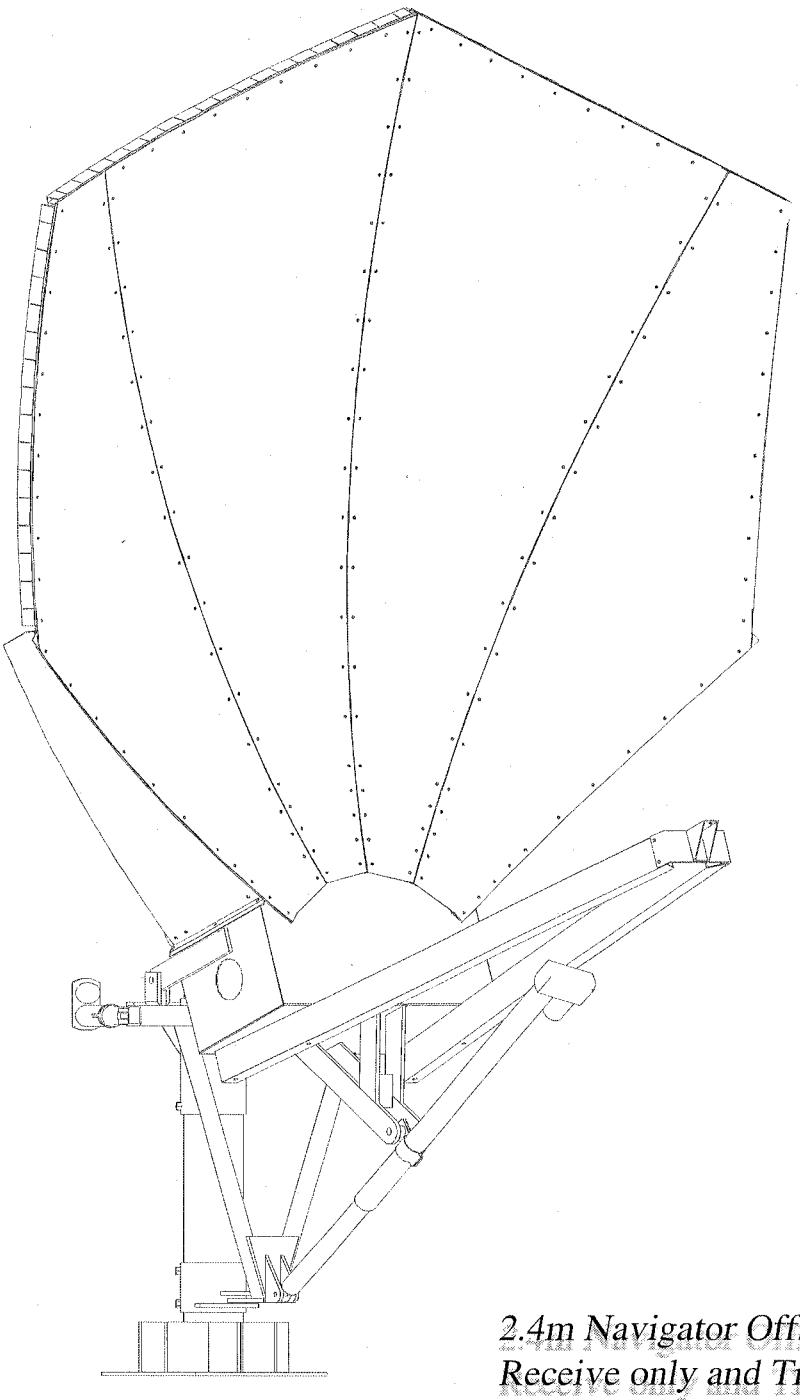
PATRIOT



2.4m Navigator 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 then 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

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. This manual will help you to know the tools and proper installation of the product. Please check, read and understand the content of this manual before beginning your antenna installation.

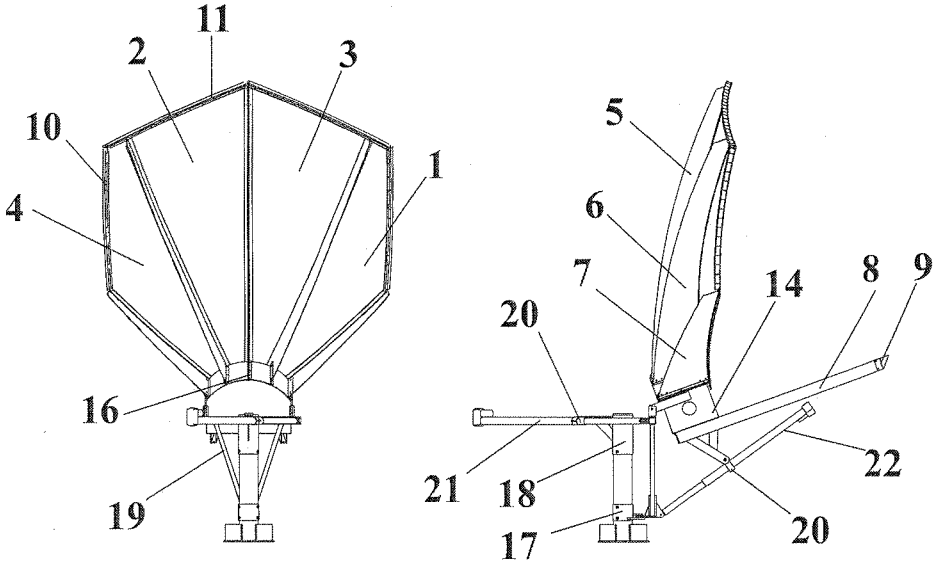
Identify and verify that all parts have been received by comparing packaged contents with the Hardware on the following page. Record the serial number of the unit on page 2 for future reference and read the warranty information. The serial number can be found on the antenna hub.

Tools Required

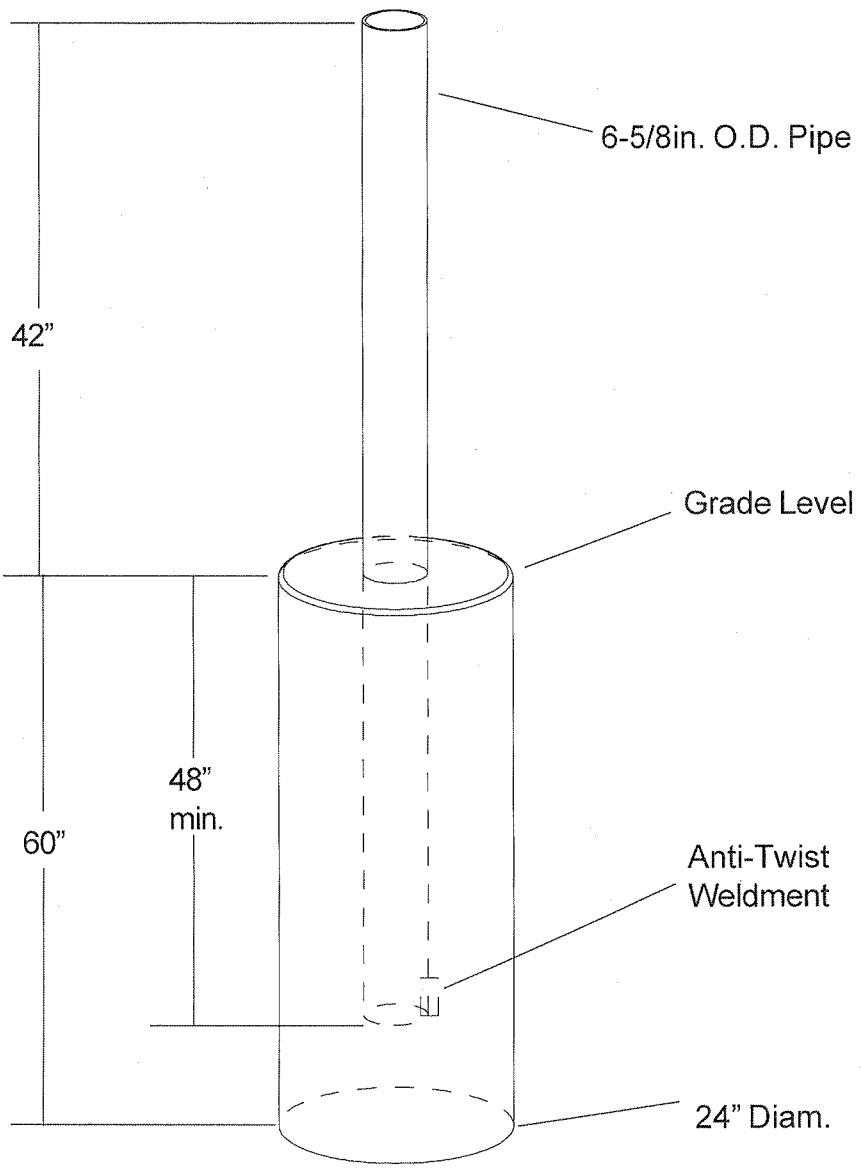
1- Combination wrench set (thru 3/4")
1- Adjustable wrench 12in
1- Ratchet/Allen 5/32 inch socket
1- Level
1- 8ft ladder

Note: A 3/8 inch drive socket set, a battery operated drill, and air tools can help speed up the installation.

Item#	Description	Part#	Rev#	Qty
	PRT-240M NAV			
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, FEED ADAPTER, 2.4 OFFSET	224122	000	1
10	ASSEMBLY, 2.4OFFSET CURFING SHORT	224128	001	2
11	ASSEMBLY, 2.4OFFSET CURFING LONG	224129	001	2
SEE PG 13	SHIM, 2.4M BOOM .125"	224131	000	4
SEE PG 13	SHIM, 2.4M BOOM .25"	224132	000	4
14	HUB, 2.4 MOTORIZED	224133	000	1
SEE PG 9	SPACER, 5.0 HUB ELEVATION	250024	000	2
SEE PG 9	SPACER, .44"	295046	000	2
16	ANGLE,4.5 HUB	4M45004	000	5
	MASTER HARDWARE KIT	3HP240000	001	1
	PRT-NAV180			
17	ASSEM, 3.8M NAV BTM COUPLING GALV-	295031G	001	1
18	ASSEM, 3.8M NAV TOP COUPLER GALV-	295032G	001	1
19	ASSEM, 1.8M NAV YOKE GALV-	295047G	000	1
20	CLAMP,ACTUATOR KIT FOR THOMPSON	TS-CLMP	000	2
21	THOMPSON ACTUATOR (24")	TS24BRL	000	1
22	THOMPSON ACTUATOR (36")	TS36BRC	000	1
	PREBAG,FOR PRT-NAV380-3	3HP38016	000	1



In-Ground Mast Foundation

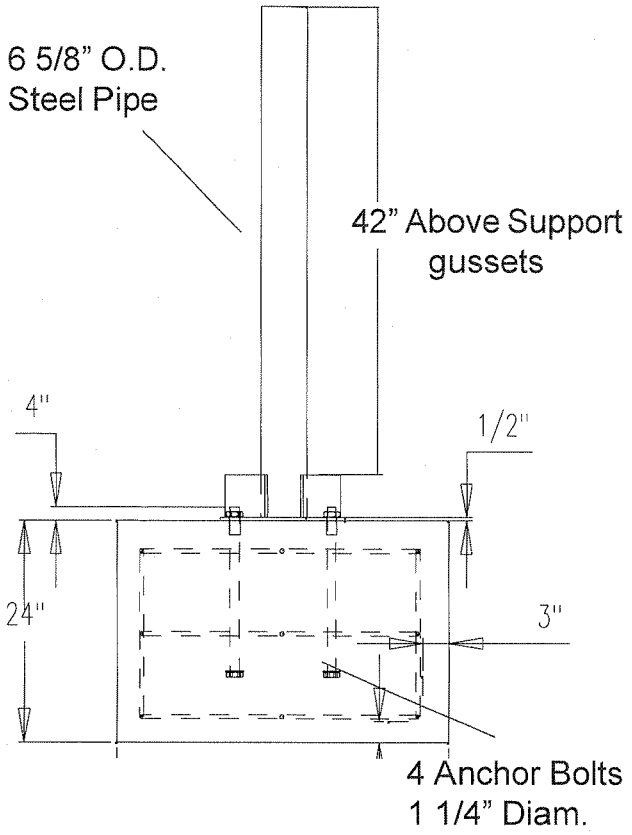


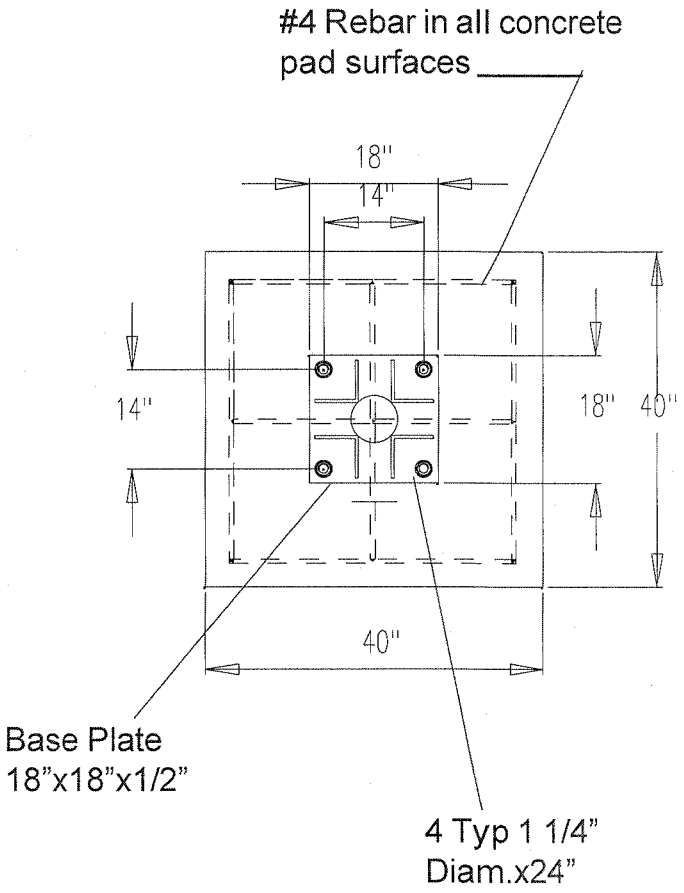
Foundation Requirements & Specifications:

- Steel Mast: 6" Schedule 80, L=90"; 6 5/8" O.D.
- Concrete: 3000 psi at 28 days, poured against undistrurbed soil
  (Allow concrete 24 hour set time before installation of antenna)
- Soil Bearing Capacity > 2000 psf.
- Ground the Antenna to meet applicable local Codes.

NOTE: Required space needed for Navigator is 42" minimum on pole above ground.

Mast Pipe(optional)
with Bolt & Template Kit



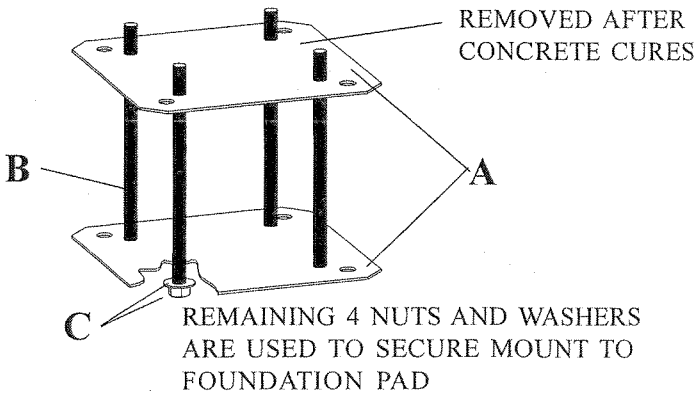


The Optional Kit Includes:

Schedule 80 6" (6-5/8" OD)
42" 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.

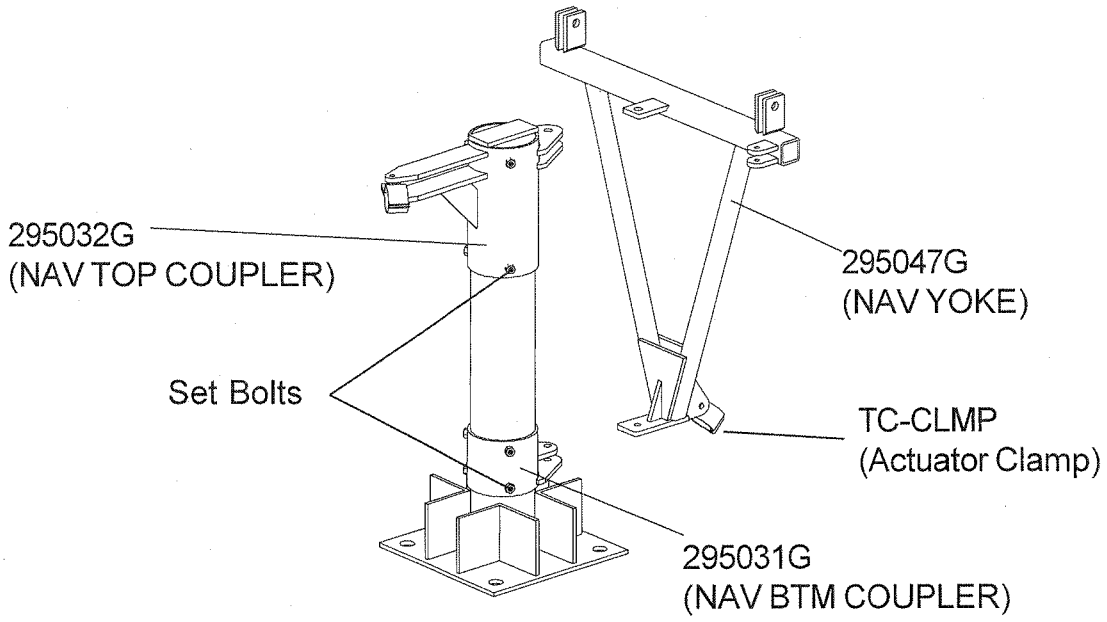


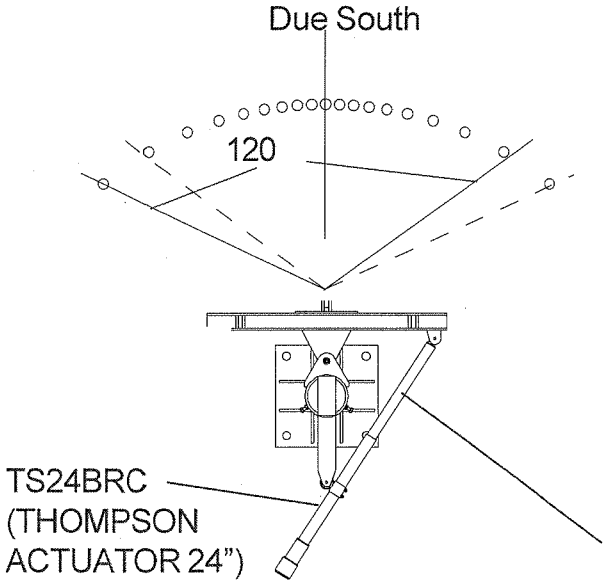
Mount Assembly

1. Slide 295031G (NAV BTM COUPLER), and then 295032G (NAV TOP COUPLER)over the mast pipe as shown. Do not tighten the set bolts at this time.
2. Attach 295047G(NAV YOKE) to 295032G (NAV TOP COUPLER) and 295031G (NAV BTM COUPLER) using pre-installed ¾ shoulder bolts and 5/8 nuts.
3. Carefully align 295031G with 295032G by means of "squaring" them with the 295047G (NAV YOKE) and then tighten the set bolts on the collars.

NOTE: 295047G(NAV YOKE)(when pointing directly away and perpindular to the collars) and collars should be initially aligned due south.

4. Remove TC-CLMP (Actuator Clamp), hardware and spacers from elevation pick up on NAV YOKE. (DO NOT DISCARD THESE ITEMS)





Align the mount for range of tracking.

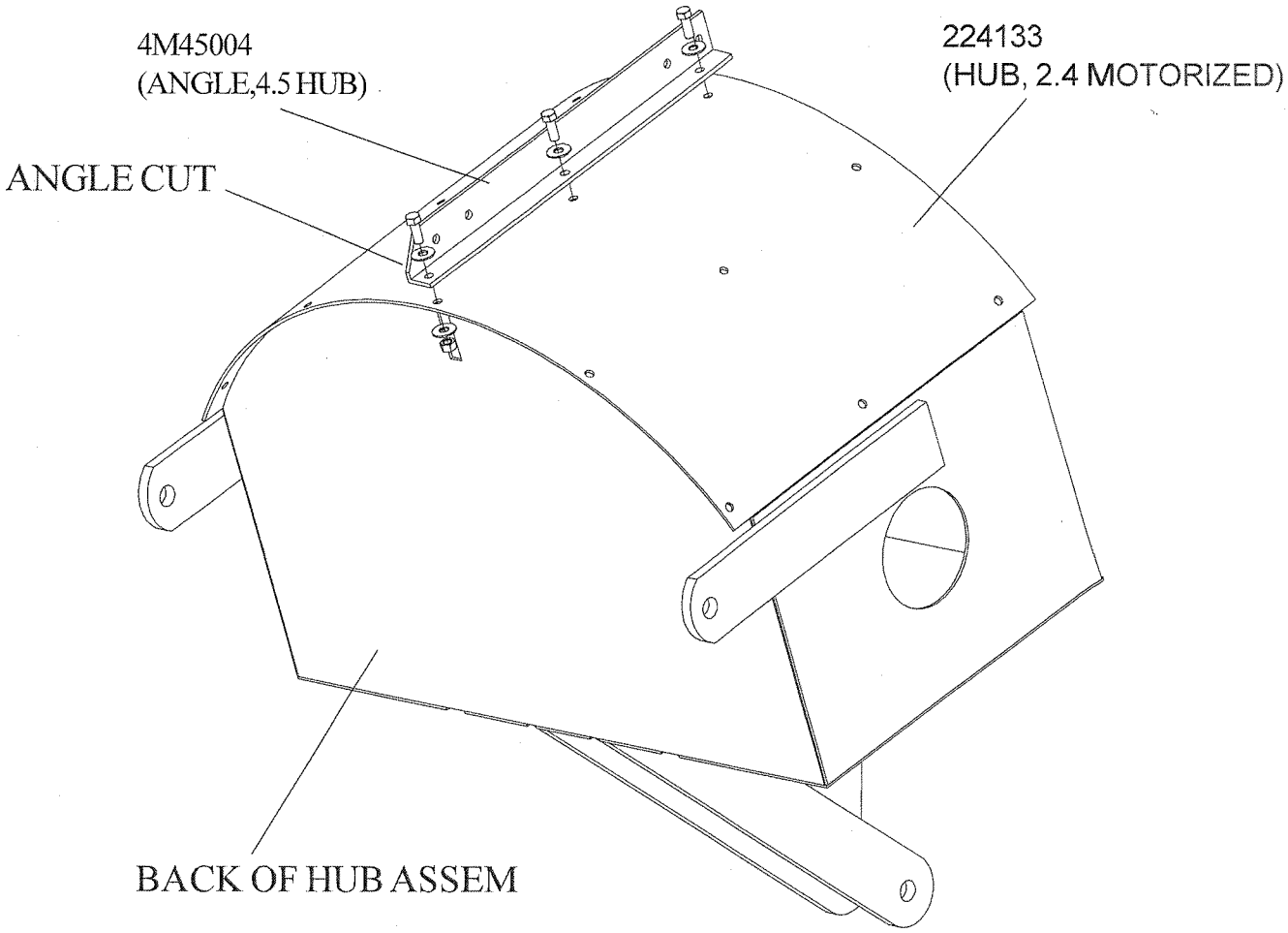
IMPORTANT INITIAL ALIGNMENT PROCEDURE. It is important that the drive system components be so aligned (with reference to east and west) to allow the antenna to be driven by the controller to the lowest satellite above horizon in either the east or the west as viewed from your location.

You may have to adjust off from due south while siting in later in the installation.

5. Install the Azimuth Actuator as shown.

Reflector Assembly

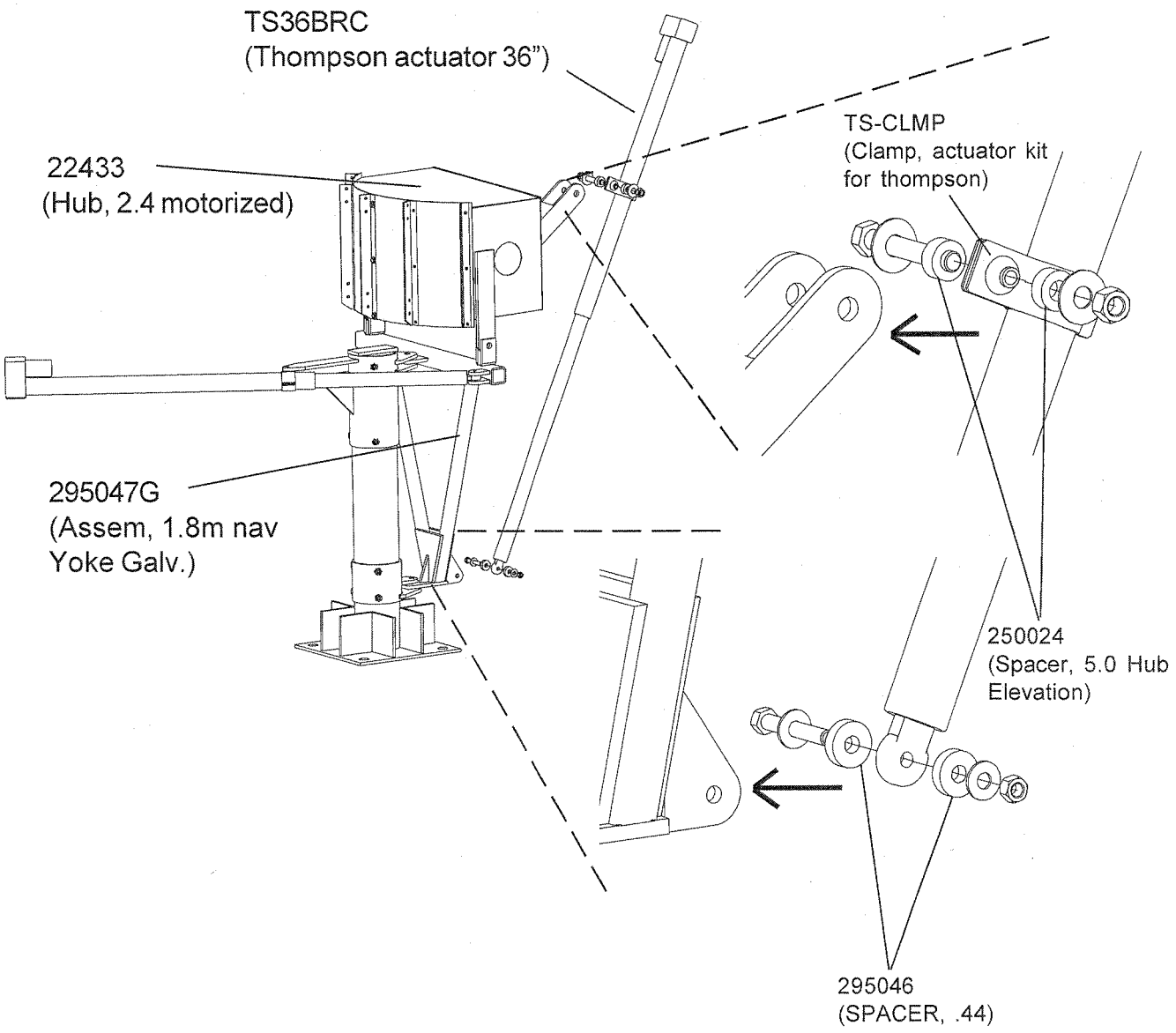
1. Fasten 4M45004 (ANGLE,4.5 HUB) to 224133 (HUB, 2.4 MOTORIZED) as shown, using hardware from Hardware Pack#3HP240002. (Make sure that the angle cut is pointing TOWARDS back of hub as pictured)
2. Repeat step till all 5 angles are attached.



Reflector Assembly (continued)

2. Attach 22433 (Hub, 2.4 motorized) to 295047G (Assem, 1.8m nav Yoke Galv.) to yoke as pictured below. (This will require two people to lift Hub Assem into place use pre attached shoulder bolts in Yoke assem)
3. Using TS-CLMP (Clamp, actuator kit for thompson) hardware and spacers (250024 (Spacer, 5.0 Hub Elevation)) that were removed earlier, attach TS36BRC (Thompson actuator 36") to 22433 (Hub, 2.4 motorized) as pictured below.
4. Using 295046 (SPACER, .44) and matching hardware, attach TS36BRC to 295047G (Assem 1.8m nav Yoke Galv.) as pictured below.

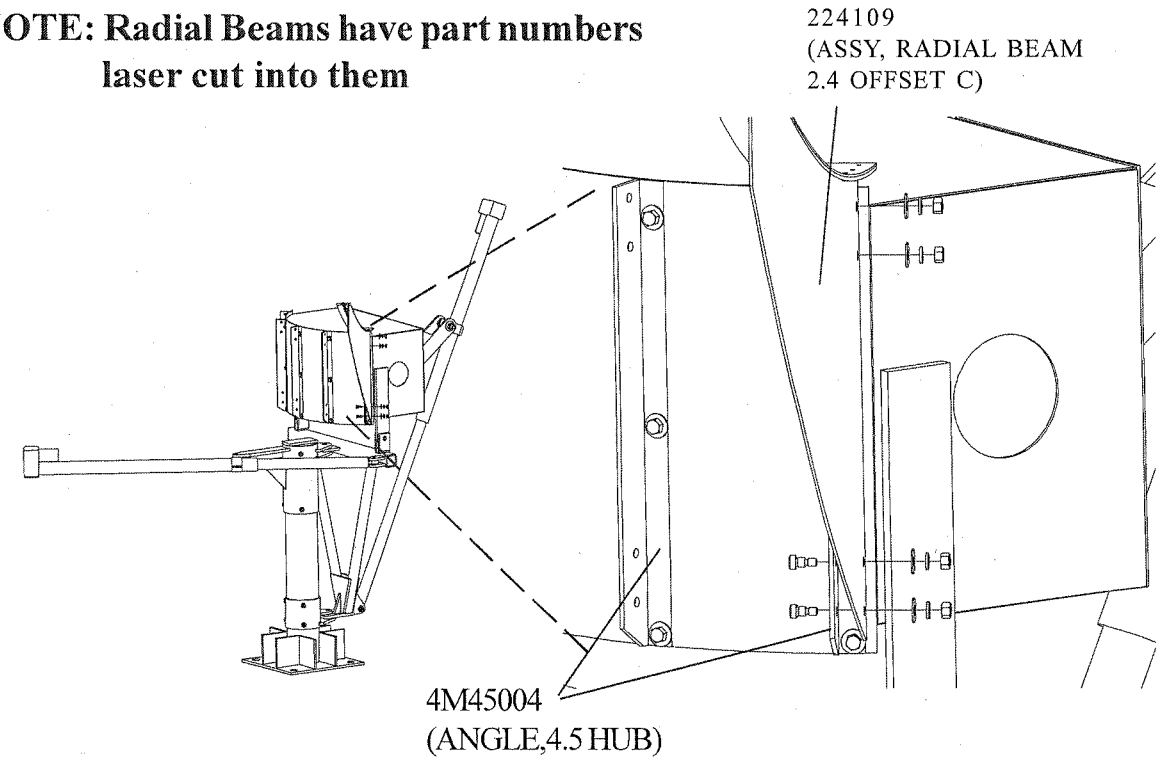
NOTE: For ease of panel and radial beam assembly, make sure hub is orentated as pictured.

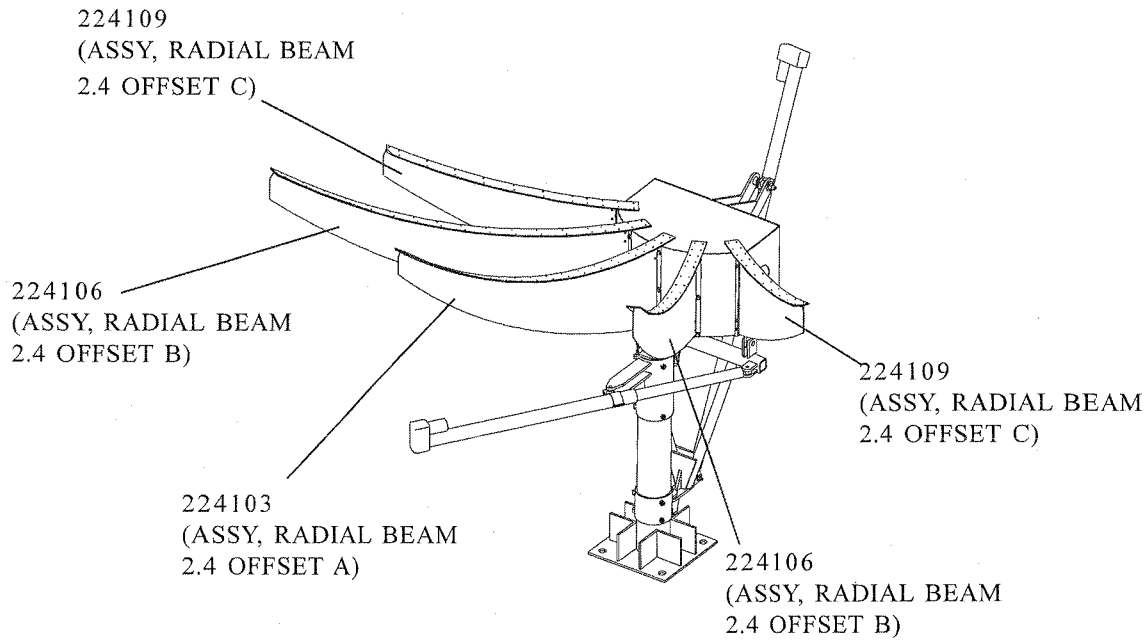


Radial Beam Assembly

1) Attach 224109 (ASSY, RADIAL BEAM 2.4 OFFSET C) to the INSIDE of 4M45004 (ANGLE,4.5 HUB) (as pictured) to insure proper beam focus, using one 3/8 washer, one 5/16 lock washer, and one 5/16 nut per 3/8 shoulder bolt.
2) Repeat step on on next radial beam 224106 (ASSY, RADIAL BEAM 2.4 OFFSET B) till all radial beams are attached to Hub Assem

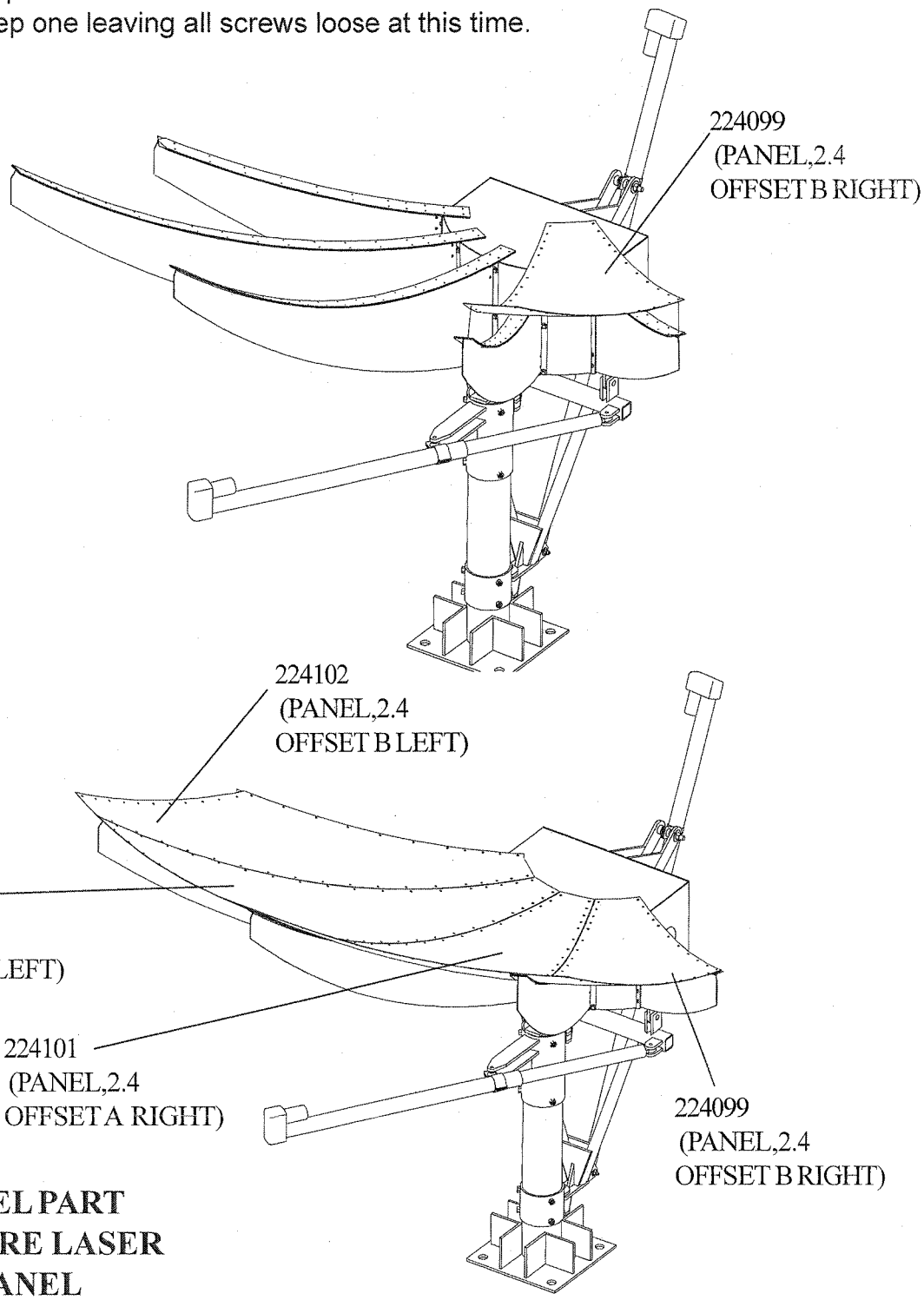
NOTE: Radial Beams have part numbers laser cut into them





Panel Assembly

1. Attach 224102 (PANEL,2.4 OFFSET B LEFT) using 1/4-20 Button Head panel Screw from harware bag 3HP240001. (Leave screws loose at this time)
2. Attach all other panels in the same manor as described in step one leaving all screws loose at this time.



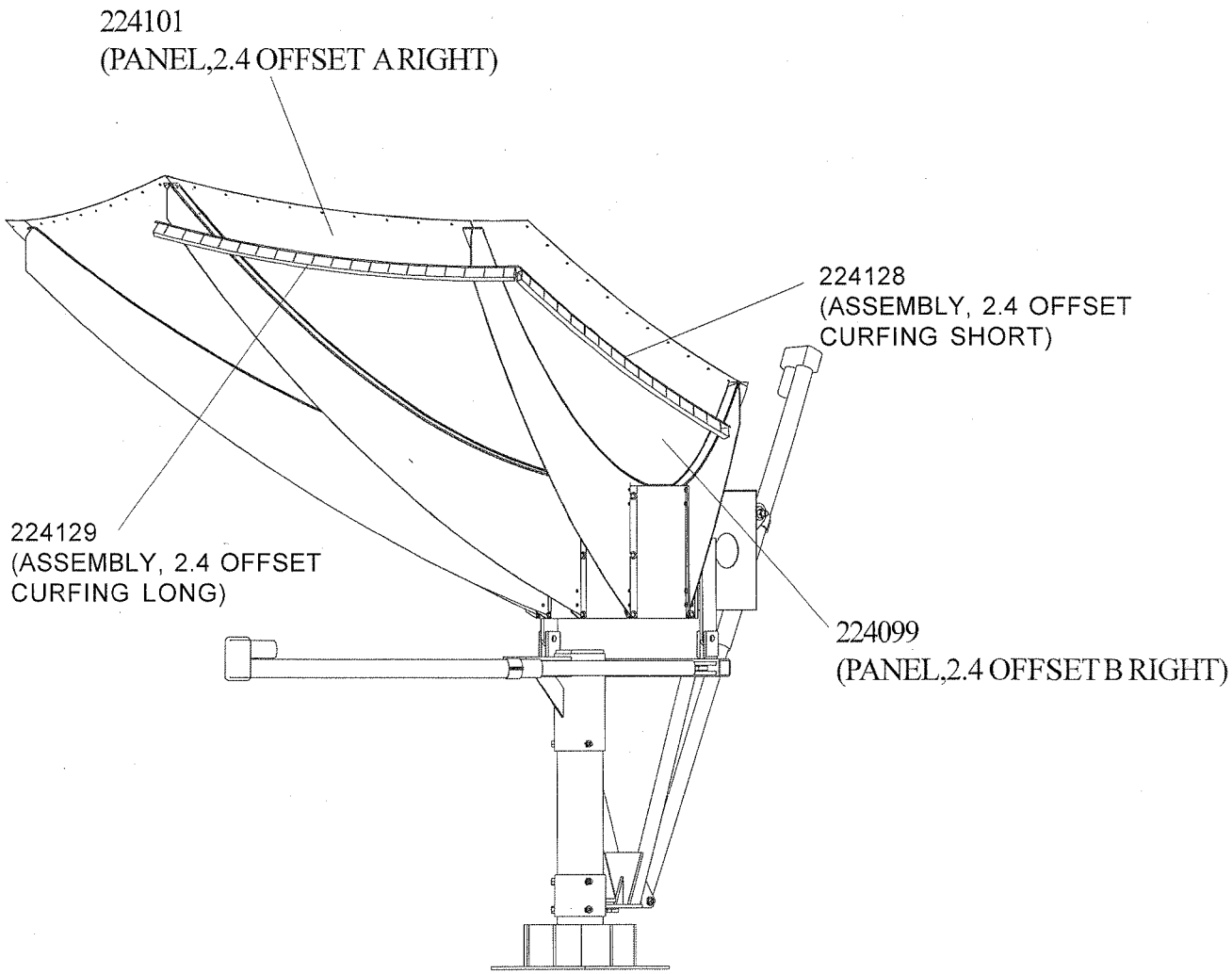
NOTE: PANEL PART NUMBERS ARE LASER CUT INTO PANEL

Panel Assembly (cont.)

3. Attach 224128 (ASSEMBLY, 2.4OFFSET CURFING SHORT) to 224099 (PANEL,2.4 OFFSET B RIGHT), and the other to 224102 (PANEL,2.4 OFFSET B LEFT) using same screws from hardware pack 3HP240001.

4. Attach 224129 (ASSEMBLY, 2.4OFFSET CURFING LONG) to 224101 (PANEL,2.4 OFFSET A RIGHT), and the other to 224100 (PANEL,2.4 OFFSET A LEFT) using same screws from hardware pack 3HP240001.

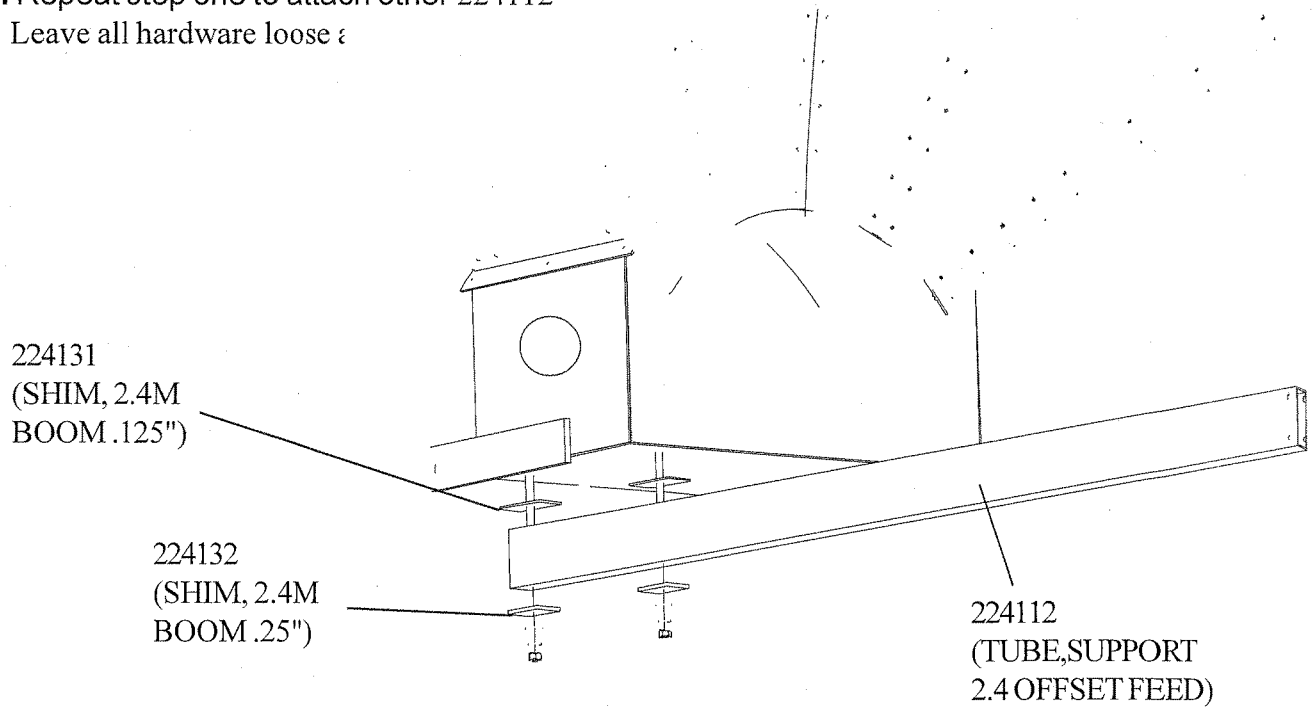
5. Tighten ALL PANEL SCREWS at this time, starting from the hub and working out.



Feed Boom and Feed Assembly

1. Attach224112 (TUBE,SUPPORT 2.4 OFFSET FEED) to bottom side of Hub using 1/2 hardware with bolt and washer inside of hub. Leave all hardware loose at this time

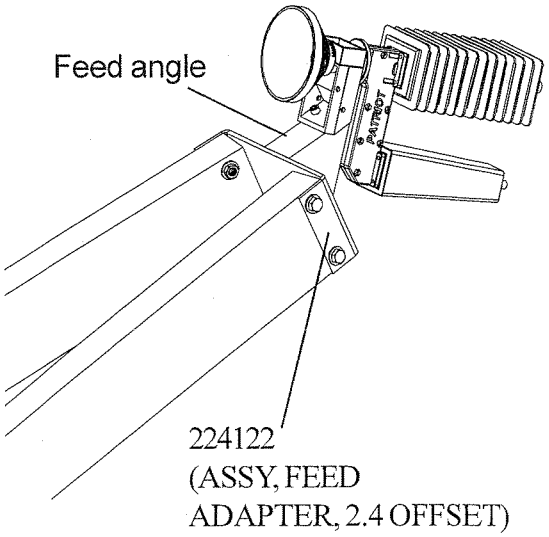
2. Repeat step one to attach other 224112
Leave all hardware loose a



3. Attach 224122 (ASSY, FEED ADAPTER,2.4 OFFSET) to 224112 (TUBE,SUPPORT 2.4 OFFSET FEED) using 3/8 hardware bolts, washers, and nuts.

NOTE: Feed angle should be pointing up.

4. Tighten ALL hardware at this time

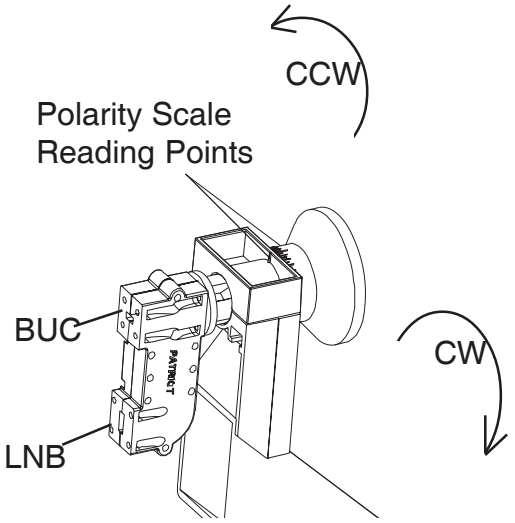


Feed Adjustment (Polarity tuning)

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.

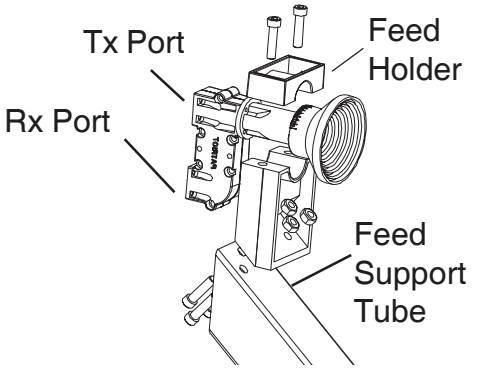


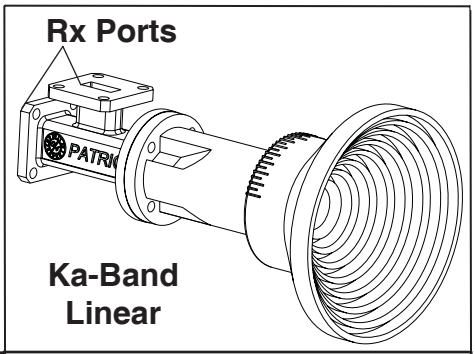
Feed Rotation Chart

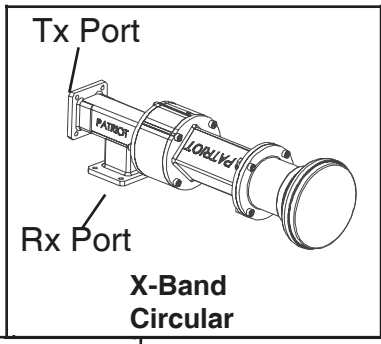
Install site west of satellite	Install site East of satellite	
CW	CCW	Northern Hemisphere
CCW	CW	Southern Hemisphere

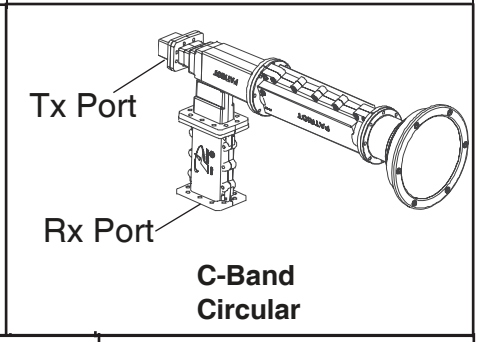
Feed Assembly

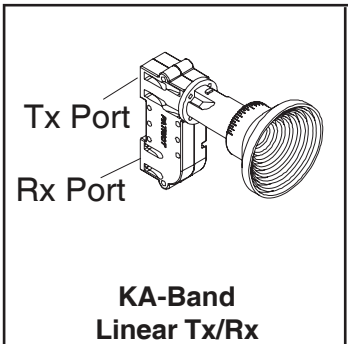
1. Attach the relevant Feed Assembly.
2. Insert the Feed Assembly into the Feed holder and assemble to the Feed Support Tube using the hardware illustrated below.
3. Insert plastic plug into end of feed support tube.

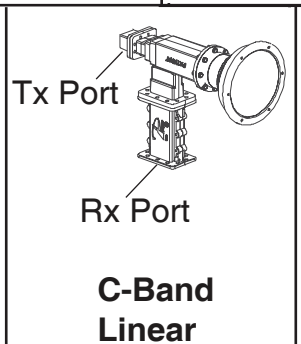


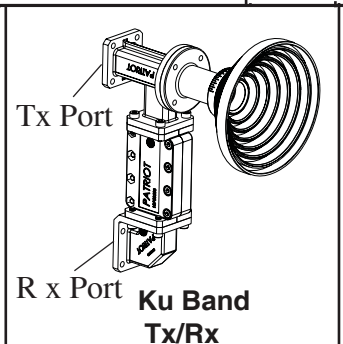


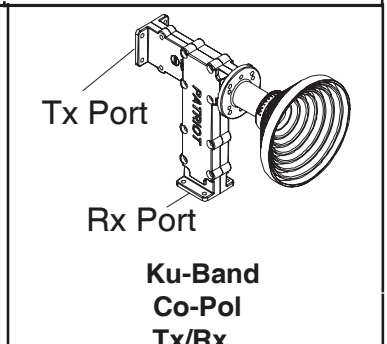


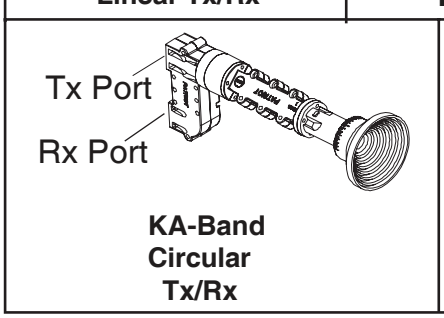


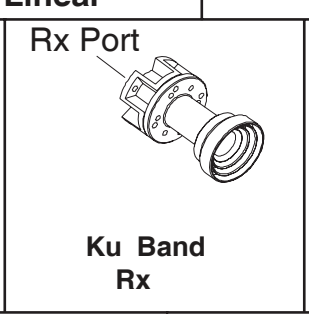


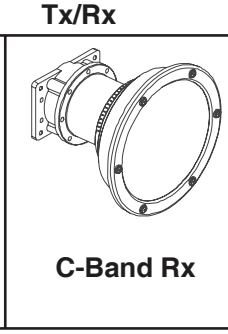


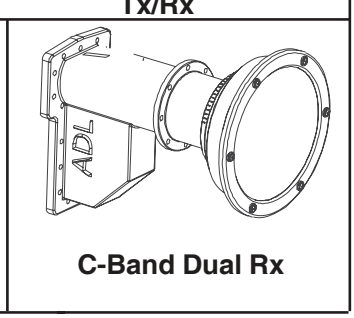


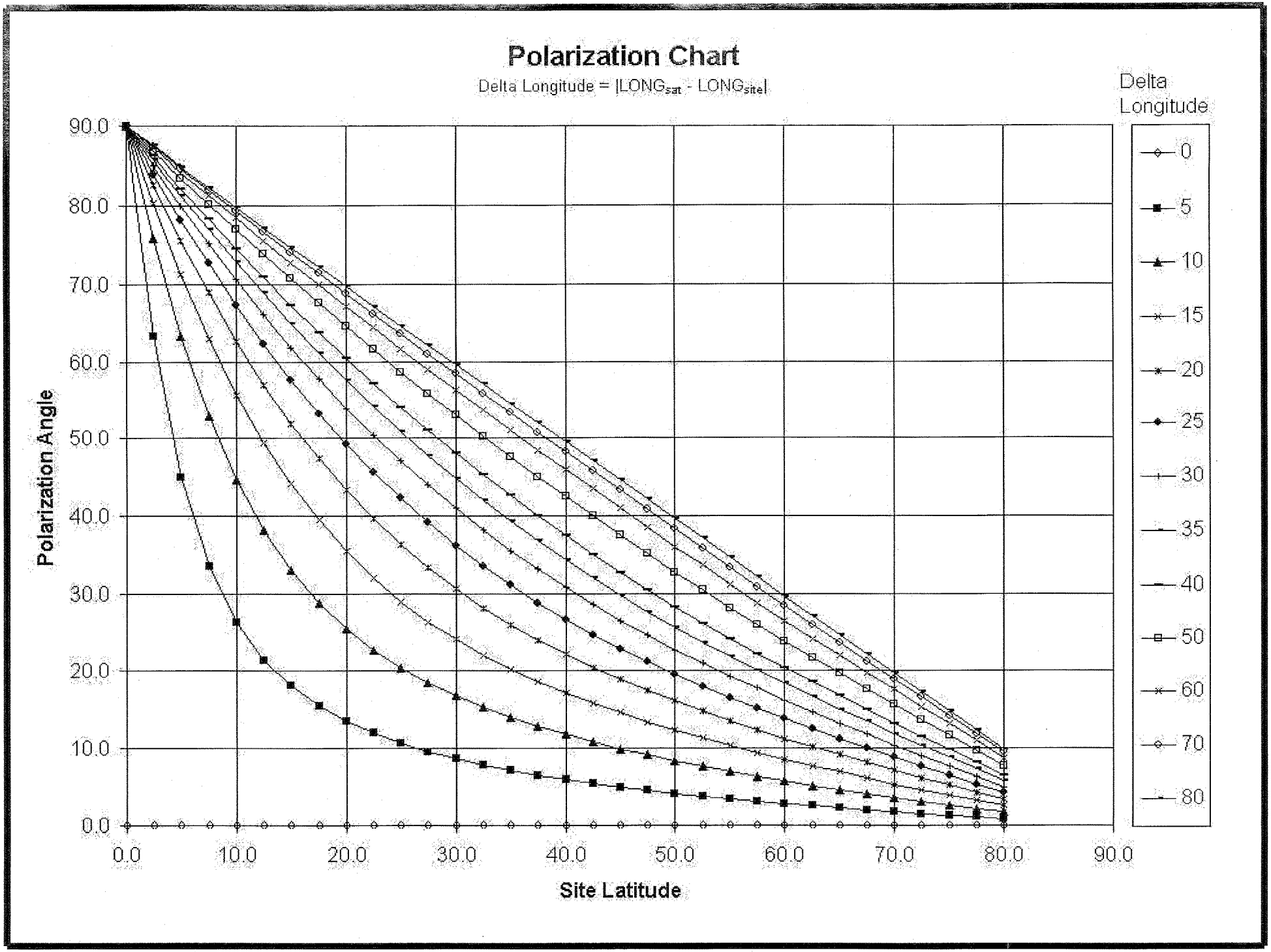











Polarization Chart
Delta Longitude = |LONG$_{sat}$ - LONG$_{site}$|
Delta Longitude
0
5
10
15
20
25
30
35
40
50
60
70
80
Polarization Angle
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
0.0
10.0
20.0
30.0
40.0
50.0
60.0
70.0
80.0
90.0
Site Latitude

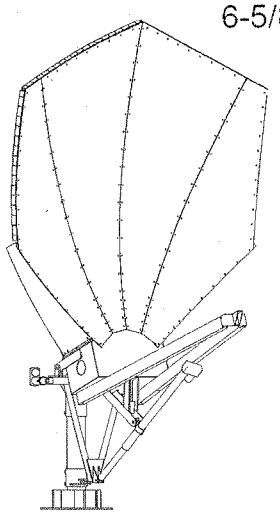
Specifications

Electrical — *Ku-Band*

Gain Midband	Tx- 49.6dBi	Rx- 48.0
3dB Beamwidth	Tx- 0.6 Deg	Rx- 0.7 Deg
Side Lobes	ITU - 580	
Cross Polarization (on axis)	>35dB	
VSWR	Tx- 1.2:1	Rx- 1.3:1

Mechanical

Antenna Size	2.4m
Offset Angle	21.34
F/D	.64
Operational Wind	50mph
Survival Wind	125mph
Operational Temp	-40 to 140 F
Rain	Operational = 1/2in./hr Survival = 3in./hr
Ice	1 in. Radial -or- 1/2 in. + 60mph wind
Pole Size	6-5/8" OD



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