

## CHAPTER 3

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### COMMISSIONING

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#### INTRODUCTION

- 1 Equipments that are interswitched and/or interfaced with other radar equipments are described in their respective Handbooks.

#### POWER SUPPLIES

- 2 Check that all cables have been installed and correctly connected. Set switch S1 to OFF (8.4V) and switch S2 to ON (26V).

#### LINKS SETTINGS

- 3 Ensure that the Display Unit is set to work with the installed Transceiver.

#### Modulator Links

- 4 The links operate as pairs and are listed as such:

- (1) PRF Jitter (normally set for no Jitter)

LK1	OPEN for no Jitter	MAKE for Jitter
LK2	MAKE for no Jitter	OPEN for Jitter

- (2) Pre-pulse (special option with additional PCB)

LK3	MAKE for NO Pre-pulse	OPEN for Pre-pulse
LK4	OPEN for No Pre-pulse	MAKE for Pre-pulse

- (3) -ve HT Supply

LK5	MAKE for HT NO LOAD test	OPEN for Modulator run
LK6	OPEN for HT NO LOAD test	MAKE for Modulator run

- (4) Short Pulse PRF

LK7	MAKE for 3000Hz	OPEN for 1500Hz
LK8	OPEN for 3000Hz	MAKE for 1500Hz

- (5) Medium Pulse PRF

LK9	MAKE for 1500Hz	OPEN for 750Hz
LK10	OPEN for 1500Hz	MAKE for 750Hz

(6) X-Band or S-Band

LK11 MAKE for X-Band  
LK12 OPEN for X-Band

(7) X-Band or S-Band (1.5 minute timer)

LK13 MAKE for X-Band  
LK14 OPEN for X-Band

(8) External Trigger (Special option, with additional PCB)

LK15 OPEN for Internal Trigger      MAKE for External Trigger  
LK16 MAKE for Internal Trigger      OPEN for External Trigger

(9) Tune Indicator (all installations)

LK17 MAKE  
LK18 OPEN

(10) Azimuth Mute (Az pulses required before Modulator will run)

LK19 OPEN for Az Mute      MAKE for Mute override (test)  
LK20 MAKE for Az Mute      OPEN for Mute override (test)

(11) Soft Start Monitor/Board Test

LK21 MAKE for Soft Start Monitor      OPEN for Board Test  
LK22 OPEN for Soft Start Monitor      MAKE for Board Test

**Receiver Links**

LK1 MAKE for tune sample delay of approx. 50 ns  
LK2 MAKE for tune sample delay of 100 ns  
LK3 MAKE for minimum tune sample delay.  
Note only one of LK1, LK2 or LK3 is to be made. Selected for best  
AFC performance  
LK5 B for minimum AFC lock  
A for intermediate AFC lock  
A & B OPEN for maximum AFC lock

## SETTING TO WORK

5 Carry out the following:

- (1) Check that the Upmast Transceiver/Turning Mechanism ON/OFF switch is set to ON.
- (2) Switch on the mains at the isolator.
- (3) Set the Display power switch to ON.
- (4) At the display, ensure that the Transceiver is entered as Mk IV in the installed equipment parameters.
- (5) At the display, verify that the display indicates TX READY after the warm-up period of approximately 1.5 minutes for X-Band.

## MONITORING

### General

6 This following procedures provide:

- (1) An alignment check of the antenna.
- (2) Heading Line PCB adjustment to give maximum bearing accuracy.
- (3) Performance monitoring checks for the optional transmission and receiver monitors.

### Alignment Check

*Note: For Nucleus 3 systems the heading line error can be adjusted in the display. No adjustment is needed at the transceiver/turning mechanism.*

7 Access to the Heading Line PCB, is obtained by removing the side panels from the Upmast Transceiver/Turning Mechanism housing.

8 During the Heading Line alignment procedure, the ship must be stationary on a fixed, known heading and must have bearing information from the gyro compass available. The ship should be alongside; less accurate results will be obtained if at anchor or at a buoy. Proceed as follows:

- (1) Switch ON the Display and select HEAD UP mode with a range of 6 nautical miles
- (2) Select a stationary target which is in visual range and also paints an echo on the screen.

- (3) Take a compass bearing of the target, and compare this with the bearing of the echo paint on the display. Note the degree and direction of any discrepancy.

### **Error Correction**

- 9 For an error of less than 6°, proceed as follows:
  - (1) Switch OFF all the supplies.
  - (2) Loosen the Heading Line PCB fixing screws (Figure 2) and move the PCB in the appropriate direction to correct the error. The divisions on the PCB represent 2° steps.
- 10 For errors greater than 6° adjust the opto disc position. An Allen key is secured in a phosphor bronze clip in the port side of the housing; use this to make adjustments.
- 11 Proceed as follows:
  - (1) Release the graduated ring by slackening off the two socket headed grub screws located in the side of the slip ring (Figure 2). These screws are accessible internally on the port side directly above the casting holding the fixed waveguide.
  - (2) Hold the antenna secure.
  - (3) Using the allen key as a lever, move the graduated ring to compensate for the direction and degree of error noted above. (The graduated ring is marked in degree units).
  - (4) After adjustment, tighten one of the grub screws and switch all supplies to ON. Check for heading line error (if any), as detailed in paragraph 8. Re-adjust if necessary by repeating paragraph 9, or 11.
  - (5) Tighten both grub screws, return the key to its storage position and secure the Transceiver side panels.

### **Performance Monitoring Checks**

- 12 To carry out the performance monitor check, proceed as follows:
  - (1) Switch the display power to ON
  - (2) After waiting 1.5 minutes, the screen should indicate TX READY, select GO TO RUN and then select TX A.
  - (3) Select the 1.5 nautical mile range and PERF.MON, (indicated on the top left hand side of the screen)
  - (4) Using the VRM facility, measure the range of the X-Band radar 'sun' (Figure 3) shown in the centre of the display (typical value - 0.6nm).
  - (5) For future reference, record the range in the operators record under the PERFORMANCE MONITOR heading. RX.... nm
  - (6) Select the 12 mile range.
  - (7) Using the VRM facility, measure the range of the plume (Figure 4), which should be at a bearing of approximately 140 degrees, and record as in (5) under TX.....nm. heading (typical value 6nm).