

2.4m Offset Antenna
Receive only and
Transmit-Receive

PATRIOT

LIMITED TWELVE (12) MONTH WARRANTY

This PATRIOT ANTENNA equipment is warranted to be free from defects in material and workmanship under normal use and service. PATRIOT ANTENNA shall repair or replace defective equipment, at no charge, or at its option, refund the purchase price, if the equipment is returned to PATRIOT ANTENNA not more than twelve (12) months after shipment. Removal or reinstallation of equipment and its transportation shall not be at cost of PATRIOT ANTENNA except PATRIOT ANTENNA shall return repaired or replaced equipment freight prepaid.

This Warranty shall not apply to equipment which has been repaired or altered in any way so as to affect its stability or durability, or which has been subject to misuse, negligence or accident. This Warranty does not cover equipment which has been impaired by severe weather conditions such as excessive wind, ice, storms, lightning, or other natural occurrences over which PATRIOT ANTENNA has no control, and this Warranty shall not apply to equipment which has been operated or installed other than in accordance with the instructions furnished by PATRIOT ANTENNA.

Claimants under this Warranty shall present their claims along with the defective equipment to PATRIOT ANTENNA immediately upon failure. Noncompliance with any part of this claim procedure may invalidate this warranty in whole or in part.

THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER AGREEMENTS AND WARRANTIES, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE IS LIMITED IN DURATION TO THE DURATION OF THIS WARRANTY. PATRIOT ANTENNA DOES NOT AUTHORIZE ANY PERSON TO ASSUME FOR IT THE OBLIGATIONS CONTAINED IN THIS WARRANTY AND PATRIOT ANTENNA NEITHER ASSUMES NOR AUTHORIZES ANY REPRESENTATIVE OR OTHER PERSON TO ASSUME FOR IT ANY OTHER LIABILITY IN CONNECTION WITH THE EQUIPMENT DELIVERED OR PROVIDED.

IN NO EVENT SHALL PATRIOT ANTENNA BE LIABLE FOR ANY LOSS OF PROFITS, LOSS OF USE, INTERRUPTION OF BUSINESS, OR INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES OF ANY KIND.

In no event shall PATRIOT ANTENNA be liable for damages in an amount greater than the purchase price of the equipment.

Some states do not allow limitations on how long an implied warranty lasts, or allow the exclusion or limitation of incidental or consequential damages, so the above limitations or exclusions may not apply to you.

PATRIOT ANTENNA has the right to void the warranty when the antenna is installed by someone other than a certified installer.

Product Serial Number- _____

Date Purchased- _____

Patriot Antenna Systems

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IMPORTANT!!!

INSTALLATION OF THIS PRODUCT SHOULD BE PERFORMED ONLY BY A PROFESSIONAL INSTALLER AND IS NOT RECOMMENDED FOR CONSUMER D.I.Y. (DO-IT-YOURSELF) INSTALLATIONS.

WATCH FOR WIRES!

Installation of this product near power lines is dangerous. For your own safety, follow these important safety rules.

1. Perform as many functions as possible on the ground.
2. Watch out for overhead power lines. Check the distance to the power lines before starting installation. We recommend you stay a minimum of 6 meters (20 feet) from all power lines.
3. Do not use metal ladders.
4. Do not install antenna or mast assembly on a windy day.
5. If you start to drop antenna or mast assembly, get away from it and let it fall.
6. 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.
7. Make sure that the mast assembly is properly grounded.

WARNING

Assembling dish antennas on windy days can be dangerous. Because of the antenna surface, even slight winds create strong forces. For example, a 1.0m antenna facing a wind of 32 km/h (20 mph) can undergo forces of 269 N (60 lbs.). Be prepared to safely handle these forces at unexpected moments. Do not attempt to assemble, move or mount dish on windy days or serious, even fatal accidents may occur. PATRIOT ANTENNA SYSTEMS is not responsible or liable for damage or injury resulting from antenna installations.

WARNING

Antennas improperly installed or installed to an inadequate structure are very susceptible to wind damage. This damage can be very serious or even life threatening. The owner and installer assumes full responsibility that the installation is structurally sound to support all loads (weight, wind & ice) and properly sealed against leaks. PATRIOT ANTENNA SYSTEMS will not accept liability for any damage caused by a satellite system due to the many unknown variable applications.

Introduction

Thank you for purchasing your Patriot Commercial Antenna. We trust that you will find this to be a well designed product that will provide many years of reliable service. Please read this manual thoroughly before beginning assembly. For best results in the assembly process, perform each step in the same sequence as listed in this manual. Record the serial number of the unit on page two for future reference and read the warranty information. The serial number plate can be found on the pedestal mount.

Unpacking and Inspection

Shipping cartons should be unpacked and contents checked for damaged or missing parts. Should there be any parts that are damaged or missing, please contact technical support for replacement.

Site Selection

The main objective of conducting a site survey utilizing a compass and inclinometer is to choose a mounting location on the ground that will give you the greatest amount of swing for azimuth and elevation for present as well as future use. A thorough pre-installation site survey is strongly recommended because it can alert you to any "look angle", soil, wind or other problems.

The first and most important consideration when choosing a prospective antenna site is whether or not the area can provide an acceptable "look angle" to the satellite. A site with a clear, unobstructed view facing south, southeast is required. Your antenna site must be selected in advance so that you will be able to receive the strongest signal available. Also consider obstructions that may occur in the future such as the growth of trees.

It is important to conduct an on-site survey with a portable antenna or with a compass and clinometer to avoid interference, obstructions, etc.

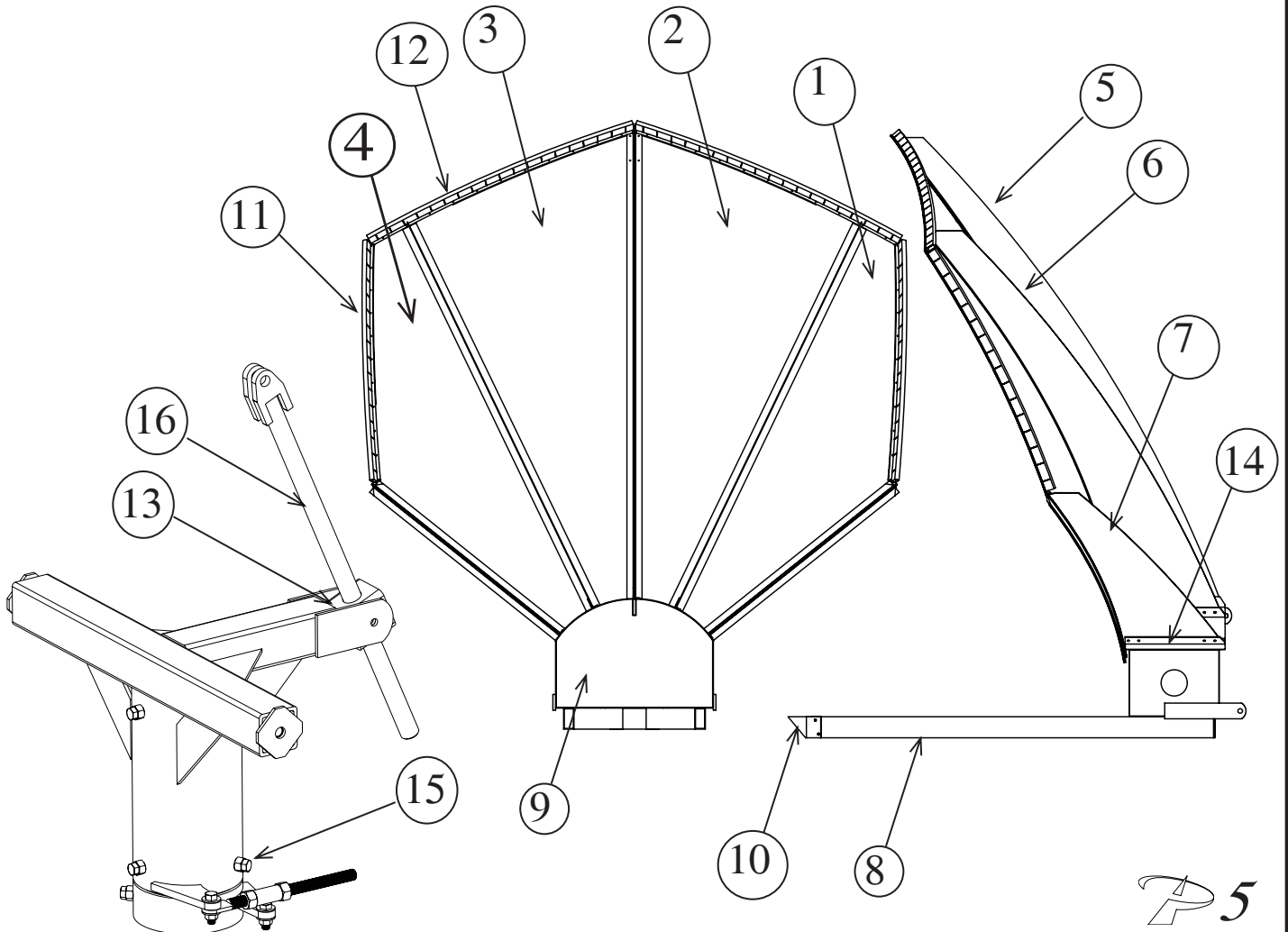
When selecting "look angle", be sure to observe and take readings approximately 10 deg to the left and right, above and below your selected "look angle".

Before Ground Pole Installation, the soil type should be checked because soil conditions vary widely in composition and load bearing capacity. A soil check will help you to determine the type and size of foundation required to provide a stable base for the antenna.

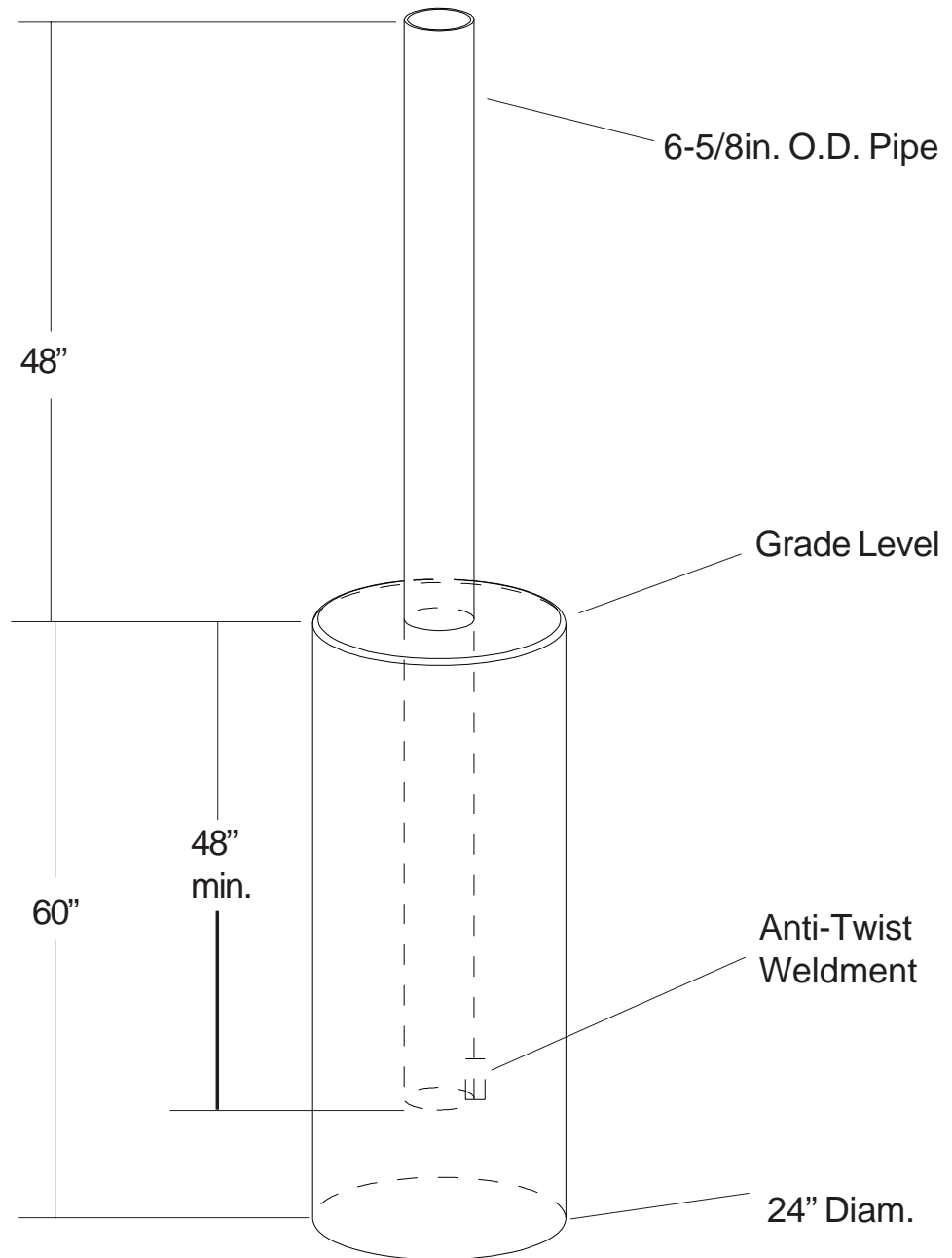
Before digging is done, information regarding the possibility of underground telephone lines, power lines, storm drains, etc., in the excavation area should be obtained from the appropriate agency.

As with any other type of construction, a local building permit may be required before installing an antenna. It is the property owner's responsibility to obtain any and all permits. Ground mounts are certified for 125 mph wind survival.

Item Number	Part Description	Part Number	REV	Quantity
1	PANEL,2.4 OFFSET B RIGHT	224099	000	1
2	PANEL,2.4 OFFSET A LEFT	224100	000	1
3	PANEL,2.4 OFFSET A RIGHT	224101	000	1
4	PANEL,2.4 OFFSET B LEFT	224102	000	1
5	ASSY, RADIAL BEAM 2.4 OFFSET A	224103	001	1
6	ASSY, RADIAL BEAM 2.4 OFFSET B	224106	001	2
7	ASSY, RADIAL BEAM 2.4 OFFSET C	224109	001	2
8	TUBE,SUPPORT 2.4 OFFSET FEED	224112	000	2
9	ASSY,2.4 OFFSET HUB	224115	000	1
10	ASSY, FEED ADAPTER, 2.4 OFFSET	224122	000	1
11	ASSEMBLY, 2.4OFFSET CURFING SHORT	224128	001	2
12	ASSEMBLY, 2.4OFFSET CURFING LONG	224129	001	2
pg 13	SHIM, 2.4M BOOM .125"	224131	000	4
pg 13	SHIM, 2.4M BOOM .25"	224132	000	4
13	BLOCK,3.1 PIVOT GALV	231104G	000	1
14	ANGLE,4.5 HUB	4M45004	000	5
15	ASSY,3.8 AZ-EL MOUNT	238011	002	1
	(See Page 8 for further break down of this item)			
16	ASSY,3.8 THREADED ROD	238002	001	1
	2.4M.OFFSET MASTER HARDWARE	3HP240000	002	1



In-Ground Mast Foundation

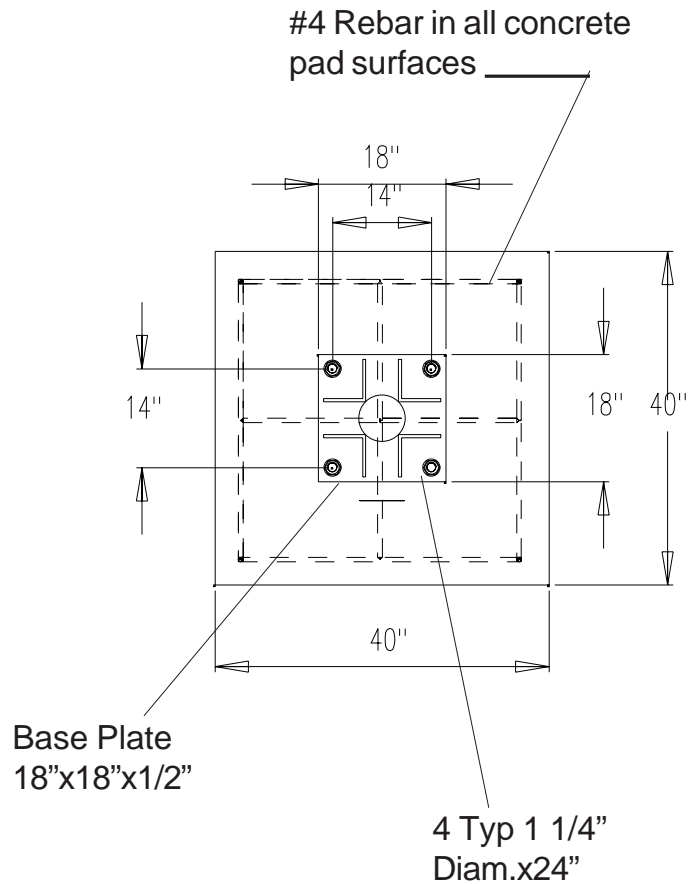
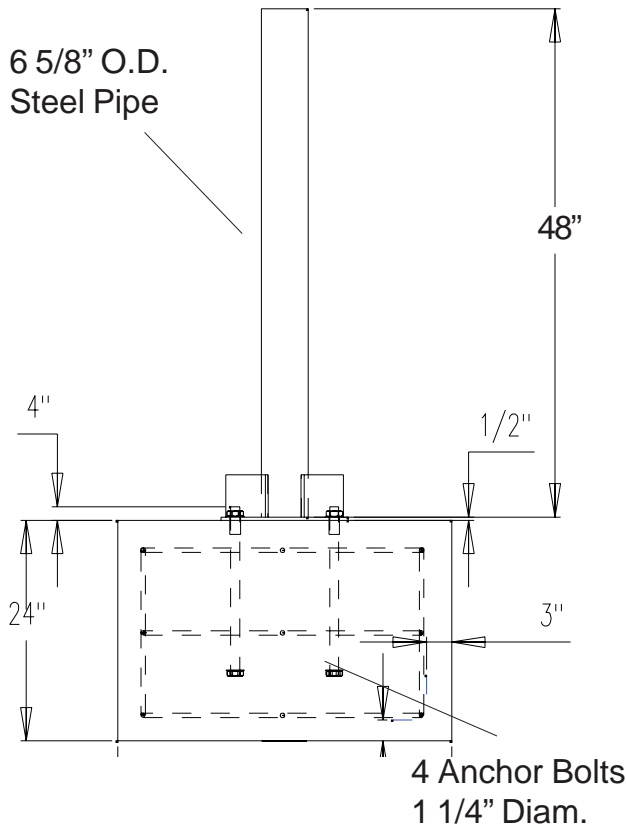


Foundation Requirements & Specifications:

- Steel Mast: 6" Schedule 80, L=96"; 6 5/8" O.D.
- Concrete: 3000 psi at 28 days, poured against undisturbed soil
(Allow concrete 24 hour set time before installation of antenna)
- Soil Bearing Capacity > 2000 psf.
- Ground the Antenna to meet applicable local Codes.

Mast Pipe(optional)

with Bolt & Template Kit

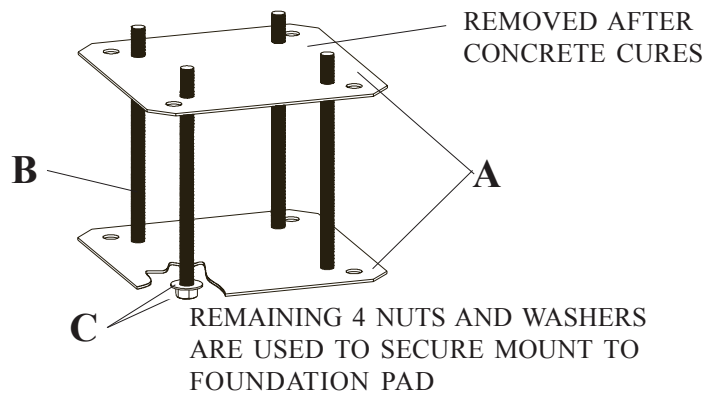


The Optional Kit Includes:

- Schedule 40 6" (6-5/8" OD)
- 4' Mast Steel Pipe
- 18"x18"x1/2" Base Plate
with 14" Centered Holes
- Reinforced Steel Angles for Support
- Bolt and Template Kit with Pipe
(On one skid) = 215 Lbs.
- Note: See Foundation Requirements
& Specifications on previous page.

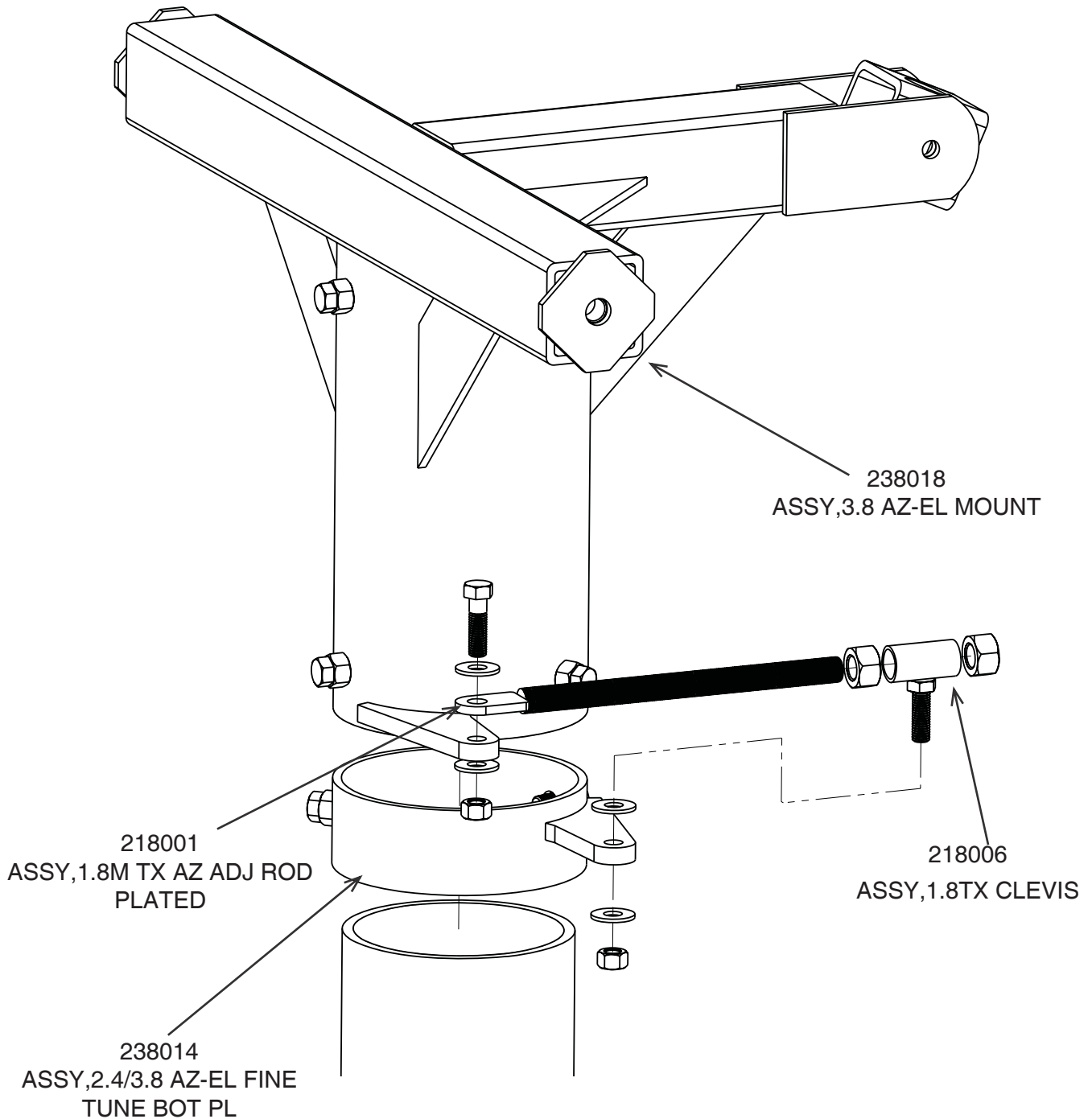
PRT-BTKPS

- A: (2) 18"x18" Templates
- B: (4) 1-1/4x24" Threaded Rod (Bolts)
- C: (8) 1-1/4" Nuts & Washers



Fine Tune Assembly

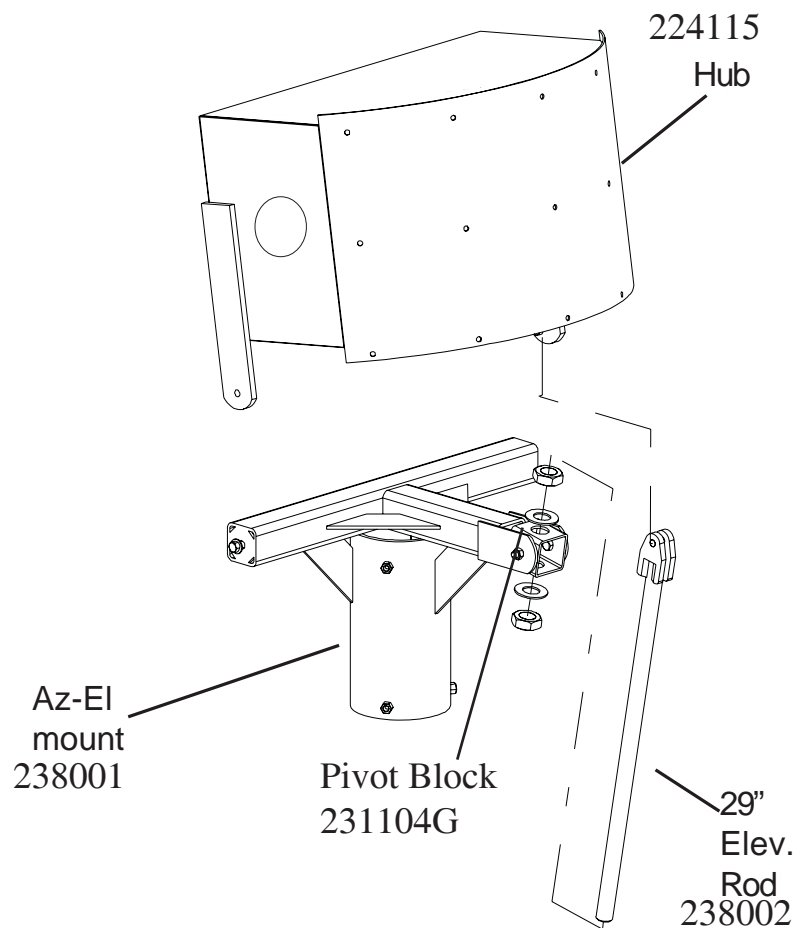
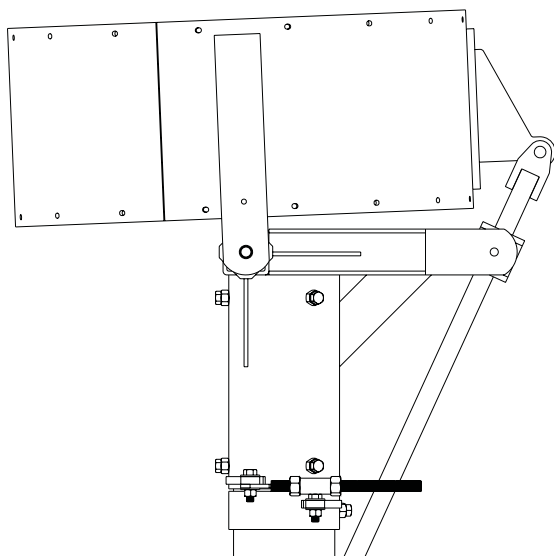
1. Slide pre-assembled fine tune mount assembly over post.
2. Point mount towards general location of desired satellite.
3. Draw bolts on Prt# 238014 tight to pipe.
4. Snug bolts on Prt# 238018 to pipe. (DO not tighten at this time. Make contact to hold mount in place during hub install)



Mount Assembly

1. Place the pre-assembled Az-EI pole mount on top of the 6 5/8" OD pipe, leaving the bolts loose.
2. Add nuts and washers from the **Az-EI Elevation** pack hardware to the Threaded Elevation Rod as shown. Thread the nut all the way up to the welded end. Insert the rod into the Anchor Block pre-assembled on the Az-EI pole mount.
3. With 2 helpers place the hub assembly in the zenith (bird bath) position on top of the Az-EI mount as shown. Insert bolts and washers to hold the hub assembly to the mount cross bar. Assemble the Threaded Elevation Rod to the hub extension as shown using pre-installed 3/4" hardware.

NOTE: You must position the hub in the position shown below or it will be unsafe to build the reflector. You will also be able to assemble the dish without moving your ladder. With the mount pipe bolts loose the dish can spin on the pipe for ease of assembly.



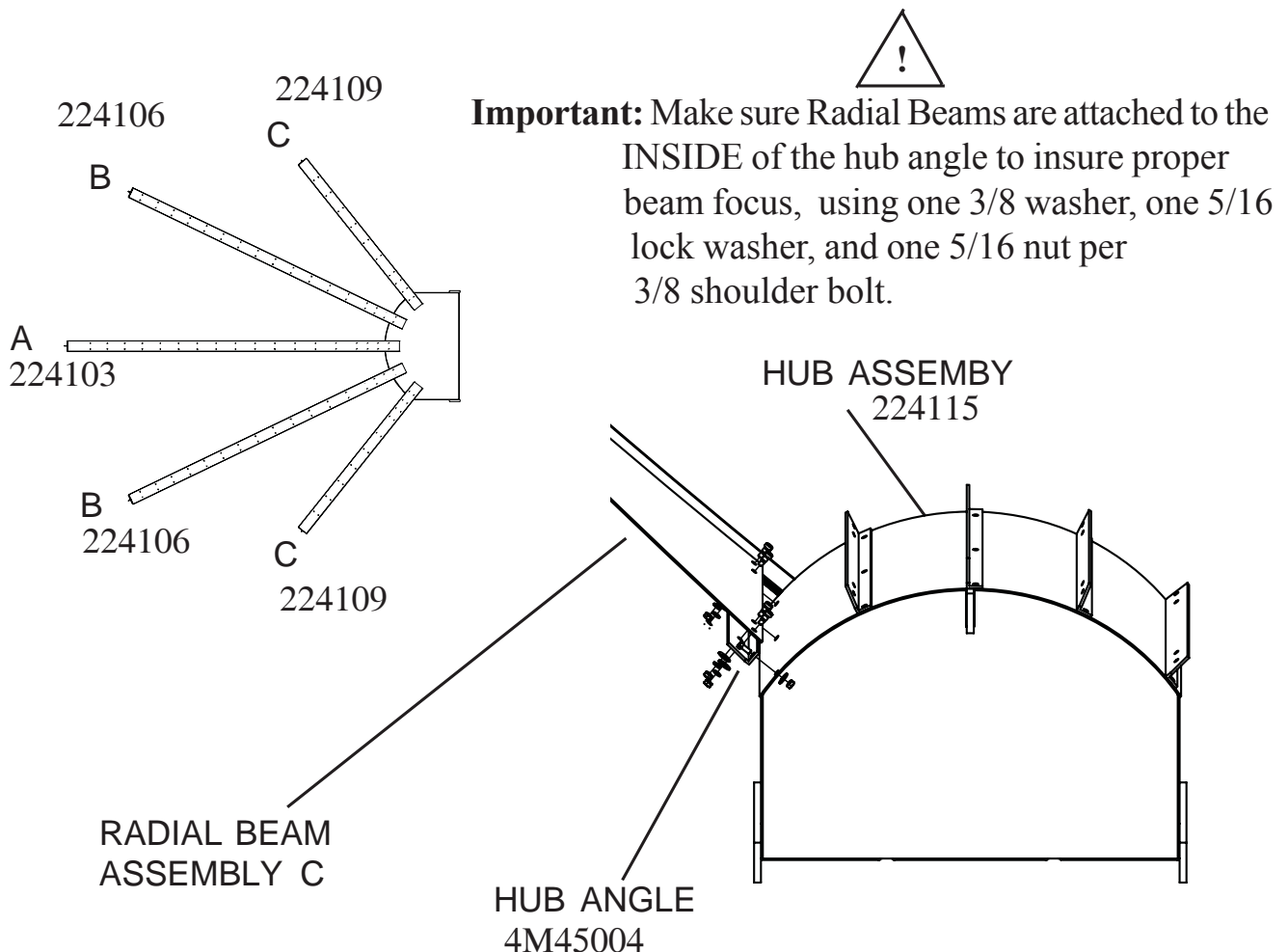
Reflector Assembly

1. Fasten 5- Hub Angles to Hub as shown, using 3- 3/8x1 bolt hardware from Hub to Angle Hardware Pack. (2- 3/8" washer, 1-nut per)
2. Adjust the Hub into the position shown, and select the shortest Radial Beam assembly - "C" and place into the outermost location inside the Hub. Fasten using 3/8in shoulder bolt from Radial Beam to Angle Hardware Pack. (1 - 3/8" washer, 1- 5/16 lock washer & 1-nut per) Leave 1/2 turn loose.

Do the same with the opposing "C" Radial Beam assembly.

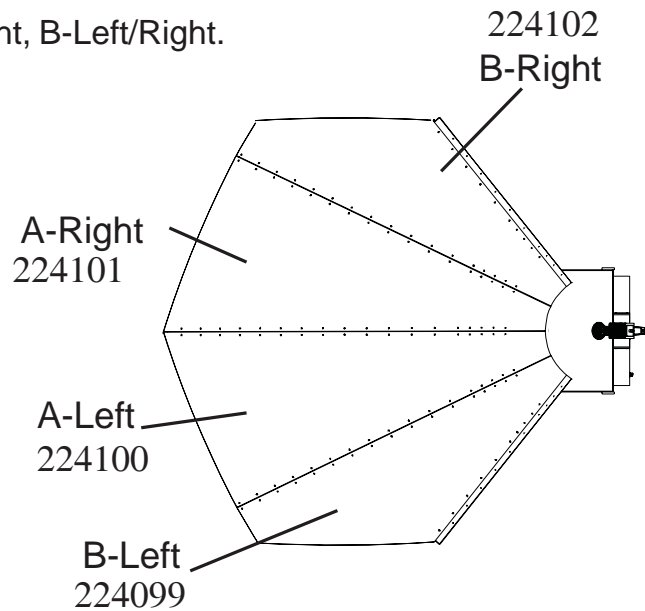
NOTE: Hard to reach hardware can be accessed by reaching inside and around the end of the Radial Beam to reach the back side.

3. Repeat step 2 for "B", and "A" Radial Beam assemblies.
4. Tighten all Radial Beam hardware in steps 1 through 3.



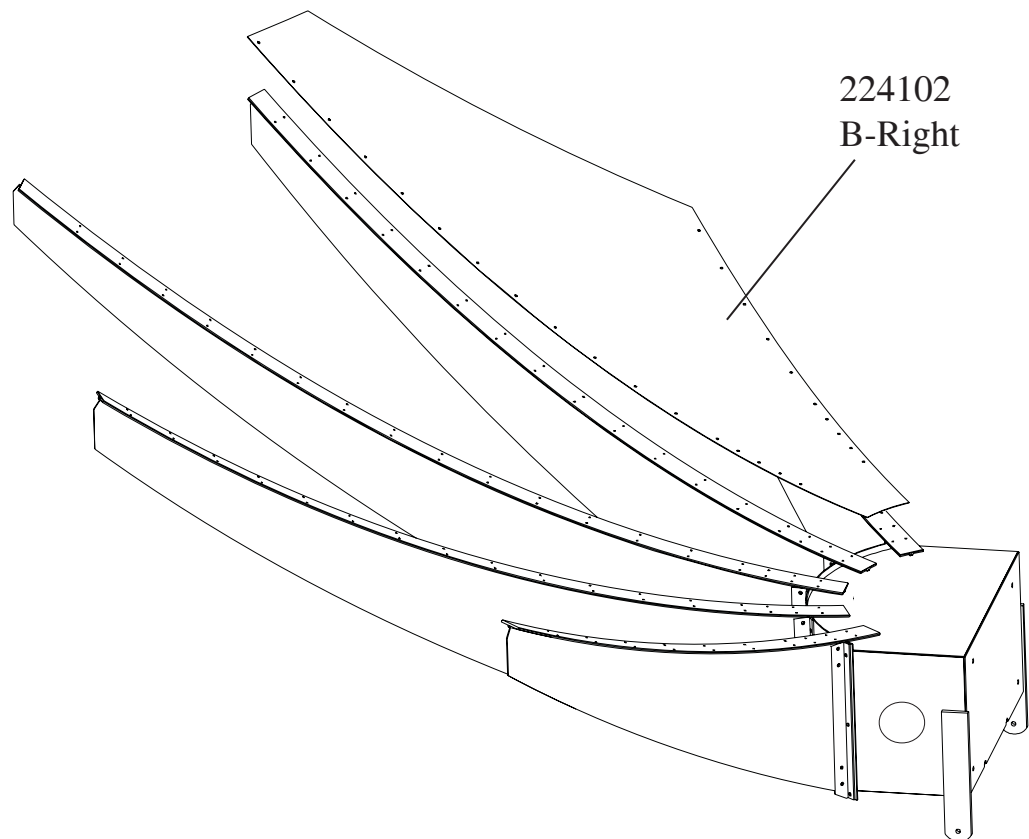
Panel Assembly

Panels are shaped as follows- A-Left/Right, B-Left/Right.



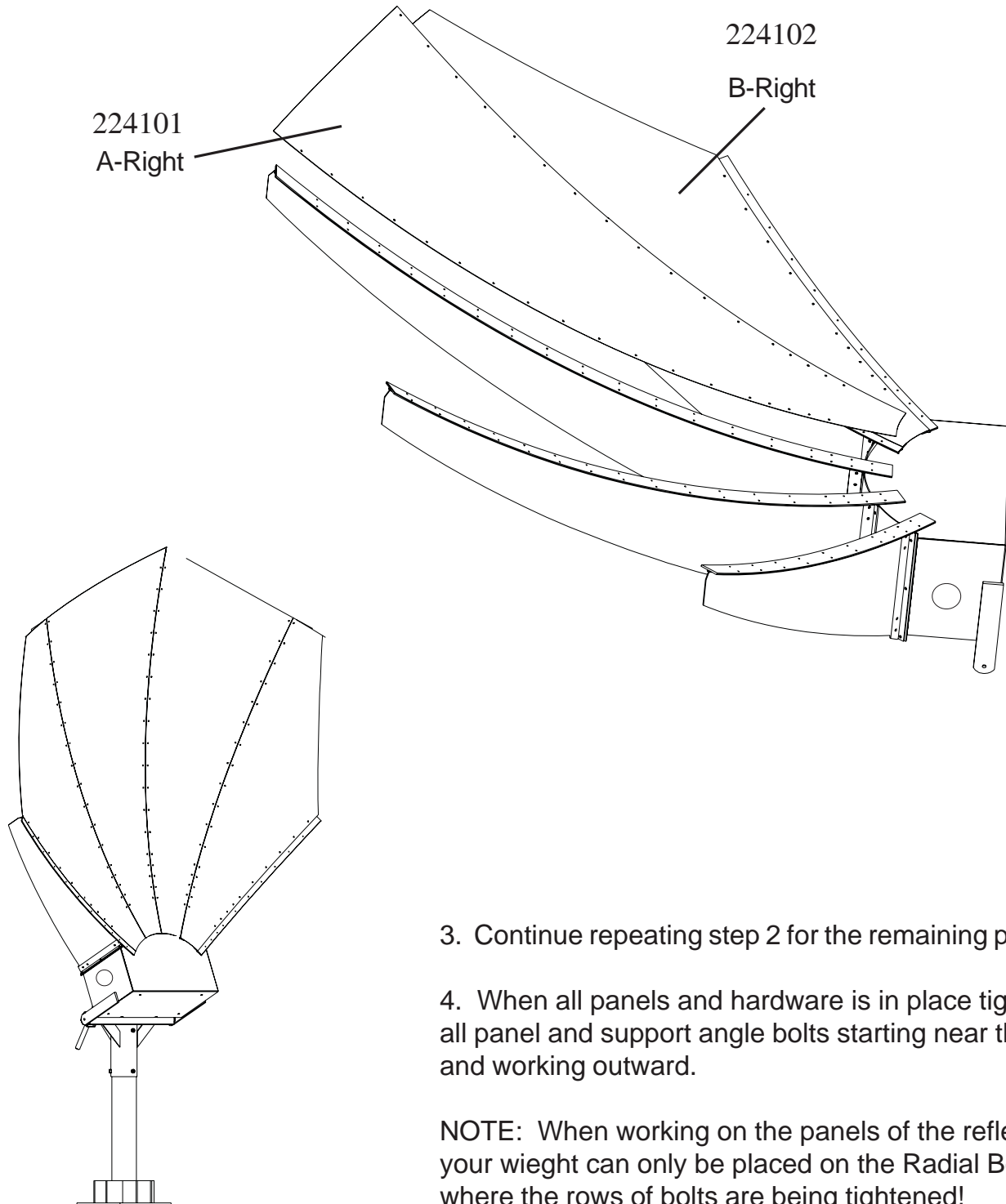
Starting with Panel B Right-

1. Place the panel into place onto the left-most Radial Beam "B" & "C" as shown. Fasten with 1/4x1/2 truss head bolts. Leave bolts 1/2 turn loose at this time.



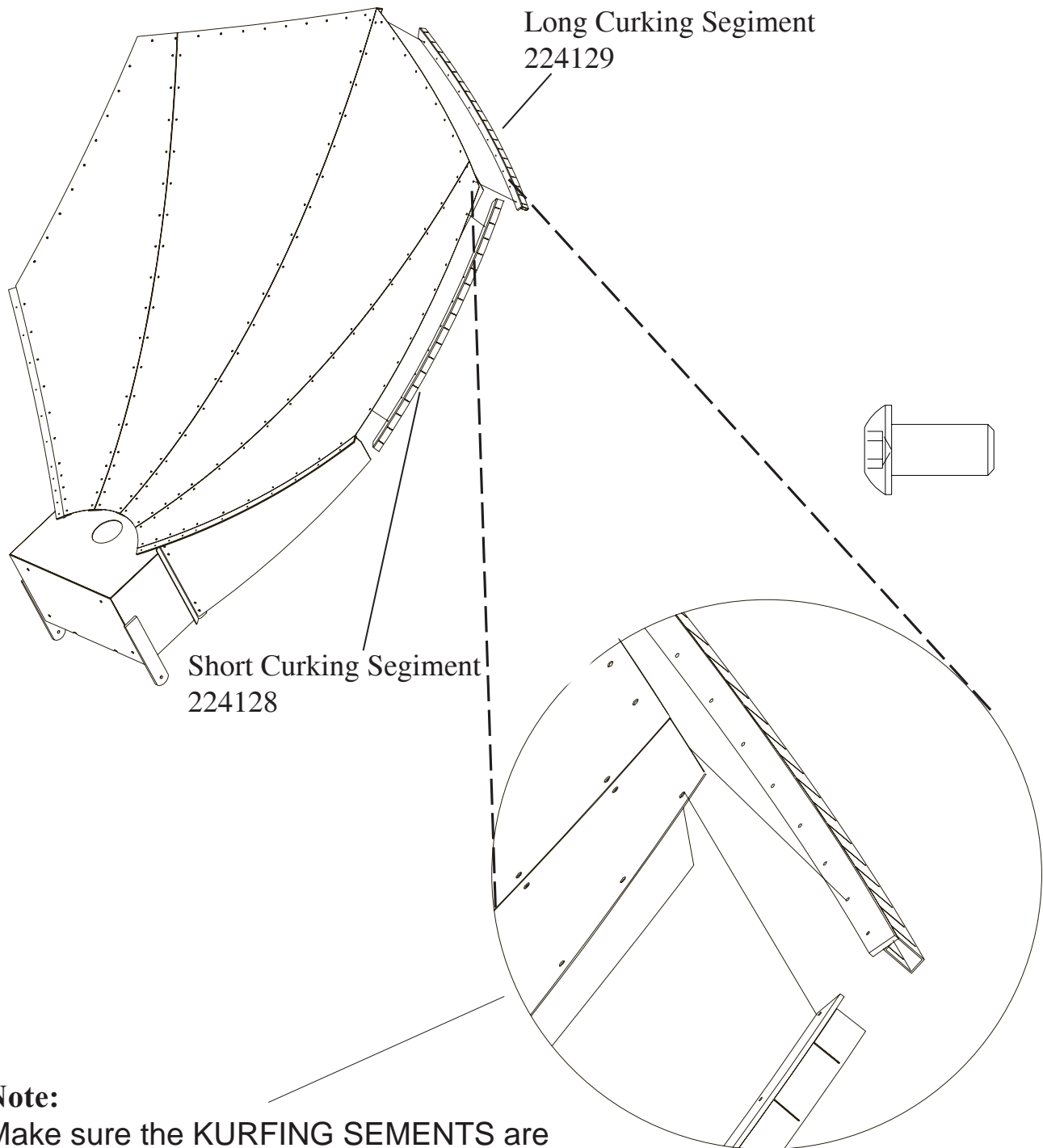
Panel Assembly (cont.)

2. Set a panel "A-Right" in place next to panel "B-Right" and fasten with hardware as in Step 1 leaving bolts 1/2 turn loose..



Panel Assembly (cont.)

5. Attach the outer kurving segments using the same cap screw as pictured below.



Note:
Make sure the KURFING SEGMENTS are attached as shown to ensure proper fit to panel

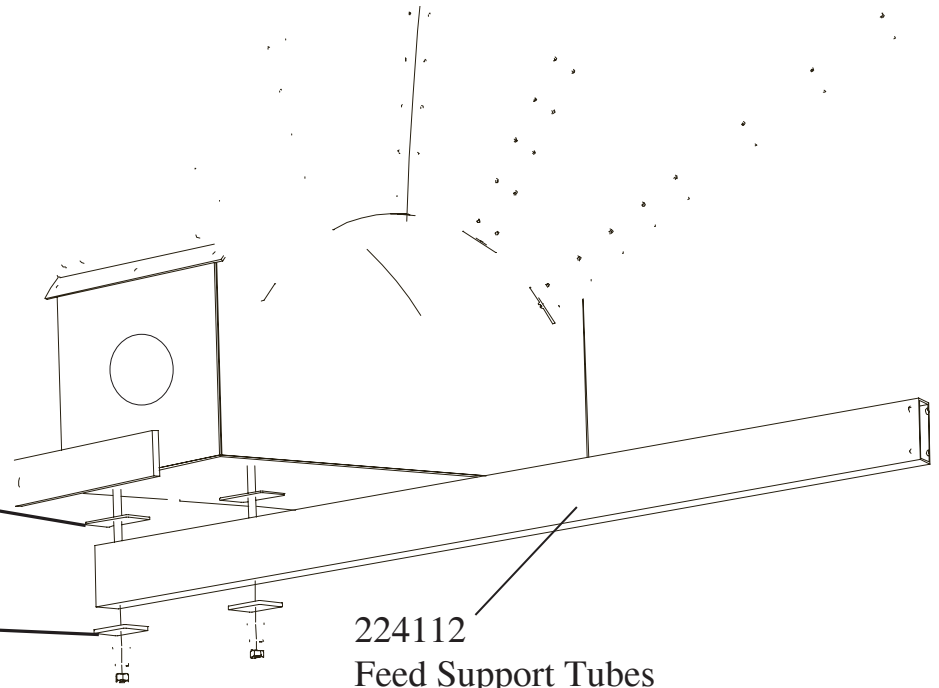
Feed Boom and Feed Assembly

Attach Feed support to bottom side of Hub using 1/2 hardware with bolt and washer inside of hub. Repeat for remaining Feed Support.

224133
1/8" Thick spacer
this side

224132
1/4" Reinforcement
plate 1/2" flat washer
lock washer and nut

224112
Feed Support Tubes



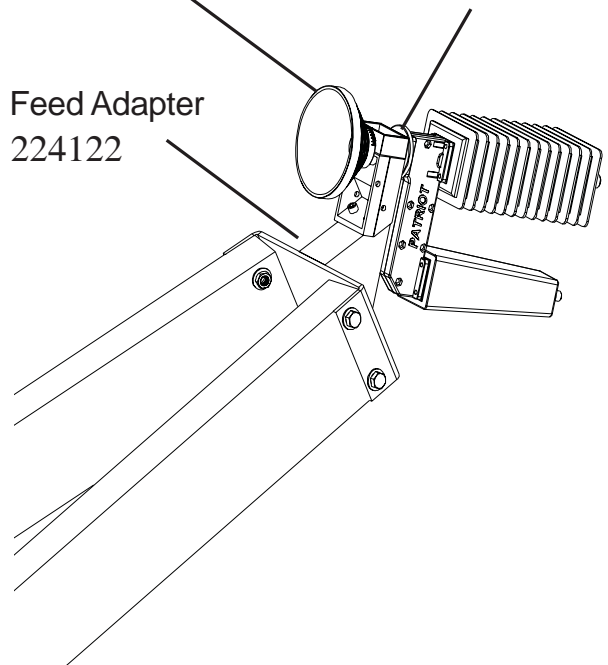
Feed Assembly

Feed Holder

Feed Adapter
224122

Attach the Feed adaptor to the Feed supports using 3/8 hardware bolts, washers, and nuts. Feed angle should be point up.

Attach Feed holder to Feed adapter using (3) 1/4 cap screws.



Windload Information

	125mph	50mph
Force on Front of Dish-	3,200 lbs	510 lbs
Force on Back of Dish-	1,900 lbs	300 lbs
Torque at Base of mount-	2,760 ftlbs	300 ftlbs
Overturning Moment-	29,300 ftlbs	4,425 ftlbs

Note: For Windloads of 100 mph or more, we recommend using schedule 80 pipe filled with concrete

Antenna Pointing

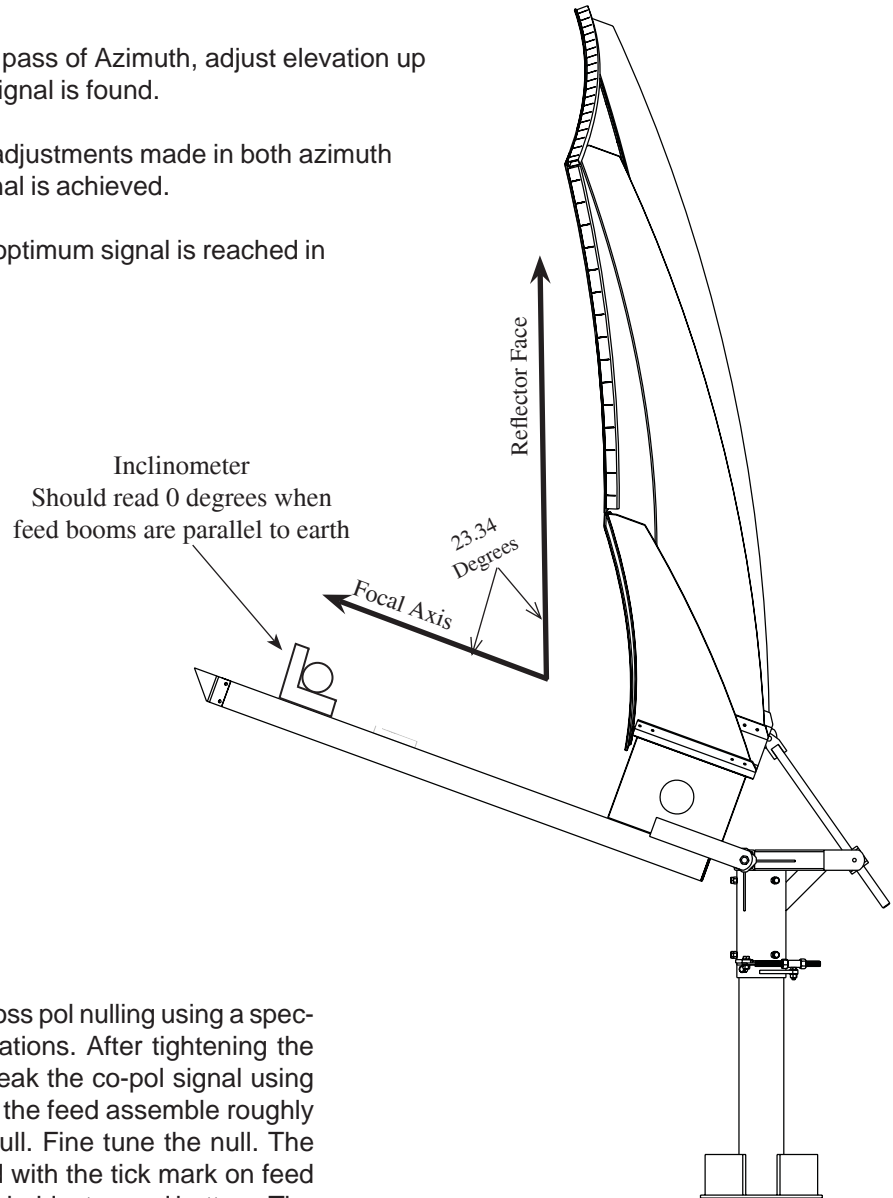
NOTE: This reflector contains a 21.34 degree offset look angle. Therefore, when the face of the reflector looks perpendicular to the ground, the antenna is actually looking 21.34 degrees in elevation.

1. Adjust the reflector up or down in elevation by turning the two 2" hex nuts on the Elevation Rod Assembly until the desired elevation is measured (taking Elevation angle measurement from the Feed Support Arms).
2. Azimuth Adjustment: With the electronics set to acquire the satellite, use the double-nut threaded adjustment on the Azimuth Rod.

NOTE: If signal is not found on first pass of Azimuth, adjust elevation up or down in 2 deg increments until signal is found.

3. Peak the satellite signal by fine adjustments made in both azimuth and elevation until the optimum signal is achieved.

Note: Adjust, tighten, recheck until optimum signal is reached in both Azimuth and Elevation.



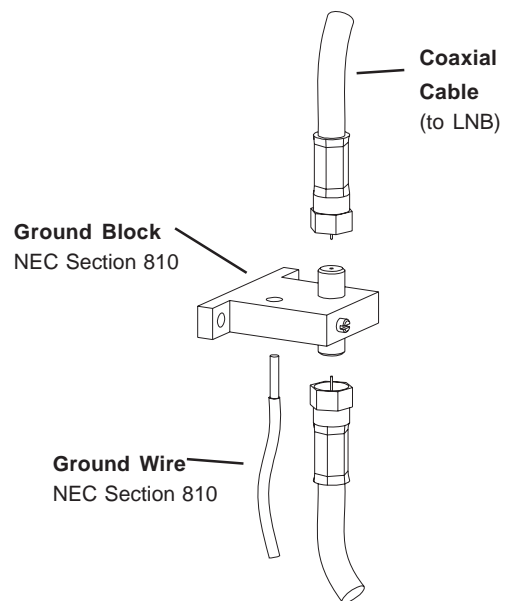
4. Patriot recommends the use of cross pol nulling using a spectrum analyzer during TX/RX installations. After tightening the azimuth and elevation hardware, peak the co-pol signal using the spectrum analyzer. Then rotate the feed assembly roughly 90 degrees to obtain a cross pol null. Fine tune the null. The scale on the feed horn can be used with the tick mark on feed holder top or the seam between feed holder top and bottom. The tick mark and seam are 90 deg. apart. Note that changes may be necessary to the resolution and video bandwidth to bring the signal above the noise floor. Note the angle of optimum cross pol null. Rotate the feed back exactly 90 degrees and tighten the feed clamp.

Grounding

Grounding Antenna Feed Cables

1. Ground antenna feed cables in accordance with current National Electric code and local electric codes. The illustration shows a typical grounding method.

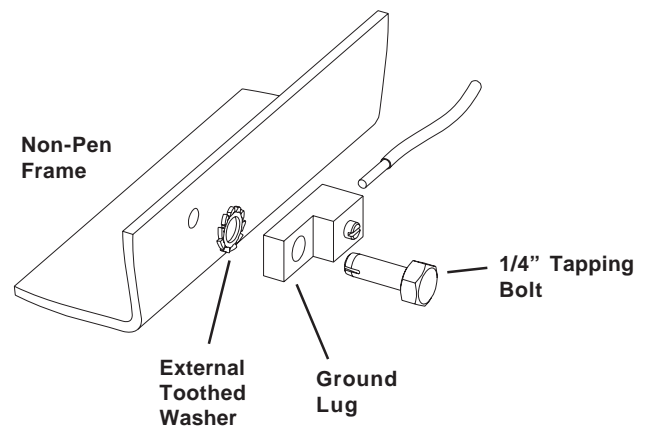
Clamps that provide a solid connection between ground wire and a ground source should be used.



Grounding Non-Penetrating Mount Frame (if applicable)

1. Ground the Non-Penetrating mount frame. The illustration shows a typical grounding method.

Refer to the NEC Section 810 and local electric codes for specific instructions on grounding the remaining end of the ground wire.



Antenna Pointing

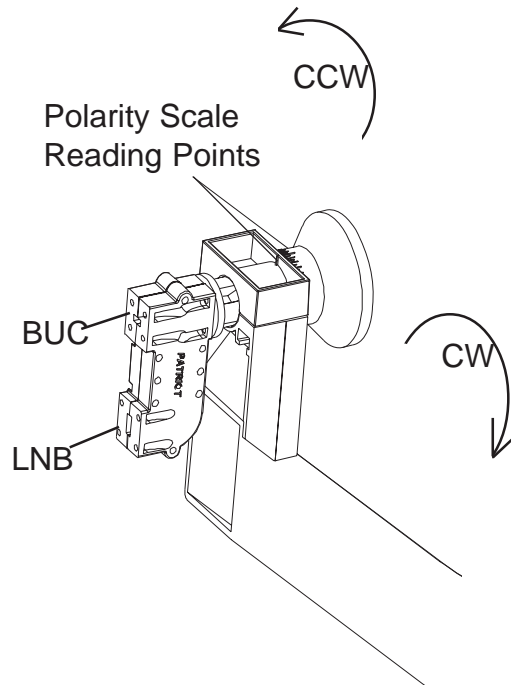
- 1) Begin by obtaining the correct Az/EI pointing data for the satellite of interest based for your site location.
- 2) Using an inclinometer or position readout form controller placed on the enclosure drum surface, position the antenna to the specified elevation angle.
- 3) Manually scan the antenna (back-and-forth in the azimuth around the direction of the specified azimuth angle) to achieve the maximum transponder signal.
- 4) Next repeat the procedure for elevation.
- 5) Repeat this procedure alternating between the azimuth and elevation until maximum transponder signal is achieved.

Feed Adjustment (Polarity tuning)

1. Adjust the Feed to the appropriate skew angle using the provided scale reference.

NOTE: Refer to the chart on back for polarization angle. Elevation and polarity are both dependent on site azimuth and the difference between satellite and site longitude.

NOTE: Some satellites have a slant angle with respect to the satellite belt angle. Contact the satellite operator for details.

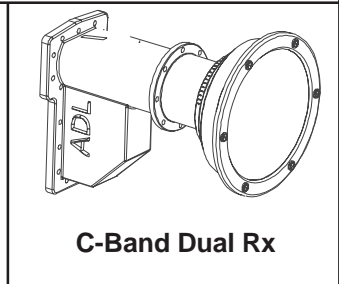
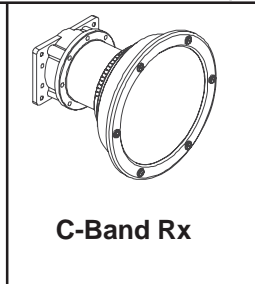
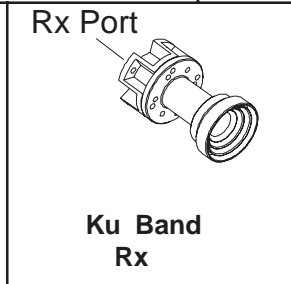
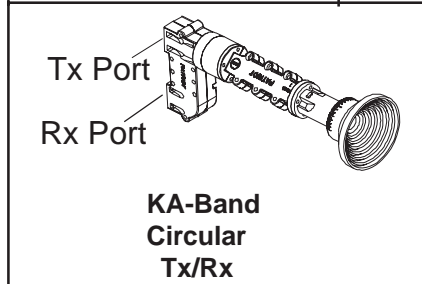
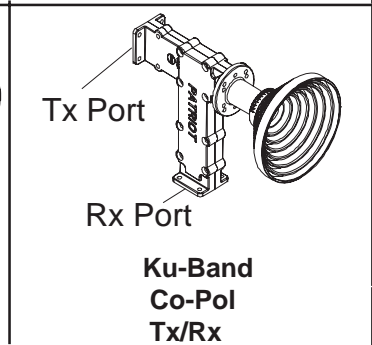
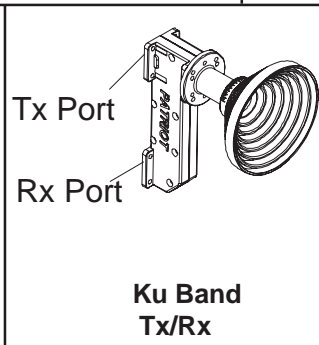
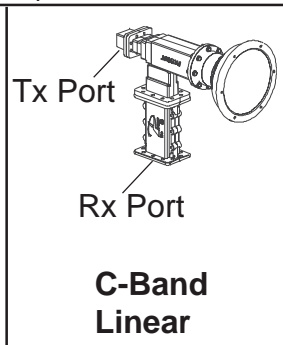
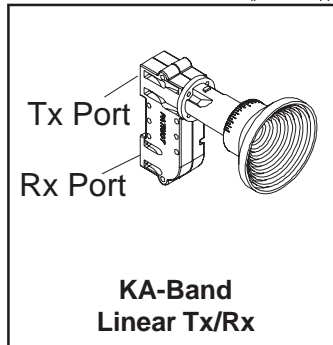
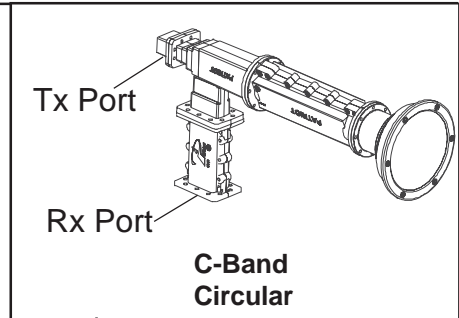
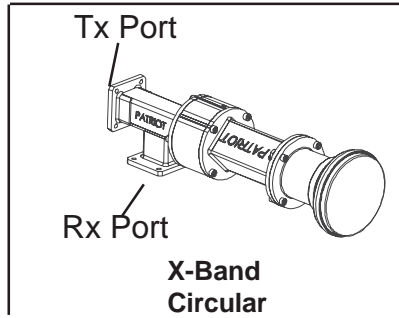
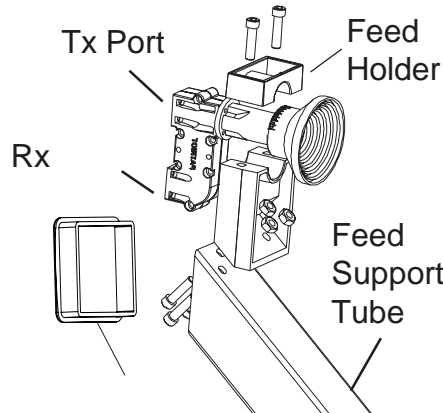


Feed Rotation Chart

Install site west of satellite	Install site East of satellite	
CW	CCW	Northern Hemisphere
CCW	CW	Southern Hemisphere

Feed Assembly

1. Attach the relevant Feed Assembly.
2. Insert the Feed Assembly into the Feed holder and assemble to the Feed Support Tube using the hardware illustrated below.
3. Insert the Feed Support Tube into the support tube.



Specifications

Electrical

Gain Midband
Efficiency
3dB Beamwidth
Side Lobes
Cross Polarization (on axis)
VSWR

Ku-Band

Tx- 43.5dBi	Rx- 42.0
70%	
Tx- 1.2 Deg	Rx- 1.4 Deg
ITU - 580	
>35dB	
Tx- 1.2:1	Rx- 1.3:1

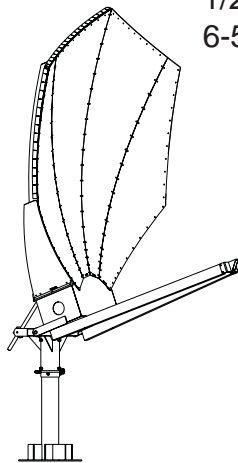
Mechanical

Antenna Size
Offset Angle
F/D
Operational Wind
Survival Wind
Operational Temp
Rain

Ice

Pole Size

2.4m
21.34
.62
50mph
125mph
-40 to 140 F
Operational = 1/2in./hr
Survival = 3in./hr
1 in. Radial -or-
1/2 in. + 60mph wind
6-5/8" OD



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2MTXINT240KUS REV001