OPERATION AND INSTALLATION
FOR SEA TEL MODEL
ST24 SATELLITE TV RECEIVE-ONLY ANTENNA

Please record your Antenna Serial Number Here;

Antenna Model: _____Serial Number: _____

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Sea Tel Inc is also doing business as Cobham Antenna Systems

Sea Tel Marine Stabilized Antenna systems are manufactured in the United States of America.

Sea Tel is an ISO 9001:2008 registered company.

Certificate Number 13690 issued March 14, 2011.

R&TTE

CE

This Sea Tel Marine Stabilized Antenna Pedestal with DACP or GACP Antenna Control Panel complies with the requirements of directive 1999/5/EC of the European Parliament and of the Council of 9 March 1999 on Radio equipment and Telecommunication Terminal Equipment. A copy of the R&TTE Declaration of Conformity for this equipment is contained in this manual.

Copyright Notice

Revision History

REV	ECO#	Date	Description	By
X		August 24, 2010	Preliminary Release	ECM
X1		September 30, 2010	Updated text and graphics per Product Manager Feedback, added LNB replacement Procedure, added Manual to AutoPol Conversion Procedure	ECM
X2		November 3, 2010	Updated text and graphics to reflect current software build features. Added Setup Wizard procedure	ECM
A		December 20, 2010	Production Release	ECM
B		January 23, 2011	Updated text and graphics to reflect current software build features.	ECM
C	8491	May 19, 2011	Updated text, graphics and drawings to reflect current production build.	ECM
D	9954	December 17, 2012	Updated drawings to new reflector design.	MDN
D1		February 27, 2013	Updated RTT&E / CE insert and added declaration page to manual.	MDN
E	N/A	May 06, 2013	Update setup & operation chapters to include NMEA Heading and GPS input capability, AZ & EL Trims and Tone & Voltage controls.	MDN

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R&TTE Declaration of Conformity

Doc Number 122932 Revision G

Sea Tel Inc. declares under our sole responsibility that the products identified below are in conformity with the requirements of:

DIRECTIVE 1999/5/EC of the European Parliament and of the Council of 9 March 1999 on Radio equipment and Telecommunication Terminal Equipment and the mutual recognition of their conformity.

Product Names:

3004 Ku Band TVRO Maritime Satellite Earth Station.
4004 Ku Band TVRO Maritime Satellite Earth Station.
5004 Ku Band TVRO Maritime Satellite Earth Station.
6009 C-Band TVRO Maritime Satellite Earth Station.
6011 C/Ku Band TVRO Maritime Satellite Earth Station.
ST24 Ku Band TVRO Maritime Satellite Earth Station.
ST88-21 C/Ku Band TVRO Maritime Satellite Earth Station.
ST94-21 C/Ku Band TVRO Maritime Satellite Earth Station.
ST144-21 C/Ku Band TVRO Maritime Satellite Earth Station.

These products have been assessed to Conformity Procedures, Annex IV, of the above Directive by application of the following standard(s):

EMC:

Marine Navigational and Radio Communication Equipment and Systems – General Requirements: **IEC EN 60945:1997**

Safety:

Safety of information technology equipment: **IEC EN 60950-1:2001 (1st Edition)**

Certificates of Assessment were completed and are on file at NEMKO USA Inc, San Diego, CA and BACL Labs, Santa Clara, CA.

Sea Tel, Inc
Concord, CA

2/26/13

Peter Blaney, Chief Engineer Date

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2. Quick Start

Operation of the ST24 Series antenna is accomplished via the **G**raphic **A**ntenna **C**ontrol **P**anel (GACP). Once properly configured, the antenna will automatically search for and identify the last targeted satellite held in memory. Because of programming requirements or changing of geographic locations, you may be required to change what satellite you wish to track.. Read below for general panel operation instructions.

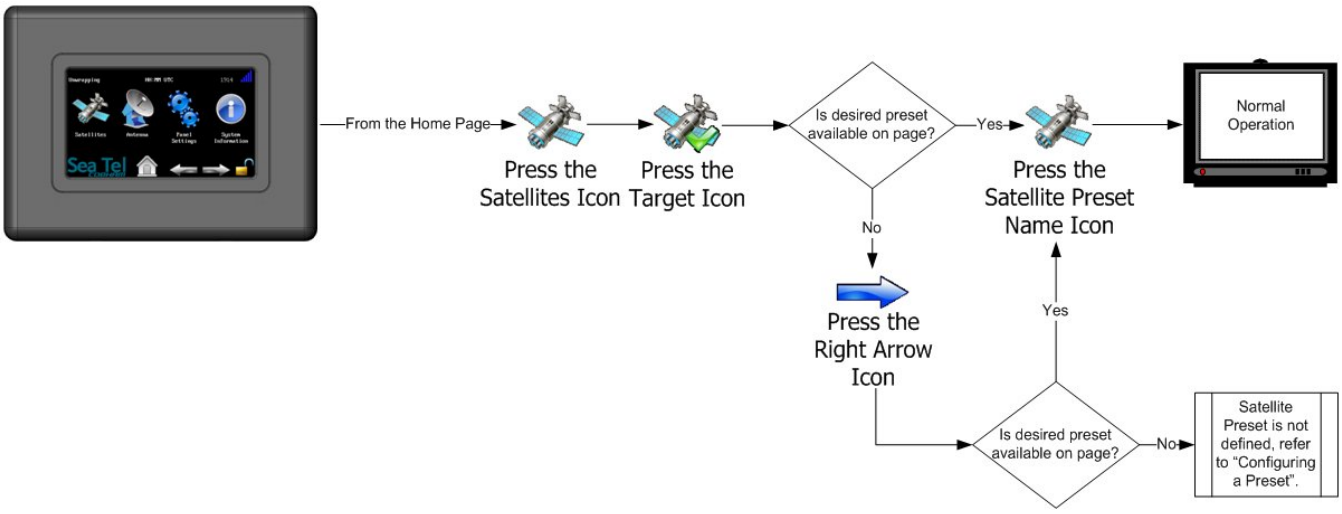
2.1. General Panel Operation

The GACP is a Panel Mount touch screen controller and navigation through its main and sub menu's is accomplished by pressing the desired icon itself and not the descriptive text below the icon. When applicable, the Left and Right arrows may be used to navigate between main menu pages. The HOME icon may be pressed to return to the HOME Page from any given menu or sub menu display. The Panel will go into a locked mode after five minutes of inactivity. The Panel will go into Sleep mode after being in a locked mode for five minutes. NOTE: The Antenna will still be fully functional. Press anywhere on the screen to bring the panel out of sleep mode and access the "Panel Unlock" screen.

The graphic to the right depicts the proper way to navigate through the menus by pressing the icon itself.	
The graphic to the right depicts the incorrect way to navigate through the menus by pressing on the displayed text.	
Navigational icons that are in full color are considered valid selections such as the "BACK" arrow shown to the right.	
Navigational icons that are in black and white are considered invalid selections, such as the "BACK" arrow shown to the right.	

2.2. Target a Satellite

Use the following flow chart to target a satellite.



3. Installation

Installation of the ST24 Antenna system will be presented into two major sections, the **A**bove **D**ecks **E**quipment (ADE) and the Below Decks Equipment (BDE). This installation must be performed by or under the direct supervision of an authorized Sea Tel Dealer for the limited warranty policy to be valid and enforced. A proper Site Survey ***MUST*** be performed prior to the actual antenna installation to help ensure the best possible operation of the system. Proper planning is the key to a good installation, please read this entire chapter thoroughly before beginning the actual installation and measure it against your site survey and make adjust any details that you may have been overlooked.

The three following Simplified Block Diagrams (figures 1-3) are for visual reference only. Always refer to the System Block Diagram, located in the drawings section of this manual for Coax and Wire interconnections and/or troubleshooting purposes.

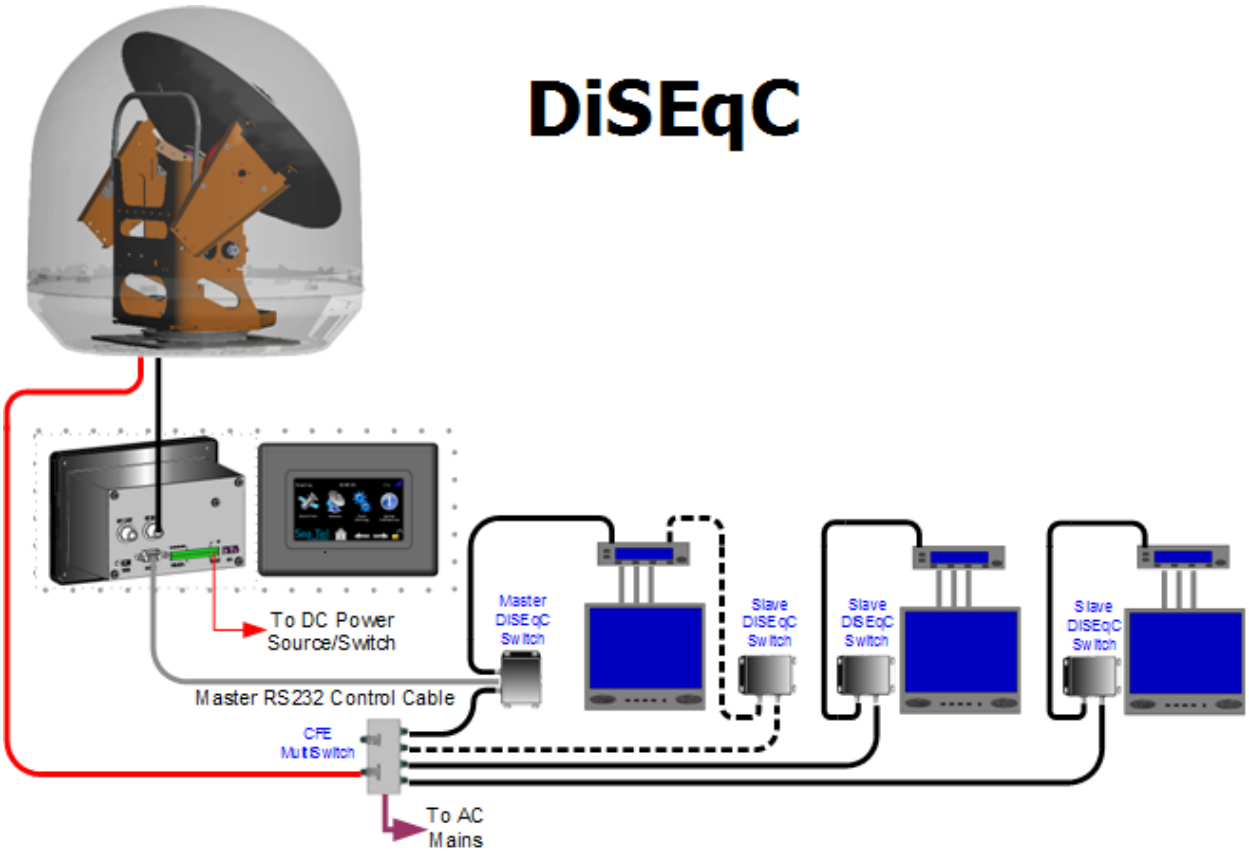


Figure 1 ST24 DiSEqC Simplified Block Diagram

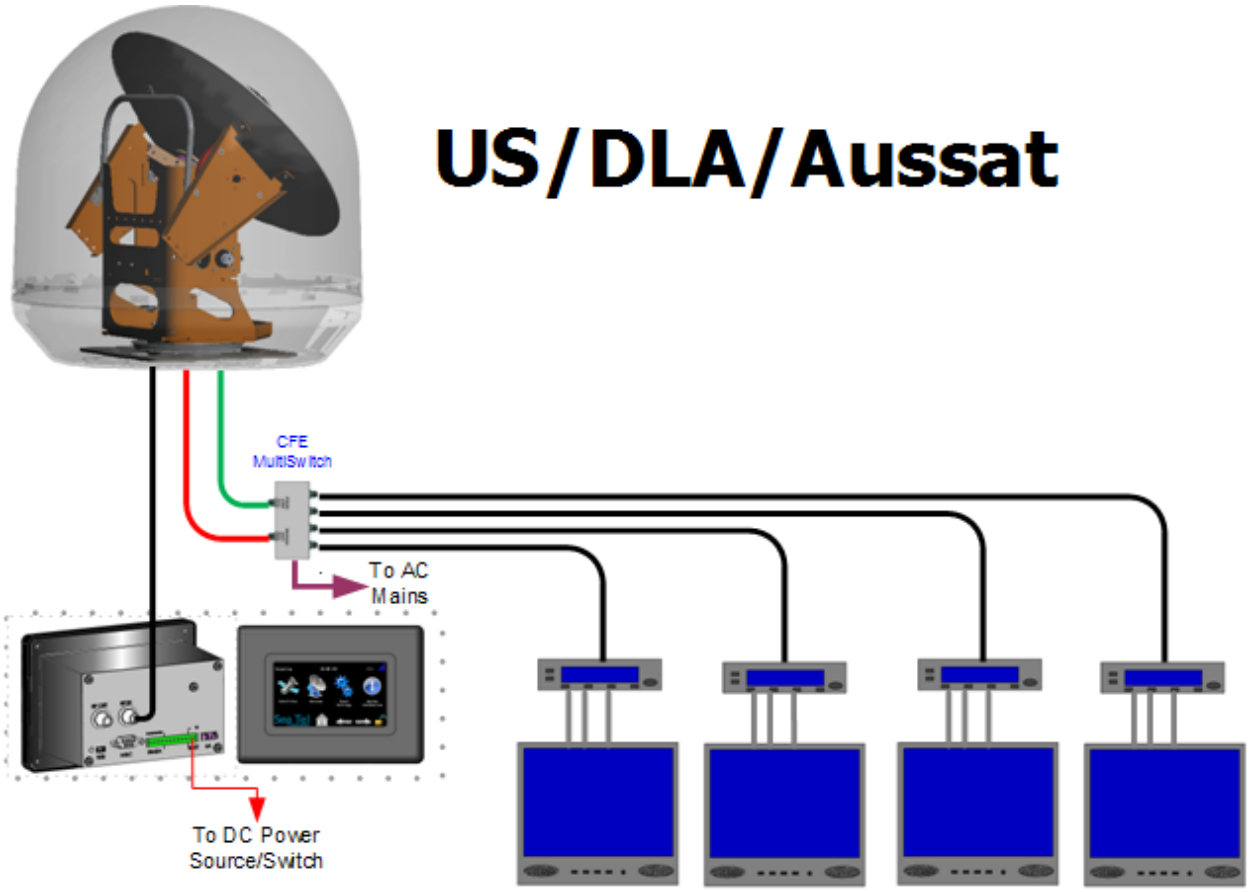


Figure 2 ST24 US/DLA/AUSSAT Simplified Block Diagram

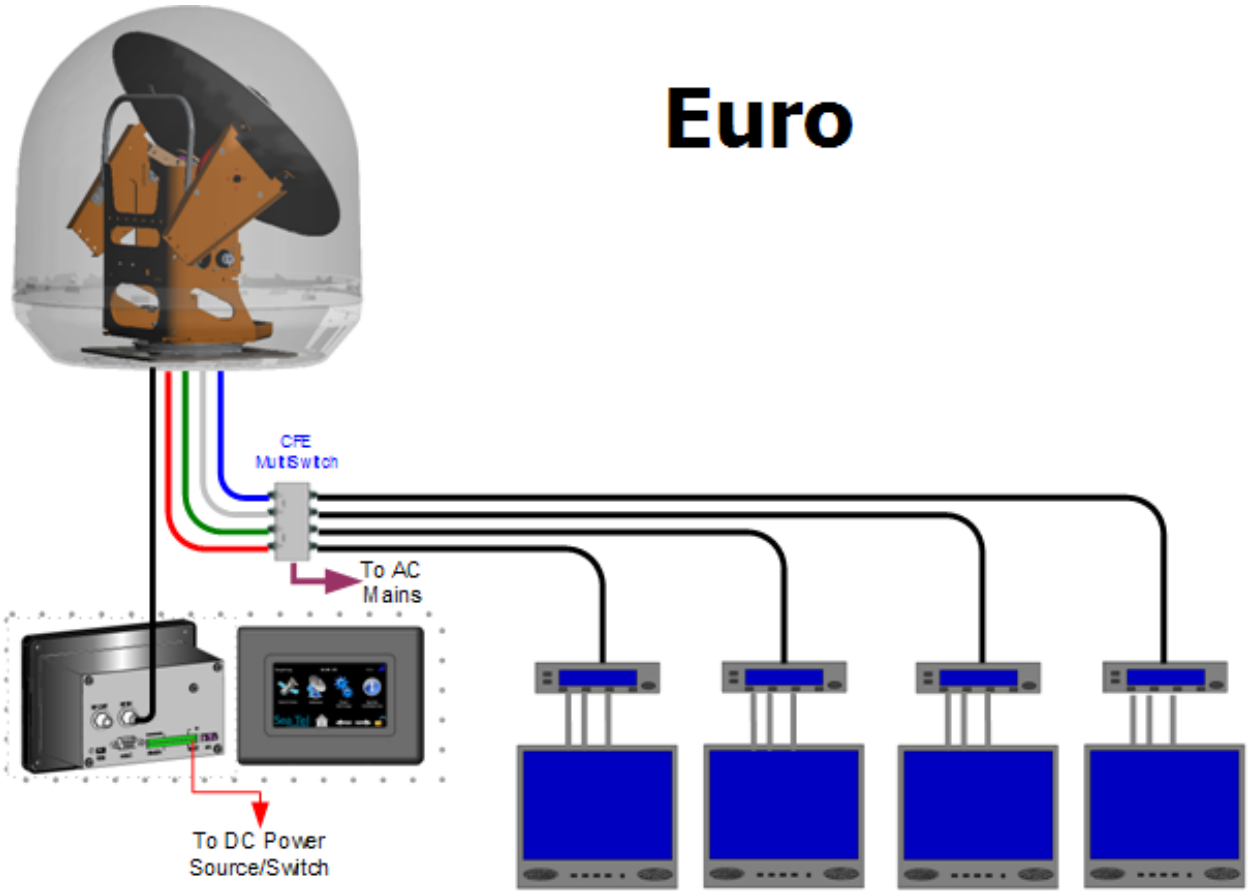


Figure 3 ST24 Euro Simplified Block Diagram

3.1. Verify System Components

Before beginning it is critical that you inventory all system components. Refer to the appropriate packing list for your Model antenna. Any discrepancies should be immediately reported to the Sea Tel service department so that a Service Call may be filed and the required parts be shipped out.

3.2. Site Selection

Determine the optimum mounting location for the antenna radome assembly. Choosing the best mounting location on vessels where there are few choice locations to choose from, is frequently a compromise. Below are some considerations that should be taken as part of the Site Survey process.

- **Above Decks**

1. Blockage: The antenna should be mounted where the antenna has a clear line-of-sight view to as much of the sky as is practical. Choosing a location where masts or other structures do not block the satellite signal from the dish as the boat turns will directly affect the antenna's ability to locate and track the desired satellite.
2. The antenna is at least 5 feet away from other transmitting antennas (HF, VHF and radar) that may generate signals that may interfere with the Coastal Series antenna. The further away the Coastal antenna is from these other antennas, the less impact their operation will have on it as will our antenna have less of an impact on them.
3. The antenna radome assembly should be rigidly mounted to the boat. If necessary, reinforce the mounting area to assure that it does not flex due to the boat motion or vibration.
4. Bow or the Stern? Due to the violent G-forces exerted onto an antenna while the vessel's BOW heaves versus the relatively "cushioned" G-forces exerted onto an antenna at the stern of the vessel choosing the Stern would be the 'best' option with all other factors being equal.

5. Mounting Height: The pedestal mounting height specification is not intended to be an absolute restriction on pedestal placement. It is generically referred to in the section of the manual which describes the vessel motions for which the stabilization accuracy is guaranteed. An exact mounting height limit is difficult to quantify since all vessels respond differently to various wave patterns and no two sea-states produce the same pattern of waves. We can, however, state a range of practical conditions and show the expected pedestal response and limits for those conditions. Figure 2-2 shows the expected antenna performance in relationship to vessel motion.

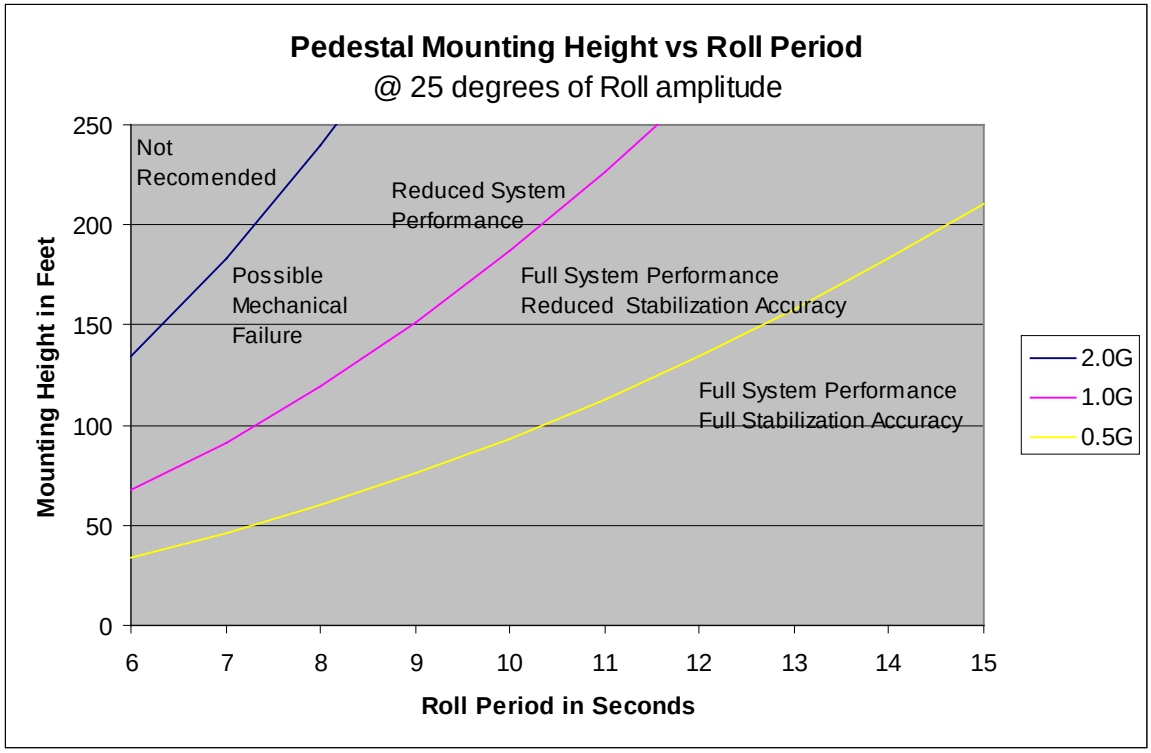


Figure 3-2 Antenna Mounting Height vs. Antenna Performance

6. Below Decks Equipment. Knowing where the BDE will be installed is useful so that you can determine the shortest and most convenient cable path from the antenna to below decks.

- **Below Decks**

  The Graphic Antenna Control Panel should be mounted in a convenient location for the operation of the antenna system. It should be near one of the satellite receiver/television locations so that the receivers' TV screen can be viewed while the antenna is being operated. The supplied antenna control cable is routed from the radome to the control panel, so routing path and cable length are important considerations both in choosing the location of the control panel and to determine what type of RF cable should be used. The technical specifications section of this manual provides the Sea Tel recommended cable type(s) as defined by the overall cable run (from radome to the furthest receiver on the network).

Satellite receiver(s) and television set(s) - Satellite receiver(s) and television set(s) should be mounted near each other in convenient viewing locations. If enclosed in a cabinet or panel, assure that there is adequate airflow to prevent the receiver(s) and active matrix switch from over-heating and provide forced airflow if needed. At each receiver location, leave a sufficient length of cable (service loop) to remove the receiver in order to access its rear panel without pulling connections off of the rear panel.

3.2.1. Prepare the Antenna Radome Mounting Location

1. Lay the Installation Template (drawing 132903) on the mounting surface location that you have chosen to mount the radome on.
2. Align the radome "bow" mark on the template to be parallel to the bow of the boat. By default the orientation of the "Sea Tel" logo is oriented towards BOW. You may as you see fit, adjust the position of the "Bow" marker on template to orient the LOGO where you want it. When you are satisfied with the position, tape the template in place.
3. Using the center punch and hammer, mark the locations of the four radome mounting holes and the cable passage. Remove the template drawing.

   NOTE

   The 29" radome assembly provides the means to install the antenna to its mounting surface on either a 9" D.B.C (factory default) or 12" D.B.C. You are only required to use one of these hole patterns, not both.
4. Drill the four radome mounting holes using the 7/16" drill bit and the cable passage hole using a 4.5" hole saw.

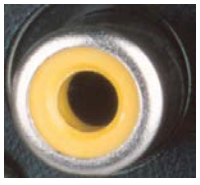
3.2.2. Prepare the Antenna Control Panel mounting location

1. Lay the Installation Template (drawing 132230) on the mounting surface location that you have chosen to mount the Graphic Antenna Control Panel in.
2. Adjust the position of the template to center the Antenna Control Panel cutout portion of the drawing where you want it. When you are satisfied with the position tape the template in place.
3. Using the center punch and hammer, mark the locations of the four mounting holes and the four corners of the cutout area. Remove the template drawing.
4. Mark the perimeter of the cutout area. Drill a hole inside the perimeter of the cutout area to enable you to cut the area out with the saw (the 1" hole saw might be used for this).
5. Cut the area out.
6. Drill out the four GACP mounting holes.

3.3. Cable and Equipment Installation

3.3.1. Determine your Cables

In addition to the required Coaxial cable that will interconnect the above decks equipment with the below decks equipment, you will need to determine what cables are going to be used to interconnect satellite receivers to the televisions and if installed the surround sound system. The below guide may be used to help determine which cable type is best suited for your installation. You should refer to the manual of the CFE equipment for additional guidance.

Video Connection Reference	**Audio Connection Reference:**
OK: **Composite Video** (Non-HD Video Only)  Typically an RCA Jack, this type of connection combines and transmits chrominance and luminance information on a single cable.	OK: **Stereo RCA** (2 channel Analog)  These RCA Jack connections are a means of passing analog line-level audio signals (split into left and right channels) from the satellite receiver to your television or audio amplifier.

Good: **S-Video** (Non HD Video Only)

S-video connections transmit the chrominance (color) and luminance (brightness) portions of a video signal along different paths, allowing them to be processed separately.

Good: **RCA** (Multi-Channel Analog)

These preamp-level analog inputs features jacks for up to 8 channels: left front, right front, center channel, left surround, right surround, and subwoofer. Because the subwoofer channel carries a limited range of frequencies, it's the ".1" in 5.1. A 6.1 input features the same jacks as a 5.1 input, but adds a back surround jack. A 7.1 input adds two back surround jacks.

Better: **Component** (HD Video Only)

This 3-cable connection allows the chrominance (color) and luminance (brightness) portions of a video signal to be processed separately .S-Video works similarly, but component video improves color accuracy further by splitting the chrominance signal into two portions.

Better: **XLR** (Hi Resolution Analog)

XLR audio connections are used primarily with high-performance audio gear. This 3 pin connector dedicates one of these pins for ground which helps reduce electronic noise throughout the cable. A clasp built into the round XLR plug locks it tightly into the socket, ensuring a secure connection even during full ships motion.

Best: **HDMI** (Both HD Video and Digital Audio)

HDMI is a multi-pin connection used for passing standard- and high-definition digital video signals, as well as up to 8 discrete digital audio channels, through a single cable.

3.4. ADE to BDE Cables:

3.4.1. Antenna M&C Coax

Route and label an Antenna M&C Coax from the radome mounting location through the vessel and down to the GACP mounting location.

Adjust the cable routing so that about 12 inches (30.5cm) of cable extends beyond the radome mounting surface and about 4 inches (10cm) of cable extending out of the antenna control panel mounting surface.

3.4.2. Satellite IF Coaxes

If required, route and the IF Coax(es) from the radome mounting location through the vessel and down to the active multi-switch mounting location.

Adjust the cable routing so that about 12 inches (30.5cm) of cable extends beyond the radome mounting surface and about 6 inches (10cm) of cable extending out of the antenna control panel mounting surface.

ST24 Euro Systems require 4 ADE to BDE Coax cables in addition to the Antenna M&C Coax. (Horizontal High Band IF is stacked onto the Antenna M&C Coax)

ST24 US/DLA Systems require 2 ADE to BDE Coax Cables in addition to the Antenna M&C Coax.

ST24 DiSEqC System require 1 ADE to BDE Coax Cable in addition to the Antenna M&C Coax.

3.5. BDE Cables

3.5.1. DC Power Cable (All Models)

3.5.1.1. Supply to GACP

Route the DC Power cable assembly from the Vessel Power Source to the GACP mounting location.

3.5.1.2. Supply to Optional Power Switch

Perform the following step only if installing the optional power switch.

Route the DC Power cable assembly from the Vessel Power Source to the Optional Power Switch mounting location.

Continue routing the remaining wires from the Optional Power Switch mounting location to the GACP mounting location.

3.5.2. ST24 US/DLA/AUSSAT:

3.5.2.1. Multiswitch to Receiver(s)

Route the receiver IF coaxes from the Multiswitch mounting location to each of the receivers on the network. Leave about 4 inches (10cm) of coax extending out each mounting location.

3.5.2.2. Receiver(s) to Television(s)

Route the appropriate Audio/Visual cables from each Television mounting location to each of the receivers mounting locations.

3.5.3. ST24 DiSEqC:

3.5.3.1. Multiswitch to DiSEqC Switch(es)

Route the receiver IF coaxes from the Multiswitch mounting location to each of the DiSEqC switch mounting locations of the network. Leave about 4 inches (10cm) of coax extending out each mounting location.

3.5.3.2. DiSEqC Switch(es) to Receiver(s)

Route the receiver IF coaxes from DiSEqC switch mounting locations to each of the Receiver mounting locations on the network. Leave about 4 inches (10cm) of coax extending out each mounting location.

3.5.3.3. Master DiSEqC Switch to GACP

Route the RS-232 Serial Cable from Master DiSEqC switch mounting locations to the GACP mounting location. Leave about 4 inches (10cm) of coax extending out each mounting location.

3.5.3.4. Receiver(s) to Television(s)

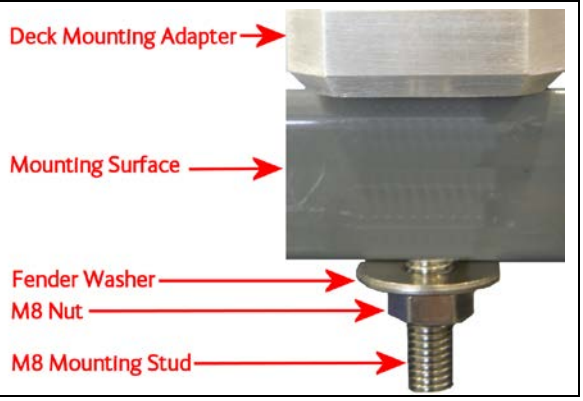
Route the appropriate Audio/Visual cables from each Television mounting location to each of the receivers mounting locations.

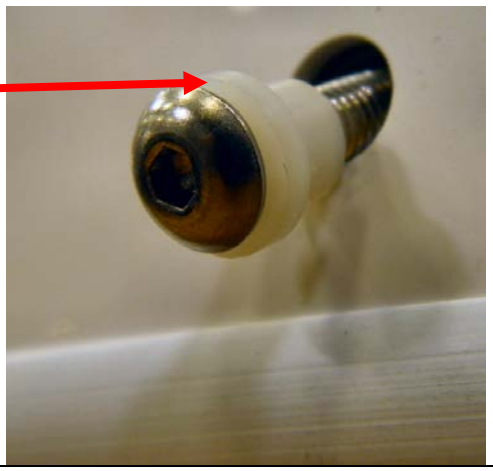
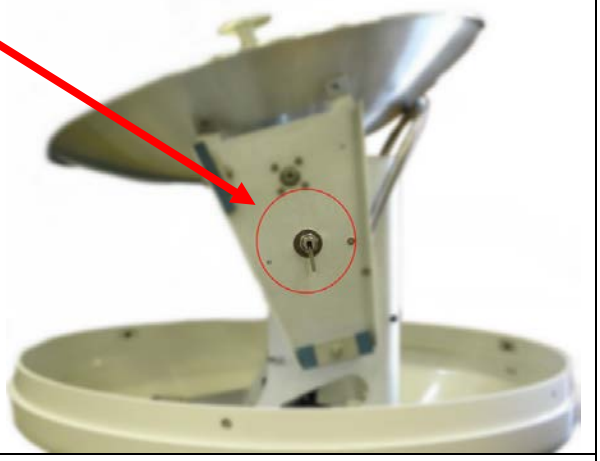
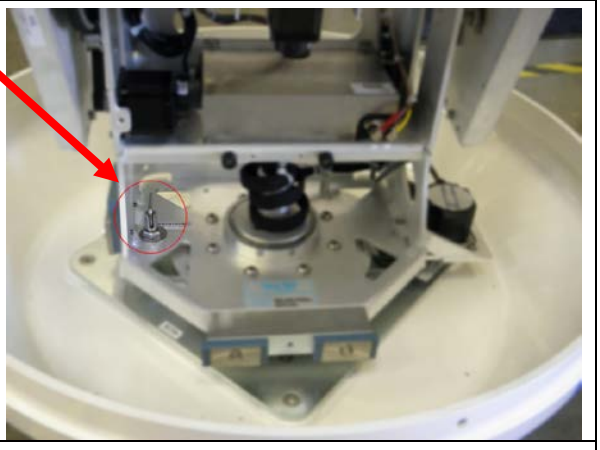
3.5.4. ST24 Euro:

3.5.4.1. Multiswitch to Receiver(s)

Route the receiver IF coaxes from the Multiswitch mounting location to each of the receivers on the network. Leave about 4 inches (10cm) of coax extending out each mounting location.

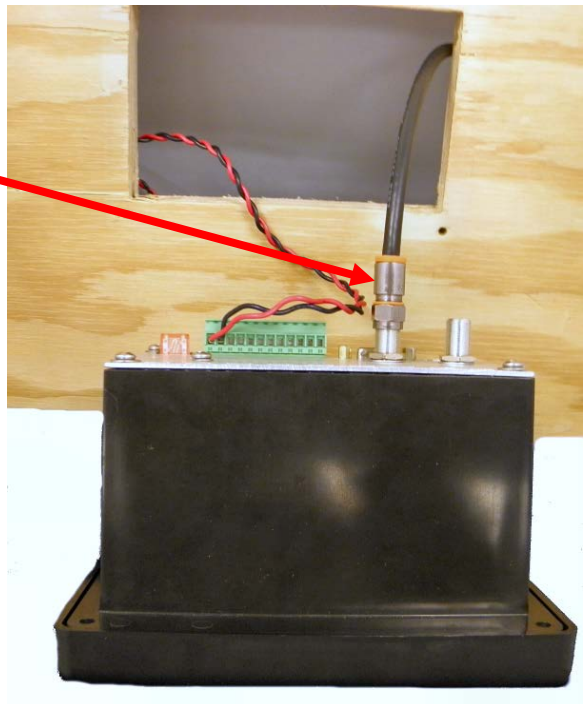
3.6. Antenna/Radome Installation

Connect and secure the Antenna M&C Coax to the M&C connector (Black Heat Shrink) at the base of the radome. Referring to the System Block Diagram for color code callouts, connect and secure the IF Coaxes from below decks to the connector bracket at the base of the radome.	
Apply Loctite™ thread locker to the four M8 Mounting Studs. Using the provided L-Key, install and secure the studs onto the deck mounting adapters located at the base of the radome.	
Carefully place radome onto mounting location, be careful not to pinch coaxes in between radome and mounting surface.	
From below the mounting surface, apply Loctite thread locker to the four M8 mounting studs. Install the fender washers and the M8 nut and Torque to 15 N-m. **NOTE: Graphic to the right is shown with the radome mounting pad (normally installed flush with mounting adapter) removed for clarity.**	

Using a 3mm Allen Wrench, remove the hardware that secures radome top to radome base. ***Use caution as to not lose the mounting inserts.***	
Locate and disengage the Elevation Stowage lock. Refer to the Maintenance section of this manual for complete procedures to stow and un-stow your antenna.	
Locate and disengage the Azimuth Stowage lock. Refer to the Maintenance section of this manual for complete procedures to stow and un-stow your antenna.	
Perform range of motion check on antenna. Verify free range in Azimuth, Elevation and Polarization drive.	

3.7. Graphic Antenna Control Panel

Label, Connect, and Secure the Antenna M&C Coax (from Above Decks) to the RF In port of the GACP.



Connect NMEA 0183 heading input

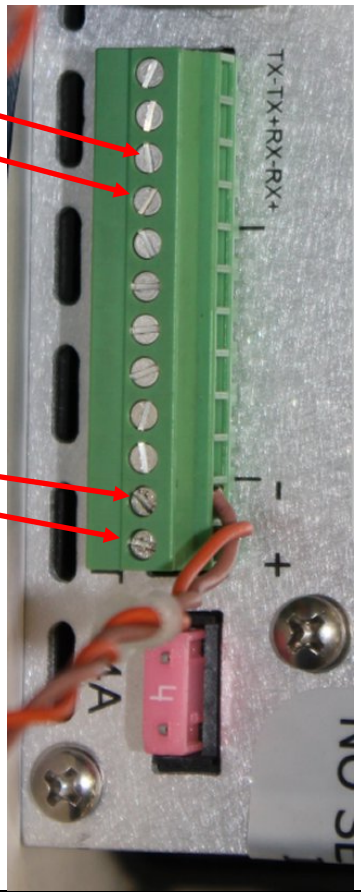
Gyro NMEA - output to RX-

Gyro NMEA + output to RX+

Connect and secure the DC Power Cable Assembly or the optional DC Power Switch Cable Assembly onto the "BATT" connector of the GACP.

Ground to -

+10-30VDC to +



<table>
<tr><td colspan="2">Carefully remove GACP front lid to provide access to the four mounting holes.

Use caution as to not damage or pull out the “COM 0” interface harness that interconnects the display module PCB to the controller PCB.</td></tr>
<tr><td>Carefully install the GACP into the mounting location while placing the excess cables into the void of the mounting location and secure using 4 self tapping screws.</td><td>  </td></tr>
<tr><td>Reinstall the GACP front lid to the enclosure.</td><td>  </td></tr>
</table>

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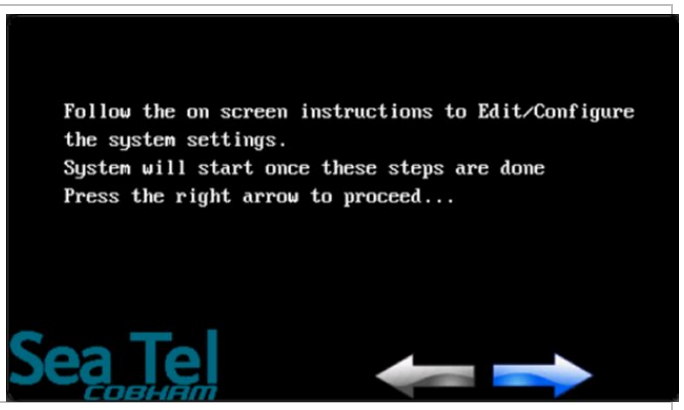
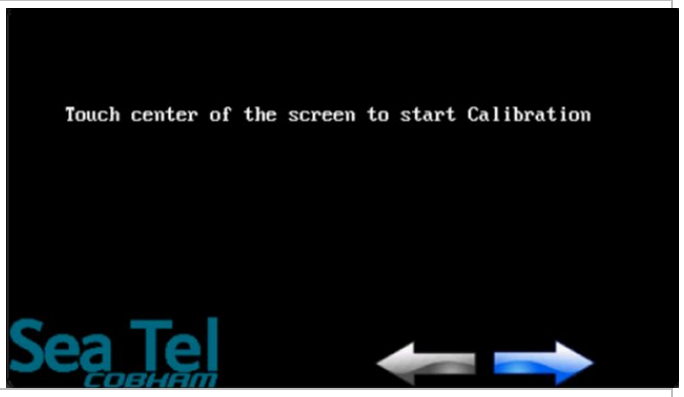
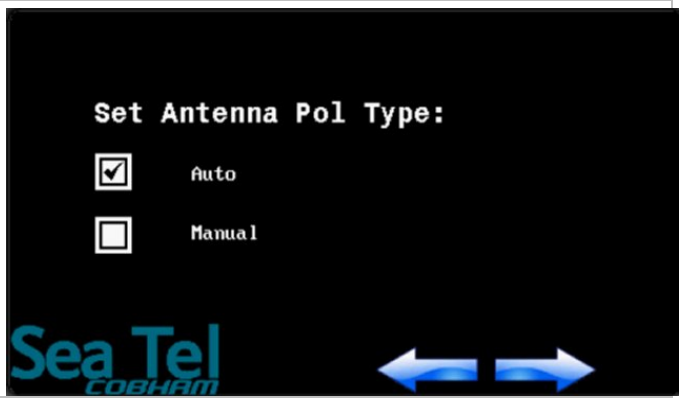
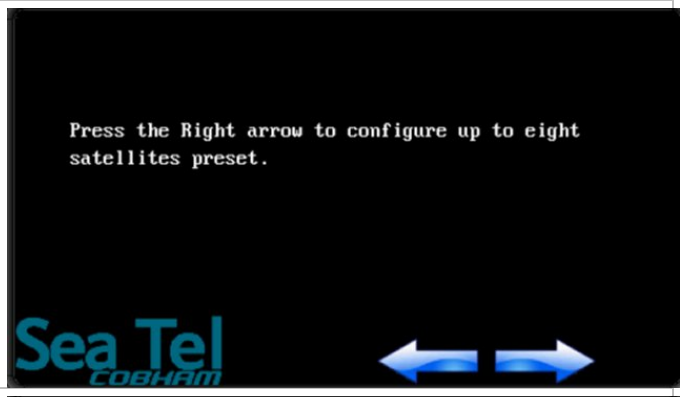
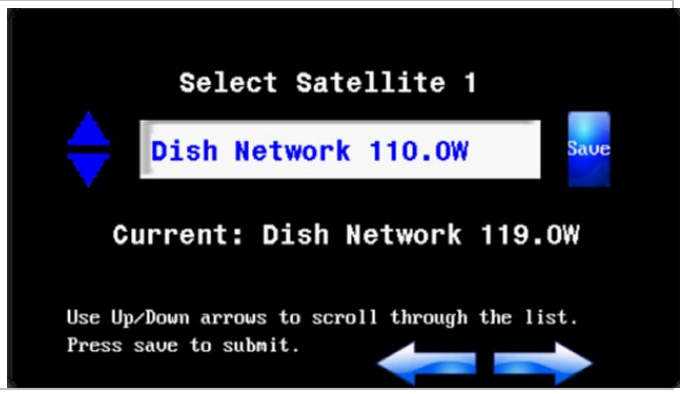
4. Setup

As a part of initial commissioning of the ST24 you will be required to configure and optimize the system to the clients specific needs. An easy to use Setup Wizard will aid in this configuration process. Use the below procedures and flowcharts as a guide to accomplish these tasks.

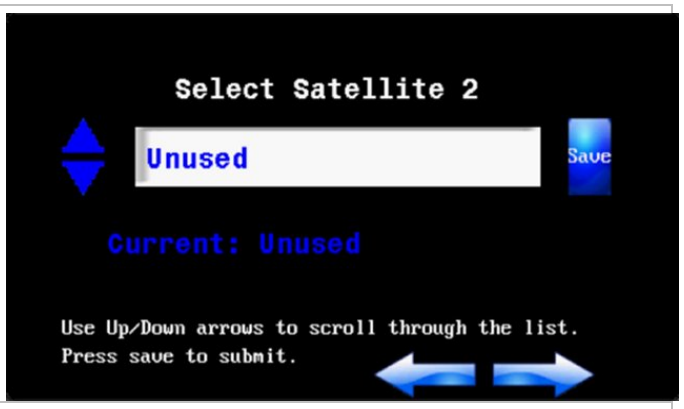
4.1. Setup Wizard

When the system is turned on for the first time, the user will be prompted to configure the ST24 Antenna System for operation via an easy 6 step setup wizard. Otherwise, this setup wizard is accessible on page two of the Antenna's Advanced Options menu.

1. When prompted press the right arrow to begin the setup Wizard.	
2. If desired, press in the middle of the screen to calibrate the touch screen panel. Press the right arrow to skip this step.	
3. Select the Antenna's Polarization type, choose Auto if your feed assembly is fitted with a drive motor otherwise choose Manual.	

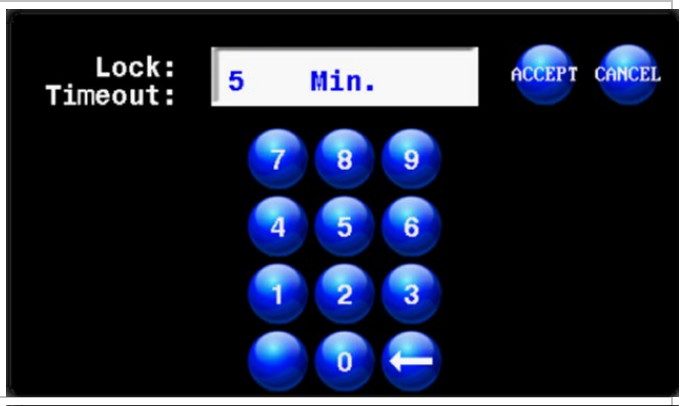
4. Select the satellite switching mode. Choose to Active to enabled DiSEqC based satellite switching or choose Inactive for manual satellite switching mode. NOTE: DiSEqC switches and compatible EchoStar based receivers are required in order to run in Active mode.	
5. Skip to the next step if you have selected "Inactive" in the previous screen) Select the amount of satellites required as specified by your service provider.	
6. Press the Right Arrow to begin the Satellite Preset selection process. The chosen presets will be displayed on the Satellite Target, Edit, and View menus. If you are operating a DiSEqC based system, you will need to know how many satellites are required before continuing. Refer to your EchoStar Receiver owner's manual for detailed information on how to perform a check switch test.	
7. Using the Up and/or Down Arrows, cycle through the available list of preset satellites until your desired satellite is displayed the press save to submit. Press the right arrow to move to the next preset.	

8. Using the same procedure in step 7, select and save your desired satellite for presets 2-6. If no additional satellite presets are required set to Unused.

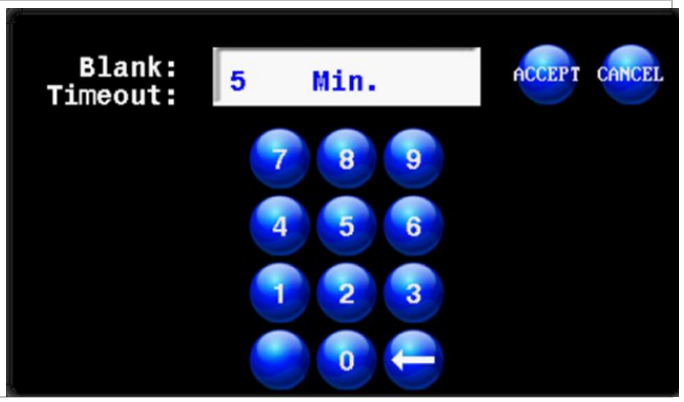


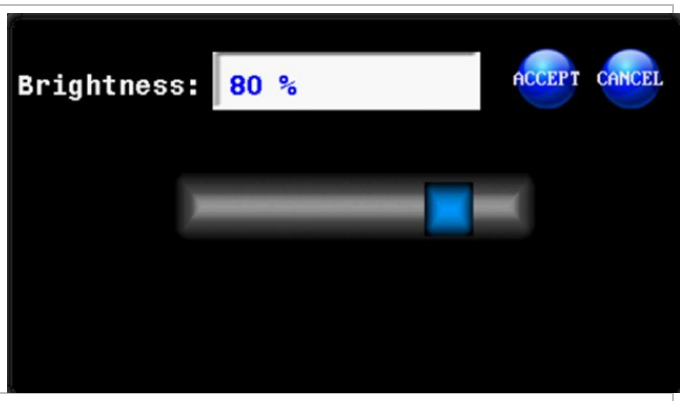
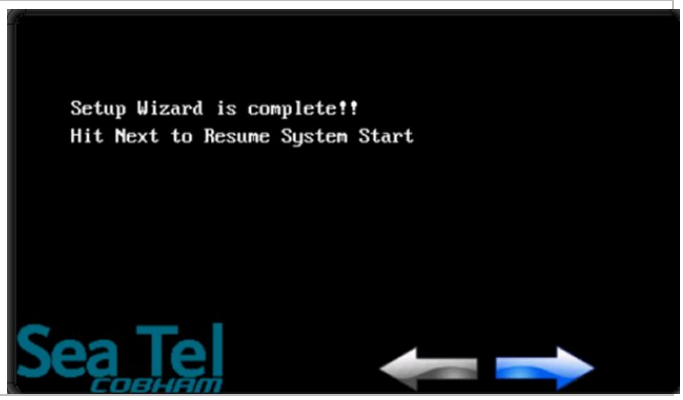
9. Select a text line to enter/edit the installing dealer contact information.
10. Repeat as required to enter/edit lines 2-4.

11. Select the Screen Lock Timeout parameter to define in whole minutes when the panel will go into a Panel Lock Mode. Set to 0 to prevent the panel from automatically locking.



12. Select the Screen Blank Timeout parameter to define in whole minutes when the panel will go into Blank Mode. This is the amount of time from when the lock screen is displayed until the panel goes blank. If the Screen Lock Timeout parameter is set to 0, the panel will not blank until after the panel is manually locked. Set to 0 to prevent the panel from automatically blanking.



13. Select the Screen Brightness Control to adjust the screen brightness.	
14. Select the Time Zone Selection parameter to define the vessels current GMT time zone offset.	
15. After all the Panel Settings Parameters have been defined press the Right Arrow.	
16. Press the Right Arrow to confirm the completion of the Setup Wizard and save to memory.	

5. Operation

This section provides you with information about the menu displays of the GACP. Operation of your antenna system is accomplished through these screens.

5.1. Graphic Antenna Control Panel

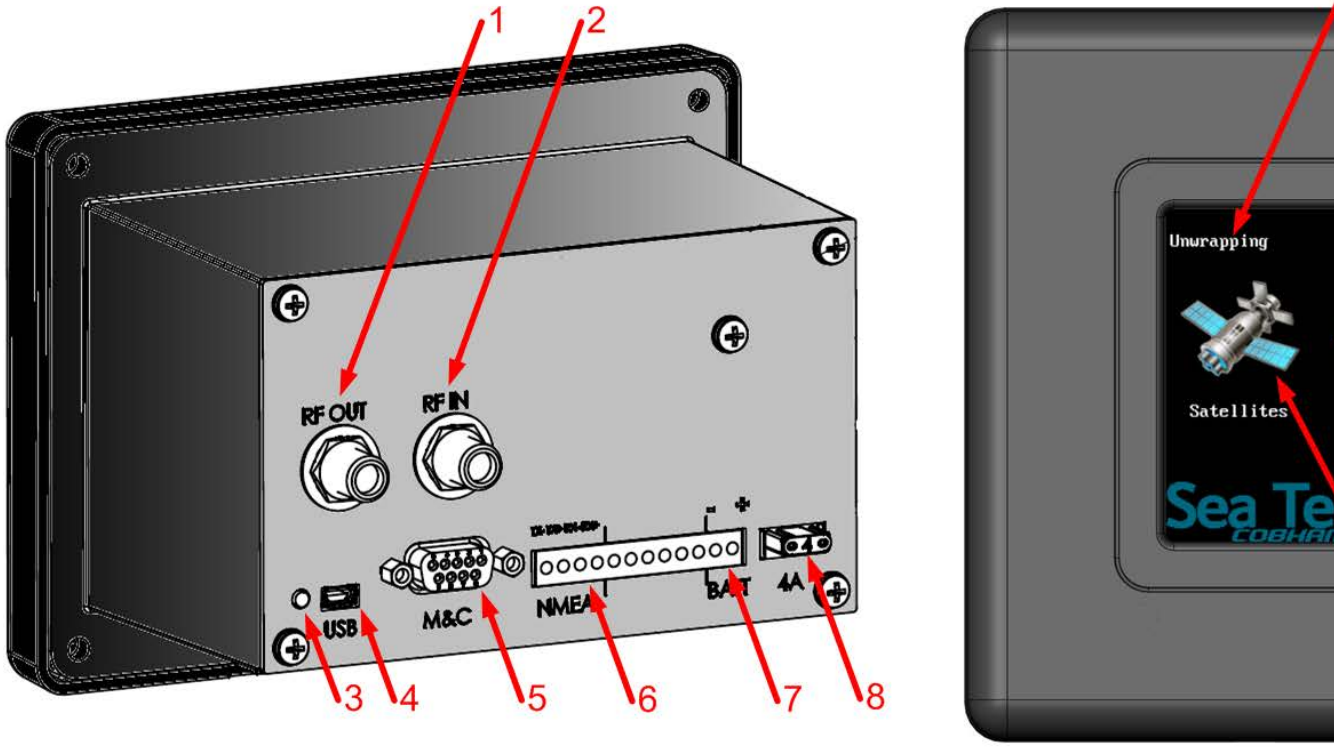
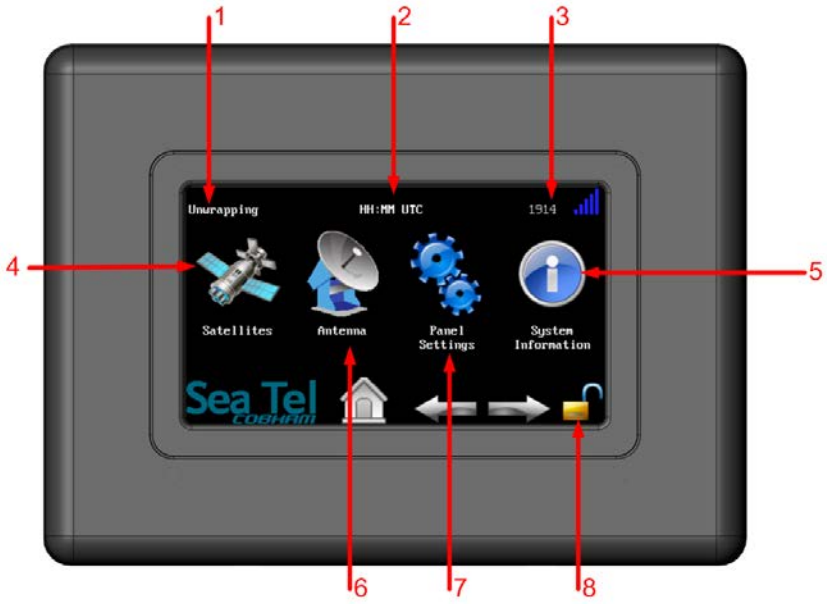


Figure 4 GACP

#	Description	Function
1.	RF output Port	Not used
2.	RF Input Port	Antenna M&C to/from Above Decks
3.	Status LED	ADE to BDE FSK communications status LED
4.	USB Port	Used to perform software updates to the ST24 GACP
5.	RS232 Antenna M&C Port	RS232 Serial M&C Port, used to perform software updates to the ST24 PCU, or as a communication port w/ a DiSEqC Switch
6.	Optional NMEA Interface Port	Future Use
7.	Battery Input Port	10-30VDC Supply input port
8.	Fuse	4 amp system fuse
9.	System Status	Rolling Text indicating current system status of: Initializing, Unwrap, Searching, Targeting, Identifying or Tracking.
10.	Time Stamp	Time Stamp, based on the on-board GPS antenna

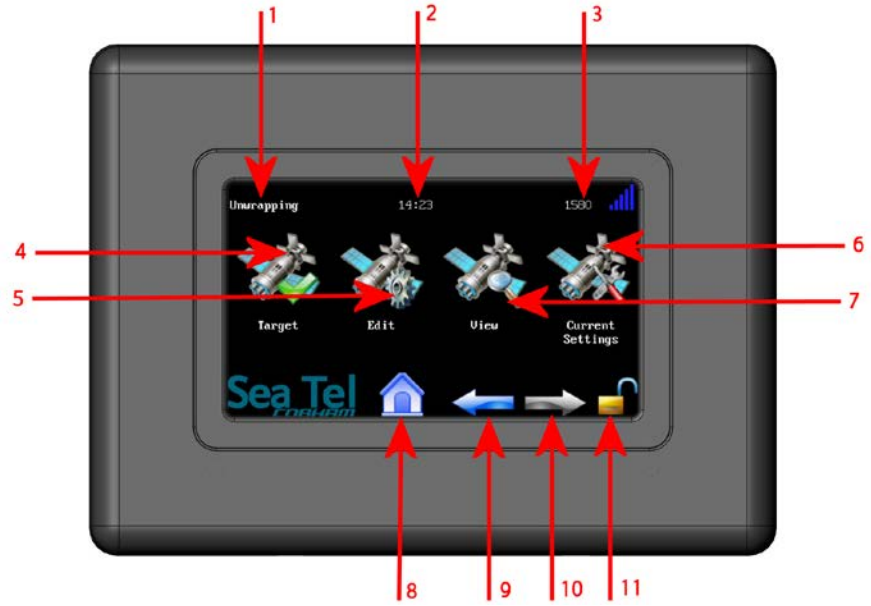
11.	AGC Signal Strength	Current system signal level
12.	Page Navigation	System menu navigational icons
13.	Panel Lock	Press to “Lock” the GACP interface.

5.2. GACP Home Page



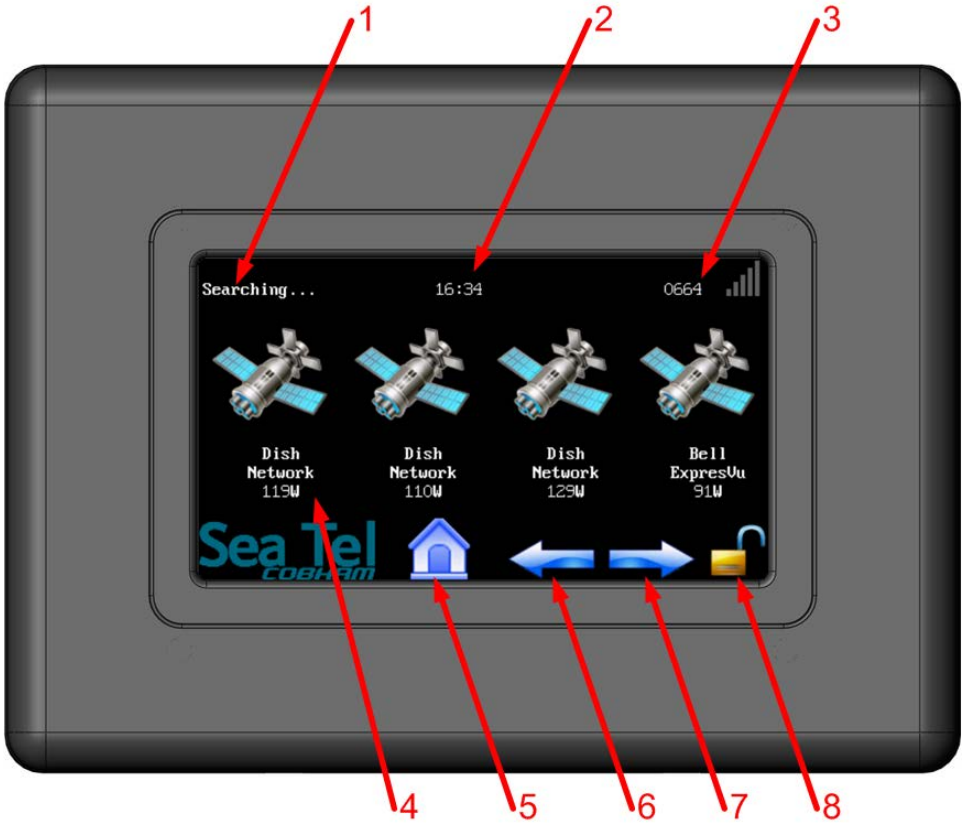
#	Description	Function
1.	System Status	Rolling text indicating the systems current status of: Initializing, Searching, Targeting, Tracking, Identifying or Unwrapping.
2.	Time Stamp	Current time stamp, based on the antenna's on–board GPS.
3.	AGC	System Signal Strength in AGC counts with visual signal bar.
4.	Satellites	Press to access the "Satellites" Main Menu Page.
5.	System Information	Press to access the "System Information" Main Menu Page.
6.	Antenna	Press to access the "Antenna" Main Menu Page 1.
7.	Panel Settings	Press to access the "Panel Settings" Main Menu Page.
8.	Panel Lock	Press to "Lock" the GACP interface.

5.3. Satellites Page



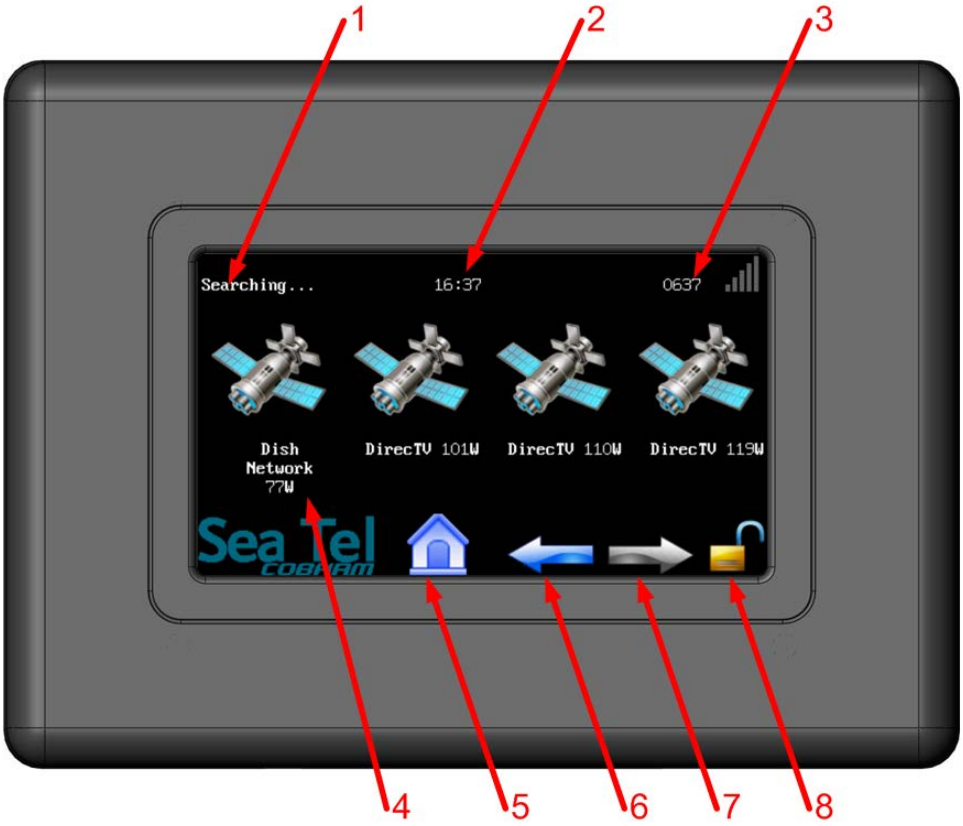
#	Description	Function
1.	System Status	Rolling text indicating the systems current status of: Initializing, Searching, Targeting, Tracking, Identifying or Unwrapping.
2.	Time Stamp	Current time stamp, based on the antennas on –board GPS.
3.	AGC	System Signal Strength in AGC counts with visual signal bar.
4.	Target	Click to access the Satellite Presets Target Page.
5.	Edit	Click to access the Satellite Presets Edit Page.
6.	Current Settings	Click to access the Current Settings Page.
7.	View	Click to access the Satellite Presets View Page.
8.	Home	Click to access the GACP Home Page.
9.	Back	Click to access the previous Page.
10.	Forward	Non-Functional in this screen.
11.	Panel Lock	Press to “Lock” the GACP interface.

5.3.1. Satellite Target Page 1



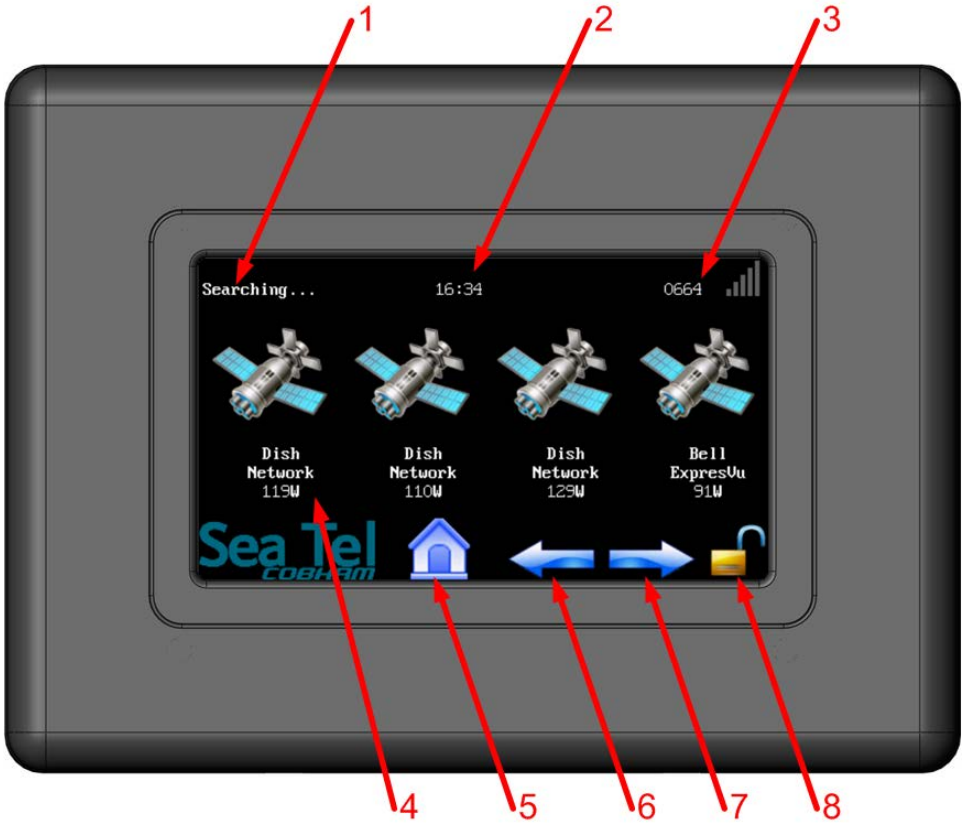
#	Description	Function
1.	System Status	Rolling text indicating the systems current status of: Initializing, Searching, Targeting, Identifying, Tracking, or Unwrapping.
2.	Time Stamp	Current time stamp, based on the antenna's on –board GPS.
3.	AGC	System Signal Strength in AGC counts with visual signal bar.
4.	Satellite Presets 1-4	Click Satellite Presets Icon to submit satellite parameters and target satellite.
5.	Home	Click to access the GACP Home Page.
6.	Back	Click to access the previous Page.
7.	Forward	Click to access the Satellite Target Page 2
8.	Panel Lock	Press to "Lock" the GACP interface.

5.3.2. Satellite Target Page 2



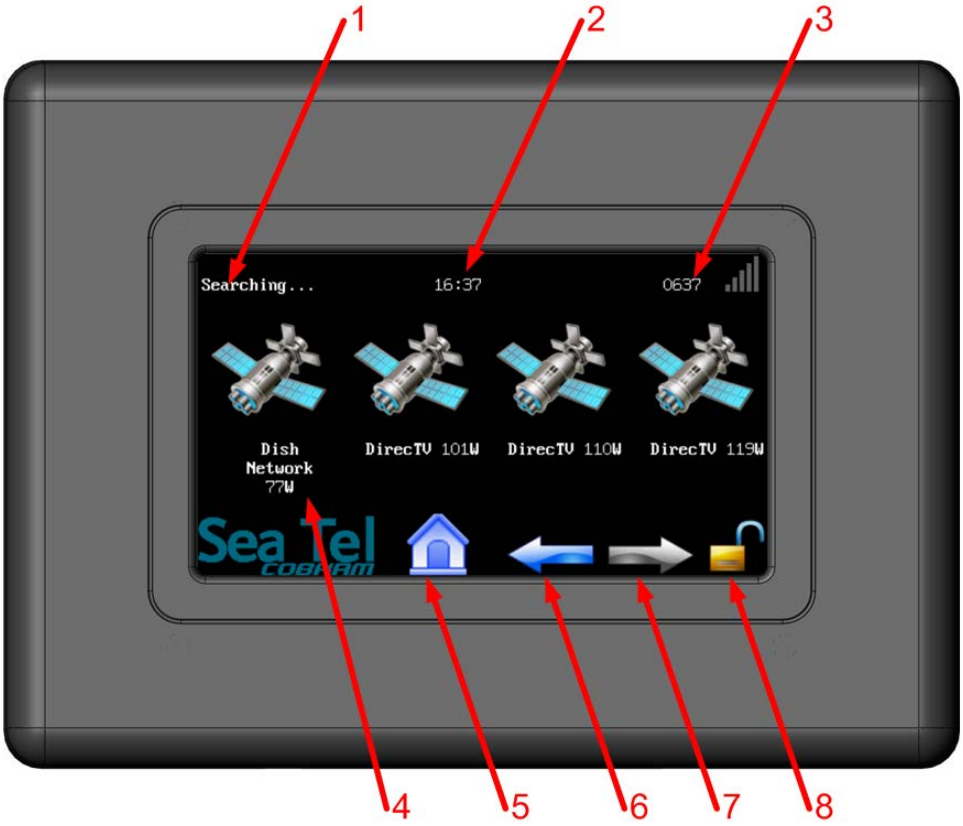
#	Description	Function
1.	System Status	Rolling text indicating the systems current status of: Initializing, Searching, Targeting, Identifying, Tracking, or Unwrapping.
2.	Time Stamp	Current time stamp, based on the antenna's on –board GPS.
3.	AGC	System Signal Strength in AGC counts with visual signal bar.
4.	Satellite Presets 5-8	Click Satellite Presets Icon to submit satellite parameters and target satellite.
5.	Home	Click to access the GACP Home Page.
6.	Back	Click to access the Satellite Presets Page 1.
7.	Forward	Non-Functional in this screen.
8.	Panel Lock	Press to "Lock" the GACP interface.

5.3.3. Satellite Edit Page 1



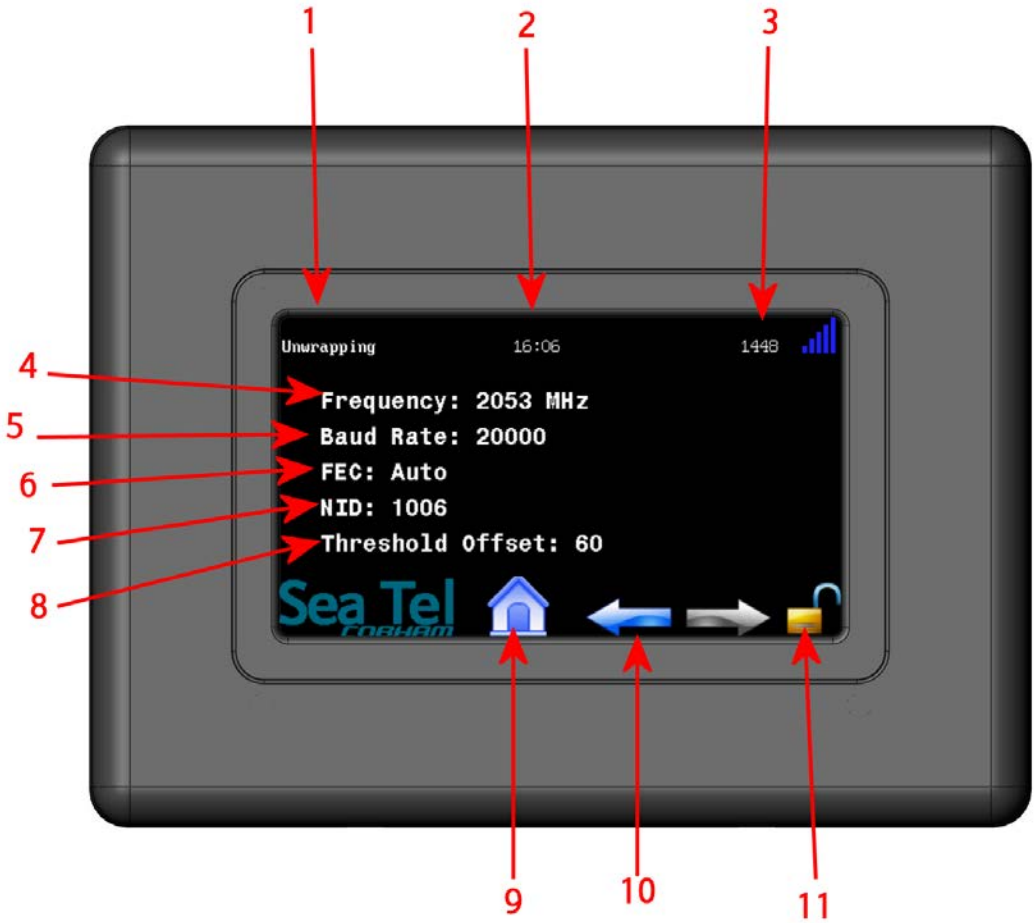
#	Description	Function
1.	System Status	Rolling text indicating the systems current status of: Initializing, Searching, Targeting, Identifying, Tracking, or Unwrapping.
2.	Time Stamp	Current time stam, based on the antenna's on –board GPS.
3.	AGC	System Signal Strength in AGC counts with visual signal bar.
4.	Satellite Presets 1-4	Click Satellite Presets Icon to access and edit the parameters associated with that preset satellite.
5.	Home	Click to access the GACP Home Page.
6.	Back	Click to access the previous Page.
7.	Forward	Click to access the Satellite Edit Page 2.
8.	Panel Lock	Press to "Lock" the GACP interface.

5.3.4. Satellite Edit Page 2



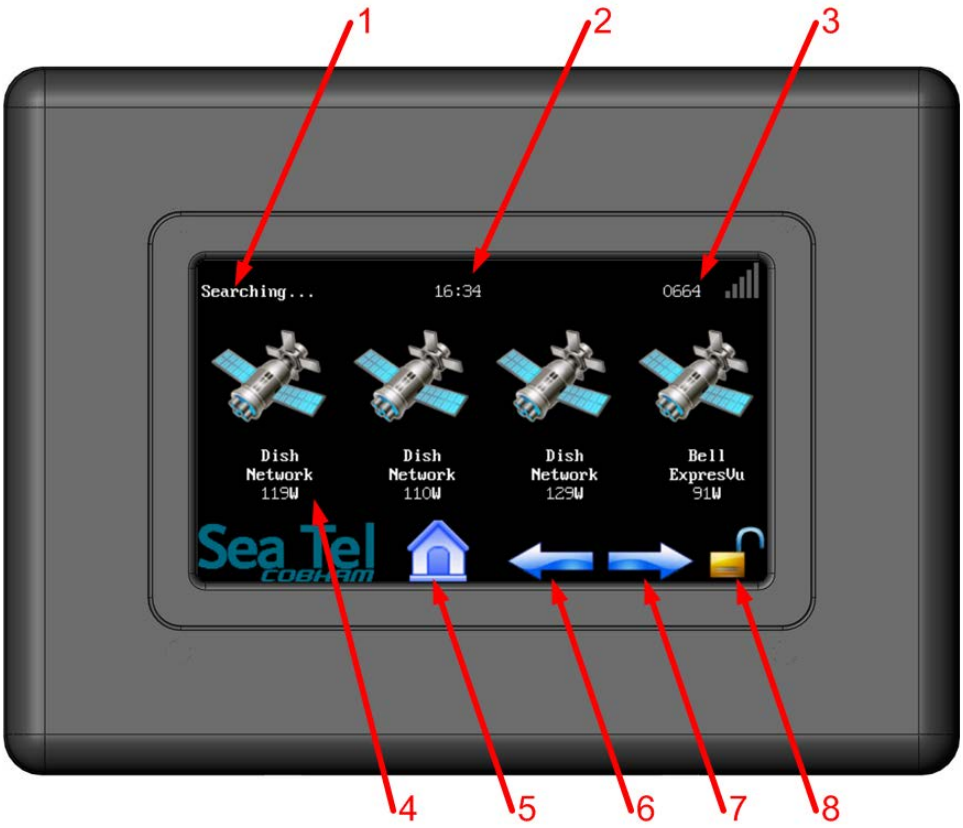
#	Description	Function
1.	System Status	Rolling text indicating the systems current status of: Initializing, Searching, Targeting, Tracking, or Unwrapping.
2.	Time Stamp	Current time stamp in UTC, based on the antenna's on –board GPS.
3.	AGC	System Signal Strength in AGC counts with visual signal bar.
4.	Satellite Presets 5-8	Click Satellite Presets Icon to access and edit the parameters associated with that preset satellite.
5.	Home	Click to access the GACP Home Page.
6.	Back	Click to access the Satellite Presets Page 1.
7.	Forward	Non-Functional in this screen.
8.	Panel Lock	Press to "Lock" the GACP interface.

5.3.1. Satellite Preset Edit Page



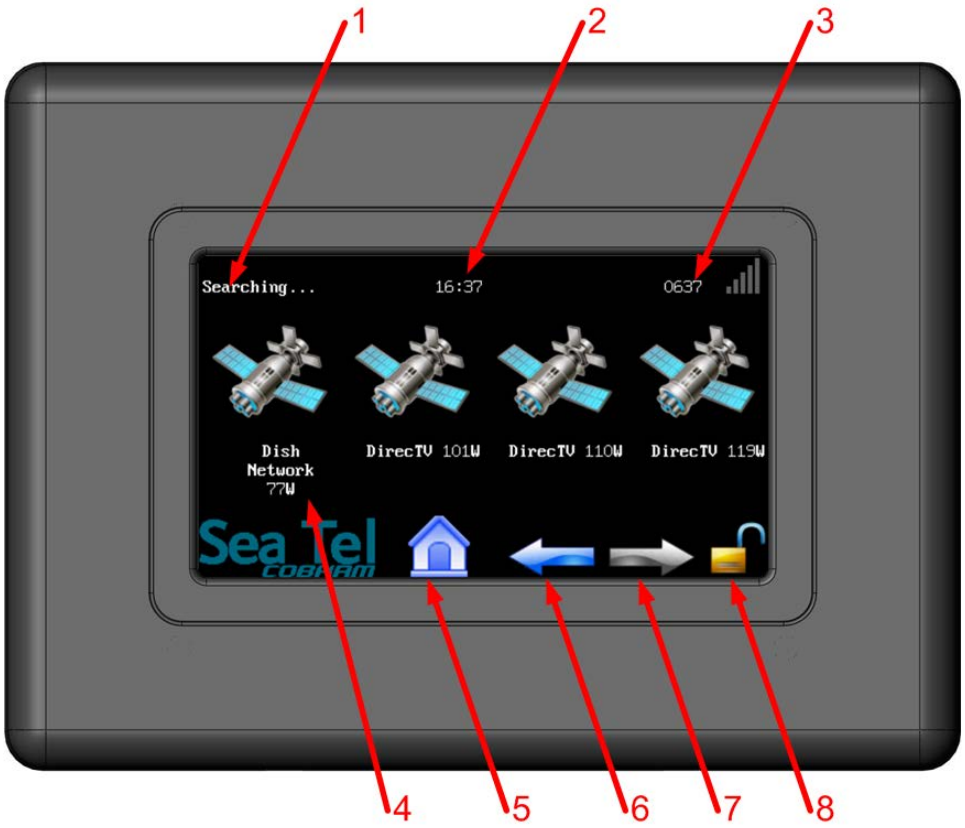
#	Description	Function
1.	System Status	Rolling text indicating the systems current status of: Initializing, Searching, Targeting, Tracking, or Unwrapping.
2.	Time Stamp	Current time stamp in UTC, based on the antenna's on –board GPS.
3.	AGC	System Signal Strength in AGC counts with visual signal bar.
4.	Frequency	Click to edit the tracking receivers tuning frequency in MHz
5.	Baud Rate	Click to edit the tracking receivers Baud Rate
6.	FEC	Click to edit the tracking receivers Forward Error Correction Rate
7.	NID	Click to edit the tracking receivers Hexadecimal Network ID
8.	Threshold Offset	Click to edit the Threshold offset for this satellite preset. **This parameter is used to calculate the Threshold value**
9	Home	Click to access the GACP Home Page.
10	Back	Click to access the previous page.
11	Panel Lock	Press to "Lock" the GACP interface.

5.3.2. Satellite View Page 1



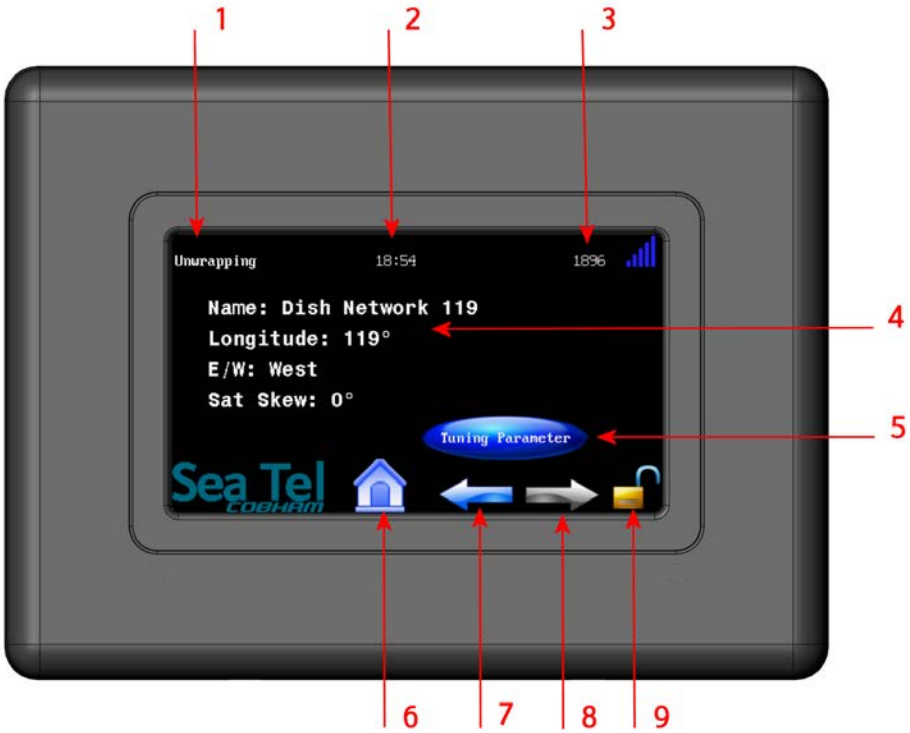
#	Description	Function
1.	System Status	Rolling text indicating the systems current status of: Initializing, Searching, Targeting, Identifying, Tracking, or Unwrapping.
2.	Time Stamp	Current time stamp, based on the antenna's on –board GPS.
3.	AGC	System Signal Strength in AGC counts with visual signal bar.
4.	Satellite Presets 1-4	Click Satellite Presets Icon to access and view the parameters associated with that preset satellite.
5.	Home	Click to access the GACP Home Page.
6.	Back	Click to access the previous Page.
7.	Forward	Click to access the Satellite Edit Page 2.
8.	Panel Lock	Press to "Lock" the GACP interface.

5.3.3. Satellite View Page 2



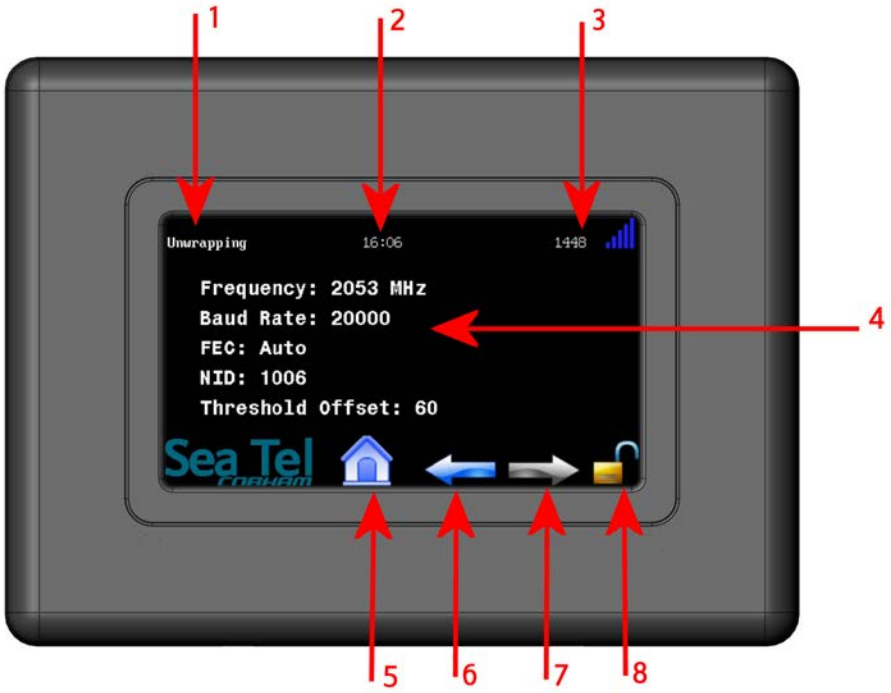
#	Description	Function
1.	System Status	Rolling text indicating the systems current status of: Initializing, Searching, Targeting, Identifying, Tracking, or Unwrapping.
2.	Time Stamp	Current time stamp, based on the antennas on –board GPS.
3.	AGC	System Signal Strength in AGC counts with visual signal bar.
4.	Satellite Presets 5-8	Click Satellite Presets Icon to access and view the parameters associated with that preset satellite.
5.	Home	Click to access the GACP Home Page.
6.	Back	Click to access the Satellite Presets Page 1.
7.	Forward	Non-Functional in this screen.
8.	Panel Lock	Press to “Lock” the GACP interface.

5.4. Current Settings Page 1



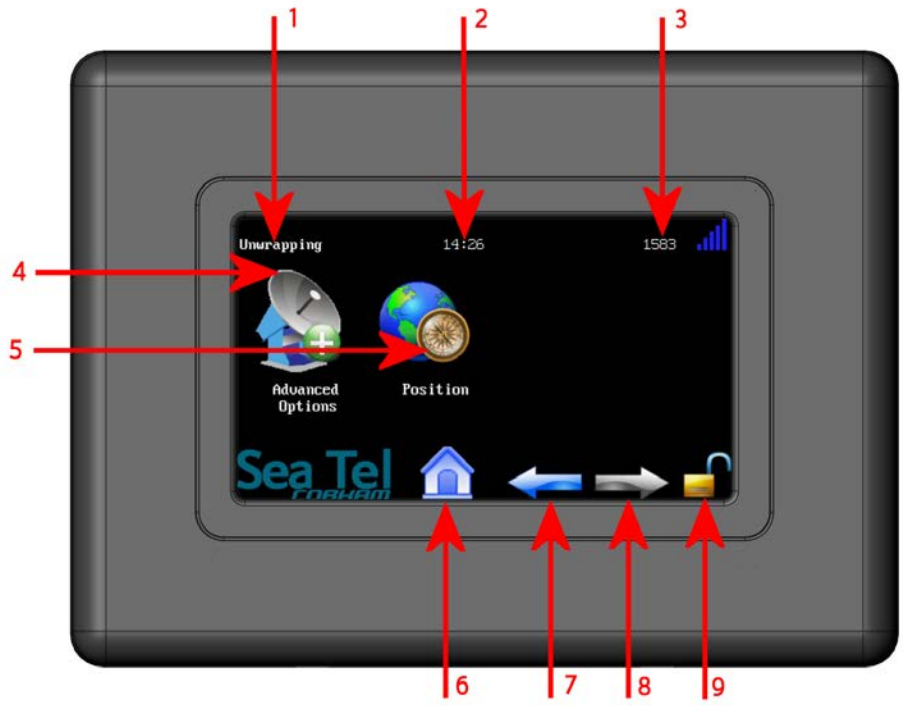
#	Description	Function
1.	System Status	Rolling text indicating the systems current status of: Initializing, Searching, Targeting, Identifying, Tracking, or Unwrapping.
2.	Time Stamp	Current time stamp, based on the antenna's on –board GPS.
3.	AGC	System Signal Strength in AGC counts with visual signal bar.
4.	Satellite Info	Read only display of current satellite in memory.
5.	Tuning Parameters	Click to view current tracking receiver.
6.	Home	Click to access the GACP Home Page.
7.	Back	Click to access the previous Page.
8.	Forward	Non-Functional in this screen.
9.	Panel Lock	Press to "Lock" the GACP interface.

5.4.1. Current Settings Page 2



#	Description	Function
1.	System Status	Rolling text indicating the systems current status of: Initializing, Searching, Targeting, Identifying, Tracking, or Unwrapping.
2.	Time Stamp	Current time stamp, based on the antennas on –board GPS.
3.	AGC	System Signal Strength in AGC counts with visual signal bar.
4.	Tuning Information	Read only display of current tracking receiver settings in memory.
5.	Home	Click to access the GACP Home Page.
6.	Back	Click to access the previous Page.
7.	Forward	Non-Functional in this screen.
8.	Panel Lock	Press to "Lock" the GACP interface.

5.5. Antenna Page

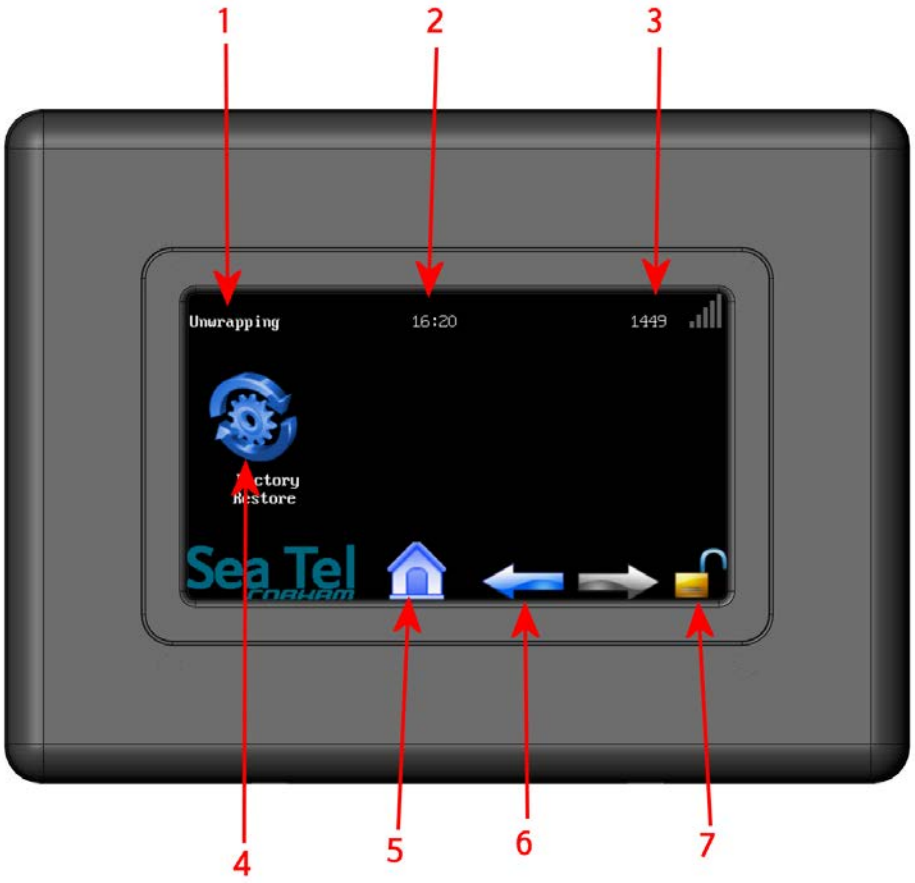


#	Description	Function
1.	System Status	Rolling text indicating the systems current status of: Initializing, Searching, Targeting, Identifying, Tracking, or Unwrapping.
2.	Time Stamp	Current time stamp, based on the antenna's on –board GPS.
3.	AGC	System Signal Strength in AGC counts with visual signal bar.
4.	Advanced Options	Click to access the Advanced Options Page.
5.	Position	Click to access the Manual GPS Entry Page.
6.	Home	Click to access the GACP Home Page.
7.	Back	Click to access the previous Page.
8.	Forward	Non-Functional in this screen.
9.	Panel Lock	Click to "Lock" the GACP interface.

5.5.1. Antenna Advanced Options Page 1

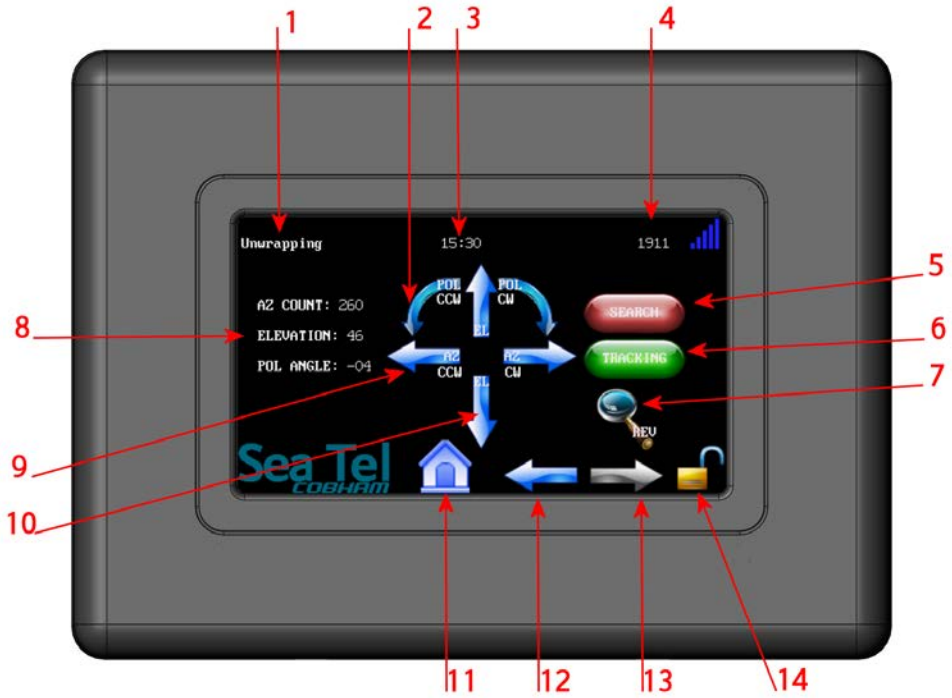
#	Description	Function
1.	System Status	Rolling text indicating the systems current status of: Initializing, Searching, Targeting, Identifying, Tracking, or Unwrapping.
2.	Time Stamp	Current time stamp, based on the antennas on –board GPS.
3.	AGC	System Signal Strength in AGC counts with visual signal bar.
4.	GPS Status	Click to access the GPS Status Page.
5.	Home	Click to access the GACP Home Page.
6.	Manual Control	Click to access the Manual Control Main Menu Page.
7.	Back	Click to access the previous page.
8.	System Test	Click to access the System Test Main Menu Page.
9.	Forward	Click to access the Advanced Settings Page 2.
10.	Setup Wizard	Click to start the interactive setup wizard.
11	Auto Threshold Offset	Click to “Lock” the GACP interface.

5.5.2. Antenna Advanced Options Page 2



#	Description	Function
1.	System Status	Rolling text indicating the systems current status of: Initializing, Searching, Targeting, Identifying, Tracking, or Unwrapping.
2.	Time Stamp	Current time stamp, based on the antennas on –board GPS.
3.	AGC	System Signal Strength in AGC counts with visual signal bar.
4.	Factory Restore	Click to restore all system settings to factory default.
5.	Home	Click to access the GACP Home Page.
6.	Back	Click to access the previous page.
7.	Panel Lock	Press to “Lock” the GACP interface.

5.5.2.1. Manual Control Page

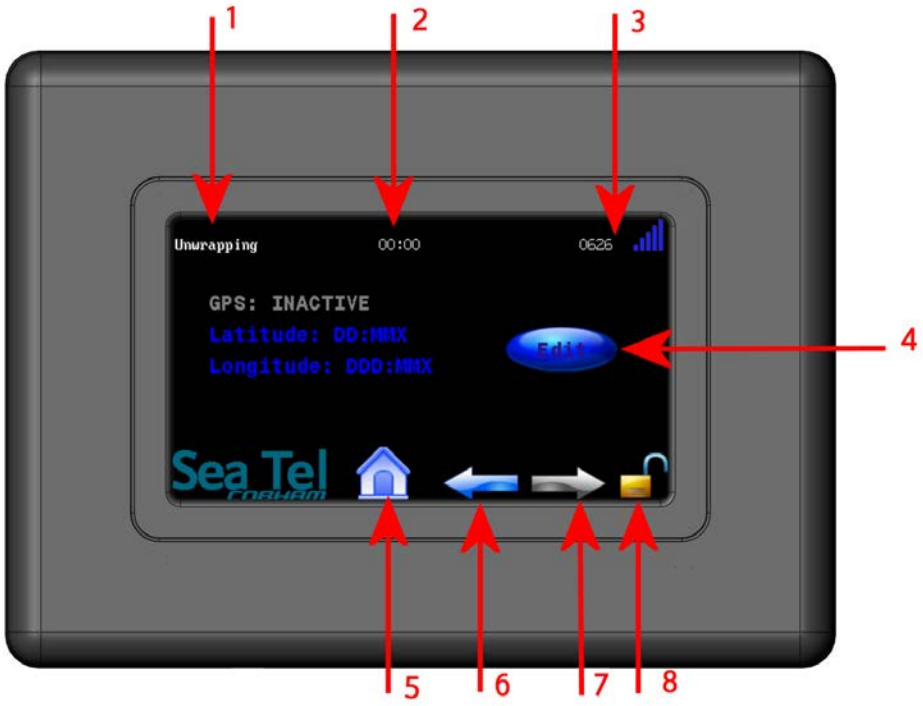


#	Description	Function
1.	System Status	Rolling text indicating the systems current status of: Initializing, Searching, Targeting, Identifying, Tracking, or Unwrapping.
2.	POL	Click to drive feed assembly (Polang) CW or CCW.
3.	Time Stamp	Current time stamp, based on the antennas on –board GPS.
4.	AGC	System Signal Strength in AGC counts with visual signal bar.
5.	Search	Click to initiate a linear azimuth sweep search pattern.
6.	Tracking	Click to toggle tracking state.
7.	Rev	Click to “reverse” drive direction of current search pattern
8.	Azimuth, Elevation, Polang	Azimuth, Elevation, and Polarization Readout
9	Az	Click to drive antenna in azimuth one whole degree.
10	El	Click to drive antenna in elevation one whole degree.
11	Home	Click to access the GACP Home Page.
12	Back	Click to access the previous Page.
13	Forward	Non-Functional in this screen.
14	Panel Lock	Press to “Lock” the GACP interface.

5.5.2.2. System Test Page

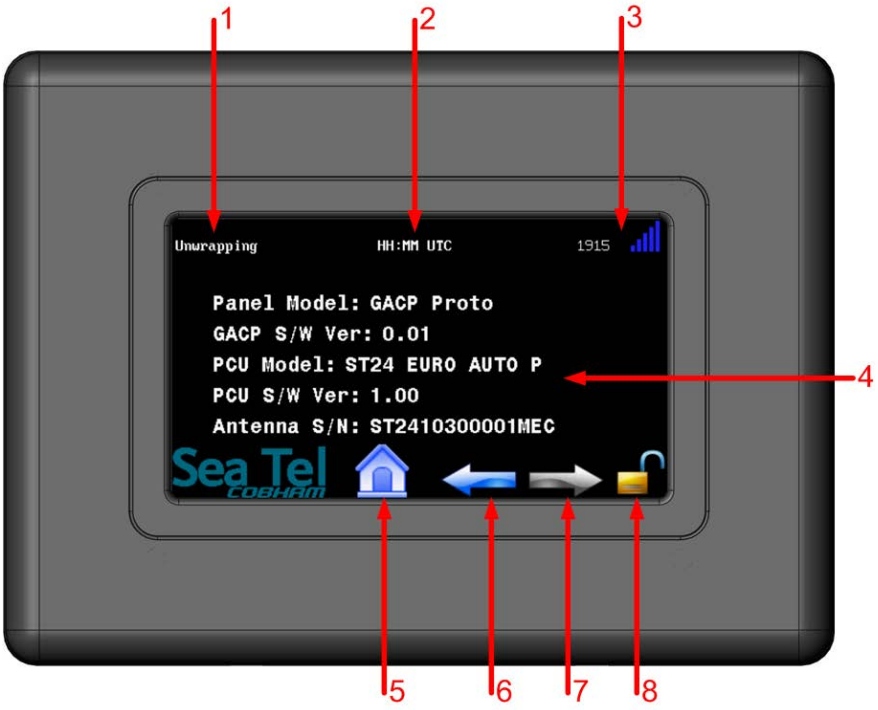
#	Description	Function
1.	System Status	Rolling text indicating the systems current status of: Initializing, Searching, Targeting, Identifying, Tracking, or Unwrapping.
2.	Time Stamp	Current time stamp, based on the antennas on –board GPS.
3.	AGC	System Signal Strength in AGC counts with visual signal bar.
4.	Power On Self Test Results	Click to access the results of the test performed during initialization of the PCU or GACP.
5.	In Service Test	Click to perform an “In Service System Test” of the PCU or GACP.
6.	Out of Service Test	Click to perform an “Out of Service System Test” of the PCU or GACP.
7.	Home	Click to access the GACP Home Page.
8.	Back	Click to access the previous Page.
9.	Forward	Non-Functional in this screen.
10.	Panel Lock	Press to “Lock” the GACP interface.

5.6. Position



#	Description	Function
1.	System Status	Rolling text indicating the systems current status of: Initializing, Searching, Targeting, Tracking, or Unwrapping.
2.	Time Stamp	Current time stamp in UTC, based on the antenna's on –board GPS.
3.	AGC	System Signal Strength in AGC counts with visual signal bar.
4.	Built-In GPS status	Displays whether or not the internal GPS is functional and active: • NOTE: A Non-Active GPS Status will allow manual entry of vessel location. Press on EDIT to enter edit mode.
5.	Home	Click to access the GACP Home Page.
6.	Back	Click to access the previous Page.
7.	Forward	Non-Functional in this screen.
8.	Panel Lock	Press to "Lock" the GACP interface.

5.7. System Information Page



#	Description	Function
1.	System Status	Rolling text indicating the systems current status of: Initializing, Searching, Targeting, Identifying, Tracking, or Unwrapping.
2.	Time Stamp	Current time stamp, based on the antennas on –board GPS.
3.	AGC	System Signal Strength in AGC counts with visual signal bar.
4.	System Information	Displays the: • GACP and PCU Model configuration(s) • GACP and PCU Software Versions • Antenna Serial Number
5.	Home	Click to access the GACP Home Page.
6.	Back	Click to access the previous Page.
7.	Forward	Non-Functional in this screen.
8.	Panel Lock	Press to “Lock” the GACP interface.

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6. Maintenance

6.1. Warranty Information

Sea Tel Inc. supports its ST24 Series systems with a warranty program unsurpassed in the industry. These systems are backed by a TWO YEAR full warranty on parts and a ONE YEAR warranty on labor.

What's Covered by the Limited Warranty?

The Sea Tel ST24 Series Limited Warranty is applicable for parts and labor coverage to the complete antenna system, including all above-decks equipment (radome, pedestal, antenna, motors, electronics, wiring, etc.) and the antenna control panel. It does not include television sets, DBS/DTH receivers, multi-switches or other distribution equipment, whether or not supplied by Sea Tel. Televisions, DBS/DTH receivers and accessories are covered by the applicable warranties of the respective manufacturers.

Factory refurbished components used to replace systems parts under this warranty are covered by this same warranty as the original equipment for the balance of the original warranty term, or six months from the date of replacement, whichever occurs last. Original Installation of the Coastal Series 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.

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

6.2. Who to contact for repairs

Should technical assistance be required to repair your system, the first contact should be to the agent/dealer you purchased the equipment from. Please record their contact information below for future reference. Repairs to your Coastal Series 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.

Agent/Dealer: _____

Address: _____

_____

Phone: _____ Fax: _____

Sea Tel can recommend local dealers that can provide service in your local area that can be contacted for assistance. You can contact us directly at either of the locations below;

Sea Tel, Inc.
4030 Nelson Avenue
Concord, CA 94520 USA
Tel: 925-798-7979
Fax: 925-798-7986
Toll Free: 1-888-798-7979
Email: satcom.concordsupport1@cobham.com
http://www.cobham.com/seatel

Sea Tel Europe
Unit 1 Orion Industrial Centre
Wide Lane Swaythling
Southampton, UK S018 2HJ
Tel: +44 (0)23 80 671155
Fax: +44 (0)23 80 671166
e-mail: satcom.southamptonsupport@cobham.com

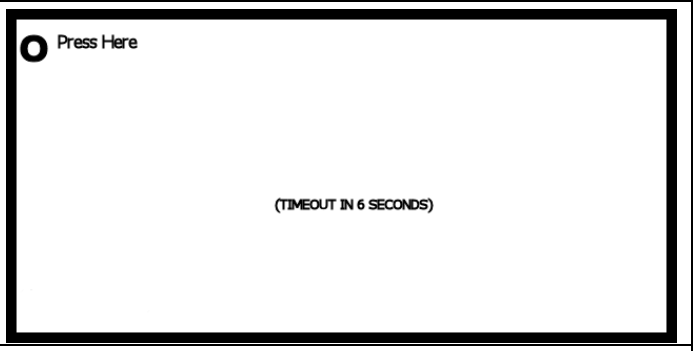
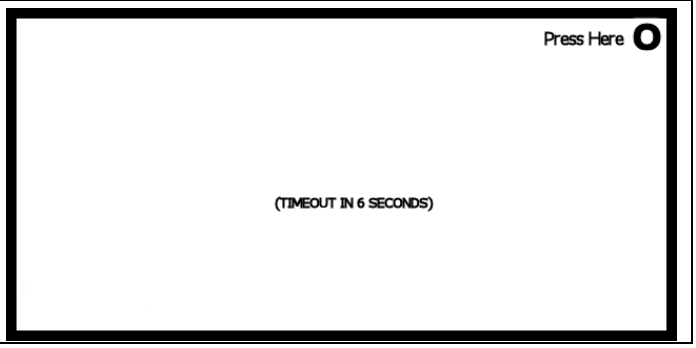
6.3. Preventive Maintenance

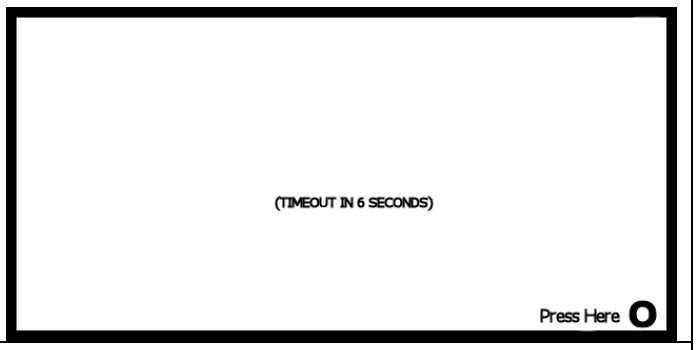
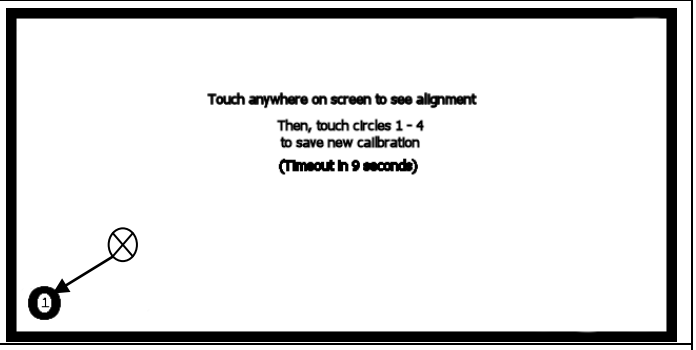
As needed - Clean the outside surface of the radome with warm soapy water to remove dust, grime and salt residue.

There is no other preventive maintenance required.

6.4. Touch Screen Calibration

If the icons on the GACP are non-responsive, it may require you to re-calibrate the touch screen itself. Use the following procedure.

Install a straight 9 wire serial cable from the GACP's M&C port to an available com port on a computer/laptop with Sea Tel Program Terminal (ProgTerm) Installed.	
If not already apply power to the GACP.	
Open up ProgTerm and select Coastal PCU to Panel Translation mode.	
In the main ProgTerm window, type in "&TC <ENTER>" That's a dollar sign ($) capital T (T), capital C (C) carriage return.	
Follow the on-screen instructions to calibrate screen.	
Press the circle located in the bottom left corner of screen.	
Press the circle located in the upper left corner of screen.	
Press the circle located in the top right corner of screen.	

Press the circle located in the bottom right corner of screen.	
Press on an area of the screen near circled number one and then continue to drag your finger towards the middle of the circle.	
Repeat for process for circles 2 -4.	
Verify display provides positive feedback that the new calibration has been saved.	
Once complete it is MANDATORY that you cycle DC power to the GACP.	
This completes the Screen Calibration Procedure and you may resume normal operation. If GACP Icons are still non-responsive contact your dealer.	

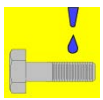
6.5. Fault Isolation/Trouble-shooting

The following table is provided to help isolate problems in the ST24 Series Antenna systems.

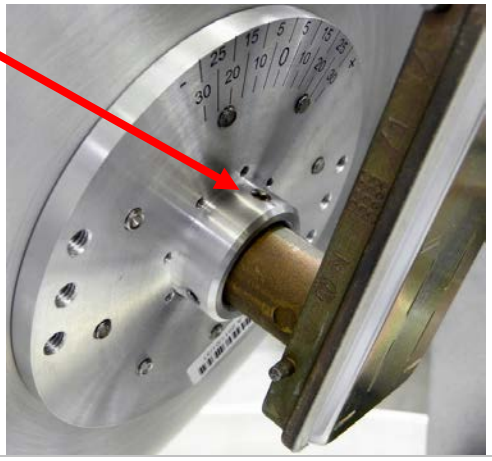
Symptom	*Possible Fault*
GACP icons are non responsive	Touch screen requires calibration. Refer to the "Touch Screen Calibration" procedure in the maintenance section of this manual.
Antenna tracking but receiver not providing desired programming	Incorrect satellite. Press the desired preset to search for the correct satellite. Receiver fault. Refer to receiver manual for operation and testing.
Antenna tracking, receiver only gets some desired channels	May be in weak area of footprint Receiver may not be generating correct voltage or tone output. Refer to receiver manual for operation and testing. Matrix switch may not be passing voltage or tone output from the receiver. Contact your dealer/agent. LNB assembly failure. Contact your dealer/agent.
Intermittent freeze-framing of picture	Check for blockage May be in weak area of footprint Receiver may not be generating correct voltage or tone output. Refer to receiver manual for operation and testing. Is matrix switch buzzing or clicking. Contact your dealer/agent. Check all coax cables for poor connection Possible receiver failure. Contact your dealer/agent. Possible antenna failure. Contact your dealer/agent.
Antenna does not come on when the ON Power is applied	Check +12 VDC input to GACP. Verify that all connections on the rear of the antenna control panel are properly seated. Check the 4A fuse in the rear panel of the antenna control panel Call dealer/agent for further assistance
Antenna doesn't track any satellites (constantly searching)	Assure that at least one receiver is ON Check for blockage Assure correct starting elevation May be out of satellite footprint Check all coax cables for poor connection Call dealer/agent for further assistance
Antenna in constant UNWRAP	Cycle antenna power OFF/ON to reinitialize the antenna. Call dealer/agent for further assistance
Antenna tracks well at the pier, but loses the satellite when underway	Call dealer/agent for further assistance
Antenna does not stay on satellite at pier, or underway	Check all coax cables for poor connection Call dealer/agent for further assistance

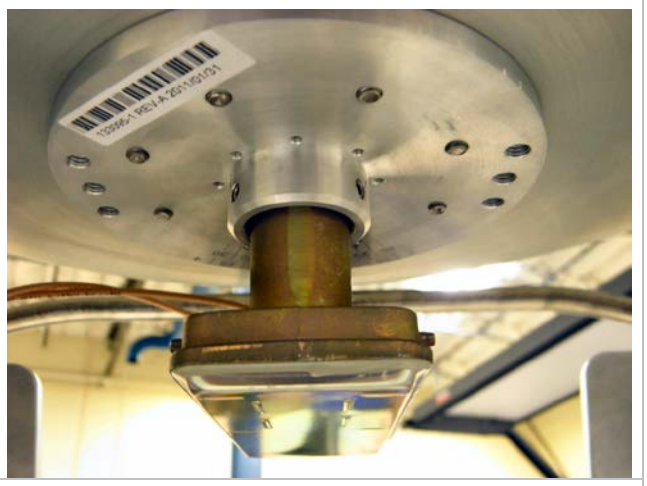
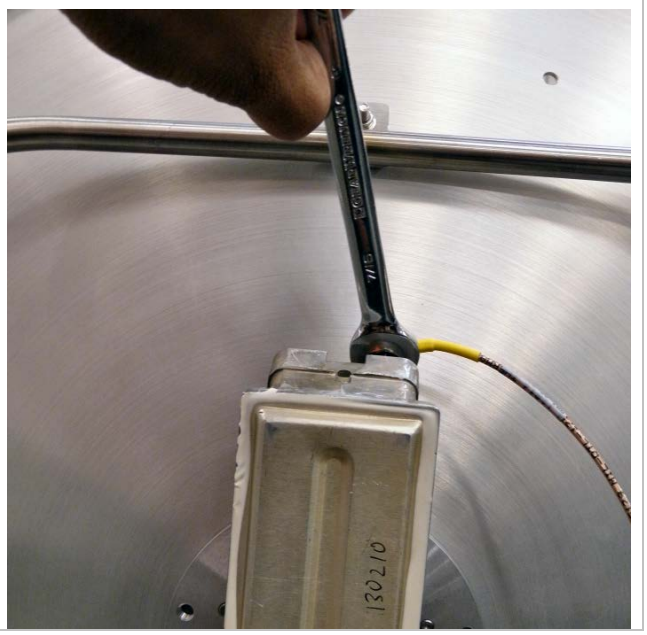
6.6. Replacing an LNB

Follow the procedure below to install and align a replacement Ku-Band circular receive LNB.



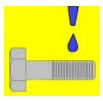
Unless otherwise noted, apply adhesive to all hardware per Sea Tel Specification Document 121730

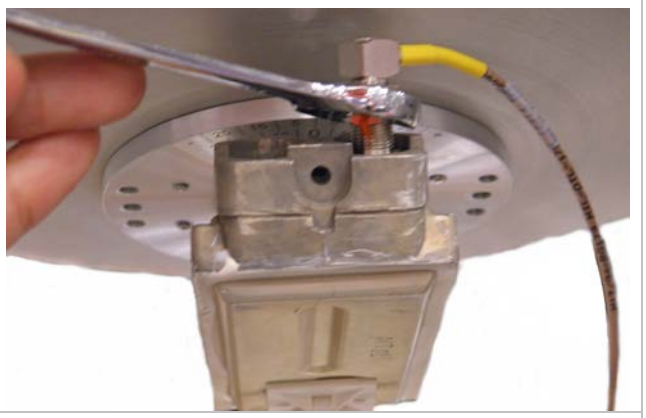
Turn the DC supply power Off to the GACP. Remove radome top. You may need to rotate the antenna to gain access the back of the reflector.	
Using a 7/16" Wrench, remove the Coax(es) connected to the LNB.	
Using an Allen Wrench, loosen the three set screws used to secure the LNB to mounting cuff. Remove LNB and place aside.	

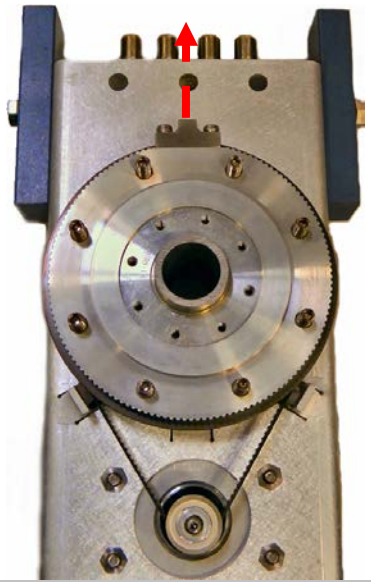
Install replacement LNB into mounting collar as close to the orientation prior to removal and then tighten down the set screws loosened earlier.	
Reconnect and secure coax(es) removed earlier.	

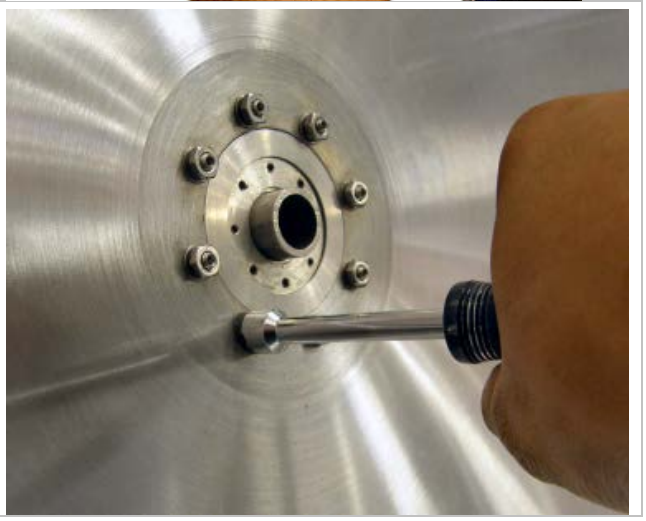
6.7. Manual Pol to AutoPol Conversion Procedure

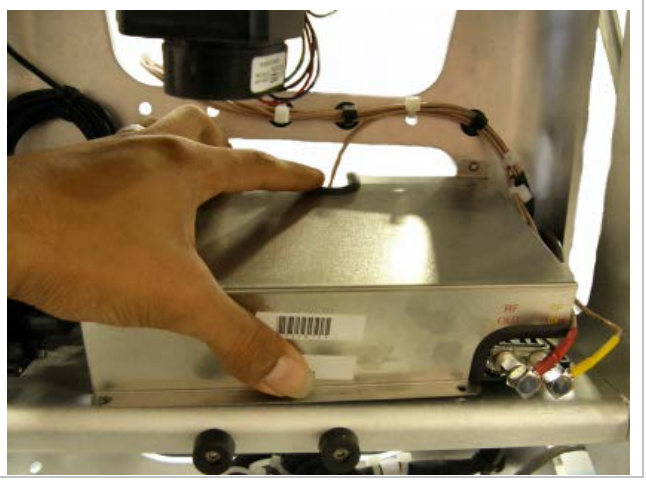
Follow the procedure below to retrofit an existing ST24 with a Ku-Band Manual Polarization Feed assembly to an Auto Polarization feed assembly. Please read through this entire procedure and verify the contents of conversion kit part number 133235 prior to performing retrofit.

 Unless otherwise noted, apply adhesive to all hardware per Sea Tel Specification Document 121730

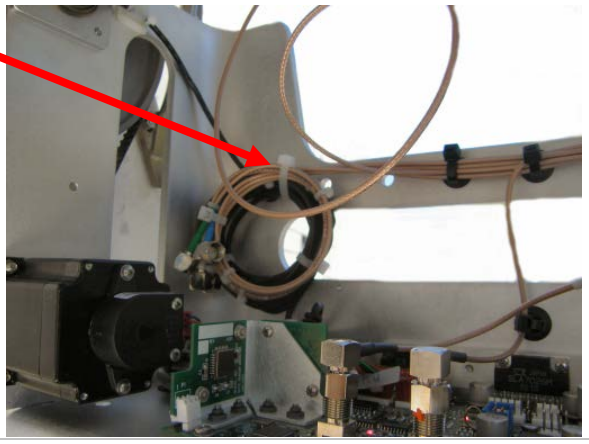
Turn the DC supply power Off to the GACP. Remove radome top. You may need to rotate the antenna to gain access the back of the reflector.	
Using a 7/16" Wrench, remove the Coax(es) connected to the LNB. *Your installed LNB may vary from the graphic depicted to the right*	
Using a 2.5mm Allen head wrench, remove the hardware securing feed tube to reflector/feed assembly. Carefully remove Feed tube and set aside for future use.	

Using a 4mm Allen Head Wrench, remove the hardware securing the feed assembly to the reflector.	
On the Auto Polarization Feed Assembly to be installed, manually rotate drive pulley (by hand) to align the physical Polang stop in its' center of range as shown to the right.	

Carefully install Auto Polarization assembly into rear of reflector as shown to the right.	
Apply Loctite thread locker to the hardware provided in kit, and using an 8mm driver secure feed assembly to reflector.	

Install feed tube with the alignment notch in the vertical axis as shown to the right. Secure using a 2.5mm Allen Wrench. DO NOT OVERTIGHTEN	
Front view of the reflector showing a secured feed tube. **CAUTION: DO NOT ATTEMPT TO ROTATE THE ANTENNA IN AZIMUTH, ELEVATION, OR POLARIZATION BY USING VERTEX FEEDTUBE.**	
Using a #1 Phillips head screw driver, remove the four screws that secure the PCU Cover to the Antenna chassis and place aside for future use.	

Using snips carefully cut the tie wrap that secures the (previously unused) IF coaxes to the GPS Antenna Cable service loop.

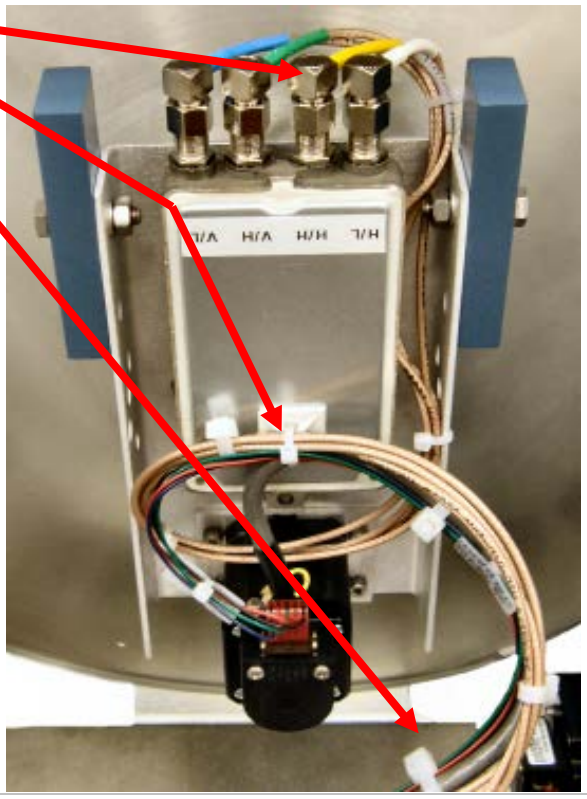


Route the four coaxes up to and secure to LNB.

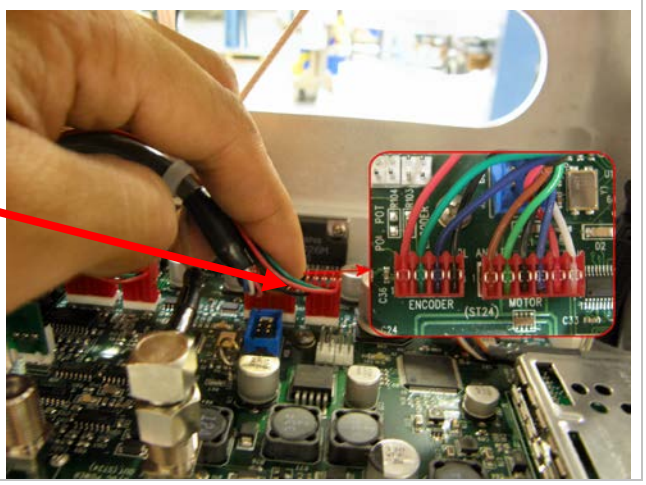
Using a tie wrap secure coaxes and Motor/Encoder Harness to the LNB.

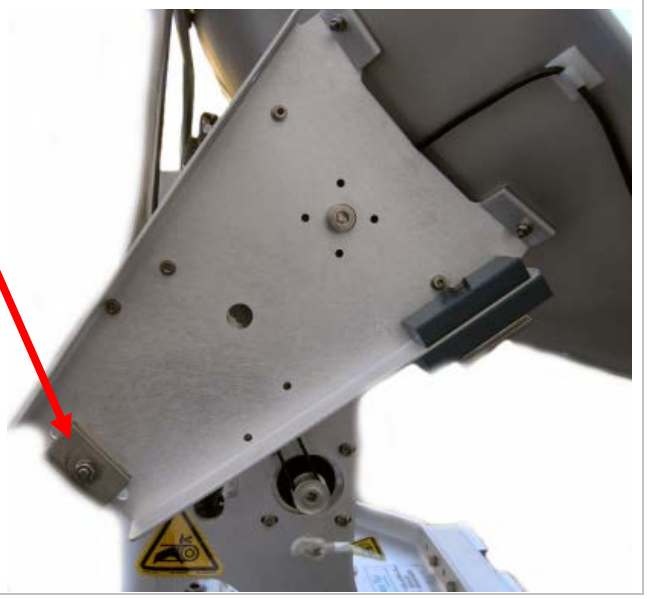
Using another tie wrap secure the coaxes to the Motor/Encoder wire harness.

Ensure a large enough service loop to allow for full range of motion in Polarization at all elevation look angles.



Install the Motor Driver and Encoder IDC Connectors on to the PCU PCB as shown to the right.



Using caution as to not pinch, kink or otherwise damage the IF coaxes and/or interface harnesses, re-install and secure the PCU PCB cover.	
Remove the counter balance weight(s) located in the bottom side of right EL Pan. Store weights for future use.	

7. ST24 Technical Specifications

7.1. Installed Weight

	ST24
Total Weight (dry):	58 lbs. (26.3 kg)

7.2. Radome

	ST24
Diameter	29.13 inches (73.99 centimeters)
Height	29.81 inches (75.72 centimeters)
Mounting	4 x M8 fasteners equally spaced on 12.73" D.B.C. (9" pattern) or 4 x M8 fasteners equally spaced on 16.97" D.B.C. (12" pattern)
Wind:	Withstand relative average winds up to 125MPH from any direction.
Ingress Protection Rating	All Sea Tel radomes have an IP rating of 56

7.3. Antenna

	ST24
Type	Spun Aluminum reflector
Size	24 inch (61.0cm)
Feed	Backfire
Polarization	Motorized Auto skew adjustment (ST24E and ST24AUS systems only) Manual (ST24DBS,DLA,DiSEqC systems only)
Min EIRP	45 dB
LNB	See Interchangeable Linear or Circular LNB information below.

7.4. Interchangeable LNB Options

The ST Series antennas can be easily fitted with a variety of LNB assemblies. Below are the LNBs which are currently available for these systems.

7.4.1. US Circular LNB

Sea Tel Part Number:	127444-1
Type:	Dual output
RF Frequencies:	12.2 - 12.7 GHz
IF Frequency:	950 - 1450 MHz
LO Frequency:	11.250 GHz
Polarization modes:	LHCP or RHCP circular
Polarization control:	18VDC (LHCP) or 13VDC (RHCP) voltage switched

7.4.2. DLA Circular LNB

Sea Tel Part Number:	115075-2
Type:	Dual output
RF Frequencies:	11.45 - 12.2 GHz
IF Frequency:	950 - 1700 MHz
LO Frequency:	10.5 GHz
Polarization modes:	LHCP or RHCP circular
Polarization control:	18VDC (LHCP) or 13VDC (RHCP) voltage switched

7.4.3. Aussat Linear LNB

Sea Tel Part Number:	131942-1
Type:	Dual output
RF Frequencies:	11.7 - 12.75 GHz
IF Frequency:	1000 - 2050 MHz
LO Frequency:	10.7 GHz
Polarization modes:	Horizontal or Vertical Linear
Polarization control:	18VDC (H) or 13VDC (V) voltage switched

7.4.4. European Quad Universal Linear LNB

Sea Tel Part Number:	132463	
Type:	Quad output	
	Low Band	**High Band**
RF Frequencies:	10.7 - 11.7 GHz	11.7 - 12.75 GHz
IF Frequencies:	950 - 1950 MHz	1100 - 2150 MHz
LO Frequencies:	9.75 GHz	10.6 GHz
Polarization modes:	2 Horiz., 2 Vert. Outputs	
Band Selection:	2 Hi, 2 Lo band outputs	

7.5. Pedestal Control Unit

Size	2 in x 8 in x 5 in (5.08 cm x 20.32 cm x 12.70 cm)
Features	Fully integrated controller, sensors, motor drivers, RF Signal Monitor and Output, GPS signal monitor(s), and BDE communications.
Connectors	
Below Decks Interface	Type F
Motors	IDC
Encoders	IDC
RF Signal Monitor	Type F
RF Signal Output	Type F
GPS Signal Monitor	RJ45
Service Port	Mini B USB

7.6. Stabilized Pedestal

Type	Two-axis positioning (Elevation & Azimuth) and Polarization
Stabilization	3 Dimensional Velocity mode Servo
Stab Accuracy	1.5 degrees MAX, 0.7 degrees RMS in presence of specified ship motions for pointing accuracy (see below).
Motors	Size 23 DC Step Motors with PWM Microstep drive
Elevation	Size 23 High Torque w/ Encoder
Azimuth	Size 23 High Torque
Pol skew Motor	Size 17 High Torque w/ Encoder
Inertial Reference	3 single axis Solid State Silicon Rate Sensors
Gravity Reference	Dual Axis MEMS accelerometer
Azimuth Reference	Closed Loop Tracking on Satellite signal
Stabilization rates	
Roll/Pitch	> 25 degrees / second
AZ./Turn	> 15 degrees / second
Range of Motion	
Elevation	-10 to 80 degrees
Azimuth	680 degrees
Polarization	+/- 120 degrees (240˚ Total)
Maximum Ship Motion	
Roll	+/- 25 degrees (implied)
Pitch	+/- 15 degrees (implied)
Elevation Pointing	
+/- 0 degrees of Roll	+0 to +70 degrees
Ship Motions for specified pointing accuracy	
Roll	+/-20 degrees with 8-12 sec periods
Pitch	+/-10 degrees with 6-12 sec periods
Yaw	+/-8 degrees with 15 to 20 sec periods
Turning rate	Up to 12 deg/sec.

7.7. Pedestal Control Unit

Size	2 in x 8 in x 5 in (5.08 cm x 20.32 cm x 12.70 cm)
Features	Fully integrated controller, sensors, motor drivers, RF Signal Monitor and Output, GPS signal monitor(s), and BDE communications.
Connectors	
Below Decks Interface	Type F
Motors	IDC
Encoders	IDC
RF Signal Monitor	Type F
RF Signal Output	Type F
GPS Signal Monitor	RJ45
Service Port	Mini B USB

7.7.1. DVB Compliant Tracking Receiver

Internal Satellite Identification Receiver

Tuning range	950 to 2150 MHz in 1 MHz increments in DVB Mode.
Input RF Level	-85 to -25 dBm typical
Output RF Level	Input level +/- 1 dB typical
Sensitivity	30 mV / dB typical
Bandwidth	Selectable in DVB Mode, 7.5MHz with a Baud Rate =/< 5k 20 MHz with a Baud Rate >5k)
Polarity switching	13 VDC output to select **Vertical** or **RHCP** polarity. 18 VDC to output select **Horizontal** or **LHCP** polarity
Band Switching:	22kHz continuous tone output to select **High** band, No tone to select **Low** band.
Satellite ID	Network ID for DVB signals. QPSK demodulator and FEC decoder lock for DSS, or DVB without NID (forced NID).
QPSK Demodulator	3000 to 30000 baud (ksps)
FEC Decoder	1/2, 2/3, 3/4, 5/6, 6/7, 7/8, or Automatic.
Pipeline Decoder	DVB or DSS compatible.

7.8. Below Decks Interface

Size	
Front Panel	6.25 in x 4.65 in (15.88 cm x 11.81 cm)
Mounted Enclosure	6.007 in x 4.437 in x 3.2 in (15.26 cm x 11.27 cm x 8.13 cm)
Display Viewing Area	2.1220 in 3.7402 in 53.9 mm 95.0 mm)
Display	
Type	4.3 in (10.92 cm) TFT
Resolution	480 x 272 WQVGA
Horizontal Viewing Angle	130 deg typical
Vertical Viewing Angle	60 deg (Top) 50 deg (Bottom) typical
Backlight Display Type	LED
Indicators	1 LED status indicators
Service Ports	
Serial Interface	9600 baud RS-232 Interface for diagnostics and computer interface.
USB Interface	Mini B USB Interface (Future Use)
NMEA Interface	NMEA 0183 Interface (Future Use)
Connectors	
DC Power	2 Screw Terminals
Pedestal Interface	Type F (for FSK Communications)
IF	Type F (950 to 2150Mhz Typical_)
RS-232 Interface	9 Pin Male D-Sub connector (DTE)

7.9. Power Requirements

Voltage	10-30 VDC normal operating range
Current	3.0 Amps nominal @ 13.8 VDC
Steady (continuous) current	3.1 Amps (<40W) @ 12.0VDC
	1.4 Amps (<35W) @ 24.o VDC
Peak (inrush) current	7 Amps @ 12.0VDC
	4 Amps @ 24.0VDC
Transient Protection	
Load Dump	60 Volts
Inductive coupling	+/- 200V @1µSecond
Reverse Battery	Indefinite
24V Jump Start	Indefinite

7.10. *Environmental*

Temperature	-20 to +55 degrees C.
Humidity	Up to l00% @ 40 degrees C.
Rain	Up to 4 inches per hour. Degraded RF performance when the radome surface is wet.
Wind	Up to 125 MPH from any direction.
Corrosion	Parts are corrosion resistant or treated to endure effects of salt air and salt spray.
Storage Temperature	-40 to +70 degrees C

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8. DRAWINGS

The following drawings have been provided as a reference tool. Should you have any questions or concerns please notify the Sea Tel Service Department.

Drawing	Title	
132500-002_A	System, ST24, US, Auto-Pol	8-3
132500-003_A	System, ST24, DLA, Auto-Pol	8-4
132500-004_A	System, ST24, DISEQC, Auto-Pol	8-5
132500-007_A	System, ST24, US, Manual Pol	8-6
132500-008_A	System, ST24, US, Manual Pol	8-7
132500-009_A	System, ST24, DISEQC, Manual Pol	8-8
137906-001_A	System, ST24, Euro, Auto-Pol	8-10
137906-005_A	System, ST24, Aussat, Auto-Pol	8-11
137906-006_A	System, ST24, Euro, Manual Pol	8-12
137906-010_A	System, ST24, Aussat, Manual Pol	8-13
137907-1_A	General Assembly, ST24, Auto-Pol	8-15
137907-2_A	General Assembly, ST24, Manual Pol	8-17
138159-1_A	System Block Diagram, ST24, Euro, Auto-Pol, Optim	8-21
138159-2_A	System Block Diagram, ST24, US, Auto-Pol, Optim	8-22
138159-3_A	System Block Diagram, ST24, DLA, Auto-Pol, Optim	8-23
138159-4_A	System Block Diagram, ST24, DISEQC, Auto-Pol, Optim	8-24
138159-5_A	System Block Diagram, ST24, Aussat, Auto-Pol, Optim	8-25
138159-6_A	System Block Diagram, ST24, Euro, Manual Pol, Optim	8-26
138159-7_A	System Block Diagram, ST24, US, Manual Pol, Optim	8-27
138159-8_A	System Block Diagram, ST24, DLA, Manual Pol, Optim	8-28
138159-9_A	System Block Diagram, ST24, DISEQC, Manual Pol, Optim	8-29
138159-10_A	System Block Diagram, ST24, Aussat, Manual Pol, Optim	8-30
138160_A	Antenna System Schematic, ST24	8-37
132903-1_A	Installation Template, 29 inch radome	8-39
132230_A	Installation Template, GACP	8-40
133491_B	Installation Arrangement ST24	8-41

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SINGLE LEVEL MFG BILL OF MATERIAL

FIND	QTY	PART NO	REV	DESCRIPTION	REFERENCE DESIGNATOR
1	1 EA	132370-1	C	GENERAL ASS'Y, ST24, AUTO POL	
2	1 EA	132542-1	D	RADOME ASS'Y, GA INSTALL, 29 IN, ST24	
3	1 EA	127444-1	C	LNBF MOD, DUAL DBS, CAL AMP	
4	1 EA	130922-1	A1	ENCLOSURE ASS'Y, GACP	(NOT SHOWN) ,
5	1 EA	122583-6	B	CABLE ASS'Y, RG-6, F(M) TO F(M), 6FT	(NOT SHOWN) ,
6	1 EA	132877	A	HARNESS ASS'Y, DC POWER GACP	(NOT SHOWN) ,
10	1 EA	133197	A	CUSTOMER DOC PACKET, ST24	(NOT SHOWN) ,
15	1 EA	133666-1	A	BRACKET, POLANG HARNESS	
20	1 EA	111679-5	B	CABLE CLAMP, NYLON, .375 DIA, #8 MTG	
21	2 EA	119801-019	B	CABLE TIE, NYLON, 7.5 IN, NATURAL	(NOT SHOWN) ,
50	2 EA	119973-107		SCREW. SOCKET HD, M4 X 6, S.S.	
58	3 EA	114580-230		WASHER, FLAT, M4, S.S.	
59	1 EA	120089-231		NUT, HEX, M4, S.S.	

Sea Tel
COBHAM

SYSTEM, ST24, US, AUTO POL

PROD FAMILY SERIES 98E	EFF. DATE 12/17/2012	SHT 1 OF 1	DRAWING NUMBER 132500-002	REV A

SINGLE LEVEL MFG BILL OF MATERIAL

FIND	QTY	PART NO	REV	DESCRIPTION	REFERENCE DESIGNATOR
1	1 EA	132370-1	C	GENERAL ASS'Y, ST24, AUTO POL	
2	1 EA	132542-1	D	RADOME ASS'Y, GA INSTALL, 29 IN, ST24	
3	1 EA	115075-2	H	LNB MOD, DUAL DLA	
4	1 EA	130922-1	A1	ENCLOSURE ASS'Y, GACP	(NOT SHOWN) ,
5	1 EA	122583-6	B	CABLE ASS'Y, RG-6, F(M) TO F(M), 6FT	(NOT SHOWN) ,
6	1 EA	132877	A	HARNESS ASS'Y, DC POWER GACP	(NOT SHOWN) ,
10	1 EA	133197	A	CUSTOMER DOC PACKET, ST24	(NOT SHOWN) ,
15	1 EA	133666-1	A	BRACKET, POLANG HARNESS	
20	1 EA	111679-5	B	CABLE CLAMP, NYLON, .375 DIA, #8 MTG	
21	2 EA	119801-019	B	CABLE TIE, NYLON, 7.5 IN, NATURAL	(NOT SHOWN) ,
50	2 EA	119973-107		SCREW. SOCKET HD, M4 X 6, S.S.	
58	3 EA	114580-230		WASHER, FLAT, M4, S.S.	
59	1 EA	120089-231		NUT, HEX, M4, S.S.	

Sea Tel
COBHAM

SYSTEM, ST24, DLA, AUTO POL

PROD FAMILY SERIES 98E	EFF. DATE 12/17/2012	SHT 1 OF 1	DRAWING NUMBER 132500-003	REV A

SINGLE LEVEL MFG BILL OF MATERIAL

FIND	QTY	PART NO	REV	DESCRIPTION	REFERENCE DESIGNATOR
1	1 EA	132370-1	C	GENERAL ASS'Y, ST24, AUTO POL	
2	1 EA	132542-1	D	RADOME ASS'Y, GA INSTALL, 29 IN, ST24	
3	1 EA	130210	A1	LNB, DISHPRO, SINGLE, MODIFIED	
4	1 EA	130922-1	A1	ENCLOSURE ASS'Y, GACP	(NOT SHOWN) ,
5	1 EA	122583-6	B	CABLE ASS'Y, RG-6, F(M) TO F(M), 6FT	(NOT SHOWN) ,
6	1 EA	132877	A	HARNESS ASS'Y, DC POWER GACP	(NOT SHOWN) ,
7	1 EA	129734	E	ENCLOSURE ASSY, DISEQC VOLTAGE SWITCH	(NOT SHOWN) ,
8	1 EA	120643-25	B	CABLE ASS'Y, RS232, 9-WIRE, STRAIGHT,	(NOT SHOWN) ,
10	1 EA	133197	A	CUSTOMER DOC PACKET, ST24	(NOT SHOWN) ,
15	1 EA	133666-1	A	BRACKET, POLANG HARNESS	
20	1 EA	111679-5	B	CABLE CLAMP, NYLON, .375 DIA, #8 MTG	
21	2 EA	119801-019	B	CABLE TIE, NYLON, 7.5 IN, NATURAL	
50	2 EA	119973-107		SCREW. SOCKET HD, M4 X 6, S.S.	
58	3 EA	114580-230		WASHER, FLAT, M4, S.S.	
59	1 EA	120089-231		NUT, HEX, M4, S.S.	

Sea Tel
COBHAM

SYSTEM, ST24, DISEQC, AUTO POL

PROD FAMILY SERIES 98E	EFF. DATE 12/17/2012	SHT 1 OF 1	DRAWING NUMBER 132500-004	REV A

SINGLE LEVEL MFG BILL OF MATERIAL

FIND	QTY	PART NO	REV	DESCRIPTION	REFERENCE DESIGNATOR
1	1 EA	132370-2	C	GENERAL ASS'Y, ST24, MANUAL POL	
2	1 EA	132542-1	D	RADOME ASS'Y, GA INSTALL, 29 IN, ST24	
3	1 EA	127444-1	C	LNBF MOD, DUAL DBS, CAL AMP	
4	1 EA	130922-1	A1	ENCLOSURE ASS'Y, GACP	(NOT SHOWN) ,
5	1 EA	122583-6	B	CABLE ASS'Y, RG-6, F(M) TO F(M), 6FT	(NOT SHOWN) ,
6	1 EA	132877	A	HARNESS ASS'Y, DC POWER GACP	(NOT SHOWN) ,
10	1 EA	133197	A	CUSTOMER DOC PACKET, ST24	(NOT SHOWN) ,

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SYSTEM, ST24, US, MANUAL POL

PROD FAMILY SERIES 98E	EFF. DATE 12/17/2012	SHT 1 OF 1	DRAWING NUMBER 132500-007	REV A

SINGLE LEVEL MFG BILL OF MATERIAL

FIND	QTY	PART NO	REV	DESCRIPTION	REFERENCE DESIGNATOR
1	1 EA	132370-2	C	GENERAL ASS'Y, ST24, MANUAL POL	
2	1 EA	132542-1	D	RADOME ASS'Y, GA INSTALL, 29 IN, ST24	
3	1 EA	115075-2	H	LNB MOD, DUAL DLA	
4	1 EA	130922-1	A1	ENCLOSURE ASS'Y, GACP	(NOT SHOWN) ,
5	1 EA	122583-6	B	CABLE ASS'Y, RG-6, F(M) TO F(M), 6FT	(NOT SHOWN) ,
6	1 EA	132877	A	HARNESS ASS'Y, DC POWER GACP	(NOT SHOWN) ,
10	1 EA	133197	A	CUSTOMER DOC PACKET, ST24	(NOT SHOWN) ,

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SYSTEM, ST24, DLA, MANUAL POL

PROD FAMILY SERIES 98E	EFF. DATE 12/17/2012	SHT 1 OF 1	DRAWING NUMBER 132500-008	REV A

SINGLE LEVEL MFG BILL OF MATERIAL

FIND	QTY	PART NO	REV	DESCRIPTION	REFERENCE DESIGNATOR
1	1 EA	132370-2	C	GENERAL ASS'Y, ST24, MANUAL POL	
2	1 EA	132542-1	D	RADOME ASS'Y, GA INSTALL, 29 IN, ST24	
3	1 EA	130210	A1	LNB, DISHPRO, SINGLE, MODIFIED	
4	1 EA	130922-1	A1	ENCLOSURE ASS'Y, GACP	(NOT SHOWN) ,
5	1 EA	122583-6	B	CABLE ASS'Y, RG-6, F(M) TO F(M), 6FT	(NOT SHOWN) ,
6	1 EA	132877	A	HARNESS ASS'Y, DC POWER GACP	(NOT SHOWN) ,
7	1 EA	129734	E	ENCLOSURE ASSY, DISEQC VOLTAGE SWITCH	(NOT SHOWN) ,
8	1 EA	120643-25	B	CABLE ASS'Y, RS232, 9-WIRE, STRAIGHT,	(NOT SHOWN) ,
10	1 EA	133197	A	CUSTOMER DOC PACKET, ST24	(NOT SHOWN) ,

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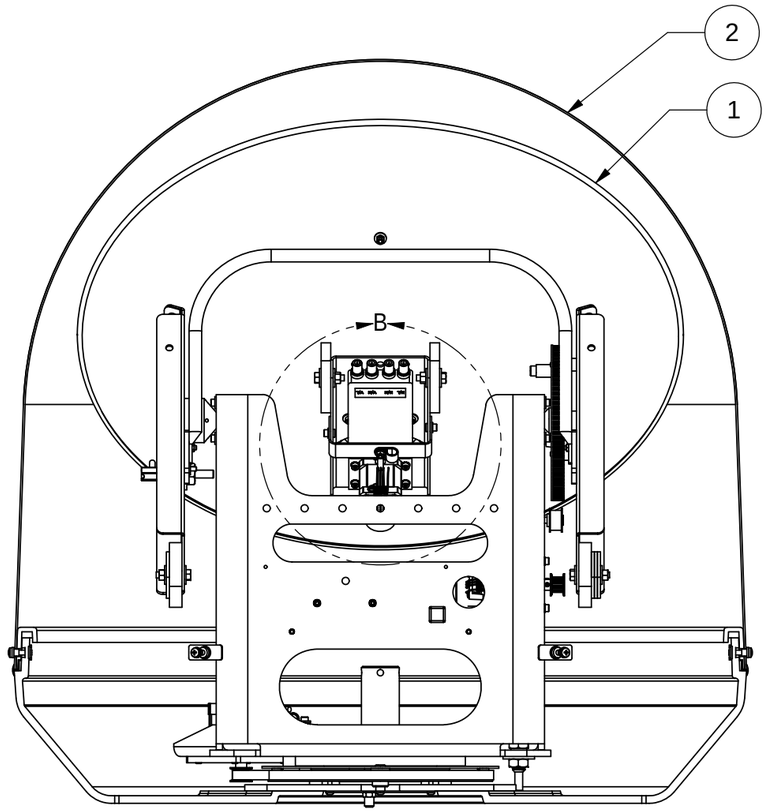
COBHAM

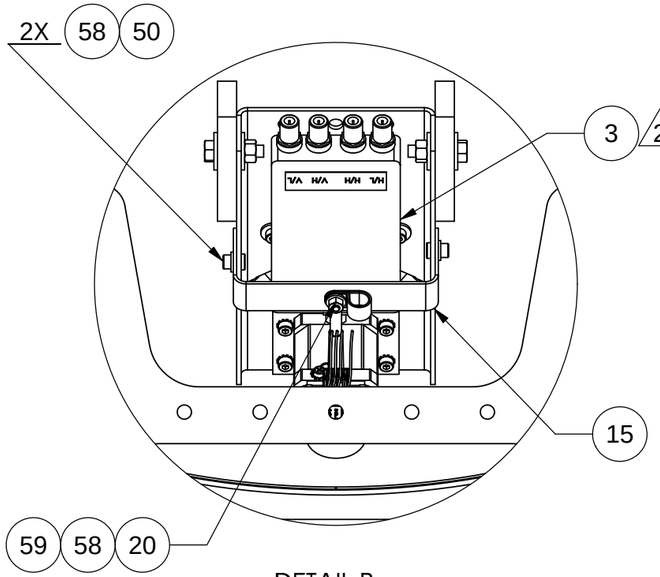
SYSTEM, ST24, DISEQC, MANUAL POL

PROD FAMILY SERIES 98E	EFF. DATE 12/17/2012	SHT 1 OF 1	DRAWING NUMBER 132500-009	REV A

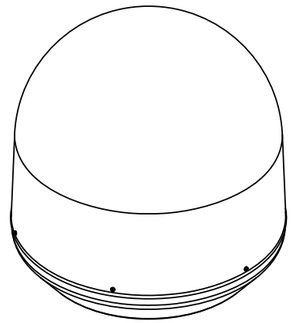
REVISION HISTORY				
REV	ECO#	DATE	DESCRIPTION	BY
A	E8106	01-04-11	RELEASE TO PRODUCTION WAS X4	HT



(-001 CONFIGURATION SHOWN)



DETAIL B
SCALE 1 : 3



(PARTS USED ON AUTOPOL ONLY)

SYSTEM DESCRIPTION	SYSTEM P/N	LNB P/N	AUTO POL
ST24 EURO, AUTO POL	132500-001	132463-1	YES
ST24 US, AUTO POL	132500-002	127444-1	YES
ST24 DLA, AUTO POL	132500-003	115075-2	YES
ST24DiSEqC, AUTO POL	132500-004	130210	YES
ST24 AUSSAT, AUTO POL	132500-005	131492-1	YES
ST24 EURO, MAN POL	132500-006	132463-1	NO
ST24 US, MAN POL	132500-007	127444-1	NO
ST24 DLA, MAN POL	132500-008	115075-2	NO
ST24DiSEqC, MAN POL	132500-009	130210	NO
ST24 AUSSAT, MAN POL	132500-010	131492-1	NO

NOTES: UNLESS OTHERWISE SPECIFIED
1. APPLY ADHESIVE PER SEATEL SPEC. 121730.
2. NOTE ORIENTATION OF LNB RELATIVE TO POLANG ASSEMBLY & TORQUE SETSCREWS TO 120 OZ*IN.
3. ROUTE ALL HARNESS AND CABLE ASSEMBLIES PER SEATEL SPEC. 121872.

REFERENCE DRAWINGS:
132765 ANTENNA SYSTEM ASS'Y, ST24
132766 SYSTEM BLOCK DIAGRAM, ST24

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES.
X.X = ±.050
X.XX = ±.020
X.XXX = ±.005
ANGLES: ±.5°
INTERPRET TOLERANCING PER ASME Y14.5 - 2009

DESIGNER/ENGINEER: LARRY WONG		DRAWN BY: HIEP T.	Sea Tel COBHAM
WEIGHT: 55.263 lbs		DRAWN DATE: 09-22-10	Tel. 925-798-7979 Fax. 925-798-7986
MATERIAL: N/A		APPROVED BY:	TITLE: SYSTEM, ST24
FINISH: N/A		APPROVED DATE:	
SURFACE ROUGHNESS:	SIZE: B / SCALE: 1:6	DRAWING NUMBER: 132500	REV: A
3rd ANGLE PROJECTION	FIRST USED: ST24	SHEET NUMBER: 1 OF 1	

SINGLE LEVEL MFG BILL OF MATERIAL

FIND	QTY	PART NO	REV	DESCRIPTION	REFERENCE DESIGNATOR
1	1 EA	137907-1	A	GENERAL ASS'Y, ST24, AUTO POL	
2	1 EA	132542-1	D	RADOME ASS'Y, GA INSTALL, 29 IN, ST24	
3	1 EA	132463-1	C	LNBF, QUAD, KU, INVERTO, MODIFIED	
4	1 EA	130922-1	A1	ENCLOSURE ASS'Y, GACP	(NOT SHOWN) ,
5	1 EA	122583-6	B	CABLE ASS'Y, RG-6, F(M) TO F(M), 6FT	(NOT SHOWN) ,
6	1 EA	132877	A	HARNESS ASS'Y, DC POWER GACP	(NOT SHOWN) ,
10	1 EA	133197	A	CUSTOMER DOC PACKET, ST24	(NOT SHOWN) ,
15	1 EA	133666-1	A	BRACKET, POLANG HARNESS	
20	1 EA	111679-5	B	CABLE CLAMP, NYLON, .375 DIA, #8 MTG	
21	2 EA	119801-019	B	CABLE TIE, NYLON, 7.5 IN, NATURAL	(NOT SHOWN) ,
50	2 EA	119973-107		SCREW. SOCKET HD, M4 X 6, S.S.	
58	3 EA	114580-230		WASHER, FLAT, M4, S.S.	
59	1 EA	120089-231		NUT, HEX, M4, S.S.	

Sea Tel
COBHAM

SYSTEM, ST24, EURO, AUTO POL

PROD FAMILY SERIES 98E	EFF. DATE 12/17/2012	SHT 1 OF 1	DRAWING NUMBER 137906-001	REV A

SINGLE LEVEL MFG BILL OF MATERIAL

FIND	QTY	PART NO	REV	DESCRIPTION	REFERENCE DESIGNATOR
1	1 EA	137907-1	A	GENERAL ASS'Y, ST24, AUTO POL	
2	1 EA	132542-1	D	RADOME ASS'Y, GA INSTALL, 29 IN, ST24	
3	1 EA	131492-1	B	LNB, KU-BAND ACER LNBFTUP, MODIFIED	
4	1 EA	130922-1	A1	ENCLOSURE ASS'Y, GACP	(NOT SHOWN) ,
5	1 EA	122583-6	B	CABLE ASS'Y, RG-6, F(M) TO F(M), 6FT	(NOT SHOWN) ,
6	1 EA	132877	A	HARNESS ASS'Y, DC POWER GACP	(NOT SHOWN) ,
10	1 EA	133197	A	CUSTOMER DOC PACKET, ST24	(NOT SHOWN) ,
15	1 EA	133666-1	A	BRACKET, POLANG HARNESS	
20	1 EA	111679-5	B	CABLE CLAMP, NYLON, .375 DIA, #8 MTG	
21	2 EA	119801-019	B	CABLE TIE, NYLON, 7.5 IN, NATURAL	(NOT SHOWN) ,
50	2 EA	119973-107		SCREW. SOCKET HD, M4 X 6, S.S.	
58	3 EA	114580-230		WASHER, FLAT, M4, S.S.	
59	1 EA	120089-231		NUT, HEX, M4, S.S.	

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SYSTEM, ST24, AUSSAT, AUTO POL

PROD FAMILY SERIES 98	EFF. DATE 12/17/2012	SHT 1 OF 1	DRAWING NUMBER 137906-005	REV A

SINGLE LEVEL MFG BILL OF MATERIAL

FIND	QTY	PART NO	REV	DESCRIPTION	REFERENCE DESIGNATOR
1	1 EA	137907-2	A	GENERAL ASS'Y, ST24, MAN POL	
2	1 EA	132542-1	D	RADOME ASS'Y, GA INSTALL, 29 IN, ST24	
3	1 EA	132463-1	C	LNBF, QUAD, KU, INVERTO, MODIFIED	
4	1 EA	130922-1	A1	ENCLOSURE ASS'Y, GACP	(NOT SHOWN) ,
5	1 EA	122583-6	B	CABLE ASS'Y, RG-6, F(M) TO F(M), 6FT	(NOT SHOWN) ,
6	1 EA	132877	A	HARNESS ASS'Y, DC POWER GACP	(NOT SHOWN) ,
10	1 EA	133197	A	CUSTOMER DOC PACKET, ST24	(NOT SHOWN) ,

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SYSTEM, ST24, EURO, MANUAL POL

PROD FAMILY SERIES 98	EFF. DATE 12/17/2012	SHT 1 OF 1	DRAWING NUMBER 137906-006	REV A

SINGLE LEVEL MFG BILL OF MATERIAL

FIND	QTY	PART NO	REV	DESCRIPTION	REFERENCE DESIGNATOR
1	1 EA	137907-2	A	GENERAL ASS'Y, ST24, MAN POL	
2	1 EA	132542-1	D	RADOME ASS'Y, GA INSTALL, 29 IN, ST24	
3	1 EA	131492-1	B	LNB, KU-BAND ACER LNBFTUP, MODIFIED	
4	1 EA	130922-1	A1	ENCLOSURE ASS'Y, GACP	(NOT SHOWN) ,
5	1 EA	122583-6	B	CABLE ASS'Y, RG-6, F(M) TO F(M), 6FT	(NOT SHOWN) ,
6	1 EA	132877	A	HARNESS ASS'Y, DC POWER GACP	(NOT SHOWN) ,
10	1 EA	133197	A	CUSTOMER DOC PACKET, ST24	(NOT SHOWN) ,

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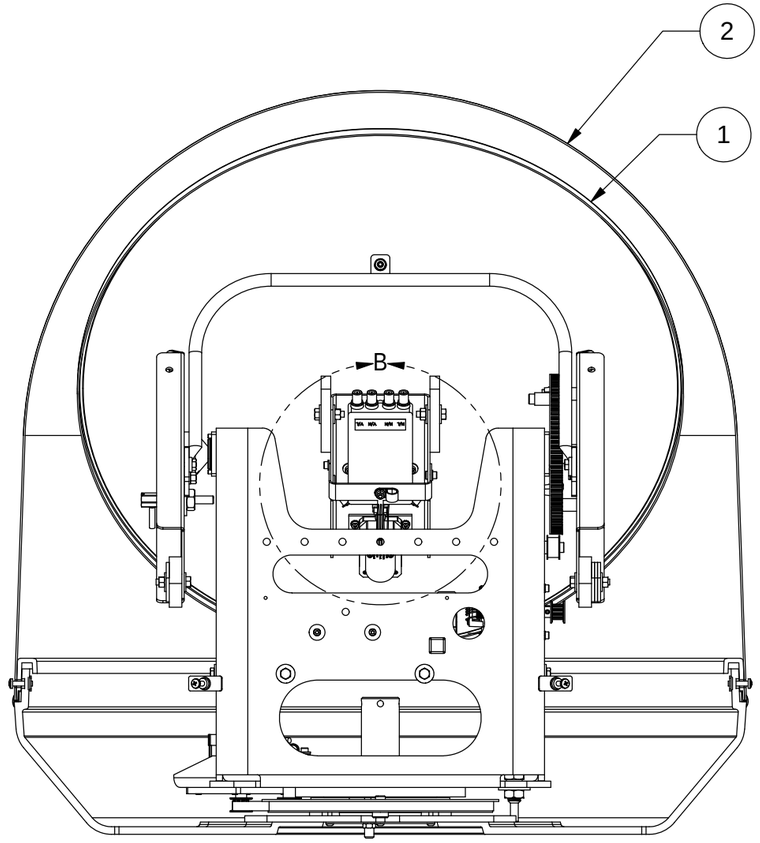
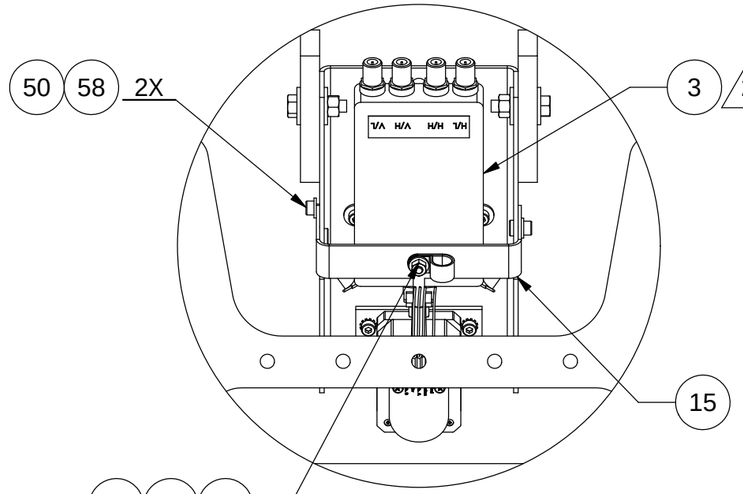
SYSTEM, ST24, AUSSAT, MANUAL POL

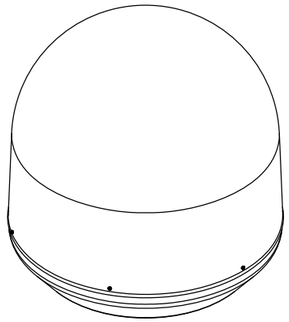
PROD FAMILY SERIES 98	EFF. DATE 12/17/2012	SHT 1 OF 1	DRAWING NUMBER 137906-010	REV A

REVISION HISTORY				
REV	ECO#	DATE	DESCRIPTION	BY
A	9954	12-14-12	RELEASED TO PRODUCTION, WAS X1	K.D.H.





DETAIL B
SCALE 1 : 3



SYSTEM DESCRIPTION	SYSTEM P/N	LNB P/N	AUTO POL
ST24 EURO, AUTO POL	137906-001	132463-1	YES

NOTES: UNLESS OTHERWISE SPECIFIED
1. MANUFACTURE PER SEATEL STANDARD 122298.
2. NOTE ORIENTATION OF LNB RELATIVE TO POLANG ASSEMBLY & TORQUE SETSCREWS TO 120 OZ*IN.
3. ROUTE ALL HARNESS AND CABLE ASSEMBLIES PER SEATEL SPEC 121872.

REFERENCE DRAWINGS:
138160 ANTENNA SYSTEM SCHEMATIC, ST24
138159 SYSTEM BLOCK DIAGRAM, ST24

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES.
X.X = ±.050
X.XX = ±.020
X.XXX = ±.005
ANGLES: ±.5°
INTERPRET TOLERANCING PER ASME Y14.5 - 2009

DESIGNER/ENGINEER: K.D.H.	DRAWN BY: K.D.H.	Sea Tel COBHAM	
WEIGHT: 56.8 lbs	DRAWN DATE: 8-16-12	Tel. 925-798-7979 Fax. 925-798-7986	
MATERIAL: N/A	APPROVED BY:	TITLE: SYSTEM, ST24	
FINISH: N/A	APPROVED DATE:		
SURFACE ROUGHNESS:	SIZE: B / SCALE: 1:6	DRAWING NUMBER: 137906	REV: A
3rd ANGLE PROJECTION	FIRST USED: ST24	SHEET NUMBER: 1 OF 1	

SINGLE LEVEL MFG BILL OF MATERIAL

FIND	QTY	PART NO	REV	DESCRIPTION	REFERENCE DESIGNATOR
1	1 EA	137908-1	A	PEDESTAL ASS'Y, ST24	
2	1 EA	137909-1	A	ANTENNA ASS'Y, ST24, AUTO	
3	1 EA	138079	A	EMI COVER, PCU, ST24, OPTIM	
4	1 EA	130861-1	B	RF CONNECTION PLATE, ST24	
5	5 EA	114178	O	ADAPTER, F(F)-F(F) (BULLET), 1.10 IN	
6	1 EA	121655-8	H14	LABELS INSTALLATION, ST24	(NOT SHOWN) ,
10	1 EA	131381-1	D	GPS ANTENNA, SERIAL	
11	1 EA	132675-36YEL	A	CABLE ASS'Y, RG-179, COAX, F(RA) TO F	(NOT SHOWN) ,
12	1 EA	132635	B	HARNESS ASS'Y, RX INTERFACE, ST24	(NOT SHOWN) ,
13	2 IN	124077-5	B	TAPE, 3M VHB #4991, SYNTHETIC ADHESIV	
14	8 EA	122782	A	CABLE TIE HOLDER, .281 DIA PUSH MOUNT	(NOT SHOWN) ,
15	2 EA	115927-4	B	BUMPER, RUBBER RECESSED, 5/8 OD X 13/	
18	2 EA	108519-4	H	WEIGHT, TRIM 7.0 OZ	
19	1 EA	108519-3	H	WEIGHT, TRIM 6.0 OZ	
21	1 EA	121226-7136		SPACER, #10 X .62 OD X 1.00, ALUM, AL	
22	1 EA	111679-5	B	CABLE CLAMP, NYLON, .375 DIA, #8 MTG	
23	1 EA	108517-1	D	WEIGHT, TRIM 0.5 OZ	
24	9 EA	108517-2	D	WEIGHT, TRIM 1.0 OZ	
25	1 EA	111679-2	B	CABLE CLAMP, NYLON, 3/16 DIA, #8 MTG	
50	4 EA	119745-118		SCREW, PAN HD, PHIL, M3 X 8, S S	
58	4 EA	114580-210		WASHER, FLAT, M3, S.S.	
60	5 EA	129830-193		SCREW, BUTTON HD, HEX SOC, M4 X 14, S	
61	5 EA	119973-116		SCREW, SOCKET HD, M4 X 10, S.S.	
62	2 EA	119973-122		SCREW, SOCKET HD, M4 X 25, S.S.	
63	1 EA	119973-131		SCREW, SOCKET HD, M4 X 35, S.S.	
68	14 EA	114580-230		WASHER, FLAT, M4, S.S.	
69	9 EA	120089-231		NUT, HEX, M4, S.S.	
70	2 EA	114589-138		SCREW, HEX HD M6X25	

Sea Tel
COBHAM

GENERAL ASS'Y, ST24, AUTO POL

PROD FAMILY SERIES 98E	EFF. DATE 12/17/2012	SHT 1 OF 2	DRAWING NUMBER 137907-1	REV A

SINGLE LEVEL MFG BILL OF MATERIAL

FIND	QTY	PART NO	REV	DESCRIPTION	REFERENCE DESIGNATOR
71	1 EA	114589-139		SCREW, HEX HD M6X30	
72	2 EA	114589-141		SCREW, HEX HD M6X35	
78	10 EA	114580-250		WASHER, FLAT, M6, S.S.	
79	5 EA	120089-251		NUT, HEX, M6, S.S.	
86	5 EA	126264-13	A1	WASHER, STAR, INTERNAL TOOTH, NARROW	
89	5 EA	119967	A1	NUT, HEX, PANEL, 3/8-32	

Sea Tel
COBHAM

GENERAL ASS'Y, ST24, AUTO POL

PROD FAMILY SERIES 98E	EFF. DATE 12/17/2012	SHT 2 OF 2	DRAWING NUMBER 137907-1	REV A

SINGLE LEVEL MFG BILL OF MATERIAL

FIND	QTY	PART NO	REV	DESCRIPTION	REFERENCE DESIGNATOR
1	1 EA	137908-1	A	PEDESTAL ASS'Y, ST24	
2	1 EA	137909-2	A	ANTENNA ASS'Y, ST24, MANUAL	
3	1 EA	138079	A	EMI COVER, PCU, ST24, OPTIM	
4	1 EA	130861-1	B	RF CONNECTION PLATE, ST24	
5	5 EA	114178	O	ADAPTER, F(F)-F(F) (BULLET), 1.10 IN	
6	1 EA	121655-8	H14	LABELS INSTALLATION, ST24	(NOT SHOWN) ,
10	1 EA	131381-1	D	GPS ANTENNA, SERIAL	
11	1 EA	132675-36YEL	A	CABLE ASS'Y, RG-179, COAX, F(RA) TO F	(NOT SHOWN) ,
12	1 EA	132635	B	HARNESS ASS'Y, RX INTERFACE, ST24	(NOT SHOWN) ,
13	2 IN	124077-5	B	TAPE, 3M VHB #4991, SYNTHETIC ADHESIV	
14	8 EA	122782	A	CABLE TIE HOLDER, .281 DIA PUSH MOUNT	(NOT SHOWN) ,
15	2 EA	115927-4	B	BUMPER, RUBBER RECESSED, 5/8 OD X 13/	
18	2 EA	108519-4	H	WEIGHT, TRIM 7.0 OZ	
19	1 EA	108519-3	H	WEIGHT, TRIM 6.0 OZ	
21	1 EA	121226-7136		SPACER, #10 X .62 OD X 1.00, ALUM, AL	
22	1 EA	111679-5	B	CABLE CLAMP, NYLON, .375 DIA, #8 MTG	
23	1 EA	108517-1	D	WEIGHT, TRIM 0.5 OZ	
24	9 EA	108517-2	D	WEIGHT, TRIM 1.0 OZ	
25	1 EA	111679-2	B	CABLE CLAMP, NYLON, 3/16 DIA, #8 MTG	
50	4 EA	119745-118		SCREW, PAN HD, PHIL, M3 X 8, S S	
58	4 EA	114580-210		WASHER, FLAT, M3, S.S.	
60	5 EA	129830-193		SCREW, BUTTON HD, HEX SOC, M4 X 14, S	
61	5 EA	119973-116		SCREW, SOCKET HD, M4 X 10, S.S.	
62	2 EA	119973-122		SCREW, SOCKET HD, M4 X 25, S.S.	
63	1 EA	119973-131		SCREW, SOCKET HD, M4 X 35, S.S.	
68	14 EA	114580-230		WASHER, FLAT, M4, S.S.	
69	9 EA	120089-231		NUT, HEX, M4, S.S.	
70	2 EA	114589-138		SCREW, HEX HD M6X25	

Sea Tel
COBHAM

GENERAL ASS'Y, ST24, MAN POL

PROD FAMILY SERIES 98E	EFF. DATE 12/17/2012	SHT 1 OF 2	DRAWING NUMBER 137907-2	REV A

SINGLE LEVEL MFG BILL OF MATERIAL

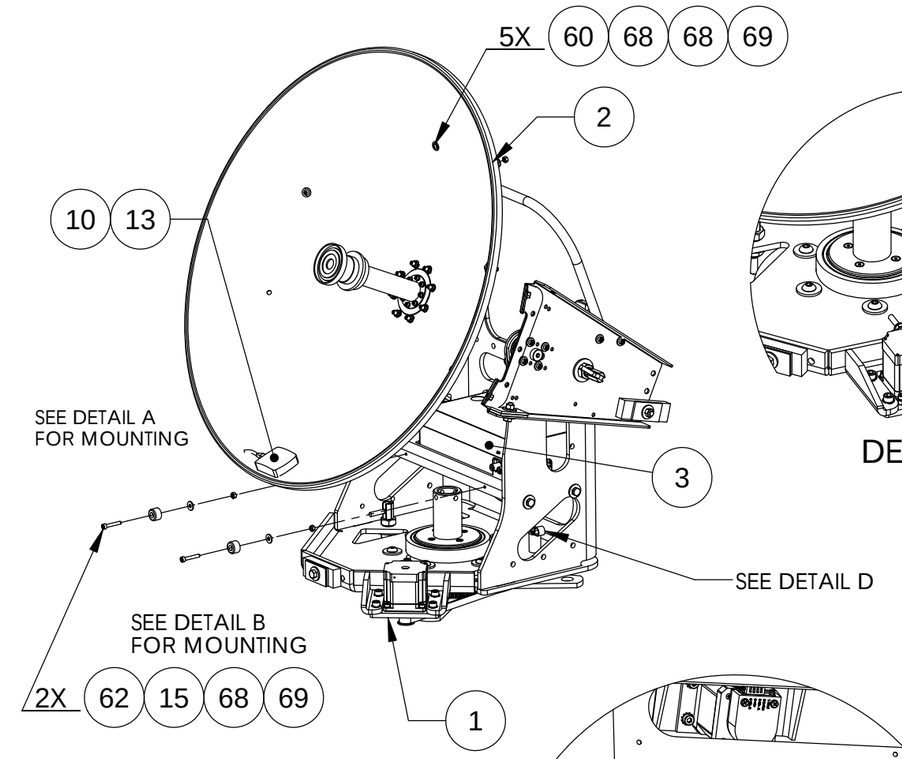
FIND	QTY	PART NO	REV	DESCRIPTION	REFERENCE DESIGNATOR
71	1 EA	114589-139		SCREW, HEX HD M6X30	
72	2 EA	114589-141		SCREW, HEX HD M6X35	
78	10 EA	114580-250		WASHER, FLAT, M6, S.S.	
79	5 EA	120089-251		NUT, HEX, M6, S.S.	
86	5 EA	126264-13	A1	WASHER, STAR, INTERNAL TOOTH, NARROW	
89	5 EA	119967	A1	NUT, HEX, PANEL, 3/8-32	

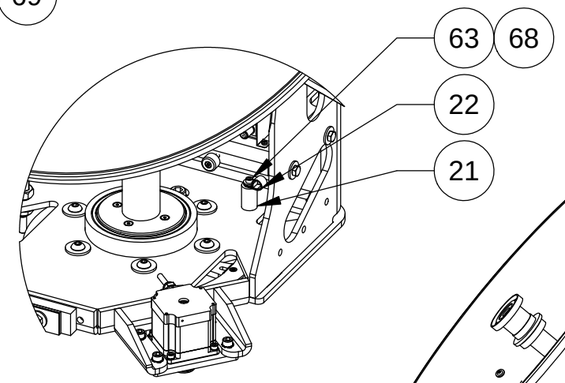
Sea Tel
COBHAM

GENERAL ASS'Y, ST24, MAN POL

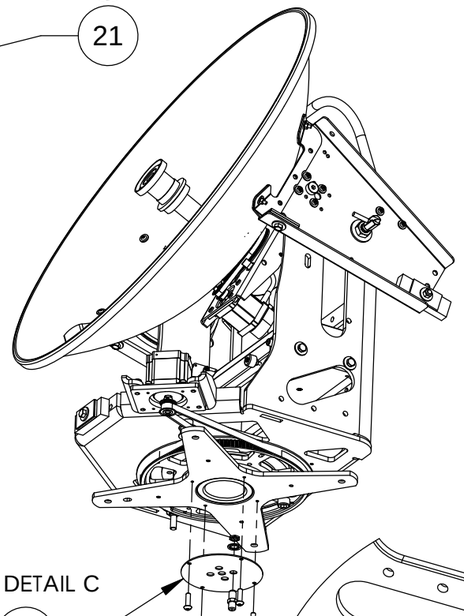
PROD FAMILY SERIES 98E	EFF. DATE 12/17/2012	SHT 2 OF 2	DRAWING NUMBER 137907-2	REV A

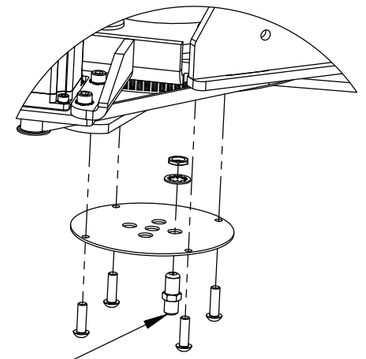
REVISION HISTORY				
REV	ECO#	DATE	DESCRIPTION	BY
A	9954	12-14-12	RELEASED TO PRODUCTION, WAS X1	K.D.H.



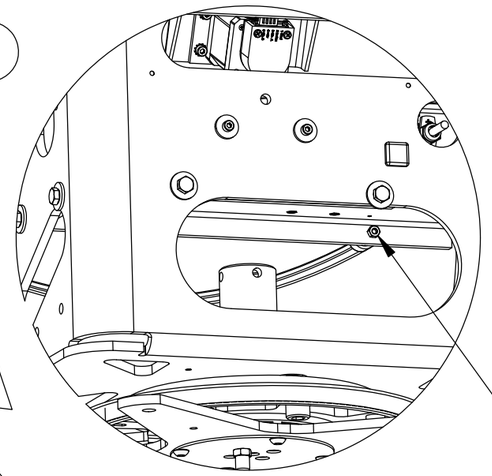


DETAIL D

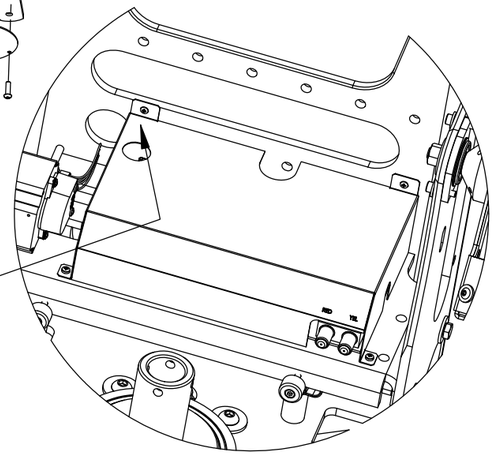




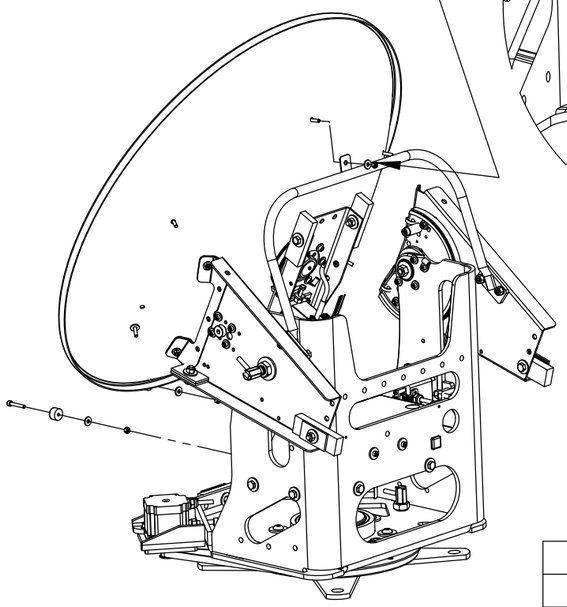
DETAIL C
SCALE 1 : 4



DETAIL B
SCALE 1 : 4



DETAIL A
SCALE 1 : 4



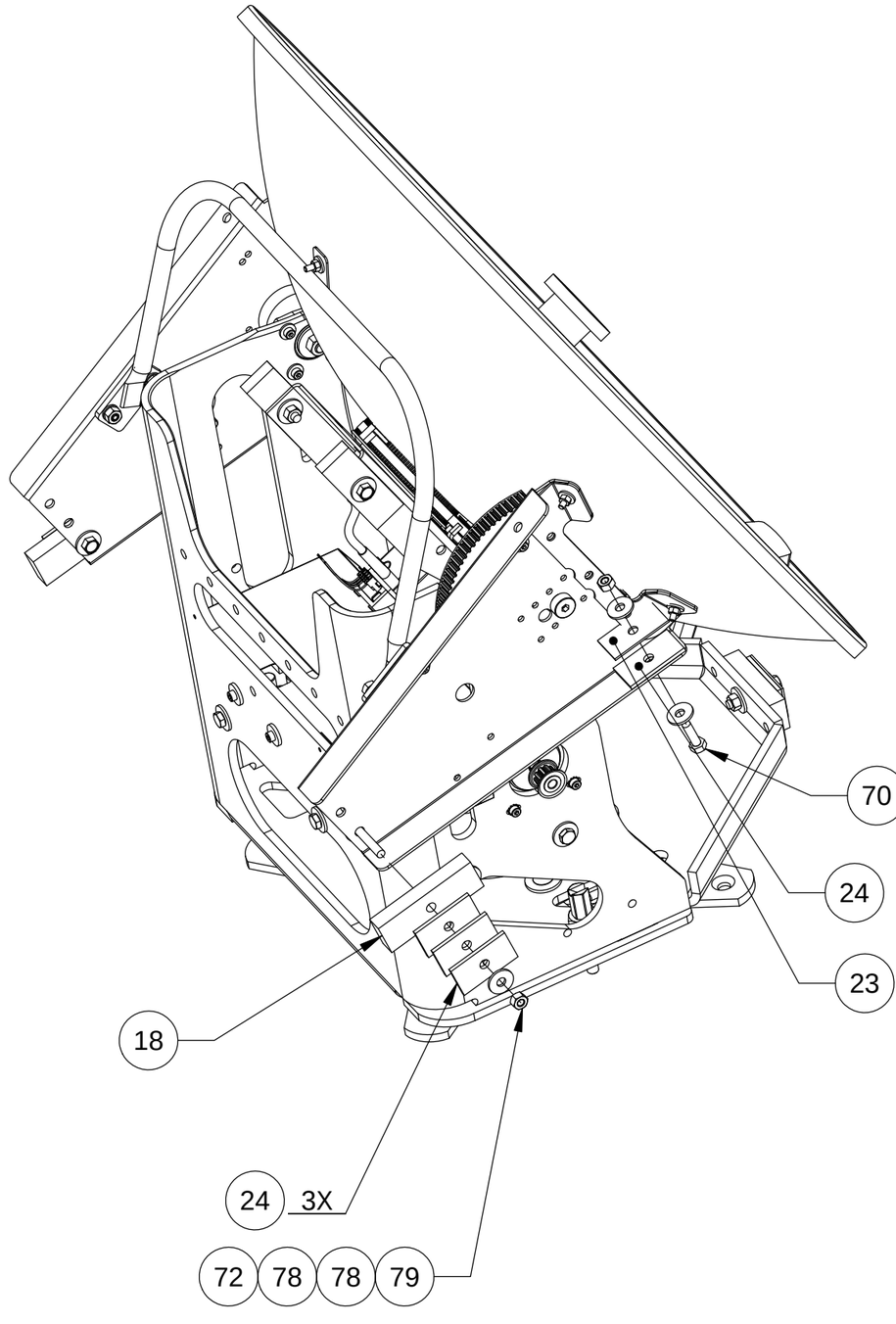
DASH	ANTENNA ASS'Y	POLANG
-1	137909-1	AUTO
-2	137909-2	MANUAL

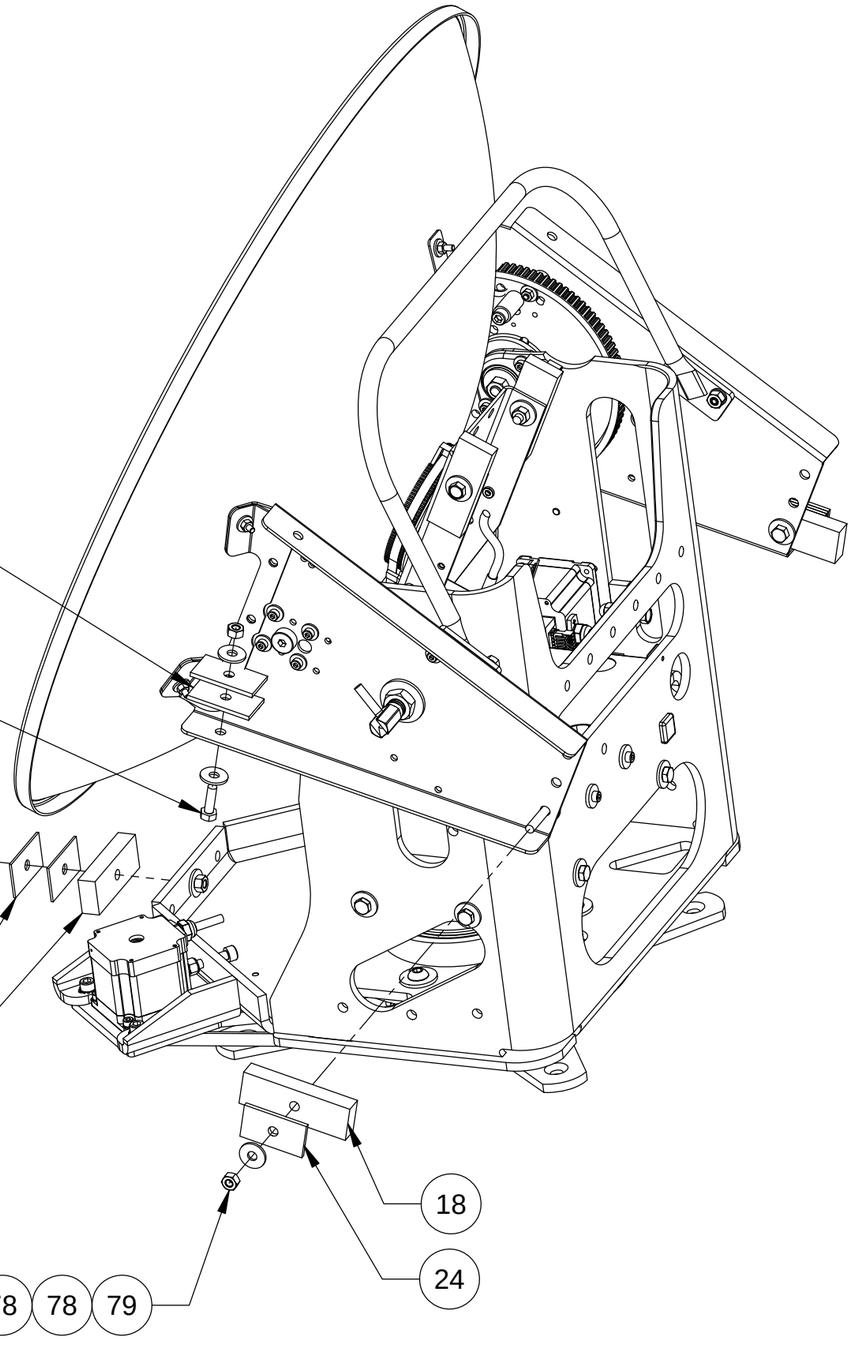
NOTES: UNLESS OTHERWISE SPECIFIED

1. MANUFACTURE PER SEATEL STANDARD 122298.
2. △2 ADJUST EL LOW LOOK STOP TO ACHIEVE -10°.
3. TORQUE F CONNECTORS TO 20 IN LBS THEN APPLY TORQUE SEAL.
4. COUNTER WEIGHTS SHOWN AS STARTING POINT ONLY, TRIM/ADJUST AS NEEDED TO ACHIEVE PROPER BALANCE.
5. DASH ONE CONFIGURATION SHOWN.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.
X.X = ±.050
X.XX = ±.020
X.XXX = ±.005
ANGLES: ±.5°
INTERPRET TOLERANCING PER ASME Y14.5 - 2009

DESIGNER/ENGINEER: K.D.H.	DRAWN BY: K.D.H.	Sea Tel COBHAM	
WEIGHT: 37.94 lbs.	DRAWN DATE: 8-15-12	Tel. 925-798-7979 Fax. 925-798-7986	
MATERIAL: N/A	APPROVED BY:	TITLE: GENERAL ASS'Y, ST24	
FINISH: N/A	APPROVED DATE:		
SURFACE ROUGHNESS:	SIZE: B / SCALE: 1:8	DRAWING NUMBER: 137907	REV: A
3rd ANGLE PROJECTION	FIRST USED: ST24	SHEET NUMBER: 1 OF 2	





70 78 78 79

24

23

18

24 3X

72 78 78 79

24 2X

72 78 78 79

19

24 2X

70 78 78 79

18

24

71 78 78 79

SIZE	SCALE:	DRAWING NUMBER	REV
B	1:8	137907	A
		SHEET NUMBER 2 OF 2	

SINGLE LEVEL MFG BILL OF MATERIAL

FIND	QTY	PART NO	REV	DESCRIPTION	REFERENCE DESIGNATOR
1	1 EA	137907-1	A	GENERAL ASS'Y, ST24, AUTO POL	
2	1 EA	132463-1	C	LNBF, QUAD, KU, INVERTO, MODIFIED	
3	1 EA	132362-1	D	PCU ASS'Y, ST24, SOFTWARE	
5	1 EA	132675-36YEL	A	CABLE ASS'Y, RG-179, COAX, F(RA) TO F	
6	1 EA	132635	B	HARNESS ASS'Y, RX INTERFACE, ST24	
10	5 EA	113480-1	C1	CABLE ASS'Y, RF, RG6, 50 FT.	
11	1 EA	120422	B	(REF ONLY, USE DASH #) MULTISWITCH, D	(ACCESSORY OPTION / CFE) ,
13	1 EA	130922-1	A1	ENCLOSURE ASS'Y, GACP	
14	1 EA	132877	A	HARNESS ASS'Y, DC POWER GACP	

Sea Tel
COBHAM

SYSTEM BLOCK DIAGRAM, ST24, EURO, AUTO POL, OPTIM

PROD FAMILY LIT	EFF. DATE 12/17/2012	SHT 1 OF 1	DRAWING NUMBER **138159-1**	REV **A**

SINGLE LEVEL MFG BILL OF MATERIAL

FIND	QTY	PART NO	REV	DESCRIPTION	REFERENCE DESIGNATOR
1	1 EA	137907-1	A	GENERAL ASS'Y, ST24, AUTO POL	
2	1 EA	127444-1	C	LNBF MOD, DUAL DBS, CAL AMP	
3	1 EA	132362-1	D	PCU ASS'Y, ST24, SOFTWARE	
5	1 EA	132675-36YEL	A	CABLE ASS'Y, RG-179, COAX, F(RA) TO F	
6	1 EA	132635	B	HARNESS ASS'Y, RX INTERFACE, ST24	
10	3 EA	113480-1	C1	CABLE ASS'Y, RF, RG6, 50 FT.	(ACCESSORY OPTION / CFE) ,
11	1 EA	119732	A5	MULTI-SWITCH, 4/8/12 OUTPUT, (REF. US	(ACCESSORY OPTION / CFE) ,
13	1 EA	130922-1	A1	ENCLOSURE ASS'Y, GACP	
14	1 EA	132877	A	HARNESS ASS'Y, DC POWER GACP	

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COBHAM

SYSTEM BLOCK DIAGRAM, ST24, US, AUTO POL, OPTIM

PROD FAMILY LIT	EFF. DATE 12/17/2012	SHT 1 OF 1	DRAWING NUMBER **138159-2**	REV **A**

SINGLE LEVEL MFG BILL OF MATERIAL

FIND	QTY	PART NO	REV	DESCRIPTION	REFERENCE DESIGNATOR
1	1 EA	137907-1	A	GENERAL ASS'Y, ST24, AUTO POL	
2	1 EA	115075-2	H	LNB MOD, DUAL DLA	
3	1 EA	132362-1	D	PCU ASS'Y, ST24, SOFTWARE	
5	1 EA	132675-36YEL	A	CABLE ASS'Y, RG-179, COAX, F(RA) TO F	
6	1 EA	132635	B	HARNESS ASS'Y, RX INTERFACE, ST24	
10	3 EA	113480-1	C1	CABLE ASS'Y, RF, RG6, 50 FT.	(ACCESSORY OPTION / CFE) ,
11	1 EA	119732	A5	MULTI-SWITCH, 4/8/12 OUTPUT, (REF. US	(ACCESSORY OPTION / CFE) ,
13	1 EA	130922-1	A1	ENCLOSURE ASS'Y, GACP	
14	1 EA	132877	A	HARNESS ASS'Y, DC POWER GACP	

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COBHAM

SYSTEM BLOCK DIAGRAM, ST24, DLA, AUTO POL, OPTIM

PROD FAMILY LIT	EFF. DATE 12/17/2012	SHT 1 OF 1	DRAWING NUMBER **138159-3**	REV **A**

SINGLE LEVEL MFG BILL OF MATERIAL

FIND	QTY	PART NO	REV	DESCRIPTION	REFERENCE DESIGNATOR
1	1 EA	137907-1	A	GENERAL ASS'Y, ST24, AUTO POL	
2	1 EA	130210	A1	LNB, DISHPRO, SINGLE, MODIFIED	
3	1 EA	132362-1	D	PCU ASS'Y, ST24, SOFTWARE	
5	1 EA	132675-36YEL	A	CABLE ASS'Y, RG-179, COAX, F(RA) TO F	
6	1 EA	132635	B	HARNESS ASS'Y, RX INTERFACE, ST24	
10	2 EA	113480-1	C1	CABLE ASS'Y, RF, RG6, 50 FT.	(ACCESSORY OPTION / CFE) ,
11	1 EA	119732	A5	MULTI-SWITCH, 4/8/12 OUTPUT, (REF. US	(ACCESSORY OPTION / CFE) ,
13	1 EA	130922-1	A1	ENCLOSURE ASS'Y, GACP	
14	1 EA	120643-25	B	CABLE ASS'Y, RS232, 9-WIRE, STRAIGHT,	
15	1 EA	129734	E	ENCLOSURE ASSY, DISEQC VOLTAGE SWITCH	
16	1 EA	132877	A	HARNESS ASS'Y, DC POWER GACP	

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COBHAM

SYSTEM BLOCK DIAGRAM, ST24, DISEQ, AUTO POL, OPTIM

PROD FAMILY LIT	EFF. DATE 12/17/2012	SHT 1 OF 1	DRAWING NUMBER **138159-4**	REV **A**

SINGLE LEVEL MFG BILL OF MATERIAL

FIND	QTY	PART NO	REV	DESCRIPTION	REFERENCE DESIGNATOR
1	1 EA	137907-1	A	GENERAL ASS'Y, ST24, AUTO POL	
2	1 EA	131492-1	B	LNB, KU-BAND ACER LNBFTUP, MODIFIED	
3	1 EA	132362-1	D	PCU ASS'Y, ST24, SOFTWARE	
5	1 EA	132675-36YEL	A	CABLE ASS'Y, RG-179, COAX, F(RA) TO F	
6	1 EA	132635	B	HARNESS ASS'Y, RX INTERFACE, ST24	
10	3 EA	113480-1	C1	CABLE ASS'Y, RF, RG6, 50 FT.	(ACCESSORY OPTION / CFE) ,
11	1 EA	120422	B	(REF ONLY, USE DASH #) MULTISWITCH, D	(ACCESSORY OPTION / CFE) ,
13	1 EA	130922-1	A1	ENCLOSURE ASS'Y, GACP	
14	1 EA	132877	A	HARNESS ASS'Y, DC POWER GACP	

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COBHAM

SYSTEM BLOCK DIAGRAM, ST24, AUSSAT, AUTO POL, OPTIM

PROD FAMILY LIT	EFF. DATE 12/17/2012	SHT 1 OF 1	DRAWING NUMBER **138159-5**	REV **A**

SINGLE LEVEL MFG BILL OF MATERIAL

FIND	QTY	PART NO	REV	DESCRIPTION	REFERENCE DESIGNATOR
1	1 EA	137907-2	A	GENERAL ASS'Y, ST24, MAN POL	
2	1 EA	132463-1	C	LNBF, QUAD, KU, INVERTO, MODIFIED	
3	1 EA	132362-1	D	PCU ASS'Y, ST24, SOFTWARE	
5	1 EA	132675-36YEL	A	CABLE ASS'Y, RG-179, COAX, F(RA) TO F	
6	1 EA	132635	B	HARNESS ASS'Y, RX INTERFACE, ST24	
10	5 EA	113480-1	C1	CABLE ASS'Y, RF, RG6, 50 FT.	(ACCESSORY OPTION / CFE) ,
11	1 EA	120422	B	(REF ONLY, USE DASH #) MULTISWITCH, D	(ACCESSORY OPTION / CFE) ,
13	1 EA	130922-1	A1	ENCLOSURE ASS'Y, GACP	
14	1 EA	132877	A	HARNESS ASS'Y, DC POWER GACP	

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SYSTEM BLOCK DIAGRAM, ST24, EURO, MAN POL, OPTIM

PROD FAMILY LIT	EFF. DATE 12/17/2012	SHT 1 OF 1	DRAWING NUMBER 138159-6	REV A

SINGLE LEVEL MFG BILL OF MATERIAL

FIND	QTY	PART NO	REV	DESCRIPTION	REFERENCE DESIGNATOR
1	1 EA	137907-2	A	GENERAL ASS'Y, ST24, MAN POL	
2	1 EA	127444-1	C	LNBF MOD, DUAL DBS, CAL AMP	
3	1 EA	132362-1	D	PCU ASS'Y, ST24, SOFTWARE	
5	1 EA	132675-36YEL	A	CABLE ASS'Y, RG-179, COAX, F(RA) TO F	
6	1 EA	132635	B	HARNESS ASS'Y, RX INTERFACE, ST24	
10	3 EA	113480-1	C1	CABLE ASS'Y, RF, RG6, 50 FT.	(ACCESSORY OPTION / CFE) ,
11	1 EA	119732	A5	MULTI-SWITCH, 4/8/12 OUTPUT, (REF. US	(ACCESSORY OPTION / CFE) ,
13	1 EA	130922-1	A1	ENCLOSURE ASS'Y, GACP	
14	1 EA	132877	A	HARNESS ASS'Y, DC POWER GACP	

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SYSTEM BLOCK DIAGRAM, ST24, US, MAN POL, OPTIM

PROD FAMILY LIT	EFF. DATE 12/17/2012	SHT 1 OF 1	DRAWING NUMBER **138159-7**	REV **A**

SINGLE LEVEL MFG BILL OF MATERIAL

FIND	QTY	PART NO	REV	DESCRIPTION	REFERENCE DESIGNATOR
1	1 EA	137907-2	A	GENERAL ASS'Y, ST24, MAN POL	
2	1 EA	115075-2	H	LNB MOD, DUAL DLA	
3	1 EA	132362-1	D	PCU ASS'Y, ST24, SOFTWARE	
5	1 EA	132675-36YEL	A	CABLE ASS'Y, RG-179, COAX, F(RA) TO F	
6	1 EA	132635	B	HARNESS ASS'Y, RX INTERFACE, ST24	
10	3 EA	113480-1	C1	CABLE ASS'Y, RF, RG6, 50 FT.	(ACCESSORY OPTION / CFE) ,
11	1 EA	119732	A5	MULTI-SWITCH, 4/8/12 OUTPUT, (REF. US	(ACCESSORY OPTION / CFE) ,
13	1 EA	130922-1	A1	ENCLOSURE ASS'Y, GACP	
14	1 EA	132877	A	HARNESS ASS'Y, DC POWER GACP	

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SYSTEM BLOCK DIAGRAM, ST24, DLA, MAN POL, OPTIM

PROD FAMILY LIT	EFF. DATE 12/17/2012	SHT 1 OF 1	DRAWING NUMBER **138159-8**	REV **A**

SINGLE LEVEL MFG BILL OF MATERIAL

FIND	QTY	PART NO	REV	DESCRIPTION	REFERENCE DESIGNATOR
1	1 EA	137907-2	A	GENERAL ASS'Y, ST24, MAN POL	
2	1 EA	130210	A1	LNB, DISHPRO, SINGLE, MODIFIED	
3	1 EA	132362-1	D	PCU ASS'Y, ST24, SOFTWARE	
5	1 EA	132675-36YEL	A	CABLE ASS'Y, RG-179, COAX, F(RA) TO F	
6	1 EA	132635	B	HARNESS ASS'Y, RX INTERFACE, ST24	
10	2 EA	113480-1	C1	CABLE ASS'Y, RF, RG6, 50 FT.	(ACCESSORY OPTION / CFE) ,
11	1 EA	119732	A5	MULTI-SWITCH, 4/8/12 OUTPUT, (REF. US	(ACCESSORY OPTION / CFE) ,
13	1 EA	130922-1	A1	ENCLOSURE ASS'Y, GACP	
14	1 EA	120643-25	B	CABLE ASS'Y, RS232, 9-WIRE, STRAIGHT,	
15	1 EA	129734	E	ENCLOSURE ASSY, DISEQC VOLTAGE SWITCH	
16	1 EA	132877	A	HARNESS ASS'Y, DC POWER GACP	

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SYSTEM BLOCK DIAGRAM, ST24, DISEQ,MAN POL, OPTIM

PROD FAMILY LIT	EFF. DATE 12/17/2012	SHT 1 OF 1	DRAWING NUMBER **138159-9**	REV **A**

SINGLE LEVEL MFG BILL OF MATERIAL

FIND	QTY	PART NO	REV	DESCRIPTION	REFERENCE DESIGNATOR
1	1 EA	137907-2	A	GENERAL ASS'Y, ST24, MAN POL	
2	1 EA	131492-1	B	LNB, KU-BAND ACER LNBFTUP, MODIFIED	
3	1 EA	132362-1	D	PCU ASS'Y, ST24, SOFTWARE	
5	1 EA	132675-36YEL	A	CABLE ASS'Y, RG-179, COAX, F(RA) TO F	
6	1 EA	132635	B	HARNESS ASS'Y, RX INTERFACE, ST24	
10	3 EA	113480-1	C1	CABLE ASS'Y, RF, RG6, 50 FT.	(ACCESSORY OPTION / CFE) ,
11	1 EA	120422	B	(REF ONLY, USE DASH #) MULTISWITCH, D	(ACCESSORY OPTION / CFE) ,
13	1 EA	130922-1	A1	ENCLOSURE ASS'Y, GACP	
14	1 EA	132877	A	HARNESS ASS'Y, DC POWER GACP	

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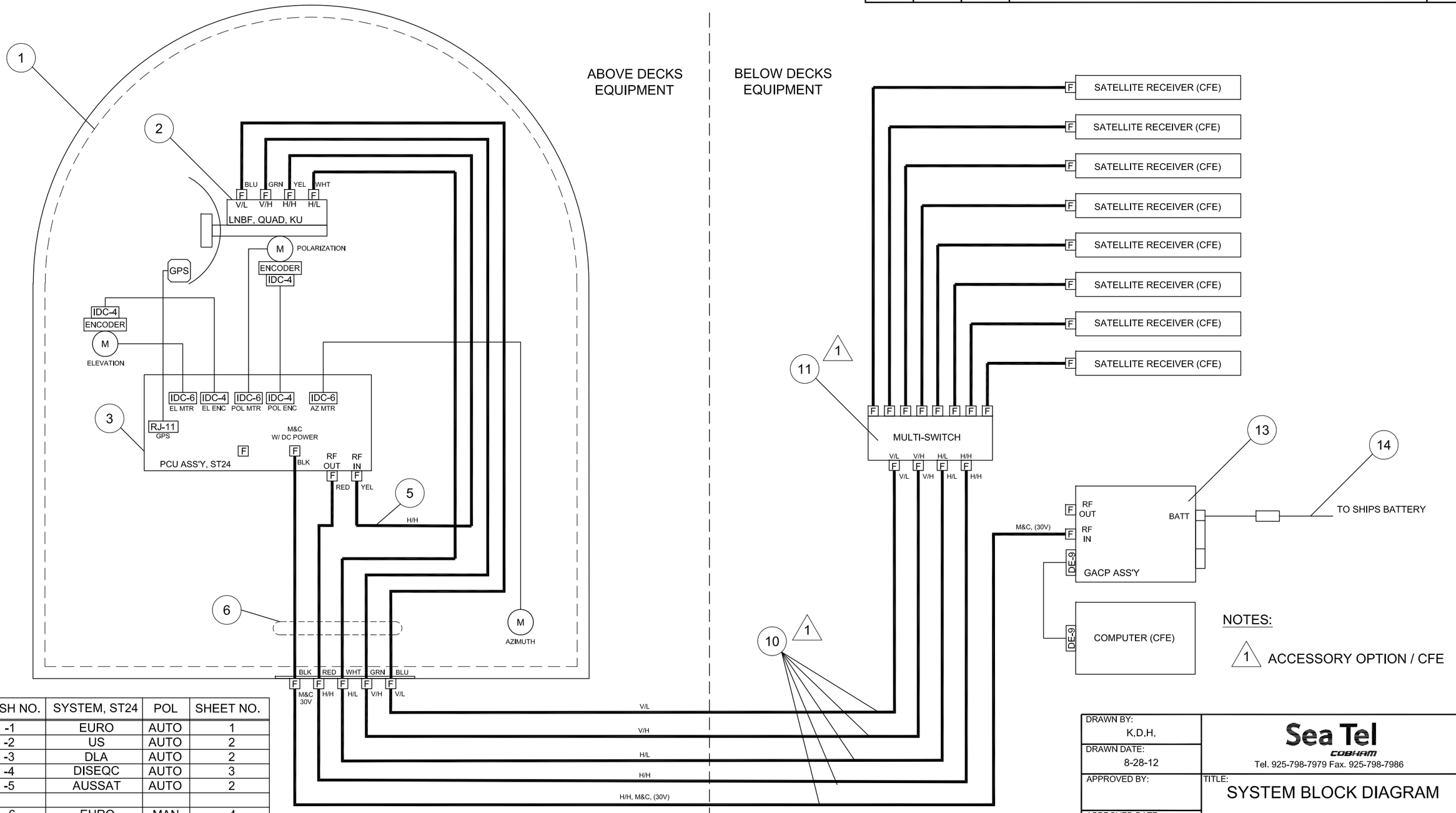
SYSTEM BLOCK DIAGRAM, ST24, AUSSAT, MAN POL, OPTIM

PROD FAMILY LIT	EFF. DATE 12/17/2012	SHT 1 OF 1	DRAWING NUMBER 138159-10	REV A

REVISION HISTORY				
REV	ECO#	DATE	DESCRIPTION	BY
A	9954	8-28-12	NEW DRAWING, NO PRIOR REV	K.D.H.

ABOVE DECKS EQUIPMENT

BELOW DECKS EQUIPMENT



NOTES:

1 ACCESSORY OPTION / CFE

DASH NO.	SYSTEM, ST24	POL	SHEET NO.
-1	EURO	AUTO	1
-2	US	AUTO	2
-3	DLA	AUTO	2
-4	DISEQC	AUTO	3
-5	AUSSAT	AUTO	2
-6	EURO	MAN	4
-7	US	MAN	5
-8	DLA	MAN	5
-9	DISEQC	MAN	6
-10	AUSSAT	MAN	5

REFERENCE DRAWING

138160 SCHEMATIC, ANTENNA SYSTEM, ST24

DRAWN BY:	K.D.H.
DRAWN DATE:	8-28-12
APPROVED BY:	
APPROVED DATE:	

Sea Tel
COBHAM
Tel. 925-798-7979 Fax. 925-798-7986

TITLE: SYSTEM BLOCK DIAGRAM

ST24, OPTIM

SIZE	SCALE:	DRAWING NUMBER:	REV:
B	NONE	138159	A

FIRST USED: ST24

SHEET NUMBER: 1 OF 6

ABOVE DECKS EQUIPMENT

BELOW DECKS EQUIPMENT

1

2

BLU

GRN

YEL

WHT

RHCP (VERT)

LHCP (HORZ)

LNBF, DUAL, KU

M

POLARIZATION

ENCODER

IDC-4

GPS

IDC-4

ENCODER

M

ELEVATION

IDC-6 EL MTR

IDC-4 EL ENC

IDC-6 POL MTR

IDC-4 POL ENC

IDC-6 AZ MTR

3

RJ-11

GPS

M&C

W/ DC POWER

PCU ASS'Y, ST24

BLK

RF OUT

RF IN

LHCP (HORZ)

RED

YEL

5

6

M

AZIMUTH

BLK

RED

WHT

GRN

BLU

SATELLITE RECEIVER (CFE)

SATELLITE RECEIVER (CFE)

SATELLITE RECEIVER (CFE)

SATELLITE RECEIVER (CFE)

SATELLITE RECEIVER (CFE)

SATELLITE RECEIVER (CFE)

SATELLITE RECEIVER (CFE)

SATELLITE RECEIVER (CFE)

1

11

MULTI-SWITCH

RHCP / 13V (VERT)

LHCP / 18V (HORZ)

LHCP

13

14

RF OUT

RF IN

M&C, (30V)

BATT

TO SHIPS BATTERY

DE-9

GACP ASS'Y

DE-9

COMPUTER (CFE)

10

1

RHCP (VERT)

LHCP (HORZ)

M&C, (30V)

NOTES:

1 ACCESSORY OPTION / CFE

SIZE	SCALE:	DRAWING NUMBER:	REV:
B	NONE	138159	A
		SHEET NUMBER: 2 OF 6	

DOCUMENT NO. 124225-4_A

ABOVE DECKS EQUIPMENT

BELOW DECKS EQUIPMENT

1

2

BLU GRN WHT YEL

LNBF, DP SINGLE, KU

M POLARIZATION

ENCODER IDC-4

GPS

IDC-4 ENCODER

M ELEVATION

IDC-6 EL MTR | IDC-4 EL ENC | IDC-6 POL MTR | IDC-4 POL ENC | IDC-6 AZ MTR

3

RJ-11 GPS

M&C W/ DC POWER

RF IN | RF OUT

PCU ASS'Y, ST24

RED | BLK | RF OUT RED | RF IN YEL

5

6

M AZIMUTH

BLK RED WHT GRN BLU

RHCP (950-1450 MHz), LHCP (1650-2150 MHz)

M&C, (30V)

DISEQC SWITCH | SATELLITE RECEIVER (CFE) (×7)

DISEQC SWITCH (MASTER)

M&C TO ACP/DAC

DE-9

15

11

1

MULTI-SWITCH

RHCP/13V | LHCP/18V

N.C.

L-BAND

12

10

1

13

14

16

DE-9

M&C

RF OUT | RF IN

BATT

GACP ASS'Y

TO SHIPS BATTERY

M&C, (30V)

NOTES:

1 ACCESSORY OPTION / CFE

SIZE	SCALE:	DRAWING NUMBER:	REV:
B	NONE	138159	A
		SHEET NUMBER:	3 OF 6

DOCUMENT NO. 124225-4_A

ABOVE DECKS EQUIPMENT

BELOW DECKS EQUIPMENT

1

2

BLU GRN YEL WHT

F V/L F V/H F H/H F H/L

LNBF, QUAD, KU

GPS

IDC-4 ENCODER

M ELEVATION

IDC-6 EL MTR

IDC-4 EL ENC

IDC-6 AZ MTR

3

RJ-11 GPS

M&C W/ DC POWER

F F

PCU ASS'Y, ST24

BLK

RF OUT

RF IN

F RED F YEL

5

H/H

6

M AZIMUTH

BLK RED WHT GRN BLU

F M&C 30V F H/H F H/L F V/H F V/L

V/L

V/H

H/L

H/H

M&C, (30V)

F SATELLITE RECEIVER (CFE)

F SATELLITE RECEIVER (CFE)

F SATELLITE RECEIVER (CFE)

F SATELLITE RECEIVER (CFE)

F SATELLITE RECEIVER (CFE)

F SATELLITE RECEIVER (CFE)

F SATELLITE RECEIVER (CFE)

F SATELLITE RECEIVER (CFE)

1

11

F F F F F F F F

MULTI-SWITCH

V/L V/H H/L H/H

F V/L F V/H F H/L F H/H

10

1

13

14

F RF OUT

F RF IN

DE-9 GACP ASS'Y

BATT

TO SHIPS BATTERY

M&C, (30V)

DE-9 COMPUTER (CFE)

NOTES:

1 ACCESSORY OPTION / CFE

SIZE	SCALE:	DRAWING NUMBER:	REV:
B	NONE	138159	A
		SHEET NUMBER: 4 OF 6	

DOCUMENT NO. 124225-4_A

ABOVE DECKS EQUIPMENT

BELOW DECKS EQUIPMENT

1

2

BLU

GRN

YEL

WHT

RHCP (VERT)

LHCP (HORZ)

LNBF, DUAL, KU

GPS

IDC-4

ENCODER

M

ELEVATION

IDC-6

EL MTR

IDC-4

EL ENC

IDC-6

AZ MTR

3

RJ-11

GPS

M&C

W/ DC POWER

PCU ASS'Y, ST24

BLK

RF OUT

RF IN

RED

YEL

5

6

M

AZIMUTH

BLK

RED

WHT

GRN

BLU

SATELLITE RECEIVER (CFE)

SATELLITE RECEIVER (CFE)

SATELLITE RECEIVER (CFE)

SATELLITE RECEIVER (CFE)

SATELLITE RECEIVER (CFE)

SATELLITE RECEIVER (CFE)

SATELLITE RECEIVER (CFE)

SATELLITE RECEIVER (CFE)

1

11

MULTI-SWITCH

RHCP / 13V (VERT)

LHCP / 18V (HORZ)

10

1

13

14

RF OUT

RF IN

BATT

TO SHIPS BATTERY

M&C, (30V)

DE-9

GACP ASS'Y

DE-9

COMPUTER (CFE)

RHCP (VERT)

LHCP (HORZ)

M&C, (30V)

NOTES:

1 ACCESSORY OPTION / CFE

SIZE	SCALE:	DRAWING NUMBER:	REV:
B	NONE	138159	A
		SHEET NUMBER:	5 OF 6

DOCUMENT NO. 124225-4_A

ABOVE DECKS EQUIPMENT

BELOW DECKS EQUIPMENT

1

2

BLU GRN WHT YEL

LNBF, DP SINGLE, KU

GPS

IDC-4 ENCODER

M ELEVATION

IDC-6 EL MTR

IDC-4 EL ENC

IDC-6 AZ MTR

3

RJ-11 GPS

M&C W/ DC POWER

PCU ASS'Y, ST24

BLK

RF OUT

RF IN

RED

YEL

5

6

M AZIMUTH

BLK RED WHT GRN BLU

DISEQC SWITCH

SATELLITE RECEIVER (CFE)

DISEQC SWITCH (MASTER)

M&C TO ACP/DAC

DE-9

15

11

MULTI-SWITCH

RHCP/13V

LHCP/18V

N.C.

L-BAND

13

14

16

DE-9

M&C

RF OUT

RF IN

BATT

GACP ASS'Y

TO SHIPS BATTERY

M&C, (30V)

10

RHCP (950-1450 MHz), LHCP (1650-2150 MHz)

M&C, (30V)

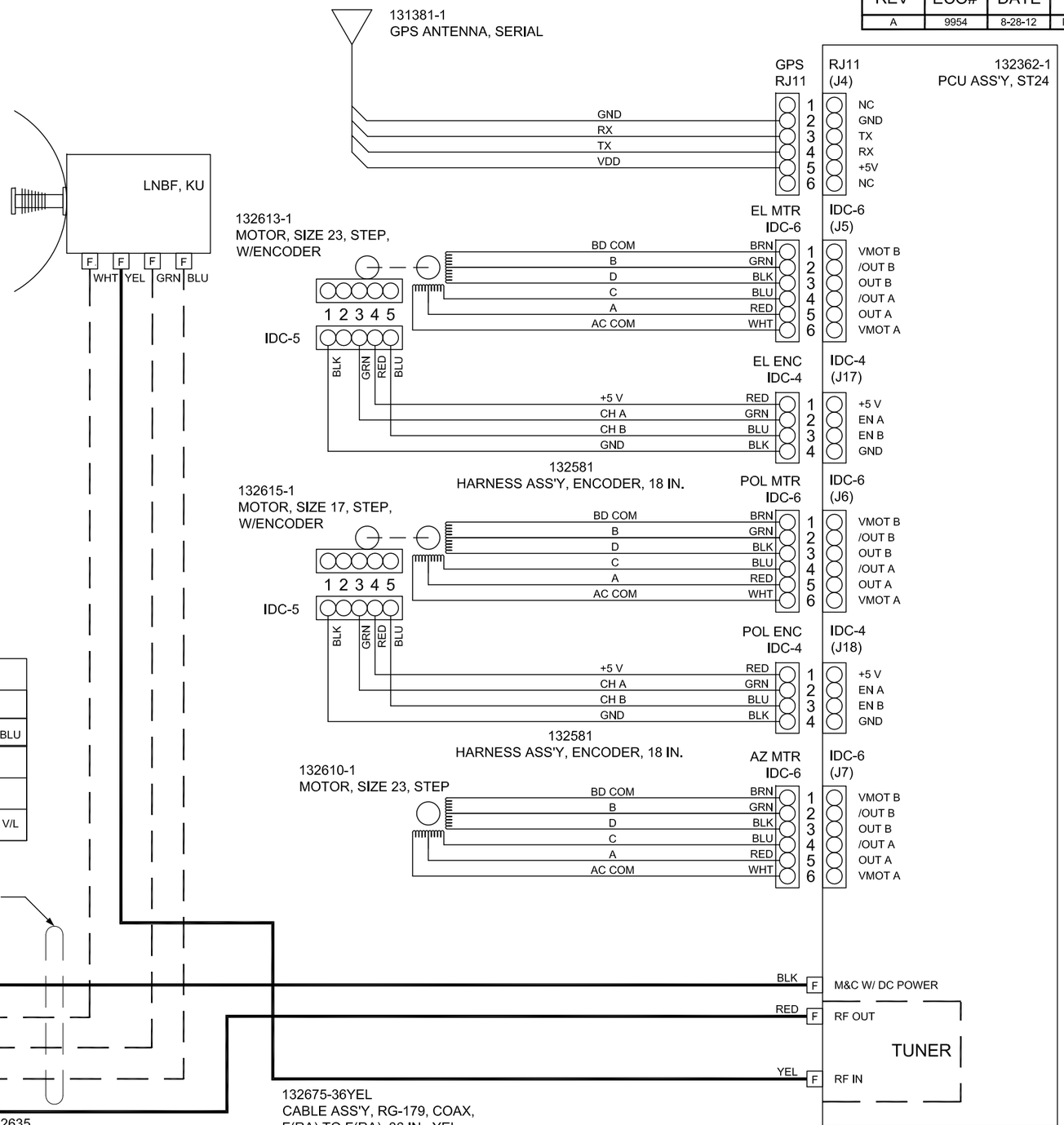
NOTES:

1 ACCESSORY OPTION / CFE

SIZE	SCALE:	DRAWING NUMBER:	REV:
B	NONE	138159	A
		SHEET NUMBER: 6 OF 6	

DOCUMENT NO. 124225-4_A

REVISION HISTORY				
REV	ECO#	DATE	DESCRIPTION	BY
A	9954	8-28-12	NEW DRAWING, NO PRIOR REV	K.D.H.



RX INTERFACE HARNESS FUNCTION CHART				
	CONNECTOR COLOR			
LNBF	RED	WHT	GRN	BLU
DISEQC	RHCP (950-1450 MHz) LHCP (1650-2150 MHz)			
DUAL	LHCP, H		RHCP, V	
QUAD	H/H	H/L	V/H	V/L

SHEET NO.	DESCRIPTION
1	AUTO POL
2	MANUAL POL

REFERENCE DRAWINGS

137906 SYSTEM, ST24
138159 SYSTEM BLOCK DIAGRAM

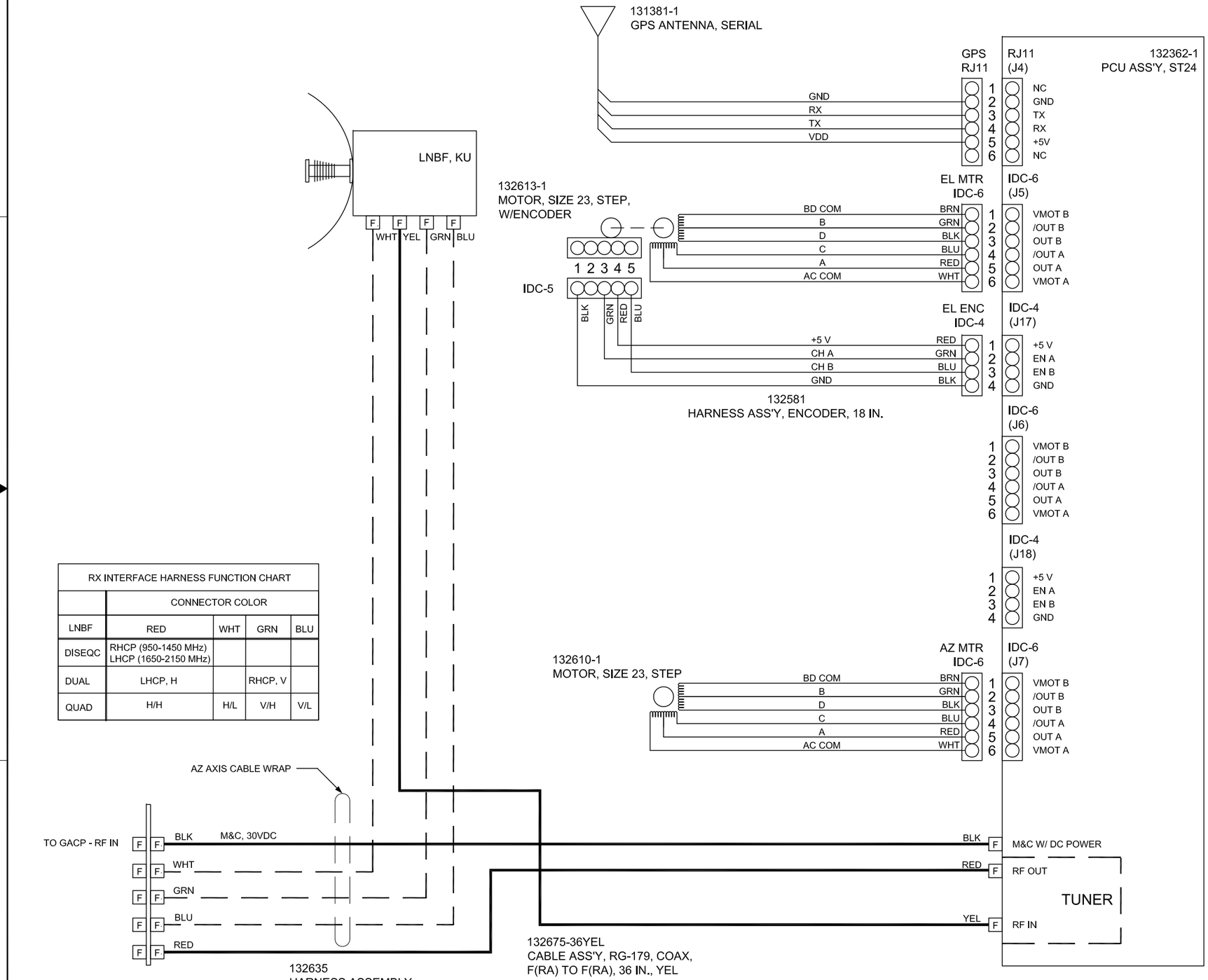
DRAWN BY: K.D.H.
DRAWN DATE: 8-28-12
APPROVED BY:
APPROVED DATE:

Sea Tel COBHAM
Tel. 925-798-7979 Fax. 925-798-7986

TITLE: SCHEMATIC, ANTENNA
SYSTEM, ST24, OPTIM

SIZE: B | SCALE: NONE | DRAWING NUMBER: 138160 | REV: A
FIRST USED: ST24 | SHEET NUMBER: 1 OF 2

DOCUMENT NO. 124225-4_A

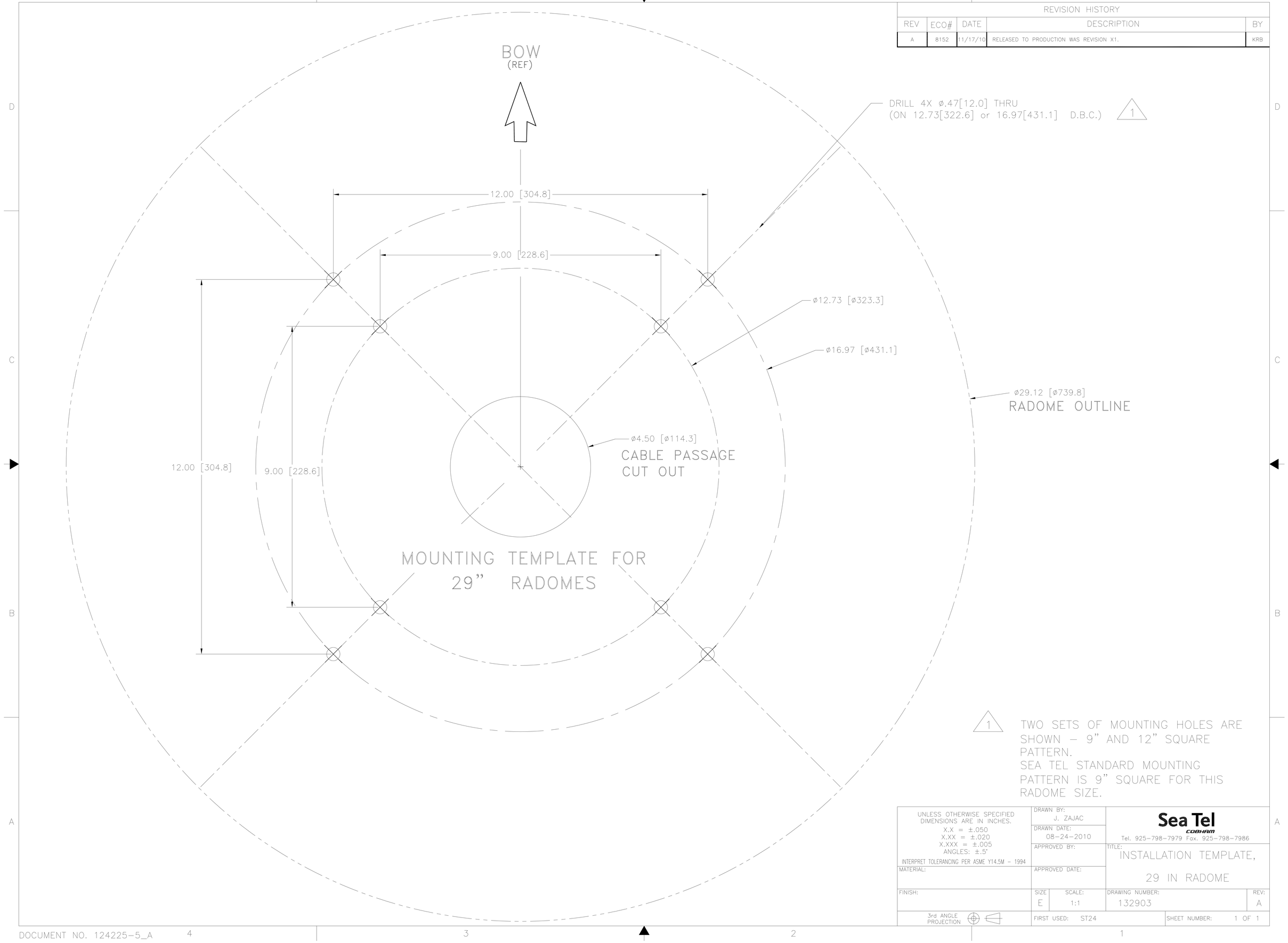


RX INTERFACE HARNESS FUNCTION CHART				
	CONNECTOR COLOR			
LNBF	RED	WHT	GRN	BLU
DISEQC	RHCP (950-1450 MHz) LHCP (1650-2150 MHz)			
DUAL	LHCP, H		RHCP, V	
QUAD	H/H	H/L	V/H	V/L

SIZE	SCALE:	DRAWING NUMBER:	REV:
B	NONE	138160	A
		SHEET NUMBER: 2 OF 2	

DOCUMENT NO. 124225-4_A

REVISION HISTORY				
REV	ECO#	DATE	DESCRIPTION	BY
A	8152	11/17/10	RELEASED TO PRODUCTION WAS REVISION X1.	KRB

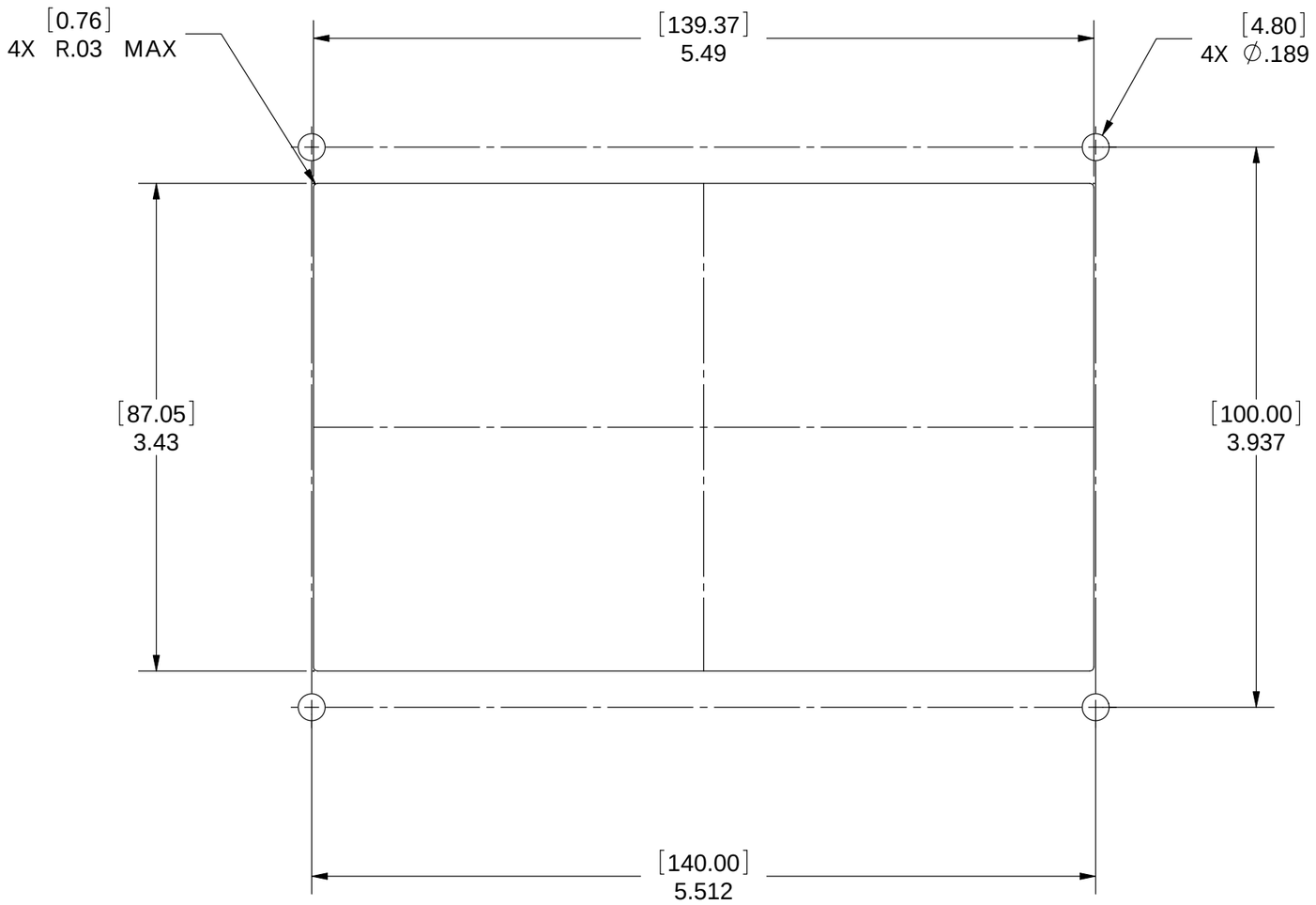


1 TWO SETS OF MOUNTING HOLES ARE SHOWN – 9" AND 12" SQUARE PATTERN.
SEA TEL STANDARD MOUNTING PATTERN IS 9" SQUARE FOR THIS RADOME SIZE.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. X.X = ±.050 X.XX = ±.020 X.XXX = ±.005 ANGLES: ±.5' INTERPRET TOLERANCING PER ASME Y14.5M – 1994	DRAWN BY: J. ZAJAC DRAWN DATE: 08–24–2010 APPROVED BY: APPROVED DATE:	Sea Tel COBHAM Tel. 925–798–7979 Fax. 925–798–7986	
MATERIAL:		TITLE: INSTALLATION TEMPLATE, 29 IN RADOME	
FINISH:	SIZE: E SCALE: 1:1	DRAWING NUMBER: 132903	REV: A
3rd ANGLE PROJECTION	FIRST USED: ST24	SHEET NUMBER: 1 OF 1	

DOCUMENT NO. 124225–5_A

REVISION HISTORY				
REV	ECO#	DATE	DESCRIPTION	BY
A	8152	11/16/10	RELEASED TO PRODUCTION. WAS REVISION X1.	KRB



NOTES: UNLESS OTHERWISE SPECIFIED

1. MINIMUM 6" CLEARANCE DEPTH REQUIRED FOR GACP ENCLOSURE AND CABLES.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.
X.X = ±.050
X.XX = ±.020
X.XXX = ±.005
ANGLES: ±.5°
INTERPRET TOLERANCING PER ASME Y14.5M - 1994

MATERIAL:

FINISH:

3rd ANGLE PROJECTION

DRAWN BY: J. ZAJAC

DRAWN DATE: 04/15/2010

APPROVED BY:

APPROVED DATE:

Sea Tel
COBHAM
Tel. 925-798-7979 Fax. 925-798-7986

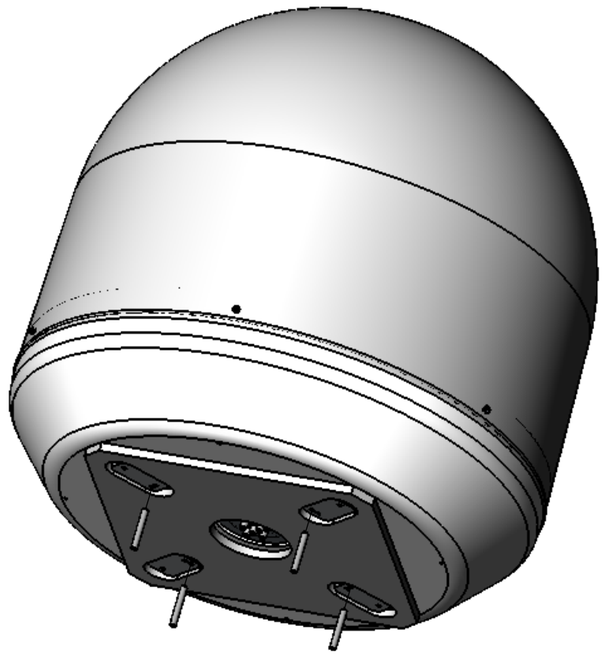
TITLE: TEMPLATE, GACP ENCLOSURE INSTALL

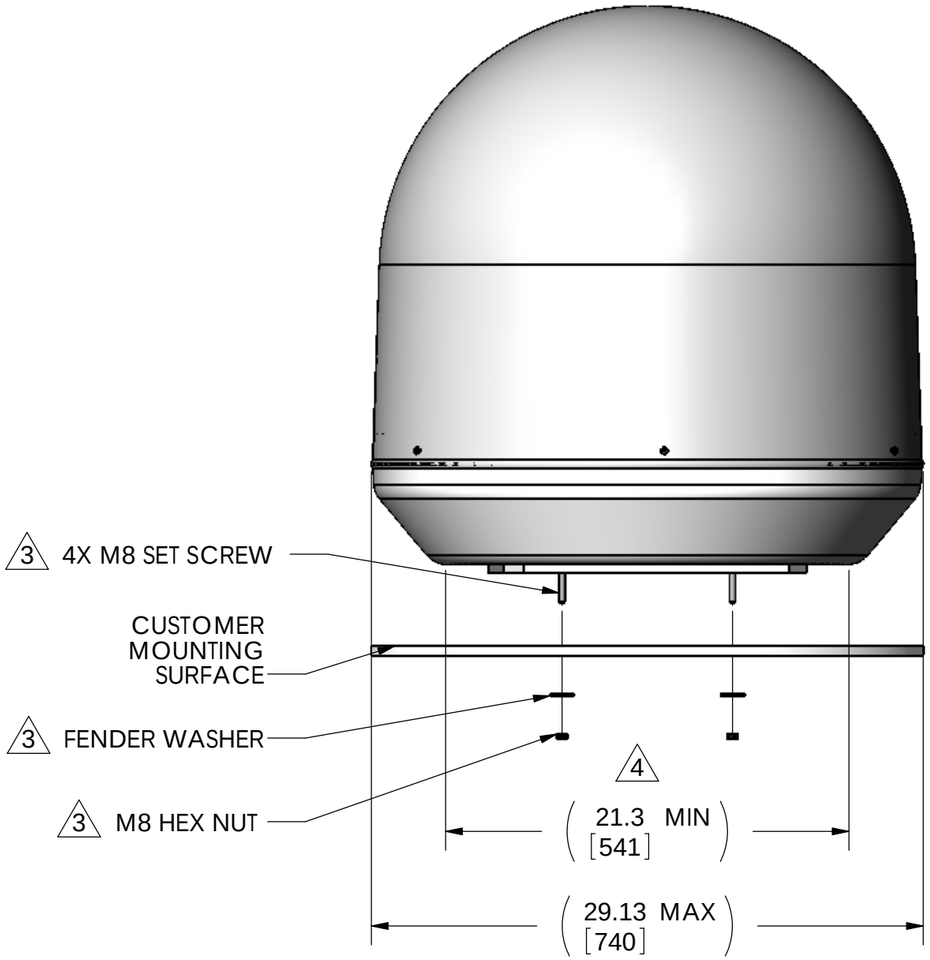
SIZE: B | SCALE: 1:1 | DRAWING NUMBER: 132230 | REV: A

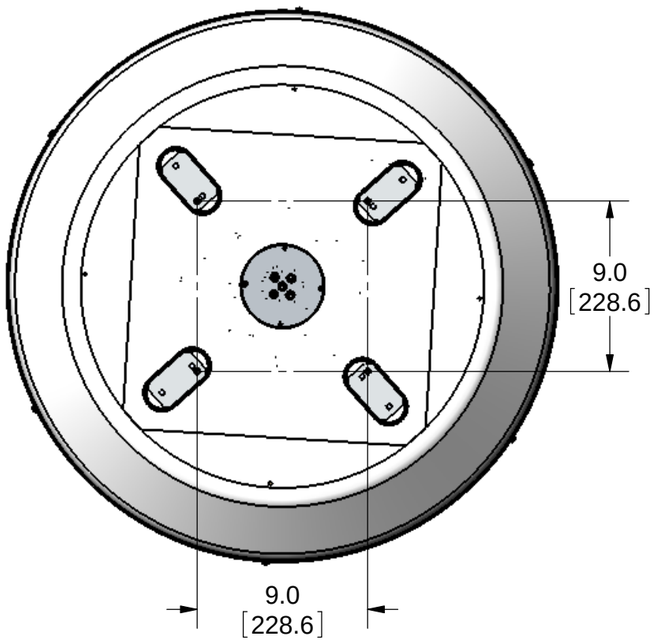
FIRST USED: COASTAL | SHEET NUMBER: 1 OF 1

9 INCH MOUNTING PATTERN

REVISION HISTORY				
REV	ECO#	DATE	DESCRIPTION	BY
A	N/A	12/14/10	RELEASED TO PRODUCTION.	JZ
B	8491	05-06-11	UPDATE CONNECTOR PLATE W/5TH HOLE AND CONNECTORS; UPDATE DRAWING FORMAT	HT







BOTTOM VIEW

REFERENCE DRAWINGS:
132542 GA INSTALL, ST24
133041 GA INSTALL, USAT 24
132903 INSTALLATION TEMPLATE, 29 IN RADOME

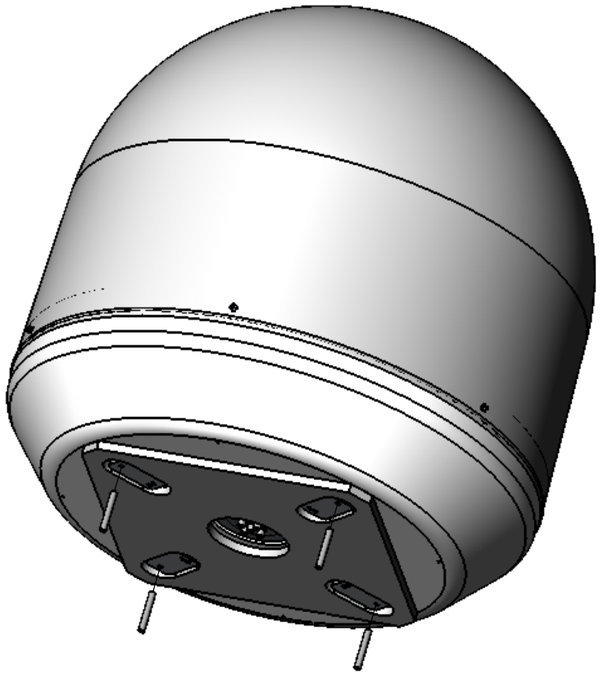
NOTES: UNLESS OTHERWISE SPECIFIED

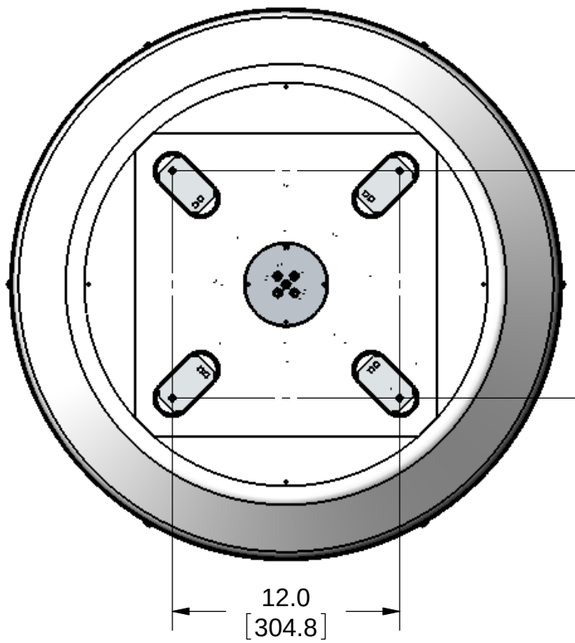
1. APPLY ADHESIVE PER SEATEL SPEC. 121730.
2. TORQUE THREADED FASTENERS PER SEATEL SPEC. 122305.
3. HARWARE SHOWN IS PART OF RADOME MOUNTING KIT P/N 132853-1.
4. MINIMUM DIAMETER OF MAST MOUNTING PLATE EQUAL TO RADOME BASE DIAMETER.
5. FOR ADAPTER PLATE USE OF COUNTERSUNK SCREW IS NOT RECOMMENDED. USE COUNTERBORE INSTEAD.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.
X.X = ±.050
X.XX = ±.020
X.XXX = ±.005
ANGLES: ±.5°
INTERPRET TOLERANCING PER ASME Y14.5 - 2009

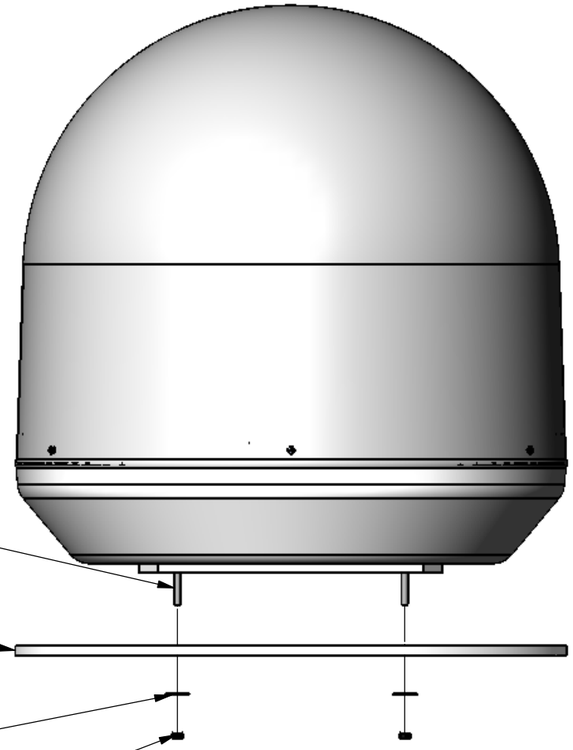
DESIGNER/ENGINEER:		DRAWN BY: J. ZAJAC	Sea Tel COBHAM Tel. 925-798-7979 Fax. 925-798-7986
WEIGHT:		DRAWN DATE: 11/30/2010	
MATERIAL: N/A		APPROVED BY:	TITLE: INSTALLATION ARRANGEMENT 29 IN RADOME, ST24 AND USAT24
FINISH: N/A		APPROVED DATE:	
SURFACE ROUGHNESS:	SIZE: B / SCALE: 1:8	DRAWING NUMBER: 133491	REV: B
3rd ANGLE PROJECTION	FIRST USED: ST24		SHEET NUMBER: 1 OF 2

12 INCH MOUNTING PATTERN





BOTTOM VIEW



SIZE	SCALE:	DRAWING NUMBER	REV
B	1:8	133491	B
		SHEET NUMBER 2 OF 2	