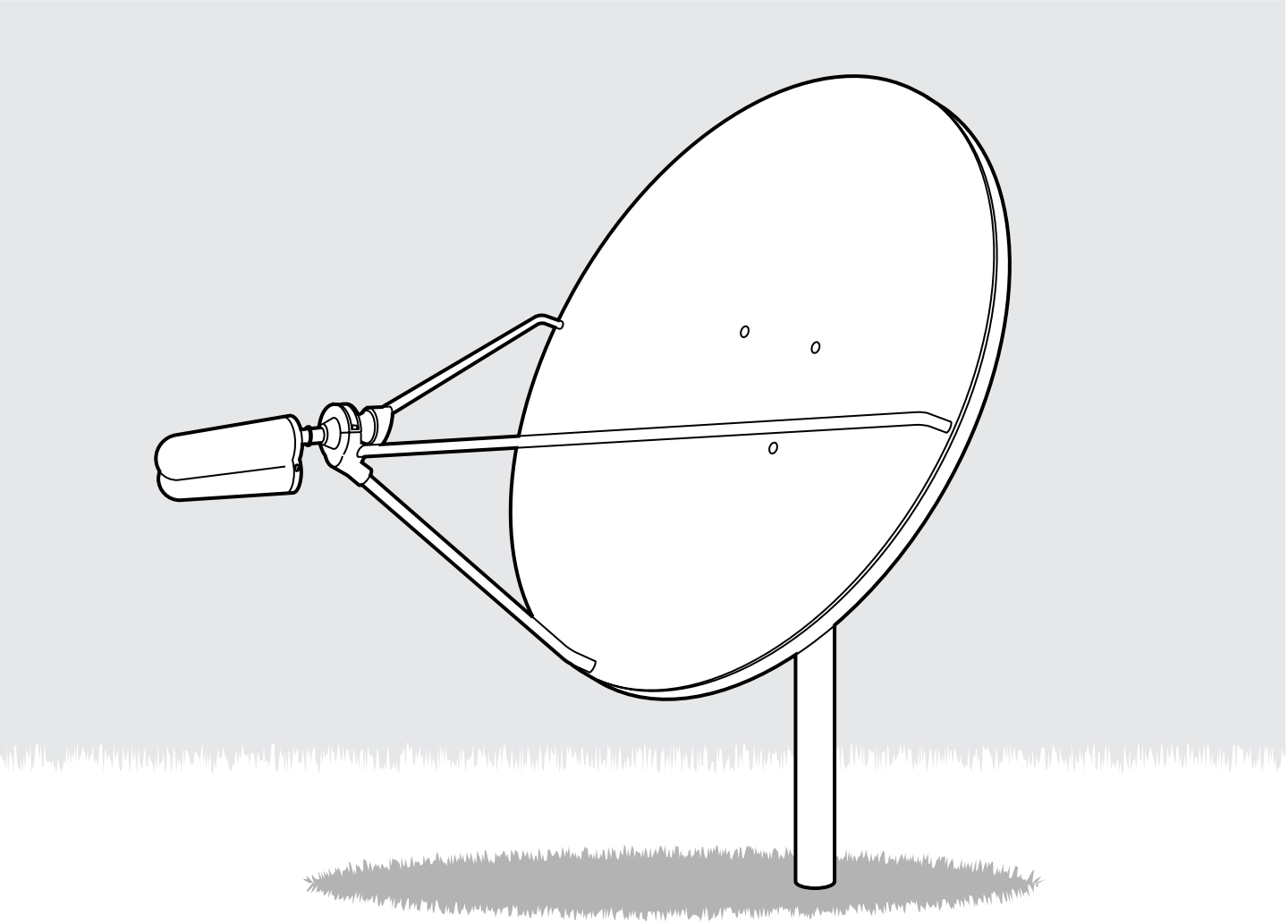
Assembly Instructions

8000284-01

Type 100 and Type 120 SMC Antenna System

1.0 Meter and 1.2 Meter Reflector with Az/El Cap Mount



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MANUAL REVISION HISTORY

DATE	DESCRIPTION	REVISION
11/08	5079947	Rev A
11/09	644	Rev B

WARRANTY

SKYWARE GLOBAL
VERY SMALL APERTURE TERMINAL (VSAT) PRODUCTS
TWELVE (12) MONTH LIMITED WARRANTY

Seller warrants that all SKYWARE GLOBAL manufactured VSAT products are transferred rightfully and with good title; that they are free from any lawful security interest or other lien or encumbrance unknown to Buyer. Seller also warrants that for a period of twelve (12) months from the date of shipment from Seller's factory, all its VSAT products shall be free from defects in material and workmanship which arise under proper and normal use and service. Buyer's exclusive remedy hereunder is limited to Seller's correction (either at its plant or at such other place as may be agreed upon between Seller and Buyer) of any such defects by repair or replacement at no cost to Buyer, except for the costs of any transportation in connection with the return of the defective VSAT products to be replaced or repaired, and the costs to remove and/or reinstall the products, which shall be borne by Buyer. The limited warranty period shall not be extended beyond its original term with respect to any part or parts repaired or replaced by seller hereunder.

This warranty shall not apply to VSAT products which (i) have been repaired or altered in any way so as to affect stability or durability, (ii) have been subject to misuse, negligence or accident, (iii) have been damaged by severe weather conditions such as excessive wind, ice, storms, lightning, or other natural occurrences beyond Seller's control; (iv) have presented damages, defects or nonconformances caused by improper shipping, handling or storage, and (v) have not been installed, operated or maintained in accordance with Seller's instructions.

Buyer shall present any claims along with the defective VSAT product(s) to Seller immediately upon failure Non-compliance with any part of this warranty procedure may invalidate this warranty in whole or in part.

SELLER MAKES NO WARRANTY, EXPRESS OR IMPLIED, OTHER THAN AS SPECIFICALLY STATED ABOVE. EXPRESSLY EXCLUDED ARE ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. THE FOREGOING SHALL CONSTITUTE ALL OF SELLER'S LIABILITY (EXCEPT AS TO PATENT INFRINGEMENT) WITH RESPECT TO THE VSAT PRODUCTS. IN NO EVENT SHALL SELLER BE LIABLE FOR ANY LOSS OF PROFITS OR REVENUE, LOSS OF USE, INTERRUPTION OF BUSINESS, OR INDIRECT, SPECIAL, CONSEQUENTIAL OR INCIDENTAL DAMAGES OF ANY KIND AS A RESULT OF THE USE OF THE PRODUCTS MANUFACTURED BY SELLER, WHETHER USED IN ACCORDANCE WITH THE INSTRUCTIONS OR NOT. UNDER NO CIRCUMSTANCES SHALL SELLER'S LIABILITY TO BUYER EXCEED THE ACTUAL SALES PRICE OF THE VSAT PRODUCTS HEREUNDER.

In some jurisdictions, Buyer may have other rights under certain statutes that may imply non-excludable warranties. No representative is authorized to assume for Seller any other liability in connection with the VSAT products.

DO NOT DISCARD CONTENTS
The product in this packaging was placed in the market after August 13, 2005. Its components must not be discarded with normal municipal or household waste.

Contact your local waste disposal agency for recovery, recycling, or disposal instructions.

WARNINGS

LAW: Installation and installer must meet local codes and ordinances regarding safety! Installation of this product should be performed only by a professional installer and is not recommended for consumer Do-It-Yourself installations.

DANGER: WATCH FOR WIRES! Installation of this product near power lines is extremely dangerous and must never be attempted. Installation of this product near power lines can result in death or serious injury! For your own safety, you must follow these important safety rules. Failure to follow these rules could result in death or serious injury.

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. Stay at least 6 meters (20 feet) away from all power lines.
3. Do not install antenna or mast assembly on a windy day.
4. If you start to drop antenna or mast assembly, move away from it and let it fall.
5. 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.
6. Make sure that the mast assembly is properly grounded.

WARNING: Assembling dish antennas on windy days is extremely dangerous and must never be attempted. Due to the surface area of the reflector, even slight winds create strong forces. For example, this antenna facing a wind of 32 km/h (20 mph) can undergo forces of 269 N (60 lb). **BE PREPARED TO SAFELY HANDLE THESE FORCES AT UNEXPECTED MOMENTS. ATTEMPTING TO ASSEMBLE, MOVE OR MOUNT A DISH ON WINDY DAYS COULD RESULT IN DEATH OR SERIOUS INJURY.** SKYWARE GLOBAL 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 and ice) and properly sealed against leaks. SKYWARE GLOBAL will not accept liability for any damage caused by a satellite system due to the many unknown variable applications.

PRE INSTALLATION CONSIDERATIONS

TOOLS REQUIRED:

Compass	13 mm Deep Socket (3/8" Drive)	10 mm Nut Driver	Torque Wrench
Clinometer	#1 or #2 Phillips Screwdriver	10 mm Socket (3/8" Drive)	9" Magnetic Level
3/8" Drive Ratchet Wrench	13 mm Combination Wrench	10 mm Combination Wrench	(2) 17 mm Open End Wrenches

ADDITIONAL INSTALLATION MATERIALS (Not Included with Antenna)

Installation Mount (Ground Pole, King Post, Wall Mount or Roof Mount).
Grounding Rod, Clamp & Grounding Block - As required by National Electric Code or local codes.
Ground Wire - #10 solid copper or #8 aluminum as required by National Electric Code or local codes (length as required).
RG-6 Coaxial Cables from antenna to indoor units.
Concrete: See "Ground Pole" section for quantity
M10 or #3 Rebar: See "Ground Pole" section for quantity. Deformed steel per ASTM A615, Grade 40 or 60.

SITE SELECTION

The first and most important consideration when choosing a prospective antenna site is whether or not the area can provide an acceptable "look angle" at the satellites. A site with a clear, unobstructed view is preferred. Also consider obstruction that may occur in the future such as the growth of trees. Your antenna site must be selected in advance so that you will be able to receive the strongest signal available. To avoid obstructions, etc., conduct an on-site survey with a portable antenna. The satellite antenna can be installed on a ground pole, wall/roof mount, or non-penetrating roof mount with 2-7/8" or 3" outside diameter mast. The chosen mount type should be assembled and in place before installing the antenna. Refer to instructions packed with mount for its proper installation. The mast pipe must be vertical and plumb to insure ease of alignment.

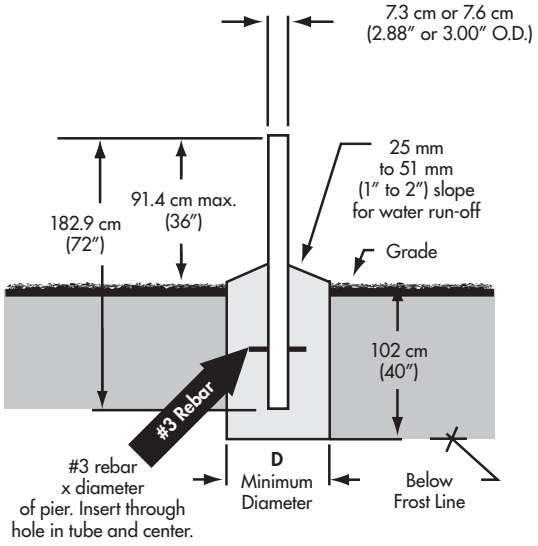
As with any other type of construction, a local building permit may be required before installing an antenna. It is the property owner's responsibility to obtain any and all permits.

Before any 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.

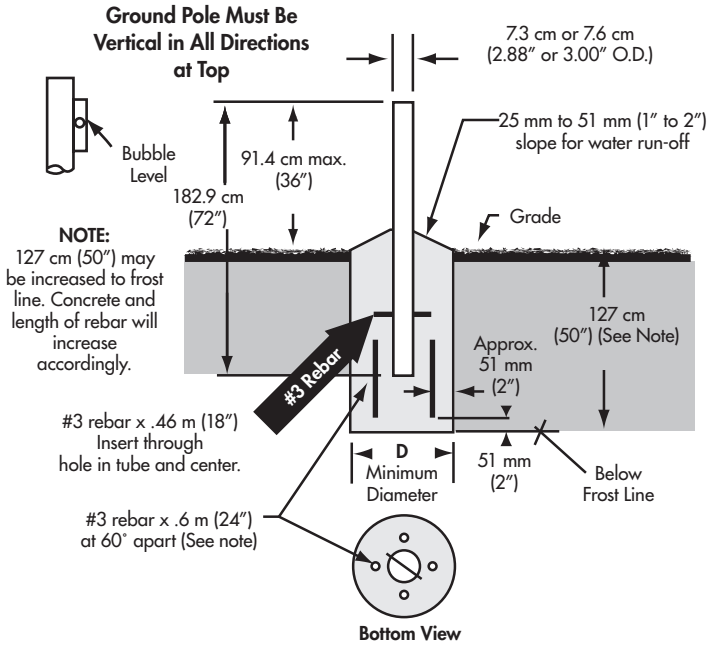
Because soils vary widely in composition and load capacity, consult a local professional engineer to determine the appropriate foundation design and installation procedure. A suggested foundation design with conditions noted is included in this manual for reference purposes only.

GROUND POLE INSTALLATION

Pier Foundations



Deep Frost Line Foundations



		Pier Foundations				Deep Frost Line Foundations				
		EXPOSURE B		EXPOSURE C		EXPOSURE B		EXPOSURE C		
	WIND VEL km/h (mph)	DIM D cm (in)	CONC VOL m^3 (ft^3)	DIM D cm (in)	CONC VOL m^3 (ft^3)	DIM D cm (in)	CONC VOL m^3 (ft^3)	DIM D cm (in)	CONC VOL m^3 (ft^3)	GROUND POLE
1.0 m Antenna	161 (100)	25 (10)	0.05 (1.8)	38 (15)	0.12 (4.1)	18 (7)	0.03 (1.1)	25 (10)	0.06 (2.2)	A, B or C
	201 (125)	36 (14)	0.10 (3.7)	51 (20)	0.21 (7.4)	23 (9)	0.05 (1.9)	36 (14)	0.13 (4.6)	A, B or C
1.2 m Antenna	161 (100)	30 (12)	0.07 (2.5)	46 (18)	0.17 (6.0)	20 (8)	0.04 (1.4)	33 (13)	0.11 (3.8)	A ,B or C
	201 (125)	43 (17)	0.15 (5.2)	61 (24)	0.30 (10.5)	30 (12)	0.09 (3.2)	48 (19)	0.23 (8.1)	A or C

POLE SPECIFICATIONS:

Ground Pole "A" 2-1/2 Schedule 40 Steel ASTM A53 Pipe (73 mm x 5 mm Wall/2.88″ OD x .203″ Wall)
Ground Pole "B" 3.0″ OD x 9 Gauge (.148″ Wall) Steel ASTM A501 Pipe (76 mm OD x 3.8 mm Wall)
Ground Pole "C" 2-1/2 Schedule 80 Steel ASTM A53 Pipe (73 mm x 7 mm Wall/2.88″ OD x .276″ Wall)

NOTE:

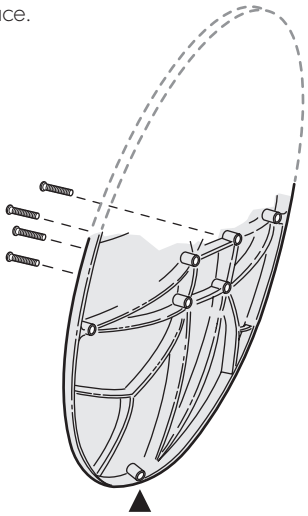
1. Poles are not supplied (purchase locally to above specifications) and must be field drilled 5/8″ diameter for M10 #3 rebar, 5.5 mm for self tapping grounding screw and (.218″) for 1/4-20 self tapping grounding screw. Poles and screws must be galvanized or painted for protection.
2. Pole and foundation design based on the following criteria:
   - **a.** Uniform building code Exposure B or C wind loading.
   - **b.** Vertical soil pressure of 13790 kPa (2000 pounds per square foot).
   - **c.** Lateral soil pressure of 2758 kPa (400 pounds per square foot).
   - **d.** Concrete compressive strength of 17.2 MPa (2500 pounds per square inch) in 28 days.
3. See page 6 for grounding recommendations.

CAUTION: The foundation design shown does not represent an appropriate design for any specific locality. Soil conditions vary and may not meet design criteria given in Note 2. Consult a local professional engineer to determine your soil conditions and appropriate foundation.

ASSEMBLY AND INSTALLATION

Step 1

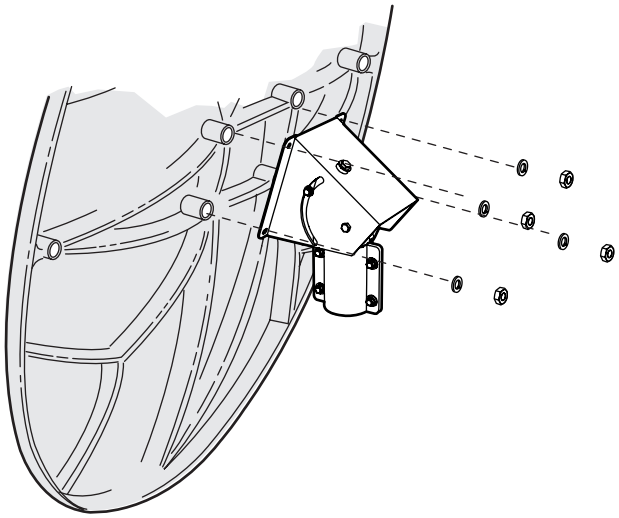
Insert M8 x 60 mm plow bolts through four holes of reflector. Note that bottom feed leg hole is located as shown. This hole should be closer to the sground surface.



Reflector should be positioned with bottom feed leg hole here.

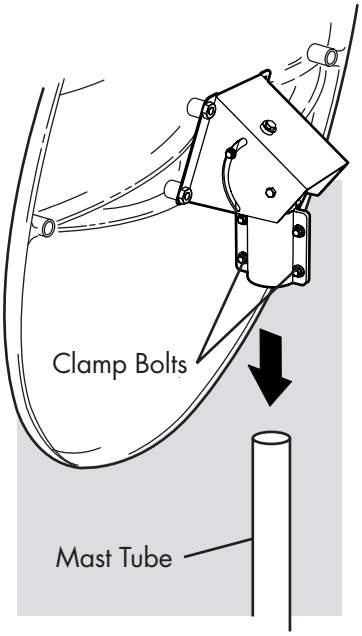
Step 2

Secure Az/El mount to reflector with four plow bolts, 5/16 lock washers and M8 hex nuts.



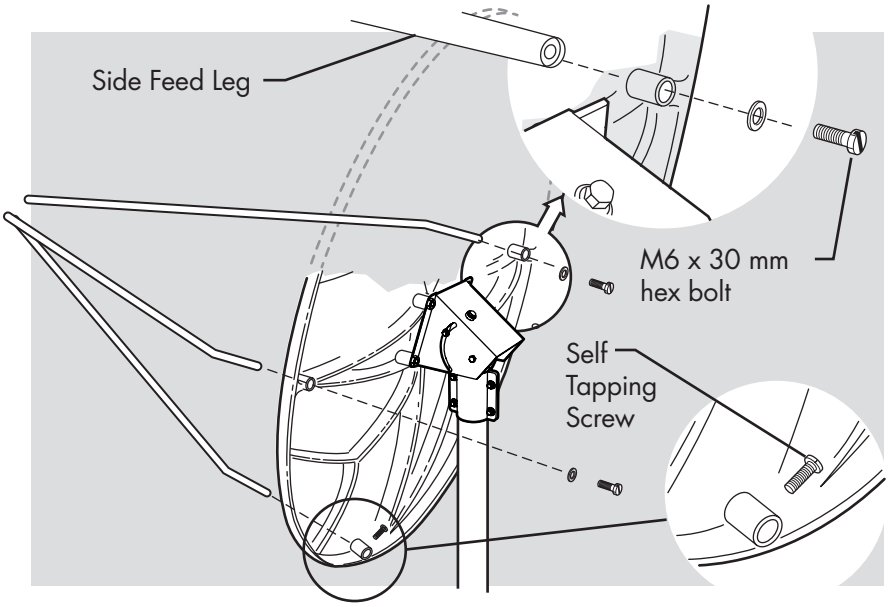
Step 3

Slide Az/El mount over mount mast tube and loosely fasten clamp bolts until final assembly is complete.



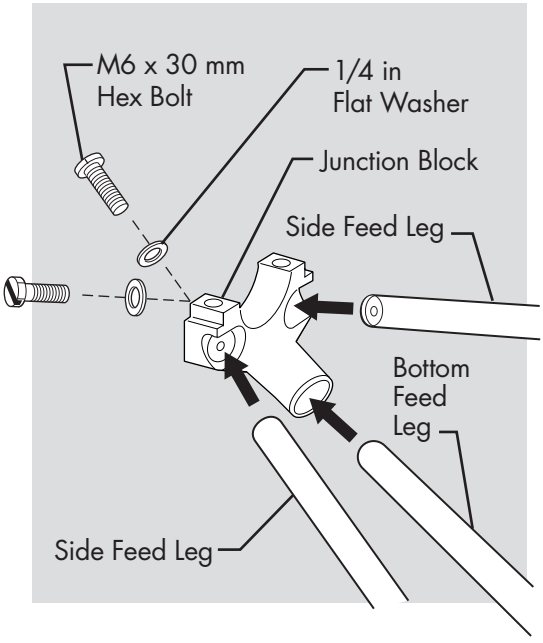
Step 4

Insert bottom feed leg into hole in bottom edge of antenna. Secure with self tapping screw but do not tighten. **NOTE:** *Bottom feed leg is the one with a slight bend on one end of leg, lance on opposite end, and is shorter than the two side legs.* Install side legs to antenna. From back side of antenna, secure with M6 x 30 mm hex bolts and 1/4 in special flat washer. Do not tighten.



Step 6

Insert bottom leg into hole on center of junction block until lance on leg is engaged. Insert opposite side leg into junction block and secure with M6 x 30 mm hex bolt and 1/4 in flat washer. Tighten and torque bolts securing side legs to junction block and antenna to 4 ft-lb (5.4 N-m). Tighten self tapping screw with bottom feed leg.

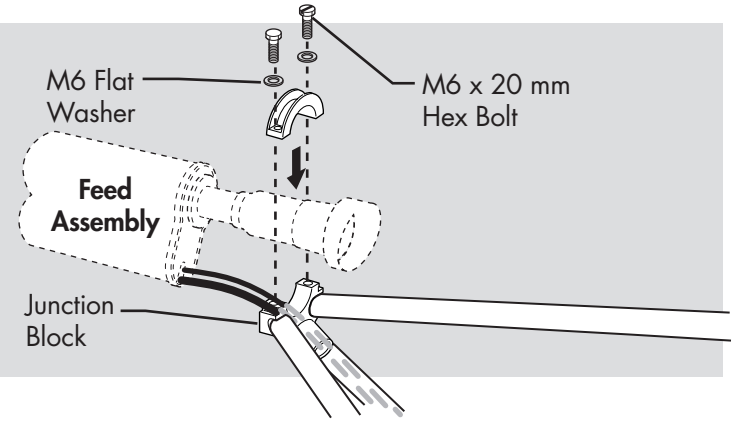


ASSEMBLY AND INSTALLATION

Step 7

See the instruction sheet accompanied with your feed assembly for more information regarding the assembly of the feed to the junction block. Attach feed assembly to junction block as shown with upper clamp and secure with two M6 x 20 mm hex bolts and M6 flat washers. Tigten hardware. Route grounding wire and coaxial cable through bottom feed leg as shown below.

Note: Your feed may not appear as shown. See your instruction sheet accompanying your feed for more information.



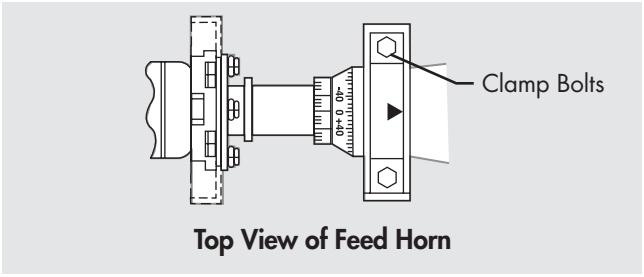
SATELLITE ALIGNMENT

Alignment with the satellite is obtained by setting polarization, elevation, and azimuth. Charts are provided in this manual to determine the values for your earth station antenna site. "ΔL" is the difference between the earth station antenna site longitude and the satellite longitude. Use "ΔL" and your earth station latitude to obtain polarization, elevation or azimuth setting.

Step 8 Set Polarity

Loosen feed horn M6 clamp bolts(and turn feed clockwise or counterclockwise, depending on being east or west of the satellite (as shown on polarization chart on page 7). Align marks on the horn clamp and appropriate mark on the horn scale clamp is installed with arrow pointed toward antenna as shown. Keep cable groove on header in the down position when adjusting polarization.

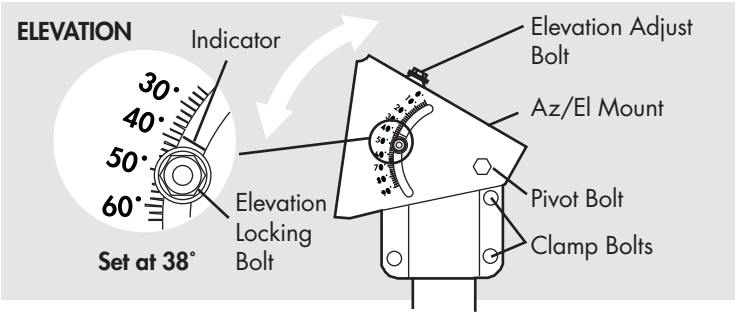
NOTE: *Single Polarity Feed is factory assembled for vertical polarity. If horizontal polarity is desired, rotate feed 90° (clockwise or counterclockwise).*



Top View of Feed Horn

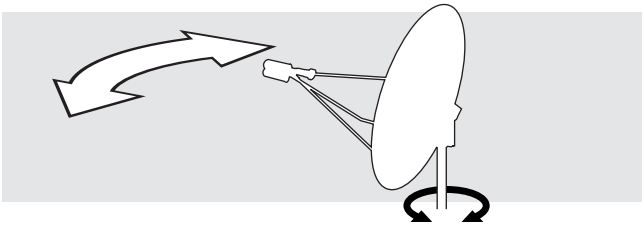
Step 9 Set Elevation

To obtain elevation value for your satellite, refer to elevation setting chart on page 8. Loosen bolts in curved slots of AZ/EL Housing 1/8 to1/4 a turn. Turn elevation adjustment bolt clockwise to decrease elevation and counter clockwise to increase elevation. Align the edge of clamp with appropriate mark at the desired elevation reading. **NOTE:** *Degree values shown on elevation scale are beam; that is when the antenna face isvertical mechanical elevation is 0°, while the beam Elevation (signal) is 22.6°.* This will be an approximate setting. Optimum setting achieved when fine tuning. Temporarily tighten elevation bracket nuts.



Step 10 Set Azimuth

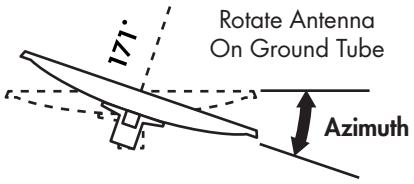
Use azimuth chart on page 9 and determine your azimuth setting. Values in chart must be adjusted for magnetic deviation for your location for correct compass reading. Rotate the antenna and mount, pointing it to the correct compass reading for your location and satellite. Slowly sweep the antenna in azimuth until a signal is found. If the desired signal is not found, increase or decrease elevation setting and repeat the azimuth sweep.



Step 11 Fine Tuning

Use Signal Tuning Device for final adjustments to obtain maximum antenna performance. Alternate between elevation and azimuth fine tuning to reach maximum signal strength, until no improvement can be detected. Azimuth is fine tuned by loosening the (4) carriage head bolts and swivel nut which allows adjusting the azimuth fine tune adjusting bolt for the peak signal. When fine tuning is complete, tighten and torque all az/el hardware to 16.3 N-m (12 ft-lb). Do not exceed 16.3 N-m (12 ft-lb). Torque Clamp Hardware to 24.4 N-m (18 ft-lb) in alternating sequence.

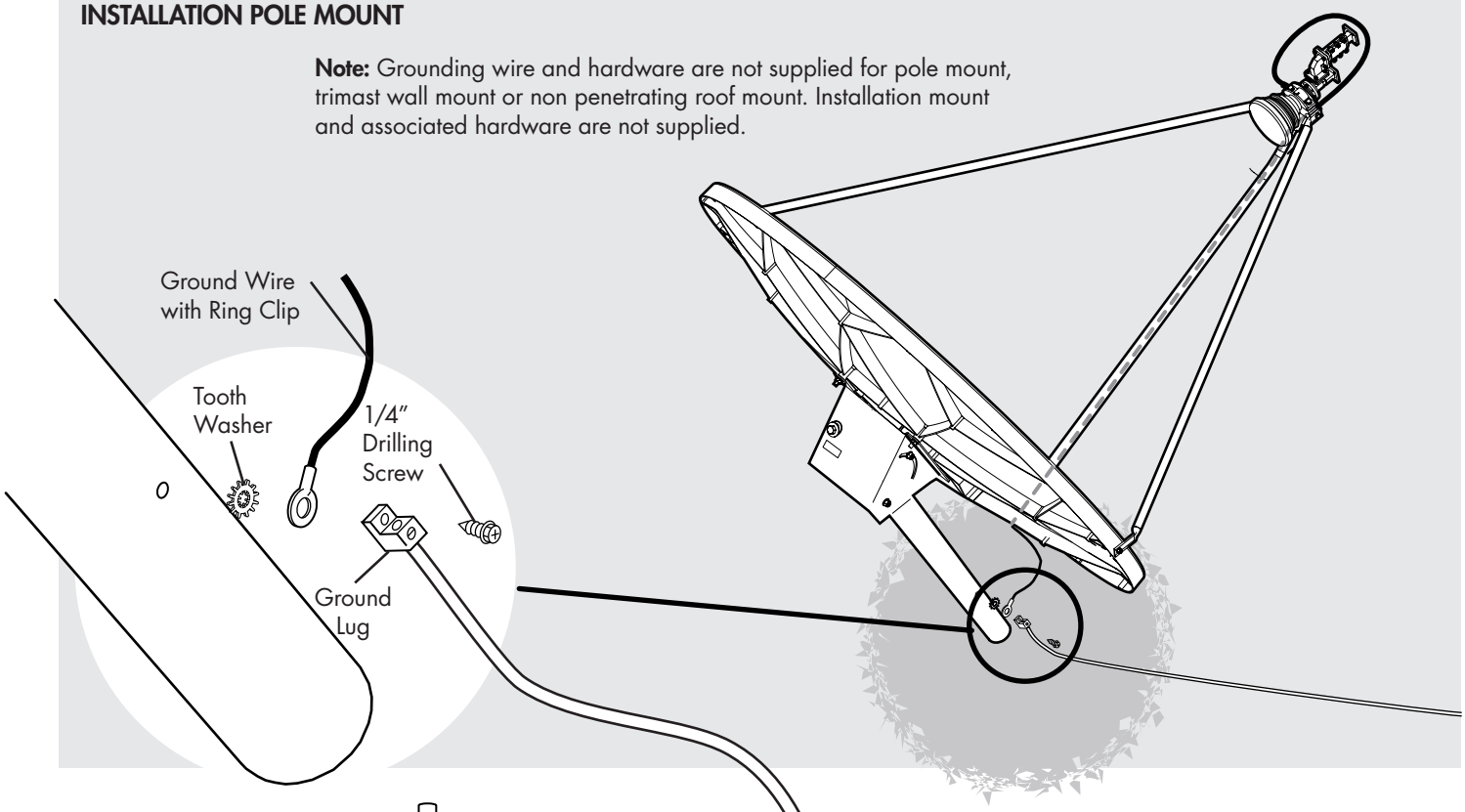
IMPORTANT: *Recheck and repeat torque on four clamp bolts, in alternating sequence, until all bolts are equally torqued to 18 ft-lb.*



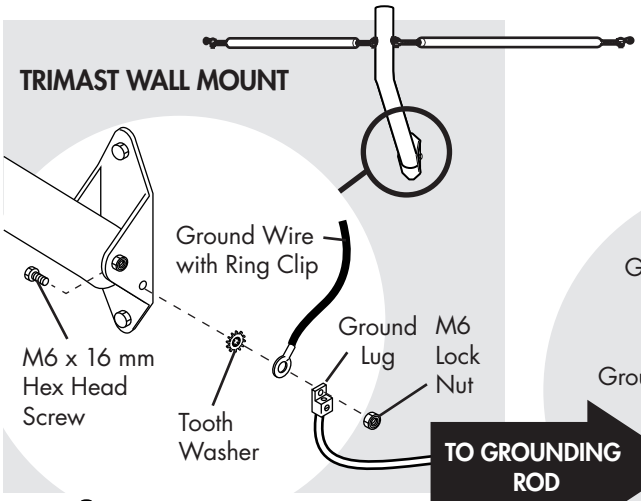
GROUNDING PROCEDURE

INSTALLATION POLE MOUNT

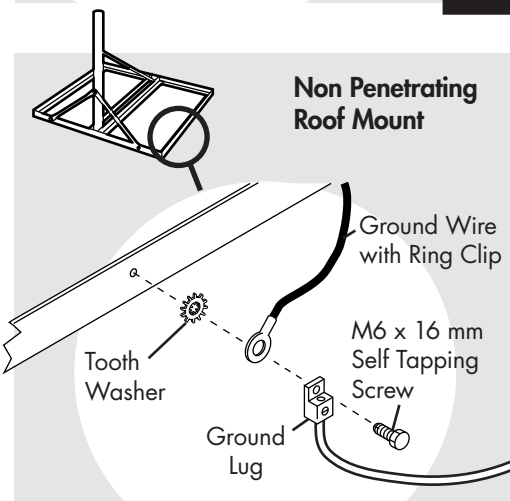
Note: Grounding wire and hardware are not supplied for pole mount, trimast wall mount or non penetrating roof mount. Installation mount and associated hardware are not supplied.

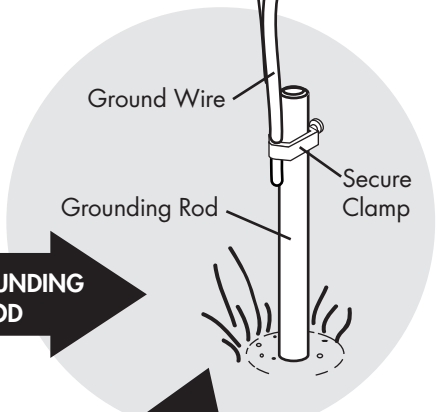


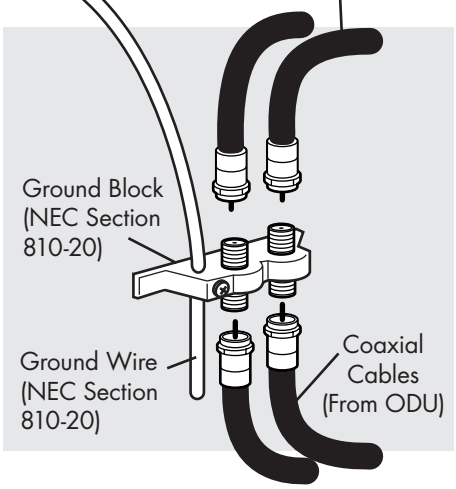
TRIMAST WALL MOUNT



Non Penetrating Roof Mount





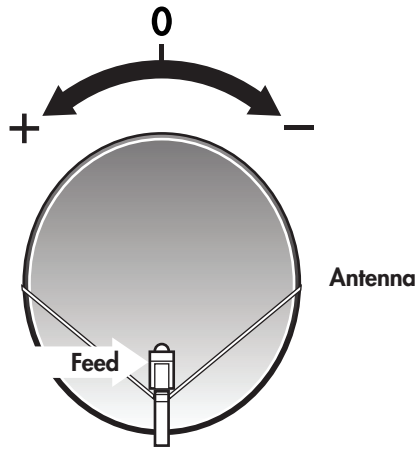


Note: *Ground wire, secure clamp, grounding rod, coaxial cables and ground block are not supplied.*

IMPORTANT: *All antenna sytems must be properly grounded. Refer to NEC (National Electric Code) Article 810, 820 and local building codes for specific requirements. Typical grounding methods are shown as examples. Tighten all hardware securely to assure good continuity.*

POLARIZATION CHART

Polarization Chart Sign Values (+ or -)	Northern Hemisphere	Southern Hemisphere
Antenna Site West of Satellite Longitude	-	+
Antenna Site East of Satellite Longitude	+	-



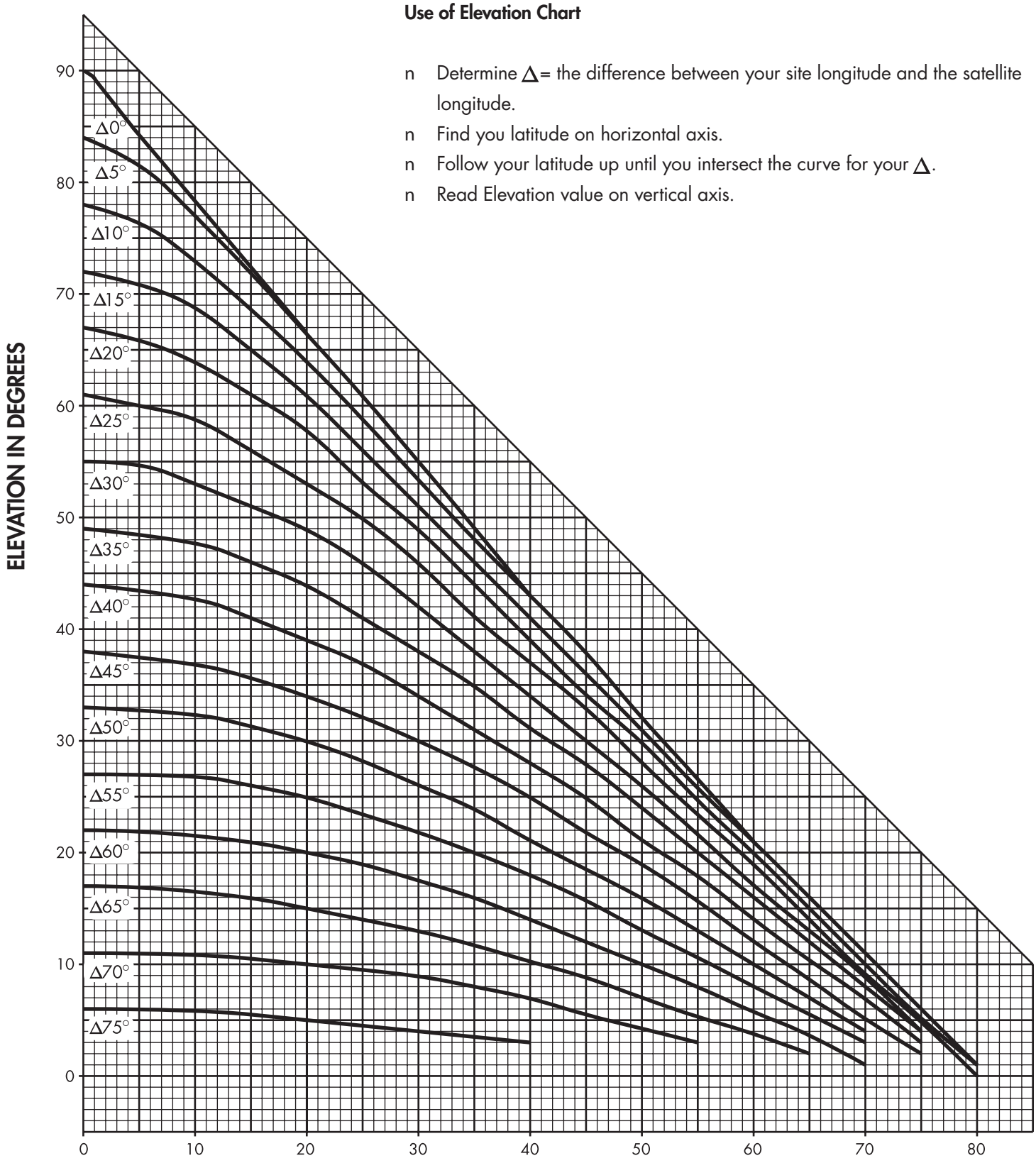
FEED ROTATION
(Facing Antenna)
For **+** Polarization Rotate Counter Clockwise
For **-** Polarization Rotate Clockwise

EARTH STATION LATITUDE IN DEGREES NORTH OR SOUTH OF EQUATOR

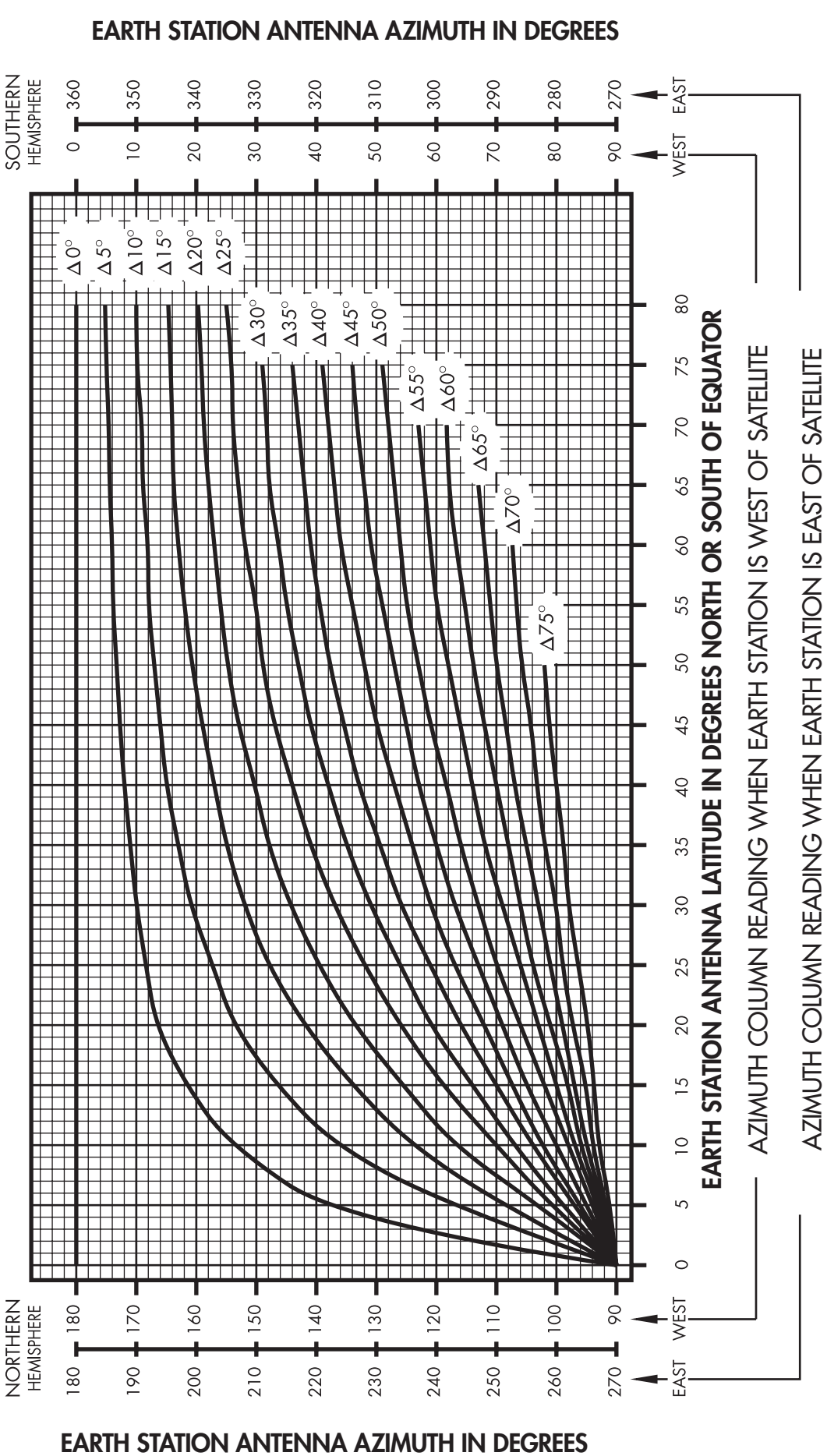
ELEVATION CHART

Use of Elevation Chart

- Determine Δ= the difference between your site longitude and the satellite longitude.
- Find you latitude on horizontal axis.
- Follow your latitude up until you intersect the curve for your Δ.
- Read Elevation value on vertical axis.



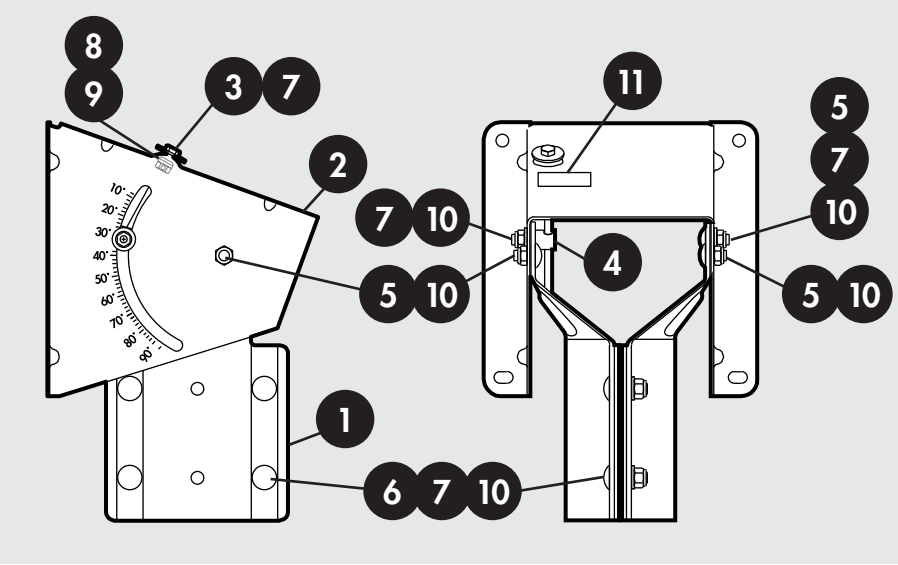
AZIMUTH CHART



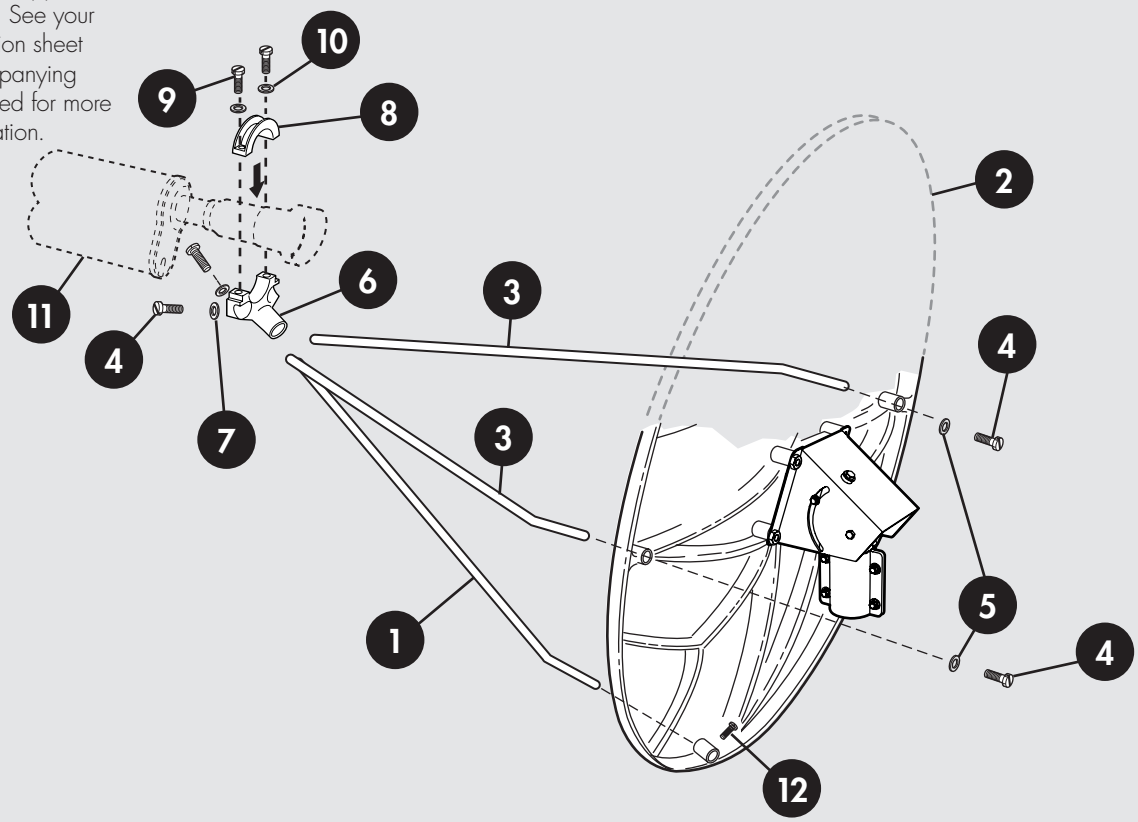
PARTS LIST

Az/El Cap Mount Parts List

ITEM	DESCRIPTION	QTY
1	2-7/8 in - 3 in Az/El Clamp Half	2
2	Az/El Cap Mount Housing	1
3	M8 x 130 mm Hex Head Bolt	1
4	Special M8 Swivel Nut	1
5	M8 x 20 mm Carriage Bolt	3
6	M8 x 30 mm Carriage Bolt	4
7	5/16 in Flat Washer	7
8	M8 Hex Nut	1
9	Spherical Delrin Washer	1
10	M8 Elastic Stop Nut (ESNA)	8
11	Elevation Adjustment Label	1



Note: Your feed may not appear as shown. See your instruction sheet accompanying your feed for more information.



ITEM	DESCRIPTION	QTY
1	Bottom Feed Leg	1
2	Reflector	1
3	Side Feed Leg	2
4	M6 x 30 mm Hex Bolt	4
5	4" x 7/8" Flat Washer	2
6	Junction Block	1

ITEM	DESCRIPTION	QTY
7	1/4" x 3/4" O.D. Flat Washer	2
8	Junction Block Clamp	1
9	M6 x 20 mm Hex Head Bolt	2
10	M6 x 1/2" O.D. Flat Washer	2
11	Feed Assembly	1
12	M6 Special Tapping Screw	1