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Telaxis Communications Corp.
Model(s): FL60-1250(-AL1 & -BL1)
FCC ID: P57-FL60-1250
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APPENDIX I: MANUAL

Please see the following pages.

Model FL60-1250

FiberLeap Access Unit
Installation and Operation Manual

Telaxis Communications
20 Industrial Drive East
South Deerfield, MA 01373 USA



413-665-8551
www.fiberleap.com

Dwg #5031597401

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1 SERVICE

- FiberLeap is designed and sold for installation and use by authorized, trained professionals.
- Failure to follow these installation instructions could damage the equipment and/or result in improper operation. Should any questions arise during installation or operation, contact Telaxis Customer Assistance Center (CAC).
- Maintenance is strictly limited to ensuring that the exterior of the Access Unit is kept clean, and that the power and ground connections are secure and free of corrosion.
- For service, the unit must be returned to Telaxis CUSTOMER ASSISTANCE CENTER (CAC):
 - Phone 1-413-665-8551
 - Fax 1-413-665-7090
 - Email customerassistance@tlxs.com
- This product complies with CFR 1040.10 and 1040.11. A Class I laser is utilized in the Access Unit as a fiber optic driver. Class 1 lasers do not emit radiation at known hazardous levels. However, it is recommended that maintenance or service personnel should never look at an open fiber end or connector that is carrying a live signal. During use, this optical fiber communications system is completely enclosed except if an accidental break occurs in the system cable, or if the patch cable becomes accidentally disconnected from the Interface Panel.

2 WARRANTY

- Refer to your sales order or lease agreement for warranty terms and conditions. Any attempt to modify a FiberLeap Access Unit will void the warranty.

3 OVERVIEW

- **Application**

The FiberLeap™ product is designed to extend the reach of fiber optic networks through wireless connections where installation barriers and high cost make installing additional fiber connections less desirable. Telaxis has developed this product to enable direct fiber optic connection and transmission of fiber optic signals over a wireless link without the use of conventional modems (see Figure 1). These fiber extension links function, and can be managed and serviced, as if they were a length of fiber optic cable.

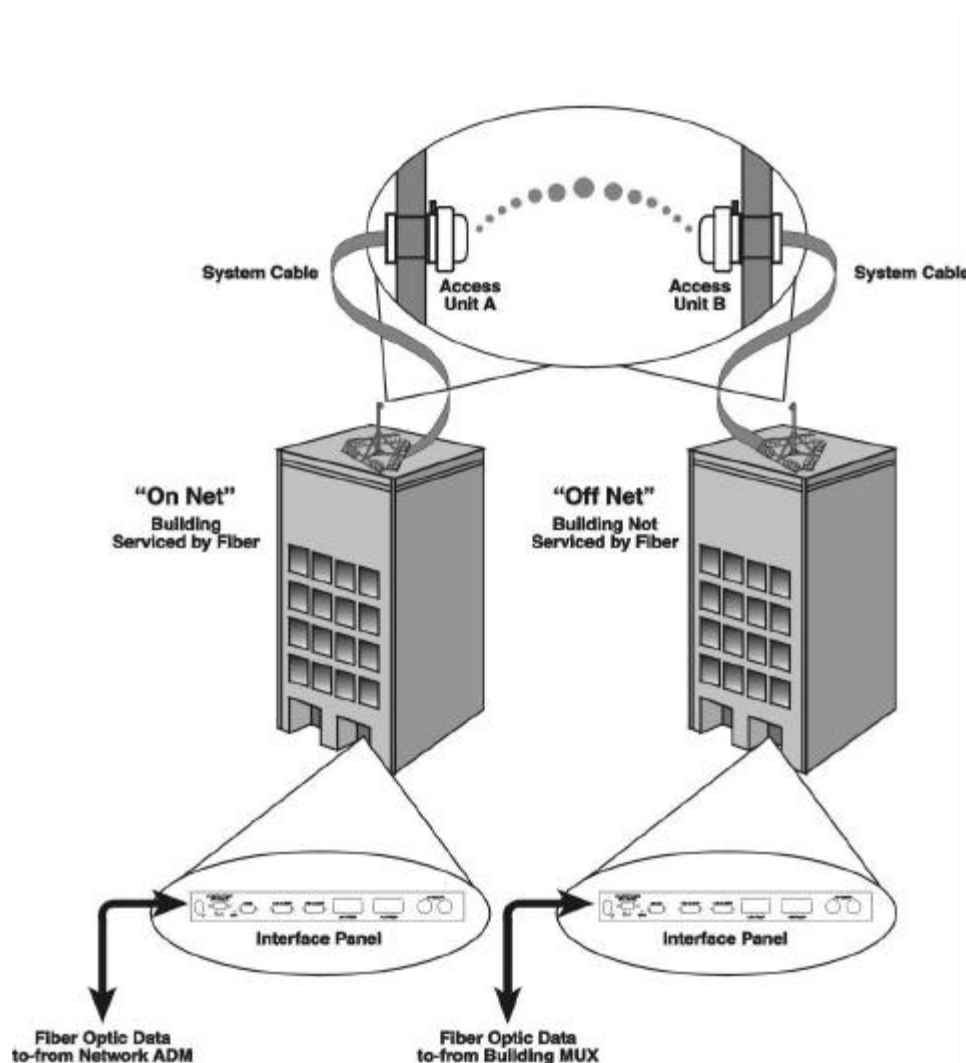


Figure 1. FiberLeap Link Overview

- **Hardware Description**

A FiberLeap fiber extension link consists of:

- Access units (2)
- Antenna with mast Mount Assembly (2)
- Mast Mount Assembly Kit (2)
- FiberLeap Interface panels (2)
- FiberLeap System Cables (2)

The two Access Units are mounted within direct visual Line-of-Site of each other. Each of the two Access Units is connected to an Interface Panel (located indoors), by means of a System Cable and, in some instances, supplementary lengths of standard fiber and copper cables. The Interface Panels connect to the fiber optic network. **(Refer to Installation and Operation Manual, Interface Panel Model SP2000.)**

- **About this Manual**

This Installation and Operation Manual provides instructions on how to install the Access Unit and associated antenna on one end of a FiberLeap link which is then repeated for the other end of the link. The manual also provides instructions for removing and replacing just the Access Unit.

This installation procedure assumes that the necessary rooftop mast for mounting the Access Unit and the System Cable have already been installed as described in section 5 of this manual under the topic “Prerequisites”.

IMPORTANT:

- **A FiberLeap system must be installed to conform to all applicable, local and regional, lightning, electrical, public safety and fire protection codes. It is the responsibility of the user to determine what codes apply and the necessary requirements.**
- **Telaxis Customer Assistance Center will supply, upon request, a bulletin which lists suggested steps towards making a FiberLeap installation conform to NFPA 780, Standard for the Installation of Lightning Protection Systems, 2000 Edition.**

4 INSPECTION AND UNPACKING

Inspect the shipment packaging and contents for any obvious damage due to shipment. If any damage is evident, you should immediately file a claim with the transporter and forward a copy to the FiberLeap Customer Assistance Center.

The Packing List itemizes each component shipped. Verify each part of the indicated quantity. If any parts are missing, immediately contact:
FiberLeap Customer Assistance Center (CAC).

• Parts Identification

- 1 FiberLeap Access Unit, Model FL60-1250
- 1 Antenna with mast Mount Assembly and hardware kit, Model MT2000-PR
- 1 FiberLeap Installation and Operation Manual (5031597401)
- 1 Access Unit Hardware Kit, Installation (5031597701)

5 GETTING STARTED

This section lists the tools and parts needed to install the mast Mount Assembly and Access Unit, as well as important Safety Guidelines.

Hardware Installation, Cable Connections and Alignment

• Tools Required

- One open end wrench, 17 mm
- Two open end wrenches, 9/16"
- One hex socket driver, 5/16"
- Crimping Tool (Ground lug attachment to ground wire)
- Multimeter for dc voltage measurement and continuity checks
- BNC-to-BNC Cable with BNC-to-test lead adapter

• Safety Information

The following are safety guidelines that you should observe when working with any equipment that connects to electrical power or telephone wiring;

Safety Warnings



WARNING

This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents.

**WARNING**

Do not work on the system or connect or disconnect cables during periods of lightning activity.

**WARNING**

Before performing any of the following procedures, ensure that the equipment room dc power source supplying power to the Interface Panel is OFF.

- **Prerequisites**

Before initiating the actual installation of the Access Unit, certain other activities should already have been accomplished. These include:

1. A Site Engineering Study – This study would have been initiated by a Site Survey to determine all the physical and environmental constraints of the installation. The engineering study ensures that the performance of the data link can be met and specifies the details of the installation, i.e. the location of the Interface Panel, diameter of the mount/mast for the Access Unit and its location, identification of the power source, length of the System Cable, distance between the two FiberLeap Access Units (link distance), far end Access Unit location, etc.
2. Installation of the Rooftop Mast for the Access Unit – A suitable mast, 2.5 to 4.5” O.D., of sufficient height to meet the Access Unit mounting height requirement specified in the engineering study must have been installed. This mast must be braced or ballasted to survive high winds and grounded to the rooftop lightning protection system in accordance with NEC or local regulations. An alternative, such as railing mount, may be utilized in some installations.
3. Installation of the System Cable – This installation must have been completed in conformance with building requirements and governing codes by trained and licensed installers. In locations where the System Cable does not extend fully to the Interface Panel, the System Cable should be terminated at a Junction Box near the Rooftop Mast. A connection to the Interface Panel must be accomplished by the installation of copper and fiber cable extensions between the Junction Box and the Interface Panel.
4. Installation of the Interface Panel – The Interface Panel should be either rack or wall mounted in a suitable location in the Equipment Room to allow easy connection to the network switch and the dc power source. (Refer to Installation and Operation Manual, Interface Panel Model SP2000.)
5. Review of Installation Details – The installer should review the engineering study to assure an understanding of all the installation requirements. This includes the Access Unit type (A or B), mounting height, Line-of-Sight direction to the far end of the link, antenna polarization (Horizontal or Vertical) and data source identification.

6 INSTALLATION

6.1 Positioning the mast Mount Assembly

The site engineering study specifies the physical requirements for mounting the Access Unit and the installer must refer to that document to determine the pre-determined parameters for properly installing the mast Mount Assembly and Access Unit:

- Height above the roof deck
- Location of the two Access Units and the connecting line-of-sight
- Access Unit type at each link end (A or B)

6.1.1 Single Link Installation

For single link installations it is recommended that the Access Unit always be mounted to the right of the pole or mast as shown in Figure 2. The brass elevation adjustment pin on the Mount Assembly should be closest to the installer when so assembled. The associated elevation adjustment hex nut will be facing up.

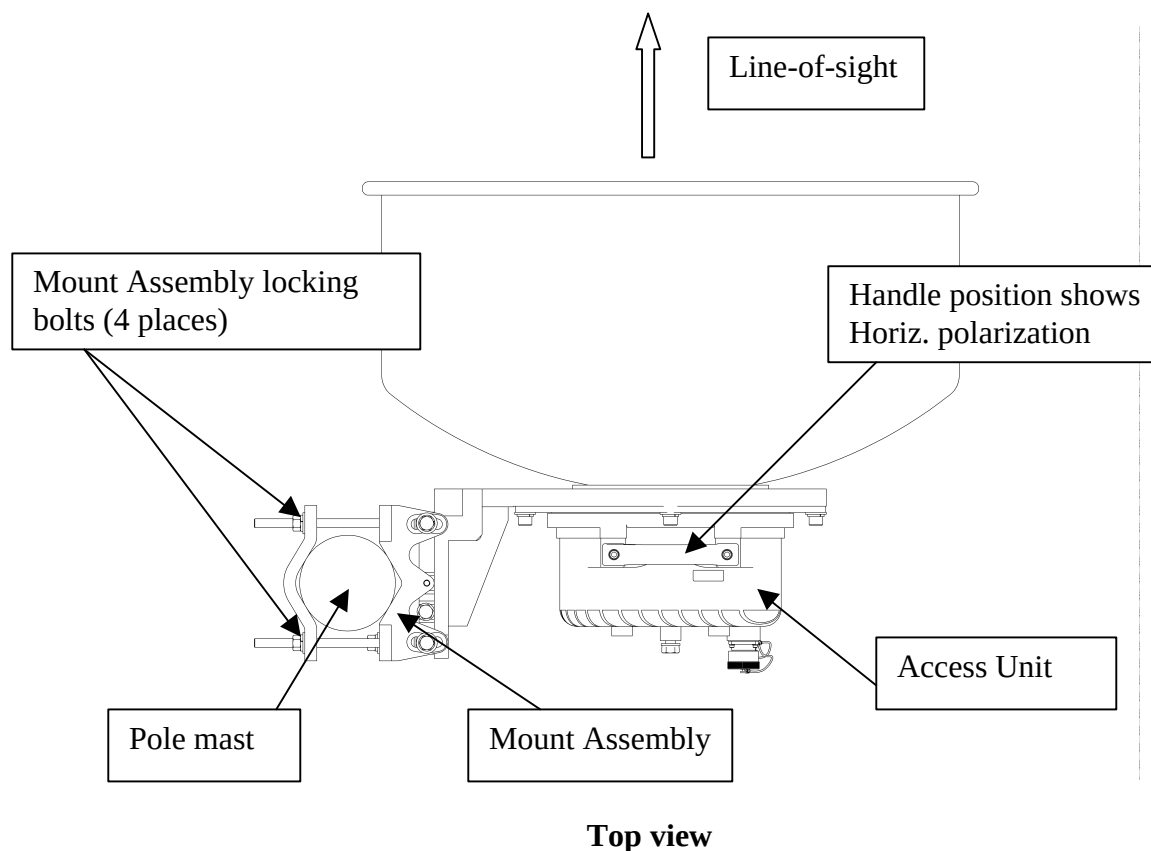


Figure 2. Mount Assembly Orientation to Line-of-Sight for Installation to Right-hand Side of Pole/Mast

Positioning the mast Mount Assembly (cont.)

Note: Two open drain holes on the antenna will be located underneath the antenna for this installation.

**WARNING**

When working on a roof, on a ladder, mast or staging, use extreme care. Observe all facility and OSHA (or other applicable regulatory agency) required safety precautions.

Ensure that the (4) locking bolts on the mast Mount Assembly are always loosened approximately 1 turn when making azimuth or height adjustments.

Position the mast Mount Assembly on the mast, at the height specified in the Site Engineering Study. See Figure 3.

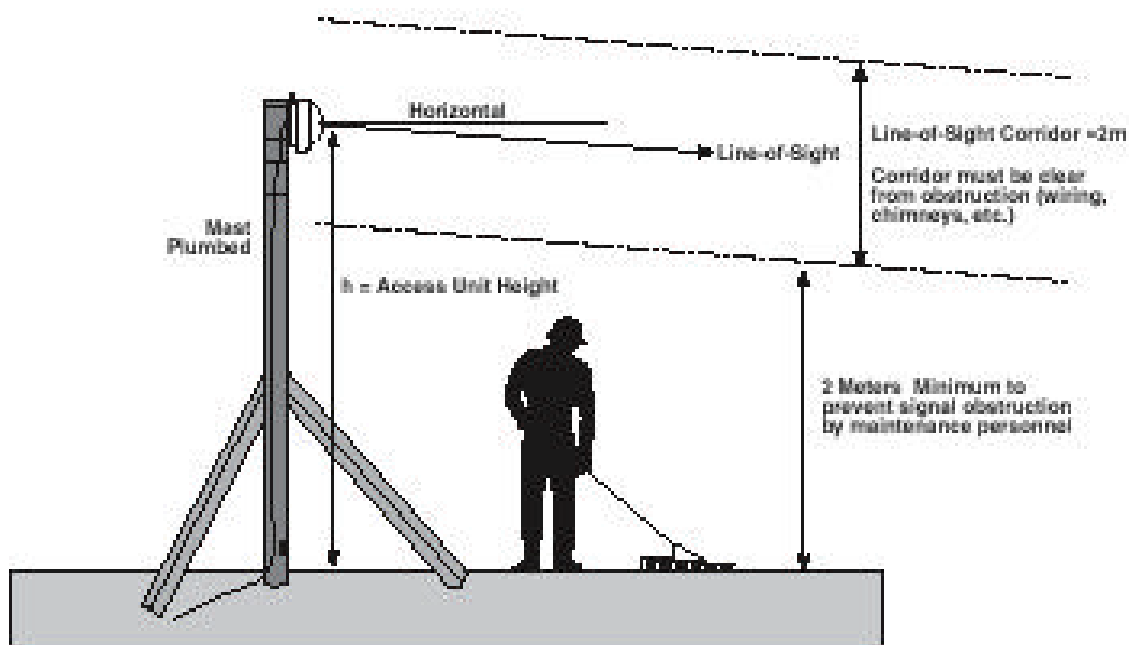


Figure 3. Access Unit Height above Roof

IMPORTANT:

- DO NOT position Access Unit Line-of-Sight in such a manner that the antenna beam is directed towards areas where maintenance personnel could obstruct it.

Positioning the mast Mount Assembly (cont.)

For installations where it is not possible to have the Access Unit mounted to the right of the pole/mast, the Mount Assembly needs to be flipped over resulting in the installation shown in Figure 4.

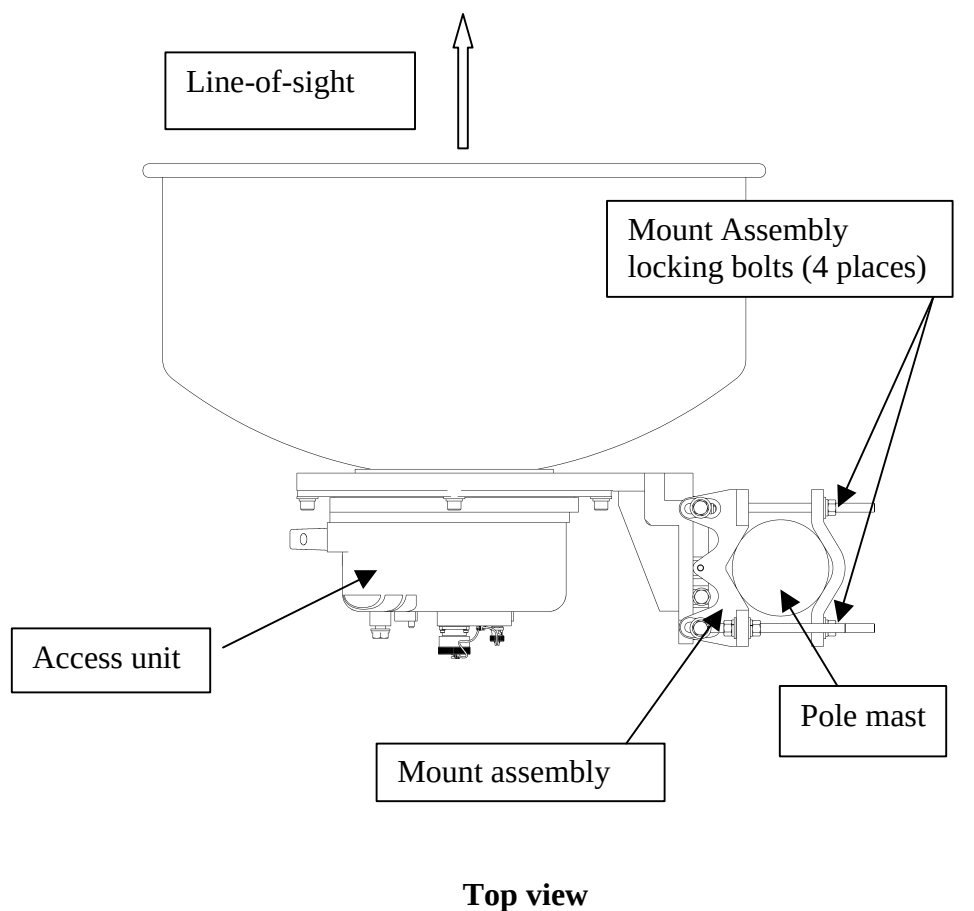


Figure 4. Mount Assembly Orientation to Line-of-Sight for Installation to Left-hand Side of Pole/Mast

Note: The brass elevation adjustment pin on the Mount Assembly should still be closest to the installer when working from the rear, but the elevation adjustment hex nut will instead now be facing down.

*It will be necessary to move two drain hole plugs (now facing down) on the antenna to the top of the antenna. **This will create two open drain holes underneath the antenna for this installation.***

6.1.2 Dual Link Installation

Some installations may require two links installed on the same pole/mast. Two different scenarios are anticipated here.

Positioning the mast Mount Assembly (cont.)

a) An installation involving two Access Units on the same mast (two different links) and pointing in different directions can have Access Units positioned for the same or different polarization. Figure 5 shows horizontal polarization selected for each link.

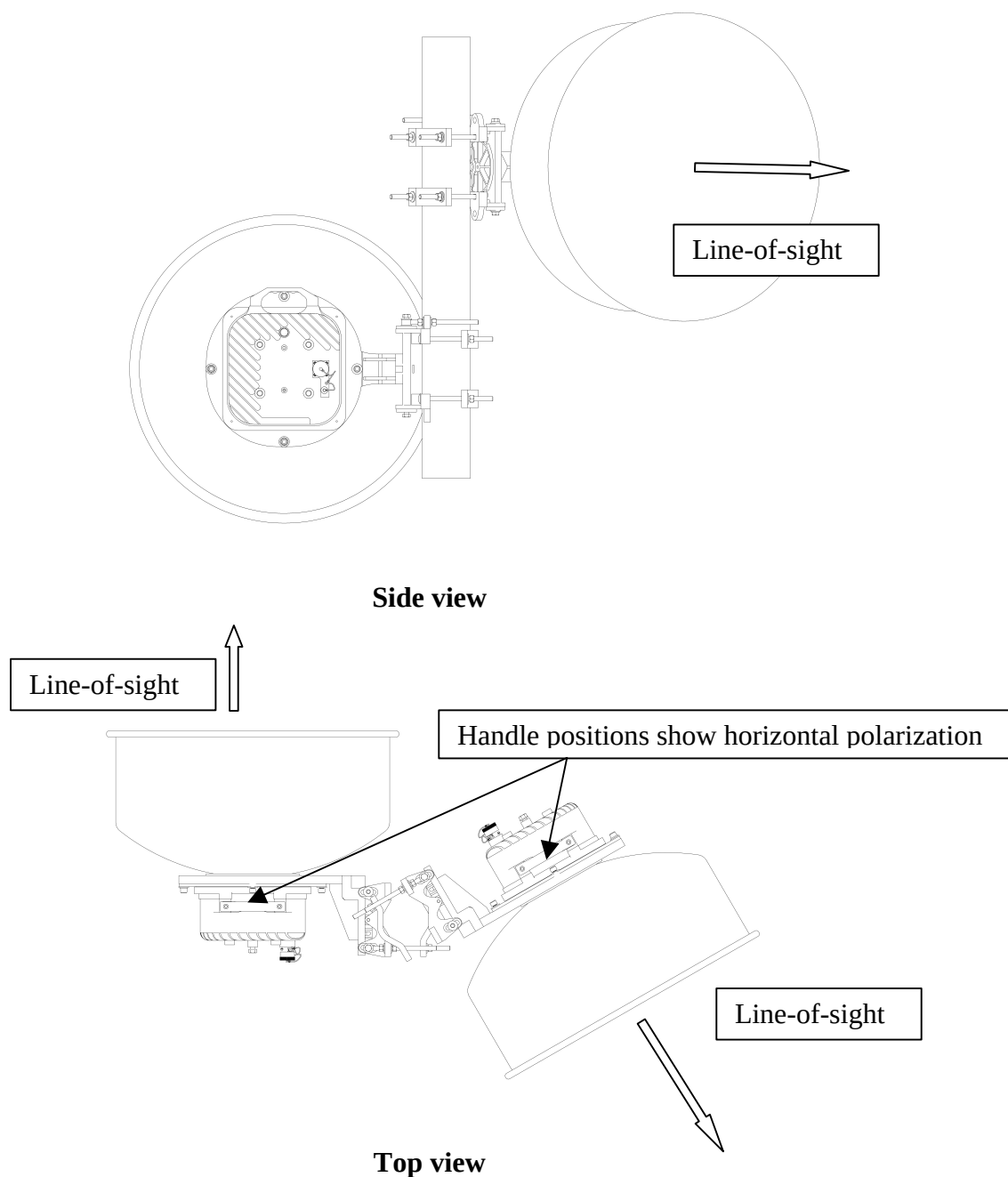


Figure 5a. Two Access Units with Different Line-of-Sight having the same polarization

Positioning the mast Mount Assembly (cont.)

b) An installation involving two Access Units on the same mast (two separate links) and pointing in the same direction requires one Access Unit positioned for horizontal polarization (Carry handle located on top or bottom of Access Unit). The second Access Unit should be positioned for vertical polarization (Carry handle located on either side of the Access Unit). See Figure 5b.

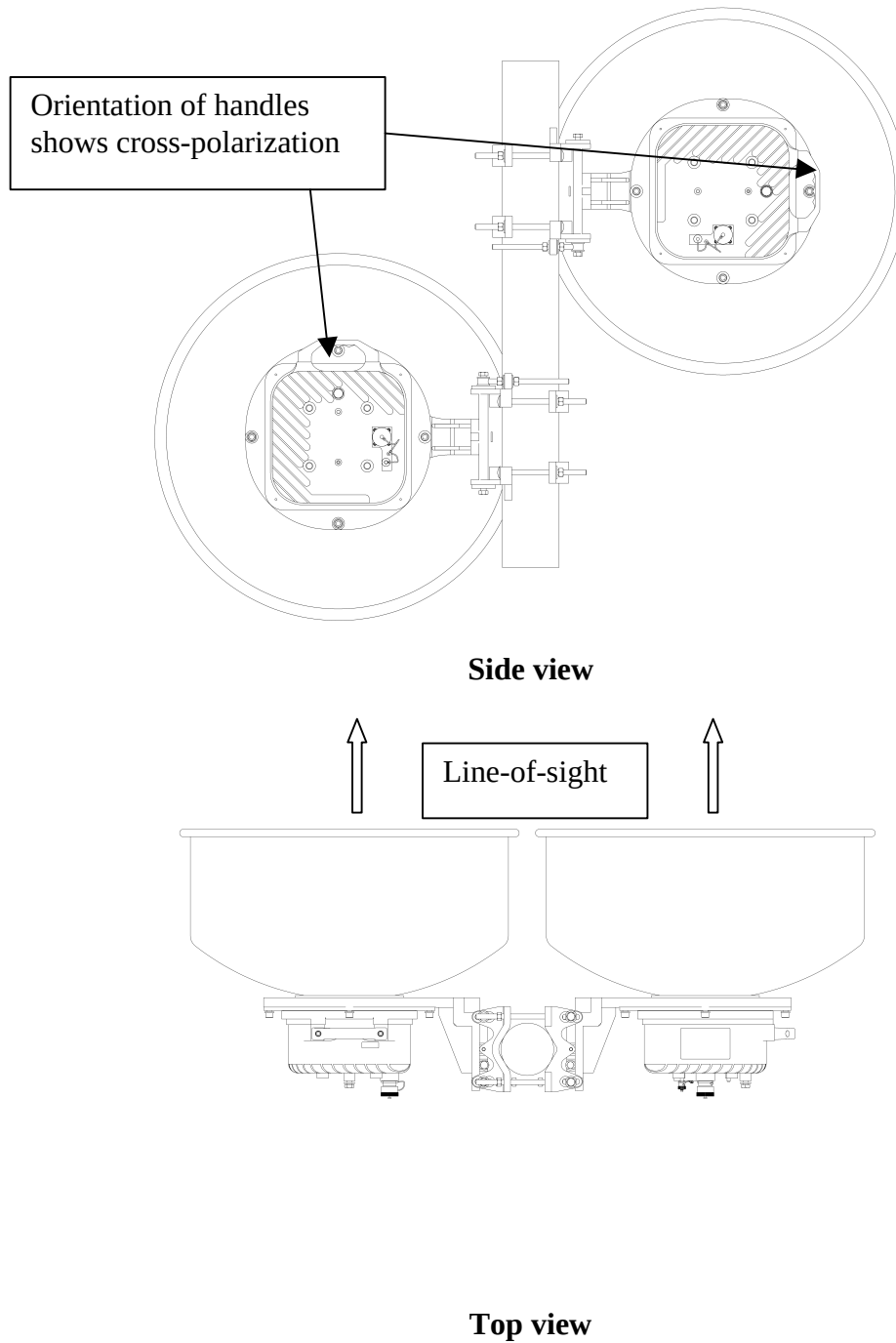


Figure 5b. Two Access Units with Same Line-of-Sight

6.2 Attach the mast Mount Assembly

6.2.1 Attach to Mast (Do not loosen Az Lock Bolts):

Using (4) 3/8-16 galvanized nuts, flat washers, lock washers and (2) clamp plates, secure mount assembly to pole. Tighten hardware (4 places). Torque to 45-55 N-m (33-40 lb-ft).

IMPORTANT:

- **By sighting along the center pin and elevation adjustment pin on the Mount Assembly, adjust the Mount Assembly for approximate link line up. See Figure 6.**

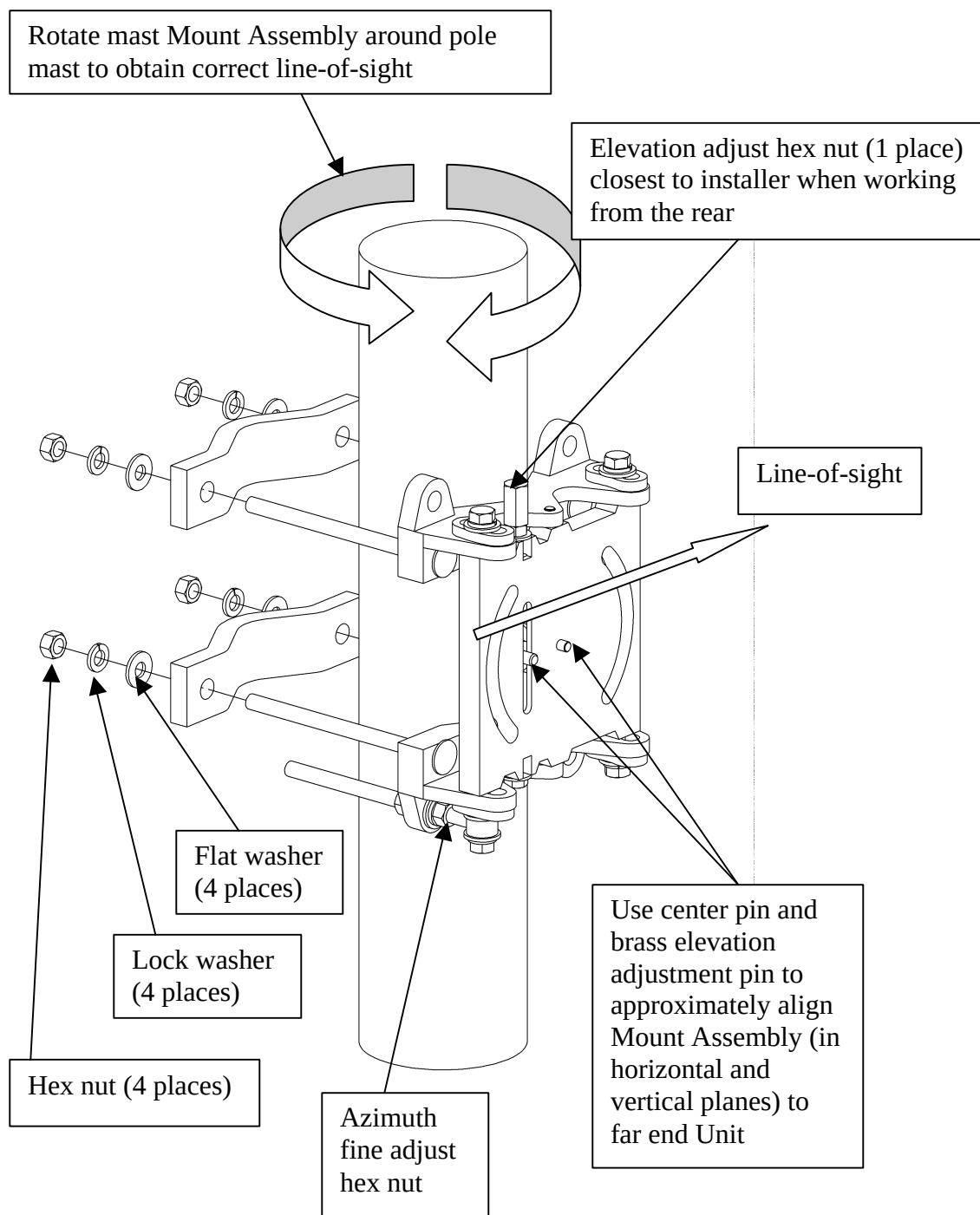
6.2.2 For fine elevation adjust:

Loosen (2 places) 3/8-16 galvanized elevation mounting and locking screws (see Figure 7), rotate (1 place) elevation adjust hex nut (see Figure 6) to required amount of tilt. Tighten 3/8-16 galvanized elevation mounting and locking screws (2 places). Torque to 45-55 N-m (33-40 lb-ft).

6.2.3 For fine Azimuth adjust:

Loosen (4 places) Azimuth locking screws (see Figure 7). Use 3/8-16 nuts (2 places) to drive antenna Left or Right to required pointing direction (see Figure 7). Tighten 3/8-16 nuts (2 places). Tighten 3/8-16 Azimuth locking screws (4 places). Torque to 45-55 N-m (33-40 lb-ft).

Attach the mast Mount Assembly (cont.)

**Figure 6. FiberLeap mast Mount Assembly Hardware**

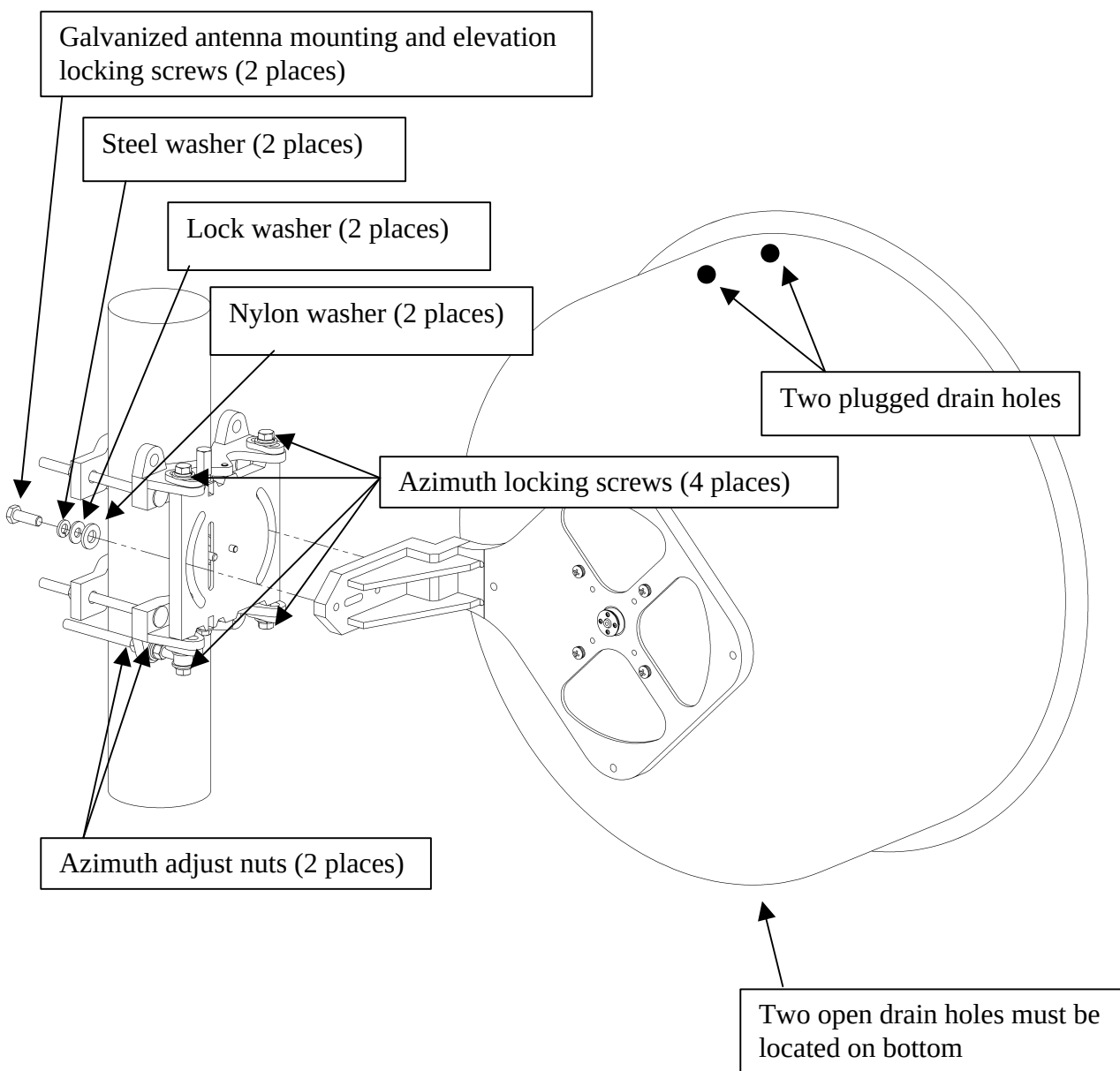
6.3 Attach FiberLeap Antenna Unit to mast Mount Assembly

CAUTION:

- Handle Antenna Unit carefully to prevent damage
- Avoid impact or shock to the unit, especially to the antenna radome
- Always have protective cap on antenna feed except when Access Unit is attached.

- 6.3.1 Attach the antenna to the mast Mount Assembly by aligning the center pin hole and elevation adjustment pin on the antenna bracket to the two pins on the mast Mount Assembly. Use (2) 3/8-16 UNC x 1.00inch hex screws with nylon washers, flat washers and lock washers to fasten as shown in Figure 7. Do not torque.
- 6.3.2 Ensure that (4) Azimuth locking screws and (2) Elevation mounting and locking screws are all loosened approximately 1 turn.

Attach FiberLeap Antenna Unit to mast Mount Assembly (cont.)

**IMPORTANT:**

- After assembly, ensure that the two plugged drain holes are located at the top of the antenna as depicted in Figure 7.

Figure 7. Antenna Attachment to mast Mount Assembly

6.4 Attach FiberLeap Access Unit to Antenna Unit

- 6.4.1 Remove the protective cap on the antenna feed and inspect o-ring for any damage.
- 6.4.2 Remove the protective clear tape from the antenna interface port on the Access Unit.
- 6.4.3 Mount the Access Unit to the Antenna Unit using (4) 3/8-16 x 1.25 inch stainless steel socket head screws, lock washers and flat washers as shown in Figure 8. Ensure that the handle on the Access Unit is positioned either on the side (vertical polarization) or on the top or bottom (horizontal polarization) of the Access Unit depending on the polarization specified by the Site Engineering Study. Torque the bolts to 30-38 N-m (22-28 lb-ft).

IMPORTANT:

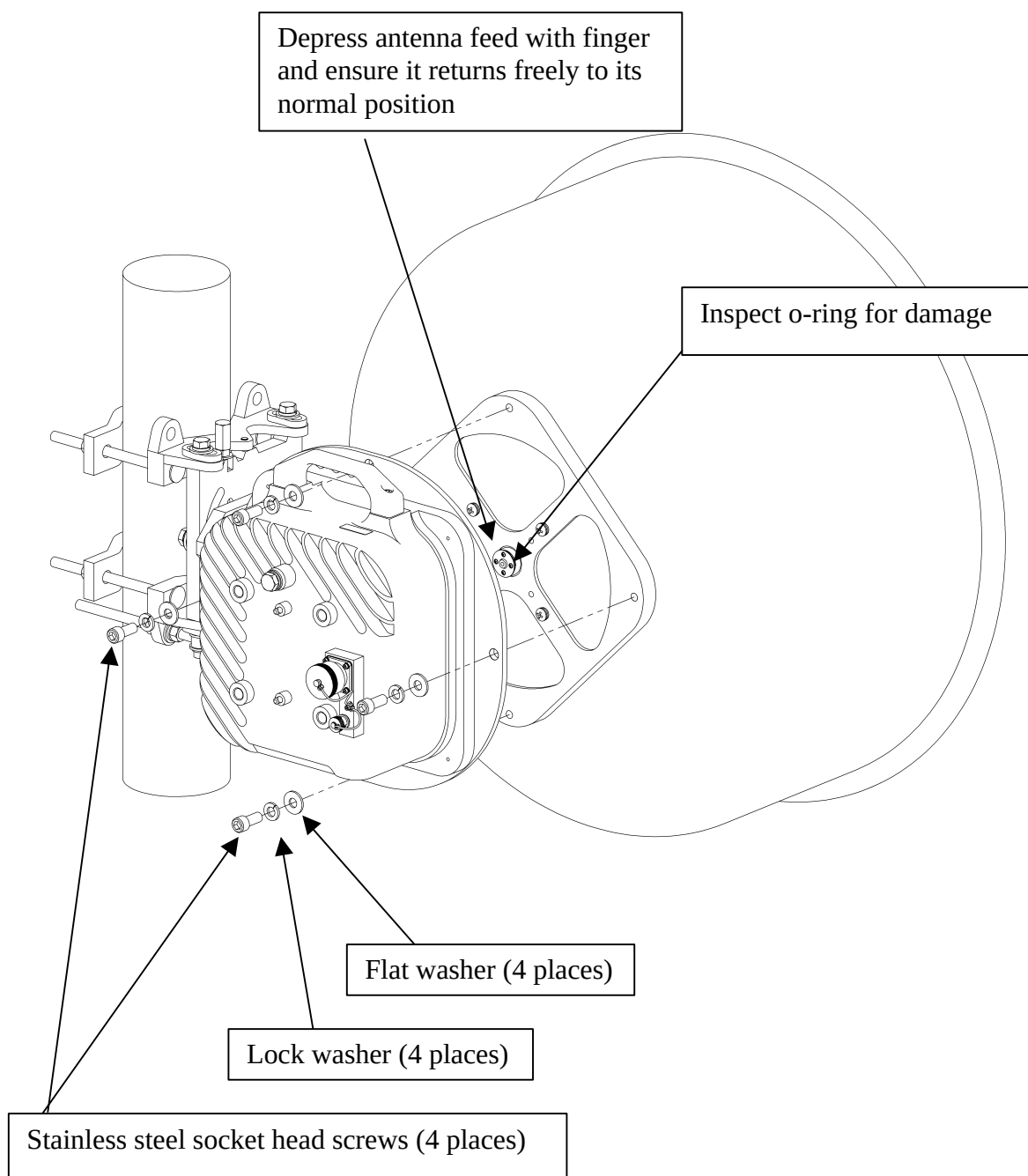
- Polarization of the **near end** and **far end** Access Units must be the same. The Site Engineering Study specifies Horizontal or Vertical polarization.
- Ensure that the (4) azimuth and (2) elevation locking screws on the mast Mount Assembly are always loosened approximately 1 turn when making azimuth or elevation adjustments to prevent damage to the adjustment mechanisms.
- Each link is comprised of two Access Units, one type A and one type B, as designated by the suffix after the model number (example FL60-1250-AL1 indicates type A). Install the type A or type B Access Units at the near end or far end, as specified in the Site Engineering Study.



WARNING

Attachment of any antenna other than the one supplied may violate FCC approval.

Attach FiberLeap Access Unit to Antenna Unit (cont.)

**Figure 8. Access Unit Attachment to Antenna Unit**

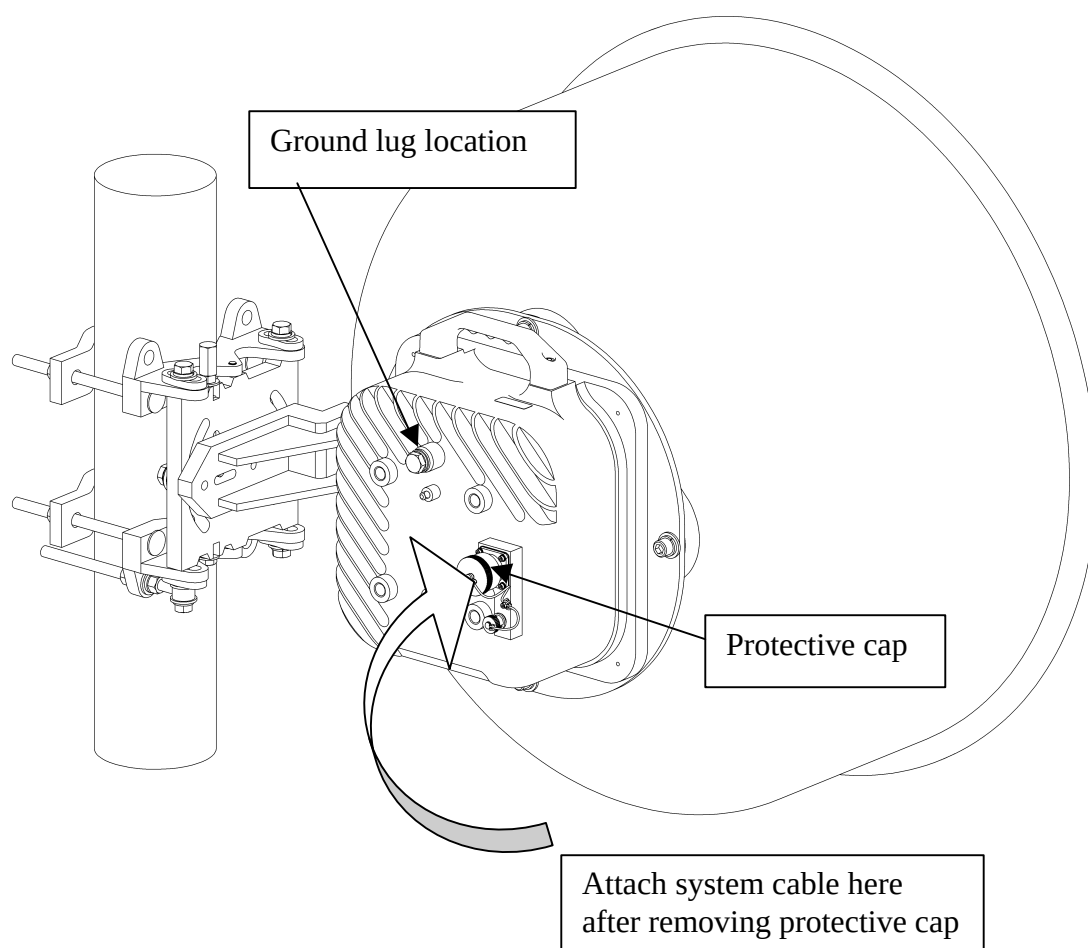
6.5 Make Cable Connection to FiberLeap Access Unit

- 6.5.1 Route an AWG 6 ground wire and System Cable up the mast and dress appropriately approximately every 18” using cable ties such that the wiring is close to the mast and an adequate service loop remains to connect to the Access Unit. Minimum bend radius for the System Cable is 130 mm (5 inches).
- 6.5.2 Crimp (1) M10 (.39 inch I.D) Ring Terminal on the AWG 6 ground wire using the appropriate crimping tool and setting.
- 6.5.3 Attach the ground wire to the Access Unit using the M10 x 1.5 x 25mm Hex Hd screw, M10 Lock Washer and M10 Flat Washer through the Ring Terminal. Torque to 45-50 N-m (33-37 lb-ft). See Figure 9.
- 6.5.4 Remove the protective caps on the Access Unit connector AND System Cable connector. Align the System Cable connector to match the Access Unit and connect, turning the connector nut until secure.
- 6.5.5 Mate the two protective caps. Use the tie-wrap to secure the two protective caps to the cable.

CAUTION:

- Before proceeding with the cable connection, ensure that the corresponding power switch on the Interface Panel (rear) is OFF.

Make Cable Connection to FiberLeap Access Unit (cont.)

**Figure 9. FiberLeap Access Unit Back View****IMPORTANT:**

- The ground wire and connections at both ends must present a low impedance path to afford adequate lightning protection to the installation and to ensure protection against electrical shock. Failure to provide an adequate ground could invite malfunction by making the installation susceptible to electromagnetic interference.

6.6 Powering Up

- 6.6.1 Verify the proper connection of the System Cable (and any extension cables inside the building) to the Interface Panel. Proper connections are specified in the “Installation and Operation Manual, Interface Panel Model SP2000”, Section 6, Installation.
- 6.6.2 Verify the connection of the Interface Panel to the power source. Observe proper polarity of the DC POWER INPUT connections as shown in Figure 10.
- 6.6.3 Enable the power source to the Interface Panel
- 6.6.4 Verify the power source voltage is between 36-60 Vdc using a voltmeter at the DC POWER INPUT terminals on the Interface Panel.
- 6.6.5 Turn ON Access Unit power at the Interface Panel (rear). The green LED on the front of the Interface Panel should illuminate to indicate power is available and enabled to the Access Unit.

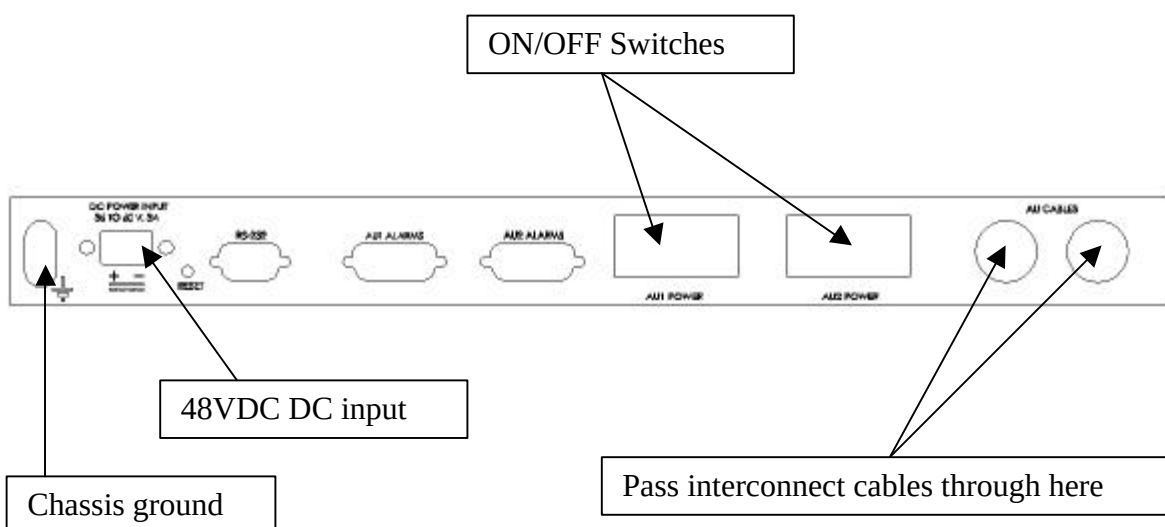


Figure 10. Interface Panel Connections (Rear)

6.7 Make Final Adjustment to Maximize Received Signal

The purpose of this step is to adjust the Line-of-Sight of the Access Unit to maximize the main lobe signal level. During this step, the second FiberLeap Access Unit at the far end of the link must also be at the same step in the installation procedure and powered ON. When the Access Unit is powered ON without any optical data signal (i.e. with the network data patch cable disconnected from the Interface Panel) it will transmit a continuous CW signal which can be used for alignment purposes.

- 6.7.1. Connect a dc voltmeter to the BNC connector on the rear of the Access Unit using a BNC-to-test lead adapter as shown in Figure 11. If the peak alignment of the two Access Units is sufficiently close, the voltmeter should give a typical alignment voltage as shown in the **Alignment Voltage Chart** supplied with each unit. This chart will provide an alignment voltage for some typical installed link ranges. Visually adjust alignment if necessary.
- 6.7.2 Using the Azimuth Adjustment Nuts (see Figure 11), adjust the azimuth until the reading on the voltmeter is at a maximum. It is advised that, in order to ensure the true maximum, you should adjust through the maximum (peak voltage) until the voltage clearly drops and continues to drop to lower level side-lobes. Adjust back until the maximum is again attained (see Figure 12).
- 6.7.3 Using the Elevation Adjustment Screw (see Figure 11), adjust the elevation until the reading on the voltmeter is at a maximum. It is advised that, in order to ensure the true maximum, you should adjust through the maximum (peak voltage) until the voltage clearly drops and continues to drop to lower level side-lobes. Adjust back until the maximum is again attained (see Figure 12).
- 6.7.4 Repeats steps 6.7.2 and 6.7.3 above to guarantee optimum alignment for maximum signal strength. Refer to the **Alignment Voltage Chart** supplied with each unit.
- 6.7.5 Tighten the Azimuth adjustment nuts on the Mount Assembly while observing the voltmeter reading to ensure the azimuth alignment does not change while tightening. Tighten nuts to 45-55 N-m (33-40 lb-ft). Tighten (4) azimuth adjustment locking screws. Torque screws to 45-55 N-m (33-40 lb-ft).
- 6.7.6 Tighten the two Elevation adjustment screws on the Mount Assembly while observing the voltmeter reading to ensure the elevation alignment does not change. Tighten screws to 45-55 N-m (33-40 lb-ft).

Make Final Adjustment to Maximize Received Signal (cont.)

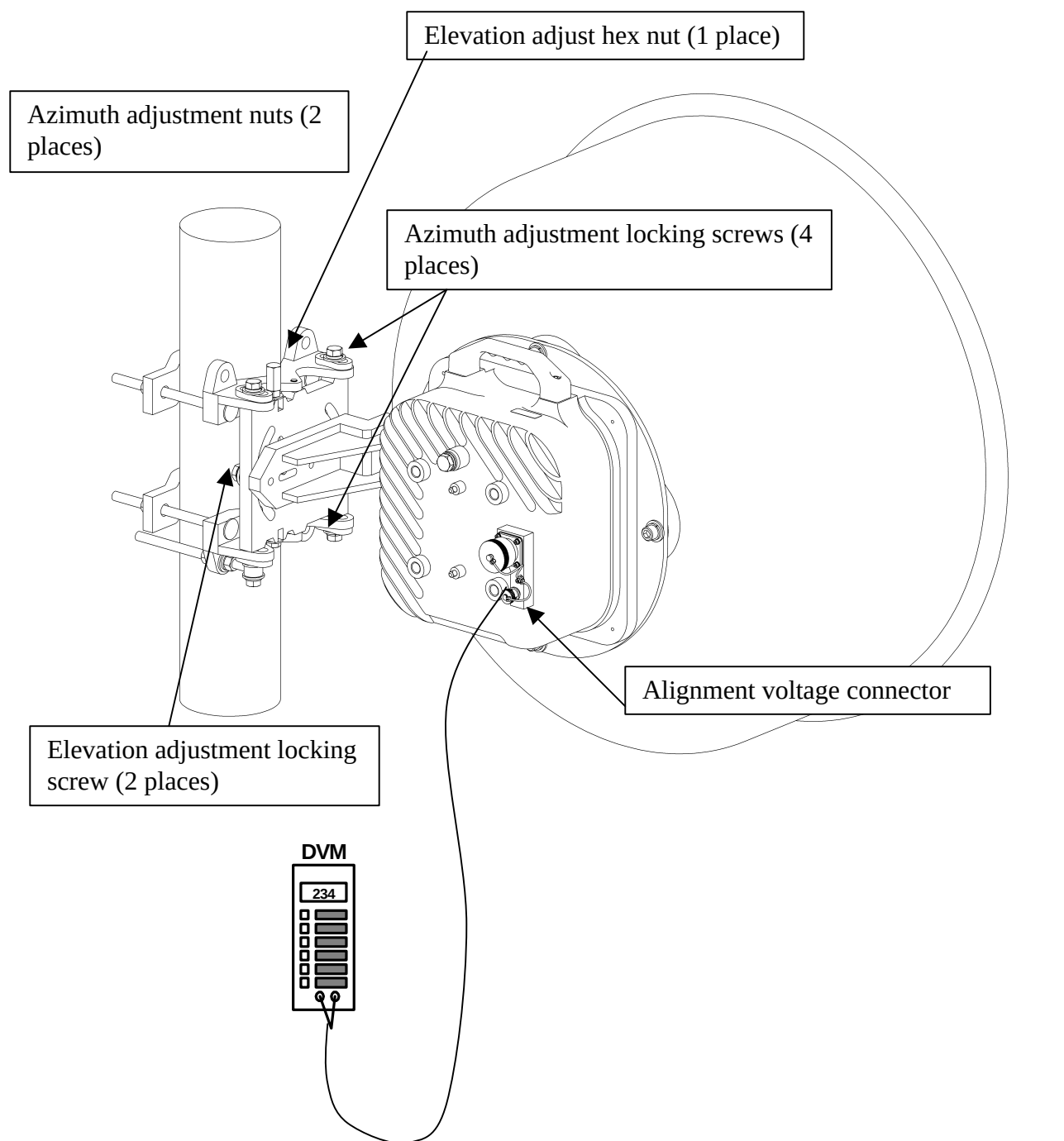
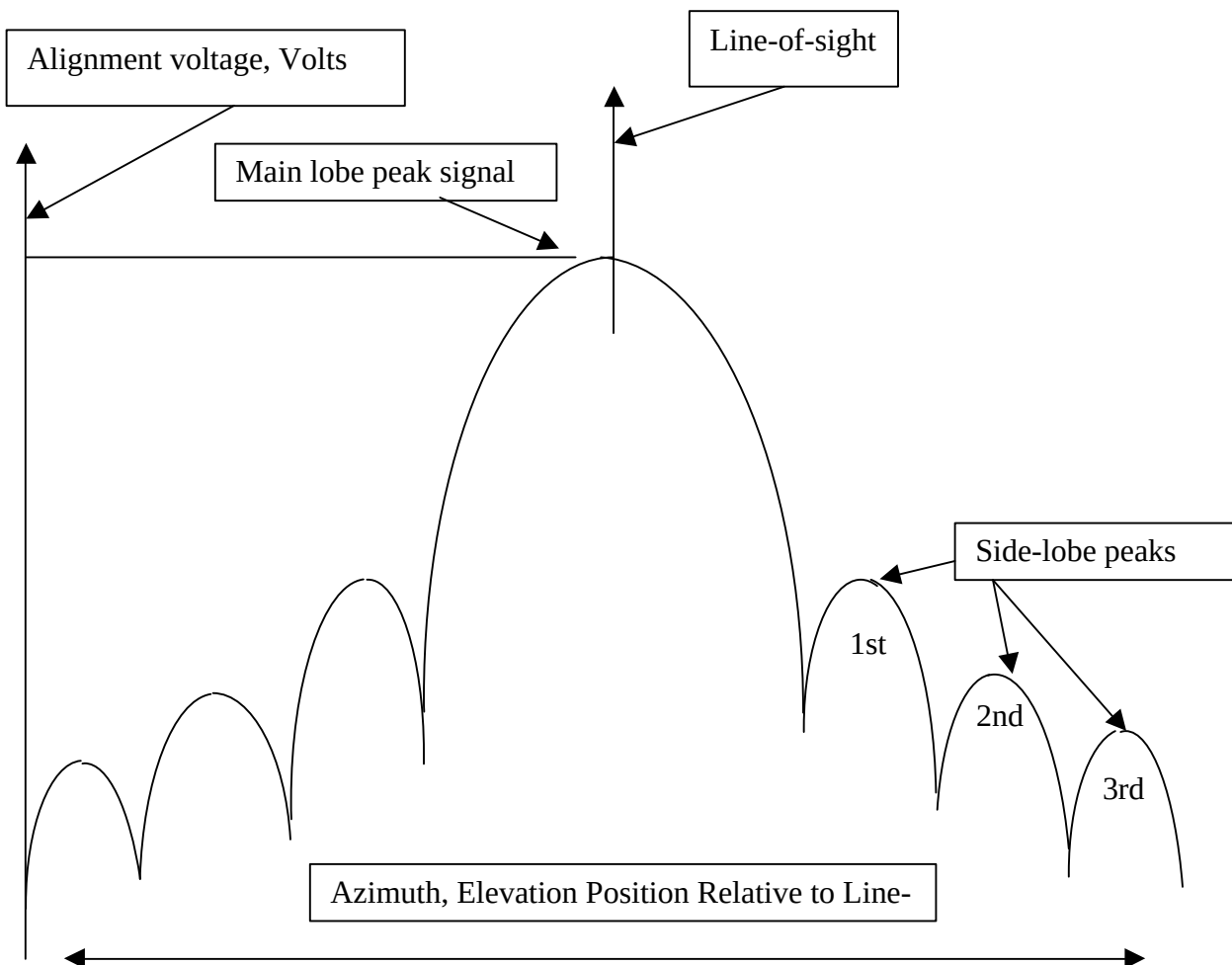


Figure 11. Final Line-of-Sight Adjustment and Signal Optimization for Link #1 (Access Unit 1 on A and B ends of Link)

**Figure 12. Peak Signal****IMPORTANT:**

- It is possible to obtain a false peak alignment voltage from the signal of a side-lobe. Up to three different side-lobes on either side of the main lobe may give false peak alignment voltages. It is important that a wide sweep in both azimuth and elevation is made in order to identify these false peak voltages thereby homing in on the true peak alignment voltage attributed to the main antenna beam

6.8 Test the Link

Prior to placing the link in service for network traffic, the link should be tested using standard network procedures.

The Installation Record and Warranty Registration form at the back of this manual should be completed with pertinent installation information. This should be done for each link installed.

6.9 Remove/Replace Access Unit

IMPORTANT:

The azimuth and elevation alignment of the Access Unit is maintained by the Antenna Unit and the mast Mount Assembly. In the event that an Access Unit is removed and replaced with another Unit, the Antenna Unit and the mast Mount Assembly do not need to be removed or replaced, and preferably, its position should be left undisturbed. If these are left in position and the azimuth and elevation adjustments are not changed, then it should not be necessary to perform any alignment when replacing an Access Unit.

- 6.9.1 Turn Access Unit power switch OFF at the Interface Panel (rear). The green LED on the front of the Interface Panel will turn OFF.
- 6.9.2 Disconnect the System Cable from the Access Unit. Cover both the System Cable connector and the Access Unit connector with the protective caps to ensure that the fiber connectors remain clean.
- 6.9.3 Disconnect the ground wire from the Access Unit.
- 6.9.4 Remove the hardware holding the Access Unit to the Antenna Unit (four socket head screws plus lock washers and flat washers).
- 6.9.5 Attach the replacement Access Unit as described in Step 6.3.2. Ensure that the replacement Access Unit handle is oriented for correct polarization. Inspect and replace o-ring as necessary.
- 6.9.6 Reinstall the ground wire to the Access Unit. Torque grounding bolt to 45-50 N-m (33-37 lb-ft).
- 6.9.7 Reconnect the System Cable to the Access Unit. Mate the two protective caps. Use a tie wrap to keep caps secure to the cable.
- 6.9.8 Turn Access Unit power switch ON at the Interface Panel (rear). The green LED on the front of the Interface Panel should illuminate.

7 OPERATION

Operation of a FiberLeap link is quite simple. There are no user controls or adjustments possible except for the ON/OFF switches on the Interface Panels at each end of the link, and aiming of the Access Units. Once turned ON, the units are fully operational.

If the network is supplying optical data to the DATA TX connector at the Interface Panel, the Access Unit will transmit that data to the link far end Access Unit. Absence of a valid optical signal will place the transmitter in CW mode.

In the event of malfunction or network alarms, refer to the FiberLeap Troubleshooting Guide.

Any attempt to open or modify a FiberLeap Access Unit will void the warranty.

8 INSPECTION AND MAINTENANCE

Routine inspection of the FiberLeap Access Unit and exterior portions of the Cables should be performed at least once per year to check for loose hardware, damage, corrosion or other disturbance to the installed hardware. Pay particular notice to the condition of the lightning protection and safety ground connections. Any damage, corrosion or conditions not conforming to the original installation should be corrected immediately.

Replacement of an Access Unit, Interface Panel or System Cable, or any realignment of either of the two FiberLeap Access Units requires a retest for Bit Error Rate at the optical interface located on the front of the Interface Panel.

9 APPENDIX

A. FCC and Safety Information

FCC Licensing

FiberLeap operates as an unlicensed device under FCC rules, Part 15, Low Power Communication Device Transmitter.

FCC Part 15 Rules Compliance

This device complies with Part 15 of the FCC rules. Operation is subject to the following conditions:

- This device may not cause harmful interference
- This device must accept any interference received, including interference that may cause undesired operation.

The FiberLeap Access Unit has no user accessible controls and may not be modified or altered in any way. Changes or modifications to the equipment could void the user's warranty.

FCC RF Exposure Compliance

The Federal Communications Commission (FCC), with its action in General Docket 93-62, November 7, 1997, has adopted a safety standard for human exposure to Radio Frequency (RF) electromagnetic energy emitted by FCC regulated equipment. Telaxis subscribes to the same safety standard for the use of its products. Proper operation of this equipment will result in user exposure far below the Occupational Safety and Health Act (OSHA) and Federal Communications Commission limits at any location external to the Access Unit.

FCC ID# P57-FL60-1250

B. RF Safety Notice

This unit has been tested for RF emission levels and found not to exceed the FCC RF exposure requirements for occupational and general public exposure. Even though the RF levels external to the unit are not hazardous to humans, Telaxis believes it is prudent to minimize all exposure to RF emissions and therefore recommends the installation be such that the RF beam emitted by the antenna be positioned over the heads of any personnel working in the vicinity.

C. Laser Safety Notice

The Access Unit includes a Class I laser. Class I lasers do not emit radiation at known hazardous levels. There are no controls or adjustments other than power ON/OFF that may be accessed by the user.

CAUTION:

Use of controls or adjustments or performance of procedures other than those specified in this Manual may result in hazardous radiation exposure



Installation Record and Warranty Registration

Telaxis Communications
Customer Assistance Center
20 Industrial Drive East

South Deerfield, MA 01373 USA

Please completely fill out and return a copy of this form to
Telaxis (mail, fax, or email at the addresses listed on the right).

Phone (413) 665-8551 • Fax (413) 665-7090

Email: customerassistance@tlxs.com

Purchasing/Leasing Company Information

Customer/Company _____

Address _____

Address _____

City/Town _____ State _____ Zip _____

Company Contact Name _____

Title _____ Phone _____

Fax _____ E-mail _____

Purchase Order No. _____ Date: _____

Installation Information

Application (OC-3, OC-12, GigE, Etc. _____

Company Link Identification Number _____

End 'A'

Installation Address _____

Address _____

City/Town _____ State _____ Zip _____

Installer Name/Company _____

Access Unit

Model Number _____ S/N _____

Interface Panel (as applicable)

Model Number _____ S/N _____

System Cable

Model Number _____ S/N _____

BER Test

Technician Company/Name _____

Test Date _____ Pass Fail [Circle One]

Rev B

Payload/Test Pattern _____
 Bit Error Rate Achieved _____
 Test Duration _____ Days Hours [Circle One]

End 'B'

Installation Address _____
 Address _____
 City/Town _____ State _____ Zip _____
 Installer Name/Company _____

Access Unit

Model Number _____ S/N _____

Interface Panel (as applicable)

Model Number _____ S/N _____

System Cable

Model Number _____ S/N _____

BER Test

Technician Company/Name _____
 Test Date _____ Pass Fail [Circle One]
 Payload/Test Pattern _____
 Bit Error Rate Achieved _____
 Test Duration _____ Days Hours [Circle One]