Product: <u>**BridgeMaster E Series Radars**</u>

Subject: <u>**Serial Message , 'TX COMMS' and 'TX BIST' Alarms**</u>

Communications between the Transceiver and Display takes place by using a proprietary format Serial Message on the TX DATA and DU DATA lines. These messages are sent as a RS422 signal @ 76.8 kbaud.

TX DATA

The TX DATA is generated by the Trigger Processor (Trigger PCB) and is read by the Radar Processor (Radar Processor PCB). This message contains Azimuth, Heading Marker, Configuration, Status, Error and BIST information.

If the Radar Processor does not 'see' the TX DATA then 'TX COMMS' alarm is Displayed. At the same time, as there will be no BIST messages (part of TX DATA), the 'TX BIST' alarm will also be displayed. At this stage, ignore the TX BIST alarm and resolve the TX COMMS alarm first.

Possible faults when **TX COMMS** alarm is displayed.

Tx/Rx PSU not switching ON

No Mains supply to Tx/Rx: Check LED D31 on PSU. 'OFF' indicates Ship's Mains is NOT present. Check mains breaker, fuses etc.

No DU DATA present: The presence of the DU DATA actually starts the PSU. Check LED D1 on Input Panel. 'OFF' indicates PSU is NOT starting. On the PSU, move LKA (Start Override) to position 1-2. Do this *very carefully* as high voltages exists around this link. If necessary isolate from mains supply first. If LKA starts the PSU, (D1 will light up and the pulse length relays will click), then DU DATA is NOT present. Restore LKA back to 2-3. Trace problem back to Display.

Trigger Processor NOT generating TX DATA

No Azimuth Pulses from Pulse Bearing PCB: Check by setting Service Links LK5, LK6 (on Trigger PCB) to position 2-3. If fault clears then Pulse Bearing PCB/cable is faulty.

Service Links LK5, LK6: These links when in position 2-3 bypasses the Azimuth 4096 and the Heading Marker Pulse (from the Pulse Bearing PCB) to internally generated signals. This allows Transmission to be possible when the Antenna is stationary. Note the rotation will be considerably slower and will vary between low and high PRFs.

Trigger PCB Faulty: Make sure LK1 is fitted and LK2, LK3, & LK4 are NOT. LK5, LK6 should be restored to normal 1-2.

TX DATA not reaching Radar Processor

This could be due to either cable or component failure. On the Input Panel (in the Tx/Rx) ensure links LK3, LK4 are in the 2-3 position (**NOT 1-2**).

Service Links LK3, LK4*: Fitting these links in 1-2 will short TX DATA + to DU DATA+ and TX DATA- to DU DATA-. This can be used to check continuity (loop back) at the Display end.*

The TX DATA path is as follows:

Tx/Rx Unit: Trigger PCB(PLYB)⇒(PLZB)Input PCB(TSB) via data cable to…
Display Unit: ⇒(TSA)Input Panel⇒Back Plane PCB⇒Radar Processor PCB

TX BIST Alarm

If the Trigger Processor does not 'see' the DU Data then an error flag is set in the Error message and then the 'TX BIST' alarm is displayed.

Equally, any of the following faults will produce a 'TX BIST' alarm :

> Magnetron Spark Gap (Spark Gap activated)
> Corrupt Data (DU Data checksum error)
> Message to TXRX (Unable to read DU Data)
> Heading Marker (see note)
> Charge Trigger
> Modulator Trigger

To identify the actual fault, select: SYSTEM ⇒TEST DATA⇒BIST

The only way to correctly monitor the TX DATA line is by using an oscilloscope. The following **approximate** wave forms can be expected. *Both* lines must be active as shown.

TX DATA +   TX DATA -

+3V

0 V
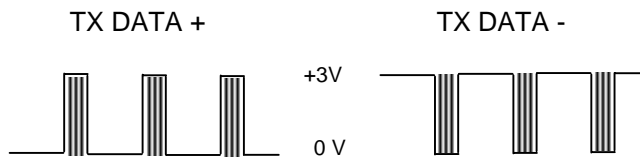
Period between bursts approx 450 μsec (in Transmit with Standard Speed)

DU DATA

The DU Data is generated by the Radar Processor and is read by the Trigger Processor. This message contains Control Commands and Tune data.

As previously mentioned, NO DU DATA will result in the Tx/Rx PSU not switching on, resulting in TX COMMS error followed by TX BIST alarm.

If DU DATA is present but corrupt, then only a TX BIST alarm will be displayed. In that case check via SYSTEM ⇒TEST DATA⇒BIST to identify fault.

The DU DATA + and DU DATA – signals are identical to the TX DATA + and the TX DATA - signals with the exception of the period between bursts being random around 20 msec.

Possible faults when DU DATA not present are similar to TX DATA except the path is reversed, plus the DU DATA is routed to the PSU to start it (via LKA).