

## CHAPTER 3

### COMMISSIONING

#### INTRODUCTION

- 1 After Installation, certain checks are required to bring the Antenna/Transceiver up to full working order. The majority of PCBs and Modules have been factory tested, and preset, and do not require any adjustment. However, certain setting up checks are needed to enable the set to become operational.
- 2 The installer must carry out the following procedures to set equipment to work.
- 3 Check that all cables have been installed and connected correctly.

#### Fitting the Links

- 4 The links should be set up as follows::

##### a) Azimuth/Heading Line PCB

Azimuth PCB link set to 90                      90 pulses per revolution

##### b) Antenna PCB CTX-A204/2

LK1 set to 750 position                      Triggers Dummy Sync pulse for Mute state

If Transceiver Terminals PCB CTX-A368 is fitted

|            |                                  |
|------------|----------------------------------|
| LK1 - A    | Antenna rotates on Run only      |
| LK1 - B    | Antenna rotates continuously     |
| LK2 - MADE | Dummy sync pulse for Mute sector |
| LK2 - OPEN | No dummy sync for Mute sector    |

##### c) FET Modulator CTX-A332

|                                                                 | Grid | Status | Function                                            |
|-----------------------------------------------------------------|------|--------|-----------------------------------------------------|
| LK1                                                             | E1   | MADE   | Heater current                                      |
| LK2                                                             | F4   | MADE   | 400V HT connected to power output stage             |
| LK3                                                             | D4   | OPEN   | Automatic Magnetron Current control circuit enabled |
| LK4                                                             |      |        | Not used                                            |
| LK5                                                             | D3   | OPEN   | Safety trips enabled                                |
| LK6                                                             | D3   | MADE   | Trigger pulse jitter. Enabled                       |
| LK7                                                             | C1   | MADE   | 75 ohm load connected                               |
|                                                                 |      |        | allows modulator to run on its Internal trigger     |
| Other links are soldered onto board to set current pulse width. |      |        |                                                     |
| SW1                                                             | A7   | ON     | (Towards heatsink). HV supply enabled               |

d) 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) |            |                                                |
| LK4                                                                                  | NOT FITTED |                                                |
| LK5                                                                                  | B          | Minimum AFC lock                               |
|                                                                                      |            | A - intermediate AFC lock                      |
|                                                                                      |            | A & B OPEN - maximum AFC lock.                 |
| LK6                                                                                  | A          | 3 bandwidths. SP, MP and LP/VLP                |
| LK7                                                                                  | OPEN       | Minimum Vco gain                               |
| LK8                                                                                  | B (82 ohm) | TR5 mounted on link                            |
| LK9                                                                                  | MADE       | Sets regulator output to +5V                   |

## SETTING TO WORK

- 5 Assuming connection has been made to the display, switch on the power to the Transceiver. Ensure that 'TX Ready' is indicated at the display after approximately 60 seconds.

### Transceiver Terminals PCB

- 6 This PCB requires no adjustments apart from the setting up of links.

### Checking the Alignment of the Heading Line

- 7 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.*

- 8 With the vessel stationary, or at anchor proceed as follows:
- (1) Check that array/gearbox alignment mark  $\wedge$  is correct.
  - (2) Switch ON the Display and operate in a HEAD UP mode and 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 paint on the display. Note the degree and direction of discrepancy.

### **To Correct an Error (Fine Adjustment)**

- 9 Any error 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 transceiver.
  - (4) Loosen the Azimuth/Heading Line PCB locking screws, refer to Figure 2.
  - (5) Note the position of the pointer on the scale, which is marked in two degree steps.

*Note: Pulling the PCB forward moves the video clockwise with respect to the Heading Line.*

- (6) Remove the error by sliding the PCB by the number of degrees of error from Paragraph 8(4).
- (7) Retighten the Azimuth/Heading Line PCB locking screw.
- (8) Repeat Paragraphs 8 and 9 until no error is present.

### **To Correct and Error (Coarse Adjustment)**

- 10 The Heading Line Opto Disc is factory set, however, if fine adjustment does not achieve the required correction, proceed as follows:
- (1) Perform paragraph 9, steps (1) to (3).
  - (2) Remove the transceiver unit as described in Chapter 5 Paragraph 13.
  - (3) The heading line disc recess position may be corrected by slackening the three M4 retaining bolts. DO NOT remove the bolts completely.
  - (4) Manually rotate the disc to the new position required and retighten the bolts.
  - (5) Refit and reconnect the transceiver in the reverse order to Paragraph 10(2).
  - (6) To check that the Heading Line is correct, refer to the Fine Adjustment Paragraph 9.

## SETTING UP THE TRANSMISSION MONITOR

- 11 The efficiency of the magnetron is checked by carrying out a performance monitor check.
- 12 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 scanner unit. 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

- 13 To carry out the performance monitor check, proceed as follows:
  - (1) Switch the display power to ON.
  - (2) After the Tx warm-up period, the Nucleus screen should indicate TX READY, select GO TO RUN.
  - (3) Select 1.5 mile range and PERF.MON, (this should also be indicated - top left hand side of the Nucleus screen).
  - (4) By using the VRM facility, measure the diameter of the radar sun that appears in the centre of the display.
  - (5) For future reference, record the diameter in the operators record under the PERFORMANCE MONITOR heading in the RX.... nm.
  - (6) Select the 12 mile range.
  - (7) Using the VRM facility, measure the plume (at a bearing of approximately 210 degrees from the heading line) and record as in (5) under TX.....nm. Heading.