




**Field Service Spares Replacement Procedure – Pol Motor Kit, ST24**

**Approval:**

Approving Authority	Signature	Date
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**Revision History**

Rev.	ECO	Description of Change	Date
A	9145	Initial release	03-05-2012

# ***Field Service Procedure – Replacement Pol Motor Kit, ST24***

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## **1. Brief Summary:**

Troubleshooting document for diagnosing a fault with and replacing the pol motor on the ST24 antenna.

## **2. Checklist:**

- Verify Initialization
- Run the Built-In Test

## **3. Theory of Operation:**

The polarization motor located on the feed assembly of the system is used to counter act the roll of the vessel exerted on the system, meaning as the vessel rolls the feed assembly will be driven to maintain the linear polarization look angle to the satellite. Feedback from the sensor(s) is feed into the PCU where the amount of voltage change overtime in calculated into the amount of physical movement being exerted on the system and in turn the PCU will output the drive command to the pol motor to move it the opposite amount of movement therefore maintaining the position of the feed in relation to the satellite signal.

An encoder is integrated into the pol motor and will provide feedback to the PCU as per the angle of the feed assembly and based on the antennas GPS position and the desired satellite the feed will be driven until the correct output from the encoder is received aligning it for the correct angle of the linear satellite signal.

## **4. Initialization:**

To reinitialize the pedestal, cycle the Power to the antenna by toggling the power switch to the GACP control panel. During the initialization process the antenna will calibrate the encoders on the elevation and pol motors as well as verifying the motor drive and acquiring GPS lock. The initialization process is as follows:

1. EL drive – The elevation axis drives down into its end stop to calibrate the encoder and then up to a zero degree look angle.
2. Pol Drive – The feed drives counter clockwise into its end stop to calibrate the encoder and then drives clockwise until the LNB is vertical.
3. EL Drive 45 – The elevation axis then drives the reflector to a 45 degree look angle.

Once the initialization process is complete the system will then target the last preset satellite in the GACP.

## **5. Run the ST24 Built-In Test:**

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 & Encoder – Loose connection, a winding is down in the motor, encoder failure. Verify connection, replace the motor.
2. Pol Motor & 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 and 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 & Encoder – Loose connection, a winding is down in the motor or encoder failure. Verify the connection, replace the motor.
2. Pol Motor & 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.
4. PCU (communications) – Failure of communication with the PCU verify cable, verify voltage to the PCU/antenna powered, 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 Pol Motor:

#### 6.1. Tools.





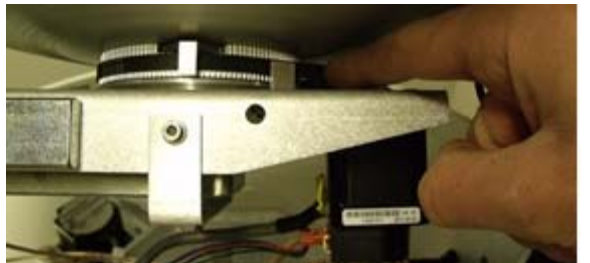
- #1 Phillips Screwdriver
- Snips/Cutters
- 7mm Wrench/Spanner
- 3mm Allen Wrench/Key
- Cable Ties/Tie Wraps
- Loctite 242

#### 6.2. Procedure.





Procedure for replacing the pol motor, Sea Tel kit part number: 135917 (motor assembly part number: 132494-1).

<p><b>*Caution:</b> Power down the pedestal before following this procedure.</p> <p>1. Using a #1 Phillips screwdriver remove the 4 screws securing the PCU cover to the yoke and remove it. Save the hardware for future use.</p>	
<p>2. Disconnect the pol motor and encoder IDC connectors from the PCU PCB.</p>	
<p>3. Using a pair of snips cut the cable ties securing the pol motor harness to the coax cables.</p>	
<p>4. Remove the P-clip securing the pol motor harness to the bracket using a 7mm wrench. Save the hardware for future use.</p>	

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<p>5. Back off the pol motor tensioning screw by undoing the bolt using a 7mm wrench.</p>	
<p>6. Remove the four screws which mount the pol motor assembly to the feed using a 3mm Allen wrench.</p>	
<p>7. Install the replacement motor assembly with the motor and coax cable pointing upwards. Install with the hardware removed from the previous step and apply Loctite 242 to the threads. Do not fully tighten at this time.</p>	
<p>8. Apply Loctite 242 to the thread of the tensioner bolt and adjust the belt tension by tightening the screw, checking the tension periodically as per the next step.</p>	
<p>9. Verify the belt tension by pressing the central point between the main drive sprocket and motor pulley. The belt tension should have some give in it being tight enough that the belt won't skip on the teeth of the sprockets.</p>	

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<p>10. Once complete tighten the four screws and verify the tension again. If the tension needs adjusting repeat steps 8 and 9.</p>	
<p>11. Secure the pol motor, encoder and coax cables, with the P-clip removed in step 4 and install the securing nut and washer. Apply Loctite 242 to the thread.</p>	
<p>12. Connect the replacement pol motor and encoder IDC connectors to the PCU PCB.</p>	
<p>13. Secure the pol motor, encoder harnesses and coax cables with cable ties.</p> <p><b>*Note:</b> ensure the feed assembly has enough slack on the cables to rotate full, check and adjust if necessary.</p>	
<p>14. Install the PCU cover using the four screws removed in step one, apply Loctite 242 to the threads.</p>	