

3.1m Commercial Antenna
Polar Mount



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

704 North Clark Street

Albion, MI 49224 USA

Tel: (517)629-5990

Fax: (517)629-6690

E-mail: info@sepatriot.com

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 to 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.

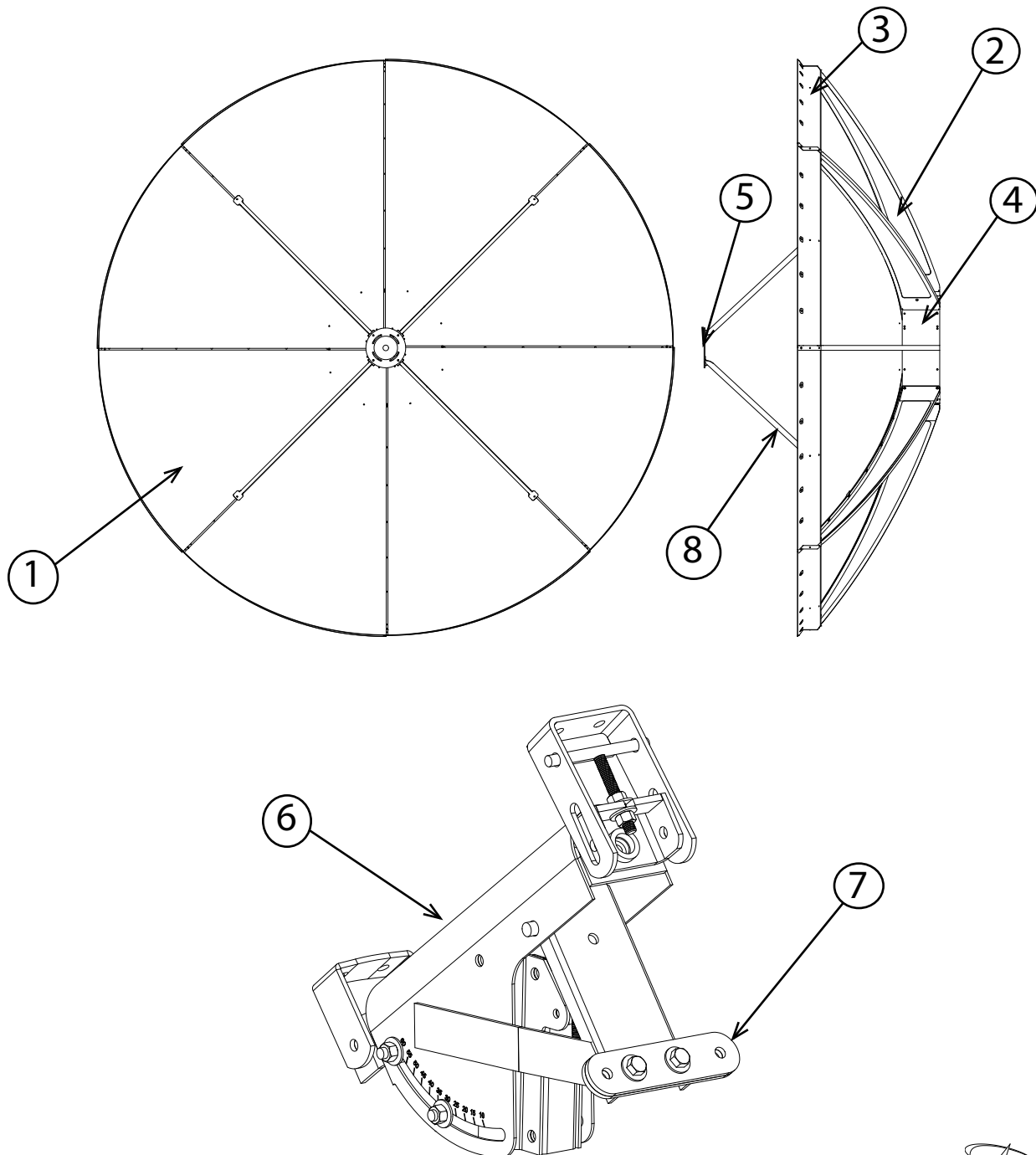
When selecting "look angle", be sure to observe and take readings approximately 10 deg to the left and right, above and below your selected "look angle".

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.

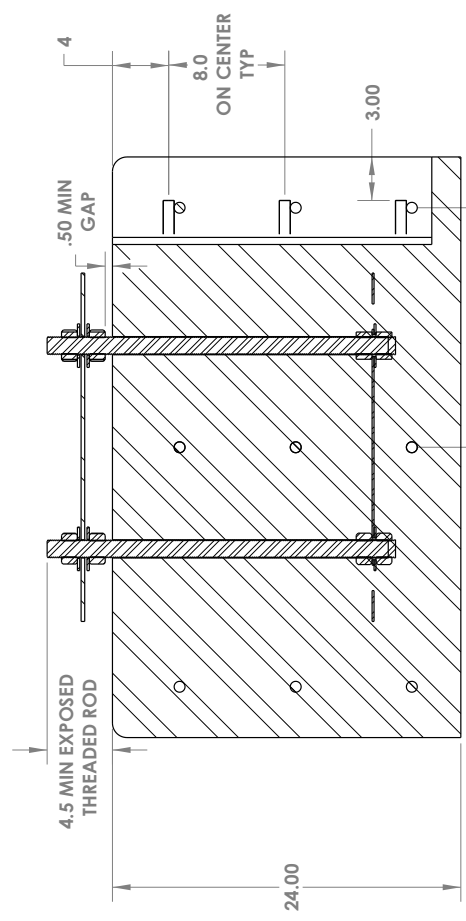
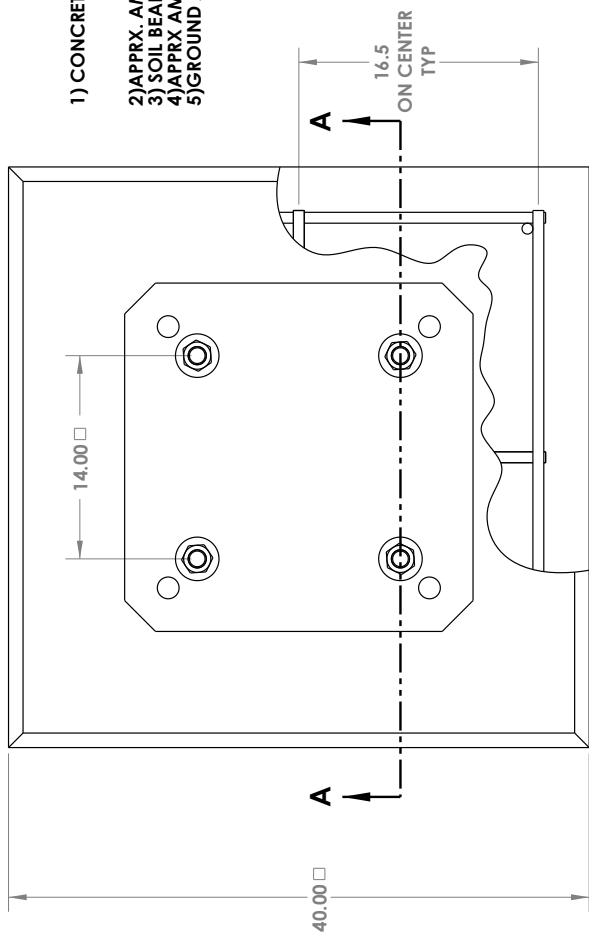
As with any other type of construction, a local building permit may be required before installing an antenna. It is the property owner's responsibility to obtain any and all permits. Ground mounts are certified for 125 mph wind survival.

| ITEM # | PART# | DESCRIPTION | REV | QTY |
|----------|-----------|-------------------------------|-----|-----|
| 1 | 231001 | PETAL, 3.1 PRIME | 000 | 8 |
| 2 | 231002 | RADIAL BEAM, 3.1 PRIME WELDED | 000 | 8 |
| 3 | 231003 | OUTBOARD SKIRT, 3.1 PRIME | 000 | 8 |
| 4 | 231004 | ASSY, 3.1 HUB | 000 | 1 |
| 5 | 231106 | PLATE, C-BAND 3.1/3.8/4.5 | 000 | 1 |
| 6 | PRT-POLAR | MOUNT, POLAR 3.1mtr | 000 | 1 |
| 7 | 231081 | BRKT, TRACKER EXTENTION | 000 | 2 |
| 8 | 231009 | STRUT, 3.1 PRT FEED | 000 | 4 |
| See Pg 8 | 231082 | ASSY,POLAR TRACKER ATTMT | 000 | 1 |



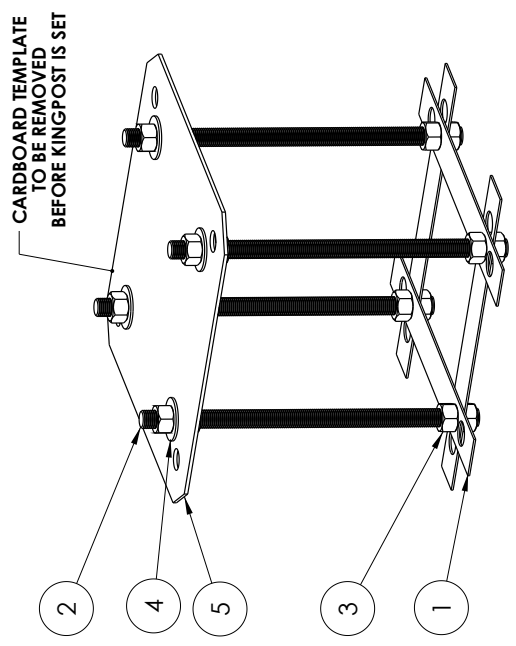
| ZONE | REV | DESCRIPTION | DATE | APPROVED |
|------|-----|-------------|------|----------|
| | | | | |

- 1) CONCRETE: 3000psi AT 28 DAYS, POURED AGAINST UNDISTURBED SOIL (ALLOW CONCRETE 24 HOURS SET TIME BEFORE ANTENNA INSTALLATION)
- 2)APPRX. AMOUNT OF CONCRETE NEEDED: 18.50 CUBIC FEET
- 3) SOIL BEARING CAPACITY >2000psf
- 4)APPRX AMOUNT OF #4 REBAR NEEDED: 55ft
- 5)GROUND ANTENNA TO MEET APPLICABLE LOCAL CODES



SECTION A-A

| PRT-BTKPS | | | |
|-----------|-------------|------|--|
| ITEM NO. | PART NUMBER | QTY. | |
| 1 | 20000021 | 4 | |
| 2 | 3HTG0002 | 4 | |
| 3 | 3HMG0001 | 16 | |
| 4 | 3HWG0001 | 8 | |
| 5 | 4BPTBK38455 | 1 | |



PATRIOT 720 North Clark Street, Albany, NY 12208 USA

TITLE: **PIPESTAND FOUNDATION LAYOUT**

| | |
|-------------------|-------|
| NAME | DATE |
| DRAWN BY: D PRATT | 02/07 |
| ENG APPR: D PRATT | 02/07 |

NOTES:

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES:
CORNERS ARE AT 90°

TOLERANCES:
FRACTIONAL: 1/16"
DECIMAL: ± .1"
ANGULAR: ± 1°
HOLE POSITION: ± .0031"
HOLE SIZE: ± .015"
HOLE LOCATION: ± .015"
HOLE DEPTH: ± .015"
HOLE DIAMETER: ± .015"

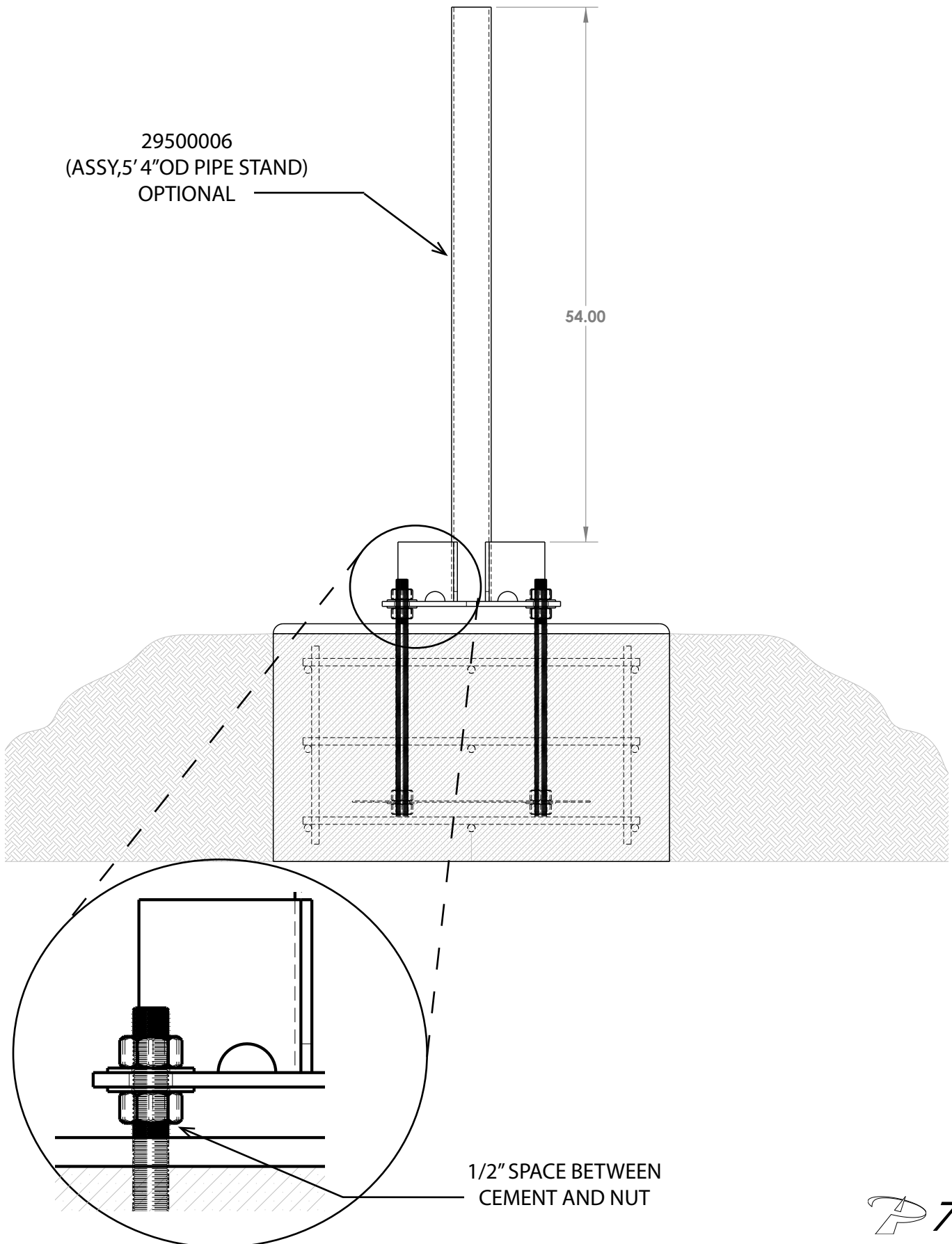
PROPRIETARY AND CONFIDENTIAL
THE INFORMATION CONTAINED IN THIS
DRAWING IS THE PROPERTY OF
PATRIOT ANTENNA SYSTEMS. ANY
REPRODUCTION IN PART OR AS A WHOLE
WITHOUT THE WRITTEN PERMISSION OF
PATRIOT ANTENNA SYSTEMS IS PROHIBITED.

SIZE DWG. NO. **B 2FDPIPESTAND000**

REV **000**

SCALE: 1:8 SHEET 1 OF 1

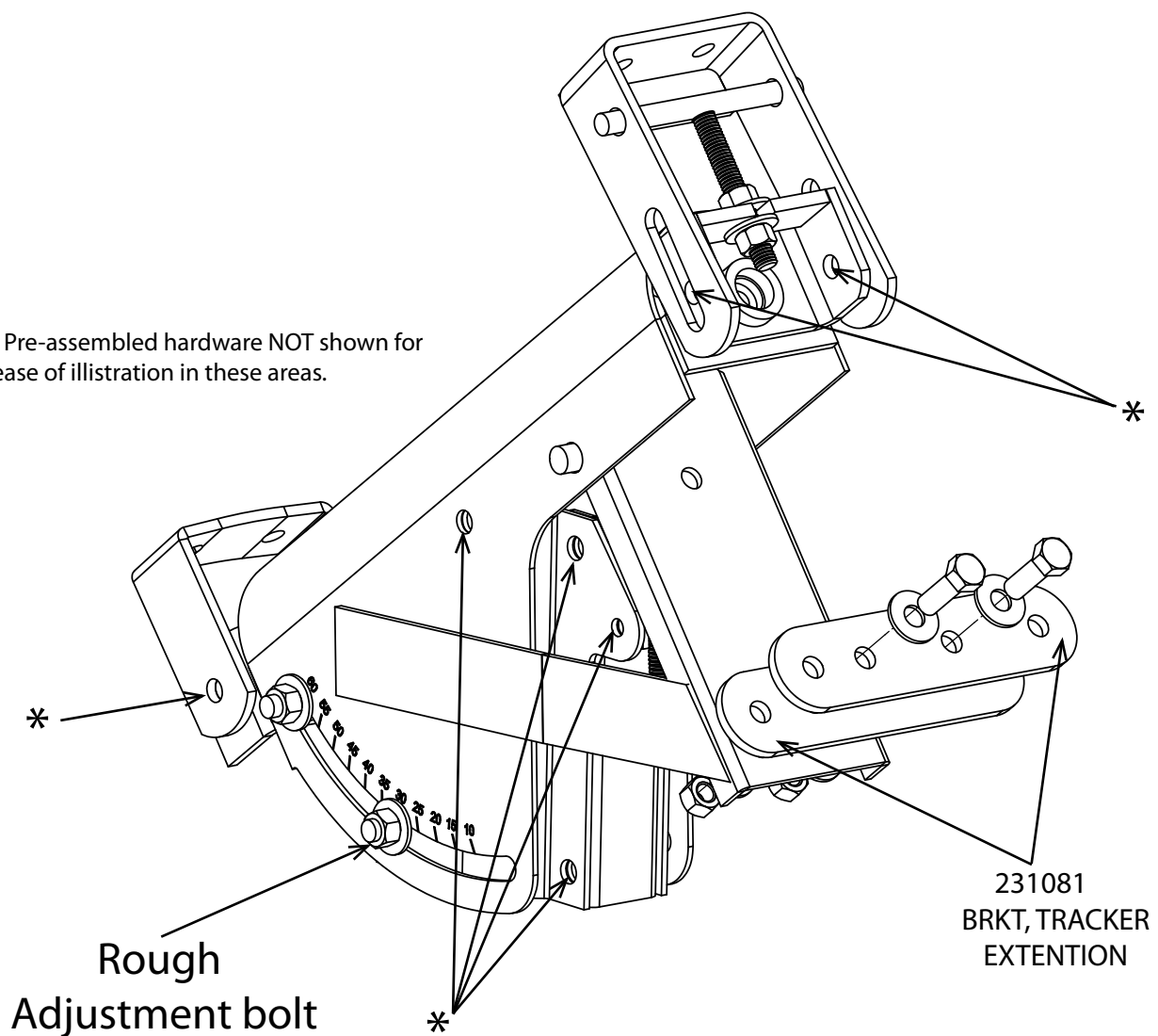
Optional Pipe Mount Placement.



Mount Prep.

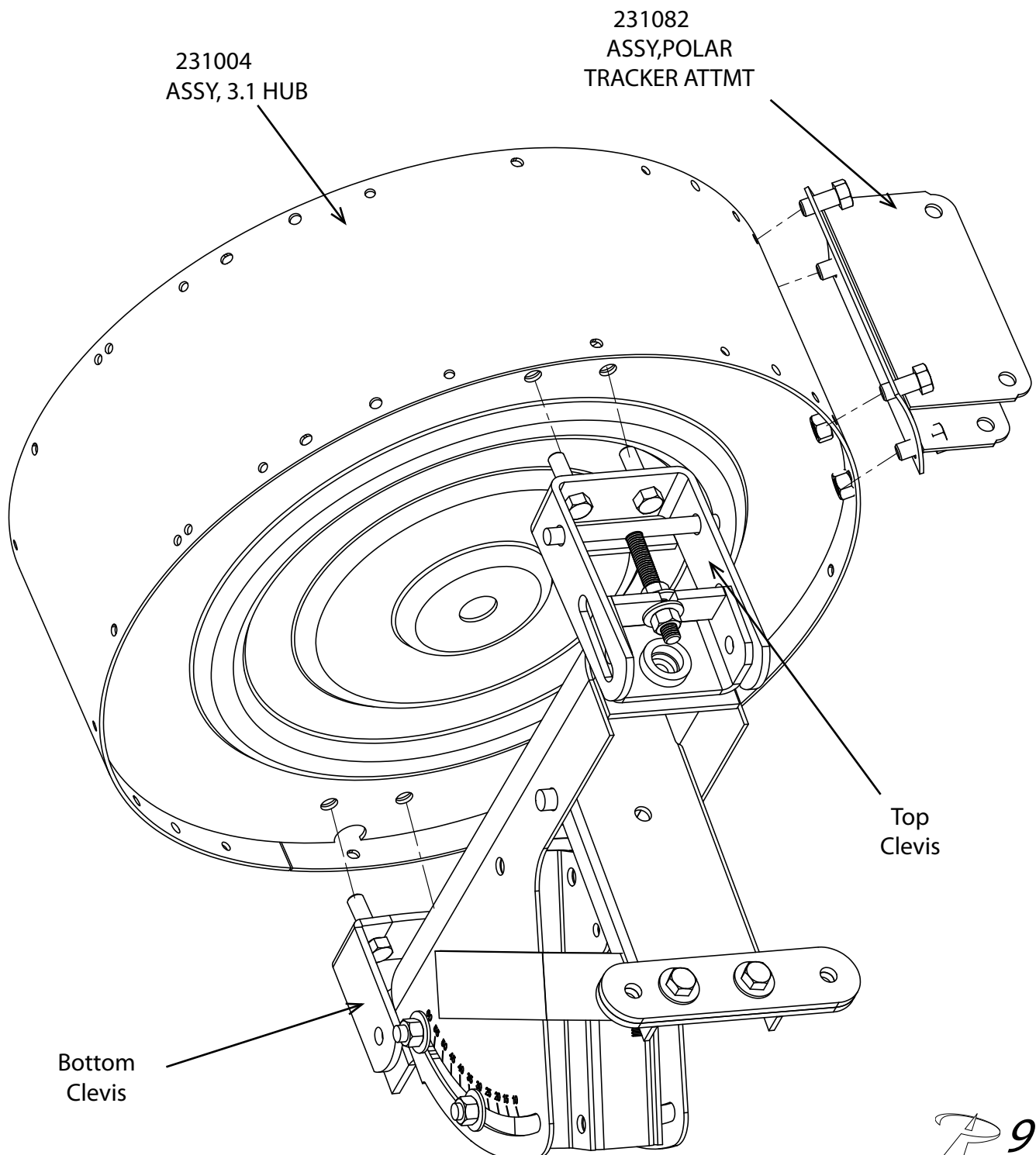
- 1) Attach Tracker Extension Brackets to Polar Mount as pictured below. (Mkae sure to stack BOTH brackets to ensure proper alignment of azimuth lock down)
- 2) Loosen all Rough Adjustment bolts and set Polar Mount to "birds bath" (straight up) position
- 3) Tighten all Rough Adjustment bolts.

* Pre-assembled hardware NOT shown for ease of illustration in these areas.



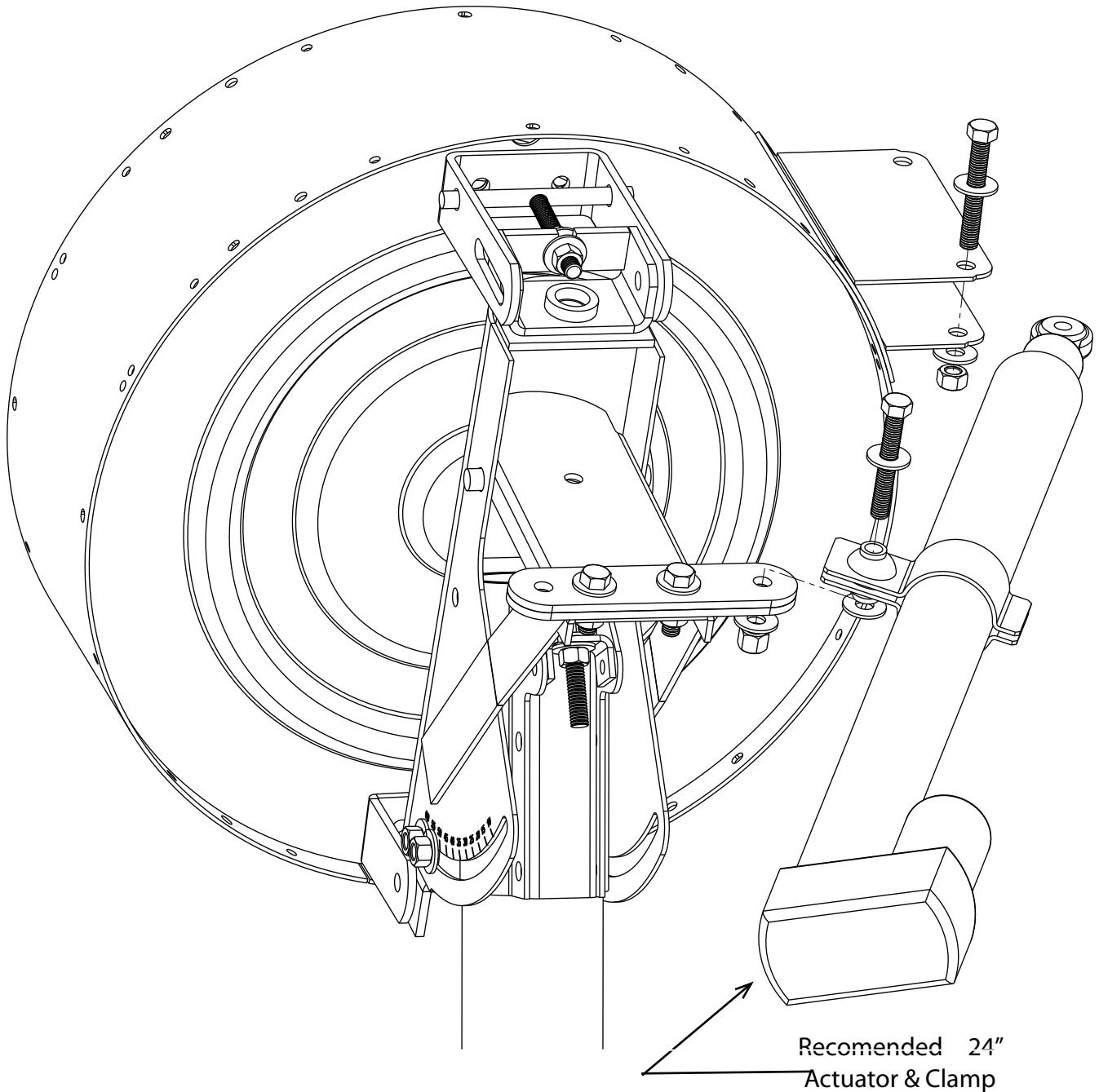
Hub Assembly

1. Lay the hub face down and place the preassembled Polar Mount on top of the hub placing two bolts each in top and bottom clevises. Tighten these bolts.
2. With a helper lift the Hub/Mount assembly and slide it down onto the 4" mast pipe.
3. Attach 231082 ASSY,POLAR TRACKER ATTMT to the proper side of the hub where the majority of the satellites to be viewed are located.
4. Adjust POLAR MOUNT so that hub is pointing straight up. Sung rough adjustment bolts at this time.



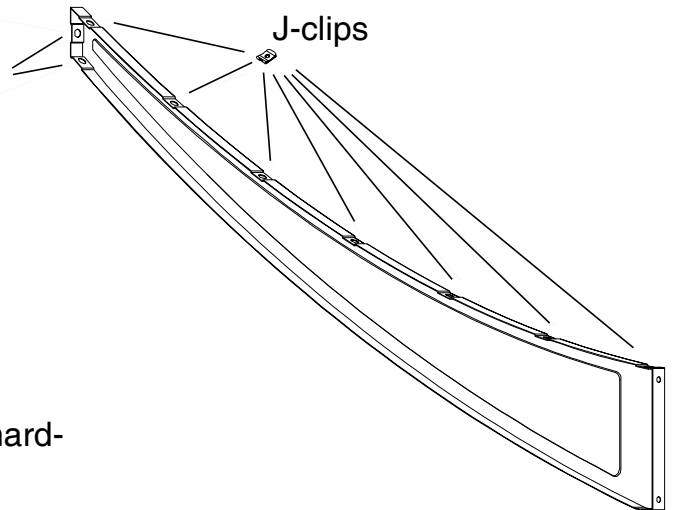
Actuator Assembly

1. Attach clamp / actuator to polar mount as pictured below. (leave clamp loose at this time.)
2. Swing hub fully to the right (as you are standing BEHIND assembly)
3. Retract actuator fully and attach to hub as pictured below.
4. Tighten clamp at this time.

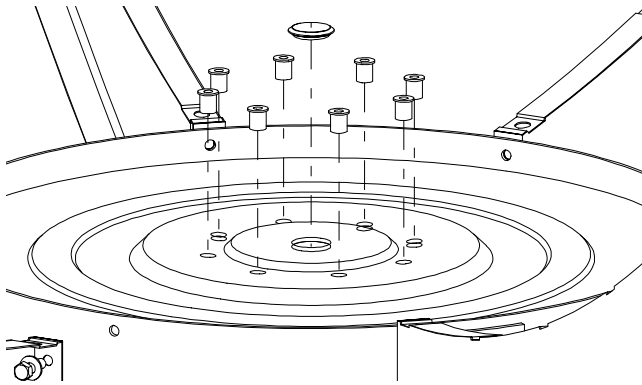
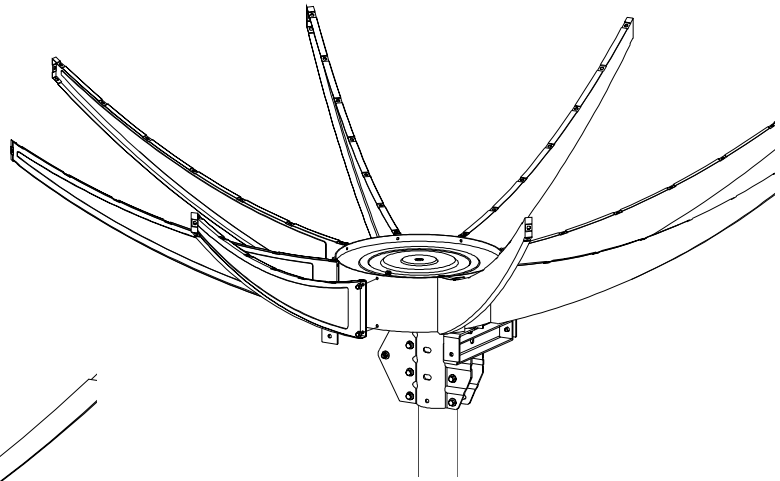


Reflector Assembly

5. Pre-install 9- J-Clips and into each of the 8 Radial Beams as shown.

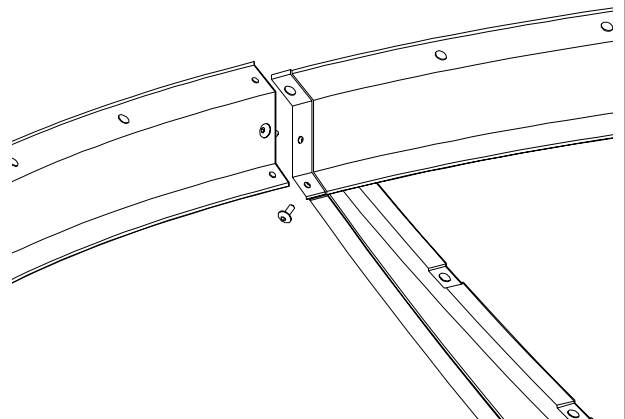


6. Install the 8 Radial Beams to the Hub using hardware labeled- **Radial Beam pack** as shown.

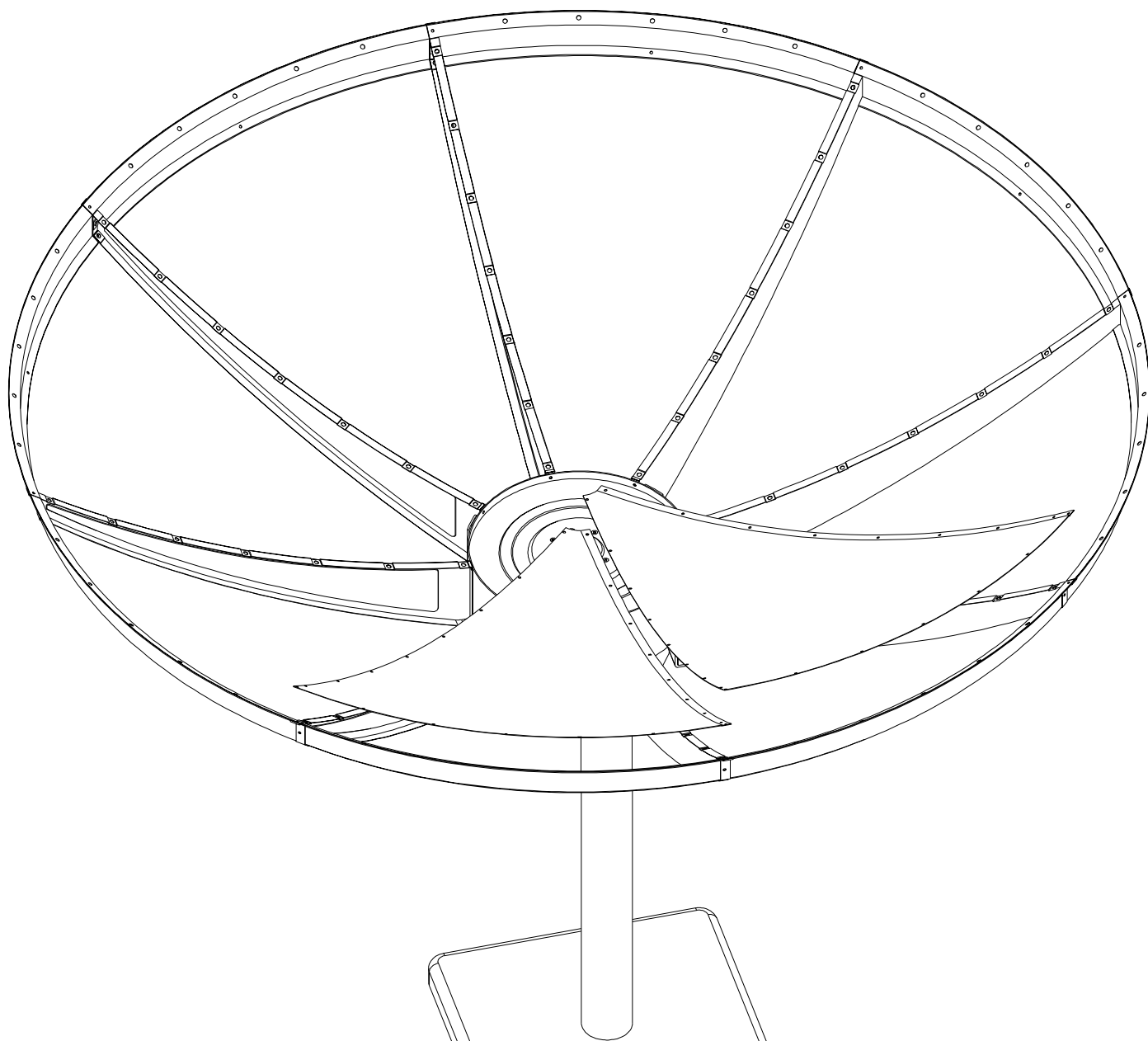


If not installed already, install the 8 threaded rubber grommets and hub plug to the front side of the hub at this time.

7. Now install the Outboard Skirts on the end of the Radial Beams as shown using **2-1/4" Allen bolts** from hardware labeled **Reflector and Feed pack** (note the overlay of the adjacent skirt). Leave this hardware loose.

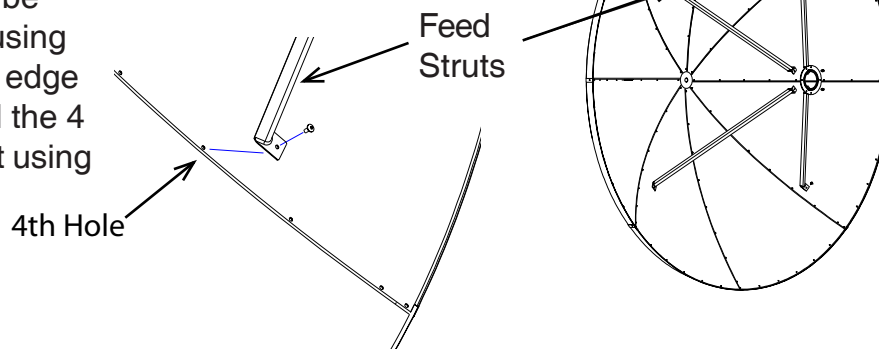


8. Install Anenna Panels noting overlay of joining edge. Join 2 panels to one Radial Beam using 1/4" Allen Bolts from the Reflector and Feed pack. Work out from the hub (note edge overlay should be even) Tighten the hardware into each J-clip after all hardware is in place.
9. Install 48- 1/4" Allen bolts with flange nuts to Antenna Panel perimeter edge and Outboard Skirts tightening them as they are installed.
10. Tighten all Reflector hardware at this time.

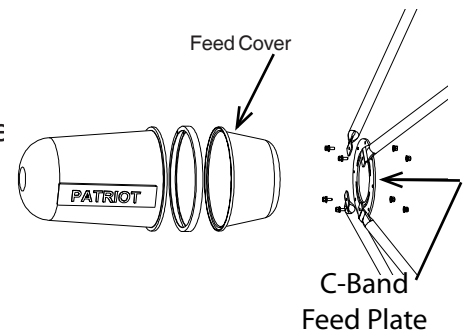


Reflector and Feed Support Assembly

11. Feed Struts are to be installed as shown by using the fourth bolt from the edge of the reflector. Install the 4 struts 90 degrees apart using every other panel.



12. Assemble the Feed Plate to the inside of the Feed Struts as shown using the 1/4" hardware also from the Feed Strut Top pack. Then assemble the feed scalar to the dish side of the plate using the 4 slotted holes with the feed cover bottom half to the opposite side of the plate.



13. Check Focal Distance- 1.04m (41.04")

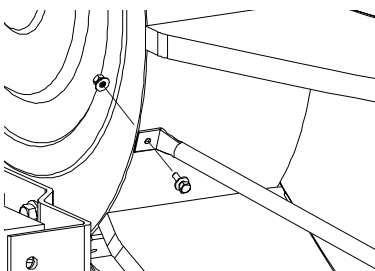
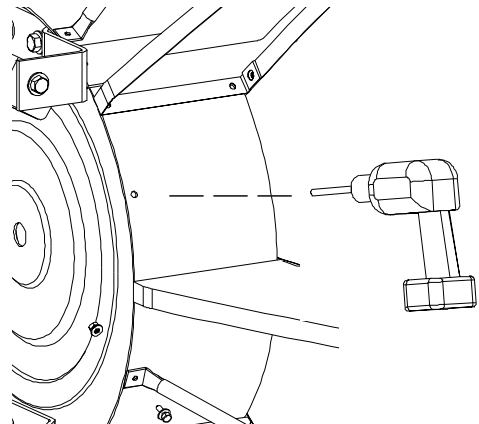
NOTE: The 4 slotted holes provide skew adjustment setting

(Optional 3.1m Wind Kit)

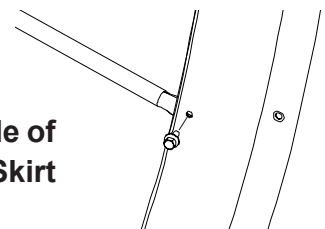
Install the Wind Kit Struts to the back of the Reflector using the supplied 1/4" hardware as shown below.

1. If you received a unit without a pre-drilled hub assembly, the needed holes will need to be drilled with a hand drill. Using a 5/16" drill, drill the 8 holes needed along the back rim of the hub. The holes should be equally spaced between the Radial Beam holes, and aligned in the same bolt circle.

2. Install the Wind Kit Struts to the back of the Reflector using the supplied 1/4" hardware as shown below.



Place inside of
Outboard Skirt



Mount Adjusting

1.) Start with checking the mounting of the feed horn. All the legs on the tripod should be of the same length. You should measure them, and do any adjustment you can if they are not the same length. Next you have to check the distance from three different points on the edge of the dish, to the center of the feed horn. Remember, even if the tripod legs have the same length, that does not mean the feed is centered! You might have to “bend” the feed back into center of the dish.

2.) Set the off-set angle on your polar mount (declination). This is an adjustment that tilts the dish forward at an angle of about 4-6 degrees, depending on what latitude you live. You can find the exact angle for your location in charts, but if you set it for about 5 degrees, you'll be close enough to get going. This adjustment is usually done on one of the mounts connected directly to the dish.

3.) You then move the dish to the highest point on your polar mount. You do this by using the actuator. You can do this by visually looking at the dish and the polar mount. You are basically centering the dish on the highest point on the polar mount. Now you have to set the elevation angle of the dish. I like to use a meter for this, but it is also possible to do it without. The elevation angle is about 40 degrees, depending on you latitude. This is not very critical at this point because you will adjust the angle for best reception later. If you measure the angle on the mount, you might have to add the declination angle to get the true dish pointing angle.

4.) You need to find a satellite that is located just south of your location. In most cases, there is a satellite close to the longitude you live. A few degrees off will not make much difference because the dish moves almost flat in the center of arc. Try a Ku band satellite because the accuracy is much higher. However, you might look for a C band satellite when you start. It will be easier to find than a Ku band satellite. Having the dish parked at the highest point of the arc, you have to turn the whole polar mount on the ground pole till you hit the satellite. If your elevation was way off, you might not even get a signal. Adjust the elevation and turn the mount again until you find the satellite located straight south.

5.) Fine tune the elevation angle. Turn the mount sideways until max signal and then adjust the elevation angle until its maxed. At this point, you have set the off-set angle and the elevation angle for the satellite at the highest point in the arc.

6.) Now, you have to get the dish to track on the sides of the arc. This is where most people fail. Do not adjust any elevation angles on the mount at this point. Move the dish using the actuator to a satellite on one side of your arc. You should hopefully see the signal from the satellite, if not, pick a satellite closer to the center of the arc. Peak the dish on the satellite using the actuator. Next, you have to push or pull upwards and downwards on the dish. You don't have to use much force, just a bit to see if the signal gets better or worse when you push/pull on the dish. What you are actually doing is to change the elevation angle a bit. If your dish is pointing at a satellite to the east of center and you have to push up on the dish to get a better signal, then the elevation angle must be adjusted higher. You adjust this by turning the whole mount to the east. You have to use the actuator and move the dish a bit west to peak the signal. You go back and forth until the dish has the correct elevation. Next, you have to check a satellite on the other side of the arc. If you peaked the dish for center, and the for one side, the other side should be very close. This will depend on your ground pole, offset angle/elevation angle and quality of feed/dish.

7.) If your dish is not hitting center on the other side, try the same adjustment as above. If the dish needs to be pushed up to get a better signal, then turn the whole mount in that direction, If the dish needs to be pulled down for better signal, then turn the mount the opposite direction (towards the higher point on arc).

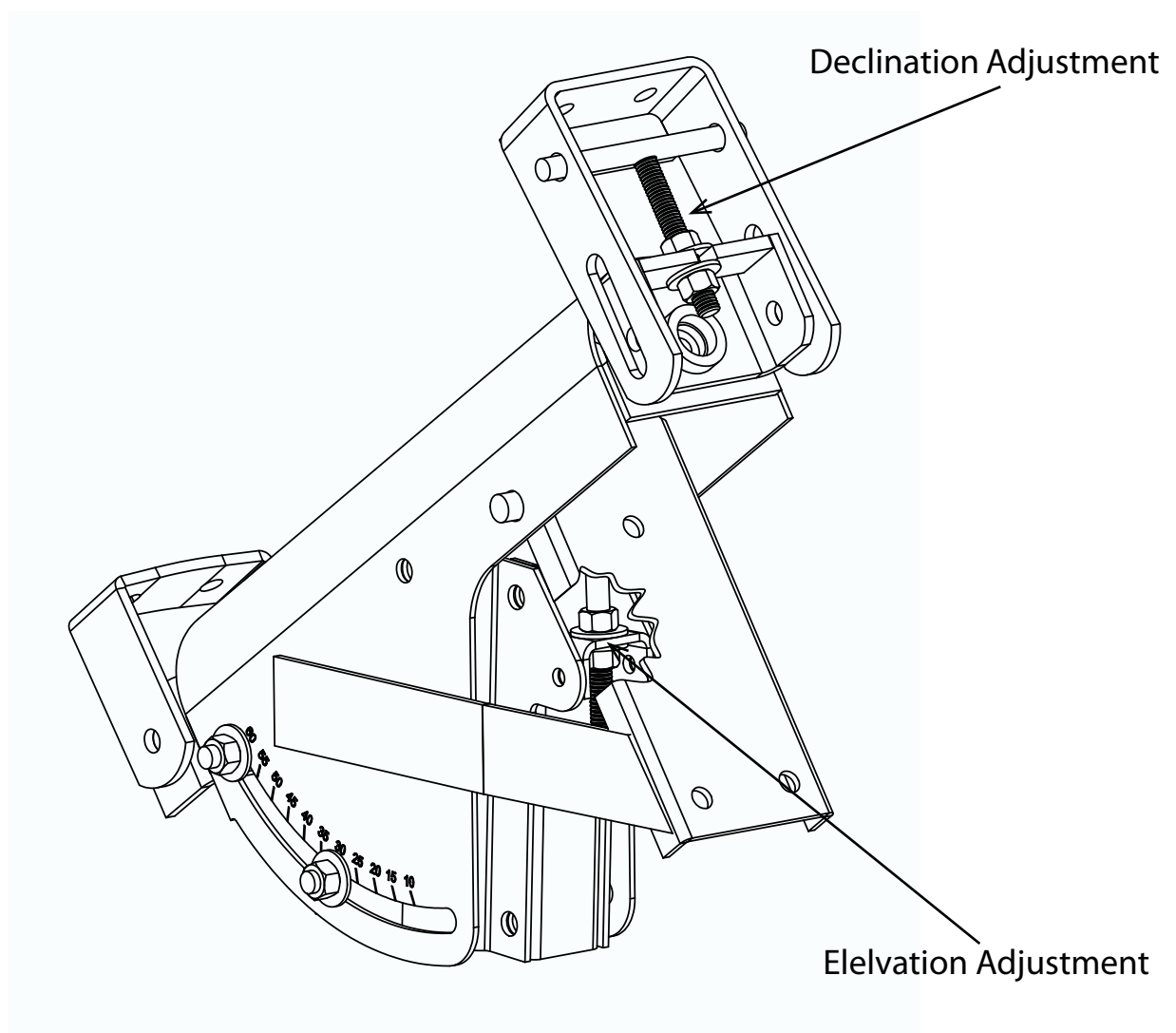
8.) Then, go back and check the other side. Hopefully, you're not far off. You might have to go from side to side before your dish tracks perfectly.

9.) If, and only if you can not get both sides to peak, both sides would be too low or too high. You can then do a small adjustment of the declination (elevation) angle to get the two sides into peak. But only do this if you can confirm that both sides are low or high. Increase the declination and the elevation angle the same amount. They will cancel each other in the center of arc, but track lower on the sides.

10.) You should now have a perfectly peaked dish. If you used Ku band satellites for the peaking, it will be as good as it can get, If you used C band satellites, you might want to do the same thing using Ku band satellites.

The antenna assembly is now complete. A brief overview of tracking the Clark follows. This work requires a qualified installation technician to insure a reliable setup. You must first know the declination setting for your site. Pre-set this declination angle between the pivot axis and the antenna hub by adjusting the slotted declination bracket on top of the mount assembly. Adjust the Elevation setting to the latitude angle of your site. Peak this elevation adjustment on a due south satellite with satellite measuring or viewing equipment. Next drive the actuator to a lower look angle and peak the antenna on a known satellite by slightly loosening the mount and rotating the antenna/mount assembly about the mast pipe. Tighten the hardware when the signal is peaked on this lower satellite. Track the arc, if any additional fine adjustments are needed repeat the steps beginning with a slightly different declination setting.

Installation is complete.



Specifications

Electrical

Gain Midband
Efficiency
3dB Beamwidth
Avg 1st Side Lobe
Cross Polarization
VSWR (max)

C-Band

40.4 dBi
66%
1.72Deg
-30dB
>35dB
1.25:1

Ku-Band

49.6 dBi
61%
.55Deg
-23dB
>35dB
1.25:1

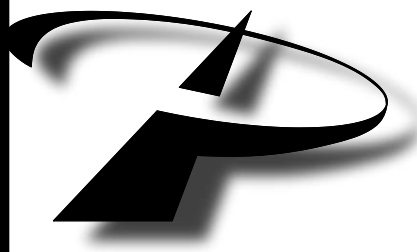
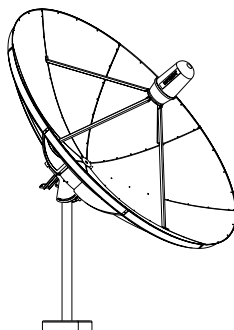
Mechanical

Antenna Size
Focal Distance
F/D
Operational Wind
Survival Wind
Operational Temp
Rain

3.1m (10')
1.04m (41.04")
.336
45mph
125mph (see wind spec. pg. 10)
-20 to 140 F
Operational = 1/2in./hr
Survival = 3in./hr
1 in. Radial -or-
1/2 in. + 60mph wind
4" OD
320 lbs.

Ice

Pole Size
Shipping Weight



***PATRIOT ANTENNA SYSTEMS
704 NORTH CLARK STREET
ALBION, MICHIGAN 49224 USA
WWW.SEPATRIOT.COM***