

# Sea Tel Tracker 6000 800W Satellite Antenna Installation Manual



## EAR Controlled - ECCN EAR99

This technical data is subject to US Government export control in accordance with the Export Administration Regulations. Export of this data to any foreign country, or disclosure of this data to a Non-US person, may be a violation of Federal law.

Sea Tel, Inc.  
(trading as Cobham SATCOM)  
4030 Nelson Avenue  
Concord, CA 94520  
Tel: +1 (925) 798-7979  
Fax: +1 (925) 798-7986

**Sea Tel**  
COBHAM

**Web:** <http://www.cobham.com/satcom>

Thrane & Thrane A/S  
(trading as Cobham SATCOM)  
Lundtoftegaardsvej 93 D, 2800 Kgs.  
Lyngby, Denmark  
Tel: +45 3955 8800  
Fax: +45 3955 8888

**Email:** [satcom.ohc@cobham.com](mailto:satcom.ohc@cobham.com)



Sea Tel Tracker Stabilized Antenna systems are assembled in the United States of America.



These commodities, technology or software were exported from the United States in accordance with the Export Administration Regulations. Diversion contrary to U.S. law is prohibited.



Sea Tel is an ISO 9001:2015 registered company.  
Certificate Number 13690 originally issued March 14, 2011  
and was renewed/reissued on March 9, 2023

#### Copyright Notice

**Copyright © 2021 Sea Tel Inc. All Rights Reserved.** The information contained in this document is proprietary to Sea Tel, Inc.. This document may not be reproduced or distributed in any form without prior written consent of Sea Tel, Inc. The information in this document is subject to change without notice. Sea Tel Inc, is also doing business as Cobham SATCOM – Maritime.

#### Revision History

REV	DCO#	Date	Description	By
A		March 24, 2021	Production Release	MDN
B		August 25, 2023	Update all text, graphics and drawings.	MDN



**This Page Intentionally Left Blank**

1. SAFETY .....	1-1
2. SITE SURVEY – LAND BASED .....	2-1
2.1. SITE SELECTION .....	2-1
2.2. ANTENNA SHADOWING (BLOCKAGE) AND RF INTERFERENCE .....	2-1
2.2.1. <i>Mounting Foundation Mounting on a Concrete Pad</i> .....	2-2
2.3. INDOOR EQUIPMENT LOCATION .....	2-2
2.4. CABLES .....	2-2
2.5. GROUNDING .....	2-2
3. INSTALLATION .....	3-1
3.1. GENERAL CAUTIONS & WARNINGS .....	3-1
3.2. PREPARATION .....	3-1
3.3. PREPARING LOCATION FOR THE OUT DOOR UNIT (ODU) .....	3-2
3.3.1. <i>Lay Out ODU Mounting Holes</i> .....	3-2
3.3.2. <i>Open General Assembly Crate</i> .....	3-2
3.3.3. <i>Mount the Base section of the Pedestal</i> .....	3-3
3.3.4. <i>Open Radome Crates (2)</i> .....	3-3
3.3.5. <i>Assembling the Bottom Layer of the Radome</i> .....	3-4
3.3.6. <i>Assembling the Top Layer of the Radome</i> .....	3-5
3.3.7. <i>Assembling the Third Layer of the Radome</i> .....	3-6
3.3.8. <i>Assembling the Fourth Layer of the Radome</i> .....	3-7
3.4. ASSEMBLING THE PEDESTAL .....	3-7
3.5. ASSEMBLING THE REFLECTOR .....	3-8
3.6. INSTALLING THE REFLECTOR .....	3-9
3.7. CLOSING THE RADOME .....	3-11
3.8. FINAL CHECKS .....	3-11
4. MAINTENANCE .....	4-1
4.1. SAFETY .....	4-1
4.2. WARRANTY INFORMATION .....	4-1
4.3. TORQUE AND LOCTITE SPECIFICATIONS .....	4-2
4.4. BALANCING THE ANTENNA .....	4-2
5. TRACKER 6000 DRAWINGS .....	5-1
5.1. MODEL SPECIFIC DRAWINGS .....	5-1

**This Page Intentionally Left Blank**

## 1. Safety

---

The following general safety precautions must be observed during all phases of operation, service and repair of this equipment. Failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards of design, manufacture and intended use of the equipment. Sea Tel Inc (dba Cobham SATCOM) assumes no liability for the customer's failure to comply with these requirements.

### Service

Access to the interior of the Out Door Unit (ODU), is allowed for inspection of components by a technician/engineer. Maintenance of the ODU should only be performed by technicians/engineers who are authorized by Cobham SATCOM. Only authorized Partners who have received factory training on this equipment will be able to file a claim for warranty reimbursement. Failure to comply with standard practices, which include but are not limited to modification of the terminal away from factory documented assemblies may also void the warranty period.

### Do not service or adjust alone

Do not attempt internal service or adjustments unless another person, capable of rendering first aid resuscitation, is present.

### Personal Protection Equipment (PPE):

Hard hat, safety glasses and steel toe work boots are required.

To avoid injuries, it is important to be aware of the risks present when handling and testing an antenna from inside the dome. There is a risk of the antenna injuring the operator, as the antenna moves, so the operator must be aware of the position of the antenna at all times while inside the radome.

### Grounding, cables and connections

To minimize shock hazard and to protect against lightning, the equipment chassis and cabinet must be connected to an electrical ground. The ODU equipment must be grounded to a known good earth ground. For further grounding information refer to the Installation chapter of this manual.

Do not extend the cables beyond the lengths specified for the equipment. The cables between the ODU and the Baseband Equipment Rack must comply with the specified data concerning cable losses etc.

### Power supply

AC Power to the ADE is provided by a separate, breaker, power source.

### Do not operate in an explosive atmosphere

Do not operate the equipment in the presence of flammable gases or fumes. Operation of any electrical equipment in such an environment constitutes a definite safety hazard.

### Keep away from live circuits

Operating personnel must not remove equipment covers. Component replacement and internal adjustment must be made by qualified maintenance personnel. Do not replace components with the power cable connected. Under certain conditions, dangerous voltages may exist even with the power cable removed. To avoid injuries, always disconnect power and discharge circuits before touching them.

### SAFETY: INTERNAL BATTERY

The main PCB inside the ICU contains a lithium battery. These batteries should last for many years but if replacement is required, use caution. These batteries are only to be replaced by a technician authorized by Cobham SATCOM to perform such service.



**CAUTION - RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE.  
DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS.**

**Failure to comply with the rules above will void the warranty!**

**This Page Intentionally Left Blank**

## **2. Site Survey – Land Based**

There are three objectives of the site survey. The first is to find the best place to mount the antenna [Outdoor Unit (ODU)] and the Indoor Unit (IDU). The second is to identify the length and routing of the cables and any other items or materials that are required to install the system. The third is to identify any other issues that must be resolved before or during the installation.

### ***2.1. Site Selection***

The radome assembly should be installed on a shore based concrete pad, where:

- The antenna has a clear line-of-sight to view as much of the sky (horizon to zenith at all bearings) as is practical.
- S-Band (10cm) Radars - The ODU should be mounted more than 4 meters/12 feet from an S-band Radar.
- The ODU should not be mounted on the same plane as the radar, so that it is not directly in the radar beam path.
- The ODU should be mounted more than 2.5 meters/8 feet from any high power MF/HF antennas (<400W).
- The ODU should be mounted more than 4 meters/12 feet from any high power MF/HF antennas (1000W).
- The ODU should also be mounted more than 4 meters/12 feet from any short range (VHF/UHF) antennae.
- The ODU should be mounted more than 2.5 meters/8 feet away from any L-band satellite antenna.
- The ODU should be mounted more than 3 meters/10 feet away from any magnetic compass installations.
- The ODU should be mounted more than 2.5 meters/8 feet away from any GPS receiver antennae.
- Another consideration for any satellite antenna mounting is multi-path signals (reflection of the satellite signal off of nearby surfaces arriving out of phase with the direct signal from the satellite) to the antenna.
- The ODU and the IDU should be positioned as close to one another as possible. This is necessary to reduce the losses associated with long cable runs.
- The mounting location far enough away from surrounding buildings, towers, cranes or other structures will also cause significant degradation of the signal when in direct line-of-sight between the antenna and the LEO satellite it is tracking.

If these conditions cannot be entirely satisfied, the site selection will inevitably be a "best" compromise between the various considerations.

### ***2.2. Antenna Shadowing (Blockage) and RF Interference***

At the transmission frequencies of this satellite antenna system, any substantial structures in the way of the beam path will cause significant degradation of the signal. Care should be taken to locate the ODU so that it has direct line-of-sight with the satellite without any structures in the beam path through the full 360 degrees of ships turn, or 360 degrees around the antenna. Wire rope stays, lifelines, small diameter handrails and other accessories may pass through the beam path in limited numbers; however, even these relatively insignificant shadows can produce measurable signal loss at these frequencies.

Surrounding buildings, towers, cranes or other structures will also cause significant degradation of the signal when in direct line-of-sight between the antenna and the LEO satellite it is tracking.

### **2.2.1. Mounting Foundation Mounting on a Concrete Pad**

When installing the antenna on a concrete pad in a land based configuration, care should be taken to locate the ODU away from surrounding buildings, towers, cranes or other structures that will cause significant degradation of the signal when in direct line-of-sight between the antenna and the LEO satellite it is tracking.

The ODU should be mounted on a contractor grade concrete pad with multiple attachment points around the perimeter of the base frame to mount the ODU (refer to the Installation Arrangement drawing for more information). The installation must allow access through a door in one of the side panels.

### ***2.3. Indoor Equipment Location***

Tall Indoor Equipment units that are standard 19" rack mount design should be installed in one of these racks. Plan to allow access to the rear of the equipment in the rack.

The Satellite Receiver, router, computers and any other associated equipment should be properly mounted per their design.

### ***2.4. Cables***

During the site survey, walk the path where the cables will be installed. Pay particular attention to how cables will be installed; such as what obstacles they will be routed around, difficulties that will be encountered and the overall length of the cables. The ODU should be installed using good electrical practice. Sea Tel recommends referring to IEC 60092-352 for specific guidance in choosing cables and installing cables onboard a ship. Within these guidelines, Sea Tel will provide some very general information regarding the electrical installation.

In general, all cable shall be protected from chaffing and secured to a cableway. Cable runs on open ground or in the pad shall be in conduit suitable for terrestrial use. The conduit shall be blown through with dry air prior to passing cable to ensure all debris has been cleared out of the conduit and again after passing the cable to ensure no trapped moisture exists. The ends of the conduit shall be sealed with cable glands (preferred), mastic or low VOC silicon sealant after the cables have been passed through.

Cables passing through bulkheads or decks shall be routed through approved weather tight glands.

### ***2.5. Grounding***

Refer to the Installation chapter for grounding/bonding information.

### 3. Installation

This section contains instructions for unpacking, final assembly and installation of the equipment. *It is highly recommended that final assembly and installation of the Antenna system be performed by trained technicians.* Read this complete chapter before starting.

#### 3.1. General Cautions & Warnings

	<b>WARNING:</b> Assure that all nut and bolt assemblies are tightened according to the tightening torque values listed below:			
	SAE Bolt Size	Inch Pounds	Metric Bolt Size	Kg-cm
	1/4-20	75	M6	75.3
	5/16-18	132	M8	150
	3/8-16	236	M10	270
	<b>NOTE:</b> All nuts and bolts should be assembled using the appropriate Loctite thread-locker product number for the thread size of the hardware.			
	Loctite #	Description		
	222	Low strength for small fasteners.		
	242	Medium strength		
	638	High strength for Motor Shafts & Sprockets.		
	2760	Permanent strength for up to 1" diameter fasteners.		
<b>WARNING:</b> Hoisting the sections of the radome with other than a webbed four-part sling may result in catastrophic crushing of the radome.	290	Wicking, High strength for fasteners which are already assembled.		
	<b>CAUTION:</b> The sections of the radome are very light for their size and are subject to large swaying motions if hoisted under windy conditions. Always ensure that tag lines, attached to the base of the radome sections, are attended while the assembly is being hoisted to its assigned location.			

#### 3.2. Preparation

Read this entire assembly procedure **before** beginning.

Refer to the System Block diagram, Antenna Schematic, General & and lower level Assembly drawings, Radome Hole Pattern layout, All Radome Assembly & Installation drawings for your system.

We recommend that you place the crates in the area that you have chosen to assemble each of these major components. It is recommended that you do not unpack the crates until you are ready to sub-assemble and install the equipment.

Assure that you have a large, flat, level, open area to sub-assemble the general assembly and the upper & lower sections of the radome. This area should be clean and free of debris. The site should also provide protection from wind, rain and other adverse weather.

A hoist, or small crane, is needed to assemble these sub-assemblies to form the final Out Door Unit (ODU) Assembly.

*You can change order of these steps; however, in the end the objective is to have a well sealed radome with flanges that well aligned and are clean of excess caulking.*

### 3.3. Preparing Location for the Out Door Unit (ODU)

#### 3.3.1. Lay Out ODU Mounting Holes

The first step is to lay out the holes in the concrete pad for the base of the pedestal and the bottom of the fiberglass radome to be bolted down onto.

Refer to drawing 94-163300 SITE ARRANGEMENT, RADOME PAD, 8.0M, LEO for the mounting hole pattern and relation to true North.

- The hole pattern of the Pedestal Base MUST be oriented to true North.
- The hole pattern of the Radome Panels MUST be oriented for the entry door to be South, or other desired position relative to true North.

Refer to drawing 97-168704 8M RADOME HOLE MARKING JIG to fabricate a jig for marking the radome mounting hole pattern.

Refer to drawing 99-169359 T6000 Antenna and Radome Mounting Hole Layout Instructions;

- Locate Center of Installation and True North

During the planning process you will have determined the location for the T6000 antenna, HVAC and radome. Locating the center point of the antenna and radome is a critical first step in laying out all the fastening locations.

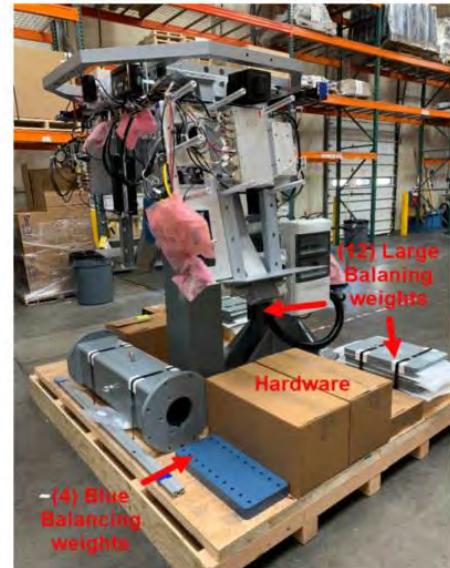
- Mounting Holes Related to Center

When completed you will have marked 8 holes for the antenna pedestal and 96 holes for the radome. Both sets of holes depend on center location. Once center is located drill a  $\varnothing 5/16$ " hole 2 inches deep in mounting surface for a 1/4-20 female threaded anchor.

#### 3.3.2. Open General Assembly Crate

Move the crate to a location that will not interfere with assembling the ODU. Inventory & Stage components

1. Remove the side panels of Crate A
2. Remove the shipping hardware that mounts the Base of the Pedestal to the pallet of the crate. Discard this hardware.



### 3.3.3. Mount the Base section of the Pedestal

1. Locate the base post section (approx. weight 700lbs) to its mounting location on the concrete pad.
2. The base MUST be oriented to true North (notch pointing to true North). Rotate the base to align the notch with true North.
3. Bolt the pedestal base down on the concrete pad. Apply Loctite to the threads of the 8 mounting bolts/studs. Install the bolts/studs with washers through the base into the anchors in the concrete and tighten to torque spec.



### 3.3.4. Open Radome Crates (2)

Move the crates to a location that will not interfere with assembling the ODU.

Open the removable panel of Radome Crate B & E. Inventory & Stage components;

**Crate B** contains the lower radome section (that connects to the pad directly), the top cap for the upper radome, the lightning rod, and various hardware.

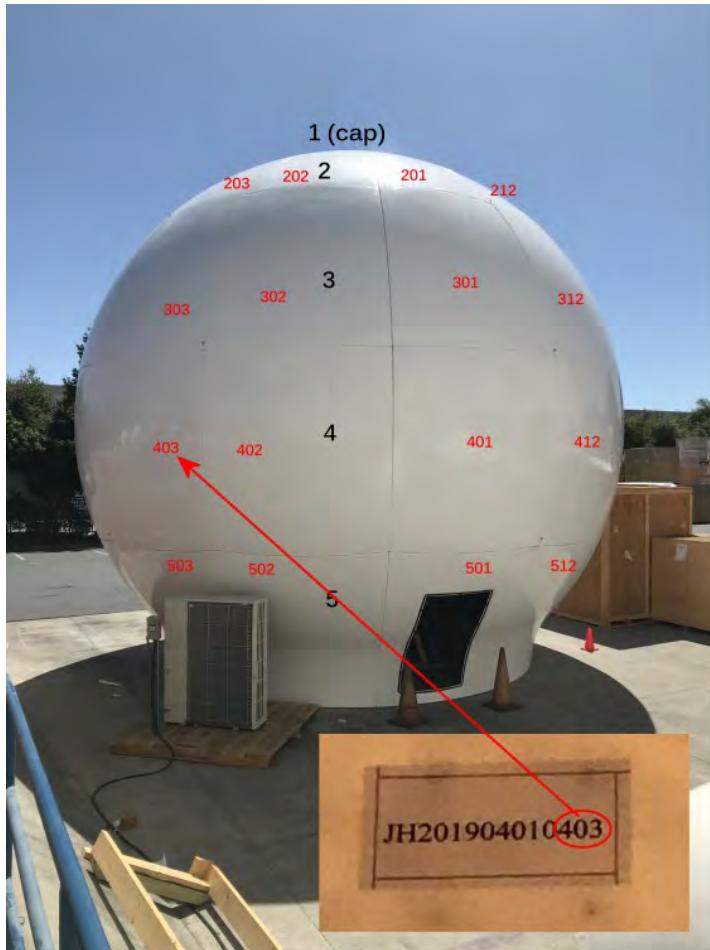


**Crate E** contains all the remaining sections (panels) used to build the upper radome.



### 3.3.5. Assembling the Bottom Layer of the Radome

Start assembling the bottom layer panels (serial numbers ending with 501-512) of the radome by bolting them to each other on a flat smooth surface (ie the concrete pad). They are numbered to assure that they are assembled in the correct order.



1. Set panels 501 & 502 beside each other and loosely install the vertical flange mounting bolts and washers.
2. While holding those panels, set panel 503 in its correct order position and loosely install the vertical flange mounting bolts and washers.
3. While holding those panels, set panel 504 in its correct order position and loosely install the vertical flange mounting bolts and washers.
4. While holding those panels, set panel 505 in its correct order position and loosely install the vertical flange mounting bolts and washers.
5. Assure that the bottom flange of the panels are sitting down level on the concrete. Apply caulking to mating flange of panels 501 & 502. Apply Loctite to the exposed threads of the bolts and tighten to torque spec from the bottom of the vertical flange to the top. Wipe off the excess caulking from inside and outside of these panels. Repeat with flange 502-503, 503-504 & 504-505.
6. Move/rotate this sub-assembly to assure that the door is oriented South, or other desired location. Then align the bottom holes in these radome panels with the anchors/studs in the concrete pad and loosely start several bolts with washers per panel into the anchors/studs in the concrete. Maintain positive control of these panels [HINT; an empty crate could be positioned against the center of these panels to hold them as you continue installing panels].



7. Apply caulking to the mating flange of the next adjacent panel in correct order and loosely install the vertical flange mounting bolts and washers. Assure that the bottom flange of the panel is sitting down level on the concrete, apply Loctite to the exposed threads of the bolts and tighten to torque spec from the bottom of the vertical flange to the top. Wipe off the excess caulking from inside and outside of this panel flange. Loosely start several bolts with washers per panel into the anchors/studs in the concrete.
8. Repeat step 7 until all of the lower level panels (501-512) have been joined.
9. Apply Loctite to the bolts that mount the base of the radome to the concrete pad. Install bolts & washers and tighten to torque spec starting from the left-most hole in panel 501, removing the previously installed bolts, as you go. Continue installing & tightening bolts with washers until all of the mounting bolts into the concrete are completed in panels 501-512.
10. Apply bead of caulking to the mating of the radome panels to the concrete all the way around the perimeter of the outside of the radome. Repeat applying a bead of caulking to the mating of the radome panels to the concrete all the way around the perimeter of the inside of the radome.



### 3.3.6. Assembling the Top Layer of the Radome

In a different location, start assembling the top layer panels (serial numbers ending with 201-212 plus the cap) of the radome by bolting them to each other and to the panels below. They are numbered to assure that they are assembled in the correct order (201 is mounted on top of 401, etc).



1. Set panel 201 & 202 beside each other and loosely install the vertical flange mounting bolts and washers. Install a lifting strap on the bottom bolt between these panels.
2. While holding those panels, set panel 203 in its correct order position and loosely install the vertical flange mounting bolts and washers.
3. While holding those panels, set panel 204 in its correct order position and loosely install the vertical flange mounting bolts and washers.
4. While holding those panels, set panel 205 in its correct order position and loosely install the vertical flange mounting bolts and washers. Install a lifting strap on the bottom bolt between these panels.
5. While holding those panels, set panel 206 in its correct order position and loosely install the vertical flange mounting bolts and washers.



6. While holding those panels, set panel 207 in its correct order position and loosely install the vertical flange mounting bolts and washers.
7. Assure that the bottom flange of the panels are sitting down level on the concrete. Apply caulking to mating flange of panels 201 & 202. Apply Loctite to the exposed threads of the bolts and tighten to torque spec from the bottom of the vertical flange to the top. Wipe off the excess caulking from inside and outside of these panels. Repeat with flange 202-203, 203-204, 204-205, 205-206 & 206-207.
8. Repeat step 6 to mount panels 208-211. Install a lifting strap on the bottom bolt between panels 207 & 208 and 210 & 211.
9. Apply a bead of caulking to the bottom of the top flange of the cap. Set the cap into the opening in to top of the upper panels. Align the mounting holes and loosely install the mounting bolts and washers. Apply Loctite to the exposed threads of the bolts and tighten to torque spec the bolts. Wipe off the excess caulking from inside and outside of the cap.
10. Apply a bead of caulking to the vertical sides of panel 212. With someone inside put panel 212 in place, align the mounting holes and loosely install the mounting bolts and washers. Apply Loctite to the exposed threads of the bolts and tighten to torque spec the bolts starting from the cap and then down both sides from the top to the bottom. Wipe off the excess caulking from inside and outside of the cap and panel.
11. Attach a 4-part lifting sling to the lifting straps.
12. Using a suitably rated derrick or crane, lift the top section of the radome about 6 feet to allow installation of the third layer of the radome under the top section.



### **3.3.7. Assembling the Third Layer of the Radome**

With the top section of the radome suspended, start assembling the third layer panels (serial numbers ending with 301-312) of the radome by bolting them to each other and to the panels above. They are numbered to assure that they are assembled in the correct order (301 is mounted to the bottom of 201, etc).

1. Set panel 301 in place under 201 and loosely install the horizontal flange mounting bolts and washers. Apply Loctite to the exposed threads of the bolts, and with the flange open apply a bead of caulking between the panels. Assure that panel 301 is centered on panel 201 and tighten to torque spec the bolts. Wipe off the excess caulking from inside and outside of the panel flange.

2. Apply a bead of caulking to the left and top flanges of panel 302. Set panel 302 in place under 202 and loosely install the vertical & horizontal flange mounting bolts and washers. Apply Loctite to the exposed threads of the bolts and tighten to torque spec the bolts. Install a lifting strap on the bottom bolt between these panels. Wipe off the excess caulking from inside and outside of the panel flanges.
3. Repeat step 2 to mount panels 303-312. Install a lifting strap on the bottom bolt between panels 304 & 305, 307 & 308 and 310 & 311.
4. Set the radome assembly down on the concrete and relocate the 4-part lifting sling to the lifting straps around the base of the third layer of the radome.
5. Lift the radome assembly about 6 feet to allow installation of the fourth layer of the radome under the third section.

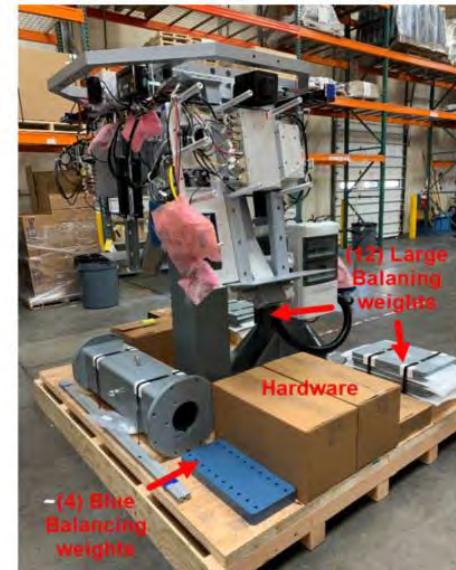
### **3.3.8. Assembling the Fourth Layer of the Radome**

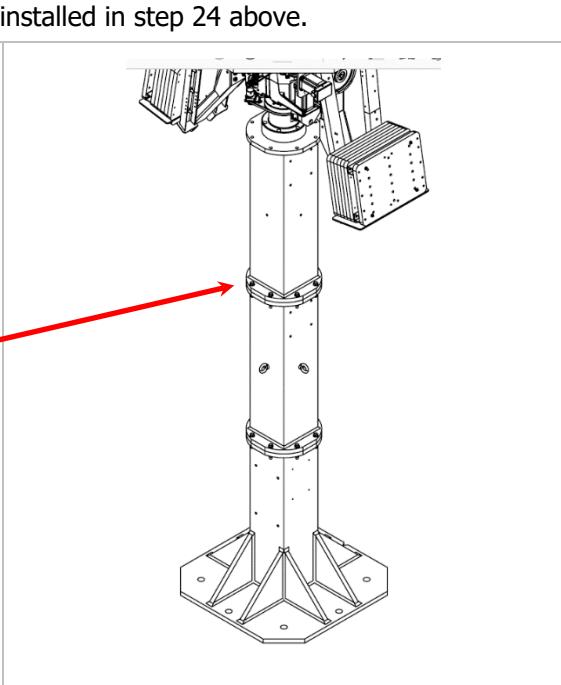
With the third section of the radome suspended, start assembling the fourth layer panels (serial numbers ending with 401-412) of the radome by bolting them to each other and to the panels above. They are numbered to assure that they are assembled in the correct order (401 is mounted to the bottom of 301, etc).

1. Set panel 401 in place under 301 and loosely install the horizontal flange mounting bolts and washers. Apply Loctite to the exposed threads of the bolts, and with the flange open apply a bead of caulking between the panels. Assure that panel 301 is centered on panel 301 and tighten to torque spec the bolts. Wipe off the excess caulking from inside and outside of the panel flange.
2. Apply a bead of caulking to the left and top flanges of panel 402. Set panel 402 in place under 302 and loosely install the vertical & horizontal flange mounting bolts and washers. Apply Loctite to the exposed threads of the bolts and tighten to torque spec the bolts. Install a lifting strap on the bottom bolt between these panels. Wipe off the excess caulking from inside and outside of the panel flanges.
3. Repeat step 2 to mount panels 403-412. Install a lifting strap on the bottom bolt between panels 404 & 405, 407 & 408 and 410 & 411.
4. Set the radome assembly down on the concrete and relocate the 4-part lifting sling to the lifting straps around the base of the third layer of the radome.

### ***3.4. Assembling the Pedestal***

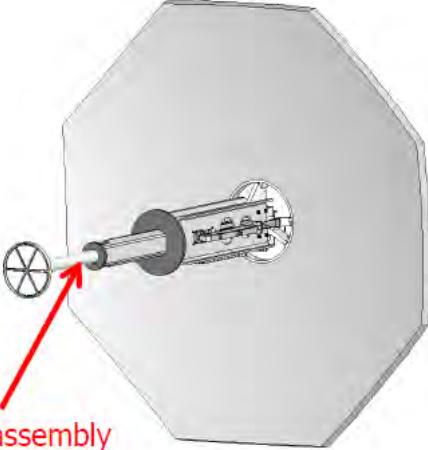
1. Locate the Items in the General Assembly (GA) crate;



<ol style="list-style-type: none"> <li>2. Using a suitably rated derrick or crane, lift the Equipment Frame assembly (approx. weight 2100lbs) up over the radome base section and suspend just above the middle post section.</li> <li>3. Rotate the upper post to align the notch in its base to the notches in the middle and base pedestal sections.</li> <li>4. Set the upper post section onto middle post section and assure that the notches remain aligned.</li> <li>5. Apply Loctite to threads of the mounting bolts. Install the bolts &amp; washers and tighten to torque spec.</li> </ol>	
<ol style="list-style-type: none"> <li>6. Remove the lifting spreader bracket installed in step 24 above.</li> <li>7. There is a burnished 6mm threaded hole in the top side of the bottom plate of the middle post section.</li> <li>8. There is another burnished 6mm threaded hole in the under side of the top plate of the Base Stand post section.</li> <li>9. Apply Loctite to threads of 2 6mm bolts. Use the bolts &amp; washers to install a ground strap around the mating of these two plates.</li> <li>10. Tighten the bolts torque spec.</li> </ol>	

### 3.5. Assembling the Reflector

1. Open the Reflector Hub and Feed crate.
2. Place the hub on raised platform (or crate) where the Reflector & feed can be assembled.

<ol style="list-style-type: none"> <li>3. Lift reflector hub to vertical and hold.</li> <li>4. Apply Loctite to threads of the feed mounting bolts.</li> <li>5. Insert feed into hub (assure that someone is on the front side of the hub to gently hold the end of the feed).</li> <li>6. Orient the feed, installing shims (if needed), mounting bolts and washers.</li> <li>7. Tighten mounting bolts to torque spec.</li> </ol>	
<ol style="list-style-type: none"> <li>8. Apply Loctite to threads of the reflector petal mounting bolts &amp; washers.</li> <li>9. Mount petal 1 using the petal mounting bolts &amp; washers, but leave bolt slightly loose.</li> <li>10. After mounting first petal, DO NOT mount adjacent petal as there is a potential for hub to tip over which can cause reflector damage or Installer injury.</li> <li>11. Sea Tel recommends mounting opposing petals in the following order; 1 then 5, 3 then 7, 2 then 6 and last 4 then 8.</li> <li>12. After all hardware is installed, tighten all hardware starting with one seam (ie petal 1 &amp; 2) at the reflector hub, then each bolt out to out end of each petal joint. Tighten bolts to torque spec.</li> <li>13. Repeat the previous step on the next seam. Continue with each subsequent seam until all mounting bolts have been tightened to torque spec.</li> </ol>	

### 3.6. Installing the Reflector

<ol style="list-style-type: none"> <li>1. Install two 3/8-16 x 1-1/2" all thread in empty bracket holes. Install two lifting eye nuts on 4 out of 8 brackets.</li> <li>2. Attach 4 equal length straps to lift antenna assembly. Make sure, straps are long enough to clear feed while lifting.</li> </ol>	
--	---



3. Install at least 2 additional long straps on 2 of the eye nuts to be used as tag lines. This will help to control the reflector in case of wind while hoisting.



4. Using a suitably rated derrick or crane, lift the Antenna Assembly (approx. weight 870lbs) up over the radome base section and suspend just above the Equipment Frame assembly.

### 3.7. Closing the Radome



1. Attach the 4-part lifting sling to the lifting straps around the base of the upper radome assembly (approx. 1500 lbs).
2. Attach at least 2 tag lines to 2 opposite lifting straps to control the upper radome assembly while it is hoisted.
3. Using a suitably rated derrick or crane, lift the upper radome assembly above the antenna assembly and move into position to set the upper radome assembly onto the radome base assembly.
4. Exercise extreme caution to assure that the upper radome assembly does not damage the feed tube or reflector as it is lowered down to within several inches of the top of the radome base section.
5. Rotate the upper radome assembly to align panel 401 to be in place directly above panel 501.
6. Continue lowering the upper radome assembly, while guiding it to be properly aligned with panel 401 centered directly atop panel 501 and suspended 1/4 inch above the radome base section.
7. While holding the upper radome assembly suspended, loosely install the horizontal flange mounting bolts and washers. Apply Loctite to the exposed threads of the bolts, and with the flange slightly open apply a bead of caulking between the panels. Lower the upper radome assembly until it is sitting on the radome base section and tighten to torque spec the bolts. Wipe off the excess caulking from inside and outside of the horizontal panel flange mating.
8. Remove the 4-part lifting sling from the radome assembly.

### 3.8. Final Checks

Remove all tools, parts and installation debris from inside the radome.

Remove all tools, parts and installation debris from the area around the outside of the radome.

**This Page Intentionally Left Blank**

## 4. Maintenance

This section describes the maintenance procedures for this antenna system.



**WARNING:** *Electrical Hazard – Dangerous AC Voltages exist in the Circuit Breaker Box mounted on the pedestal post. Observe proper safety precautions when working inside the Antenna Breaker Box.*

### 4.1. Safety

#### Service

Access to the interior of the Out Door Unit (ODU), is allowed for inspection of components by a technician/engineer. Maintenance of the ODU should only be performed by technicians/engineers who are authorized by Cobham SATCOM. Only authorized Partners who have received factory training on this equipment will be able to file a claim for warranty reimbursement. Failure to comply with standard practices, which include but are not limited to modification of the terminal away from factory documented assemblies may also void the warranty period.

#### Do not service or adjust alone

Do not attempt internal service or adjustments unless another person, capable of rendering first aid resuscitation, is present.

#### Personal Protection Equipment (PPE):

Hard hat, safety glasses and steel toe work boots are required.

To avoid injuries, it is important to be aware of the risks present when handling and testing an antenna from inside the dome. There is a risk of the antenna injuring the operator, as the antenna moves, so the operator must be aware of the position of the antenna at all times while inside the radome.

#### Keep away from live circuits

Operating personnel must not remove equipment covers. Component replacement and internal adjustment must be made by qualified maintenance personnel. Do not replace components with the power cable connected. Under certain conditions, dangerous voltages may exist even with the power cable removed. To avoid injuries, always disconnect power and discharge circuits before touching them.

### 4.2. Warranty Information

Sea Tel Inc. supports these systems with a **TWO** year warranty on parts and labor.

Access to the interior of the Outdoor Equipment (ODE), is allowed for inspection of components as described in the Scheduled Inspections section of this manual may be accomplished by technician/an engineer. Maintenance of the ODE should only be performed by technicians/engineers who are authorized by Cobham SATCOM. Only authorized Partners who have received factory training on this equipment will be able to file a claim for warranty reimbursement. Failure to comply with standard practices, which include but are not limited to modification of the terminal away from factory documented assemblies may also void the warranty period.

#### What's Covered by the Limited Warranty?

The Sea Tel Limited Warranty is applicable for parts and labor coverage to the complete antenna system, including all ODU (radome, pedestal, antenna, motors, electronics, wiring, etc.) and the ACU or MXP.

#### What's NOT Covered by the Limited Warranty?

It does not include Transmit & Receive RF Equipment, Modems, Multiplexers or other distribution equipment, whether or not supplied by Sea Tel commonly used in Satellite Communications (TXRX)

Systems. These equipments are covered by the applicable warranties of the respective manufacturers.

Original installation of the system must be accomplished by, or under the supervision of, an authorized Sea Tel dealer for the Sea Tel Limited Warranty to be valid and in force.

Should technical assistance be required to repair your system, the first contact should be to the agent/dealer you purchased the equipment from.

Please refer to the complete warranty information included with your system.

#### 4.3. Torque and Loctite Specifications

	<p><b>WARNING:</b> Assure that all nut and bolt assemblies are tightened according to the tightening torque values listed below:</p>			
	SAE Bolt Size	Inch Pounds	Metric Bolt Size	Kg-cm
	1/4-20	75	M6	75.3
	5/16-18	132	M8	150
	3/8-16	236	M10	270
	1/2-13	517	M12	430
	<p><b>NOTE:</b> All nuts and bolts should be assembled using the appropriate Loctite thread-locker product number for the thread size of the hardware.</p>			
	Loctite #	Description		
	222	Low strength for small fasteners.		
	242	Medium strength		
	638	High strength for Motor Shafts & Sprockets.		
	2760	Permanent strength for up to 1" diameter fasteners.		
	290	Wicking, High strength for fasteners which are already assembled.		

#### 4.4. Balancing the Antenna

The elevation and cross-level motors have a brake mechanism built into them, therefore, **power** must be ON to release the brakes and **DishScan® and antenna drive** must be OFF to balance the antenna. . **Do NOT remove any of the drive belts.** Balancing is accomplished by adding or removing balance trim weights at strategic locations to keep the antenna from falling forward/backward or side to side. The antenna system is not pendulous so 'balanced' is defined as the antenna remaining at rest when left in any position.

The "Balance Mode" selection located on the upper part of the "Four Quadrant Test" screen in the **Tools – Test** menu page. When enabled, Balance Mode temporarily turns DishScan®, Azimuth, Elevation and Cross-Level drive OFF. This function is required when trying to balance this antenna system.

**Assure that Antenna power is ON and that the antenna has completed initialization.**

##### At the Computer:

1. Log into the GUI, select Tools - Test in the side bar menus.
2. Select "Balance Mode" to enable balance mode. The screen will then show ON & OFF buttons.
3. Click ON. The screen will temporarily display "Submitting ... Please Wait". When this message disappears the antenna is in balance mode. DO NOT EXIT THIS SCREEN.

***At the Antenna:***

4. At the Antenna: Balance the antenna with the elevation near horizon (referred to as front to back balance) **by adding, or subtracting, small counter-weights**.
5. Then balance Cross Level axis (referred to as left-right balance) **by moving existing counter-weights from the left to the right or from the right to the left**. Always move weight from one location on the equipment frame to the same location on the opposite side of the equipment frame (ie from the top left of the reflector mounting frame to the top right of the reflector mounting frame). Do NOT add counter-weight during this step.
6. Last, balance the antenna with the elevation pointed at, or near, zenith (referred to as top to bottom balance) **by moving existing counter-weights from the top to the bottom or from the bottom to the top**. Always move weight from one location on the equipment frame to the same location on the opposite side of the equipment frame (ie from the top left of the reflector mounting frame to the bottom left of the reflector mounting frame). Do NOT add counter-weight during this step.
7. When completed, the antenna will stay at any position it is pointed in for at least 5 minutes.
8. ***Do NOT cycle antenna power to re-Initialize the antenna.*** which is still in Balance Mode. Click OFF. The screen will temporarily display "Submitting ... Please Wait". When this message disappears the antenna is in normal operation mode. When you exit Balance Mode the antenna will return to normal (DishScan®, Azimuth, Elevation and Cross-Level drive ON).

**This Page Intentionally Left Blank**

## 5. Tracker 6000 Drawings

---

The drawings listed below are provided as part of this manual for use as a diagnostic reference. Spare Parts kits listings are provided as part number reference for replaceable parts and common assemblies.

### 5.1. Model Specific Drawings

Drawing	Title	
40-300411	Sea Tel Tracker 6000, 800W GS, 8.0 RADOME	5-3
DL-174525	SYSTEM BLOCK LIST, TRACKER 6000 800W	5-8
93-174525	SCHEMATIC, TRACKER 6000 SYSTEM 800W	5-17
62-174525	GENERAL ASSY, T6000 800 WATT	5-24
62-174526	PEDESTAL ASSY, T6000 800W	5-26
62-174534	ELECT. EQUIP. PEDESTAL ASSY, T6000 800W	5-33
62-174531	ELECT. EQUIP. FRAME ASSY, T6000 800W	5-35
62-166977	ICU AND POWER SUPPLY MOUNTING ASSY, T6000	5-40
62-162996	ANTENNA ASSY, T6000	5-42
62-163000	FEED TOWER ASSY, T6000	5-48
62-174535	TX WAVEGUIDE RUN KIT, T6000	5-55
62-174998	KIT, BALANCE WEIGHT, T6000 800W	5-57
62-163802	IF INTERFACE & 10MHz DISTRIBUTION ASSY	5-60
93-174825	SCHEMATIC, IF INTERFACE & 10MHz DISTRIBUTION ASSY	5-65
62-173278	CIRCUIT BREAKER ASSY, 3 PHASE 32 AMP, T6000, 800W	5-66
92-173278	WIRING DIAGRAM, T6000 800W CIRCUIT BREAKER ASSY	5-74
62-166653	SAFETY CIRCUIT INTERFACE BOX ASSY	5-76
62-175119	BRACKET KIT, SERVICE, T6000	5-78
99-169359-A	T6000 Antenna and Radome Mounting Hole Layout Instructions	5-85
94-163300-A	SITE ARRANGEMENT, RADOME PAD, 8.0M, LEO	5-99
62-168704	8M RADOME HOLE MARKING JIG	5-101
62-172181	RADOME ASSY, GA INSTALL, 8.0M, KATX-E, LEO, WHITE	5-105
62-175222	HARDWARE KIT, FIELD INSTALLATION, TRACKER 6000 800W	5-110
119918_01	LIFTING STRAP, RADOME	5-111
62-165842	RADOME LIGHTING KIT, T6000	5-112
62-164608	MUTE DOOR SENSOR KIT	5-113
93-164608-A_01	SCHEMATIC, DOOR MUTE SENSOR CIRCUIT	5-114
62-165834	REMOTE E STOP ASSY, IP66, SPST-NC	5-115
93-165834-A_01	SCHEMATIC MAINTENANCE MODE REMOTE CIRCUIT	5-116
62-171768	KIT, OBSTRUCTION LIGHT AND LIGHTNING DIVERTER	5-117
62-156979	KIT, SNOW ROPE ASSEMBLY	5-122
97-156979-A	SNOW ROPE INSTALLATION INSTRUCTIONS	5-123
99-169239-B	Procedure, Test, Product, Tracker 6000 Site Test	5-130

**This Page Intentionally Left Blank**

# ORACLE BOM Explosion Report

**Item Number:** 40-300411

**Description:** Sea Tel Tracker 6000, 800W GS, 8.0 RADOME

**Item Revision:** A.19 ECO-00039388

**Date as of:** 03/24/2021 06:36:42 AM PDT

Find Num	Qty	Inventory Unit (LN6)	Number	Rev	Description / Title	BOM Notes
0	REF	pcs	97-300411	A ECO-00039276	ASSY DWG, SEA TEL, TRACKER T6000 800W GLOBALSTAR	
0	REF		99-176272-A	A DCO-00041773	Final Inspection Checklist for T6000 800W	
1	1	pcs	62-174525	A.26 ECO-00038953	GENERAL ASSY, T6000 800 WATT	
2	1	pcs	62-162996	A.03 MCO-00049561	ANTENNA ASSY, T6000	
3	1	pcs	62-172181	A.01 ECO-00038361	RADOME ASSY, GA INSTALL, 8.0M, KATX-E, LEO, WHITE	
4	1	pcs	62-171583	A MCO-00049343	T6000 ACCESSORY EQUIPMENT KIT	NOT SHOWN
10	1	ea	88-207608-000	MCO-00047453	ETHERNET TERMINAL AND DEVICE SERVER	NOT SHOWN
20	2	pcs	88-207866-000	A MCO-00049206	LNB, X-BAND, 6.875-7.055 GHz, LO 9.160 GHz	
30	2	pcs	88-207867-008	MCO-00050339	SSPB, TERRASAT 800W, 5.09-5.25 GHz, L.O. Freq 4.25	
41	1	ea	62-174998	A ECO-00038889	KIT, BALANCE WEIGHT, T6000 800W	
42	1	pcs	62-172069	A MCO-00049343	FIELD TRIM WEIGHT KIT, LARGE TRACKER	NOT SHOWN
45	1	pcs	62-168704	A.02 MCO-00049240	8M RADOME HOLE MARKING JIG	NOT SHOWN
46	1	ea	62-175911	A.01 ECO-00039111	KIT, GROUNDING STRAPS, T6000 800W	
47	1	pcs	62-176242	A ECO-00039364	KIT, DECAL INSTALL, 8.0M RADOME ASSY	
48	1	ea	62-174986	A ECO-00038260	SHIPPING ARRANGEMENT, T6000 800W	
49	1	pcs	83-176216	A.03 ECO-00039388	Customer Doc Pack USB, T6000, 800W, ECCN EAR99	
50	8	ea	119973-118	MCO-00012113	SCREW, SOCKET HD, M4 X 16, SS.	
58	8	ea	114580-230	MCO-00039541	WASHER, FLAT, M4, SS.	
70	REF	ea	114586-622	MCO-00012113	SCREW, HEX HD, 3/8-16 x 3/4, SS.	30x for each BUC

**Created By:** Mike Needham

**Create Time:** 03/24/2021 06:37:52 AM PDT

**ORACLE® BOM Explosion Report****Item Number:** 40-300411**Description:** Sea Tel Tracker 6000, 800W GS, 8.0 RADOME**Item Revision:** A.19 ECO-00039388**Date as of:** 03/24/2021 06:36:42 AM PDT

Find Num	Qty	Inventory Unit (LN6)	Number	Rev	Description / Title	BOM Notes
78	REF	ea	114580-031	MCO-00012114	WASHER, FLAT, 3/8, SS.	30x for each BUC
		pcs	40-300411	A.19 ECO-00039388	Sea Tel Tracker 6000, 800W GS, 8.0 RADOME	

**Created By:** Mike Needham**Create Time:** 03/24/2021 06:37:52 AM PDT