Field Service Spares Replacement Procedure – Furuno GPS Antenna XX09 MK1

Approval:

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Revision History

Rev.	ECO	Description of Change	Date
A	8878	Initial release	08-12-2011
B	9041	Clerical revisions	10-18-2011

Field Service Procedure – Replacement Furuno GPS Antenna Kit, XX09 MK1

1. Brief Summary:

Troubleshooting document for diagnosing a fault with and replacing the Furuno GPS antenna on the XX09 MK1 antenna.

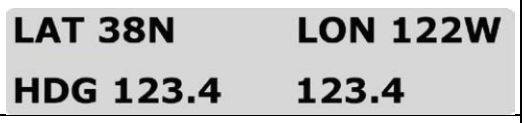
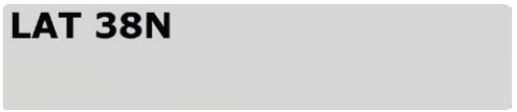
2. Theory of Operation:

A GPS antenna is installed on the pedestal to provide the vessels co-ordinates to the DAC for targeting purposes. Based on the feedback from the systems GPS antenna, the system will calculate the azimuth & elevation look angles. In addition, the pol angle will also be calculated. On a VSAT system, the GPS position will typically be fed into the SAT Modem via the TMS. This is required to calculate the distance from the satellite when using a TDMA link.

Should the GPS antenna fail and stop updating, tracking will keep the system on the satellite but the pol angle will not change as required. This will cause signal degradation and in turn, bad cross pol isolation. Should the antenna re-target, it will mispoint due to miss-calculation of the AZ, EL and POL positions. A known sign of a GPS antenna failure is when the position defaults to Japan (approximately 35N, 135E); the coordinates of where the GPS antenna is manufactured. If the satellite modem loses its GPS signal, it will eventually drop out of the network and only the RX LED will be illuminated (provided the antenna is on satellite). If the system loses its GPS, it is common to see a satellite out of range error (error 128) on the DAC. This is flagged when the target EL is calculated at below 0 or above 90 degrees elevation (out of range).

3. Latitude/Longitude Auto-Update Check:

This verifies that the integrated GPS antenna is automatically updating the position information.

1. Press the **NEXT** key until the Ships menu is displayed.	
2. Press the **ENTER** key to isolate the Latitude entry menu.	
3. Press the **LEFT** arrow key to display a cursor under the numeric value.	
4. Press the **UP** arrow key to change the displayed value.	
5. Press the **ENTER** key to submit change.	
6. If automatic updating is working properly, the Longitude value display will return to the current ships position within a few seconds.	

4. Troubleshooting:

Four polar orbiting GPS satellites cover any one location at any given time. In order to triangulate the GPS position, the GPS antenna needs to receive a signal from three out of the four satellites. If partial blockage of the GPS antenna on the pedestal causes only two or less of the satellites to be received, the GPS position will stop updating. If blockage is causing a problem with the update then there is a possibility of running the vessels GPS into the DAC via the TMS. If this is carried out then the antennas GPS must be disconnected. Do this by disconnecting the BNC connector at the PCU. Tie up any loose cable to prevent catching.

5. Replacing the XX09 MK1 GPS Antenna:

5.1. Tools.

- Snips/Cutters
- #1 Phillips Screwdriver
- Tie Wraps/Cable Ties
- Loctite 242

5.2. Procedure.

Procedure for replacing the XX09 MK1 GPS antenna, Sea Tel kit part number: 135373 (GPS antenna part number: 125082).

***CAUTION:** Power down the pedestal before following this procedure. 1. Using diagonal cutters, cut the three ties along the edge of the dish and any ties that join the GPS cable to the other harnesses at the PCU.	
2. Using the #1 Phillips screwdriver, remove the 2 Phillips screws that mount the existing GPS to its bracket. 3. Apply Loctite 242 and re-install the 2 Phillips screws to secure the replacement GPS to the bracket. 4. Insert new 7" ties into the buttons and secure the GPS cable along the edge of the dish toward the PCU. 5. Coil the excess GPS cable length and use a cable-tie to bind the coil. 6. Plug the GPS cable into the "GPS" port on the PCU.