Min 2 People
Ideal 3

Installation time
(average)

Max weight of
any part

TOWER FRAME HARDWARE LIST

- ☐ Side frames (3)
- ☐ Angled corner posts (3)
- ☐ Adjustable leg extensions (3)
- ☐ Tower feet (3 small and 3 large))
- ☐ Anchoring screws (3)
- ☐ Mast sections (3 - lower, middle and upper)
- ☐ Wind Sensor Mount (1)
- ☐ Spreader posts (3) with guy wires (1 set of three components)
- ☐ Installation hardware

Ensure kit contains all of these components before proceeding.

REQUIRED TOOLS

- ☐ 7/16" deep socket wrench
- ☐ 1" socket with 3/8" driver
- ☐ Socket/Combination wrenches
  - 7/16"
  - 9/16"
  - 11/16"
- ☐ 5/16" nut driver
- ☐ Flathead screwdrivers
- ☐ Pliers
- ☐ Vice grips
- ☐ Medium adjustable wrench
- ☐ Side cutters
- ☐ Lithium grease
- ☐ Spirit level
- ☐ Sledgehammer
- ☐ Tri-leg Winch
- ☐ Compass

Ensure you know the DECLINATION for the site.

SITE SELECTION

- The site should be relatively flat and large enough to accommodate the tower's footprint and the mast when lowered.
- The ground should be class B soil to ensure proper anchoring of the assembly.
- There should be at least 4 feet of clear space around the tower base and the fully lowered mast for optimal working conditions bearing in mind the mast and its lowering zone are oriented towards true north (south in the southern hemisphere).
- There should be no features which could obstruct any signals, cast shade on the solar panel, or interfere with the mast (such as tree canopy).

IMPORTANT SAFETY INFORMATION

- **Only wind sensors (max weight 7 lbs/ 3 kg) should be mounted on mast.**
- **Tri-leg tower is designed to be anchored in compacted Class B (US OSHA standard) soil with a minimum depth of 20 inches (51 cm).**
- **When properly assembled and anchored, the tri-leg tower is rated to sustain maximum wind speeds of 100 mph (161 kph).**
- **Ensure area is clear of overhead power or other lines which may interfere with raising/lowering the mast.**
- **Close proximity to high voltage power lines can generate an induced electrical field on the tower components, creating an electrical shock hazard if tower not properly grounded.**
- **Ensure there are no underground pipes or cables before inserting the tri-leg anchors or grounding rods.**
- **Ensure the distance between the tower and the treelines is sufficient for the intended application of the tower. Consider projected tree growth.**

TOWER SET UP AREA DIMENSIONS (MAST IN LOWERED POSITION)

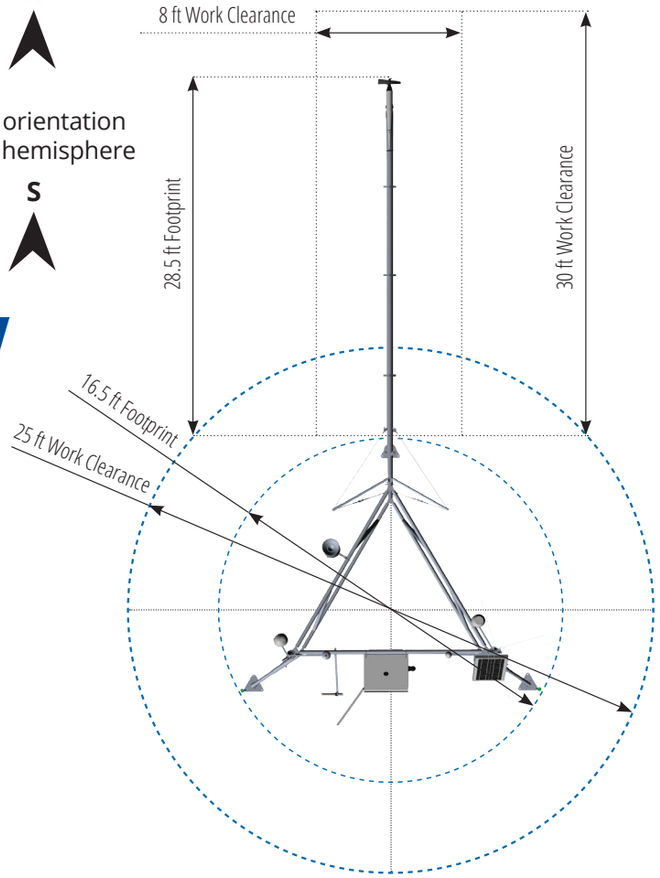
IMPORTANT! One leg and mast MUST be oriented along a line of bearing running from true north to south (taking declination of site into account). The leg and mast MUST point to the nearest geographical pole.

Mast orientation north hemisphere

N

Mast orientation south hemisphere

S



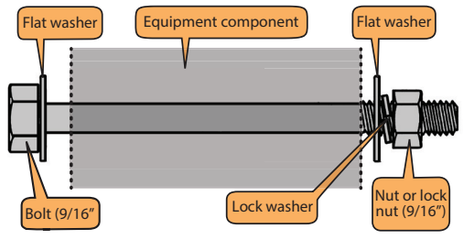
CONVERSION CHART

FEET	METRES
3.2	1
4	1.2
6	1.8
8	2.4
10	3
16.5	5
20	6
25	7.6
26.5	8
30	9.1
33	10
51	15.5

OPTIONAL FENCE SETUP

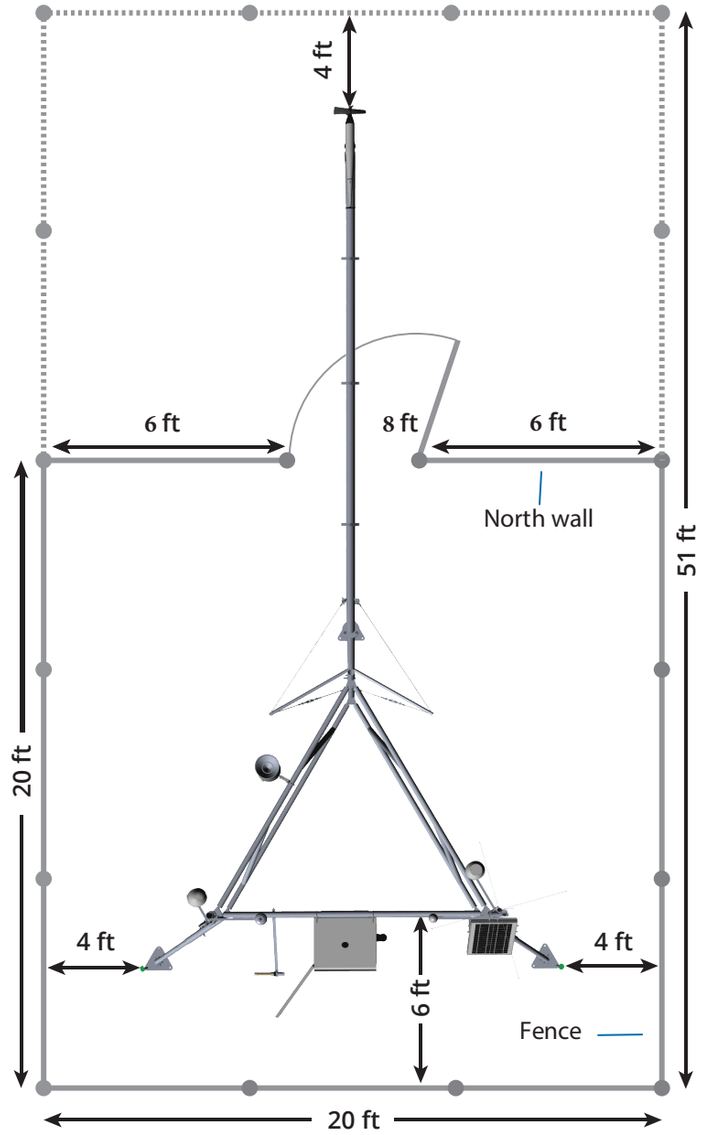
- Minimum 4 feet distance should be maintained between all tower legs and fence for optimal set up and working conditions.
- For sites with smaller sized fencing, the gate must be set up directly in front of tower mast and open when lowering the mast.
- Dotted lines show dimensions for larger site fencing which permits mast being lowered within the fenced area.

BOLT INSTALLATION:



SECURING TOWER FEET

The method to secure the tower feet is dependent on the type of terrain. Ideally, the tower is designed to be secured in Class 2 soil using the supplied anchors. However, rocky terrain may require specialized equipment and hardware to permit anchoring the feet to rock.



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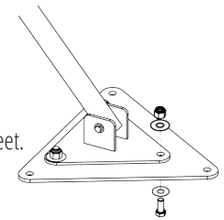
1 LEG ASSEMBLY

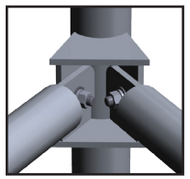


- Slide leg inserts into corner posts to max depth
- Secure with 3 ½ " bolts
- Align holes on small feet with bolt holes on large feet. Ensure large bore on feet will point out.
- Bolt together as shown
- Align leg insert into the foot bracket and secure with 3 ½ " bolts

2 SIDE FRAME ASSEMBLY

- Assemble side frames and corner post brackets on ground as show and secure with 1 ½ " bolts

3 Lift and bolt side frames together.



4 Use the compass to adjust base so one leg points to true north (south in the southern hemisphere).

IMPORTANT! Adjust compass reading for the site's declination.

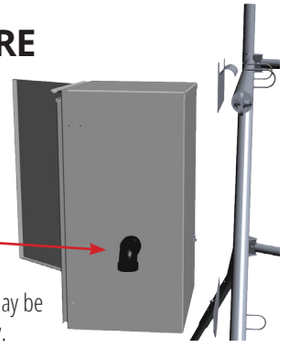
5 Use the level to check tower for horizontal and vertical balance. Adjust legs as necessary.

6 KEYWAY ENCLOSURE

Install mounting brackets on enclosure using 4 installation nuts and bolts provided. Mount enclosure on center frame panel opposite the mast using 3" U-bolts.

Mount cable gland (plastic elbow) to cutout hole as shown.

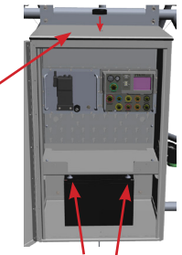
NOTE: For high wind areas, the keyway enclosure may be mounted inside the tri-leg frame to increase stability.



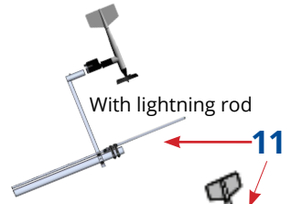
7 BATTERY & GPS ANTENNA

Mount GPS antenna, ensuring it is flat and lock nut is secure.

Install battery. If two batteries, couple together with supplied coupling cable and insert lengthwise.

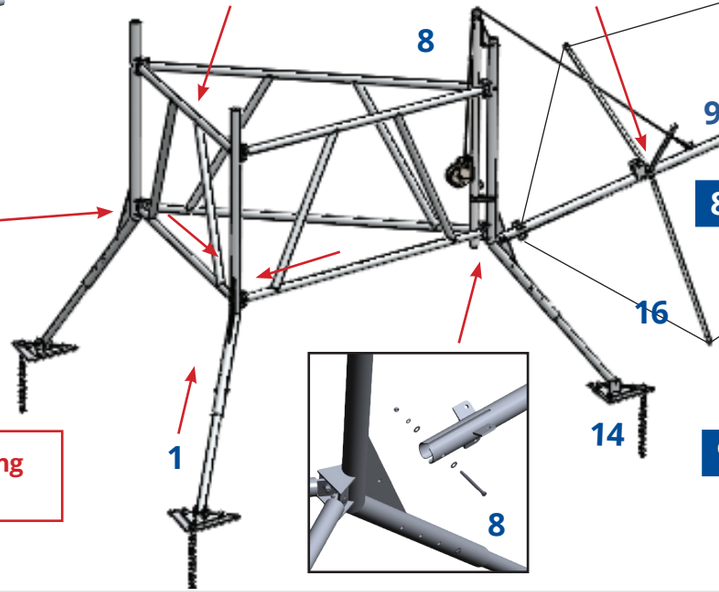


Battery terminals at front



Mount enclosure here

U-bracket faces up

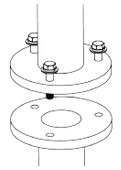


8 Attach Tri-leg winch. Slide bottom mast cut out over angled gusset plate of north facing leg. Ensure U-shaped bracket on mast is pointing up. Align bolt holes and pin with 3 ½ " bolt and lock nut. DO NOT over tighten.

9 Shackle the winch cable to the mast's shackle point. Lower mast to a horizontal plane and allow the weight of mast to be taken by the cable.

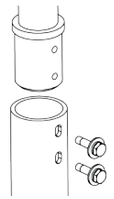
10 In turn, bolt on the middle and top sections of the mast. Ensure the guy wire eyelets on all sections align. Insert bolts as shown and secure with lock nuts.

HINT:Adjust the mast angle so the top of the mast sections can rest on the ground to assist in connection.



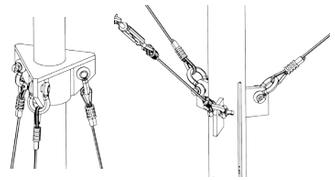
11 **NOTE:** If installing optional lightning rod kit follow kit instructions for step 11.

Insert the wind sensor mount and mount the wind sensor on top of the mast in accordance with its instructions. Secure its cable along the mast looping over mast unions to prevent chaffing.



12 Slide spreader posts over lugs on bottom mast. Adjust mast angle to provide ground clearance for the bottom bar.

13 Shackle guy wires to eyelets on top mast. Insert the caps into the spreader posts and shackle the guy wires to the bottom eyelets.
DO NOT tighten the guy wires yet.

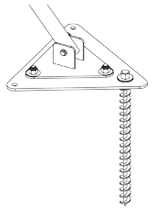


NOTE: Mouse all guy wire shackles using lockwires

IMPORTANT! DO NOT raise the mast without the guy lines in place.

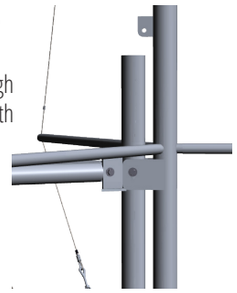
14 ANCHOR TOWER

Use winch to raise mast. Confirm wind sensor and mast are oriented correctly. Insert the anchor screws into the large bores in the feet and fully screw into the ground using the 1" socket and driver.



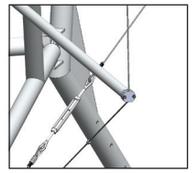
15 SECURE MAST

Grease 4" pinning bolt and insert through the U-bracket and post holes. Secure with locking nut. Remove winch.



16 ADJUST GUY LINES

Use the turnbuckles to evenly tighten the guy wires. Bring the spreader posts 90° to the mast (use level) and secure by tightening the hex bolts on the spreader bar cap.



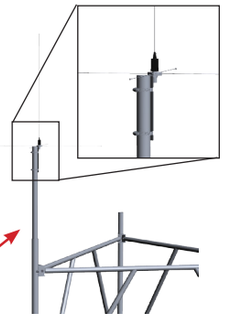
17 SENSOR CONNECTIONS

- All sensors should be mounted relative to the mast as indicated in the diagram
- Apply lithium grease to all sensor connection threads
- Place loop in cables from mast to prevent strain when lowering the mast
- Secure cables underneath the frame to prevent damage if personnel climb frame
- Sensor cables should be secured to the tower frame with cable ties

18 RVT ANTENNA (OPTIONAL)

Attach RVT antenna to 7' long post mount using hose clamps as shown. Connect cable to RVT antenna, and using a plastic tie secure cable to post at a point approximately 16" below antenna.

Insert post mount into leg post, align bolt holes, and fasten with 31/2" bolt.

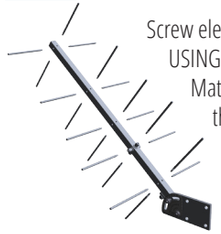


19A EON2 ANTENNA

Install EON antenna mount onto the tower leg and tighten with U-bolts.

Optional aiming mount available for locations outlined in Technical Bulletin 700-AN-128 on the FTS support website)

19B YAGI ANTENNA

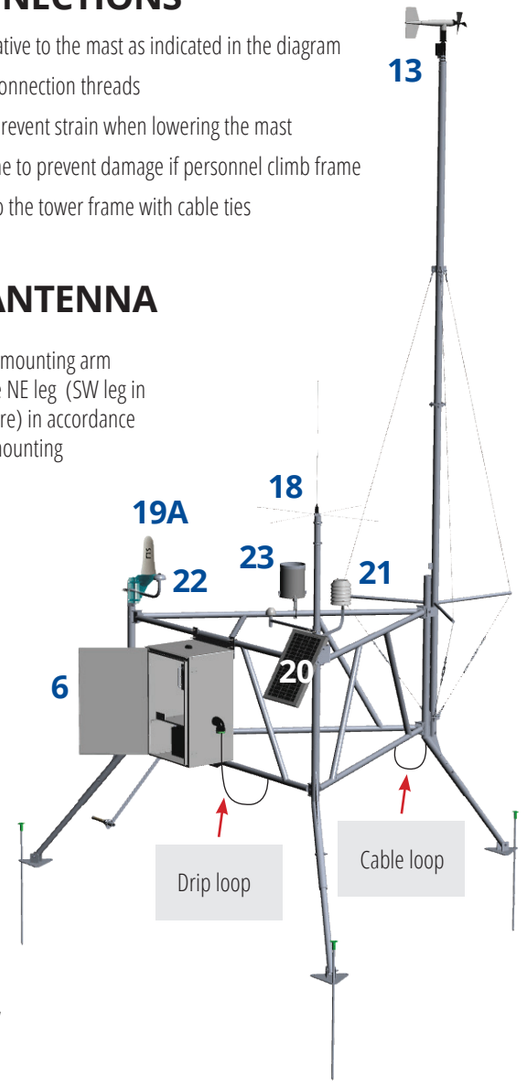


Screw elements into antenna body USING ONLY FINGER STRENGTH. Match the number of rings at the base of each element with the number of stamps at each position on the boom (5 sets, 0-4).

Mount antenna base on tower leg pointing away from mast. Point skywards aprx. 40°. Do not fully tighten clamps/bolt yet.

19C UBICOM ANTENNA

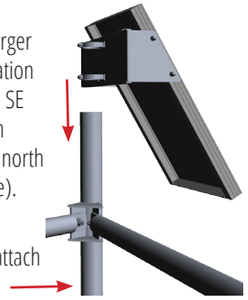
Mount the Ubicom mounting arm and antenna on the NE leg (SW leg in northern hemisphere) in accordance with its enclosed mounting directions.



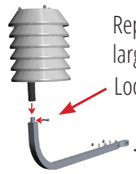
20 SOLAR PANEL

Replace the solar panel hose clamps with the larger clamps from the installation kit. Mount panel on the SE corner post facing south (NW corner post facing north in southern hemisphere).

If the RVT antenna is mounted on this post, attach the solar panel here.



21 TEMPERATURE/ HUMIDITY SENSOR



Replace support arm U-bolt with larger size from Tri-leg installation kit.

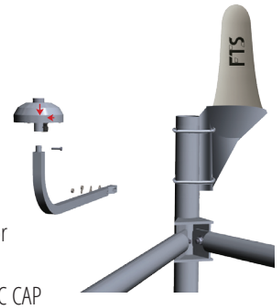
Locking screw

Mount temperature/ humidity sensor arm to corner post as shown, and level with spirit level. Apply grease to locking screw, and fasten temperature/ humidity sensor to arm.

22 SOLAR RADIATION SENSOR

Install support arm to corner, level with spirit level, and set it to point towards the solar panel. Apply grease to locking screw, and fasten solar radiation sensor to arm.

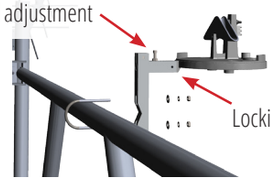
REMOVE RED PLASTIC CAP FROM SENSOR.



23 RAIN GAUGE MOUNTING

Mount bracket and rain gauge as indicated. Tighten U-bolt, loosely tighten locking screw.

Vertical adjustment



Locking screw

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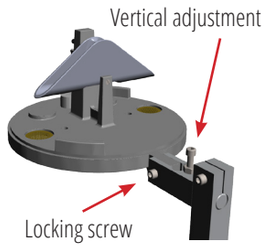
24 RAIN GAUGE SET-UP

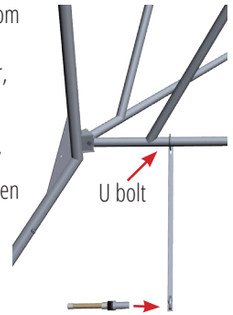
Remove barrel. Inside, remove rubber band from tipper. Set vertical alignment as close as possible using vertical adjustment screw. Adjust base plate in a horizontal plane using bubble level, and tighten locking screw.



Fine tune horizontal and vertical alignment by adjusting screws until bubble moves to center ring in level. Replace barrel onto base, and close spring latches.

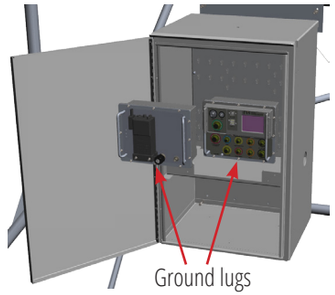
25 FUEL STICK SENSOR (optional)

Install support arm to bottom rail of south-facing frame as indicated. Mount sensor, positioning hose clamp around aluminum stock of sensor. Position sensor 12" above "fuel bed", and tighten U-bolt.



26 AXIOM DATALOGGER

Mount F6 datalogger (and optional RVT radio on left) to back panel as indicated. Connect green wires to both ground lugs.



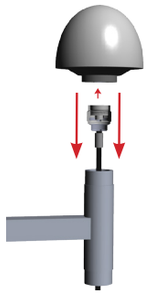
27 SENSOR CONNECTIONS

Plug in cables to their respective components, and lay cables neatly along tower structure using cable ties. Ensure cables routed to cable gland on right side of keyway enclosure with several feet to spare. Pull cables through gland (largest connectors first).

Coil excess cable inside keyway and place on the shelf. Tie outside portion of cables together creating a curved harness, providing a good rain drip, and install supplied foam seal into bottom of gland.

28 ICE RATED GPS ANTENNA (optional)

Mount support arm to any tower leg (except the mast leg), free and clear of other components. Pull coaxial cable through antenna holder and thread onto antenna. Gently rotate antenna onto holder until fully threaded. Pull other end of cable through cable gland.



29 INSTALL CABLES & SECURE TOWER

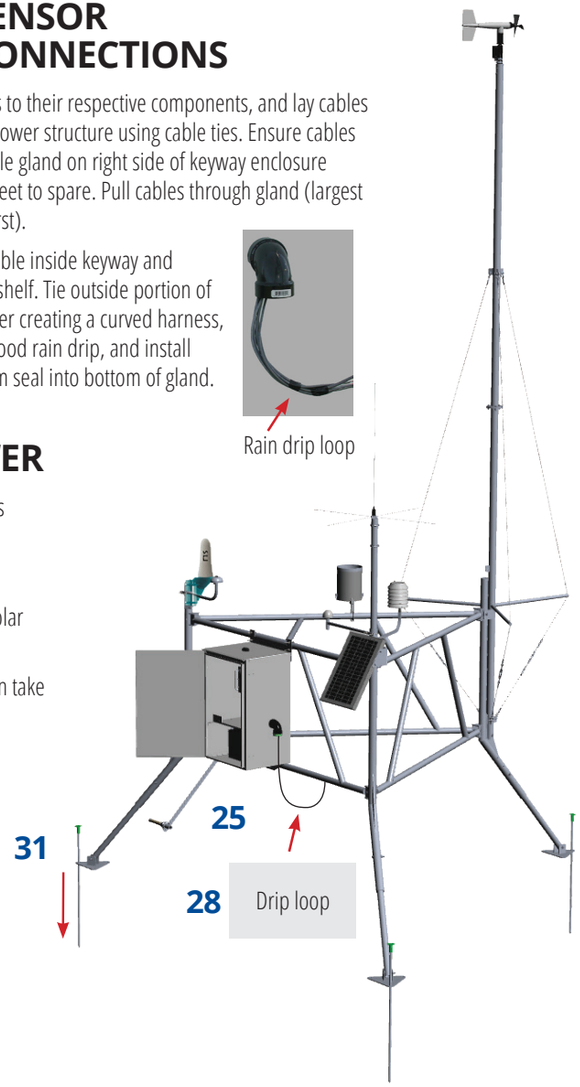
Ensure all cables are plugged into sensors and laid out as indicated in step 17. Plug them into the Axiom in the order listed.

Order of cables:
1. Antennas
2. Sensors

IMPORTANT! Power connections MUST be made in the correct order. Failure to do so can result in damage to the power system.

30 CONNECT POWER

- Ensure that you have at least 20 minutes before the scheduled transmit time
- Plug in the battery cable first
- Wait 30 seconds and then plug in the solar panel cable
- Wait for the Axiom to have a GPS fix (can take up to 20 minutes)



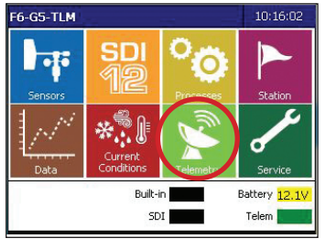
31 GROUND TOWER

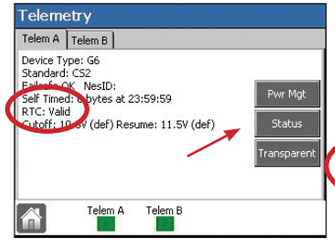
While waiting for the GPS fix, hammer in a grounding rod in each foot. Connect 8 AWG copper wire to ground lug at rear of enclosure to the nearest ground rod.

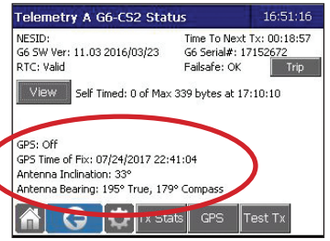
An optional FTS Grounding Kit is available.

32 ADJUST YAGI/EON* ANTENNAS

Wait for a GPS fix (indicated when RTC:Valid is displayed on the Datalogger's Telemetry screen). Then select Status. Note the antenna inclination and bearing.







Adjust the YAGI antenna to the bearing and inclination.

*An EON antenna only needs to be aimed for locations outlined in the Technical Bulletin 700-AN-128 found on the FTS Support website.