

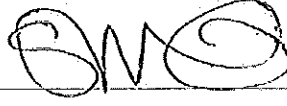


Field Service Spares Replacement Procedure – FSK Modem Troubleshooting

Approval:

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Revision History

Rev.	ECO	Description of Change	Date
X1	8872	Initial release	08-18-2011
A	9059	Clerical revisions	10-30-2011

Page 1 of 1		Document No 135310 Rev A
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Field Service Procedure – FSK Modem Troubleshooting

1. Brief Summary:

Troubleshooting document for diagnosing a fault with and replacing FSK modems on the XXo6 and XXg7 series antennas.

2. Checklist:

- Verify Harness and Coax connections
- Verify System Configuration
- Frequency Drift

3. Theory of Operation:

Pedestal communications are used so that target calculations, tracking decisions, drive commands and pol position updates can be sent from the DAC to the PCU; in turn the PCU will send the command to drive the relevant axis. The PCU will also communicate with the DAC for dishscan feedback and error information.

Commands are sent from the DAC as RS-422 (serial) data, which are then multiplexed into a frequency by the below decks FSK Modem. The comms signal is then passed along a coax cable to the pedestal where the above decks modem converts the communications frequency back into RS-422 and feeds it into the PCU. On unlimited azimuth systems the pedestal communications will be multiplexed onto an RF channel meaning no additional coax for the pedestal communications will need to be installed. VSAT systems with Codan RF equipment will use an additional pair of FSK Modems for communications with the BUC from the below decks.

A communication error (error 4) will be raised when a number of checksums that are sent from the DAC aren't returned by the PCU, its common to see this error displayed as an error 20 as if communications are down the DAC doesn't receive the dishscan pulse from the PCU so the dishcan error (error 16) is also flagged ($4 + 16 = 20$). If no communications are established the DAC will display "Remote Not Responding".

4. Troubleshooting:

A communication error could be caused by any component in between the DAC and PCU, this includes a damaged harness, damaged coax cables, lose connectors, a bad contact patch in the rotary joint, hardware failure of the FSK Modem(s) or possibly a power failure to the pedestal causing the PCU to not be energised.

Page 1 of 5	Sea Tel COBHAM	Document No 135310 Rev A
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Field Service Procedure – FSK Modem Troubleshooting

5. System Connections and Configuration:

Jumper JP3 on the DAC-2X02 motherboard is used to switch between the internal FSK modem and coax connection and the 9-pin D-sub connector for use with an external below decks modem. If using an external below decks modem jumper JP3 should be between pins 1 and 2. If using the internal FSK modem on the DAC motherboard for the XX04 or USAT series antennas the jumper should be between pins 2 and 3.

Check all connections on the comms path between the ACU and the PCU. This includes the interface connection between the PCU and above deck FSK modem, the coax cable between the modem and rotary joint, the rotary joint and the connection in the radome base. Check the rotary joint by switching channel 1 and channel 2 for diagnostic purposes (always use the centre channel for the transmit path). Next check the ACU-MUX harness is correctly installed the end marked "TAC-92" should go to "J4A" of the DAC-2202 or "J1" if using a TAC-92 unit, "Radio M+C" should connect to MUX p/n: 117611-4 and "Ped M+C" should go to MUX p/n: 117168-2.

If using a Codan system with dual muxes (117168-1/127169-5 and 117168-2 for pedestal comms and 117611-3 and 117611-4 for RF comms), which has a pedestal communications error the pair of RF modems can be switched with the pedestal modems to verify the communications path (they need to be switched as a pair as they transmit and receive on a different frequency to the pedestal modems).

6. Frequency Drift:

In extreme temperature conditions FSK modems have been known to overheat, causing the receive and transmit frequencies to drift. Try removing the above decks MUX and cooling it if you believe this to be a potential problem. Re-install the MUX and see if the comms return. If so then a solution will need to be found.

7. FSK Modem Failure:

Once it's been verified that the system is correctly configured, the installation is wired correctly and that the PCU is energised then the next step should be to look at them modems. Replacement modems should be used for diagnostics purposes to verify which modem is causing the communication failure.

Page 2 of 5	Sea Tel COBHAM	Document No 135310 Rev A
-------------	--------------------------	-----------------------------

Field Service Procedure – FSK Modem Troubleshooting

8. FSK Modem Information:

Part Number	Application	Description	TX FREQ	RX FREQ	Voltage Output
116782-1	ADE	4 CHAN, RF	1.1MHz	1.5MHz	15VDC
116782-2	BDE	4 CHAN, RF	1.5MHz	1.1MHz	N/A
117611-1	ADE	3 CHAN, 50 OHM	1.1MHz	1.5MHz	PASSIVE
117611-2	BDE	3 CHAN, 50 OHM	1.5MHz	1.1MHz	N/A
117611-3	ADE	3 CHAN, 50 OHM	1.9MHz	700KHZ	PASSIVE
117611-4	BDE	3 CHAN, 50 OHM	700KHZ	1.9MHz	N/A
117168-1	ADE	3 CHAN, 75 OHM	1.1MHz	1.5MHz	PASSIVE
117168-2	BDE	3 CHAN, 75 OHM	1.5MHz	1.1MHz	N/A
127169-5	ADE	3 CHAN, 75 OHM	1.1MHz	1.5MHz	13/18VDC
117168-5	ADE	3 CHAN, 75 OHM	1.1MHz	1.5MHz	15VDC
117168-6	ADE	3 CHAN, 75 OHM	1.1MHz	1.5MHz	18VDC
117168-7	ADE	3 CHAN, 75 OHM, 5MHZ	5.2MHZ	5.1MHZ	15VDC
117168-8	BDE	3 CHAN, 75 OHM, 5MHZ	5.1MHZ	5.2MHZ	N/A

Field Service Procedure – FSK Modem Troubleshooting

9. Replacing the FSK Modems:

9.1. Tools.

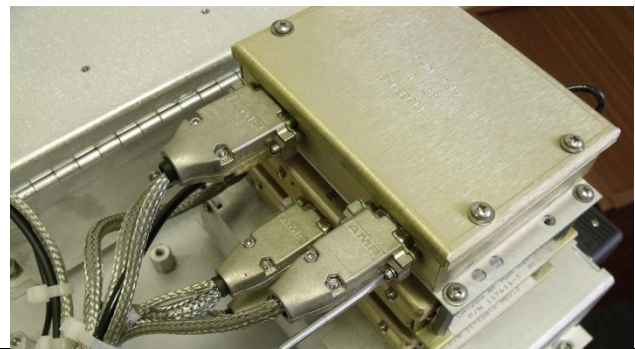
- 2mm Flat Blade (Terminal) Screwdriver
- #1 Phillips Screwdriver
- 5/16" Wrench/Spanner
- 1/4" Wrench/Spanner
- Loctite 242.

9.2. Procedure.

Universal procedure for replacing the FSK Modems assemblies.

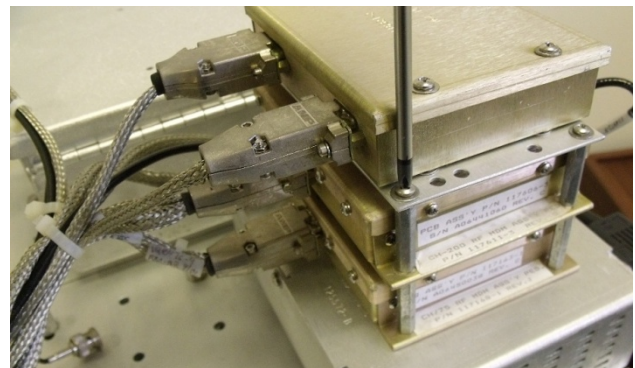
***CAUTION:** Power down the pedestal before following this procedure.

1. Using a 2mm flat blade screwdriver remove the harness connections from the pol aux relay.



2. Now using a #1 Phillips screwdriver remove the 4 screws securing the pol aux relay to the assembly and remove it.

***Note:** if your system doesn't support RF communications you'll only have a single ADE modem.

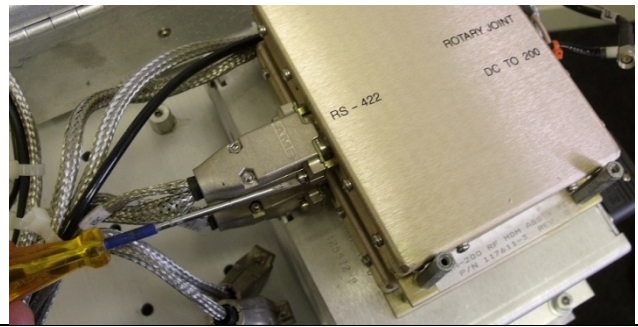


3. Using a 5/16" wrench undo the SMA cables from the modem, noting their orientation.

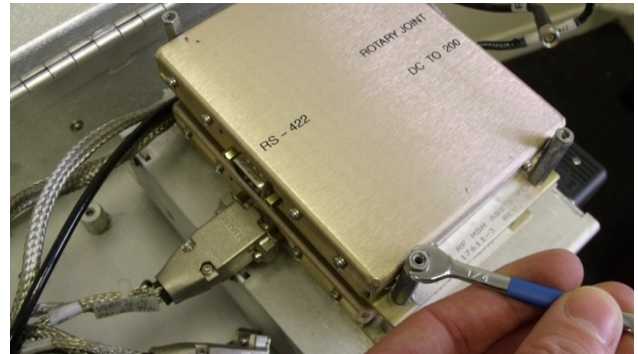


Field Service Procedure – FSK Modem Troubleshooting

4. Using a 2mm flat blade screwdriver disconnect the harness connection from the modem.



5. Using a ¼" wrench undo the standoffs to remove the modem (repeat the above procedures if the lower modem is to be replaced).



6. Install the replacement modem and reinstall the hardware, applying Loctite 242 to the standoffs.
7. Reconnect the harnesses D-sub connector(s).
8. Reconnect the SMA cable(s).
9. Reinstall the pol aux relay, apply Loctite 242 to the screws and reconnect the harness connections.

