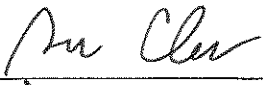

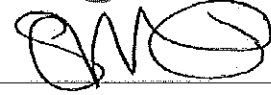


**Field Service Spares Replacement Procedure – Pol Motor Kit,
6003A/6004**

Approval:

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Revision History

| Rev. | ECO | Description of Change | Date |
|------|------|-----------------------|------------|
| A | 8799 | Initial release | 08-10-2011 |
| B | 9041 | Clerical revisions | 10-18-2011 |
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Field Service Procedure – Pol Motor Kit, 6003A/6004

1. Brief Summary:

Troubleshooting document for diagnosing a fault with and replacing the pol motor on the 6003A and 6004 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 stepper motor for the correct orientation of the 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 to issue voltage to drive the pol motor until the pol pot outputs the correct value at which point the feed will be aligned to the polarity of the satellite signal (provided its been calibrated correctly). Then as 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).

An 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 8 degrees below at high elevation look angles) 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 before targeting the satellite.

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 8 degrees above or below the desired target position of the satellite. 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 setting is "0030".

Set the pol type setting 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 enter the pol window and drive the pol assembly down into its end stop, observe the position of the feed. Now drive the pol assembly up, the feed should move 180 degrees under normal operation.

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5. Verify Pot Range:

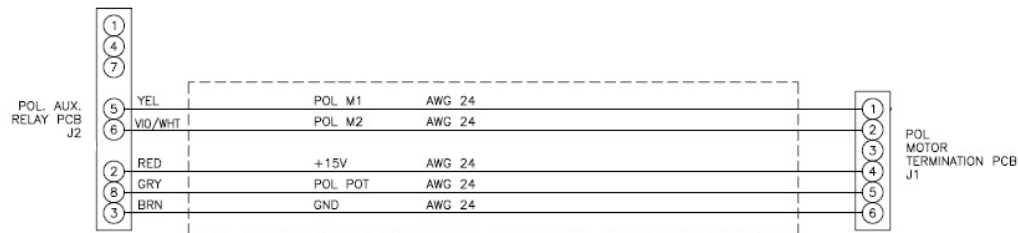
If no feed drive is present verify the pol reading on the DAC, isn't out of range (i.e. displaying a value of either 0 or 255). If one of these values are displayed it's possible the pot isn't aligned correctly and that adjusting it may bring it back to within the scale the DAC recognizes. Back the pot off from the main gear sprocket and rotate its pulley, verifying if the feedback changes on the DAC once the pot has been realigned. 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 is outputting a default value, no drive will be issued to the pol motor as the value is out of the range which the system operates in. Then the pol pot must be changed.

6. Measure the 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, 12VDC 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.



If the harness connections are good, then the pol aux relay PCB isn't outputting the voltage to drive the motor and needs replacing, should this not rectify the issue then it's possible the PCU, or the interface harness is at fault.

When the antenna is in auto pol as long as the pol range is within the pot limits the DAC will issue the pol drive command to the PCU motherboard, based on the antenna targeting, a change in the vessels GPS position or operator inputs. The PCU motherboard will then issue the command to switch the pol aux relay to drive the pol motor. The motor will then drive the feed until the correct output from the pot has been received, at which point the feed will be in the correct reception position (providing the system is functioning and calibrated correctly). Therefore there is also the possibility for a pol drive fault to be caused by the PCU motherboard.

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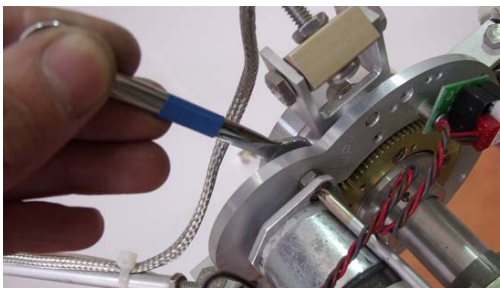

7. Replacing the 24VDC Polang Motor Assembly:

7.1. Tools.

- Snips/ Cutters
- 11/32" Wrench/Spanner
- #1 Phillips Screwdriver
- 1/16" Allen Wrench
- Loctite 222, 242 & 638

7.2. Procedure.

Procedure for replacing the 6003A/6004 polang motor using Sea Tel kit part number: 124108-1 (pol motor part number: 124069-1).

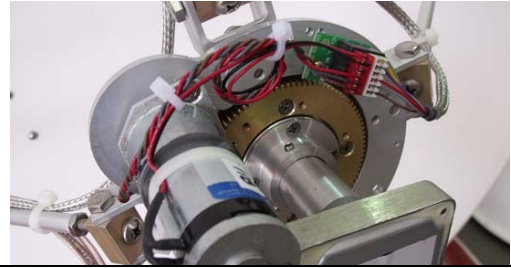
| | |
|--|--|
| <p>*CAUTION: Power down the pedestal before following this procedure.</p> <ol style="list-style-type: none">1. Firstly set the pol type setting in the DAC to "000g" (manual pol).2. Using a pair of snips cut the cable ties securing the pol motor harness.3. Now remove the pol motors IDC connector from termination block PCB connection block on the feed assembly. |  |
| <ol style="list-style-type: none">4. Using an 11/32" wrench undo the two nuts securing the pol motor assembly to the feed and remove it. |  |
| <ol style="list-style-type: none">5. Using the hardware supplied in the kit build the replacement pol motor assembly in the same configuration as the defective one. Apply Loctite 242 to the bolts securing the plate to the motor & to the outer mounting threads.6. Secure the pulley to the motor shaft in the same position and orientation as on the defective motor, applying Loctite 638 to the motor shaft & Loctite 222 to the set screw, tighten with a 1/16" Allen wrench. <p>*Note: For further information refer to the Loctite Procedure 121730 provided with this kit.</p> |  |

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7. Install the motor to the feed assembly, apply Loctite 242 to the mounting threads and tighten the securing nuts.



8. Connect the IDC connector to the termination block and secure the excess cable with cable ties.



8. Pol Alignment and Verification:

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

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 Pol Type to manual mode:

Enter the 'Setup Menu' by pressing and holding the **◀▶** arrow keys together until the "EL 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 Pol Offset window and verify the default setting is "0030". (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 'POLxxx' is displayed and then press the **▲** arrow key to activate the window.
***Note:** It's advisable to have someone watching the feed while the pol is driven. Driving the LNB past its normal range of operation can cause damage to the assembly.
6. Now hold either the **▲** or **▼** arrow key to rotate the Pol until a count of "115" is displayed.

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7. Observe the physical alignment of the LNB:

It should be horizontal pointing downwards. If not continue on to step 8, otherwise skip ahead to step 12.



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

8. Using the DAC-2202 drive the feed assembly to vertical:

Press the  arrow key to activate the cursor on the POL window. Now hold either the  or  arrow key to drive the Pol angle until the LNB is aligned vertically facing downwards (align the center of the LNB with the lower feed strut). Now press the  button to de-activate the window.

9. Locate the Pol Pot on the feed and loosen the screw that secures the slotted mounting plate (fig. 1.1) with a 3/32" Allen wrench and then carefully move the Pol Pot gear out of alignment with the main driven gear (Fig. 1.2).




(Fig. 1.1)



(Fig. 1.2)

10. Align the potentiometer:

On the DAC verify the cursor is not displayed on the Pol window, if it is press the  button (Fig 1.3) failure to do this will result in display not changing. Now rotate the pot manually until a count of 115 is displayed. Now reinstall the POT on the main sprocket (Fig 1.4).

***Note:** When re-installing the pot onto the main sprocket its common for the reading to change as the teeth of the sprockets are engaged. Because of this the tolerance is +/- 2 degrees so 113-117 counts.





(Fig 1.3)




(Fig 1.4)










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11. Drive the Polang 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 ACU press the  arrow key to display cursor underneath Pol value. Press and hold the  arrow key to drive the feed to its upper end stop and verify the LNB is horizontal with the coax cable towards the left. The Pol value should be approximately 211 counts.





Now press and hold the  arrow key to drive the feed to its lower end stop and verify the LNB is horizontal with the coax cables towards the right. The Pol value should be approximately 28 counts.

12. In the DAC setup menu, go to the Pol Type parameter and set antenna back into Auto Pol Mode:

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 pol type and pol offset will be stored in the DAC.