hsb² PLUS Series Fishfinders
Owner's Handbook

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Intended Use

Raymarine *hsb²* Plus Series Fishfinders are intended for recreational fishfinding. The combined Fishfinder/Chartplotter devices are intended for recreational fishfinding and course chartplotting. The optional chartplotter function is intended as an aid to navigation and should not be relied upon as a substitute for official navigation charts.

SAFETY NOTICES

This equipment must be installed and operated in accordance with the instructions contained in this manual. Failure to do so can result in personal injury and/or navigational inaccuracies. In particular:

1. HIGH VOLTAGE. The LCD display unit contains high voltages. Adjustments require specialized service procedures and tools only available to qualified service technicians – there are no user serviceable parts or adjustments. **The operator should never remove the display unit cover or attempt to service the equipment.**

2. NAVIGATION AID. The chartplotter unit is only an aid to navigation. Its accuracy can be affected by many factors, including equipment failure or defects, environmental conditions, and improper handling or use. It is the user's responsibility to exercise common prudence and navigational judgements. This unit should not be relied upon as a substitute for such prudence and judgement.

EMC Conformance

All Raymarine equipment and accessories are designed to the best industry standards for use in the recreational marine environment.

The design and manufacture of Raymarine equipment and accessories conform to the appropriate Electromagnetic Compatibility (EMC) standards, but correct installation is required to ensure that performance is not compromised.

Preface

This handbook describes the following Raymarine *hsb²* Plus Series Fishfinder Displays:

- L755RC Plus 7" Monochrome LCD Fishfinder Display with Chartplotter
- L760 Plus 7" Color LCD Fishfinder Display
- L760RC Plus 7" Color LCD Fishfinder Display with Chartplotter
- L1250 Plus 10.4" Color LCD Fishfinder Display
- L1250RC Plus 10.4" Color LCD Fishfinder Display with Chartplotter

The combined Fishfinder/Chartplotter display units include a cartridge holder assembly that contains two slots for C-MAP NT or NT+ chart cards. Fishfinder systems require an appropriate Raymarine transducer unit and inter-connecting cable. Details for selecting and installing the transducer are described in document number *81196, Transducers for Fishfinders Owner's Handbook*.

This handbook contains very important information on the installation and operation of your new fishfinder. In order to obtain the best results in operation and performance, please read this handbook thoroughly.

Raymarine's Technical Services representatives or your local dealer will be available to answer any questions you may have.

TFT LCD Displays

The colors of the display may seem to vary when viewed against a colored background or in colored light. This is a perfectly normal effect that will be seen with all color LCD displays.

In common with all Thin Film Transistor (TFT) LCD displays, the screen may exhibit a few (less than 20) wrongly illuminated pixels. These may appear as black pixels in a light portion of the screen, or as colored pixels in black areas.

CAUTION:
To provide protection against the damaging effects of UV light, it is advisable to replace the sun cover provided when the color LCD display is not in use.

Raymarine Products and Services

Raymarine products are supported by a network of Authorized Service Representatives. For information on Raymarine products and services, contact either of the following:

United States   Raymarine, Inc.
22 Cotton Road, Unit D
Nashua, NH 03063-4219
USA
Telephone: 1-603-881-5200
1-800-539-5539
Fax: 1-603-864-4756

Europe   Raymarine Ltd
Anchorage Park
Portsmouth, Hampshire
England PO3 5TD
Telephone: +44 (0) 23 9269 3611
Fax: +44 (0) 23 9269 4642

Or, you may contact us on the World Wide Web at *www.raymarine.com*.

Warranty

To register your *hsb²* Plus Series display unit ownership, please take a few minutes to fill out the warranty registration card found at the end of this handbook. It is very important that you complete the owner information and return the card to the factory in order to receive full warranty benefits.

Technical Accuracy

The technical and graphical information contained in this handbook, to the best of our knowledge, was correct as it went to press. However, the Raymarine policy of continuous improvement and updating may change product specifications without prior notice. As a result, unavoidable differences between the product and handbook may occur from time to time, for which liability cannot be accepted by Raymarine.

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SeaTalk is a registered trademark of Raymarine Limited.

hsb² is a trademark of Raymarine Limited.

Pathfinder Plus is a trademark of Raymarine Limited.

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Chapter 1: Overview

1.1 Introduction

This handbook describes the following *hsb²* (High Speed Bus) Plus Series Fishfinder displays:

Fishfinder	Display Type	Display Size	Chartplotter
L755RC Plus	Monochrome LCD	7 inch	Yes
L760 Plus	Color LCD	7 inch	No
L760RC Plus	Color LCD	7 inch	Yes
L1250 Plus	Color LCD	10.4 inch	No
L1250RC Plus	Color LCD	10.4 inch	Yes

Raymarine *hsb²* Plus Series Fishfinders use the latest processor and sonar technology for accurate performance and echo detection. Units feature 7" or 10.4" daylight viewable monochrome or color LCD displays and the Raychart (RC) models include a full C-Map NT/NT+ Chartplotter. With up to 600 watts output power and dual frequency operation, *hsb²* Plus Series Fishfinders provide performance from 1 up to 3000 ft. In fact, the L1250 Plus and L1250RC Plus units offer 1000 watts power and a depth range up to 5000 ft.

Use the High Speed Bus (*hsb²*), SeaTalk and NMEA interfaces to provide an integrated system with additional devices, such as Pathfinder Plus Radar, Raymarine Autopilot and Raystar Wide Area Augmentation System (WAAS) GPS products.

Connecting an *hsb²* Series Plus Fishfinder to an *hsb²* Series Pathfinder Plus Radar and to an *hsb²* Series Plus Chartplotter enables fishfinder, radar, and chart data to be displayed on all three units. Similarly, chart data can be repeated on a fishfinder-only device from any via *hsb²* from any other *hsb²* device with chart capabilities.

This handbook describes the display unit controls and details both fishfinder and chart operations. Controls that are specific to either fishfinder or chartplotter are described in fishfinder or chart sections/chapters.

Note: *Many illustrations in this handbook show example screens. The screen you see on your display depends on your system configuration and set up options, so it may differ from the illustration.*

How to Use This Handbook

If you are installing the display system yourself, you should read *Chapter 2* before you start the installation. This chapter also provides information that will be useful if you are connecting your *hsb²* Plus Series system to other equipment.

For an overview of the display unit controls, the fishfinder and the chartplotter systems, read *Chapter 1*. *Chapter 3* will help you start using your system.

For detailed information on fishfinder operations refer to *Chapter 4*.

For chartplotter operating details, refer to *Chapter 5* and *Chapter 6*.

To change the system set up defaults, read *Chapter 7*.

Chapter 2 provides planning considerations and detailed instructions for installing the fishfinder display unit. It should be referred to when you are ready to install the system. Details to connect the display to other equipment via *hsb²*, NMEA and SeaTalk are also provided.

Chapter 3 explains how to start using the display and describes how to use some of the basic fishfinder and chart functions. Chapter 3 also provides operating guidelines for typical chartplotter scenarios; these guidelines introduce you to many of the chartplotter functions.

Chapters 4 provides detailed operating information for the fishfinder functions - selecting depth range limits, adjusting gain, color and STC, setting alarms, using the VRM marker, marks and man overboard.

Chapter 5 provides detailed operating information for the standard chartplotter functions - using chart cards, plotting waypoints and routes, following routes and showing tracks.

Chapter 6 provides detailed operating information for further chart functions, including measuring distances, man overboard and cursor echo. It includes instructions for setting up a differential GPS.

Chapter 7 provides instructions for setting up your system to suit your preferences. You should read this chapter to determine how to set up the fishfinder and chartplotter system defaults.

Chapter 8 provides information on user maintenance, and what to do if you experience problems.

The Appendices provide additional information that you may find useful: **Appendix A** lists the technical specifications for the fishfinder and for the chartplotter.

Appendix B provides details on connecting the display unit to specific GPS systems.

Appendix C defines the chart features shown on the chart display.

Appendix D defines the SeaTalk and NMEA data that is transferred on integrated systems.

A List of Abbreviations, **Index** and warranty information are included at the end of the handbook.

A summary of the fishfinder and chartplotter controls are provided on the Quick Reference Cards supplied with your system.

Terminology

The following terminology is used to describe the various display unit configurations:

Master	A unit capable of sourcing specific data such as fishfinder, chart, or radar data.
Repeater	A unit capable of displaying data, such as radar, from the High Speed Bus.
Fishfinder Display	Unit providing Fishfinder Master and Radar Repeater functionality. The L755RC, L760RC, and L1250RC Plus displays also provide Chart Master functionality.
Radar Display	Unit providing Radar Master, Fishfinder Repeater and Chart Reader functionality.
Chart Display	Unit providing Chart Master, Fishfinder Repeater and Radar Repeater functionality.
Combined Display	Unit providing both Fishfinder and Chart or Radar and Radar Repeater functionality.
Integrated System	Additional instruments are connected via *hsb²*, SeaTalk or NMEA interfaces.
hsb²	High Speed Bus- links up to ten compatible display units. For full display and control between *hsb²* Plus Series display units, the units must be connected via *hsb²* **and** SeaTalk.

Introduction

General

The *hsb²* Plus Series Fishfinder system, illustrated below, is comprised of the 7" or 10.4" LCD display unit, fishfinder transducer, and associated cables.
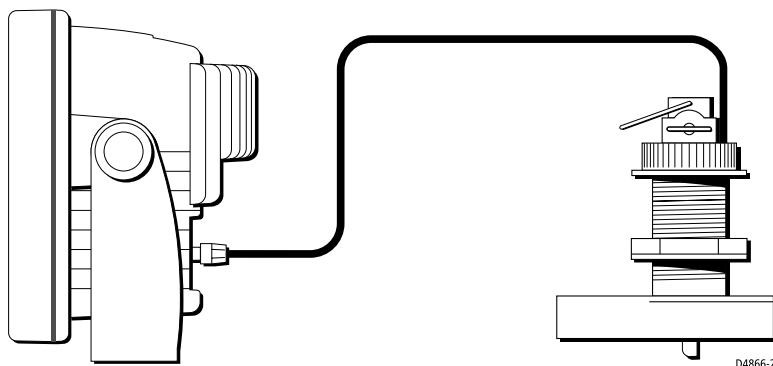
Figure 1-1:   Basic Fishfinder System

Display Unit

The *hsb²* Plus Series LCD display unit is waterproof to CFR46 and can be installed either above or below deck.

The unit includes:

- 7" or 10.4" LCD display
- Trackpad
- Eleven dedicated (labeled) control keys
- Four soft keys (unlabeled) whose functionality changes
- Two slots for the C-MAP NT® or NT+ chart cards (Raychart models only)

The display and keys can be illuminated for night-time use.

Transducer

The *hsb²* Plus Series Fishfinders require a transducer, either thru-hull, in-hull, or transom-mount.

Transducers can measure water depth, temperature, distance traveled, and/or speed. It is important to position your transducer correctly. For details on transducers, including location and installation instructions, see document number 81196, *Transducers for Fishfinders Owner's Handbook*.

Note: *If speed and temperature are being input via SeaTalk, these values are displayed instead of the speed and temperature inputs from the transducer.*

Introduction to *hsb²* Systems

The *hsb²* (High Speed Bus) connection enables transfer of data among compatible units. For example, fishfinder data is transferred from the fishfinder (the master display) via the *hsb²* connection and can be displayed *and controlled* on any other *hsb²* Plus Series LCD or CRT display (the repeater display). However, if you change, say, depth range on one display, it affects all displays showing fishfinder or fishfinder/chart overlay.

In particular, you can connect your *hsb²* Series Plus Fishfinder to a remote *hsb²* Series Pathfinder Plus Radar and then to a remote *hsb²* Series Plus Chartplotter to provide fishfinder, chart, and radar functionality on all three displays.

Full functionality of the fishfinder is achieved when it is part of an integrated system, with other equipment (in addition to other *hsb²* Plus units) connected via SeaTalk or NMEA 0183. Data from this equipment including position and heading is displayed on the display and is used in calculations.

It is possible to connect up to ten *hsb²* Plus Series LCD or CRT displays to provide an integrated system. Earlier HSB (non-Plus) Display units can be upgraded to provide *hsb²* compatibility. See *Connecting hsb2 Plus Series Displays* on *page 2-20* for details.

Note: *Please contact Raymarine Customer Service or your authorized Raymarine dealer about upgrading your existing HSB (non-Plus) display units to provide full hsb² Plus functionality.*

The *hsb²* system can include several chartplotter displays, each with two chart cartridge slots. Each display can access two local and up to six remote chart cartridges. Charts can be controlled *independently* on each display, even when a remote chart cartridge is being used. Details on connecting the equipment are given in *Chapter 2*.

Display Unit Features

Fishfinder
- Displays depth, speed, and temperature, if the transducer is so equipped
- Dual or split frequency fishfinder display – 50 kHz, 200 kHz
- Display options – fishfinder window, zoom, bottom lock and A-Scope
- Uses position data from GPS, DGPS, WAAS or Loran-C technology
- Displays and transfers *hsb²*, SeaTalk and NMEA data
- Provides full control of data from other *hsb²* instruments
- Half-screen windows to display additional data: depth/temperature graph, Course Deviation Indicator (CDI), Bearing and Distance Indicator (BDI), navigation data

Chartplotter

- Displays information from the C-MAP NT® and NT+ chart cards (C-Cards)

- Three full-screen operating modes: Fishfinder, Chart, Data Log (if appropriate data is available)

- View fishfinder and chart simultaneously

- Choice of chart orientation: Head Up, Course Up and North Up

Operating Modes

If you have a combined Fishfinder/Chartplotter unit, or have an *hsb²* Plus Series Chartplotter connected to a Fishfinder, three full-screen modes – fishfinder, chart and data log are available; you select the operating mode using the **DISPLAY** key as described in *Chapter 3*.

You can also set *Windows On* to split the display into two half-screen windows to show supplementary data, or to display fishfinder and chart simultaneously. The main operating mode (fishfinder or chart) is displayed in the upper window; you choose what is displayed in the lower window.

In addition, if you have an *hsb²* Series Pathfinder Plus Radar display connected, you can set the display to radar mode; this provides similar functionality to a combined Pathfinder Radar/Chartplotter.

If you only have an L760 Plus or L1250 Plus fishfinder-only unit connected, only fishfinder mode is available.

Operating Modes

Half -Screen Window Options

The following information, if available on your system, can be shown:

Table 1-1:   Window Options for Combined/Integrated Systems

Full-screen mode	Half-screen Window Options - Fishfinder/Chart Display only	Half-screen Window Options - Fish/Chart + Radar Displays
Fishfinder Mode	Depth/temp, Chart, CDI, BDI, or Data	Depth/temp, Chart or CDI, BDI
Chart Mode	CDI, BDI, Nav Data or Fishfinder	CDI, BDI, Nav Data, Fishfinder or Radar
Radar Mode	Not Available	CDI, BDI, Chart or Nav Data
Data Log Mode	Half-screen Windows not available	Windows not available

- **Chart display (when in Fishfinder or Radar mode)**
  Fishfinder display (when in Chart mode):
  Radar display (when in Chart mode):
  If data is available, either as a function of the combined display unit or via the *hsb²* link, it can be displayed.

- **Depth/temp graph (Fishfinder mode):** This shows a plot water temperature and depth against time.

- **Data (Fishfinder mode)**: This option splits the fishfinder vertically. The left hand window displays data boxes; there are three different sets of data (A, B and C) that you can select for display.

- **CDI:** This gives the Course Deviation Indicator graphical display, with data relating to the target waypoint.

- **BDI:** This gives the Bearing and Distance Indicator graphical display, with data relating to the target waypoint.

- **Nav Data (Chart mode):** This shows sixteen data boxes, providing navigational data in the units specified in your set up. Note that up to 6 of these data boxes are also available as a *user-selectable group* (see *Section 7.3*).

For details on the radar, refer to the Owner's Handbook supplied with your radar.

Note: *MARPA functionality is available on the fishfinder display if you have an integrated system with a Pathfinder radar master display that includes MARPA as a primary function.*

Details on selecting windows are given in *Chapter 3*.

1.2 The Fishfinder Display

When you first turn the display unit on and select fishfinder mode, the scrolling bottom graph is displayed. This is a graphical representation of the echoes seen by the Fishfinder. As time passes, this display scrolls from right to left and becomes a record of the echoes seen. A typical display is shown in *Figure 1-2*.

The images at the right hand side of the display are the most recent echoes. Some echoes indicate fish, and others show the bottom. It can also indicate bottom structures, such as a reef or shipwreck. The upper and lower depth range limits are shown.

The fishfinder screen includes a status bar that displays transducer frequency and indicates which auto settings are enabled (Gain, Color Gain, Range, Zoom and Frequency), and alarm status (fish and shallow/deep water depths).

You can customize the fishfinder by choosing what is displayed and how it is displayed (including language and units). For example, you can set the scroll speed of the bottom graph display, and you can select the range to adjust the amount of detail displayed.

You can view the cursor position and a variety of data (such as speed, heading and depth) from the transducer and other equipment in user-selectable data boxes. These data boxes can be moved around the screen and they can be switched on or off.

Chapter 3 includes details on adjusting the display, other set up options are described in *Section 7.3* and *Section 7.4*.

Fishfinder Options
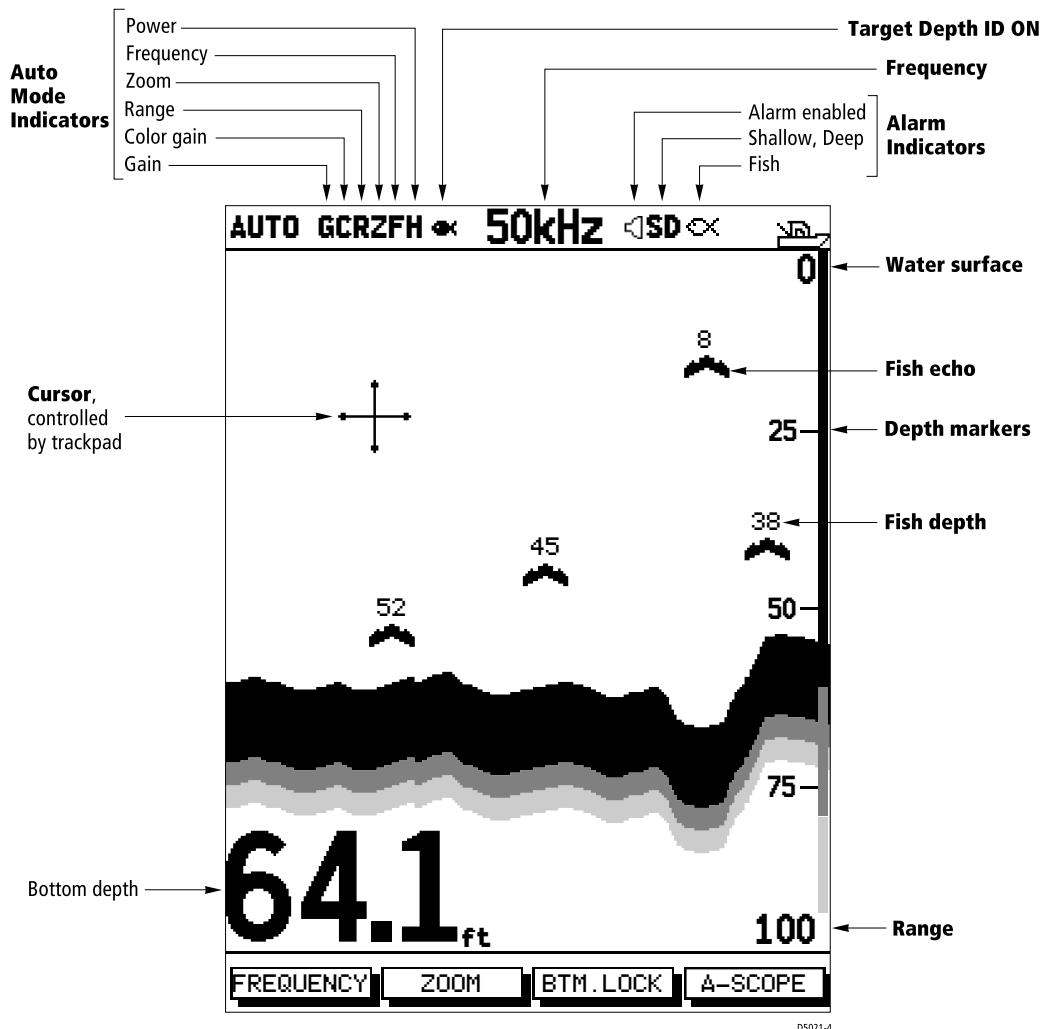
Figure 1-2:   Typical Fishfinder Display

Fishfinder Options

The fishfinder provides controls to select additional modes:

- Frequency – you can select the transducer frequency, 50 kHz for wide coverage and deep water, 200 kHz for a detailed view, both frequencies simultaneously or auto-frequency. The default setting is auto-frequency, which determines the optimum frequency of operation based on the current depth.

- Bottom Lock – changes the operating mode to re-set the bottom. It provides a bottom-up view: the bottom is used as the reference, its image is flattened and depths are displayed here. Bottom lock mode is used primarily to filter-out the bottom structure and display fish details only.

- A-Scope – displays a real-time image of the bottom structure and fish directly below the transducer. The A-Scope window also displays the patented Bottom Coverage width indication.

- Zoom – enlarges all or part of the bottom graph display. You can select x2, x4 or x6 magnification and the zoom area can be automatically or manually adjusted.

You can select Zoom, Bottom Lock or A-Scope to be vertically split with the bottom graph display. Alternatively, Zoom or Bottom Lock can be displayed in place of the bottom graph display.

If you choose dual frequency, the scrolling bottom graph is displayed in both frequencies, split horizontally. Zoom, Bottom Lock or A-Scope can be displayed with the dual frequency graph.

All of these options are available when the fishfinder is displayed in a half-screen window.

Fishfinder Functions

The *hsb²* Plus Series Fishfinder includes the following functions:

- Automatic or manual selection of scroll speed for bottom graph display
- Automatic or manual selection of transducer frequency
- Automatic or manual selection of upper and lower depth range limits
- Adjustment of foreground/background color and image color threshold (contrast control on the L755RC Plus monochrome display)
- Adjustment of Gain, Color Gain and STC
- Set up alarms for Fish, Shallow water and Deep water
- VRM marker to determine depth and distance
- Add marks to record important or dangerous locations
- Man Overboard (MOB) to navigate back to a person or object

Operation of these fishfinder functions is described in *Chapter 3* and *Chapter 4*.
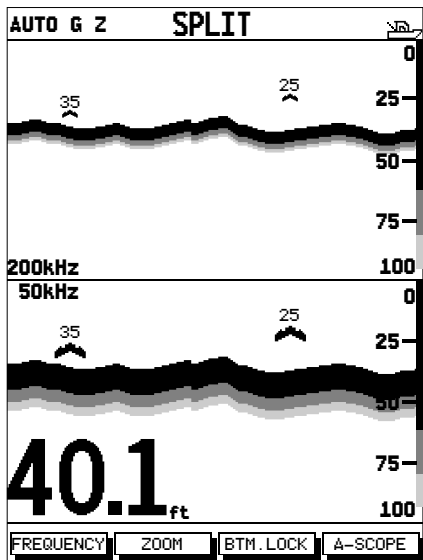
Split Frequency
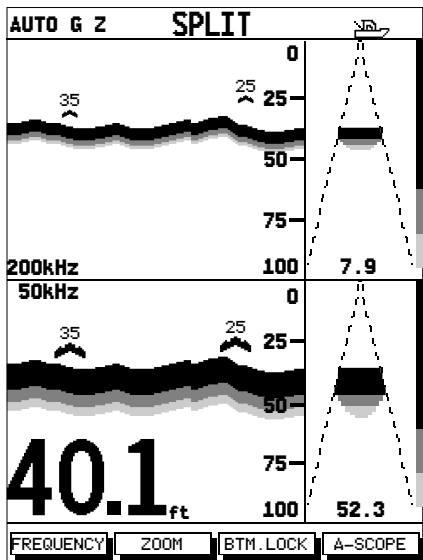
Split Frequency with A-Scope
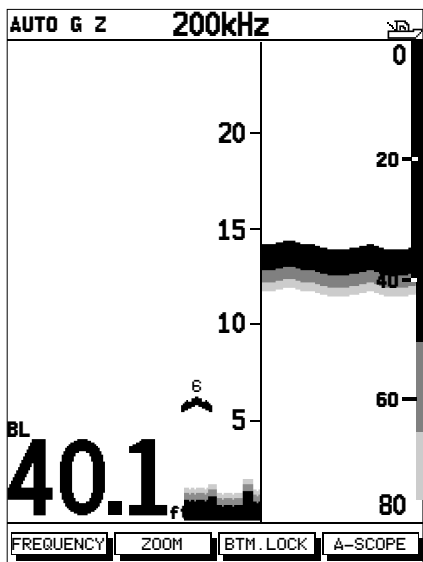
Bottom Lock Split with Bottom Graph
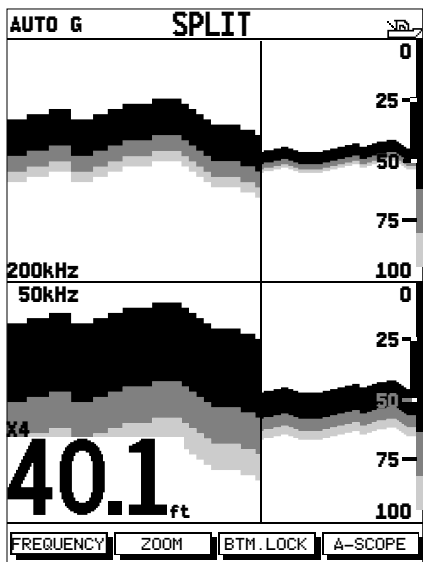
Zoom Split with Split Frequency

Figure 1-3:   Fishfinder Display Options

1.3 The Chartplotter Display

The L755RC, L760RC and L1250RC Plus Fishfinders include a Chartplotter. The chartplotter includes a small-scale world map and detailed navigation information is displayed when a cartographic chart card is installed. The details displayed depend on the chart zoom level selected. A plotter mode is provided to enable route plotting and tracking at large scales even when a chart card is not installed A typical chartplotter screen is shown in *Figure 1-4*.

Note: *For an L760 Plus or L1250 Plus fishfinder-only unit to have access to chartplotter functionality, it must be connected to an* hsb² Plus *Series Chartplotter device. This is discussed fully in the section Integrated Systems on page 2-18.*

The chartplotter uses position information from a GPS, DGPS, WAAS, or Loran-C instrument. Once the position fix has been established, your vessel's position, if on screen, is shown as a boat shape pointing in the direction of the current heading (or COG if heading data is not available). If no heading or COG data is available, the vessel is shown as a circle.

The chartplotter screen includes a status bar that displays chart scale, with either cursor position, range and bearing or, when the cursor is homed to the vessel (by pressing FIND SHIP), vessel position, Speed Over Ground (SOG), Course Over Ground (COG) and fix type (VES POS, DIF FIX or SD FIX). The status bar also indicates if radar/chart overlay is switched on.

Any waypoints you have placed are displayed (unless you turned them off in Chart Set Up as described in *Chapter 7*) and the current route is shown. Information can be viewed on-screen by positioning the cursor over a waypoint, current route or chart object. The chartplotter screen can also show additional information, depending on your currently selected options, set up selections and data available from other equipment.

An example chart display, in its default configuration, with a chart card installed, is shown in the following illustration.

Several functions are available to control the display as follows:

- Zoom in/out and Pan the Display
- Offset the Chart or Center the Chart around the Vessel
- Overlay Radar Targets onto the Chart Display
- Synchronize the Chart and Radar (if radar data is available)

Operation of these functions is described in *Chapter 3*.

Chartplotter Display Options

Set up options allow you to customize the chart by choosing what is displayed (including cartographic features), how it is displayed (including language and units), heading mode and how the chartplotter operates with other *hsb²* units. You can also view the cursor position and a variety of data from other equipment (for example, speed, heading, depth, wind, and tide information) in a set of user-selectable data boxes. The cursor box and user-selected data boxes can be moved around the screen and they can be turned on or off. You can also obtain autopilot status and locked heading information.

Display options are provided in System Set Up and Chart Set Up as described in *Chapter 7*. Chart set up options allow you to customize the chart by selecting:

- What cartographic features and level of detail are displayed
- The chart color palette (shade or sunlight)
- Chart orientation (north up, head up or course up), datums and position off-set
- How waypoints are displayed (symbols and numbers) and how chart object information is displayed
- Vectors for heading, COG and tide

In addition Screen Presentation Options, described in *Chapter 3* are provided to switch:

- Cursor Box and Databoxes On/Off
- Chart Grid On/Off
- Custom Chart Details On/Off

Note: *When you turn the display off and on again, these settings are retained in memory.*

Chart Range — 48nm · CSR 50°11'908N BRG 147°T / POS 001°13'612W RNG 9.82nm — Status Bar

Chart Boundary

Vessel Position

Waypoint — Cursor - selecting chart object

Depth Area

Object data box - for object selected by cursor — 1 Object / Buoy Spec.Purp Pillar Y 'EC2' / Fl(4)Y.15s Racon Whis(2)

CURSOR / 282° R / 9.815nm

Cursor position box
Shows the current cursor position as either Range/Bearing or Lat/Long. You can move this box to your preferred position on the screen or turn it off.

ROUTE   GOTO   SCREEN   FIND SHIP

Default soft key labels
These can be turned off: press any soft key to redisplay them.
Different labels are displayed when you press a key.

D4275-3

Figure 1-4:   Typical Chartplotter Display

Custom Chart Details

The chartplotter set up options include a sub-menu to customize the cartographic features. This menu allows you to switch features On, Off, or control them using the CUSTOM soft key. The factory default settings for the Custom chart options are as follows:

ON: Chart text, chart boundaries, depth contours, navigation marks and land features.

OFF: Caution and routing data.

CUSTOM: Spot sounding, light sectors, marine features.

Note: *The factory default for the* CUSTOM *settings is* ON*.*

Icons are displayed in detail, depth shading limit is 10 m and depth contour display is 0-100 m.

A complete list of chart features is given in *Appendix C*.

Chartplotter Functions

The *hsb²* Plus Series Chartplotter includes the following functions:

- Display C-MAP NT and NT+ C-Card chart information including Ports and Tides (if available)

- View chart information (if available) for the Nearest Port

- Place, Move, Erase and Edit a Waypoint

- Goto Waypoint or Cursor

- Create, Save, Name, Edit and Follow a Route

- Review Route and Waypoint Lists

- Display vessel's track; Save and Name the Track for re-call to screen

- Measure Chart Distances and Bearings on-screen

- Set Up Alarms and Timers

- Man OverBoard (MOB) to navigate back to a missing person or object

- Differential GPS set up page

Operation of these functions is described in *Chapter 5* and *Chapter 6*.

Chartplotter
Functions

1.4 Operating Controls

You operate the fishfinder and chart systems using a variety of controls:

- A trackpad providing up, down, left, right and diagonal control of an on screen cursor
- Eleven dedicated (labeled) control keys
- Four soft keys with labels displayed on the screen
- Pop-up menus, displayed on-screen, from which you select options
- Database lists, displayed on-screen, which enable you to edit items

Note: *The cursor is the cross-hair symbol (+) visible on the display. You move the cursor using the trackpad and use it to select a position or item on the chart.*

The control keys are shown in *Figure 1-6*. They are back-lit for night-time use when the display brightness is dimmed. When you use a control, a help message is displayed at the top of the screen (unless you switch help off as described in *Chapter 7*). The following paragraphs describe the controls and on-screen facilities.
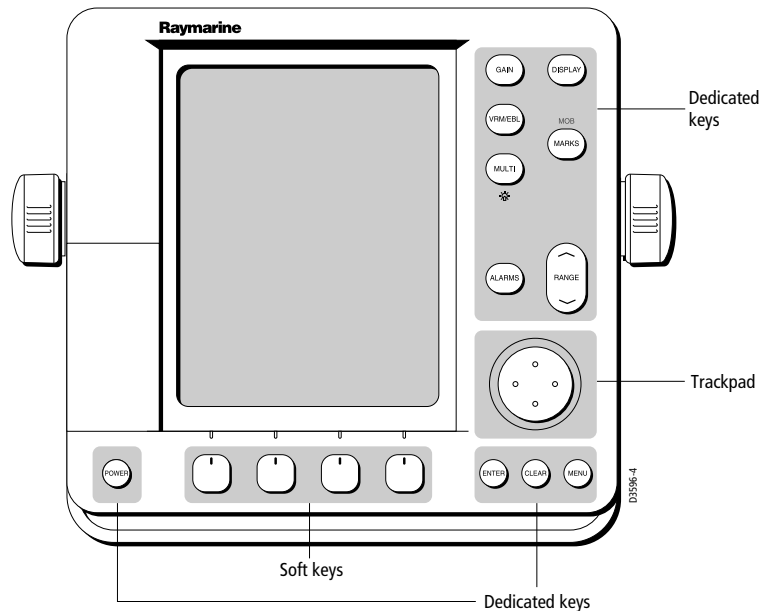
Figure 1-5:   7" LCD Display Control Keys
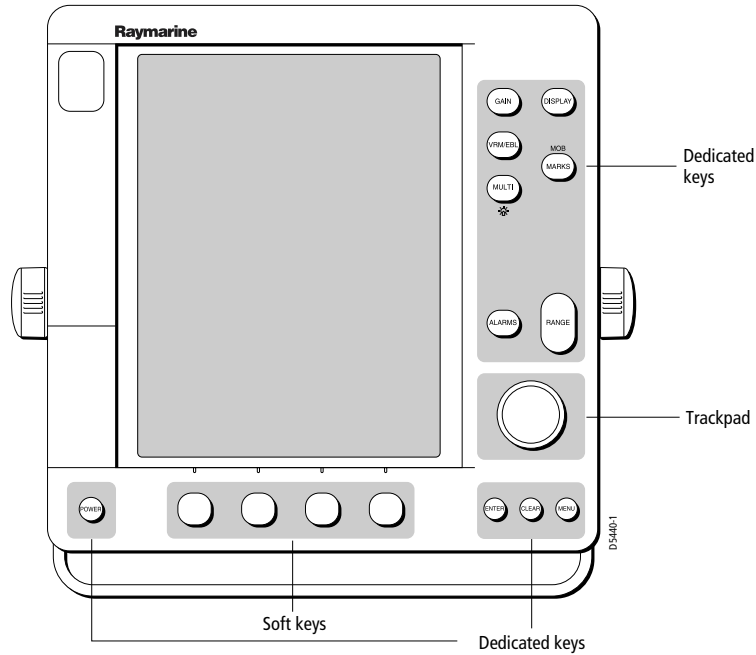
Figure 1-6:   10.4" LCD Display Control Keys

Trackpad and Cursor

The trackpad has several functions:

- To move the cursor around the screen
- To select an item from a pop-up menu
- To adjust a variable soft key control

The cursor is used to:

- Select a position on the screen
- Select an item, for example, chart object on the chartplotter
- Pan the chart display

Moving the Cursor

You can press on any of the four sections of the trackpad to move the cursor in that direction (up, down, left or right), or press two sections at the same time to move diagonally. The cursor moves faster as you continue to press the trackpad. The current cursor position is shown in the cursor data box (if selected).

Note: *During many operations you cannot move the cursor around the screen; if you cannot move the cursor using the trackpad, check the default soft keys are displayed (unless they have been switched OFF in system set up). If not, press* **ENTER** *until they are displayed.*

The cursor is normally displayed as a crosshair. However, in chart mode, if you have not moved the cursor for more than five seconds, when you next move it the cursor is outlined by a circle so it is easier to locate on the screen.

Context-Sensitive Cursor Control

The cursor is context-sensitive. When the cursor is positioned over special features on the display a text label appears to identify the feature as follows:

Table 1-2:   Context-Sensitive Cursor Text Labels

Text Label	Feature	Fishfinder/Chart
BOX	Data box (any type)	Both
MOB	Man Over Board marker	Both
WPT	Waypoint	Both
BL	Bottom Lock	Fishfinder
VRM	Variable Range Marker	Fishfinder
ZOOM	Zoom	Fishfinder
A➡B	Ruler line	Chart
COG	Course Over Ground vector	Chart
HDG	Heading vector	Chart
POS	Vessel's position	Chart
RTE	Route leg	Chart
TIDE	Tide vector	Chart
Chart Icons	Various	Chart

Some items on the fishfinder/chartplotter screen, such as the cursor have information associated with them. Most information is displayed in a data box. The context-sensitive cursor allows you to move databoxes. In the case of Fishfinder VRM data, depth is displayed on the right hand side of the horizontal indicator, and distance is displayed at the top of the vertical indicator.

Dedicated Keys

The dedicated keys: **DISPLAY, MARKS, GAIN, VRM/EBL, MULTI, ALARMS, RANGE, ENTER, CLEAR, MENU** and **POWER** have fixed functions; the functions are similar on all *hsb²* Plus Series displays. For example, **ALARMS** is used to set up the system alarms on both a fishfinder and a chartplotter.

Some keys can be used in two ways:

• **Press:** Press the key momentarily and then release it. This method is used for most key operations.

• **Press and hold:** Press the key and hold it down for the length of time stated (for example, 3 seconds), and then release it.

When you press a dedicated key, one of the following happens:

i.   The associated operation is performed, e.g., change chart scale (**RANGE**).

ii. A pop-up menu is displayed, providing further options.

iii. A set of soft keys is displayed, providing further functions.

As you press a key, a single audio beep confirms the key action. If the key-press is not valid for the current screen or mode, three rapid beeps sound to indicate that no response is available. If required, you can turn the key beeps off as part of your set up procedure (see *Chapter 7*).

Soft Keys

The four keys below the screen are called soft keys because their functions change according to the operation. The soft keys are grouped into related sets and subsets providing access to the various functions. The soft key labels are displayed on the screen just above the keys. The default soft keys are displayed until you press a key, or select an item on the screen; the soft keys associated with the action are then displayed.

The currently-selected soft key option is shown by its green background (gray for the L755RC Plus monochrome display). If the key text is displayed in gray rather than in black, it is not currently available.

When you press a soft key one of the following happens:

i.   The associated operation is performed, e.g., 50 kHz.

ii. A sub-set of soft keys is displayed, providing further functions.

Dedicated Keys

iii. A pop-up menu is displayed, providing further options.

As with dedicated keys, when you press a soft key a single audio beep confirms the key action. If the key-press is not valid for the current screen or mode, three rapid beeps sound to indicate that no response is available. If required, you can turn the key beeps off as part of your set up procedure (see *Chapter 7*).

Pop-Up Menus

Pop-up menus usually provide set up options. When a pop-up menu is on-screen, a set of associated soft keys is also displayed as shown in *Figure 1-7*.

```
              ALARMS SET UP

 ARRIVAL ALARM              0.01nm
 OFF TRACK ALARM            ON
 ANCHOR ALARM               OFF
 GROUNDING ALARM            5M/1.0nm
 COUNTDOWN TIMER            00:33:00
 ALARM CLOCK                OFF




              SELECT ARRIVAL
               ALARM RADIUS
                 ▼         ▲
                                    D4265-4
```
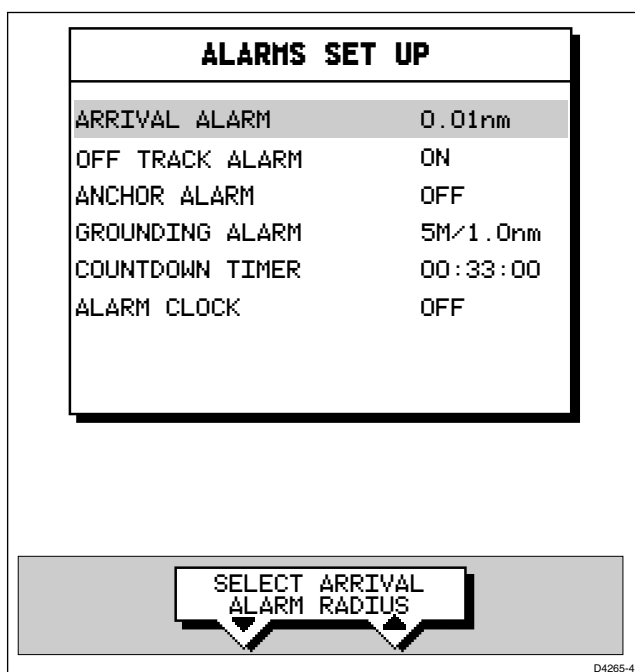
Figure 1-7:   Typical Pop-up Menu

You use the trackpad to select an option from the menu, then use the appropriate soft key to set the option. For example, you can toggle the OFF TRACK ALARM on/off.

Database Lists

The waypoints, routes and tracks that you create on the chartplotter are stored in database lists. You can view these lists and select items for editing.

```
┌─────────────────────────────────┐
│        WAYPOINT LIST            │
│   SYMBOL          NAME          │
│     ⚓        WAYPOINT 001       │
│     ✗        WAYPOINT 002       │
│     ✗        WAYPOINT 003       │
│     ✗        WAYPOINT 004       │
│     ✗        WAYPOINT 005       │
│ POSITION        50°21:966N      │
│                001°20:368W      │
│ BRG _186°     RNG _21.0nm       │
│ TEMP ___°c    DEPTH ___m        │
│ DATE __/__/__  TIME  __:__:__   │
└─────────────────────────────────┘

 GOTO      EDIT     MAKE NEW  WAYPOINT
WAYPOINT  WAYPOINT  WAYPOINT  TRANSFER
```
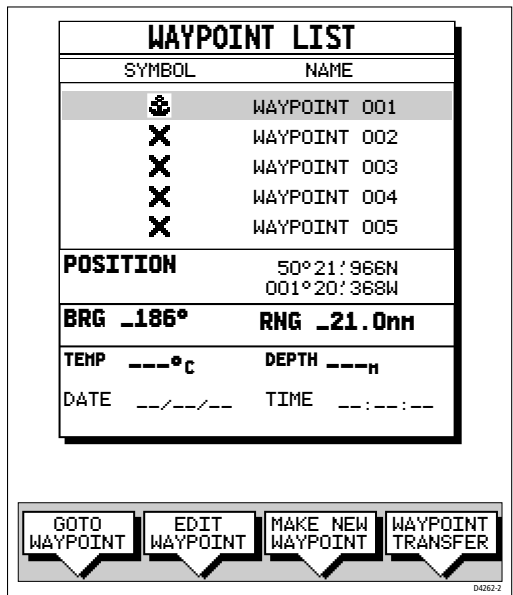
Figure 1-8:   Typical Database List

As with pop-up menus, when a database list is on-screen, a set of associated soft keys is also displayed; you use the trackpad to select an item from the list, then use the appropriate soft key to edit the item. For example, you can erase a waypoint or a route.

Chapter 2: Installation

2.1 Introduction

This chapter provides installation instructions for the *hsb²* Plus Series Fishfinders. Simple systems such as that in *Figure 2-1* below, or integrated systems such as that in *Figure 2-2* are explained (see *Section 2.7).* Details for mounting the *hsb²* Plus Series LCD Display and connecting the equipment are included.
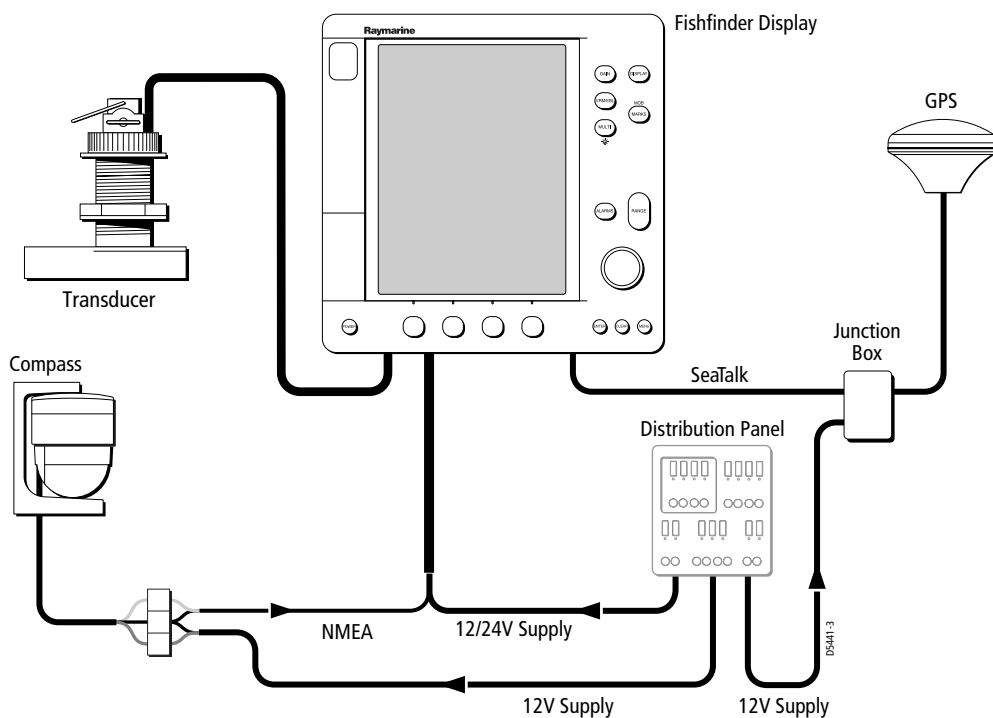
Figure 2-1:   Typical Fishfinder System
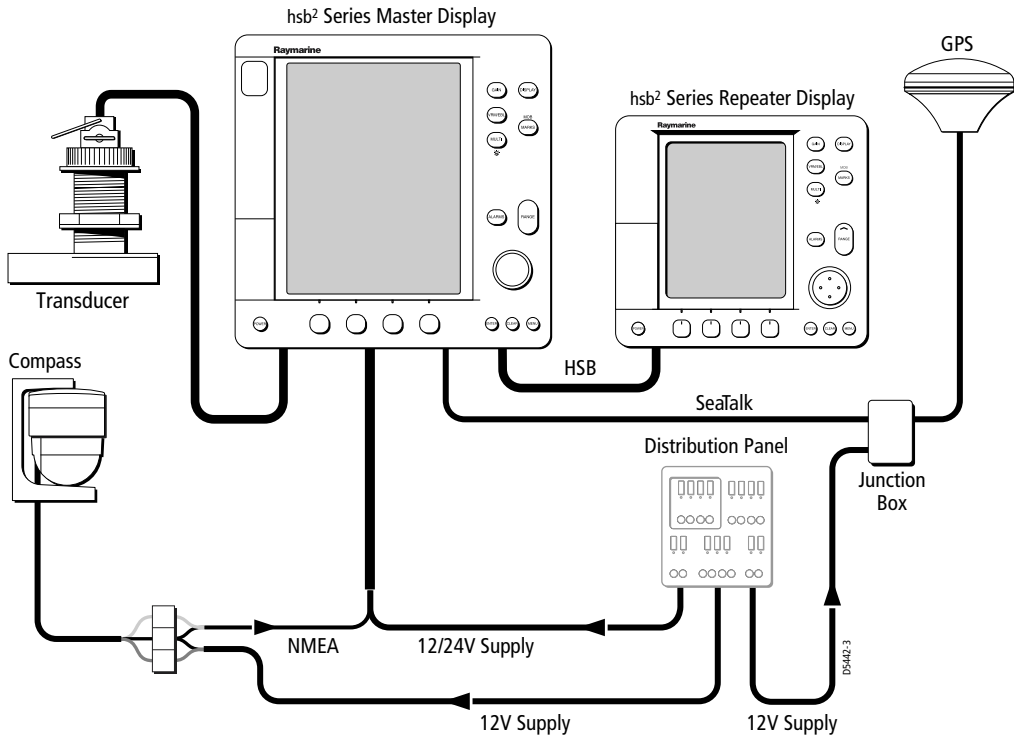
Figure 2-2:   Fishfinder in an Integrated System

Note: *If you wish to practice using the display before installation, use the simulator mode, as described in Chapter 3. For power, connect a 12V or 24V DC power supply, attaching the red wire via a quick blow fuse (6A for 12V or 4A for 24V) to positive and the black wire to negative.*

If you are connecting your display to other equipment (including another *hsb²* Plus Series display unit) install then test the fishfinder display and transducer as described in this chapter. Once the display is operating correctly, you can connect it to other equipment as described in *Section 2.7Integrated Systems* on page 2-18, taking particular care to ensure the correct polarity of the SeaTalk supply. *Section 2.7* describes the *hsb²*, SeaTalk and NMEA interfaces.

For the Fishfinder to display depth, water temperature and speed, you must install the Depth/Speed/Temp transducer supplied with your system. For full functionality of the radar and chartplotter you need to provide position and heading data.

- Heading data enables the chart to operate in North Up and Course Up modes. If speed data is also available the MOB function operates.

- Position data is required for full functionality of the chart display.

Full details of heading, position and other data are given in *Section 2.7*.

Planning the Installation

Before you install your system, plan the installation, considering:

- Correct transducer for your application. See document number 81196, *Transducers for Fishfinders Owner's Handbook*.
- Location of the display unit, as described in *Section 2.3*
- Cable Runs, including cables for an integrated system (to provide heading and position data, etc.), as described in *Section 2.4*.

EMC Installation Guidelines

All Raymarine equipment and accessories are designed to the best industry standards for use in the recreational marine environment.

Their design and manufacture conforms to the appropriate Electromagnetic Compatibility (EMC) standards, but correct installation is required to ensure that performance is not compromised. Although every effort has been taken to ensure that they will perform under all conditions, it is important to understand what factors could affect the operation of the product.

The guidelines given here describe the conditions for optimum EMC performance, but it is recognized that it may not be possible to meet all of these conditions in all situations. To ensure the best possible conditions for EMC performance within the constraints imposed by any location, always ensure the maximum separation possible between different items of electrical equipment.

For **optimum** EMC performance, it is recommended that **wherever possible**:

- Raymarine equipment and cables connected to it are:
  - At least 3 ft (1 m) from any equipment transmitting or cables carrying radio signals, e.g., VHF radios, cables and antennas. In the case of SSB radios, the distance should be increased to 7 ft (2 m).
  - More than 7 ft (2 m) from the path of a radar beam. A radar beam can normally be assumed to spread 20 degrees above and below the radiating element.
- The equipment is supplied from a separate battery from that used for engine start. Voltage drops below 10 V, and starter motor transients, can cause the equipment to reset. This will not damage the equipment, but may cause the loss of some information and may change the operating mode.
- Raymarine specified cables are used. Cutting and rejoining these cables can compromise EMC performance and must be avoided unless doing so is detailed in the installation manual.

• If a suppression ferrite is attached to a cable, this ferrite should not be removed. If the ferrite needs to be removed during installation it must be reassembled in the same position.

Suppression Ferrites

The following illustration shows typical cable suppression ferrites used with Raymarine equipment. Always use the ferrites supplied by Raymarine.
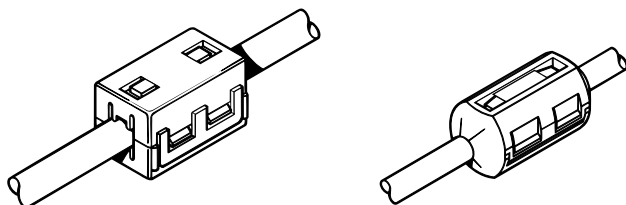
D3548-3

Figure 2-3:   Typical Suppression Ferrites

Connections to Other Equipment

If your Raymarine equipment is to be connected to other equipment using a cable not supplied by Raymarine, a suppression ferrite MUST always be attached to the cable near to the Raymarine unit.

2.2 Unpacking and Inspecting the Components

Unpack your system carefully, to prevent damage to the equipment. Save the carton and packing, in case you need to return a unit for service.

Check that you have all the correct system components. These depend on your system package, as follows:

Table 2-1:   Parts and Accessories

Item	Part No.	Supplied with:	Option for:
7″ Monochrome Fishfinder/Chartplotter	E63007	L755RC Plus	—
7″ Color LCD Fishfinder	E63019	L760 Plus	—
7″ Color LCD Fishfinder/ChartplotterS	E63010	L760RC Plus	—
10.4″ Color LCD Fishfinder	E63013	L1250 Plus	—
10.4″ Color LCD Fishfinder/Chartplotter	E63014	L1250RC Plus	—
7″ LCD Display Sun cover	D331	L755RC, L760, L760RC	—
10.4″ LCD Display Sun cover	E55031	L1250, L1250RC	—
Handbook, Fishfinder/Chart	81195	All	—
Quick Reference Card, Fishfinder	86066	All	—
Quick Reference Card, Chart	86067	L755RC, L760RC, L1250RC	—
Mounting bracket knobs (x2)	W145	All	—
7″ Display Mounting bracket assy	W143	L755RC, L760, L760RC	—
10.4″ Display Mounting bracket assy	E55032	L1250, L1250RC	—
7″ Display Flush Mount Kit	M92708	—	L755RC, L760, L760RC
10.4″ DIsplay Flush Mount Kit	E55033	—	L1250, L1250RC
Power cable	W144	All	—
SeaTalk cable assembly -			
Flat moulded plugs both ends:			
3 ft 3 in (1 m) long	D284	—	All
9 ft 9 in (3 m) long	D285	—	All
16 ft 3 in (5 m) long	D286	—	All
29 ft 3 in (9 m)) long	D287	—	All
Flat to male round connector:			
12 in (0.3 m) long	D187	—	All
Flat to female round connector:			
12 in (0.3 m) long	D188	—	All
Flat moulded plug one end only:			
3 ft 3 in (1 m) long	D229	—	All
SeaTalk auxiliary junction box	R55006	All	—

Table 2-1:   Parts and Accessories

Item	Part No.	Supplied with:	Option for:
hsb² cable assy			
3 ft 3 in (1 m)	R55001	—	All
10 ft (3 m)	R55002	—	All
20 ft (6 m)	R55003	—	All
30 ft (10 m)	R55004	—	All
60 ft (20m)	E55010	—	All
hsb² In Line Terminator	R58117	All	—
hsb² Splitter Cable	E55040	—	All
NMEA OUT cable assy			
4 ft 11 in (1.5m)	R55005	All	—
Transducer and Cables (See *81196 Transducers for Fishfinders Handbook*)	—	—	—

2.3   Selecting the Equipment Location

Display Unit Mounting Location

The display unit can be mounted using the mounting bracket supplied, or console mounted using the optional flush-mounting kit. The dimensions of the display units, including the bracket, are shown below in *Figure 2-4*, *Figure 2-5* and *Figure 2-6*.

When planning the display installation, the following should be considered to ensure reliable and trouble free operation:

- **Convenience:** The contrast and colors seen on all LCD displays vary slightly with viewing angle; this is more noticeable on the left hand side. Power the unit and select a suitable mounting location prior to installing the display. The mounting location should be easily accessible to allow operation of the front panel controls.

- **Access:** There must be sufficient space behind the display to allow cable connections to the rear panel connectors, avoiding tight bends in the cable.

- **Interference:** The selected location should be far enough away from devices that may cause interference, such as motors, generators and radio transmitter/receivers (see the EMC guidelines earlier in this section).

- **Magnetic compass:** Mount the display unit at least 3 ft (1m) away from a magnetic compass.

- **Cable runs:** The display unit must be located near a DC power source. The power cable supplied is 4.9 ft (1.5m), but a longer cable can be used if required: refer to *Section 2.4*.

  The maximum length of cable between a master display and the trans-ducer unit should not normally exceed 30 ft (10 m). If you need to use a longer cable, refer to *Section 2.4.*

- **Environment: Do not restrict airflow at the rear of the display unit; the display incorporates Cold Cathode Florescent Lamps (CCFL), which have a reduced light output when the unit is very hot. Ventilation is required to prevent the unit from overheating.**

The display should be protected from physical damage and excessive vibration. Mount the display in a protected area away from prolonged and direct exposure to rain and salt spray.

Selecting the Equipment Location

0.95 in
(24.3 mm)

6.89 in (175 mm)

0.4 in
(10 mm)

10.51 in (267 mm)

7.3 in (185 mm)

8.1 in (205.2 mm)

8.8 in (223.6 mm)

8.5 in (217 mm)

1.42 in (36 mm)

4.53 in (115 mm)

6.9 in (176 mm)
cable cleareance

1.3 in
(33.5 mm)

2.1 in
(53.5 mm)

3.15 in
(80 mm)

6.3 in (160 mm)

1.28 in (32.5 mm)

8.85 in (225 mm)

Weight: 8.1 lbs (3.7 Kg)

Compass Safe Distance: 39 in (1 m)
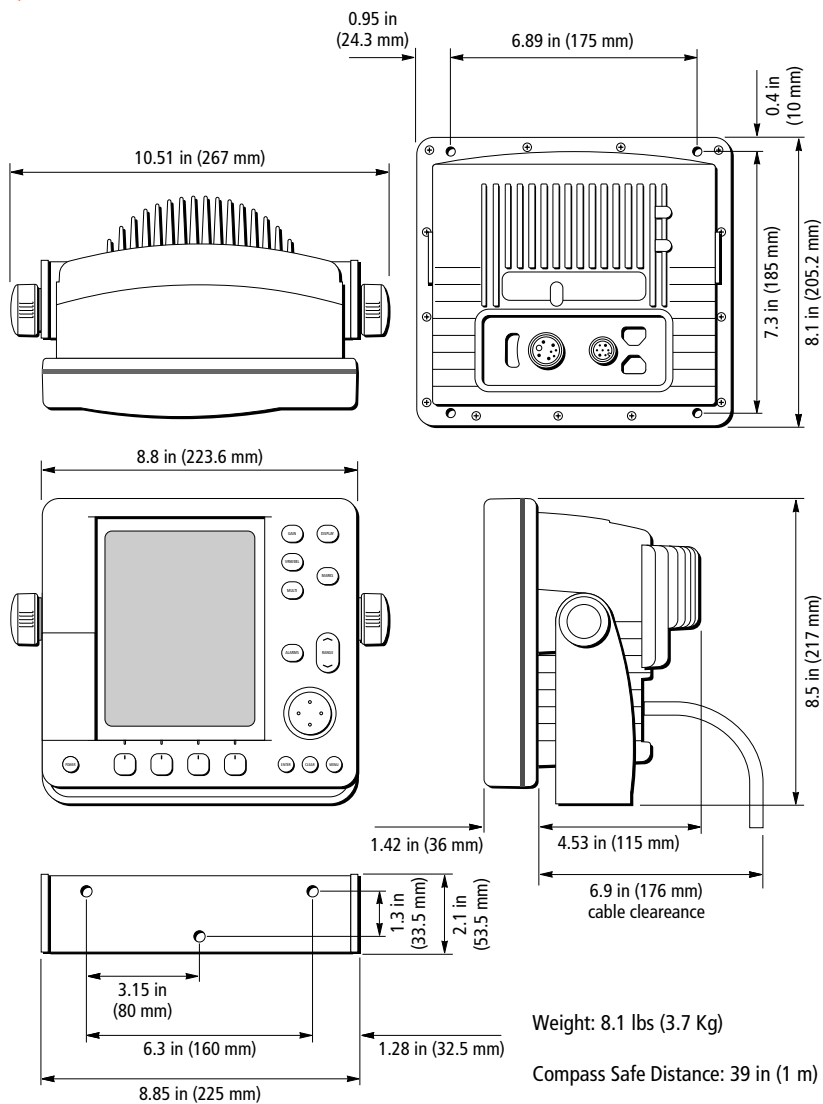
D4847-4

Figure 2-4:   7" Color LCD Fishfinder Display Unit Dimensions
                (L760 Plus and L760RC Plus)

0.95 in
(24 mm)

6.89 in (175 mm)

0.95 in
(24 mm)

0.4 in
(9.5 mm)

10.54 in (267.7 mm)

7.3 in (185 mm)

8 in (204 mm)

0.4 in
(9.5 mm)

8.76 in (222.5 mm)

8.5 in (216 mm)

1.45 in (37 mm)

3.2 in (81 mm)

6.9 in (176 mm)
cable cleareance

1.3 in
(33.5 mm)

2.16 in
(55 mm)

3.15 in
(80 mm)

3.15 in
(80 mm)

6.3 in (160 mm)

8.85 in (225 mm)

Weight: 7.5 lbs (3.415 Kg)

Compass Safe Distance: 39 in (1 m)
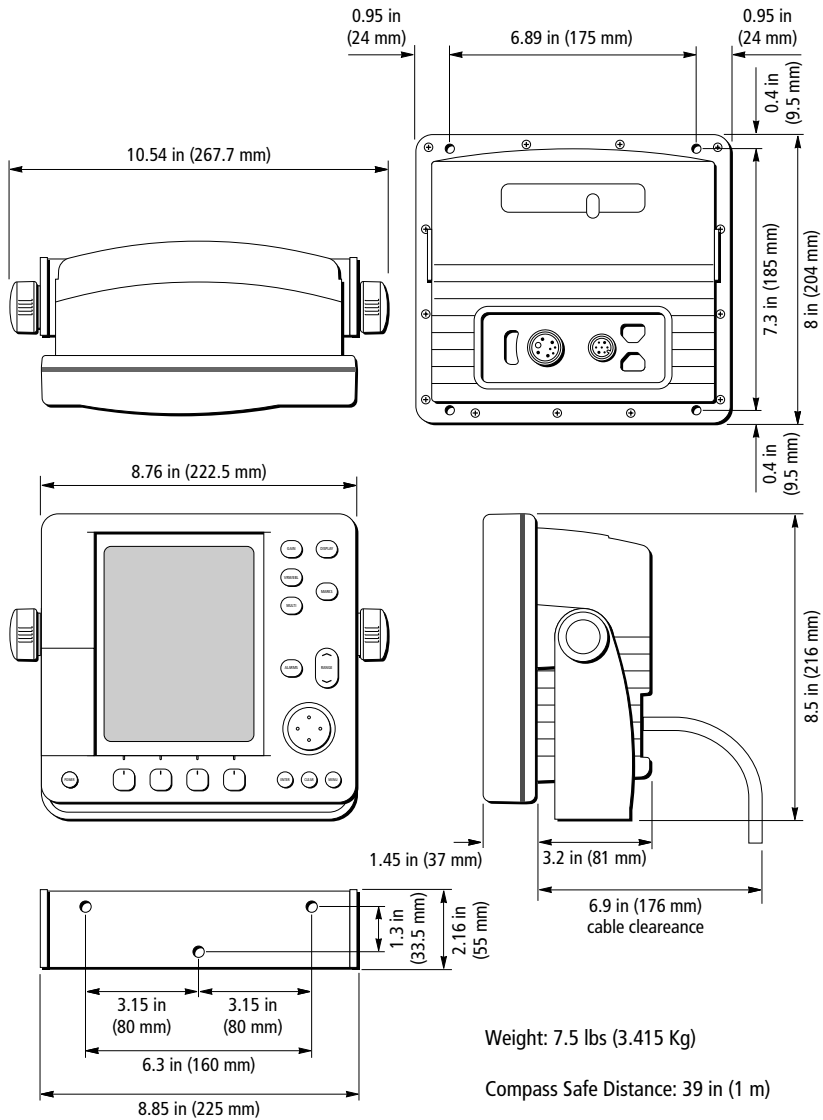
D5071-2

Figure 2-5:   7″ Monochrome LCD Fishfinder Display Unit Dimensions
                        (L755RC Plus)

11.5 in (292 mm)

3.82 in (97 mm)

11.4 in (289 mm)

12.3 in (313 mm)

6.38 in (162 mm)
cable clearance

1.65 in
(42 mm)

12.9 in (328 mm)

10.83 in (275 mm)

0.28 in
(7.1 mm)

9.7 in (246 mm)   0.87 in (22.1 mm)

3.15 in
(80 mm)

3.94 in (100 mm)

7.88 in (200 mm)   1.7 in (43 mm)   Compass Safe Distance: 39 in (1 m)

11.26 in (286 mm)
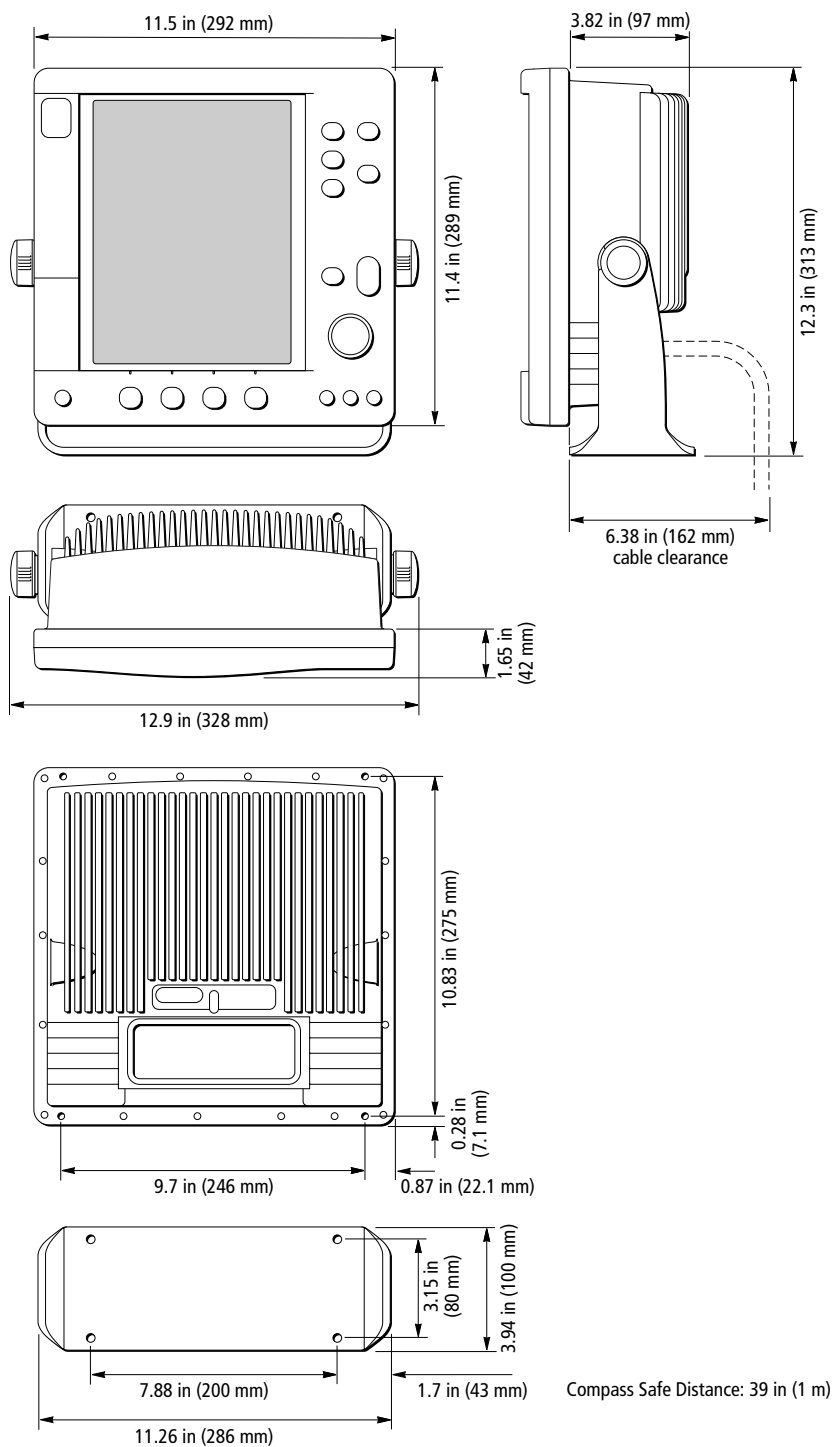
D5066-3

Figure 2-6:   10.4″ Color LCD Fishfinder Display Dimensions
                (L1250 and L1250RC Plus)

2.4 Cable Runs

Consider the following before installing the system cables:

- You need to attach the power cable and the transducer cable. Additional cables will be required if you are installing an integrated system.

- All cables should be adequately secured, protected from physical damage and protected from exposure to heat. Avoid running cables through bilges or doorways, or close to moving or hot objects.

- Acute bends must be avoided

- Where a cable passes through an exposed bulkhead or deckhead, a water-tight feed-through should be used.

- Secure cables in place using tie-wraps or lacing twine. Coil any extra cable and tie it out of the way.

You need to run the following cables:

- **Power/NMEA Input cable**, supplied with the display unit. This has a connector plug at one end for connecting the display unit, and 7 wires at the other end for connecting the power supply and optional NMEA inputs (see *Integrated Systems* on page 2-18).

- **Transducer cable**, supplied with the transducer. This 30 ft (10 m) cable has a connector plug (with an outer nut that you must attach) at one end for the display unit or extension cable.

- **SeaTalk cable**, optional, with SeaTalk connector(s) at one or both ends.

- **HSB cable**, optional.

- **NMEA Output cable**, optional, with an NMEA OUT connector at one end only.

Power Cable

The *hsb²* Plus Series Fishfinder is intended for use on ships' DC power systems rated from 10.7 V to 32 V.

A 5 ft (1.5 m) power cable is supplied for connecting the ship's DC power to the display unit. The power cable may be extended by up to 60 ft (20 m) using a wire gauge of AWG 12 (3.5 mm²) or greater.

Transducer Cable

A 30 ft (10m) cable is supplied with the transducer. The transducer cable may be extended up to a maximum of 60 ft (20 m) using optional extension cables. For details, see document number 81196, *Transducers for Fishfinders Owner's Handbook.*

Cable Runs

2.5 Mounting the Display Unit

The *hsb²* Plus Series LCD display unit is waterproof to CFR46 and can be installed either above or below deck. The display unit can be mounted using the mounting bracket supplied, or console mounted using the optional flush-mounting kit (see *Section 2.2*).

Mounting Bracket

The display unit can be mounted on a dash, chart table, bulkhead, or deckhead.
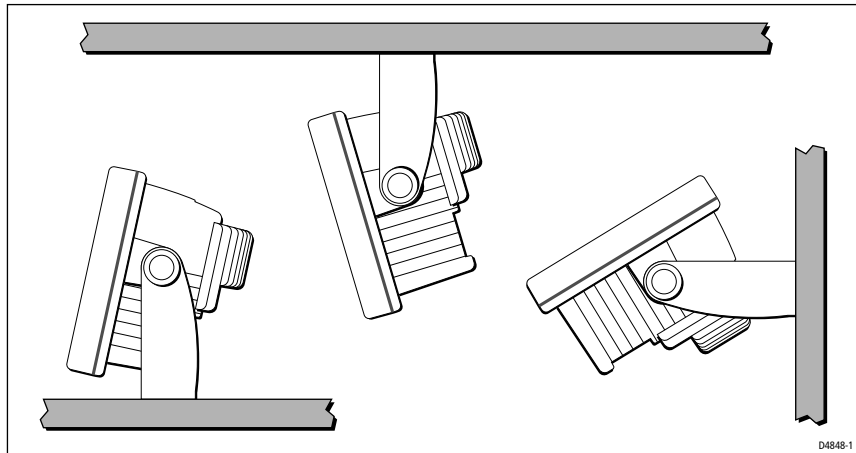

Figure 2-7:   LCD Display Mounting

1. Loosen the knobs and remove the mounting bracket from the display unit.

2. Mark the locations of the mounting bracket screw holes on the mounting surface.

3. Use the screws supplied to attach the mounting bracket at the marked locations.

4. Attach the display unit to the mounting bracket, adjust the display angle, and tighten the knobs.

Console Mounting

The display unit can be console mounted if required, using the optional flush-mounting kit (Raymarine part number M92708 for 7″ Fishfinder displays and E55033 for 10.4″ Fishfinder displays).

CAUTION:
Make sure there are no hidden electrical wires or other items behind the location before proceeding. Make sure there is sufficient rear access for mounting and cabling.

1. Check the selected location for the unit. A clear, flat area at least 9 in (230 mm) wide by 8¼ in (210 mm) high, with at least 6.9 in (176 mm) of clearance behind the panel, is required.

2. Unpack the flush-mounting kit.

3. Using the supplied template, trace out the display unit opening.

4. Drill a ½ in (12.7 mm) pilot hole in each corner of the cut-out area.

5. Using a suitable saw, cut along the inside edge of the cut-out line.

6. Remove the mounting bracket knobs and bracket from the display unit. Make sure that the unit fits in the cut-out area.

   If the optional screw fitting is required, drill four 3/16 in (5 mm) holes as indicated on the template.
   Screw the studs into the holes provided at the rear of the display.

7. Connect the DC power cable, transducer cable, and any other accessory cables to the display. Avoid tight bends in the cables.

8. Place the gasket on the unit and slide the unit into the panel cut-out.

9. Use the flush-mounting kit to secure the unit to the console.

   Alternatively, place a spacer over each of the four studs and secure with the thumb nuts.

Mounting the Display Unit

2.6 System Connections

Grounding the System

It is important that an effective RF ground is connected to the system. You must ground the display by connecting the drain wire (shield) of the Power/ NMEA Input cable to the ship's RF ground; a single ground point should be used for all equipment.

If you need to extend the wire, the extension wire should be an 8 mm braid or AWG 10 (6.0 mm^2) multi-stranded cable.

If your vessel does not have an RF system, connect the drain wire to the negative battery terminal.

DC Power Connection

The *hsb²* Plus Series Fishfinder is intended for use on ships' DC power systems rated from 10.7 V to 32 V.

The power connection to the display should be made at either the output of the battery isolator switch, or at a DC power distribution panel. Raymarine recommends that power is fed directly to the display via its own dedicated cable system and MUST be protected by a thermal circuit breaker or fuse, installed close to the power connection.

Use a 6 amp fuse for 12V systems or 4 amp fuse for 24/32V systems.

The DC system should be either:

- Negative grounded, with the negative battery terminal connected to the ships ground.
- Floating, with neither battery terminal connected to the ships ground.

CAUTION:
This system is not intended for use on "positive" ground vessels.

The power cable Ground (earth) connections must be connected to the ship's ground as described above.

Power for External Equipment

**External equipment cannot be powered from the display's SeaTalk interface.**
It must be powered from the ship's supply or via a SeaTalk bus.

Refer to *Section 2.7* for further details.

Display Unit Connection

The rear of the *hsb²* Plus Series LCD display provides the following connection sockets:

- **Transducer** connection.
- **HSB,** in/out connector for connecting to another *hsb²* Plus Series display (such as a chartplotter, radar, or second fishfinder display).
- **SeaTalk**, for SeaTalk data input and output and connecting to another *hsb²* Plus Series display (such as a chartplotter, radar, or second fishfinder display).
- **NMEA Output,** for NMEA data output in an integrated system.
- **Power/NMEA Input**, for 12 V, 24 V or 32 V DC power connection, two NMEA 0183 inputs and one RF ground (screen) connection.
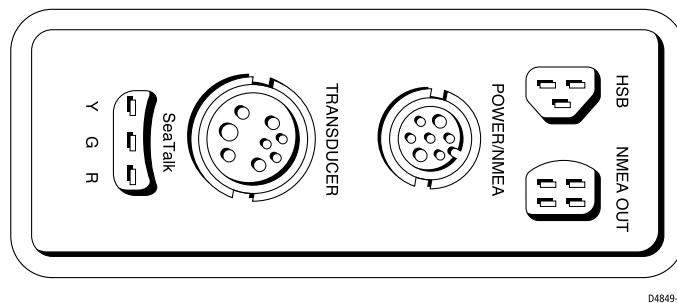
D4849-2

Figure 2-8:   Fishfinder Display Connector Panel

The following sections detail the display unit connectors used when installing a single *hsb²* Plus Series LCD Display. The remaining connector details are provided in *Section 2.7*.

Transducer Connection (master displays)

The transducer cable connector (and Y-shaped connector, if supplied) has a nut that has been removed to aid installation. To allow you to complete the installation without cutting the cable, ensure that any holes you drill are large enough to accept the connector, with the nut removed (approximately 13/16" or 21 mm).

Before attaching the transducer cable, you will need to attach the connector nut and split ring. These items, plus a wedge tool, are included in the transducer packaging.

The transducer cable is attached to the 7 pin male connector marked TRANSDUCER on the rear of the display unit. How you connect the cable to the display unit depends on the type of transducer you have installed:

- **Combined depth/speed/temp** transducers have a 7 pin female connector. Attach the transducer cable connector directly to the display unit.

- **Combined speed/temperature** transducers have a 3 pin female connector that requires the use of an additional Y-shaped cable (Raymarine part number E66022) to attach to the 7 pin connector on the display. This Y-cable is included with your speed/temperature transducer.
Attach the 7 pin female connector on the Y-cable to the display unit then attach the transducer cable to the 3 pin male connector on the Y-cable.

- **Depth-only** transducers have a 7 pin female connector.
Attach the transducer cable connector directly to the display unit.

  or

  If being installed in conjunction with a speed/temperature transducer, attach the 7 pin female connector on the Y-cable to the display then attach the transducer cable to the 7 pin male connector on the Y-cable.

Note: *If your system requires both a Y-cable and a transducer extension cable, ensure that you connect the Y-cable to the display unit and the extension cable to the transducer.*

The connector pins are shown in the following diagram, together with the connections and wire colors; this is information is provided as an aid to fault diagnosis.

CAUTION:
Do not cut the transducer cable or remove the connector. Do not try to shorten or splice the cable. If the cable is cut, it cannot be repaired. Cutting the cable will also void the warranty.
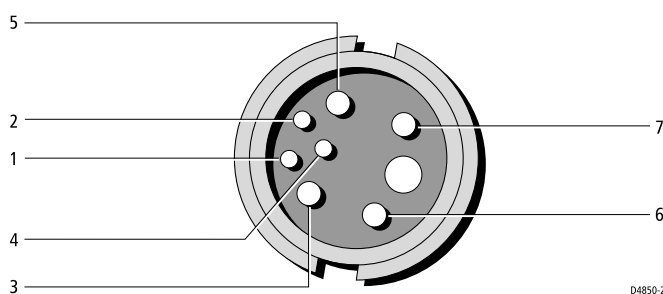
D4850-2

Pin No.	Function	Color	Pin No.	Function	Color
1	Speed	Red	5	Speed/Temp Ground	Brown
2	Temp	White	6	+ Depth	Blue
3	Shield	Drain	7	- Depth	Black
4	Sense	Green			

Figure 2-9:   Fishfinder Transducer Connector

Power and NMEA Input Connection

The DC power and NMEA input should be connected at the rear Power/
NMEA seven-pin connector. The connector (viewed from the outside) and pin
functions are shown in the following diagram and table. The NMEA Input is
detailed in *Section 2.7*.
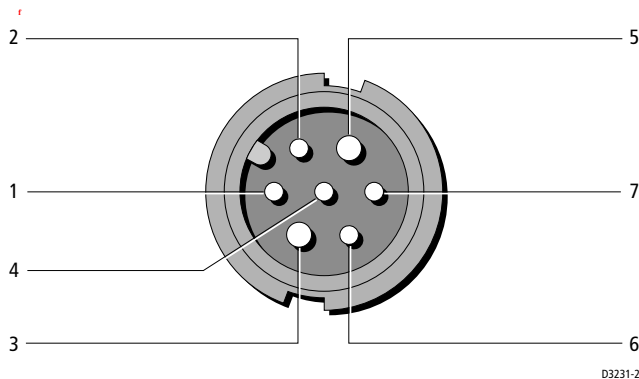
Pin No.	Function	Color
1	Channel 1 NMEA data input (+ve)	Orange
2	Channel 1 NMEA return (-ve)	Yellow
3	Battery negative	Black
4	Shield (drain wire)	No insulation
5	Battery positive (12/24/32 V systems)	Red
6	Channel 2 NMEA data input (+ve)	Green
7	Channel 2 NMEA return (-ve)	Blue

Figure 2-10:   Power and NMEA Connector

Power Connection

CAUTION:
**If the power connections are accidentally reversed the system will not
work. Use a multimeter to ensure that the input power leads are
connected for correct polarity.**
Switch off the display unit before you remove the power cord.

The RED wire must be connected to the feed from the positive (+) battery
terminal and the BLACK wire to the feed from the negative (–) battery
terminal. The shielded wire (screen) should be connected to the ship's RF
ground as previously described in *Grounding the System* on page 2-14. Any
unused wires should be insulated and taped back.

EMC Conformance

Always check the installation before going to sea to make sure that it is not affected by radio transmissions, engine starting, etc.

2.7 Integrated Systems

The *hsb²* Plus Series displays can be linked to other equipment to transfer data as follows:

- A second display, either CRT or LCD, can be connected via *hsb²* (and SeaTalk) to repeat fishfinder, chart and/or radar information at a remote location.

Note: *If you have an integrated system with a Pathfinder Plus radar **master** display that includes MARPA as a primary function, MARPA functionality is available on the LCD repeater display.*

- Data can be received via SeaTalk or NMEA, some of which will increase the functionality of the display. Other data can be viewed on the display.
- Data can be transmitted via SeaTalk and NMEA to enhance other equipment.
- Some incoming data can be converted across the communication link and re-transmitted.

Power for External Equipment

External equipment cannot be powered from the display's SeaTalk interface. It must be powered from the ship's supply or via a SeaTalk bus. Ensure correct polarity of the SeaTalk connection.

For systems where the ship's power source is 24 V only, you may need to install a 24 V to 12 V DC converter. This is only necessary if the products being connected to the display are:

- SeaTalk compatible (for example, compass, GPS and instruments), and there is no existing SeaTalk bus
- NMEA compatible, but operate only from 12 V (for example, compass, GPS and some navigators)

The DC-DC converter must conform to the following specification:

Table 2-2:   DC-DC Converter for External Equipment

Input	21 to 32 V DC
Output	13.6 V DC, isolated
Load	Continuous current rating, in excess of required load

High Speed Bus (*hsb²*)

The High Speed Bus (*hsb²*) provides extremely rapid transfer of data between master and repeater displays. With an *hsb²* and a SeaTalk connection, most data available can be controlled and displayed by any unit.

Master functionality is provided by the display with the appropriate transducer/scanner connected as defined in *Table 2-3* . You can have a master fishfinder and a master radar in the same system. Data on master units are displayed on all connected repeater units.

Note: *If the master display is an L1250 Plus or L1250RC Plus, repeater displays can take advantage of these units' extended power (1000 watts vs. 600 watts RMS) and depth range (5000 feet vs. 3000 feet).*

Up to ten *hsb²* Plus Series displays can be combined to create a variety of functionalities. For example, you can connect your *hsb²* Series Plus Fishfinder to a remote *hsb²* Series Pathfinder Plus Radar and then to a remote *hsb²* Series Plus Chartplotter to provide fishfinder, chart, and radar functionality on all three displays. You can display some combinations, such as fishfinder/chart or radar/chart, in half-screen windows.

Note: *Fishfinder STC cannot be adjusted on a repeater display, nor can depth offset, speed and temperature calibration be set. Frequency can be selected on either master or repeater, but the same frequency is used on all displays.*

The *hsb²* system can include several chartplotter displays, each with two chart cartridge slots. Each display can access two local and up to six remote chart cartridges. Charts can be controlled *independently* on each display, even when a remote chart cartridge is being used.

Table 2-3:   *hsb²* Plus Series Master Displays

Master Function	Plus Series Display Type	Transducer/Scanner
Radar	R70, RL70, RL70C, RL70RC, RL70CRC, R80, RL80, RL80C, RL80RC, RL80CRC	Any Pathfinder Series Scanner
Chart	RC520, RC530, RC631 RL70RC, RL70CRC, RL80RC, RL80CRC, L755RC, L760RC, L1250RC	Display includes a two-slot chart cartridge
Fishfinder	L755RC, L760, L760RC, L1250, L1250RC	Fishfinder transducer

Note: *Earlier HSB (non-Plus) Display units with can be upgraded to provide hsb² Plus compatibility. Please contact your authorized Raymarine dealer for details.*
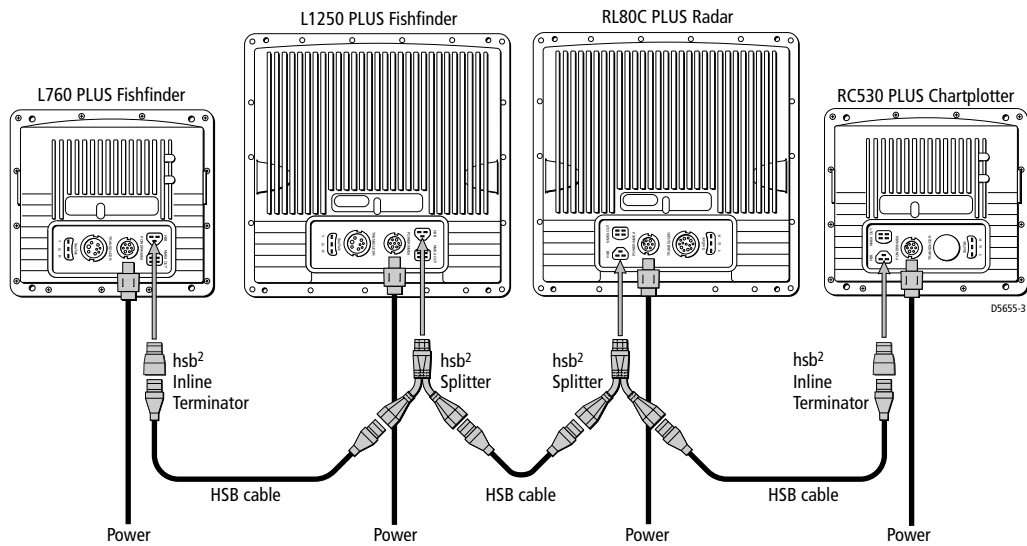
High Speed Bus (hsb2)

High Speed Bus
(hsb2)

Figure 2-11:   Fishfinder Integrated System with Multiple *hsb²* Plus Connections

Upgrading Existing HSB Series Displays

Earlier HSB (non-PLUS) display units can be upgraded to provide *hsb²* Plus compatibility. Two types of upgrades are available:

1. A full hardware and software upgrade (Plus upgrade) provides full compatibility with the *hsb²* system.

    This configuration supports up to eight true Plus (or Plus upgraded) displays with a cable limit of 60 meters, or up to ten true Plus (or Plus upgraded) displays at a maximum of 40 meters cable length.

2. A software-only upgrade enables the display to be used with a Plus (or Plus upgraded) unit in the *hsb²* system.

    However, like the old HSB (non-Plus) system, this configuration only supports two displays: two software-only upgraded units, or one software-only upgraded with one true Plus (or Plus upgraded) display.

Connecting *hsb²* Plus Series Displays

Figure 2-11 illustrates how to inter-connect various *hsb²* Plus Series Displays. When connecting your *hsb²* Plus Series displays, there are several important points to keep in mind:

1. If more than two *hsb²* Plus Series displays are to be connected, you must use an *hsb²* Splitter Cable, Raymarine part number E55040.

2. *hsb²* displays at the end of the chain must be terminated using the Inline Terminator plug (Raymarine part number R58117) included with your *hsb²* Plus Series display unit.

3. The total cable length for an *hsb²* network containing the maximum 10 display units (both Plus and Plus upgrades) must not exceed 40 meters. A network comprised of only 8 displays can extend up to 60 meters.

4. Earlier HSB (non-Plus) Display units can be enhanced with a hardware and software upgrade to provide full *hsb²* Plus functionality.

5. Earlier non-Plus displays can also be outfitted with a software-only upgrade, which enables *hsb²* compatibility. However, these software-only upgraded displays are not true Plus units. They must not use the Inline Terminator plug because they are already terminated internally.
    Like the old HSB system, this configuration only supports two displays: two software-only upgraded units, or one software-only upgraded with one true Plus (or Plus upgraded) display.

An In/Out connector cable is provided for connecting to another *hsb²* Plus Series display.

Note: *The HSB cables have ferrite clamps attached at each end to ensure EMC conformance. The cables are available in lengths of 1, 3, 6, 10 and 20 m.*

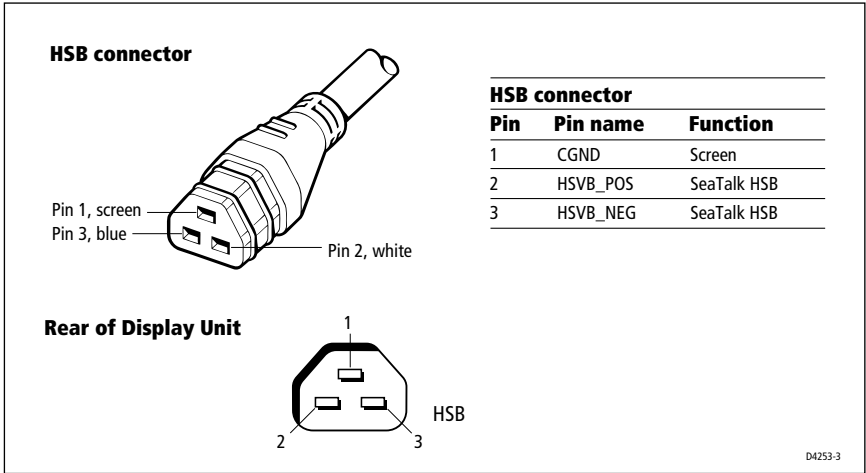| HSB connector		
Pin	Pin name	Function
1	CGND	Screen
2	HSVB_POS	SeaTalk HSB
3	HSVB_NEG	SeaTalk HSB

Figure 2-12:   HSB Connector

The display unit is supplied with a blanking plug. This should be attached to the HSB cable port if the HSB port is not used. If the display unit is installed in an exposed position, seal the blanking plate with silicon compound.

High Speed Bus (hsb2)

SeaTalk and NMEA In

The *hsb²* Plus Series display can receive a comprehensive range of data. The primary data is described below:

Table 2-4:   Function of SeaTalk and NMEA Data

Data	Primary Uses	Suggested Source
Heading	Chart: modes/ vectors	Compass connected to SeaTalk bus, NMEA Compass
Position	Chart: own vessel position MOB (also requires speed and HDG data)	SeaTalk GPS connected via Auxiliary JB Existing GPS Navigator via SeaTalk bus Existing GPS (or Loran-C) navigator with NMEA output
Waypoint	Chart: Waypoint and route transfer	Existing GPS Navigator via SeaTalk bus Existing GPS (or Loran-C) navigator with NMEA output

Heading data should ideally contain both magnetic and true heading. If only one is available then a source of magnetic variation should be connected.

Radars and chartplotters can exchange their cursors via SeaTalk. Locked heading should be used for Course Up if available via SeaTalk. Other data connected via a SeaTalk bus or via NMEA is generally displayed in data boxes, e.g., depth, apparent wind angle and speed, time.

Note: *The Fishfinder uses its own depth data, rather than any other depth data on SeaTalk. If there is no other depth data on SeaTalk, Fishfinder depth is transmitted. If speed and temperature data are available on SeaTalk the Fishfinder uses this data; if this data is not on SeaTalk from other instruments, it is transmitted by the Fishfinder.*

For details of received data refer to the table in *Appendix D: SeaTalk and NMEA Data*. Examples of SeaTalk and NMEA systems are shown in *Figure 2-13* and *Figure 2-14*.
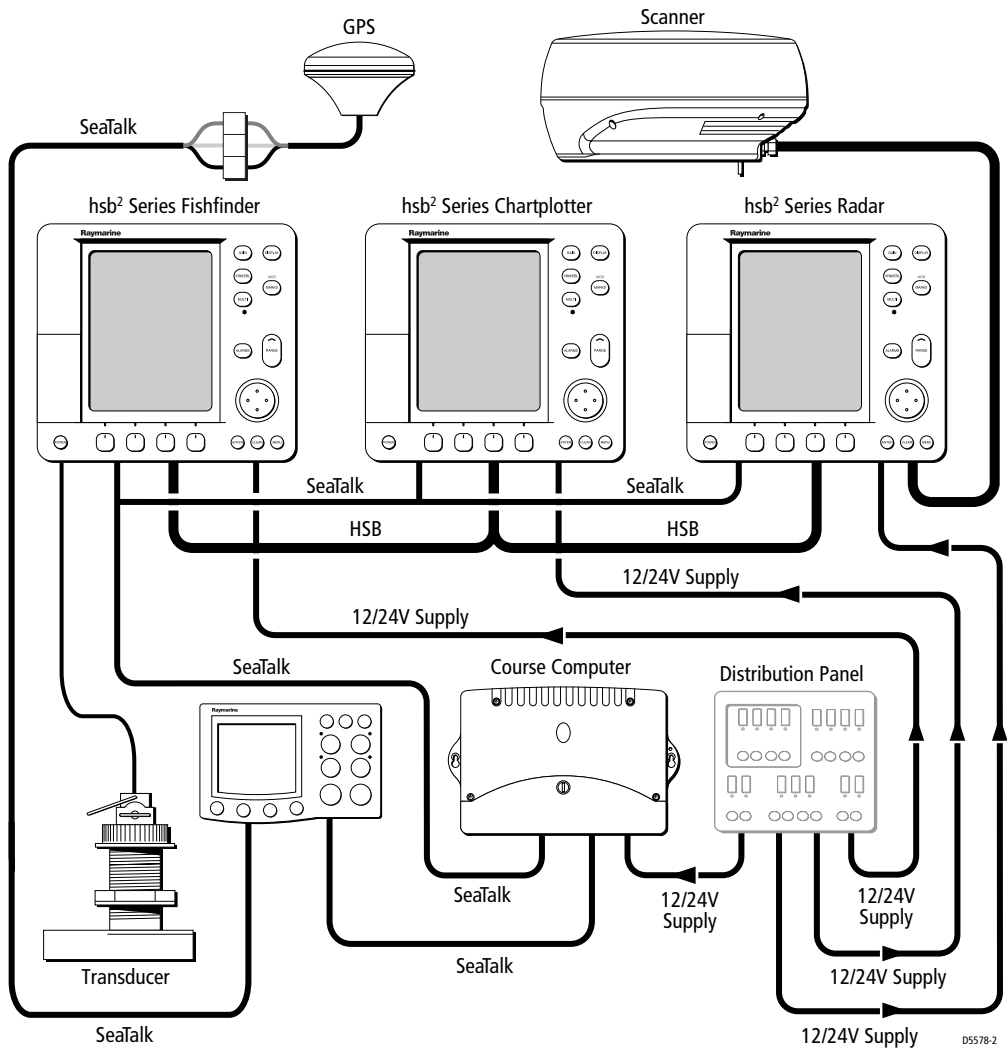
Figure 2-13:   Integrated System with Repeater Displays and SeaTalk Instruments
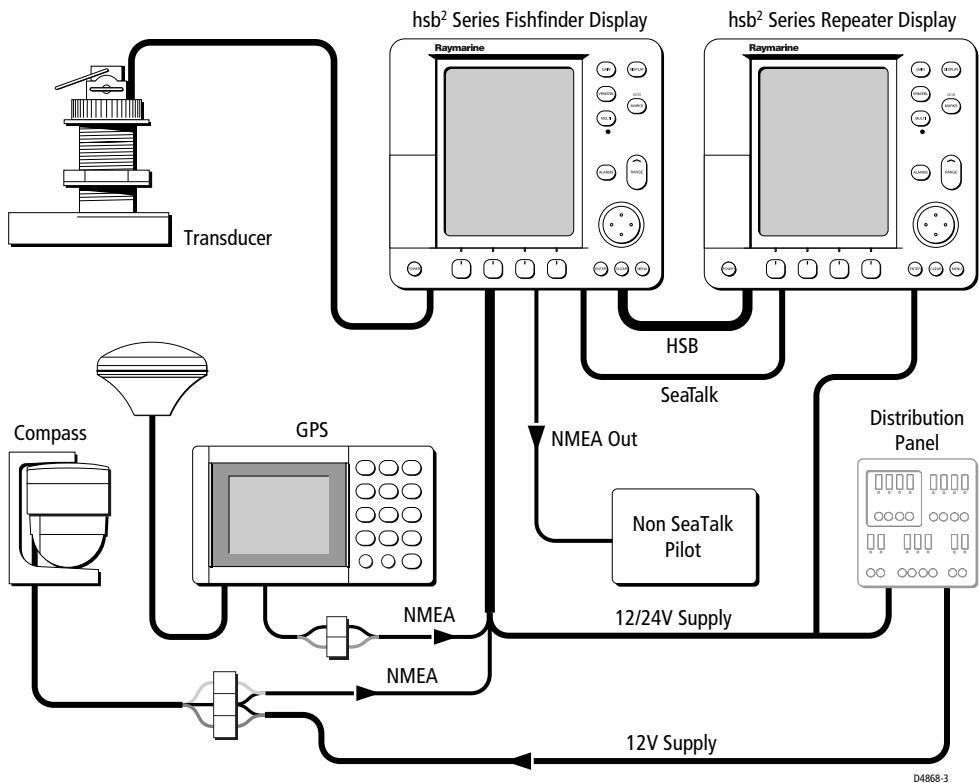
Figure 2-14:   Integrated System with Repeater Display and NMEA Instruments

SeaTalk

The SeaTalk standard was originally developed by Autohelm (part of the Raymarine group), and allows compatible instruments to be connected by a single cable carrying power and data in/out. This means that additional instruments and functions can be added to a SeaTalk system, simply by plugging them into the network.

SeaTalk is a precise, high-speed, bi-directional protocol which is flexible enough to adapt to any number of instruments, without a central processor. SeaTalk equipment can also communicate with non-SeaTalk equipment via the NMEA standard.

SeaTalk Connection

SeaTalk data, if present, is the primary source for all navigational data except heading.

This connection is necessary for full functionality between *hsb²* Plus Series displays.

The SeaTalk input/output should be connected at the rear SeaTalk 3-pin connector. This appears as follows, when viewed from outside:
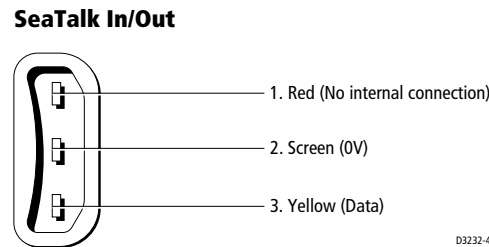
SeaTalk In/Out

Figure 2-15:   SeaTalk Connector

Table 2-5:   Sea Talk Connections

Pin No.	Function	Color
1	+12 V	Red
2	0 V	Shield
3	Data	Yellow

Note:

1. *The display does not supply 12 V via the SeaTalk connector, nor does the SeaTalk connector require 12 V to operate.*
   12 V is required for other SeaTalk units (except where SeaTalk is connected only between two hsb² displays).

2. *If you are connecting an active compass to the fishfinder, the NMEA input has priority. You should, therefore, use an NMEA input channel (see Power and NMEA Input Connection) rather than the SeaTalk interface, unless the compass only has a SeaTalk output.*

To connect the display unit to the SeaTalk bus, connect a standard SeaTalk cable between the SeaTalk connector on the rear of the display and a SeaTalk instrument or the SeaTalk bus.

Standard SeaTalk cables are available in a range of lengths (part numbers D284 to D287), and cables for connecting to SeaTalk units with round connectors are also available (part numbers D187 or D188), see *Section 2.2* for further details.

NMEA 0183

The NMEA 0183 Data Interface Standard was developed by the National Marine Electronics Association of America. It is an international standard that enables equipment from many different manufacturers to be connected together and to share information.

The information is passed in "sentences", each of which has a three-letter sentence identifier. When you check to see if one item will "talk" to another, make sure that the two items both use the same sentence identifiers. For example: VTG carries Course and Speed Over Ground data; GLL carries latitude and longitude; DBT carries water depth; MWV carries relative wind angle and wind speed data.

The NMEA 0183 standard carries similar information to SeaTalk. However, it has the important difference that one cable will only carry information in one direction. For this reason NMEA 0183 is generally used to connect a data receiver and a transmitter together: for example, a compass sensor transmitting heading to a radar, or a GPS sensor (or Chartplotter) transmitting position and navigation data to a radar.

NMEA Input Connection

The two NMEA/Power input connectors are normally used for non-SeaTalk Compass (heading) data or GPS. It can also be used for additional navigation data (if not provided via SeaTalk).

Connect the input(s) to the orange and yellow wires (Channel 1) and/or the green and blue wires (Channel 2). Refer to *Power and NMEA Input Connection* on page 2-17 for further details.

For example, to connect a Raymarine Heading Sensor to the NMEA Channel 1 input, connect the cables and power supply using a suitable connector block, as shown in the diagram below. If installed, it may be convenient to connect the power to the SeaTalk auxiliary junction box described in the following section.

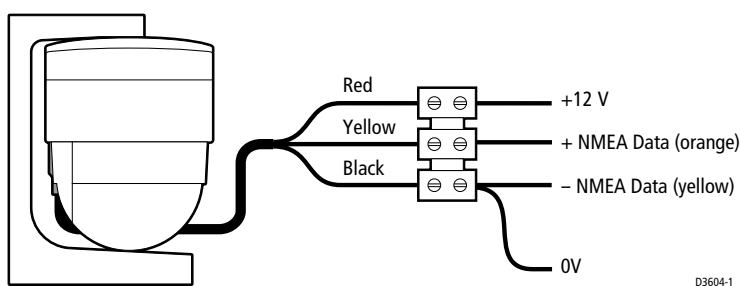Figure 2-16:   NMEA Input Connection

Using the SeaTalk Auxiliary Junction Box

A junction box is used to connect the SeaTalk system to the *hsb²* Plus Series display unit. This junction box enables the SeaTalk bus, power and GPS to be connected.

If power is not already available (via another SeaTalk instrument), the junction box can be used to apply power to the SeaTalk bus for other applications. The junction box may also be used for other purposes, e.g., supplying power to a flux gate compass and routing the compass data to the *hsb²* Plus Series display NMEA In connection, or alternatively, for connecting a NMEA GPS system.

The junction box includes:

- SeaTalk cable and connector to attach to display unit
- Power cable to connect to 12 V power (if required)
- Input connections to connect SeaTalk cable from external equipment
- Spare connections for another instrument

CAUTION:

Ensure correct polarity of the 12 V supply before applying SeaTalk power. Use a multimeter to check the connections.

Figure 2-17 shows how to connect the junction box; *Appendix B* provides connection details for specific Raymarine, Apelco and Autohelm GPS and Beacon Receiver systems.

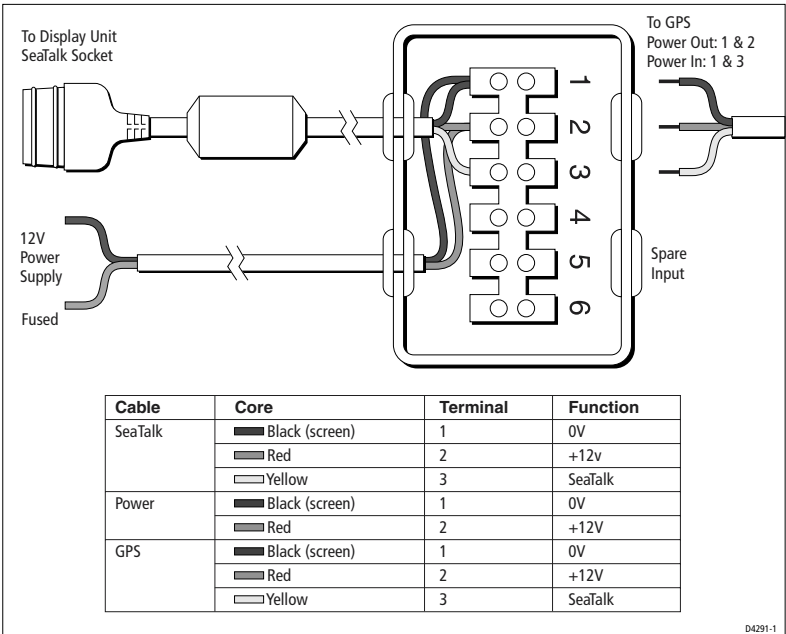| Cable	Core	Terminal	Function
SeaTalk	Black (screen)	1	0V
	Red	2	+12v
	Yellow	3	SeaTalk
Power	Black (screen)	1	0V
	Red	2	+12V
GPS	Black (screen)	1	0V
	Red	2	+12V
	Yellow	3	SeaTalk

Figure 2-17:   Using the Auxiliary Junction Box

Data Output

Data is transmitted in SeaTalk and NMEA formats as detailed in *Appendix D* and can be used to enhance other equipment as required.

The SeaTalk input/output connection is detailed in *SeaTalk Connection* on page 2-24.

The NMEA output connector is a 4-pin connector as illustrated below. The 1.5 m NMEA OUT cable has a ferrite clamp attached to ensure EMC conformance.
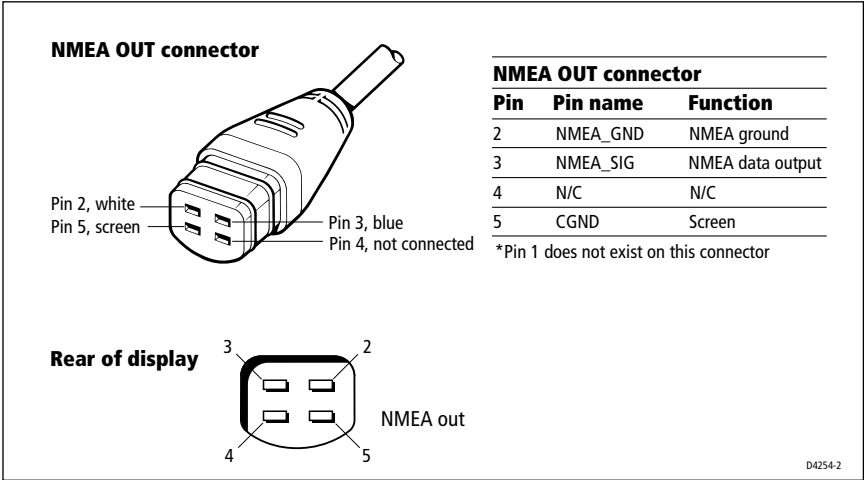

NMEA OUT connector

Pin 2, white
Pin 5, screen
Pin 3, blue
Pin 4, not connected

NMEA OUT connector		
Pin	**Pin name**	**Function**
2	NMEA_GND	NMEA ground
3	NMEA_SIG	NMEA data output
4	N/C	N/C
5	CGND	Screen

*Pin 1 does not exist on this connector

Rear of display

3   2

4   5

NMEA out

D4254-2

Figure 2-18:   NMEA Output Connector

Data Conversion

The *hsb²* Plus Series displays convert some information across the communications links as follows:

NMEA In to NMEA Out and SeaTalk
SeaTalk to NMEA Out

This enables data received by the display to be passed to other instruments. For example, if you have a master and a repeater display, you only need to connect NMEA In to the master display, which will pass the data to the repeater via SeaTalk.

You can prevent NMEA heading data being bridged onto the SeaTalk bus - refer to *Bridge NMEA Heading* on page 7-9.

Note: *To transfer NMEA data, or to convert the data, the display must be powered On.*

2.8 Integrated System Checks

Chart Display

When you have connected your display unit to the required equipment ensure that position data is available at the display via NMEA or SeaTalk.

To confirm your chartplotter is operating correctly, perform the following checks:

1. Without a chart card installed, select the Chart display mode and select a suitable range scale. Verify that the world map is visible.
   Use the trackpad to check cursor movement and normal scrolling action.

2. To ensure that the display is responding to position data:
   Press FIND SHIP, check the cursor is fixed on the vessel symbol which is correctly positioned at the center of the chart display.

3. Insert a chart cartridge for the area of your vessel.
   Use the **RANGE** key to zoom-in to check that the chart data is being displayed.

Received Data

If either SeaTalk or NMEA In is connected, verify that the expected data is displayed.

1. Press **DISPLAY** and select the NAV DATA WINDOW ON.
   Check that the expected data is displayed.

2. If heading data is connected, select Chart mode and check it is displayed in the heading data box, or select Radar mode and check heading is displayed in the Status Bar.

Transmitted Data

If SeaTalk or NMEA Out is being transmitted to other equipment, check that the data is being received correctly.

An NMEA Out connector is used to transmit navigation data. The NMEA Output cable should be connected to the upper, left connector on the rear of the display unit.

Note: *The NMEA Output cable has a ferrite clamp attached to ensure EMC conformance.*

Integrated System
Checks

Transmitted Data

Chapter 3: Getting Started & Adjusting the Display

3.1 Introduction

This chapter provides information, instructions to get you started using the *hsb²* Plus Series Fishfinder displays. It will help you to become familiar with the display and the functions of the controls before you start using the unit. More detailed information on operating the Fishfinder display is provided in *Chapter 4*. Chartplotter operating details are given in *Chapter 5* and *Chapter 6*.

Conventions Used

Throughout this handbook, the dedicated (labelled) keys are shown in bold capitals; for example, **MENU**. The soft key functions, menu names and options are shown in normal capitals; for example, SCREEN.

Operating procedures, which may consist of a single key-press or a sequence of numbered steps, are indicated by a ➤ symbol in the margin.
When the procedure requires you to press a soft key, the soft key icon is shown in the margin.

Simulator

The display unit includes a simulator function, that allows you to practice operating your Fishfinder or Chartplotter (Raychart models only) without data from the transducer or GPS system. You will need to use the set up options to switch the display to simulator mode, as described in *Section 3.2*.

You need to connect the display to a 12V or 24V DC power supply, connecting the red wire from the power lead to positive (+) and the black wire to negative (-). See *Chapter 2* for full details.

The following section, *Section 3.2*, includes instructions to view simulated fishfinder and chart images.

3.2   Switching the Display On and Off

The factory default power-up mode is full-screen fishfinder. Once you have used the display unit it powers-up in the last used mode. The following sections describe the power-up sequence in fishfinder and chart modes, how to adjust the lighting and color controls, and how to select simulator mode.

➤   To switch the display on in fishfinder mode:

Press and hold the **POWER** key until the unit beeps. The keys light up and after a few moments the display shows the fishfinder screen.
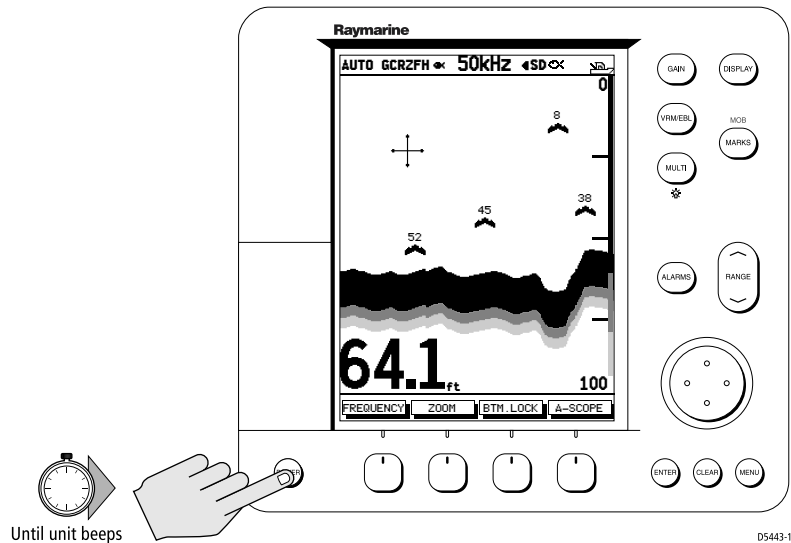

Figure 3-1:   Switching On in Fishfinder Mode

You can adjust the display brightness and contrast/colors, as described later in this chapter.

Setting the Fishfinder as Master/Repeater

You need to set your display as a fishfinder master or repeater. If the display is connected to a sonar transducer it is a master display. If your display is part of an integrated system, connected to another fishfinder master it is a repeater display. Fishfinder functionality is the same on both master and repeater displays, with the following limitations:

• Automatic Gain cannot be adjusted on the repeater display, but Manual Gain can be.

• STC cannot be adjusted on the repeater display.

• Depth offset, speed and temperature calibration (see *Section 7.4*) cannot be set on the repeater display.

• Frequency can be selected on either master or repeater display, but the same frequency is used on both displays.

- Range adjustment can be made on either master or repeater display, but any changes made are used on both displays.

- Simulator mode is repeated from the master, but cannot be selected on the repeater display.
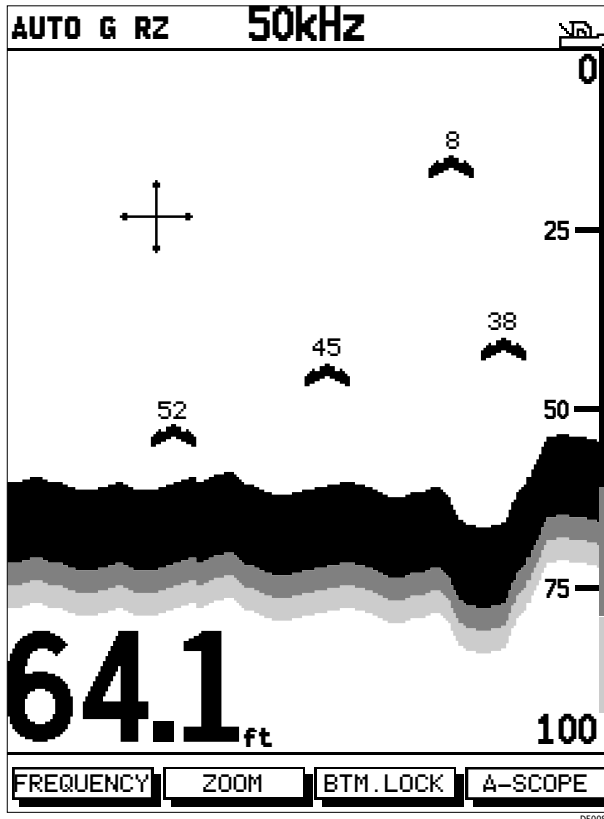

Figure 3-2: Typical Fishfinder Display at Switch On

➤ To set the fishfinder display as a master or repeater:

1. Press the **MENU** key, then press the SONAR SET UP soft key. The sonar set up pop-up window is displayed.

2. Use the trackpad to move the selection bar over the option SONAR HSB MODE. The HSB mode soft keys are displayed.

3. Press the appropriate soft key to set the display as a MASTER or REPEATER.

Press **ENTER** twice to return to the default display.

Chart Mode (Raychart Models only)

If the display was last used in chart mode before being powered off, it will
return to chart mode the next time it is switched on.

➤   To switch the display on in chartplotter mode, press and hold the **POWER** key
until the unit beeps. The keys light up, the Raychart graphic is displayed,
followed by the caution:

CAUTION:
**Raychart chart displays are based on cartographic data that C-MAP
believes to be accurate. However, you should not rely on these displays as
your primary source of navigation. Rather, your Raychart should be used
only as a backup to official government charts and traditional methods of
navigation.**

When you have read and understood the caution, press the CONTINUE soft key.
The chart is displayed.
If this is the first time the chartplotter has been turned on, and no chart card is
installed, the display shows the small-scale world map and the default soft
keys. Otherwise, the display shows the selected chart area and any data that
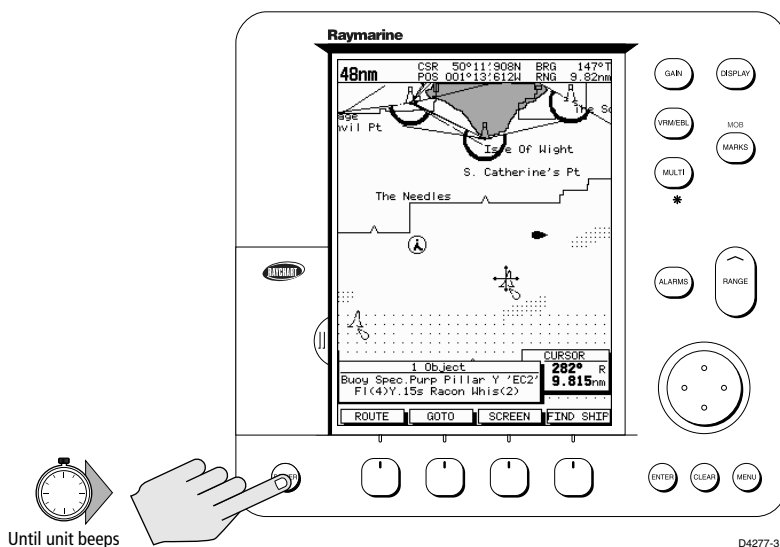were displayed when the display was last used.

Figure 3-3:   Switch On - Chart Mode

Switch Off

CAUTION:
**To provide protection against the damaging effects of UV light, it is
advisable to replace the sun cover provided when the color LCD display is
not in use.
A reminder is displayed when you switch off the color LCD display.**

➤ To switch the display unit off, press and hold the **POWER** key for three seconds. A countdown timer is displayed as shown below:
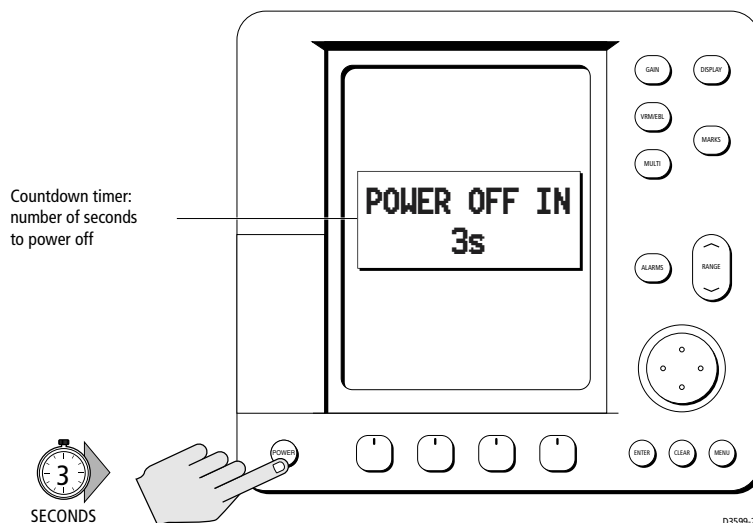

Countdown timer: number of seconds to power off

POWER OFF IN
3s

3 SECONDS

D3599-2

Figure 3-4:   Switch Off

When the counter reaches zero a beep sounds, and the display unit switches off. Release the **POWER** key.

Note: *Switch the display unit off before you remove either the power or transducer cords.*

Simulator Mode

When simulator mode is on a simulator database box is displayed.

When the display is switched off then on again, simulator mode is maintained. It is recommended that you select the System Set Up Menu and switch off simulator mode when you have finished.

➤ To view simulated image:

MENU

1. Press **MENU** followed by either:
   the SYSTEM SET UP soft key for simulated data or
   the SONAR SET UP soft key for a simulated fishfinder image.
   The set up menu pop-up is displayed.

SYSTEM
SET UP...

SONAR
SET UP...

2. Use the trackpad to move the selection bar over the option SIMULATOR/ SONAR SIMULATOR. The simulator soft keys are displayed.

3. In the system set up menu, press DATA to view the chart display with simulated position.
   In the sonar set up menu, press the ON soft key to switch on the sonar simulator.

4. Press **ENTER** twice to return to the default display.

Note: *Any waypoints placed on the chartplotter in simulator mode are retained in the database list and are available for use in routes.*

Simulator Mode

Changing the Lighting & Contrast (Monochrome LCD)

On the L755RC Plus, you can change the level of backlighting and contrast for the screen and keys. The key lighting is set the same as the screen lighting, except that it remains switched on at its lowest level even when the screen lighting is turned off, so that you can always find the keys.

➤   To change the lighting and contrast:

1. Press the **MULTI** key to display the soft key controls:

   The last-used soft key is highlighted in inverse video (white text on a black background).
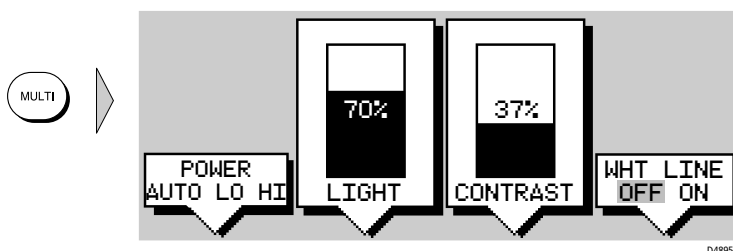
2. Press the LIGHT soft key if it is not already highlighted.

3. The LIGHT soft key toggles lighting ON/OFF.

4. Use the trackpad (up or down) to increase or decrease the setting. You can press and hold the trackpad to change the setting more rapidly. The lighting level is adjusted as you change the setting.

5. Press the CONTRAST soft key. Adjust the setting in the same way as for the lighting. There are 64 different contrast levels.

6. Press **ENTER** to return to the default screen, with the new lighting and contrast levels retained, or press **CLEAR** to discard the changes and return to the default screen.
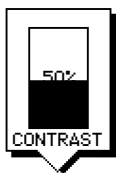
If lights are left ON when you switch off the display, the next time the display is switched on, the lights will be ON, but at the default setting of 42%. The new contrast level is retained until you reset it, unless you set the control very low or very high; in this case, the contrast will be restored as follows:

Contrast set   < 30%   restored to 30%
Contrast set   > 70%   restored to 70%

Changing the Brightness & Color Settings (Color LCD)

The **MULTI** key on the color LCD Fishfinder provides controls to set up the display colors and brightness. You can choose the background color and the color threshold; color threshold lets you determine which echoes are displayed, by selecting the minimum color strength the fishfinder uses. You can also select the color set, for a bold or soft color palette. The brightness of the screen can be adjusted over a wide range, suitable for viewing in daylight (high brightness level) or at night (low brightness level).

The key lighting is automatically adjusted as you alter the screen lighting, so that you can always find the keys. If you set the backlight to a high level, the key lighting is dimmed; if you set the backlight to a low level, the key lighting level is increased.

Adjusting the Brightness

➤ To change the screen brightness:

1. Press the **MULTI** key to display the soft key controls:
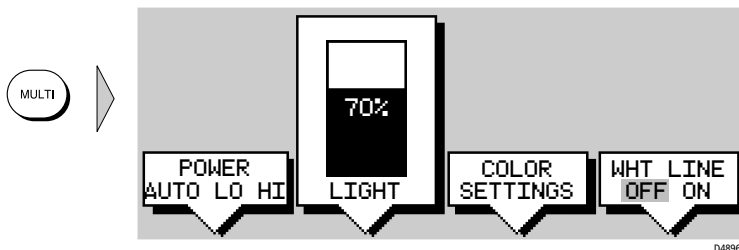
2. The LIGHT soft key indicates the brightness level, use the trackpad (up or down) to increase or decrease the setting. You can press and hold the track-pad to change the setting more rapidly. The brightness level is adjusted as you change the setting.

3. Press **ENTER** to return to the default screen, with the new brightness level.

➤ To set the screen brightness to 100%:

Press and hold the **MULTI** key for one second. The brightness is increased to 100%.

The brightness level is retained when you switch off the display.

Note: *During night-time use, the brightness may be set very low, when subsequently operated during the day it may not be apparent that the display is on; press* **MULTI** *then use the trackpad to increase brightness. Alternatively, press and hold* **MULTI** *for one second to set the brightness to 100%.*

Selecting the Background Color

Five colors are available for the fishfinder display background – black, dark gray, light gray, white and dark blue. The color you select is used on all the fishfinder windows (scrolling bottom, Zoom, Bottom Lock and A-Scope).

You will probably find that you need to change the background color in different light conditions. For example, a white background is probably easiest to see in bright sunlight, but a black background may be preferable at night.

➤ To change the background color:

MULTI

COLOR
SETTINGS

B'GROUND
COLOR

1. Press the **MULTI** key to display the soft key controls, then press COLOR SET-TINGS.

2. Press the BGROUND COLOR soft key. The background color soft keys are displayed below a pallet of available colors. The selected color is high-lighted.

3. Press the left or right BACKGROUND COLOR soft key until the required color is highlighted.
   The fishfinder display changes, so you can see the effect as you change the background color.

4. Press **ENTER** or **CLEAR** twice to return to the **MULTI** soft keys.

Selecting the Color Threshold

You use the color threshold control to determine the minimum echo strength that is displayed. Each range of echo strengths is displayed in a color as shown in the color bar; you select the minimum strength that is displayed by blanking echo colors below the required minimum.

If you blank a color, the corresponding echoes are displayed in the background color. You can remove up to six colors, but you cannot remove the strongest color.

The color threshold you select is used on all the fishfinder windows (scrolling bottom, Zoom, Bottom Lock and A-Scope).

➤ To change the color threshold:

MULTI

COLOR
SETTINGS

COLOR
THRESH

1. Press the **MULTI** key to display the soft key controls, then press COLOR SET-TINGS.

2. Press the COLOR THRESH soft key. The color threshold soft keys are displayed below color indicator showing the available echo colors.
   The weakest color is at the bottom of the indicator, the strongest color at the top; you can remove colors from the bottom up.

3. Press the left or right ADJUST COLOR THRESHOLD soft key to change the color threshold.
   Pressing the left key removes out the next color up, it increases the minimum strength displayed.
   Pressing the right key displays the next color down, it decreases the minimum strength displayed.

4. Press **ENTER** or **CLEAR** twice to return to the **MULTI** soft keys.

Selecting the Color Set

➤ To change the color palette:

MULTI

COLOR
SETTINGS

1. Press the **MULTI** key to display the soft key controls, then press COLOR SET-TINGS.

2. Press the COLOR SET soft key; this toggles between color set 1, bolder colors and color set 2, softer colors.

3. Press **ENTER** or **CLEAR** twice to return to the default screen.

3.3 Controlling the Display

You control the display using the cursor and control keys. You start all operations from the default screen, that is the default soft keys are displayed:

Fishfinder

```
FREQUENCY    ZOOM    BTM.LOCK   A-SCOPE
```
D5010-1

Chart

```
ROUTE      GOTO     SCREEN    FIND SHIP
```
D4160-1

When you have completed an action using the soft keys, press **ENTER** or **CLEAR** to return to the default screen; you may need to press **ENTER** or **CLEAR** several times to back-track through the soft key hierarchy.

Note: *If you have set up your system so that the default soft keys are not displayed all the time, press any soft key to display the labels.*

The remainder of this section describes how to select the mode of operation and switch half-screen windows on/off. The following sections describe how to set up the display for the Fishfinder and for the Chart (for fishfinder displays with chartplotter functionality).

The controls are summarized in the laminated Quick Reference cards that accompany this handbook.

Selecting the Mode of Operation

You use the **DISPLAY** key to select the full-screen mode. If the data is available on your system, the following modes (described in *Operating Modes* on *page 1-6*) can be selected:

• Chart

Controlling the
Display

- Fishfinder (Sonar)
- Data Log

The **DISPLAY** key also accesses the soft keys for the half-screen window options.

➤   To change the mode, press the **DISPLAY** key to show the DISPLAY pop-up, then press again to cycle through the modes available, shown in *Figure 3-5*.
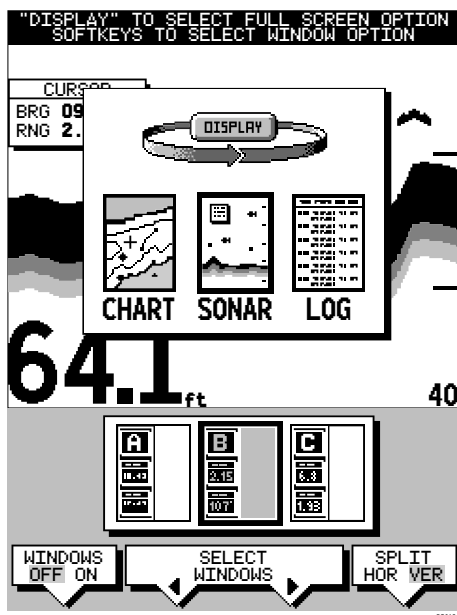
(DISPLAY)

Figure 3-5:   Using the DISPLAY Key

The selected mode is shown by an icon with a black (monochrome LCD) or red (color LCD) border and the mode is displayed on the screen. The associated half-screen window soft keys are also displayed.

When the required mode is shown, press **ENTER** or **CLEAR**. The default soft keys are displayed. The selected mode is shown full-screen; in Fishfinder and Chart mode you can switch on half-screen windows for additional display, as described in the following section.

If you press **DISPLAY** again, the pop-up and soft keys for the current mode are shown.

### Using the Dedicated Keys in Different Display Modes

When certain dedicated (hard) keys are pressed on a unit with the Raychart feature, the sets of soft keys that appear can vary depending on whether the currently selected mode is fishfinder or chart. The following describes the soft keys that appear in the Fishfinder and Chart modes.
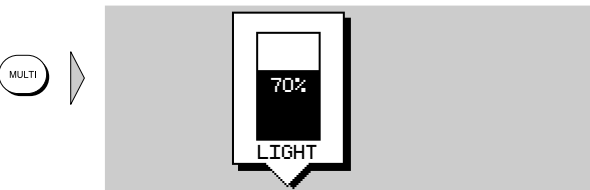
MULTI key

In Fishfinder mode on the L755RC Plus Monochrome display:

D4895-2
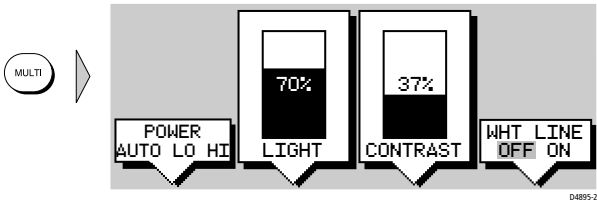
In Fishfinder mode on all color displays:
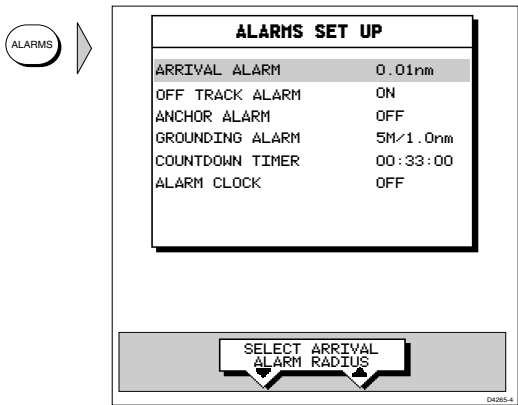

D4896-2
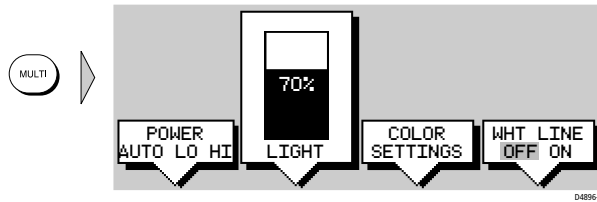
In Chartplotter mode on all displays:

ALARMS key

In Fishfinder mode on all displays:

D5031-1

In Chartplotter mode on all displays:

ALARMS SET UP

ARRIVAL ALARM	0.01nm
OFF TRACK ALARM	ON
ANCHOR ALARM	OFF
GROUNDING ALARM	5M/1.0nm
COUNTDOWN TIMER	00:33:00
ALARM CLOCK	OFF

SELECT ARRIVAL
ALARM RADIUS

D4265-4

Selecting the Mode
of Operation

Selecting a Half-Screen Window for Display

Note: *Windows can only be used with Fishfinder or Chart screens, they are not available on the data log screen.*

➤ To select a window for display:

1. From the full-screen Fishfinder or Chart mode, press the **DISPLAY** key. The following soft keys are displayed with an image of each available window:

Fishfinder

D5011-1

Chart

D4156-2

2. In fishfinder mode check that SPLIT is set to HOR. To select a different window, press either SELECT WINDOWS soft key until the required window is highlighted. If necessary, this will toggle windows on. Press **ENTER**.

3. To toggle windows off, press the WINDOWS OFF ON soft key.

If any data boxes were displayed at the bottom of the full-screen image, they are switched off until you return to full-screen mode. However, you can use the SCREEN soft key in chart mode to switch the data boxes on - they are displayed in the upper window.

Figure 3-6 shows the half-screen horizontal windows (in fishfinder mode).

### Switching Control Between Fishfinder & Chart Screens

In a combined or an integrated system, to switch control between fishfinder, radar and chart, you can change the full-screen mode using the **DISPLAY** key. Alternatively, when you have both fishfinder and chart displayed in half-screen windows the soft key CHRT SNR lets you toggle operating control between the fishfinder and the chart window.

If a window is active, i.e., control of the cursor via the trackpad is available in that window, and you switch windows off, control automatically returns to the full-screen (upper window) mode.

Fishfinder:

| FREQUENCY | ZOOM | MORE... | CHRT SNR |

D5013-1

Chart:

| ROUTE | GOTO | MORE... | CHRT SNR |

D5025-1
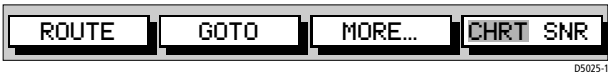
➤ To change the active window, press the CHRT SNR soft key to toggle control between the fishfinder and chart display. The current active display is highlighted in gray (monochrome LCD) or red (color LCD) on the CHRT SNR label and the cursor appears in that window.
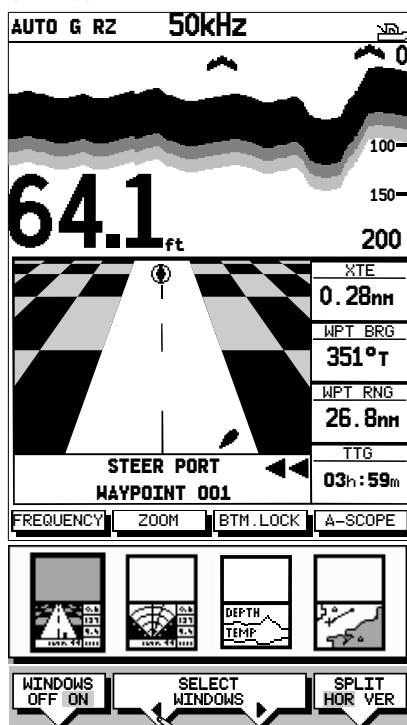
Returning to the Full-Screen Display

To return to the full-screen display you can turn windows off, as previously described. Alternatively, to return to full-screen display:

➤ Press and hold the **DISPLAY** key for 2 seconds to return to the currently selected full-screen (upper window) display.

DISPLAY

Selecting the Mode of Operation

CDI Window

BDI Window

Depth/Temperature Window

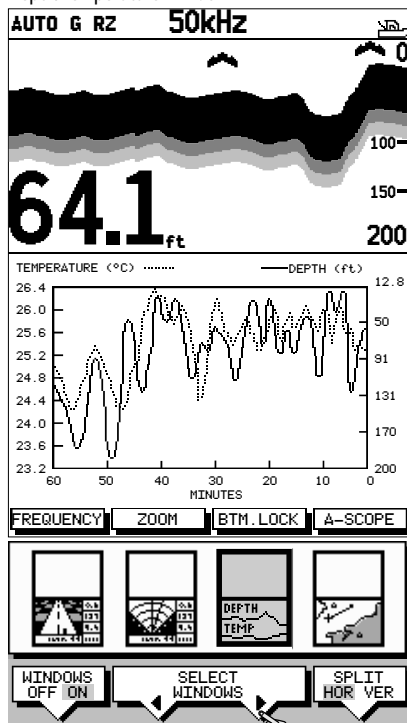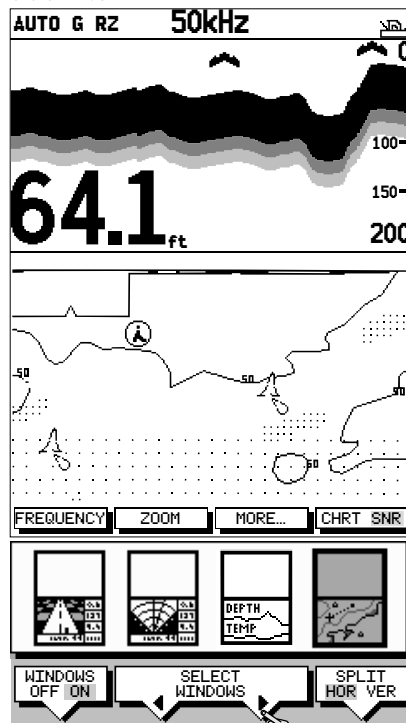Chart Window

Figure 3-6:   Fishfinder Half-Screen Window Options

3.4   Fishfinder Display Control Functions

The Fishfinder automatically locates the bottom and displays the information using an appropriate scroll speed and range. However, controls are provided so you can adjust scroll speed and range. You can also select the transducer frequency and select certain data for display. This section describes how to use the controls to set-up your fishfinder display:

- Viewing databoxes
- Changing the scroll speed
- Changing the range
- Selecting the power setting
- Selecting the frequency

In addition this section describes how to select the fishfinder display options.

- Display Bottom Lock
- Display A-Scope
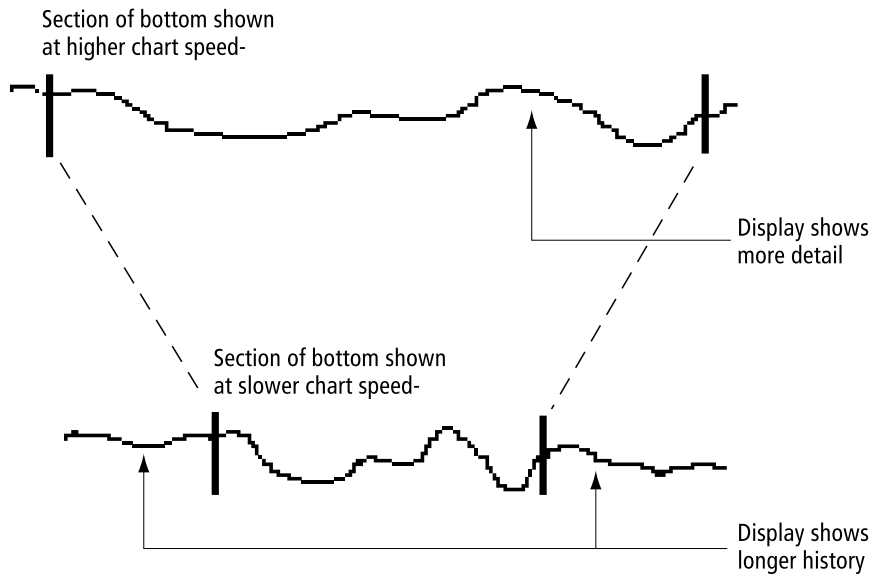- Zoom an area of the image.

Viewing Data Boxes

The cursor data box and a group of up to six data boxes can be displayed, if the information is available on your system. **You select which data is displayed in the boxes during system set up as described in *Chapter 7*.** The default data box positions are along the bottom of the display. Each box can be moved to the required position on the screen using the context-sensitive cursor.

To switch the data boxes on and off you need to go to Chart mode – see *Customizing the Screen Presentation Options* on *page 3-26*. Switching the databoxes on/off in Chart mode also affects their display in Fishfinder Mode.

Changing the Scroll Speed

The standard fishfinder display is the scrolling bottom image; this is a graphical representation of the echoes seen by the Fishfinder. New information appears at the right hand side of the display and scrolls to the left.

The speed at which the display scrolls is adjustable, but the same section of the bottom is displayed regardless of scrolling speed. As illustrated in *Figure 3-7*, if you select a faster speed, more detail is displayed and is useful when you are looking for fish; if you select a slower speed the information remains on the display for longer.

Section of bottom shown
at higher chart speed-

Display shows
more detail

Section of bottom shown
at slower chart speed-

Display shows
longer history

D5024-2

Figure 3-7:   Effect of the Scroll Speed

The Fishfinder automatically adjusts the scroll speed, based on depth.
Alternatively you can manually adjust the speed. If you select automatic
adjustment, the scroll speed is related to boat speed as follows:

•   Less than, or equal to 0.5 kn, scroll speed is constant at 10%

•   Between 0.5–15 kn, scroll speed varies linearly with boat speed

•   Greater than 15 kn, scroll speed is constant at 100%

If you select manual adjustment, the scroll speed is not related to the speed of
the boat over the bottom. You can also pause the display (the depth indication
continues to be updated).

➤   To change the scrolling speed:
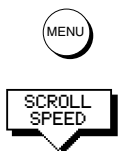
1. Press **MENU**, then press the SCROLL SPEED soft key.

2. If necessary, press the SCROLL AUTO MAN soft key to toggle the setting
    between AUTO and MAN.

3. For manual adjustment, use the trackpad to increase the scroll speed. You
    can press and hold the trackpad to change the value more rapidly.

4. Press **ENTER** to return to the Menu soft keys, then **ENTER** again to return to
    the default display.

➤   To pause the scrolling display:
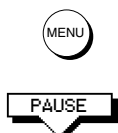
1. Press **MENU**, then press the SCROLL SPEED soft key.

2. Press the PAUSE soft key. The display stops scrolling and the key is rela-
    beled RESUME.

3. To resume scrolling, press the RESUME soft key. The key is relabeled PAUSE.

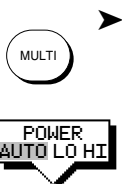4. Press **ENTER** to return to the Menu soft keys, then **ENTER** again to return to the default display.

Selecting the Power Setting

The POWER soft key provides adjustment of the transducer signal. When AUTO is selected (default), the Fishfinder automatically determines the power setting based on the current depth. LO power (100 W) is used in depth ranges less than 8 ft (2.4 m) and HI power (600 or 1000 W, depending on your transducer) is selected for depths greater than 12 ft (3.7 m). When AUTO is selected the current automatic power setting is indicated in the top status line by an L (low) or H (high).

Note: *When* AUTO POWER *has been selected, and you manually adjust the* RANGE *to 30 ft (10 m) or greater, the Fishfinder switches to* HI *power, regardless of what the digital depth is calculated to be.*

If, however, you wish to manually adjust the power to suit current conditions, you can select either LO or HI power.

The power setting is retained when the unit is powered off.

➤ To change the power setting:

1. Press the **MULTI** key to display the soft key controls.

2. Press the POWER soft key to toggle between AUTO, LO, or HI power. The selected setting is highlighted.

3. Press **ENTER** or **CLEAR** to return to the default screen.

Changing the Fishfinder Range

The Fishfinder automatically adjusts the display range. Alternatively, the **RANGE** key lets you select the maximum depth displayed on the scrolling bottom and A-Scope displays. You can also set the shift value to move the image window up or down within the current range.

If you select automatic range adjustment, the Fishfinder selects the shallowest range that keeps the bottom in the lower half of the display window. Shift is disabled (the value is ignored) when auto-range is selected.

The following range/shift values are available:

Table 3-1:   Range and Shift Values

Feet		Fathoms		Meters	
Range	**Shift**	**Range**	**Shift**	**Range**	**Shift**
5	1	1	1	2	1
10	2	2	1	4	1
15	5	3	1	6	2
20	5	4	1	8	2
30	10	5	1	10	2
40	10	8	2	15	5
50	10	10	2	20	5
60	20	15	5	25	5
80	20	20	5	30	10
100	25	25	5	40	10
150	50	30	10	50	10
200	50	40	10	60	20
250	50	50	10	80	20
300	100	60	20	100	25
400	100	80	20	150	50
600	200	100	25	200	50
800	200	150	50	300	100
1000	250	200	50	400	100
1500	500	250	50	500	100
2000	500	300	100	600	200
2500	500	400	100	800	200
3000	1000	500	100	1000	250
3500	875	600	150	1200	300
4000	1000	700	175	1400	350
4500	1500	750	250	1500	500
5000	1250	850	170	1700	425

Note:

1. *Range detection below 3000 ft (1000 m) is only available with the L1250 Plus and L1250RC Plus displays after you have fixed the Depth Range setting to 5000 ft. See Depth Range (L1250 Plus and L1250RC Plus only) on page 7-15 for details.*

2. *All other hsb² Plus Series Fishfinders are limited to a maximum depth range of 3000 ft (1000 m), unless repeating data from an L1250 Plus or L1250RC Plus via the High Speed Bus.*

➤   To adjust the range and shift values:

1. Press **RANGE**, this sets adjustment to manual and the range soft keys are displayed. The range adjusts up or down depending on the direction pressed.

2. Use the **RANGE** key to adjust the range: press the up arrow to select a shallower range, press the down arrow to select a deeper range.

3. If necessary, press the RANGE AUTO MAN soft key to select AUTO range. AUTO range is indicated by the letter R in the status bar.

4. To adjust the shift, press the appropriate SHIFT soft key: use the up soft key to select a shallower shift, use the down soft key to select a deeper shift. The image window is shifted up by the selected amount

5. Press **ENTER** to return to the default display.

When AUTO POWER has been selected, and you manually adjust the RANGE to 30 ft (10 m) or greater, the Fishfinder switches to HI power, regardless of what the digital depth is calculated to be.
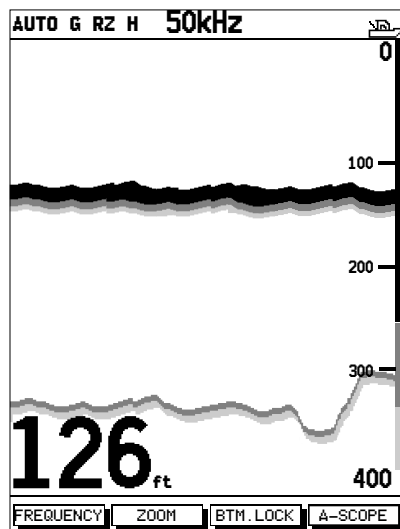
Manually Adjusting RANGE to Ignore Surface Clutter

There may be a time when clutter near the water's surface is so thick it returns an echo that is stronger than the return from the bottom. In this a case, it is possible the fishfinder may determine the clutter to be the seabed rather than the bottom itself. You can use the RANGE setting to force the fishfinder to ignore any interference in the upper boundaries of the water that may be giving false bottom readings.

If you manually adjust the RANGE to 400 ft (150 m) or greater, the Fishfinder ignores the first 25% of the range for the purpose of determining the digital depth. If the RANGE is set to 400 ft (150 m), the first 100 ft (37.5 m) is ignored for determining the depth. If the RANGE is set to 3000 ft (1000 m), the first 750 ft (250 m) is ignored, etc.

As an example, let's say the RANGE is set to 400 ft but there is some clutter at 126 ft that is returning a stronger signal than the bottom. Because its return is stronger, the fishfinder determines the clutter to be bottom and displays it as the bottom depth (126 ft). See *Figure 3-8*.

The upper 25% (400 x 0.25 = 100 ft) of the range is ignored but because the clutter is deeper than this (126 > 100 ft), the clutter is still detected as bottom. If you then manually adjust the RANGE to 600 ft, the value that is ignored now increases to 150 ft (600 x 0.25 = 150). The clutter is now within the excluded range (126 < 150) and so is ignored. The correct bottom of 302 ft is now displayed.

Changing the
Fishfinder Range

Signal from surface clutter is stronger than from bottom. When RANGE is set to 400 ft, clutter is below top 25% of range (100 ft), so is incorrectly determined to be bottom.
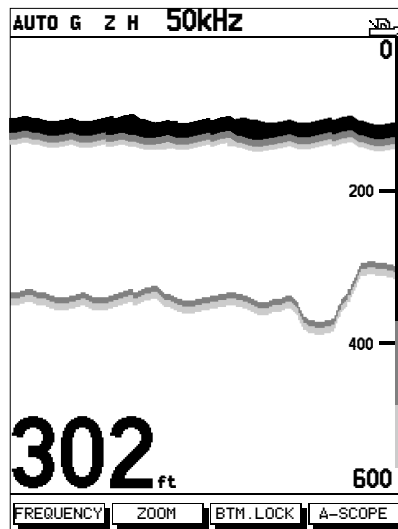
Manually adjusting RANGE to 600 ft, clutter is now within top 25% of the range (150 ft), so it is ignored and the correct bottom is detected.

Figure 3-8:   Manually Adjusting RANGE to Ignore Surface Clutter

Selecting the Frequency

The *hsb²* Plus Series Fishfinders use dual frequency sonar. The two frequencies used are 50 kHz and 200 kHz. The Fishfinder automatically selects the appropriate frequency. Alternatively, you can manually select either frequency, or both frequencies simultaneously. Each is suitable for a particular purpose:

50 kHz Frequency

When using this frequency, the transducer scans a wide area. The 50 kHz signal penetrates water well, so is good for use in deep water.

200 kHz Frequency

When using this frequency, the transducer scans a narrower area, but produces a more detailed view. The 200 kHz signal is good for finding fish near the bottom or close together. It is better for use in shallow water.

Split Frequency

The transducer can operate in both 50 kHz and 200 kHz frequencies at the same time. If you choose split frequency operation, the scrolling bottom display is split horizontally; the upper half shows the 200 kHz detailed view and the lower half shows the 50 kHz image.

➤ To change the frequency:

FREQUENCY

1. Press the FREQUENCY soft key. The frequency selection soft keys are dis-
    played.

2. Press the appropriate soft key – 50 KHZ, 200 KHZ or SPLIT. The scrolling bot-
    tom is displayed in the selected frequency. If you choose split, the scrolling
    bottom is displayed in both frequencies with 200 kHz in the upper window
    and 50 kHz in the lower window.

3. If necessary, press the AUTO FREQ OFF ON soft key to select AUTO fre-
    quency. AUTO frequency is indicated by the letter F in the status bar.

4. Press **ENTER** or **CLEAR** to return to the default display.

You can choose the split frequency display with the fishfinder display options,
Bottom Lock, A-Scope, or Zoom.

When the RANGE has been manually set to 400 ft (150 m) or greater, the digital
depth calculation will be made at 50kHz, regardless of the FREQUENCY setting
used. 200kHz can still be displayed, but will not be used in determining the
depth.

Using Bottom Lock

The scrolling bottom display provides a *top-down* view, referenced from the
surface of the water. Bottom Lock shows a water column of fixed height,
referenced from the bottom, that appears flat. It removes bottom detail to
provide an image of objects directly above the bottom, and is useful when you
are looking for fish that feed close to the bottom.

You can select the Bottom Lock image to be vertically split with the scrolling
bottom display, or it can replace the scrolling bottom display.

As illustrated in *Figure 3-9*, the bottom is shown as a straight line. Notice that
some bottom features may extend above this line. The actual depth reading is
given in the bottom left hand corner of the Bottom Lock display.

Range intervals on Bottom Lock are measured up from the bottom (rather than
down from the surface). Thus, the bottom is shown as zero and the top number
indicates the maximum distance above the bottom being displayed. You can
adjust the Bottom Lock range.

If the A-Scope or Zoom image was displayed, selecting Bottom Lock
automatically switches OFF A-Scope or Zoom.
If you have split frequency selected, the Bottom Lock image is displayed in
both frequency windows.

If Target Depth ID is ON (see *Target Depth ID* on *page 7-13*), the target depth
is displayed as distance from the bottom.

Using Bottom Lock

➤ To display the Bottom Lock image:

BTM.LOCK

1. Press the BTM. LOCK soft key. The Bottom Lock selection soft keys are displayed.

2. Press the BTM. LOCK OFF ON soft key to toggle the function ON.
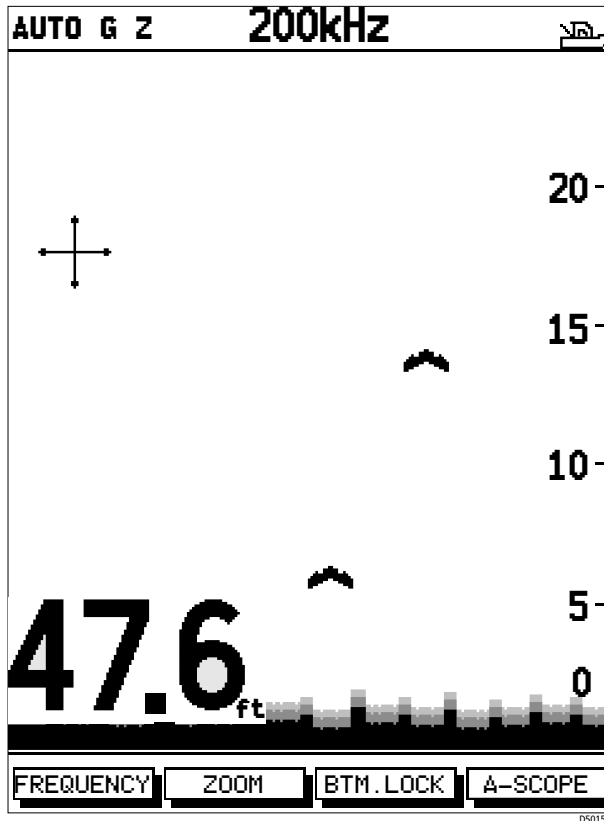

Figure 3-9:   Bottom Lock Display

3. Press the BTM. LOCK FULL SPLIT soft key to toggle between a full window bottom lock image or split windows. The bottom lock image is displayed. If you select split windows, the fishfinder display is split vertically, with the bottom lock image in the left hand window and the scrolling bottom display in the right hand window.

   In a split window display, a vertical bar appears (along the right hand edge of the scrolling bottom image) that references the range being displayed in the bottom lock window. This bar varies in height as the bottom lock range is changed.

4. To adjust the range, press the appropriate BTM LOCK RANGE soft key: press the up arrow to select a larger range, press the down arrow to select a smaller range.

5. Press **ENTER** or **CLEAR** to return to the default display.

➤   To reposition the bottom lock image:

$\underset{\text{BL}}{+}$

1. Use the trackpad to move the cursor to the bottom image until the text BL is displayed near the cursor.

2. Press **ENTER**, a horizontal line appears, indicating the cursor is active. Use the trackpad to move the line to the required bottom lock image position.

3. Press **ENTER** to reposition the bottom lock image, or **CLEAR** to cancel the operation.

Using A-Scope

The scrolling bottom display provides a historical record of sonar echoes. Use the A-Scope screen to show raw sonar data directly from the transducer beam. This gives you a "real time" image of fish and bottom structure directly below the transducer. This function is very useful in showing the strength of the echo returned from a fish. At the lower end of the window, A-Scope also displays the patented Bottom Coverage width indication.

➤   To display the A-Scope image:
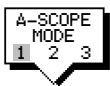
A-SCOPE

1. Press the A-SCOPE soft key. The display is split vertically, with the A-Scope image in the right hand window and the scrolling bottom image in the left hand window.

A-SCOPE
MODE
1 2 3

2. Press the A-SCOPE MODE soft key to select one of the three modes for A-Scope, as demonstrated in *Figure 3-10*:

    i.   Mode 1, in which the A-Scope image is angled outward as the signal width (indicated with dotted lines) increases with depth.

    ii. Mode 2, in which the image expands to take up the entire A-Scope window, providing greater resolution.

    iii. Mode 3, in which only the left hand side of the image displayed in Mode 2 expands to the entire A-Scope window. This mode provides the greatest resolution.

3. Press **ENTER** to accept your selection.

Note: *If the Bottom Lock or Zoom image is displayed, selecting A-Scope automatically switches* OFF *Bottom Lock or Zoom.*
If you have split frequency selected, the A-Scope image is displayed in both frequency windows.

➤   To remove the A-Scope image:

1. Press the A-SCOPE soft key.

A-SCOPE
OFF ON

2. Press the A-SCOPE ON OFF soft key to toggle off A-Scope.

3. Press **ENTER**.

A-SCOPE Mode 1   Mode 2   Mode 3
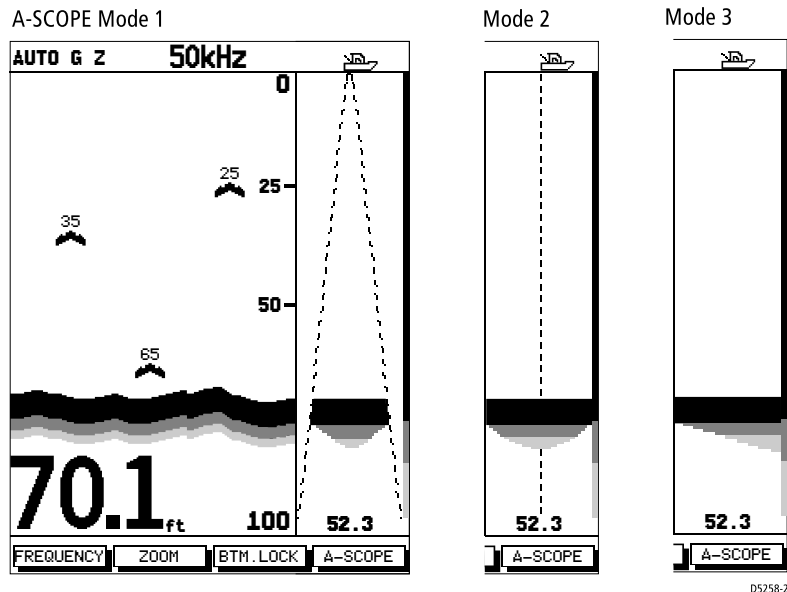

D5258-2

Figure 3-10:   The Three Modes of A-Scope

Using Zoom

Zoom enlarges all or part of the scrolling bottom display. You can select automatic zoom so the fishfinder selects a zoom level that keeps the bottom in the lower half of the display window. Alternatively, you can manually pick the area to be zoomed.

➤   To select zoom:

ZOOM

1. Press the ZOOM soft key, if necessary press the ZOOM ON OFF soft key to toggle zoom on.

2. Press the ZOOM FULL SPLT soft key to toggle between a full window zoom image or split windows.
   If you select split windows, the display is split vertically, with the zoom image in the left hand window and the scrolling bottom display in the right hand window.
   In a split window display, a vertical bar appears (along the right hand edge of the scrolling bottom image) that references the range being displayed in the zoom window. This bar varies in height with the selected zoom level.

3. If necessary, press the ZOOM AUTO MAN soft key to toggle the setting between AUTO and MAN. The manual setting allows you to reposition the zoomed image.

4. For zoom level selection, press the ZOOM X 2 4 6 soft key until the required zoom level is selected.

5. Press **ENTER** or **CLEAR** to return to the default display.

➤   To reposition the zoom window:

If manual zoom is selected, you can reposition the area of the image that is zoomed.

1. Use the trackpad to place the cursor in the zoom window, the text ZOOM is displayed near the cursor.

2. Press **ENTER**, a horizontal line appears, indicating the cursor is active. Use the trackpad to select the new position.

3. Press **ENTER** to reposition the zoom image, or **CLEAR** to cancel the operation.

If the Bottom Lock or A-Scope image was displayed, selecting Zoom automatically switches OFF Bottom Lock or A-Scope.
If you have split frequency selected, the selected Zoom image is displayed in both frequency windows.

Using Zoom

3.5   Chart Display Control Functions (Raychart Models)

Customizing the Screen Presentation Options

The SCREEN soft key lets you set the following screen presentation options on or off:
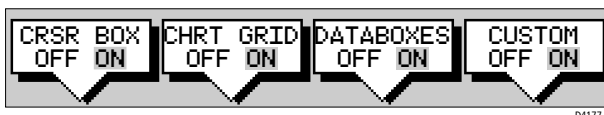
Switching the Cursor Data Box On and Off

The cursor data box provides the cursor's position in latitude/longitude and/or bearing/range. If you wish to see a full image, you can switch the data box off.

➤   To control the cursor data box:

1. Press the SCREEN soft key.

2. Press the CRSR BOX soft key to toggle the setting from OFF to ON or from ON to OFF.

3. To return to the default soft key display, press **ENTER**.

➤   You can move the cursor data box using the context-sensitive cursor.

Switching Chart Grid On and Off

The Chartplotter display includes grid lines of latitude and longitude, which you can use to help determine position on the chart. The grid lines can be switched on if required.

➤   To turn the chart grid on or off:

1. Press the SCREEN default soft key.

2. Press the CHRT GRID soft key to toggle the setting from OFF to ON or from ON to OFF.

To return to the default soft key display, press **ENTER**.

Data Boxes

A group of up to six data boxes can be displayed, if the information is available on your system. **You select which data is displayed in the boxes during system set up as described in *Chapter 7*.**

The default data box positions are along the bottom of the display. Each box can be moved to the required position on the screen using the context-sensitive cursor.

Note: *If you select fishfinder, BDI, CDI or Nav Data for display in a half-screen window, the data boxes are temporarily hidden.*

At any time, you can switch the *group* of data boxes on or off using the SCREEN soft key. When first installed, the boxes are all OFF. When the display unit is switched off and on again, the data boxes return to their last-used states (ON or OFF) and positions.

Note: *The* SCREEN *soft key does not control the sixteen data boxes that can be displayed in the half-screen window.*

➤ To switch the group of data boxes on or off:

SCREEN

1. Press the SCREEN default soft key.

DATABOXES
OFF ON

2. Press the DATABOXES soft key to toggle the setting from ON to OFF or from OFF to ON.

To return to the default soft key display, press **ENTER**.

If you turn the data boxes on and none are displayed, you need to select the ones you require using the system set up menu, as described in *Section 7.3*.

➤ To move any data box:

BOX

1. Use the trackpad to position the cursor over the box until the letters BOX are displayed.

2. Press **ENTER** to take control of the box, use the trackpad to move it to the required position, and press **ENTER** again.

Custom Options - Chart Mode

When chart details have been customized in the Chart Set Up menu (as described in *Section 7.5*) the SCREEN soft key can be used to switch the custom chart options off or on:
When set to ON, all chart options set to CUSTOM in the Customize Chart menu are displayed; when set to OFF, options set to CUSTOM are not shown.

The factory default for custom chart options is ON.

➤ To switch the customized options on or off:

SCREEN

1. Press the SCREEN default soft key.

CUSTOM
OFF ON

2. Press the CUSTOM soft key to toggle the setting from OFF to ON or from ON to OFF.

To return to the default soft key display, press **ENTER**.

Moving Around the Chart

You will normally operate the chartplotter with the chart showing your vessel's current location. The default orientation is North-Up, and the vessel moves across the screen. You will need to move the chart if your vessel moves out of the area currently displayed, or if you wish to examine or place waypoints in another area. Alternatively, you can *home* the cursor onto the vessel using FIND SHIP.

There are four ways in which you can move the chart:

- Use the trackpad to move the cursor to the edge of the chart. The chart will pan across. This method is useful if the area you wish to see is only just off the screen.
- Use the context-sensitive cursor to change the chart center.
- Automatically re-center the vessel using the FIND SHIP soft key.
- Change the chart scale to zoom out and in to a new area centered on the cursor position. This method is useful if the area you wish to see is a long distance away.

Changing the Chart Center

You can move the area of the chart displayed on the screen using the context-sensitive cursor. This allows you to center your vessel in the middle of the screen, or to move the chart so that your vessel is displayed off-center anywhere on the screen.

➤ To center the chart:

1. Use the trackpad to move the cursor to the vessel's position. The cursor text POS is displayed.

2. Press **CLEAR**. The chart is moved so that your vessel's position is in the center of the screen.

3. Use FIND SHIP, as described in the following section.

➤ To move your vessel's position off-center:

1. Move the cursor over your vessel's position until the letters POS are displayed.

2. Press **ENTER** to take control of the chart position. The letters POS are now in inverse video, and the cursor symbol has changed to a four-way arrow. This indicates that the cursor can be used to move the chart in any direction.
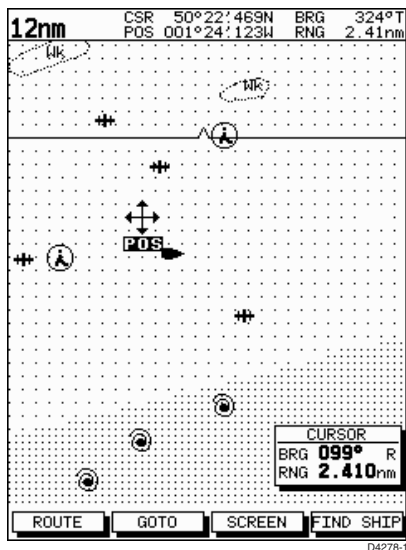
Figure 3-11:   Changing the Chart Center

3. Use the trackpad to move the cursor to the required position.

4. Press **ENTER** to select the position and return to normal cursor control. The chart is redrawn with the vessel position at the cursor.
    Alternatively, you can press **CLEAR** to abandon the move and leave the chart (and vessel) in its former position.

Using FIND SHIP

FIND SHIP is used in chart mode to re-draw the chart with the vessel at the center and the cursor homed onto the vessel.

When you press FIND SHIP the following occur:

•   The chart is re-drawn with the vessel's position in the center.

•   The cursor is homed onto the vessel position and moves with it.

•   When the vessel moves near the edge of the chart window, the chart is redrawn to place the vessel and cursor at the center again.

•   The status bar indicates vessel position, speed and course over ground.

➤   To release the cursor from homed mode press the trackpad to move the cursor away from the vessel's current position. The status bar shows the cursor position, range and bearing.

Changing the Chart Scale

The **RANGE** key allows you to change the chart scale so that you can see a smaller or larger area on the screen.

Plotter mode is available to allow you to zoom into a smaller area, even when no chart data is available for that scale. *Section 7.5* describes how to set plotter mode on/off.

The cartographic detail available on charts varies according to the chart scale and some areas include detail at smaller scales than others. This can cause blank areas on the display when adjacent areas with different levels of detail are displayed. To reduce this effect you can use the Chart Set Up options (see *Section 7.5*) to set chart display detail to simple. Then, as you zoom in, charted areas are displayed but with less detail shown.
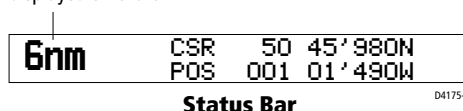
You can change the chart scale for two purposes:

- To see either more detail (of a smaller area) or a larger area (in less detail) on the screen.
- To move the display to another area of the chart, by zooming out to a small scale chart, then zooming in on another position centered on the cursor.

Each time you press the **RANGE** key, the chart scale changes to the next available setting. The status bar indicates the distance from top to bottom of the screen, in nautical miles.

Increases the chart distance

Decreases the chart distance
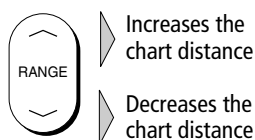
Vertical distance displayed on chart

| **6nm** | CSR | 50 45'980N |
| | POS | 001 01'490W |

Status Bar

D4175-3

➤ To change the scale quickly, press and hold the required arrow on the **RANGE** key.

The distance indicator at the left-hand end of the status bar is updated whenever you change the chart scale.

➤ To zoom in to a larger-scale (more detailed) chart:

1. Use the trackpad to position the cursor in the area you wish to see in more detail.

2. Press the lower part of the **RANGE** key to zoom into the area.

   The section of the chart around the cursor is enlarged to fill the screen with a larger-scale chart showing more detail. The cursor is now positioned in the center of the screen.

   The distance indicated at the top left of the screen is updated.

3. If further chart enlargement is available using the current chart card you
    can press the bottom of the **RANGE** key to zoom in again, re-positioning
    the cursor first if required.

    An area of further chart detail is indicated by a box around the area as
    shown in *Figure 3-12*.

Chart Boundary -
indicates further
detail is available inside
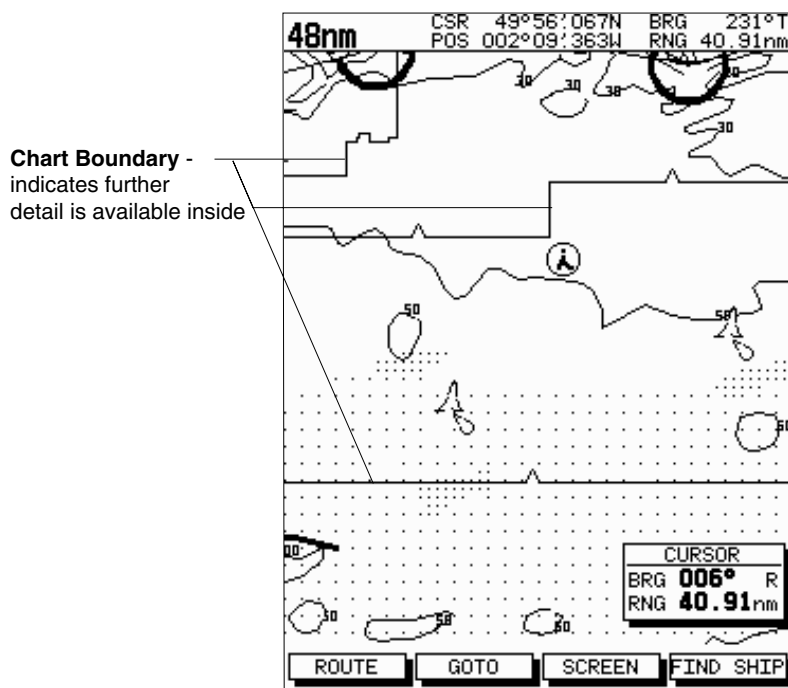
Figure 3-12:   Chart Boundaries

4. When no further chart detail is available, as you press the bottom of the
    RANGE key, the effect depends on whether **Plotter Mode** is on or off as
    follows:

    •   If Plotter Mode is Off, the chart scale remains unchanged, indicating
        the smallest chart scale is displayed.

    •   If Plotter Mode is On, the scale is decreased and the message NO CHART
        DATA is displayed. The vessel, waypoints, routes and tracklines are dis-
        played without cartography.

    The chart information is restored when you return to a chart scale for which the
    information is available.

➤   To zoom out to a smaller-scale (less detailed) chart, simply press the upper part
    of the **RANGE** key as many times as required.

Radar/Chart Overlay

If radar data is available from another display connected on *hsb²*, the radar targets can be overlaid onto the full-screen chartplotter display. The radar/chart overlay option helps you to distinguish between fixed, charted objects and other objects that could be moving vessels. Some radar controls are available in overlay mode.

The following criteria must be true for radar/chart overlay to function correctly:

- Position and heading data are provided so that vessel position and orientation can be determined.
- The vessel must be displayed on screen.
- The chartplotter must be in North Up or Course Up mode (see Section 7.7).
- The chartplotter range must be between 1/4nm and 48nm (equivalent to a radar range of 1/8nm to 24nm).
- Custom range scales are disabled on the radar.
- The radar must be transmitting.

To ensure the vessel remains on the screen, you could use Find Ship (see *Using FIND SHIP* on *page 3-29*) to home the cursor onto the vessel.

When Radar/Chart overlay is switched on, the status bar indicates OVL. If the option is switched on but the overlay is not visible (because one of the above criteria has failed), the status bar indication changes to (OVL).

When Radar/Chart overlay is switched on the soft key MORE... provides access to the SCREEN soft key and to the radar controls TARGETS and MARPA. The radar **GAIN** control is also active in overlay mode.

Note: *Radar/Chart overlay is displayed at the current chart range. You should be aware that if radar is shown on any other display, its range will match that displayed on Radar/Chart overlay. Conversely, if you change the radar range on any display, the Radar/Chart overlay image will change to the new radar range.*

➤ To select radar/chart overlay:

1. Press the **DISPLAY** key to show the DISPLAY pop-up, then if necessary press again to select Chart mode.
2. Press the OVERLAY OFF ON soft key to toggle the option on.

The two highest intensity radar returns are displayed in purple, over the chart image. The radar image is translucent, so that chart text, contours and outlines are visible beneath the radar targets.

Chapter 4: Fishfinder Operations

4.1 Introduction

Basic Fishfinder operation, including a description of the different display options, was given in *Chapter 3*. This chapter helps you the get the most from your Fishfinder. It describes how to fine-tune the image and use the controls to get additional information.

This chapter covers the following topics:

- Interpreting and Adjusting the Fishfinder Image, including fish and bottom indications, using the white line feature and adjusting gain (sensitivity)
- Viewing Data Windows
- Setting up and Using Alarms for fish, shallow water and deep water
- Using a VRM to Determine Depth and Distance from Boat of a particular spot
- Placing Waypoints
- Using the Man Overboard (MOB) function

4.2 Interpreting and Adjusting the Fishfinder Image

The *hsb²* Plus Series Fishfinders use sound waves (sonar) to find fish and show the bottom of a lake or sea. The transducer sends high-frequency sound waves down into the water; these sound waves strike fish, the bottom, or other objects in the water and return as echoes. The fishfinder interprets these echoes to present an image of the fish and bottom.

The strength of echoes is indicated by different colors (or shades of gray in the monochrome L755RC Plus). You can use this information to determine the size of fish and the bottom structure. Other objects in the water, such as debris and air bubbles, also return echoes; these echoes are generally weaker than the fish or bottom echoes and produce background noise or *clutter* on the Fishfinder display.

The Fishfinder provides controls to reduce the background noise and to adjust the way in which echoes of different strengths are displayed. The color Fishfinders also let you select the background color and remove the display colors for weaker echoes. Refer to *Changing the Brightness & Color Settings (Color LCD)* on *page 3-6* for details on these two functions.
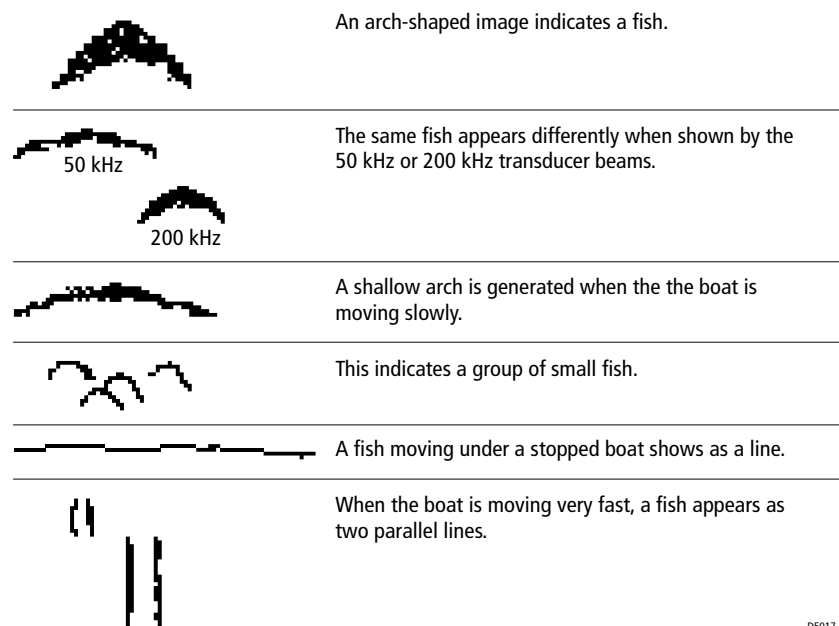
The Fishfinder provides a White Line feature which helps to distinguish between the bottom and fish (or other items such as weed) that are close to the bottom.

Fish Indications

When the Fishfinder detects a fish, it displays an arch-shaped mark. In general, a larger arch indicates a larger fish, though this rule is not always true. Let's say that there are two fish of the same size: one is close to the surface, the other is near the bottom. The fish which is close to the surface has a larger arch because, being closer, more sound waves get returned to the Fishfinder.

To display the depth of the fish, switch on the TARGET DEPTH ID from the SONAR SET UP menu, as described in *Section 7.4, Fishfinder Set Up Parameters*.

The sound waves are actually reflected by the swim bladder near the center of the fish, not by the body of the fish. The size of this swim bladder is different for different kinds of fish and this can affect the size of fish arches on the image. A fish with a large swim bladder produces a large fish arch, while a fish with a small one produces a small arch. Several arches together show a school of fish. Figure *Figure 4-1* illustrates some typical fish indications.

An arch-shaped image indicates a fish.

The same fish appears differently when shown by the 50 kHz or 200 kHz transducer beams.

50 kHz

200 kHz

A shallow arch is generated when the the boat is moving slowly.

This indicates a group of small fish.

A fish moving under a stopped boat shows as a line.

When the boat is moving very fast, a fish appears as two parallel lines.

D5017-2

Figure 4-1:   Fish Indications

Effect of Frequency and Boat Speed

The return from a fish has a different appearance depending on the frequency used: 50kHz produces a wide beam, so a fish spotted by this frequency gives a broad arch; the 200 kHz beam is narrower so the same fish produces a narrower arch.

The shape of the arch is also affected by the speed of the boat. If the boat is moving slowly, the arches tend to be longer; if the boat is moving more quickly, the arches are short and peaked. If the boat is moving very fast, a fish may be indicated by a single vertical line.

In Bottom lock mode the fish arches may appear distorted as the bottom topography is removed from the image.

Bottom Indications

The bottom usually produces a strong echo, so it is easy for the Fishfinder to see a lot of detail. The Fishfinder can indicate many different kinds of bottom conditions.

As illustrated in *Figure 4-2*, a hard bottom appears as a thin line.

A   Hard bottom (sand)

B   Soft bottom (mud)

C   Rocky bottom

D   White line feature on:
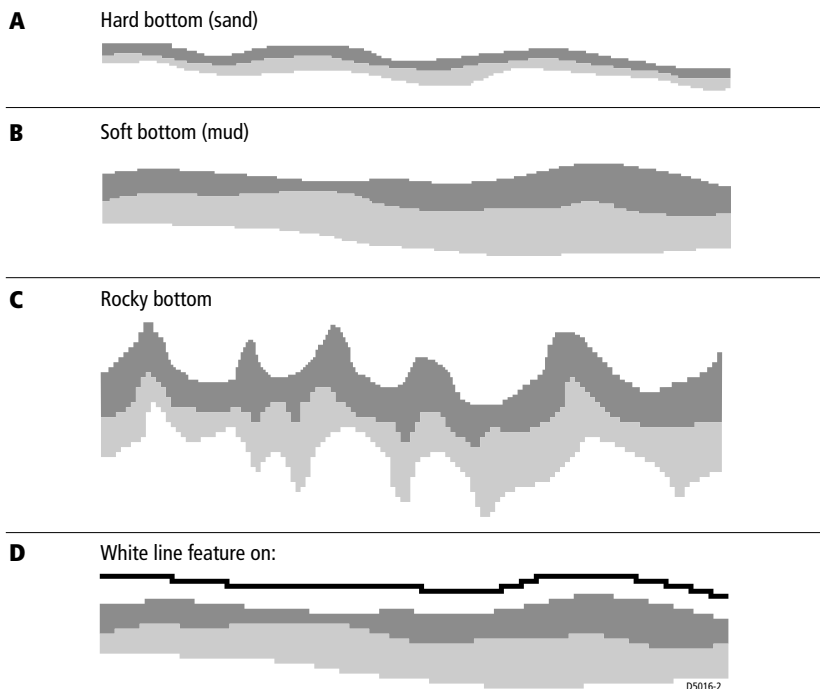
D5016-2

Figure 4-2:   Fishfinder Bottom Indications

An uneven bottom which is covered with rocks or coral produces a complex display; the bottom image is irregular, with long *tails* pointing upward. A wreck produces a similar image.

A softer bottom or a bottom covered with seaweed produces a wide line, as the sound waves reflect from different layers of the bottom. In Figure 4.2b, the Fishfinder is getting a good echo from the bottom, so the upper layer of the bottom is shown as dark gray.

Notice that the lower layer of the bottom is shown as a lighter gray, this indicates a weaker echo. This could mean that the upper layer is soft; some sound waves may get through this layer and be reflected as a more solid layer below.

It is also possible that the sound waves are making two complete trips – hitting the bottom, bouncing off the boat, then reflecting off the bottom again; this can happen if the water is shallow, the bottom is hard, or gain is set high.

Using White Line

The White Line feature separates echoes from fish near the bottom and the bottom itself. When the White Line is switched on, the Fishfinder displays the echoes differently.

With color LCDs, the strongest echoes are displayed in the background color with a thin line on top. All other echoes remain unchanged.

In the L755RC Plus monochrome LCD, the weakest echoes continue to be displayed in the background color white, but colors for the other signal are reversed. Thus, from the strongest to the second weakest the colors are: light gray with a thin black line on top, dark gray, black.
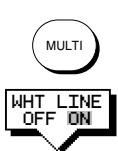
➤ To switch the white line feature on and off:

1. Press the **MULTI** key, the WHT LINE soft key is displayed.

2. Press the WHT LINE soft key to toggle the white line feature ON or OFF.

Adjusting Display Gain (Sensitivity)

The fishfinder provides controls for GAIN, COLOR GAIN, and STC. These controls, accessed from the **GAIN** key, are used to reduce background noise and determine how different strength echoes are shown. Automatic adjustment of GAIN or COLOR GAIN is available, alternatively you can manually adjust any of these parameters using the trackpad and you can fine-tune the auto-gain setting. You adjust gain for each transducer frequency independently.

The color bar on the right hand side of the display, when set to ON in the Fishfinder Set Up menu (see *Section 7.4*), shows the colors being used, with strongest echo color at the top and the weakest echo color at the bottom. The height of each bar indicates the range of signal strengths displayed in that color.

If you change the settings, the new GAIN, COLOR GAIN, or STC values and mode (auto or manual) remain set even when you turn off the display. However, any fine-tuning you make to auto-gain is removed when the unit is powered off.
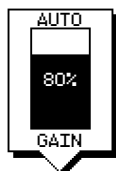
Gain

The GAIN, or sensitivity, of the display adjusts background noise by varying echo strength for display. The value of the GAIN control determines the strength above which echoes are displayed: If the gain is low only the strongest echoes are displayed; as the gain is increased more, but weaker echoes (from, say air bubbles) are displayed.

The display GAIN should be set high enough to see fish and bottom detail, but without too much background noise. Generally, a high gain is used in deep and/or clear water; a low gain in shallow and/or murky water.

The fishfinder provides automatic or manual GAIN adjustment. Automatic adjustment is based on depth and water conditions. As conditions change the auto-gain adjusts to display fish with a minimum of background noise. You can manually add a bias to the auto-gain setting. If you select manual adjustment, you will need to re-adjust the gain as conditions change.

Color Gain

The COLOR GAIN determines how echoes of different strengths are displayed. Three shades of gray (monochrome LCD) or seven colors (color LCD) per palette are available and the echo strengths are divided into three (monochrome) or seven (color) bands to correspond with each shade of gray/color.

The COLOR GAIN control sets the lower limit for the top color band:
All echoes with a signal strength above this value are displayed in the strongest shade/color.
All echoes weaker than this value are divided equally between the remaining shades/colors.

Setting a low value produces small band for the strongest color, but a wide signal band for the other colors; setting a high value gives a wide band for the strongest color, but a small signal band for the other colors.

Adjusting Display Gain (Sensitivity)

Note: *The color LCD Fishfinder also provides a* COLOR THRESHOLD *control to reduce the number of colors displayed. You can use* COLOR THRESHOLD *with* COLOR GAIN *to determine how echoes are displayed.*

The Fishfinder provides automatic or manual COLOR GAIN adjustment. Automatic adjustment displays colors based on current conditions, with as many colors as possible, while minimizing noise and clutter. As conditions change the auto-color gain adjusts. You can manually add bias to the auto-color gain settings. If you select manual adjustment, you will need to re-adjust the gain as conditions change.

STC

GAIN

S TC (Sensitivity Time Control) reduces surface clutter by reducing the gain in the top 30-40 ft of the display: A low STC value has little effect on gain in shallow water; a high S TC value decreases the gain in shallow water, thus only the strongest echoes are displayed.

25%

STC

This function is useful for reducing background noise, caused by air bubbles and floating debris, that often appears in shallow water.

➤ To adjust a parameter:

GAIN

1. Press the **GAIN** key, the gain sliders are displayed. The last used slider is highlighted (displayed in inverse video) to show that it is selected.

GAIN
ADJUST
200 50

2. If necessary on a split frequency display, press the GAIN ADJUST soft key to select the required frequency for adjustment.

Note: *On a single frequency display you adjust the gain for the displayed frequency.*

3. If necessary, press the required soft key so the slider is highlighted. Press it again, if necessary, to toggle between AUTO and MANUAL adjustment.

4. Use the trackpad to move the slider up or down. You can press and hold the trackpad to move the slider quickly rather than in single steps. The image on the screen changes as you move the slider and the value is indicated in the slider.

Note: *Because the changes to the settings are made immediately, you cannot revert to the previous settings by pressing* **CLEAR***.*

5. When you have set all the controls to the levels you require, press **ENTER** or **CLEAR** to return to the default display.
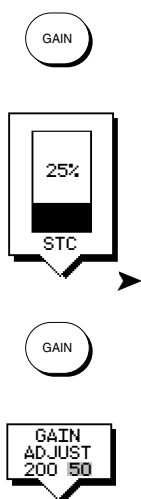
4.3 Fishfinder Data Window

The Fishfinder can display various measurements in large format data boxes.

Use the **DISPLAY** key options to select a data window that is vertically split with the full-screen fishfinder display. Three data windows are available, each window provides several large-format data boxes for specific information as follows:
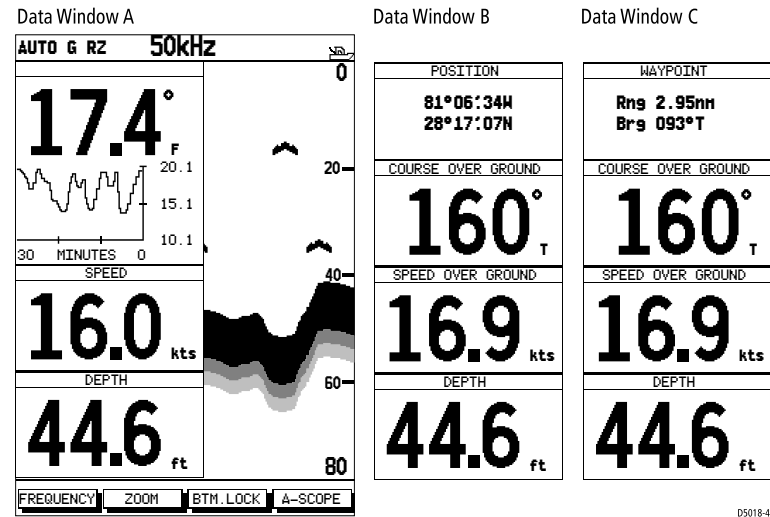

Figure 4-3:   Fishfinder Data Windows

- Data Window A – provides surface temperature with a 30 minute tempera-ture graph, speed through water and depth.
- Data Window B – provides position, course over ground (COG), speed over ground (SOG) and depth.
- Data Window C – provides waypoint range and bearing, course over ground (COG), speed over ground (SOG), and depth.

The data boxes display information in the units selected in system set up (see *Section 7.3*).

4.4 Using Alarms

ALARMS

The **ALARMS** key is used to set up alarms; three alarms are available to alert you of fish, shallow water and deep water. Each alarm can be toggled ON and OFF, and you set the depth at which shallow and deep water alarms are triggered (between the ranges 2–3000 feet/0.5–500 fathoms/1–1000 meters).

You may want to use the shallow and deep water alarms when you are anchored. Set the limits to just above and below your anchor depth; the Fishfinder triggers an alarm if the anchor drags and the boats moves into shallower or deeper water.

- Fish Alarm – If this alarm is ON the unit sounds a buzzer whenever it finds a fish. Different buzzer tones are used to indicate fish detected by the 50 kHz and 200 kHz frequencies.

- Shallow water – You set depth at which the shallow water alarm triggers. When the depth is less than that set, the buzzer sounds and a pop-up window describing the alarm is displayed. You cannot set the shallow alarm to be deeper than the deep alarm.

- Deep water – You set depth at which the deep water alarm triggers. When the depth is more than that set, the buzzer sounds and a pop-up window describing the alarm is displayed. You cannot set the deep alarm to be shallower than the shallow alarm. After you have acknowledged the sounding of a deep water alarm, a minimum of 30 seconds must elapse before a another depth alarm can sound again.

The top line status bar shows the condition of the alarms:

- ◁ indicates an alarm is enabled. The speaker symbol is unfilled until an alarm is triggered and silenced, then the symbol is shown solid.

- S indicates the shallow alarm is enabled; a pop-up window indicates when the alarm is triggered.

- D indicates the deep alarm is enabled; a pop-up window indicates when the alarm is triggered.

- ◁ indicates the fish alarm is enabled.

External Alarms

All SeaTalk system alarms (except autopilot, shallow and deep) alarms are received and displayed on the Fishfinder. You can silence these alarms by pressing any key. No other action is taken by the Fishfinder except to silence the alarm.

➤   To set an alarm

    1. Press the **ALARMS** key. The alarms soft keys are displayed.

    2. For the shallow or deep alarms, press the SHALLOW ALARM or DEEP ALARM
       soft key then use the up or down soft keys to change the alarm limit.
       Press the up arrow (right) soft key to select deeper water; press the down
       arrow (left) soft key to select shallower water.
       The depth is in the units selected in system set up (see section *Section 7.4*)

    3. If required, press the ALARM OFF ON soft key to toggle the alarm on or off.
       If you turn the shallow or deep alarm off, its value is retained and will be
       used when you turn the alarm on again.

    4. Press **ENTER** or **CLEAR** to save the changes and clear the list.

➤   To silence an alarm and clear the alarm message, press any key.

4.5 Using VRM to Determine Depth & Distance from Boat

The **VRM** (variable range marker) key is used on the Fishfinder to determine
the depth and distance-behind-boat of an object on the display. The **VRM**
function is available on the scrolling fishfinder display, bottom lock and zoom
windows.

A VRM is displayed as a cross hair with height and width of the display
window. The center of the crosshair is the reference for which depth and
distance-behind-boat are displayed. You can use the context-sensitive cursor
to move the VRM over a particular object.

Depth is displayed, in the system units, on the right hand edge of horizontal
line. In the scrolling fishfinder and zoom windows depth is measured from the
surface down. In the bottom lock window, depth is measure from the bottom
up.

Distance-behind-boat is displayed next to the vertical line, at the top of the
window. The VRM distance units correspond to the depth units assigned in the
System Set Up Parameters (see *page 7-4)* as follows:

System Depth Unit	VRM Distance Unit
Meters	meters
Feet	feet
Fathoms	feet

The distance-from-boat continues to update as your boat moves. However, the vertical line does not scroll with the scrolling fishfinder image. If the display range changes, the VRM adjusts its relative position so that it does not move out of the visible display area.

When you switch on the VRM, it is displayed at its last position (unless off screen, then it is displayed on-screen).

If the Fishfinder is in split frequency display mode or a zoom window is displayed with the scrolling fishfinder image, then the VRM is shown in both windows at the same position.
If bottom lock is displayed with the scrolling fishfinder image, then the crosshair lines appear in bottom lock window, but not in the scrolling fishfinder window.

➤ To switch the VRM on, or re-position an off-screen VRM:

VRM/EBL

1. Press **VRM/EBL**.
   The VRM is displayed in its last-used position.
   The cursor is positioned at the center of the crosshair and has control of the VRM, as indicated by four-way arrow, the solid crosshair and the text VRM.

2. Use the trackpad to position the center of the crosshair over the required object. The depth and distance-from-boat are updated as you move the cursor.

3. Press **ENTER** to drop the VRM. The crosshair is displayed as a dashed line.

➤ To move a VRM:

1. Move the cursor over the VRM you wish to change then press **ENTER**.
   The cursor is positioned at the center of the crosshair and has control of the VRM, as indicated by four-way arrow, the solid crosshair and the text VRM.

2. Use the trackpad to move the cursor and VRM to the required position.

3. Press **ENTER** to drop the VRM, or **CLEAR** to abandon the operation and return the VRM to its previous position.

➤ To switch the VRM off:

Either:

Press **VRM/EBL**. The VRM is switched off.

Or:

Move the cursor over the VRM, until the text VRM appears, then press **CLEAR**.

4.6 Waypoints

MARKS

The **MARKS** key lets you to place up to 998 waypoints. A waypoint is a position, normally entered on a chart as a reference, or as a place to go to. However, the *hsb²* Plus Series units with Raychart functionality (L755RC Plus, L760RC Plus, and L1250RC Plus) let you place waypoints in Fishfinder mode as well as Chartplotter mode.

Waypoints are described fully in *Chapter 5*. This section provides details that are specific to placing Waypoints in Fishfinder mode.

A waypoint can be placed at the cursor position or at the vessel's current position (this is sometimes known as an event mark); all waypoints placed on the Fishfinder are stored in a waypoint database list with position, depth and temperature when it was placed.

Waypoints placed on the Fishfinder are displayed as a solid vertical line on the scrolling bottom, Zoom and Bottom Lock displays. The waypoint number is shown at the top of the vertical line. The waypoint scrolls to the left with the scrolling bottom display.

If you place a waypoint at the cursor position in Fishfinder mode, and a chart window is open, the waypoint is displayed on the chart. You can GOTO, EDIT and ERASE a cursor waypoint.

Note: *When in chart mode, if you place a waypoint at the cursor position, it is not shown on the Fishfinder display.*

If you place a waypoint at the vessel position in Fishfinder mode it is shown in the chart window.

Placing a Waypoint

➤ To access the place waypoint soft keys, press **MARKS**:

MARKS

PLACE WPT | PLACE WPT | WAYPOINT
AT CURSOR | AT VESSEL | LIST

D4169-1

➤ To place a waypoint at the cursor position or at the vessel position:

1. Press either the PLACE WPT AT CURSOR or the PLACE WPT AT VESSEL soft key. The waypoint is added to the waypoint list and tagged using the next available number.

2. Press **CLEAR** or **ENTER** to remove the place waypoint soft keys.

Waypoints

➤ To place a waypoint using the Waypoint List:

MARKS

1. Press **MARKS**, followed by the WAYPOINT LIST soft key. The Waypoint List and associated soft keys are displayed.

WAYPOINT
LIST

```
┌──────────────────────────────────────────┐
│           WAYPOINT LIST                    │
├──────────────────────────────────────────┤
│      SYMBOL              NAME               │
├──────────────────────────────────────────┤
│        ⚓        WAYPOINT 001               │
│        ✕        WAYPOINT 002               │
│        ✕        WAYPOINT 003               │
│        ✕        WAYPOINT 004               │
│        ✕        WAYPOINT 005               │
├──────────────────────────────────────────┤
│  POSITION          50°21'966N              │
│                    001°20'368W             │
├──────────────────────────────────────────┤
│  BRG _186°        RNG _21.0nm              │
├──────────────────────────────────────────┤
│  TEMP  ___°C       DEPTH ___m              │
│                                            │
│  DATE  __/__/__    TIME  __:__:__          │
└──────────────────────────────────────────┘

  ┌────────┐ ┌────────┐ ┌────────┐ ┌────────┐
  │ GOTO   │ │ EDIT   │ │MAKE NEW│ │WAYPOINT│
  │WAYPOINT│ │WAYPOINT│ │WAYPOINT│ │TRANSFER│
  └────────┘ └────────┘ └────────┘ └────────┘
                                          D4262-2
```

2. Press the MAKE NEW WAYPOINT soft key.

MAKE NEW
WAYPOINT

The waypoint is placed at the current vessel position, or if not available, the cursor position. It is added to the Waypoint List and named with the next available number.

To return to the default soft key display, press **ENTER** or **CLEAR** three times.

➤ To GOTO a cursor waypoint see *Going To an Individual Target Point* on *page 5-33*.

➤ To ERASE a cursor waypoint see *Erasing a Waypoint* on *page 5-15*.

4.7 MOB

If you lose a person or object overboard, and need to return to the location, you should use the Man Overboard (MOB) function.

You can select the type of data used for the MOB position using the set up menus (see *Section 7.3*).

Note: *To obtain MOB position, you need either of the following:*

- Position data from a GPS or equivalent device
- Heading and speed data, so that the position can be calculated by dead reckoning

➤ To initiate the MOB procedure, press and hold the **MARKS** key for two seconds. The system then performs the following tasks automatically:

- Marks the Fishfinder image with a vertical line and the letters MOB.
- Marks the current position on the chart display with a MOB symbol 🔯.
- Displays the MOB data box, showing the bearing and distance from your vessel to the MOB waypoint position, and the elapsed time since the MOB was initiated (*Figure 4-4*).
- Sounds a 4-second alarm pattern every 30 seconds.
- Sends an MOB message (including bearing and distance) to other units in the system, via the SeaTalk connection.
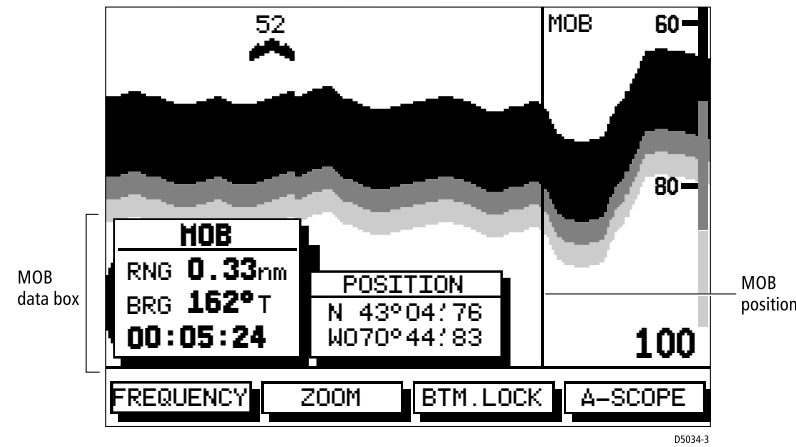
Figure 4-4:   MOB Display

➤ To cancel the MOB, press and hold the **MARKS** key for 2 seconds. The MOB symbol and data box are removed.

Note: *The MOB procedure can also be initiated or cancelled if the appropriate SeaTalk message is received by the display unit.*

MOB

Chapter 5: Standard Chart Operations

5.1 Introduction

This chapter explains how to navigate using the chart functions that are available with the L755RC Plus, L760RC Plus, and L1250RC Plus Combined Fishfinder/Chartplotter Displays. Chart functions are also available on L1250 Plus and L760 Plus fishfinder-only units, when connected to an *hsb²* Plus Series device with chartplotter functionality (see *Section 2.7, Integrated Systems*). This chapter covers the following topics:

- Using chart cards
- Controlling waypoints, including placing, moving, editing and deleting waypoints
- Working with routes, including creating a new route, managing routes using the route database and editing routes
- Following routes and going to waypoints
- Transferring Waypoints and Routes
- Using tracks, including showing tracks, track set up and saving tracks

All these chart functions are available in plotter mode, so you can plot and track routes at large scales even when a chart card is not installed.

Further functions, including measuring distances and setting alarms are described in *Chapter 6*.

Safety

The chartplotter makes it very easy to place a waypoint and travel towards it. However, you should always check first that the route is safe. If you are using the chartplotter in combination with a SeaTalk autopilot, the autopilot will prompt for confirmation before it steers the vessel towards the waypoint.

If you have entered your route using a small-scale chart, zoom in to a larger scale to check for hazards, such as small shoals, that may not be shown on the smaller scale charts.

Note: *Until you are familiar with interpreting the chart display, you should take every opportunity to compare the displayed objects with visual targets, such as buoys and coastal structures. You should practice harbor and coastal navigation during daylight and in clear weather conditions.*

Introduction

CAUTION:
The equipment should not be used as a substitute for good navigational practice nor for official government paper charts.

5.2 Using Chart Cards

The chartplotter has a built-in world map; most areas are displayed on a scale of 4000 nm from the top to the bottom of the screen, and can be zoomed in to 150 nm.

To use the chartplotter as a navigation aid, charts with detailed information for the area you wish to navigate are required. The charts are available on C-MAP NT and NT+ electronic chart cards (C-Cards), each of which can store as many as 20 charts in an electronic format. A single C-MAP chart normally provides as much information as is available in paper charts for that geographic area, and can be displayed down to a range of 1/64 nm on the screen if the data is available.

Two card slots are provided on the display unit. Chart data from both slots can be downloaded.

The chart scale in use is indicated in the status bar - the number represents the distance (in nautical miles) displayed from the top of the screen to the bottom of the screen.

Note: *You can remove and insert cards while a chart is displayed. The chart information is retained on-screen until the chartplotter redraws the screen: for example, when you pan outside the current area, or use the **RANGE** key to change the chart scale.*

Data on a chart card is also available to a repeater display, which can be used independently of the master. When the master display is switched off chart data is retained on the repeater screen until the chart is redrawn.

Inserting a Chart Card

➤ To insert a chart card:

1. Check that the card is a C-MAP NT or NT+ C-Card with the required chart stored on it.

2. Open the card cover, at the lower left of the display front panel.

3. Hold the card with the title label towards the left, as shown in the illustration.

4. Gently push the card into one of the two slots. The card will only go in if it is correctly oriented. Push the card in as far as it will go, then move it to the right so that the top is under the retaining pegs. The card will be held in place by the pegs.

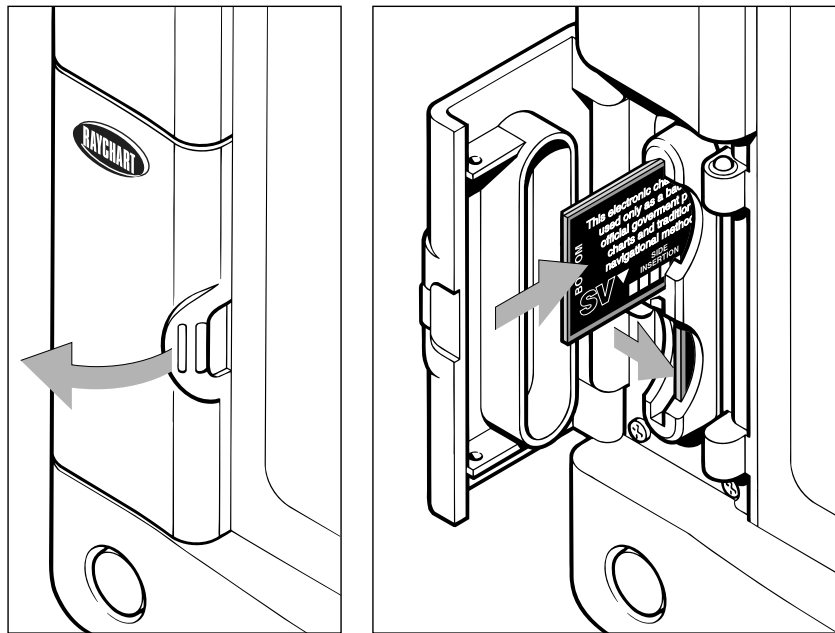5. Close the card cover until it clicks shut, to prevent water entering the display unit.

D4158-2

Figure 5-1:   Inserting the Chart Card

Removing a Chart Card

➤   To remove a chart card:

1. Open the card cover, at the lower left of the display front panel.

2. Press on the card you wish to remove, and move the top of the card to the left to clear the retaining pegs.
   The card will spring half-way out, enabling you to grip the card and remove it from the slot.

3. Remember to close the card cover so that it clicks shut, to prevent water from entering the card reader assembly.

Displaying the Chart Data

The new chart information will be displayed when you move the cursor into an area covered by the new chart or, if it is already in the area, change the range scale.

If an *hsb²* Plus Series repeater display is connected, the chart can also be accessed by the repeater display. To see the chart you may need to zoom or pan, to redraw the chart area to the screen.

The boundary of each chart digitized in the current card is defined by a box or rectangle. (You can switch off the chart boundaries display if you wish, as part of the chartplotter set up described in *Section 7.5*.)

➤   To zoom in:

1. Use the trackpad to move the cursor inside one of the chart boxes, and press the lower part of the **RANGE** key.

   That area is expanded, with the cursor at the center, so that you can see more detail. Note that the smaller the chart box is on the screen, the further you can zoom in and the greater the amount of detail that is available.

   If you have switched on Plotter Mode (see *Section 7.5*), you can zoom in further than the most detailed chart; all chart functions remain available.

Displaying Chart Object and Source Information

Chart cards include a number of displayed objects for which information is available, such as lights and buoys. They also contain additional source data for structures, lines, open sea areas etc. You can use the context-sensitive cursor to identify (in a pop-up box) an object or chart position and you can obtain detailed information for the selected item.

Set up options let you specify when an identification pop-up is displayed; three options are available:

• Display a pop-up for *all* objects and source data automatically when the cursor is over the object symbol or source area.

• Display a pop-up for displayed objects when the cursor is over the symbol.

• Do not display the identification pop-ups.

The chartplotter also provides information for the nearest waypoint, port facility, tide station, wreck or obstruction for a selected position. If your chart includes port and tide data, this can be displayed.

➤ To identify and item and obtain detailed information:

1. Move the cursor over the symbol or chart position for which you require the information. If specified in Chart Set Up, a pop-up box such as the following is displayed at the lower left or upper right corner of the screen:

```
              1 Object
FAIRWAY BN Bn Safe Water RW
    LFI.W.10s7m5M
```
D4260-2

2. To view detailed information, press **ENTER**. The details available are listed on-screen in an object information pop-up.

   The pop-up is split into two windows; objects are listed in the upper win-

dow and details for the selected object are provided in the lower window. Use the trackpad to select an object in the upper window and use the soft keys to scroll up or down the detailed information in the lower window.

3. Press **CLEAR** to remove the pop-up from the screen and return to the default display.

Port Area

At large chart scales port area information is indicated by the symbol ⬤. An object information pop-up provides the name of the marina or port and a list of the facilities available.

Where available, details for each facility can be displayed. This information includes items such as accommodation, slip sizes, fueling, sanitation, electrical or other maintenance services provided, VHF channels monitored, and other safety and navigation information.

In some areas the chart shows symbols for individual facilities. The facilities and their associated symbols are illustrated in *Figure 5-2*.

Displaying Chart
Object and Source
Information
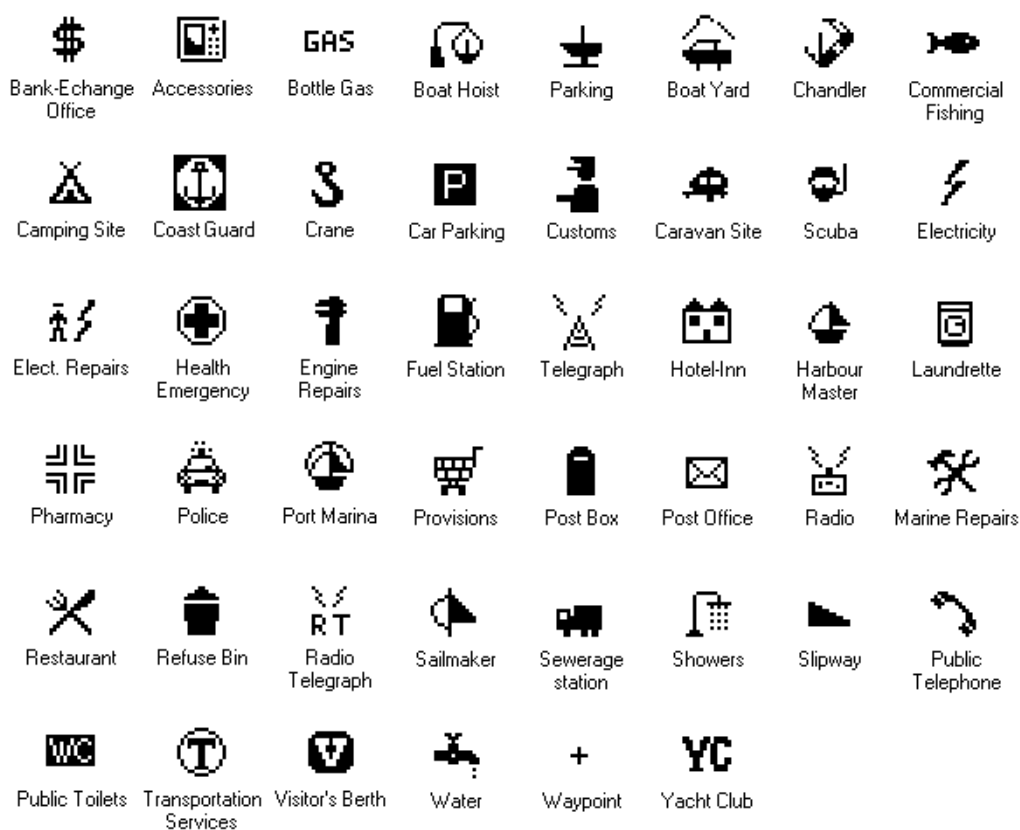
Figure 5-2:   Port Symbols

Tide Data

The symbol ⬦ indicates tide height data is available for that position on the chart. When you select the tide height option, a graph of predictions for maximum and minimum tide heights is displayed, data for sunrise and sunset is also provided as illustrated *Figure 5-3*.

Note: *The predictions available are sufficiently accurate under moderate weather conditions, for the coastal areas served by the reference station, to be used for navigation planning. However, certain weather fronts and storms can alter tidal patterns and influence predicted times and heights.*

The cursor, represented by a dotted vertical line on the graph, is used to select a time for which the tide height is displayed.
You can use the soft keys and trackpad to change the date for which tide information is shown.
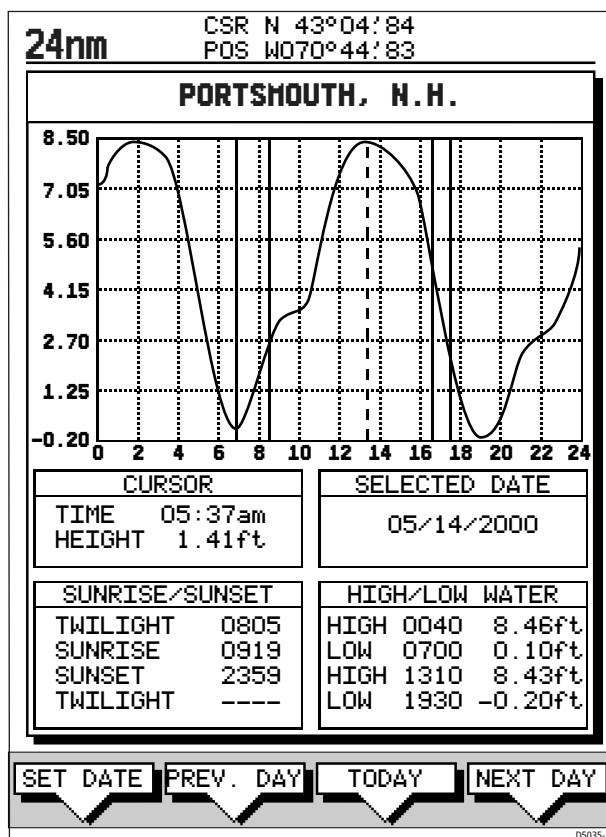
Figure 5-3:   Tide Data

➤ To select a time, use the trackpad to move the cursor to the required time.

➤ To change the day press PREV. DAY, DAY or TODAY, as required. Alternatively, press SET DAY; to change date, use the trackpad to move the cursor left/right to select the character and up/down to increase/decrease the value.
The graph and tide data will be updated accordingly.

Nearest

You can obtain information for the eight nearest waypoints, port services, ports, tide stations, wrecks, or obstructions for a selected position. The chartplotter also provides options to redraw the chart with a selected item at the center, Goto a waypoint and display a list of all the port on the chart card.

➤ To obtain the information for the nearest objects:

1. Move the cursor to the required position, and then press **ENTER** to display the object information pop-up.

2. Press the NEAREST soft key. The Find Nearest pop-up list is displayed. Use the trackpad to highlight the required object, and then press **ENTER**.

   i. For port services the port service symbols are displayed. Use the track-pad to highlight the required service, and then press **ENTER**.
   If you select a port then press **ENTER**, detailed information for the service at that port are displayed. Typical port data is shown in *Figure 5-4*.

Figure 5-4:   Nearest Port - Typical Data

   ii. For all other items, the eight nearest objects are listed with distance and bearing.

Displaying Chart
Object and Source
Information

Soft keys provide you with options to EXPAND port, wreck and obstructions data; view a FULL LIST of ports detailed on the chart card; SHOW TIDE data; GOTO a waypoint and FIND the object (redraw the chart with the object at the center). Use the trackpad to highlight an object, then press the required soft key.

3. To return to the default display, press **CLEAR** to back-track through the pop-up lists.

5.3 Working with Waypoints

Introduction

The Chartplotter enables you to place up to 998 waypoints. (Waypoint number 999 is used for MOB operation.) A waypoint is a position entered on a chart as a reference, or as a place to go to. All waypoints placed on the chartplotter are stored in a waypoint database list, which includes symbol, position, bearing, range and additional data. All waypoints in the database are displayed on the screen, unless you set waypoint display off in the Chart Set Up menu, as described in *Chapter 7*. You can select a waypoint, either on-screen or from the list, for editing.

A waypoint can be placed at the cursor position or at the vessel's current position (sometimes known as an event mark). A waypoint at the vessel position includes additional information (if available) on the depth and temperature when it was placed. Alternatively, you can manually enter Waypoints as either Lat/Long coordinates or Loran TDs which are automatically converted into Lat/Long coordinates. All waypoints can be included in a route. You can place waypoints, using simulator mode, before you install the chartplotter on your vessel.

Note: *Radar marks may also be displayed on the screen if your chartplotter is part of an integrated system; these are screen annotations - you cannot go to marks, nor can they be included in routes.*

When you place a new waypoint, it is displayed using the default symbol of a cross (unless you have changed the symbol in Chart Set Up). The waypoint is added to the waypoint list and tagged with the next available number. You can use the edit functions to change the symbol and name. When the cursor is positioned over a waypoint, the waypoint bearing and range are displayed.

Waypoints in the current route are available on other SeaTalk instruments that support current route transfer, for example, another *hsb²* Plus Series Chartplotter or the ST80 Masterview. You can also transfer waypoints between the chartplotter and other NMEA or SeaTalk instruments using the Waypoint Transfer functions.

This section explains how to perform the following tasks using the on-screen cursor and the waypoint list:

Working with
Waypoints

- Placing a Waypoint
- Selecting a Waypoint
- Displaying Waypoint data
- Editing a Waypoint (symbol, name & position)
- Erasing a Waypoint
- Moving a Waypoint

At the end is a section about using the ST80 Navigator Keypad to select, edit, and name your waypoints.

Placing a Waypoint

The scenario *Place and Goto a Waypoint* on *page 5-44* provides a simple example of how to place a waypoint.
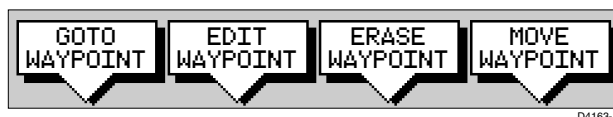
➤ To access the place waypoint soft keys, press **MARKS**:

MARKS

| PLACE WPT AT CURSOR | PLACE WPT AT VESSEL | WAYPOINT LIST | LOAD/SAVE USER CARD |

D5572-1

➤ To place a waypoint at the cursor position or at the vessel position:

PLACE WPT AT CURSOR

PLACE WPT AT VESSEL

1. Press either the PLACE WPT AT CURSOR or the PLACE WPT AT VESSEL soft key. The waypoint is added to the waypoint list and tagged using the next available number.
The waypoint soft keys are displayed until you move the cursor away from the waypoint or press **CLEAR**.

| GOTO WAYPOINT | EDIT WAYPOINT | ERASE WAYPOINT | MOVE WAYPOINT |

D4163-1

You can use the EDIT WAYPOINT soft key to name the waypoint as described in Editing Waypoints below.

2. Press **CLEAR** or **ENTER** to remove the place waypoint soft keys.

➤ To place a waypoint as latitude/longitude using the Waypoint List:

MARKS

WAYPOINT LIST

1. Press **MARKS**, followed by the WAYPOINT LIST soft key. The Waypoint List and associated soft keys are displayed.

Placing a Waypoint

```
┌─────────────────────────────────────┐
│          WAYPOINT LIST              │
│   SYMBOL          NAME              │
│     ⚓        WAYPOINT 001          │
│     ✕        WAYPOINT 002          │
│     ✕        WAYPOINT 003          │
│     ✕        WAYPOINT 004          │
│     ✕        WAYPOINT 005          │
│  POSITION        50°21'966N         │
│                  001°20'368W        │
│  BRG _186°       RNG _21.0nm        │
│  TEMP  ___°C     DEPTH ___m         │
│  DATE  __/__/__  TIME  __:__:__     │
└─────────────────────────────────────┘
```

| GOTO WAYPOINT | EDIT WAYPOINT | MAKE NEW WAYPOINT | WAYPOINT TRANSFER |

D4262-2

MAKE NEW WAYPOINT

2. Press the MAKE NEW WAYPOINT soft key followed by the LAT/LONG soft key; the WPT POSITION (LAT/LONG) screen is displayed, with it's associated soft keys. The waypoint is placed at the current vessel position, or if not available, the cursor position.

3. You can use the soft keys to edit the waypoint position as described in *Editing the Waypoint Details* on *page 5-13*.
    It is added to the Waypoint List and named with the next available number.

To return to the default soft key display, press **ENTER** or **CLEAR** twice.

➤ To place a waypoint as Loran TDs using the Waypoint List:

1. Press **MARK**, followed by the WAYPOINT LIST soft key; the Waypoint List and associated soft keys are displayed.

2. Press the MAKE NEW WAYPOINT, the waypoint is placed at the current vessel position, or if not available, the cursor position. To change the position press the LORAN TDs soft key; the WPT POSITION (LORAN TDs) screen is displayed, with it's associated soft key:

```
      WPT POSITION (LORAN TDs)

CHAIN   6731 - NELS Lessay
SLAVES  Y - Z (24 -39)
TD 1    29138.0
TD 2    44713.8
ASF 1   +0.0
ASF 2   +0.0
```

```
  CHAIN   ASF1/ASF2  SET TD 1   SET TD 2
```
D5591-1
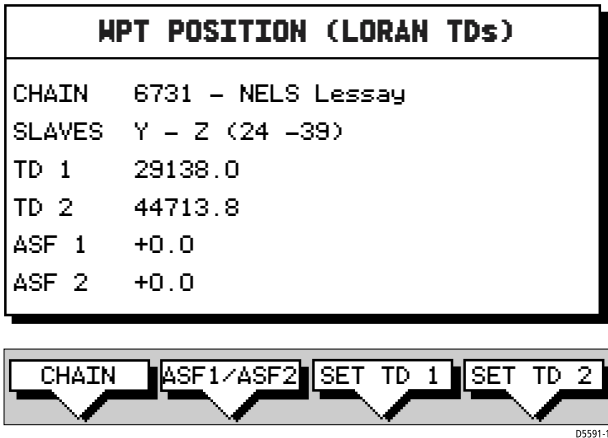
Note: *You can enter waypoints as Loran TDs which are converted to Lat/
Long coordinates. However, although the waypoint is shown in both Lat/
Long and Loran TDs in the Waypoint List, you can subsequently only edit
the position as Lat/Long coordinates. TD entries in the Waypoint List are
shown only for those waypoints which were entered as TDs.*

3. Edit the Loran parameters as required, using:

   i. The CHAIN soft key, which enables selection of both the Chain and it's
       Slave:

```
      WPT POSITION (LORAN TDs)

CHAIN   6731 - NELS Lessay
SLAVES  Y - Z (24 -39)
TD 1    29138.0
TD 2    44713.8
ASF 1   +0.0
ASF 2   +0.0
```

```
  SELECT  CHAIN         SELECT  SLAVES
```
D5592-1
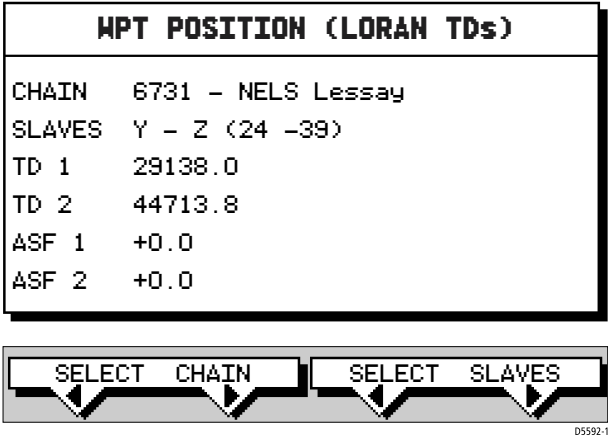
   ii. The ASF1/ASF2 soft key, which presents two soft keys for editing ASF 1
       and ASF 2 parameters independently:

```
SET ASF 1  SET ASF 2
```
D5593-1

   iii. The SET TD 1 and SET TD 2 soft keys, which enable editing of each TD's
        parameters independently.

Placing a Waypoint

Note: *Except for the* CHAIN *setting, parameters are edited using the trackpad as described in Editing the Waypoint Details on page 5-13.*

4. When editing is complete, press the **ENTER** key to save the waypoint or **CLEAR** to cancel the operation; the display returns to the New Waypoint screen.

   Press the **ENTER** or **CLEAR** to return to the Waypoint List.

Selecting a Waypoint

Positioning the cursor over a waypoint selects that waypoint and accesses the waypoint soft keys. These keys enable you to GOTO (described in *Section 5.5*), EDIT (symbol, name, position), ERASE or MOVE the waypoint.

Selecting a waypoint from the List allows you to GOTO and EDIT (symbol, name, position, erase) the waypoint. The Waypoint List also provides options to make a new waypoint and transfer waypoints.

➤ To select a waypoint using the cursor:

1. Move the cursor over the waypoint, until the letters WPT are displayed. The Waypoint Data box (see *Waypoint Data Display* on *page 5-13*) and the following soft keys are displayed:
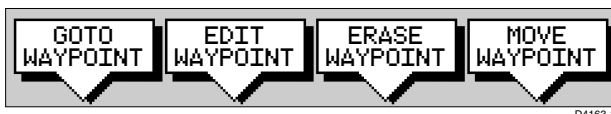
The selected waypoint can be edited via these soft keys.

➤ To select a waypoint using the Waypoint List:

1. Press **MARKS**, followed by the WAYPOINT LIST soft key.
   The Waypoint List and associated soft keys are displayed.
   The list details all waypoints in alpha-numeric order. The selected waypoint is indicated by the selection bar; its position, bearing and range are provided.

2. Use the trackpad to move the selection bar up and down the list to highlight the required waypoint.

   or

   Use the ST80 Navigator to select to highlight the required waypoint, as described in *Using the ST60 or ST80 Navigator Keypad* on *page 5-16*.

The selected waypoint can be edited via the soft keys displayed.

Waypoint Data Display

Waypoint data can be viewed in two ways: you can use the context-sensitive cursor to select the waypoint and thus display the waypoint data box, or you can view waypoint details on the waypoint list.

Note: *To permanently display the target waypoint data box, select it in the System Set Up menu (see Section 7.3) and use the SCREEN soft key to switch data boxes on.*

➤ To display the waypoint data box, move the cursor over the waypoint. The waypoint data box is displayed, this indicates waypoint number/name, bearing and range (or latitude and longitude if selected in the system set up menu).

```
 WAYPOINT 001
BRG    191°T
RNG    2.2nm
```
D4250-1
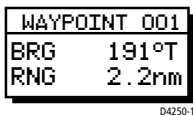
While the cursor is over the waypoint, the waypoint soft keys are displayed.

➤ To remove the waypoint data box and soft keys either:

Move the cursor away from the waypoint, or press **CLEAR**.

➤ To display the waypoint details from the waypoint list:

MARKS

WAYPOINT
LIST

Select the waypoint in the list as described above. The details for the selected waypoint are displayed in the lower half of the window. Temperature, depth, date and time are included (if available) for waypoints placed at the vessel position.

To remove the Waypoint List and return to the default soft key display, press **CLEAR** twice.

Editing the Waypoint Details

You can change the name, symbol and position of any waypoint.

➤ To edit a waypoint:

1. Select the waypoint, using the cursor or the waypoint list, as previously described. The waypoint soft keys are displayed.

EDIT
WAYPOINT

2. Press the EDIT WAYPOINT soft key. The Edit Waypoint soft keys are displayed:

```
 SYMBOL      NAME      POSITION
```
D4166-1
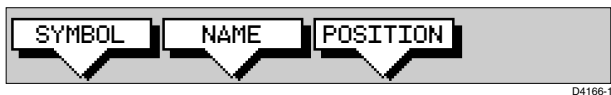
3. To edit the symbol, press the SYMBOL soft key.

Waypoint Data
Display

Use the soft keys, shown in the following illustration, to highlight the required symbol, then press **ENTER** to confirm the selection.

Press **ENTER** or **CLEAR** to return to the default soft keys.
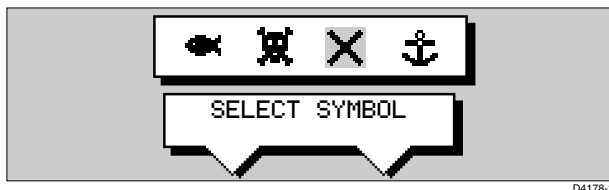
4. To edit the waypoint name, press the NAME soft key. The NAME WAYPOINT window is displayed.

Using the trackpad to edit the name:

iv. Use the left or right side of the trackpad to move the cursor to the character you wish to change.

v. Then use the top or bottom of the trackpad to scroll through the characters.

Using the ST80 Navigator Keypad to edit the name:

i. Use the left or right arrows of the Navigator's keypad to move the cursor to the character you wish to change.

ii. Use the up and down arrow keys to scroll through the characters.

or

Use the alphanumeric keypad to change the character, as described in *Using the ST60 or ST80 Navigator Keypad* on *page 5-16*

When you have finished editing the name, to remove the window, press **ENTER** to save the name or **CLEAR** to cancel the operation. The waypoint name replaces the waypoint number.

Press **ENTER** or **CLEAR** to return to the default soft keys.

5. To edit the waypoint position, press the EDIT WAYPOINT soft key, followed by POSITION. The Waypoint Position pop-up is displayed.

Use the soft keys to select LAT, LON, BRG or RNG.

Using the trackpad to edit the value:

i. Use the left or right side of the trackpad to move the cursor to the character you wish to change.

ii. Use the top or bottom of the trackpad to scroll through the characters.

iii. Adjust each parameter until the waypoint position is correct.

Using the ST80 Navigator Keypad to edit the value:

i. Use the left or right arrows of the Navigator's trackpad to move the cursor to the character you wish to change.

ii. Use the up and down arrow keys to scroll through the characters.

or

Use the alphanumeric keypad to change the character. Press the **def/2** key for East, **mn/5** for North, **rst/7** for South, and **uvw/8** for West.

iii. Adjust each parameter until the waypoint position is correct.

When you have finished editing the position, press **ENTER** to save the position or **CLEAR** to cancel the operation.

Press **ENTER** or **CLEAR** again, the Waypoint Position window is removed from the screen and the default soft keys are displayed.

Erasing a Waypoint

You cannot erase the target waypoint or waypoints that are used in routes. However, you can remove a waypoint from the current route - see *Editing a Route* on *page 5-28*.

If you try to erase a waypoint that is used in a saved route you are warned "WAYPOINT IS USED IN A ROUTE & CANNOT BE DELETED"

➤ To delete a waypoint using the cursor:
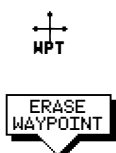
1. Move the cursor over the waypoint, until the letters WPT are displayed. The waypoint soft keys are displayed.

2. Press the ERASE WAYPOINT soft key. The waypoint is removed from the screen and the Waypoint List is updated.

Note: *If you have stopped a GOTO (see Stop Follow or Stop Goto on page 5-34), the target waypoint remains displayed as a target; you need to use the CLEAR GOTO soft key before you can erase the waypoint using the cursor.*

➤ To delete a waypoint using the waypoint list:

1. Select the waypoint from the waypoint list as previously described. The waypoint list soft keys are displayed.

2. Press the EDIT WAYPOINT soft key, followed by ERASE WAYPOINT. The waypoint is removed from the screen and the waypoint list is updated.

Moving a Waypoint

You can move any waypoint except the target waypoint (the waypoint you are following). You can use the Waypoint soft keys and cursor to move the selected waypoint, or you can edit the waypoint position.

CAUTION:
Take care when editing waypoints as it is possible to move waypoints that are used in routes stored in the Route Database.
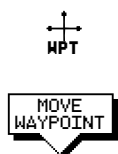
➤ To move a waypoint using the cursor:

1. Move the cursor over the waypoint, until the letters WPT are displayed. The waypoint soft keys are displayed.

2. Press MOVE WAYPOINT, the cursor changes to a four-headed arrow.

3. Move the cursor to the required waypoint position.
   Press **ENTER** to set the position and return to normal cursor control.
   Press **CLEAR** to cancel the operation.

➤ To move a waypoint using the Waypoint Edit functions:

1. Select the waypoint using either the cursor or the waypoint list as described above. The waypoint soft keys are displayed.

2. To edit the waypoint position proceed as previously described in *Editing the Waypoint Details* on *page 5-13*.

Using the ST60 or ST80 Navigator Keypad

If you have an ST60 or ST80 Navigator Keypad connected on SeaTalk it can be used to name or edit your waypoints, tracks, or routes on any display in the system. The keypad can also be used to select entries in the Waypoint List. The Navigator provides 10 dedicated alphanumeric keys, a multidirectional cursor control pad, plus Insert and Delete keys.

Note: *When using the Navigator Keypad, you should be aware that it can control several displays simultaneously; any display in edit mode (i.e. ready for alpha-numeric data entry) will be affected by the Navigator Keypad.*
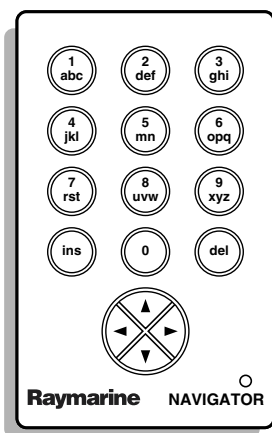
D1934-2

Figure 5-5:   ST60/ST80 Navigator Keypad

Most of the alphanumeric keys are used to input multiple characters. Each time you press one of these keys in succession, the next character on that key is input. For example, each press of the **1** key alternately inputs A, B, C, then 1.

The Navigator's arrow keys function much like the fishfinder's trackpad, enabling you to move the cursor position or input alpha, numeric, or special characters (. , - / ' &).

The **ins** key functions the same as the **ENTER** key on fishfinder and **del** inserts a space during edit mode.

Selecting an Entry in the Waypoint List

The Navigator can be used to select an existing item in the Waypoint List. This can be accomplished using the arrow or alphanumeric keys.

➤ To select an existing item in the Waypoint List:

1. Use the up and down arrow keys to move the selection bar up and down the list to highlight the desired entry, just as you would with the fishfinder's trackpad.

    or

    Press the alphanumeric key that contains the first letter or number of the desired waypoint name. The selection bar moves to the entry starting with that letter or number.

    If more than one entry begins with that character, the selection bar moves to the first one in the list. Each time the same key is pressed, the selection bar moves to the entry starting with the next character on the key. If no entry exists for that character, the entry starting with the nearest previous character is selected. If the numeric value of the key is input when no numeric entry exists, the selection bar moves to the first alpha entry.

    For example, let's say we have four waypoints named ORION, POLARIS, QUANTUM, and 6-GUN. Pressing the **opq/6** key four successive times would select the waypoints ORION (O), POLARIS (P), QUANTUM (Q), then 6-GUN (6). However, pressing the **rst/7** key four successive times would select QUANTUM for the first three key presses because entries beginning with the associated letters do not exist and Q is the next previous beginning letter. The fourth press of the **rst/7** key would select 6-GUN because no entries begin with a 7 and 6 is the next previous beginning number.

2. Use the **ins** key like the fishfinder's **ENTER** key, to close the Waypoint List.

    The **del** key and left and right arrow keys do not function in select mode.

Editing Entries in the Waypoint, Route, or Track Lists

You can also use the ST80 Navigator Keypad to edit an existing item or to name a new item in the Waypoint List, Route List, or Track List. You first must enter the edit mode for the list you want to modify. Methods for editing each list are described in the respective sections of this chapter.

➤ To edit an item in a list using the Navigator:

1. If necessary, use the right and left arrow keys to move the cursor to the desired character position.

2. Press an alphanumeric key until the desired character is displayed. Each time you press one of these keys in succession, the next character on that key is input.

    or

    Use the up and down arrow keys to scroll through the list of alpha, numeric, and special characters until the desired character is displayed (just as you would with the fishfinder's trackpad). Note that you must use this method to input special characters; they are not available using the alphanumeric keys.

    Use the **del** key to insert a space, if required.

3. Use the arrow keys and alphanumeric keys to input the remainder of the characters required to complete the editing.

4. When done, press the **ins** key to enter your changes.

5.4 Working with Routes

A route is made up of a series of waypoints (maximum 50). To make a route you place a series of waypoints on the chart.

When a route is created it becomes the current route and is displayed on-screen. The current route is maintained when you power-off. Only one route can be current and is displayed (if it is in the field-of-view) as solid lines connecting waypoints. If you are following the route, the current leg is shown as a dotted line and previous legs are removed from the screen (although the waypoints remain displayed). The current route (and its waypoints) is transferred via SeaTalk to a repeater chart display and other instruments. You can also use the Waypoint Transfer functions to transfer the route database to a repeater display.

Once you have created a route you can use the GOTO soft keys to follow the route. In addition, the GOTO default soft key provides various options as described in *Section 5.5*.

Up to 20 routes can be saved in the route database. You can then select a route from the database list as the current route.

The current route can be edited by adding and moving waypoints. The current route is always placed in the database list as route number 0, so you can edit the current route without affecting the original route in the database. Once a route has been saved, options are also provided to name a route, erase a route and to display route details.

You can use the route information to review your passage plan by adjusting the planned Speed Over Ground (SOG).

Note: *The route database is stored locally, in the display unit on which it was created. Although the current route is automatically transferred, you need to use the WAYPOINT TRANSFER function, described in Section 5.6, to transfer the complete route database to a repeater display connected via* **hsb²**.
Also, it is possible for the current route to be overwritten by a route from another unit on an integrated system, so it is advisable to save all routes.

This section explains how to perform the following tasks:

- Creating a new route.
- Saving the current route in the database list.
- Clearing the current route.
- Retrieving a route from the database list as the current route.
- Displaying route information, including the route leg data and waypoint details. Use the waypoint details to review your passage plans for different speeds.
- Using the database list to erase and name existing routes.
- Editing a route by adding, removing and moving waypoints.

➤ To access the route soft keys, press the default soft key ROUTE:

Creating a New Route

Note: *If there is a current route, it is cleared when you select* MAKE ROUTE. *If you are following the current route you are prompted to* STOP FOLLOW. *Press the* YES *soft key to continue, or* NO *to abandon route creation. If the route has not been saved you are prompted to save it.*

The chart scenario *Make and Follow a Route* on *page 5-46* provides a simple example of how to create a route.

You can edit a route after you have finished making it, as described in *Editing a Route* on *page 5-28*.

➤ To make a new route by placing waypoints:

Note: *You can pan the chart and change the scale while placing waypoints.*

1. If necessary, move the cursor to the area in which you wish to make the route, and select a suitable chart scale.

2. Press the ROUTE soft key, then press the MAKE ROUTE soft key. The make route soft keys are displayed:

PLACE WAYPOINT	UNDO WAYPOINT	ACCEPT ROUTE	USE WPT LIST

D5575-1
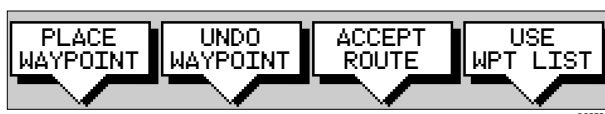
3. Move the cursor to the position on the chart where you want your first waypoint to be. Press the PLACE WAYPOINT soft key.

Note: *You can position the cursor on an existing waypoint – the text WPT indicates you are re-using the waypoint rather than placing a new one. This waypoint is included in the route when you press PLACE WAYPOINT.*

The waypoint appears on the screen at the cursor position. The number displayed alongside the waypoint identifies its position in the route. The new waypoint is temporarily added to the waypoint list with the first available waypoint number. The waypoints in the current route are re-numbered to identify the new positions.

Note: *If you Clear the route before it is Saved, the waypoint is removed.*

4. Move the cursor to the next waypoint position. A dotted line connects the cursor to the last placed waypoint.

5. Press PLACE WAYPOINT again. The waypoint is placed and the dotted line changes to a solid line.

    If you placed the waypoint incorrectly, you can delete the last-placed waypoint by pressing the UNDO WAYPOINT soft key.

6. Repeat steps 4 and 5 until you have placed all your waypoints. You can have up to 50 waypoints in a route.

7. When you have entered all your waypoints, either:

    Press the ACCEPT ROUTE soft key (or **ENTER**) to complete the route. Your route is displayed on the screen, and is the current route, but it is not active.

    The first waypoint of a new route is outlined with a square, indicating that it will be the target waypoint when the route is activated. If selected, the waypoint data box is displayed for the target waypoint.

ROUTE

MAKE ROUTE

PLACE WAYPOINT

PLACE WAYPOINT

UNDO WAYPOINT

ACCEPT ROUTE

Creating a New Route

➤   To make a new route using the Waypoint List:

ROUTE

1. Press the ROUTE soft key; the route soft keys are displayed.

| MAKE ROUTE | EDIT ROUTE | CLEAR ROUTE | MORE... |

D4167-1A
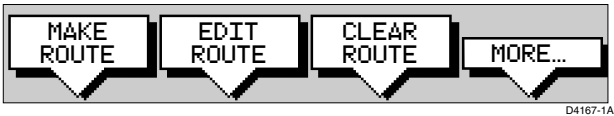
MAKE ROUTE

2. Press the MAKE ROUTE soft key; the make route soft keys are displayed

| PLACE WAYPOINT | UNDO WAYPOINT | ACCEPT ROUTE | USE WPT LIST |

D5575-1

USE WPT LIST

3. Press the USE WPT LIST soft key; the MAKE ROUTE screen is displayed with its associated soft keys.

MAKE ROUTE	
WAYPOINTS	**NEW ROUTE**
COWES	01 HARBOUR
GURNARD LEDGE	02 MAIN CHANNEL
MAIN CHANNEL	03 COWES
NEEDLES FAIRWAY	04 LYMINGTON
PORT SOLENT	
50°50′000N 001°06′000W	50°52′230N 001°02′390W
348°m 2.30nm	300°m 1.00nm

| INSERT WAYPOINT | REMOVE WAYPOINT | ACCEPT ROUTE | USE CURSOR |

D5574-1

The available Waypoints are listed in the left hand column (alphanumeric); the right hand column lists the waypoints in the New Route, the number indicates its order in the route. The lower part of the table shows position, bearing and range of the highlighted waypoint.

You use the trackpad left/right to move control between the two columns (the highlighted title indicates the selected column) and the trackpad up/down to scroll through the lists.

4. Select a waypoint from the Waypoint List then go to the New Route column and select a position in the list.

Note: *A waypoint cannot be used more than once in a route; those already used are displayed in a lighter shade of gray.*

INSERT WAYPOINT

5. Press the INSERT WAYPOINT soft key to place the waypoint *below* the selected position in the Route. You can have up to 50 waypoints in a route.

Creating a New Route

REMOVE
WAYPOINT

6. To remove a waypoint from the New Route column, highlight the way-
    point and press the REMOVE WAYPOINT soft key.

Note: *The INSERT WAYPOINT or REMOVE WAYPOINT action adds/removes the
highlighted waypoint to/from the Route column, regardless of which column
is selected.*

ACCEPT
ROUTE

7. When all waypoints have been entered, press the ACCEPT ROUTE soft key
    (or **ENTER**) to complete the route.

Note: *The completed route is stored in the display unit and will be re-dis-
played if you turn the unit off then on again. However, on an integrated system
it is possible for a current route from another unit to overwrite this route; it is
therefore recommended that you save the route, as described in **Saving the
Current Route**.*

Saving the Current Route

You can save up to 20 named routes in the route database list. These routes can
then be re-displayed and followed at a later date. When you save the route, all
new waypoints are saved in the Waypoint List.

Note: If the current route has not been saved, when you attempt an operation
that affects this route, e.g., CLEAR ROUTE, you are prompted to save it.

➤   To save and name the current route:
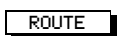
ROUTE

1. To access the SAVE ROUTE soft key, press the ROUTE soft key, followed by
    MORE.

SAVE
ROUTE

2. Press the SAVE ROUTE soft key. The save route pop-up and the NAME ROUTE
    soft keys are displayed as illustrated in *Figure 5-6*.

3. The next available entry on the route list is highlighted.
    (If required, you can use the trackpad to select another position in the list;
    this can be a blank slot, or an existing route that you no longer require).
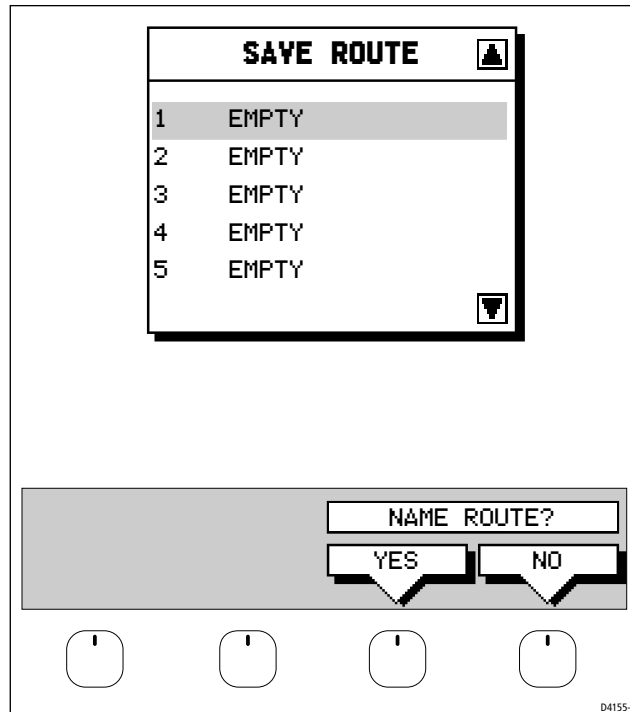
Figure 5-6:   Save Route Window

4. If you do not wish to name or re-name the route, press the NO soft key to clear the list. The route is saved and is listed as Route Not Named.

5. If you wish to name the route press the YES soft key:

   Use the trackpad to move the cursor right or left to the character you wish to edit. Then use the top or bottom of the trackpad to increase or decrease the letter or number.

   or

   Use the arrow keys and alphanumeric keys on the ST80 Navigator keypad to input or edit the characters, as described in *Using the ST60 or ST80 Navigator Keypad* on *page 5-16*.

6. Press **ENTER** to finish and clear the Name List, or press **CLEAR** to cancel the operation. To return to the default soft key display, press **ENTER** again.

Saving the Current Route

Clearing the Current Route

You can clear the current route from the screen. When you select CLEAR ROUTE if the current route has not been saved, you have the option of saving it and, if you are following the current route, you have the option to stop.

➤ To clear the current route:

```
 ROUTE
```

        1. Press the ROUTE default soft key or place the cursor over a route leg until
           the text RTE is displayed.
           Press the CLEAR ROUTE soft key.

```
 RTE
```

```
 STOP
FOLLOW
```

        2. If you are following the current route the STOP FOLLOW soft keys are dis-
           played.
           To cancel the CLEAR operation press NO.
           To stop following and clear the route press YES.

```
 SAVE
ROUTE
```

        3. If the route has not been saved the SAVE ROUTE soft keys are displayed.
           To clear the route, without saving it in the route database, press NO.
           To save the route in the database, press YES. The Name route soft keys are
           displayed and you should continue as described in the previous section,
           Saving the Current Route on *page 5-22*.

The current route is cleared from the screen and the default soft keys are displayed. You can now use the ROUTE soft keys to make a route, or to show another route from the database.

Retrieve a Route From the Database

You can select a route as the current route from the database list. The list is accessed from the second set of ROUTE soft keys.

➤ To select a route as the current route:

```
 ROUTE
```

        1. Press the ROUTE soft key, followed by MORE, then press ROUTE LIST. The
           route list is displayed as illustrated in *Figure 5-7*. The selection bar indi-

```
 SHOW
ROUTE
```

           cates the selected route.

        2. Use the trackpad to select the required route then press the SHOW ROUTE
           soft key. The chart is re-drawn at a scale suitable to display the whole route.
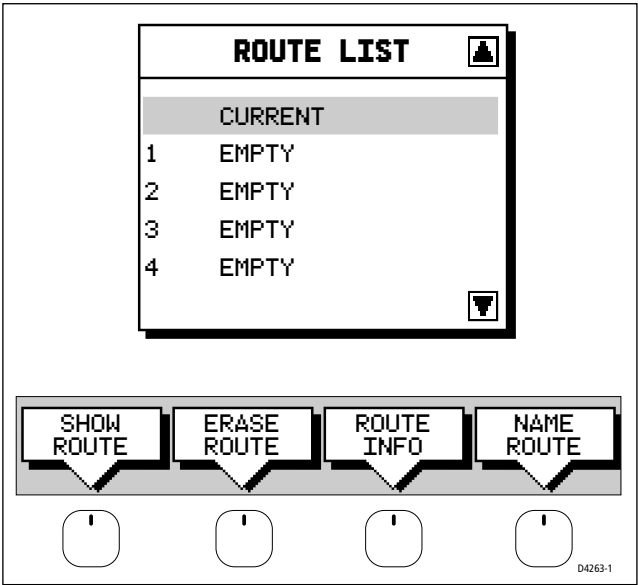
Figure 5-7:   Route List Window

Displaying Route Information

You can display the following information that relates to your route:

- Route leg or waypoint information, using the context-sensitive cursor.

- Details of waypoints in the route, using the soft keys. You can use this information to review your passage plan.

Route Leg and Waypoint Information

➤   To display information about a route leg, move the cursor over the leg until the letters RTE are displayed. A Route Leg data box such as the following is displayed.

To remove the data box, move the cursor away from the route or press **CLEAR**.

➤   To display information about a route waypoint, move the cursor over the waypoint until the letters WPT are displayed. The waypoint data box is displayed, this box includes the route and waypoint number.
To remove the data box, move the cursor away from the route or press **CLEAR**.

Using Route Information to Review Your Passage Plan

You can view data for all the waypoints in the current route, or any saved route.

You select the route from the database list and the information is displayed in a Route Information pop-up; the following details are provided for each waypoint:

- Position
- Bearing (from previous waypoint)
- Length of leg (from previous waypoint)
- Total Length
- Time (ETA or Elapsed)

Soft keys are provided to toggle the time between ETA or elapsed and to change the Speed Over Ground (SOG) value; the ETA for each waypoint is calculated using the selected SOG, so you can change the SOG to determine its effect on your ETA.

The chart scenario *Review Your Passage Plan* on *page 5-48* provides a simple example of how to use the route information.

➤ To display information about any route in the database:

ROUTE

1. Press the ROUTE soft key, followed by MORE, then press ROUTE LIST. The route list is displayed. The selection bar indicates the selected route.

2. Use the trackpad to select the required route, then press the ROUTE INFO soft key.

ROUTE
INFO

The Route Information pop-up is displayed. As illustrated in *Figure 5-8*, this lists the waypoints in the route and details bearing, length of each leg, total distance, and either the estimated time of arrival (ETA) or the elapsed time.

The soft keys allow you to toggle between ETA or total (elapsed) time, and to change the Speed Over Ground (SOG) value used in the time calculations. The current selections are highlighted.

➤ To change the SOG used for ETA calculations:

1. Press one of the PLANNED SOG keys to switch from actual to planned SOG.

2. Press the up or down PLANNED SOG keys to change the planned SOG value. The Time values in the Route Information list are updated.

3. Press the ACTUAL SOG key to use the actual SOG value rather than a planned one.

```
┌─────────────────────────────────────────┐
│  INFO FOR ROUTE-CURRENT ROUTE            │
├─────────────────────────────────────────┤
│ WPT POSITION BRG DISTANCE TOTAL TIME     │
│                 °T    nm     nm   ETA     │
│ 01  50°21:97N ---   0.0     0.0 --:--     │
│     001°15:80W                            │
│ 02  50°21:97N 090   4.4     4.4 --:--     │
│     001°08:75W                            │
│ 03  50°27:48N 000   5.5    10.0 --:--     │
│     001°08:75W                            │
│                                           │
│                                           │
│                                           │
│                                           │
│                                           │
└─────────────────────────────────────────┘

     ┌──────────┐                              
 TIME │  ACTUAL  │                              
ETA TOTAL│  SOG  │   PLANNED SOG                
      │  1.0Kn │     0.0Kn                      
                     ▼        ▲           D4264-1
```
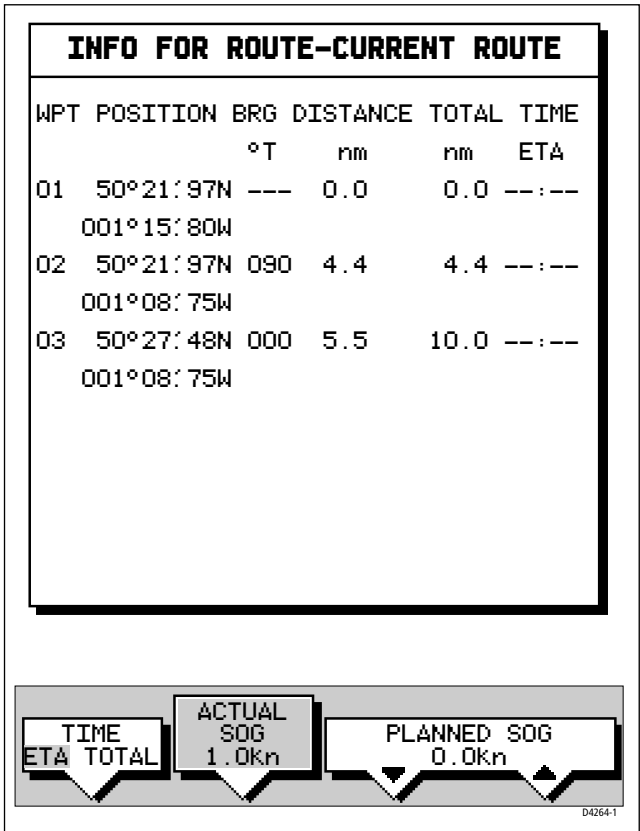
Figure 5-8:   Route Information Window

4. Press **ENTER** to remove the Route Information window, then **ENTER** or **CLEAR** to return to the route soft keys.

5. To return to the default soft key display, press **ENTER**.

Using the Route List to Erase and Name a Route

You can delete a route and you can re-name a route by selecting the route on the route list.

➤ To select a route to delete or re-name:

ROUTE

1. Press the ROUTE soft key, followed by MORE, then press ROUTE LIST. The route list is displayed. The selection bar indicates the selected route. Press the appropriate soft key – ERASE ROUTE or NAME ROUTE.

2. If you ERASE a route you are prompted to confirm.

ERASE
ROUTE

Press NO to cancel the operation, then **ENTER** or **CLEAR** if you wish to remove the route list.
Press YES to erase the route from the list, then **ENTER** or **CLEAR** to remove the route list.

NAME
ROUTE

3. If you NAME a route:

    Use the trackpad to move the cursor right or left to the character you wish
    to edit. Then use the top or bottom of the trackpad to increase or decrease
    the letter or number.

    or

    Use the arrow keys and alphanumeric keys on the ST80 Navigator keypad
    to input or edit the characters, as described in *Using the ST60 or ST80
    Navigator Keypad* on *page 5-16*.

4. Press **ENTER** to clear the Name List, or **CLEAR** to cancel the name then to
    return to the default soft key display, press **ENTER** again.

Editing a Route

Once you have created a route, you can edit it by:

*   Inserting a Waypoint into the route
*   Adding waypoints at the end of the route
*   Removing a Waypoint
*   Reversing a Route
*   Moving a Waypoint as described in *Moving a Waypoint* on *page 5-15*

Any changes you make to the route affect only the current route. The current
route is always held in position 0 in the database, so you need to Save the route
if you want to keep the changes.

Inserting a Waypoint into a Route

You can use the context-sensitive cursor to insert one or more waypoints in the
current route. However, if the route is being followed you cannot insert a
waypoint into the current leg.

➤   To insert a new waypoint in the current route:

RTE

1. Move the cursor over the route leg into which you wish to insert a way-
    point. The letters RTE and the route leg data box are displayed. The Route
    soft keys are displayed.

2. Press **ENTER**. The cursor changes to a four-way arrow, controlling a new
    waypoint. The waypoint is connected to the existing waypoints on either
    side with a dashed line.

3. Move the new waypoint to the required position, and press **ENTER** to drop
    it and return to normal cursor operation, or **CLEAR** to cancel the operation.

The new waypoint is temporarily added to the waypoint list and named with
the first available waypoint number. The waypoints in the current route are re-
numbered to identify the new positions.

Note: *If you Clear the route before it is Saved, the new waypoint is removed.*

Adding Waypoints at the End of the Route

➤ To add waypoints at the end of the route:

ROUTE

EDIT ROUTE

1. Press the ROUTE soft key, followed by the EDIT ROUTE soft key.
   The Make Route soft keys are displayed and the cursor is connected to the last-placed waypoint with a dotted line. You can add further waypoints to the route in the same way as for a new route.

PLACE WAYPOINT

2. Move the cursor to the required location, and press PLACE WAYPOINT soft key.
   If you place the waypoint in the wrong position, press the UNDO WAYPOINT soft key.

UNDO WAYPOINT

Note: *You can UNDO waypoints in the original route, not just the new ones.*

ACCEPT ROUTE

3. Place as many waypoints as required, and press the ACCEPT ROUTE soft key, the default soft keys are displayed.

Removing a Waypoint from the Route

➤ To remove a waypoint from the current route:

WPT

1. Move the cursor over the required waypoint until the letters WPT are displayed. The waypoint soft keys are displayed.

REMOVE WAYPOINT

2. Press the REMOVE WAYPOINT soft key. The waypoint is removed from the route and the route is re-numbered.

Alternatively, you can remove the last waypoint from a route by pressing the UNDO WAYPOINT soft key, as described above in *Adding Waypoints at the End of the Route* on *page 5-29*.

If the route has not been saved, the waypoint is erased.
If the route has been saved, the waypoint remains on the screen.

Reversing the Route

➤ To reverse the route, so you can Follow the route back:

ROUTE

1. Either press the ROUTE soft key followed by MORE,
   or move the cursor over the required waypoint until the letters RTE are displayed.
   The route soft keys are displayed.

REVERSE ROUTE

2. Press the REVERSE ROUTE soft key. The current route is reversed on the screen.

Editing a Route

5.5 Following Routes and Going to Points

The default soft key GOTO accesses the functions to FOLLOW a route and GOTO a waypoint or cursor. When you select the target destination, the chartplotter calculates bearing, distance and cross track error; this information is passed to a helmsman or autopilot. You can also restart the cross track error (XTE) from the actual vessel position to set XTE to zero at that point.

ROUTE	GOTO	SCREEN	FIND SHIP

D4160-1

When the chartplotter is following a route, the target destination is indicated by a square around the waypoint (or cursor marker) and a dotted line shows the intended track, from your start point or previous waypoint, to the target waypoint.

This section describes the following:

- Follow a route either forwards, or in reverse order
- Target Point Arrival
- Other follow route options, including joining at a selected waypoint, advancing waypoints, and restarting XTE
- Go to an individual point, either an existing waypoint or the cursor
- Stop and Restart Follow/Goto

An alarm is triggered when you approach a waypoint, this section describes what happens when you arrive at waypoints. *Chapter 6* describes how to set the alarm.

The chartplotter can also display the vessel's actual track and the track can be recorded for later display. The Track function is described in the *Section 5.7*.

➤ To access the Goto/Follow soft keys, press the default soft key GOTO (the soft keys differ if a follow or goto is already in progress):

GOTO

GOTO WAYPOINT	GOTO CURSOR	FOLLOW ROUTE

D4171-1
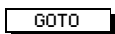
Follow a Route

Note: *The current route may have been created on this display, or created on another unit and received on this display via SeaTalk.*

If a route has been reversed or if a route on screen was being followed but stopped before completion, the target waypoint – outlined by a square box – may be different to when the route was created.
You should always check the target waypoint before initiating a follow route.

➤   To follow the current route:

GOTO

1.   Press the GOTO default soft key. The Goto/Follow soft keys are displayed.

FOLLOW
ROUTE

2.   Press the FOLLOW ROUTE soft key.

Alternatively, to follow a route:

RTE

FOLLOW
ROUTE

1.   Place the cursor over a route leg until the letters RTE and the route soft keys are displayed then press FOLLOW ROUTE.

Your vessel's current position becomes the origin, and the target waypoint in the current route becomes the active target.
The soft keys change as follows:

STOP FOLLOW	EDIT ROUTE	CLEAR ROUTE	REVERSE ROUTE
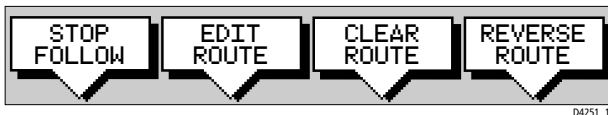
D4251_1

These options are described in the following sections.

➤   To follow the current route in reverse:

ROUTE

1.   Press the ROUTE default soft key, followed by MORE. The route soft keys are displayed.

REVERSE
ROUTE

2.   Press the REVERSE ROUTE soft key. The current route is reversed on the screen. Press **ENTER** or **CLEAR**.

GOTO

3.   Press the GOTO default soft key. The Goto/Follow soft keys are displayed.

4.   Press the FOLLOW ROUTE soft key.

FOLLOW
ROUTE

The soft keys change as follows:

STOP FOLLOW	GOTO CURSOR	RESTART XTE	WAYPOINT ADVANCE
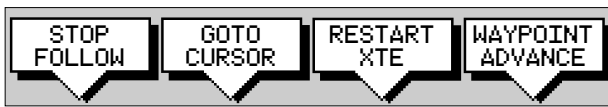
D4172-1

These options are described in the following sections.

Alternatively:

RTE

REVERSE
ROUTE

1.   Place the cursor over the route leg until the letters RTE and the route soft keys are displayed. Press REVERSE ROUTE then FOLLOW ROUTE.

Your vessel's current position becomes the origin, and the target waypoint in the current route becomes the active target.

FOLLOW
ROUTE

Target Point Arrival

You can set up target alarms (see *Section 6.3*) to alert you when the vessel is approaching the target point. The arrival alarm is defined as a circle (not visible on the screen), with a specified radius around the target.

The alarm is triggered when either of the following conditions is met:

- The distance to the target point is less than that specified for the arrival alarm.

- Your vessel reaches the closest point of approach to the target (defined by a line passing through the waypoint and perpendicular to the route leg).

➤ To cancel the arrival alarm and go towards the next waypoint in the route: Press any key.
or
Wait for 10 seconds.

The target becomes the origin, the next waypoint becomes the target point, and the two are connected by a dotted line indicating the current leg. Any previous route leg is removed from the screen, but waypoints remain.

Note: *When following a route using a SeaTalk autopilot, the autopilot will not turn to the new waypoint until it is accepted at the autopilot control unit.*

Other Follow Route Options

You can use the soft keys to follow a route from a selected waypoint (join a route), or if already following, you can advance to the next waypoint. You can also restart the cross track error, setting the current vessel position as the new origin.

In addition, you can move a selected waypoint as described in *Section 5.3*, or remove a waypoint from the route as described in *Section 5.4*.

Joining a Route

➤ To start tracking the current route at a selected waypoint:
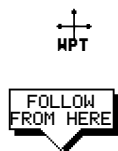
1. Move the cursor over the required waypoint until the letters WPT and the waypoint soft keys are displayed.

2. Press the FOLLOW FROM HERE soft key.
   Your vessel follows the route, using the selected waypoint as the target point.

3. To return to the default display, move the cursor away from the waypoint or press **CLEAR** or **ENTER**.

Advancing to a Waypoint

➤ Once you are following a route, you can advance to the next waypoint, even if you have not reached the current target waypoint:

GOTO

1. If necessary, press the GOTO default soft key to display the Goto/Follow soft keys.

| STOP FOLLOW | GOTO CURSOR | RESTART XTE | WAYPOINT ADVANCE |

D4172-1

2. Press the WAYPOINT ADVANCE soft key. The current leg of the route is abandoned and the next waypoint becomes the target. The display is updated to show the new route leg.

WAYPOINT ADVANCE

Restart Cross Track Error (XTE)

While you are following a route, or going to a target point, you can restart the XTE. This sets the XTE to zero and moves the origin to the actual vessel position.

Restarting XTE is useful if you find yourself off track and want to go straight to your target, rather than get back onto the original track.

➤ To restart XTE:

GOTO

1. Press the GOTO default soft key, the Follow/Goto soft keys are displayed.

RESTART XTE

2. Press the RESTART XTE soft key. The route origin moves to the current vessel position, thus the XTE becomes zero.

Going To an Individual Target Point

Rather than following a route, you can go directly to a selected target point, this can be an existing waypoint (not in the current route), or the cursor position.

➤ To navigate directly to an existing waypoint:

WPT

1. Use the trackpad to position the cursor over the required waypoint until the letters WPT and the waypoint soft keys are displayed.

| GOTO WAYPOINT | EDIT WAYPOINT | ERASE WAYPOINT | MOVE WAYPOINT |

D4163-1

Alternatively, you can select the waypoint from the waypoint list as described in *Section 5.3*.

GOTO
WAYPOINT

2. Press the GOTO WAYPOINT soft key.
   Navigation to the selected waypoint begins. The soft key STOP GOTO is displayed.

3. To return to the default soft key display, move the cursor away from the waypoint or press **ENTER** or **CLEAR**.

➤ To navigate directly to the cursor position:
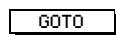
1. Use the trackpad to position the cursor as required.

GOTO

2. Press the GOTO default soft key, followed by GOTO CURSOR.
   If navigation is currently in progress you are warned "Already following route. Cancel route and goto cursor?".

GOTO
CURSOR

To cancel the GOTO CURSOR operation, press NO.

To continue with the GOTO CURSOR operation (and stop the current GOTO ROUTE), press YES.

The chartplotter places a temporary waypoint as the target and starts to navigate towards it. The waypoint is shown as a square with a circle and dot in the center, and is connected to the vessel's starting position with a dashed line.

STOP
GOTO

The soft key STOP GOTO is displayed.

Note: *The temporary waypoint is not added to the waypoint list; when the* GOTO *is complete, or is stopped, the temporary waypoint is erased.*

3. To return to the default soft key display, move the cursor away from the waypoint or press **ENTER** or **CLEAR**.

Stop Follow or Stop Goto

➤ To stop following the route or target point
  either:

GOTO

If necessary, press the GOTO soft key, then press the STOP GOTO/FOLLOW soft key.

STOP
GOTO

Or:

STOP
FOLLOW

Move the cursor over any waypoint or leg in the current route, then press the STOP GOTO/FOLLOW soft key.

The dotted line from your vessel to the target waypoint disappears.

If you subsequently use the FOLLOW ROUTE soft key to restart navigation, the route is followed from the point at which it was stopped. This is indicated by a square around the target waypoint. If you want to follow from another waypoint you can initiate the follow then use the WAYPOINT ADVANCE or FOLLOW FROM HERE soft key to step through the route.

5.6 Transferring Waypoints and Routes

Displayed SeaTalk Waypoints

In an integrated system, when a route is made current on any SeaTalk equipment it is sent to all SeaTalk instruments, including this chartplotter; this route will override any other current route. When GOTO waypoint or GOTO cursor is in operation it is considered a route.

The current route can be edited on any instrument with route edit capability.

Note: *Transferred waypoints that are part of a route are not automatically saved by the chartplotter, however you can save the route locally, thus adding the waypoints to the local waypoint list.*

Managing Database Lists

There are several methods of maintaining database lists. The method you choose will depend on the links available (*hsb²*, SeaTalk or NMEA) and whether you want to transfer individual waypoints or the complete waypoint and route list:

*   You can save the complete Waypoint and Route Lists to a user cartridge in the chart card slot.

*   You can load new Waypoint and Route Lists from a user cartridge in the chart card slot.

*   If waypoints are transmitted by other equipment on SeaTalk or NMEA, you can receive them on the chartplotter.
    When RECEIVE WPTS FROM ST/NMEA is selected, any waypoints sent on SeaTalk or NMEA are transferred and appended, one-by-one, to the way-point list; routes sent on NMEA are appended to the route list.
    You can use this function to add waypoints from a PC connected via NMEA.

*   You can send the waypoint **and** route lists from the chartplotter to other instruments via NMEA using the SEND WPT LIST function.
    Sending the waypoint list does not affect **current** routes.
    The NMEA link could be to a PC.

Transferring
Waypoints and
Routes

- You can transfer the waypoint **and** route lists from one chartplotter to another across an *hsb²* link using SEND WPT LIST ON HSB and RECIEIVE WPTS FROM HSB.

CAUTION:
The functions LOAD USER CARD, SEND WPT LIST ON HSB **and** RECIEIVE WPTS FROM HSB **replaces the existing waypoint and route lists with the transferred lists.**

➤ To save waypoints to, or load waypoints from a user cartridge:

CAUTION:
Loading waypoints from a user cartridge overwrites any existing waypoint and route lists.

1. Insert a C-MAP User Card into the lower of the two cartridge slots.

(MARKS)

1. Press **MARKS** followed by the LOAD/SAVE USER CARD soft key.

2. The User Card Menu and associated soft keys are displayed.

3. Press the SAVE WPT/RTE DATA TO CARD or LOAD WPT/RTE DATA FROM CARD soft key; an appropriate warning and Yes/No soft keys are displayed.

```
┌──────────────────────────────┐
│       USER CARD MENU         │
├──────────────────────────────┤
│      USER CARD PRESENT       │
├──────────────────────────────┤
│           WARNING            │
│     SAVING DATA TO THE USER  │
│  CARD WILL ERASE ALL EXISTING│
│    WAYPOINT AND ROUTE DATA   │
│          ON THE CARD.        │
└──────────────────────────────┘
```

```
              ┌──────────────────────┐
              │    ARE YOU SURE ?    │
              ├───────────┬──────────┤
              │    YES    │    NO    │
              └───────────┴──────────┘
                                    D5594-1
```

4. Press Yes to continue or No to abandon the operation and return to the previous screen.

5. If the operation is successful, confirmation of the number of Routes and Waypoints saved/loaded is displayed.

```
      USER CARD MENU
    USER CARD PRESENT


      SAVE COMPLETE
   SAVED 2 ROUTE(S) AND
      7 WAYPOINT(S)
```

```
LOAD WPT/  SAVE WPT/  CHECK
RTE DATA   RTE DATA   CARD IN
FROM CARD  TO CARD    USER SLOT
```

If the operation fails, the Save Failed message is displayed.

```
      USER CARD MENU
  USER CARD NOT PRESENT

      SAVE FAILED
   NO OR INCORRECT CARD
 ENSURE USER CARD IS CORRECTLY
   INSERTED IN THE LOWER SLOT
```
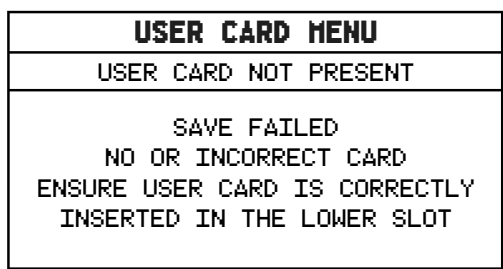
```
LOAD WPT/  SAVE WPT/  CHECK
RTE DATA   RTE DATA   CARD IN
FROM CARD  TO CARD    USER SLOT
```
D5596-1

➤ To receive incoming waypoints on SeaTalk or NMEA:

MARKS

1. To display the waypoint list, press **MARKS** followed by the WAYPOINT LIST soft key.

WAYPOINT
LIST

2. Press the WAYPOINT TRANSFER soft key.

3. Press the soft key RECEIVE WPTS FROM ST/NMEA.
    The soft key changes to STOP RECEIVING WAYPOINTS.
    When waypoints are transmitted by other equipment they are added to the waypoint list on the chartplotter. Routes transmitted on NMEA are appended to the route list.

WAYPOINT
TRANSFER

4. To disable waypoint transfer, press the soft key STOP RECEIVING WAY-POINTS.
    Alternatively, press **ENTER**, or **CLEAR**, twice to close the Waypoint List.

➤ To send the waypoint list on NMEA:

WAYPOINT TRANSFER

1. Display the waypoint list as previously described, then press the WAY-POINT TRANSFER soft key.

2. Press the soft key SEND WPT LIST ON NMEA.
   The soft key changes to STOP SENDING WAYPOINTS.
   The waypoint and route lists are transmitted from the chartplotter to other instruments on NMEA.

➤ To receive the waypoint and route lists via *hsb²*, you must set-up the transfer on both display units - one unit will send waypoints, the other will receive them.

CAUTION:

Receiving waypoints from another *hsb²* instrument overwrites any existing waypoint and route lists.

WAYPOINT TRANSFER

1. Display the waypoint list as previously described, then press the WAY-POINT TRANSFER soft key.

2. Press the soft key SEND WPT LIST ON HSB or RECIEIVE WPTS FROM HSB; you are prompted to confirm.
   Press NO to cancel the operation, then **ENTER** if you wish to remove the route list.
   Press YES to continue. The waypoint list is transmitted to/from the chart-plotter from/to another instrument on *hsb²*. While the data is being trans-ferred the soft key changes to STOP SENDING WAYPOINTS; when the transfer is complete the soft key is re-displayed.

Transferring
Waypoints and
Routes

5.7 Using Tracks

The Track function is used to mark on-screen the trail that your vessel has followed, as if it had left a visible fixed wake.

While the track is turned on, it is recorded in the display unit's memory. You specify the interval at which track points are made, a line is drawn on-screen between each point. A maximum of 750 track points each can be saved in the current track and in up to 5 saved tracks, for a total of up to 4500 points. The current track remains on-screen, even following a power off/on, until you clear the track.

A track can be saved and retrieved for display at a later date. For example, you may wish to display a previous track, and then place waypoints along it that you can follow. You can only display one track at a time; you must clear a current track from the screen if you want to display a saved track.

Breaks in the track will be caused when any of the following occur for longer than the specified track interval: the track is switched off then on; the position fix is lost; the display unit is switched off.

To enable you to follow this track on your return voyage, the SmartRoute function converts the track (or the last segment of a track with breaks) into a route which is automatically reversed, see *SmartRoute* on *page 5-42*.

This section describes:

- Setting up a track, including how to specify the interval.
- Clearing the current track.
- Managing tracks, using the track list, including Saving, Naming, Erasing and Showing a track.
- Using Smart Route.

➤ To access the track controls:

1. From the chart display, press the **MENU** key to display the chart set up soft keys.
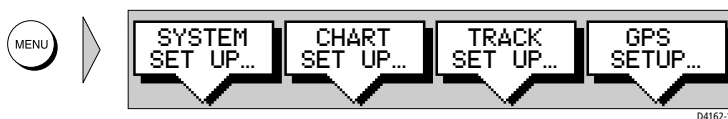
2. Press the TRACK SETUP soft key to display the Track soft keys:
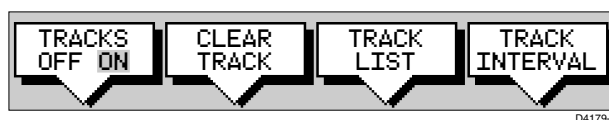
The following instructions assume you have the track soft keys displayed.

Using Tracks

Setting Up a Track

You use the track soft keys to switch the track on and to specify the interval at which track points are saved. The interval default is a distance of 0.1nm. The maximum track length is 500 points, when the track has reached this length, the first points are overwritten. The track is saved until you switch it off.

➤ To set up a track:

> **TRACK INTERVAL**

1. Press the TRACK INTERVAL soft key.
   Press the appropriate soft key to set either a time interval or a distance interval; press the UP arrow to increase the interval, the DOWN arrow to decrease the interval.
   Press **ENTER** to return to the track soft keys.

```
        TIME                  DISTANCE
         1S                    0.1nm
      ▼        ▲             ▼        ▲
```
D4258-1
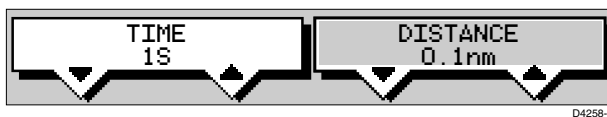
> **TRACK OFF ON**

2. Press the TRACK OFF ON soft key to toggle tracks on.
   Your vessels trail will be displayed on-screen, with a line joining the points at the selected interval.

Clearing the Current Track

You can clear the current track from the screen. When you select CLEAR TRACK, if the current track has not been saved, you have the option of saving it.

➤ To clear the current track:

> **CLEAR TRACK**

1. Press the CLEAR TRACK soft key.

> **SAVE TRACK**

2. If the track has not been saved the SAVE TRACK soft keys are displayed.
   To clear the track without saving it in the Track List, press NO.
   To save the track in the list, press YES. The Name track soft keys are displayed and you should continue as described in the following section, Saving and Naming a Track.
   Press **CLEAR** to abort the Clear Track operation.

The current track is cleared from the screen and the default soft keys are displayed.

Managing Tracks

Although it is easy to set up a track, and this track is retained even if you switch off your display, you can store a number of different tracks so that you can review them at a later date. This section explains how to:

- Save and name a track.
- Name, Erase and Show an existing track.

Setting Up a Track

Saving and Naming a Track

You can save up to 5 named tracks in the Track List. These tracks can be re-displayed at a later date.

➤ To save and name the current track:

TRACK
LIST

1. Press the TRACK LIST soft key. The track list pop-up and associated soft keys are displayed.

2. The next available entry on the track list is highlighted.
   (If required, you can use the trackpad to select another position in the list; this can be a blank slot, or an existing track that you no longer require).

SAVE
TRACK

3. Press SAVE TRACK. The name track soft keys are displayed.
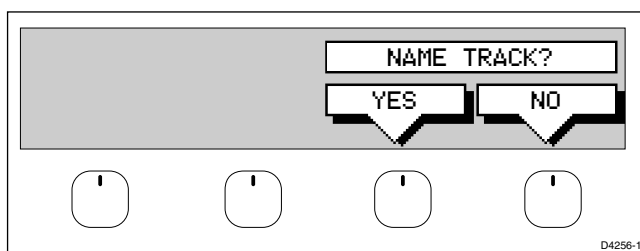
4. If you do not wish to name or rename the track, press the NO soft key (or **CLEAR**) to clear the list. The track is saved and is listed as Track Not Named.

5. If you wish to name the route press the YES soft key:

   Use the trackpad to move the cursor right or left to the character you wish to edit. Then use the top or bottom of the trackpad to increase or decrease the letter or number.

   or

   Use the arrow keys and alphanumeric keys on the ST80 Navigator keypad to input or edit the characters, as described in *Using the ST60 or ST80 Navigator Keypad* on *page 5-16*.

6. Press **ENTER** to finish and clear the Track List, then to return to the default soft key display, press **ENTER** again or **CLEAR**.

Naming, Erasing and Showing a Track

➤ To name an existing track, erase a track or show a track, you select the track from the track list, then press the appropriate soft key as follows:

TRACK
LIST

1. Press the TRACK LIST soft key. The Track List is displayed. The grey selection bar indicates the selected track.
   Select the required track then press the appropriate soft key.

NAME
TRACK

2. If you NAME a track:

Managing Tracks

Use the trackpad to move the cursor right or left to the character you wish to edit. Then use the top or bottom of the trackpad to edit the character.

or

Use the arrow keys and alphanumeric keys on the ST80 Navigator keypad to input or edit the characters, as described in *Using the ST60 or ST80 Navigator Keypad* on *page 5-16*.

Press **ENTER** finish the operation or **CLEAR** to cancel the name, then **ENTER** to remove the track list.

ERASE
TRACK

3. If you ERASE a track you are prompted to confirm.
    Press NO to cancel the operation, then **ENTER** if you wish to remove the track list.
    Press YES to erase the track from the list, then **ENTER** to remove the track list.

SHOW
TRACK

4. If you SHOW a track, and you have a current track on screen, you are prompted to save the track. Proceed as previously described in Clearing the Current Track.
    Alternatively, press the NO soft key to cancel the SHOW TRACK operation. The track list is removed and the selected track is displayed.

5. Press **ENTER** or **CLEAR** to return to the default display.

SmartRoute

SmartRoute enables the current track, or the last segment of a track with breaks, to be converted to a route (the track could have been retrieved from the track list). SmartRoute places a waypoint at the last track point, then considers each point in turn and determines the closest route through the recorded track.

The number of waypoints created is minimized, while maintaining optimum correlation to the recorded track. On completion, the maximum deviation of the route from the recorded track is displayed.

➤   To convert the current track into a route:

1. Select MAKE INTO ROUTE and press **ENTER**.
    The current track is converted to a new route and becomes the current route, with the most recently placed track point as the start of the route, i.e. the track is reversed.
    If there is an unsaved current route on screen, the option to save the route is given, see *Section 5.4, Working with Routes*.

2. Check the calculated route and, in particular, that the route deviation from the original, given in the warning box, is within navigable limits.

CAUTION:
Before following the route, ensure that it is safe for navigation, noting that it may deviate from your actual path travelled.

5.8 Typical Chart Scenarios

The following illustrations provide operating guidelines for typical navigation scenarios. These scenarios can be used as a training guide; they show you how to perform a particular operation and they introduce many of the chartplotter functions.
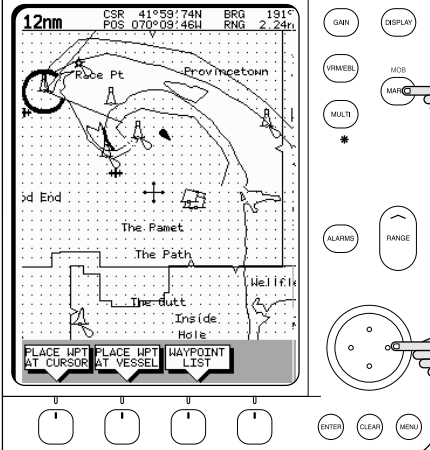
Each scenario indicates the key presses required to perform particular tasks. A typical chartplotter screen image is shown for each task.

The scenarios assume you have read the previous sections of this chapter and that you are familiar with the Operating Controls.
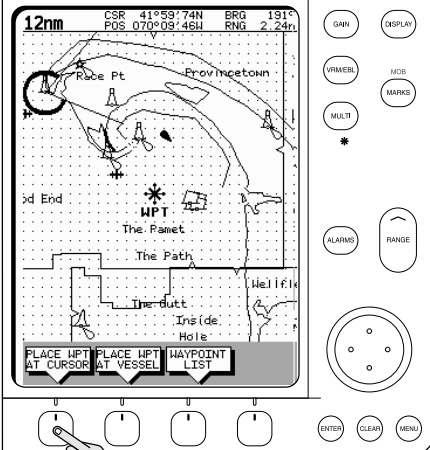
Operating guidelines are provided for the following scenarios:

- **Working with Waypoints**
  Place a Waypoint
  Goto a Waypoint

- **Make and Follow a Routes**
  Create a Route
  Follow a Route

- **Review the Passage Plan**
  View Route Information
  Change the SOG, Hours and ETA.

Typical Chart
Scenarios
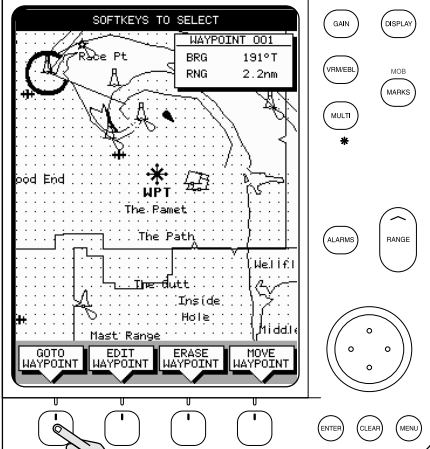
Place and Goto a Waypoint

1. Press MARKS

2. Position Cursor as required

Press the soft key

Press the soft key to go to the
waypoint selected by the cursor.

D4267-1

The vessel navigates towards the target waypoint

See Sections:
5.3 Working wth Waypoints
5.5 Following Routes and Going to Points
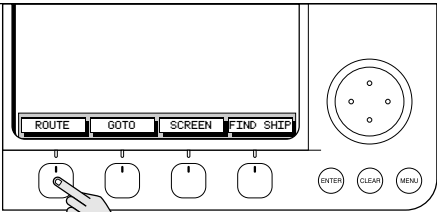
D4267-2c

Place and Goto a Waypoint
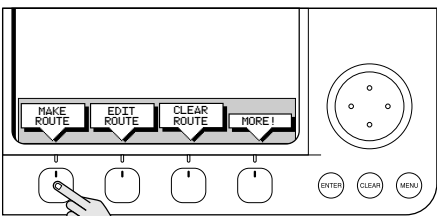
Make and Follow a Route

1 Press the soft key

ROUTE   GOTO   SCREEN   FIND SHIP

2 Press the soft key

MAKE ROUTE   EDIT ROUTE   CLEAR ROUTE   MORE!

3

12nm   CSR 41°59'74N   BRG 191°T
       POS 070°09'46W   RNG 1.35nm

Race Pt   Provincetown

WPT
The Pamet
The Path
The Gutt   Wellfie
Inside   Hole   Middle
Mast Range

PLACE WAYPOINT   UNDO WAYPOINT   ACCEPT ROUTE
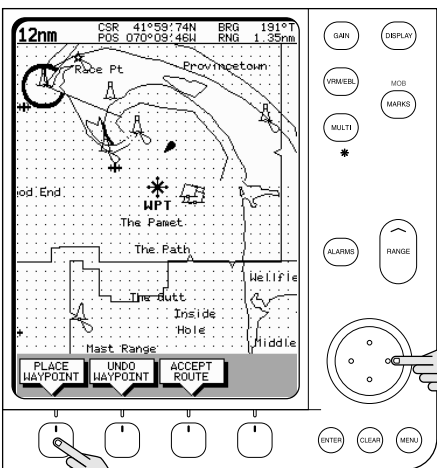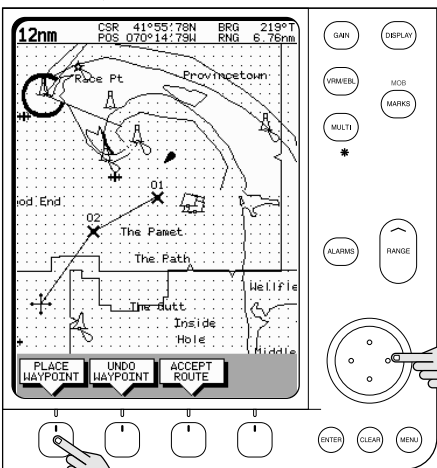
1. Position Cursor - in this example over an existing waypoint

2. Press the soft key

4

12nm   CSR 41°55'78N   BRG 219°T
       POS 070°14'79W   RNG 6.76nm

Race Pt   Provincetown

01
02   The Pamet
The Path
The Gutt   Wellfie
Inside   Hole   Middle

PLACE WAYPOINT   UNDO WAYPOINT   ACCEPT ROUTE

Position Cursor for next waypoint, then press soft key.
Repeat to plot all waypoints in sequence.

D4268-1

5

CSR 41°55'78N   BRG   219°T
12nm   POS 070°14'79W   RNG   6.76nm

Race Pt   Provincetown

od End

The Pamet

The Path

Wellfle

The dutt

Inside

Hole

Middle

PLACE   UNDO   ACCEPT
WAYPOINT   WAYPOINT   ROUTE

Press the soft key. The route becomes
the current route.

6

ROUTE   GOTO   SCREEN   FIND SHIP

Press the soft key

7

GOTO   GOTO   FOLLOW
CURSOR   WAYPOINT   ROUTE

Press the soft key

8

CSR 41°54'44N   BRG   160°T
12nm   POS 070°05'81W   RNG   7.06nm

Race Pt   Provincetown

od End

The Pamet

The Path

Wellfl

The dutt

Inside

Hole

Middle

STOP   GOTO   RESTART   WAYPOINT
FOLLOW   CURSOR   XTE   ADVANCE

The vessel starts to navigate to the
first (target) waypoint in the route.

See Sections:
5.4 Working with Routes
5.5 Following Routes and Going to
    Points

Make and Follow a
Route

D4268-2c

Review Your Passage Plan

D4269-1

See Section:
5.4 Working with Routes

Change the TIME to HOURS - the display indicates it will take 32 minutes to reach the destination. You can change the PLANNED SOG; the display updates to indicate TIME required at the planned speed.

D4269-2c

Review Your
Passage Plan

Review Your
Passage Plan

Chapter 6: Further Chart Operations

6.1 Introduction

This chapter explains how to use the additional functions that are provided with the L755RC Plus, L760RC Plus, and L1250RC Plus Combined Fishfinder/Chartplotter Displays. Chart functions are also available on L1250 Plus and L760 Plus fishfinder-only units, when connected to an *hsb²* Plus Series device with chartplotter functionality (see *Section 2.7, Integrated Systems*).

This chapter covers the following topics:

- Measuring distances and bearings on the chart, using the VRM/EBL key
- Setting alarms and timers
- Man Overboard (MOB)
- Cursor Echo
- Radar Overlay
- GPS Setup
- Data Log Mode

In order to use some of these functions, you may need the following additional data from equipment connected to your system via a SeaTalk, *hsb²*, or NMEA link:

Table 6-1:   Function of External Data

Data	Example source	Integrated functions available
Heading COG	Compass· GPS	- North Up or Course Up heading modes - MOB (if speed data also available)
Radar data	Radar system (via *hsb²*	- Radar data, either full-screen or in a half-screen window
Position	GPS system	- Waypoints - Position, COG, SOG and time data in Data Box and Nav Window - MOB - Data Log
Other data	Transducers	- Data Box and Nav Window data displays, including speed, depth, wind, temperature

*If heading data is available via both NMEA and SeaTalk, NMEA data takes priority. For all other data, SeaTalk data takes priority (see *Section 6.3*).

Introduction

6.2   Measuring Distances Using the VRM/EBL Key

You can obtain an accurate measurement of the distance and bearing between two points by using the **VRM/EBL** key.

➤   To place a ruler line and Ruler data box:

(VRM/EBL)

1. Position the cursor on the starting point from which you wish to measure.

2. Press **VRM/EBL**.
   A Ruler data box is displayed showing the bearing and distance from the starting point to the cursor position. The character A appears at the cursor location.

3. Use the trackpad to move the cursor to the measurement end point. A line connects the cursor to the starting point, and the Ruler data box is updated to show the bearing and length of the line as shown in *Figure 6-1*.

4. Press **ENTER** to fix the end point of the ruler line, and return to normal cursor control. The letter B marks the location of the end point on the chart.
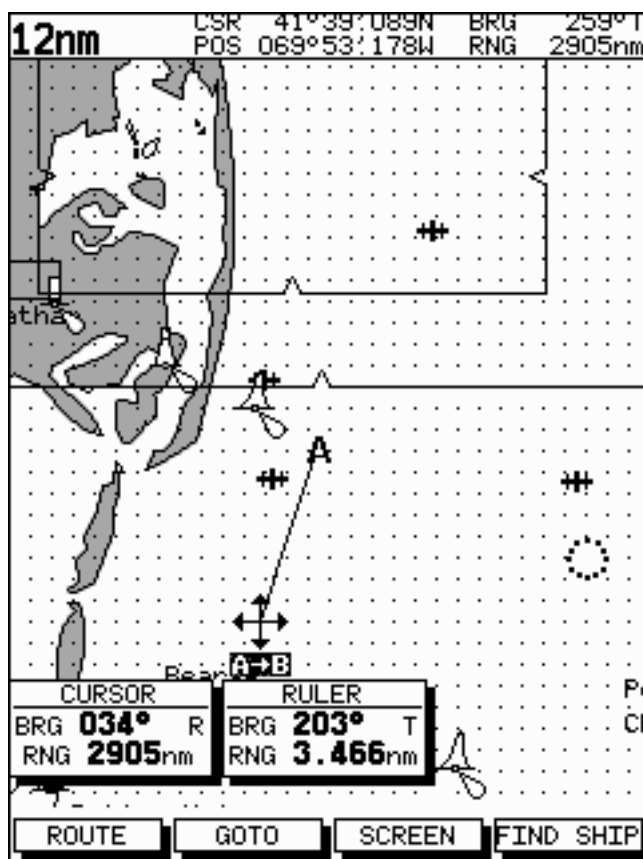
Figure 6-1:   Measuring Distance Using a VRM

➤   To re-position one end of the ruler line:

   1. Move the cursor over the ruler line towards the end that you want to re-position, until the letters A→ B are displayed.

   2. Press **ENTER** to take cursor control of the ruler. The ruler end moves to the cursor which changes to a four-headed arrow.

   3. Move the cursor to the required position. The ruler data box is updated.

   4. Press **ENTER** again to set the position and return to normal cursor control. Alternatively, press **CLEAR** to reset the ruler to the previous position.

➤   To clear the ruler line and ruler data box
    either:
    Move the cursor over the ruler line, until the letters A→ B are displayed, then press **CLEAR**.
    or:
    Press **VRM/EBL**, the ruler soft keys are displayed. Press RULER OFF ON to toggle the ruler line and data box off.

➤   To clear the ruler data box:
    Press **VRM/EBL**, the ruler soft keys are displayed. Press RULER DATABOX OFF ON to toggle the ruler data box off.

➤   To move the Ruler data box, using the context-sensitive cursor:

   1. Move the cursor over the box until the letters BOX are displayed, and press **ENTER** to take cursor control of the box.

   2. Use the trackpad to move the box to its new location, and press **ENTER** to drop it and return to normal cursor operation.

Measuring
Distances Using the
VRM/EBL Key

6.3 Alarms and Timers

Alarm Reporting

ALARMS

The chartplotter reports the following alarms, that are set using the **ALARMS** key:

Alarm	Indicates:
Arrival	Your vessel has arrived at the active waypoint: it has either reached the arrival circle (the radius of which is specified) or, has reached its closest point of approach (defined by a line passing through the waypoint and perpendicular to the route leg).
Off Track	Your vessel has exceeded the specified distance (maximum cross track error) from the active route leg.
Anchor	Your vessel has drifted from its anchor position (set when the alarm was turned on) by more than the specified distance.
Grounding	The chartplotter checks a sector ahead of your vessel for a dangerous object (land, depth area, intertidal area, rock, obstruction or shore obstruction). You specify the depth and range of the sector from your vessel. You can view a report of the objects that triggered the alarm.
Countdown	The countdown timer has reached zero.
Alarm Clock	The time matches the specified alarm time.

The alarms are switched on or off, and the limits set, using the Alarms Set Up menu, accessed from the **ALARMS** key.

When an alarm is triggered, the alarm buzzer sounds and a pop-up window describing the alarm is displayed.

➤ To silence the alarm and clear the message, press any key.
If the alarm was generated by the chartplotter, the appropriate action is taken.
For example, following an arrival alarm, the next route leg is activated.
If an anchor alarm is silenced, but the alarm condition persists, the alarm is repeated every 30 seconds.

External Alarms

All SeaTalk system alarms (except autopilot alarms) are received and displayed on the chartplotter. You can silence these alarms by pressing any key. No other action is taken by the chartplotter except to silence the alarm.

Setting Alarms and Timers

➤   To set up an alarm or timer:

ALARMS

1. Press the **ALARMS** key. The Alarms Set Up menu is displayed, showing the current settings (see *Figure 6-2*).

2. Use the trackpad to move the selection bar up or down the options. As each line is highlighted, the soft key labels are updated to show the current settings and controls.

ALARMS

ALARMS SET UP

ARRIVAL ALARM	0.01nm
OFF TRACK ALARM	ON
ANCHOR ALARM	OFF
GROUNDING ALARM	5M/1.0nm
COUNTDOWN TIMER	00:33:00
ALARM CLOCK	OFF

SELECT ARRIVAL
ALARM RADIUS

D4265-4
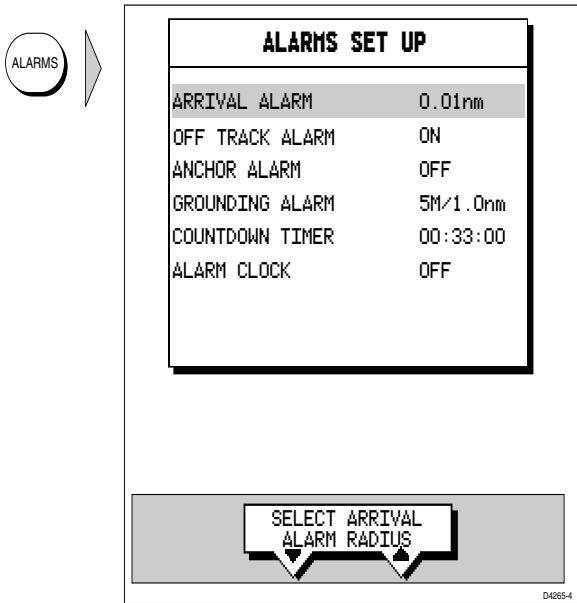
Figure 6-2:   Alarms Set Up List

3. Use the up or down soft keys to change the alarm setting. For example, for the arrival alarm you can adjust the radius from the waypoint at which the arrival alarm will be triggered.
    The arrival, off track and anchor alarm distances can be set in the range 0.01 to 9.99 nm, in steps of 0.01nm.
    The grounding alarm depth can be set from 1 to 20m in 1m steps and can be specified to cover a sector at a range from 0 to 1nm, in 0.1nm steps.
    The timer is set in hours, minutes and seconds, and the alarm clock in hours and minutes.

ALARM
OFF ON

4. If required, press the ALARM OFF ON soft key to toggle the alarm on or off. If you turn an alarm off, its value is retained and will be used when you turn the alarm on again.

Note: *You can turn all the alarms and timers on and off, except for the Arrival Alarm which is always on.*

5. Press **ENTER** to save the changes and clear the list.

Setting Alarms and Timers

6.4 Man Overboard (MOB)

If you lose a person or object overboard, and need to return to the location, you should use the Man Overboard (MOB) function.

You can select the type of data used for the MOB position using the set up menus (see *Section 7.3*).

Note: *To obtain MOB position, you need either of the following:*

• Position data from a GPS or equivalent device

• Heading and speed data, so that the position can be calculated by dead reckoning

➤ To initiate the MOB procedure, press and hold the **MARKS** key for two
  seconds. The system then performs the following tasks automatically:

MARKS

• Redraws the chart at 1/2 nm (even if cartography is not available but plotter mode is on).

• Marks the current position with a MOB symbol 🔅 which replaces any current active waypoint and route.

• Displays the MOB data box, showing the bearing and distance from your vessel to the MOB waypoint position, and the elapsed time since the MOB was initiated (*Figure 6-3*).

• Displays the position data box, showing your vessel's position.

• As your vessel moves from the MOB position, a dotted line is displayed connecting the MOB symbol and the vessel's current position.

• Sounds a 4-second alarm pattern every 30 seconds.

• Sends an MOB message (including bearing and distance) to other units in the system, via the SeaTalk connection.
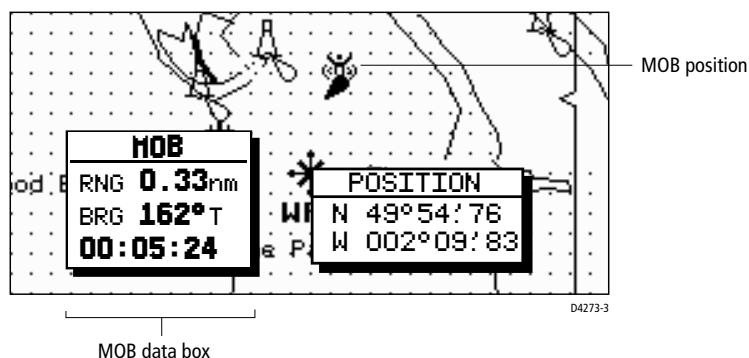
Figure 6-3: MOB Display

Man Overboard
(MOB)

➤ To cancel the MOB, press and hold the **MARKS** key for 2 seconds.
The chart is re-drawn at its previous scale, and the MOB symbol and data box are removed.

(MARKS)

Note: *The MOB procedure can also be initiated or cancelled if the appropriate SeaTalk message is received by the display unit.*

6.5 Cursor Echo

In a system with a radar display connected via SeaTalk, you can set the display to enable cursor echo. Cursor echo (accessed from System Set Up, described in *Section 7.3*) enables you to display a radar cursor on the chart picture, or a chart cursor on the radar picture (you cannot display a remote chart cursor in a chart window nor a remote radar cursor in a radar window).

The following options can be toggled ON or OFF:

- **Radar Cursor In:** displays the cursor from another radar on the chart display or chart window (default - OFF).
- **Chart Cursor In:** displays the cursor from another or chartplotter on the radar display or radar window (default - OFF).

Note: *The remote display must have SeaTalk Cursor Out enabled.*

- **SeaTalk Cursor Out:** enables the output, onto SeaTalk, of the display's own cursor (default - OFF).
- **Cursor Echo Local:** echoes the cursor position between open windows on the same display (default - ON).

If you set the options to OFF, no cursor echo information is displayed.

When the appropriate option is switched on, the display shows its own cursor, plus the cursor of the other display with appropriate cursor text (RDR or CHT) to indicate its origin. This means that you could move the cursor over a target on the radar display, and check the identity of the target by looking at the radar cursor position on the chartplotter.

6.6 Radar Overlay

If radar data is available from another display connected on *hsb²*, the radar targets can be overlaid onto the full-screen chartplotter display. The radar/chart overlay option helps you to distinguish between fixed, charted objects and other objects that could be moving vessels. Some radar controls are available in overlay mode.

The following criteria must be true for radar/chart overlay to function correctly:

Cursor Echo

- Position and heading data are provided so that vessel position and orientation can be determined.

- The vessel must be displayed on screen.

- The chartplotter must be in North Up or Course Up mode (see *Section 7.5*).

- The chartplotter range must be between 1/4nm and 48nm (equivalent to a radar range of 1/8nm to 24nm).

- Custom range scales are disabled on the radar.

- The radar must be transmitting.

To ensure the vessel remains on the screen, you could use Find Ship (see *Using FIND SHIP* on *page 3-29*) to home the cursor onto the vessel.

When Radar/Chart overlay is switched on, the status bar indicates OVL. If the option is switched on but the overlay is not visible (because one of the above criteria has failed), the status bar indication changes to (OVL).

When Radar/Chart overlay is switched on the soft key MORE... provides access to the SCREEN soft key and to the radar controls TARGETS and MARPA. The radar **GAIN** control is also active in overlay mode.

Radar/Chart overlay is displayed at the current chart range. You should be aware that if radar is shown on any other display, its range will match that displayed on Radar/Chart overlay. Conversely, if you change the radar range on any display, the Radar/Chart overlay image will change to the new radar range.

➤ To select radar/chart overlay:

1. Press the **DISPLAY** key to show the DISPLAY pop-up, then if necessary press again to select Chart mode.

2. Press the OVERLAY OFF ON soft key to toggle the option on.

The two highest intensity radar returns are displayed in purple, over the chart image. The radar image is translucent, so that chart text, contours and outlines are visible beneath the radar targets.

Radar Overlay

6.7 GPS Setup

GPS set up page provides you with information and the status of the tracked navigation satellites for a SeaTalk GPS. It also enables you to SET UP a SeaTalk Differential GPS, by manually retuning it to a different differential beacon.

Note: *The satellite information is not available when you use an NMEA GPS.*

➤   To select GPS Set Up:

1. Press **MENU**, then press the GPS SETUP... soft key.
    The Navigation Status pop-up window shown in *Figure 6-4*. This window provides, for each tracked satellite, the satellite number, its signal strength, azimuth angle and elevation angle from your vessel.

```
              NAVIGATION STATUS

   SAT    SIGNAL        STATUS   AZ     ELEV
   03    ███████████▒   IN USE   085    085
   31    ████████████▒  IN USE   292    051
   21    ████████████▒  IN USE   127    048
   23    █████████▒▒▒▒  IN USE   075    043
   22    ████████▒▒▒▒▒  IN USE   174    028
   19    █████████▒▒▒▒  IN USE   290    014
   17    ███████▒▒▒▒▒▒  IN USE   056    012
   27    █████████▒▒▒▒  SPARE    321    011
   16    ████████▒▒▒▒▒  SPARE    024    005
   15    ████████▒▒▒▒▒  SPARE    237    065

         ┌─────────┐        ┌───────────┐
         │  HDOP   │        │ FIX STATUS│
         │    1    │        │    FIX    │
         └─────────┘        └───────────┘


  ┌─────────┐ ┌─────────┐
  │ RESTART │ │  D-GPS  │
  │   GPS   │ │ SETUP...│
  └─────────┘ └─────────┘
                                   D4281-2
```
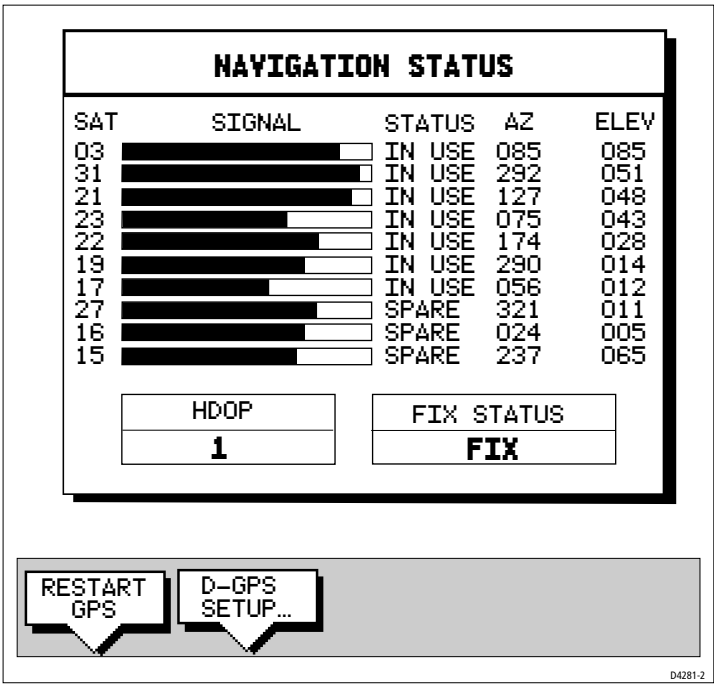
Figure 6-4:   Navigation Status Window

➤   To tune a differential SeaTalk GPS to another beacon:

1. Press D-GPS SETUP, the Differential GPS Setup pop-up is displayed with MODE and BEACON SELECT soft keys.

2. Press MODE AUTO MAN to toggle the GPS to manual tuning.

3. Press BEACON SELECT, use the soft keys to set the required beacon frequency and bit rate.
    The status of the selected beacon is displayed in the pop-up.

    Press **ENTER** to select the beacon and return to the Navigation Status window, then **ENTER** to return to the **MENU** soft keys.

GPS Setup

Note: *Under normal circumstances* RESTART GPS *is not required.*

6.8   Data Log Mode

You can set the chartplotter to log course data every thirty minutes. Up to 48 log entries are held, when 48 entries have been made, the chartplotter will start overwriting the first entries.

You start the log using soft keys provided in Data Log Mode. When you select Data Log Mode the log is displayed full-screen. If the screen is full, you use the trackpad to scroll the list and view further log entries. Each line in the log shows:

- Time of log entry
- Position at time of log entry
- Course Made Good (CMG) since last log entry
- Distance Made Good (DMG) since last log entry

Once you have enabled the data log, data is continually logged, but you must set the display to Data Log Mode to view it. You use the **DISPLAY** key to change the full-screen mode.

You can stop the log at any time and you can clear the log from memory.

➤   To activate Data Log Mode:

1. Press **DISPLAY**, the DISPLAY pop-up is shown.

2. Press **DISPLAY** again, until LOG is selected, then press **ENTER**.

➤   To start recording log entries, press the START LOG soft key.
As shown in *Figure 6-5*, the chartplotter records the time and vessels position. Every thirty minutes the time, new position, distance made good and course made good are recorded.

The START LOG soft key changes to STOP LOG.

DISPLAY

START LOG

TIME	POSITION	CMG	DMG
15:30	50°21:890N 001°20:610W	346°ᴍ	6.86ᴋᴍ
16:00	50°18:010N 001°20:070W	180°ᴍ	7.23ᴋᴍ
16:30	50°21:850N 001°19:290W	012°ᴍ	7.23ᴋᴍ
17:00	50°18:500N 001°21:300W	206°ᴍ	6.67ᴋᴍ
17:30	50°20:990N 001°18:280W	043°ᴍ	5.74ᴋᴍ
18:00	50°19:660N 001°21:960W	245°ᴍ	5.00ᴋᴍ
18:30	50°19:730N 001°18:030W	093°ᴍ	4.63ᴋᴍ
19:00	50°20:930N 001°21:750W	302°ᴍ	5.00ᴋᴍ
19:30	50°18:550N 001°18:650W	145°ᴍ	5.74ᴋᴍ

```
STOP LOG   CLEAR LOG
```

D4284-1

Figure 6-5:   Data Log Window

Data Log Mode

➤   To stop recording log entries:
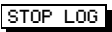
`STOP LOG` Press the STOP LOG soft key.

➤   To clear the log entries:
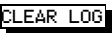
`CLEAR LOG` Press the CLEAR LOG soft key, you are prompted "Are You Sure". To cancel the
CLEAR LOG operation press the NO soft key.
To continue press the YES soft key, all log entries are deleted, but the data log
remains active.

➤   To return to the chart display,:

`DISPLAY` Press **DISPLAY** to select the chart mode, then press **ENTER**.
The log continues until you return to the data log mode and press STOP LOG.

`STOP LOG`

Data Log Mode
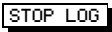
Chapter 7: Setting Up the System Defaults

7.1 Introduction

Once you have installed your display unit and are familiar with its basic operation (described in *Chapter 1* and *Chapter 3*), you need to set it up so that it obtains the correct information from the equipment you have connected it to, operates according to your requirements, and displays information according to your preferences.

This is achieved using the soft key controls that are displayed when you press the **MENU** key.

In most cases, you will only need to use the **MENU** key options when you first set up your system. However, you may decide to change the way you have customized some aspects, such as the screen and help setting, as you become more familiar with your system.

Once you have set the values, they remain as the default settings until you reset them; they are retained even if you power off your display.

This chapter covers the following topics:

- Changing the default set up parameters
- System parameter functions and default settings
- Fishfinder specific parameter functions and default settings
- Chart specific parameter functions and default settings

You should check the functions of the parameters, and decide on the new settings, before making the changes.

Note: *The SYSTEM SET UP menu option from the chartplotter display is the same as that accessed from the fishfinder display SYSTEM SET UP menu.*

7.2 Changing the Set Up Parameters

The set up parameters are divided into three sections:

- **System**, to control the aspects of the system that are not specific to the fish-finder or chart.

- **Fishfinder**, to control the fishfinder display preferences, including HSB mode, calibration and simulator.

- **Chart**, to control the chartplotter display (in fishfinders with the Raychart feature), including waypoint information, vectors and radar/chart synchronization.

Note: *The GPS menu is described in Chapter 6 and the Track Set Up menu is described in Chapter 5.*

This section provides instructions for displaying and changing the default values. The following sections list the parameters and their possible settings, and describe the function of each parameter in turn.

➤ To set the default parameters:

1. Press the **MENU** key to display the set up soft keys. The options available depend on the selected operating mode.

Fishfinder

| SYSTEM SET UP... | SONAR SET UP... | SCROLL SPEED | TRIP RESET |

D5019-1

Chart

| SYSTEM SET UP... | CHART SET UP... | TRACK SET UP... | GPS SETUP... |

D4162-1
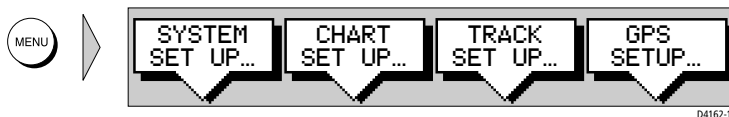
2. Press the soft key for the set up you require.

   The requested set up menu is displayed, listing the parameters and their current settings.

3. Use the trackpad to move the selection bar up and down the list. An arrow is displayed at the top or bottom right-hand corner if you can scroll the list to display further parameters.

   As each line is highlighted, the soft keys are updated to show the settings available.

   - For parameters that have a numeric value, or more than four possible settings, a scroll list is displayed above two of the soft keys.

- Some parameters are controlled by a slider that is displayed above two of the soft keys.

- For some parameters, a soft key provides access to a sub-menu of further options.

4. Press the soft key corresponding to the desired setting or, for scroll lists, use the soft keys to scroll forwards or backwards through the list until the required setting is displayed. This setting is retained when you move the selection bar on to the next parameter in the menu list.

   For sliders, press the appropriate soft key repeatedly to increase or decrease the slider value in individual steps, or press and hold the key to change the setting quickly.

5. Once you have reset all the required values, press **ENTER** to clear the menu and return to the set up soft keys.

6. Press **ENTER, MENU** or **CLEAR** to clear the soft keys and return to the default display.

You can return all the settings to their original factory settings, if required, by performing a factory reset as described in *Chapter 8*.

Changing the Set
Up Parameters

7.3   System Set Up Parameters

The following table lists the System menus and their options, shows the
factory default setting, and provides a space for you to make a note of your
new default setting. Each parameter is described in the following subsections.

Table 7-1:   System Set Up Parameters

Menu	Options	Factory Default	New Default
DATA BOXES			
POSITION	OFF, LAT/LONG, or TDs	OFF	
SPEED	OFF or ON	OFF	
DEPTH	OFF or ON	OFF	
COG	OFF or ON	OFF	
SOG	OFF or ON	OFF	
TIME	OFF or ON	OFF	
DATE	OFF or ON	OFF	
WIND	OFF, APPARENT, TRUE, BOTH	OFF	
WAYPOINT	OFF, LAT/LON, RNG/BRG/TTG	OFF	
CROSS TRACK ERROR	OFF or ON	OFF	
HEADING	OFF or ON	OFF	
LOG/TRIP	OFF or ON	OFF	
PILOT	OFF or ON	OFF	
VMG	OFF, WIND, WPT, or BOTH	OFF	
TEMPERATURE	OFF or ON	OFF	
TIDE SET/DRIFT	OFF or ON	OFF	
BEARING MODE	MAGNETIC or TRUE	TRUE	
CURSOR REFERENCE	MAG/TRUE or RELATIVE	RELATIVE	
CURSOR READOUT	OFF, LAT/LONG, RNG/BRG, or BOTH	RNG/BRG	
DAY/NIGHT (L755RC only)	DAY/NIGHT	DAY	
HELP	OFF or ON	ON	
SOFT KEYS	OFF or ON	ON	
KEY BEEP	OFF or ON	ON	
MOB DATA	DR or POSITION	DR	
PILOT POP-UP	OFF or ON	OFF	
MENU TIMEOUT PERIOD	NO TIMEOUT, 10, 20, or 30 SECONDS	NO TIMEOUT	
DISTANCE UNITS	NAUTICAL MILES, STATUTE MILES, KILOMETERS, or KILOYARDS	NAUTICAL MILES	
SPEED UNITS	KNOTS, MILES PER HOUR, or KILOMETERS PER HOUR	KNOTS	

Table 7-1:   System Set Up Parameters

Menu	Options	Factory Default	New Default
DEPTH UNITS	METERS, FEET, or FATHOMS	FEET	
TEMPERATURE UNITS	CENTIGRADE or FAHRENHEIT	FAHRENHEIT	
VARIATION SOURCE	AUTOMATIC or MANUAL	AUTO	
BRIDGE NMEA HEADING	OFF or ON	OFF	
NMEA-OUT SET UP			
APB	OFF or ON	ON	
BWC	OFF or ON	ON	
BWR	OFF or ON	ON	
DBT	OFF or ON	ON	
DPT	OFF or ON	ON	
MTW	OFF or ON	ON	
RMB	OFF or ON	ON	
RSD	OFF or ON	ON	
RTE	OFF or ON	ON	
TTM	OFF or ON	ON	
VHW	OFF or ON	ON	
VLW	OFF or ON	ON	
WPL	OFF or ON	ON	
GGA	OFF or ON	ON	
GLL	OFF or ON	ON	
RMA	OFF or ON	ON	
RMC	OFF or ON	ON	
VTG	OFF or ON	ON	
CURSOR ECHO			
RADAR CURSOR IN	OFF or ON	OFF	
CHART CURSOR IN	OFF or ON	OFF	
SEATALK CURSOR OUT	OFF or ON	OFF	
CURSOR ECHO LOCAL	OFF or ON	ON	
DATE FORMAT	DD/MM/YY or MM/DD/YY	MM/DD/YY	
TIME FORMAT	12 HOUR or 24 HOUR	12 HOUR	
TIME OFFSET	UTC, or local offset value: Plus or minus up to 12 hours, in whole hours	UTC	
GPS SOG/COG FILTER	HIGH, MEDIUM, or LOW		
COMPASS SETUP	LINEARISE COMPASS or ALIGN HEADING		

Table 7-1:   System Set Up Parameters

Menu	Options	Factory Default	New Default
LANGUAGE	ENGLISH (UK), ENGLISH (US), DANISH, FRENCH, GERMAN, DUTCH, ICELANDIC, ITALIAN, NORWEGIAN, PORTUGUESE, SPANISH, SWEDISH, or FINNISH	ENGLISH (US)	
SIMULATOR	OFF, DATA, RADAR, or BOTH	OFF	

Data Boxes

Press the SELECT BOXES soft key to display the data box sub-menu. This allows you to select up to 6 data boxes that you can display on the fishfinder.

Note:

1. A fixed set of sixteen (nine in the L755RC Plus) of these data items are available for display in the Nav Data half-screen window (see Chapter 3).

2. In addition to these grouped data boxes, boxes for the cursor readout, VRM/EBL data, waypoint data, MOB data and simulator status are displayed when selected or when the appropriate function is active.

3. Radar data is only repeated if the display is connected to an hsb² *Plus Series radar master display.*

Data boxes provide regularly used data in a compact form so that most of the picture can still be seen. The ones you select here can be turned on and off as a group during normal operation, and you can also move them around the screen individually using the context-sensitive cursor (see *Context-Sensitive Cursor Control* on *page 1-18)*.

Bearing Mode

The mode (magnetic or true) of all the bearing and heading data displayed. This is indicated in the radar status bar after the heading value, if displayed.

Cursor Reference

The mode of the bearing data displayed for the cursor readout. The bearing information can be displayed in either of two forms:

• Relative: The bearing relative to your vessel's heading.

• Mag/True: The actual bearing in either degrees magnetic or degrees true. This option is only available in Radar mode if your system includes a radar display and you have heading data from a compass.

If you choose this mode, the selection you made for the previous parameter (Bearing Mode), °M or °T, is displayed in the cursor (Rng/Brg) data boxes. The current units are shown for the heading value in the status bar at the top of the screen.

Cursor Readout

This option controls whether the cursor data is shown in latitude and longitude or in range and bearing. Alternatively, you can show both types of readout, in separate boxes, or turn the cursor data box off.

You can also turn the cursor readout box(es) on and off during normal operation, via the SCREEN default soft key (see *Switching the Cursor Data Box On and Off* on *page 3-26*).

Day/Night (Monochrome Display only)

This option allows you to change the target presentation between day and night modes.

In the normal day presentation, black targets are displayed on a white background. If you select NIGHT presentation, the picture is reversed, so that white targets are shown on a black background to reduce the intensity of the image.

Help

When Help is set to ON, a prompt appears when selecting a soft key or menu choice, and when using the context-sensitive cursor. The help message is cleared when an action is selected.

Soft Keys

When the Soft Keys option is set to ON, the default soft keys are displayed if no other operation is in progress.

When the Soft Keys option is set to OFF, the default soft keys are only displayed when a soft key is pressed, and they disappear if no operation is performed for 10 seconds.

Key Beep

This option controls whether or not the keys make a noise when you press them.

MOB Data

This option controls whether MOB data is based on position data, or on dead reckoning (DR). Dead reckoning normally provides a better indication of the course to an object in the water, on the assumption that your vessel and the object are both subject to the same tide and wind effects.

Autopilot Pop Up

This option controls whether or not the autopilot pop up is displayed. When set to ON, when the status and locked heading of the autopilot changes, they are displayed in a pop up box. The box is removed from the display after two seconds.

When Autopilot Pop set to OFF, the pop up box is disabled.

Menu Timeout Period

With no timeout set, menus and soft key labels remain displayed until you clear them by pressing **ENTER**, **CLEAR** or the appropriate dedicated key.

If you set a value here, the menus and soft key labels will be cleared if a key has not been pressed for the specified number of seconds.

This setting does not affect the *default* soft key labels, which are controlled by the Soft Keys option (see above).

Units

You can set the units for speed, depth and temperature. The units you set will be used to display all data, including information received from other instruments on the system. However, the distance units do not affect the instrumented range of the radar, which is always in nautical miles.

Variation Source

The variation value is the difference between True and Magnetic direction data for heading or bearing values. The Variation Source option provides soft keys for selecting Auto or Manual variation mode, displays the current variation value for each and highlights the currently selected mode.

Auto Mode (available in systems with *hsb²* Radar)

If you select Auto mode, the unit obtains the value of variation automatically, normally from received data. The variation value that is used depends on the data available, and is selected in the following order of priority:

1. Variation value from the same source as the heading data:

   • If heading data is being taken from NMEA, then variation is also taken from NMEA

   • If heading is taken from SeaTalk, then SeaTalk variation is used

2. Variation value from a different source:

    •   If heading data is being taken from NMEA, but no NMEA variation is available, then variation is taken from SeaTalk

    •   If heading is taken from SeaTalk, but no SeaTalk variation is available, then variation is taken from NMEA

3. A calculated variation value, using position data, if no SeaTalk or NMEA value is available

4. The current manual variation value, if no SeaTalk or NMEA value and no position data is available

Manual Mode

If you select Manual mode, by pressing either of the MANUAL keys, you can specify the local variation value according to the area in which you are operating. Press the appropriate MANUAL key to adjust the variation up or down, to a maximum of 30° East or West.

This value is then transmitted to any other SeaTalk instruments on your system. It is retained if you turn the display off and on again.

In Manual mode, incoming NMEA variation is ignored. However, if the variation is changed on another SeaTalk instrument, the new value is used and the manual value that is displayed is updated.

Note: *The Manual variation value defaults to 0°, so it is important to set up a value if variation is not available from an external source.*

Bridge NMEA Heading

The *hsb²* Plus Series Fishfinder displays bridge NMEA input data to the SeaTalk bus (see *Section 2.7*). The Bridge NMEA Heading option can be used to prevent NMEA heading data being bridged onto the SeaTalk bus.

For example, if you have a course computer connected on SeaTalk and NMEA, and an active compass connected on NMEA (for MARPA), SeaTalk data overrides NMEA data in the course computer.

You should therefore switch OFF the Bridge NMEA Heading option to ensure the course computer receives the same NMEA heading input as the rest of the system.

NMEA-Out Set Up

This option lets you disable the transmission of specific NMEA sentences, which may be necessary if you have other instruments sending the same data as your fishfinder. See *Appendix D* for a list of NMEA input messages.

For example, if the DPT (depth) sentence is set ON but the fishfinder's transducer is designed to sense temperature and speed only, the depth value will be transmitted as zero. If you also have an ST60 Depth instrument installed, there may be confusion between the zero depth sent by the fishfinder and the actual depth sent by the ST60. Turning OFF the DPT sentence disables the reading from the fishfinder.

The factory default for all NMEA sentences is transmission ON. Disable the sentence by selecting the OFF soft key. The following table displays the available NMEA sentences and their meanings.

Table 7-2:   NMEA Sentences

Sentence	Meaning
APB	Autopilot Sentence "B"
BWC	Bearing & Distance to Waypoint
BWR	Bearing & Distance to Waypoint – Rhumb Line
DBT	Depth Below Transducer (see note below)
DPT	Depth (see note below)
MTW	Water Temperature
RMB	Recommended Minimum Navigation Information
RSD	Radar System Data
RTE	Routes
TTM	Tracked Target Message
VHW	Water Speed and Heading
VLW	Distance Travelled through the Water
WPL	Waypoint Location
GGA	Global Positioning System Fix Data
GLL	Geographic Position – Latitude/Longitude
RMA	Recommended Minimum Specific Loran-C Data
RMC	Recommended Minimum Specific GPS/TRANSIT Data
VTG	Course Over Ground and Ground Speed

The messages will not stop transmitting until after **ENTER** is pressed. Consult your NMEA instrumentation documentation to determine which strings should remain ON.

Note: *The L760/RC Plus outputs the same depth value for DBT and DPT, regardless of the Depth Offset value in Sonar Setup.*

Cursor Echo (Systems with Radar Display)

You can set up an integrated system so that radar and chartplotter displays connected via SeaTalk can display each other's cursors.

Cursor echo functions so that you can display a chart cursor on the radar picture, or a radar cursor on the chart picture (you cannot display a remote radar cursor in a radar window nor a remote chart cursor in a chart window). When the appropriate options are switched on, each display shows its own cursor, plus the cursor of the other display with appropriate cursor text (RDR or CHRT) to indicate its origin. This means that you could move the cursor over a target on the radar display, and check the identity of the target by looking at the radar cursor position on the chartplotter.

Press the CURSOR ECHO soft key to display the cursor transfer soft keys. The following options can be toggled ON or OFF:

- **Radar Cursor In:** displays the cursor from another radar on the chart display or chart window (default - OFF).

- **Chart Cursor In:** displays the cursor from another or chartplotter on the radar display or radar window (default - OFF).

Note: *The remote display must have SeaTalk Cursor Out enabled.*

- **SeaTalk Cursor Out:** enables the output, onto SeaTalk, of the display's own cursor (default - OFF).

- **Cursor Echo Local:** echoes the cursor position between open windows on the same display (default - ON).

If you set the options to OFF, no cursor echo information is displayed.

Date and Time Settings

Set your preferred date format (DD/MM/YY or MM/DD/YY) and time format (12 or 24 hour). If you wish to display local time, use the soft keys to change from UTC to the required time offset. This can be up to plus or minus 12 hours, in hourly steps.

GPS SOG/COG Filter

The SOG/COG filter averages the velocity vectors to compensate for the oscillating motion of the vessel, giving a clearer indication of the vessel's course and speed. The filter does not affect the calculation of the GPS position. The velocity vectors calculated from the GPS Signal give an instantaneous measure of speed and direction of the GPS antenna. The COG and SOG can therefore seem erratic under certain conditions. For example, when a vessel is moving slowly through rough seas, the antenna moves from side to side as well as in the direction of the vessel.

Slow moving vessels, or vessels sailing in rough seas will benefit from a high setting, whereas a power boat that can quickly change speed and direction will benefit from a low setting.

Select the SOG/COG filter setting as required. This can be set to HIGH, MEDIUM or LOW.

Compass Set Up

This option is used to calibrate a Raymarine heading sensor such as the Pathfinder Smart Heading System. Controls are provided for LINEARISE COMPASS which detects and corrects for heading errors caused by metal objects, and ALIGN HEADING which matches the displayed heading to a known heading or transit.

Refer to the Handbook supplied with your heading sensor for more details.

Language

Select the language in which you wish information to be displayed. The selected language will be used for screen text, labels, menus and options, but will not affect the letters displayed by the context-sensitive cursor. The language setting also affects the display format for lat/long position information.

Simulator

The simulator allows you to operate your display without data from the transducer and/or external data sources. The system set up simulator options have the following functions:

- **Data** provides simulated numerical data, and a waypoint display.
- **Radar** (integrated systems with a radar display) provides simulated radar picture, with example targets. The picture does not change if you change the range, although the range rings are adjusted (see *Pathfinder Radar* documentation).
- **Both** provides simulated data and radar picture.

When the simulator is switched on, a SIMULATOR data box is displayed during operation, showing the simulation selected.

Fishfinder simulator mode is set in the Sonar setup menu, described in *Section 7.4*.

7.4 Fishfinder Set Up Parameters

The SONAR SET UP option allows you to set up the fishfinder according to your system configuration and your personal preferences.

The following table lists the Sonar Set Up parameters and their options, shows the factory default setting, and provides a space for you to make a note of your new default setting. Each parameter is described in the following subsections.

Table 7-3:   Fishfinder Set Up Parameters

Parameter	Options	Factory Default	New Default
TARGET DEPTH ID	OFF ON	OFF	
COLOR BAR	OFF ON	ON	
DEPTH DIGIT SIZE	LARGE SMALL	LARGE	
SONAR HSB MODE	REPEATER MASTER	MASTER	
DEPTH OFFSET	Value	0.0	
SPEED CALIBRATE	0% to 200%	100%	
SONAR HISTORY	LARGE or SMALL	LARGE	
TEMP CALIBRATE	-9.0 °F to +9.0 °F	0°F	
DEPTH RANGE (L1250/RC Plus only)	3000 ft (1000 m) 5000 ft (1700 m)	3000 ft (1000 m)	
SONAR SIMULATOR	OFF ON	OFF	

Target Depth ID

You can select whether or not the depth is displayed for displayed fishfinder echoes. When Target Depth ID is set to ON, the depth is displayed just above each fish echo. When set to OFF, the depth of each echo is not displayed.

Color Bar

The color bar indicates the range of echoes displayed in each color (shade of gray for monochrome displays). When set to ON the color bar is displayed on the right hand side of the display.

Depth Digit Size

The depth under the boat is displayed in the bottom left hand corner of the fishfinder display. You can select small or large digits for the depth display.

Sonar HSB Mode

You need to specify if the Fishfinder display is a master display (directly connected to the transducer), or a repeater display (connected via *hsb²* to a Fishfinder master display). Depth data is sourced from a master display.

Depth Offset

The depth offset is added to the measured depth value before it is displayed. You can specify the depth as a positive value – Waterline Offset, or a negative value – Keel Offset. The depth offset can be set adjusted in 0.1 increments of the units you have set for Depth Units: meters, fathoms, or feet. See *Section 7.3, System Set Up Parameters*. You can only specify depth offset for a master display.

Speed Calibrate

If the transducer is equipped with a speed paddle wheel, the fishfinder display detects and displays the speed of the boat through the water. The speed calibrate option allows you to adjust the displayed speed so that it matches your actual speed through the water. You can adjust the displayed speed, for a master display, from 1% to 200%.

If the Fishfinder reading is too low, set Speed Calibration to more than 100%. If the Fishfinder reading is to high, set Speed Calibration to less than 100%.

Temperature Calibrate

The fishfinder display detects and displays the temperature of the water. The temperature calibrate option allows you to adjust the displayed temperature. You can adjust the displayed temperature, for a master display, by -9.0°F to +9.0°F.

Sonar History

Sonar History determines the number of data sample columns that appear on the screen at one time. The options are: SMALL, which displays 240 columns of data or LARGE, which shows 480 columns. Information displayed in a single column using the LARGE setting would occupy two columns with SMALL. As a result, twice as much data history is displayed under the LARGE setting. Data displayed using SMALL appears wider and scrolls across the screen faster.

The default setting is LARGE.

Depth Range (L1250 Plus and L1250RC Plus only)

The L1250 Plus and L1250RC Plus can be set to detect a maximum depth of 5000 ft (1700 m). However, other *hsb²* devices only recognize a maximum depth of 3000 ft (1000 m). If another *hsb²* device is connected to the fishfinder, you should leave the Depth Range at the default setting of 3000 ft. Set the Depth Range for 5000 ft only if no other *hsb²* device is connected.

Sonar Simulator

The simulator allows you to operate your display without data from the transducer, in order to become familiar with the fishfinder features and functions.

Depth Range
(L1250 Plus and
L1250RC Plus only)

7.5 Chart Set Up Parameters (Raychart Models)

For Fishfinders with the Raychart feature installed, the CHART SET UP option allows you to set up the chartplotter according to your system configuration and your personal preferences.

The following table lists the Chart set up parameters and their options, shows the factory default setting, and provides a space for you to make a note of your new default setting. Each parameter is described in the following subsections.

Table 7-4:   Chart Set Up Parameters

Parameter	Options	Factory Default	New Default
CUSTOMIZE CHART	See below for details		
PLOTTER MODE	OFF, ON	OFF	
CHART ORIENTATION	NORTH UP, COURSE UP, HEAD UP	NORTH UP	
OBJECT INFORMATION	OFF, ON POINTS, ON ALL	ON ALL	
PALETTE (COLOR LCD)	SHADE, SUNLIGHT	SUNLIGHT	
WAYPOINT SYMBOLS	OFF, ON	ON	
WAYPOINT NUMBERS	OFF, OFF	ON	
DEFAULT WAYPOINT SYMBOL	⬗ , ☒ , ✕ , ⚓	✕	
HEADING VECTOR	OFF, 3 MINS, 10 MINS, INFINITE	OFF	
COG VECTOR	OFF, 3 MINS, 10 MINS, INFINITE	OFF	
TIDE VECTOR	OFF, 10 MINS, 1 HOUR, INFINITE	OFF	
RADAR/CHART SYNCH	OFF, ON	OFF	
DATUM SELECTION	WGS 84, LOCAL	WGS 84	
POSITION OFFSET	OFF, ON	OFF	

Customize Chart

This provides a list of chart options, enabling you to specify how the chart features are displayed. Most options can be toggled between on, off and custom. Custom passes on/off control to the SCREEN soft keys (see *Customizing the Screen Presentation Options* on *page 3-26*).

The following features can be set using Customize Chart, factory default settings are shown in **bold** type:

- chart text (**on**, off, custom)
- chart text size (small, **normal**, large)
- chart display (simple**, detailed**)
- chart boundaries (**on**, off, custom)
- spot soundings (on, off, **custom**)
- depth shading limit (set the limit)
- depth contours (**on**, off, custom)
- depth contour display (set the upper and lower limits)
- nav marks (**on**, off, custom)
- nav marks icon (**international**, US)
- light sectors (on, off, **custom**)
- caution and routing data (on, **off**, custom)
- marine features (on, off, **custom**)
- land features (**on**, off, custom)
- icon display (simple, **detailed**, custom)

The factory default for CUSTOM options is OFF. This can be changed using the SCREEN soft key in chart mode.

Plotter Mode

Plotter Mode enables you to zoom into a smaller area, even when no chart data is available for that scale. This allows you use the chartplotter functions at large scales even when a chart card is not installed.

Chart Orientation

The chart orientation is normally North Up, but can be changed to Course Up or Head Up if heading data is available. The orientation modes give the following displays:

- **North Up:** The chart is displayed with north upwards. As you change heading, the ship's heading marker moves. This is the default mode, and is the only mode available if there is no heading data.

- **Course Up:** The chart is stabilized and displayed with the currently selected course upwards. If you select a new course, the picture rotates to display the new course upwards.
  The reference used for the Course Up depends on the information available. The first available in the following is used:

  i. A locked heading over a SeaTalk connection

  ii. The heading at the time Course Up was selected

  To update the Course Up reference while Course Up is the current mode, re-select Course Up from the set up menu.

- **Head Up:** The chart is displayed with the vessel's current heading upwards. As the heading changes the chart will rotate.

Object Information

You can set Object Information ON ALL, ON POINTS or OFF to determine when an object identification pop-up is displayed. When set to ON ALL, the information pop up is displayed when the cursor is placed over any chart area for two seconds. ON POINTS enables the information pop up when the cursor is placed over a displayed chart object and OFF disables the information pop up.

Palette (Color LCDs only)

The Palette option lets you specify which color palette, SHADE or SUNLIGHT, the display uses.

The Sunlight palette is optimized for best display clarity in bright sunlight. In dimmer conditions you may prefer the shade palette.

Waypoint Options

Waypoint Symbols controls whether or not the waypoints are shown on the Chart display, with their appropriate symbols. The active waypoint, and waypoints in the current route are always shown.

Waypoint Numbers controls whether or not the waypoint numbers are shown for any waypoints in the current route.

Default Waypoint Symbol lets you select the symbol you want used for waypoint display.

Vectors

Heading, Tide and Course Over Ground vectors can be displayed as a line from your vessel. The length of the vector is determined by your choice of SOG and the time period. An infinite vector extends to the edge of the chart screen.

Heading Vector indicates your current heading.

COG Vector indicates your course over ground.

Tide Vector indicates the tide angle. Tide information is calculated from the speed through water, compass and position data.

Radar/Chart Synch (Systems with Radar Display)

If you have an *hsb²* Plus Series combined Fishfinder/Chartplotter display
connected via *hsb²* to a Pathfinder Plus Series Radar display, you can select
Radar/Chart Synch ON or OFF. When set ON with chart and radar windows
displayed, FIND SHIP can be used to synchronize the radar and chart images.

The chart is redrawn so that its center matches that of the radar display. The
radar is redrawn to the scale and heading mode of the chart.

Datum Selection

You can select either WGS 84 or LOCAL datum. In LOCAL mode, you are
presented with a list of datums; use the trackpad to scroll through the list, then
press **ENTER** to select the option and close the menu.

When you change datum selection, the system attempts to set any connected
GPS to the new mode, using SeaTalk and NMEA set up commands. A
message shows whether the set up was successful or not.

CAUTION:
**Changing the chart datum does *not* cause any waypoint or routes stored
in the chartplotter to move. Waypoints and routes may therefore appear
to be at different positions when you change the datum.
When adding waypoints numerically to the waypoint list, or via SeaTalk,
hsb², or NMEA, it is important that they are referenced to the same
datum that the chart is to be operated in.**

Position Offset

You can offset the vessel position to allow for differences between the GPS
and paper chart data. This may be useful if you are using a datum that is not
available on the Chartplotter, or if you are referring to a paper chart drawn to
unknown datum.

You can change the offset by moving the cursor to the known vessel position.
This offset is applied to all incoming position data. The default offset value is
zero.

When position offset is switched on, all displayed vessel position data is
annotated (C) to indicate it has been corrected.

➤ To switch the position offset on/off:

1. Select the POSITION OFFSET option, then press the OFFSET OFF ON soft key
    to toggle the option on/off. The last selected offset value is added to posi-
    tion data and the vessel is displayed at the corrected position.

➤ To set a new offset value:

1. Select the POSITION OFFSET option, then press the SET UP OFFSET soft key.
    If necessary, position offset is automatically toggled on.

2. Use the trackpad to move the cursor to the required vessel position; the cur-
    sor position is displayed in a position offset data box.

3. Press the ACCEPT OFFSET soft key, the vessel is displayed at the new posi-
    tion. Press **ENTER** to return to the default display.

➤ To set the offset value to zero:

1. Select the POSITION OFFSET option, then press the SET UP OFFSET soft key

2. Press the CANCEL OFFSET soft key. The position offset value is set to zero.

Chapter 8: Maintenance and Problem Solving

This chapter provides information on routine maintenance and on possible causes of problems you may experience with your *hsb²* Plus Series display unit.

8.1 Maintenance

WARNING:

The display unit contains *high voltage*. Adjustments require specialized service procedures and tools only available to qualified service technicians - there are no user serviceable parts or adjustments and the operator should not attempt to service the equipment. *The operator should not remove the rear cover of the display.*

Switch off the display unit before removing the power cord.

Routine Checks

The LCD display is a sealed unit. Maintenance procedures are therefore limited to the following periodic checks:

- Examine the cables for signs of damage, such as chafing, cuts or nicks.
- Check that the cable connectors are firmly attached.

Cleaning Instructions

Cleaning the Display

CAUTION:
Take care when cleaning the display. Use the display cleaning cloth provided. Avoid wiping the display screen with other types of dry cloth - this could scratch the screen coating.
Do not use acid, ammonia based or abrasive products.

- Ensure power is off, wipe the display clean with a damp cloth.
- If necessary, use IPA (isopropyl alcohol) or a mild detergent solution to remove grease marks.

Cleaning the Transducer

Sea growth can collect quickly on the bottom of the transducer, this can reduce the performance in just a few weeks. To prevent the build-up of sea growth, coat the transducer with a thin layer of paint.

Maintenance

Use only a water-based antifouling paint, or a water-based paint specifically designed for transducers. Apply the paint with a brush.

If your transducer becomes fouled or stops working because of sand or sea growth, use a stiff brush to clean it. You may sand the surface with a fine-grit wet or dry sandpaper (#320 grade or finer), but this will affect the performance of the unit when the boat is moving at higher speeds.

The paddle wheel mechanism may become jammed by dirt, grit or barnacles. Work this out of the mechanism, then clean the unit with soap and water or alcohol.

Cleaning the Hull

Use caution when sanding or cleaning the outside of the hull near the transducer.

CAUTION:
Harsh cleaning solvents such as acetone may damage the transducer.

EMC Servicing and Safety Guidelines

- Raymarine equipment should be serviced only by authorized Raymarine service technicians. They will ensure that service procedures and replacement parts used will not affect performance. There are no user serviceable parts in any Raymarine product.

- Some products generate high voltages, so never handle the cables/connectors when power is being supplied to the equipment.

- When powered up, all electrical equipment produces electromagnetic fields. These can cause adjacent pieces of electrical equipment to interact with one another, with a consequent adverse effect on operation. In order to minimise these effects and enable you to get the best possible performance from your Raymarine equipment, guidelines are given in the installation instructions, to enable you to ensure minimum interaction between different items of equipment, i.e. ensure optimum Electromagnetic Compatibility (EMC).

- Always report any EMC-related problem to your nearest Raymarine dealer. We use such information to improve our quality standards.

- In some installations, it may not be possible to prevent the equipment from being affected by external influences. In general this will not damage the equipment but it can lead to spurious resetting action, or momentarily may result in faulty operation.

8.2 Resetting the System

There are three types of reset available for the Fishfinder display:

• **Factory Reset:** This resets **all** values back to their original factory settings.

CAUTION:

The factory reset clears the Marks database, the chartplotter Waypoints and Routes databases, the sonar depth offset, and speed and temperature calibrations. The factory reset also returns the sonar repeater to its master mode.

• **Power-On Reset:** When you turn the display off and on again, the screen reverts to the fishfinder or chart picture with all windows cleared.

• **Picture Reset:** Press and hold the **DISPLAY** key for two seconds to return the screen to the full-screen picture of the top window with all windows cleared.

At power-on, the last-used values are retained for all the options, except for those listed in the following table which are reset to the factory default each time.

Table 8-1:   Power On Default Settings

Item	Power-on setting
Heading Mode	North Up (chart)
Brightness	
Mono LCD	ON at 100%
Color LCD	ON at 42% if previously left ON, or else OFF if previously set to OFF.

➤ To perform a factory reset:

1. Press **MENU**.

2. Press the SYSTEM SET UP soft key to display the System Set Up page (see *Section 7.3* for details).

3. Press and hold **MENU** for 5 seconds.

   A countdown timer is displayed. If you release the **MENU** key before the timer reaches zero, the reset is not performed.

   When the reset request has been accepted, the system restarts.

The factory default settings are listed in *Section 7.3*.

Resetting the
System

8.3 Problem Solving

All Raymarine products are, prior to packing and shipping, subjected to comprehensive test and quality assurance programs. However, if this unit should develop a fault, please refer to the following table to identify the most likely cause and the corrective action required to restore normal operation.

If you still have a problem after referring to the table below, contact your local dealer, national distributor or Raymarine Technical Services Department for further advice. Always quote the product serial numbers. The display unit serial number is printed on the back of the unit.

Common Problems and Their Solutions

Table 8-2:   Common Fishfinder Problems

Problem	Correction
Display does not function	1. Make sure that the power supply cable is sound and that all connections are tight and free from corrosion. 2. Check the system fuse.
Display "freezes"	1. Check the scroll speed is not set to zero. 2. Check the transducer cable for damage. If damaged, the cable and transducer must be replaced as a unit.
Fishfinder does not see bottom or fish	1. If you have a transom-mount transducer, check that the transducer hasn't kicked-up on hitting an object. 2. Check that the gain is not set too low. 3. Check that the transducer is within 10° of vertical. 4. Check that the transducer face is not covered or fouled. If necessary clean the transducer. 5. Check the voltage from the power source; if this is too low it can affect the transmitting power of the Fishfinder.
Fishfinder does not display fish	1. Fish arches are not displayed if the boat is stopped - fish appear on the display as straight line. 2. Ensure the transducer is within 10 ° of vertical. 3. Check that the gain is not set too low.
Fishfinder display is unreliable at high boat speeds	1. Turbulence around the transducer may be confusing the unit.
Fishfinder displays a lot of back-ground noise	1. Check that the gain is not set too high. 2. Check that the transducer is mounted correctly and is clean.
Fishfinder speed or log readings are wrong	1. Check that the transducer paddle wheel is clean. 2. If necessary add a speed offset. 3. If receiving SeaTalk speed, unplug the SeaTalk connector.
Fishfinder temperature readings are wrong	1. If necessary, adjust the TEMP CALIBRATE parameter. 2. If receiving SeaTalk temperature, unplug the SeaTalk connector.

Problem Solving

How to Contact Raymarine

On the Internet

Visit the Raymarine World Wide Web site for the latest information on Raymarine electronic equipment and systems at:

www.raymarine.com

Customer Support

Navigate to the **Customer Support** page for links to:

- Finding Factory Service locations and Authorized Dealers near you
- Registering your Raymarine products
- Accessing handbooks in Adobe Acrobat format
- Downloading RayTech software updates
- Accessing the Raymarine solution database

Clicking the **Find Answers** link routes you to our solution database. Search questions and answers by product, category, keywords, or phrases. If the answer you are seeking is not available, click the **Ask Raymarine** tab to submit your own question to our technical support staff, who reply to you by e-mail.

In the US

Accessories and Parts

Many Raymarine accessory items and parts can be obtained directly from your authorized Raymarine dealer. However, if you are in need of an item not available from the retailer, please contact Raymarine Technical Services at:

800-539-5539 ext. 2333, *or*
603-881-5200.

Technical Service is available Monday through Friday 4:00 AM to 6:00 PM Eastern Time.

Please have the Raymarine item or part number ready when calling if placing an order. If you are not sure which item is appropriate for your unit, you should first contact the Technical Support Department to verify your requirements:

800-539-5539 ext. 2444, *or*
603-881-5200.

How to Contact Raymarine

Technical Support

For technical support, call:

    800-539-5539 ext. 2444, *or*
    603-881-5200.

Our Technical Support Specialists are available to answer questions about installing, operating and trouble-shooting all Raymarine products.

Questions can be sent directly to our Technical Support Department via the Internet. Point your browser to *www.raymarine.com* and click on the **Customer Support** link. From there, select **Find Answers** and click the **Ask Raymarine** tab.

Product Repair and Service

In the unlikely event your Raymarine unit should develop a problem, please contact your authorized Raymarine dealer for assistance. The dealer is best equipped to handle your service requirements and can offer timesaving help in getting the equipment back into normal operation.

In the event that repairs can not be obtained conveniently, product service may also be obtained by returning the unit to:

    Raymarine, Inc.
    Product Repair Center
    22 Cotton Road, Unit D
    Nashua, NH 03063-4219

The Product Repair Center is open Monday through Friday 8:15 a.m. to 5:00 p.m. Eastern Time. All products returned to the Repair Center are registered upon receipt. A confirmation letter will be sent to you acknowledging the repair status and the product's reference number. Should you wish to inquire about the repair status of your unit, contact the Product Repair Center at:

    800-539-5539

Please have the product reference number, or unit serial number, ready when you call. We will do everything possible to make the repair and return your unit as quickly as possible.

In Europe

In Europe, Raymarine support, service and accessories may be obtained from your authorized dealer, or contact:

Raymarine Ltd
Anchorage Park
Portsmouth, Hampshire
England PO3 5TD
Tel +44 (0) 23 9269 3611
Fax +44 (0) 23 9269 4642

Technical Support

The Technical Services Department handles inquiries concerning installation, operation, fault diagnosis and repair. For technical helpdesk contact:

Tel:+44 (0) 23 9271 4713
Fax: +44 (0) 23 9266 1228

Questions can be sent directly to our Technical Support Department via the Internet. Point your browser to *www.raymarine.com* and click on the **Customer Support** link. From there, select **Find Answers** and click the **Ask Raymarine** tab.

Accessories and Parts

Raymarine accessory items and parts are available through your authorized Raymarine dealer. Please refer to the lists of component part numbers and optional accessories in the Installation chapter of this manual, and have the Raymarine part number ready when speaking with your dealer.

If you are uncertain about what item to choose for your Raymarine unit, please contact our Customer Services Department prior to placing your order.

Worldwide Support

Please contact the authorized distributor in the country.

Worldwide Support

Worldwide Support

Appendix A: Specifications

hsb² Plus Series Fishfinder Displays

General

Approvals:		
	CE - conform to	89/336/EEC (EMC), EN60945:1997
	FCC - conforms to	Part 80 (47CFR) and Part 2 (47CFR)
Size:	L755RC	8.8" x 8" x 4.72" (223 x 204 x 120 mm), excluding bracket
	SL760, L760RC	8.8" x 8.1" x 6" (223 x 205 x 152 mm), excluding bracket
	L1250, L1250RC	11.5" x 11.4" x 5.46" (292 x 289 x 139 mm), excluding bracket
Weight:	L755RC	7.72 lbs (3.5 kg)
	SL760, L760RC	8.16 lbs (3.7 kg)
	L1250, L1250RC	12.8 lbs (5.8 kg)
Mounting		Bracket with panel mount option
Power:		External 10.7 - 44 VDC required
		Floating earth/fully isolated
	L755RC	10 W consumption with full backlighting
	SL760, L760RC	20 W consumption with full backlighting
	L1250, L1250RC	30 W consumption with full backlighting
Environmental:		Waterproof to CFR46; suitable for external mounting
Operating/Storage		
Temp. Range:		
	Mono LCD	-10°C to +70°C
	Color LCDs	-10°C to +50°C
Humidity limit:		up to 95% at 35°C non-condensing
Controls:		11 defined keys, 4 soft keys and trackpad
Cursor:		Context sensitive, provides range/bearing or lat/lon
Display Type:		
	L755RC	7" Monochrome Film Super Twist Neumatic (FSTN) LCD, with 4 gray scales
	SL760, L760RC	7" Color Thin Film Transistor (TFT) LCD
	L1250, L1250RC	10.4" Color TFT LCD
Resolution:		
	Mono LCD	320 x 240 (1/4 VGA)
	Color LCDs	640 x 480 (VGA)
Display Size:		
	L755RC	143 mm x 111 mm
	SL760, L760RC	136 mm x 100 mm
	L1250, L1250RC	211 mm x 154.4 mm
Illumination		Screen: Color LCD - Backlighting adjustable 0% to 100%
		Monochrome - 8 levels of backlighting
		Keypad: 3 levels of backlighting

Mono LCD Contrast	64 levels, selectable via soft keys.
Languages	UK English, US English, Danish, French, German, Dutch, Italian, Icelandic, Norwegian, Portuguese, Spanish, Swedish, Finnish
Connectors	7 pin transducer 3 pin HSB input/output 3 pin SeaTalk input/output 7 pin power including 2 NMEA input channels 4 pin NMEA output
Interfaces	1 x SeaTalk, receive and transmit 1 x *hsb²*, receive and transmit 2 x NMEA 0183, receive 1 x NMEA 0183, transmit C-MAP cartridge reader - 2 slots (Raychart models only)
Man Overboard (MOB Mode)	Mark placed with course line; readout shows range, bearing, lat/lon of MOB and time elapsed since MOB.
Screen Functions	Full, half and quarter screens available dependent on function
Data Boxes	Up to six user selectable information boxes

Fishfinder Features

Output Power:
    L755RC,L760, L760RC
    L1250, L1250RC
	
	600 Watts RMS
	1000 Watts RMS

Frequency	Dual 50 KHz and 200 KHz

Depth:
    L755RC,L760, L760RC
    L1250, L1250RC
	
	1 to 3000 ft (1000 m)
	1 to 5000 ft (1700 m) [1]

Target Detection	Sonar echo with target depth readout
Display Windows	Full or split screen of either frequency, digital data and chart (if Raychart equipped). Radar screen if available via *hsb²*.
Display Modes	A-Scope with bottom coverage, Bottom Lock, Auto or Manual Zoom, White Line
Waypoints	998 waypoints entered at cursor or vessel position
Color Options	Background color selection: black, dark grey, light grey, white or blue. Two color palettes Adjustable color thresholds
Transducer	Transom mount, in-hull, or thru-hull

[1] Other *hsb²* devices recognize a maximum depth of only 3000 ft (1000 m). If another *hsb²* device is connected, you should leave the Depth Range setting at the default of 3000 ft. Set the Depth Range for 5000 ft only if no other *hsb²* device is connected, using the *Depth Range* Sonar Set Up Parameter as described on page 7-15.

Chartplotter Features (Units with Raychart)

Cartography	C-MAP® NT and NT+ micro cartridges available from C-MAP® Chart of the world built in
Display Windows	Chart, Radar, Data Log, BDI, CDI, Navdata
Chart Scaling	1/64 nm (if cartographic data is available) to 4000 nm
Presentation Modes	North up (selectable True or Magnetic) Head up or Course up
Waypoints	998 waypoints entered via cursor, lat/lon, range and bearing from present position or at vessels position. 16 character name can be assigned
Waypoint Transfer	hsb^2, current route via SeaTalk, NMEA
Routes	A route plan may contain up to 50 waypoints. Up to 20 routes can be stored in the units internal memory
Track History	5 tracks with up to 750 points in each can be stored in the units internal memory
Alarms	Programmable arrival, cross track error, anchor drift, position fix/ data loss warning, grounding, countdown timer and alarm clock
Navigation Information	Own ships position in Lat/Lon, XTE, TTG and SOG/COG selectable. Mileage scale ruler. Bearing and distance to waypoint. Bearing and distance to cursor, SeaTalk data (see 'interfacing' section)
Variation Source	Auto (SeaTalk/NMEA/Internal algorithm) or Manual
Chart/Radar Synchroniza-tion	User selectable in split screen mode provided radar/chart data available

Interfacing

High Speed Bus	Fully independent use of remote Chart data if present on hsb^2. Full remote control and display of Radar data if present on hsb^2.
SeaTalk Input	Depth, Speed Over Ground & Course Over Ground, Position, Waypoint number, range, bearing and time to go, Speed through water, Time, Cross Track Error, Heading, Wind, Date, Log/Trip, Pilot Status, Temperature, Man Overboard, and cursor position
NMEA Input	NMEA 0183 (GLL, GGA, GLC, GTD, VTG, BWC, BWR, RMA, RMB, RMC, XTE, VHW, HDG, HDM, HDT, DBT, DPT, APB,VLW, MWV, MTW,WPL, RTE and ZDA)
SeaTalk Output	Cursor data, Guard zone alarm and Navigational data bridged from NMEA
NMEA Output	APB, BWC, BWR,DBT, DPT,GGA, GLL, MTW, RMA, RMB, RMC, RSD, TTM, VLW, VHW, VTG, WPL

Appendix B: Using the Auxiliary Junction Box

The SeaTalk Auxiliary Junction Box is used to connect SeaTalk GPS and Differential beacon receivers to your *hsb²* Plus Series Fishfinder.

Note: With the exception of the Raystar 114, when you use the following Differential Beacon Receiver configurations, the receiver must be set to AUTO MODE in the GPS Set-Up page. Manual selections will not be accepted. Refer to Chapter 6 for details.

The recommended method of providing position, course over ground and speed over ground information to the fishfinder displays is by connection to a SeaTalk GPS. The *hsb²* Plus Series displays are supplied with an Auxiliary Junction Box, whose main purpose is to make this connection easier. The junction box has two flying leads, one with a SeaTalk plug for connection to the display and the other lead is for connection to a 12V power supply (the display does **not** provide power for the GPS).

The following sections detail the connections to the Auxiliary Junction Box for several different types of GPS, including a beacon receiver if installed. Except for Raystar 114, the differential beacon receivers used are NRD-2A, Apelco BR101 and the Autohelm Beacon Receiver.

The connections detailed in the following sections ensure that the GPS will always operate in SeaTalk mode. Note that the Raystar 112LP and Raystar 120 must be the SeaTalk versions.

Raystar 112, 105, Apelco 182 and 182XT

In order to connect your GPS to your Fishfinder, you must first cut off the 6-pin connector and strip back the insulation on all the wires. Connect to the Auxiliary Junction Box as shown in the first illustration below.

To connect your Differential Beacon Receiver, you must cut off the 5-pin connector, strip back the insulation on all the wires, and connect to the Auxiliary Junction Box as shown in the second illustration below.

CAUTION:
Ensure the correct polarity of the 12 V supply before applying display or SeaTalk power. It is recommended that a multimeter is used to check the connections.
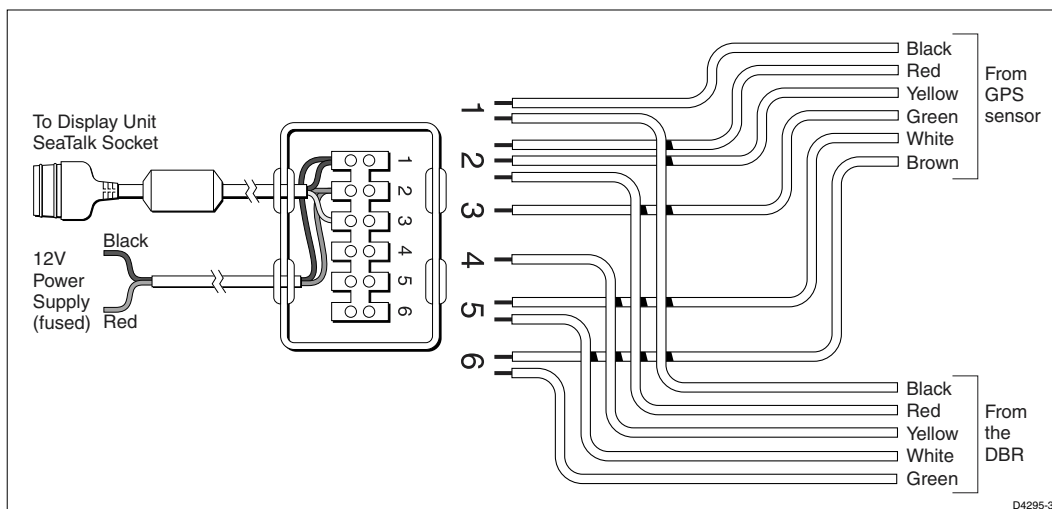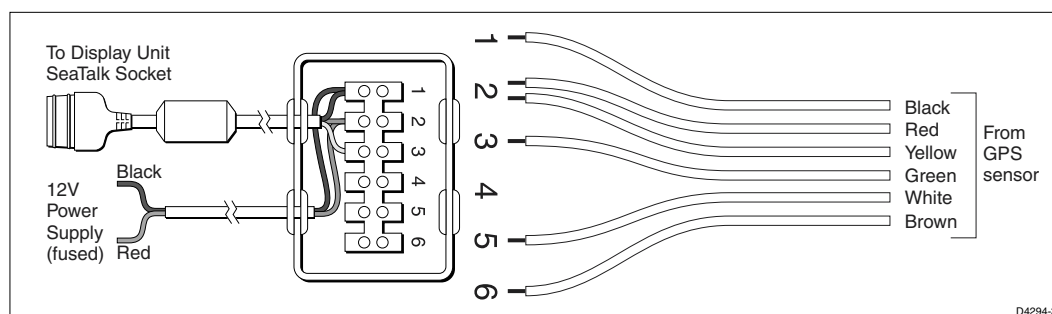
Autohelm GPS, Z260 and Z273

To connect your GPS to your Fishfinder connect the wires as shown in the first illustration below.

To connect your Differential Beacon Receiver, you must cut off the 5-pin connector, strip back the insulation on all the wires, and connect to the Auxiliary Junction Box as shown in the second illustration below.

CAUTION:
Ensure the correct polarity of the 12 V supply before applying display or SeaTalk power. It is recommended that a multimeter is used to check the connections.
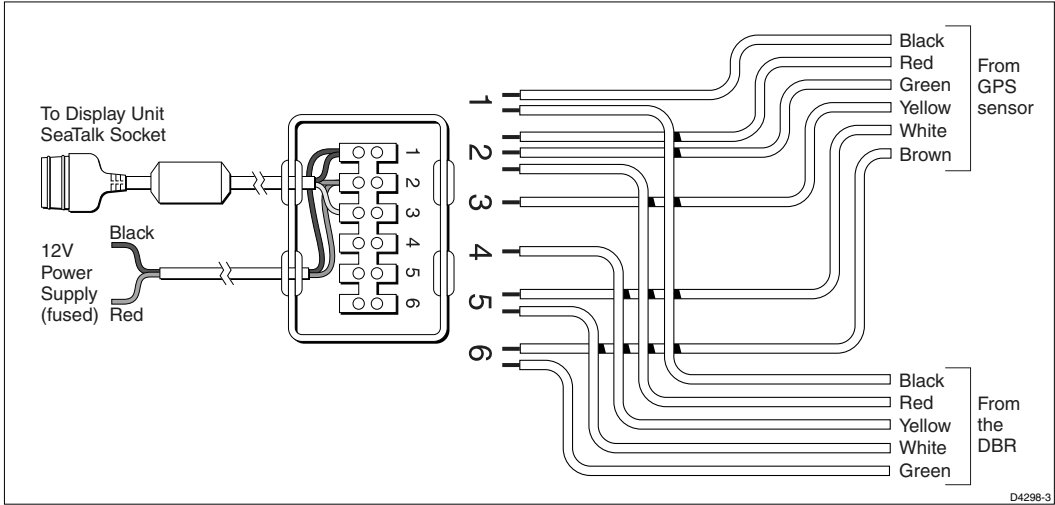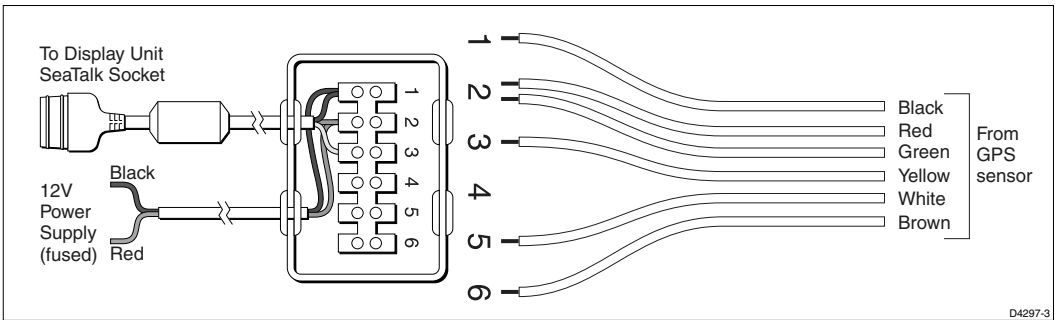
Raystar 112LP (SeaTalk version)

To connect your Raystar 112LP to your Fishfinder, refer to the first illustration below or follow the instructions in *Chapter 2*.

To connect the Raystar 112LP and your Differential Beacon Receiver, cut off the 5-pin connector and strip back the red, black, and green wires. Remove the sleeve from the end of the Raystar 112LP cable to expose the green and brown wires, then connect to the Auxiliary Junction Box as shown in the second illustration below.

CAUTION:
Ensure the correct polarity of the 12 V supply before applying display or SeaTalk power. It is recommended that a multimeter is used to check the connections.
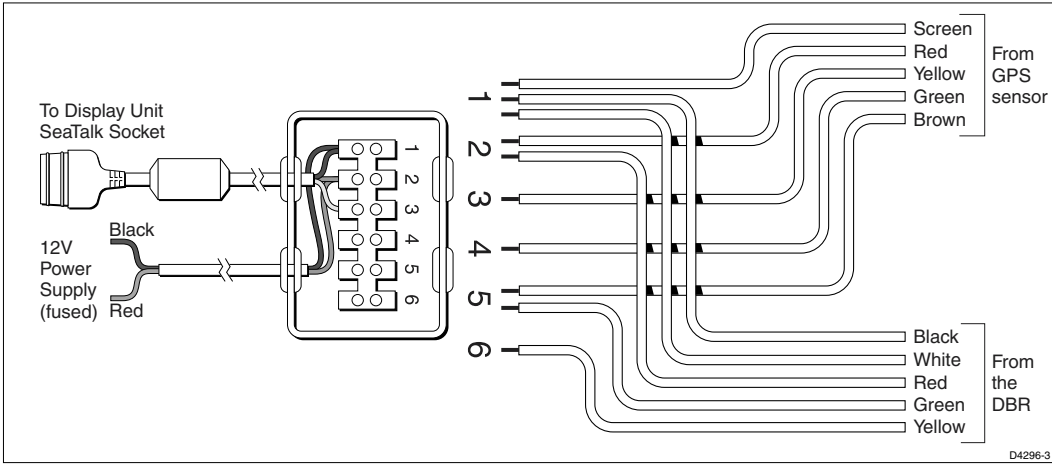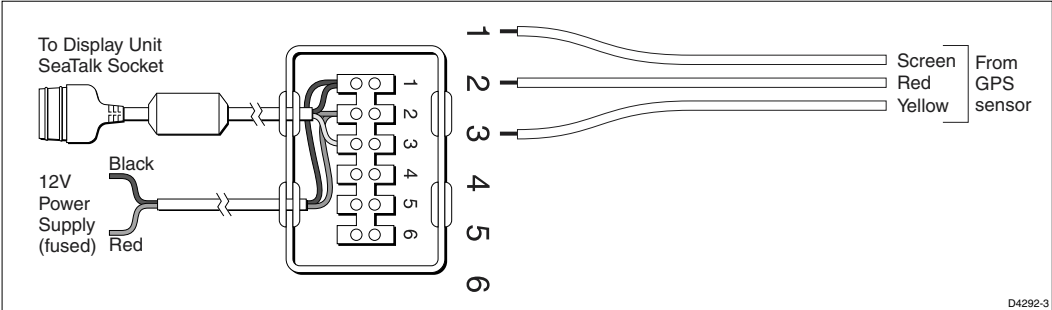
Raystar 114 Combined GPS and Differential Beacon Receiver

To connect your Raystar 114 Combined GPS and Differential Beacon Receiver to your Fishfinder, cut off the 5-pin connector, strip back the insulation on all the wires and connect to the Auxiliary Junction Box as shown in the illustration below.

CAUTION:
Ensure the correct polarity of the 12 V supply before applying display or SeaTalk power. It is recommended that a multimeter is used to check the connections.

Note: You can use the GPS Set-Up page to manually tune the Raystar 114. Refer to Chapter 6 for details.
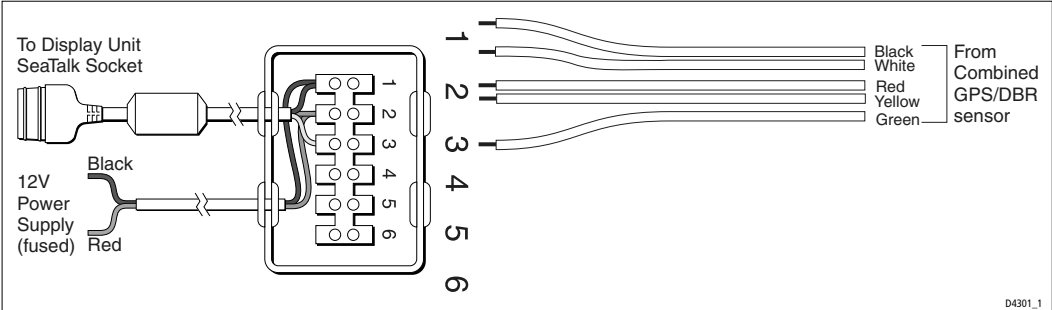
Raystar 120 WAAS Satellite Differential Receiver

To connect your Raystar 120 WAAS Satellite Differential Receiver to your Fishfinder, connect to the Auxiliary Junction Box as shown in the illustration below. Optional connections to RTCM are also shown. Note that the green wire is not used.

CAUTION:
Ensure the correct polarity of the 12 V supply before applying display or SeaTalk power. It is recommended that a multimeter is used to check the connections.
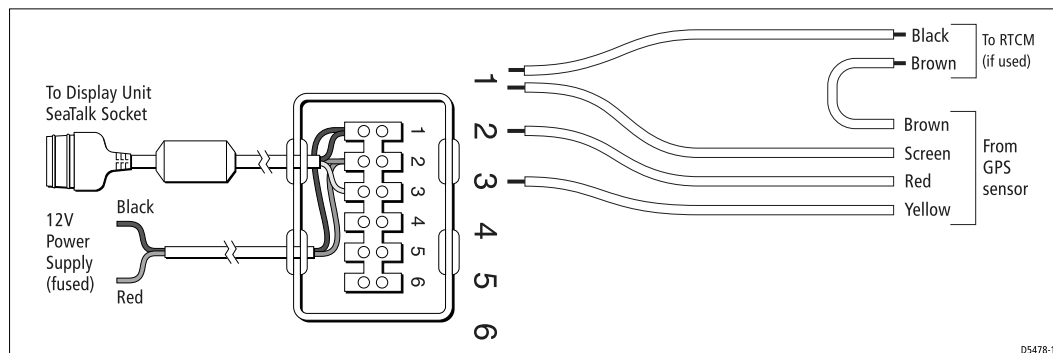
Appendix C: C-MAP Chart Card Features

The C-MAP chart cards display cartographic features which are derived from a library of symbols. The library includes a set of 16 x 16 pixel bitmaps which provide realistically shaped icons for many chart objects. However, these complex icons can overlap and clutter the display at some scales, so it possible for the user to select smaller, simple icons. Some chart objects are represented by text; in such cases conventional abbreviated text is used, for example, M – mud, R – rock, Wk – wreck

The chartplotter set up menu provides the sub-menu CUSTOMIZE CHART, which lets you determine how chart features are displayed. You can set the icon display of many features to custom; you then use the CUSTOM soft key to switch the customized icons off/on. The factory default for the CUSTOM options is on.

The chart features controlled from the Customize Chart menu are grouped as detailed below, some groups are sub-divided into categories

Menu Option	Chart Features		
CHART TEXT	Names		
CHART BOUNDARIES	Chart Boundaries		
SPOT SOUNDINGS	Spot Soundings		
DEPTH SHADING LIMIT	Reference Depth		
DEPTH CONTOURS	Depths (Bathymetric Lines) Depth Labels		
DEPTH CONTOUR DISPLAY	Depth Contour Range		

NAV MARKS	**Lights:**
	Light
	Light moire' effect
	Light float
	Light vessel
		Buoys and Beacons:
		Buoy, cardinal
		Buoy, installation
		Buoy, isolated danger
		Buoy, lateral
		Buoy, safe water
		Buoy, special purpose
		Buoy, generic
		Beacon, cardinal
		Beacon, isolated danger
		Beacon, lateral
		Beacon, safe water
		Beacon, special purpose
		Beacon, generic
			Signals:
			Anchor
			Cairn
			Chain/Wire
			Fog signal
			Radar reflector
			Top mark
			Nav aid, generic
			Extended nav aid,
			  generic
			Radar station
			Radar transponder
			  beacon
			Radio station

LIGHT SECTORS	Light Sectors		

Menu Option	Chart Features	

CAUTION & ROUTING DATA	**Caution Areas:**
	Caution area
	Fishing facility
	Marine farm/culture
	Cable, submarine
	Cable area
	Offshore prod'n area
	Pipeline
	Pipeline area
	Anchor berth
	Anchorage area
	Cargo transhipment area
	Contiguous zone
	Continental shelf area
	Custom zone
	Dumping ground
	Exclusive economic zone
	Fishery zone
	Fishing ground
	Free port area
	Harbour area (administrative)
	Incineration area
	Log pond
	National territorial area
	Sea area
	Spoil ground
	Straight territorial sea baseline
	Submarine transit lane
	Territorial sea area
	Restricted area
	Sea Plane landing area
	Military practice area
		Tracks and Routes:
		Deep water route part
		Deep water route
		  centerline
		Fairway
		Ferry route
		Navigation line
		Precautionary area
		Radar line
		Radar range
		Radio calling
		Recommended route
		  centerline
		Recommended track
		Recommended traffic
		  lane part
		Traffic separation line
		Traffic separation,
		  scheme boundary
		Traffic separation,
		  scheme crossing
		Traffic separation,
		  scheme lane part
		Traffic separation,
		  scheme roundabout
		Traffic separation zone
		Two-way route part

MARINE FEATURES	**Tideways & Currents:** Tideway Water turbulence Tide height	**Seabed bottom:** Sand waves Seabed area Spring Weed/Kelp

Menu Option	Chart Features		
LAND FEATURES	**Natural Features:**	**Cultural Features:**	
	Coastline	Airport area	Building, religious
	Dune	Built-up area	Building, single
	Hill	Railway	Cemetery
	Land elevation	Road crossing	Fortified Structure
	Land region	Road part	Siloway route part
	Land	Runway	Chimney
	Salt pan	Sloping ground	Dish aerial
	Slope topline	Square	Flagstaff/flagpole
	Tree	Cable, overhead	Flarestack
	Vegetation area	Fence	Mast
	Natural Features - Rivers	Pipeline, overhead	Monument
	Canal	Pylon	Radar dome plane
	Canal bank	Telepheric	landing area
	Rapids	Tunnel entrance	Tower
	River	Tank	Windmill
	River bank		Windmotor
	Waterfall		
	Lake		
	Lake shore		
ICON DISPLAY	Complex (detailed) object/Simple object		

The following chart features are always displayed:

Menu option	Chart features		
PORTS	**Ports:**	**Services:**	**Port Information:**
	Berthing facility	Coast Guard station	Port area
	Causeway	Pilot boarding place	Harbour master
	Checkpoint	Rescue station	Coast Guard
	Crane	Signal station, traffic	Police
	Dam	Signal station,	Customs
	Distance mark	warning	Health emergency
	Dock area		Post office
	Dry dock		Yacht club
	Dyke area		Boat yard
	Dyke crown		Accessories
	Floating dock		Electrical/electronic repairs
	Gate		Engine repairs
	Gridiron		Sailmaker
	Harbour facility		Fishing/diving gear, SCUBA
	Hulk		Hotel/Inn
	Landing place		Restaurant
	Landing stairs		Bank/Exchange office
	Lock basin		Pharmacy
	Oil barrier		Port/Marina
	Pile		Slipway
	Pontoon		Boat hoist
	Ramp		Crane
	Shoreline construction		Fuel station
	Slipway		Water
	Weir		Electricity
	Small craft facility		Showers
			Launderette
			Public toilets
			Post box
			Public telephone
			Refuse bin
			Visitor's berth
			Chandler
			Provisions
			Bottle gas
			Car Parking
			Parking for boat and trailers
			Caravan site
			Camping site
			Sewerage pump-out station
CARTOGRAPHIC OBJECTS	Line, generic Area, generic		
NATURAL FEATURES	Land area Bridge		
ROCKS	Underwater Rock		
WRECKS	Wrecks		

The following chart features are always displayed:

Menu option	Chart features
DEPTHS 1	Depth area
DEPTHS 2	Dredged area
DEPTHS 3	Intertidal area
PORTS	Mooring/Warping facility
CAUTION AREAS	Fish haven
OFFSHORE INSTALLA-TIONS	Diffuser Obstruction Production installation Offshore platform
AREAS, LIMITS	No data area
CARTOGRAPHIC OBJECTS	Incomplete survey area
NATURAL FEATURES (Ice)	Ice area Pingo
COMPOSITE OBJECTS	Airport
	Anchorage Channel edge Deep water route Defined water Harbour Range system Lighthouse Mooring trot Navigation mark, afloat Navigation mark, fixed in point Traffic Separation Scheme System
CARTOGRAPHIC AREAS	Cartographic II25 area

Appendix D: SeaTalk and NMEA Data

SeaTalk and
NMEA Data

The following table defines the data received on the NMEA/SeaTalk ports.
Data sources are listed in order of priority except where indicated.

Data Received	Source
Position (LAT/LON)	SeaTalk, GGA, RMC, RMA, GLL
Position (Loran C TD's)	GLC, RMA, GTD
Speed and Course Over Ground	SeaTalk, RMC, RMA, VTG
Waypoint Data	SeaTalk, RMB, APB, BWC, BWR, RMB, XTE
Depth	SeaTalk, DBT, DPT
Apparent Wind Angle and Speed	SeaTalk, MWV (relative)
Boat Speed Through Water	SeaTalk, VHW
Total Log and Trip Log	SeaTalk, VLW
Water Temperature	SeaTalk, MTW
Average Boat Speed through the Water	SeaTalk only
Heading	HDG, HDM, HDT, VHW, SeaTalk,
Locked Heading	SeaTalk only (Autopilot / Steering Compass)
Magnetic Variation	SeaTalk, RMC, RMA, HDG
Rudder Angle (not displayed)	SeaTalk only
Time (No priority)	SeaTalk, ZDA, GGA, RMC, GLL, BWC, BWR
Date	SeaTalk, ZDA, RMC
MOB data	SeaTalk only
Autopilot Status (Standby / Auto / Vane / Track)	SeaTalk only
Cursor Range and Bearing (from Chartplotter) Cursor Range and Bearing (from Radar)	SeaTalk only SeaTalk, RSD
Global Alarms - Watch alarm, Wind alarm, Autopilot alarms, Depth alarms. Waypoint arrival	SeaTalk Only SeaTalk, RMB, APB
Waypoint/Route Transfer	SeaTalk, WPL, RTE

* If Magnetic Heading is not available, the True Heading and Variation (if available) are used to
generate the magnetic heading.

The *hsb²* Plus Series display unit transmits the following data, if available, on SeaTalk:

Data Output	SeaTalk	NMEA Out
Position (LAT/LON)	✔	GGA, GLL, RMC[1], RMA
Position (Loran C TD's)	✔	RMA
Speed Over Ground and Course Over Ground	✔	RMC, VTG[1], RMA
Waypoint Data	✔	RMB, APB, BWC, BWR[1]
Depth	✔	DBT, DPT[2]
Apparent Wind Angle and Speed	✔	—
Boat Speed Through Water	✔	VHW[2]
Total Log and Trip Log	✔	VLW[2]
Water Temperature	✔	MTW[2]
Heading	✔	VHW[2,3]
Magnetic Variation	✔	RMA, RMC
Time	✔	ZDA
Date	✔	ZDA
MOB data	✔	—
Cursor Range & Bearing	✔	RSD[4]
EBL/VRM Data	—	RSD[4]
Heading mode	—	RSD[4]
Radar display range	✔	RSD[4]
Radar Tracked targets	—	TTM[4]
Waypoint/Route Transfer	—	WPL, RTE
Global Alarm Waypoint Arrival Alarm	SeaTalk	— APB, RMB

[1] When available, NMEA OUT data is transmitted from a combined Fishfinder/Chartplotter display or from a Fishfinder-only unit if connected to a Chart display via *hsb²*.

[2] Fishfinder data.

[3] Bridged from NMEA if selected in the System Set Up menu.

[4] When available, NMEA OUT data is transmitted from a Fishfinder display only if connected to a Radar display via *hsb²*.

Appendix E: Abbreviations

A	Amp
ANSI	American National Standards Institute
AWG	American Wire Gauge
BDI	Bearing and Distance Indicator
Brg	Bearing
CCFL	Cold Cathode Fluorescent Lamp
CDI	Course Deviation Indicator
CFR	Code of Federal Regulations
CMG	Course Made Good
COG	Course Over Ground
CRT	Cathode Ray Tube
CTR	Center
dB	deciBels
DC	Direct Current
DMG	Distance Made Good
DR	Dead Reckoning
EBL	Electronic Bearing Line
EMC	Electro Magnetic Compatibility
ETA	Estimated Time of Arrival
FCC	Federal Communication Commission
FLT	Float - floating EBL/VRM
ft	feet
FTC	Fast Time Constant
GPS	Global Positioning System
dGPS	differential Global Positioning System
GRD	Guard Zone
GHz	Giga Hertz
HDG	Heading
hsb²	High Speed Bus
Hz	Hertz
MHz	Mega Hertz
IEEE	Institute of Electrical & Electronic Engineers
in, "	inch
Kg	kilogram
kW	kilo Watt

lat	latitude
lbs	pounds
LCD	Liquid Crystal Display
lon/long	longitude
M	Magnetic
m	meters
MARPA	Mini Automatic Radar Plotting Aid
MBS	Main Bang Suppression
mm	millimeter
MOB	Man OverBoard
MRK	Mark
nm	nautical mile
NMEA	National Marine Electronics Association
POS	Position (of vessel)
RC	Raychart (chartplotter)
RF	Radio Frequency
Rng	Range
rpm	Revolutions Per Minute
SHM	Ships Heading Marker
SSB	Single Side Band
SOG	Speed Over Ground
STC	Sensitivity Time Control
T	True
TFT	Thin Film Transistor
TTG	Time To Go
V	Volts
VHF	Very High Frequency
VMG	Velocity Made Good
VRM	Variable Range Marker
WPT	Waypoint
XTE	Cross Track Error
yds	yards
ZMB	Zoom Box

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