
CHAPTER 5

COMMISSIONING

INTRODUCTION

- 1 Interswitched equipments, or equipments interfaced with other radar equipments, are described in their respective Handbooks.

CAUTION

The transceiver RF output must not be operated into an open circuit or poorly matched feed cable. Damage to the RF head will result.

POWER SUPPLIES

- 2 Check that all cables have been installed and connected.

LINK AND SWITCH SETTINGS

- 3 Ensure that the correct links are fitted to the Display Unit to enable it to work with the MkVII Transceiver.
- 4 The Transceiver links are factory set. The links/switches listed below are options for the installation. All other links and switches are listed in the unit descriptions. Check that the MkVII Transceiver links/switches are set as follows:

a) Receiver CTX-A356

LK1	OPEN	Tune sample delay (intermediate, approx. 50 ns)
LK2	MADE	Tune sample delay (maximum, approx. 100 ns)
LK3	OPEN	Tune sample delay (minimum)
		Note: only one of LK1, LK2 or LK3 is to be MADE. Selected for best AFC performance)
LK5	B	Minimum AFC Lock
		A - intermediate AFC lock
		A & B OPEN - maximum AFC lock

b) Tx Microcontroller PCB:

	Grid		
SW1-3	4A	ON	Jitter enabled
		OFF	No PRF jitter
SW2-1	3A	OFF	Antenna Motor starts on Run
		ON	Antenna Motor on all of the time

SETTING TO WORK

- 5 Carry out the following:
 - (1) Switch on the single phase mains at the Isolators for the Display and Transceiver.
 - (2) Set the display power switch to ON.
- 6 At the display ensure that the Transceiver is entered as MkVII in the installed equipment parameters.
- 7 Verify that the display indicates TX READY after the warm up period of approximately 90 seconds.
- 8 Set to RUN.
- 9 Transceiver status is indicated by LEDs located on the modulator and control board. Only the LEDs on the Tx Microcontroller PCB are visible with the transceiver cover removed. The other LEDs are only visible with the Electronics Unit (CTX-A370) in the test position. Refer to Fault Diagnosis procedures in Chapter 7 details of the LEDs and the test position.
- 10 The LEDs on the Tx Microcontroller PCB are as follows:

	Grid	
D18	8F	Lit, indicating Tune Indicator signal present (Run mode only)
D41	4E	Flashing, indicating that the processor is running
D42	4E	Only lit when external trigger pulses being applied
D43	4E	Lit, indicating magnetron heater OK Flashes slowly for warm up time Flashes quickly after warm up time
D44	4E	Not used

HEADING LINE ADJUSTMENT

General

- 11 Following installation, the heading line may be checked to give maximum bearing accuracy as follows:

NOTE: 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 is to be alongside; less accurate results are obtained if at anchor or at a buoy.

Checking the Alignment

- 12 With the vessel stationary, or at anchor, proceed as follows:
- (1) Check that the array/gearbox alignment mark is correct.
 - (2) Switch ON the Display and operate in a HEAD UP mode and at a range of 6 miles.
 - (3) Select a stationary target which can be seen by eye and which paints an echo on the screen.
 - (4) Take a compass bearing on the target, and compare this with the bearing of the echo point on the display. Note the degree and direction of discrepancy.

To Correct an Error (Fine Adjustment)

- 13 Any error is present in the Heading Line may be adjusted as follows:
- (1) Switch the Gearbox Safety Switch to OFF.
 - (2) Switch all supplies to STANDBY.
 - (3) Remove the four captive screws securing the cover to the rear of the Turning Mechanism and remove the cover.
 - (4) Loosen the Azimuth/Heading Line PCB locking screws, refer to Figure 1.
 - (5) Note the position of the pointer on the scale, which is marked in two degree steps.

NOTE: Moving the PCB to the left moves the video anti-clockwise with respect to the Heading Line.

- (6) Remove the error by sliding the PCB by the number of degrees to correct the misalignment.
- (7) Retighten the Azimuth/Heading Line PCB.
- (8) Refit the outer cover.
- (9) Set the Safety Switch to ON.
- (10) Set the Display to RUN and check that the visual and PPI display bearing of the known target.

- (11) To make any further adjustment repeat step (6).
- (12) Secure the rear cover.

To Correct an Error (Coarse Adjustment)

- 14 The Heading Line Opto Disc is factory set, however if the fine adjustment does not achieve the required correction, proceed as follows:
- (1) Perform Paragraph 13, steps (1) to (3).
 - (2) Disconnect the plug to the Heading Line PCB.
 - (3) Remove the Heading Line PCB, ensuring that the opto sensor does not foul against the opto disc.
 - (4) With the array facing forward, check that the leading edge of the heading line disc recess is in line with the array centre line.
 - (5) The heading line disc recess may be corrected by slackening the three M4 retaining bolts holding the disc in place. **Do not** remove the bolts completely.
 - (6) Manually rotate the disc to the new position required and retighten the bolts.
 - (7) Refit and reconnect the Heading Line PCB by sliding the opto device over the edge of the opto disc.
 - (8) Refit the retaining pillars and reconnect the plug.
 - (9) To check that the Heading Line is correct, refer to the Fine Adjustment Paragraph.

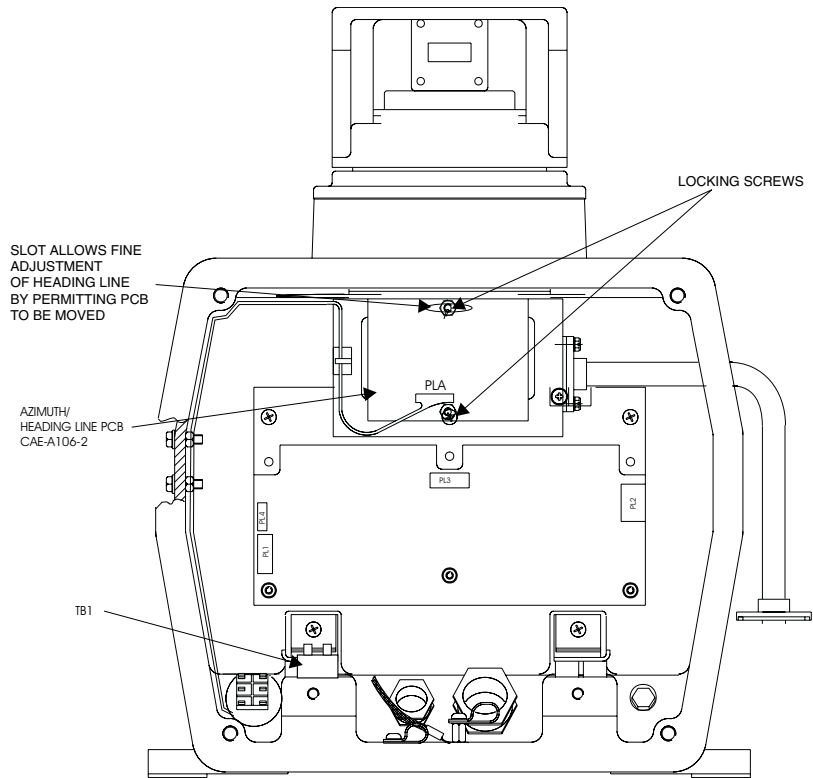
SETTING UP THE TRANSMISSION MONITOR

- 15 The efficiency of the magnetron is checked by carrying out a performance monitor check.
- 16 The two specific types of optional performance monitors that can be fitted are:
- (1) **Transmission Monitor** - comprises a monitor arm fitted to the outer case of the turning mechanism. The transmission monitor is selected by setting PERF. MON to ON at the display. The monitor arm neon is ionised as the antenna passes over the arm, and a 'plume' is displayed on the screen.
 - (2) **Receiver Monitor** - comprises a resonant cavity with an adjustable plunger, which is factory set according to magnetron frequency. It is fitted to the rotating joint waveguide. The receiver monitor is selected by setting PERF. MON to ON at the display and is displayed as a 'sun' in the centre of the screen.

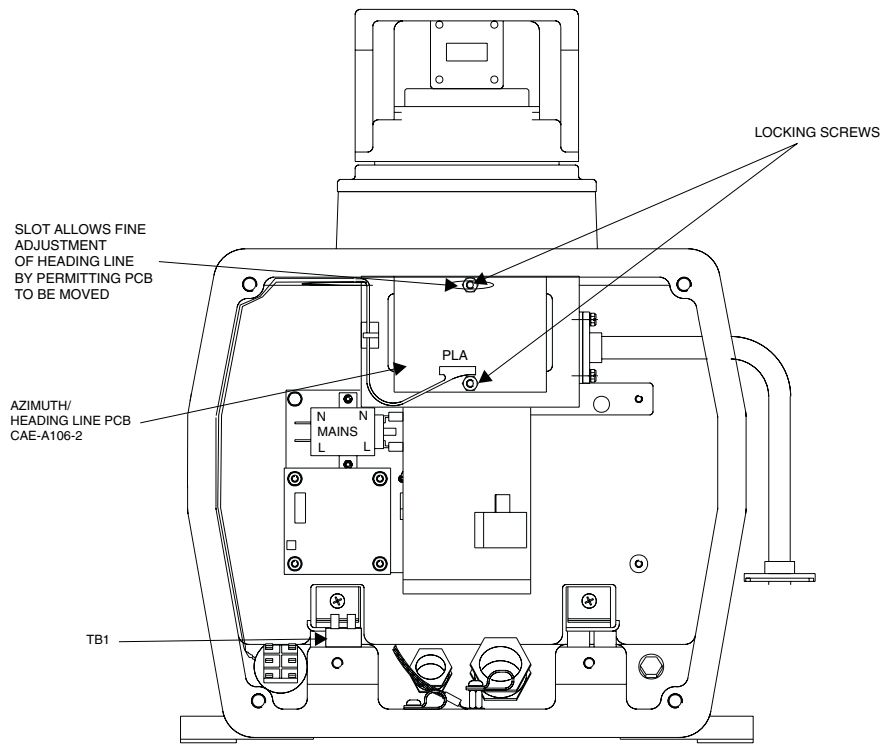
PERFORMANCE CHECKS

17 A performance monitor check is carried out to check the efficiency of the Transceiver magnetron and RF component. To carry out the performance monitor check, proceed as follows :

- (1) Switch the display power to ON.
- (2) After waiting 90 seconds, 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 diameter of the radar sun (Figure 2) that appear in the centre of the display.
- (5) For future reference, record the diameter in the operators record under the PERFORMANCE MONITOR heading. RX.... nm.
- (6) Select the 12 mile range.
- (7) Using the VRM facility, measure the plume (Figure 2), at a bearing of approximately 320 degrees and record as in (5) under TX.....nm Heading.



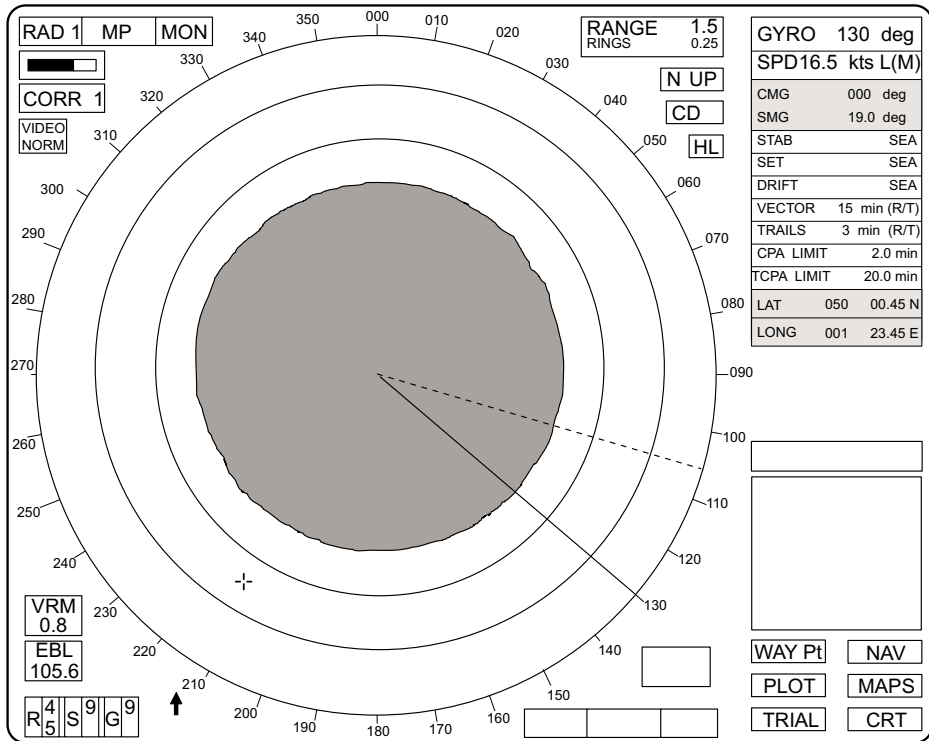
HIGH SPEED TURNING MECHANISM CAE-A30-6



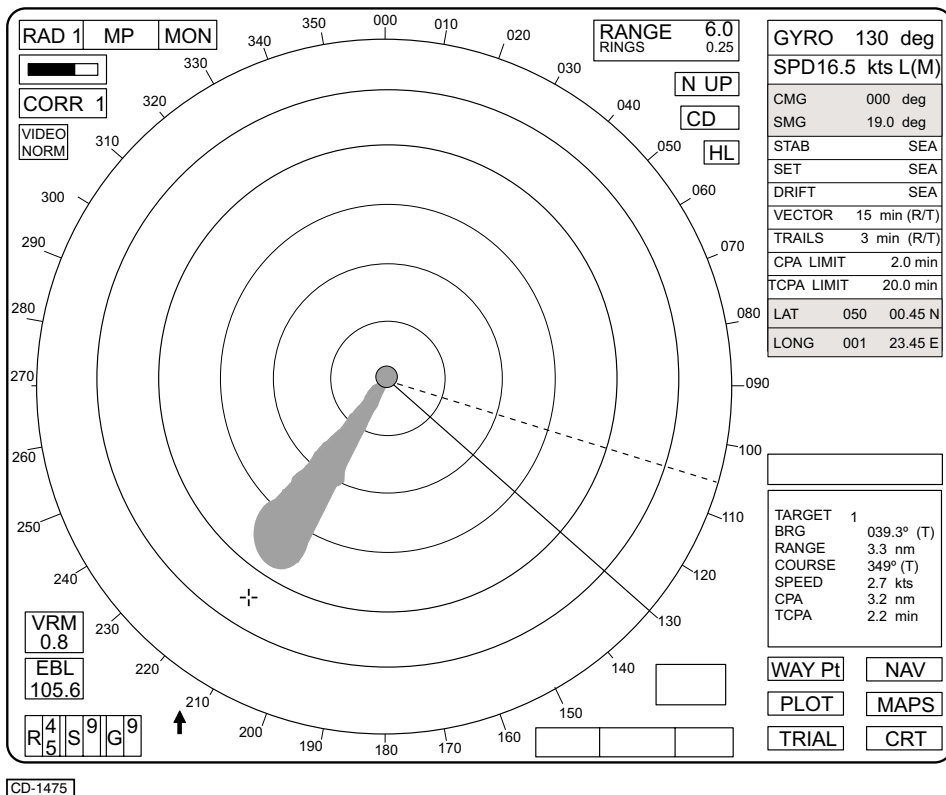
CD-3920

LOW SPEED TURNING MECHANISM CAE-A30-5

Figure 1 Turning Mechanism : Access



Receiver Monitor



Transmitter Monitor

Typical figures: Tx = 6 to 8 nm
Rx = 0.75 to 1 nm

Figure 2 - Typical Tx/Rx Monitor Responses