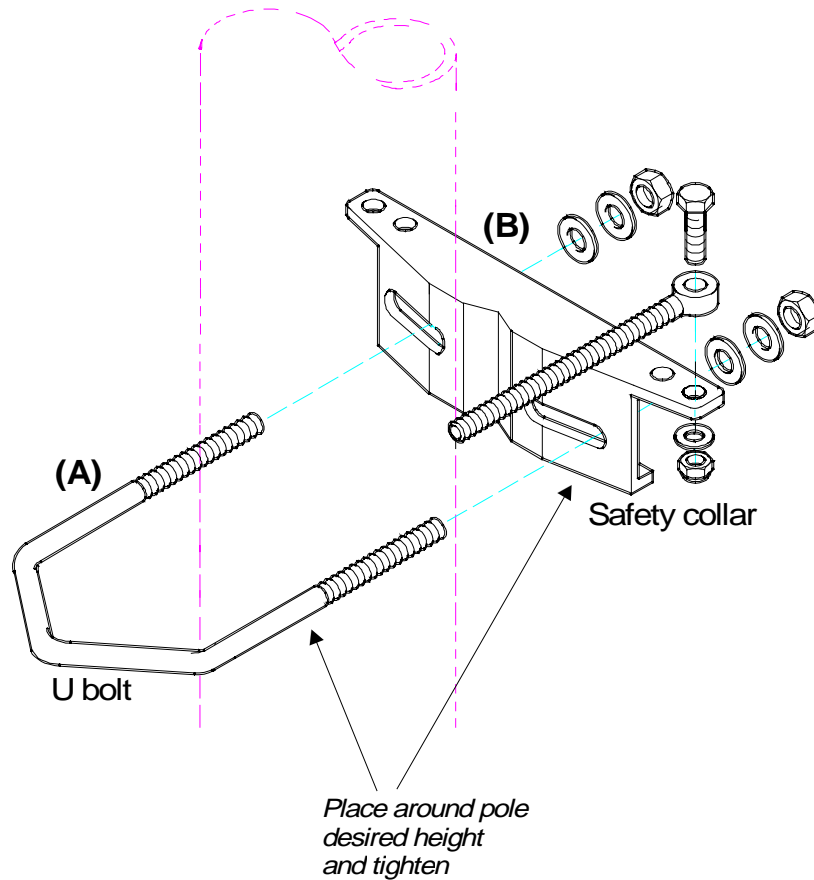

Figure 3-27 Antenna Assembly - Two Foot Antenna (cont.)

Note   *The safety assembly installed above ((**A**) and (**B**)) is used to support the antenna mount during installation and antenna alignment. Once the mount is in place and alignment is completed, all bolted joints are tightened and there is no further need for the support provided by the safety assembly. It may then be removed for use in future installations.*

2. Place part **(C)** and U bolts **(D)** and **(E)** around pole on the safety collar
    and tighten it.

*Place around pole
on safety collar,
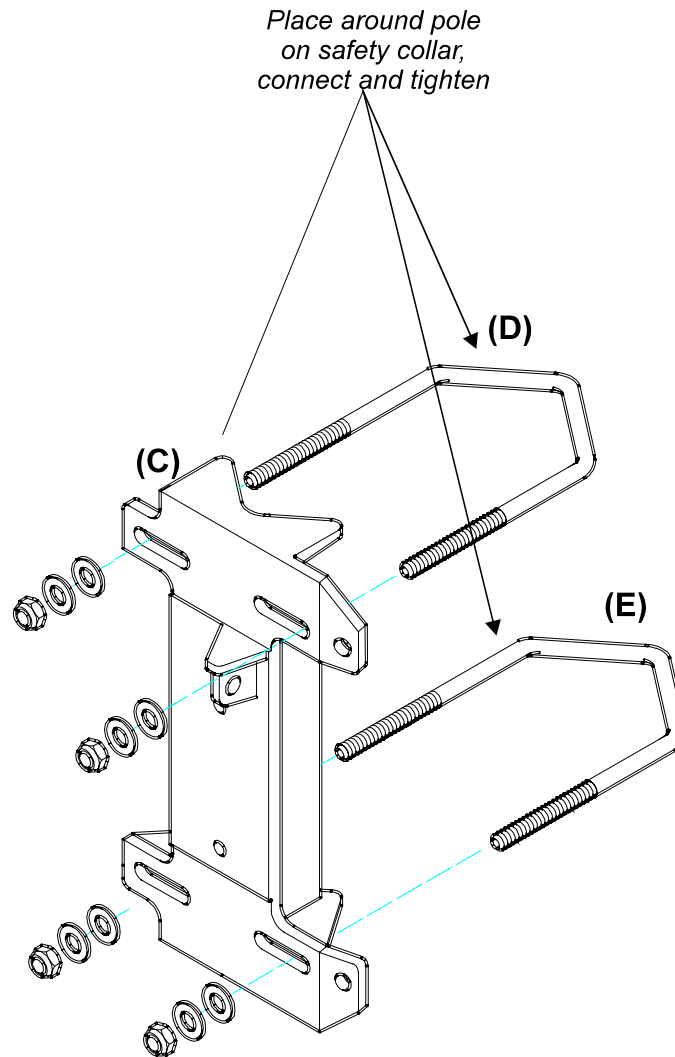connect and tighten*

(D)

(C)

(E)

Figure 3-28 Antenna Assembly - Two Foot Antenna (cont.)

3. Connect part **(F)** to part **(C)**. Before tightening the two parts together, set the approximate elevation angle of part **(F)**.

connect and tighten

(C)

(F)

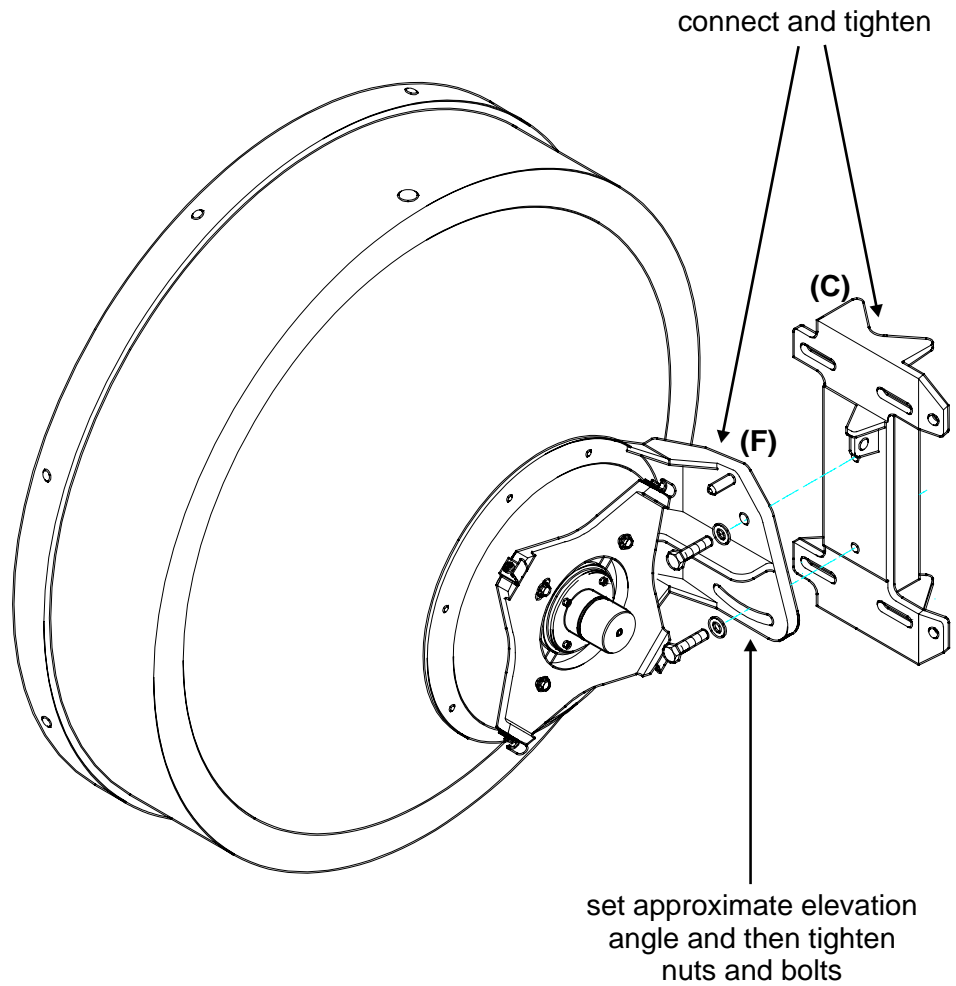set approximate elevation
angle and then tighten
nuts and bolts

Figure 3- 29 Antenna Assembly - Two Foot Antenna (cont.)

4. Insert spindle **(G)** into hole **(H)** and connect spindle **(G)** to **(I)**.Attach the antenna to the antenna mount **(H)**.
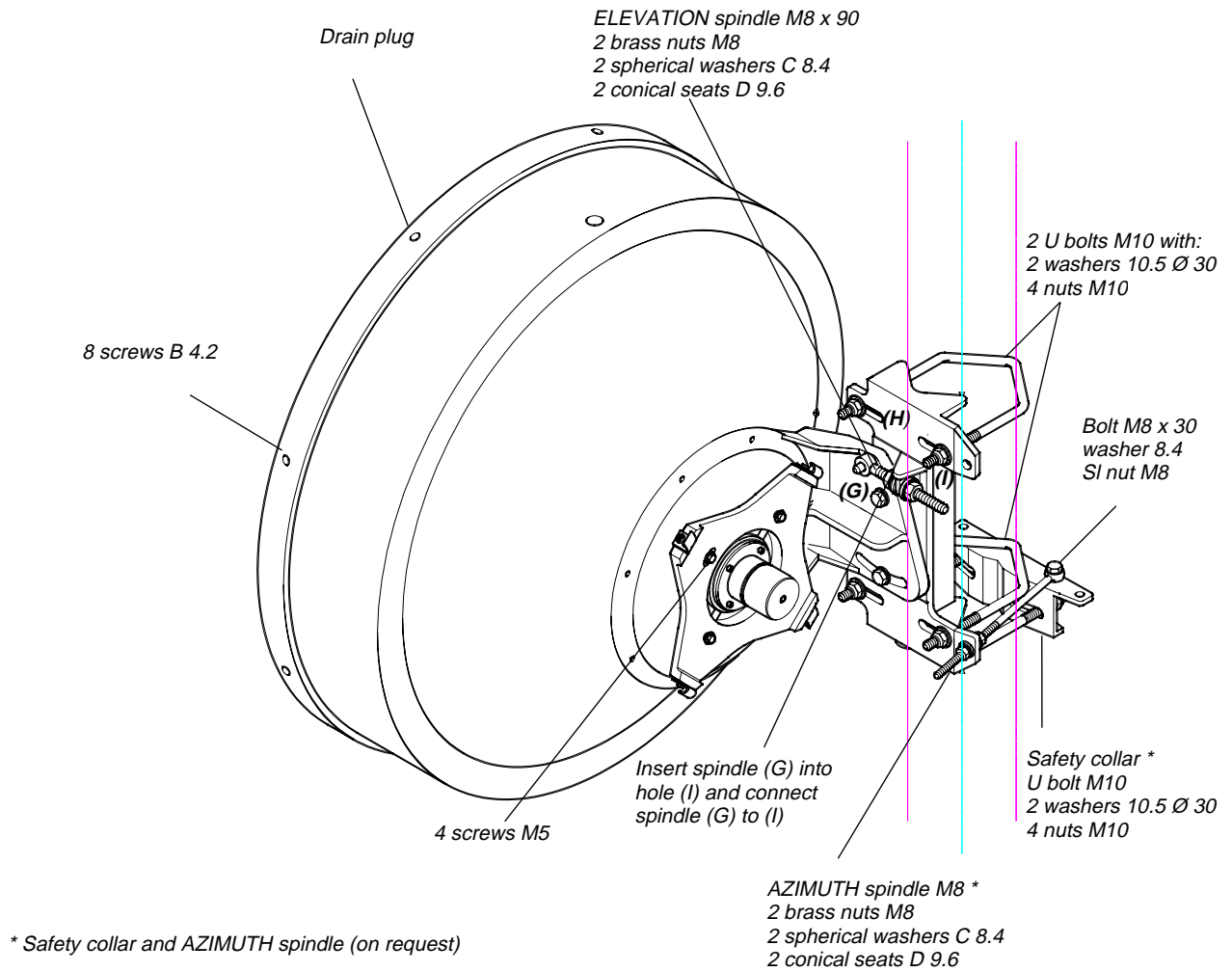
Drain plug

ELEVATION spindle M8 x 90
2 brass nuts M8
2 spherical washers C 8.4
2 conical seats D 9.6

2 U bolts M10 with:
2 washers 10.5 Ø 30
4 nuts M10

8 screws B 4.2

(H)

Bolt M8 x 30
washer 8.4
Sl nut M8

(G)

(I)

Insert spindle (G) into
hole (I) and connect
spindle (G) to (I)

Safety collar *
U bolt M10
2 washers 10.5 Ø 30
4 nuts M10

4 screws M5

AZIMUTH spindle M8 *
2 brass nuts M8
2 spherical washers C 8.4
2 conical seats D 9.6

Safety collar and AZIMUTH spindle (on request)

Figure 3- 30 Antenna Assembly - Two Foot Antenna (cont.)

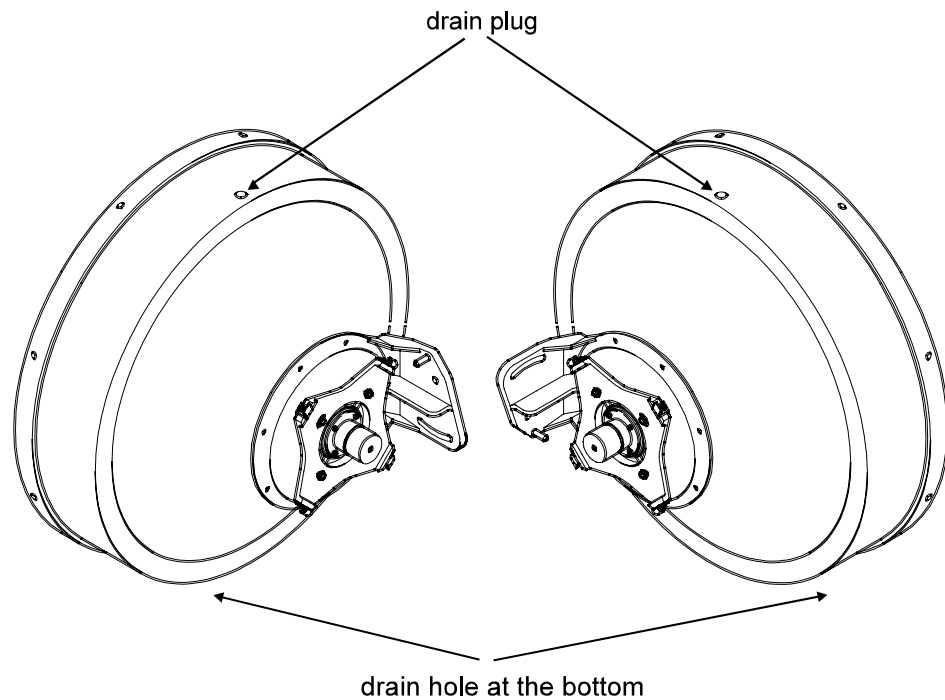Make sure to install the antenna with the drain plug side up as shown in the following figure.

drain plug

drain hole at the bottom

Figure 3-31 Correct Orientation of Antenna

5. Roughly align the antenna with the opposing site. This may be done by eyesight, using a compass or with the Giganet optical viewfinder.

Tip *It is sometimes difficult to identify the opposing site. For this reason, it is sometimes helpful to have someone at the opposing site use a reflecting device, such as a hand-held mirror, to reflect sunshine towards you.*

6. Attach the ODU to the mount assembly using the four latches on the ODU **(L)**. See the following.

⚠️
Warning

To verify proper sealing, confirm existence of a rubber O-ring on the antenna, as seen in the following figure.

Setting Polarity

Polarity is determined by the orientation of the ODU. If the handle of ODU is facing up or down then the polarity is vertical. If the handle of the ODU is to the side then the polarity is horizontal.
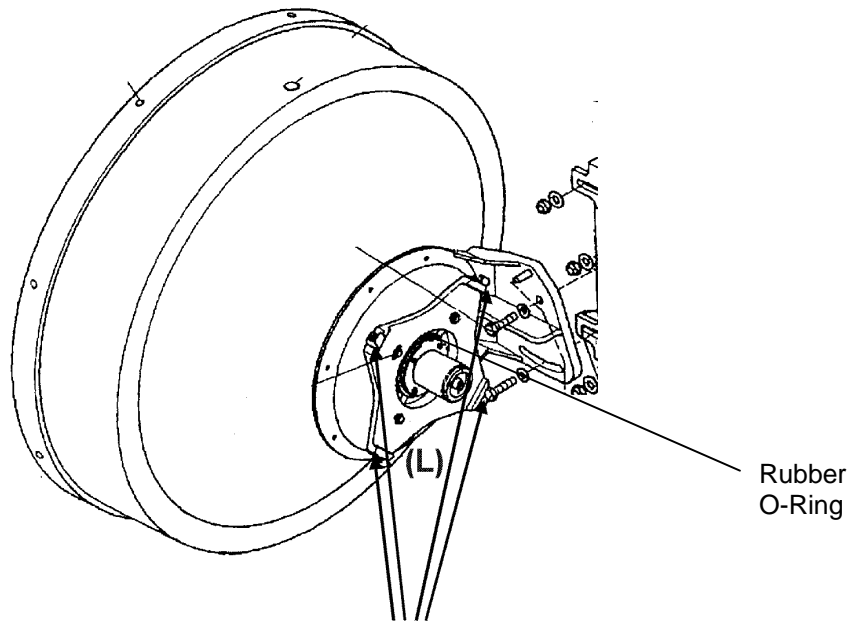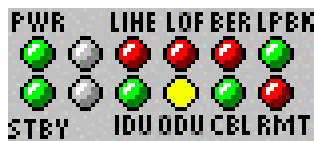
attach ODU to the
mount using 4 latches

Rubber
O-Ring

(L)

Figure 3-32 Attaching the ODU to the Mount Assembly

7. Connect the coaxial cable between the IDU and ODU using the N-Type connectors on the IDU and the ODU.

Tip   *Connect and disconnect the IDU from the ODU only when power is off.*

8. Turn the power switch on the IDU to ON.
   The LED display should appear as described below:

LED	Color	Explanation
PWR	Green	Power on
STBY	Green	Normal operation
BER	Red	Excessive bit errors detected
LINE	Red	No input to main channel/High BER
LBK	Green	Loopback not operated
LOF	Red	Loss of Frame detected (no radio connection)
IDU	Green	IDU operating and no IDU alarm
ODU	Yellow	Rx/Tx out of range
CBL	Green	Cable between ODU and IDU properly connected
RMT	Red	Remote unit not connected.

If the LED display is not as described above, refer to *Chapter 6 - Troubleshooting & Diagnostics*.

9. Connect the headset BNC adapter to the ODU.

10. Connect the headset to the adapter and put it on.

3.10.2. Initial Antenna Alignment − *Using the Headset*

If a tone is heard, your initial alignment is OK. Now you can adjust the aim to find the highest tone pitch and proceed to the final alignment as described in section 3.9.18.

If no tone is heard, the initial alignment is not satisfactory. It is recommended to use the mechanical aim for initial alignment.
In this case, loosen the azimuth bolts and adjust azimuth and tighten in the position where the highest tone is heard. If this does not help, adjust elevation and then azimuth. See directions below.

Note   *We recommend that two people perform this installation and alignment procedure, one at each ODU site, with some method of communications between them.*

3.10.2.1.   **Azimuth Alignment**

■   Loosen the nuts, as shown in the following figure, and rotate the antenna and mount, pointing it to the location of the opposing antenna.

■   Slowly sweep the antenna in azimuth.

■   If the desired signal is not found, increase or decrease elevation setting and repeat the azimuth sweep.
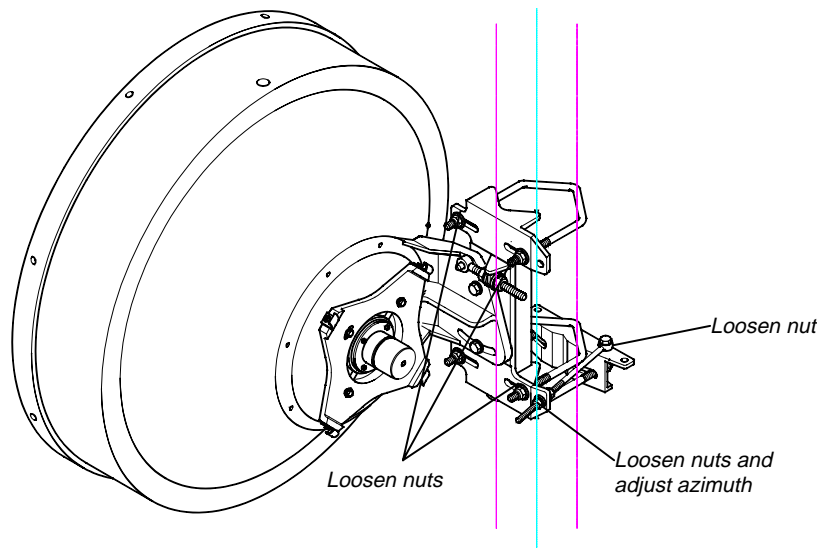

Figure 3- 33 Adjusting Azimuth - Two Foot Antenna

3.10.2.2.   **Elevation Alignment**

■   Loosen elevation adjustment bolts and nuts to adjust elevation (refer to the following figure).

■   Align pointer or edge of clamp with appropriate mark at the desired elevation reading.

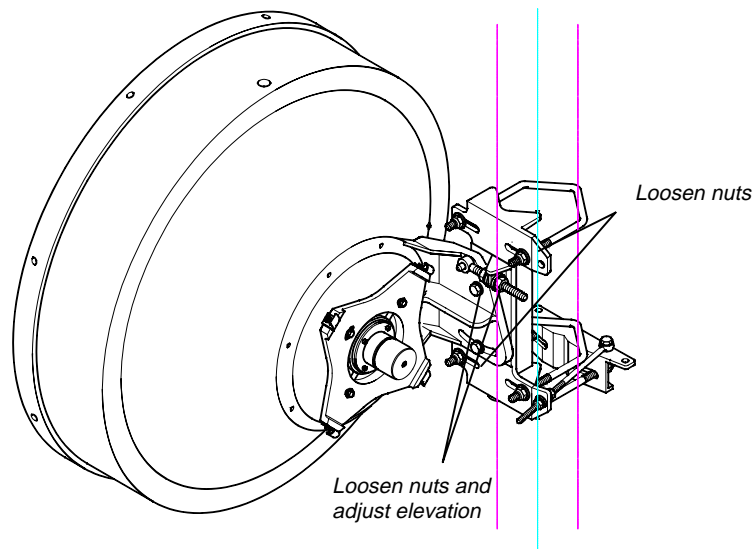■   Make an approximate setting. Temporarily tighten elevation bracket nuts.

Figure 3-34 Adjusting Elevation - Two Foot Antenna

11. Once you attain the highest audible tone, disconnect the BNC headset adapter.

This completes the initial alignment of the system.

3.10.3. Alignment Verification – Checking Actual Receive Level

When pivoting the antenna ±2° in azimuth and elevation during antenna alignment, three distinct lobes are probable: the two side lobes and the center (main) lobe. To ensure optimum system performance, the center lobe of the antenna must be aligned with the center of the opposing antenna in the link.

The initial alignment procedure explained in the previous section allows you to align the system to the peak of a lobe. However, it is difficult to make sure that the system is aligned to the center lobe using the tone heard through the headset. Therefore, following the initial alignment procedure you must perform the final alignment verification explained below in order to make sure that the system is aligned to the center lobe by verifying that the actual received signal level corresponds to the expected receive signal level. When the antenna is aligned to a side lobe, the expected RSL is at least 25dB less than the calculated unfaded RSL.
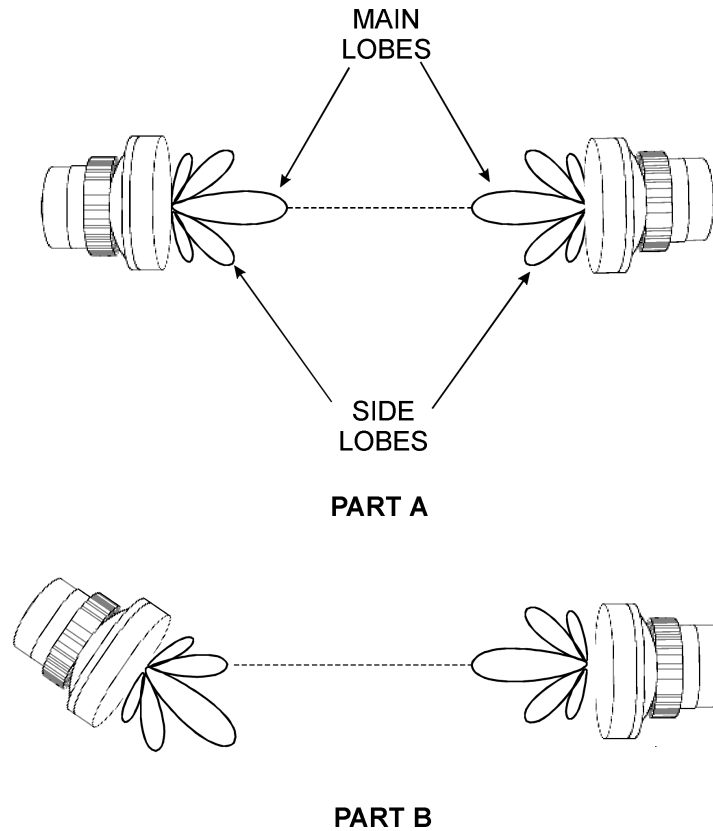
MAIN
LOBES

SIDE
LOBES

PART A

PART B

Figure 3-35 Antenna Alignment – Main and Side Lobes

1. Connect a DVM (Digital Voltmeter) - BNC adapter to the ODU.

2. Set the DVM to 2 VDC.

3. Turn the DVM on.
   The reading on the DVM indicates receive signal level.

   For example, if -1.44V is displayed, receive signal level is -44 dBm.

4. Compare the value displayed on the DVM to the expected value determined in section 3.9.11, step 2.

5. If the received signal level matches the expected level, tighten all bolted joints and remove the safety assembly.

⚠ *Important*

It is important to verify that the antenna is aligned to the center lobe peak. Proper alignment reduces the sensitivity to antenna movement, which can be due to strong winds or any other forces.

3.10.4. Final Check

When the antenna is installed, make sure that all aspects of the installation instructions have been followed. Check that all bolted joints are tightly locked, and connect and cover the coax cable connector as follows:

1. Connect the coaxial cable between the IDU and ODU using the N-Type connector on the IDU and the ODU.

2. Make sure that the fittings and the coax cable are clean and dry.

3. Peel approximately 6 inches of COAX-SEAL from the paper backing.

4. Wrap isolation tape over the coax cover. Start winding from coax cover towards fitting with one half overlap with each winding making sure all joints are well covered.
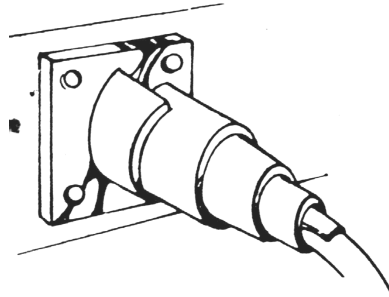

Figure 3-36 Steps 1, 2 & 3

5. After entire fitting and coax cable are covered with approximately 3/16" thick layers, mold and form COAX-SEAL with fingers to make a smooth surface and force out any air.
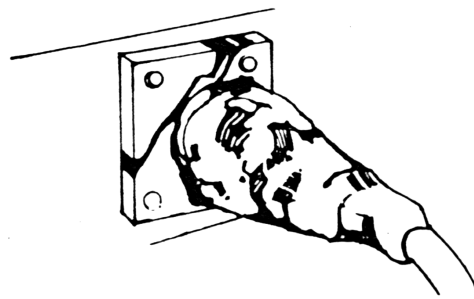

Figure 3- 37 Step 4

6.   If more COAX-SEAL is necessary to complete seal simply cut the needed amount and add to existing COAX-SEAL, molding and press into the other material. COAX-SEAL adheres to itself with slight pressure. Carefully inspect seal to make certain that all joints are covered

3.10.5. Safety and Grounding

The pole, antenna mount assembly and feed cables must be grounded in accordance with current national and local electric codes to protect from surges due to nearby lightning strikes. The following figure illustrates a typical grounding method.

Clamps that provide a solid connection between ground wire and ground source should be used.
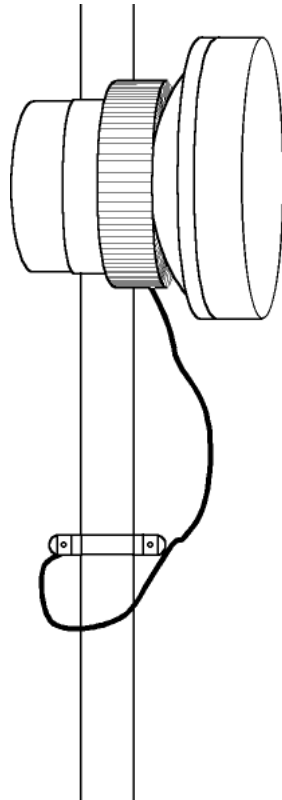

Figure 3-38 Grounding the ODU Assembly

The ODU installation and initial alignment is now complete. Repeat this procedure for the opposing ODU.

3.11. Installation Verification

3.11.1. Using the Headset and Buzzer

Connect a headset to the headset connector on the IDU (both sides), verify communications and test the buzzer (also on IDU front panel). Note that to use the headset, the Engineering Order Wire option must be set to active. The Engineering Order Wire is an audio connection between the two indoor units.

3.11.1.1. Verifying Activation of Engineering Order Wire (EOW)

To verify that the Engineering Order Wire (EOW) option is activated, follow these steps:

1. Select **Configuration ➢ Sonet/SDH**.
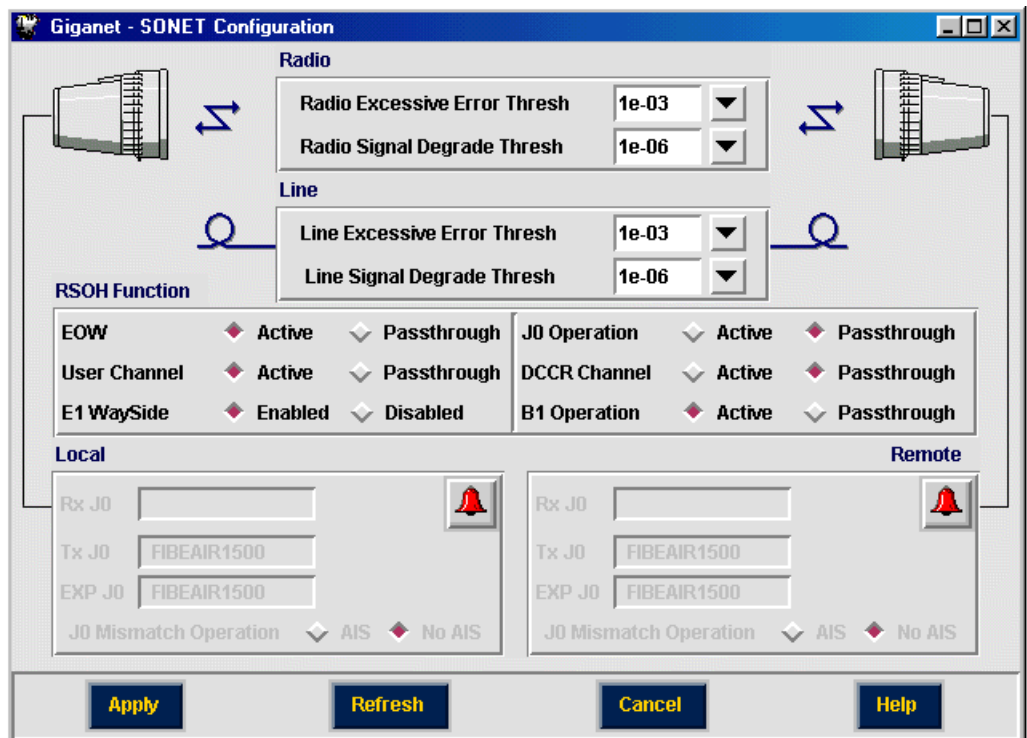   The Sonet/SDH Configuration window is displayed.

Figure 3-39 Sonet/SDH Configuration Window

2. In the first line of the RSOH Function section of the window, next to EOW, click on Active (radio button should be filled ♦).

3. Click **Apply**.

4. Click **Cancel**.
   The Sonet/SDH Configuration window is closed and you are returned to the Work Area window.

3.11.2. Checking the Frequency Plan

1. Enter the Management software and select **Configuration** ➢ **Set frequency**.
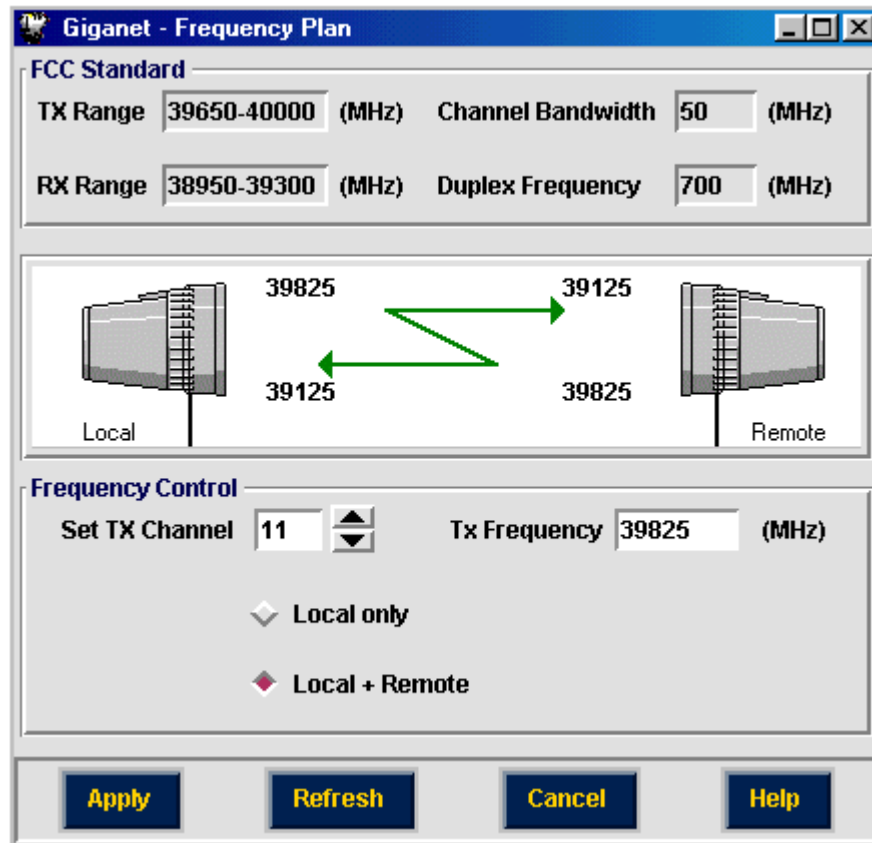   The Frequency Plan window is displayed.

Figure 3-40 Frequency Plan Window

2. Verify that the lightning bolt between the two ODU images is displayed in green.

3.11.3. Checking the ODU Configuration

1. Select **Configuration** ➢ **ODU**.
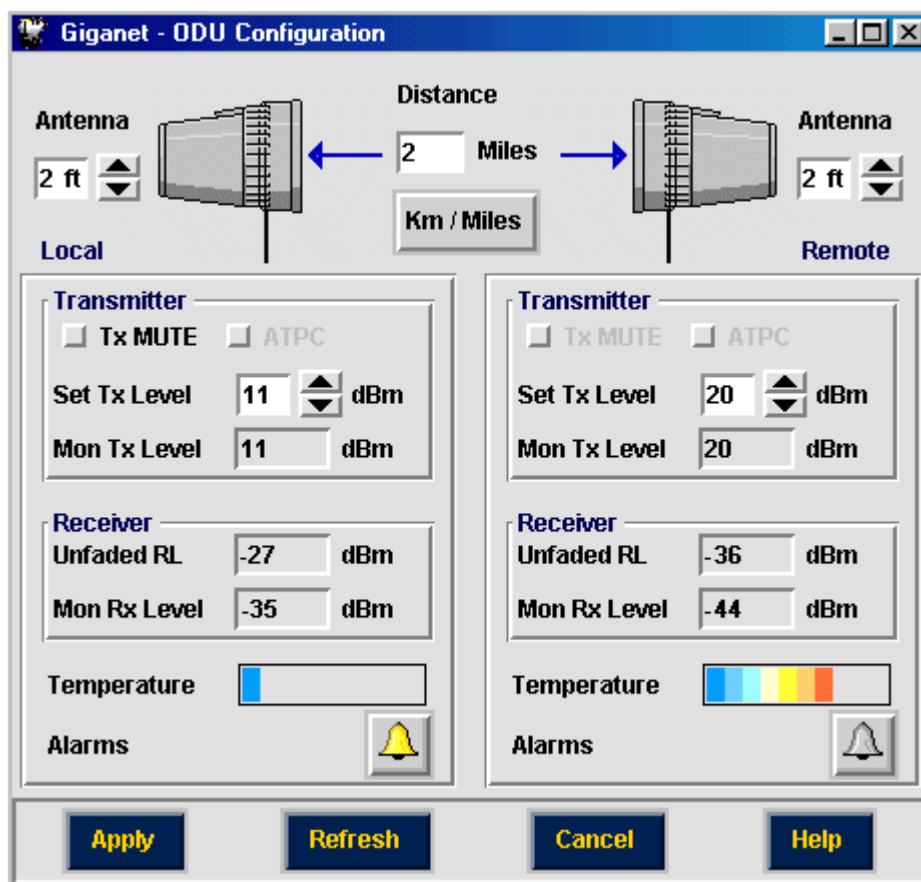   The ODU Configuration window is displayed.

Figure 3-41 ODU Configuration Window

2. Verify that the remote side of the ODU Configuration window is active (values can be changed).

3. Verify that the Monitored Rx displayed is as previously measured by the DVM (Unfaded RSL).

If any problems were encountered during the checks described above, refer to *Chapter 6 - Troubleshooting & Diagnostics*.