APPENDIX 5

USER INSTRUCTIONS

FOURTEEN (14) PAGE USER INSTRUCTIONS
FOLLOW THIS SHEET

USER INSTRUCTIONS
FCC ID: BT9BVT30

APPENDIX 5

CHAPTER 4

RADAR OPERATING INSTRUCTIONS

INTRODUCTION

This Chapter details the functions of the keys and controls on the Radar Control Panel(s), and explains their use. The individual menus are shown, with any special instructions, and the operating menu hierarchy is also shown (refer to Figure 4.4).

The operating instructions for BridgeMaster II Radars depend on the options available to the radar operator. The instructions begin with those operational features which are applicable to all BridgeMaster II Radars, and are followed by the additional features applicable to Autotrack and ARPA options. The operating instructions relating to the Geographics option follow those concerned with radar operation.

The most basic radar presentation available is the unstabilised Relative Motion Display, referred to as Head-Up. Interfacing the radar with compass information provides the operator with a North-Up or Course-Up stabilised presentation. By the addition of Speed information, either estimated or via an external input, a True Motion presentation is available to the operator. With BridgeMaster II Displays, an additional presentation mode is selectable, known as Fixed Origin - True Trails (previously known as True Motion - Fixed Origin). This provides the operator with the same facilities as True Motion with the added advantage of a constant view ahead (see later notes).

Autotrack, as its name implies, enables selected target echoes to be automatically tracked, providing the operator with information relating to the targets such as true speed, true course, closest point of approach, etc.

ARPA (Automatic Radar Plotting Aid) extends the Autotrack facility by allowing Trial Manoeuvres to be executed. With the ARPA option, a Radar Control Panel containing three extra keys is fitted in place of the standard Radar Control Panel.

Geographics option is concerned mainly with overlaying maps on the radar picture.

Apart from the ON/OFF switch, BridgeMaster II Radars are operated from the Radar Control Panel and, if fitted, from the additional Geographics Control Panel.

For the **Radar Control Panel**, the controls comprise:

a)   Dedicated rotary controls for commonly used analogue functions such as Gain and Sea Clutter etc.

b)   Dedicated pushbutton keys for commonly used functions such as selecting Range scale, VRM on/off, etc.

d)   A joystick for moving the cursor and menu pointer.

For less commonly used functions, a series of menus is provided. Figure 4.4 shows the Radar menu hierarchy.

For the **Geographics Control Panel**, the controls are confined to dedicated pushbutton keys. However, operation of the Geographics option requires the use of several Radar Control Panel controls. Figure 4.5 shows the Geographics menu hierarchy.

The method of presentation for the descriptions of the various keys, is as follows:

The related key is shown in the left hand margin (refer to Figures 4.1 and 4.3 for location of radar and geographics keys respectively).

The related area(s) on the radar display is shown under the key (refer to Figure 4.2 for identification of the display area).

Colour versus Monochrome Displays The use of colour allows the several types of information presented to an operator to be easily distinguishable.   With monochrome displays, prudent use of the amount of synthetic information displayed simultaneously will obviate the chance of mistaking one type of information for another.

A long press (4 seconds) of the Menu Key will remove the following synthetics from the screen: Index Lines, Parallel Cursor, Constant Radius Turn, and all Geographics.

PREPARATION FOR USE

Preparation for use is limited to switching the Display Unit ON, aligning the compass (if connected - see Note below), and setting the MANUAL Speed (if this is to be used). All the facilities of the radar will assume set parameters. These parameters can be changed as required, using the procedures detailed in this Chapter.

If you are operating the radar for the first time, read the descriptions of the controls before switching the radar ON.

Note: The Autotrack, ARPA, and Geographics options require a suitable compass to be interfaced with the radar, unless the radar is installed in a fixed location such as a harbour installation. If the latter obtains, consult Decca Marine for details.

Switching ON

   Warm Up
   Operate the ON/OFF switch located behind the control cover at the front of the Display Unit. Set the DISPLAY BRILL control to mid-position to ensure a visible picture on the display.
   Note: There is a three minute warm-up period during which settings can be changed via the menus. After 12 seconds the RADAR STANDBY message

changed via the menus. After 12 seconds the RADAR STANDBY message is displayed, together with a warm-up countdown message to indicate when the transceiver is available for transmit, unless the optional Low Temperature option has been installed. The Low Temperature option extends the operation of the Scanner Unit to −40°C, and the transceiver is not available for transmit until the turning unit has reached its operating temperature.

Note: With S-Band Scanner Units, a warm-up countdown message is **not** **displayed** during the three minute warm-up period. STANDBY will be indicated unless the standby (ST BY) key is pressed, in which case the display will indicate transmit but the transmitter will not function until the timer has operated (approximately three minutes).

Compass
If the Display Unit is set for compass installed, you will be prompted to enter the compass heading, except where the compass is a Serial Type. No operator action is required for Serial Compass Types VHW, HDG, and HDT which send True Heading data to the display.

With Serial Type HDM the menu prompts the operator to input the local magnetic variation in degrees and minutes, east or west. As soon as this is stored, the menu will show the magnetic heading. The compass reading at the top of the display will show True Heading.

Note: Each time the display is switched on, the previously stored value of magnetic variation will be displayed. This value may need to be amended before being entered.

Note: With BSH Mode selected, the prompt 'NO ACTION' will be displayed if an attempt is made to select the Heading Menu with a serial compass selected for use.

Speed
Press the SPEED key and select the required mode. The initial setting for the MANUAL speed is 0 Kt. If using this mode, set and enter the estimated speed.

Note: Speed information derived from a MANUAL setting, or PULSE LOG, is measured 'through the water' whereas ECHO REF and NAV G provide 'speed over the ground'. The former provides Sea Stabilisation and the latter Ground Stabilisation for the various presentation modes. LOG F/A and P/S information, derived from a serial log, provides a composite speed which may be 'through the water' or 'over the ground'.

Transmit
When the warm-up count is complete, press the standby (ST BY) key to set the radar to TRANSMIT. The antenna will rotate and the radar picture will be displayed, after a few seconds.

Note: With S-Band Scanner Units, the antenna rotation is not controlled by the ST BY key i.e., the antenna rotates as soon as the radar is switched on. If the antenna rotation is stopped by switching off the power at the Scanner Control Unit, the system will revert to STANDBY after approximately 30 seconds.

Note: For slave Displays, the Display can be set to TRANSMIT after 12 seconds, if the master radar is transmitting.

RADAR CONTROLS AND MENUS

The following procedures are used in conjunction with PROMPTS, displayed in area 19 of the screen (refer to Figure 4.2). The prompts give guidance in the form of step-by-step instructions.

Joystick   The joystick is used to move the cursor around the display. The joystick is also used to move the pointer on the menus.

DATA Controls   There are two rotary DATA controls, either of which increase a value by rotating clockwise and decrease a value by rotating counter-clockwise.

VRM/DATA

The VRM/DATA control is used to change the VRM positions, or for general data input when prompted.

EBL/DATA

The EBL/DATA control is used to change the EBL positions, or for general input when prompted.

GAIN   The GAIN control is used to vary the level of the radar signals displayed on the screen.

ANTI-CLUTTER SEA   With A/C MANUAL selected, the ANTI-CLUTTER SEA control is used to reduce the clutter appearing on the display due to the radar signals from the sea surface.

ANTI-CLUTTER RAIN   With A/C MANUAL selected, the ANTI-CLUTTER RAIN control is used to reduce the clutter appearing on the display due to radar signals from rain.

TUNE (24)   The TUNE control is used to manually tune the receiver when AFC (Automatic Frequency Control) is turned off. The AFC option is not available with S-Band Transceivers - see Page 3-70.

| PANEL BRILL | The PANEL BRILL control is used to set the brilliance of the control panel illumination. |
| DISPLAY BRILL | The DISPLAY BRILL control is used to set the brilliance of the display. Use this control in conjunction with NIGHT/DAY key (see later). |

PUSHBUTTON KEYS

EBL
OFF
⑥⑫⑬

There are two EBLs (Electronic Bearing Lines). A numeric display of the positions of the EBLs is given, together with a rectangular highlight indicating which EBL can be adjusted via the EBL/DATA control.

A short press of the EBL key displays EBL 1 and its associated readout. A second short press adds EBL 2 and its readout to the screen. Further short presses toggle the highlight between EBL 1 and EBL 2.

EBL 1 can be off-centred and used in the SHIFT & CARRIED or SHIFT & DROPPED modes relative to own ship, set by the EBL 1 OFFSET MENU. The menu is displayed as soon as the EBL key is pressed and may be used with EBL 1, even when EBL 2 has the highlight against its readout. The menu will automatically timeout after 30 seconds if no actions are initiated, or it can be removed by pressing any menu key or CANCEL.

With the menu displayed, select CARRIED or DROPPED using the # key. Use the joystick with the CENTRE/SHIFT key held down to position the origin of EBL 1 and then release the key. In the CARRIED mode, the EBL origin will maintain its position relative to ownship, and in the DROPPED mode the origin will maintain its position with respect to the water or ground depending on whether the picture is Sea or Ground stabilised. A press of the CENTRE/SHIFT key with the menu displayed will re-centre EBL 1.

The EBL can be CARRIED in all stabilisation modes, and DROPPED in North-UP and Course-Up modes. If DROPPED is selected, then OFF CENTRED is automatically selected. If the stabilisation mode is changed with the EBLs displayed, they will be removed, leaving the menu available for re-use, unless the change is to Head-Up. In this case, the menu is also removed.

A long press of the EBL key removes the displayed EBLs and clears the EBL 1 OFFSET menu (if displayed). If EBL 1 is off-centred with its associated VRM 1 displayed, a long press of the EBL key removes the displayed EBLs **and VRMs**.

Subsequent short presses of the EBL key will re-instate the EBLs in their original positions. The VRMs are similarly re-instated by short presses of the VRM key. Re-instating an off-centred VRM 1 will automatically re-instate EBL 1.

EBL 1 Offset Menu

```
EBL 1 OFFSET
■ MODE    CARRIED


              CENTRED
```

VRM
OFF
⑦⑫⑬
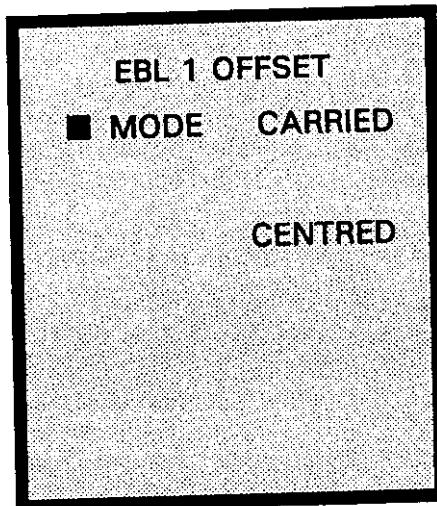
There are two VRMs (Variable Range Markers). A numeric display of the positions of the VRMs is given, together with a rectangular highlight indicating which VRM can be adjusted via the VRM/DATA control.

A short press of the VRM key displays VRM 1 and its associated readout. A second short press adds VRM 2 and its readout to the screen. Further short presses toggle the highlight between VRM 1 and VRM 2.

A long press of the VRM key removes the displayed VRMs. Subsequent short presses will re-instate the VRMs in their previously set positions.

When a VRM is OFF and the related EBL is ON, the range at which the VRM crosses the EBL is indicated on the EBL by a small circle. These lines are then termed Electronic Range and Bearing Lines ERBLs.

With EBL 1 off-centred, VRM 1 will be centred on EBL 1 origin.
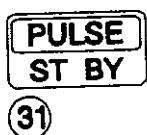
PULSE
ST BY
㉛

When in STANDBY, a short press of the key will switch the radar to TRANSMIT. When in TRANSMIT, short presses of the key will cycle through the available pulse lengths (provided an alternative pulse length is available on the selected range scale). The pulse length in use is displayed.

A long press while in TRANSMIT will switch the radar to STANDBY, retaining the selected pulse length for the return to TRANSMIT.

Note: The system will revert to STANDBY and NO SCAN alarm raised if the Heading Marker signal is absent for approximately 30 seconds, e.g. if the Antenna rotation has stopped for any reason.

△
RANGE
㉟

A press on the key will increment the RANGE. The range display will increment to show the selected range.

RANGE ▽
㉟

A press on the key will decrement the RANGE. The range display will decrement to show the selected range.

RINGS
㉓ ㉞

Operating the key selects between RANGE RINGS ON and OFF. The range rings calibration display is only shown if the rings are selected ON.

STAB
UNSTAB
㉜

When unstabilised, the display is HEAD-UP (HD UP). Pressing the key while unstabilised will change the display to NORTH-UP (N UP). Pressing the key while in the N UP will change the display to COURSE-UP (CRS UP), with a triangular symbol indicating the course set on the bearing scale. Subsequent presses of the key will switch the display between CRS UP and N UP. A double press of the key in CRS UP gives a CRS UP reset.

A long press of the key while CRS UP or N UP will change the display to unstabilised (HD UP).

Note: NORTH-UP and COURSE-UP are only available with a valid compass input.

TM
RM
㉝

When in RELATIVE MOTION (RM), a short press of the key changes the display to FIXED ORIGIN - TRUE TRAILS (FOTT). Pressing the key while in FOTT, changes the display to TRUE MOTION (TM). Further short presses of the key change the display between TM and FOTT. Refer to the Operator Notes of this Chapter for notes on these Modes.

A long press selects RELATIVE MOTION (RM). If RM is selected, either stabilised or unstabilised may be selected. If TM or FOTT are selected, only NORTH UP or COURSE-UP may be selected.

TRAILS
PERM
㉕

Short presses of the key will set the trails to OFF, SHORT, or LONG. . A long press of the key will change the trails to PERMANENT. Trails cannot be set to OFF if FOTT is selected.

The trails mode is determined by the display operating mode selected, ie., Relative Motion displays Relative Trails, True Motion and Fixed Origin - True Trails display True Trails.

AUTO
ENH'CE
㉖ ㉗

Short presses of the key selects either manual Anti-Clutter or automatic Anti-Clutter. Long presses of the key selects Enhance ON or OFF except on range scales below 0.75 n.miles (1.5 km). If Enhance has been selected and the display is subsequently switched to an invalid range, it will be temporarily de-selected until a valid range is selected.

CENTRE SHIFT

This key is used in three separate ways:

A short press of the key centres the radar picture. With the key pressed and held, the joystick can be used to set the cursor to the required off-centre position. The picture may be off-centred by up to two thirds of the radius. When the key is released, the picture will move to the new off-centre position. Ship's head is indicated at the bearing scale by a short line, marked with an *.

When the EBL 1 OFFSET MENU is displayed, the Centre key is used to position the origin of EBL 1 (see EBL above).

A long press on all ranges except 96 n.miles (192 km) will offcentre ownship in a manner similar to a True Motion reset, so long as the cursor has not been moved. Ownship will be positioned at two thirds radius so that the course will pass through the centre of the display. With sea stabilised presentations, the course will be the heading of ownship, but with ground stabilisation the course will be 'course made good'. For the Head-Up presentation where the bearing scale is relative to ships head, the offcentre direction will always be 180°.

HM OFF
⑤

The HEADING MARKER (HM) OFF key is used to remove the heading or stern marker from the display. When the key is pressed and held, the displayed marker is removed. When the key is released, the marker is shown again.

MARK CLEAR

A short press of the key places a MARK at the cursor position, as set by the joystick. Marks can be cleared by a short press of the key with the cursor positioned on the required mark. All marks can be cleared by a long press of the key. There are 20 marks available. Marks can be dropped or carried as set on the SYSTEM SETUP 2 Menu during Initialisation.

PLOT SELECT
⑱

(The following description is applicable to displays without Autotrack or ARPA installed.) A short press of the key produces a PLOT at the position of the cursor, as set by the joystick. After 30 seconds a second PLOT can be made, and target Course, Speed, CPA and TCPA is displayed. The target number and related data display can be selected by a press and hold of the key and use of the DATA input control. Plots are automatically dropped after 12 minutes. Plots will be displayed as **relative** with Relative Motion selected or as **true** with True Motion or FOTT selected. See later operating notes for a full description of manual plotting.

Refer to the CANCEL key detail, for the procedure to cancel PLOTS.

Note: See Autotrack Operating Instructions for use of this key with Autotrack installed. See ARPA Operating Instructions for use of this key (renamed 'MANUAL ACQ' with ARPA installed.

CANCEL
(15)(18)

To cancel a plot, use the joystick to position the cursor over the target end of the vector and press the key. A long press of the key followed by a confirmation short press will cancel all plots, regardless of the cursor position.

If the display is in any of the menu modes or a data entry mode, pressing the key will return the display to the next highest menu level.

Note: See Autotrack and ARPA Operating Instructions for further notes on the use of the 'CANCEL' key.

VECTOR TIME
(17)

A short press of the key changes between true and relative vectors. The vector time can be changed by a press and hold of the key and the use of either of the DATA controls. The status of the vectors is shown in the Vector Box.

If you select the alternative vector type to that of the display mode i.e., Relative Vectors with True Motion or vice versa, the vector type will revert automatically after a 30 second time-out period **unless the Vector Timeout mode has been set to OFF in the System Setup menu.** During the period when the vectors are different from the motion mode, text in the Vector Box will be red in place of the usual green.

SPEED
(10)(18)

A short press of the SPEED key will display a menu of the available speed modes.

MANUAL (estimated speed) mode is normally used when no other speed information is available. This mode provides Sea Stabilisation.

Caution: **Because the Manual Speed is only an estimate, this mode should be used with caution.**

PULSE LOG mode can be selected if a suitable Log of this type is connected to the display. This mode also provides Sea Stabilisation.

ECHO REF mode can only be selected with Autotrack or ARPA installed. To select echo referencing involves placing the cursor over the selected (previously established) target and holding the Speed key down for a long press. A letter **R**, placed adjacent to the target, identifies it as the reference. This mode provides Ground Stabilisation, with CMG and SMG (Course and Speed Made Good) indication.

Caution: **The use of Racons for echo referencing is not recommended owing to the variable nature of the target.**

NAV G mode can be selected if a suitable sensor is connected to the display. This mode also provides Ground Stabilisation with CMG and SMG indication.

See Caution below regarding use of Nav sensors.

Note: This option is not available in BSH (German) mode.

SERIAL LOG mode can be selected if a suitable sensor is connected to the display and the I/O OPTIONS 2 menu is correctly initialised. The serial log may input Water locked information (Sea Stabilised), Ground locked information (Ground Stabilised), or both with the type indicated by a W or G. The menu shows Fore/Aft speed (F/A) and Port/Starboard speed (P/S), with Aft and Port displayed as negative values. When a mode is selected for use, the resultant speed derived from the F/A and P/S components is displayed at the top of the screen, together with its W or G indicator.

If for any reason the serial information becomes invalid, the figures will be replaced by dashes (--.-).

Speed Menu

Caution: The use of some navigation sensors for speed information may result in an erratic display of velocity vectors, owing to the random errors associated with the positional information. This is particularly noticeable at low speeds.

SPEED (KTS)		
■ MANUAL		17.0
PULSE LOG		17.3
ECHO REF		17.4
NAV G	135	17.5
	F/A	P/S
LOG W	17.1	−3.7
LOG G	19.2	1.1

INDEX
CLEAR
(18)(22)

Up to 64 INDEX lines can be defined on range scales 0.25 to 24 n.miles (0.5 to 48 km) inclusive. The lines are organised as 16 'Sets' of (up to) 4 lines per Set. Up to three consecutive Sets (i.e., a maximum of 12 lines) can be displayed simultaneously, e.g. Sets 2, 3 and 4, or 14, 15 and 16. Each line can be drawn in one of three line styles which are: a) Solid, b) Dashed 4:12 ratio, or c) Dashed 8:8 ratio.

Setting up the parameters for each Index line is performed via the INDEX LINE menu. Initially all lines are undefined but once set, they are saved for later recall and modification if required. Although Index lines are available on RM, TM, FOTT presentation modes, they cannot be set up with TM (True Motion) selected.

A short press of the key displays the menu and a further short press removes it, leaving selected lines on the display. When the menu is not on display, a long press of the key removes all lines from the display, leaving them in memory. The menu will time out after 30 seconds if no actions are executed.

Defining an Index Line

With the menu displayed, move the highlight to LINE NO and use the # key to select line 1, 2, 3, or 4. Move to EDIT LINE and press #. A line will be displayed parallel to a previously defined line (if any) in the same set. The first line to be defined in a set will be horizontal on the screen, passing through ownship. The line may now be moved and/or rotated using the joystick and one of the DATA controls. Range from ownship and the true bearing are displayed during the set up, except in Head-Up mode when the bearing will be relative to ownship's heading. When the line is in the required position, press #. This removes the range/bearing display, but leaves the line flashing on and off to show that it is the last line to be defined. The highlight automatically moves to the top of the menu. If required, the line style can be changed at this stage. The line will continue to flash until either the INDEX (or CANCEL) key is pressed, or until a new line is selected for definition.

To define lines in other Sets, move the highlight to SELECT SET and use the DATA control followed by the # key to select a new number (1 to 16 inclusive). Define the lines in this new set as above.

Note: For many applications a single set (up to four lines) will be sufficient. In this case, leave SELECT SET and DISP SETS set to 1.

The figure shown against DISP SETS (Displayed Sets) is the number of sets simultaneously visible on the screen:

for DISP SETS = 1, only the Current Set 'n' is displayed, e.g. 7.
for DISP SETS = 2, Set 'n-1' and 'n' are displayed, e.g. 6 and 7.
for DISP SETS = 3, Set 'n-1', 'n' and 'n+1' are displayed, e.g. 6,7 and 8.

Note: If 'n' = 1, a maximum of 2 sets are available for display - 1 and 2
If 'n' = 16, a maximum of 2 Sets are available for display - 15 and 16.

Deleting an Index Line

Press the INDEX key to display the menu. If the line to be deleted is on the screen and is flashing, select DELETE LINE and press #. If the line is displayed but not flashing, select LINE NO and cycle through the sequence with the # key until the line flashes, then delete as before.

If the required line does not flash, it is not part of the 'Current Set'. The simplest way of determining which Set the line belongs to is to reduce DISP SETS to 1 and then to cycle through the SELECT SET numbers until the required line is displayed. Then cycle through the LINE NO sequence until the line flashes and delete as above.

If the required line is not on display, centre the picture, and proceed as in the previous paragraph.

Index Line Menu

```
            INDEX
   ■ LINE NO            2
     EDIT LINE
     DELETE LINE
     TYPE             8:8
     SELECT SET         7
     DISP SETS          3
     _ _._ _ NM _ _ _·_
```

G ZONE
CLEAR

② ㉘ ㉙
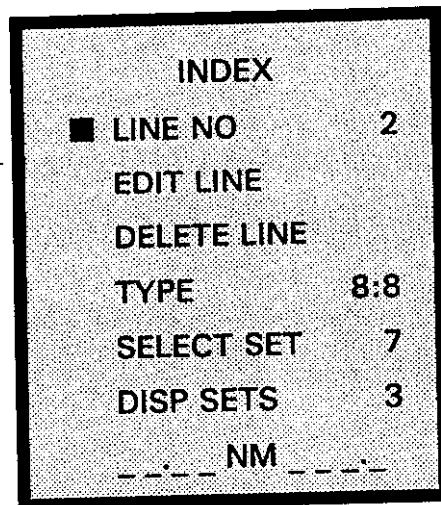
There are two guard zones which are adjustable in range and angular coverage. A short press of the key selects which of the guard zones is adjustable. One or both of the zones may be displayed except in BSH (German) Mode where Guard Zone 2 can only be displayed when Zone 1 is selected. Follow the prompts to set up the start range and the start/stop bearings of the zone. These are initially displayed with their default settings which can then be adjusted over certain limits. The depth of the zones are pre-determined and depend on the selected range scale at the time of definition.

Note: Refer to Chapter 1, Technical Specification for guard zone initial settings and adjustment limits. With BSH (German) Mode selected, the Guard Zone 1 initial settings and adjustment limits are defined separately.

For non Autotrack displays each Guard Zone can alarm on a maximum of ten targets. The zone violations are indicated by a red line through the target. When the tenth violation occurs, the GZ1 or GZ2 FULL alarm is displayed.

With an Autotrack/ARPA display up to ten targets, initiating alarms, are automatically acquired and tracked in each guard zone. When they leave the zone, they revert to the same status as a manually acquired target (see later notes). The zone violations are indicated by red triangles close to the targets plus a GZ1 or GZ2 alarm. When the tenth violation occurs, the GZ FULL alarm is also displayed.

A long press of the key selects guard zones OFF.

Note: A display tellback, GZ1 and/or GZ2 at the bottom left hand of the display indicates which a guard zones are active as it is possible to off-centre the picture such that the zones are not displayed.

PERF MON

With an X-Band BridgeMaster II System the PERF MON key is used to switch the performance monitor function ON, and to select between the two modes of the function. TX MONITOR mode monitors the performance of the system. TR MONITOR mode monitors the performance of the receive path for incoming signals, including the Receiver located in the Transceiver Unit.

Note: The 24 n.mile (48 km), Long Pulse, must be selected for Performance Monitor Operation.

A press and hold on the key will set the display to TR MONITOR mode. Use the DATA control to tune the Performance Monitor to give maximum presentation on the display. When the key is released, the performance monitor is turned OFF.

A further press and hold on the key will set the display to TX MONITOR mode. Use the DATA control to tune the Performance Monitor to give maximum presentation on the display. When the key is released, the performance monitor is turned OFF.

The sequence of modes is as follows: OFF 1, TR MONITOR, OFF 2, TX MONITOR. The mode being monitored is indicated on the display.

The performance monitor shows four arcs on the display. The arcs are spaced at 5 dB intervals. For example, if performance decreases below the second arc, this shows a 10 dB drop in performance.

MENU
(18)(19)

The MENU key is used to display the first of a series of menus referred to as the MAIN menu. A second key press removes the MAIN menu from display. Refer to Figure 4.4 for details of the menu structure.

A long press (4 seconds) of the Menu Key will remove the following synthetics from the screen: Index Lines, Parallel Cursor, Constant Radius Turn, and all Geographics.

#
(19)

The # key is used to select a menu option or confirm a data entry.

ALARM ACK
(16)

A short press of the key acknowledges the highest priority alarm. Only one alarm can be acknowledged at a time. The related alarm message and status for the acknowledged alarm is updated.

NIGHT DAY

Short presses of the key set the intensity of the display to one of four levels (NIGHT levels). A long press of the key sets the intensity of the display to the normal use DAY level. The lowest intensity NIGHT level shows radar information, the bearing scale, and text in red (colour displays only). This key should be used in conjunction with the DISPLAY BRILL rotary control to obtain the required level of brilliance.

USING THE MENUS

Main Menu

The Main Menu is displayed when the MENU key is pressed. A second press of the key removes the menu. The joystick is used to move the pointer on the menus. The # key is used to select the option pointed to by the pointer, or to select options ON and OFF. The display area under the menu gives information on using the option pointed to by the pointer. The Main Menu is in two parts as shown.

```
        MAIN MENU
   ■ DEGAUSS
     HEADING
     BRILLIANCE
     RADIUS TURN
     AUTOTRACK/ARPA
     ROTATE CURS OFF

     MORE ≫ ≫ ≫
```
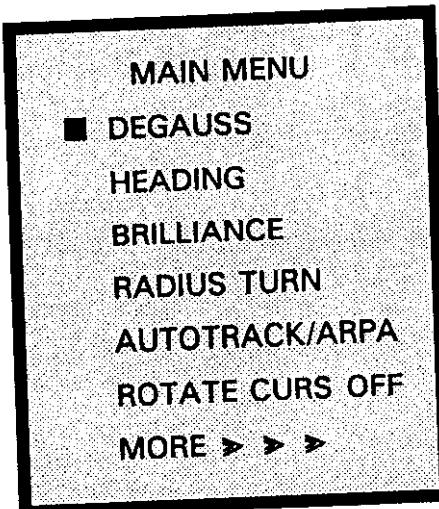
The sub-menus of the Main Menu are shown in the following paragraphs. Step-by-step instructions in the form of prompts are given for each action. Some of the menus are only available if a particular system option is included, as stated.

```
        MENU 2
   ■ WATCH ALARM
     NAV DATA
     INITIALISATION
     TEST
     INTERSWITCH
```
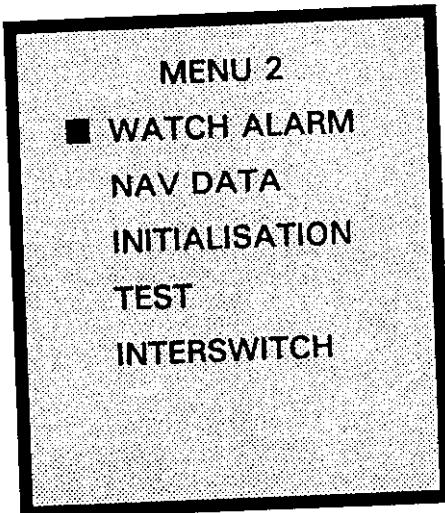
Degauss

The degauss function, which only applies to colour displays, is used to counteract the effect of terrestrial magnetism which can cause colour changes when ownship alters course. Pressing the # key operates the degauss, which is then inhibited from further use for 1 minute.

APPENDIX 6

TRANSMITTER MAINTENANCE PROCEDURES

FIVE (5) PAGE TRANSMITTER MAINTENANCE PROCEDURES
FOLLOW THIS SHEET

INITIALISATION AND COMMISSIONING

Introduction

Prior to switch on, Initialisation and Commissioning involves ensuring that the complete installation has been carried out in accordance with the information contained in this chapter, together with that contained in the Installation Diagrams provided with the units. If a discrepancy exists between this Manual and the Installation Diagrams, the latter should take precedence.

Initialisation and Commissioning also includes ensuring that all the connections and links have been correctly set prior to switch on.

Pre Switch-on Checks

1. Are all the Units securely attached to their mountings and sited with regard to the recommendations given at the beginning of this chapter? In particular, is the turning circle for the antenna free of obstructions?

2. Are all possible corrosion points suitably protected by Densopaste?

3. Are all cables correctly installed with due regard to strain relief and protection against chafe?

4. Are all cables correctly terminated according to the cabling schedules, and are their braids clamped where applicable?

5. Have the correct fuses been installed in the Switch/Fuse units and the Transceiver?

6. Is the Scanner Control Unit current trip correctly set according to the table on page 3.37.

7. Has the Fan connector on the Turning Unit Input Board been correctly positioned. See Figure 3.8 for location.

8. Are the links shown in Figures 3.8, 3.15 (if applicable) and 3.37 set as indicated?

Tune Level

WARNING: LETHAL VOLTAGES

TAKE EXTREME CARE WHEN THE EQUIPMENT IS OPENED FOR ACCESS, LETHAL VOLTAGES ARE EXPOSED.

BridgeMaster II New S-Band

Remove the Display Unit top cover, and the Display Compatibility Unit cover. Refer to Figure 3.36, for location of RV3 display coarse tune control, and Figure 3.37 for location of RV1 coarse TUNE control in the Display Compatibility Unit.

1. Set the radar to 24 n.mile range, using the RANGE keys.
2. Set the radar to transmit mode Long Pulse using the PULSE key.
3. Set the TUNE control on the display control panel to the central position.
4. Select AFC off.
5. Set RV3 display coarse TUNE control to the fully counter clockwise position.
6. On the Display Compatibility Unit adjust RV1 coarse tune until the TUNE INDICATOR shows the maximum number of diamond symbols.
   (in a multi-display system adjust RV1 for display A, RV2 for display B, RV3 for display C, and RV4 for display D.)

New S-Band Performance Monitor (if installed)

There are two potentiometers which are used to set the sensitivity of the Performance Monitor in its two modes of operation. One mode checks the **Overall Radar System Performance** (TX mode), and the other mode checks the **Receive Path** (TR Mode) of the radar system as a diagnostic aid.

Refer to Figure 3.36 for access and identification of RV1 (XT ADJ), and RV2 (XR ADJ) potentiometers.

1. Set the radar to Transmit mode, using the PULSE key. Select the 24 n mile range, Long Pulse. Ensure that the AFC is ON. Set RV1 and RV2 on the Processor board both fully counter clockwise.

2. Press and hold the PERF MON key to set the monitor to the TR mode (Receive Path), Check that TR is displayed in the Menu area of the Display screen. If the Menu shows that TX (Overall Radar Performance mode) mode is selected, press and hold the PERF MON key again to select TR mode.

3. With the PERF MON key **still pressed** slowly adjust the DATA control to tune the PerformanceMonitor to give maximum presentation on the display - i.e. 4 arcs at a range of approximately 9 n.miles, and a bearing of 280° with respect to the Heading Marker.

    (This tunes the Performance Monitor to the magnetron frequency)

4. Adjust RV1 (XT ADJ) to make the fourth ring (counting from the inner arc) just visible. Recheck that the tuning is maximum, readjust RV1 if necessary to maintain the fourth arc just visible.

    (This calibrates the Performance Monitor output level)

5. Release the PERF MON key, and then press and hold the key again to set the monitor to the TX mode (Overall Radar System Performance test mode). Check that TX is displayed in the Menu area of the display screen.

6. With the PERF MON key still pressed, use the DATA control to tune the Performance Monitor to give maximum presentation on the display - i.e. 4 arcs at a range of approximately 9 n.miles, and a bearing of 280° with respect to the Heading Marker..

7. Adjust RV2 (XR ADJ) to make the fourth arc just visible as before. Recheck the tuning and readjust RV2 if necessary to maintain the fourth arc just visible.

8. If the level of the fourth arc is too low this may be corrected by a small adjustment of RV1 (XT ADJ). **NOTE:** only minor readjustments should be made with RV1 at this stage.

9. Release the PERF MON key.

Note: If the PERF MON key is inadvertently released and re-pressed at any time other than as directed above, it will toggle the Performance Monitor into an unwanted mode. Therefore, it is essential that the mode in use is monitored at all times during the set up procedure.

Initialisation and Commissioning Check List

Record all actions and settings on the Installation and Commissioning Checklist which appears on pages 3-81 onwards in the BridgeMaster II Ships Manual.

PLDE
(–VE)

PLDX
(+VE)

RV1
XT ADJ.

RV2
XR ADJ.

RV3
TUNE

NOTE: THIS FIGURE SHOWS A 250
DISPLAY, BUT APPLIES EQUALLY FOR
ALL DISPLAY SERIES.
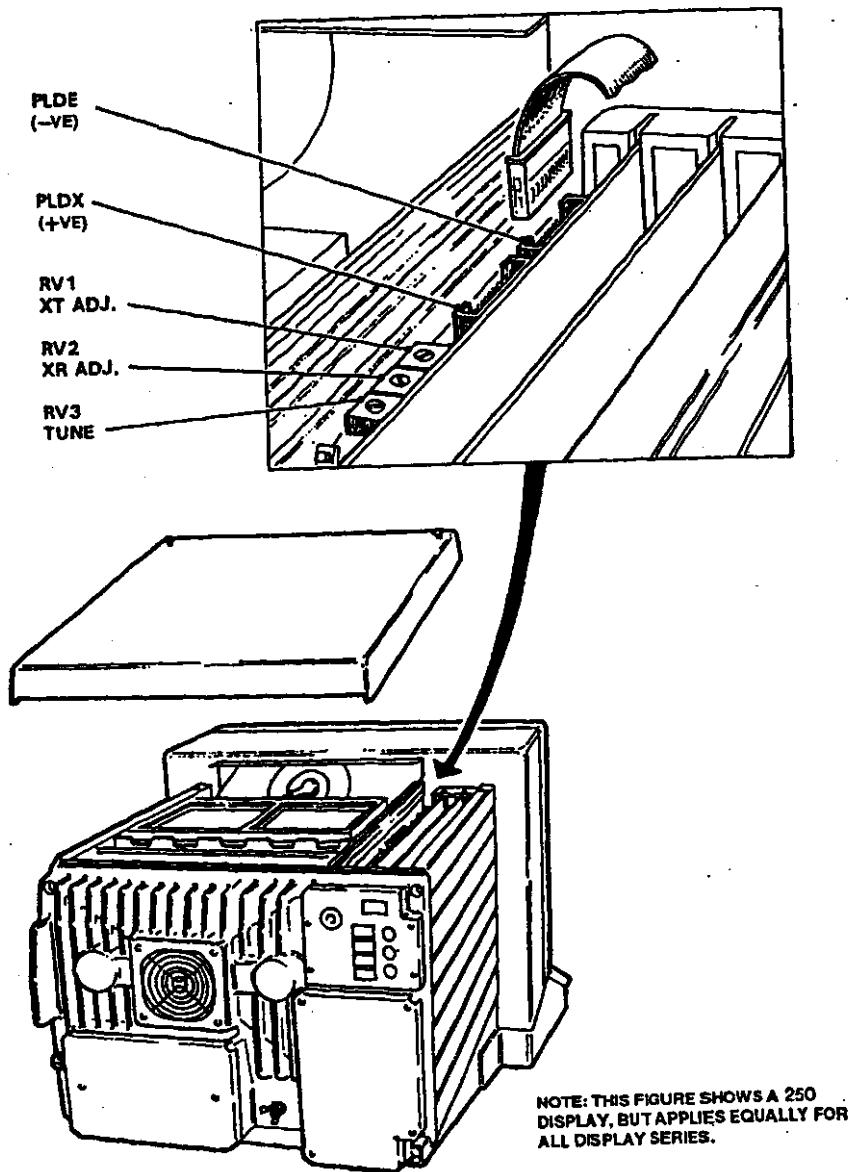
Figure 3.36 Potentiometer and PCB Location: 180/250/340 Display Series
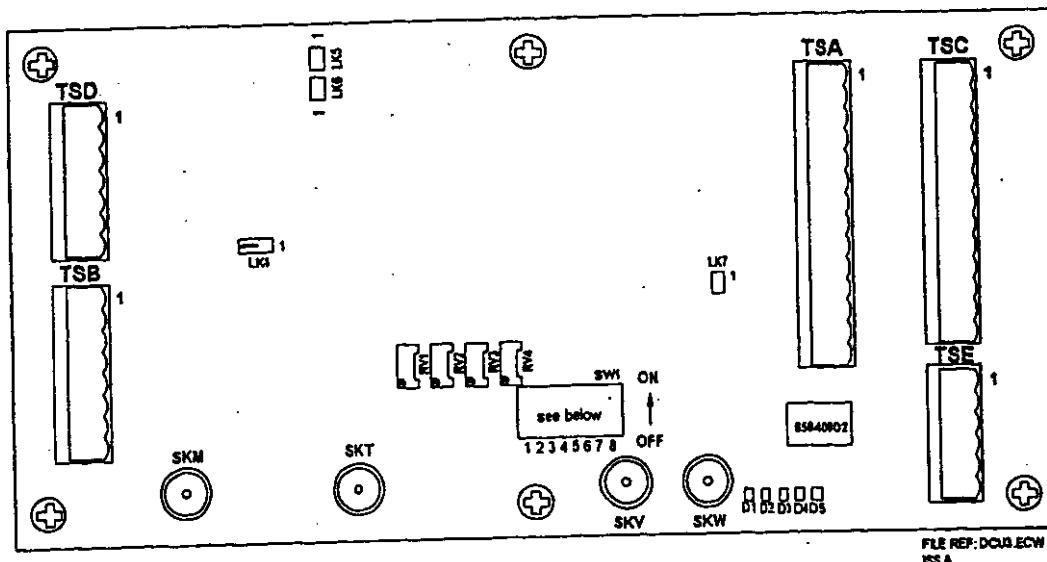
BEARING LINK
LK1   NORMAL OPERATION (90 pulses/rev)   2 - 3
LK1   360 PULSES/REV   1 - 2

TEST LINKS
LK5   NOT FITTED
LK6   NOT FITTED
LK7   NOT FITTED

Note: LK5, LK6, & LK7 are only fitted For Factory Test puposes.

SW1 SETTINGS
1 - Display Identity in Interswitched Systems - see Table
2 - OFF = NORMAL (Display is to be used either as MASTER,
          or MASTER/SLAVE in an interswitched system)
    ON = If display is to be used only as a SLAVE.
3 - Display Identity in Interswitched Systems - see Table
4 - OFF = NORMAL (serial data rate 76.8 kbaud)
    ON = FACTORY TEST (serial data rate 38.4 kBaud).
5 - OFF = If used with Interswitch Type 65842, or 65846 .
    ON = No Interswitch, or Interswitch Type 65642AA.
6 - not used
7 - not used
8 - not used

DISPLAY IDENTITY

DISPLAY	1	3
A	OFF	OFF
B	ON	OFF
C	OFF	ON
D	ON	ON

Interswitched systems only.
In non interswitched systems
display is identified as "A".

LINK AND SWITCH SETTINGS DISPLAY COMPATIBILITY UNIT PCB 65801802

Figure 3.37 Display Compatibility Unit - Circuit Board Details

APPENDIX 7

CIRCUITS AND DEVICES TO STABILIZE FREQUENCY

Operating frequency is established by
characteristics of the magnetron.

Pulse width and pulse repetition rate
is established by conventional pulse-
forming circuitry.

APPENDIX 8

CIRCUITS TO SUPPRESS SPURIOUS RADIATION
LIMIT MODULATION AND CONTROL POWER

a.   Spurious emission suppression is accomplished by waveguide characteristics which attenuate lower frequencies.   Spurious radiation suppression is accomplished by shielding and by-passing.

b.   Modulation limiting is provided by characteristics of the PRF generator circuitry, trigger SCR, and magnetron.

c.   Power output is maintained by power supply regulation, trigger SCR and magnetron.