
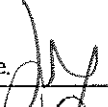
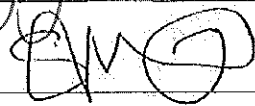


Field Service Spares Replacement Procedure – AZ Motor Kit, ST24

Approval:

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Revision History

Rev.	ECO	Description of Change	Date
A	9145	Initial release	03-06-2012

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Field Service Procedure – Replacement AZ Motor Kit, ST24

1. Brief Summary:

Troubleshooting document for diagnosing a fault with and replacing the azimuth motor on ST24 antennas.

2. Checklist:

- Verify Drive / Motor
- Check the Motor for Dead Spots
- Run the Built-In Test (If supported by your PCU software version)

3. Theory of Operation:

The azimuth motor on the ST24 antenna is used to drive the system in 360 degree rotations during the initial search for the satellite, once the satellite has been located and identified changes in the vessels heading will be sensed by the azimuth rate sensor on the PCU PCB and in turn drive will be issued to the azimuth motor to maintain the look angle to the satellite. Once the tracking function of the antenna is enabled azimuth drive will also be issued to optimize the receive signal level, based on feedback from each dishscan revolution.

4. Verify the Drive of the Azimuth Axis:

Drive from the azimuth motor should be consistent, rotating the radome base around the antenna will cause the PCU to issue drive. Observe the motor and verify if it's functioning correctly. If the motor skips instead of driving smoothly it's possible a winding has failed or if no drive is present its possible there is a short in the motor.

If it is suspected there is a dead spot in the motor power down the system and gently rotate the axis by moving the belt backwards and forwards. This in turn will rotate the motor pulley and shaft and it should be apparent if there is a dead spot as the rotation will feel taught at that position.



***Caution:** Be extremely careful rotating the pedestal around while your fingers are in this area to prevent pinching or crushing your fingers in the pedestal assembly.

5. Run the ST24 Built-In Test:

***Note:** At the time of print the built in test doesn't support the azimuth motor (will always say passed on the test results). If your PCU Software version is 1.11 or higher contact your local Sea Tel service department to verify if this test is supported by your software.

To run the internal system test on the ST24 antenna access the home page of the control panel. If there is a locked padlocked displayed in the lower right corner of the screen, press this to access the options.

Select the antenna option from the home page and then select the advanced options, you'll now see the option to run "system test". Select the system test option to display the different tests available. You'll now have the following options:

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5.1. Power on Self Test Results PCU:

Displays the PCUs test results for the elevation motor and encoder, pol motor and encoder, azimuth motor, tilt sensor, rate sensors, GPS, and some internal communication tests which were recorded when the antenna was last initialized. Possible Failure results are:

1. EL Motor and Encoder – Loose connection, a winding is down in the motor, encoder failure. Verify connection, replace the motor.
2. Pol Motor and Encoder – Loose connection, a winding is down in the motor, encoder failure. Verify connection, replace the motor.
3. AZ Motor – Loose connection, a winding is down in the motor. Verify the connection, replace the motor. This test is not currently active at time of print contact your local Sea Tel service department to verify if it's supported by your PCU software (version 1.11 or higher).
4. Tilt (MEM) Sensor – Failure of the solid state accelerometer or the pedestal is tilted more than 15 degrees, rerun test with pedestal level, or replace the PCU.
5. Rate Sensor – Failure of one of the rate sensors, replace the PCU. This test is not currently active at time of print contact your local Sea Tel service department to verify if it's supported by your PCU software (version 1.11 or higher).
6. GPS – The GPS is only tested during the in service test due to the amount of time required for the GPS antenna to acquire lock.
7. Processor – Failure of the main PCU processor to communicate properly with onboard devices, replace the PCU.
8. Tuner Communication – Failure of the DVB tuner, replace the PCU.

5.2. In Service Test PCU:

Tests the internal components on the PCU PCB including the tilt (MEM) sensor, rate sensor, GPS, processor and tuner communication. Possible Failure results are:

1. Tilt (MEM) Sensor – Failure of the solid state accelerometer or the pedestal is tilted more than 15 degrees, rerun test with pedestal level, or replace the PCU.
2. Rate Sensor – Failure of one of the rate sensors, replace the PCU.
3. GPS - No active GPS update, verify connection, replace GPS antenna, or replace PCU.
4. Processor – Failure of the main PCU processor to communicate properly with onboard devices, replace the PCU.
5. Tuner Communication – Failure of the DVB tuner, replace the PCU.

5.3. Out of Service Test PCU:

This will take the antenna off satellite by doing a software reset of the PCU, reinitializing the system. In doing this it re-runs the PCU's power on self test which include the elevation motor and encoder, pol motor and encoder, azimuth motor, tilt sensor, rate sensors, GPS, and some internal communication tests. Possible Failure results are:

1. EL Motor and Encoder – Loose connection, a winding is down in the motor or encoder failure. Verify the connection, replace the motor.
2. Pol Motor and Encoder – Loose connection, a winding is down in the motor or encoder failure. Verify the connection, replace the motor.

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3. AZ Motor – Loose connection, a winding is down in the motor. Verify the connection, replace the motor. This test is not currently active at time of print contact your local Sea Tel service department to verify if it's supported by your PCU software (version 1.11 or higher).
4. Tilt (MEM) Sensor – Failure of the solid state accelerometer or the pedestal is tilted more than 15 degrees, rerun test with pedestal level, or replace the PCU.
5. Rate Sensor – Failure of one of the rate sensors, replace the PCU. This test is not currently active at time of print contact your local Sea Tel service department to verify if it's supported by your PCU software (version 1.11 or higher).
6. GPS – The GPS is only tested during the in service test due to the amount of time required for the GPS antenna to acquire lock.
7. Processor – Failure of the main PCU processor to communicate properly with onboard devices, replace the PCU.
8. Tuner Communication – Failure of the DVB tuner, replace the PCU.

5.4. Power on Self Test Results Panel:

Displays the control panels test results for the GACPs processor, touch screen, modem board and PCU communications which were recorded when the antenna was initialized. Possible Failure results are:

1. Processor - Failure of the GACP processor, replace the GACP.
2. Touch Screen - Failure of the GACP touch screen, replace the GACP.
3. Modem Board - Failure of the GACP modem board, replace the GACP.
4. PCU (communications) – Failure of communication with the PCU verify cable, verify voltage to the PCU/antenna powered, replace the GACP.

5.5. In Service Test Panel:

Tests the internal components on the control panel including the GACP processor, touch screen, modem board and PCU communications. Possible Failure results are:

1. Processor - Failure of the GACP processor, replace the GACP.
2. Touch Screen - Failure of the GACP touch screen, replace the GACP.
3. Modem Board - Failure of the GACP modem board, replace the GACP.

5.6. Out of Service Test Panel:

Runs the panels power on tests which include the GACP processor and touch screen. Possible Failure results are:

1. Processor - Failure of the GACP processor, replace the GACP.
2. Touch Screen - Failure of the GACP touch screen, replace the GACP.

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6. Replacing the Azimuth Motor:

6.1. Tools.

- #1 Phillips Screwdriver
- Snips/Cutters
- 10mm Wrench/Spanner
- 3mm Allen Wrench/Key
- Cable Ties/Tie Wraps
- Loctite 242

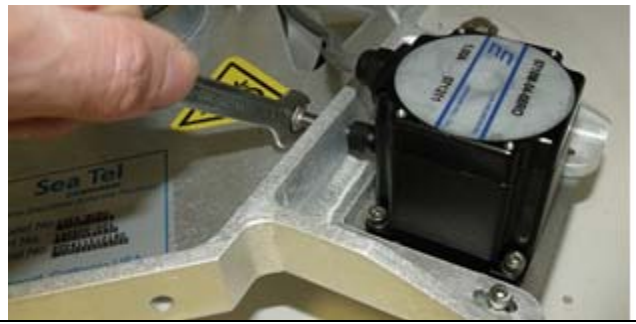
6.2. Procedure.

Procedure for replacing the azimuth motor, Sea Tel kit part number: 135919 (azimuth motor assembly part number: 132499-1).

<p>*Caution: Power down the pedestal before following this procedure.</p> <p>1. Using a #1 Phillips screwdriver remove the four screws securing the PCU PCB cover to the yoke and remove it. Save the hardware for future use.</p>	
<p>2. Disconnect the azimuth motor IDC connector from PCU PCB.</p>	
<p>3. Using a pair of cutters snip the cable ties securing the azimuth motor harness to the yoke.</p>	

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4. Using a 10mm wrench back of the tensioning nut from the azimuth motor.



5. Undo the four screws mounting the azimuth motor assembly to the yoke. Save the hardware for future use.

***Note:** Undo the outer screws for the motor plate, not the screws mounting the motor to the plate (as shown on the right).



6. Install the replacement motor assembly by slipping the pulley through the belt ensuring it's correctly installed on the tensioning wheel (located under the yoke and in front of the motor mounting point).

7. Align the motor assembly with the harness facing towards the pedestal and apply Loctite 242 to the hardware removed in the previous step. Do not fully tighten the hardware at this time.



8. Apply Loctite 242 to the thread of the tensioning screw and tighten it using a 10mm wrench. Periodically check the belt tension as per the following step.



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9. Verify the belt tension by rotating the belt at the central point between the main drive sprocket and motor pulley. The belt should be easily rotated through to 90 degrees at which point it should become tight. If the belt can easily be rotated past 90 degrees the tension is too loose, if it can't be rotated to 90 degrees the tension is too tight.
10. Once complete tighten the 4 motor mounting screws and re-check the belt tension. Adjust if necessary.



11. Connect the azimuth motor IDC connector to the PCU PCB.



12. Secure the azimuth motor harness to the yoke, using cable ties.



13. Refit the PCU PCB cover using the hardware removed in step 1. Apply Loctite 242 to the threads.

