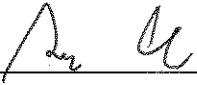

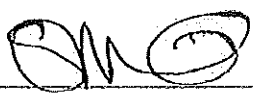


**Field Service Spares Replacement Procedure – Pol Motor Kit, 6006C,  
6009C, 9597B & 9707B**

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Approval:

Approving Authority	Signature	Date
Doc Control:	Ron Chaffee / Signature on file. 	11-2-11
Assistant Service Manager, Global	John VanderJagt / Signature on file. 	11-2
Author:	Stuart Broadfield / Signature on file. 	11-02-11

Revision History

Rev.	ECO	Description of Change	Date
A	8799	Initial release	08-12-2011
B	9063	Clerical revisions	10-25-2011

# ***Field Service Procedure – Replacement Pol Motor Kit, 6006C, 6009C, 9597B & 9507***

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## **1. Brief Summary:**

Troubleshooting document for diagnosing a fault with and replacing the pol motor on the 6006C, 6009C, 9597B and 9507 series antennas.

## **2. Checklist:**

- Verify Range of Motion
- Verify Pot Range
- Measure Motor Voltage
- Verify Harness

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

The antennas feed assembly is driven through its 180 degree range of motion by a 24VDC motor for the correct orientation of the LNB, relative to the received linear signal. Based on the vessels GPS position and the look angle to the desired satellite, the DAC will calculate the numerical value for the position of the pol assembly. The PCU will then send the command to the POL Aux relay PCB to drive the pol motor until the correct feedback value is obtained from the pol pot. When the vessel sails and the GPS position changes, the look angle to the satellite will also change and adjustments will be made to maintain good cross pol isolation (alignment to the satellites linear signal).

One indication that there is a fault with the feed alignment of the system is the target light will be permanently illuminated on the DAC and the antenna won't target correctly, sitting 8 degrees above or below the satellites elevation look angle. As part of the antennas targeting procedure, the system will target above or below the satellite, calculate the auto threshold setting based on the noise floor level and then align the feed for the correct reception position based on the vessels GPS position and the lookup table in the DAC. If the system is unable to drive the pol motor so the correct feedback is received from the pot, or the pot has failed and won't give the correct feedback, the system can't complete the targeting process and the antenna will stay in this position. Setting the pol type to "0009" will make the antenna target by removing the auto pol function from the targeting process; however the miss-alignment of the feed will cause bad cross pol isolation.

## **4. Verify Range of Motion:**

Firstly, verify the settings in the DAC are correct. The Pol Scale should be set to "0090" to give the feed 180 degrees of motion and the default Pol Offset is "0040" for the 6009C or "0030" for the 9597B and 9507 antennas; however this may have been modified slightly to "trim" the pol angle.

Set the Pol Type in the setup menu of the DAC to "0009" to change the mode of the pol assembly from automatic (Pol Type "0072") to manual. This removes the automatic calculation based on the vessels GPS position and allows the feed assembly to be manually driven for diagnostic purposes. Now access the pol window and drive the pol assembly, verifying that it has a full 180 degrees of movement.

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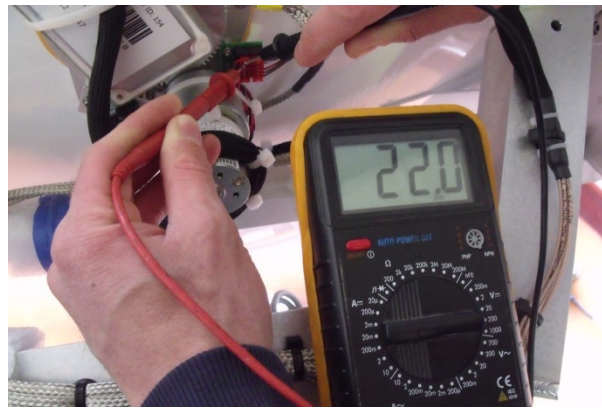
## 5. Verify Pot Range:

If no feed drive is present, verify the pol reading on the DAC. If the count is either 0 or 255, it is possible the pot isn't aligned correctly. Adjusting it may bring it back to within its range. Disengage the pot from the main gear and rotate the pot, verifying if the feedback changes on the DAC. If so, calibrate the pol pot and verify operation as described in the later stages of this document.

If the pol count on the DAC doesn't change when the pot is adjusted, the pot has failed and its resistance value is static (open or closed). No drive will be issued to the pol motor as the value is out of the range which the system operates in. The pol pot must be changed.

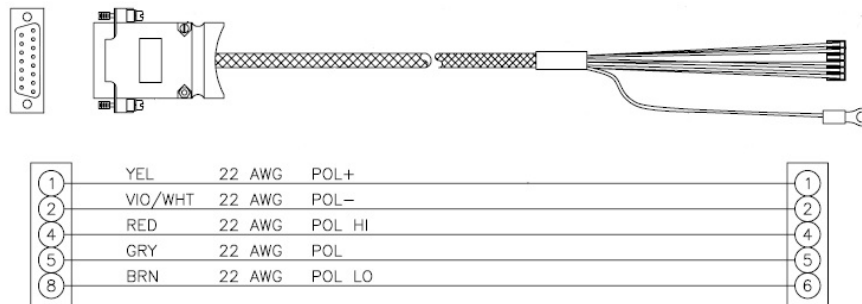
## 6. Measure Motor Voltage:

Leaving the pol type in manual mode, apply drive to the feed assembly and measure the voltage to the motor on the IDC connector; 24VDC should be present. If voltage is present but the motor isn't driving, the motor is defective and needs replacing.



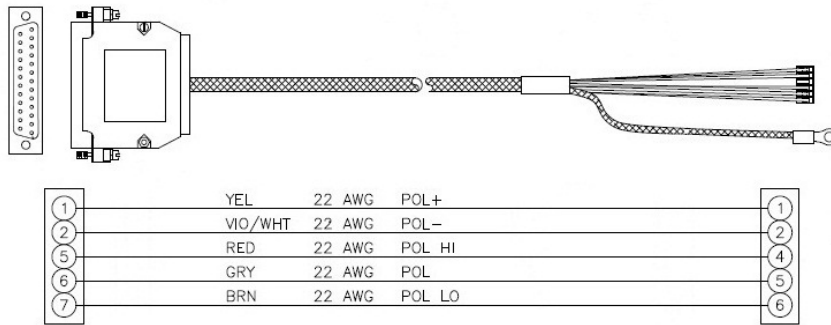
If no voltage is present verify the connections of the reflector harness by measuring pin to pin as per the below diagram:

6006C and 6009C MK1

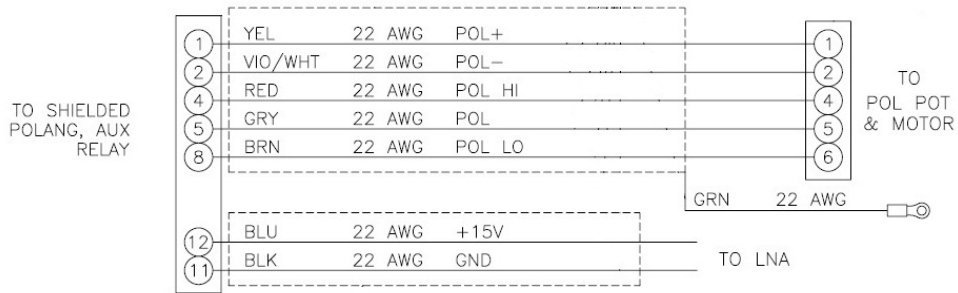


# Field Service Procedure – Replacement Pol Motor Kit, 6006C, 6009C, 9597B & 9507

## 6009C MK2



## 9597B and 9507



If the harness connections and the motor are good, the pol aux relay isn't outputting the voltage to drive the motor and needs replacing.

As long as the pol count is within the pot limits, the DAC will issue a pol drive command to the PCU, as required, to maintain correct pol alignment. The command for pol drive is issued from the DAC, to the PCU and then to the pol aux relay. Therefore, it is possible that the PCU and/or pol aux relay are defective.

# Field Service Procedure – Replacement Pol Motor Kit, 6006C, 6009C, 9597B & 9507




## 7. Pol Motor Replacement Procedure:

### 7.1. Tools.


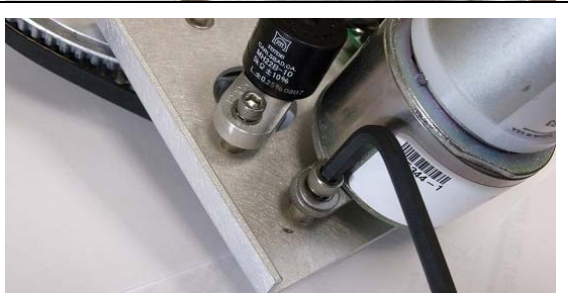



- Snips/Cutters
- 5/64" Allen Wrench/Key
- 1/8" Allen Wrench/Key
- 1/16" Allen Wrench/Key
- Loctite 222, 242 and 638
- Cable Ties/Tie Wraps

### 7.2. Procedure.

Procedure for replacing the pol motor on the 6009C, 9597B and 9507 series antennas, Sea Tel kit part number: 134926 (motor part number: 121880-2).

<p><b>*CAUTION:</b> Power down the pedestal before following this procedure.</p> <p>1. Disconnect the pol motor harness from the IDC connector from the termination block and remove the cable ties securing the pol motor harness.</p>	
<p>2. Using a 5/64" Allen wrench undo the two screws securing the pol motor and remove the assembly.</p>	
<p>4. Remove the two screws and bracket attached to the defective pol motor and install the bracket to the replacement motor applying Loctite 242 to the threads.</p> <p>5. Install the pulley to the replacement motor in the same orientation as on the defective one, applying Loctite 638 to the motor shaft. Install the set screw so it's against the flat edge of the motor shaft. Secure the set screw with Loctite 222 and tighten with a 1/16" Allen wrench.</p> <p><b>*Note:</b> For further information refer to the Loctite Procedure 121730 provided with this kit.</p>	






## Field Service Procedure – Replacement Pol Motor Kit, 6006C, 6009C, 9597B & 9507

<p>6. Loosen the screw securing the pol pot bracket and disengage it from the belt (take care not to let the pot pulley rotate).</p>	
<p>7. Install the replacement pol Motor assembly, applying loctite 242 to the threads, do not fully tighten at this time.</p>	
<p>8. Pull down on the motor to tension the belt and tighten the screws.</p>	
<p>9. Apply Loctite 242 to the thread of the pol pot screw and reengage the pulley with the pol belt. Ensure the teeth are engaged then tighten the screw.</p>	
<p>10. Reconnect the Pol Motor IDC Connector and secure the harness with cable ties.</p> <p>11. Follow the below procedure for calibrating the pot.</p>	









# Field Service Procedure – Replacement Pol Motor Kit, 6006C, 6009C, 9597B & 9507

## 8. Pol Pot Alignment and Verification:

1. Drive the reflector to zero degrees of elevation to view the orientation of the feed assembly:

Press the **TRACK** button to turn the tracking function off (if applicable) to prevent the antenna from going into a search. Push the **NEXT** button until the 'Antenna' window is displayed (the screen will show the AZ, EL and REL values). Press the **ENTER** button twice to isolate the 'EL' window and then press the  arrow to activate it (a cursor will be displayed). Now use the  and  arrow keys to scroll the cursor along and use the  and  arrow keys to change the elevation value to "00.0" and press the **ENTER** button.



2. Set the Pol Type to manual mode:

Enter the 'Setup Menu' by pressing and holding the   arrow keys together until the "EL Trim" or 'Auto Trim' window is displayed. Push the  arrow key until the 'Polang Type' window is displayed. Press the  arrow key to activate the window. Now use the  and  arrow keys to scroll the cursor along and use the  and  arrow keys to change the characters. Set the 'Polang Type' to "0009" which is manual mode and press the **ENTER** button.

3. Press the **ENTER** button to go to the pol offset window and verify the default setting is "0030" for a 9597B or 9507 or "0040" for a 6009C. (If necessary use arrow keys to select appropriate digits and change accordingly).

4. Now keep pressing the **NEXT** button until the 'Antenna' window is displayed (the screen will show the AZ, EL and REL values).

5. Press the **ENTER** button 4 times until 'Pol xxx' is displayed and then press the  arrow key to activate the window.

6. Now hold either the  or  arrow key to drive the pol until a count of either "130" for the 6009C, or "120" is displayed for the 9597B and 9507 pedestals.

**\*Note:** It's advisable to have someone watching the feed while it's being driven as if the pot isn't correctly calibrated there is the possibility to damage the assembly if the LNB hits the pol motor or the reflector harness is coiled around the feed.

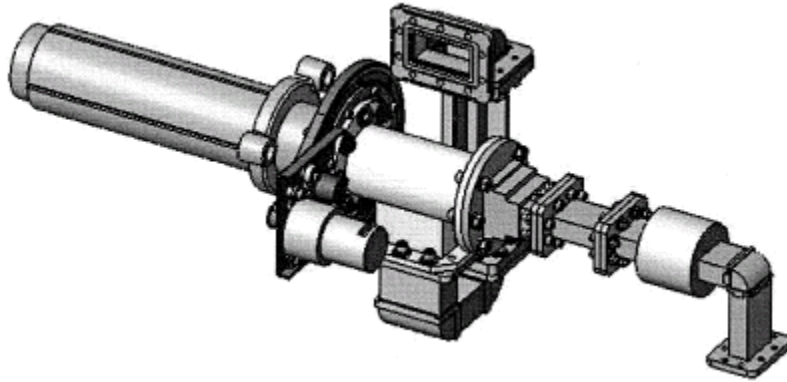
7. Observe the physical alignment of the feed:

The RX waveguide should be facing downwards, with the TX Reject filter to the right vertically with the LNB horizontal above the assembly with the coax exiting to the left. Later revisions of this system use an additional length of waveguide with the filter above the assembly, horizontally and the LNB facing downwards on the left side.







## Field Service Procedure – Replacement Pol Motor Kit, 6006C, 6009C, 9597B & 9507

\*Note: LNB not shown for clarity.




(Steps 8-12 requires assistance to observe and operate antenna simultaneously)

- Using the DAC-2202 drive the feed so the RX waveguide exits vertically.  
Press the  arrow key to activate the cursor on the pol window. Now hold either the  or  arrow key to drive the pol motor until the RX wave guide is facing downwards. Now press the  button to de-activate the window.
- Locate the pol potentiometer on the feed and loosen the screw that secures the slotted mounting plate with a 9/64" Allen wrench and carefully move the pol pot gear out of alignment with the belt (fig. 1.1).



(Fig. 1.1)

- Align the potentiometer:

On the DAC verify the cursor is not displayed on the pol window, if it is press the  button (failure to do this will result in display not changing). Now rotate the pot sprocket manually until a count of either 120 (9597B and 9507) or 130 (6009C) is achieved, depending on your antenna model. Now reinstall the pot on the main sprocket.



\*Note: When re-installing the pot onto the belt, it is common for the reading to change as the teeth are engaged. Once the pot had been installed recheck the pol value and adjust if necessary. Due to the belt/sprocket alignment of the pot the tolerance is +/- 2 degrees so 118-122 counts for the 9597B and 9507 and 128-132 for the 6009C.




## Field Service Procedure – Replacement Pol Motor Kit, 6006C, 6009C, 9597B & 9507










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11. Drive the pol motor to its upper and lower electrical limits and verify the assembly drives in the correct direction and that the feed assembly has 180 degrees of rotation:

On the DAC press the  arrow key to display cursor underneath the pol value and then press and hold the  arrow key to drive the feed to its upper end stop. Verify the assembly drives 90 degrees so the exit of the RX wave guide is horizontal, facing the left with the LNB now vertical with the coax facing upwards (provided the LNB was horizontal in the previous step, depending on the configuration of the antenna). The pol reading should be approximately 211 counts.





Now press and hold the  arrow key to drive the feed to its lower end stop and verify feed rotates 180 degrees, with the exit of the RX wave guide horizontal, facing the right and the LNB now vertical with the coax facing downwards (depending on the configuration of the antenna). The pol reading should be approximately 28 counts.

12. Set the Pol Type to Automatic (auto pol):

Press and hold the   arrow keys together until the 'EL Trim' or 'Auto Trim' window is displayed. Push the  arrow key to scroll through the settings until the 'Polang Type' window is displayed and press the  arrow key to activate the window. Now use the  and  arrow keys to scroll the cursor along and use the  and  arrow keys to change the value from "0009" to "0072" and then press the  button to put the system back into automatic polang (auto pol) mode.

Watch the LNB and verify it returns to the correct reception position (while the POL motor is driving the target light will be illuminated on the DAC).

13. Save the settings in the DAC-2202:

Press and hold the   arrow keys together briefly, "Save New Parameters" will be displayed. Press the  arrow key to activate the window and then press the  button, "Parameters Saved" will be displayed and the polang type and pol offset will be stored in the DAC.

**\*Note:** If making adjustments to the polarization alignment of a VSAT antenna contacting the NOC to run through a cross-pol isolation test and calibrating the Pol Offset will be necessary.

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