




VISIONMASTER FT®

ECDIS User Guide

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ECDIS User Guide

Part Number: 65900012-12

Publication Revision : A

Software Version : 10.0

Before using the equipment, please read this manual.

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Warnings and Cautions

The features, functionality and capability which are described in this manual are not necessarily present in all versions or configurations of the VisionMaster FT system.

WARNING: Lethal Voltage Hazard
WHEN ACCESS COVERS ARE REMOVED, LETHAL VOLTAGES MAY BE EXPOSED. SOME CAPACITORS USED IN THE EQUIPMENT TAKE SEVERAL MINUTES TO DISCHARGE THEIR STORED VOLTAGES AFTER SWITCH OFF; THIS IS A LETHAL VOLTAGE HAZARD. ALWAYS SET THE SUPPLY SWITCH-FUSE TO OFF AND REMOVE THE FUSES, BEFORE REMOVING THE ACCESS COVERS OF THE EQUIPMENT.

WARNING: Health Hazard
WHEN CLEANING THE INSIDE OF THE EQUIPMENT, TAKE CARE NOT TO INHALE DUST. THE DUST IS A TEMPORARY HEALTH HAZARD, DEPENDING ON INDIVIDUAL ALLERGIES.

WARNING: Radiation Hazard
KEEP OUTSIDE THE HAZARD ZONE AROUND AN ANTENNA OR OPEN WAVEGUIDE RADIATING POWER. REFER TO THE TABLE BELOW FOR HAZARD ZONES. WHEN IT IS NECESSARY TO WORK ON THE SCANNER UNIT, MAKE SURE THAT RADAR IS SWITCHED OFF, AND THAT BOTH THE MAINS ISOLATOR AND THE SCANNER CONTROL UNIT ARE TURNED TO THE OFF POSITION. NEVER LOOK DIRECTLY INTO AN OPEN WAVEGUIDE. RADAR AND OTHER FORMS OF RF RADIATION CAN CAUSE CARDIAC PACEMAKERS TO MALFUNCTION. IF YOU USE A CARDIAC PACEMAKER AND SUSPECT A MALFUNCTION, LEAVE THE VICINITY OF THE RADAR SYSTEM IMMEDIATELY AND SEEK MEDICAL ADVICE.

Most countries accept that there is no significant radiation hazard at RF power density levels of up to 100W/m² (10mW/cm²).

Antenna Length	Hazard Zones		
	100 W/m ²	50 W/m ²	10 W/m ²
1.2 m X-Band	1.7 m	8.5 m	17 m
1.8 m X-Band	1.05 m	5.25 m	10.5 m
2.4 m X Band	0.75 m	3.75 m	7.5 m
2.7 m S-Band	0.73 m	3.65 m	7.3 m
3.7 m S-Band	0.55 m	2.75 m	5.5 m

CAUTION: Electrostatic Sensitive Devices (ESSDs)

This equipment contains ESSDs. Take care not to damage these devices by discharge of electrostatic voltages.

CAUTION: Anti-Virus Protection

Before connecting an external device such as a USB memory stick, or external media such as a CD or DVD to the VisionMaster PC it is important that the external device/media should first be scanned with a recognised virus and malware scanning program that includes up-to-date virus definitions. Also, the external device/media should be reserved for use with VisionMaster PCs, with use on other computers kept to an absolute minimum.

VMFT USB ports must be used only for operational data transfer, not for other purposes e.g. USB charging.

Care should be taken to ensure that any PCs (e.g. laptops) that have been previously connected to other networks are subject to the same checks as external media prior to being connected to the network on which VisionMaster PCs are connected.

PREFACE

ABOUT THIS MANUAL

The structure of this manual and the design of the pages can help you to find the information that you need. Consistent presentation techniques are used throughout the manual, to make it easy to use.

 *Depending on the composition and configuration of your installation, not all of the facilities presented in this User Guide may be applicable to your system.*

This manual is intended to be used by the VisionMaster FT operator and is divided into the following chapters, appendices and annexes:

Chapter 1	-	Overview
Chapter 2	-	Getting Started with ECDIS
Chapter 3	-	Basic Operation of ECDIS
		Appendix A - Operational Functions specific to Multi-node and Client/Server Systems
Chapter 4	-	Charts
		Appendix A - Chart Datum Codes
Chapter 5	-	Navigation Tools
Chapter 6	-	Sensor Management
Chapter 7	-	Alerts
Chapter 8	-	Routes
Chapter 9	-	Electronic Range and Bearing Lines
Chapter 10	-	Targets
Chapter 11	-	Radar
Chapter 12	-	Brilliance
Chapter 13	-	System
Annex A	-	Static Site

Your system may include optional features or purchased features that are not described in this manual. For information on these optional features, refer to Supplementary Features User Guide, 65900014.

NOTICE

Northrop Grumman Sperry Marine (“NGSM”) products may include factory installed software. By use of such product/s the user explicitly agrees and accepts the terms and conditions contained within the NGSM End User License Agreement.

The EULA is available to view in the Ships Manual Volume 2, (65900011V2) Introduction.

Northrop Grumman Sperry Marine B.V. has a policy of continuous development. This may lead to the equipment described in this manual being at variance with equipment manufactured after its publication.

Industry Recommendations for ECDIS Training

Ship owners and operators should provide crews with a comprehensive familiarisation program based on the IMO Model Course on ECDIS (1.27). This training is recommended even when ECDIS is used on vessels to which SOLAS and IMO STCW (Standards of Training, Certification and Watchkeeping) do not apply.

Ship owners and operators should always refer to their national Administrations for the latest regulations governing ECDIS carriage and use.

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Chapter 1 Overview

Hardware Configurations

The VisionMaster FT system consists of the following hardware configurations:

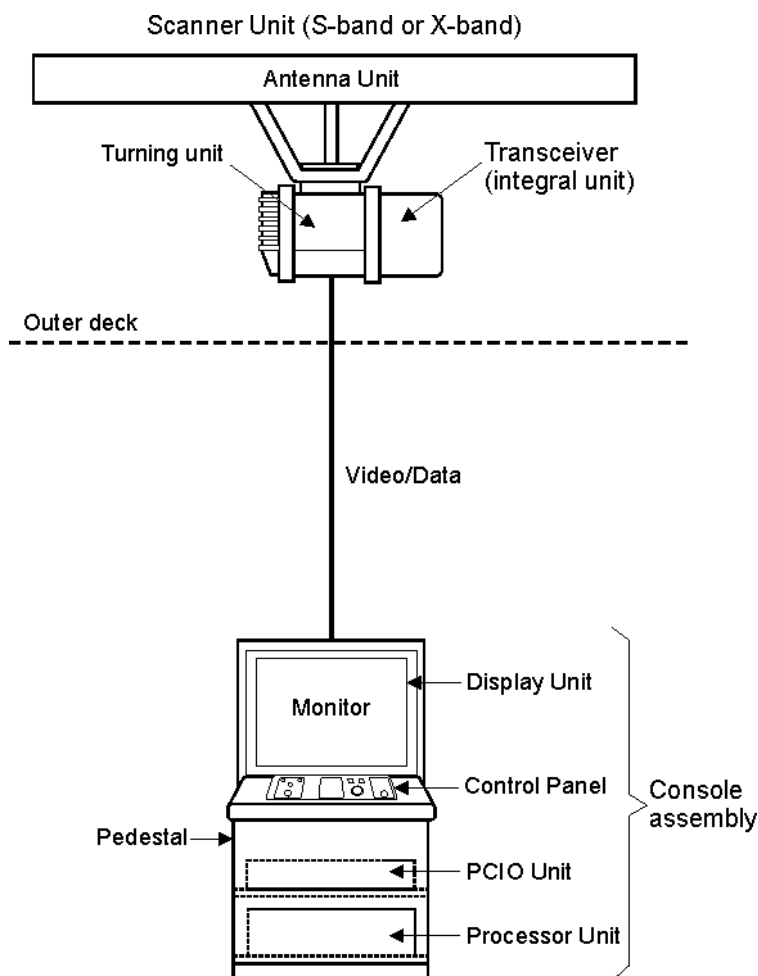
- A single node system, comprising one console connected to a transceiver, antenna and turning unit (collectively known as a Scanner Unit), see Single System.
- An interswitched system, with each console connected via an Interswitch to separate Scanner Units, see Interswitched System.
- A multi-node system, where consoles, configured to specific product types, are connected via a LAN, see Multi-Node System.
- A single node dual radar system, comprising one console connected to two Scanner Units, see Dual Radar Single System.
- An interswitched system, with a combination of dual radars and single radars, connected via a six way Interswitch to Scanner Units, see Dual Radar Interswitched System.
- A Client /Server Radar (CSR) system where one or more servers provide radar video over a network for display at Client nodes, see Client Server Radar System.

On conventional radar systems radar video and other radar/chart radar sensor data is output directly from the PCIO to the console (monitor and PC)¹. On a CSR system data is output from the PCIO to the Server unit before the data is supplied on request to Client nodes via an Ethernet network.

Traditional bridge equipment and most navigation sensors can be interfaced to a VM FT system. On a CSR system Client nodes can provide master or slave displays at any required location.

¹ On VM FT systems that require no radar (for example, ECDIS without radar overlay or Conning INFO Display) a PCIO is not required. Data can be received over a network connection.

Single System



Scanner Assembly². Comprises an Antenna unit, a Turning unit and an optional Performance Monitor. If the system includes an integral transceiver then this also forms part of the Scanner Assembly. If the system uses a bulkhead transceiver then the transceiver unit is not included in the Scanner assembly.

Antenna Unit. 10cm S-band (9 or 12ft aperture) or 3cm X-band (4, 6 or 8 ft aperture).

Performance Monitor. If fitted, the performance Monitor Antenna is mounted on the Turning Unit.

Transceiver. Masthead (mounted as an integral part of the Scanner assembly) or Bulkhead (mounted as a separate unit below decks).

Scanner Control Unit – for switching the scanner on and off – are supplied for S-band radars only.

Console Assembly - supplied as a standalone 250 tabletop and 340 tabletop/deck mounted console (including pedestal); or a kit version for installation into an existing console suite. The 250/340 console assembly includes the following modules:

Input/Output (PCIO) Unit - receives data inputs from the transceiver and external sensors; outputs data to the processor unit.

Processor Unit - a single PC running Windows XP operating system.

Display Unit - includes a flat panel monitor

Control Panel - There are two types of control panel: Basic and Enhanced. The basic control panel only includes a trackball with left and right keys. The enhanced control panel includes the following additional group of controls: Rotary controls and Adjustment & Acknowledgement buttons.

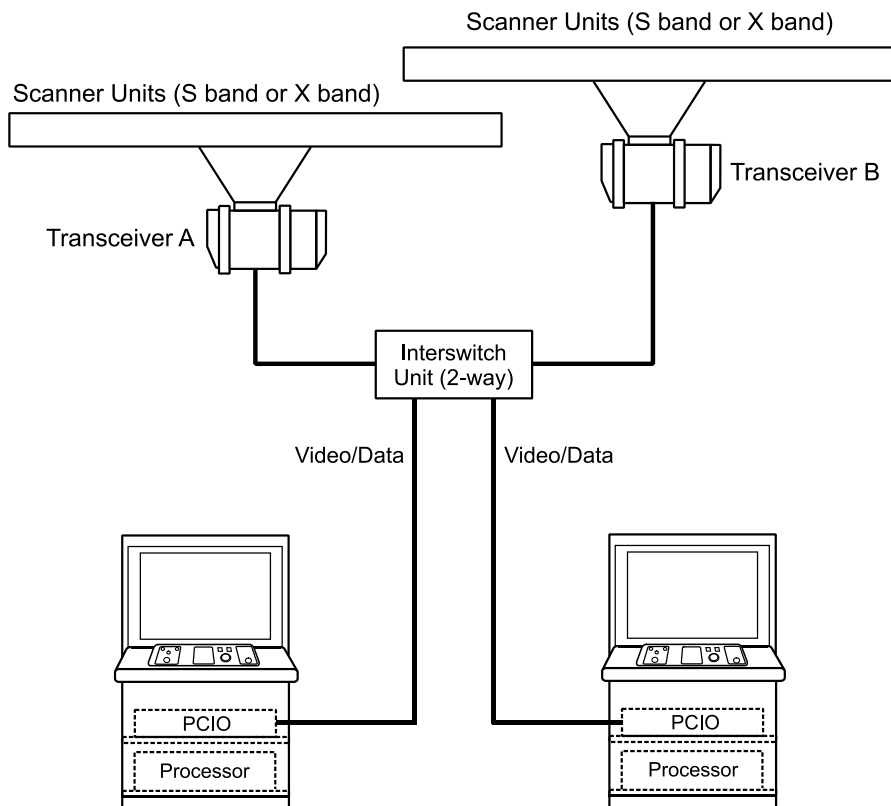
The console assembly may also be supplied as a 19" Integrated Tabletop, where the Monitor, PCIO, Processor and control panel are all contained in a single mechanical housing.

² A Scanner assembly may also be referred to as a 'Top Unit'.

Interswitched System

The basic, single-scanner/single-console configuration can be expanded by the introduction of an Interswitch Unit, plus additional scanners and display configurations. The arrangement below shows two scanners (S band or X band), two transceivers (A and B) with a two-way interswitch unit connected to two consoles. A 6-way interswitch unit is available for systems with a maximum of six scanners and six consoles.

A console may be connected via the interswitch to any one of the scanner units, and can be selected as the master display, or as a slave display.



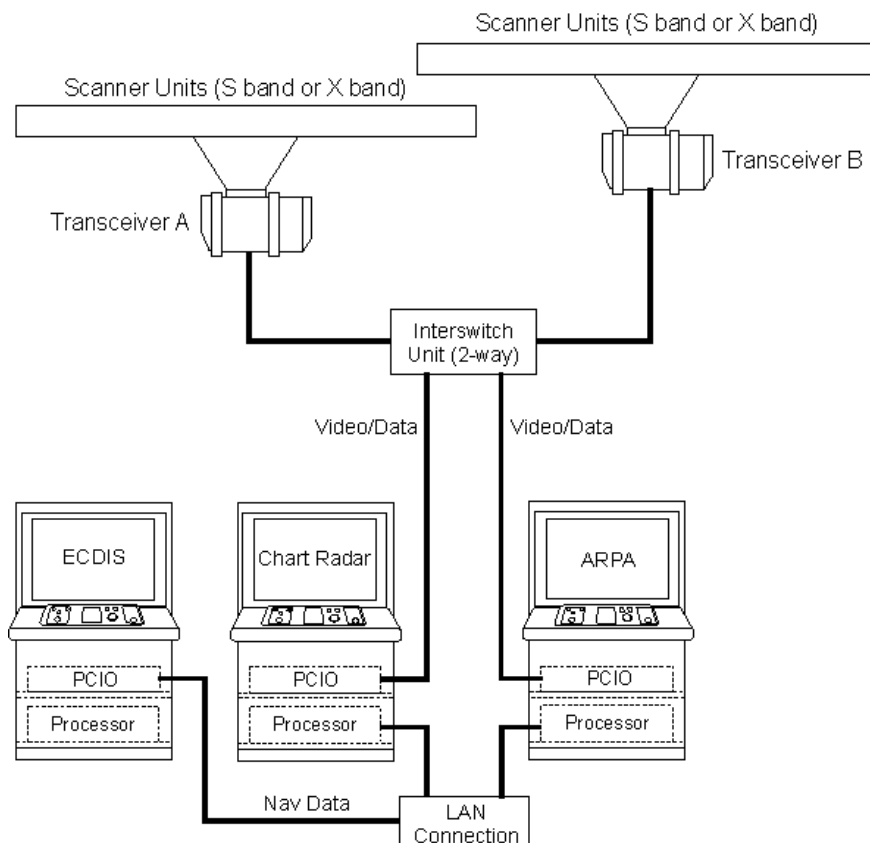
A console selected as a master display has full control of the connected scanner. The controls available at a master display but NOT at a slave display are as follows:

- switching the transceiver between standby and transmit mode
- selection of transmission pulse-length
- tuning the transceiver
- selecting Manual or [AFC](#) mode for tuning
- tuning the performance monitor.

Multi-Node System

A multi-node system may include a number of consoles which have been configured as specific product types, see Watch Mode.

Each console is linked via a LAN so that data input to one console is available to all. Consoles providing radar video data will be connected via the interswitch to one or more scanner units, and can be selected as the master display, or as a slave display.

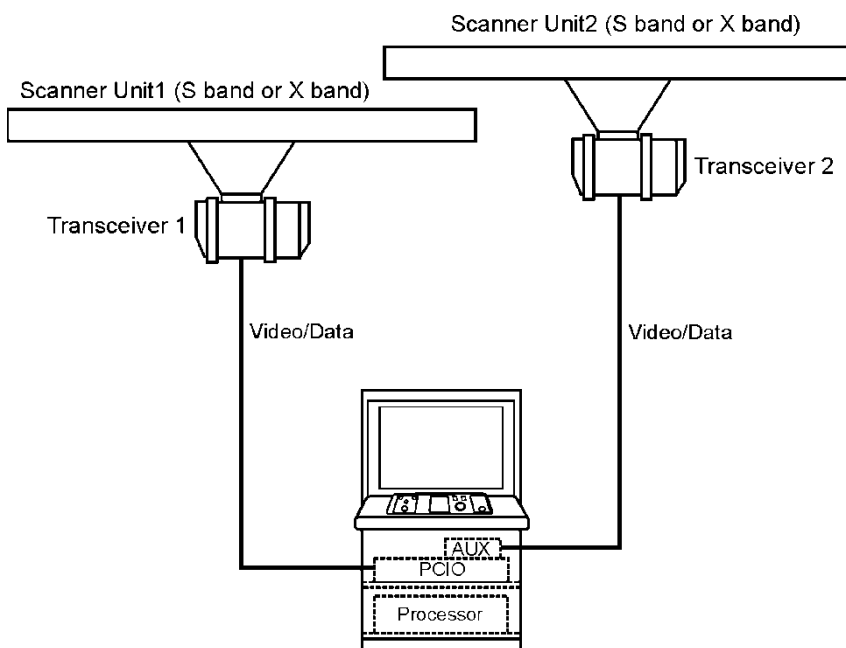


Dual Radar – Single System

A dual radar system can connect to two scanner units at the same time, enabling the overlay of radar video from both scanners to form a composite display. Each radar video source is known as a 'Channel'.

A dual radar system includes an additional scan converter card and an auxiliary PCIO unit.

For an overview on features specific to dual radar, see Dual Radar Features

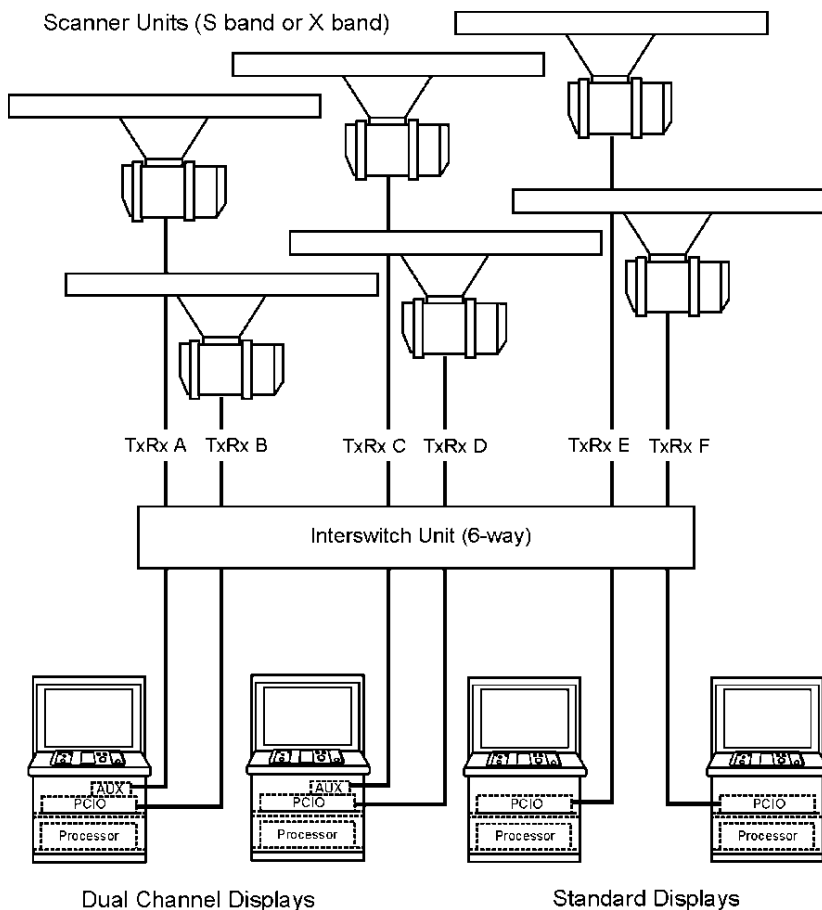


Dual Radar – Interswitched System

On an interswitched system a display radar channel can be associated with any one of the scanner units in the system. A scanner unit can be selected from its associated display as a Master radar channel for controlling that scanner, or as a Slave radar channel if another display radar channel has been selected as the Master.

The Master/Slave status of all display radar channels, and their specific scanner couplings, can be monitored from any display unit in the system.

The figure below shows two dual channel displays with two standard displays, connected to a 6-Way Interswitch unit.



Dual Radar Features

The following specific features are available if your VisionMaster FT system is configured as dual channel radar:

- Targets can be tracked on one channel through the blind arc of the other channel.
- Output of targets on the Track Table Output irrespective of the channel they are being tracked on.
- Both scanner units may be X band or S band, or an X and S band may be superimposed.
- Displays origin symbol for Channel 1.
- Enable test targets to be controlled on channel 1, channel 2 or both.

The following specific Transceiver features are available:

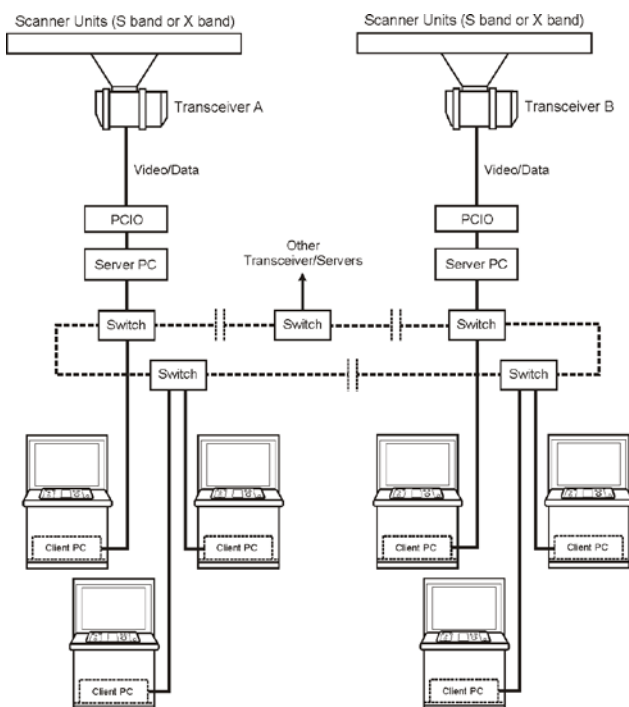
- Independent display of transceiver video.
- Individual control of the Standby/Transmit status of each transceiver.
- Individual Video Display On/Off control.
- Individual control of the other video related parameters (e.g. Gain and clutter controls).

Client Server Radar System

In a Client Server Radar (CSR) system, a Server unit is connected to each Transceiver on the system. Servers and Clients are linked via an Ethernet network, with each Server supplying data to a maximum of eight Clients.

Each Client can request a specific service from any one of the Servers. When all Clients request a connection to a different Transceiver, those Clients can all be set as Master of the requested Transceiver through the associated Server and will then have full control of that Transceiver. If two or more Clients need to use the same Transceiver, one must be set as Master, with the other Clients set as Slaves. A Client may request a change to which Transceiver it is connected. This process is controlled by negotiation between the Servers and is known as Virtual Interswitching.

The Client nodes, whether acting as Master or Slave, retain the same independent control of video presentation capability as a conventional VisionMaster FT system.



Product Types

There are two VisionMaster FT ECDIS product types available at commissioning:

1. ECDIS
2. ECDIS with Radar Overlay.

An ECDIS is not connected to a scanner unit and therefore receives no radar/video.

An ECDIS with Radar Overlay is connected to a scanner unit, receives radar/video and includes additional user controls, see Radar Overlay Features.

If your ECDIS is for a stationary installation, it will be configured as a Static Site. For information on Static Site refer to Annex A - Static Site.

In addition to the ECDIS product types, the following product types are available for selection at the configuration tool:

- Radar/Chart Radar (CAT 1 and CAT 2 variants). For information on the different Radar/Chart Radar product types, refer to the Radar/Chart Radar User Guide, 65900010.
- Conning Information Display (CID) see Chapter 2 in the Supplementary Features User Guide, 65900014.
- Central Alert Management (CAM), see Chapter 7 'Alerts'.
- Total Watch (a multi-function workstation that enables switching between watch modes; for example, ECDIS to Chart Radar).
- Radar Video Server - In a Client/Server Radar system only Servers are configured as a Radar Video Server. All other Client nodes may be configured as any of the product types listed (with the exception of a CAT 2 Radar).

The features applicable to ECDIS and ECDIS with Radar Overlay product types are given in the following tables:

- ECDIS Features - lists the features which are applicable to all ECDIS product types.
- Purchasable Features – lists purchasable features that can be added to your ECDIS.
- Radar Overlay Features - lists the features which specifically apply to ECDIS with Radar Overlay.

ECDIS Common Features

The following table lists all the features common to ECDIS product types, in addition to optional features that may be configured for your system.

Feature	Additional details
Display controls	Picture brilliance (day/night selection). Brightness check Displaying/hiding heading line and synthetics. Centring and off-centring (MAX view) the picture. Display of primary, or primary and secondary presentation displays (vertical/horizontal split screen or popup window secondary display). Hides all windows currently shown on the display, or restore all previously opened windows. Zoom window defines a specific area of the chart display to zoom into. Display Chart – temporarily hides all synthetics and displays only currently selected chart layer. Display Base temporarily hides all synthetics and displays only the chart base layer
Display Features	A north arrow pointed true north in the upper left corner of the chart window. Scale and latitude bars drawn vertically 2 to 4 mm from the left border of the display.
Defining and displaying user specified data	Own ship's position. Waypoint data. Wind and depth data.
Scale selection	Scale ratio from 1:500 to 1:20,000,000
Range Rings	Range rings on or off. Ring interval dependant on scale.

Ship's heading and speed display	Compass alignment. Selection of speed mode (through water or over ground). Selection of water or ground stabilisation
Selection of Sensor Source	Selection of sensor source for data type (heading, <u>STW</u> , position etc.)
Selection of presentation mode	North-up or Course-up
Motion Mode	True Motion (TM) only
Selection of vector mode	Selection of true (T) or relative (R) vectors. Selection of vector time.
Chart Facilities	Enables vector and raster charts installed from an installer facility to be displayed. Chart feature sets can be customised and manually updated by the operator.
Chart Symbols Colour Diagram	Ensures any adjustments made to brightness and contrast settings will enable chart symbol SENC data, such as coastlines, safety contour and other objects to be adequately displayed.
Defining and displaying EBLs, VRMS & ERBLs	Two electronic bearing lines – EBL 1 & EBL 2. Two variable range markers – VRM 1 & VRM 2. Each EBL/VRM pair can be displayed as a combined <u>ERBL</u> – ERBL 1 and/or ERBL 2.
Extensive alert indications (Alarms, Warnings and Cautions)	Displaying the current unacknowledged alert with highest priority in the alert status indicator. Facility for acknowledging alerts in a status indicator. Display all alerts, listed in groups of alarms, warnings and cautions, or sorted by group. Alert buzzer facility. Watch alarm facility.
Temporary and Permanent prompts	Both Temporary and Permanent prompts are displayed below alerts.

Navigation facilities	Position as derived from navigational sensors, or an estimated position.
Routes facilities	Monitor and display internal, external and temporary route data. Import or export route plans
Target Facilities	Enables system and AIS targets to be displayed and selected for display of tote information.
Navigation Tools	Create, edit and delete different types of commissioned Navigation (NAV) tools.
Selection of Display Settings	Display of own ship display settings, including: True Scale Ship, Beam Line, Vector Tick marks.
Conning Information Display	Enables a Conning Information Display (CID) windows to be shown over the display. If a wide screen display is used CID pages are permanently shown on a side panel, see ECDIS Screen Layout.
System tools	Define system time and set a time zone offset Display information on unit groups, user profiles, diagnostics and commissioning.
Diagnostic facilities	Monitor the performance of the system or the receiver Generate a report and export the report file. View Detail Logfiles and export the detail log as a zip file. View the status of the sensor data from the sensor source. Test the Alert buzzer.
Commissioning facilities	Enables user login. Display of TCVR settings, Video and Authorization information
Print	Prints a screen image to a printer connected to the VisionMaster console.
Help facility	Online Help Guide. Context sensitive Help.

Optional Features

The following table lists optional features that can be added to your VisionMaster FT ECDIS.

Feature	Additional details
Tides and Currents	Enables stations to be created that hold manually entered values for tide/sea current speed, direction, and time.
PADs	Outlines drawn on the display to mark areas that need to be avoided by own ship.
Track Control ³	Track control is used to keep the ship on a monitored route under various conditions. A track control system consists of one or more nodes and an Autopilot. The Autopilot interface may also include a Joystick controller.
Propulsion Control ³	Propulsion control enables to control the speed of the ship by interfacing to the propulsion system via an external controller.
Total Tide ³	A chart-based prediction program which provides tide and stream predictions for shipping routes generated from the Admiralty Tide Tables (ATT).
NAVTEX ³	Enables access to marine safety information broadcast from coastal transmitting stations using a Client/Server application called PC NAVTEX.
Weather Fax ³	Enables weather and navigational data to be displayed on a web stage via a receiver device.

³ For information on the last five optional features refer to the Supplementary Features User Guide 65900014.

Purchasable Features

The following table lists purchasable features that can be added to your VisionMaster FT ECDIS.

For information on all purchasable features listed below, refer to the Supplementary Features User Guide 65900014

Feature	Additional details
iView3D	iView3D comprises a 3D display. The 3D display shows a 3D visualisation of chart depth.
iView3D with SonarWatch	This comprises a sonar and 3D display. The sonar, mounted on the bow of the ship, which relays sonar data to VisionMaster
iVideo	Enables video from CCTV to be displayed, either via a LAN connection, or via the PiP feature on the monitor.
Route Based (Automatic) Speed Control ⁴	A control mode in which speed orders are generated based on a monitored speed plan.
3rd Party Applications	Enables third party applications to be launched from the Watch Mode. The applications are opened in a separate window.

⁴ Route based speed control is a purchasable feature whereas a propulsion control system and a track control system are available as optional features.

Radar Overlay Features

The optional radar interface provides access and display of target information. Radar contacts are automatically processed to provide a single target list, so that if two VisionMaster nodes have acquired the same target it will be displayed as one target at the ECDIS. Symbols representing radar targets are displayed on the electronic chart, see Target Facilities.

In addition to the targets display, the radar interface can optionally provide a Radar Overlay, which displays radar video on the electronic chart, see Radar Video Mode. The radar return information from fixed navigation points can be used to check the accuracy of the displayed chart, matching chart data to actual location data for objects visible to the radar.

The following table lists the additional features available with the radar overlay option.

Feature	Additional details
Transceiver control	Selection and set up. Manual/automatic tuning.
Video processing controls	Video gain. Manual/AUTO anti-clutter, SEA/RAIN control. Enhanced video mode.
Selection of Trails mode	Selection of True or Relative Trails Selection of different types of trail modes.
Target facilities	Enables Radar targets and AIS targets to be selected and relevant information displayed. Provides different types of target alarm states.
Transparency Level	Enables the transparency level percentage of radar video to be set.

Total Watch

If your VisionMaster FT system is configured as a Total Watch (see Product Types), the following presentation options may be available from the Watch Mode button:

- Chart Radar
- ECDIS
- Playback
- Conning INFO Display
- Central Alert Management
- Third Party Applications

The availability of the presentation options listed above is dependent on the product type and security device installed at initialisation, see System Security.

This User Guide describes the ECDIS product type. The Central Alert Management (CAM) presentation option is described in Chapter 7 'Alarms' - Central Alert Management.

For information on the Radar and Chart Radar, refer to the VisionMaster Radar/Chart Radar User's Guide, 65900010.

For information on Playback, Conning INFO Display and Third Party Applications, refer to the Supplementary Features User Guide 65900014.

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Information on Sensor Inputs to the System

The VisionMaster Radar system is Type Approved using 19", 23.1" and 25.5" displays with X-Band and S-Band top units. To function correctly the system requires sensor input from external devices. Any limitations associated with the method of sensor input are stated below.

Compass Input

The approved method of compass input is via an analogue input, either through a Synchro or Stepper motor interface. If an analogue input is unavailable then a serial input may be used with data conforming to IEC 61162-2 at 38400 baud rate and a message update rate of approximately 50Hz.

The primary compass data should be used in all circumstances. For example, re-constituting serial data as analogue data via a converter is inferior to using the serial data direct.

Log Input

The speed log input used must be compliant to IMO resolution A 824(19).

When a ground speed log is in use, true video trails will be ground stabilised, using both longitudinal and transverse data if available from the log. However, a ground speed log may have inaccuracies in deep waters, depending on the actual depth of the sea. Additionally, if a single axis log is used it will not take into account transverse effects due to leeway, tides and currents. The magnitude of these effects will depend on their strength and direction.

When a water speed log is in use, true video trails will be water stabilised, using both longitudinal and transverse data if available from the log.

Position Input

The EFPS connected to the system must be compliant with IMO resolution MSC112(73) or MSC.114(73).

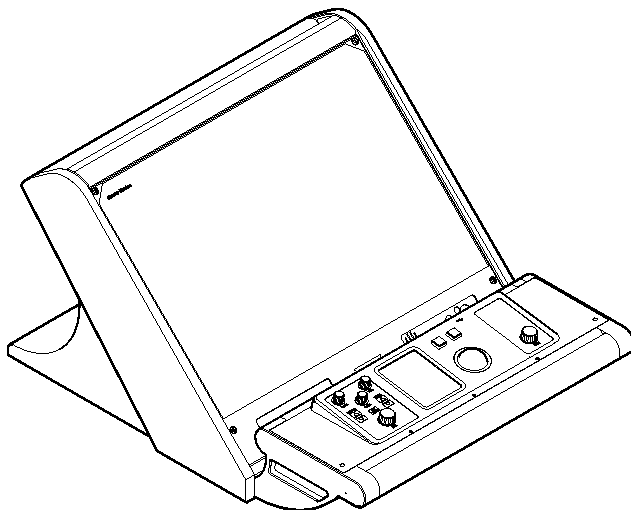
Chapter 2 Getting Started with ECDIS

This section shows you how to start up the ECDIS display and how to use the ECDIS controls. The following topics are covered:

- a description of the System Controls
- System startup and Security features
- typical layout of an ECDIS display and access to System Functions
- a description of fixed and movable windows in the ECDIS display
- switching between Standby and Transmit mode
- using the screen cursor and a list of cursor graphics
- how to access the online Help and accessing Tool Tips
- a description of system generated Operator Messages
- shutting down the system

System Controls

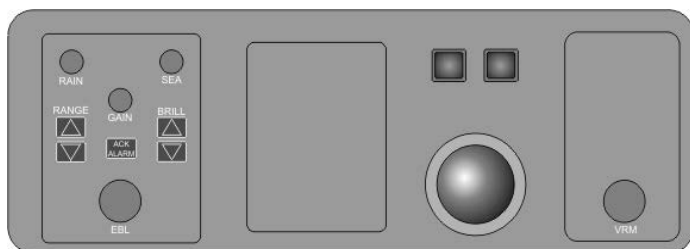
The operator controls the VisionMaster FT system via a control panel assembly, monitor controls and a power On/Off switch.



Control Panel

The Control Panel consists of the following group of controls:

- Trackball assembly
- Rotary controls
- Adjustment and Acknowledgement buttons.



Trackball Assembly

The trackball assembly comprises a trackball and two associated keys (left and right). The trackball controls the position of the screen cursor. Selections are made by positioning the cursor over a menu caption or control button on the chart display and clicking (press and release) on the left key. The right key is used to provide additional functionality such as accessing drop down menus applicable to the function.

 Throughout this manual, instructions to 'left click' or 'right click' relate to a press-and-release of either the left key or right key.

Rotary Controls

The rotary controls include the following:

- Turning the EBL control automatically switches on EBL1. Turning the control in a clockwise or anti-clockwise direction adjusts the EBL1 bearing, see Electronic Bearing Line (EBL) in Chapter 11 Electronic Range and Bearing Lines.
- Turning the VRM control automatically switches on VRM1. Turning the control in a clockwise or anti-clockwise direction adjusts the VRM range, see Variable Range Marker (VRM) in Chapter 11 Electronic Range and Bearing Lines.
- The GAIN control adjusts the video gain setting for the currently selected anti-clutter mode, see Video in Chapter 12 Radar.
- The RAIN control adjusts the anti-clutter rain setting, see Video in Chapter 12 Radar.
- The SEA control adjusts the anti-clutter rain setting, see Video in Chapter 12 Radar.

Adjustment and Acknowledgement Buttons

The RANGE buttons increase or decrease the currently selected scale ratio by one level, see Scale Ratio in Chapter 3 Basic Operation of ECDIS.

The BRILL (brilliance) buttons change the day/night modes by one level, see Day and Night Modes in Chapter 8 Brilliance.

Pressing the ACK ALARM button acknowledges the currently displayed alarm announcement, see 'Alert Status Indicator' in Chapter 3 Basic Operation of ECDIS.

Monitor Controls

The monitor controls include an On/Off button and a brightness adjustment control.

The On/Off button controls the monitor only; it does NOT control the radar system.

The brightness adjustment control has an indexed position, marked as a white line. This indexed position sets the default brightness and calibrated operation.

WARNING!
THE USE OF THE MONITOR BRIGHTNESS CONTROL MAY INHIBIT VISIBILITY AT NIGHT.

Monitor On Screen Display Controls

The monitors used in VisionMaster systems include On-Screen Display (OSD) controls. These controls enable access and adjustments to be made to monitor settings, including the image position, scaling and image quality. The OSD functionality available may vary dependent on the type of monitor your system uses.

Under normal circumstances the OSD controls should not require operator adjustment. However, if information on the monitor OSD controls is required refer to section 2.2 '*Monitor Unit*', in Chapter 5 '*Fault Reporting and First Line Servicing*', VisionMaster Ships Manual Volume 1 (65900011V1).

Power On/Off

The ECDIS system is switched on at the Power On/Off switch located on the underside of the control panel, see System Start-Up.

The system must be powered down as described in System Shutdown. Do NOT switch the power off until the system has fully powered down.

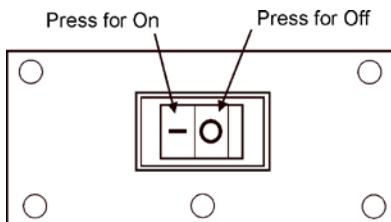
System Start-Up

Switching on the System

The VisionMaster workstation is designed such that one switch at the workstation typically applies power to that workstation's computer and monitor.

In a multi-node system, as the system is started, the software automatically establishes communication with other workstations that may already be running.

To start up the system press the On/Off rocker switch, located on the underside of the control panel. When this switch is turned On the system powers up.



 *The On/Off switch is the only system control accessible to the operator. Do NOT remove the front panel.*

CAUTION:

When starting up the system always leave at least one minute after the system has powered down before switching the On/Off switch to On.

Software Start-Up

Each VisionMaster workstation is equipped with a device called a Security Block (sometimes called a 'dongle') which is attached to a USB port on the PC. On start-up, the system compares permit codes and the product type identifier (e.g. 'ECDIS with Radar Overlay' or Chart Radar) stored in the dongle to the corresponding data in the system configuration file. If the data does not match, the system will not be authorized and will run in a degraded state. For further information, see System Security.

In a multi-node system the dongle will also contain security data which defines the number of nodes in the system of each product type (e.g. two Radars and one ECDIS).

Starting up the software takes approximately 2 to 3 minutes. Soon after the system is powered up the VisionMaster FT Start Up window appears on the screen, this window shows the current system software version number, copyright information and a status bar displaying the system loading status.



After system initialisation has completed the start up window is replaced by the ECDIS display. By default the system opens with the chart display in centre mode with ownship symbol shown in the centre of the chart. On start up the system is always in Standby mode.

Setup Procedures

After the VisionMaster software has loaded, some setup procedures may be necessary. To verify proper setup, make the following checks:

- On the sensor data display at the top left of the screen, the indicators for HDG (Heading), COG (Course Over Ground), SOG (Speed Over Ground), and STW (Speed Through Water) should all be green. Yellowish-orange data indicates a loss of valid data from the selected source. The sensor data display indicates the current stabilisation mode: water stabilised or ground stabilised, with the HDG/STW field block highlighted in water stabilisation and the COG/SOG field block highlighted in ground stabilisation. The current stabilisation mode can be toggled in a Stabilised Mode field below the motion mode and presentation mode buttons, refer to Sensor Data Display for more information.
- The heading sensor may require alignment when the system has started. If alignment is required the HDG values in the Sensor Data Display show flashing yellowish-orange dashes and Heading folder of the Sensors menu automatically opens with the Sensor also showing yellowish-orange dashes and the Alignment state as 'Unaligned', see below. To align the heading refer to Heading Source Values.



- The currently active sensor sources for navigation data are indicated to the right of the displayed sensor data. Verify that the desired sensor devices are selected. For information on sensor source selection, see Sensors Menu. On the video circle chart display, the colour of the Ownship symbol or outline is yellowish-orange if the software determines that the data sources for Position and Heading are not providing valid data.

- If any alert conditions are active the Alert Status Indicator will flash red or amber and the buzzer will sound. To acknowledge alert left click on the alert status indicator, or right click to open the Alert Display and view information on the alarms. See Chapter 7 AI for more information on using the Alert Display window.
- On the upper toolbar, verify that the selected chart type shown in the Chart button is correct. To change chart settings, or to install charts, see Chapter 4 Charts.

System Security

System security is maintained by comparing identification codes contained in the Security Block device attached to the VisionMaster PC (see System Start-up) with the codes contained in the software configuration file.

The following rules govern system security:

- In order for the VisionMaster FT to operate effectively, a Security Block device must be properly programmed by Sperry Marine and attached to the PC.
- On a multi-node system each node has a Security Block attached. The system also compares the allowed number of workstations (nodes), to the actual number of nodes in the system. If the number of nodes exceeds the limit set in the Security String an Authorization Failure alert is given.
- If the Security Block becomes damaged or detached while the VisionMaster FT is running, an Authorization Failure alert is given. The system will continue to operate but will revert to a degraded state after a period of 7 days. If the Security Block is damaged the operator should contact their supplier Sperry Marine to apply for a replacement.
- If on start-up an invalid system identification code is found in the configuration file, the system will shut down. No grace period is provided.
- While the Security Block is broken or detached, installation of charts is prohibited. This is true even if the user has obtained a temporary security password.

ECDIS Screen Layout

When the system has successfully started up the ECDIS appears. Apart from the upper toolbar area the chart display fills the whole of the display area rectangle.

The basic controls and screen layout for an ECDIS are shown below.

The control functions for an ECDIS can be divided into the following areas:

- Main Menu and Sub Menu functions (auto show/hide)
- Upper Toolbar Area (fixed)
- Lower popup Toolbar Area (auto show/hide)

Main Menu and Sub Menu Area

When the cursor is moved over the **Show Menu** button at the bottom right of the screen, the Main Menu functions and any associated Sub Menu functions are shown in a vertical panel to the right side of the screen. If the cursor is moved away from this area the functions are hidden.

If the cursor remains stationary for a short period of time (usually around 5 to 6 seconds) on the lower toolbar area the Show Menu button is replaced by the Sperry Marine VisionMaster FT logo. The Show Menu button reappears when the cursor is moved.

Upper and Lower Toolbar Areas

At the top of the screen, the upper toolbar area provides quick access to system functions that must be visible at all times, such as primary navigation information and operating modes. The upper toolbar area is fixed and always visible on an ECDIS.

The lower toolbar area is initially hidden, but can be displayed at any time by moving the cursor to the bottom of the screen. The lower toolbar area is hidden again when the cursor is moved away from the toolbar area. This area provides controls that are needed frequently during system operation.

From both the upper and lower toolbar areas, various popup windows can be opened for access to system functions, see Controlling Popup Windows.

Screen Layout for Widescreen Display

If your VisionMaster system includes a widescreen, the area to the left of the main display will be available for CID (Conning Information Display) pages.

For information on using CID pages see Chapter 2 '*Conning Information Display*' in the Supplementary Features User Guide. For information on configuring and creating CID pages, see Chapter 4 '*Conning Information Display*' in Volume 2 of VisionMaster Ship's Manual.

All other ECDIS controls and functions on a widescreen are the same as a standard screen display.

Chart Display

The ECDIS has the capability to catalogue and display vector charts and raster charts in various formats. Since chart formats differ, the system can be configured to use the formats specified by the customer.

Available vector formats include charts in the following databases:

- C-MAP charts (supported by the C-MAP chart engine)
- S-57, S-63, VPF (supported by the SevenCs chart engine)

Available raster formats include charts in the following databases:

- ARCS⁵ (supported by the SevenCs chart engine)

If a chart database is active, the display shows the most detailed chart, from the loaded database, for the area where the ship is located.

⁵ Admiralty Raster Chart Service. Suppliers of raster format electronic charts with world coverage, in the HCRF format.

Accessing System Functions

Most ECDIS system functions use controls that are located on popup windows, which can be moved to any location on the chart display.

For more information on using popup windows, see Controlling Popup Windows.

Upper Toolbar Functions



The following functions on the upper toolbar can be changed by a left click on its control button:

- HDG/STW (for water stabilised mode), COG/SOG (for ground stabilised mode)
- Video On/Off
- Standby/Transmit mode
- True or Relative Vectors
- Presentation Mode (or right click to select available modes)
- Scale Ratio Up/Down buttons
- Alert Acknowledgement
- Buzzer alarm On/Off
- Man Overboard
- Watch Mode (to select the console view)

To access the following control windows left click on these upper toolbar buttons:

- Target (for Target Display)
- AIS (for AIS Display)
- Message (for Own Ship AIS Messages)
- Danger (for Dangers window)

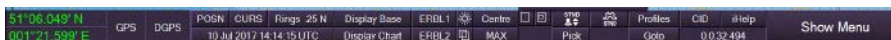
To access the following sub menu functions left or right click on these upper toolbar buttons:

- Chart Type (for selection of available charts, with its natural scale, based on position of own ship).
- Route (for Routes)
- Autopilot (for Autopilot control modes) - if configured

To access the following sub menu functions right click on these upper toolbar buttons:

- Video (for Video Settings)
- Standby/Transmit (for Transceiver Control and Interswitch)
- Target (for Targets sub menus)
- AIS (for AIS sub menus)
- HDG, COG, STW and SOG (for applicable data source)
- Motion Mode (to show, set or reset TM limits, see Setting True Motion Limits)
- Alarms (for Alarms Display window)

Lower Toolbar Functions



The following functions on the lower toolbar can be changed by a left click on its control button:

- Display Base (left click and hold to suppress synthetics and show only ECDIS chart base layer)
- Display Chart (left click and hold to suppress synthetics and show chart layers currently selected)
- Range Rings On/Off
- Popup windows Show/Hide
- Centre view (moves own ship to centre of display)
- MAX view (off centres own ship and display)
- Presentation modes (Primary and Secondary chart display)
-  STND (applies standard Chart Display Settings)
-  STND (applies ECDIS Standard Settings; see Chapter 4 'Charts').
- Print⁶ (enables a screen shot of the chart display to be printed to a printer connected to the node)

To access context sensitive Help left click on the iHelp button, the cursor changes to the iHelp icon (see Using the Cursor). Left click on a function button to display context sensitive Help for that function.

⁶ The Print button will appear on the lower toolbar only if selected in the User Interface menu of the configuration tool. The default setting for the print option is not selected.

To access the following popup windows left click on these lower toolbar buttons:

- CURS (for Cursor status)
- POSN (for own ship position status)
- ERLs 1 and 2
- Date and Time field (for Time Management window)
- Pick (accesses the Pick Report window)
- Goto

To access the following sub menu functions left click on this lower toolbar button:

- Brilliance icon (for Day/Night settings and Brilliance sub menus)
- CID (for available CID windows)
- Profiles (for apply available profiles, or to access User Profiles)
- 3D (for 3D view window) – if configured.
- Presentation Options – for secondary display options.

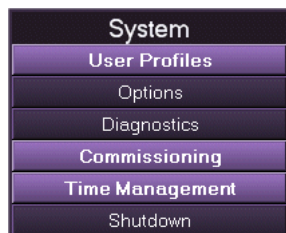
To access the following sub menu functions right click on these lower toolbar buttons:

- iHelp (for Report tab folder in the System Diagnostics sub menu)
- STND (for the Chart Settings sub menu)

Main Menu and Sub Menu Functions

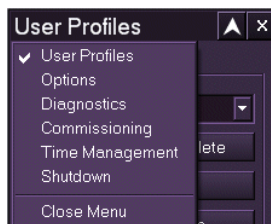
To access the sub menu functions of each main menu click on the function in the sub menu navigation list. The selected function is highlighted in the main menu and the function window opens in the upper right of the display, directly above the sub menu list. If another sub menu function is opened the function window previously opened now closes and is replaced by the new selection. To keep the previous window open, move it to another position on the display (see Controlling Popup Windows), each displayed function is highlighted in the sub menu navigation list.

To remove the function window from the display either click on its button in the navigation list, or click the **X** button on the window.



Selecting related Sub Menus from a Function Title Bar

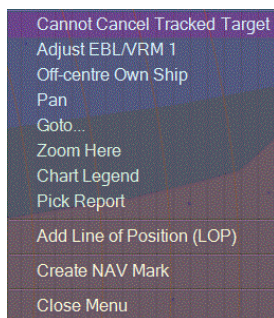
When a sub menu window is open all related sub menu options within that main menu can be quickly accessed by right clicking on the sub menu title bar and selecting from the drop down list. The sub menu option selected from the drop down list replaces the previously opened window.



Accessing Context Window from the Display

The following functions can be additionally accessed by right clicking anywhere with the chart display and selecting the option from a semi-transparent context menu:

- Cancel Target (if a target has been found)
- Adjust EBL/VRM1
- Off-centre Own Ship
- Pan
- GoTo..
- Zoom Here
- Chart Legend
- Pick Report
- Add Line of Position (LOP)
- Create NAV Mark



There may be additional options available when right clicking in the chart display, dependent on the currently selected function.

For example, if you are in route edit mode the options **Add Waypoint** or **Delete Waypoint** may be available, see Creating a Route.

The context window is automatically removed from the screen after about 10 seconds of inactivity.

Controlling Popup Windows

When a function is accessed from the lower toolbar that calls for a status window (e.g. Position or Cursor) the function's popup window appears on the chart display, directly above its access button.

Each popup window includes a top area containing the window's title, an expand/collapse button and a close button.



To move a window, select the window's title bar, hold down the left key and then use the trackball to drag the window to the desired new location.

1. To collapse a window click on the  button. Only the top toolbar area of the window appears on the display.
2. To expand a previously collapsed window click on the  button. The control area of the window re-appears.
3. To close a window click on the  button. The window is removed from the display.

 *ECDIS does not limit the number of popup windows that may be opened, and certain windows, such as CID pages, may cover a substantial part of the display. It is therefore important that popup windows are used appropriately. If no longer required, the windows should be closed, or the Hide Windows option used.*

Show/Hide Windows

To hide all windows currently shown on the chart display, click on the Show/Hide Menus button in the lower toolbar area .

To restore all previously opened windows click on the Show/Hide Menus button again. All opened windows are restored to their previous positions on the display (unless new windows have been opened since the Hide Menus button was clicked).

Using the Cursor

Wherever the cursor is displayed on the chart display, a popup Cursor window, accessed from the lower popup toolbar area gives a readout of the cursor's position within the display. By default the Cursor window gives cursor range and bearing (from own ship) and cursor latitude/longitude, see Cursor Readout.

Cursor Graphics

When the cursor moves over the system control areas and popup windows it is displayed as a small white arrow.



When the cursor passes from the control areas into the chart display it changes to an orange cross.



When the cursor is moved near to the edge of the chart window it changes from an orange cross to the following symbol.



When the cursor moves over the dividing line between the primary and secondary windows in vertical split screen mode it changes to the following symbol.



When the cursor moves over the dividing line between the primary and secondary windows in horizontal split screen mode it changes to the following symbol.



When the cursor moves over the right bottom edge of a secondary window in secondary presentation it changes to the following symbol. The window can then be re-sized.



If an adjustable parameter is selected within a control window, the cursor is displayed as a text entry cursor.



When **Select Points** is selected from Charts menu the letters **CM** are added to the cursor, see Chart Match.



When **Pick On** is selected from Pick Report menu, or **Add Annotation Mark** is selected from Manual Chart Update a **?** is added to the cursor



When a waypoint is to be added to a route plan, the letters ADD RTP appear below the cursor see Routes.



When a Polygonal activation zone is created, the letters **Add** appear below the cursor, see Activation Zones.



When a map offset is to be applied graphically, the cursor changes to the following symbol.



When a Temporary Route is created or edited, the letters TMP WPT appear below the cursor, see Temporary Routes.



When a mapping object is created or edited, the letters MO EDIT appear below the cursor.



When the cursor moves over an object to be deleted the letters DEL appear below the cursor.



When the **iHelp** button is selected and the cursor moves over screen functions it changes to the following symbol.



When the cursor moves over an Electronic Bearing Line (EBL) or Parallel Index line it changes to the following symbol.



When the range of a Variable Range Marker (VRM) or Parallel Index line is adjusted the cursor changes to the following symbol.



When the video cursor moves over an Electronic Range and Bearing Line (ERBL), or Distance Line, it changes to the following symbol.



Standby and Transmit Mode

Standby Mode

After the system has powered up the display is always in Standby mode, with own ship's symbol shown centred in the chart display (see Own Ship Symbols).

The Standby/Transmit control icon is located on the upper toolbar. When the system is in Standby the icon is shown with a white diagonal line through it.



In Standby mode you can access the following functions which allow the display to be set up for operation:

- Presentation Mode
- Radar Settings
- Alerts
- Cursor data
- Scale Ratio selection
- Chart View
- Video Processing Controls (Manual/AUTO and Enhance On/Off)
- Sensors Indicator and Sensors menu
- Electronic Range and Bearing Lines (ERBLs)
- Trial Manoeuvre settings
- Route Plans
- Navigation Tools
- Chart settings
- System Settings

Transmit Mode

In addition to the functions listed in Standby mode, the following functions are available when the ECDIS chart display is in Transmit mode:



- Radar Video
- Display and selection of target data
- Video Processing Controls, see 'Video' in Chapter 12 Radar
- Radar Fine Tuning, see 'Transceiver' in Chapter 12 Radar

If you are not familiar with using the ECDIS display, it is strongly recommended that you read System Controls. This describes how to use the external controls in order to operate the system.

Standby/Transmit Mode in Dual Radar

In a dual radar system the transceivers for channel 1 and channel 2 may be individually switched between Standby and Transmit.



For information on Standby and Transmit mode and video control for a Dual Channel Radar, refer to 'Dual Radar – Transmit and Video Mode Selection' in Chapter 3 'Basic Operation of ECDIS'.

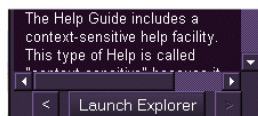
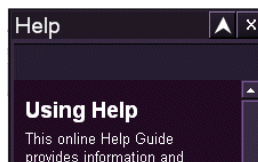
Online Help

The VisionMaster FT system includes an online Help Guide that provides information and procedures necessary to operate the system.

A context-sensitive help facility is also provided. This type of help is called "context-sensitive" because it enables the user to quickly access information relevant to the major functions displayed on the VisionMaster FT screen.

Accessing Context Sensitive Help

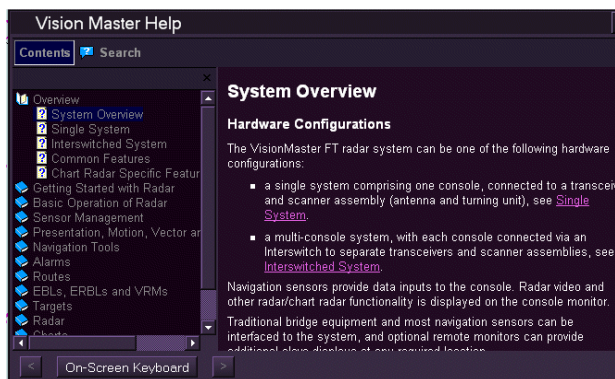
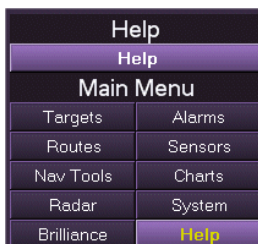
1. Click on the **iHelp** button in the lower toolbar area.
2. With the cursor displaying the ? icon click on the required function button, the Help information relevant to that function appears in a movable window on the chart display.



Accessing the Help Guide

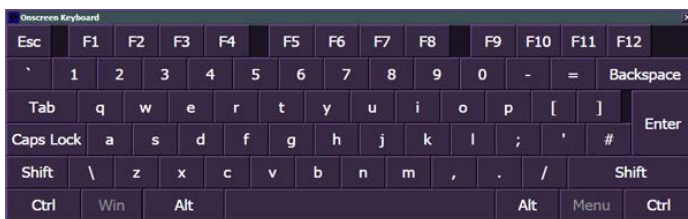
The Help Guide is accessed by clicking on the **Launch Explorer** button at the bottom of the Help window. This window can be accessed either from the context Help window previously opened, or by clicking on the **Help** button in the main menu list, and then clicking on the **Help** sub menu button.

The online Help guide appears as a moveable window and can be resized as required.



On-Screen Keyboard

The Help Guide includes a screen keyboard that allows the operator to enter text and numerical data.



To access the keyboard click the **On-Screen Keyboard** button at the bottom of the VisionMaster Help window. A keyboard window appears below the Help Guide, replicating a standard computer keyboard. The keyboard window may be minimised or closed by clicking the respective buttons at the top right of the window.

Accessing Tool Tips

As the screen cursor moves over the system function buttons the text in the highlighted button changes from white to yellow and a tool tip for that function is briefly displayed in a popup window.



Operator Messages

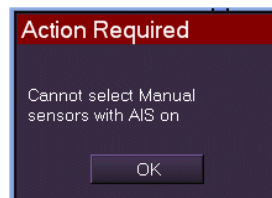
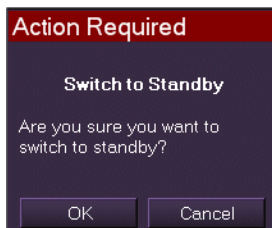
The system generates messages that appear in order to either confirm an action to proceed that the operator has requested, for example, when switching from Transmit to Standby. Or a message to confirm an action that the system is about to make, for example to acknowledge a change of own ship's course on a monitored route.

Action Required Messages

If an **Action Required** message is confirming an operator action the window will include an **OK** button and a **Cancel** button. The action is confirmed by clicking the OK button, or if the action is to be cancelled the Cancel button is clicked.

If the action requested by the operator cannot be done, the system displays the reason for not proceeding with the action and a confirmation (OK) button.

While an Action Required message is active the system periodically sounds an audible indicator, which may be muted by the operator, see Alert Buzzer.

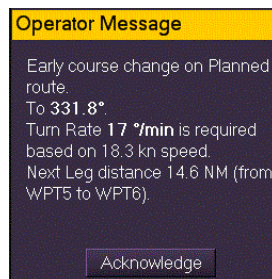


Operator Messages

Operator messages are used to notify the users at all nodes about course changes on a monitored route (see Monitor Route), or when the system is transitioning into or out of track control mode.

When an operator message is displayed, the buzzer is sounded briefly to alert the operator to their presence. All Operator Messages include an **Acknowledge** button.

If a message is not acknowledged after a period of 30 seconds it is then escalated to an Alert.



System Shut Down

To shut down a standalone node, or your particular node on a multi-node system, select **Shutdown System** in the System menu (see Shutdown) and wait for the VisionMaster FT application and the Windows operating system to power down. When the software has fully powered down then switch the On/Off switch to off.

CAUTION:
Do NOT switch the On/Off switch to Off before the VisionMaster software has fully powered down.

To shut down all the nodes on the system select **Shutdown All Systems**. For a multi-node system a prompt appears requesting a confirmation of the shutdown to be entered, see Shutdown for details.

CAUTION:
In a multi-node system, each node may be configured to provide a connection to a sensor device or other peripheral equipment that is also providing data to other nodes on the system. Therefore it is important to change to alternate data sources before shutting down a node that is providing navigational data to the system. If an active sensor is lost, an aler is generated, and the colour of data displayed for that sensor will change to yellowish-orange on the nodes that are still running.

Chapter 3 Basic Operation of ECDIS

This section describes the basic operation of the ECDIS. The following topics are covered:

- Selecting Transmit Mode
- Own ship's heading line and ship symbols
- Cursor readout
- Position data
- Alert Status Indicator
- Sensor Data Display
- Presentation Modes
- Motion Modes (including setting True Motion limits)
- Vector Modes
- Radar Video Mode
- Scale Ratio
- Chart Database & Sub Menu Selection
- access to Target Display
- access to AIS Display
- access to Own Ship AIS messages
- User interface, including Presentation options, screen navigation, range rings and synthetics
- Positioning options, including Panning Offsetting and Goto and Centre and Maximum View
- Display options, including Display Chart and Display Base
- Access to Pick Report
- Current Date and Time
- Brilliance Control
- User Profiles
- Zooming into an area
- Watch Mode
- Safety Checking
- CID windows
- Print screen
- Printing a secondary chart
- Alternate bow functionality

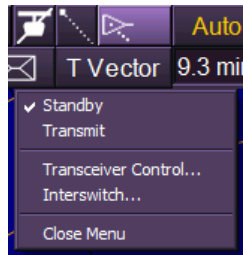
Appendix A describes operational functions specific to Multi-node and Client/Server systems.

Selecting Transmit Mode

When **Transmit** is selected, either from the Standby/Transmit button or the Transceiver window (see Radar Settings, Transceiver), the system is switched from Standby to Transmit mode. In Transmit mode the transceiver starts transmitting radar pulses and the ECDIS can be enabled to show video overlay, see Video Overlay Mode.

There are three ways of selecting Transmit mode:

1. Left click on the Standby/Transmit button.
The white diagonal line is removed from the button and the system transfers to Transmit mode.
2. Right click on the Standby/Transmit button and select **Transmit** from the drop down list
3. Right click on the Standby/Transmit button and select **Transceiver Control**, the Transceiver window appears on the display. From this window click on the **Transmit** radio button in the Operational Mode area of the window, see Transceiver.



In Transmit mode the transceiver starts transmitting radar pulses and the display shows own ship's heading line to indicate ship's direction (see Heading Line) and radar origin, centred on own ship symbol (unless antenna offset locations have been configured).

The sensor devices that have been configured for the system will begin acquiring navigation data to be made available to the operator, see Sensor Data Display.

When Transmit is selected and the Transceiver is a Master (see Interswitch) the pulse length buttons and tune modes (Manual and AFC) become active in the Transceiver window.

In Transmit the default presentation mode is North Up, see Presentation Modes.

Selecting Transmit Mode in an Interswitched System

In an Interswitched system switching to transmit is only possible at a display selected as a Master, or if the display is a Slave and the Master display that is connected to the same transceiver is in transmit.

If the Master display is in Standby the Slave display cannot switch to transmit.

Selecting Transmit Mode in a Client Server Radar System

In a Client/Server Radar (CSR) system switching to transmit is only possible if that Client is selected as a Master, or if the Client is a Slave and the Master Client connected to the same Transceiver/Server (TRServer) is in transmit. If the Master Client is in Standby the Slave Client cannot switch to transmit.

A Client that is currently a Slave display can switch to being the Master display of a TRServer from the Interswitch menu, see 'Interswitch on a Client/Server Radar' in the Radar chapter.

If a Client has no connection to a transceiver via a Server the message **TCVR Disconnected** appears on the chart display and the Standby/Transmit button on the upper toolbar displays a red **X** to indicate that the node is disconnected. The node can be reconnected from the Interswitch menu.

Dual Radar – Transmit Selection

In Dual Radar each channel may be independently selected for Standby or Transmit.

1. To select transmit for channel 1 or channel 2 left click on the Standby/Transmit button. The Transceiver window opens directly below the upper toolbar.
2. Select which channel you require to be transmitting by clicking on the **Channel 1** or **Channel 2** tab buttons. From the operational mode area of the window select **Transmit**.



When both channels are set to Transmit, the Transmit/Standby button is displayed as for single radar. If one channel is set to Transmit and the other channel is set to Standby the button displays the channel number that is transmitting, i.e. if Channel 1 is set to Transmit and channel 2 set to Standby then **1** will be shown on the icon.

Returning to Standby Mode

To return to Standby mode left click on the Standby/Transmit button, or click on the **Standby** radio button in the Transceiver window. An **Action Required** popup window appears prompting to confirm the switch to Standby. To confirm click the **OK** button, or to return to Transmit mode click the **Cancel** button.



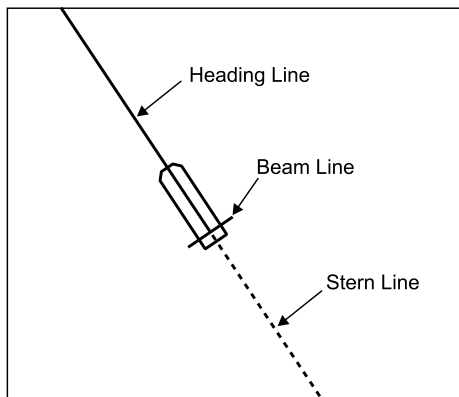
When the Transceiver is switched to Standby any active Radar Video is automatically switched off. In a multi node system this applies to all nodes if a Master Display switches to Standby.

Heading Line, Beam Line and Stern Line

The Heading Line (HL) and Stern Line (SL) are lines drawn parallel to the ship's fore/aft axis indicating the current own ship heading (HL) or the reciprocal of the current own ship heading (SL). The HL and SL begin at the CCRP⁷ of own ship and are drawn to the edge of the chart display. The Beam Line is drawn perpendicular to the HL and SL at the CCRP.

The HL is always displayed. The SL may be selected for display, in addition to the HL, from the Display Settings in the NAV Tools menu. The SL is shown as a dotted line.

The figure below shows own ship with HL and SL displayed.



The bearing of the HL or SL is dependent on the presentation mode.

- In Course Up (C UP) mode the heading line is initially drawn vertically and then changes dependent on the current heading bearing (this mode is not available when using raster charts, see North Uniformity)
- In certain presentation modes / conditions, north cannot be displayed as uniform. When this occurs uniformity is then calculated from the centre of the displayed screen and the term "at centre" will appear beneath the north arrow. The following presentation modes / conditions will trigger this -

When in Polar Stereographic Projection

⁷ The position of the heading line and beam line within own ship's outline symbol is dependent on the distance values applied to the CCRP in the Configuration tool (see Chapter 1 Configuration in Volume 2 of the VMFT Ship's Manual). To position the CCRP in the centre of the ship's outline the distance from bow must be half the configured value for ship's length. If no value is applied, the heading and beam line will appear at the bow of ship's outline symbol.

- **In North Up (NUP)** mode at scale values of 1:5,000,000 and higher
 - **In Course Up (CUP)** mode at scale values of 1:3,000,000 and higher
- In Polar Stereographic Projection or Mercator
- For latitudes above 70deg. at any scale
 - Presentation Mode dictated by Raster Charts.
 - In North Up (N UP) mode the heading line is drawn at the current compass heading.

When own ship is off-centred, the heading line bearing is automatically adjusted so that the scale is always referenced correctly.

For further information on own ship's heading line, see Presentation Modes.

Beam Line

The beam line is a short line drawn at right angles to the heading line and extending to each side of own ship's [CCRP](#), the default (minimum) length is 10mm.

The beam line length can be increased from the 10mm default from the Display Settings sub-menu in the NAV Tools menu.

Own Ship Symbols

There are three types of symbol that may be used to display own ship's position and heading:

- Circle Symbol
- Outline Symbol
- Custom Symbol

Circle Symbol

The circle symbol is drawn where the outline symbol cannot be resolved at the given scale. The symbol has a 6mm diameter for the outer circle and a 3mm diameter for the inner circle, in addition to heading line and beam line. The circle symbol is displayed in white in all day/night modes apart from Day Bright, when the symbol is displayed in black.



Outline Symbol

The outline symbol is displayed when **Default Symbol** is selected in Ownship Display Settings and the greatest dimension of the ship is larger than 6mm on the display.

The outline symbol is displayed in addition to the heading line and beam line.



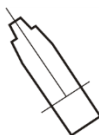
 *The position of the heading line and beam line wrt the outline symbol is dependent on CCRP location offsets applied at commissioning.*

Custom Symbol

This symbol represents ownship drawn to the actual outline of the ship. The custom symbol is displayed when **Custom Symbol** is selected in Ownship Display Settings and the beam of the ship is larger than 3mm on the display.

Note that Custom Symbol will only be enabled if an outline definition for own ship has been defined in the Configuration tool by entering line segments, which are defined as x,y coordinates for the start and end point of each segment. If no custom symbol has been defined then this symbol will be unavailable for display.

The custom symbol is displayed in addition to heading line and beam line.



Ship's Symbol Colours

The colour of the ship's symbol and heading line/beam line is shown as white when the Day/Night mode is set to Day Black or darker. If the mode is set to Day Bright ship's symbol and heading line/beam line will appear as black.

Faults in Heading and Position Data affecting Own Ship Symbol

If the position data becomes invalid, ship's outline or circle symbol are shown in orange and chart data becomes unavailable for display. The heading line and beam line remain in white (if in Day Black or darker).

If the heading data becomes invalid, ownship's symbol and course vector are displayed in orange, but ship's heading line is not displayed and only **North Up** Presentation Mode is available. Chart data remains displayed.

Own Ship Vector

The own ship vector symbol is a line indicating ship's direction and speed. The end of the line is shown with a double arrowhead when in ground stabilisation mode, and a single arrowhead when in water stabilisation mode. For a description of the stabilisation modes see Sensor Data Display.

The vector line begins at own ship's CCRP and is drawn with a length corresponding to the distance on the chart display that own ship will cover, given its current speed, in the vector time chosen, see Vector Modes.

When in ground stabilised mode, the vector line is drawn to reflect the COG shown on the sensor data display. When in water stabilised mode, the vector line is drawn to reflect the course through the water based on the current heading shown on the sensor data display.

Own ship vector is not drawn if Predicted Vector is enabled (see Display Settings, Ownship) and the stabilisation mode is ground based⁸.

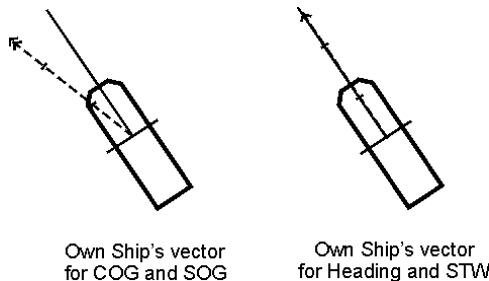
In water stabilised mode own ship vector is drawn in addition to the predicted vector.

 *This is the default presentation, set at commissioning. Ownship vector and predicted vector may be selected for simultaneous display, but this is NOT the recommended setting.*

If own ship vector's end point is not on the available area of the chart display, a semicircle is drawn, centred at the point that the vector intersects the edge of the available area.

Own ship vector is shown in yellowish-orange when the data received from the sensors used to draw the vector (water or ground stabilised) is invalid or degraded.

If enabled, tick marks will be displayed along the vector length at one minute intervals. The tick marks can be switched on or off, and the tick mark interval time adjusted from the Display Settings sub-menu in the NAV Tools menu.



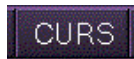
Predicted Vector

Predicted vector is a tool to indicate where the ship will go based on current COG, SOG and ROT. Predicted Vector is turned on and off from Ownship tab in Display Settings, NAV Tools menu.

⁸ This is the default presentation, set at commissioning. Ownship vector and predicted vector may be selected for simultaneous display, but this is NOT the recommended setting.

Cursor Readout

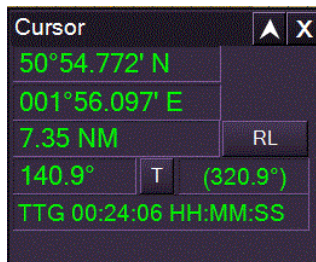
The cursor readout window is accessed by clicking on the **CURS** button, located on the lower popup toolbar.



The readout displays the location of the cursor position relative to the [CCRP](#) of own ship. Readout data appears when the cursor is within any area of the chart display. If the cursor is moved to a secondary chart window (see ECDIS Presentation Options) the readout data shown is applicable to that chart.

The Cursor readout includes the following:

- Latitude corresponding to the current cursor position.
- Longitude corresponding to the current cursor position.
- Range - the distance between the CCRP and the cursor position as measured in nautical miles (NM).
- Bearing from the CCRP to the cursor position, displayed as true or relative by clicking on the **T** or **R** toggle button.
- Reciprocal bearing, defined as bearing from the cursor position to the CCRP, displayed as true or relative by clicking on the **T** or **R** toggle button.
- Time To Go (TTG) – the estimated remaining time, displayed as hours, minutes and seconds, between the CCRP and the cursor position divided by speed over ground (when in ground stabilised mode) or speed through water (when in water stabilised mode) . For information on stabilisation options, refer to Sensor Data Display.



Cursor data may be calculated based on Rhumb Line route or Great Circle route, the default is **RL**. To change the calculation of cursor data to Great Circle click on the button, the button text changes to **GC**. For more information on rhumb line and great circle, see descriptions in Routes Chapter – Approaching Leg.

The Latitude/Longitude (L/L) readings are replaced by dashes if the following happen:

- the cursor passes over popup windows or toolbars
- own ship's position is lost
- the compass is unaligned
- there is a compass error.

Where the L/L and bearing data is acquired from a valid sensor data source the values are displayed in green, if the position data is degraded then the values are displayed in yellow, if the position data is considered invalid and unusable the data is shown in yellowish-orange. For further information on sensor data sources see Sensors Menu.

Position

Summary data on own ship's current location is displayed in the left corner of the lower toolbar area, also displayed is the sensor source and quality indicator used for the position values.

51°05.989' N	GPS	DGPS
001°22.760' E		

The operational area for the VMFT ECDIS is between 85°N and 85°S latitude.

The information in the lower toolbar is replicated in the Position window, accessed by clicking on the **POSN** button on the lower popup toolbar.



Ownship position information will be displayed in green, if good and using a "continuous" positioning source. If position display is yellow, this can be due to the positioning source being "non-continuous" which should be considered as of "doubtful integrity". Typically this will be when the source is from "Dead Reckoning" or "Line of Position". Alternatively, a yellow display may also be due to position information becoming degraded, uncorroborated or from manual input. If position information becomes unusable it will be displayed as yellowish-orange.

The Position window includes the following data:

- The latitude/longitude (L/L) position of the [CCRP](#), as reported by the Position sensor. Where the L/L data is acquired from a valid sensor data source the values are displayed in green, if the position data is degraded then the values are displayed in yellow, if the position data is considered invalid and unusable the data is shown in yellowish-orange. For further information on sensor data sources see Sensors Menu.
- The sensor source of the position data. The connected position sensor will in most cases be a [GPS](#) receiver and should be configured to send position data using the GGA sentence⁹. When position data is sent using the GGA sentence, the quality is indicated as shown in the table below.

Position		▲	×	
50°57.998' N	GPS			
001°48.405' E				
Differential	WGS84			
11.6 m	DBT			
System Time	17 May 2008			
	18:51:00 UTC			

⁹ NMEA sentence which provides the GPS current fix data. A sentence is a self contained line of data.

GGA - GPS Quality indicator		
Indicator	Description	Field Acronym
0	Fix not available or invalid	-
1	GPS SPS	Normal
2	differential GPS	Differential
3	GPS Precise	Prcs
4	Real Time Kinematic	RTK
5	Real Time Kinematic Float	FRTK
6	Estimated dead reckoning	DR
7	Manual	MAN
8	Simulated	-

 *Indicator values 0 and 8 are degraded values. No acronym appears in the field but L/L values change to degraded colour (orange).*

A Loran-C device or an older GPS device may not provide position using the GGA sentence. In this case the GLL sentence may be used. Quality indicators when using the GLL sentence are shown in the table below.

GLL - system mode indicator		
Indicator	Description	Field Acronym
A	Autonomous	Normal
D	Differential	Differential
E	Estimated dead reckoning	DR
M	Manual	MAN
S	Simulated	-
N	Not valid	-

 *Indicator values S and N are degraded values. No acronym appears in the field but L/L values change to degraded colour (orange).*

If a GLONASS device is providing position data it is likely to be configured to send the data using the GNS sentence. Quality indicators when using GNS are shown in the table below.

GNS - system mode indicator		
Indicator	Description	Field Acronym
A	Autonomous	Normal
D	Differential	Differential
E	Estimated dead reckoning	DR
F	Real Time Kinematic Float	FRTK
M	Manual	MAN
N	Not valid	-
P	GNS Precise	Prcs
R	Real Time Kinematic	RTK
S	Simulated	-

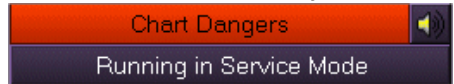
 *Indicator values N and S are degraded values. No acronym appears in the field but L/L values change to degraded colour (orange).*

- The field to the right of the quality indicator denotes the datum used for position data (defaults to WGS84). For information on WGS-84 ¹⁰ datum see 'Factors affecting Chart Accuracy' in Chart Facility.
- The depth value as reported by the depth sensor. If no sensor data is available a series of yellowish-orange dashes are shown in the field. The field to the right of the depth value denotes the depth source sensor; this may be either depth below keel (DBK), depth below transducer (DBT) or depth below waterline (DBW).
- The system time shown hours, minutes and seconds. This can be either UTC or Local (local time may have a time offset applied), depending on the selection of system time made in Time Management. The current selection is shown next to the time.

¹⁰ World Geodetic System 1984 (WGS-84) is a chart datum model used by chart makers to map the earth's surface.

Alert Status Indicator

The Alert Status Indicator displays the current alert status of the system. The display of alerts is prioritised; with active alarms first, followed by warnings and then cautions.



The Alert Status Indicator will show a background colour based on the status of active alerts in the system. If no active alerts exist, the background colour shows the system background colour and the message **No Alerts** is displayed. If unacknowledged Alarm or Warnings exist, the background colour changes and flashes a colour based on the highest unacknowledged alert priority, these are:

- red for alarms
- yellowish-orange for warnings

Alarms and Warnings need to be acknowledged in one of two ways:

1. either by clicking on the message in the Alert Status Indicator; or
2. by clicking on the **ACK ALARM** button on the control panel.

The alert is removed from the Alert Status Indicator and, if other unacknowledged alerts exist, is replaced by the next in order of priority. The alert remains listed (non flashing) in the Alerts Display list as long as the condition exists and the message Alarms or Warnings Present will be displayed.

When all alerts have been acknowledged but any are still active, the background colour will be determined by the highest priority active alert category.

To view details on an alert right click on the Alert Status Indicator, the Alert Display menu appears.

Cautions are displayed as steady yellow text and do not need to be acknowledged.

Alert Status

- There are three types of alert status:
- Unacknowledged Alerts
- Acknowledged Alerts
- No Alerts

Sensor Data Display

The VisionMaster FT system acquires data via interfaces connected to the PCIO unit. The sensor information relating to own ship's heading, course and speed is displayed in the sensor data display at the top left of the upper toolbar area.

HDG	272.8 °T	Gyro	STW	20.3 kn	Log
COG	272.6 °T	GPS	SOG	18.3 kn	GPS

Sensors provide sensor information for the following data types:

- HDG (Heading)
- STW (Speed Through Water)
- COG (Course Over Ground)
- SOG (Speed Over Ground)

For each data type, a sensor source must be selected to provide the required data. The selected sensor source for each data type can be viewed, or where necessary changed, from the Sensors menu.

The four data type fields are divided into three columns:

Caption

The captions are always the abbreviated data types listed above.

Readout

The readout shows the latest valid sample received by the selected sensor. Valid sensor data is shown in green. If the data is currently invalid it is shown in yellowish-orange.

A readout of true heading is always displayed, unless compass alignment is being prompted, or a compass error ¹¹ has occurred.

 *If the SOG goes below 0.5 knots the COG value will show as a series of green dashes. The COG will return to display an active course bearing when SOG is at 0.5 knots or higher.*

¹¹ A compass error will cause the heading readout to change from green to red and a compass alarm will be raised. When heading data is unavailable the only presentation mode available is North Up.

For certain types of compass input, it will be necessary to align the heading readout by manually entering the current heading after the chart display is switched-on. The need for alignment is indicated by the heading readout flashing green.

Data Source

The currently selected sensor from which the readout is taken (e.g. GPS, Gyro etc.).

Stabilisation Options

There are two stabilisation modes for target tracking, ground and water referenced. The HDG and STW field block indicates water stabilisation and the COG/SOG field block indicates ground stabilisation.

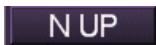
To toggle between the two stabilisation modes either click anywhere within the two field blocks, or right click on the display and select from the drop down list (the current stabilisation mode is shown ticked). The selected block is highlighted and sensor data is extracted based on the stabilisation mode selected.

Multi-node System

In a multi-node system all nodes on the system provide the same indication of selected sensor source for each data type, regardless of the node from which the operator makes selections.

Presentation Modes

The currently selected presentation mode for the chart display is shown on the presentation mode button on the upper toolbar area. The following modes may be available for selection:



- **North-Up (N UP)**

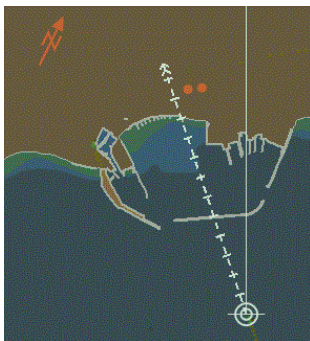
This is the power up default presentation mode for vector charts. True north is at the top of the chart window with the North arrow pointing vertically. The ship's heading marker is shown at the appropriate bearing.



North Up is the only presentation mode that can be selected when a usable source of heading data is unavailable.

- **Course-Up (C UP)**

On selection of Course-Up mode, the ship's bearing at the time of changing to course-up is shown at the top of the chart display with the North arrow pointing in the direction of true north. A usable source of heading data is required for Course Up mode.



In this mode the orientation of the display remains constant even as the ship's heading changes.

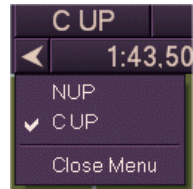
To change the presentation mode, do the following:

Left Click the presentation mode button. This will cycle through the available choices for the presentation mode (N Up and C Up only).

Or:

Right click on the presentation mode button. A list of available presentation modes will be shown in a drop down menu with the currently selected presentation mode ticked(unavailable modes will be greyed out).

Left click on the presentation mode you want to use.



North Uniformity

In certain presentation modes / conditions, north cannot be displayed as uniform. When this occurs uniformity is then calculated from the centre of the displayed screen and the term "at centre" will appear beneath the north arrow. The following presentation modes / conditions will trigger this -



When in Polar Stereographic Projection

- In North Up (NUP) mode at scale values of 1:5,000,000 and higher
- In Course Up (CUP) mode at scale values of 1:3,000,000 and higher

In Polar Stereographic Projection or Mercator

- For latitudes above 70deg. at any scale

Presentation Mode dictated by Raster Charts

If raster charts are being displayed the presentation mode is dictated by the orientation of the currently loaded chart. If the displayed chart is a north oriented raster chart then North Up (N UP) will be the only available presentation mode. If the raster chart is not north oriented, then Chart Up (CH UP) will be the only presentation mode available.

The presentation mode will change automatically when the type of displayed raster chart changes. This could be due to own ship sailing across an area covered by more than one type of raster chart.

If the secondary window is displaying a vector chart then the vector chart is displayed with the same orientation as the raster chart.

For more information on raster charts, refer to 'Using Raster Charts' in Chapter 4 Charts.

Motion Modes

The motion mode determines how the trails of moving targets are shown across the screen relative to own ship and how chart information is updated.

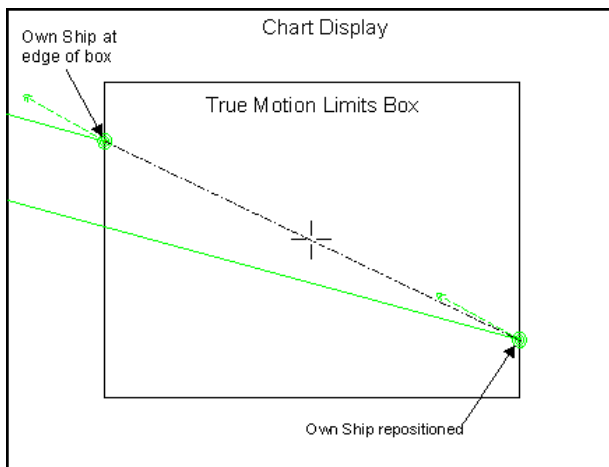
The only motion mode available to ECDIS is True Motion (TM). The motion mode is displayed as an abbreviation at the top right of the screen.

TM

True Motion

In TM, own ship moves across the screen by the system applying Latitude and Longitude (L/L) positional updates to it. All stationary items (i.e. items with constant L/L coordinates) remain in a fixed position on the screen and all targets move according to their true course and speed.

When own ship reaches the edge of the TM limits box, and true motion reset limits are enabled, it is repositioned to the edge of the box, such that a line drawn from own ship's CCRP in the direction of the current course passes through the centre of the TM Limits box (see figure below).



The TM limits box default size is approximately 90% of the chart window size (90% being the maximum size of the box). The box size can be redrawn by the operator, see Setting True Motion Limits.

Vector Modes

Vectors are shown on the display to indicate the velocity (speed and direction) of own ship and moving targets. The length of the vector indicates speed and its bearing indicates direction. On an ECDIS vectors are shown in both Standby and Transmit modes. For information on own ship vectors, see Own Ship Symbols.

Target vectors are drawn using the same colour as the target symbol, based on the following conditions:

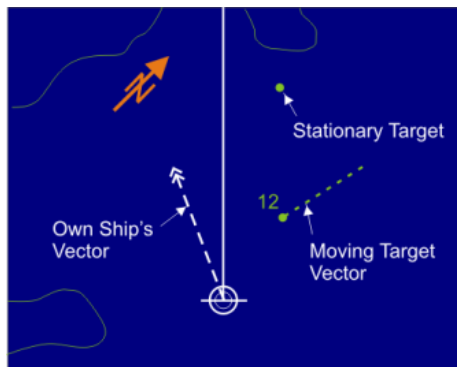
- Target with no alarm condition : Non-flashing green
- Target with unacknowledged alarm : Flashing red
- Non-dangerous target with acknowledged alarm : Non-flashing green
- Dangerous target with acknowledged alarm : Non-flashing red

Selecting the Vector Mode

The vector mode determines whether the vectors represent the true velocity of targets or their velocity relative to own ship.

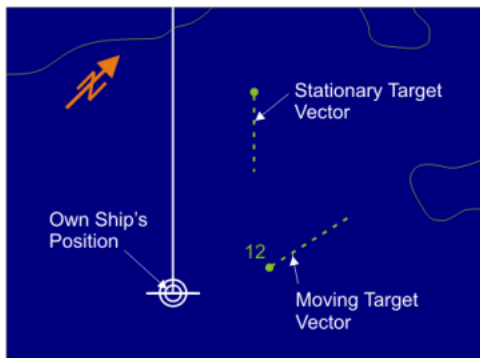
- **True Vectors**

All moving targets and own ship have a vector representing their movement (speed and direction) over the water/ground. Stationary targets do not have a vector.



▪ Relative Vectors

If own ship is moving, all targets, both moving and stationary, have a vector representing their movement (speed and direction) relative to own ship. Own ship will not have a vector in this mode.



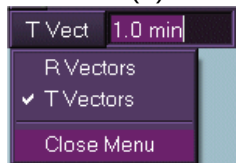
On an ECDIS without radar overlay the vector mode defaults to **True**. Relative vector may be selected but the vector button will be displayed in the warning colour (yellowish-orange). The vector mode will revert to True to match True Motion after about 30 seconds.

On an ECDIS with radar overlay the vector mode will match the trails mode, see 'Video' in Chapter 12 Radar. The default for trails and vector mode is true. If relative trails is selected the Relative vector becomes the default. If true vector is selected when trails are relative, or relative vector is selected when trails are true, then the vector button is displayed in amber before reverting to the original setting after about 30 seconds.

To select a Vector Mode, do the following:

A true (T) or relative (R) Vector mode can be selected as follows:

1. Position the screen cursor over the Vector mode selection field.
2. Consecutive left clicks will toggle the mode between True (T) and Relative (R) vectors.
3. Or right click on the current vector mode and select from True or Relative from the drop down menu.



If the selected vector mode is not the same as the current Trails mode, the vector text is shown in the warning colour (yellowish-orange) The vector mode will revert to the same as the Trails mode (relative or true) after 30 seconds if

the Vector Timeout check box is ticked in Target Display. If it is not ticked the vector text will remain in yellowish-orange.

Vector Time

The Vector Time selected will determine the length of the vectors shown on the radar display. The length of a vector represents the distance the ship or target will travel in the vector time. For example:

Vector Time	5 minutes
Speed (of ship or target)	12kn
Length of vector	1NM

The optimum vector time will depend upon the scale ratio that is in use. Extending the vector time will help you predict closest point of approach (CPA) of targets to own ship and other targets.

To change Vector Time, do the following:

Either:

1. Position the screen cursor over the vector time field.
2. Left click to edit. The text becomes green (editable).
3. Move the trackball left to decrease or right to increase the time.
4. Left click to accept the re-entered time.



Or:

1. Right click over the vector time field. The numeric keypad appears.
2. Enter the revised vector time field using the numeric keys. With the required values enter click the OK key.
3. The keypad is removed from the screen and the revised value is entered at the vector time field.



Extending the vector time lets you visually check on [CPAs](#) of targets by projecting their movements further into the future.

Radar Overlay Mode

If your product type is an ECDIS with Radar Overlay, the following radar overlay controls can be accessed from the radar overlay icon at the top of the fixed toolbar area:

- Radar Overlay On or Off
- Radar Overlay transparency levels
- Radar Overlay Settings window

Radar overlay can only be switched on when the system is in Transmit mode, see Transmit and Standby Modes.

If your product type is an ECDIS without Radar Overlay, the area on the fixed toolbar where the radar overlay button will be blank.

Switching the Radar Overlay On

When radar overlay is switched off or the system is in Standby, the radar overlay icon is shows a white diagonal line through it.



Radar is switched off and the icon is displayed with a yellow background, in addition to a black diagonal line, if one of the following happens:



1. The current scale ratio is outside the radar overlay limits (1:500,000 or more or 1:3,000 or less, see Scale Ratio).
2. Ownship is too far from the centre of the display area due to the display being moved to a location via the Pan or Goto functions.

To turn the radar overlay on, left click on the icon, or right click and select **Radar Overlay On**. The white diagonal line is removed and radar overlay is shown on the chart display.

In primary and secondary presentation mode (see ECDIS Presentation Options) radar overlay appears in the primary chart window only.



Setting Radar Overlay Transparency Levels

The radar overlay icon enables the radar overlay transparency level to be set. The default transparency level setting at power up is 60%.

To change the transparency levels right click on the icon and select from the pre-set values (20%, 40%, 60% or 80%) or 100% for opaque. The transparency of radar overlay shown on the display will increase or decrease dependent on the level selected.

The settings made for the level of radar overlay transparency are persisted after a system restart.

Radar Overlay Settings

To access radar overlay settings right click on the icon and select **Radar Overlay Settings..** The Radar Overlay popup window appears on the chart display.

The Radar Overlay window includes controls and settings for the following:

- Video Processing Controls (Gain, RAIN, SEA)
- Auto Anti-Clutter and Enhance
- Trails - control of video trails (relative/true and trails length).

For information on setting radar overlay controls see 'Radar Overlay' in Chapter 12, Radar.

Dual Radar – Radar Overlay Control

Radar overlay for each radar channel may be switched on or off independently.

The radar overlay icon on the upper toolbar displays the radar overlay status from the two channel's transceivers.

When channels 1 and 2 are in Transmit, and radar overlay is switched on for both channels, the icon is displayed in the same way as described previously for single radar.

To view the radar overlay status for each channel right click on the icon. If both channels are in Transmit the option to select **Radar Overlay On** or **Radar Overlay Off** for both, or individually select radar overlay for channel 1 or channel 2 is available.

When only one channel is in Transmit the icon shows the number of the transmitting channel (1or2). Right click on the icon in this mode only radar overlay for the transmitting channel and Radar Overlay Off are available.

If radar overlay is switched off at channel 2 (with channel 2 still in Transmit), or the video is automatically suppressed if channel 2 radar overlay origin is too far from the centre of the display area, the video is automatically switched back on if channel 1 is switched to or forced into Standby, or the radar overlay at channel 1 is switched off.

If the origin of channel 2 radar overlay is automatically suppressed while channel 1 is in Standby the video icon is displayed with a yellow background and a temporary prompt appears confirming the video suppression.

The yellow background is removed when either channel 2 radar overlay re-appears, or channel 1 is switched to Transmit.

Scale Ratio

The scale ratio includes two selection modes: Automatic (AUTO) and Manual.

The system defaults to AUTO scale selection on first use. In Auto mode the scale ratio button on the upper toolbar shows the letter **A** after the scale.



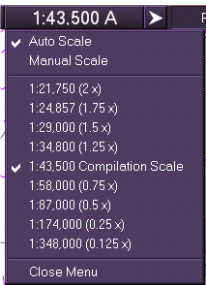
Automatic Scale

In AUTO scale mode, the system periodically checks the current scale of each display area for ownship position against the compilation scale of the largest chart. If the scales differ, the scale ratio is automatically changed to the match the complication scale of the chart.

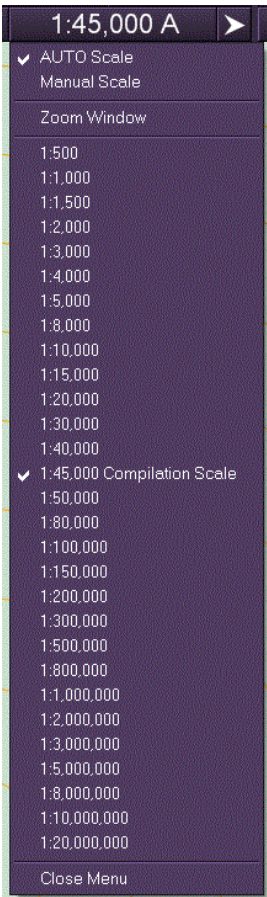
To view or select the current compilation scale, right click on the scale ratio button.

The drop down window shows the current scale selection mode ticked.

- 1. For vector charts the manual scale ratios that may be selected range from 1:500 to 1:20,000,000 and include a Compilation Scale, which in AUTO scale will be ticked. For a description of a chart's compilation scale, see Chart Facility.
- 2. For raster charts a smaller range of scale ratios are available. The scales will be dependent on the raster chart currently selected, see Using Raster Charts.



AUTO scale cannot be applied if True Motion limits are off, for example in panning or zoom mode.



Manual Scale

The scale mode is switched from AUTO to Manual as a result of the following actions:

- Manually changing the scale, the scale can be changed in one of following ways:
 1. Clicking on the  button to decrease the scale, or the  button to increase the scale.
 2. Clicking on the Up/Down **Range** buttons on the Control Panel to decrease or increase the scale.
 3. Right clicking on the Scale Ratio button and selecting a scale ratio from the drop down list.
- Switching the system to panning mode.
- Selecting a different chart from the **Chart** button in the upper toolbar.

When the scale mode is Manual the letter **A** is removed from the scale ratio readout.

When the ECDIS is in secondary chart window mode (see ECDIS Presentation Options) you can select different scale ratios for the primary window and secondary window.

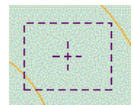
 *AUTO scale selection is not available in a secondary chart window.*

Zoom Window

The zoom feature enables the operator to zoom into a specified area on the chart display. The zoom feature can be applied independently to vector charts on the primary and secondary chart windows, see ECDIS Presentation Options.

To use the zoom window feature, do the following:

1. Select **Zoom Window** from the Scale Ratio drop down list. A dotted zoom box appears around the cursor. If the cursor is not moved for about five seconds the box disappears.
2. Move the cursor to the area on the chart display where you want the zoom window to originate from.
3. Left click to fix the centre of the zoom window and move the trackball left or right to expand the zoom box.



4. With the zoom box shown at the required size left click to set the parameters. The chart display is centred on the zoom window, the scale ratio automatically decreases to the zoom window parameters and the TM limits are switched off, see Setting True Motion Limits.
5. To re-apply TM limits to the chart window either click on the **TM Limits Off** button or the **Centre** button. The chart window is re-drawn with own ship in the centre of the display and the motion indicator button displays **TM**.

 *The scale ratio will remain at the size specified for the zoom window after TM limits have been re-applied.*

Chart Database & Chart Sub Menu Selection

The Chart button on the upper toolbar displays the currently selected chart database format and the chart depth in use (i.e. metres). The ECDIS has the capability of switching between chart databases.

S-57 - Metres

The chart databases available are defined by which chart engines have been configured (for example, SevenCs or C-Map) and what chart data has been installed onto the node.

All types of SevenCs chart databases (for example, S-57, S-63, ARCS etc.) are installed from the SevenCs ChartHandler utility. C-Map charts are installed from the Sperry Chart Installer utility.

 All chart installation requires shutting down the VMFT application and therefore should NOT be done when the vessel is sailing. The chart installation process is described in the Supplementary Features User Guide, 65900014, Chapter 1, 'Chart Installation'.

The Chart button enables the operator to switch between chart databases and available charts, or to switch charts off.

The button also enables access to the Chart sub menus.

 If automatic database selection is enabled in Chart Databases, then the system will periodically search all enabled databases and automatically change the selected database to be the one which provides the largest scale chart. Refer to Chart Databases.

1. Left click on the Chart button to display a drop down list.
This list displays the available chart databases (e.g. SevenCs - S-57). The currently selected chart database is indicated by a bullet point.

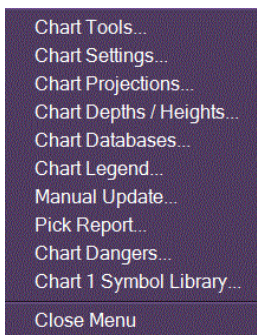
S-57 - Metres	N UP	TM	
No Route Loaded	◀	1:37.500 A	▶
Planning Sheet			
No Chart			
• SevenCs - S-57			
✓ 1:37.500 - GB40282A - Official			
✓ 1:75.000 - GB302640 - Official			
1:150.000 - GB202600 - Official			
1:750.000 - GB100004 - Official			
SevenCs - VPF			
[No Charts Found]			
SevenCs - ARCS			
1:21.750 - Dover to North Foreland (Chart 1828) - Official			
1:43.500 - Dover Strait Western Part (Chart 1892) - Official			
1:43.500 - Dover Strait Eastern Part (Chart 323) - Official			
1:87.000 - Approaches to the Thames Estuary (Chart 1610)			
1:87.000 - Newhaven to Dover and Cap d'Antifer to Cap G			
1:87.000 - Dover Strait to Westerschelde (Chart 2449) - Offi			
1:145.000 - Dover and Calais to Orford Ness and Scheven			
1:290.000 - English Channel (Chart 2675) - Official			
1:435.000 - North Sea Southern Sheet (Chart 2182A) - Offi			
1:870.000 - North Sea (Chart 4140) - Official			
C-Map - ENC			
1:37.500 - GB40282A			
1:75.000 - GB302640			
1:150.000 - GB202900			
1:150.000 - GB202600			
1:500.000 - GB200000			
1:750.000 - GB100004			
1:10.000.000 - GB104011			

If the system has been configured to display raster charts the available charts are displayed in a drop down list under the chart engine, e.g. **SevenCs - ARCS**. Each raster chart includes a brief description of its coverage. For information on raster charts, see 'Using Raster Charts' in Chapter 4 Charts.

Listed below each chart database are all the available charts within an area of own ship, or if own ship isn't on the display, the charts available at the centre of the screen.

Charts that are currently under ownship's position are indicated with tick marks. The chart's compilation scale and its status (i.e. Official) are included with the chart name.

2. To suppress all chart information in the display area, select Planning Sheet at the top of the list. The message **No Chart** is displayed on the chart button and the ECDIS will appear as an Radar, with only radar video, navigational tools and mariner objects¹² displayed (if enabled).
3. To select another chart click on the chart line in the list. The scale ratio changes to the selected chart's compilation scale. If the selected chart is not provided by the currently selected chart database, the selected chart database will be changed to that which contains the selected chart.
4. To select a different chart database, without affecting the system scale ratio, click on the chart engine line, e.g. **SevenCs - ARCS** or **C-Map - ENC**.
5. Chart sub menus may be opened from the Chart Database button by selecting from the bottom of the drop down list. The selected sub menu will appear as a movable window on the display.



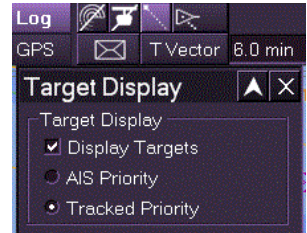
¹² Mariner objects are selected from a list of pre-defined object types (point, line and/or area) which have data assigned to them, such as category, type, description and position.

Mariner objects are then saved and retrieved from a database and can be displayed on the chart, assigned to a chart layer or exported to an external system. For details refer to Chapter 4 'Charts', Manual Update.

Target Display Button

The target display button, located on the upper toolbar, enables you to quickly access the Target Display window by left clicking on the button.

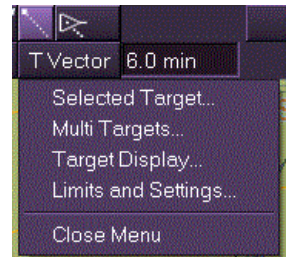
The Target Display window enables the display of targets to be switched on and off and the target priority changed between AIS and tracked targets. When **Tracked Priority** is selected the target display button is shown in a lighter tone colour; when **AIS Priority** is selected the AIS button is shown in a lighter tone.



For information on the Target Display sub menu and other target facilities see Target Display in Chapter 10 'Targets'.

To access other options right click on the button, a drop down list appears from where you can open the following target facility windows:

- Selected Target
- Multi Targets
- Target Display
- Limits and Settings



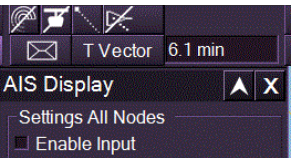
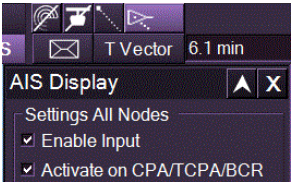
AIS Display Button

The AIS button, located on the upper toolbar, enables you to quickly access the AIS Display window by left clicking on the button.

The AIS Display window enables the AIS input to be switched on and off. AIS targets are tracked and displayed on the chart window when AIS input is enabled.

When the **Enable Input** check box is ticked the AIS Display button is displayed as shown. The AIS Display button is shown in a lighter tone when **AIS Priority** is selected from the Target Display window.

When AIS input check box is un-ticked, a white diagonal line appears through the AIS button and all AIS targets are removed from the chart window. AIS transmissions will continue to be stored so that known targets can be rendered quickly when the AIS display is re-enabled.



 *If the Activate on CPA/TCPA/BCR check box is ticked and an AIS target infringes these limits (as defined in Limits and Settings), the AIS display is automatically activated.*

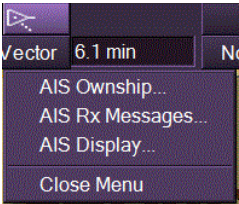
The default setting for AIS target filters is for all filter settings to be switched on, for a description of AIS Filter Settings, see AIS Display. If any AIS filter settings are switched off the AIS button is displayed with an additional AIS icon in white outline.



For information on AIS display settings and other AIS related data, see 'AIS Display' in Chapter 10 Targets.

Access to Own Ship AIS

To access the Own Ship AIS sub menu right click on the AIS button. The drop down list enables you to select **AIS Ownship** and **AIS Rx Messages**, in addition to **AIS Display**.



Messages

AIS messages are used to convey to the operator information that requires attention. The messages are generated from an external source, for example another ship in the area. When a message has been received the Message envelope icon on the upper toolbar is displayed in orange, with a white outline, an audible indicator is given.



To access the message left click on the icon, the **Own Ship AIS** window appears below the message icon.

For information on AIS messages, see 'Own Ship AIS' in Chapter 10, Targets.

ECDIS Presentation Options

The [ECDIS](#) can be viewed as a primary display only (where one chart covers the whole display area), or a primary and secondary display.

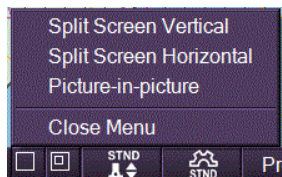
The chart presentation options available are:

- Primary (secondary presentation off)
- Primary and Secondary, vertical split screen
- Primary and Secondary, horizontal split screen
- Primary, with secondary screen as popup window (picture in picture mode)

The chart presentation controls, located on the lower popup toolbar, include a single chart button and secondary display button.



To access the chart presentation options click on the secondary display button. A popup window enables the selection of Split Screen Vertical, Split Screen Horizontal and Picture-in-Picture modes.



To return to the primary display when a split screen or picture-in-picture presentation is enabled click the single chart button.

Picture in Picture Mode

When the system is first switched into picture-in-picture mode, the secondary chart window is shown as a popup window over the primary chart window. The secondary chart window can be moved and resized within the maximum and minimum limits.

To change the secondary window size, do the following:

1. Move the cursor to the bottom right corner of the window. The cursor changes to the following symbol .
2. To resize the window hold down the left key and move the trackball left or right to reduce or enlarge the window. When the required window size is shown release the left key.

Split Screen Mode

When the system is first switched into a split screen mode, the primary and secondary chart windows occupy an equal amount of area on the display.

To change the split screen size do the following

1. Move the screen cursor to the dividing line between the primary and secondary windows.

On a vertical split screen the cursor changes to the following symbol 

On a horizontal split screen the cursor changes to the following symbol 

2. To move the split screen hold down the left key and move the trackball left or right for a vertical split screen, or up and down for a horizontal split screen. When the required screen split is shown release the left key.

On subsequent reversions back to split screen mode, the system divides the primary and secondary window to match the last specified division.

Functions Available in Secondary Chart Windows



The following functions are available in secondary chart windows and can be changed independently of the current settings in the primary display.

- **Scale Ratio** - the AUTO scale ratio, which may be selected in the primary chart display, is NOT available in a secondary window. If the primary chart display is in AUTO Scale the scale of the secondary chart window is shown to the nearest manual scale.
- **Centre** - centres own ship within the secondary window.
- **MAX** - positions ownship to the edge of the TM limits box within the secondary window.
- **GoTo** - a separate Latitude/Longitude and location may be defined for own ship within the secondary chart window.
- **Chart Database and Chart Set** - a different chart database and chart than the one displayed on the primary display may be selected for display in the secondary chart window. Note that ARCS charts are not available for selection in a secondary chart window.

Off Centre, Pan and Goto

The following positioning options are available from a semi-transparent window when you right click within the chart display:

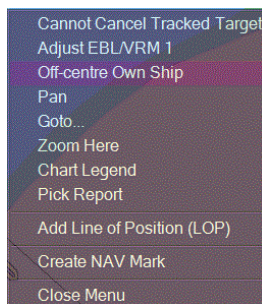
- **Off-centre Own Ship** - moves own ship to a selected position within the True Motion (TM) limits, with all chart and target positions also moved in accordance. The Off-centre Own Ship action can be applied separately to the primary and secondary chart displays.
- **Pan** - moves a selected chart position (navigation marker or object) to the centre of the chart display. Own ship's position, chart data and target positions are all moved in accordance. Panning mode can be applied independently to the primary and secondary chart displays.
- **Goto...** - moves a specified location to the centre of the chart display by using the location's Latitude/Longitude coordinates, or by selecting a previously saved location.

When Pan or Goto positioning is selected the TM limits are disabled and the message **TM limits off** is displayed in the Motion Mode button.

Off Centring Own Ship

To off centre own ship do the following:

1. Move the cursor to a position within the chart display where you want the off centre position to be and right click. A semi-transparent window appears at the selected position.
2. Select **Off-centre Own Ship** from the window. Own ship's CCRP is moved to the position selected, (see note below). All chart and target positions are also moved in accordance.



 *If the position selected is outside the TM limits the Off centre position will be limited to the edge of the TM limits box, nearest to the selected position, see Setting True Motion Limits.*

3. To cancel the operation and remove the window from the screen, select **Close Menu**.

Panning

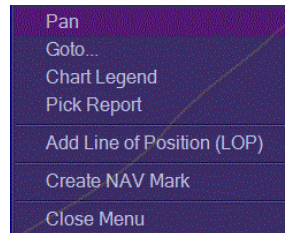
The Pan function enables you to pan the chart display to view neighbouring chart areas by positioning a selected point at the centre of the display.

In Panning mode TM limits are switched off and the motion mode button displays **TM Limits Off**. TM limits are re-enabled when the following are selected:

- Off Centre, Centre or Max View
- TM or Reset TM Limits from the Motion Mode button.

To pan the picture, do the following:

1. Move the cursor to either a specific point on the chart (for example, a mariner object or a chart location), or to a selected position within the chart display and right click. A semi-transparent window appears at the selected point.
2. Select **Pan** from the window. The selected position is moved to the centre of the chart display. Own ship and all other chart and target positions are also moved in accordance.
3. To cancel the operation and remove the window from the screen, select **Close Menu**.



Panning mode is automatically turned off when the following are selected:

- Off Centre, Centre or MAX View; Or:
- selecting True Motion (TM)

The system will automatically centre own ship if panning mode is switched off and own ship is currently outside the offset limits.

Goto

The **Goto..** function enables the centre of the chart display to be moved to known locations or a specific location on the chart. Any geographic location on the chart display can be designated by its Latitude/Longitude (L/L) coordinates. Locations that may be needed repeatedly can be saved by name, and then selected from a drop-down list, which is sorted alphabetically. When a designated position is accepted, the chart display shifts to show the desired location.

When a Goto location is applied TM limits are switched off and the motion mode button displays **TM Limits Off**. TM limits are re-enabled when the following are selected:

- Off Centre, Centre or MAX View
- TM or Reset TM Limits from the Motion Mode button.

To create a new location do the following:

1. Right click at a selected position within the chart display and select **Goto..** from the popup window.
2. The Goto control window displays the L/L position selected. To display the list of previously saved locations click on the drop down arrow to the right of the **Locations** field.
3. To create a new location based on the L/L position click on the **Create..** button, the new location name field shows { **Auto-Generate Name** }. To generate a location name based on the current date and time click the **OK** button.
4. To generate the location under another name click in the new location name field, a keypad appears below the location field. Enter a location name using the keypad, and when complete click the **OK** button.
5. The Goto.. control window reappears with the saved location name in the Location drop down list.
6. To enter revised coordinates for the new location click in the **LAT** and **LON** fields, a numerical keypad appears on the menu area from where you can enter the new L/L coordinates.
7. To assign the coordinates to the location click the **Update** button.
8. To move L/L position to the centre of the chart display click the **Go** button. Own ship along with all other chart and target positions are moved in accordance.



To rename or delete a location do the following:

To delete a saved location:

1. Select the location name to be deleted by clicking on the **Locations** drop down arrow.
2. With the location shown in the field, click the **Delete** button. The location and its coordinates are deleted from the list.

To rename an existing location:

1. Select the location name to be renamed by clicking on the **Locations** drop down arrow.
2. With the location shown in the field, click the **Rename** button.
3. The Goto.. window prompts to rename the current location's name and includes the option of automatically generating a name based on the current date and time **{Auto-Generate Name}**.
4. To auto generate the name click the **OK** button, or to create another name click in the field and enter a name using the screen keypad. When the location has been renamed the new name appears in the location drop down list.



Centre & Maximum View Options

The Centre and MAX view actions can be independently applied to a specified chart window. A secondary display (see ECDIS Presentation Options) will include its own Centre and MAX view controls.

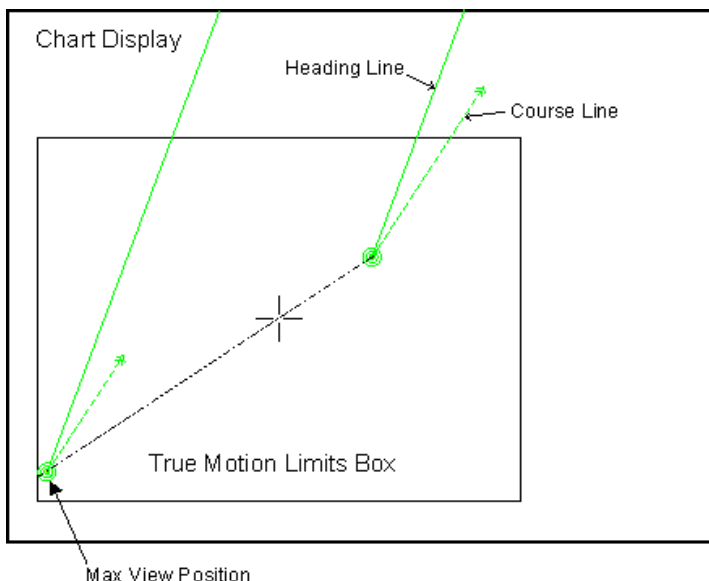


Centring

If own ship's [CCRP](#) has been off centred or panned, left click on the **Centre** button to redraw. The CCRP will be redrawn centred within the TM limits box, see Setting True Motion Limits.

Maximum View

Clicking on the **MAX** button positions own ship's CCRP at the edge of the TM limits box, so that a line drawn from it in the direction of the current course passes through the centre of the box (see figure below).



True Motion Limits

When a chart window is first displayed, the TM limits for that chart window is centred with a default maximum width and height of approximately 90% of the chart window's width and height.

When own ship's CCRP reaches the edge of the TM limits box and TM reset limits are enabled, own ship is repositioned to the opposite edge of the box such that a line drawn from own ship in the direction of the current course passes through the centre of the box, see Motion Modes.

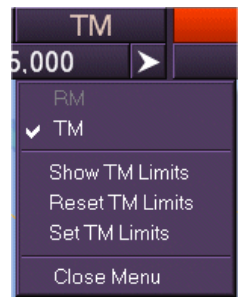
Own ship may be moved outside the TM limits box when TM reset limits are disabled (either in panning mode, or when Goto.. location values are applied). In this case, the message **TM Limits Off** is displayed in the Motion Mode field. To move own ship back to the centre of the TM limits box left click on the Motion Mode button, TM limits are re-enabled to the display.

Displaying the TM Limits

The effective ship box is hidden on the chart display. To temporarily display the box right click on the Motion Mode button and select **Show TM Limits**, the effective ship box is displayed for about three seconds.

Setting the TM Limits

The size and location of the TM limits can be set independently on primary and secondary chart displays.

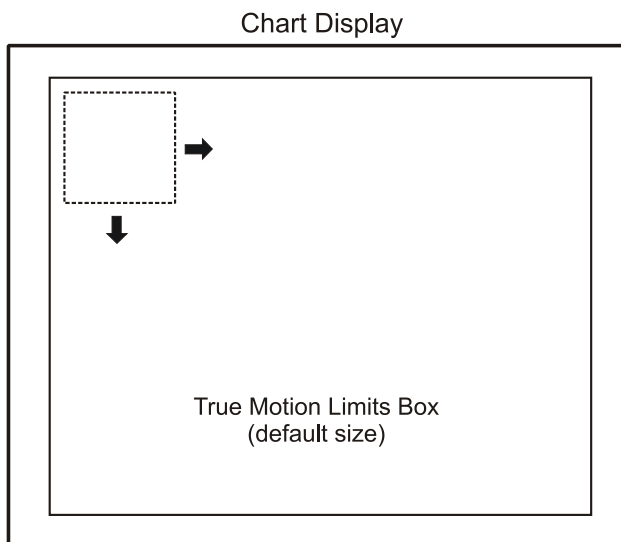


To set the TM limits do the following:

1. Right click on the Motion mode button and select **Set TM Limits** from the drop down list. The current TM limits appear on the chart display with a movable square box in hatched line, representing the minimum size of the TM limits. See Figure below.
2. With the cursor inside the box left click to specify the centre of the TM limits box. You can then re-size the box by moving the trackball across or down.
3. When the required parameters are displayed left click. The TM limits are re-sized and own ship is moved to the centre of the box.
4. To change the TM limits in a secondary chart window select **Set TM Limits**, move the screen cursor inside the secondary window TM box and repeat steps 2 and 3 above.

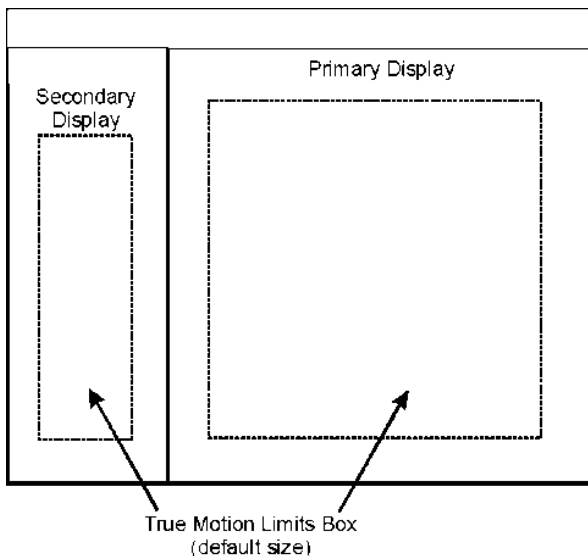
5. To reset the TM limits back to the default parameters right click on the Motion mode button and select **Reset TM Limits** from the drop down list. The TM box is resized to its maximum parameters and centred in the chart display for both primary and secondary chart windows.

 *When TM limits are reset own ship remains in the position previously set when the box was resized. Click on the **Centre** button in the lower toolbar to move CCRP to the centre of the chart display.*

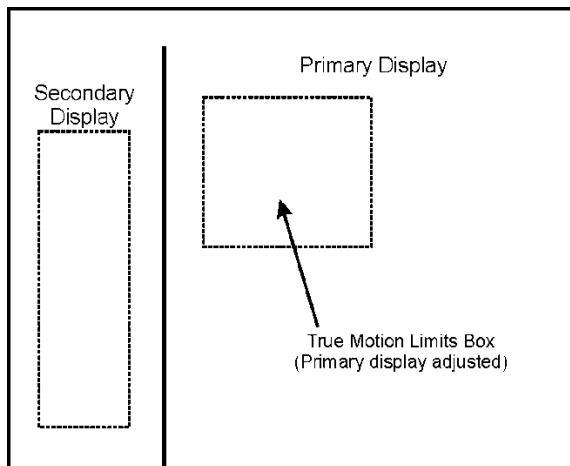


Re-sizing the TM Limits box

When the display is in secondary display mode the system automatically adjusts the size of the TM limits boxes of the Primary and Secondary displays, see figure below.

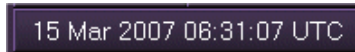


TM limits can be adjusted independently for both display modes, see figure below.



Current Date and Time

The current date and time are displayed in the lower popup toolbar area.



15 Mar 2007 08:31:07 UTC

The field displays the date, year and the current time in hours, minutes and seconds. The current date and time shown are displayed as either [UTC](#) or local time, dependent on the current time selected in Time Management.

To access the Time Management popup window left click on the date and time field. For information on setting time parameters see Time Management in the System menu.

Range Rings

The Range Ring button enables you to toggle the display of range rings on or off. When range rings are switched on the button shows the current scale in nautical miles (NM). The range rings are centred on own ship's [CCRP](#) and are equally spaced. Range rings are drawn out to the edge of the display, irrespective of the scale ratio or any offsetting of the CCRP.



The range ring interval is dependent on the currently selected scale ratio. If the scale ratio is 1:2,000,000 and over the range rings are disabled.

The table below lists when the range ring interval changes at a particular scale ratio.

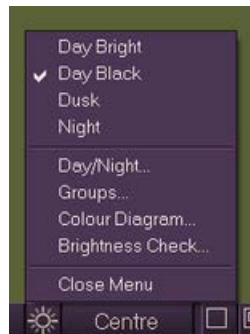
Scale Ratio	Range Ring Interval (NM)
1:500	0.025
1:3,000	0.05
1:5,000	0.10
1:8,000	0.25
1:30,000	0.5
1:80,000	1
1:150,000	2
1:300,000	4
1:500,000	8
1:1,000,000	16

Brilliance Control

The Brilliance Control icon, located on the lower popup toolbar area, provides quick access to the current day/night settings and sub menu functions for the Brilliance menu.

To view the options right click on the icon, the following selections are available from the list:

- Change of day/night settings, with the current setting ticked, see Day and Night Modes.
- Access to the following sub menu windows:
 - Day and Night Modes
 - Brilliance Groups
 - Colour Diagram
 - Brightness Check



On a multi-node system changes to the Brilliance settings on one node affect all nodes on the system.

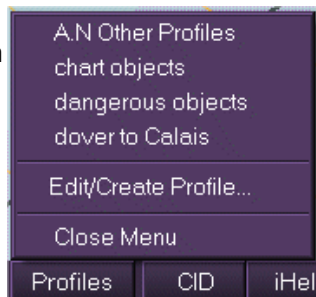
Profiles

The Profiles button, located on the lower popup toolbar area, enables you to apply previously created user profiles, which may contain specific chart, route, and other display settings, to the currently enabled chart display.

To apply a profile left click on the **Profiles** button and select the profile from the list at the top of the fly out. When a profile has been applied a temporary prompt appears confirming the application.

To create or edit a user profile select **Edit/Create Profile..** from the fly out. The User Profiles sub menu appears.

For information on creating and editing profiles see User Profiles.



Zoom Window

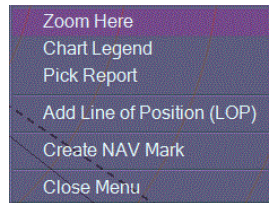
The zoom window function enables the operator to adjust the scale and geodetic centre of a chart window by zooming into a specific area of the chart display.

A zoom window can be independently applied to both primary and secondary chart windows.

When a zoom window has been selected TM limits are switched off and the motion mode button displays **TM Limits Off**.

To access the zoom window function do the following:

1. Right click in the area of the chart display where you want to zoom into.
2. Select **Zoom Here** from the semi-transparent window. A dotted rectangle box appears, centred where the right click action was made. The proportions of the zoom box are directly proportional to the chart window.

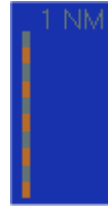


3. To cancel the zoom action right click, the box disappears from the screen. The box will also disappear from the screen if the cursor is not moved for a period of about five seconds.
4. Set the zoom box size by moving the trackball. When the box is displayed at the required size left click. The window zooms to the selected area, the scale ratio changes in accordance with the size of the zoom area and the TM limits are switched off.
5. To re-apply TM limits click on **TM Limits Off** in the upper toolbar, or to re-apply TM limits and centre own ship click on the **Centre** button in the lower toolbar.

Scale Bar

At most scale ratios a vertical bar indicating the current scale in nautical miles (NM) is shown on the lower left side of the screen. The scale of the bar changes dependent on the following scale ratios selected:

1. At scale ratios between 1:8,000 to 1:50,000 the bar shows the length of one NM, divided into 10 equally spaced units
2. At scale ratios between 1:80,000 to 1:5,000,000 the bar shows the length of 10 NM divided into 5 equally spaced units
3. At scale ratios of 1:5,000 and below, and 1:8,000,000 and above the NM bar is not shown.



Watch Mode

If your system is configured as a Total Watch, the Watch Mode button at the top right of the screen enables the console view to be changed.

To view or change the watch mode click on the button. The drop down list shows the watch modes available with the currently selected watch mode ticked.

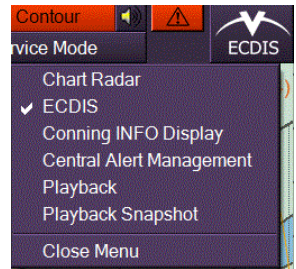
Watch modes unavailable for selection are listed in orange lettering.

The following Watch Modes are supported:

- Chart Radar
- ECDIS
- Central Alert Management
- Playback¹³
- Conning INFO Display¹¹
- If a Third Party Application¹¹ has been configured as a watch mode application this will be available for selection from the Watch Mode button.

The availability of the product presentations listed above is dependent on the product type installed at initialisation.

Products not available from the Watch Mode list can be purchased from your VisionMaster FT supplier.



For user information on the Conning INFO Display (CID), Playback mode and Third Party Applications refer to the Supplementary Features User Guide, 65900014.

For information on configuring the watch mode options, refer to Chapter 1 'Configuration' in Volume 2 of the VisionMaster Ship's Manual 65900011V2.

Total Watch Features

When a watch mode is changed on a Total Watch product, certain settings made that are common to Radar/Chart Radar and ECDIS are retained across modes. These common settings include:

- Transmit/Standby
- Target Display
- AIS On/Off
- Activation Zones
- Chart Depths
- EBLs and VRMs

Functional aspects that are specifically not shared across watch modes include stabilisation mode (water/ground based) and presentation settings, including presentation mode, motion mode, centre and max view.

When Central Alert Management watch mode is selected the display retains the Alert Status and Prompts indicators, the Alert buzzer and Watch Mode button.

When a Third Party Application watch mode is selected the display retains the Alert Status indicator and Watch Mode button.

When Playback mode is selected the display retains the Watch Mode button only.

Display Base

All synthetics on the screen can be temporarily suppressed, retaining only chart related information contained in ECDIS base display mode.

Suppression of synthetics applies to both primary and secondary chart windows.

To suppress synthetics:

1. Move the cursor to the lower popup toolbar area, left click and hold the left key down on the **Display Base** button. All synthetics on the screen are suppressed. All synthetics on the screen are suppressed and the chart is rendered in base display mode while the button is pressed.
2. To restore all synthetics release the left key on the **Display Base** button. If the display mode was previously **Standard** or **Other**, then this chart display mode is re-applied (see Chart Settings, Display Mode).



Display Base

Display Chart

All non-chart synthetics can be temporarily suppressed, retaining only chart related information contained in the currently applied ECDIS chart display mode. Suppression of synthetics applies to both primary and secondary chart windows.



To suppress non-chart synthetics:

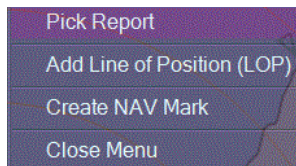
1. Move the cursor to the lower popup toolbar area, left click and hold the left key down on the **Display Chart** button. All non-chart synthetics on the screen are suppressed.
All synthetics on the screen are suppressed while the button is pressed (including ownship heading, course vector and all target data). The only synthetic retained is ownship symbol.
2. To restore synthetics release the left key on the **Display Chart** button.



Pick Report

The Pick Report facility enables the operator to highlight and view detailed information on specific chart areas and geographic objects in the chart display.

The Pick Report window is accessed by right clicking on an object or area of the chart display and selecting **Pick Report** from the semi-transparent window.

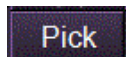


When Pick Report is activated in this way the report is performed at the right click position, based on the current set of filter options, see Pick Report Options. The Results folder will automatically display objects in the area and detailed information on the object.

When a report is activated the selected object, line or area is highlighted on the chart display with a suitable graphic. For a description of the different object types see Pick Report Results.

With AIO enabled in Chart Settings Symbology AIO objects such as temporary and preliminary notices relevant to the current chart display can be rendered from the Pick Report window. For information on AIO objects refer to AIO Data.

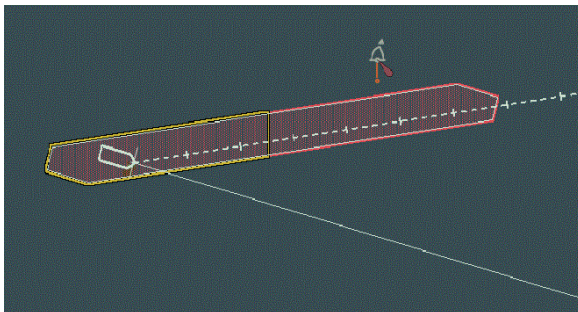
In addition to the right click option described above the Pick Report window can be quickly accessed by clicking on the **Pick** button in the lower popup toolbar. Note that using this option to access Pick Report will result in no data in the Results window.



For further information on the Pick Report refer to **Pick Report Results** in the Charts Chapter.

Safety Checking

The safety checking facility provides the operator with advanced warning that own ship may be headed towards objects that could endanger the safety of own ship, as indicated in the ENC¹⁴ or mariner object database.



The system periodically searches the chart database and mariner objects¹⁵ database for objects that could endanger the safety of own ship. Contours, prohibited areas, and areas with special conditions are considered dangerous if their depth is less than own ship's safety depth or no depth is defined for that object.

All objects above the water are considered dangerous if their clearance is less than own ship safety height. When an object currently not in the list of dangerous objects intersects own ship's safety region, the object is added to the Danger List in the Chart Dangers menu. The display of ownship's safety region is controlled from the Local Display area of the Chart Dangers menu.

In addition to the display of a safety region, an ECDIS display also enables **Safety Contour**, **NAV Hazards** and **Special Condition** areas to be highlighted for ownship. For information on these features refer to Chart Dangers.

¹⁴ Electronic Nautical Chart. Chart data conforming to specification published in IHO Special Publication No. 57 (S57). Charts complying with this specification are available from various suppliers.

¹⁵ Mariner objects are selected from a list of pre-defined object types which have data assigned to them, such as category, type, description and position. Mariner objects are then saved and retrieved from a database and can be displayed on the chart, assigned to a layer or exported to an external system. For details refer to Chapter 4 'Charts', Manual Update

The safety depth and height for each object are checked against the default depth, height and contour settings in the Chart Depths/Heights window, see Chart Depths/Heights in Chapter 4 Charts.

The proximity of dangers to own ship is indicated by the safety check icon at the top right of the upper toolbar. When there are no objects in the Dangers list the background colour of the icon is shown in the system colour; when one or more items are added to the Dangers list the icon colour changes to red (for Chart Danger alarms) or yellow (for Chart Danger cautions).

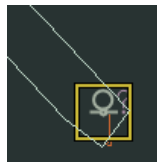


In addition to the safety check icon, when items are added to the Dangers list the Alerts button shows the most recent chart danger message on a red flashing background colour when the chart danger has been defined as an alarm. If the chart danger is defined as a warning, the Alert Status Indicator will show the alert with a yellowish-orange flashing background.

Highlight Indicators

As part of the Safety Checking feature, the following highlighting indications apply when ownship detects potential dangerous object of concern.

If the ownship Look-Ahead region intersects an object of concern a boundary box will appear around the object. For a “caution” object, this box will be displayed in yellow. If the object is a “danger” the box will be displayed as red and additionally the inside of the box will be shaded as semi-transparent red.



If the ownship Look-Ahead region intersects a chart danger area, the boundary of the chart danger within the Look-Ahead region will be highlighted in red. Additionally the portion of danger area inside the region will be shaded as semi-transparent red.

WARNING!

THE ABILITY TO DETECT CHART DANGERS IS RELIANT ON THE QUALITY OF THE DATA CONTAINED IN THE LOADED AND ENABLED CHART DATABASE AND THE QUALITY OF THE VECTOR CHART COVERAGE. THE OPERATOR NEEDS TO BE AWARE OF THE QUALITY OF THE DATABASE PRESENTLY LOADED AND ENABLED FOR THE OPERATING AREA, AND ALWAYS KEEP THE DATABASE UPDATED. IN ADDITION THE OPERATOR MUST ALWAYS SET THE LOOK AHEAD RANGE (TIME OR DISTANCE) TO AN APPROPRIATE VALUE CONSIDERING

OPERATIONAL PARAMETERS SUCH AS SHIP'S SPEED, STOPPING DISTANCE AND GENERAL ABILITY TO MANOEUVRE, SEE CHART DANGERS. IN ADDITION TO THE OWN SHIP BASED SAFETY CHECKING THE OPERATOR SHOULD REVIEW THE DANGERS LIST PROVIDED ON THE DANGERS TAB OF THE MONITOR ROUTE MENU WHENEVER A NEW ROUTE IS LOADED, AND PERIODICALLY DURING THE ROUTE WHEN PROGRESSING TO NEW LEGS, SEE MONITOR ROUTE - DANGERS. THE ROUTE-BASED REGION CHECKED USES THE XTD ALERT LIMIT WHICH IS TYPICALLY MUCH WIDER THAN THE OWNSHIP SAFETY REGION, AND THEREFORE CAN INDICATE THE AVAILABLE CORRIDOR FOR SAFE DEVIATION FROM THE ROUTE ON EITHER SIDE OF THE TRACK LINE.

IT IS PARTICULARLY IMPORTANT THAT THE OPERATOR BE AWARE THAT:

- 1. THE OWNSHIP BASED SAFETY CHECKING IS THE ONLY SAFETY CHECKING PROVIDED WHEN MAKING A DEVIATION ON A TEMPORARY ROUTE. THE TEMP ROUTE DOES NOT APPLY A SAFETY CHECKING REGION BASED ON THE XTD LIMIT AS THE SAVED/NAMED ROUTE DOES. THE DANGERS LIST PROVIDED ON THE ROUTE MONITOR 'DANGERS' TAB ARE FOR THE PERMANENT ROUTE ONLY.**
- 2. SAFETY CHECKING IS DONE PERIODICALLY, WITH AS MUCH AS 30 SECONDS BETWEEN SEARCHES. THE OPERATOR SHOULD THEREFORE BE AWARE THAT THERE MIGHT BE A SLIGHT DELAY IN UPDATING THE LIST OF CHART DANGERS TO REFLECT THE CURRENT CONDITIONS.**
- 3. SAFETY CHECKING WILL NOT BE APPLIED TO AN AREA OF AIO DATA (FOR INFORMATION REFER TO AIO DATA IN PICK REPORT). NORMAL SAFETY CHECKING WILL CONTINUE TO APPLY TO THE ENC CHARTS THAT THE AIO IS ASSOCIATED WITH.**

Multi-node Support

All nodes on a multi-node system perform safety checking. Each node in the system will list the objects of concern detected by own ship safety checking the charts on that particular node.

The periodic own ship safety checking is triggered on all nodes at the same time.

Only one alert is raised for all chart dangers found on all nodes during the safety checking operation. One node on the system is designated as an arbiter for Chart Dangers alerts.

Chart Dangers alerts will appear on all nodes, irrespective of whether a particular node has the necessary chart installed (for example, Radar only node or a node with only raster charts installed).

If the following safety checking parameters are changed at any node, these changes automatically go into effect on all nodes:

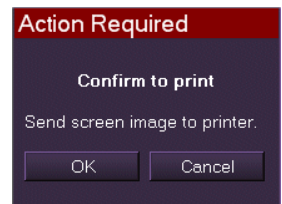
- Safety depth (see Chart Depths/Heights)
- Safety contour (see Chart Depths/Heights)
- Safety height (see Chart Depths/Heights)
- Look ahead time (see Dangers)

Print Screen

If configured, the primary display and secondary display include the option of printing a screen image to a connected printer.



1. To generate a screen image click the **Print** button. This is located in the lower toolbar of the primary display, and on the top toolbar of the secondary display.
2. An Action Required window appears requesting to confirm the print operation. Click the **OK** button to confirm. A temporary prompt confirms the image is sent to the printer. When the print is complete the popup window is removed from the display.
3. To cancel the print operation click the **Cancel** button.



Alternate Bow

If an alternate bow in use has been configured the system assumes that there are two bows that may be used, the 'normal bow' at the front of the ship and the 'alternate bow', usually at the rear of the ship.

The system should also be configured to include two CCRPs, one applicable for each bow direction.

A switch may provide a discrete signal, which is also used by gyros and speed logs to indicate whether the normal bow or alternate bow is acting as the current bow of the ship.

If no external discrete signal is available an alternate bow menu can be selected in the Configuration tool that enables the operator to tick an Alternate Bow in Use check box. This is found in the Characteristics tab of the Commissioning menu.

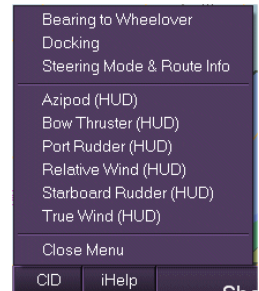
When alternate bow is enabled and the bow is switched from Normal to Alternate and the following changes take place:

- All external sensor readings will update to reflect alternate bow use, e.g. heading and speed logs. If the system is using a stepper interface (see '*Information on Sensor Inputs to the System*' in Chapter 1 '*Overview*') then the stepper may be re-aligned to reflect the alternate bow heading. Although sensor inputs may be different to those displayed, no inappropriate sensor alerts should be generated as a result.
- Ownship symbol may change where the 'bow' of the outline is 180° opposite of the heading being supplied.
- All other synthetics (CCRP, radar positions, ownship vector origin) are re-drawn to correctly reflect positions based on configured offsets.
- Corrections are performed to all sensor data (e.g. positions and velocities) based on interpretation of configured positions.
- Radar video is re-drawn such that it is centred on the correct position origin, based on configured offsets (e.g. if the marker is a heading marker in normal bow, it will be considered a stern marker when switched to alternate bow).
- Radars remain in transmit without adverse effects, other than needing to rebuild trails or re-acquire targets.

CID Windows

The following default Conning Information Display (CID) popup windows are available from the CID button in the lower toolbar.

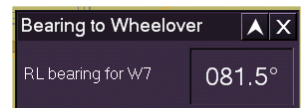
- Bearing to Wheelover
- Steering Mode & Route Info
- Docking
- HUD Widgets



For a description of CID pages; accessed either from the CID side page on a VMFT widescreen display, or when a CID watch mode is selected on a Total Watch system, refer to Chapter 2 'Conning Information Display' in Supplementary Features User Guide, 65900014.

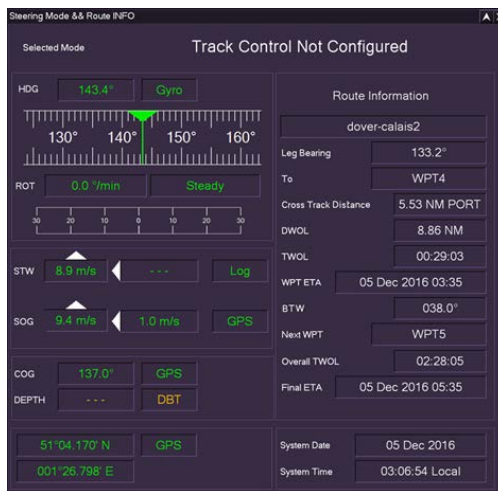
Bearing to Wheelover

Displays the Rhumb Line (RL) bearing of own ship along the current leg of a monitored route.



Steering Mode & Route INFO

The Steering Mode and Route Information window is generally used to display information when the system is in Track Control mode.



The data displayed on the Steering Mode and Route information window is designed to satisfy the requirements of the IEC 62065 Track Control

System specification, which states that the following information be displayed clearly and continuously in the vicinity of the main conning position.

- Mode of Steering
- Sources of actual selected position, heading and speed
- Status and failure of selected heading, speed and position sensors
- Track course and actual heading
- Actual position, cross track distance including direction and speed over ground
- TO-waypoint and NEXT-waypoint
- Time and distance to TO-waypoint
- Next track course
- Selected track identification
- Optionally actual course over ground

To access the window, select **Steering Mode & Route INFO**. A tab folder with a title showing the mode (**Track Control** if configured) is displayed.

The **Steering Mode & Route INFO** window displays the following read-only data for own ship.

On the left side of the window is the following data:

- True heading data, the current bearing value as shown in the HDG data display and the data source of the value e.g. Gyro. A graphical display below the HDG also shows the bearing value.
- Rate of Turn, the current rate of turn in degrees per minute as shown in the Rate of Turn tab folder. A graphical display below the ROT also shows the degrees per minute value.
- Course and Speed data, including STW, SOG, COG values as shown in their respective tab folders and the data source of the value e.g. GPS.
- Depth value, as shown in Depth tab folder and the data source of the value.

On the right side of the window is the following data:

- Route Information - information on the currently monitored route. If no route is being monitored the data fields are shown with dashes.
- System date and time, either UTC or local time, as shown in the Current Date and Time field.

Docking Display

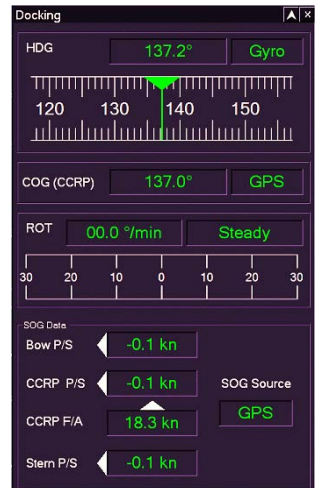
The docking display uses various sensor data from serial interfaces connected to the PCIO unit to compute own ship's fore and aft motion and its port and starboard velocity at the bow and the stern.

The docking display is intended for use during ship docking and other low-speed manoeuvring operations such as anchoring.

To access the docking display window click on the CID button on the lower popup toolbar and select **Docking**. The Docking popup window appears on the chart display.

The docking window shows the following data:

- True heading data, the current bearing value as shown in the HDG data display (see Sensor Data Display) and the data source of the value e.g. Gyro. A graphical display below the HDG also shows the bearing value.
- True course over ground, the current bearing value as shown in the COG data display (see Sensor Data Display) and the data source of the value e.g. GPS.
- Rate of Turn, the current rate of turn in degrees per minute as shown in the ROT folder, (see Rate of Turn Values). A graphical display below the ROT also shows the degrees per minute value.
- Speed over Ground (SOG) data displaying the following values (in kilometres) and source of data:
 - Bow Port/Starboard speed over ground
 - Ship Port/Starboard speed over ground
 - Ship Fore/Aft speed over ground
 - Stern Port/Starboard speed over ground



HUD Widgets

Head Up Display (HUD) objects are CID widgets that may be viewed in the chart display area as a semi-transparent. Generally used to aid docking or other low-speed manoeuvring operations, by indicating the status of particular sensors.

Objects such as targets, waypoints, mariner objects and other synthetics that appear under a HUD widget are selectable without moving it.

The following HUD widgets are available from the CID button as default:

- Azipod - displays the angle of the azipod
- Bow Thrusters - each bow thruster displays the percentage of thrust and the port/starboard direction.
- Rudder (Port / Starboard) - displays the rudder angle and port/starboard direction.
- Relative Wind - displays relative wind angle, the relative wind angle readout, and the relative wind speed readout.
- True Wind - displays true wind angle, the true wind angle readout, and the true wind speed readout.



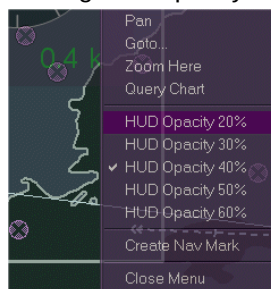
Up to six HUD widgets may be created in the CID Designer (see Chapter 4 '*Conning Information Display*' in Volume 2 VMFT Ship's Manual) five of these may be displayed together and moved around the chart area.

To reposition a HUD widget:

1. Move the screen cursor inside the widget, the title bar appears.
2. Move the cursor to the title bar, the cursor changes to a bidirectional arrow indicator.
3. Hold down the left key and use the trackball to move the object around the chart display.

The opacity of HUD widgets are 40% by default. To change the opacity right click on it and select from the list of HUD Opacity settings (from 20% to 60%).

To close a HUD widget, click on the Close button at the top right of the Title bar.



Appendix A - Operational Functions specific to Multi-node and Client/Server Systems

The following operational function is specific to a multi-node system.

- System In Control (refer to Supplementary User guide)

The following operational function applies to a multi-node system and Client/Server Radar (CSR) system.

- Database Synchronization

Station in Control

Refer to Supplementary User guide for information

Database Synchronization

In a multi-node system and/or Client/Server Radar (CSR) system VisionMaster uses a database to record and share certain information. This information includes Routes, PI Lines, GoTo locations, Radar Maps, Manual Updates and User Profiles.

In both multi-node and CSR systems one node is assigned to be the master copy of this database (the current master node is displayed on the **Database** tab in the System Diagnostics menu). If a node is switched off or disconnected from the network then any changes made to the functions listed above may not be properly saved. When this happens a **Database Node Missing** warning is raised describing the potential results of the missing node, see *List of Alarms, Warnings and Cautions* in Chapter 7 Alerts.

When the node is switched on or reconnected an **Operator Message** is displayed prompting to select the source node which the database will be synchronized to.



CAUTION:

Always select the node where the last set of changes were made, otherwise data entered on one or more nodes will be lost.

With the source node selected click the **Synchronize** button. A **Database Initializing** warning is displayed informing the operator that updates to the functions listed above are not allowed during the initialization progress.

Chapter 4 Charts

This section covers all aspects of chart information. The following topics are covered.

- a description of charts, including chart types, chart rendering, factors that may affect chart accuracy and indications of chart overscale, see About Charts.
- using charts in raster format, see Using Raster Charts.
- match the chart with the radar video, display update summaries, install charts from an installer utility, and display chart permissions, see Tools.
- configure the display settings for the chart, see Settings.
- apply ECDIS standard settings, see ECDIS Standard Default Settings.
- A description of the chart projection types, see Chart Projections.
- change default chart contour and depth settings, see Chart Depths/Heights.
- specify the order in which charts engines are used for rendering, or disable configured chart engines, see Databases.
- view detailed read-only information about the chart currently displayed, see Legend.
- manage manual updates to charts, see Manual Update.
- view and mark a list of potential chart dangers that own ship is headed towards on present course, see Dangers.
- access to the Chart 1 Catalog One and Color Diagram

The following features may be available from the Charts menu, if configured:

- access to the ADP TotalTide application, see TotalTide.
- access to Tides/Currents

Highlighting and viewing information on specific areas of the chart or geographic objects can be done via the Pick Report sub menu. This feature is described in Chapter 3 '*Basic Operation of ECDIS*'.

Appendix A lists Chart Data with their identification codes.

If your system is configured to run the ADP TotalTide application, refer to the Supplementary Features User Guide (65900014) '*TotalTide*' for details.

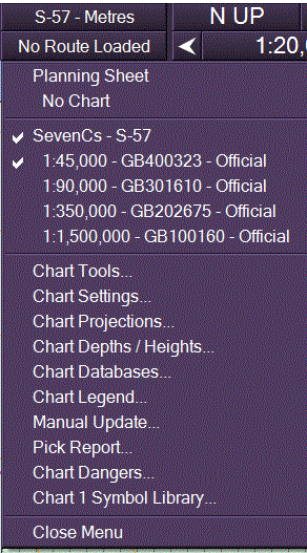
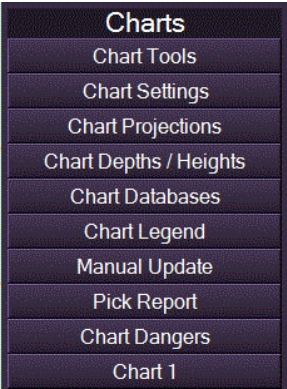
Accessing Charts Menus

You can access the charts sub-menus in one of two ways:

- 1. Left click on the Charts button in the main menu list to display the sub menu options.

Or:

- 2. Click on the Chart button in the upper toolbar (see Chart Type & Sub Menu Selection in Chapter 3, Basic Operation). The Chart button identifies the currently loaded chart engine (e.g. C-MAP or SevenCs S-57) and the chart depth units used (i.e. metres).
- 3. From the drop down list select the chart sub-menu required, which will appear as a movable window on the display.



International Hydrographic Organization (IHO) Standards and Compliance

The IHO publishes the international standards related to charting and hydrography.

Standards information regarding all current versions of IHO and ENC charts, can be accessed from the IHO website using this website address
https://www.iho.int/mtg_docs/enc/ECDIS-ENC_Stdsln_Force.htm

Compliance information covering regulatory approvals for VisionMaster FT ECDIS software versions can be found on the Sperry Marine link on the IHO website -

https://www.iho.int/mtg_docs/enc/enc_prod/latest_version_of_ECDIS_softw_are_provided_by_OEMs.pdf.

This document contains links which will open relevant pages of the Sperry Marine website where these details can be accessed.

About Charts

Chart Types

The VisionMaster ECDIS has the capability of displaying charts in a number of formats on all presentation windows.

Chart types are divided into two basic categories:

1. Vector charts: vector chart data is stored in a chart database. The chart is drawn on screen based on processing of the various stored data elements. Vector chart databases include SevenCs (S-57, S-63, VPF) and C-Map.
2. Raster charts: the chart shows a scanned version of a traditional paper chart, with the chart images stored as graphic files. Raster chart types include ARCS charts, which are supported by the SevenCs chart engine.



Safety checking does not occur when using raster charts, see Using Raster Charts.

For a detailed description of the chart databases available from the SevenCs and C-MAP chart engines refer to 'Chart Databases'.

When S57 charts are installed, the ENC data undergoes a conversion process. The result of this conversion is the creation of the System Electronic Nautical Chart (SENC) database. It is this database that is accessed and displayed by ECDIS.



Chart installation requires shutting down all navigation functions and therefore should NOT be done when the vessel is sailing. The chart installation process is described in the Supplementary Features User Guide, 65900014, Chapter 1, 'Chart Installation'.

Chart Rendering

The rendering of Chart data adheres to the z-order¹⁶ guidelines, allowing for radar video to be inserted in the proper z-order such that 'suppressed' chart objects appear below the radar video, and 'over radar' chart objects appear above the radar video.

¹⁶ The term 'Z-order' refers to the order of objects along the Z-axis. In coordinate geometry, X typically refers to the horizontal axis (left to right), Y to the vertical axis (up and down), and Z to the axis perpendicular to the other two (forward or backward). One can think of the windows in a display as a series of planes parallel to the surface of the monitor. The windows are therefore stacked along the Z-axis, and the Z-order information thus specifies the front-to-back ordering of the windows on the screen.

Factors affecting Chart Accuracy

A position plotted on a navigational chart is only as good as the accuracy of the chart. Therefore it is important to understand the factors which may limit the accuracy of both raster and vector charts. These factors are detailed below.

Survey Data

Vector charts are generally based on recent hydrographic survey data. However, the level of detail provided by different types of chart data (both raster and vector charts) may vary greatly depending upon the geographic location, these charts may sometimes use old survey data where more recent surveys do not exist.

Chart Datum

The chart datum is the mathematical model used by a chart maker to map the earth's surface. VisionMaster FT uses the datum known as World Geodetic System 1984 (WGS-84) Ellipsoid Earth model. Charts and all chart objects are displayed using the WGS-84 datum whenever possible.

While WGS-84 is the present standard for accurate mapping and display of position information, there are hundreds of data in use, and each makes different assumptions about the exact size and shape of the earth. This means that a given latitude and longitude can correspond to different locations when plotted on charts that are derived from different data. It is therefore important to be aware of the datum of the displayed chart.

If a chart is based on another datum, the system offsets the chart to WGS-84, if the offset to WGS-84 is known and provided in the chart file. Offset correction values used for the chart are computed as average values for the entire chart. These correction values may not be perfectly accurate throughout the geographical area covered by the chart. Datum discrepancies become more important when using larger-scale charts.

When displaying a chart that was created using a datum other than WGS-84, a warning displays information about the chart's datum. The Chart Legend window also shows the datum of the displayed chart, see Legend Detail.

Codes used to identify various known chart data are listed in Appendix A – Chart Datum Codes.

Compilation Scale

Chart data is compiled at a specific scale, based upon the hydrographic data from which the chart was created. This scale is called the chart's compilation scale, indicating the level of detail that is available on the chart. When charts are first selected for display, they are displayed at their compilation scale.

A chart's compilation scale is shown in the drop down list of the Charts button (see Chart Database & Sub Menu Selection in Chapter 3), the **Detail** tab folder of the Legend menu, (see Legend Detail) under Chart Usage/Scale, and Chart Index, which shows the scale and other details of all charts in a selected chart database.

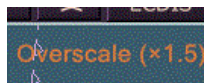
When the scale ratio is selected at a larger scale than the chart's compilation scale a permanent prompt appears with the message 'Primary Display Overscale', see 'Chart Overscale' below.

Navigational Purpose

In addition to the compilation scale, the level of detail and expected accuracy available on a chart is also related to its navigational purpose. For example, Harbour, Approach, Coastal or General. A vector chart's navigational purpose is shown in the Detail tab of the Legend sub menu, (see Chart Legend Detail) under Chart Usage/Scale. The navigational purpose of all charts is shown in Chart Index (Usage Level) (see Chart Tools).

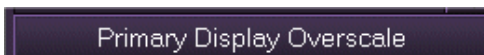
Chart Overscale

There are three ways in which the system indicates that chart data is being displayed at a larger scale than its compilation scale: the Display Overscale Prompt (detailed in Prompts), the Display Overscale Pattern (detailed below) and a permanent indication in orange lettering at the top right of the chart display, below the Watch mode button.



Display Overscale Prompt

The prompt appears as **Primary Display Overscale** or **Secondary Display Overscale**, depending on the current display option, see Primary and Secondary Display Options.



The display overscale prompt appears when any of the following three conditions are met:

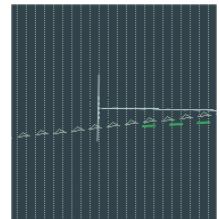
- The largest scale chart at the centre of the display is overscaled, in most cases the display is covered by several charts.
- An overscaled non-vector (e.g. raster) chart is displayed.
- An overscaled vector chart from the most detailed usage level is displayed.

A chart is considered to be overscaled if the scale ratio of the display is larger than the compilation scale of the chart. For example, the overscale prompt will be shown if the scale ratio is set to 1:20,000 and the displayed chart at screen centre has a compilation scale of 1:25,000. The scale of each chart can be viewed in the Chart Index window, see Tools.

Display Overscale Pattern

The overscale pattern is displayed over charts if the scale ratio of the display is more than double the compilation scale of any charts in the display. For example, if the compilation scale of the displayed chart is 1:75,000 and the scale ratio is set to 1:30,000 or less.

The overscale pattern is a series of closely aligned dotted vertical lines across the whole of the chart display.



Larger Scale Available Prompt

The **Larger Scale Chart Available at Ship** prompt is shown when the largest scale chart under the ships position, considering ALL enabled chart databases, is not displayed.

Chart Safety Information

Chart data suppliers such as UKHO may provide additional safety-related information about supplied ENC chart sets. This information comes in the form of a ReadMe.txt file which is accessed from the SevenCs ChartHandler screen.

Chart One Presentation Library

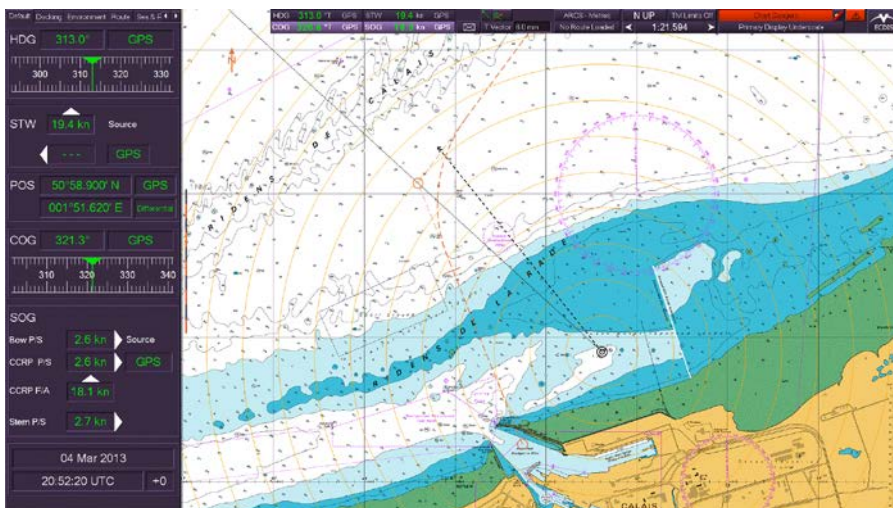
The Chart One Presentation Library contains an index of chart symbols, as used on vector charts, see Chart 1.

Using Raster Charts

Description

Raster-format charts are produced by scanning paper nautical charts, with the chart images then stored as electronic files. Multiple charts are generally distributed on a single CD-ROM, with each disk representing a chart volume, covering a large geographic area. Each individual chart within a chart volume is identified separately by name.

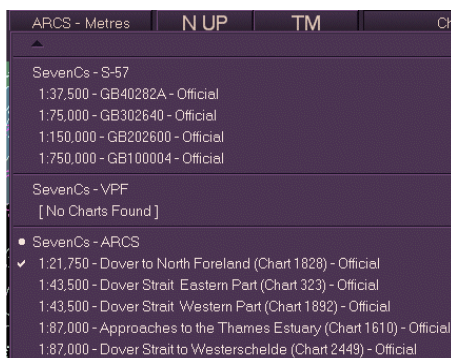
Since a raster chart is based on an image of a paper chart, the electronic version of the chart shows all information, such as buoys, lighthouses, and pilot stations that appear on the paper chart. Because the chart is not based on an underlying database, individual chart features cannot be turned on and off.



Selecting Raster Charts

The selection of raster charts is available from the Chart button on the upper toolbar, providing raster charts have been configured in the Configuration tool and a set of raster charts installed on the system.

Raster charts are available as ARCS format under the SevenCs chart engine. ARCS charts are installed via the Chart Installation area of the Chart Tools menu; this enables access to the separate SevenCs ChartHandler utility



Listed below the **SevenCs - ARCS** database are all the available charts within an area of own ship, or if own ship isn't on the display, the charts available at the centre of the screen.



Installed charts will not be listed under their chart database if the area covered by the charts is out of the display range.

Each chart is defined with a fixed scale ratio and a brief description of the area the chart covers. When a raster chart is selected the chart is ticked on the drop down list, the chart button shows the chart type and depth unit, e.g. **ARCS - Metres** and the chart is displayed on screen.

Permanent prompts '**Primary Display in RCDS mode**' and '**ENC Chart Data Available at Ship**' are displayed when raster charts are enabled.

The following functions are available when a raster chart is displayed:

- Centre and Maximum View
- Off Centre, Pan and Goto
- Pick Report
- Manual Update - Vector chart symbols may be superimposed over a raster chart. These chart symbols may be edited and queried in the same way as on vector charts.

The following functions are NOT available when a raster chart is displayed:

- Changing Presentation Mode - **North Up** will be the only available presentation mode when a north oriented raster chart is selected. If the raster chart is not north oriented then Chart Up will be the only available presentation mode.
- Implementing any changes to shallow/deep shading values, see Chart Depths/Heights.

WARNING!

ALTHOUGH SHALLOW/DEEP SHADING VALUES (AS DEFINED IN CHART DEPTHS/HEIGHTS) MAY BE CHANGED, THESE VALUES ARE HIGHLIGHTED ON VECTOR CHARTS ONLY. RASTER CHART CONTOUR AREAS CANNOT BE ADJUSTED IN THIS WAY.

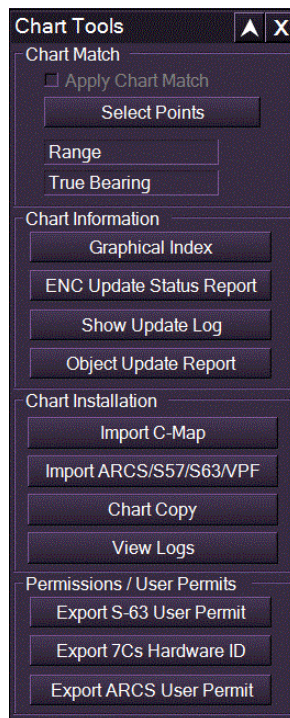
SAFETY CHECKING DOES NOT OCCUR WHEN USING RASTER CHARTS.

Notes on the displayed raster chart may be accessed and viewed via the Notes tab in the Legend sub-menu.

Chart Tools

Chart Tools is the opening sub-menu on the Charts menu. From Chart Tools you can select the following functions:

- **Chart Match** - correct the display of any discrepancies between the radar video and the chart, see Chart Match.
- **Chart Information**
 - **Graphical Index** - displays a detailed list of all charts for a selected chart database, see Graphical Index.
 - **ENC Update Status Report** – displays a status report on all ENC charts, see ENC Update Status Report.
 - **Show Update Log** – displays update information on chart databases, see Update Log.
 - **Object Update Report** - displays update information on specific chart objects, see Object Update Report
- **Chart Installation**
 - **Import C-Map** - enables C-Map charts to be installed onto a VMFT node from a separate C-Map Chart installer utility.
 - **Import ARCS/S57/S63/VPF** - opens a Chart Installation window from where SevenCs charts (S-57/S-63, ARCS and VPF) can be installed via a separate ChartHandler utility, and S63 certificates can be exported to an external device, see Installing Charts using SevenCs ChartHandler.



CAUTION:

Switching to the Chart Installer utility requires shutting down all navigation functions at the workstation. For information on installing charts refer to Appendix A `Chart Installation.

- **Chart Copy** - enables charts successfully installed on one node to be copied to other nodes on a multi-node system, see Chart Copy.
- **View Logs** – enables chart install logs on selected chart databases to be viewed, see View Logs
- **Permissions / User Permits** - enables an S-63 or ARCS permit file, a 7Cs hardware ID or an ARCS user Permit/Pin to be exported to an external drive. Also enables C-Map chart licence and expiration date to be viewed, see Permissions/ User Permits.

Tool Functions

Chart Match

The Chart Match facility allows the operator to correct a discrepancy between the radar video and the display. By selecting the radar object and the chart object to be matched, an offset can be created that is applied to the display. This offset persists until the chart match is cancelled, or until all the chart cells displayed on the screen at the time of the selection are no longer on the screen.

Chart Match includes the capability to specify a range and bearing adjustment to be applied to any loaded chart in order to alter the chart's relative position to the own ship's CCRP plotted position.

The operator specifies the range and bearing adjustment by selecting two points on the chart display .

To reposition the chart do the following:

1. Click on the **Select Points** button in the Chart Match area. The fields below prompt to click on a chart object and the Select Points button changes to **Cancel Selection**.
2. To cancel the chart match click on the button, or to proceed move the cursor into the chart display , the cursor displays **CM** below the cross hair.
3. Click on the required chart object. The lower fields in Chart Match prompts to click on a Radar Object.
4. Click on the radar object (return). The Chart Match fields change to displaying the position (nautical miles and bearing) of the chart object and the Chart Match Applied tick box becomes active.
5. Tick the **Apply Chart Match** check box. The chart is shifted so that the radar return and the chart object are displayed at the same location on the display.
6. To return to the previous chart position untick the **Apply Chart Match** check box.



Chart Match

☐ Apply Chart Match

Select Points

Range

True Bearing

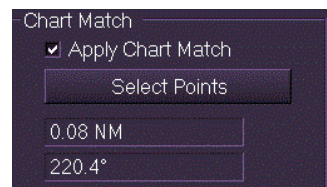


Chart Match

☒ Apply Chart Match

Select Points

0.08 NM

220.4°

Chart Information

Graphical Index

Graphical Index catalogues each chart for all loaded chart databases. The Index facility includes a number of display filtering options, the display of chart outlines within the current display area and the option to move the display location to a selected chart.

To access the Index click on the **Graphical Index** button. A tabular graphical index window appears over the chart display

Graphical Index								
Chart Name	Chart Number	Scale	Usage Level	Volume	Edition	Issue Date	Update Number	Update Date
GB300178	N/A	90000	Coastal	N/A	4	2010-01-15	3	2014-03-05
GB50326K	N/A	8000	Harbour	N/A	3	2014-12-05	1	2016-01-15
GB402366	N/A	22000	Approach	N/A	8	2014-12-12	1	2015-03-06
GB502555	N/A	8000	Harbour	N/A	8	2017-01-05	0	2017-01-05
GB301385	N/A	350000	Coastal	N/A	7	2016-07-15	1	2016-10-14
GB401781	N/A	45000	Approach	N/A	1	2014-09-04	0	2014-09-04
GB50467A	N/A	12000	Harbour	N/A	3	2016-11-11	0	2016-11-11
GB632708	N/A	4000	Berthing	N/A	2	2016-10-14	0	2016-10-14
GB50178C	N/A	12000	Harbour	N/A	3	2016-01-13	3	2014-02-24
GB209075	N/A	350000	General	N/A	8	2016-12-30	1	2017-02-17
GB50680A	N/A	8000	Harbour	N/A	5	2016-12-30	0	2016-12-30
GB104207	N/A	3500000	Overview	N/A	3	2011-06-02	1	2012-06-11
GB501404	N/A	8000	Harbour	N/A	6	2016-02-12	1	2016-03-17
GB51867A	N/A	8000	Harbour	N/A	2	2014-06-27	2	2016-06-26
GB403099	N/A	90000	Approach	N/A	7	2013-01-16	1	2013-02-12
Usage Level: All Database: SevenCa - S-57 Draw Chart Outlines Chart Selection Cursor Go To Selected Chart								

When the Graphical Index table is first opened the charts are listed with the chart names (based on their ENC alphanumeric code) in alphabetical order. The names of raster charts (ARCS) will include a short description of the location covered.

How the data is displayed may be changed by clicking on the column headings. For example, clicking on the **Scale** heading will list charts starting from the lowest compilation scale (see Chart Facility), or clicking on the **Issue Date** column will list charts from the earliest date of issue. Clicking on the column headings again will reverse the list to show the highest scale or latest issue at the top of the column.

Chart Filtering Options

The Graphical Index table includes the following filter options: **Usage Level** and **Database**.

All charts are defined with a usage level (e.g. Harbour or Coastal) with each usage level displayed in a particular colour. All the usage types are listed in a **Usage Level** drop down list, which defaults to displaying all. To display only the charts with a specific type of usage level select the level from the drop down list, the table is re-drawn showing only those charts that conform to that usage level.



To display only the charts from a specific database click on the **Database** drop down arrow and select from the list. The table is re-drawn showing only those charts assigned to that database.

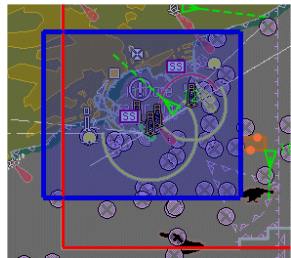
Chart Outlines

To display chart outlines, tick the **Draw Chart Outlines** check box. The display will show the coverage of the charts within the current display area as a series of coloured chart boundary rectangles, the colour of the chart boundary is dependent on the chart usage level (for example, charts with harbour usage levels are shown in a dark blue outline).



Chart Selection

Individual charts may be located and identified on the chart display. To select a chart tick the **Chart Selection Cursor** check box and move the cursor to the chart display, the letters SEL are added to the cursor. Note that the chart selection cursor is temporary, after a period of 10 to 15 seconds the cursor reverts to normal and the check box goes back to unticked.



Click in an area of the chart display. The outline of the chart is drawn and its area displayed in colour (the colour of the outline and area is dependent on the chart's usage level). The chart is also highlighted in the Index list.

Go To Chart

The Go to Selected Chart button pans the display to the centre of a selected chart from the Graphical Index window.

To pan to a particular chart, select the chart by clicking anywhere within the chart row, and with the selected chart highlighted click the **Go To Selected Chart** button. The display is re-drawn to the centre of the chart boundary box, TM limits are switched off and a temporary prompt displays **TM Limits Off**.

When using the Go to Selected Chart function the following notes should be taken into consideration:

-  *The function only changes the displayed location. It will not necessarily display the selected chart if its database is not currently enabled. If a different chart database is enabled, the operator will*

need to select the desired chart from the Chart button drop down list.

 *The function does not change the range scales to ensure the chart is displayed. It is also possible that the centre of the chart boundary box does not actually fall into a coverage area of the chart depending on the chart shape (for example, an L-shape boundary).*

TM limits are re-enabled and the navigation chart displayed when the **Centre** button or Motion Mode button are clicked.

ENC Update Status Report

The ENC Update Status Report window shows a status summary of all ENC databases and a list of data for all charts included in the various databases.

Note that the ENC status report displays chart data for a specific node, other nodes in a multi-node system may display different sets of information.

ENC Update Status Report

Chart Status Summary
(all databases)

Export Report

Chart Status:	Count	Node Name:	VM_Q87-1
Total	23904	Vessel Name:	Enterprise
Up to Date	21545 / 23904	Identifier:	IMO 123456789
Not Up to Date	2339 / 23904	ENC Update Reference Date:	13 Jul 2017 : WK28/2017
Withdrawn	0 / 23904	Date of Report:	20 Jul 2017
Unknown	20 / 23904	Content:	Full

Database

SevenCs - S-57

NB: Only databases supporting S-57/S-63 are shown

S-63 Data Server

GB

Cell Name	Edition	Update	Issue Date	Status
AR201130	3	5	30 Jan 2017	Up to Date
AR201140	1	23	26 Dec 2016	Up to Date
AR202100	2	0	07 Dec 2016	Up to Date
AR202140	1	2	28 Mar 2017	Up to Date
AR202150	1	1	20 Jan 2016	Up to Date
AR203100	1	13	01 Dec 2016	Up to Date
AR203170	1	4	07 Oct 2015	Up to Date
AR204130	1	1	01 Sep 2015	Up to Date
AR204160	1	21	29 Sep 2016	Up to Date
AR301150	1	7	01 Dec 2015	Up to Date
AR302120	4	3	04 Jul 2017	Up to Date
AR302130	1	0	11 Apr 2011	Up to Date
AR302160	1	0	29 Mar 2011	Up to Date
AR302170	1	2	24 Jun 2015	Up to Date
AR302180	1	5	01 Sep 2015	Up to Date
AR303110	1	1	31 Oct 2011	Up to Date

The Chart Status Summary includes the following read only data:

- Chart Status: Count
 - Total: – the total number of charts in all ENC databases
 - Up to Date: the number of charts in all databases that include up to date information (as defined in the Status column)
 - Not Up to Date: the number of charts in all databases where chart data is not up to date (as defined in the Status column)
 - Withdrawn: – the number of charts in the database that have been withdrawn
 - Unknown: – the number of unknown charts in the database, usually unencrypted S-57 charts.
 - Node Name: – the display name given to the node (as defined in configuration). The ENC status report only shows data for this specific node.
 - Vessel Name/Identifier: - the given name and IMO numerical identifier of ownship. If no name or identifier has been defined the message (not set) is shown.
 - ENC Update Reference Date: - the last update to the selected database server.
 - Date of Report: - the date the ENC Update report was generated (i.e. current date)
 - Content: Full

Database enables S-57/S-63 ENC chart databases supporting S-57/S-63 to be selected by clicking on the drop down arrow and selecting from the list of available databases. Note that the Database selection may also include ENC C-Map.

The S-63 Data Server defaults to **GB** (Great Britain). To select a different S-63 data server click the drop down arrow and select the most relevant data server for your chart region, or alternatively select **Unknown** for unencrypted S-57 charts.



- The ENC update status report table lists all the charts in the selected database and S-63 data server. The table includes the following columns:
 - Cell Name: the alphanumeric identifier of the chart
 - Edition and Update number for each chart
 - Issue Date: the latest issue date for each chart

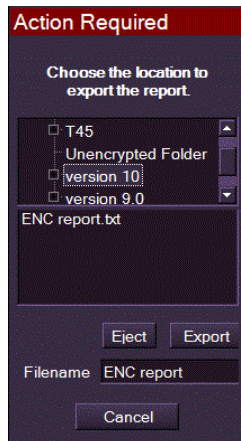
- Status: defines the chart's current status, i.e. **Up to Date**, **Not Up to Date** or **Unknown**

Exporting a Report

An ENC update status report can be exported to an external device such as a USB memory stick. The report is exported as a text file.

To export an ENC update status report do the following:

1. Insert the external device into a USB port on the PC.
2. Click on the **Export Report** button, an 'Action Required' window appears prompting to choose the export location.
3. Navigate to the area on the external device where the file is to be exported to.
4. Enter a report name in the **Filename** field.
5. Click the **Export** button, the window is temporarily removed from the screen. When the export is complete the window re-appears with the report name and a temporary prompt confirms the export of the txt file.



Update Log

The Update Log table enables update information on charts within chart databases, and updates made by the operator using manual chart update to be displayed in a separate window .

To access the window click the **Update Log** button. A Update Log window appears displaying details (if any) of chart updates on the currently loaded chart database. To select another database, or manual chart updates, click on the drop down list.

Update Log									
Chart Database		Refresh Updates							
SevenCs - S-57									
C-Map Installation Actions									
SevenCs - ARCS									
SevenCs - S-57									
Manual Updates									
		Issue Date	Application Date	Edition	Update	Actions	Type	Status	Error
	phic Office,...	15 Jan 2010	04 Jul 2017 04:55	4	0	0	Automatic	Applied	
	phic Office,...	05 Mar 2010	04 Jul 2017 05:01	4	1	7	Automatic	Applied	
GB300178	United Kingdom Hydrographic Office,...	26 Jul 2011	04 Jul 2017 05:01	4	2	1	Automatic	Applied	
GB300178	United Kingdom Hydrographic Office,...	05 Mar 2014	04 Jul 2017 05:01	4	3	3	Automatic	Applied	
GB50826K	United Kingdom Hydrographic Office,...	05 Dec 2014	04 Jul 2017 04:59	3	0	0	Automatic	Applied	
GB50826K	United Kingdom Hydrographic Office,...	15 Jan 2016	04 Jul 2017 05:04	3	1	22	Automatic	Applied	
GB402386	United Kingdom Hydrographic Office,...	12 Dec 2014	04 Jul 2017 04:57	8	0	0	Automatic	Applied	
GB402386	United Kingdom Hydrographic Office,...	06 Mar 2015	04 Jul 2017 05:04	8	1	32	Automatic	Applied	
GB502555	United Kingdom Hydrographic Office,...	05 Jan 2017	04 Jul 2017 04:59	8	0	0	Automatic	Applied	
GB301385	United Kingdom Hydrographic Office,...	15 Jul 2016	04 Jul 2017 04:55	7	0	0	Automatic	Applied	
GB301385	United Kingdom Hydrographic Office,...	14 Oct 2016	04 Jul 2017 05:02	7	1	26	Automatic	Applied	
GB401791	United Kingdom Hydrographic Office,...	04 Sep 2014	04 Jul 2017 04:57	1	0	0	Automatic	Applied	

 Note that the Update Log table may take a while to populate.

The information shown in the summary report for each chart is dependent on the chart database selected. For example, a SevenCs S-57 or C-MAP database shows the following columns:

Reference for the chart ('Chart' for C-Map, 'Name' for SevenCs)

- Issuing Authority (e.g. UKHO)
- Issue Date (the date that the update was applied to the chart)
- Application Date (the date and time the updated chart was installed in the VMTF)
- Edition and Update number
- Number of actions associated with a chart update
- Update Type (Manual or Automatic)
- Status of the update (Applied, Superseded, Rejected or Deleted)
- Errors detected (SevenCs only).

For ARCS raster charts the name and issuing authority columns are replaced with a **Chart** column, which lists the chart description and reference number.

If a chart update has failed the Update Log displays **Rejected** in the Status column and the reason for the rejection is shown in the **Error** column of the table.

To sort the list into required priorities click on a column button. For example, to sort by issue date click on the **Issue Date** button, all chart updates are displayed from either the earliest or latest date.

Click the **Refresh Updates** button to update the list to include in the list chart updates made on other nodes. While updating the table shows the message '**Updates Data Loading Please Wait..**'

 *Please note that the Update Log dialog is not applicable for VPF charts. Rather than being updated, VPF charts should be patched using whichever means is most appropriate to you.*

Viewing Manual Updates

Chart Database						
Manual Chart Updates			Refresh Updates			
Chart Name	Chart Edition	Update Date	Update Type	Update Action	Status	User Comments
FR401050	3	03 Aug 2010 19:21	Default Beacon	Add	Applied	Beacon on route
FR401050	3	03 Aug 2010 21:34	Default Beacon	Add	Applied	
GB302640	15	27 Jul 2010 21:28	Point Annotation Mark	Annotation	Applied	underwater wreck
GB202900	11	03 Aug 2010 21:40	Point Annotation Mark	Annotation	Applied	
GB202900	11	03 Aug 2010 21:45	Point Deletion Mark	Delete	Applied	

To view a summary of chart updates made by the operator, select **Manual Update** from the drop down list. The subsequent window shows the following columns:

- Chart Name
- Chart Edition
- Update Date
- Update Type
- Update Action
- Status
- User Comments

C-Map Updates

For C-Map charts, the system provides automatic registration of the databases and a record of updates is kept in the C-Map database.

C-Map Installation Actions provides a record of C-Map chart installation, including Database (e.g. ENC), Application Date (date and time of action), Status (Error or Success) and a brief summary of action or error.

Object Update Report

The Object Update Report table displays specific update information made to charts in a separate window. Object Update reports can be exported to an external device.

To access the window click the **Object Update Report** button. A blank Report window opens.

To generate an object update report select the required chart database from the drop down list and enter a time period by clicking in the **From Date** and **To Date** and use the forward and back arrows on the subsequent drop down keypad to enter the required dates.

With a chart database selected and the **From** and **To** dates entered click the **Generate Report** button, an object update report is generated based on the chart database and time period entered.

Object Update Report						
Chart Database		From Date		Generate Report		
SevenCs - S-57		12 Apr 2017				
		To Date		Export Report		
		13 Jul 2017				
Chart	Name	Type	Update Date	Application Date	Latitude	Longitude
GB102505	Buoy, special purpose/general	Delete	29 Apr 2016	04 Jul 2017 05:02	53°43.000' S	062°29.000' W
GB102505	Caution area	Modify	13 Nov 2015	04 Jul 2017 05:02	53°05.700' S	068°00.800' W
GB102505	Light	Delete	29 Apr 2016	04 Jul 2017 05:02	53°43.000' S	062°29.000' W
GB102505	Sounding	Add	29 Apr 2016	04 Jul 2017 05:02	51°53.437' S	056°59.007' W
GB102505	Sounding	Add	13 Nov 2015	04 Jul 2017 05:02	53°38.500' S	060°37.000' W
GB102505	Sounding	Add	13 Nov 2015	04 Jul 2017 05:02	51°46.889' S	056°09.636' W
GB102505	Sounding	Add	13 Nov 2015	04 Jul 2017 05:02	51°49.585' S	056°24.570' W
GB102505	Sounding	Add	29 Apr 2016	04 Jul 2017 05:02	51°46.889' S	056°09.636' W
GB102505	Sounding	Add	29 Apr 2016	04 Jul 2017 05:02	51°49.585' S	056°24.570' W
GB102505	Sounding	Add	13 Nov 2015	04 Jul 2017 05:02	51°53.437' S	056°59.007' W
GB102505	Sounding	Add	29 Apr 2016	04 Jul 2017 05:02	51°50.196' S	055°54.187' W
GB102505	Sounding	Add	29 Apr 2016	04 Jul 2017 05:02	51°49.017' S	056°37.204' W
GB102505	Sounding	Add	29 Apr 2016	04 Jul 2017 05:02	53°38.500' S	060°37.000' W
GB102505	Sounding	Add	13 Nov 2015	04 Jul 2017 05:02	51°50.196' S	055°54.187' W
GB102505	Sounding	Add	13 Nov 2015	04 Jul 2017 05:02	51°46.889' S	056°09.636' W

The object update report will show the following information columns:

- Chart - the alphanumeric identifier of the chart that includes the update information.
- Name – the name of the updated object, e.g. buoy or sounding.
- Type – the type of update, e.g. add, delete or modify.
- Update Date – the date the update was made to the chart.
- Application Date - the time the update was applied to the VMFT.
- Latitude and Longitude – the position of the object on the chart.

Exporting a Report

An object update report can be exported to an external device such as a USB memory stick. The report is exported as a text file.

To export an object update report do the following:

1. Insert the external device into a USB port on the PC.
2. Click on the **Export Report** button, an 'Action Required' window appears prompting to choose the export location.
3. Navigate to the area on the external device where the file is to be exported to.
4. Enter a report name in the **Filename** field.
5. Click the Export button, the window is temporarily removed from the screen. When the export is complete the window re-appears with the report name and a temporary prompt confirms the export of the txt file.

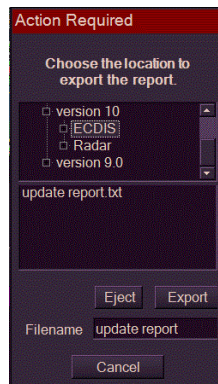


Chart Update Error Messages

A list and explanation of chart update errors and messages that may be generated in the Chart Updates table is given below.

To avoid update errors it is advisable to ensure the most up-to-date charts are installed from the latest set of Base CDs, followed by the most recent Update CD (this must be more recent than the Base CD). Once the Base/Update installs are complete, view the charts in the Chart Update Summary, sort by the Application Date, and check to see if any failures occurred during the installation operation.

For information on installing C-Map charts on to a node via the Sperry Marine Chart Installer program, see Chapter 1, 'Chart Installation' in Supplementary Features User Guide, 65900014.

Update Errors

1. Could not verify signature for file

Each ENC chart is delivered with a signature file that verifies the data was created by a proper authority (official hydrographic office). According to the IHO S-63 specification, the ECDIS must reject the chart if a problem is encountered when verifying the signature. This type of error can occur if the signature file was created incorrectly by the chart producer. Also, if the wrong certificate file (**IHO.CRT** or **PRIMAR.CRT**) is specified by the operator prior to chart import.

2. Application of update failed

This indicates the update could not be applied because it contains invalid or inconsistent data. This error may be caused when data does not comply with the chart validation rules in IHO S-58.

3. Could not decrypt file

This error occurs when the decryption of an encrypted ENC file fails. The chart files contain validation mechanisms (e.g. checksum) to ensure that the decryption is successful. If those validation mechanisms fail, then the chart is rejected. This error may also occur if the operator mistakenly selects **S-57 (unencrypted)** in the Sperry Chart Installer for encrypted ENCs. **S-63** should be selected for AVCS / Primar charts.

4. No Base Cell for Update

This indicates that the import of an update failed because the corresponding base edition for that chart was not present. Often this error can be ignored in the case that the failed updates correspond to a cancelled chart (sometimes update applications are attempted by the SevenCs ChartHandler after a cancellation operation). Another explanation for this error would be that the Update CD was applied before installing the corresponding Base CD.

5. Update belongs to a previous edition

This indicates that the update application failed because the update corresponds to a newer chart edition than the one currently installed. When this occurs, it usually indicates that a new Base CD has been released and should be installed prior to the latest Update CD.

6. Update belongs to a newer edition

This indicates that the update application failed because the update corresponds to an older chart edition than the one currently installed. This usually occurs because an old Update CD is applied after a newer chart edition was installed from a Base CD.

7. Update has wrong update number

This error can indicate that update number information in an update file does not match the expected value from the catalog. This is often an issue with the way the charts were produced.

Update Messages

1. Dataset Cancelled

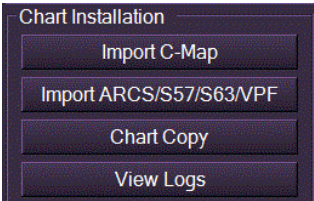
This message indicates that the chart was discontinued by the hydrographic office and replaced by a chart with a different name.

Chart Installation

Importing Charts

CAUTION:
Importing charts will cause the VMFT application to shut down.

Charts can be installed onto a VMFT node in one of three ways, depending on the chart database being installed. The type of charts that can be installed will also depend on the configuration of your system (only those charts which have been configured will be available).



1. C-Map charts are imported via the Sperry Chart Installer.
2. SevenCs charts (ARCS, S57, S63 or VPF) are imported via the SevenCs Chart Handler utility.
3. NAVTOR charts are loaded directly from CD/DVD.

In order to load charts a VM Security Block (sometimes referred to a dongle) must be connected to one of the available USB sockets at the rear of the PC. The VM dongle identifies the particular product type for the workstation, (e.g. ECDIS, Chart Radar, Total Watch etc).

For a description of importing encrypted ENC (S-63) charts provided by NAVTOR refer to '*NAVTOR Charts*' in Chapter 1, '*Chart Installation*' of the Supplementary Features User Guide, 65900014.

Importing C-Map Charts

For information regarding the importing C-Map charts, see Chapter 1, '*Chart Installation*', '*Installing C-Map Charts*' in the Supplementary Features User Guide, 65900014.

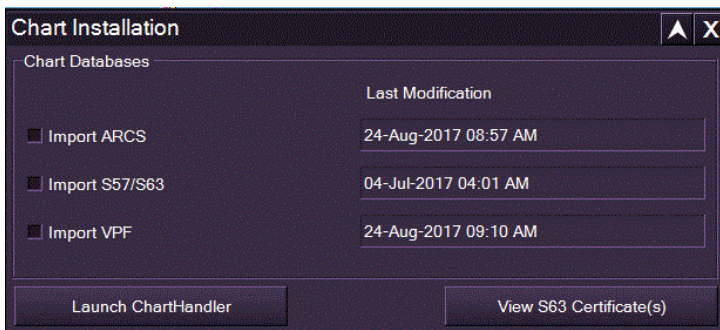
Importing SevenCs Charts

The SevenCs ChartHandler is accessed via the Chart Installation window and enables the loading of ARCS (raster format), S57/S63 and VPF charts and chart permits. VPF (Vector Product Format) charts are treated as a variant of S-57. The World Charts are preloaded into the VMFT.

The Chart Installation window also enables the expiration date of S63 certificates to be viewed and the certificate exported to an external device.

To access the SevenCs ChartHandler do the following:

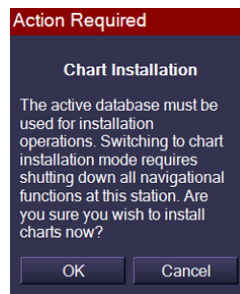
1. From Chart Installation click the **Import ARCS/S57/S63/VPF** button (depending which charts are configured this button may be labelled differently). A Chart Installation window appears showing the chart databases available for import and the last modification made to the chart databases, see below.

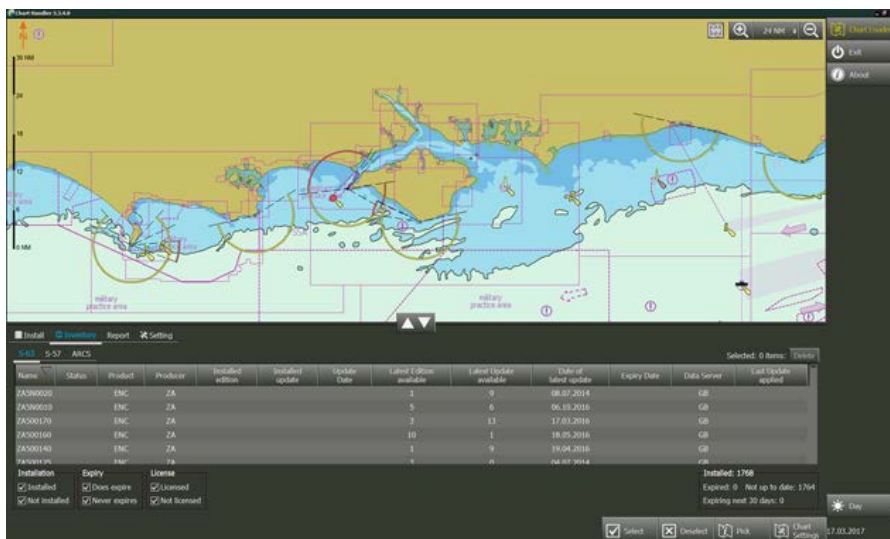


The Chart Installation window allows initial selection of the format that will be installed (ARCS, S57/S63, VPF).

2. To select a database tick the **ARCS** (ARCS charts are not applicable to Chart Radar), **S57/S63** or **VPF** check box and click the **Launch ChartHandler** button.

 *An Action Required window will appear to advise that the active database must be used for installation. It will also advise that opening ChartHandler will close the VMFT program and shut down all navigational functions*





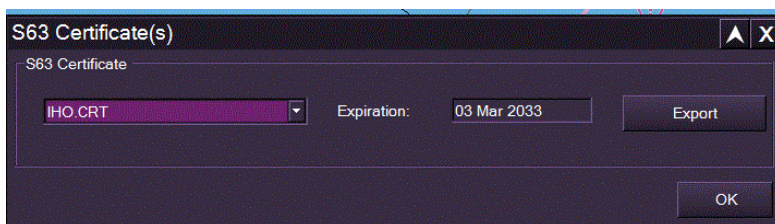
Click **OK** to confirm to start ChartHandler. The system will immediately close down. Then a **Starting ChartHandler** progress bar appears, after which the ChartHandler application opens, see below,

For full information regarding the installation of SevenCs charts, see Chapter 1, 'Chart Installation', 'Installing Charts using the ChartHandler' in the Supplementary Features User Guide, 65900014.

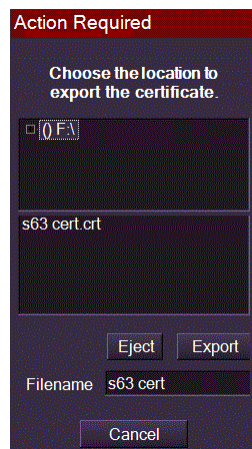
To export S63 certificates do the following:

The Chart Installation window enables the expiration date of the current S63 certificate to be viewed and the certificate exported to an external device such as a USB memory stick.

1. To view the expiration date click on the **View S63 Certificate(s)** button in the lower right of the Chart Installation window. An S63 Certificate(s) popup window appears.



2. To export the certificate connect an external device to the PC and click the **Export** button, an 'Action Required' window appears prompting to choose the location of the export.
3. Navigate to the external device and enter a name in the **Filename** field.
4. Click the **Export** button. The certificate is exported to the location specified as a **.crt** file and a temporary prompt appears confirming that the export was successful.
5. Click on the **Eject** button and remove the external device from the VMFT PC.



For full information regarding Chart Installation, see Chapter 1, 'Chart Installation' in Supplementary Features User Guide, 65900014.

Chart Copy

The Chart Copy feature allows you to copy charts installed locally to other nodes in a multi-node system.

Chart copy operations can be performed while the VisionMaster application is running on all nodes, and charts will continue to be displayed during the copy process.

When a copy operation is performed, the charts are placed in a staging area on the remote node, separate from any charts already installed on that node. After a copy operation has completed successfully, the node needs to be restarted to activate the copied charts.

 *A C-Map database must be initially installed and registered locally at each node before Chart Copy for C-Map charts is started.*

To copy a chart database to other nodes, do the following:

1. To select the chart type to be copied click on the **Chart Copy** button. The subsequent screen enables the chart type to be selected from a drop down list.

The Charts at Local Node area provides information about locally installed charts for the selected chart type. The information provided depends on the chart type. For S-57, ARCS, or VPF charts a **Last Modification** date and time is provided to indicate when the charts were last updated. For C-Map charts, an **Issue Number**, **Issue Date**, and **Update Date** are provided .

Chart Copy

Chart Type

SevenCs - S-57

Charts at Local Node

Node Name	Last Modification
VisionMaster1	27-May-2010 09:20 AM

Charts at Remote Nodes

Node Name	Issue Number	Issue Date	Update Date	Status	Action
VisionMaster2	350	14-Aug-2009	Not Updated	Matches Local Charts	Copy Local Charts To This Node
VisionMaster3	350	14-Aug-2009	21-Aug-2009	Does Not Match Local Charts	Copy Local Charts To This Node
VisionMaster4	346	17-Jul-2009	Not Updated	Does Not Match Local Charts	Copy Local Charts To This Node
VisionMaster5	350	14-Aug-2009	Not Updated	Matches Local Charts	Copy Local Charts To This Node

Copy Local Charts to All Nodes

Cancel All Copy Operations

The **Charts at Remote Nodes** table provides the latest available information about charts installed at remote nodes. The same chart time, date and update information is provided for charts on remote nodes as is provided for the local node.

The **Status** column provides an indication of whether the charts on the remote node match the locally installed charts. If the charts do match, then **Matches Local Charts** is displayed in green. Otherwise, a status **Does Not Match Local Charts** is displayed in yellow. The Status column also provides current progress information once a copy operation is started. The buttons in the **Action** column enables you to start or cancel chart copy operations for individual nodes.

The **Copy Local Charts to All Nodes** button allows you to copy the local charts to all nodes, while the **Cancel All Copy Operations** cancels all active copy operations.

2. To start a copy operation to specific nodes on the system (i.e. the nodes displaying **Does Not Match Local Charts**) click on the **Copy Local Charts to this Node** button in the Action column.
3. Or, to copy the selected chart database to all remote nodes on the system, click the **Copy Local Charts to All Nodes** button.
4. When the copy process is started the Status column provides current information about the progress of each active copy operation. If a copy operation fails for any reason (e.g. remote nodes becomes unavailable), the reason for the copy error is displayed in the Status column. Once the copy operation is started, the Action column button will change to **Cancel Copy Operation**.
5. To cancel the copy operation click the **Cancel Copy Operation** button while the copy is in progress, the copy will be cancelled and any partially set of copied files will be removed from the remote node.

Once the copy operation is complete, the Status column will display a **Copy Complete, Reboot Node** message in yellow. This indicates that the newly copied charts can be activated by restarting the remote node. After the node is restarted, the chart information displayed for that node will be automatically refreshed to match the newly activated charts.

When a C-Map database is copied to a remote node, any existing licenses installed on that node are automatically applied to the replacement charts when they are activated on reboot.

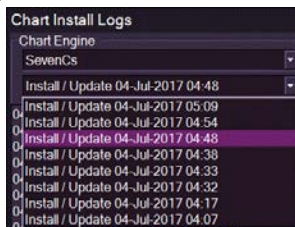
If a problem is encountered during the activation of copied charts on restart, a **Charts Activation Error** caution is raised, with a description on the reason for the failed activation.

View Logs

The View Chart Logs feature enables you to view chart install logs based on a selected chart database and installation update event, defined by date and time.

To view a chart install log, do the following:

- Double click on the **View Logs** button, the Chart Install Logs window opens displaying the latest chart install log files.
- To select a specific chart engine click on the drop down arrow on the Chart Engine field and select from the list of options.
- To view another log file click on the drop down arrow and select from the list of chart install logs.



The log file shows the time of each installation/update and a brief description of the event (e.g. VPF installation).

Permissions / User Permits

The Permissions/User Permits area includes the following access buttons:

- Export S-63 Permit
- Export 7Cs Hardware ID
- Export ARCS User Permit
- C-Map Permissions (appears if C-Map charts are available)

Permits and Licenses

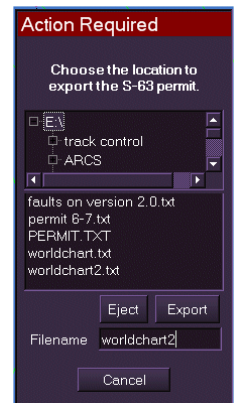
When a chart license or permit is about to expire a warning is generated. If the C-MAP license has expired (see C-Map Permissions) the system stops displaying the respective charts. The system will accept new licenses and cell permits using electronic media. For details on installing license files and/or cell permits for S-63 charts see Chart Permits . For information on installing C-Map license files see Chapter 1, '*Chart Installation*' in Supplementary Features User Guide, 65900014.

Export S-63 Permit

A SevenCs S-63 permit and an ARCS User Permit are pieces of information that are intended to provide additional system protection and authorization for the chart database. The operator is required to send the permit file to UKHO in order to activate a S-63 or ARCS account. Both permit numbers are based on the Sperry Security block PIN.

To export an S-63 permit file do the following:

1. Insert an external device, such as a USB memory stick, into a port at the rear of the PC .
2. Click on the **Export S-63 Permit** button. The subsequent window displays the external disk drive and prompts to choose the location to export the S-63 permit.
3. Navigate to the location where you want the permit exported to by clicking on the **+** button to the left of the directory folder.
4. To enter a filename for the permit click in the **Filename** field and enter a name using the screen keypad.
5. With the export location highlighted and a name entered click the **Export** button, the S-63 permit is exported to the location as a .txt file. If successful a temporary prompt is displayed confirming that



the permit has been exported with the selected location detailed in the prompt.

6. To cancel the export operation click the **Cancel** button. The Tools menu re-appears.
7. When the file has been exported, select the route directory (i.e. E:\), click the **Eject** button and remove the external device from the PC.

Once installed S-63 charts will be displayed even if cell permits have expired.

Export 7Cs Hardware ID

To export a 7Cs Hardware ID file do the following:

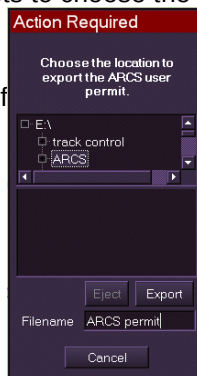
1. Insert an external device, such as a USB memory stick, into a port at the rear of the PC .
2. Click on the **Export 7Cs Hardware ID** button. The subsequent window displays the external disk drive and prompts to choose the location to export the hardware ID file.
3. Navigate to the location where you want the file exported to by clicking on the **+** button to the left of the directory folder.
4. To enter a name for the hardware ID file click in the **Filename** field and enter a name using the screen keypad.
5. With the export location highlighted and a name entered click the **Export** button, the file is exported to the location as a .txt file. If successful a temporary prompt is displayed confirming that the file has been exported with the selected location detailed in the prompt.
6. To cancel the export operation click the **Cancel** button. The Tools menu re-appears.
7. When the file has been exported, select the route directory (i.e. E:\), click the **Eject** button and remove the external device from the PC.



Export ARCS User Permit

To export an ARCS User Permit do the following:

1. Insert an external device, such as a USB memory stick, into a port at the rear of the PC .
2. Click on the **Export ARCS User Permit** button. The subsequent window displays the external disk drive and prompts to choose the location to export the permit file.
3. Navigate to the location where you want the file exported to by clicking on the **+** button to the left of the directory folder.
4. To enter a name for the hardware ID file click in the **Filename** field and enter a name using the screen keypad.
5. With the export location highlighted and a name entered click the **Export** button, The ARCS user permit is generated based on information in the Sperry security block. The user permit is a 16 character text file.



If successful a temporary prompt is displayed confirming that the file has been exported with the selected location detailed in the prompt.

6. To cancel the export operation click the **Cancel** button. The Tools menu re-appears.
7. When the file has been exported, select the route directory (i.e. E:\), click the **Eject** button and remove the external device from the PC.

C-Map Permissions

When in Standby, information on the C-Map charts, including product (ENC), region covered and permit expiration date can be viewed by clicking on the **C-Map Permissions** button. A tabular window appears over the display.

Chart Permissions		
Chart Database		
C-Map		
Product	Region	Expiration Date
ENC	Zone 0 ENC	01/07/2014

Chart Settings

The Chart Settings sub menu includes two tab folders:

- Layers
- Symbology

The Layers folder enables you to display a Standard display mode, with all standard settings selected, or to select and deselect chart settings for the currently selected mode.

The Symbology folder enables you to customise display settings for all chart databases and display settings for specific charts (e.g. C-MAP or SevenCs databases) from a list of available settings.

CAUTION:

THE SELECTION OF CHART SETS AND CUSTOM FEATURES ONLY APPLIES TO VECTOR FORMAT CHARTS. CHART SETTINGS DO NOT CHANGE THE DISPLAY OF RASTER FORMAT (ARCS) CHARTS.

The currently selected chart display mode (i.e. **Standard Chart Display**) is shown as a permanent prompt, see Prompts.

In addition to the access options described in Chart Facility, the Settings sub-menu can be quickly accessed by right clicking the STND button in the lower popup toolbar (the exception to this is when using ARCS Charts).



Settings Functions

Layers

The Layers folder includes two chart setting selection options: Standard and All.

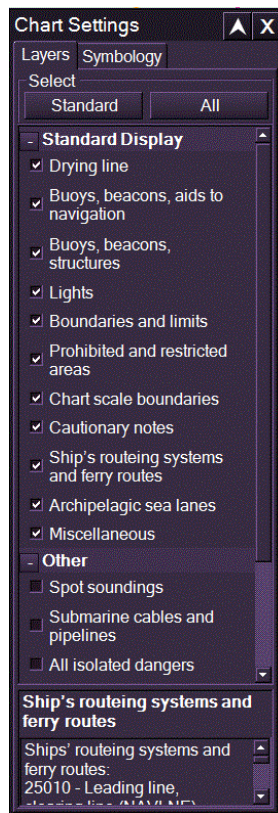
When the **Standard** button is clicked all chart settings listed under the **Standard Display** are automatically selected.

When the **All** button is clicked all the additional chart settings listed under **Other** are selected, in addition to all Standard settings.

To disable individual settings untick the setting's check box. Or, to enable additional settings tick the setting's check box in the Other list.

Whatever individual settings have been enabled or disabled, clicking the **Standard** button will revert to displaying the Standard default settings only.

Move the cursor over each setting to display a brief description of the setting at the bottom of the window.



Symbology

The selection of the display mode defines the behaviour used by the chart engine when rendering chart data.

There are three buttons available for selection: **All**, **None** and **Default**.

- All - selects and displays all the chart settings in the chart engine lists below.
- None - deselects all the chart settings in the chart engine lists (Standard chart settings listed in Layers are retained)
- Default - selects and displays the commissioned default chart engine settings only.

To enable or disable individual settings for the required chart engine tick the setting check box. A description of each function is given below the settings list when the cursor moves over the function.

The chart symbology display settings listed in the following tables are, when selected, displayed on the VMFT node.

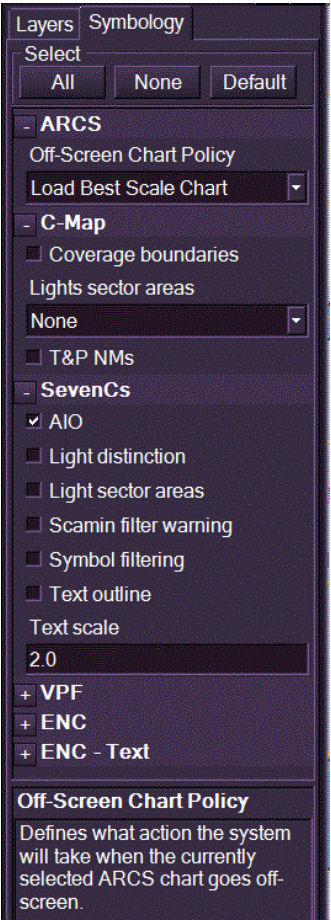
ARCS Specific Features

If ARCS chart format is enabled the custom features includes the selection of off-screen chart policy.

The Off-Screen Chart Policy defines what action the system will take when the currently selected ARCS chart goes off-screen. The default is **Load New Best Scale Chart**.

To change the off-screen chart settings, click on the drop down arrow and select from:

- Keep Off-Screen Chart Loaded
- Load New Closest Scale Chart



C-Map Settings

The chart display settings listed below are available for the C-MAP chart database.

Feature	Description	Default Value
Coverage Boundaries	Displays boundaries indicating chart coverage as a series of yellowish-orange horizontal and vertical lines.	Off
Light Sector Areas	Light sector areas enables the display of visible sectors and range of coastal lights, for example lighthouses and harbour lights. The selection of light colour display is available in white, red, green, a combination of the three or all colours by clicking on the arrow. If All is selected then all colours in the range will be displayed	Off
T & P NMs	Displays temporary and permanent notices	Off

SevenCs Settings

The chart display settings listed below are available for the SevenCs ENC chart database.

Feature	Description	Default Value
AIO	Display Admiralty Information Overlay data, see AIO Data .	On
Light Distinction	Provides non-standard symbology for fixed lights so they can be easily distinguished from floating lights.	Off
Light Sector Areas	Highlights light sector areas regions.	Off
Scamin Filter Warning	Warning (Attention: Scale Filter Applied) shown at the top of display if any chart object has been suppressed due to its SCAMIN attribute.	Off
Symbol Filtering	Suppresses overlapping chart symbols of the same size, shape, and colour to reduce clutter of the display.	Off
Text Scale Factor	Scaling factor that defines the size of text displayed on the chart. To change the scaling click in the Text Scale field and move the trackball left or right to decrease or increase the scaling. The text scale values range from 1:0 to 2:5.	2.0

VPF Settings

The chart display settings listed below are available for the VPF chart database.

Feature	Description	Default Value
GeoSym Beautification	Select to improve the appearance of GeoSym symbology.	On
Symbol Filtering	Apply filtering to suppress overlapping chart symbols of the same size, shape, and colour in order to reduce clutter.	Off
Text Information	Displays text information	Off
Text Outline	Display outline around text to provide contrast	On
TOD level 0	Display Tactical Ocean Data (TOD) Level 0 chart data.	On
TOD level 1	Display Tactical Ocean Data (TOD) Level 1 chart data.	On
TOD level 2	Display Tactical Ocean Data (TOD) Level 2 chart data.	On
TOD level 4	Display Tactical Ocean Data (TOD) Level 4 chart data.	On

ENC Settings

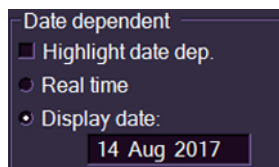
The chart display settings listed below are available for the ENC chart database.

Feature	Description	Default Value
Accuracy	Independent pattern selection of CATZOC, viewing group 31010. Symbol LOWACC01, viewing group 31011	Off
Full Light Lines	Full light sector lines displayed	Off
Highlight Information	Additional information, viewing group 31030 (INFORM, NINFOM)	Off
Highlight Document	Additional documents highlighted, viewing group 31031.	Off
Scamin Filtering	Apply filtering that suppresses chart symbols based on their SCAMIN attribute information in ENC charts.	On
Shallow	Shallow pattern displayed on waters shallower	Off

Pattern	than the safety contour.	
Shallow Water Dangers	Turns on the display of isolated danger objects which are located in shallow unsafe waters, viewing group 24050.	Off
Contour Label	Turns on the display of contour labels (including the safety contour labels), viewing groups 33021 and 33022.	Off
Four Shade Depths	Controls whether four water depths shades are used.	Off
National Language	National Language NOBJNM, text group 31.	Off
Unknown	Turns on the display of unknown objects which are not specified in S-52 standard, viewing group 21010.	Off
Point Symbol Style	Selects to display paper chart or simplified point symbol styles.	Paper Chart
Line Symbol Style	Selects to display plain or symbolised line boundaries	Symbolised
Date Dependent Objects	The Date Dependent Object settings enable a date dependent object to be highlighted and viewed by selecting a particular day or date range, see 'Highlighting and Viewing Date Dependent Objects'.	Real Time
Update Review	This function turns on colour highlighting for the objects which have undergone modification in the process of the latest accepted correction. To define a time period and view colour highlighting for that period tick the Highlight Updates check box and select a defined date range from the From and To fields using the drop down keypad.	Off

Highlighting and Viewing Date Dependent Objects

A chart object or radar mapping object may have a specific date, or a specific date range assigned for the display of the object. If the date dependency is set for a future time period the object will not be displayed on the screen until the particular day or date has been reached.



Date dependent objects may be viewed by ticking the **Highlight Objects** check box and selecting a particular date or date range by ticking the **Display Date** or **Date Range** radio buttons clicking in the data field and using the Forward and Back arrows on the subsequent drop down keypad.

When **Highlight Objects** is enabled and the day or date range dependency selected the object is shown on the display with an orange diagonal line with a **d** in a small box at the end of the line.



All date dependent objects for a particular defined day or date range will be shown on the screen.

ENC Text

The chart display settings listed below are available for ENC text symbols.

Feature	Description	Default Value
Important Text	Displays text important for navigation.	On
Other Text	Displays other text information, including Names, Lights description and All Other settings information	Off
Other Text - Names	Displays name text information	Off
Other Text - Light Description	Displays light description information	Off
Other Text - All Other	Displays other text information (this is all other information that does not include names or light descriptions)	Off

AIO Data

When the AIO checkbox is ticked in Chart Settings Symbology, AIO objects that are associated with one or more AVCS ENC chart in the current display will be rendered when accessed from Pick Report. Chart filtering modes will not affect the display of AIO objects.

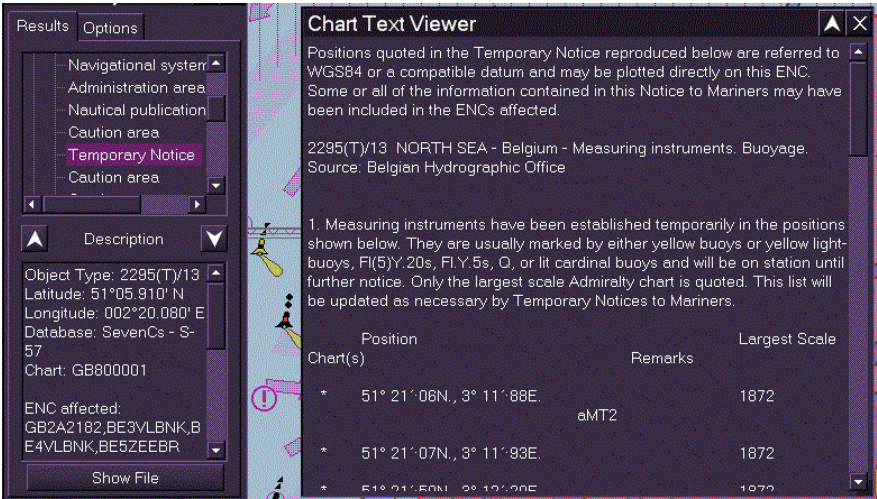
AIO data is provided as temporary notices, preliminary notices or No Information objects. Preliminary Notice and Temporary Notice AIO area objects are rendered with a solid red boundary line and red dotted pattern fill. No Information AIO area objects are rendered with a solid grey boundary line and a grey dotted pattern fill.

Details of AIO data may be displayed in either a secondary window, either as text or pictorial representation.

Displayed AIO data is listed in the Update Review tab of Chart Legend, providing detail about the AIO objects that were added and removed during each weekly update.

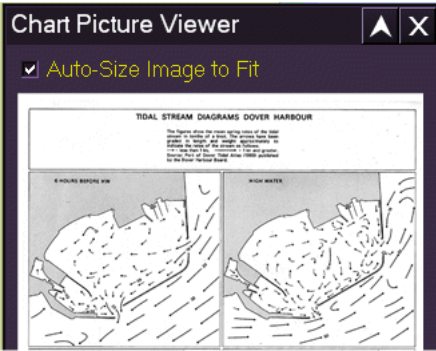
To display AIO data objects do the following:

1. From the Pick Report Results window select the area on the chart where the AIO data object resides. Preliminary Notice and Temporary Notice AIO area objects are rendered with a solid red boundary line and red dotted pattern fill. No Information AIO area objects are rendered with a solid grey boundary line and a grey dotted pattern fill.
2. When the AIO object is selected in the Results tab of Pick Report the **Show File** button becomes enabled.
3. Click the **Show File** button. A secondary window opens showing details of the notice, either as a chart text viewer or where there is pictorial representation, a chart picture viewer.



A Chart Picture Viewer displaying a graphic image will include a button to automatically scale the picture file to fit the viewer window.

- 4. To scale the picture to fit the chart picture viewer window tick the **Auto-Size Image to Fit** check box. The graphic file is re-sized



ECDIS Standard Default Settings

A left click on the STND button on the lower toolbar will open an Action Required prompt and requires confirmation to apply ECDIS Standard Default Settings.



A right click on the button will open the Standard Settings window which lists all of the currently applied settings for the system. The Apply button at the top of this screen will apply Standard Default Settings.

Standard Settings			
ECDIS Standard Default Settings			
Apply			
Group	Setting	Default	Current Value
Presentation	Range	3.0 NM	144.0 NM
	Presentation mode	NorthUp	NorthUp
	Motion mode	True Motion	True Motion
	Stabilisation	Ground	Water
	Vector mode	True	True
	Vector time	6.0 mins	6.0 mins
	True scale ship	Off	Off
Common symbology	Accuracy	Off	Off
	Date dependent objects	RealTime	RealTime
	Update Review	Off	Off
	Full Light Lines	Off	Off
	Highlight Info	Off	Off
	Highlight Document	Off	Off
	Unknown	On	Off
	Scale Min	Off	On
	Shallow Pattern	Off	Off

Chart Projections

Effect of Projections

Since the earth's surface is not flat a projection algorithm is required to map objects on the earth's surface onto the flat display screen.

On the ECDIS watch mode the projection used for presenting all LAT/LON referenced objects optimises their alignment with the chart. Navigators should be aware of the resultant small offset between radar video and other objects such as the chart, AIS targets, tracked targets, the cursor LAT/LON readout and routes.

These offsets are negligible at or near own ship's position and at the equator, and increase with range from own ship and increasing latitude. As a guide, an object that is 20NM from own ship at a latitude of 75 degrees may exhibit an offset of approximately 4 pixels (depending on screen resolution).

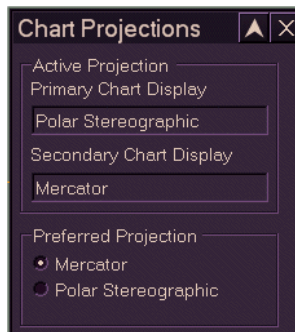
Projection Types

There are two primary projection types supported by the VisionMaster system:

- Mercator¹⁷
- Polar Stereographic¹⁸

Mercator is the default chart projection, used to display geographic areas between 0 degrees and 80 degrees latitude north or south. The exception to that is with non-navigational scales (1:1,000,000 or above) where Mercator can view regions up to 85 degrees North/South.

The Polar Stereographic projection can be used to display any region of the earth, including the north and south poles (up to 90 degrees north or south).



¹⁷ A Mercator projection is a method of showing a map of the globe on a flat surface.

On a globe, the lines of longitude (measuring east-west position) converge at the poles and the lines of latitudes (measuring north-south position) are equal distance apart. In a Mercator projection, the lines of longitude are straight vertical lines equal distance apart at all latitudes, and horizontal distances are stretched above and below the equator, this stretching is exaggerated near the poles.

¹⁸ In a Polar Stereographic projection the lines of longitude emanate from either the north or south pole (depending on which hemisphere is being displayed), and lines of latitude are displayed as concentric circles around the pole.

The Chart Projection menu allows the operator to specify which of the two projection types they prefer to use for display. The preferred projection is local to each node and is persisted.

On ECDIS the Chart Projections window includes a Primary and Secondary Chart Display. The primary and secondary chart displays may use different Active Projections at the same time.

Whenever the displayed region changes (due to scale change, panning, TM reset or Goto) the system attempts to use the preferred projection to render the chart and all other synthetics. If preferred projection is unavailable in the displayed region, then the system will select an 'Active Projection' from the available projections that are supported by the current chart engine. For example, if the preferred location is Mercator but the chart is displaying a high latitude region the Active Projection will automatically change to Polar Stereographic to render the chart display.

SevenCs vector based charts are displayed in all chart projections, whereas C-MAP is only displayed in Mercator projection. At high latitude regions, using Polar Stereographic projection, C-MAP charts are suppressed and a permanent prompt **Chart Suppressed at High Latitude** appears. C-MAP charts are restored when the chart enters a geographic region where Mercator is allowed.

When an ARCS chart is displayed the chart will dictate the projection for that display. As a result, the Active Projection value will always be ARCS when an ARCS chart is displayed, regardless of what the preferred projection is.

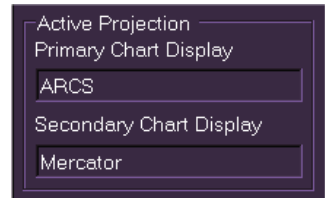
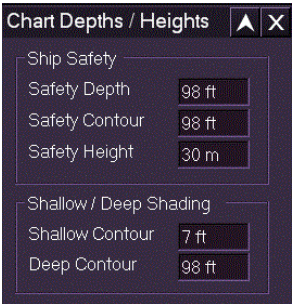


Chart Depths/Heights

The chart depths/heights window enables you to change the default settings of own ship's safety depth/height and contour, and shallow/deep shading contours.

On a multi-node system any changes made in Chart Depths/Heights are distributed and persisted across all nodes.



WARNING!

CHANGES MADE TO SHALLOW/DEEP SHADING VALUES ARE HIGHLIGHTED ON VECTOR CHARTS ONLY (E.G. C-MAP OR S-57). RASTER CONTOUR AREAS CANNOT BE ADJUSTED IN THIS WAY.

Ship Safety

The Ship Safety area includes depth, contour and height safety settings for own ship.

The safety depth is the minimum depth required by an underwater object for own ship to pass over safely. The minimum depth is the distance from the water surface to bottom of own ship's keel, plus a safety buffer against variations in the water level from the time the water was charted to the present time.

The safety contour is the minimum contour depth required for own ship to pass over safely. Safety checking uses the given value to determine whether underwater objects are to be considered Objects of Concern. An alarm is raised if own ship passes over a contour depth less than the given value.

The safety height is the minimum distance required by an overhead obstruction for own ship to pass under safely. The minimum height is the distance from the surface of the charted water to the lowest point of the overhead obstruction.

The default values for Ship Safety settings are 30 metres.

If the safety depth is set at a value less than the configured value of own ship's maximum draft a **Safety Depth Shallow** Caution is displayed.

If the safety height is set at a value less than the configured value of own ship's height a **Safety Height Low** Caution is displayed.

Shallow and Deep Shading

The Deep Contour and Shallow Contour areas are highlighted on the Chart display by colour shading, with the shallow water areas indicated by lighter shades. Contours, prohibited areas, and areas with special conditions are considered dangerous if their depth is less than own ship's safety depth or no depth is defined for that object.

WARNING!

THE CHART SHADING BASED ON THE DEFINED CONTOURS MAY NOT ALWAYS BE ACCURATE DUE TO THE GEOMETRY OF THE DEPTH CONTOURS IN THE AREA, AS WELL AS LIMITATIONS IN THE SYSTEM CHART DATA AT ANY GIVEN TIME. THESE LIMITATIONS MAY INCLUDE NON-AVAILABILITY OF USER-SPECIFIED DEPTH CONTOURS, VARIANCES BETWEEN DATA CONTENT ON OVERLAPPING CHARTS, AND OTHER DATA ISSUES. THE OPERATOR MUST TAKE THESE FACTORS INTO ACCOUNT AND USE ALL AVAILABLE SOURCES OF INFORMATION REGARDING DEPTH, AS APPROPRIATE TO THE NAVIGATION AREA.

For an illustration of deep and shallow contour areas on a chart display, refer to Legend Chart.

The default value for shallow contour is 2 metres
(maximum value = default Safety Depth).

The default value for deep contour is 30 metres
(minimum value = default Safety Depth).

When own ship's safety depth is changed the deep/shallow contour colours may change although the contour outlines will remain on the chart display.

Changing Chart Depth/Height Values

To change the default values click in the required field and move the trackball left to decrease the value or right to increase. Click the left key again to set the value.

The contour and depth values set for the selected chart are also shown in the Legend sub menu, see Legend Chart.

Chart Databases

The Chart Databases window lists all chart databases available to the system and allows databases to be enabled or disabled.

Chart Databases also allows selection of the most suitable chart database based on automatic database selection.

 *When the system is in its initial state, i.e. the first time the system is run, all chart databases that have been configured for the system are listed as enabled.*

Enabling and Disabling Databases

The chart databases are listed in the Enabled field in the order in which they will be used for rendering chart data. The databases with the highest priority are listed at the top of the Enabled field and the lowest priority at the bottom. The higher a chart database appears in the enabled list the sooner it will be selected for rendering.

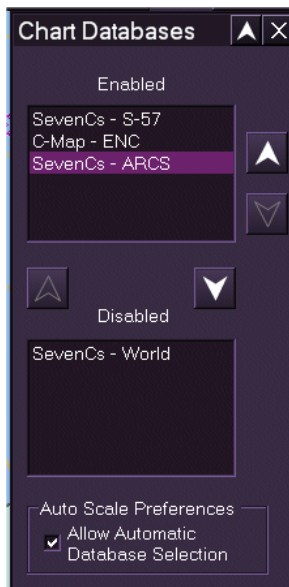
To change the chart database priority, or to disable or enable a chart database do the following.

To change the chart database order of priority:

1. Click on a chart database in the **Enabled** list, if the database is neither at the top or bottom of the list then both the Up button and Down button to the right of the list become available.
2. Click on the Up or Down button to move the position of the chart database within the list.

To disable or enable a chart database:

1. To disable, click on the chart database in the **Enabled** list and click the Down button between the Enabled and Disabled fields. The selected chart database is moved to the **Disabled** field, and will not be rendered or available for selection from the Chart Type & Sub Menu Selection.
2. To enable a previously disabled chart database click on the database in the disablement list and click the Up button between the **Enabled** and **Disabled** fields. The database is moved to the **Enabled** list.



Enabling AUTO Scale Preferences

When automatic chart database selection is enabled for a display area, the system periodically searches all enabled databases and automatically changes the selected database to be the one which provides the largest scale chart at own ship position. When multiple enabled chart databases provide a largest scale chart with an identical scale, the chart database with the highest priority is selected.

To enable Auto Scale Preferences to operate the display must be in Auto scale mode, see Chapter 3, 'Scale Ratio'.

To enable tick the **Allow Automatic Database Selection** check box.

Manual Database Selection

When a display is in manual database selection mode, the display area uses the selected chart database specified in the Chart button, see Chart Database & Sub Menu Selection

The chart display automatically switches from automatic database selection mode to manual database selection mode as the result of the following:

- The operator manually changes the selected chart database.
- Automatic scaling mode becomes disabled.

Supported Chart Engines and Chart Databases

The VisionMaster system supports C-Map and SevenCs chart engines.

The C-Map chart engine supports the following chart databases:

- C-MAP ENC¹⁹
- C-MAP Professional+²⁰
- C-MAP ENC+²¹

The SevenCs chart engine supports the following chart databases:

- S63 (encrypted S-57)²²
- S-57²³
- ARCS²⁴ (raster format charts)

¹⁹ Official S-57 charts converted to CMAP's proprietary chart database format.

²⁰ Professional+ is an extended version of CM93v3 charts supplied on DVD.

²¹ The C-Map ENC+ database consists of official ENC data and unofficial C-Map chart data where official data is not present.

²² Encrypted official chart format, implementation is based on IMO S63 standard.

²³ Unencrypted official chart format, implementation based on IHO S57 standard.

²⁴ Admiralty Raster Chart Service. Suppliers of raster format electronic charts with world coverage, in the HCRF format.

- VPF (Vector Product Format)²⁵
- World Map²⁶ (ENC).

C-Map and SevenCs presentation libraries are supported.

Official and Unofficial Chart Data

Chart databases may be classified as Official or Unofficial chart data.

Official chart data is known as Electronic Navigational Chart (ENC) data. All official ENC chart data must comply with data standards set by members of the International Hydrographic Organisation (IHO) and published in their document S-57, Edition 3.

An unofficial chart database is data which does not comply with the S-57 Edition 3 document (e.g. SevenCs World Map).

An **Unofficial Data** permanent prompt is displayed whenever chart data from an unofficial source is displayed (for example, SevenCs World Map charts). Unofficial data is not certified for safe navigational and the operator should refer to paper charts for unofficial data regions.

The unofficial data prompts are as follows:

- Unofficial Data in Primary Display
- Unofficial Data in Secondary Display

SevenCs supports both official and unofficial data. The official boundary line is always displayed to distinguish official and unofficial data, unless it has been explicitly disabled by the operator using the 'Official Boundary' custom chart setting for the SevenCs engine, see Settings.

Certain C-Map chart databases include a combination of official and unofficial chart data (see C-Map chart database descriptions above). While all types are used for safety checking, only official ENC data can satisfy the ECDIS requirements that may in some cases allow a vessel to navigate without reliance on up-to-date paper charts.



Even when official ENC data is used the operator should be mindful of the quality of data, and is encouraged to view the data quality symbol at appropriate intervals and understand the meaning of these symbols.

²⁵ As used by the Digital Nautical Chart (DNC) produced by the National Geospatial Intelligence Agency (NGA). A 'DNC data displayed' prompt appears when using these charts.

²⁶ The World Map database is delivered with the SevenCs Chart Engine and is based on the NGA World Vector Shoreline 1:250,000 charts. The structure of the data is defined by the IHO S-57 specification. Note that this database is only suitable for small scale viewing. It is not official format and therefore not safety checked.

Chart Legend

The Chart Legend sub menu enables you to view read only information on every chart currently visible on the screen.

The Chart Legend window is divided into four tab folders:

- Select
- Detail
- Update Review
- Notes



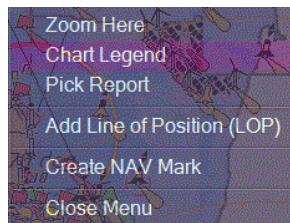
In addition to the main Chart Legend menu, a further Secondary Chart Legend menu is also available. This is available when using split screen display or picture in picture display.



Chart Information at a Specific Point

The user can access chart legend information at a specific point on the display by right clicking and selecting **Chart Legend** from the subsequent context menu.

When Chart Legend is accessed from the context menu the Chart Legend Select folder opens displaying the Latitude/Longitude position of the selection and the specific chart at that selected point under the currently loaded chart engine.



Legend Select

The Select folder displays the names of all the charts currently displayed on the screen.

From this folder you can choose the chart whose legend information will be displayed in the Detail folder, see Legend Detail.

The available charts are listed in Chart engine (C-MAP or SevenCs) folders.

The set of charts displayed in the Select folder will automatically update itself to match the cells most recently displayed on the screen.

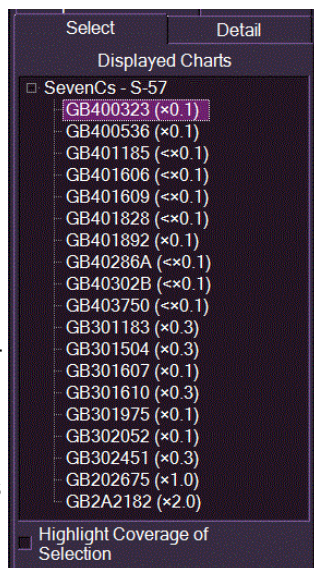
To view available charts click on the + button for each chart database.

All the listed charts include a numerical value in brackets. This value is the ratio of the current display scale to the chart's compilation scale, as shown on the **Detail** tab. For example, if a chart has a compilation scale of 74500 and the current range scale is 1:100,000, the ratio of these values is 74,500 divided by 100,000 equals x0.7, with the value rounded off to the nearest decimal point.

Charts displayed in bold are currently under ownship's position, these charts will match the charts ticked in the Charts button on the upper toolbar. Charts not shown in bold are covering a portion of the display not under ownship's position.

Show Chart Coverage

The Select tab includes the option to display coverage of a selected chart on the screen. To show chart coverage select a chart from the list and tick the **Highlight Coverage of Selection** check box. The chart outline is shown and the chart area filled in.

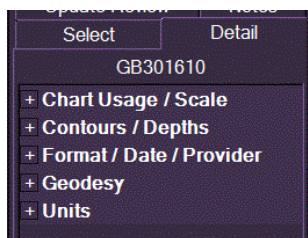


Legend Detail

The Detail folder displays all the chart legend information on the chart selected from the **Select** folder.

The information displayed in the Detail folder is divided into the following sections:

- Chart Usage/Scale
- Contours/Depths (Vector charts only)
- Format/Date/Provider
- Geodesy
- Units

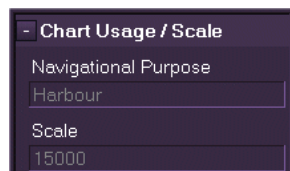


To view the read-only information on each section click on the **+** box.

If there is no chart data available for the geographical region being viewed, all component fields show **No Chart Available**.

Chart Usage / Scale

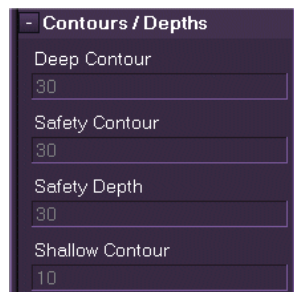
The chart usage scale displays the navigational purpose (e.g. Harbour) and scale of the selected chart (see Compilation Scale in Chart Facility).



Contours / Depths

The Contours/Depths information includes depth and contour values for the selected chart based on the requested values from the Chart Depths/Heights window.

The contours of the chart will always increase to a higher value than the minimum values set in Chart Depths/Heights. For example, if the Deep Contour value is increased from the default of 30 metres to a value ranging from 31 to 50 metres then the Deep Contour read-only value will display 50.



Deep Contour and Shallow Contour

All vector charts contain information about the contour and shape of the sea floor at a particular depth, this information is called Depth Contour.

Each chart contains depth contour information with varying levels of detail based on the survey that was originally performed to create the chart. One chart may have a set of contours for 3 metre, 5 metre, 8 metre, 10 metre, and 15 metre depths. A less detailed chart might only have contour information for 5 metre and 30 metre depths.

The deep and shallow contour values are applicable when **Four Shades Depth** is enabled (default setting) in Chart Settings - Symbolology. When four depth shades show different shades for 'very shallow' waters and 'very deep' waters. The deep contour and shallow contour define where the shading on the chart image will change.

Safety Contour

The safety contour value defines which of the depth contours available in the chart will be selected as the actual safety contour that is displayed in the chart legend. This safety contour is displayed on the chart with a bold/emphasized line; this line defines the area that the ship can never safely cross. For further emphasis the water that is deeper than the actual safety contour is displayed in a different colour to the water shallower than the actual safety contour.

The safety contour value is defined by the operator selected safety depth value in Chart Depths/Heights. The actual safety contour value is always greater than or equal to the requested safety depth value. If the defined safety depth value is not available in the chart, the next deeper contour is selected. If no contour is available in the chart that is equal to or deeper than the requested safety depth, there is effectively no applicable safety contour for that chart and the legend shows **No Contour Available**.

Safety Depth

The safety depth is the depth threshold at which spot soundings should be displayed with or without emphasis. The Safety Depth value set in Chart Depth/Heights is reflected in the Safety Depth field.

Format / Date / Provider

The Format / Date /Provider displays data on the chart's issue date, data format, provider and quality indicator (safe zones within a chart area), edition number and update information.

Geodesy

The Geodesy section provides projection type, WGS84 data, sounding, vertical and horizontal datum data and magnetic variation.

Units

Units displays the chart depth and height units (defaults to metres).

Geodesy

Magnetic Variation

0° 2015 (8° E)

Horizontal Datum

WGS 84

Vertical Datum

Mean high water springs

Sounding Datum

Approximate lowest astronomical tide

WGS84 Shift

No Shift

WGS84 Shift Magnitude

Not Applicable

Projection Type

Mercator

Format / Date / Provider

Data Quality Indicators

1 zone of confidence A1

1 zone of confidence B

1 zone of confidence D

Data Format

S-57

Data Format Version

3.1

Edition

5

Update Date

24 Mar 2017

Update Number

1

Data Provider Name

Data Quality Indicators

The data quality regions of this chart

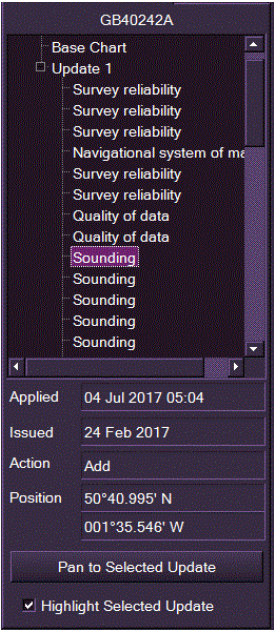
Legend Update Review

The Update Review folder displays the following data on updates applied to the selected chart.

- time and date the update was applied
- date that the update was issued
- action taken i.e. Add, Modify or Delete
- Latitude/Longitude position of update

Chart updates can be selected by clicking on the Update + box, respective update actions will be shown in the update tree.

Details for a particular chart update action can be viewed by selecting it in the navigation tree. The data listed above is displayed at the bottom of the window.



Panning to Update

To view specific updates select the chart update from the navigation tree click and the **Pan to Selected Update** box. The screen pans to the geographic position of the selected update (see Off Centre, Pan and Goto) and the TM limits are switched off.

When the **Highlight Selected Update** check box is ticked the update object is highlighted on the display with a graphic dependent on the updated object selected, see Pick Report Results.

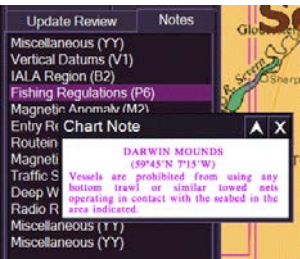
Click the **Centre** button to return the screen to own ship centred on the display.

Notes

The Notes tab in the Legend sub menu is a raster specific feature. It is used to browse pictorial metadata available for the raster chart being viewed.

With a raster (ARCS) chart displayed, click on the **Notes** tab, a list of data relevant to the chart is shown.

To view the specific data on each note (for example, information from a tidal streams station) click on the item in the list. A popup Chart Note window appears displaying details on the selected note.



Manual Update

The manual update facility enables the operator to add chart objects to the currently enabled chart.

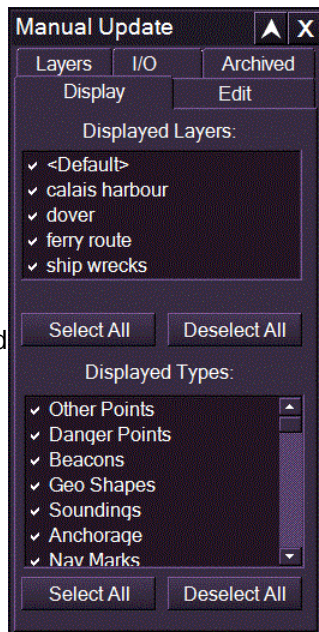
Added chart objects are displayed using the same symbology as ENC chart data but with a manual update symbol superimposed.

The Manual Update sub-menu includes the following tab folders:

- **Display** - enables the selection of chart update types and layers to be displayed.
- **Edit** - enables you to Create a Chart Update and Modify a Chart Update.
- **Layers** - enables the management of layers used for grouping manual chart updates.
- **I/O** (import/export) - enables importing or exporting of chart updates.
- **Archived** - enables updates that have been deleted in the past three months to be restored.

Multi-node Support

On a multi-node system manual chart updates are saved and retrieved from a database and may be distributed and available among all system nodes.



Manual Update Functions

Layers

The Layers tab enables you to create, edit, and delete layers. Layers provide a way to group sets of related manual chart updates, see Create Chart Update. Groupings may be made based on different criteria such as geographic region, time period, navigational mode, or danger classification. The display of chart updates within layers can be controlled from the Display folder, see Displayed Chart Updates.

Chart updates can also be imported or exported based on their layer grouping, see Importing or Exporting Chart Updates.

To create, rename or delete a chart layer do the following:

To create a new layer:

1. Click in the **Layer Name:** field, the screen keypad appears.
2. Using the keypad enter a name for the layer and click the **Add New Layer** button. The layer name appears in the Layers list. If more than one layer is created the field lists the layers alpha-numerically.
3. To enter a description of the layer click in the **Layer Description** field and enter a description using the screen keypad.

To delete a layer:

1. Select the layer from the list and click the **Delete Selected Layer** button, a delete confirmation window appears.
2. To confirm layer deletion click the **Yes** button, or to cancel the deletion click the **No** button. The layer is removed from the list when deleted.

To rename a layer:

1. Select the layer from the list enter the new name in the Layer Name: field as described above, and click the **Rename Selected Layer** button, a rename confirmation window appears.
2. To confirm the layer rename click the **Yes** button, or to cancel click the **No** button. The selected layer is renamed in the list.

Edit

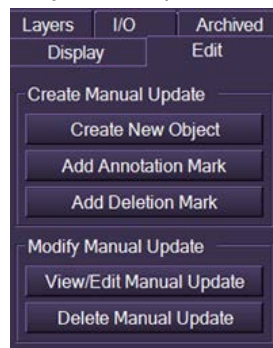
The Edit tab folder is : Create Manual Update and Modify Chart Update.

The Create Manual Update area includes the following links:

- Create New object
- Add Annotation Mark
- Add Deletion Mark

The Modify Manual Update area includes the following links:

- View/Edit Manual Update
- Delete Manual Update

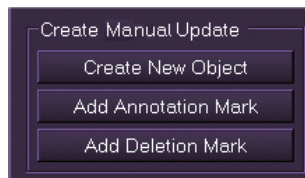


Create and Modify Manual Updates

Create Manual Update

The Create Manual Update area of the Edit tab folder enables you to do the following:

- Create New Object - creates a new chart object on an existing chart
- Add Annotation Mark - adds an annotation mark to an ENC chart object
- Add Deletion Mark - adds a deletion mark to an ENC chart object.

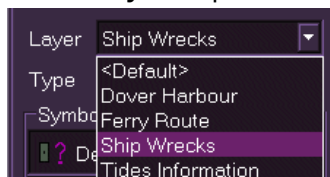


Create New Object

All chart objects are created from Create New Object. When the button is clicked a Manual Update Creation function appears.

To create a new chart object onto an existing chart do the following:

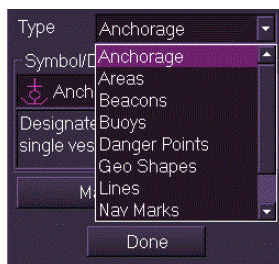
1. Click on the **Create New Object** button. The following screen allows you to specify details about the object to be created.
2. To associate the update to a layer click on the **Layer** drop down arrow and select from the list. If no chart layers have been created the update will associate to the default layer.



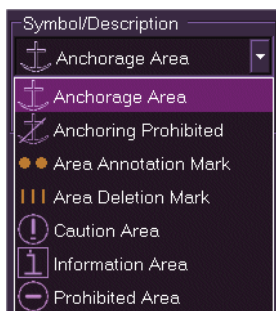
- To select the object type, click on the **Type** drop down arrow and select from the list.

The following object types are assigned:

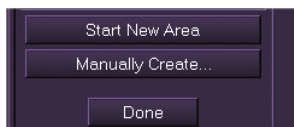
- Anchorage
- Areas
- Beacons
- Buoys
- Danger Points
- Geo Shapes
- Lines
- Nav Marks
- Other Points
- Soundings



- With the object type selected click on the **Symbol/Description** drop down list and select the object symbol. The field directly underneath the Symbol/Description drop down list includes a brief description of the selected symbol.



- Move the cursor into the chart display, the screen cursor displays **MO EDIT**.
- Click in the area where you want the object positioned. The object appears with a white highlighting. Objects with point geometry are highlighted with a white box, line or area objects are highlighted with small white circles at their individual points. When the object is created, more editable fields will become available in the window such as Position and Notes.
- To change the object's parameters click in the respective fields.
- To create the same object, or to add points to a line or area object, move the cursor to another area of the screen and left click. Each left click results in a new object of the selected type being created, or points added to the line or area.
- To create a new object with a manually specified position, click on the **Manually Create...** button. The screen prompts for a Latitude/Longitude position.



 The **Manually Create...** button can also be used to manually specify the position of additional points for a line or area objects.

10. Click in the LAT/LON fields, enter a position using the screen keypad, and click the **OK** button. A symbol is created in the position specified.
11. To exit Create New Object click the **Done** button, the objects created are fixed in position and the view returns to the Manual Update menu.

When an object has been created, the window shows the object's LAT/LON position and includes the option to associate the object with the current chart by ticking the **Associate with Chart** check box.

When creating new objects for, Soundings and Danger Points (Underwater Hazard), in addition to the LAT/LON position, a Depth box will also appear to enter depth information.

The **Notes and Labels** tab enables you to enter notes on an object. If applicable to a particular object, other editable files such as **Rotation**, **Time Label**, and **Display Label** will be available in this tab. Enter or edit values using the screen keypad.

The following sections give specific information on the creation of the listed chart types:

- Creating Geo Shapes
- Creating Anchorage, Beacons, Buoys and Danger Points
- Creating Areas and Lines
- Creating Other Point
- Creating Soundings
- Creating Date Dependent Objects

Creating Anchorage, Beacons, Buoys and Danger Points

The creation of anchorage, beacons, buoys and danger point symbols is the same procedure.



To create anchorage, beacons, buoys and danger points do the following:

1. Select the chart type (Anchorage, Beacons, Buoys or Danger Points) from the **Type** drop down list.
2. With the chart type selected click on the **Symbol/Description** drop down list and select the object symbol. The field directly underneath the Symbol/Description list includes a brief description of the selected symbol.
3. Move the cursor into the display, the screen cursor displays **MO EDIT**.
4. Click in the area of the display where you want the symbol positioned. The symbol appears with a bold white box around it and the following fields appear for the created object: **Position, Rotation** (if applicable) and **Notes**.
5. When creating a buoy or a beacon, an Include Light check box is included in the Settings tab. Tick this box if the mariner object includes a light,
6. To change the object's position, rotation or to add notes click in the respective fields.
7. To create the same symbol in a different position move the cursor to another area of the screen and left click. Each left click in the video circle results in a new symbol of the selected type being created.
8. To change the location of the object click in the LAT/LON fields, a drop down location keypad appears from where you can select the object position in a number of ways described below:
 - a. Query - Select an existing mariner object on the display for the object position.
 - b. Offset - Select a range and bearing value from the current cursor position for the object position.
 - c. From Chart - Move the cursor to the location on the display and click at the desired position.
 - d. Ownship - Select to position the object at the current location of ownship.

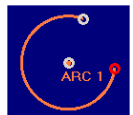
9. To create a date dependency for the object see 'Creating Date Dependent Objects'.
10. To exit the Create Chart Objects mode click the **Done** button, the objects created are fixed in position and the view returns to the Edit folder.

Creating Geo Shapes

Geo shapes include a number of geometric objects such as arcs, circles, lines, squares etc. that may be created.

To create a geo shape and specify its parameters, do the following:

1. With **Geo Shapes** selected in the **Type** drop down list, select the type of geo shape from the **Symbol/Description** drop down list.
2. Click the **Manually Create** button, a window prompts to specify a L/L position for the chart object.
3. Click in the LAT/LON fields and enter a position as previously described.
4. When the object position is defined the object appears on the display and the Settings tab displays the shape's L/L position and default parameters. If the shape is a line or polygon click at the first point position, click in the video circle to generate other line or polygon points.
5. To move the shape to another position left click in the LAT/LON position fields and edit the co-ordinates using the screen keypad.
6. To change the shape details (Rotation, Range, Start/End angle, Radius, Segment type etc.) enter data in the Settings tab.
7. If required, enter notes on the shape in the **Notes and Labels** tab. If a name is entered in the **Display Label** field, the name will be displayed underneath the origin point of the shape.
8. To create a date dependency for the object see 'Creating Date Dependent Objects'.
9. To exit the Create Chart Objects mode click the **Done** button, the objects created are fixed in position and the view returns to the Edit folder.



Creating Lines and Areas

In the creation of line and area objects you must specify the multiple geographic positions that form the line or area.

To create a line or area do the following:

1. From the Type drop down arrow select either **Line** or **Area**.
2. Click on the Symbol/Description drop down list and select the symbol you want to create.
3. Move the cursor into the display and click in the area of the where you want the first point of the line or area positioned. The first point is created as a small red circle and its LAT/LON position is shown, you can edit the position by changing the LAT/LON values.
4. To enter further points left click in the display. The points previously created appear as white circles and the last created point appears as a red circle. The system automatically connects each point with direct lines, and areas created are automatically shaded.

 *Lines require two points or more and areas require three or more points to be correctly specified.*

5. To save the current line object and start a new line or area click on the **Start New Line/Area** button. A new line or area can now be created.
6. To append a new point to a line or area click on the **Manually Create** button. The screen prompts for a LAT/LON position.
7. Click in the LAT/LON fields, enter a position using the screen keypad, and click the **OK** button. The symbol is created in the position specified.
8. The line segment type defaults to Rhumb Line. To change the line type to Great Circle click on the drop down arrow and select from the list.
9. To create a date dependency for the object see 'Creating Date Dependent Objects'.
10. To exit the Create Chart Objects mode click the **Done** button.

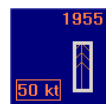
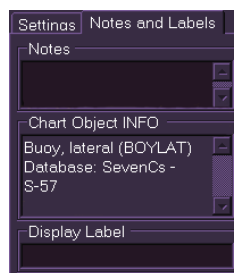
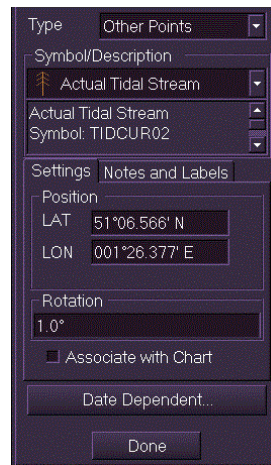


Creating Other Points

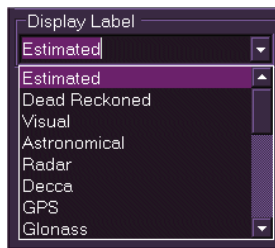
The creation of 'Other Points' requires a slightly different procedure to other types of chart objects.

To create the Other Points symbols do the following:

1. Select Other Points from the **Type** drop down list.
2. Click on the **Symbol/Description** drop down list and select the required object symbol. The field directly underneath the Symbol/Description list includes a brief description of the selected symbol.
3. Move the cursor into the display, the screen cursor displays **mo EDIT**.
4. Click in the area of the display where you want the symbol positioned. The symbol appears with a bold white box around it and a time label, shown as a four digit number.
5. The Tidal Stream symbols may be rotated. To rotate the symbol click in the **Rotation** field and move the trackball left or right to the required angle is shown. Only the symbol rotates; the time label and any display label remain horizontal.
6. The Notes and Labels tab may contain additional information relevant to the type of object being created. This may include individual notes or **Object INFO**, or **Time Label** and **Display Label** INFO.
7. The time label denotes the time, in hours and minutes, when the symbol was created. To change the time label click in the **Hour** and **Min** fields and move the trackball left or right to change the values.
8. The display label for tidal streams denotes the approximate speed of the tide in kilometres, with a range from 0 to 498 kn. To enter a value click in the **Display Label** field and move the trackball left or right until the required speed is shown. The display label appears to the lower left of the symbol.



9. The display label for a **Position Fix** is selected from a drop down list. When selected the label is shown with abbreviated letters only e.g. **EP** for Estimated position.
10. To create a date dependency for the object see 'Creating Date Dependent Objects'.
11. To exit the Create Chart Objects mode click the **Done** button, the symbols created are fixed in position and the view returns to the Edit folder.

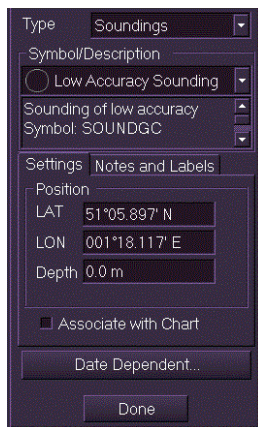


Creating Soundings

In the creation of sounding objects you must specify the depth of the sounding object.

To create the Sounding symbols do the following:

1. Select Other Points from the **Type** drop down list.
2. Click on the **Symbol/Description** drop down list and select the required sounding symbol. The field directly underneath the Symbol/Description list includes a brief description of the selected symbol.
3. Create and position the Sounding symbol as described previously for other mapping symbols.
4. To specify a depth for the sounding symbol enter a value in the **Depth** field. The value entered will be shown on the Sounding symbol.
5. To create a date dependency for the object see 'Creating Date Dependent Objects'.
6. To exit the Create Chart Objects mode click the Done button, the symbols created are fixed in position and the view returns to the Edit folder.

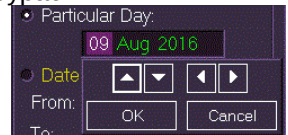
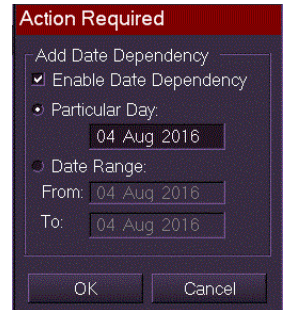


Creating Date Dependent Objects

A chart object may have a specific date or a specific date range defined for the display of the object. If the date dependency is set for a future time period the object will not be displayed on the screen until the particular day or date has been reached.

To define date dependence for a chart object do the following:

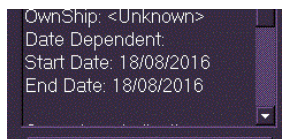
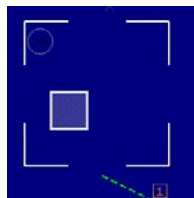
1. With the Create Chart Object window open, click on the **Date Dependent** button. An 'Action Required' window appears.
2. To enable the function tick the **Enable Date Dependency** check box. The **Particular Day** and **Date Range** options become available.
3. The Particular Day field defaults to the current day. To change the date dependent day:
 - a. Left click in the field and highlight the area you want to change (day, month or year) using the Forward and Back arrows on the drop down keypad.
 - b. With the required value highlighted use the Up/Down arrows to adjust the period forward or back.
4. To change the date range:
 - a. Select the Date Range button and left click in the From or To fields.
 - b. Change the date range using the Up/Down arrows as described previously.
5. Click the **OK** button. The drop down keypad is removed from the screen.
6. Note that date dependencies assigned to the chart object will not apply until the **Done** button at the bottom of the window is clicked. If a future date has been assigned the object is hidden on the display.



To locate a date dependent object do the following:

When a future date is assigned to a chart object the object symbol is removed from the display until the assigned date becomes active. The date dependent object may be located on the display as described below.

1. Either right click in the chart area where the date dependent object was created and select Pick Report, or;
2. From the Pick Report window click the **Pick On** button and move the cursor into the chart display, a ? is added to the cursor. Left click in the area where the date dependent object was created.
3. When a specific area of the chart display is queried a broken outline box is shown, the size of the box can be changed from the Report Options window. Any chart object in the query area, including hidden date dependent objects, will be listed in the Results field of Pick Report.
4. Select the date dependent object from the Chart Report Results field.
5. A date dependent object will be shown on screen as a white outline box and a lighter shade inside. The description will give details of the date dependent Start and End dates.



All date dependent objects may also be located by selecting **Highlight Objects** in the Chart Settings Symbology window and selecting the particular day or date range for that object from the window.

When Highlight Objects has been enabled all date dependent objects are displayed with an orange highlight marker. For details refer to Chart Settings, Symbology.

Add Annotation Mark

The Add Annotation Mark feature allows you to highlight an object (an area, line or point) on the chart display and add a note to the annotated chart object.

To annotate a chart object do the following:

1. Click on the **Add Annotation Mark** button, the following screen prompts to select the chart object to annotate.
2. Move the cursor onto the chart display and click the ENC chart object you want to annotate, a white dashed outline box is drawn on the chart area. The size of the box is dependent on the query area size as selected in the Report Options tab. 
3. The **Results** tab of the Add Annotation Mark window lists all ENC chart objects in the defined area. To page through the objects click the Up and Down arrows. 
4. Select the chart object to be annotated from the **Results** list.
5. If the object is a point (for example, a buoy or navigation marker) or an area the object or area is highlighted with a lighter, transparent background and with a white outline. If the object is a line (e.g. submarine cable) the line is displayed in white. 
6. With the required object selected click the **OK** button. The method of highlighting is dependent on the object selected:
 - a. If the object is an area the background colour changes to a small dotted background with a dotted outline.
 - b. If the object is a point a white box appears around the chart object with an **i** symbol next to the object. 
 - c. If the object is a line the white line changes to an orange dotted line annotation mark. 

The Chart Update View/Edit window confirms the annotated symbol status. The object data shown is the same as shown previously in the Create New Object section.

To exit Add Annotation Mark click the **Done** button. The white box around the object is removed but the **i** symbol remains, and the view returns to the Edit Chart Update menu.

Add Deletion Mark

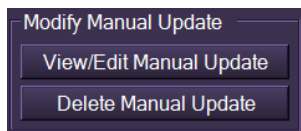
The Add Deletion Mark facility operates in the same way as Add Annotation Mark. The difference being that the deletion mark is symbolized with a diagonal orange line through the object.



Modify Chart Update

The Modify Manual Update area of the Edit tab folder enables you to do the following:

- View or Edit a chart update
- Delete a chart update



Viewing or Editing a Chart Update

To view or edit a chart update, do the following:

1. Click on the **View/Edit Chart Update** button. The window prompts to left click on the object to view/edit.
2. Navigate to the chart object, as the cursor moves over the object it changes to a bidirectional arrow indicator.
3. Click on the chart object to be viewed or edited. The next window lists the editable fields for the selected object. The fields available are dependent on the type of object selected. .

To edit the object's attributes:

1. To associate the chart update with the current chart, tick the **Associate with Chart** check box.
2. To move the object to another layer click on the **Layer** drop down arrow and select from the list of layers.
3. To change the group type click on the **Type** drop down arrow and select from the following:
 - Anchorage
 - Areas
 - Beacons
 - Buoys
 - Danger Points
 - Geo Shapes
 - Lines
 - NAV Marks
 - Other points
 - Soundings

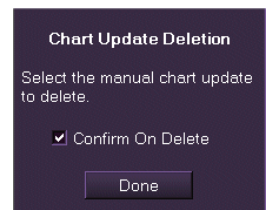
As the type is changed its graphic symbol also changes in the symbol/description field and on the display.

4. To change the symbol click on the drop down arrow and select from the list. The field directly underneath the Symbol/Description field includes a brief description of the selected symbol.
5. To change the object's position either:
 - a. Click in the LAT/LON fields and enter a position using the screen keypad;Or:
 - b. Move the cursor over the object, hold down the left key and use the trackball to drag the object to the required position.
When editing a line or area object, select the specific point to be edited by moving the cursor over the point and left clicking. The currently selected point is distinguished by a red highlight circle.
6. If required, enter notes in the **Notes and Labels** tab using the screen keypad.
7. If applicable, other editable fields such as **Rotation**, **Time Label**, and **Display Label** will be available on this tab. Edit these values by clicking in the desired field.
8. With all object editing complete click on the **Done** button. The chart object is updated.

Deleting a Chart Update

To delete a chart update, do the following:

1. Click on the **Delete Chart Update** button. The folder prompts to select the object to delete with a **Confirm on Delete** check box. To receive system prompts to confirm deletion before any object is deleted tick the check box. If the box is unticked then objects are deleted without confirmation.
2. The cursor displays DEL when moved into the chart display. Move the cursor over the object to be deleted, the cursor lines change from horizontal and vertical cross hairs to diagonal cross hairs, indicating a delete action can now be performed.
3. Click on the object to delete it. If the **Confirm On Delete** check box is ticked then the screen will prompt you to confirm the deletion. If the Confirm check box is unticked the object is immediately deleted from the screen.
4. Click the **Done** button to return to the Manual Update Edit sub menu.



Display Chart Updates

The Display tab enables you to select the layers and object types to be displayed on the currently enabled chart. Each layer and type currently displayed will have their check box ticked.

The Displayed Layers area lists the default layer and all the operator defined layers created in Layers.



Objects that were not associated with a created layer are automatically associated with the Default layer.

The Displayed Types lists all the object types that can be selected from the Type drop down list in the Chart Update Creation window, see Create Chart Update.

Manual Updates will be displayed when the corresponding check boxes are ticked, and in some cases, when appropriate settings on the Chart Settings menu are ticked. To suppress the display of a manual chart update for a particular layer or type untick the respective check box.

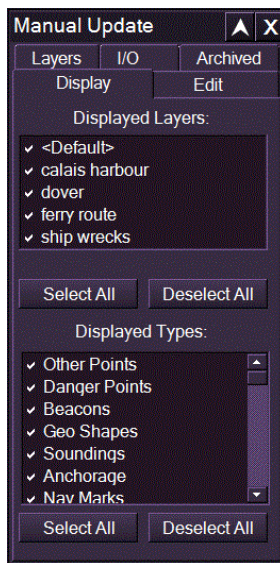
To select all chart layers and types for display click the **Select All** buttons, to deselect all for display click the **Deselect All** buttons.

For further detailed information regarding functionality, refer to Create Chart Update section.

Importing or Exporting Chart Updates

The I/O (Import/Export) tab folder enables you to import or export manual chart updates to and from VisionMaster workstations.

Chart updates not currently on a workstation can be imported from an external drive, (this is usually a USB memory stick). Manual chart updates that have been produced on a workstation can be exported to other workstations via the external drive.



Importing Chart Updates

To import chart updates do the following:

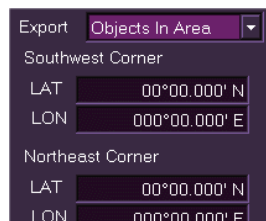
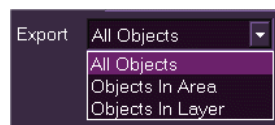
1. Insert the external device containing the chart updates into the PC, (this is usually a USB memory stick). If no external device has been inserted the window prompts to insert removable media.
2. Navigate to the directory where the chart updates reside. The field below the directory tree will show any valid object files in the selected folder.
3. Click on the file to import. The file identity appears in the **Filename** field.
4. Click the **Import** button to import the selected file's contents to your Workstation. If successful a temporary prompt appears confirming the import.
The selected chart updates are imported into the Manual Update menu. If the chart updates are included on a layer, that layer is imported with the objects and the layer defaults to selected in the Display folder.
5. When complete remove the external device from the PC.



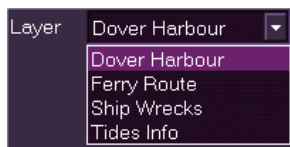
Exporting Chart Updates

To export chart updates do the following:

1. Select the external drive where the update is to be exported to.
2. Select the export option required by clicking on the drop arrow in the Export field, the export options available are:
 - **All Objects** - all manually created chart update objects on your workstation.
 - **Objects in Area** - manually created chart update objects within a specified geographic area.
 - **Objects in Layer** - all manually created chart update objects on a specific layer.
3. If **Objects in Area** is selected, the LAT/LON fields for Southwest corner and Northeast corner appear with default values at zero. Define the geographic area to export from by clicking in the LAT/LON position fields and entering values from the screen keypad.



4. If **Objects in Layer** is selected, a layer field with a drop down list appears, select the layer to be exported from the list.
5. When the required export options have been selected name the file to be exported in the Filename field and click the **Export** button. If successful a temporary prompt appears confirming the export.
6. When complete remove the external device from the PC.

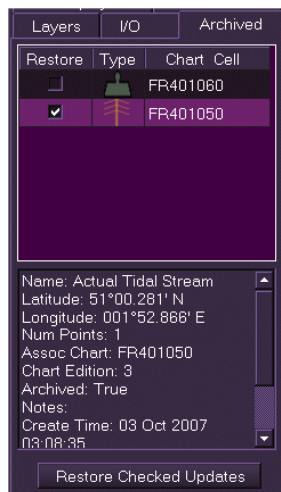


Archived

The Archived tab displays all manually created chart objects that have been deleted within the past three months.

The Archived list shows the chart object and its associated chart. To view a detailed description of each object, highlight the object line.

To restore objects to the chart tick the object's Restore check box and then click the **Restore Checked Updates** button. The selected objects are restored to their original position on the chart.



Report Query Features

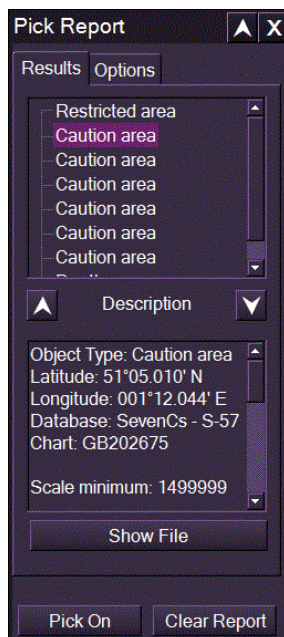
Report Results

When Pick Report is accessed by right clicking on the chart display the subsequent Results tab folder lists all ENC objects found in the report area. The size of the area can be small, medium or large, see Pick Report Options.

In addition to the ENC objects list the Results tab includes a description panel of the selected object, navigation controls and a Show File option for the selected object.

Description Panel

The Description area contains detailed information for the currently selected object. This includes a description of the type of chart object selected, its chart position, its Dataset reference number (the chart displayed at the report position), minimum scale requirement and any date dependences that have been applied to the object

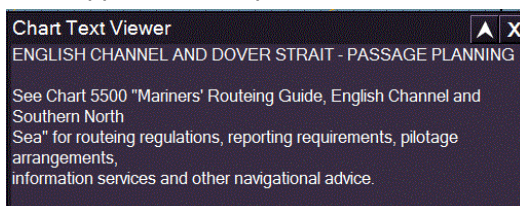


The information changes as other objects are selected from the Results list

 *Attribute values and definitions connected with chart objects are provided in the Results tab folder in short form only for ease of viewing. Full and comprehensive definitions are available for viewing on a separate CD, which was provided in the document pack that accompanied this product. This contains a copy of the applicable Standard S-57 (Appendix A, Chapter 2).*

Show File

If the selected chart object has an embedded text file or picture file the Show File button becomes enabled. To view the file click on Show File, the text file or picture file appears in a separate window.



Selecting an Object

To select a chart object, do the following:

1. To navigate up and down the objects list click on the up/down navigation arrows. The object selected in the Results folder is highlighted on the chart display with a graphic, dependant on the group type selected and the current day/night setting. White lines and outlines are shown when the node is in any day/night mode other than Day Bright, if the node is in Day/Bright the lines and outlines are displayed in black
 - a. For Points and Clusters a solid line white box with a lighter shade background is drawn around the selected object.
 - b. Areas are shown with a lighter shade background and a white outline.
 - c. Lines are displayed in a solid white line.
 2. At the bottom of the menu, two controls are provided to control the display of report results and highlighting. The Pick Off button toggles between On and Off, when activated the screen cursor changes to a ? below the cross, the next left click enables you to report objects directly on the screen.
-  After approximately 15 seconds of inactivity, the **Pick On** cursor times out and reverts to Pick Off.
3. To clear all report results from the Results window and also clear any highlighting from the chart display click the Clear Report button. Report results and objects highlighted will be cleared automatically if the scale ratio is changed, or another function is selected.



AIO Data

When the AIO checkbox is ticked in Chart Settings Symbology, AIO objects that are associated with one or more AVCS ENC chart in the current display will be rendered when accessed from Pick Report. Chart filtering modes will not affect the display of AIO objects.

AIO data is provided as temporary notices, preliminary notices or No Information objects. Preliminary Notice and Temporary Notice AIO area objects are rendered with a solid red boundary line and red dotted pattern fill. No Information AIO area objects are rendered with a solid grey boundary line and a grey dotted pattern fill.

Details of AIO data may be displayed in either a secondary window, either as text or pictorial representation.

Displayed AIO data is listed in the Update Review tab of Chart Legend, providing detail about the AIO objects that were added and removed during each weekly update.

Report Options

The Pick Report Options control allows you to set the following report options:

- Filter - search by geometry type (points, lines, areas and/or 3D and cluster points)
- Area Size - search area as a factor of scale (small, medium, large)

To include the basic geometry types in the report tick their check box. At least one check box must be ticked in order to receive report results.

The Query Area Size control allows you to select from three different sizes of query region, all three of which are based on the current selected scale ratio of the chart display.

The default values for query area size are as follows:

- Small = 10% of the scale ratio
- Medium = 20% of the scale ratio
- Large = 30% of the scale ratio

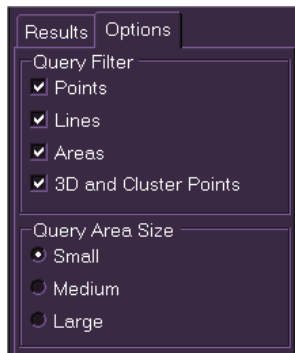


Chart Dangers

A safety checking feature periodically searches the chart database and mariner objects database for objects that could endanger the safety of own ship. For a description of this feature, see *Safety Checking*.

Safety Checking must be configured as an optional feature in system configuration before the operator can view chart dangers, see *Chapter 1 'Configuration'* in Volume 2 of the VMFT Ship's Manual.

When safety checking detects a dangerous object, a red flashing alarm appears in the Alert Status Indicator and the Dangers icon to the right of the Alert Status Indicator displays a red background with a brief description. For a chart danger, the Warnings / Cautions Danger icon will appear yellow, or if no alerts are present it will be grey.

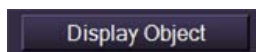
The status indicator will list the most recent chart danger alert generated by the system. Warnings will only be shown when all prior Alarm status alerts have been acknowledged. Cautions will not be shown.



Chart Dangers includes two tab folders, Danger List and Settings. The Danger List enables individual dangers to be selected and displayed and information on the object viewed. Settings enable various display settings, alert priorities and look ahead controls to be changed.

Chart Dangers divide dangerous objects into **Safety Contour Crossing**, **Navigational Hazards** and **Areas with Special Conditions** lists. Each list will be populated with chart dangers only if the object type has been selected in Settings. The lists may include alarms, displayed with a red background, which are objects or areas where the depth may be a risk to safe navigation, and are usually generated when own ship is in, or approaching, a port. Or cautions, which are usually generated to denote vessel traffic or underwater objects and are displayed with a yellow background. The objects are listed in order of age, with the most recently to least recently discovered.

At the bottom of the Chart Dangers window is a **Display Object** button. This button enables rendering of the selected object by temporarily enabling its viewing group if this is not already enabled, provided that the object is in a chart cell that is on display and from the database that is currently in use.

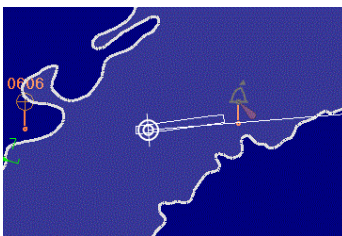


Danger List

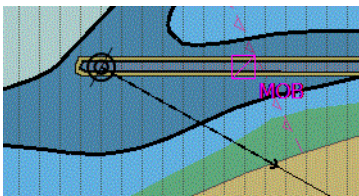
Objects in the Danger list can be viewed in a number of ways, either:

1. Click on the individual items within the list;
2. Navigate up and down the list using the up/down arrows;
3. To mark all listed objects as viewed click on the **Mark All As Viewed** button.

As each item is selected its background is displayed in a lighter shade and a white line defines its outline. A detailed description is given below the the list and the danger object is highlighted in the chart display area.



 *If your node is currently in Day Bright the background of the selected object is displayed in a darker shade and its outline is shown in black.*



When all dangerous objects have been acknowledged in the Dangers window the red background is removed from the Dangers icon, although the objects will remain listed. The system will remove objects from the Dangers list if it has been 120 seconds or more since own ship's safety region and a particular dangerous object last overlapped.

Dangers Information

The chart dangers information area at the bottom of the window gives detailed information on each dangerous object selected. This information will include the following:

- Object Type - e.g. Depth Area, Caution Area
- Latitude/Longitude position of object
- Database - the chart database, e.g. SevenCs S-57.
- Chart - the reference number of the nearest chart to the dangerous object.

Depth area information will additionally include the following data:

- Depth Range Value 1
- Depth Range Value 2

The figure shown with Value 1: usually represents the minimum depth in metres of the Depth Area. This value may be 0 or a negative value if the depth area represents height above water (e.g., land mass or a harbour wall).

The figure shown with Value 2: usually represents the maximum depth in metres of the Depth Area.

Other detailed information on dangerous objects may include (depending on the object) textual description, minimum scale, category of area etc.

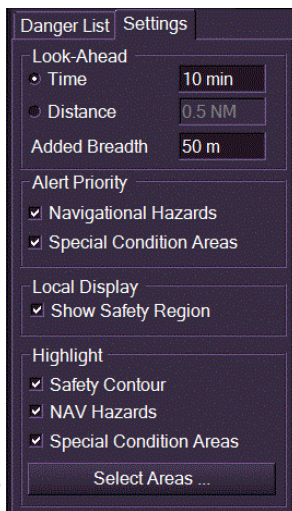
Danger Settings

Danger settings can be enabled or disabled, and default values adjusted. The Settings tab folder includes the following areas (described below):

- Look-Ahead (Time/Distance, added breadth)
- Alert Priority
- Local Display Safety Region
- Highlight (these settings apply to ECDIS watch mode only)

Look Ahead

The Look-Ahead range controls how far in advance an alert is given before a specified range limit is reached. This range may be defined either as time (minutes), or distance (nautical miles). The Look-Ahead range controls the safety region, which is indicated as a white outline rectangular box around own ship. The



Look-Ahead rectangle follows the [COG](#) from own ship. The length of the safety region represents the time, or distance, own ship will travel, based on current [SOG](#).

On a multi- node system the look-ahead range is distributed and persisted across all nodes

WARNING!

PROFILES THAT ADJUST LOOK-AHEAD TIME, BUT NOT LOOK AHEAD DISTANCE WILL HAVE NO IMMEDIATE EFFECT ON THE SIZE OF THE SAFETY CHECKING REGION IF LOOK-AHEAD DISTANCE IS CURRENTLY SELECTED. PROFILES CREATED IN VERSIONS BEFORE THE LOOK-AHEAD DISTANCE PARAMETER WAS AVAILABLE MAY BE EDITED SO THAT THE LOOK-AHEAD DISTANCE PARAMETER IS TAKEN INTO ACCOUNT.

To change Look Ahead values do the following:

1. To change the look-ahead time or distance click on the respective radio button, the active field toggles depending on the selection made. To change the time or distance, click in the field and move the trackball right to increase the value, up to 60 minutes or 10 NM, or decrease to a minimum of 0 minutes or 0.0NM, see below. As the look-ahead value is increased or decreased the safety region lengthens or shortens and the area the system checks for dangers is adjusted.

In some circumstances it may be desirable for the operator to select a zero value for Look-Ahead time or distance, for example, when ownship is in a crowded harbour area. If a zero value is selected a 'Minimal Safety Region' caution is generated. The caution is removed from the Alerts list if the time is increased to at least 1 minute, or the distance to at least 0.3 NM.

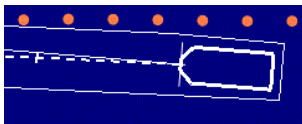
 *Safety region alerts in the Dangers window are suppressed when zero Look-Ahead time/distance is selected.*

 *As the safety checking is done periodically there is a delay of a few minutes for dangers in the dangers list to time out after the look ahead range has been adjusted. This prevents the same dangers from being added or removed from the list, and re-alarming due to fluctuations in the ship's course.*

Added Breadth enables a safety region width to be added to either side of own ship's beam. The value defines the safety breadth from ship's beam in metres that the system checks for dangerous objects (for example,

underwater obstructions) that are shallower than the Shallow Contour specified in Chart Depths/Heights.

If no added breadth is defined (i.e. the value is set at **0**) then safety checking is to the beam of the ship. Unlike Look Ahead range no caution is generated when added breadth is at **0**.



2. To change the value click in the **Added Breadth** field and move the trackball left or right. As the safety breadth is changed the width of the safety region either side of the ship's beam changes accordingly.

Alert Priority

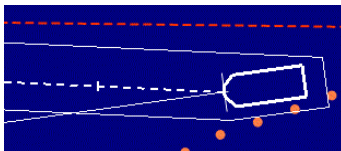
The Alert Priority area includes the following settings:

- Navigational Hazards
- Special Condition Areas

When either of these check boxes are ticked any current **Navigational Hazards** or **Special Condition Areas** safety region Cautions in the Danger List, will change to Warning status. These alerts will then show in the Alert Status Indicator (provided that here are no pre-existing unacknowledged Alarms).

Local Display

Own ship safety region is switched on/off by ticking the **Show Safety Region** check box. The ownship safety region boundary box is displayed in white. The length and width of the safety region is governed by the current Look Ahead values. If these are changed, the length and width of the safety region adjusts accordingly. As own ship moves across the screen, the line is redrawn every 30 seconds.



When there is a difference between the COG and the Heading the safety region will display a dog legged rectangle, this being the calculated safety region taking into account the different COG and HDG values. If the COG and HDG bearings are the same the safety region rectangle is drawn as straight lines.

Highlight

The Highlight area includes the following settings that when selected will display safety features on the chart.

- Safety Contour
- NAV Hazards
- Special Condition Areas

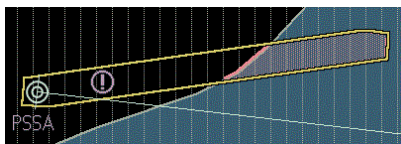
An ownship safety contour can be switched on or off by ticking the **Safety Contour** check box. When enabled the screen shows shallow contour areas highlighted in a red transparent background with an additional red line around the safety outline.

Navigation hazards highlight can be switched on or off by ticking the **NAV Hazards** checkbox, this will show a second line around the ownship's safety region boundary. The line will be displayed in yellow for navigation hazard cautions or red for dangers. If no navigation hazards are within own ship safety region the NAV Hazards line will show as white.

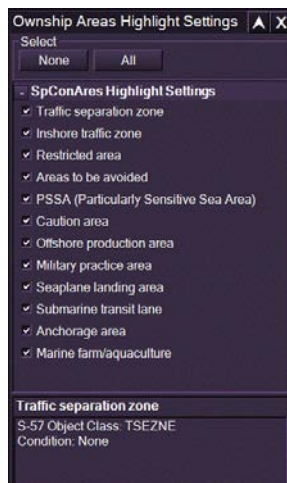


Special Condition Areas

When the **Special Condition Areas** check box is ticked a yellow outline is drawn around the borders of ownship's safety region. The yellow outline appears irrespective of whether **Show Safety Region** is enabled.



To select specific Special Condition Areas click the **Select Areas..** button, this opens a separate Ownship Areas Highlight Settings window from where areas can be selected from a list. Each area, when highlighted, includes a brief description at the bottom of the window.



To select all areas click the **All** button, or to deselect all click the **None** button. The default is All selected.

Areas that have been selected from this window will result in a Special Condition Areas chart danger being generated if ownship safety region crosses within the defined areas.

Chart 1

The Chart 1 facility provides access to the SevenCs and C-Map Chart 1 catalog and the SENC color diagram.

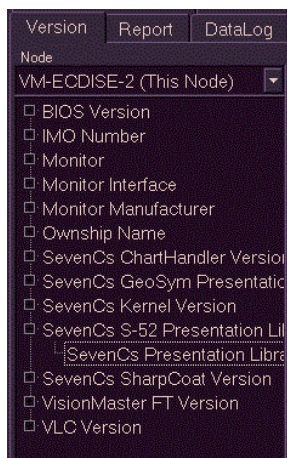
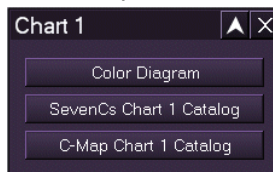
Chart 1 Catalog

This feature provides a Chart 1 symbol catalog for SevenCs and C-Map Presentation Libraries.

The catalog acts as a legend so the mariner can look up specific information, such as names and descriptions, about symbols on the chart.

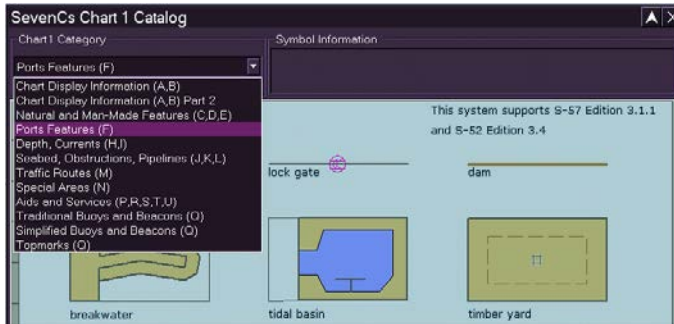
Information on C-Map or SevenCs S-52 Presentation Library editions can be found in the Version tab folder of System Diagnostics. Information on the Diagnostics Version tab folder is detailed in Chapter 2 `Diagnostics, Commissioning & Service Mode in Volume 2 of the VMFT Ship's Manual (65900011V2).

In order to improve usability of the ENC the presentation of the "SevenCs Chart 1 Catalog" has some minor deviations from the S-52 Presentation Library edition 4.0 which have been fully type approved as an acceptable alternative ENC presentation.



To access the Chart 1 catalog, do the following:

1. Click on either the **SevenCs Chart 1 Catalog** button or **C-Map Chart 1 Catalog** button. The Chart 1 Catalog appears as a moveable window, which can be resized to occupy as much of the screen as required.
2. The catalog is alphabetically divided into symbol categories. To access the categories click on the arrow to the right of the **Chart 1 Category** field and select from the drop down list.
3. To view information on a particular symbol click on the chart symbol. Information for that symbol appears in the **Symbol Information** field.



Color Diagram

The color diagram ensures that any adjustments made to the brightness and contrast settings on the VisionMaster monitor will enable the SENC data, such as coastlines, safety contour and other objects to be adequately displayed. To access, click on the **Color Diagram** button.

For a description and additional access to the color diagram, see Chart Symbols in Chapter 8, Brilliance.

Tides/Currents

The Tides and Currents is an optional feature that enables stations to be created that hold manually entered values for tide/sea current speed, direction, and time. Each station can store up to 500 tide/sea current entries.

Stations created and saved from any node are distributed to all nodes in the system.

To open the Tides and Currents feature click on **Tides/Currents** in the Charts menu. If no stations are currently active the window will show zero LAT/LON coordinates.

To create and save stations do the following:

1. Define a position for the station by clicking in the LAT/LON data field, the text becomes editable (green) and a drop down keypad appears.

To define the LAT/LON position:

- i. Manually enter a LAT/LON position by using the numbers and navigation buttons on the keypad and click **OK**.
- ii. To place the station at a specific geographic object select **Query**. Move the cursor to the display (a ? is added to the cursor) and left click, a Pick Report window appears with a list of objects in the immediate area. Select the object from the list, the station is repositioned over the chart object and a red circle filled with a red shaded background is drawn around the station.
- iii. Click **OK** on the Pick Report window to fix the station at the chart object position.
- iv. To place the waypoint at own ship's CCRP select **Ownship**.
- v. To place the waypoint at a selected location on the chart display select **From Chart**. Move the cursor to the display (a ? is added to the cursor) and left click at the required location, the station is repositioned to that location.
- vi. To specify a range or bearing for the station select **Offset**. An Offset window appears where you can set a range and bearing offset from the current position.

The screenshot shows the 'Tides/Currents' window with the following fields and buttons:

- Station Name: [Text Field]
- Buttons: Clear/New, Open, Save, Delete
- Lat: 00°00.000' N
- Lon: 000°00.000' E
- Goto: [Button]
- New Current Entry: [Section Header]
- Brg: 000.0°
- Speed: 0.0 kn
- Time: 08 Jun 2010 04:06
- Time Zone: UTC
- Add Entry: [Button]

The screenshot shows the keypad and buttons for defining the LAT/LON position:

- Lat: 00°00.000' N
- Lon: 000°00.000' E
- Goto: [Button]
- New Brg: 0
- Time: 08
- Time: 0
- Time: [Dropdown]
- Time: [OK] [Cancel]
- Query: [Button]
- Ownship: [Button]
- From Chart: [Button]
- Offset: [Button]

2. To centre the display on the selected LAT/LON location click the **Goto** button.

When a location has been entered the system draws an orange diamond symbol with a short line below the symbol and a dot at the end of the line.



3. To enter a bearing for the tide/sea current, click in the **BRG** field and move the trackball to the right until the required value is displayed. Left click to enter the bearing value.
4. To enter a speed for the tide/sea current, click in the **Speed** field and move the trackball to the right until the required value is displayed. Left click to enter the speed value.
5. The entry time defaults to the current data and time. To enter a different time click in the field, the data changes to green and an editing window appears directly below the time field. Enter a value using the editing arrows; click the **OK** button when the required time value is displayed.
6. With the required values entered in the New Current Entry area click the **Add Entry** button. The time, bearing and speed values for the tide/sea current are listed in the station's table.
7. Repeat the process to enter more tide/sea current values. Each entry is listed in the table.
8. To remove an entry, select from the list and click the **Remove Row** button, the entry is removed from the list.
9. To save the station data click the **Save** button. A 'Save Station' popup window appears prompting to name the station.
10. Enter a suitable name and click the **OK** button. The popup window is removed and the name appears in the Station Name field.
11. To remove a station from the chart click the **Clear/New** button.

Time	Brg	Spd
08 Jun 10 04:06	1.4°	16.1 kn
08 Jun 10 04:06	175.0°	8.5 kn

Station

Name station1

Clear/New

Open

Save

Delete

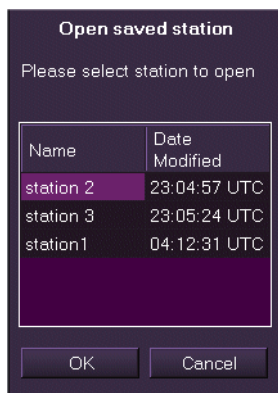
Lat 51°04.150' N

Goto

Lon 001°42.080' E

To open or delete a saved station do the following:

1. To open previously saved stations click the **Open** button. An 'Open saved station' popup window appears with the names of the saved stations and date of last modification.
2. Select the required station and click the **OK** button. The station is displayed on the chart and its data is shown in the Tides/Currents window.
3. To delete a station click the **Delete** button, select the station from the 'Delete Station' popup window and click the **OK** button. The station is removed from the system.



Appendix A Chart Datum Codes

The table below lists Chart Data with their identification codes.

Code	Description
ABI	Abidjan, Ivory Coast
ACC	Leigon Pillar (GCS No 121), Accra, Ghana
ADI	Adindan (30th Meridian), Sudan
AFG	Afgooye, Somalia
AIN	Ain el Abd 1970, Saudi Arabia
AMM	M36 Astro 1975 adjustment, Montserrat
ANT	DOS Astro A14 1977 adjustment, Antigua
ANU	A4 Astro 1956, Anguilla
ARF	ARC 1950, Africa
ARS	ARC 1960, Africa (1960 adjustment of ARC 1950 datum)
ASC	Ascension Island 1958
ASM	Astro 1958, Montserrat
ASQ	Astronomical Station 1952, Marcus Island
ASX	Astro Secor 1966, Tarawa and Gilbert Islands
ATB	Athens, Greece
ATF	Astro Beacon E 1945, IWO-JIMA, Bonin Islands
AUA	Australian Geodetic 1966
AUG	Australian Geodetic 1984
AUS	Australian National
BAT	Batavia (Djakarta), Java, Indonesia
BBE	Bathurst Base East End Datum, Gambia
BEQ	Bermuda 1943, Bermuda Islands
BER	Bermuda 1957, Bermuda Islands
BID	Bissau Base North West End Pillar, Portugese Guinea
BOO	Bogota Observatorio, Colombia
BUR	Bukit Rimpah, Bangka Island, Indonesia
CAC	Cape Canaveral, USA
CAI	Campo Inchauspe 1969, Argentina
CAJ	Castello Di Sao Jorge, Lisboa, Portugal (Bessel)

Code	Description
CAO	Canton Island Astro 1966
CAP	Cape Datum, South Africa
CAZ	Camp Area Astro 1961-62, Antarctica
CDF	Castania Delle Furie, Sicily
CGE	Carthage, Tunisia
CHI	Chatham Island Astro 1971, Chatham Island, New Zealand
CHU	Chua Astro, Paraguay
COA	Corrego Alegre, Brazil
CRA	Cruz Astro 1947, Guadalcanal, Solomon Islands
CZX	DOS 66 CZX6, Santa Cruz (DOS 1966-72)
DAK	Dakar, Senegal
DCL	DCS-3 Astro 1973 adjustment, St Lucia
DJA	Djakarta New, Indonesia
DOB	DOS Astro Gux1, Guadalcanal, Solomon Islands
DOM	M12 Astro 1983 adjustment, Dominica, Lesser Antilles
EAS	Easter Island 1967
EGT	Egypt 1907
EGY	Egypt 1930
ENW	Eniwetok-Wake 1960, Marshall Islands
EUR	European 1950
EUS	European 1979
FAH	Fahud, Oman (Also known as PD Oman)
FIN	Final 1958, Iran
FJD	Fiji 1986
FJI	Fiji 1956
FLO	Observatorio 1939 (Also known as Flores Astro 1939)
FOT	Fort Thomas 1955, St Kitts-Nevis, Lesser Antilles
FTO	Fort Thomas 1975 Adjustment, St Kitts-Nevis
GAA	Gan 1970, Addu Atoll
GCA	GCI Astro (IAGS 1959), Grand Cayman
GDA	German

Code	Description
GEN	Genoa, 1908, Italy
GEO	Geodetic Datum 1949, New Zealand
GIZ	DOS 1968, Gizo Island, New Georgia
GOE	Goenoeng Dempo, Sumatra, Indonesia
GRA	Graciosa Base SW 1948
GSE	Goenoeng Segara (P5) 1933, Kalimantan E
GTA	Grand Turk Astro 1943
GUA	Guam 1963
HEL	Helsinki, Kallio Church, Finland
HER	Hermannskogel, Austria
HIT	HITO XVIII Astro, Chile (Also known as Provisional South Chilean 1963)
HIU	HITO XXV
HJO	Hjorsey 1955, Iceland
HKD	Hong Kong 1963
HKE	Hong Kong 1980
HTN	Hu-Tzu-Shan, Taiwan
IGB	IGN (North Block, Bellevue)
IGN	IGN72 Nouvelle Calédonie
IND	Indian (Survey of India)
INF	Indian 1954
INH	Indian 1975, Thailand
IRL	Ireland 1965
IST	ISTS 073 Astro 1969, Diego Garcia
ITA	Itarare N Base, Itajuba-Santa, Catarina
JEU	British Honduras 1922
JOH	Johnstone Island 1961
KAN	Kandawala 1933, Lanka
KEA	Revised Kertau
KEG	Kerguelen Island 1949
KUS	Kusaie Astro Station 3, 1951, Kusaie Island, Caroline Islands
LAP	Le Pouce, Mauritius

Code	Description
LAT	Latvia
LCA	LC5 Astro 1961, Little Cayman and Cayman Brac
LIB	Liberia 1964 (Roberts Field Astro)
LIS	Lisboa (Castelo Di Sao Jorge), Portugal (International spheroid)
LUZ	Luzon (1911), Philippines
MAS	Massoua (Eritrea), Ethiopia
MDD	Madrid 1853, Spain
MER	Merchich, Morocco
MET	Mercury Datum (Satellite Reference System Only)
MID	Midway Astro 1961
MIN	Minna, Nigeria
MOB	Monte Mario 1875, Rome (Also known as Rome 1875)
MOD	Monte Mario 1940, Rome (Also known as Rome 1940)
MOG	Mogadishu, Somalia
MOZ	Madzansua (Zumbo), Mozambique
MVS	Monavatu 1916, Viti Levu Island, Fiji Islands
NAG	Revised Nahrwan
NAH	Nahrwan, Iraq
NAN	Nanking 1960, China
NAP	Naparima 1955, Trinidad and Tobago
NAR	North American Datum 1983 (NAD83)
NAS	North American Datum 1927 (NAD27)
NUM	Vanua Levu, Fiji
OEG	Old Egyptian, Egypt
OGB	Ordnance Survey of Great Britain 1936
OGC	OSGB 1970 (Scientific Network)
OGD	OSGB 1980 adjustment (Scientific Network)
OHA	Old Hawaiian, Hawaiian Islands
OSI	Ordnance survey of Ireland (WOFO Grid)
OSL	Oslo Observatory (Old), Norway
OSN	Norwegian (New)

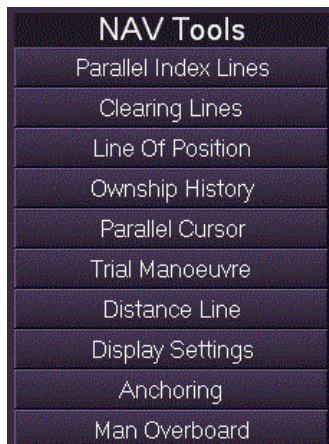
Code	Description
PAC	Panama Colon, Panama
PHA	Ayabelle Lighthouse (Phare D'Ayabelle), Djibouti
PIT	Pitcairn Astro 1967
PLN	Pico de la Nieves, Gran Canaria, Canary Islands
POE	Port Etienne, Mauritania
POS	New Porto Santo
POT	Potsdam, Germany
PRI	Principe, Sinal Domorro Do Papagaio
PRP	Provisional South American 1956 PSAD56
PUR	Puerto Rico 1927, Puerto Rico, Greater Antilles
QAT	Qatar National
QUO	Qomoq, Greenland
REU	Reunion
REY	Reykjavik, Iceland
SAG	Sainte Anne-Island IGN 1951-52, Guadeloupe, Lesser Antilles
SAN	South American 1969
SAO	Sao Braz, Sao Miguel and Santa Maria, Azores
SAP	Sapper Hill 1943, Falkland Islands
SCK	Schwarzeck, Namibia
SEG	Segura, Borneo
SEI	South East Island, Seychelles
SFO	San Fernando Observatory, Spain
SGA	ISTS 061 Astro 1968, S Georgia
SGM	Selvagem Grande 1938, Madeira
SHO	Service Hydrographique et Oceanographique de la Marine 1984 (SHOM 1984), Martinique
SIL	Sierra Leone 1960
SMG	GS8 Astro 1953, Grenada, Lesser Antilles
SOA	South Asia
SOO	Sao Tome
STO	Stockholm, Sweden
SWA	South West Africa

Code	Description
TAN	Tananarive Observatory 1925, Malagasy Republic
TEC	Tete, Mozambique
TIL	Timbalai 1948 (datum point), Sabah (Bessel 1841)
TIV	Timbalai 1948 (datum point), Sarawak + Brunei (Everest)
TOK	Tokyo, Japan
TOY	Tokyo Astronomical Observatory (Old) 1918
VAR	Varesmae (System 1937), Estonia
VID	HMS Vidal 1967 Astro
VIN	Vienna (Hermanskogel)
VLE	IGN 1957 (South Block, Tanna), Vanuatu (Also known as Tanna Astro 1957)
VOA	Fort Charlotte, St Vincent
WAK	Wake Island Astro 1952
WGC	World Geodetic System 1972 (WGS 1972)
WGD	World Geodetic System 1984 (WGS 1984)
YAC	Yacare, Uruguay
YED	Astro Yendegaia
XXX	OSI & OGB
YYY	IRL & OGB. These codes are used where a chart has been compiled by fitting information on more than one datum directly to the chart graticule without making adjustments for the shift between the datums. They indicate that, at the scale of the chart, such differences are not plottable, and the chart may be regarded as being on either datum.
UND	Undetermined Code. UND is used where it cannot be stated with any degree of certainty that positions read from the chart can be related to any one horizontal datum. Where it is possible to separately identify the datums to which different parts of the chart are referred, then the chart will be subdivided for geographic referencing purposes. In practice, there are large parts of the world where insufficient data exists to relate a chart to any specific horizontal datum.

Chapter 5 Navigation Tools

This section covers the creating, editing and deleting of the following navigation tools:

- Parallel Index Lines
- Clearing Lines
- Line Of Position
- Ownship History
- Parallel Cursor
- Trial Manoeuvre
- Distance Line
- Display Settings
- Anchoring
- Man Overboard (if configured)



This chapter also includes a description of how to create and edit Navigation Marks.

Parallel Index Lines

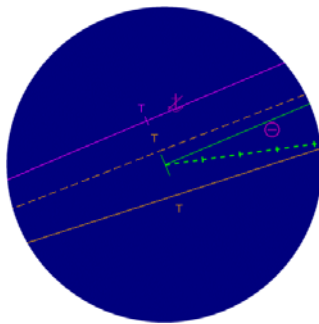
Description

The Parallel Index (PI) Lines facility allows up to fifteen index lines to be displayed simultaneously. PI lines are available in all presentation and motion modes. The lines span the entire chart display in both primary and secondary display modes, irrespective of the scale ratio in use.

Each PI line is defined by the range of its closest point to own ship, its bearing, line type and which side of the ship the line is on.

To access PI lines left click on the **Parallel Index Lines** field from the NAV Tools menu list. The PI Lines window includes the following three tab folders:

- Edit - where all PI line and PI set editing functions are done, including adding a set or line, copying, deleting or renaming a set of lines, or realigning a line or set of lines to own ship's current heading.
- Display - enables selection of one or more PI sets to be displayed on the screen.
- I/O - where import and export of PI Line sets is done.



Multi-node Support

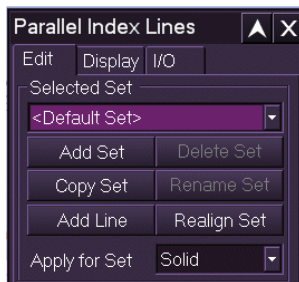
Sets of parallel index lines are saved and retrieved in a database, shared between all nodes. The set of parallel index lines displayed on a particular node may be specified independently for each node.

Edit Parallel Index Lines

The **Edit** tab folder opens as default when Parallel Index Lines is selected, and the Selected Set shows **<Default Set>**. Information on PI lines associated with the default set is displayed in the **Line Data** section of the folder.



The <Default Set> of PI Lines cannot be deleted or renamed.



To select a previously created set of PI lines click on the drop down arrow to the right of the **Selected Set** field and select from the list. The selected set is displayed on the screen and is available for editing.

Creating a new set of PI Lines

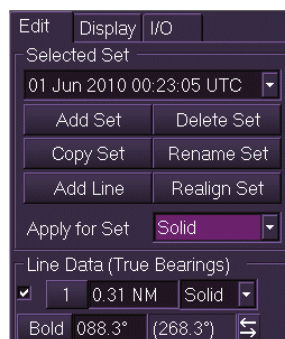
To create and name a new set of PI lines do the following:

1. Click on the **Add Set** button.
2. The screen prompts to enter a name for the new set of PI lines with the current date and time highlighted in the set field name.
3. Enter a new name using the screen keypad, press the **Back** button to delete characters or the **space** button to create a space. With the required name entered press the **OK** button.
4. When a new set is created the set name is entered in the system and displayed in the Selected Set drop down list.
5. You can now add PI lines to the set name, see *Adding PI Lines or deleting Sets*.

Adding PI Lines or Deleting Sets

To add a PI line or delete a Set do the following:

1. With the PI set name entered click the **Add Line** button. A line is created and the default line values are shown in the Line Data area. A PI line is always initially created with its axis through own ship's **CCRP** and the bearing angle the same as the current heading line of own ship.
2. To create further PI Lines click on the **Add Line** button. On the screen the previously created line is displayed as orange and the new line shown as magenta. A further set of Line Data values are displayed with default values and the last line created is highlighted in Line Data.
3. You can edit the display of PI lines by unchecking the tick boxes next to each Line button. When a tick box is unchecked the line's values remain but the line is removed from the screen.
4. To delete a line set select the set name by clicking on the **Selected Set** drop down list and with the set displayed click on the **Delete Set** button. A window appears prompting to confirm the deletion. Click **OK** to confirm, the set is deleted and the PI Lines window reappears with **<Default Set>** in the set field.



Realigning PI Lines and Sets

A set of PI Lines may be realigned so that all lines are redrawn to own ship's current heading. This feature applies to the Default Set as well as operator defined sets of PI lines.

Individual PI lines may also be realigned parallel to ship's heading.

PI lines may only be realigned when there is a valid heading for own ship.

To realign PI lines do the following:

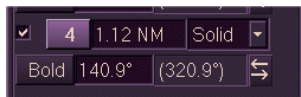
To realign a set

1. Select the PI line set from the drop down list.
2. Click on the **Realign Set** button. An 'Action Required' prompt appears requesting confirmation of the realignment.
3. Click the **Yes** button to confirm. The bearing of each line changes to ships current bearing and the PI lines are redrawn on the display parallel to ships heading line.

There are two ways of realigning a PI line to ship's heading.

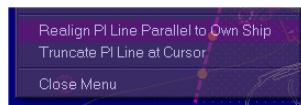
To realign using the PI Lines menu:

1. Select the line from the Line Data area by clicking on the line's reference number (when selected the numbered box is highlighted).
2. Click the **Realign Line** button at the bottom of the Parallel Index Lines window. The line bearing changes to ship's current bearing and the line is redrawn parallel to the heading line.



To realign a PI line from the screen:

1. Move the cursor over the PL line until the cursor symbol changes to the following .
2. Right click on the line and from the context menu select **Realign PI Line Parallel to Own Ship**. The line is redrawn parallel to ship's heading line and the line's bearing is adjusted.



Copying or Renaming PI Line Sets

To copy or rename a PI line set do the following:

To copy a PI Line set:

1. Highlight the set name from the Selected Set drop down list and click on the **Copy Set** button. The window prompts to enter a name for the newly copied PI line set with the current date and time highlighted in the set field name.
2. To enter the current date and time as the PI name click the **OK** button, or to edit the name click in the field, the text changes to green (editable) and the on-screen keypad is displayed immediately below the field.
3. Enter a new name using the keypad, press the **Back** button to delete characters or the **space** button to create a space. With the required name entered press the **OK** button.
4. When a new set name is created the set name is entered in the system and displayed in the Selected Set drop down list.

To rename an existing PI line set:

1. Highlight the set name from the Selected Set drop down list and click on the **Rename Set** button. The window prompts to rename the selected PI line set with the current date and time highlighted in the set field name.
2. To enter the current date and time as the PI name click the **OK** button, or to edit the name click in the field, the text changes to green (editable) and the on-screen keypad is displayed immediately below the field.
3. Enter a new name using the keypad, press the **Back** button to delete characters or the **space** button to create a space. With the required name entered press the **OK** button.
4. The PI line set is renamed in the Selected Set list.

Editing PI Line Styles

To edit a PI line style do the following:

A different line style for each PI line may be selected, or a line style may be applied to all lines in the set.

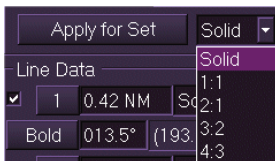
To select a line style for each PI line:

1. Click on the drop down list next to the current line style (defaults to **Solid**), the PI line is automatically selected and a list of line styles are displayed as numerical indicators.
2. Select the preferred line style from the list, each style is a variation of line dashes.
3. The line's style is changed to the selected option on screen.



To apply a line style to all PI lines in the set:

1. Click on the drop down arrow next to the Apply for Set button, the same list of line styles appears as described above.
2. Select the line style to be applied to all lines in the set and click the **Apply for Set** button. Any individual line styles previously selected are overridden by this command.



You can edit the line bearing and range in either of the following ways:

1. Move the cursor over the PI line, the cursor changes to the following symbol 
2. Hold down the left key and use the trackball to pivot the line around own ship's CCRP, the bearing angle value in Line Data automatically changes as the line bearing is moved.
3. To adjust the line range move the cursor over the middle of the line where a small centre line bisects at the CCRP. The cursor changes to the following symbol 
4. Hold down the left key and move the trackball left or right to adjust the range of the line to either side of the CCRP.



Or:

Click on the line bearing and range fields in the Line Data area, the values change to green (editable). Move the trackball to change the data values, the NM range value denotes the distance of the line to the CCRP (defaults to 0.0) and the bearing values denote the angle from 000°.

To change which side of the ship a PI line is displayed:

1. From the Line Data area click on the Toggle Side of Ship button to the right of the line bearing 
2. The selected PI line changes to the other side of own ship, without changing its bearing value.

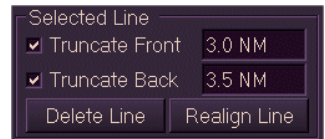
Truncating and Deleting a PI Line

Each PI line may have its forward endpoint and back endpoint graphically adjusted.

To adjust the end points of a PI line do the following.

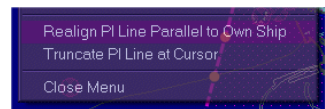
There are two ways of truncating a PI line. To truncate a line using the PI Lines menu:

1. Select the PI line to be truncated, either by clicking on the line in the display, or by clicking on the line button (**Line 1** etc.) in the Line Data section. When a line is selected the **Truncate Front** and **Truncate Back** check boxes become active.
2. To adjust the line's end points tick the **Truncate Front** and **Truncate Back** check boxes. The Truncate Front and Back values both default to a distance of 2.0 NM either side of the line's centre point.
3. Click in the fields, the text becomes editable (green), move the trackball left or right to decrease or increase the truncated values. The front and back endpoints may be different values.

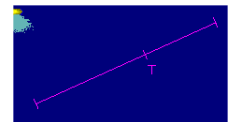


To truncate a PI line from the screen:

1. Either click on the line's end point, hold down the left key and drag the end point to the required position.
2. Or, to truncate a line at a cursor position, move the cursor over the line and right click.
3. From the context window select **Truncate PI Line at Cursor**. The line is truncated to the cursor location



When a truncated PI line is selected a short line is drawn perpendicular to the PI line's axis at the truncated end.



To delete a PI line, select the line as described above and click the **Delete Line** button. The line is removed from the display and its data removed from the **Line Data** section.

Display Parallel Index Lines

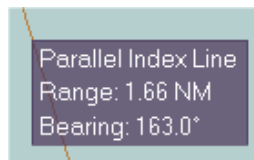
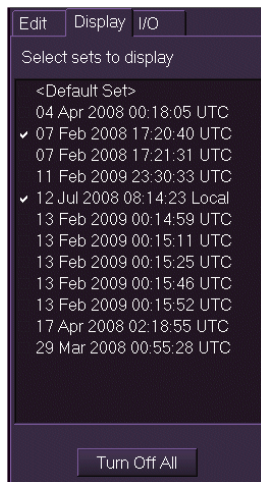
The Display tab folder enables the selection of one or more sets of Parallel Index Lines to be displayed on screen. When **Display** is initially accessed no PI Line Sets are selected for display.

The tab folder lists all the current PI Line Sets created in the Edit tab folder. To select a set for display click on the set name, the set's check box is ticked and the PI lines are displayed. Continue to select line sets for display as required.

To remove a line set from the display click on the set, the tick is removed from the check box.

To turn the display of all sets off, click the **Turn Off All** box, all PI line sets are removed from the display.

To display information for a specific PI line, hover the cursor over the line. The current range and bearing for that line are displayed on the screen.



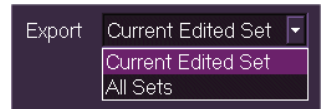
Importing and Exporting PI Lines

A set of named PI lines can be saved to an external device and imported or exported via the import/export (I/O) tab

To import or export a set of PI lines do the following.

To export PI lines:

1. Choose whether to export the currently edited set, (i.e. the set selected in the Edit tab folder), or all sets as listed in the Display list, by clicking on the **Export** drop down arrow and selecting from the two options.
2. Navigate to the directory folder where you want to export the files to (this is usually an external device such as a USB memory stick).
3. Enter a filename for the PI lines in the **Filename** field using the screen keypad.
4. Click on the **Export** button. The filename entered appears in the field below the directory tree as a **.piline** file and a temporary prompt appears confirming the exported file and folder name.



To import PI lines:

1. Navigate to the file in the directory tree, the selected file appears in the field below the directory tree.
2. Click on the **Import** button, the file is imported and a temporary prompt appears confirming the imported file and folder name.

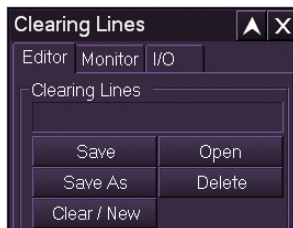


If the PI lines have been imported or exported from an external memory stick click on the **Eject** button before removing the device.

Clearing Lines

Clearing lines are bearing lines or range lines used to approximate a position where a danger to own ship lies.

The clearing line bearing or range value is used to navigate around the dangerous area such that the mariner would want ownship to remain no less than or no greater than the range or bearing of the clearing lines.



The Clearing Lines sub menu includes the following tab folders:

- Editor
- Monitor
- I/O

The Editor tab enables you to create, save, open, edit and delete one or more sets of clearing lines.

The Monitor tab enables you to select a previously saved set of clearing lines for monitoring against own ship's course.

The I/O tab enables you to import or export sets of clearing lines to and from an external device such as a USB memory stick.

Editing Clearing Lines

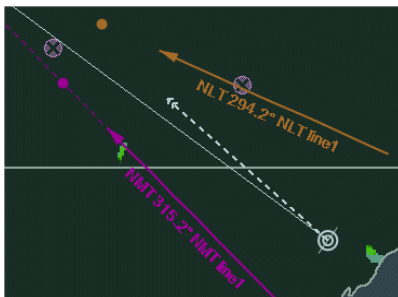
There are two types of Clearing Line available:

- Bearing Line
- Range Line

Bearing lines are drawn as a single solid line with an arrowhead towards the line's bearing. Range lines are drawn as a single arc with arrowheads on both the start point and end point of the arc line.

The clearing line bearing or range value is shown in the same colour beneath the line. The clearing line may also include a label defined by the operator.

A clearing line may be selected as a Not More Than (NMT) or Not Less Than (NLT) value. For example, in the figure below the mariner would want to keep the ship's bearing no less than 294.2° and no more than 315.2° to stay in safe water.

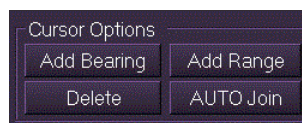


In the figure below the mariner would want to keep the ship's range to be not more than 1.0 nautical miles to stay in safe water.



To create or edit clearing lines from the Clearing Lines menu, do the following:

To create clearing lines, either click the **Add Bearing** button or the **Add Range** button in the Cursor Options area. The button of the selected option is highlighted.

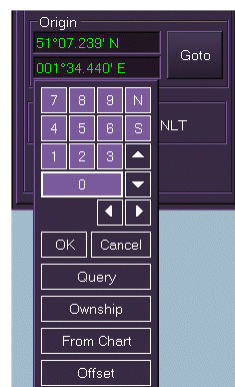


There are two ways to define the geographic origin of a clearing line:

1. Move the cursor to the required position on the display (the letters ADD are shown below the cursor symbol) and left click. A dot is drawn at the selected position. If a bearing line has been added a dashed line is drawn to the edge of the chart display along the defined bearing (which defaults to 315°) in addition to a solid line terminating with an arrow near to the line origin point. If a range line has been added a half circle radius of 1 nautical mile (NM) is drawn with an arrow at each end of the line.

Or:

2. To define a specific Latitude /Longitude (L/L) position click in the **Origin** fields, the current L/L values change to green (editable) and a drop down keypad appears. There are a number of ways of defining the origin's L/L position.
 - i. Manually enter an L/L position by using the numbers and navigation buttons on the keypad and click **OK**. The origin is moved to the entered position.



- ii. To place the origin at a specific geographic object select **Query**. Move the cursor to the display (a ? is added to the cursor) and left click, a Pick Report window appears with a list of objects in the immediate area (see Pick Report). Select the object from the list, the origin is repositioned over the chart object. Click **OK** on the Pick Report window to fix the origin at the chart object position.
- iii. To place the origin at own ship's CCRP select **Ownship**.
- iv. To place the origin at a selected location on the chart display video circle select **From Chart**. Move the cursor to the display (a ? is added to the cursor) and left click at the required location, the origin is repositioned to that location.
- v. To specify a range or bearing for the origin select **Offset**. An Offset window appears where you can set a range and bearing offset from the current position.

To move a line's origin, either:

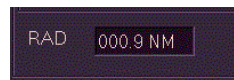
1. Move the cursor over the origin on the display until the cursor symbol changes to the following graphic
2. Hold down the left key on the trackball and move the trackball to move the origin position around the display.

To change a line's bearing, either:

1. Move the cursor over the line's arrow head on the display until the cursor symbol changes to the following graphic
2. Hold down the left key on the trackball and move the trackball to swivel the line around the origin position.
3. Release the left key when the required position is displayed.

Or:

1. Click in the **BRG** field, the current bearing value changes to green (editable). Move the trackball left or right to decrease or increase the value, left click to accept and exit edit mode.
2. To change the range of a line click in the **Rad** field and move the trackball left or right to decrease or increase the radius.

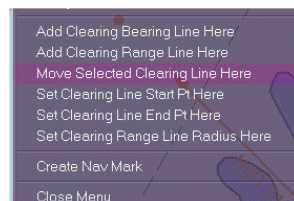
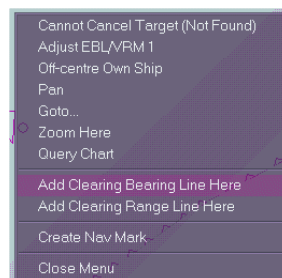


To define a start distance and end distance from the bearing origin to the end of a bearing line:

1. On the display move the cursor over the tip of the line's arrow head until the cursor symbol changes to the following graphic
2. Hold down the left key on the trackball and use the trackball to move the bearing line along the dashed line.
3. Release the left key when the required position is displayed.

To create or edit clearing lines from the context window, do the following:

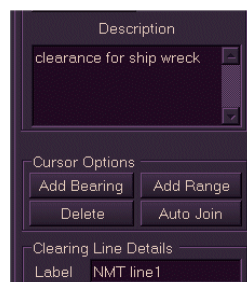
1. Right click on the display where you want the clearing line to begin and select either **Add Clearing Bearing Line Here** or **Add Clearing Range Line Here** from the context popup window. The origin of the clearing line is added at the point on the display where the right click action was done.
2. To reposition the last created clearing line move cursor to the area on display where you want clearing line moved to and right click.
3. From the popup window select **Move Selected Clearing Line Here**. The clearing line origin is moved to the selected position.
4. To change the start or end point of a clearing line move the cursor over the line, right click and select **Set Clearing Line Start/End Pt Here**. The nearest start or end point of the line is trimmed to the defined position on the display.



To change the NMT or NLT value click the respective radio button, the abbreviation below the line will change to reflect the selection.

A description of a Clearing Line set and a label for each clearing line may be entered:

1. To enter a description of a clearing line set click in the Description field and enter required text using the on-screen keypad.
2. To enter a label for each clearing line click the **Label** field and enter required text using the on-screen keypad. The label given will be displayed below the clearing line.



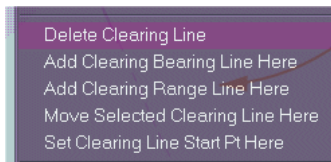
To delete clearing lines, do the following:

From the Clearing Lines Menu:

1. Click the **Delete** button, in delete mode the button is highlighted and the letters DEL are added to the cursor.
2. Move the cursor over the line's origin point. When the cursor is in the correct location the cross lines change to diagonal lines.
3. Click the left key on the trackball. The clearing line is deleted.

From the Context window:

1. Right click on the clearing line to be deleted and select **Delete Clearing Line** from the context popup window.
2. The clearing line is deleted from the display.



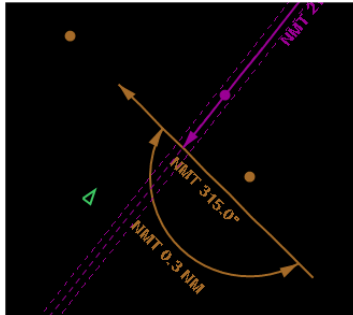
To AUTO Join clearing lines, do the following:

AUTO Join is used to make the presentation of lines clearer in cases where many clearing lines are created in close proximity.

The AUTO Join feature can be applied where two or more bearing lines or range lines bisect. For example, if two clearing lines are created in the same set, the length of the 2nd line will be automatically trimmed at the intersection point with the 1st clearing line.

1. To enable automatic joining of two or more clearing lines click the **AUTO Join** button. When **AUTO Join** is enabled the button is highlighted until the feature is disabled by clicking the button again.
2. Add the type of clearing line to auto join by clicking the **Add Bearing** or **Add Range** button, the selected button is highlighted, in addition to the **AUTO Join** button.
3. Create a clearing line on the chart display as described previously.
4. Move the cursor over the clearing line (2nd line) to be trimmed until the cursor changes to the following graphic .
5. Hold down the left key and drag the line to the 1st clearing line. When the selected line bisects the 1st clearing line the arrow at the end of the 2nd line's origin point is trimmed at the intersection point of the 1st line.

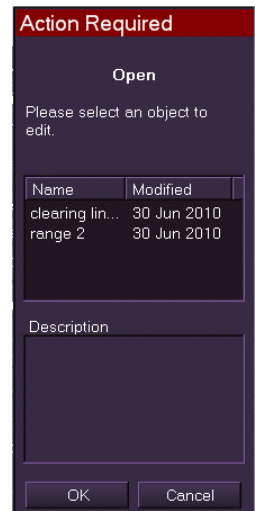
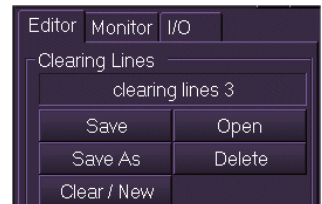
The figure below shows a range line and bearing line AUTO joined to an existing bearing line.



To save, open or delete a set of Clearing Lines, do the following:

When one or more clearing lines have been generated, the lines may be saved, opened, cleared or deleted.

1. If the set of clearing lines are new, click the **Save As** button. An **Action Required** popup window appears prompting to enter a name for the line set.
2. Enter a name using the on-screen keypad and click the **OK** button. The set is saved and the given name appears in the Clearing Lines field. Saved clearing line sets are distributed among system nodes.
3. To open a saved set of clearing lines click the **Open** button. An **Action Required** popup window appears listing the previously saved clearing lines sets.
4. Select a set from the list to open and click the **OK** button. The selected clearing line set is drawn on the display.
5. If a set has been edited since it was opened the title of the set will be displayed with an *. To save the set with the same name click the **Save** button.
6. To remove a set of clearing lines from the display click the **Clear / New** button. If any changes have been made to the set a window prompts to save the changes before clearing the lines from the screen.



 When a set of clearing lines is open in the editor the lines are automatically enabled for display (at all nodes in a multi-node system), before they are saved. However the clearing lines are not monitored for safety checking until they are saved. When clearing a saved set from the editor the set remains displayed until the set is de-selected on the Monitor tab. This may be required on each node depending on system configuration.

7. To delete a set of clearing lines An **Action Required** popup window appears listing the previously saved clearing lines sets.
8. Select the set from the list to delete and click the **OK** button. A window appears prompting to confirm the deletion. Click the **OK** button to confirm, the clearing line set is deleted from the system.

Monitoring Clearing Lines

A saved set of clearing lines may be loaded for monitoring. To monitor a set of clearing lines:

1. Click the **Monitor** tab on the Clearing Lines sub menu. The window lists the saved sets available for monitoring.
2. You can either select an individual set for monitoring by ticking its check box, or select all sets by clicking the **Select All** button. All clearing lines are drawn in pink while loaded for monitoring.
3. To stop monitoring either untick the set's check box, or click the **Select None** button.



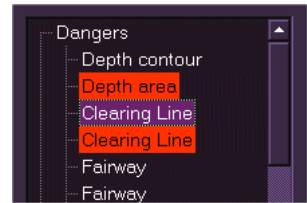
To edit a clearing line set that is currently loaded for monitoring:

1. Open the set from the Editor tab. The system creates a duplicate set for editing over the monitored set in the editable colour (yellowish-orange).
2. Make the required edits to the set. As the set is changed the screen shows the monitored set in the original position.
3. Save the changes made to the set. The monitored set is redrawn to reflect the changes made in the edited set.

Safety Checking Clearing Lines

Monitored clearing lines will trigger a chart danger (see Safety Checking) if own ship's safety region intersects a clearing line. For information on accessing and acknowledging chart dangers, see Dangers.

Monitored clearing lines can also be detected as dangers when a route is being monitored (see Monitor Route - Dangers), or by safety checking on a route opened for editing, see Edit Route - Dangers.



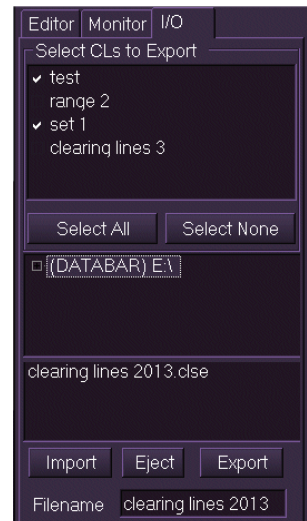
Import/Export Clearing Lines

A set of named clearing lines can be saved to an external device and imported or exported via the import/export (I/O) tab.

To import or export a set of Clearing Lines, do the following:

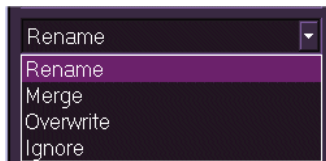
To export one or more sets of clearing lines:

1. Insert an external device such as a USB memory stick into the VisionMaster PC. The name of the external device appears in the middle field of the I/O tab folder.
2. From the 'Select CLs to Export' field either select individual sets by ticking their check boxes, or to export all sets click the **Select All** button.
3. Navigate to the directory folder on the external device where you want to export the files to.
4. Enter a filename for the clearing lines in the **Filename** field using the screen keypad.
5. Click on the **Export** button. The filename entered appears in the field below the directory tree as a **.clse** file and a temporary prompt appears confirming the exported file and folder name.



To import sets of clearing lines:

1. Navigate to the files to be imported on the external device, the selected file appears as a **.clse** file in the field below the external device directory tree.
2. Click on the **Import** button. If the imported clearing line sets already exist on the node an 'Action Required' popup window appears listing the sets to be imported and prompting to select how the duplicate files should be handled.
3. The following actions can be made, either to selected files, or to all imported files, by clicking on the drop down arrow in the lower part of the window: **Rename**, **Merge**, **Overwrite** and **Ignore**.
4. Select the required action and either click the **Apply To Selected** button to a selected set, or to apply the action to all imported sets, click the **Save** button.
5. When an import action is selected the file (or files) are imported and a temporary prompt appears confirming the import and folder name.



If clearing lines have been imported or exported from an external device click on the **Eject** button before removing the device.

Line Of Position

The geographic location of own ship can be determined by using Lines of Position (LOP), which are created by taking bearings and/or radar measurements from own ship to suitable objects. Visual bearings taken on fixed aids to navigation or landmarks such as smokestacks or towers are typically used for bearing LOPs, while the distance to a distinct shoreline or point of land measured by radar may be used for a range LOP. When two or more LOPs are created a fix of own ship's position may be obtained.

The active point used for calculating the LOP fix will be a circle for bearing objects and a triangle for range objects. A triangle inside a circle will be shown if both range and bearing are measured to the same object.

The Line Of Position window is divided into two main areas. The upper part LOP Data provides an Enhanced Position Entry control which allows user selection of range/bearing for object location. This can be either from querying the chart for point objects or by manually selecting an area of the chart.

For each operator defined LOP position, an active point symbol will be displayed. Each symbol will have a reference number i.e. LOP 1, LOP 2 etc. When the range or bearing data is entered, the time of entry is indicated beside the symbol. The symbol remains fixed at the selected location or charted object, but the time stamp moves with the line or circle, based on the speed and course of the vessel.

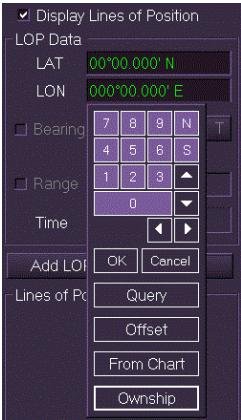
Up to six LOPs may be drawn on the chart display, note that LOP reference numbers in the LOP window may be greater than six depending on their creation methods.

Creating LOPs

Click on NAV Tools in the main menu and then select Line Of Position from the list.

To create one or more LOPs, do the following:

There is one of two ways to generate a LOP, described below:

1. Click in the Latitude/Longitude (LAT/LON) fields, a drop down location keypad appears from where you can select the object position in a number of ways described below:
 
 - a. Query - Select an existing mariner object on the chart display for the object position
 - b. Offset - Select a range and bearing value from the current cursor position for the object position.
 - c. From Chart - Move the cursor to the location on the chart display and click at the desired position.
 - d. Ownship - Select to position the object at the current location of ownship.
 - e. Enter a manual LAT/LON location using the numerical keypad.
2. Or, right click on the display at the desired LOP reference point and select **Add Line of Position (LOP)** in the semi-transparent context menu that appears. The Line Of Position menu appears when 'Add LOP' is selected from the context menu and will show the LAT/LON of the selected location with the Bearing and Range values set to 0.0.
 
3. All LOPs default to true bearing at 0.00°. To change from Bearing to range click the Range radio button. The range defaults to 0.00 NM. A bearing angle and/or a distance range can be entered for the LOP, as described below:
 - a. Select a bearing by ticking the Bearing check box. When Bearing is selected the screen displays a vertical magenta line from the LOP circle and a time stamp. Click in the field and define the required bearing angle, the bearing line is re-drawn to the angle entered. The bearing line moves across the display, based on the speed and course of the vessel.

- b. To change from True bearing to Relative bearing, click the T button, the button toggles between T (true) and R (relative).
- c. Select range by ticking the Range box. When Range is selected screen displays a circular magenta line centred on the LOP and a time stamp. Click in the field and define the required range, the range circle is re-drawn to the distance in NM entered. Range line moves across the display, based on the vessel speed and course.
- d. A Time read-only text box is displayed as part of the LOP Data group. This displays the time, in the format HH:MM:SS, of the last update of Range or Bearing.
4. The point symbol will be a triangle if a bearing LOP is used, or a circle if a range LOP is used. A triangle inside a circle will be shown if both range and bearing are measured to the same object.
5. When the required bearing/range values have been entered click **Add LOP** button. The LOP data entered is listed in the Lines of Position (LOPs) area of the window and the LOP data on the screen changes to orange.
6. Repeat the process above for the required number of LOPs.



Note that when a LOP has been added to the LOPs list its bearing and range values cannot be changed. Should LOP data need to be modified, the relevant LOP must be deleted and then replaced using the amended data.

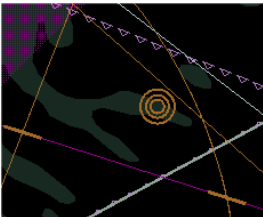
Lines of Position (LOPs)			
1	18:52:15	Delete	
	Bearing		
	Range	0.70 NM	
2	18:55:53	Delete	
	Bearing	045.0° T	
	Range	0.60 NM	
3	18:56:54	Delete	
	Bearing	293.5° T	
	Range	1.15 NM	
		Accept FIX	Clear

7. The same location or object may be used for multiple bearing and/or range observations at different times. When this is done each selection is added to the Lines Of Position list with the LOP reference numbers superimposed over each other.
8. To delete a LOP the click the Delete button. The LOP is removed from the display and the LOPs list, note that the numbers previously assigned to LOPs are retained.
9. To delete all LOPs from system click Clear button. All LOPs are removed from the display and Line Of Position window. A permanent fix symbol remains on the display after the Clear button has been clicked.
10. When all data is entered for the desired number of LOPs click **Accept Fix** to establish a LOP.

LOP Fixes

When two or more LOPs are drawn and intersect, a temporary position fix is created. A LOP temporary fix symbol is drawn at the intersection point to indicate the position of the fix.

When three or more LOPs are created with no intersection point, the temporary position fix is drawn at a calculated position, defined as the magnitude of the difference between the calculated fix and the GPS fix. The figure to the right shows two bearing lines and one range ring.



When a fix has been accepted by clicking the **Accept Fix** button, a temporary prompt **`LOP Sensor - updated'** appears and a LOP permanent fix symbol is drawn at the same position as the temporary fix symbol.

The table below shows the temporary and permanent LOP fix symbols, together with a brief description.

Symbol	Description
	The Temporary Fix symbol is created when two or more LOPs intersect. The symbol moves across the display in conjunction with the bearing lines/range rings. A temporary fix symbol is removed if: - the LOPs are deleted - the temporary fix expires (expiration time configured during commissioning) - a new temporary fix calculation fails
1811 EP VR	When the operator accepts a position fix, a permanent fix symbol is created. The symbol includes the current system time above the symbol and the fix type, e.g. VR to the lower right of the symbol and EP in the lower left of the symbol. See the table below for a list of fix types. A permanent fix symbol remains at the fix position, and is displayed in addition to a temporary fix symbol.

The following are defined as LOP fix types:

- Estimated Position Fix (EP)
- Visual Fix (V)
- Range Fix (R)
- Composite Type Fix (VR)

A minimum of three LOPs are required for a Visual, Range, or Composite type fix. Only two LOPs are required for an EP Fix.
The table below gives a description of each LOP fix label.

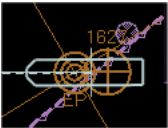
Label	Description
EP	Position was obtained using two points.
V	Position was obtained by making only bearing observations.
R	Position was obtained by making only range observations.
VR	Position was obtained by making both bearing and range observations.

Using a LOP Position Sensor

A LOP fix may be used as the active data source for the position sensor, see Position Values in Sensor Management.

The LOP Position Sensor displays the Latitude/Longitude coordinates of the permanent fix.

If the LOP Position sensor is selected, own ship is re-positioned so that its CCRP is at the centre of the permanent fix symbol.



Sensors	
☐ GPS	51°01.393' N 001°30.919' E Differential
☐ DR	51°01.400' N 001°30.909' E
☒ LOP	51°00.797' N 001°31.003' E
☐ MAN	00°00.000' N 000°00.000' E

 *The amount of time that the LOP position sensor will be considered usable after a fix is set in the configuration tool (default time 300 seconds). Note that LOP position sensor data is dead reckoned between each fix, and this data will become degraded after a period of time.*

Optional Optical Bearing Sensor (OBD)

If the system is configured to include an Optical Bearing Device there will be an additional '**Get OBD Input**' button in the LOP window. Selecting this button will open a dialogue box indicating to the user that the system is ready to receive data from the OBD.

To use optional OBD

1. Click the **Get OBD Input** button. An Action Required dialogue window appears informing the operator that the system is waiting for message data from the OBD.



Once the input from the OBD has been received the dialogue will close and the Bearing value in the LOP menu will be populated with the received data.

2. If data is not received from the OBD after a timeout period of 60 seconds, or if the user clicks the **Cancel** button, the system will revert back to the menu and allow manual entry of data.

If the bearing value is entered using an OBD, the time the message was received from the OBD will be used and shown in the **Time** field. The value represents the time the LOP was taken and used for dead-reckoning calculations.



Ownship History

Ownship history tracks are a series of lines indicating the past locations of ownship as defined by position sources. There are two types of history track:

- Primary - a line indicating the past location of ownship as defined by the configured position sensor (usually GPS).
- Position Sensor tracks - a line indicating past locations as defined by position data sources,

Both sets of history tracks may be displayed simultaneously. The history tracks are differentiated by line style and displayed in the same colour as the heading line. Primary history tracks are displayed as a thick solid line, the position sensor track line is displayed as a thin line.

Past position dots can be displayed on the history tracks, spaced at operator selected intervals.

Event marks may be added at any time to ownship's history track.

Details of past position dots and event marks may be displayed.

Primary History Track

To activate primary history track, tick the **Selected Sensor (Primary)** box, the screen will show a solid line with a series of past position dots. The number of dots shown will be based on the maximum length of the track and the spacing of the position dots.

To turn off the primary history track untick the **Selected Sensor (Primary)** check box.

When the configured position source is changed, the primary history track transitions to the newly selected position source maintain a smooth continuous line.

Position Sensor Tracks

Position sensor tracks include other available position sensor data sources as defined in the Position Sensor, these may include the following:

- DR (dead reckoned sensor)
- LOP (Line of Position)
- MAN (manually entered position)

To select a position source for a history track activate the position sensor source radio button. Only one sensor source can be selected at one time.

When a position source is changed, the primary history track transitions to the newly selected position source maintain a smooth continuous line.

Position sources for position sensors can be individually selected and turned off.

History

The History area of the window allow history tracks to be switched between Live and Daily, summary track data can also be displayed.

Live

Live displays the current history tracks based on the period of time entered in the adjacent field. The history track period is variable from 6.0 minutes to 24.0 hours. For example, if the length is set to 1 hour then ownship's position history for the past hour only will be displayed.

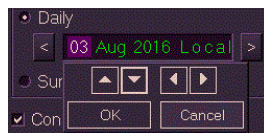
To change the maximum length click in the field and when the current value changes to green move the trackball to increase or decrease the value, click again to accept the selected time.

Daily

Daily displays the history tracks over the past 24 hours for the selected day shown in the field below. The daily history track does not automatically update but the selected day can be changed.

To change the daily tracks to a previous day:

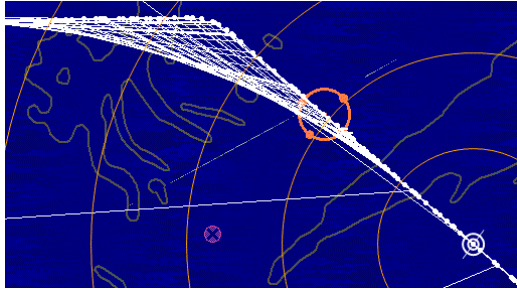
1. Click the Back arrow to page through previous days up to a maximum of 30 days ago. To return to the current day click on the Forward arrow.
2. Or, to change the day, month or year click in the date field and highlight the area you want to change using the Forward and Back arrows on the drop down keypad.



3. With the value highlighted use the Up/Down buttons to adjust the date period forward or back.
4. When the required time value is shown, click OK to complete.

Summary

The ownship history summary is the history from the current time to the earliest available history record. When summary is selected past position dots are set at 10 minute intervals and the screen shows a low resolution display of ownship's history.



Changing History Settings

Show Past Positions

When the **Show Past Positions** check box is ticked, a series of dots appear along on the history track, showing ownship's past positions. Unticking the box will remove the dots from the display.



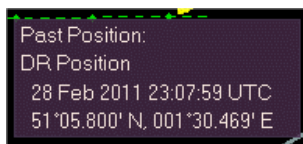
Position Spacing

The spacing of positions controls the gap between the past position dots. The minimum is 1 minute and the maximum is 120 minutes.

To change the position spacing click in the **Desired** field and when the current value changes to green move the trackball to increase or decrease the value, click again to accept the selected time. When a time is selected the Displayed time will change to match the desired time.

Position Details

To view details on past position dots or event marks click the **Position Details** check box and move the cursor over the symbol. A transparent popup window will appear showing details of the symbol, including date/time of creation and its latitude and longitude position.



Event Marks

Event marks may be applied at any time to ownship's history track. These are displayed as an event mark symbol.

To generate an event click the **Add Event** button. An orange outline box with a diagonal line through it is shown on the history track at the current [CCRP](#) position.

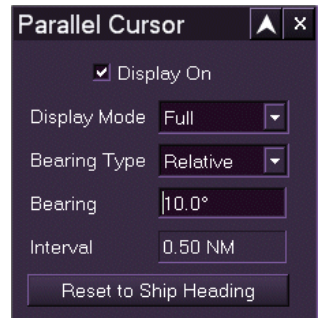


The display of events can be toggled on and off by ticking the **Display Events** check box. When an event is added to a history track the marker will appear at its original position whenever Display Events is switched on.

Parallel Cursor

The Parallel Cursor facility enables a rotating parallel cursor centred on own ship's [CCRP](#) to be displayed.

The parallel cursor graphics consist of two dashed orthogonal lines (axes) extending to the edge of the chart display with their axis crossing point at CCRP, the end points of each line are marked with a semi-circular marker at the edge of the chart display. A series of equally spaced dashed parallel lines, spaced at the currently set range ring interval, are shown on either both sides of the CCRP (full mode) or one side of the CCRP (half mode).



To access the facility click on the **Parallel Cursor** field from the NAV Tools menu list. The Parallel Cursor window is displayed.

To turn on the Parallel Cursor and change settings do the following:

1. To turn the parallel cursor on tick the **Display On** check box. The first time the parallel cursor is displayed, one cross axis runs parallel to ship's heading and the display mode is in full.
2. When the parallel cursor is displayed the Interval field changes from **Cursor Off** to displaying the line interval in nautical miles (NM). To increase or decrease the NM interval change the scale ratio.
3. To toggle between **Full** and **Half** mode click on the Display Mode drop down arrow.

4. From the Bearing Type drop down arrow select between **Relative** and **True**. When True is selected the parallel cursor is azimuth stabilised (i.e. maintains a constant orientation with respect to north). When Relative is selected the parallel cursor is unstabilised (i.e. maintains a constant orientation with respect to ship's heading). When True is selected and the heading becomes invalid the parallel cursor is not displayed.
5. To rotate the parallel cursor either click on one of the four semi-circular markers, hold down the left key and move the trackball left or right to change bearing.

Or:

5. Click in the **Bearing** field, the text becomes green (editable). Move the trackball left or right to change the bearing degree, the parallel cursors move dependent on the values entered.
6. To realign the parallel cursor along ship's heading click on the **Reset to Ship Heading** button.

Trial Manoeuvre

Trial Manoeuvre is a facility that allows the effect of a proposed manoeuvre, based on rate of turn for own ship, to be displayed, both graphically and alpha-numerically. This gives the operator the ability to evaluate the possibility of collisions, by observing the theoretical relative target vectors that would be produced.

The manoeuvre course and speed can be either ground referenced or water referenced, depending on the currently selected stabilised mode, see Sensor Data Display.

However it is recommended for Trial manoeuvres that water speed (STW) is selected. When current speed is over ground (COG) a warning is given when the **Manoeuvre On** check box is ticked that the trial course, speed and vectors will be ground referenced.

Adjusting Trial Manoeuvre Parameters

The following parameters can be specified to define the proposed manoeuvre:

- A true course to follow after the manoeuvre.
- A true speed to be maintained during and after the manoeuvre.
- A delay time before the manoeuvre is to start.
- A rate of turn for the manoeuvre.

The ranges and default values for trial manoeuvres are shown in the table below.

Parameter	Ranges	Power on Default
Final True Course	0 to 359.9°, in 0.1° increments	000.0°
Manoeuvre Speed	0.0 kn to 75 kn	15 kn
Time to Turn	0 to 30 minutes in 0.1 minute increments	0.0min
Rate of Turn	1°/min. to maximum set rate of turn in initialisation	Own ship's commissioned standard rate of turn

To enter trial manoeuvre values do the following:

The following trial manoeuvre values may be edited:

- **Trial (STW or SOG)** - the proposed speed of own ship to be maintained during and after the manoeuvre.
- **Final (CTW or COG)** - the proposed course of own ship to be followed after the manoeuvre.
- **Time to Turn** - the figure representing the time in minutes between switching the trial manoeuvre on and actually starting the manoeuvre.
- **Rate of Turn** - the value in degrees per minute to be maintained during the manoeuvre.

To change or enter a value:

1. Left click on the current value to activate, the text turns green (editable).
2. Move the trackball left or right to set the required speed.
3. Left click to accept and exit edit mode.

Turn Radius

The turn radius figure is generated from the manoeuvre speed and the rate of turn and is therefore not editable.

Delay Countdown

To set up the manoeuvre delay countdown tick the **Timer** check box, the time value previously entered in the **Time to Turn** field starts to count down to zero in real time, whether or not Manoeuvre On is enabled.

When the Time to Turn countdown reaches 30 seconds a Manoeuvre Display warning is displayed.

When the delay countdown reaches zero the **Timer** check box is automatically unticked.

Displaying the Trial Manoeuvre

Tick the **Manoeuvre On** check box to display the trial manoeuvre.

Whenever **Manoeuvre On** is ticked a large flashing **T** is displayed in the lower half of the screen.

The manoeuvre vectors are displayed until the manoeuvre is switched off by unticking the **Manoeuvre On** tick box.

The manoeuvre speed, course, rate of turn, time to turn, vector type and length can be changed at any time during the trial.

If true (T) vectors are selected, the trial vector shows own ship's proposed true course during the manoeuvre.

The Rate of Turn and the manoeuvre speed determine the radius of the turn based on data entered. Effects due to tidal stream and leeway are not taken into account.

If relative (R) vectors are selected, the trial vectors are applied to every tracked target or activated AIS target, with own ship's vector suppressed, and show the course and speed of the targets relative to own ship.

Display of Vectors

Trial manoeuvre vectors are displayed when the following conditions are satisfied:

- The **Manoeuvre On** check box is ticked.
- The heading is valid.
- The scale ratio is valid for the display of target synthetics.

The display of True or Relative vectors for trial manoeuvre is determined by the selection on the upper toolbar.



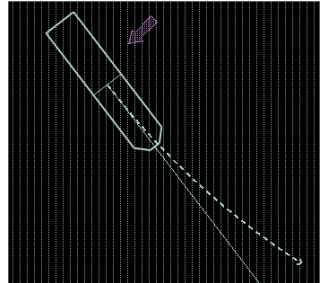
Enter the proposed vector time by left clicking in the value field and moving the trackball left or right to increase or decrease the vector time.

 *The trial manoeuvre vector lengths displayed are dictated by the selected vector time. Entering a longer vector time will allow you to see further into the trial manoeuvre. If the vector time is not long enough to cover the entire manoeuvre then only a part of a trial manoeuvre vector will be displayed.*

Trial Manoeuvre Vector

Own ship's trial manoeuvre vector consists of the following three sections:

- The first section is a straight line continuing on the own ship's current course and speed. The vector length is calculated using the own ship's current speed and the trial manoeuvre delay time.
- The second section consists of a circular arc between the end of the first section and start of the third section. The arc radius is determined by the manoeuvre rate of turn and the manoeuvre speed.
- The third section is a straight line showing the final course of the own ship at the manoeuvre speed.



Trial CPA and TCPA

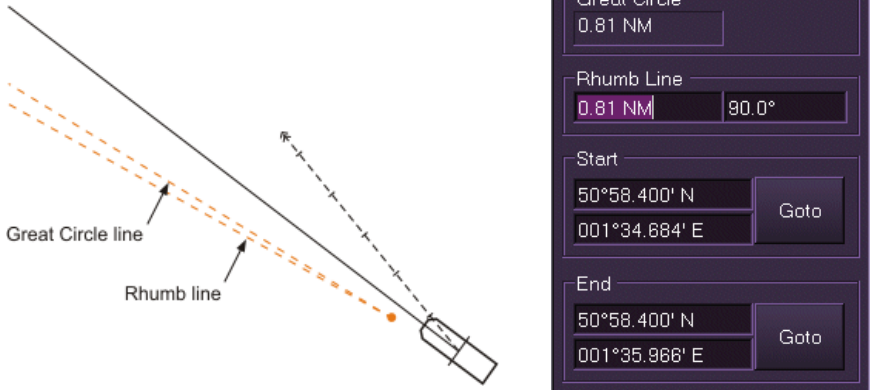
It is possible to display target trial [CPA](#) and [TCPA](#) values predicted using the trial manoeuvre parameters.

Any trial CPA and TCPA data is labelled TRIAL CPA and TRIAL TCPA respectively and does not obscure the actual target data.

Trial CPA and TCPA data is displayed for selected target in the Target Data window, see 'Target Data' in Chapter 10, Targets.

Distance Line

The Distance Line facility enables a Rhumb line to be drawn with a start and end point at specified locations. If the line covers a large distance, e.g. 75 NM or over, a Great Circle line is visible on the display, in addition to the Rhumb line.



The start and end points of the distance line may be entered in one of two ways:

1. From the Distance Line window, enter the required Start and End LAT/LON co-ordinates and click the **Goto** buttons.

Or:

2. With the Distance Line window open, right click at the required Start location on the display and from the semi-transparent context menu select **Place Distance Line Start**
3. Move the cursor to the required end point (this may require re-scaling and panning), right click again and select **Place Distance Line End**.

The distance line is drawn as a dashed orange line with a dot at the start and end.

When the distance line is displayed the line length (in nautical miles) and its rotation angle (default 90°) may be changed by clicking in the **Rhumb Line** fields and either entering the required values using the online keypad, or by moving the cursor left or right when the text is in edit mode (green).

The position and length of the line may be changed directly on the display by moving the cursor over the start and end dots.

With the cursor shown as a bidirectional arrow indicator, hold down the left key and use the trackball to move the start or end dot to the required position. To fix the position, release the left key.

As the length of the line is increased or decreased the Great Circle NM value (read only data) changes to reflect the length shown in the Rhumb line.

To remove the distance line from the display, close the Distance Line window.

Display Settings Features

Display Settings

The Display Settings menu includes the following tab folders:

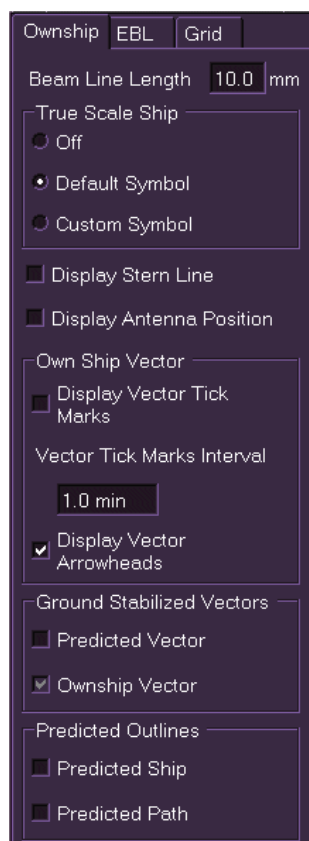
- Ownship
- EBL (if configured)
- Grid

Ownship

The Ownship tab folder enables the display of synthetics data for own ship to be controlled.

The folder includes the following options:

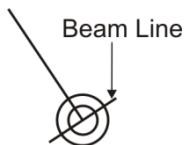
- Beam Line Length adjustment
- True Scale Ship - own ship display settings, including:
 - Off
 - Default Symbol
 - Custom Symbol
- Stern Line
- Antenna Position
- Own ship vector settings, including:
 - Vector tick marks display
 - Vector tick marks interval time
 - Vector arrowheads display
- Ground Stabilized Vectors, including:
 - Predicted Vector display
 - Ownship Vector display
- Predicted Outlines, including:
 - Predicted Ship display
 - Predicted Path display



Beam Line Length

The length of the beam line defaults to 10mm, this is the minimum length the line extends each side of own ship's CCRP.

To lengthen the beam line left click in the **Beam Line Length** field, the value figure changes to green (editable). Move the trackball right to increase the length (maximum 99.9mm), or if the length has been increased previously, left to decrease. Left click again to exit the editing process.



True Scale Ship

When the Off check box is ticked the screen shows own ship drawn as a minimised symbol, irrespective of range scale.

When the Default Symbol check box is ticked the screen shows a true scale outline of own ship based on the configured length and beam of the ship (as entered in the Configuration tool). The true scale outline may be displayed if the greatest dimension of the ship is larger than 6mm on the display.

When the Custom Symbol check box is ticked the screen shows ownship drawn to represent the actual outline of the ship. Note that Custom Symbol will only be enabled if an outline definition for own ship has been defined in the Configuration tool. If no custom symbol has been defined then this setting is disabled.

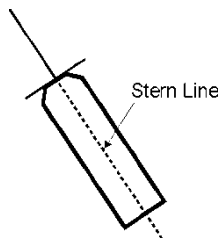
The default symbol and custom symbol are displayed in addition to the heading line and beam line.

For information on the symbols available for own ship see Own Ship Symbols.

Stern Line

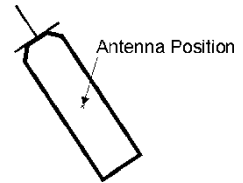
When the Display Stern Line check box is ticked the screen shows own ship's stern line, in addition to the heading line. The stern line is drawn from the CCRP, i.e. where the heading line joins the beam line.

The stern line is drawn reciprocal of the current heading line. For example, if the presentation mode is Head Up the heading line is at 000° and the stern line at 180°.



Antenna Position

The antenna position may be displayed when own ship is in true scale only. The antenna position is shown as a pair of small crossed lines, between 1mm and 2mm long, centred at the location on the display corresponding to the position of the radar antenna. Note that the antenna position may be in a different location to the CCRP, as shown in the figure to the right. For information on setting the antenna position and CCRP, see 'Top Unit Configuration' in Chapter 1, 'Configuration' of the Ship's Manual (Vol 2).



Own Ship Vector Controls

Vector Tick Marks

Tick marks can displayed along the vector length at one minute intervals, with every sixth tick mark is shown with double thickness, for more details see Own Ship Symbols.

To turn vector tick marks on or off tick or untick the **Display Vector Tick Marks** check box.

To change the default tick mark interval time from 1.0 minute, left click in the interval field, the value figure changes to green (editable). Move the trackball left to decrease the time (0.1 minute minimum), or right to increase the time (60 minutes maximum). Left click again to accept the value and exit the editing process.

Vector Arrow Head

When the Display Vector Arrowhead check box is ticked the screen shows the own ship's vector arrowhead (double arrowhead in ground stabilised mode; single arrowhead in water stabilised mode).

Ground Stabilised Vectors

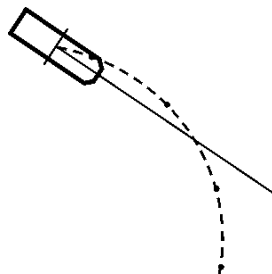
The default setting for ground stabilised vectors is Ownship vector selected, see Own Ship Symbols. To turn predicted vector on tick the **Predicted Vector** check box. When predicted vector is selected the ownship vector check box is automatically de-selected.

 *The default presentation, set at commissioning, is not to allow Ownship Vector and Predicted Vector to be displayed simultaneously. Although the option of simultaneous display may be selected from the Configuration tool, this setting is NOT in accordance with IEC 62388.*

Predicted Vector

The Predicted vector tool is used to indicate where own ship will go based on current speed, course, and rate of turn. Predicted vector is NOT intended to assess risk of collision.

Predicted vector is drawn either as a straight line or an arc from own ship's CCRP. If own ship is currently turning, a radius based on the selected Rate of Turn sensor and the current ground stabilised course and speed is drawn. If ownship is not turning, a straight line is drawn.



The length of the predicted vector is based on the True Vector time setting (up to 60 minutes) see Vector Modes. Dots are drawn on the predicted vector line, the length between each dot is based on the Vector Tick Mark interval time.

Target vectors and own ship vectors can be water stabilised or ground stabilised, but the predicted vector is always ground stabilised. If the system is in water stabilised mode ship's vector is drawn along the heading line, in addition to the predicted vector.

A warning '**Predicted Vector Mismatch**' is raised if the current speed is water stabilised when the predicted vector is displayed.

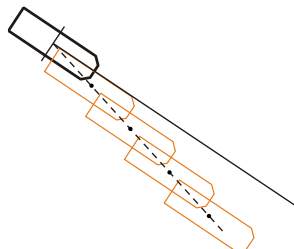
To turn off predicted vector and return to ownship vector untick the **Predicted Vector** check box.

Predicted Outlines

Predicted Ship

The predicted ship indicates a series of predicted position and heading samples of own ship based on current speed, course, and rate of turn.

Predicted ship is drawn as a series of true scale own ship symbols, shown as thin orange outlines displayed along the length of the ship vector. The true scale outlines are drawn regardless of range scale.



The spacing between each symbol is equal to the Vector Tick Marks Interval setting. The number of ship symbols drawn is equal to the vector time (see Vector Modes) divided by the tick mark interval setting, rounded down to the nearest whole number.

 *If the vector tick marks are set too high, the predicted ship outline will be spaced far apart and may not be visible on the display depending on scale and ship speed.*

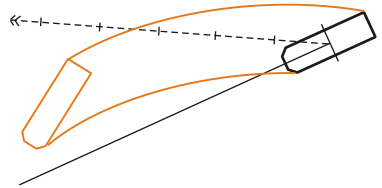
Predicted ship will be displayed regardless of whether the display setting is in predicted vector, predicted path or COG vector. When predicted vector is enabled the location of each predicted ship CCRP is shown as a small dot on the vector line.

If the system is in water stabilised mode and predicted vector/path is switched off, the predicted ship outlines continue to follow the ground stabilised vector path.

Predicted Path

Predicted Path is used to indicate the area that the ship will pass through based on current speed, course, and rate of turn.

The predicted path is two thick orange lines originating at the inside fore corner and the outside aft corner of own ship, if the ship is turning the lines are shown as arced. A true scale ship is drawn at the end of the predicted path.



 *Fore and aft are relative to the direction that own ship is moving and do not necessarily relate to bow and stern.*

Predicted path is drawn to a maximum vector time of six minutes. The predicted path is decreased from its maximum length if the vector time is decreased below six minutes.

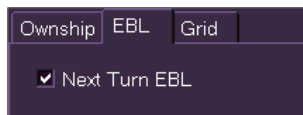
If the system is in water stabilised mode the predicted path continues to follow the ground stabilised vector path.

Next Turn EBL

The system supports the input of a Next Turn EBL sentence that transfers data from a [VMS](#), this data can then be represented graphically on screen. In order to display Next Turn EBL graphics an input must have been previously configured.

The Next Turn EBL is used while own ship is planning and executing a turn.

To turn the EBL on or off tick the **Next Turn EBL** check box.

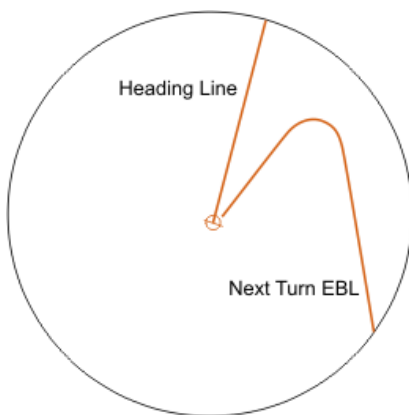


A valid compass input is required to display the Next Turn EBL graphics; if the heading is unusable then the graphics will not be displayed.

The system uses the following VMS information to display the Next Turn EBL:

- Bearing of initial line, degrees with respect to north
- Length of initial line (can be zero if initial line is not to be drawn)
- Radius of arc
- Bearing of final line, degrees with respect to north
- Display status of Next Turn EBL, on or off
- Position of origin of Next Turn EBL, fore/aft and port/ starboard, with respect to the centre of the ship

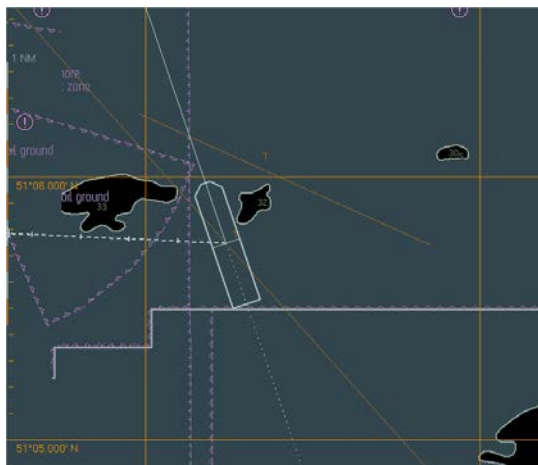
The final line is always drawn to the edge of the chart window.



Grid

A latitude/longitude (L/L) grid can be displayed on the chart window. The L/L grid values are taken from the latest valid position of own ship's [CCRP](#), as reported by the Position sensor, see 'Position' in Chapter 3, Basic Operation of ECDIS.

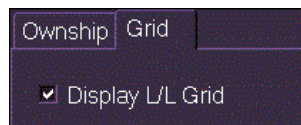
The L/L grid is only displayed when the presentation mode is N-UP. The grid is removed from the display if the presentation mode is changed to C-UP.



The grid display will vary between two latitude and three longitude lines, and four latitude and four longitude lines, based on the selected scale ratio of the display.

The L/L grid will not be displayed when the chart orientation is 45° to 135° and from 225° to 315°.

To turn the grid on or off tick the **Display L/L Grid** check box.



Anchoring

Anchoring Description

The Anchoring feature allows the operator to plan an anchorage, monitor the anchoring status, control the display of the anchorage parameters, and monitor the anchor drag after the ship is anchored.

The Anchoring function may be in Anchor Watch (anchor dropped), or Anchor Approach.

During Anchoring Planning, the operator selects a location and head bearing for the anchorage. A drop bearing object and a drop range object may also be planned. Settings for anchor depth and chain scope are also entered from the Planning tab.

During Anchor Approach, the Status tab provides information on ownship position and bearing with respect to the planned anchorage parameters. Anchoring Status is used to guide the ship to the planned anchorage location. The goal is to approach the planned anchorage over the head bearing track and use ship's bearing to anchorage, any drop bearing objects, and the ship's range to a drop range object to determine whether the ship's hawsepipe is over the planned anchorage location. Once the ship is at the desired anchorage location, Drop Anchor is activated from the Status tab to begin the Anchor Watch mode.

When anchor is dropped the **Anchoring Feature On** check box is automatically switched on in the Status tab.

Anchoring Display includes diagrams of the display options for Anchor Drop and Anchor Approach.

Anchoring Planning

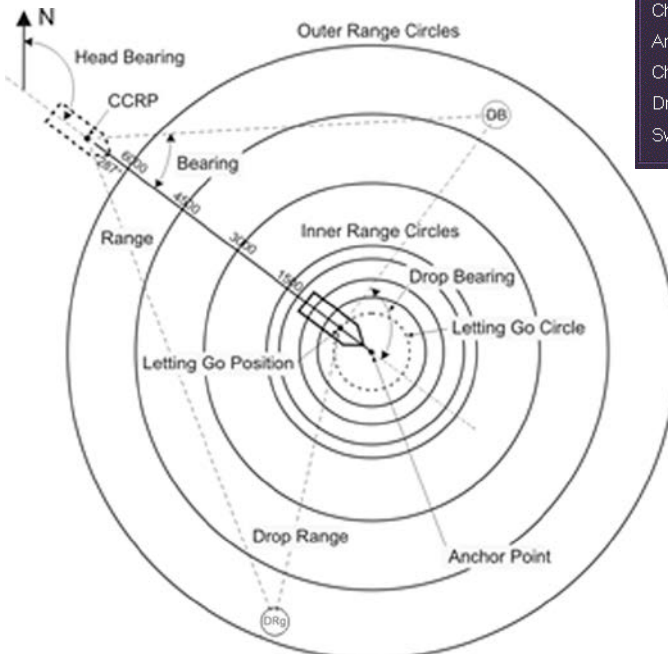
The Anchoring Planning tab enables a precise anchorage location to be entered. The operator should enter a head bearing to steer for anchorage, and may also plan a single drop bearing object, and/or a single drop range object.

Precision Anchoring

An anchor position may be selected, by entering Latitude/Longitude (L/L) coordinate values or by selecting a location on the chart display.

With anchoring on, either manually enter a L/L position using the screen keypad; or, click on the **On Chart** button, move the cursor to the desired location on the display and left click.

When an anchorage location is selected, the system draws an anchorage approach display, centred on the location, see the figure below.



Status	Planning	Display
Anchorage		
Latitude	51°03.944' N	
Longitude	001°30.015' E	
On Chart		
Anchor Track		
Head BRG	42°	
On Chart		
Range Rings		
Inner Interval	100 m	
Outer Interval	500 m	
Drop Objects		
Range	Bearing	
Latitude	51°02.668' N	
Longitude	001°29.027' E	
On Chart		
Watch Settings		
Chain Length	10.0 m	
Anchor Depth	30.0 m	
Chain Scope	None ▾	
Drag Radius	NaN m	
Swing Radius	NaN m	

Anchor Track

Anchor Track enables a true head bearing to the anchor point to be entered or selected on the chart display out to a distance of 5000 yards. The head bearing value is displayed on the chart at the start of the head bearing line.

The head bearing is the planned course to steer as the ship approaches anchorage.

To enter a head bearing, either click in the **Head BRG** field and move the trackball left or right to set the bearing angle.

Alternatively an object on the chart display may be selected as a head bearing marker (HBM). To select a HBM click on the On Chart button, move the cursor to the object or location on the display and left click.

The head bearing is drawn at the opposite bearing to the value entered, e.g. if you enter a value of 90° the system draws an anchor track at 270°.

Range Rings

The range rings provide a quick visual indication of the distance from ownship to the Anchor Point.

When anchor approach is displayed (see the figure in Display) the following types of range rings are displayed:

- Inner range circles
- Outer range circles

The Inner Interval and Outer Interval values show the spacing interval in metres between the circles. To change the spacing interval click in the field and move the trackball left to decrease, or right to increase the value. The inner interval range is from 1 to 100 metres in 1 unit increments; the outer interval range is from 5 to 500 metres in 5 unit increments.

Drop Objects

Drop Objects are conspicuous landmarks that are used as aids to navigation in approaching the Anchor Point.

There are two types of drop objects:

- Drop Range Object
- Drop Bearing Object

Drop Bearing Object

A Drop Bearing object (DBO) is an object that can be observed at a planned bearing when ownship is correctly positioned to drop anchor.

A DBO can be manually selected by specifying its L/L coordinates, or by clicking the **On Chart** button, positioning the cursor over the object and left clicking. If no chart object is identified after a query, the selected cursor position is used to calculate the drop bearing value.

If enabled in the Display options, the display shows an outline circle with the letters **DB** inside to visually indicate the current DBO position.

The bearing value from the CCRP to the DBO is continuously updated on the Status tab.

Drop Range Object

A Drop Range object (DRO) is an object that can be observed at a planned range when ownship is correctly positioned to drop the anchor.

A DRO can be manually selected by specifying its L/L coordinates, or by clicking the **On Chart** button, positioning the cursor over the object and left clicking. If no chart object is identified after a query, the selected cursor position is used to calculate the drop range value.

If enabled in the Display options, the display shows an outline circle with the letters **DRg** inside to visually indicate the current DRO position.

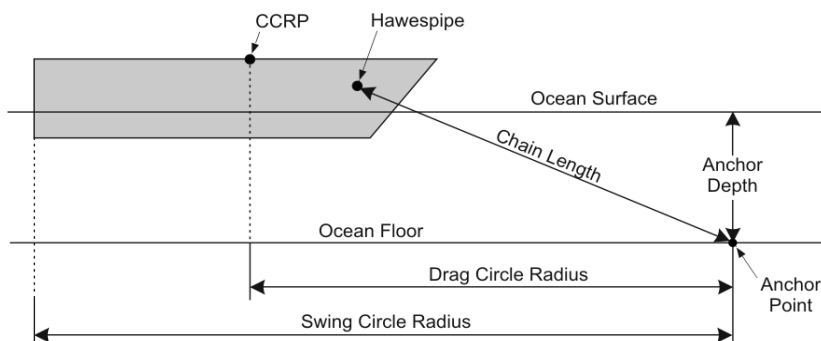
The range value from the CCRP to the DRO is continuously updated on the Status tab.

Watch Settings

The Watch Settings area allows the operator to enter values for anchor depth and chain scope, which are used by the system to calculate the values for chain length, drag circle radius and swing circle radius. These values are used to generate an alert if an anchor drag is detected.

A Warning will be raised if any part of the outline moves outside the swing ring. If the Warning is not acknowledged within 2 minutes and own ship remains outside the swing ring, the Warning is escalated to Alarm status and the anchor symbol will change colour to red. If the anchor watch function is deactivated while this alert is present, the alert shall be cleared.

The figure below shows a diagram of the Anchor Settings parameters.



Anchor Depth

The Anchor Depth is the water depth value at the Anchor Point.

 *The depth at the anchor point may be retrieved from the chart soundings, when switched on in Chart Settings.*

An anchor depth of between 1 and 100 metres may be entered when the chain scope is set any value other than None. An alert is generated if a sounding cannot be located within the distance from the anchorage to 10 percent of the current range scale.

Chain Length Scope

The chain length scope is a multiplier value used to calculate the chain length. For example, if a scope of 6 is selected in a depth of 20 feet, the chain length will be 120 feet.

The chain length scope may be one of the following values: None, 4, 5, 6 or 7.

Chain Length

The chain length is the distance from the hawsepipe to the anchor.

If a chain length scope has a value of 4, 5, 6, or 7, the system automatically calculates the chain length as the product of the anchor depth and the chain length scope. An anchor chain length may be entered from 1 and 1000 metres when the chain scope is set to **None**.

An alert is generated when the automatically calculated chain length is greater than the configured maximum usable chain length.

Drag Radius

The Drag Radius is used as a boundary where, if violated, triggers an alert indicating that the anchor drag limit has been exceeded.

The drag circle radius is automatically calculated as equal to the chain length plus the distance from the hawsepipe to the CCRP. The display of the drag circle may be switched on or off at the Display tab. The drag circle is not rendered if the diameter is less than 2 mm on the display.

An alert is generated if the distance from CCRP to the Anchor Point exceeds the length of the drag circle radius.

Swing Radius

The Swing radius is a circle centred on the Anchor Point with a radius automatically calculated as equal to the distance from the Anchor Point to the ship's stern. The display of the swing circle may be switched on or off at the Display tab.

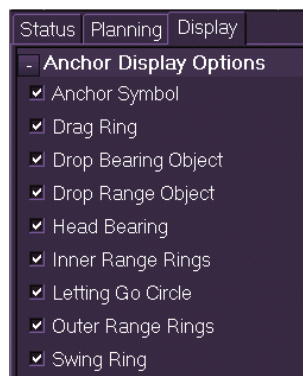
Anchoring Display

The Display tab enables Anchoring to be switched on and off, and includes the following anchor display options (the default setting is all display options enabled).

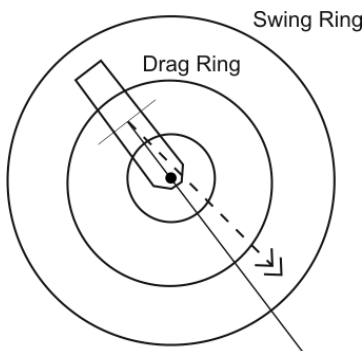
- Anchor Symbol - when enabled an anchor symbol is displayed in an outline circle over the anchor position. This symbol is displayed in both anchor range display and anchor drop mode.

The following display options only apply when in anchor drop mode:

- Drag Ring - the drag ring is a boundary where, if violated, triggers an alert indicating that the anchor drag limit has been exceeded. The drag ring is displayed when the anchor is dropped.
- Swing Ring - the swing ring is centred on the Anchor Point with a radius equal to the distance from the Anchor Point to the ship's stern.



The figure below shows a diagram of the Anchor Drop display options.



The following display options only apply when in anchor approach display:

- Drop Bearing Object - a drop bearing object is an object that can be observed at a planned bearing when ownship is correctly positioned to drop anchor.
- Drop Range Object - a drop range object is an object that can be observed at a planned range when ownship is correctly positioned to drop the anchor.
- Head Bearing - the head bearing is the planned course to steer as the ship approaches anchorage.
- Inner Range Rings - the inner range rings are rendered between the letting go circle and the inner most outer range circle. The spacing between the inner rings may be changed in the Range Rings 'Inner Interval' field, see Planning.
- Letting Go Circle - the letting go circle is represented as a dotted line, centred at the Anchor Point, which provides a visual indication of when to drop anchor. The radius of the letting go circle is equal to the distance from the CCRP to the hawsepipe.
- Outer Range Rings - the outer range rings are rendered and labelled at regular intervals from the letting go circle to the starting position of the head bearing line. The spacing between the outer rings may be changed in the Range Rings 'Outer Interval' field, see Planning.

Anchoring Planning includes an illustration of the anchor approach display.

Anchoring Status

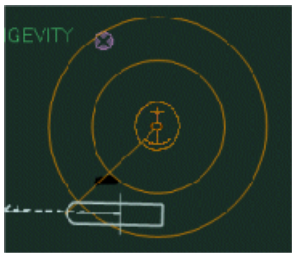
The Status tab enables you to monitor the anchor drag after the ship is anchored. All values in the Status tab are read-only, generated from values entered at Planning.

Anchor Watch Mode

Click the **Drop Anchor** button to switch to Anchor Watch mode, the anchor drop display is drawn, set to ownship hawsepipe position. The **Anchoring Feature On** check box in the Anchorage area is automatically switched on when Drop Anchor is activated.

During the Anchor Watch mode, the application periodically monitors the ship's position to see if the anchor is being dragged. An Outside Anchor Watch Area alert is generated if movement is detected in relation to the Anchor Point.

A line is drawn from the hawsepipe to the anchor location. This line is initially at zero length and represents any movement own ship makes from anchor position, based on wind, tide or current (see the figure below). Any movement is monitored on the Anchorage area of the Status folder.



Suitable warnings are generated when own ship passes over the drag ring (inner ring) and beyond the swing ring (outer ring). The warnings are escalated to alarms when own ship sails beyond the drag and swing rings. If the **Anchoring Feature On** check box is switched off, the Status tab continues to show data based on the last placed anchorage position.

Status

Planning

Display

Anchorage

☒ Anchoring Feature On

Latitude

51°03.944' N

Longitude

001°30.015' E

Range

2.22 NM

TTG

00:07:17

Anchor BRG

353.6°

T

Head BRG

042.0°

T

XTD

1.66 NM STBD

Reference Drop Objects

Bearing

181.1°

T

Drop BRG

181.1°

T

Range

1.28 NM

Drop Range

1.42 NM

Wind Velocity

• Relative

☒ True

Speed

--

Direction

--

Drop Anchor

The following sub sections describe the values shown in the Anchoring Status folder.

Anchorage

The Anchorage area displays the following read-only data:

- Latitude/Longitude - Lat/Long of planned anchorage
- Range - ships range to anchorage
- TTG - estimated remaining time to anchorage
- Anchor BRG - hawsepipe true bearing to planned anchorage (click the bearing button to toggle between True and Relative).
- Head BRG - planned bearing to the anchorage (click the bearing button to toggle between True and Relative).
- XTD - cross track distance to anchor track

Reference Drop Objects

The Reference Drop Objects area displays the following read-only data:

- Bearing - ships bearing from CCRP to drop bearing object (click the bearing button to toggle between True and Relative).
- Drop BRG - bearing from Letting Go Position to drop bearing object (click the bearing button to toggle between True and Relative).
- Range - range from CCRP to drop bearing object
- Drop Range - range from Letting Go Position to drop bearing object

Wind Velocity

The Wind Velocity area displays the following read-only data (if available):

- Speed - wind speed (Relative or True)
- Direction - wind direction (Relative or True)

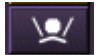
Man Overboard

The Man Overboard (MOB) function enables management of a MOB emergency. When MOB is active, a symbol is displayed on the chart display representing 'Oscar' – the person in the water.

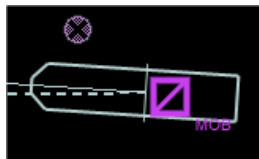
A MOB operation may be immediately activated by clicking on the top-level MOB (Oscar) button in the upper toolbar. The Oscar button is shown in a yellow background whenever the MOB event is active.



When there is no active MOB event the button is shown in the standard background colour.



Upon activating the MOB event a symbol is dropped at own ship's CCRP. The Oscar button changes to a yellow background with black outline and the Man Overboard window appears with the bearing, range, latitude, longitude and elapsed time values. Elapsed time counts up, while range, bearing and LAT/LON values update automatically based on own ship movements. Oscar will drift from the initial location based on the own ship set and drift at the time the event started.



WARNING!

THE POSITION AND HEADING DATA USED BY THE SYSTEM MUST BE VALID AND ACCURATE TO USE THE MAN OVERBOARD FEATURE AS DESCRIBED BELOW; OTHERWISE ERRONEOUS INFORMATION CAN BE INDICATED. IF THIS IS THE CASE ALTERNATIVE METHODS SHOULD BE USED TO ASSIST WITH SEARCH AND RESCUE OF THE PERSON WHO HAS GONE OVERBOARD.

A MOB event may also be activated from the Man Overboard window from the NAV Tools menu and clicking the **Start** button on this window.

 Unlike clicking the MOB button on the upper toolbar, accessing the Man Overboard window does NOT immediately generate a MOB operation. Therefore the preferred method to start an MOB event is via the Oscar button in the upper toolbar.

When a MOB event has been activated, the Man Overboard window displays the following read-only data:

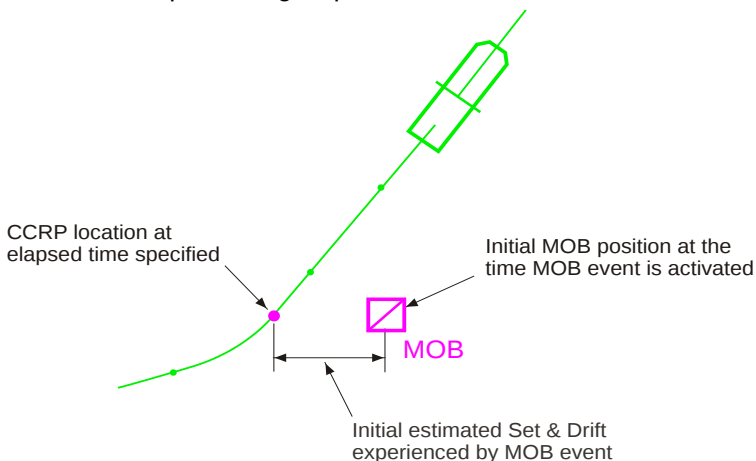
- Bearing (R) - the relative bearing from CCRP to MOB event.
- Bearing (T) - the true bearing from CCRP to MOB event.
- Range (nm) - the distance from CCRP to MOB event.
- Elapsed Time - time since the MOB event started.
- Latitude / Longitude - values from CCRP to MOB event based on Set and Drift values.

The screenshot shows a window titled "Man Overboard". It contains a button "Select A Position On Chart" at the top. Below it is a "Manual Edit" button. The main area displays several fields with their values: Bearing (R) 179.3°, Bearing (T) 200.9°, Range 0.41 NM, Elapsed Time 00:01:13, Latitude 71°08.185' N, and Longitude 028°45.861' E. At the bottom is a "Cancel MOB" button.

When an MOB operation is active the button at the bottom of the window displays **Cancel MOB**.

If MOB event is being activated based on suspicion that a person has gone overboard sometime in the past the operator may manually adjust the elapsed time value accordingly by clicking the **Manual Edit** button. If you manually edit the Elapsed Time value only, the MOB symbol is automatically placed at a position based on ownship history data, with an adjustment based on Set and Drift that was in effect at the manually specified time. Bearing, range, latitude & longitude values will automatically update to reflect the new location, which will be along the own ship history track - offset from the track based on the applied Set and Drift.

The figure below shows the calculation of Oscar position for a MOB event that occurred in the past along ship's track.



The **Manual Edit** function can also be used to enter range and bearing data, or select a position on the chart, but this should only be done if a visual sighting allows the operator to improve the accuracy of the indicated MOB location.

 *When range and/or bearing values are manually edited the MOB location will NOT be based on elapsed time and history data. The range and bearing data will be used instead.*

To manually enter the MOB values do the following:

1. From the Man Overboard window, click on the **Manual Edit** button. The Bearing, Range and Elapsed Time values become editable and additional buttons, **Done** and **Cancel Edit** appear.
2. To edit the MOB position, enter values in the relevant fields and click the **Done** button. The MOB symbol is re-drawn at the revised location.
3. Or, to cancel the edit operation, click the **Cancel Edit** button.



 *It is important to press **Done** or **Cancel Edit** after activating the manual edit function. If the manual values are left in the menu this will interfere with the immediate activation previously described. Specifically the elapsed time will not count up until the operator selects either button. The operator must ensure that the manually entered values are accurate before selecting **Done**.*

To select an MOB position on the chart do the following:

1. From the Man Overboard window, click on the **Select A Position On Chart** button and move the cursor into the chart display. The button changes to **Cancel** and the cursor displays the Oscar symbol below the cross.
2. Click in the display area to position the MOB event. The MOB symbol is dropped at the selected position with the range and bearing from the CCRP to the Oscar displayed and the **Start** button at the bottom of the window active. Note that the MOB operation is not active until the **Start** button is pressed.



3. If the MOB event was not started using the top-level button the Start button at the bottom of the window will be active and must be pressed to start the event.

To turn off the MOB event do the following:

1. Click on the **Cancel MOB** button. An Action Required window appears prompting to confirm cancellation of the MOB Event.
2. Click the **Yes** button to confirm. The MOB symbol is removed from the display, the top-level MOB button changes from yellow to the standard colour and the button in the Man Overboard menu changes from **Cancel MOB** to **Start**.

Navigation Marks

Navigation marks (NAV Marks) are generated by the operator to indicate positions of interest.

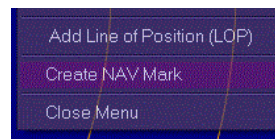


The NAV Mark is displayed as an orange information note symbol in a square box. When a NAV Mark is created and viewed in Chart mode a vertical orange line with a dot at the end is displayed below the symbol box.

NAV Marks can be created in both Standby and Transmit modes, all presentation modes and range scales.

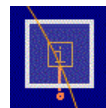
To create a NAV Mark do the following:

1. Right click anywhere within the video circle, a semi-transparent window appears at the position selected.
2. Select **Create NAV Mark** from the window. A NAV mark is created at the selected position.



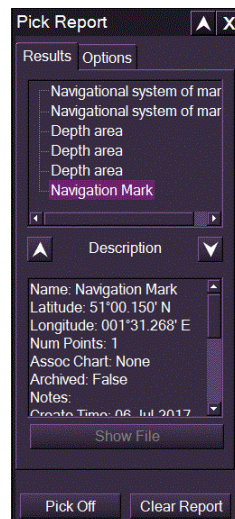
To view data on the NAV Mark do the following:

1. Right click on the NAV Mark and select **Pick Report** from the semi-transparent window. The Pick Report window appears with the Results tab opened.



The Results tab shows details on the selected NAV mark, which is highlighted on the chart display with a white box and a white transparent background fill. The Description area of the Pick Report window shows Latitude/Longitude position information and all other data relevant to the NAV Mark.

2. To de-select the NAV mark click on the **Clear Report** button. The highlight is removed from the NAV mark and the data in the **Results** tab is cleared.



For further information on Pick Report see Report Results and Report Options

To delete a NAV Mark do the following:

1. Right click on the NAV Mark, a semi-transparent window appears at the position selected.
2. Select the **Delete Navigation Mark** from the window. The NAV Mark is deleted from the system without confirmation.

Chapter 6 Sensor Management

Sensors Menu

The Sensors menu allows the operator to select the sensor source to be used for each type of data (e.g. heading, water speed, position etc.). In addition to the selection of a sensor source, adjustments to the heading alignment can be made at the Heading sensor, and an offset position can be applied to a Position sensor.

In a multi-node system, in order to apply a consistent common reference system, all nodes use the same sensor for each type of sensor data (position, heading, water speed, ground speed, etc.), regardless of the node from which the operator makes the selection. As an example, if the operator selects position from GPS1 on one node, GPS1 is selected as the source of position on all nodes.

Sensors
Heading
STW
COG
SOG
Position
Depth Below Keel
Set and Drift
Rate of Turn
Date and Time
Wind

All ECDIS systems include the same set of primary sensors; these are listed in ‘Primary Sensors on ECDIS Systems’.

If for any reason a sensor is not providing usable data an alert will be raised and the data displayed in yellowish-orange.

If automatic sensor data is unavailable manually entered values may be used in place, subject to certain restrictions.

 *If your system includes AIS target capability then AIS input must be disabled before manual sensor data can be selected (see AIS Display).*

CAUTION: MANUAL SENSOR DATA

Using manual data is not the normal mode of operation. A sensor device should be selected as soon as valid data is available.

To access the sensor source for the data types on the Sensor Data Display right click on one of the four fields and left click on the **Select nnn source** line. A window for the selected data type appears below the data display listing the available sensor data sources with the currently active sensor source and its value in highlight.



To access the Sensors menu from the main menu list:

1. Move the cursor to the **Show Menu** button at the bottom right of the screen and left click on the **Sensors** field in the main menu list.
2. With the Sensors menu displayed, click on the specific sensor source button.

CAUTION: CHANGING SENSOR VALUES

Changing the current heading, water speed or position sensor values; or realigning the compass, should not be done at critical points during track control, see Autopilot Interface. The Autopilot system may calculate incorrect values, based on computed Set & Drift, resulting in an incorrect heading order.

Sensor Data Source

The name of each available sensor data source is listed. The sensor source currently used and its current value are highlighted in bold and the sensor's radio button selected.

 *If a selection is made by the operator that is not currently allowed by the system an **Action Required** window appears with a description of the prohibited action and a confirmation button.*

Heading Sensor

To change the current sensor source for heading, see Heading Source Values.

Speed Through Water Sensor

To change the current sensor source for speed through water, see STW Source Values.

Course Over Ground Sensor

To change the current sensor source for course over ground, see COG Source Values.

Speed Over Ground Sensor

To change the current sensor source for speed over ground, see SOG Source Values.

Position Sensor

To change the current sensor source for position, see Position Values.

Depth Below Keel Sensor

To change the current sensor source for depth below keel, see Depth Source Values.

Set and Drift Sensor

To change the current sensor source for set and drift, see Set and Drift values.

Rate of Turn Sensor

To change the current sensor source for rate of turn, see Rate of Turn Values.

Date and Time Sensor

Shows the current date and time and its source (usually GPS), see Date and Time.

Wind Sensor

To view the current sensor source for wind, see Wind Values.

If your VisionMaster FT has been configured to utilize a sonar system the Sensors menu will include **Sonar** as a tab folder. For information on Sonar view and settings refer to Chapter 5 'iView3D' in the Supplementary Features User Guide, 65900014.

Primary Sensors on ECDIS Systems

The following lists the primary sensors applicable to an ECDIS system:

- True Heading
- Speed Through Water
- Position
- Course Over Ground
- Speed Over Ground

True Heading, SOG and Position primary sensors must always be commissioned and available for selection.

Exclusion of COG and SOG primary sensors at commissioning may be allowed but will raise a configuration validation warning.

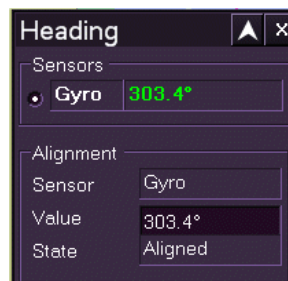
Sensor Data Sources

Heading Source Values

The Heading folder is divided into two areas; Sensors and Alignment.

The Sensors area lists the available heading sensor sources with the active sensor source and its current value in highlight.

The Alignment area shows alignment information applicable to each of the alignable heading sensors in the system. The Value field enables the operator to align a heading sensor prior to selecting it.



Sensors

The system supports the acquisition of analogue heading data via synchro and stepper interfaces and serial heading data via a serial port on the PCIO. The Sensors area may display the analogue data (Gyro) and the serial data (HDT - true heading) and will allow selection between the two data values.

If the heading data becomes invalid while the ECDIS is in Course Up mode the presentation mode will switch to North Up after 30 seconds.

To change the Heading sensor source, do the following:

1. Tick the button next to the source. Whenever the sensor source is about to be changed a window prompts you to confirm the change.
2. To confirm click the **Yes** button, or to return to the existing sensor source and value click the **No** button.
3. Where the sensor is changed the heading values shown against the selected sensor source are applied. The HDG readout shown in the Indicator Display and the ship's heading marker also change to reflect the new sensor value.

Alignment

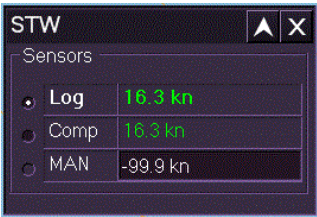
Synchro and stepper compass values require alignment unless the ratio is 1:1. If alignment is required a prompt to enter the compass angle appears when the system is powered on and the system will automatically open the Heading folder of the Sensors menu. The power up default angle is 000.0° and the heading readout flashes until aligned.

- 1. To change the alignment click in the **Value** field, the text turns green (editable).
- 2. Move the trackball left or right to alter the value. The heading readout changes when the alignment value changes even if the compass is unaligned.

STW Source Values

The [STW](#) folder lists the available STW sensor data sources with the currently active sensor source and its value in highlight.

If **Computed** is selected for the sensor data source for STW the system continually computes the values based on other active types of sensor data received.



To change the STW sensor source and values, do the following:

- 1. Tick the button next to the source. Whenever the sensor source is about to be changed a window prompts you to confirm the change.
- 2. To confirm click the **Yes** button, or to return to the previous sensor source and value click the **No** button.

If no sensor source is currently available the user can enter manual sensor data.

CAUTION: MANUAL SENSOR DATA

Using manual data is not the normal mode of operation. A sensor device should be selected as soon as valid data is available.

- 1. To enter manual sensor data click in the **MAN** field, the text changes to green (editable). Move the trackball left or right to enter the required value and left click to exit edit mode.
- 2. Click the **MAN** button to enter the value.
- 3. Where the sensor is changed the values shown against the selected data source are applied. If manual data is entered the STW readout shown in the Indicator Display is displayed in yellow.

COG Source Values

The [COG](#) sensor provides information about own ship course based on actual position history (when a position sensor such as GPS is providing the data). The COG folder lists the available COG sensor data sources with the currently active sensor source and its value in highlight.



When **Computed** is selected for the sensor data source for COG the system continually computes the values based on other active types of sensor data received.

To change the COG sensor source or values do the following:

1. Tick the button next to the source. Whenever the sensor source is about to be changed a window prompts you to confirm the change.
2. To confirm click the **Yes** button, or to return to the previous sensor source and value click the **No** button.

If no sensor source is currently available the user can enter manual sensor data.

CAUTION: MANUAL SENSOR DATA

Using manual data is not the normal mode of operation. A sensor device should be selected as soon as valid data is available.

Manual data cannot be entered for COG if AIS input is enabled. Before entering data turn off the AIS input, see AIS Display in Chapter 10 `Targets`

1. To enter manual sensor data click in the **MAN** field, the text changes to green (editable). Move the trackball left or right to enter the required value and left click to exit edit mode.
2. Click the **MAN** button to enter the value.
3. When the sensor being selected for COG also provides other data types (e.g. SOG or Position), a window appears prompting to select which of these other data types should also be taken from manual data, with the data type's current sensor source displayed. To update all click the **Apply** button, or untick the boxes next to the data source where the update should not apply. To cancel all changes and revert to the previous sensor source click **Cancel**.

- Where the sensor is changed the values shown against the selected sensor source are applied. If manual data is entered the COG readout shown in the Indicator Display is displayed in yellowish-orange and the ship's course vector line is displayed in the same colour.



If your SOG goes below 0.5 knots the COG value will show as a series of green dashes. The COG will return to display an active course bearing when SOG is at 0.5 knots or higher.

Manual Ground Velocity Sensor will also be used for the data type(s) selected below. Change selections if necessary, and select Apply. Color of data type indicates the state of the data. Degraded data types should not be selected.

Cancel will cancel all changes, leaving previous selections in effect.

Data Type	Current Sensor
☒ SOG	GPS

Apply Cancel

SOG Source Values

The [SOG](#) folder lists the available SOG sensor data sources with the currently active sensor source and its value in highlight.

When **Computed** is selected for the sensor data source for SOG the system continually computes the values based on other active types of sensor data received.

SOG ▲ X

Sensors

☒ GPS	18.3 kn
☐ REF	---
☐ Comp	18.3 kn
☐ MAN	6.6 kn

To change the SOG sensor source or values do the following:

- Tick the button next to the source. Whenever the sensor source is about to be changed a window prompts to confirm the change.
- To confirm click the **Yes** button, or to return to the previous sensor source and value click the **No** button.

If no sensor source is available manual sensor data can be entered.

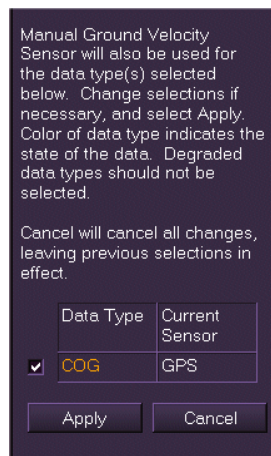
CAUTION: MANUAL SENSOR DATA

Using manual data is not the normal mode of operation. A sensor device should be selected as soon as valid data is available.

Manual data cannot be entered if AIS input is enabled. Before entering data turn off the AIS input, see AIS Display in Chapter 10 'Targets'

- To enter manual sensor data click in the **MAN** field, the text changes to green (editable). Move the trackball left or right to enter the required value and left click to exit edit mode.
- Click the **MAN** button to enter the value.

3. When the sensor being selected for SOG also provides other data types (e.g. COG and Position), a window appears prompting to select which of these other data types should also be taken from manual data, with the data type's current sensor source displayed (see COG Source Values). To update all click the **Apply** button, or untick the boxes next to the data types where the update should not apply. To cancel all changes and revert to the previous sensor source click **Cancel**.
4. Where the sensor is changed the values shown against the selected sensor source are applied. If manual data is entered the SOG readout shown in the Indicator Display is displayed in yellowish-orange and the ship's course vector line is displayed in the same colour.



Position Values

The Position folder shows geodetic position data of own ship. The current position and sensor source are also shown in the left corner of the lower toolbar area, see Position.

 *The position displayed for CCRP is accurate, providing that the correct offsets for the position sensors are set during commissioning.*

The folder is divided into two areas; Sensors and Position Offset.

Sensors

The Sensors area lists the available position sensor data sources with the currently active sensor source and its latitude/longitude values in highlight.

The area also provides computed sensor data that supplies geodetic position based on dead reckoning (DR) from the last valid position received.

If position data becomes invalid the system will automatically switch to water stabilised mode.



Dead Reckoning values

If valid position data for own ship is not received within a short period of time from the sensor interface the system establishes a computed position by dead reckoning from the last valid position received using own ship's direction and speed.

The timeout limit applied to valid dead reckoning values defaults to 30 seconds. The system considers position data to be invalid if the most recent usable sample data received from a position sensor is older than the timeout limit.

LOP Values

The geographic location of own ship, determined by using Lines of Position (LOP), may be used as the active data source for the position sensor. For information on LOPs, see Line Of Position in Chapter 5, NAV Tools.

CAUTION: LOP SENSOR

The amount of time that a LOP position sensor will be considered usable is limited. Note that LOP position sensor data is dead reckoned and this data will become degraded after a period of time.

To change the Position sensor source do the following:

1. Tick the button next to the source. Whenever the sensor source is about to be changed a window prompts you to confirm the change.
2. To confirm click the **Yes** button, or to return to the previous sensor source and value click the **No** button.

If no sensor source is currently available the user can enter manual sensor data.

CAUTION: MANUAL SENSOR DATA

Using manual data is not the normal mode of operation. A sensor device should be selected as soon as valid data is available.

Manual data cannot be entered if AIS input is enabled. Before entering data turn off the AIS input, see AIS Display in Chapter 10 'Targets'

1. To enter manual sensor data click in the **MAN** field, the text changes to green (editable). Move the trackball left or right to enter the required value and left click to exit edit mode.
2. Click the **MAN** button to enter the value.

3. Where the sensor is changed the values shown against the selected data source are applied. The STW readout shown in the Indicator Display and the ship's STW marker also change to reflect the new sensor value.

To change the sensor source from current automatic source (usually GPS):

1. Tick the **DR** or **MAN** sensor button. Whenever the sensor source is about to be changed a window prompts you to confirm the change.

 *Manual sensor data cannot be entered if the system has AIS input.*

2. To enter manual data click in the **MAN** field, the text changes to green (editable) and the screen keypad appears.
3. Enter position data from the keypad, click OK key to exit edit mode.
4. Click the **MAN** button to enter the value.
5. When the sensor being selected also provides other data types (e.g. COG, SOG, UTC), a window appears prompting to select which of these other data types should also be taken from manual data, with the data type's current sensor source displayed. To update all click the **Apply** button, or untick the boxes next to the sensors where the update should not apply. To cancel all changes and revert to the previous sensor source click the **Cancel** button.
6. Where the sensor is changed the values shown in the Posn tab change and the sensor source changes to **MAN**. Own ships symbol (scaled outline or circle symbol) will be displayed in yellowish-orange while manual position data is being used.

Position Offset

The Position Offset area shows the currently selected sensor and enables the operator to enter a position on the chart known to correspond with own ship's position and enter an offset bearing value.

Offset values are applied to all data received from the applicable position sensor.

To enter offset values do the following:

To specify an offset range:

1. Click in the Range field, the text becomes green (editable). Move the trackball left or right to change range distance, or right click in the field and enter values using the on-screen keypad.
2. When the required range is displayed, left click again to exit edit mode.

To specify an offset bearing:

1. Click on the Bearing button, an `Action Required window opens.
2. Enter the required value in the field and click the OK button. The window closes and the value entered is shown on the Bearing button.

To select an offset position on the chart display using the cursor:

1. Click on the **Set Offset by Cursor** button and move the cursor over the chart display, the cursor changes to an offset arrow graphic.
2. Click in the position on the chart display where you want the offset to be applied. The range and bearing values selected on the chart are shown in the Position Offset fields.

To apply the entered offset values to own ship tick the **Offset Applied** check box.

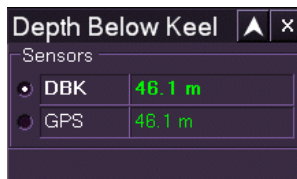
 *Offset values are not applied to the chart until this check box is ticked.*

When offset values are applied the entry is highlighted in the **Posn** popup window with **Offset** shown in orange text below the sensor source. Offset is also displayed in the left corner of the lower toolbar area, below the sensor source, see `Position' in Chapter 3, Basic Operation of ECDIS.

Depth Source Values

The Depth sensor provides information on the current depth values:

- depth below keel (DBK)
- depth below transducer (DBT)
- depth below waterline (DBW)

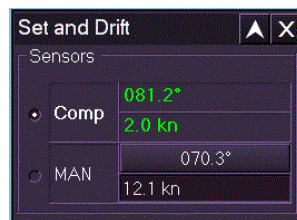


The specific sensor information available will depend upon installed and configured sensor devices.

Set and Drift Values

The data for Set is shown in degrees; the data for Drift is shown in knots (kn).

When **Computed** is selected for the sensor data source for Set and Drift the system continually computes the values based on other active types of sensor data received conventionally (via an interface).



When incorrect computed values are suspected they can be manually set to zero or to an estimated manual value. The system will re-calculate accurate Set and Drift values after accurate sensor data has been restored.

To change the Set and Drift sensor source or values do the following:

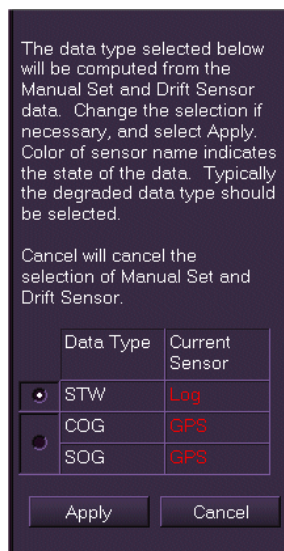
1. Tick the button next to the source. Whenever the sensor source is about to be changed a window prompts to confirm the change.
2. To confirm click the **Yes** button, or to return to the previous sensor source and value click the **No** button.

If no sensor source is available the user can enter manual sensor data.

CAUTION: MANUAL SENSOR DATA

Using manual data is not the normal mode of operation. A sensor device should be selected as soon as valid data is available.

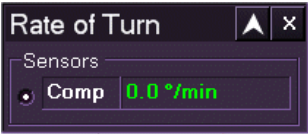
1. To enter manual sensor data click in the Manual Set and Drift fields, the text changes to green (editable). Move the trackball left or right to enter the required value and left click to exit edit mode.
2. Click the **MAN** button to enter the value.
3. A window appears prompting to select the data type (COG/SOG and STW) that will be computed from the manual set and drift sensor, with the data type's current sensor source displayed. To update all click the **Apply** button, or untick the boxes next to the data type where the update should not apply. To cancel all changes and revert to the previous sensor source click the **Cancel** button.



Rate of Turn Values

The Rate of Turn (ROT) folder lists the available ROT sensor data sources with the currently active sensor source and its value in highlight.

When **Computed** is selected for the sensor data source for ROT the system continually computes the values based on other active types of sensor data received conventionally (via an interface). The ROT is indicated as unavailable if the Heading from the selected source is unavailable or invalid.



Date and Time

The Date and Time folder shows the system date and time with the currently active date and time source and its value in highlight.

The default selection for date/time source is from a GPS sensor. If the time data is valid the values are shown in green.



Wind Values

The Wind sensor provides information on the current wind direction and velocity.

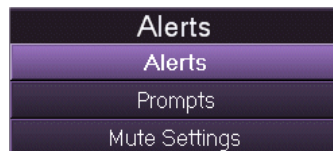
The specific sensor information available will depend upon installed and configured sensor devices.



Chapter 7 Alerts

The alert management system generates alerts related to displayed information or equipment malfunction.

In addition, prompts (permanent and/or temporary) are raised to communicate information that does not necessarily require operator action.



The Alerts menu includes a Mute Settings facility, which enables the operator to either change the length of time the alert buzzer is temporarily muted, or mute the alert buzzer for an unlimited period of time.

Alerts

There are three types of alert priority:

- Alarms
- Warnings
- Cautions

Alarms and warnings are indicated visually and audibly, via the alert buzzer. Cautions are only indicated visually.

The following conditions apply to the three different types of alerts:

1. Alarms are conditions that require immediate attention or user action.
2. Warnings indicate changed conditions requiring attention for reasons of precaution which are not immediately hazardous but may become so if no decision or action is taken.
3. Cautions indicate a condition which does not warrant an alarm or warning, but still require attention and consideration of the condition.

Alerts are initially displayed on the Alert Status Indicator, from where they can be acknowledged. An unacknowledged alert displays as a flashing colour whereas an acknowledged, but still existing alert, displays a constant colour, see Alert Status Indicator.

Alerts are raised until they are acknowledged, and the visual indications of individual alerts remain until the fault has been corrected, when the alert system automatically resets to normal operating condition. Alerts can only be cancelled if the condition causing them has been dealt with successfully. For some alerts, the system may provide the acknowledgement automatically and clear the alert.

For a list of the alarms, warnings and cautions which can be raised by the VisionMaster system and any remedial action to be taken, see List of Alarms, Warnings and Cautions.

Alert Sources

There are two types of alert sources: internal and external. Internal alerts are generated by the VisionMaster FT. External alerts are those relayed to the Central Alert Management (CAM) by external sources.

Internal alerts are displayed and acknowledged through the display menu, see Alert Display. External alerts are displayed and acknowledged through the CAM watch mode, see Central Alert Management.

Prompts

Prompts appear directly underneath the Alerts field. A Prompts window listing permanent and temporary prompts (when they appear) may be accessed either by clicking on the Prompts field, or **Prompts** in the Alerts menu, see Prompts.

In the event of a picture freeze the prompt field will freeze on a prompt or system time, see Picture Freeze.

Alert Status Indicator

The Alert Status Indicator displays the current alert status of the system. The display of alerts is prioritised; with active alarms first, followed by warnings and then cautions.



The Alert Status Indicator may show a background colour based on the status of active alerts in the system. If no active alerts exist, the background colour shows the system background colour and the message **No Alerts** is displayed. If unacknowledged Alarms or Warnings exist, the background colour changes and flashes a colour based on the highest unacknowledged alert category, these are:

- red for alarms
- yellowish-orange for warnings

Alarms and Warnings need to be acknowledged in one of two ways:

1. either by clicking on the message in the Alert Status Indicator; or
2. by clicking on the **ACK ALARM** button on the control panel.

The alert is removed from the Alert Status Indicator and, if other unacknowledged alerts exist, is replaced by the next in order of priority. The alert remains listed (non flashing) in the Alerts Display list as long as the condition exists and the message Alarms or Warnings Present will be displayed.

When all alerts have been acknowledged but any are still active, the background colour will be determined by the highest priority active alert category.

To view details on an alert right click on the Alert Status Indicator, the Alert Display window appears.

Cautions are displayed as steady yellow text and do not need to be acknowledged.

Alert Status

There are three types of alert status:

- **Unacknowledged Alerts**

When an Alarm or Warning is detected, this alert appears with a flashing background colour in the Alert Status Indicator and the Alert display. If more than one alert condition exists, the alert with the highest priority is shown. Alerts continue to be shown in the indicator until it is either:

- acknowledged;
- automatically cleared; or
- replaced with either an alert of higher priority, or a more recent alert of the same priority.

If the internal buzzer is enabled, the buzzer will only sound when there are unacknowledged alarms or warnings.

- **Acknowledged Alerts**

If an alert has been acknowledged, but the fault has not been corrected, the message **Alarms Present or Warnings Present** is displayed in non-flashing red or yellowish-orange in the Alert Status Indicator. The acknowledged alert remains listed with the text displayed in coloured lettering in the Alerts Display area, unless the **Hide Acknowledged** box has been ticked.

- **No Alerts**

If there are no alerts the caption **No Alerts** is displayed in the Alert Status Indicator and the system background colour is shown.

Alert Display

To view a list of all the currently active alerts, including alerts acknowledged on the status indicator, click on the **Alerts** in the menu list, or right click on the Alert Status Indicator.

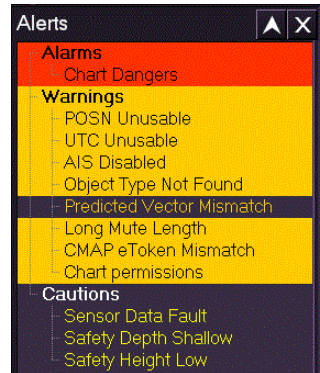
The Alerts window shows the current alert state and provides a description and a means of acknowledging alerts.

Alerts are divided into **Alarms**, **Warnings** and **Cautions**. Alarms are messages that require immediate attention or user action, whereas Warnings and Cautions indicate less critical conditions. The most recent alerts are shown at the top of the list.

You can acknowledge alarms and warning either by clicking on the selected alert in the list, or by clicking on the **ACK ALARM** button on the control panel. Cautions do not need to be acknowledged and, if active, will be displayed in yellow with the system colour background.

The alerts list will change indication as follows:

- An unacknowledged Alarm whose condition is active will appear with a flashing red background.
- An unacknowledged Warning whose condition is active will appear with a flashing yellowish-orange background.
- Cautions do not need to be acknowledged and do not flash.
- An acknowledged alert whose condition is still active will remain listed in the Alert Display window and will be displayed with coloured lettering (red for Alarms, yellowish-orange for Warnings and yellow for Cautions).
- An unacknowledged alert whose condition is no longer active will appear with a flashing grey background.
- An acknowledged alert whose condition is no longer active is removed from the Alert Display window.



Viewing Alert Details

To view more information on a particular alert right click on the text. Details of the alert, including activation date, time and description are shown below the list.

Hide Acknowledged

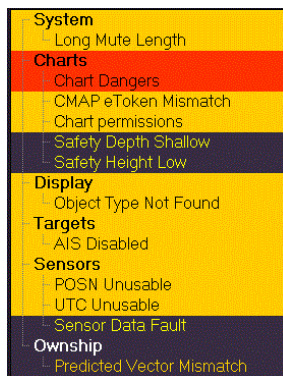
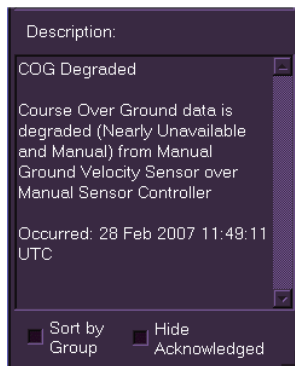
To hide acknowledged alerts tick the **Hide Acknowledged** check box. Acknowledged alerts are hidden from the display, although if the alert condition is still present the message **Alerts Present or Warnings Present** is shown in red in the message field. To show all acknowledged alerts, untick the **Hide Acknowledged** check box.

Sort by Group

To arrange alerts into groups tick the **Sort by Group** check box. Grouping reduces the type and number of alerts displayed, by de-classifying less critical alerts.

The system lists alerts in their relevant group (e.g. Targets, Routes etc.), with the exception of emergency alerts, and prioritises the alerts within each group as Distress, Primary and Secondary (see List of Alarms, Warnings and Cautions). System alerts are always shown as the highest priority, regardless of the type of alert in the system group.

In addition to acknowledging individual alerts the operator can acknowledge an entire group by clicking on the group title.



Alert Buzzer

An alert buzzer is physically located in the LCD monitor.

The buzzer is connected to one of the following types of discrete outputs to the LCD monitor:

- PCIO
- Basic Control Panel
- Labjack
- Serial Port

The buzzer will sound three beeps every 8.5 seconds when an unacknowledged Alarm is active. The buzzer will sound two beeps every 60 seconds when an unacknowledged Warning is active. An unacknowledged Caution will not activate the buzzer.

The buzzer can be temporarily muted by clicking on the icon to the right of the Alert Status Indicator. When the buzzer is muted a white diagonal line appears through the icon. To re-enable the buzzer click on the icon again, the white line is removed.



The length of time that the buzzer is muted is defined in Mute Settings and can be set to between one minute and 999 minutes. The system will automatically re-enable the buzzer once the mute length period has elapsed. The mute length may also be set to Unlimited, if Unlimited is selected the buzzer is permanently muted when the buzzer icon is clicked.

 *The mute does not prevent the buzzer sounding if an emergency alarm is generated, e.g. Backup Navigator Alarm.*

Alerts on a Multi-node System

Alert management enables system features to designate alerts that they generate as either 'System' or 'Local'.

In general, an alert generated on one node will be displayed and audibly announced on all nodes in the system. These are known as system alerts. When the operator acknowledges an alert on a node it is shown as acknowledged on all nodes in the system.

Some alerts are displayed and audibly announced only on the node that generated it (unless the alert is configured to be displayed on all nodes at commissioning). These are known as local alerts and relate to conditions that impact only the node that generated the alert. Examples of local alerts include: display warnings, computer hardware problems, authorization/licensing errors, database connection errors, transceiver and video errors, target alerts, etc.



Alerts cannot be acknowledged if Station In Control (SIC) is enabled and your node is assigned as 'Never In Control', see Supplementary User Guide, System Features, Station in Control

Alerts on a Client/Server Radar System

On a Client/Server Radar (CSR) system all alerts raised on a Server node are defined as System alerts.

Alerts raised on Client nodes retain their Local/System definitions, as described previously.

The table in List of Alarms and Warnings Specific to Client/Server Radar lists the alerts that are generated due to failure conditions specific to a CSR. Some alerts listed in this table are replicated on standard VisionMaster FT systems (see List of Alarms, Warnings and Cautions) however the possible causes of the alerts will be different and are described in the table.

CSR alerts are displayed on all Clients networked to the Server.

Alert Behaviour Specific to ECDIS

Alert management behaves slightly differently dependent on whether your VMFT system is an exclusively ECDIS system²⁷, or a Radar/Chart Radar system²⁸.

The following describes the alert behaviour for primary sensors on an ECDIS system (for the default list of primary sensors, refer to 'Primary Sensors on ECDIS Systems' in 'Sensor Management' chapter).

- If a sensor in the default list of primary sensors becomes unusable the alert generated is an Alarm.
- If a sensor that has been added to the default list of primary sensors becomes unusable the alert generated is a Warning.
- If a non-primary sensor becomes unusable the alert generated is a Caution.

²⁷ An ECDIS System is one which either all nodes on a Multi Node or CSR system have been configured to be ECDIS, or a standalone Total Watch system that is currently in the ECDIS watch mode.

²⁸ A Radar/Chart Radar system is either one in which at least one node in a Multi Node or CSR system has been configured to permit a Radar watch mode, or a standalone Total Watch system that is currently in a Radar/Chart Radar watch mode.

Prompts

Prompts appear in the field directly underneath the Alert Status Indicator and can be either temporary or permanent.

Permanent prompts

Permanent prompts denote a state or mode of operation, provide instruction to the operator, or may display settings.



Permanent prompts are displayed on a normal system colour background; if more than one permanent prompt is active the prompts are shown in rotation until the condition creating the prompt no longer exists.

Temporary Prompts

Temporary prompts are general system responses to a user interaction and are displayed briefly for a commissioned time period, usually around 5 seconds. When a temporary prompt is active a pale coloured background field appears below the permanent prompt field with the prompt message.



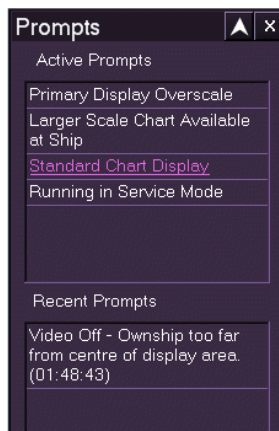
Prompts Window

A prompts window listing all the permanent prompts and temporary prompts, as they occur.

The window is divided into Active Prompts and Recent Prompts.

The Active Prompts lists all permanent prompts on the node, together with a hyperlink '**Standard (or Basic) Chart Display**' which links to the relevant page in the Help Guide.

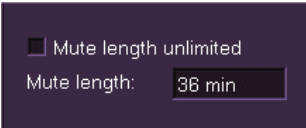
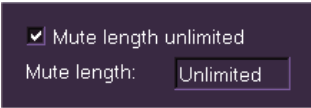
The Recent Prompts field list temporary prompts, with the time, in parenthesis, that the prompt was generated. These prompts are listing for approximately 90 seconds and then removed from the window.



Mute Settings

The Mute Settings sub menu enables the operator to adjust the length of time, in minutes, that the alert buzzer is temporarily muted. It also enables the operator to mute the buzzer for an unlimited period of time.

To change the mute settings do the following:

1. To change the mute time uncheck the **Mute length unlimited** check box (if ticked) and click in the **Mute Length:** field, the value changes to green (editable).
2. Move the trackball left to decrease the time or right to increase the time. The mute time range may be set between 1 minute and 999 minutes. The default is 5 minutes.
3. Left click in the field to accept the value.
4. To mute the alarm buzzer for an unlimited period of time tick the **Mute length unlimited** check box. The Mute Length field displays **Unlimited** as read-only.

 *If the mute length is set higher than the default time, or the mute length is set to Unlimited, a Long Mute Length Warning is displayed in the Alerts field.*

Central Alert Management

Central Alert Manager (CAM) Watchmode is supported by VMFT, if available. This will be as either a configurable option within a TotalWatch system, or as a single watchmode (CAM-only node). The alarm system is a functional alert interface which enables the operator to silence, acknowledge and cancel alerts, from all nodes, centrally.

CAM Watchmode is a clear method for viewing all alerts, either from the bridge or others received from other external equipment. The system is flexible and configurable according to specific requirements.



The CAM uses the VMFT alert output to forward unacknowledged alerts (alarms, warnings and cautions) to all nodes on the system, and to other locations of the ship as necessary. Additionally, VMFT alert data can be sent to external systems, often known as CAMs - this has to be configured using "CAM" in the config tool.

Alarms and warnings are, where possible, arranged in groups, except emergency alarms. The following types of alerts are not grouped:

- Faults requiring speed or power reduction
- Automatic shutdown of machinery
- Steering gear alerts.

A group of alerts may be acknowledged at the same time. Alert priorities include Emergency Alarm, Alarm, Warning and Caution, as described in List of Alarms, Warnings and Cautions. Alerts are sorted by these priorities and by time within each priority group. The indication of Alert status (unacknowledged or acknowledged) is the same as described previously in Alert Status and Alert Display.

The CAM displays a warning when NAVTEX messages are received via a serial connection on the client node.

The CAM includes Shutdown function buttons (Shutdown or Restart System) at the bottom of the window.

Picture Freeze

A picture freeze represents a failure to update the User Interface on an operational display. If a picture freeze occurs the permanent prompt field will freeze on the currently displayed prompt, or the system data and time if no prompts are displayed, see Prompts.

If the VisionMaster system includes a PCIO, an alert beep will sound denoting an internal error, in addition to the prompt freeze. If the system returns to normal operation then the prompt field will continue to cycle between prompts and system time, but an internal error alert will be generated.

In the event of a picture freeze it is advisable to create a system fault report (for details see Report) and to then restart the system, see Shutdown.

List of Alarms, Warnings and Cautions

The Alerts which are raised by the system, and appear in the Alert Status Indicator and in the Alerts Display, are given in the tables below, see pages 7-13 to 7-34. The tables list all alerts, and their Priority, either alarm, warning and caution.

Sensor data types that have been selected for primary navigation in the CCRS²⁹ Alert Reporter of the Configuration tool and are currently selected for navigation will always generate alarms if the data becomes unusable. For information on the behaviour of other sensor alerts refer to Alert Behaviour Specific to ECDIS.

Alerts raised on a Client/Server Radar (CSR) system may have different sets of failure causes from a standard VisionMaster FT. A list of CSR alerts is provided at the end of the main list.

It should be noted that the set up and configuration of your system will affect the priority for some Alerts, and whether they are displayed as Alarms, Warnings or Cautions. These factors include whether or not the system supports Radar, or Track Control.

²⁹ Consistent Common Reference System (CCRS) data includes the various types of data that describe the state of the ship, and which are usually received via sensors. Many of these types describe a characteristic of the ship itself (for example, the ship's heading, or the geodetic position of the ship, etc.), while others describe a characteristic of something associated with the ship, such as 'Rudder Angle' or 'Propeller Rpm and Pitch'.

Alert Type	Description	Priority	Notes
3D Chart Suppressed	3D Chart not supported for this region.	Warning	
Absolute Humidity Unusable	Sensor Absolute Humidity Integrity VisionMaster FT	Alarm or Caution	Depending on configuration
Active AIS Almost Full	Activated AIS Target Limit Almost Reached	Caution	
Active AIS Full	Activated AIS Target Limit Reached (maximum 40)	Warning	
Actual Course Change	Actual course change alert issued based on wheel-over TTG.	Warning	
Actual Course Change	Actual course change alert issued based on wheel-over TTG. Operator messages will be inhibited until alert is acknowledged.	Alarm	
Actual Fuel usage Value Error	Actual Fuel usage value is below the threshold value	Warning	
Actual Speed Value Error	Actual Speed value is below the threshold value	Warning	
Adjust for Set and Drift Failure	Track control no longer computing set and drift correction due to degraded state of one or more data types: True Heading, Water Speed, Position, Rate of Turn.	Warning	
AFC Mode Error	The AFC mode of the transceiver is in conflict	Warning	
Aggregated Generic Data Unusable	Sensor Aggregated Generic Data Integrity VisionMaster FT	Alarm or Caution	Depending on configuration
AIS Almost Full	The number of AIS targets is about to exceed system capacity.	Caution	
AIS Communication Failed	Communication with the AIS unit has failed. AIS targets are not available.	Warning	
AIS Degraded	AIS degraded because DR'ing	Warning	
AIS Disabled	Ownship position is being dead reckoned, datum is invalid or Ownship heading is unusable.	Warning	

Alert Type	Description	Priority	Notes
AIS Full	The number of AIS targets exceeds system capacity (maximum 250). AIS targets that are furthest away are not displayed.	Warning	
AIS Interface Failure	An interface with the AIS unit has failed	Warning	
AIS MMSI Mismatch	Expected AIS transceiver MMSI {0}, actual VDO MMSI {1}	Warning	
AIS: Integrity Error	Alarm generated by AIS hardware	Warning	
App Version Mismatch	Not all nodes running same version of application. Can cause unpredictable system behaviour. Ensure that all nodes have the same version installed, and restart the system.	Warning	
Approaching Route End	Approaching the end of the route.	Alarm or Warning	Depending on configuration
Approaching Waypoint	Approaching a waypoint on the external route.	Alarm or Warning	Depending on configuration
ARCS Skipper Not Supported	System detects ARCS Skipper permits installed. Only ARCS Navigator permits are supported for operation with ARCS RNC charts.	Warning	
Area With Special Conditions (ECDIS)	Crossing an area with special conditions on the chart along the ship's present course.	Warning or Caution	Depending on configuration
Arrival Time Not Achievable	System cannot generate speed orders for ship to arrive at desired arrival time and are within the speed limits of the monitored route.	Warning	
Attitude Unusable	Sensor Attitude Integrity VisionMaster FT	Alarm or Caution	Depending on configuration
Authorization Failure	System is Unauthorized	Warning	
Autopilot Communication Failed	Communication with the autopilot has failed. The system cannot control the autopilot.	Alarm	

Alert Type	Description	Priority	Notes
Autopilot Interface Failure	An interface to the autopilot has failed.	Warning	
Autopilot Power Failure	Power supplied to autopilot has failed.	Warning	
Autopilot Power Reduced	Power level supplied to autopilot has been reduced.	Warning	
Autopilot software update needed	When in HDG or Joystick mode, autopilot will not automatically adjust rudder bias. This can adversely affect steering accuracy in significant currents or winds. Autopilot software update is available to correct. Note - rudder bias is applied correctly when using the NP4000 in AUTO mode and when operating in Track mode.	Caution	
AZ Entry	Target has entered an Activation Zone	Warning	
AZ Full	Activation Zone Full	Warning	
Azimuth Error	Number of azimuths per revolution has varied from its nominal value of 4096	Warning	
Backup Navigator	Description text set at runtime.	Emergency	
Blank sectors invalid	Tracker - blank sectors failed to configure	Warning	
Bow Crossing Limit	Target has infringed bow crossing limits.	Alarm	
Bow Ground Speed Unusable	Sensor Bow Ground Speed Integrity VisionMaster FT	Alarm or Caution	Depending on configuration
Bypassed Critical Point(s)	One or more critical points have been bypassed by temp route.	Warning	
Chart Available	No chart displayed at the ship's position, but a chart is available for the ship's position.	Warning	
Chart Cautions	Cautions found on the chart along the ship's present course.	Alarm	

Alert Type	Description	Priority	Notes
Chart Dangers	Dangers found on the chart along the ship's present course.	Alarm	
Chart Permission Expired	The permit for ENC [cell] has expired. This cell may be out of date and MUST NOT be used for Primary NAVIGATION.	Warning	
Chart Permissions	Chart subscription service has expired.	Warning	
Chart Permissions Expiring	Chart subscription service will expire in less than 30 days. Contact chart agent or distributor for subscription renewal	Warning	
Chart Render Failure	A chart render failure has been detected.	Alarm	
Charts Activation Error	Problem encountered during the activation of charts copied from a remote node. Copy operation must be performed again.	Caution	
CMAP eToken Mismatch	Insert Correct eToken And Restart The System	Warning	
Colors Not Approved	The colors are potentially unsafe	Warning	
Config File Mismatch	Config File Mismatch	Warning	
Config File Modified	Config File Modified	Warning	
Control Panel Comms	Communication with the control panel has failed.	Warning	
Course Criteria Violated	Target violated course criteria for a zone.	Warning	
Course Difference	Difference limit between heading and route bearing exceeded.	Warning	
Course Over Ground Unusable	Sensor Course Over Ground Integrity VisionMaster FT	Alarm, Warning or Caution	Depending on configuration
CPA/TCPA Limit	Target has infringed CPA/TCPA limits.	Alarm	
Critical Point Abeam	Ship is abeam a Critical Point.	Warning	

Alert Type	Description	Priority	Notes
Critical Point Approach	Critical Point is now within the specified time or distance.	Warning	
Critical Point Off Route	Critical point is too far off the route.	Warning	
Crossing NAV Hazards	Crossing a navigation hazard on the chart along the ship's present course.	Warning or Caution	Depending on configuration
Crossing Safety Contour	Crossing a safety contour on the chart along the ship's present course.	Alarm	
Detail Logdisabled	Unable to log to Detail Logdatabase.	Warning	
Database Connection	Database Connection Has Failed	Warning	
Database Initializing	Database is initializing. After a brief initialization period, updates made while detached will be available for import.	Warning	
Database Node Missing	Node(s) listed are switched off or not connected to the network. Any changes made while nodes not connected will result in their data being overwritten with current database when they are reconnected. Potentially affects Routes, Pls, GoTo locations, RADAR maps, Manual chart updates.	Warning	
Database Server	Database server not found. Changes made to local database may be lost when reconnecting. Export a backup of changes recommended.	Warning	
Database Synchronization	Database at this node is synchronizing to the system database. Synchronization must complete before making changes to any database items, including Routes, Pls, GoTo locations, RADAR Maps, Manual Updates, and User Profiles.	Warning	
Database Updates	Local changes import failed for:	Warning	

Alert Type	Description	Priority	Notes
Date and Time Unusable	Sensor Date and Time Integrity VisionMaster FT	Alarm, Warning or Caution	Depending on configuration
Datum Offset Unusable	Sensor Datum Offset Integrity VisionMaster FT	Alarm or Caution	Depending on configuration
Depth Below Keel Unusable	Sensor Depth Below Keel Integrity VisionMaster FT	Alarm, Warning or Caution	Depending on configuration
Depth Below Transducer Unusable	Sensor Depth Below Transducer Integrity VisionMaster FT	Alarm, Warning or Caution	Depending on configuration
Depth Below Waterline Unusable	Sensor Depth Below Waterline Integrity VisionMaster FT	Alarm, Warning or Caution	Depending on configuration
Dew Point Unusable	Sensor Dew Point Integrity VisionMaster FT	Alarm or Caution	Depending on configuration
Distance To Quay Unusable	Sensor Distance To Quay Integrity VisionMaster FT	Alarm or Caution	Depending on configuration
Distribution Service Error	Distribution service is not running	Warning	
Docking Speeds Unusable	Sensor Speed And Distance Integrity VisionMaster FT	Alarm or Caution	Depending on configuration
Draft Unusable	Sensor Draft Integrity VisionMaster FT	Alarm or Caution	Depending on configuration

Alert Type	Description	Priority	Notes
Dual Homing Config Error	Conflict detected in VMFT configuration of Dual Homing and actual setup.	Warning	
Dual Homing Fault	No connection on one or more of the network adapters.	Warning	
Dynamic Licensing Insufficient Credits	Dynamic Licensing has been disabled because there are no chart credits remaining.	Warning	
Dynamic Licensing Low Credits	Dynamic Licensing has a low number of chart credits remaining.	Warning	
Dynamic Licensing Report Expired	Dynamic Licensing has been disabled because the Dynamic Licensing report is past due.	Warning	
Dynamic Licensing Report Near Due	The Dynamic Licensing report is almost due. Charts must be reported by {0}.	Warning	
Early Course Change	Early course change alert issued based on wheel-over TTG.	Warning	
Early Course Change	Early course change alert issued based on wheel-over TTG. The operator messages will be inhibited until this alert is acknowledged.	Alarm	
Engine Mass Based Fuel Consumption Rate Unusable	Sensor Engine Mass Based Fuel Consumption Rate Value Integrity VisionMaster FT	Alarm or Caution	Depending on configuration
Engine Power Value Unusable	Sensor Engine Power Value Integrity VisionMaster FT	Alarm or Caution	Depending on configuration
Engine Propulsion Power Unusable	Sensor Engine Propulsion Power Integrity VisionMaster FT	Alarm or Caution	Depending on configuration
Engine RPM Unusable	Sensor Engine RPM Integrity VisionMaster FT	Alarm or Caution	Depending on configuration
Engine Speed Value Unusable	Sensor Engine Speed Integrity VisionMaster FT	Alarm or Caution	Depending on configuration

Alert Type	Description	Priority	Notes
Engine Thrust Value Unusable	Sensor Engine Thrust Value Integrity VisionMaster FT	Alarm or Caution	Depending on configuration
Engine Torque Value Unusable	Sensor Engine Torque Value Integrity VisionMaster FT	Alarm or Caution	Depending on configuration
Engine Total Energy Value Unusable	Sensor Engine Total Energy Value Integrity VisionMaster FT	Alarm or Caution	Depending on configuration
Engine Total Revolutions Value Unusable	Sensor Engine Total Revolutions Value Integrity VisionMaster FT	Alarm or Caution	Depending on configuration
Entry Criteria Violated	Target violated entry criteria for a zone.	Warning	
Error Finding Dangers	An error finding dangers on the chart has been detected.	Warning	
Excessive Turn Rate Required	Difference limit between required turn rate and planned turn rate exceeded.	Warning	
Exit Criteria Violated	Target violated exit criteria for a zone.	Warning	
External Equipment Malfunction	Equipment malfunction detected on Alert Management Interface.	Caution	
External Route Degraded	External route data from the selected source is degraded.	Warning	
External Route Unusable	External route data from the selected source is unusable.	Warning	
External Targets Comms	No external targets received on port.	Warning	
Fuel Consumption Corrected Unusable	Sensor Fuel Consumption Corrected Integrity VisionMaster FT	Alarm or Caution	Depending on configuration

Alert Type	Description	Priority	Notes
Fuel Consumption Observed Unusable	Sensor Fuel Consumption Observed Integrity VisionMaster FT	Alarm or Caution	Depending on configuration
Fuel Consumption Volume Unusable	Sensor Fuel Consumption Volume Value Integrity VisionMaster FT	Alarm or Caution	Depending on configuration
Fuel Density Unusable	Sensor Fuel Density Integrity VisionMaster FT	Alarm or Caution	Depending on configuration
Fuel Heat Value Unusable	Sensor Fuel Heat Value Integrity VisionMaster FT	Alarm or Caution	Depending on configuration
Fuel Specific Gravity Unusable	Sensor Fuel Specific Gravity Value Integrity VisionMaster FT	Alarm or Caution	Depending on configuration
Fuel Temperature Unusable	Sensor Fuel Temperature Integrity VisionMaster FT	Alarm or Caution	Depending on configuration
Generic Data Unusable	Sensor Generic Data Integrity VisionMaster FT	Alarm or Caution	Depending on configuration
Generic Data with Units Unusable	Sensor Generic Data with Units Integrity VisionMaster FT	Alarm or Caution	Depending on configuration
Global Thread Delay Detected	A potential global thread delay has been detected, verify this by checking the periodic thread delay log file.	Caution	
Heading Joystick Interface Failure	An interface to the heading joystick has failed.	Warning	
Heading Marker Error	A heading marker has not been received for at least 10 seconds	Warning	
Heading Uncorroborated	Sensor Heading Uncorroborated VisionMaster FT	Warning	
Heave Unusable	Sensor Heave Integrity VisionMaster FT	Alarm or Caution	Depending on configuration

Alert Type	Description	Priority	Notes
I/O Device Unavailable	I/O Device Unavailable	Warning	
Inaccurate Chart	Positions on this chart are inaccurate, because this chart does not provide a mapping to standard WGS-84 coordinates.	Warning	
Incompatible PCIO firmware	PCIO firmware required is v1.04 or later.	Warning	
Incorrect Compass Ratio.	Configured compass ratio is incorrect for current board type.	Warning	
Internal Error	An unrecoverable internal error has occurred, please restart the equipment	Warning	
Interswitch Comms	Interswitch communications failed. Transceiver source unknown. Top Unit settings may be invalid (e.g. Heading Marker Offset, Turning Unit Offset)	Warning	
Interswitch Model Conflict	The interswitch model conflicts with the configured model	Warning	
Interswitch Request Failed	The Interswitch request failed.	Warning	
Invalid Datum In Use	Datum in use is not WGS84.	Warning or Caution	Depending on configuration
Invalid Network Config	Invalid network configuration detected.	Warning	
IO Comms Interrupted	IO communications interrupted on an Alert Management Interface.	Caution	
IO Comms Reception	IO communications unavailable for Alert Management Interface.	Caution	
Local Time Offset Unusable	Sensor Local Time Offset Integrity VisionMaster FT	Alarm or Caution	Depending on configuration

Alert Type	Description	Priority	Notes
Long Mute Length	The mute length setting is longer than recommended or is unlimited.	Warning	
Lost Connection	Lost connection to Distribution Service	Warning	
Lost Echo Reference	The Echo Reference Target is lost	Warning	
Lost Target	Target is lost	Warning	
Low Turn Rate Order	Turn Rate Order lower than minimum recommended. Monitor steering closely. Increase turn rate to improve steering effectiveness in this mode, especially if high winds are influencing the vessel.	Warning	
Low Video Level	The video level has dropped below the minimum threshold	Warning	
Magnetic Course Over Ground Unusable	Sensor Magnetic Course Over Ground Integrity VisionMaster FT	Alarm or Caution	Depending on configuration
Magnetic Heading Unusable	Sensor Magnetic Heading Integrity VisionMaster FT	Alarm or Warning	
Magnetic Sensor Heading Unusable	Sensor Magnetic Sensor Heading Integrity VisionMaster FT	Alarm or Caution	Depending on configuration
Magnetic Set and Drift Unusable	Sensor Magnetic Set and Drift Integrity VisionMaster FT	Alarm or Caution	Depending on configuration
Magnetic Variation Unusable	Sensor Magnetic Variation Integrity VisionMaster FT	Alarm or Caution	Depending on configuration
Maneuver Time	Time to trial maneuver is less than 30sec.	Warning	
Mariner Object Database Is Corrupt	The mariner object database has corrupt data for one or more mariner objects and these mariner objects are being ignored.	Warning	
Mariner Objects Database Errors	Mariner objects are currently unavailable due to database operation(s) that failed to execute.	Warning	

Alert Type	Description	Priority	Notes
Maximum Latitude Exceeded	Due to maximum latitude being exceeded, system inaccuracies may develop and functionality may be disabled. Inaccuracies generally become more serious as own ship travels toward the pole after exceeding the maximum latitude. Do not rely on system as primary means of navigation when operating beyond the maximum latitude.	Caution	
Minimal Safety Region	A low value for look-ahead time or distance has resulted in a small safety region for detecting chart dangers on own ship's course. This may not provide adequate time to take action if a danger is detected. Use the 'Chart Dangers' menu to increase look-ahead if necessary.	Caution	
Monitor Comms	No Response: The system is unable to communicate with the LCD through its serial port. Use the external knob to manually adjust backlight brightness.	Warning	
Monitor Data	Bad Data: The LCD monitor failed to acknowledge a command. Use the external knob to manually adjust backlight brightness.	Warning	
Multiple Interfaces On SCU	A switched SCU is communicating over multiple interfaces.	Warning	
Multiple Master SCUs	The autopilot has identified multiple master SCUs.	Warning	
Next Turn EBL Comms	No messages received from external VMS system.	Warning	
No CAM Watchmode	There are no CAM supporting product types in the system in CAM watch mode.	Caution	
No Set and Drift for MOB	Man Over Board is active with no valid set and drift data. MOB event marker position is the drop location and will not be adjusted for set and drift.	Warning	

Alert Type	Description	Priority	Notes
No SIC	There is no Station In Control.	Warning	
No SIC Timeout	No Station In Control for a period greater than the configured SIC timeout.	Warning	
Object Type Not Found	A mariner created object in view is not be displayed because its type cannot be found in the type library.	Warning	
Off Track	Off-track distance exceeds the limits of the route.	Alarm	
Outside Anchor Watch Area	Possible anchor drag detected. Ship is farther from the anchor drop location than the specified anchor chain length allows.	Alarm or Warning	Depending on Escalation
PCIO Comms Failure	PCIO acknowledge Comms Failure	Warning	
PCIO Reset	The PCIO has rebooted	Warning	
PCIO USB Comms	The PCIO USB communications has failed	Warning	
Pitch Unusable	Sensor Pitch Integrity VisionMaster FT	Alarm or Caution	Depending on configuration
Playback Suspended	Failed to write to storage device	Warning	
Port Output Too Slow	A given port cannot output the requested data fast enough.	Warning	
Position Uncorroborated	Sensor Position Uncorroborated VisionMaster FT (when in Track Control)	Warning	
Position Unusable	Sensor Position Integrity VisionMaster FT	Alarm or Warning	Depending on configuration
Predicted Path Mismatch	Target vectors and own ship vectors are water stabilized but the predicted path is always ground stabilized.	Warning	
Predicted Ship Mismatch	Target vectors and own ship vectors are water stabilized but the predicted ship is always ground stabilized.	Warning	

Alert Type	Description	Priority	Notes
Predicted Vector Mismatch	Target vectors and own ship vectors are water stabilized but the predicted vector is always ground stabilized.	Warning	
Pressure Ground Unusable	Sensor Pressure Integrity VisionMaster FT	Alarm or Caution	Depending on configuration
Propeller RPM and Pitch Unusable	Sensor Propeller RPM and Pitch Integrity VisionMaster FT	Alarm or Caution	Depending on configuration
Propulsion Equipment Data Unusable	Sensor Propulsion Equipment Data Integrity VisionMaster FT	Alarm or Caution	Depending on configuration
Pulse Length Error	Pulse length state of the transceiver is in conflict	Warning	
Pulse Length Error	Pulse length state of transceiver regarding channel one is in conflict	Warning	
Rate of Turn Unusable	Sensor Rate of Turn Integrity VisionMaster FT	Alarm or Caution	Depending on configuration
Relative Humidity Unusable	Sensor Relative Humidity Integrity VisionMaster FT	Alarm or Caution	Depending on configuration
Relative Wind With Relative Direction Unusable	Sensor Relative Wind With Relative Direction Integrity VisionMaster FT	Alarm or Caution	Depending on configuration
Roll Unusable	Sensor Roll Integrity VisionMaster FT	Alarm or Caution	Depending on configuration
Rolls Royce Propulsion Status Unusable	Sensor Rolls-Royce Propulsion Status Integrity VisionMaster FT	Alarm or Caution	Depending on configuration
Route Leg Skipped	The ship has skipped one or more legs of the route plan.	Warning	
Route Monitoring Stopped	Route Monitoring Stopped	Alarm	

Alert Type	Description	Priority	Notes
Rudder Angle Unusable	Sensor Rudder Angle Integrity VisionMaster FT	Alarm or Caution	Depending on configuration
Rudder Equipment Data Unusable	Sensor Rudder Equipment Data Integrity VisionMaster FT	Alarm or Caution	Depending on configuration
Safe Mode Activated	This node is currently running as a stand-alone node due to network connectivity problems. The Connection Status menu provides a 'Leave Safe Mode' button to restore normal network communication, after the problem has been resolved.	Warning	
Safety Depth Shallow	The chart's safety depth is set shallower than the ship's max draft.	Caution	
Safety Height Low	The chart's safety height is set lower than the ship's height.	Caution	
SC PCIO Comms	The SC PCIO communications has failed	Warning	
Sensor Data Fault	Some sensor data is unusable or degraded. See the Sensor Status menu (under System, Diagnostics) for more details.	Caution	
Sensor Data Fix Uncorroborated	The data used to fix a sensor is not corroborated with external sensors.	Caution	
Set and Drift Unusable	Sensor Set and Drift Integrity VisionMaster FT	Alarm or Caution	Depending on configuration
Ship Overall Efficiency Corrected Unusable	Sensor Ship Overall Efficiency Corrected Integrity VisionMaster FT	Alarm or Caution	Depending on configuration
Ship Total Fuel Consumption Rate Unusable	Sensor Ship Total Fuel Consumption Rate Value Integrity VisionMaster FT	Alarm or Caution	Depending on configuration
Ship Total Power Unusable	Sensor Ship Total Power Integrity VisionMaster FT	Alarm or Caution	Depending on configuration

Alert Type	Description	Priority	Notes
Ship Total Propulsion Power Unusable	Sensor Ship Total Propulsion Power Integrity VisionMaster FT	Alarm or Caution	Depending on configuration
SIC Changed	The new station in control is:	Warning	
SIC Lost	Station In Control lost on node:	Warning	
Slave Only Display Conflict	The interswitch and config file slave only displays are incompatible	Warning	
Slave Only TCVR Conflict	The interswitch and config file slave only transceivers are incompatible	Warning	
Sonar Communication Error	Communications with the sonar system has failed.	Warning	
Sonar Returns Detected	Sonar return detected within safety region and above safety depth.	Alarm	
Sonar System Error	The sonar system has reported an error.	Warning	
Specific Fuel Rate Corrected Unusable	Sensor Specific Fuel Rate Corrected Integrity VisionMaster FT	Alarm or Caution	Depending on configuration
Specific Fuel Rate Observed Unusable	Sensor Specific Fuel Rate Observed Integrity VisionMaster FT	Alarm or Caution	Depending on configuration
Speed Control Relinquished	Speed Control Relinquished	Alarm	
Speed Criteria Violated	Target violated speed criteria for a zone.	Warning	
Speed Over Ground Unusable	Sensor Speed Over Ground Integrity VisionMaster FT	Alarm, Warning or Caution	Depending on configuration

Alert Type	Description	Priority	Notes
Standby/Transmit Error	The standby transmit state of the transceiver is in conflict	Warning	
Steering Control Received	The autopilot has transferred steering control to this system. Control of the heading command and the ability to activate track control is available at one or more stations.	Warning	
Steering Control Relinquished	System has relinquished steering control. Autopilot or another device or system will control steering until control is transferred back to this system.	Warning	
Stern Ground Speed Unusable	Sensor Stern Ground Speed Integrity VisionMaster FT	Alarm or Caution	Depending on configuration
STPW Unusable	Sensor Ship Total Power Integrity VisionMaster FT <i>applicable when Track Control is configured and for ECDIS only configurations.</i>	Alarm or Caution	Depending on configuration
STW Unusable	Sensor Speed Through Water Integrity VisionMaster FT	Alarm, Warning or Caution	Depending on configuration
System Tracks Almost Full	Tracking 95% of the system maximum number of targets	Caution	
System Tracks Full	Tracking the system maximum number of targets.	Warning	
Target Anchor Drift	Target out of the anchor watch limit circle.	Warning	
Targets Full	System cannot allocate any more target numbers	Warning	
Temperature Unusable	Sensor Temperature Integrity VisionMaster FT	Alarm or Caution	Depending on configuration
Temporary Authorization	System is only temporarily authorized	Warning	

Alert Type	Description	Priority	Notes
Test targets failed	Turning on/off moveable test targets failed.	Warning	
Time Unusable	Sensor Time Integrity VisionMaster FT	Alarm or Caution	Depending on configuration
TM Reset	The system will reset the ship's plotted position momentarily.	Warning	
Top Unit Conflict	There is a discrepancy between the number of top units configured on this node and the rest of the system	Warning	
Total Set and Drift Unusable Alarm	Sensor Total Set and Drift Integrity VisionMaster FT	Alarm or Caution	Depending on configuration
Track Control Stopped	Track control stopped warning.	Alarm or Warning	Depending on configuration
Track Control Using Man Speed	Track control is providing heading orders based on manual speed. Track keeping performance may be degraded if the entered speed does not match the actual speed.	Warning	
Tracking Failure	SC tracking data not present	Warning	
Tracking Unavailable	The heading data used for tracking is either invalid or unavailable.	Warning	
Tracks Almost Full	Tracking 95% maximum number of targets	Caution	
Tracks Full	Tracking maximum number of targets	Warning	
Transceiver BITE	There is an error reported by the transceiver BITE	Warning	
Transceiver Control Loss	Mastership of the Transceiver was taken by another operator.	Warning	
Transceiver Disconnected	Connection to the requested transceiver terminated.	Warning	
Transceiver Disconnected	No connection to the requested transceiver is available.	Warning	

Alert Type	Description	Priority	Notes
Transducer Data Unusable	Sensor Transducer Data Integrity VisionMaster FT	Alarm or Caution	Depending on configuration
Trigger Error	The trigger has dropped below the minimum threshold	Warning	
Trim Band Unusable	Sensor Trim Band Integrity VisionMaster FT	Alarm or Caution	Depending on configuration
Trim Unusable	Sensor Trim Integrity VisionMaster FT	Alarm or Caution	Depending on configuration
True Heading Unusable	Sensor True Heading Integrity VisionMaster FT	Alarm or Warning	Depending on configuration
True Wind With Relative Direction Unusable	Sensor True Wind With Relative Direction Integrity VisionMaster FT	Alarm or Caution	Depending on configuration
True Wind With True Direction Unusable	Sensor True Wind With True Direction Integrity VisionMaster FT	Alarm or Caution	Depending on configuration
Turn Radius Modified	The ordered turn radius has been automatically changed.	Warning	
Turning unit selection failed	Tracker - turning unit selection failed	Warning	
Turning Unit speed not optimal	Optimal operation with turning unit speed faster than 35 RPM requires a hardware update of the scan converter card.	Warning	
VDR Communication	VDR Communication VisionMaster FT	Warning	
Video Buffer Overflowed	The video buffer has overflowed.	Warning	
Video Failed	RADAR video cannot be displayed.	Warning	
Video Level Setting	The video level for the selected transceiver is not set correctly. This may result in poor RADAR video performance.	Warning	

Alert Type	Description	Priority	Notes
Vigilance	Operator is not alert.	Alarm	
Water Temperature Degraded	Sensor Water Temperature Integrity VisionMaster FT	Alarm or Caution	Depending on configuration
Water Temperature Unusable	Sensor Water Temperature Integrity VisionMaster FT	Alarm or Caution	Depending on configuration
Wheelover Notifications Off	System will not provide messages to indicate planned course changes due to 'Wheelover Notifications' being switched off on 'Monitor Route' menu. On systems with track control available, notifications are automatically switched on whenever Track mode is engaged.	Warning	

List of Alarms and Warnings specific to Client/Server Radar

Alarm	Description	Possible Causes
PCIO USB Comms	The PCIO USB communications has failed	Server to PCIO USB cable disconnection.
Tracking Unavailable	The heading data used for tracking is either invalid or unavailable.	Server to PCIO cable disconnection.
Transceiver Unavailable	The Transceiver is unavailable for selection from the Client node	Client/Server channel connection unavailable.
Sensor Alarms	Sensor alarms have been raised.	PCIO serial port disconnection for sensor input.
Server Connection Terminated	Communication with server has been terminated.	1. Client/Server channel connection unavailable. 2. Server to PCIO cable disconnection. 3. Server to Transceiver comms disconnection.
Server Failure	The connection to the server has been lost.	

Warning	Description	Possible Causes
Heading Marker Error	A heading marker has not been received for at least 10 seconds	1. Client/Server channel connection unavailable. 2. Server to PCIO cable disconnection. 3. Server to Transceiver comms disconnection.
Interswitch Request Failed	The Interswitch request failed.	A Client node has unsuccessfully attempted to change a Client/Transceiver connection at the Interswitch menu. Usually because two or more Clients have requested control of the same transceiver.
Low Video Level	The video level has dropped below the minimum threshold	1. Client/Server channel connection unavailable. 2. PCIO to Transceiver video cable disconnection. 3. Server to PCIO cable disconnection.
Video Data Watchdog	Video data not received for a time.	
NFE PCIO Comms	The NFE PCIO communications has failed	Server to PCIO cable disconnection
Standby / Transmit Error	The standby transmit state of the transceiver is in conflict	1. Client/Server channel connection unavailable. 2. Server to PCIO cable disconnection. 3. Server to Transceiver comms disconnection. 4. Client/Server/Transceiver Standby/Transmit mismatch.
Transceiver Control Loss	Mastership of the Transceiver was taken by another operator.	A Client node has selected control of a Transceiver at the Interswitch menu. The Client node that is currently Master will be set to Slave.
Transceiver Changed	The transceiver is changed due to interswitching.	A Client node has changed the Client/Transceiver connection by selecting a different interswitch setting in the Interswitch menu.
Transceiver Comms	The communications from the selected transceiver have failed	1. Client/Server channel connection unavailable. 2. Server to PCIO cable disconnection. 3. Server to Transceiver comms disconnection.

Chapter 8 Routes

This section describes route editing, monitoring, display and storage. The following topics are covered.

- A description of Routes.
- Creating and editing routes graphically on screen, see Creating a Route.
- Editing a route from a menu, see Edit Route.
- Monitoring a validated route, see Monitoring a Route.
- Calculating the time, speed and distance between waypoints on a monitored route, see ETA Calculator.
- Specify the speed for a current leg and future legs on a monitored route, see Route ETA.
- Specify an arrival time on a monitored route, the system then calculates the speed required to achieve this arrival time, see Required Speed.
- Specify variable speeds to be used on remaining segments of a monitored route, see Speed Planning.
- View and edit SAR pattern routes, see Search and Rescue.
- Viewing a summary of the active leg of a monitored route, see Route Status.
- Importing, exporting or backing up a route, see Importing and Exporting a Route.
- Displaying route information, see Route Display Settings.

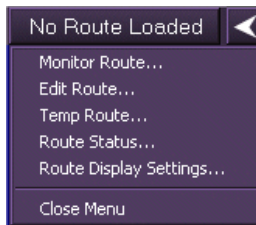
Routes
Monitor Route
ETA Calculator
Route ETA
Required Speed
Speed Planning
Edit Route
Temp Route
Search and Rescue
Route Status
Route Import / Export
Route Display Settings

The Route sub-menus can be accessed by either:

1. clicking on Routes from the Main Menu list;
or
2. clicking the Route field in the upper toolbar.

The Routes sub menu list includes the following:

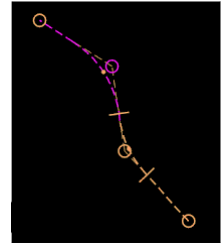
- Monitor Route
- ETA Calculator
- Route ETA
- Required Speed
- Speed Planning
- Edit Route
- Temp Route
- Search and Rescue
- Route Status
- File Import / Export
- Route Display Settings



 *The Routes sub menu list will also include External Route, if configured at initialisation. Refer to Chapter 1 'Configuration' in Volume 2 of the VisionMaster Ship's Manual.*

Routes

A route consists of a number of defined waypoints and adjoining lines (legs). Waypoints³⁰ are marked by small circles; legs are displayed as straight lines between two waypoints. If a waypoint has both an approaching leg and a departing leg, the system automatically generates a turn at the waypoint to indicate the planned path of the ship. Wheelover³¹ marks are represented by short lines, in the same colour as the route, which cross the track at a relatively short distance before the turn begins. The distance is configurable to be appropriate for the ship's turning characteristics.



Waypoint legs are represented as thin dashed lines. The route plan is represented as a thick long-dashed line.

There are three types of routes:

- **Internal Routes** - An internal route can be created and saved at a single VisionMaster FT console, or it may have been created on another ship's VisionMaster FT system and copied using the file Import/Export function.
- **External Routes** - These are routes created by and stored at an external device, which can then be transmitted and distributed to all nodes on a network for display and monitoring, see External Routes
- **Temporary Routes** - A temporary route is a route that starts at own ship's CCRP, and can be edited quickly on the chart display, see Temporary Route. Temporary routes are intended for one-time manoeuvres and deviations from pre-planned internal routes. On ships installed with VisionMaster FT track control, temporarily routes can also be used to steer the ship onto a planned internal route.

When a route has been imported or created all the details of the route can be viewed and edited from the Edit Route sub menu. The saved internal route can be monitored from the Monitor Route sub menu.



It is advisable that routes created by the operator should be backed up to an external device (usually a USB memory stick). This is done from the File Import/Export window.

³⁰ A geographical Latitude/Longitude location on a route indicating a significant event on a vessel's planned route (for example, course alteration point, calling in point, etc).

³¹ The geographic location, represented by a line where rudder movement should be activated to accomplish a planned turn. The wheelover (WO) line may be displayed perpendicular to the approaching track or parallel to the departing track of each turn.

Multi-node Support

On a multi-node system internal routes are saved and retrieved from a database.

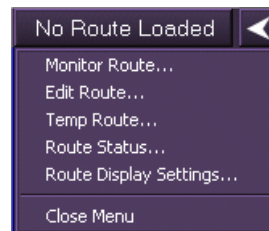
Routes saved to the database can also be loaded for monitoring from any node on the network, only one route may be monitored in a multi-node system. The same route monitoring information and monitored track is displayed on all nodes, regardless of which node the operator began monitoring.

Unlike a monitored route, a route that is opened for editing from the Edit Route sub menu may be edited independently on each node. In addition, an external route that is displayed on a particular node may be specified independently for each node.

Creating a Route

To create waypoints you must first select **Edit Route**, either by clicking on the Routes button on the upper toolbar (before a route is loaded this button will display the message **No Route Loaded**), or by selecting from the Routes menu.

When Edit Route is selected waypoints can be created anywhere within the chart display (routes are not limited to the True Motion limits).



Adding a Waypoint

There are two screen options initially available when adding waypoints:

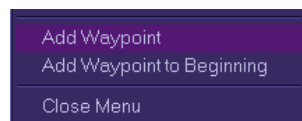
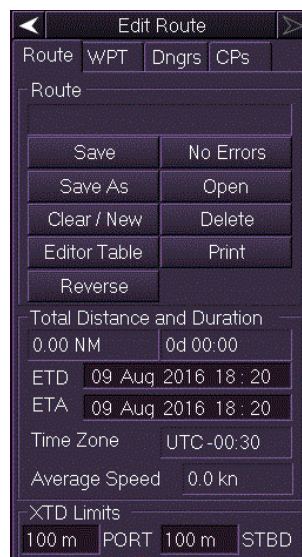
- Add Waypoint; or
- Add Waypoint to Beginning.

If the waypoint to be added is the first in the route, then either waypoint option can be selected.

 *You can select to annotate routes on screen (with waypoint and wheelover numbers, planned leg speed and leg bearing data) by selecting the display options from Route Display Settings.*

To add a waypoint do the following:

1. With Edit Route displayed, right click in the chart display at the point where the waypoint is to be placed. A semi-transparent window appears at the point where the selection was made.
2. Click on either the **Add Waypoint** or **Add Waypoint to Beginning** field from the window.



Add Waypoint

Add Waypoint is selected where the insertion of a new waypoint is to be made **after** the last waypoint, e.g. if the last waypoint on the route was **WPT5** then the appended waypoint will be **WPT6**.

To add a waypoint to a route, do the following:

1. Select **Add Waypoint** from the semi-transparent window. The screen shows a coloured circle at the cursor point when the waypoint selection was made. To view the waypoint Latitude/Longitude position, select the waypoint and click on the Edit Routes Waypoints tab, see Editing a Route.
2. To add an additional waypoint, position the cursor at the required point and select **Add Waypoint** again. An additional waypoint is created.

When two or more waypoints are created a straight route leg is drawn between each waypoint.

When three or more waypoints are created the system displays the turn radius at each waypoint (except first and last) using the system default radius, or a radius value modified by the user, see Editing a Route.

Add Waypoint to Beginning

Add Waypoint to Beginning is selected where the insertion of a new waypoint is to be numbered **before** the first waypoint in the route e.g. the new waypoint becomes **WPT1** and all other waypoint references are moved up one digit accordingly.

To add a waypoint to the beginning of a route, do the following:

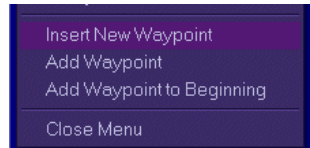
1. Select **Add Waypoint to Beginning** from the window. The screen shows a coloured circle at the cursor point when the waypoint selection was made. To view the waypoint details click on the Edit Routes Waypoints tab, see Editing a Route.
2. To add another waypoint before the first waypoint, position the cursor at the required point and select **Add Waypoint to Beginning** again. The new waypoint becomes **WPT1** and the first waypoint changes to **WPT2**.

Inserting a Waypoint

A new waypoint can be inserted at a selected point along the straight segments of a route leg. A wheelover line is automatically created with the waypoint.

To insert a new waypoint, do the following:

Right click route leg where you want to insert a waypoint and select **Insert New Waypoint** from the semi-transparent window. A new waypoint is created at the selected route leg position, together with a wheelover line.



The wheelover line is a short orange line drawn across the route leg immediately preceding a planned turn. The wheelover line moves in accordance with any changes made to the waypoint location.

The distance between the wheelover and the start of the turn depends on ship turning characteristics as configured in the system. Wheelovers are always bow referenced, i.e. own ship will start the turn when its bow reaches the wheelover line, NOT the ship's CCRP.

The new waypoint and wheelover are automatically numbered depending on their position on the route, e.g. if the waypoint is created on the leg between waypoints W3 and W4 then the new waypoint becomes W4 and all subsequent waypoints on the route are re-numbered accordingly.

The position of inserted waypoints can be modified as described in 'Changing a Waypoint's Position'.

Changing a Waypoint's Position

A waypoint's position can be changed directly on screen, or by entering a Latitude/Longitude value in the Waypoints tab folder.

To change a waypoint's position on screen, do the following:

1. Move the cursor over the waypoint to be edited. The cross hair cursor changes to a bidirectional arrow indicator.
2. Left click on a waypoint to select. When a waypoint is selected the waypoint circle, adjoining legs and turn radii change to an editable colour.
3. Hold down the left key and use the trackball to move the waypoint around the screen; the route's attributes change as the waypoint is moved. Release the left key when the waypoint is at the desired location.

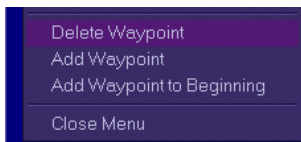
To numerically specify an exact Latitude/Longitude position for the waypoint refer to Editing a Route Plan.

Delete a Waypoint

A waypoint's position can be deleted either directly on screen, or in the Waypoints tab folder, see Edit Route.

To delete a waypoint from a route, do the following:

Right click on the waypoint to be deleted and select **Delete Waypoint** from the semi-transparent window.



 *When a waypoint is deleted all waypoint references are adjusted accordingly.*

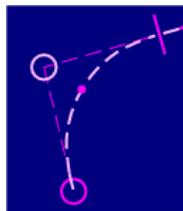
Changing a Waypoint's Turn Radius

A waypoint's turn radius can be manually changed, either on screen or in the Waypoints tab folder, see Edit Route.

 *When the turn is created, its turn radius is set to either the previous turn's radius, or, if this is the first turn, it is set to the default radius.*

To change a turn radius do the following:

1. Click on the small dot at the centre of the radius. The cursor changes to a bidirectional arrow indicator.
2. With the dot highlighted hold down the left key and use the trackball to drag the radius dot to the desired position. The route and wheelover lines are redrawn as the turn radius is changed.
3. The route data shown in the Waypoints tab folder also changes to reflect the revised co-ordinates. The radius can also be adjusted numerically, or as a result of numeric adjustment of the turn rate, see Editing a Route.



Editing a Route

Edit Route

The Edit Route sub-menu includes the following tab folders:

- Route
- WPT (Waypoints)
- CPs (Critical Points)
- Dngrs (Dangers)

Internal routes are opened, saved, validated and managed from the **Route** tab folder.

The **WPT** tab folder enables all the route's attributes (waypoint, leg and turn data) to be edited.

The **CPs** tab folder allows the operator to insert alerts, in the form of a warning, along a route.

The **Dngrs** tab folder lists objects and areas that could endanger the safety of own ship on the route currently opened from the **Route** tab.

 *The Dangers tab will only appear if Safety Checking has been selected in the system configuration. Refer to Chapter 1 'Configuration' in Volume 2 of the VMFT Ship's Manual.*

Route Tab Folder

Routes are managed from the Route tab folder of the Edit Route sub-menu. The folder is divided into the following areas:

- Route
- Total Distance and Duration
- XTD Limits
- Description and Notes

Route

From the Route area of the folder you can perform the following route management functions:

- **Save** - save a newly created route, or save changes to the route under the same name, the previous version of the route is overwritten and the revised date for the route changes accordingly as indicated in the list of available routes (if displayed).
- **No Errors/Errors** - the system checks the validity of the loaded route, if there are no errors in the route the button displays **No Errors** in the system background colour. If the route's attributes do contain errors the route cannot be validated and the button changes to display **Errors** with a yellow background.



A route can be saved even if it does contain errors. However the route must have no errors before it can be loaded for monitoring.

- **Save As** - used when either creating a new route, or to rename an existing route. The route name and current date are added to the Load Route list.
- **Open** - load a previously saved route for editing.
- **Clear/New** - clear an existing route from the screen prompting the user to save an unsaved route if necessary.
- **Delete** - delete a route from the list of previously saved routes.

- **Editor Table** - enables the operator to edit all waypoint and leg attributes for the edited route via a separate movable window, see Route Editor Table.
- **Print** - if a printer is connected to the system (either local or network) a print of the currently loaded route can be made.
- **Reverse** - generate a new route that is a mirror image of the original route.

A route may be selected with a double mouse click on the Edit Route menu.

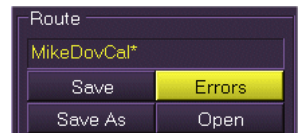
To manage a route, do the following:

To save a route:

1. If changes to a route have been made the route name shows an asterisk after the name (e.g. **Route 2***). To save a route click on the **Save** button, or if the changes made to a route are to be saved under a new name, click on the **Save As** button. A window appears prompting to enter a name for the route.
2. Enter a name using the screen keypad and click on the keypad **OK** button.
3. The route name is entered, the current time/date is listed in the Open Route window and a temporary prompt appears confirming that the route plan has been saved.

To check for errors on a route:

1. If changes to the route's attributes are not validated by the system the **No Errors** button changes to **Errors** with the button's background colour and route's name in yellow.
2. To check the error messages click on the **Errors** button. A Route Validation Messages window is displayed. Any errors on the route appear in the messages field. Click the **OK** button to confirm.



If the route has no errors the message **{No validation messages}** appears. The route is correctly validated and can be loaded for monitoring when required.

 *The validation process only checks the geometry of a route. To check the route against dangers, refer to Edit Route - Dangers.*

To open a previously saved route:

1. Click on the **Open** button. The **Open Route** window appears prompting to select a route to open and displaying a list of existing

routes on the workstation with the last modified date of each route. Routes shown in yellow are routes that have not been correctly validated. Below the list the **Description** field contains a description (if any) of the selected route.

2. Select the route to be opened from the list, scroll down the list if necessary, and with the route selected click on the **OK** button. The route data appears in the Route folder and a graphic representation of the route appears on screen, assuming the displayed location contains the route.

To clear a route from the chart display:

1. With the selected route displayed click on the **Clear/New** button.
2. If unsaved changes have been made to the route, a Close Confirmation window appears prompting to Save, Don't Save or Cancel the closure.
3. Select the required option, the route is cleared from the screen.

To delete a route from the route list:

1. Click on the **Delete** button. The **Delete Route** window appears prompting to select a route to delete and displaying a list of existing routes on the workstation with the last modified date of each route. Below the list, the **Description** field contains a description (if any) of the selected route.
2. Select the route to be deleted from the list, scroll down the list if necessary, and with the route selected click on the **OK** button. The screen prompts to confirm deletion of the selected route.
3. Click the **Yes** button to confirm deletion. The route is deleted and the file name removed from the list.

Delete Route

Please select a route to delete.

Name	Modified
route 1	07 Feb 2008
route 2	07 Mar 2007
route	01 Mar 2007
ROUTE 3	01 Mar 2007
route 12	01 Mar 2007

Description

OK Cancel

To reverse a route:

1. Open the saved route you wish to reverse from the routes database.
2. Click the **Reverse** button.
3. If you have made changes in the existing route an **Action Required** message appears stating that the unsaved changes to the existing route will be lost if you proceed.
 - a) To draw the reversed route to not include the changes made to the current route click **OK**. The changes will not be saved to the current route.
 - b) Or, to first save the changes to the current route click **Cancel** and then the **Save** button.

When a route has been reversed a temporary confirmation prompt appears. The route is re-drawn as a mirror image of the current route with the same number of waypoints, critical points and other attributes assigned to that route. No name is assigned to the reversed route.

4. To save the reversed route click on the **Save As** button and enter a name using the screen keypad.

Total Distance and Duration

The Total Distance and Duration area calculates the total route distance, the total route duration in days (if needed), hours and minutes and the average planned speed made by own ship over the entire route.

The Time Zone is displayed as [UTC](#). If the current time is set to local and a time zone offset has been applied in Time Management that time offset is shown as a plus or minus figure after UTC.

The route distance, time, and average speed are read only values which are recalculated as the route is changed. For example, if the speed for a leg is increased, the total route time will decrease and the route's average speed will increase accordingly.

The [ETD](#) displays the current date and time and the [ETA](#) displays the total route time value added to the current date and time as the estimated time of arrival. These values are updated each time the **Clear/New** button is clicked.

To change the ETD/ETA data do the following:

1. Click inside the ETD or ETA field on the specific data to be changed. The field data changes to green (editable) and the specific data is highlighted. An editing window appears directly below the selected field.
2. To move the date or time back click on the Down arrow, to move the date or time forward click on the Up arrow. To move the highlight back or forward (e.g. from Month to Year) click on the side arrows.
3. With the correct ETD/ETA data displayed click on the **OK** button.

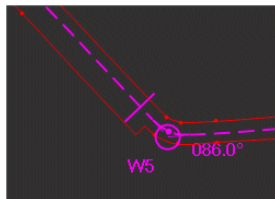
XTD Limits

The XTD Limits area enables a set of distance values to be applied for the Port and Starboard side of a route. The value represents the limit of deviation from the planned route at which the off-track alert occurs.

The settings in the Route tab will apply to all legs and turns on a route. Different XTD limits for individual legs and turns may be made from the Waypoint tab folder. The default value is 100 metres for the Port and Starboard sides.

To change the XTD Limits do the following:

1. Click in the PORT and STBD fields, the value changes to green (editable).
2. Move the trackball left to decrease the value, or right to increase. Left click again to accept the value.
3. When the XTD alarm limits have been changed an 'Action Required' prompt appears requesting confirmation of the alarm change. Click the **OK** button to confirm the change, or select **Cancel** to reject the change.



The XTD limits can be viewed along the route, providing **Show XTD Alarm Lines** is enabled in Route Display Settings. The XTD alarm lines are shown as thin red lines either side of the route line.

Description and Notes

To add a description of the route or create notes do the following:

1. Move the cursor inside the respective field and left click. A screen keypad appears from where you can enter text.
2. With the required text entered click on the keypad **OK** button. The text is saved in the Description or Notes field.

Waypoints Tab Folder

The Waypoints (WPT) tab folder displays all the waypoint and leg attributes for the route being edited. The folder is divided into the following areas:

- Route
- Waypoint
- Approaching Leg
- Turn
- Departing Leg

Route

The Route area enables the currently monitored route to be saved and validated. When a route has been saved its name is displayed above the Save/No Error buttons.

The **Save** and **No Error/Error** functions in the Waypoints tab folder are the same as described previously in the Edit Route - Route Tab.

Waypoint

The Waypoint area enables you to quickly navigate between waypoints and includes the following editing functions:

- create a new waypoint
- delete an existing waypoint
- enter a waypoint label
- change the Latitude/Longitude position of a waypoint.

Route	WPT	Dngrs	CPs
Route			
dov cal			
Save		No Errors	
Waypoint			
< WPT2		>	
<< New		Delete >>	
51°02.990' N		Goto	
001°44.930' E			
Approaching Leg			
1.95 NM		320.9°	
Rhumb Line		10.0 kn	
XTD Limits		60.0 m	PORT
		60.0 m	STBD
Turn			
1.00 NM		10 °/min	
Speed		10.0 kn	No change
XTD Limits		60.0 m	PORT
		60.0 m	STBD
Departing Leg			
2.15 NM		290.4°	
Rhumb Line		10.0 kn	
XTD Limits		60.0 m	PORT
		60.0 m	STBD

To edit the Waypoint data do the following:

The Waypoint area displays the waypoint currently selected (e.g. W3). To select the previous waypoint in the route plan click the **<** button, to select the next waypoint in the route plan click the **>** button. To select the first waypoint in the route plan click the **<<** button, or to select the last waypoint in the route plan click the **>>** button.

To enter a label for the waypoint:

1. Left click in the blank field to the right of the currently selected waypoint, the screen keypad appears.
2. Enter an identifying label using the keypad and click **OK**. The name appears in the label field, and if the Waypoint Label tick box is enabled in the Route Display Settings, also on the route plan.

To create a new waypoint:

1. Navigate to the location in the route where you want the new waypoint created and left click on either the previous waypoint or the next waypoint and then click the **New** button. The system creates a new waypoint on the route leg midway between the selected waypoint and next waypoint i.e. if **WPT1** is selected then the new waypoint becomes **WPT2** and all subsequent waypoints are automatically re-numbered.
2. Move the waypoint to the required position, either directly on screen, or by specifying its position numerically, see below.

To delete a waypoint:

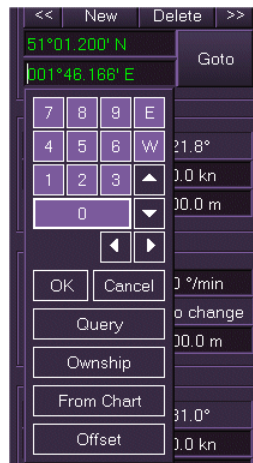
Navigate to the waypoint to be deleted using the navigation buttons and click the **Delete** button. The system deletes the selected waypoint from the route, the route is re-drawn and all subsequent waypoints are automatically re-numbered.

To specify a waypoint Latitude/Longitude (L/L) position:

1. Select the waypoint by using the Waypoint navigation buttons.
2. To centre the display on the selected waypoint click the **Goto** button.
3. To change the L/L position of the waypoint click in the L/L data fields, the text becomes editable (green) and a drop down keypad appears.

There are a number of ways of defining the L/L position for the selected waypoint.

- i. Manually enter a L/L position by using the numbers and navigation buttons on the keypad and click **OK**. The waypoint is moved to the entered position.
- ii. To place the waypoint at a specific geographic object select **Query**. Move the cursor to the display (a ? is added to the cursor) and left click, a Pick Report window appears with a list of objects in the immediate area (see Pick Report). Select the object from the list, the waypoint is repositioned over the chart object and a red circle filled with a red shaded background is drawn around the waypoint. Click **OK** on the Pick Report window to fix the waypoint at the chart object position.
- iii. To place the waypoint at own ship's CCRP select **Ownship**.
- iv. To place the waypoint at a selected location on the chart display select **Chart**. Move the cursor to the display (a ? is added to the cursor) and left click at the required location, the waypoint is repositioned to that location.
- v. To specify a range or bearing for the waypoint select **Offset**. An Offset window appears where you can set a range and bearing offset from the current position.



Approaching Leg

The Approaching Leg area enables you to edit the following attributes of the leg approaching the selected waypoint:

- Rhumb Line³² or Great Circle³³
- Leg Speed - estimate average speed for the route leg (maximum speed 99 kn.)
- XTD Limits - the distance in metres that the ship can stray from the route leg's track line before an off track error alarm occurs.
Different values may be entered for the Port and Starboard side of the route leg's track line.

The following leg attributes are read-only which automatically change if the route data is changed:

- Leg Distance - the leg distance between each waypoint.
- Leg Bearing - the bearing of the leg in degrees.

To edit the Approaching Leg data do the following:

1. To change the leg speed or off track limit click in the relevant field, the text changes to green (editable). Move the trackball left or right to change the values.
2. To change the departing or approaching leg from Rhumb Line to Great Circle click on the drop down arrow to the right of the field and make the desired selection.
3. To change the XTD limits click in the PORT or STBD field, the text changes to green (editable). Move the trackball left or right to change the values and left click to accept. The values defined will only apply to that leg.

³² A line on a sphere that cuts all meridians at the same angle; the path taken by a ship or plane that maintains a constant compass direction.

³³ A circle drawn around the Earth such that the centre of the circle is at the centre of the Earth. Following such a circle plots the shortest distance between any two points on the surface of the Earth.

Turn

The Turn area enables you to edit the following turn attributes:

- Turn Rate - the maximum turn rate is 1200°/minute.
- Turn Radius - the maximum turn radius is 10 NM.
- Speed - speed of turn, the maximum speed is 99 Kn
- XTD Limits - the cross track distance in metres that the ship can stray from the route turn track line before an off track error alarm occurs. Different values may be entered for the Port and Starboard side of the route turn track line.

To change the turn rate, turn radius, speed of turn or XTD limits, click in the relevant field, the text changes to green (editable). Move the trackball left or right to change the values.

The turn rates for each turn must be less than or equal to the Own Ship's configured maximum turn rate.

The speed of turn is used to calculate the turn rate based on the displayed turn radius data. However if the turn rate data is modified the turn speed is used to calculate new turn radius data. Often the turn speed will be the same as the approaching and/or departing leg. However, the system provides the flexibility to enter different values. This is useful when it is important to strictly adhere to a specific turn rate due to vessel type or conditions.

The turn speed must be less than or equal to the own ship's configured maximum speed. If the turn speed is adjusted the read only value to the right of the speed automatically adjusts (minus if the speed is less than the leg speed, plus if the speed is more). If the turn of speed entered is greater than own ship's speed a validation error is generated.

Departing Leg

The Departing Leg area enables you to edit the following attributes of the leg of the route, which departs from the selected waypoint:

- Rhumb Line or Great Circle
- Leg Speed - estimated average speed for the route leg. The maximum speed is 99 Kn.
- XTD Limits - as in Approaching Leg attributes

The following leg attributes are read-only values which automatically change if the route data is changed:

- Leg distance - the leg distance between each waypoint.
- Leg Bearing - the measured angle of the leg in true degrees.

To edit the Departing Leg data do the following:

1. To change the leg speed or XTD limit click in the relevant field the text changes to green (editable). Move the trackball left or right to change the values.
2. To change the departing or approaching leg from Rhumb Line to Great Circle click on the drop down arrow to the right of the field.

Default Leg and Turn Attributes

The first leg of a route inherits planned speed and XTD limit attributes from system configurable default values. Subsequent legs inherit attributes from the preceding leg.

The first waypoint of a route inherits turn radius from a system configurable default value, and turn speed from the preceding leg's planned speed. Subsequent waypoints inherit turn radius from the preceding waypoint, and turn speed from the preceding leg. Turn rate is calculated based on turn radius and turn speed, but turn rate may also be used to adjust turn radius.

Dangers

The **Dngrs** tab folder enables the operator to view objects and areas that could endanger the safety of own ship on the edited route.

When a route is opened for editing or monitoring the system continually searches the chart database and mariner objects database for objects and areas that intersect the route plan safety region.

WARNING!

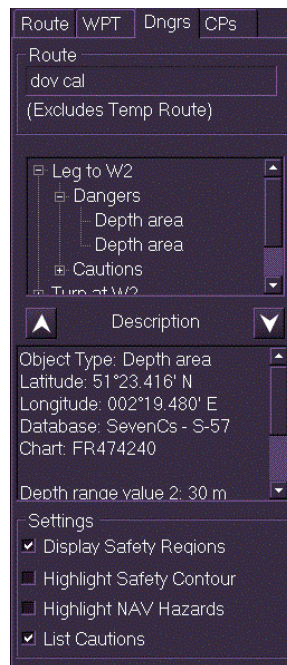
TEMPORARY ROUTES ARE NOT SEPARATELY SAFETY CHECKED. THE OPERATOR MUST RELY ON OWN SHIP SAFETY REGION FOR DETECTING DANGERS WHILE OWN SHIP IS ON A TEMPORARY ROUTE.

Route dangers are listed in a directory tree, with the dangers separated into the number of leg and turn segments on the route, the number being dependent on the number of route waypoints.

If the **List Cautions** check box is ticked the directory tree will also include cautions related to that segment.

To view route dangers or cautions on the display do the following:

1. Navigate to the required route segment by clicking on the  box. Each Leg or Turn segment is further divided into Dangers and Cautions sub directories.
2. To view a route segment's dangers click on the Dangers  box. Any dangers related to that segment are listed in the directory.
3. To view the dangers on the video circle click on each danger in the list. A graphic representation of the danger is displayed across the affected area of the route and a description of the danger, including its Latitude/Longitude position, appears in the Description field.
4. To navigate to the next danger in the list click the  arrow. To move up the list click the  arrow. As each danger is highlighted it is shown on the chart display.
5. To view cautions on the route repeat the procedure above.



Settings

The Dangers tab folder also includes the following safety settings.

- Display Safety Regions
- Highlight Safety Contour (not available on Chart Radar nodes)
- Highlight NAV Hazards (not available on Chart Radar nodes)
- List Cautions

Display Safety Regions

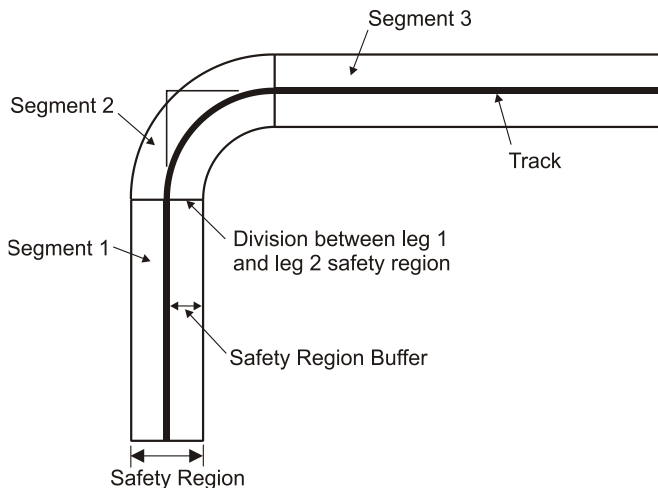
The Dangers tab folder also includes the option of displaying the route safety region. To display tick the **Display Safety Regions** check box, the safety region is displayed along the length of the route.



The route safety region is divided into segments and is defined as follows:

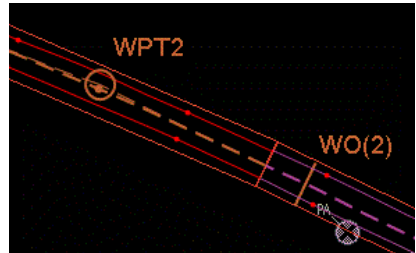
Route safety region buffer = cross track distance limit + $\frac{1}{2}$ ship beam.

The width of the safety region buffer will reflect the left and right cross track distances set in XTD Alarm limits in the Routes tab folder.



Highlight Safety Contour & NAV Hazards

The Safety Contour setting turns the display of route safety contour on and off. The NAV Hazards setting turns the display of route navigational hazards on and off. The figure below shows a route with the two check boxes ticked and the same route with neither check box ticked.



Critical Points

The Critical Points tab folder enables the operator to create specific Latitude/Longitude (L/L) positions on a route which are defined as critical points.

A warning alert is generated when own ship is in the proximity of each critical point on the route (the alert can be triggered by either a specified distance or time).

The Critical Points tab folder is divided into the following areas:

- Route
- Critical Point

The Route area enables the currently monitored route, displayed in the route name field, to be saved and validated. For a description of the Save and Error functions see Edit Route - Route Tab.

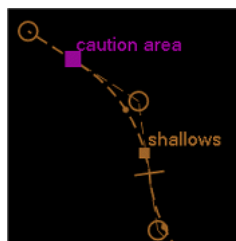
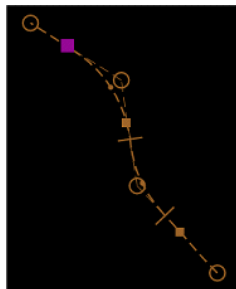
 A screenshot of the 'Critical Points' tab interface. It features a top bar with tabs for 'Route', 'WPT', 'Dngrs', and 'CPs'. The 'Route' tab is selected, showing 'route 1' in the 'Route' field. Below this are 'Save' and 'Errors' buttons. The 'Critical Point' section includes a list of points with a header 'CP1' and navigation arrows. There are buttons for '<<', 'New', 'Delete', and '>>'. The coordinates '51°04.121' N' and '001°25.949' E' are displayed, with a 'Goto' button. The 'Alert Trigger' is set to 'Distance' with a dropdown arrow, and the 'Ownship Proximity' is set to '1852 m'. A 'Description' field is at the bottom.

Critical Point

To generate critical points on a previously saved route open the route plan from the Route tab of the Edit Route sub menu. The selected route will appear on screen.

To create critical points on a route do the following:

1. Move the cursor to the position on the route where you want the first critical point to be placed. As the cursor moves over the route the letters ADD CRTP are displayed below the cross hair.
2. Click on the required position, a purple square is drawn at that position on the route and the window shows the abbreviation CP1 with its L/L co-ordinates. If the critical point label check box is ticked in the Route Display Settings, the CP number is also shown on screen.
3. To change a CP label from the default CP1, CP2 etc. select the CP and click in the field to the right of the label, the screen keypad appears. Enter a label name using the keypad and click the keypad **OK** button. The label appears next to the selected CP (if the label tick box is enabled in the Route Display Settings).
4. To create more critical points continue to click on the required positions on the route. As each CP is created the purple square of the previous CP is displayed in the same colour as the route and the Critical Points window shows each CP's label and L/L position.
5. To select a previous CP in the route click the **<** button, to select the next CP click the **>** button. To select the first CP in the route click the **<<** button, or to select the last CP click the **>>** button.



To change a CP's position do one of the following:

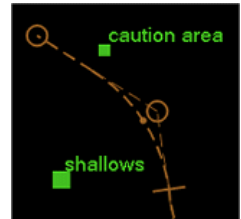
1. Move the cursor over the CP in the route, hold down the left button and move the trackball. The CP can be moved either up or down the length of the route, or away from the route. When the required CP position is shown on screen release the left button. Or:
1. In the Critical Points tab navigate to the CP using the navigation buttons, and with the required CP label shown click in the L/L fields, a drop down keypad appears enabling you to select a position for the CP.

There are a number of ways of defining the L/L position for the selected CP. For a description of the position options available refer to 'How to edit waypoint data' in Edit Route - Waypoints Tab.

- When a L/L position for the CP has been selected click the keypad **OK** button. The CP is moved to the new position.

 If a CP is moved away from the route, its colour changes to green and the **No Errors** button changes to **Errors**

 Clicking the Goto button centres the chart display on the selected CP.



To delete a critical point do the following:

- In the Critical Points window navigate to the CP to be deleted using the navigation buttons and click on the **Delete** button. The CP is removed from the screen and list.

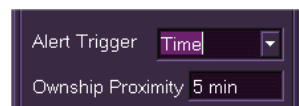
Or:

- Move the cursor over the CP to be deleted. As the cursor moves over the CP the letters DEL CRTP are displayed below the cross hair.
- Right click on the CP and select **Delete Critical Point** from the semi-transparent window. The CP is removed from the screen and list.

 Although Critical points are associated with a route they are not associated with route track segments. When a route track segment is moved or deleted, the critical points that were on that route track segment remain in their original place.

The CP alert trigger defaults to distance; with the trigger being the proximity of own ship to a CP, shown in metres. When own ship's proximity to a CP is less than the distance shown an alert is raised.

To change the alert trigger to time, click on the drop down arrow to the right of the field and select **Time**. The Ownship proximity changes to displaying the trigger value in minutes. To change the proximity time click in the field and move the trackball left (to decrease) or right (to increase).

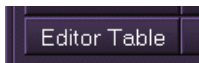


The operator can define the text to be displayed when an alert is raised during route monitoring. To generate alert text click in the **Description** field, a screen keypad is displayed. Using the keypad, enter the required alert message and when finished click the **OK** button on the keypad.

Editor Table

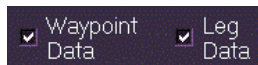
The route editor table enables the operator to edit aspects of a route that has been opened from the Edit Route folder and is displayed on screen.

Click on the **Editor Table** button in the Route tab of the Edit Route sub menu to open the route editor table.



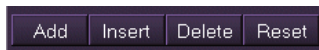
The route editor table displays the name of the route and lists all the route's waypoint attributes and leg attributes as fields in a spreadsheet.

The two check boxes at the top of the table enable the following display options to be made:



- **Waypoint Data** - tick this box to only display columns containing waypoint specific data
- **Leg Data** - tick this box to only display columns containing leg specific data

The four buttons to the right of the check boxes enable the following route editing actions:



- **Add** - adds a new waypoint to the end of the route.
- **Insert** - inserts a new waypoint between two existing waypoints
- **Delete** - deletes the selected waypoint from the route and redraws the route
- **Reset** - resets selected waypoint data to default values

To edit waypoint or leg data directly on screen do the following:

1. Click on a waypoint, the waypoint and its adjoining legs are displayed in white. The rows displaying the data for the waypoint and adjoining legs are highlighted in the table.
2. To move the waypoint hold down the left key and use the trackball to drag the waypoint to the desired location.
3. To change the waypoint's turn radius click on the small dot at the centre of the radius, hold down the left key and use the trackball to increase or decrease the radius.

If changes to the route result in validation errors the **Errors**



button changes to displaying **Errors** with a yellow background and the route name shown in an invalid colour (orange). Click on the button to open a popup window that lists the validation errors, for more information see Waypoints Tab Folder.

If changes to the edited route have been made the route name shows an asterisk after the name (e.g. **Route 2***). To save any changes to the currently edited route click on the **Save** button, the route is saved and the asterisk removed from the name.



If manual changes have been made to planned speeds over a route leg, or changes to the ETA, clicking the **Reset MIN/MAX Speeds** button calculates and resets the minimum and maximum speed values over each leg of the route.



The following editable data for each leg/turn segment is displayed as read-only in the Speed Planning Setup window:

- Planned Speed
- Minimum Speed
- Maximum Speed

Waypoint Data on Route Editor Table

The following waypoint data can be edited on the route editor table:

- Label, the name given to the waypoint (WPT1 etc.)
- Latitude/Longitude (L/L) values
- Turn rate through wheelover, shown in degrees per minute
- Turn radius of Wheelover
- Speed - planned ground speed of ownship along route leg.
- MIN Speed – the minimum planned ground speed of own ship along route leg.
- MAX Speed – the maximum planned ground speed of own ship along route leg.
- XTD Limits (Port and Starboard) - the limit of deviation from the planned route at which activation of an automatic off-track error alarm occurs, shown in metre(s).

The following waypoint data is read-only on the route editor table:

- The estimated time of arrival (ETA) showing the date and time to the wheelover, if a wheelover exists for the waypoint, otherwise the ETA to the next waypoint.

Leg Data on Route Editor Table

The following leg data can be edited on the route editor table:

- Speed - planned ground speed of ownship along route leg.
- MIN Speed – the minimum planned ground speed of own ship along route leg.
- MAX Speed – the maximum planned ground speed of own ship along route leg.
- XTD Limits (Port and Starboard) - the limit of deviation from the planned route at which activation of an automatic off-track error alarm occurs, shown in metre(s).
- Leg Type - Rhumb Line or Great Circle

The following leg data is read-only on the route editor table:

- Distance - the leg distance between each waypoint
- Bearing - the bearing angle of each leg
- Leg Time - the estimated time for leg traversal (in days, hours and minutes)

Editing Data on the Route Editor Table

To edit route data in the route editor table do the following:

To change the waypoint label:

1. Click in the label field for the selected waypoint, the text changes to green (editable) and the screen keypad appears.
2. To clear the existing label click the **Clear** button. Enter a label name using the keypad and click the keypad **OK** button. The label entered appears next to the selected waypoint (if the Show waypoint labels tick box is enabled in the Route Display Settings).

To change the waypoint L/L position click in the L/L data field, the text becomes editable (green) and a drop down keypad appears. There are a number of ways of defining the L/L position.

1. Manually enter a L/L position by using the numbers and navigation buttons on the keypad and click **OK**.
2. To place the waypoint at a specific geographic object select **Query**. Move the cursor to the display (a ? is added to the cursor) and left click, a Pick Report



window appears with a list of objects in the immediate area. Select the object from the list, the waypoint is repositioned over the chart object and a red circle filled with a red shaded background is drawn around the waypoint. Click **OK** on the Report Results window to fix the waypoint at the chart object position.

3. To place the waypoint at own ship's CCRP select **Ownship**.
4. To place the waypoint at a selected location on the chart display select **Chart**. Move the cursor to the display (a ? is added to the cursor) and left click at the required location, the waypoint is repositioned to that location.
5. To specify a range or bearing for the waypoint select **Offset**. An Offset window appears where you can set a range and bearing offset from the current position.

To change the turn waypoint data, or speed and XTD leg data:

1. Click in the required field, the text changes to green (editable).
2. Move the trackball left or right to decrease or increase the value. Left click in the field to set the revised value. The route will change dependent on the values entered.

The leg type defaults to **Rhumb Line**, to change to **Great Circle** click on the drop down arrow to the right of value and select from the list.

A Copy Value feature enables the user to copy a cell value and paste the value into other cells in the same column, either above or below the copied cell.

1. To copy the data from the lowest cell in a column highlight the cells from the top of the column, right click and select **Copy Value**. The value in the last cell is copied to all the selected cells. For example, in the screen on the right the **8.3 kn** value is pasted into all cells.
2. To copy the value in the top cell in a column highlight the cells from the bottom of the column, right click and select **Copy Value**. The value in the top cell (i.e. **7.4 kn** in the screen on the right) is copied to all the selected cells.



The screenshot shows a table with two columns of speed values. The first column contains values 7.4 kn, 8.3 kn, 8.3 kn, 8.3 kn, and 8.3 kn. The second column contains values 12.0 kn, 12.0 kn, 12.0 kn, and 12.0 kn. A context menu is open over the table, showing the option 'Copy Value'.

7.4 kn	12.0 kn
8.3 kn	12.0 kn
8.3 kn	12.0 kn
8.3 kn	12.0 kn
8.3 kn	12.0 kn

Monitoring a Route

Monitor Route

The Monitor Route window enables you to monitor all aspects of a route against own ship's course. The monitored route must be initially saved and validated in the Edit Route sub menu.

The Monitor Route window contains the following tab folders:

- **Route** - displays read only data monitoring own ship's progress against a route plan.
- **Dngrs** (Dangers) - lists dangerous objects and areas that intersect the route plan safety region.
- **CPs** (Critical Points) - displays data on critical points that have been added to a route.

Route

The data shown in the Route tab folder is calculated internally from the monitored route and is read-only.

A summary of the active leg of the monitored route is also shown on the Route Status popup window.

To monitor own ship's progress against a route, the ship's COG must be within 110 degrees toward the planned track and within 80 degrees away from the planned track, this is referred to as the 'bearing criteria'. If the ship's COG deviates more than the bearing criteria, then route monitoring will stop.

When a route is loaded for monitoring, monitoring automatically starts on the leg closest to the ship that is within the bearing criteria. If none of the route's legs meet the criteria, then route monitoring will automatically start when the ship comes within the monitoring criteria of a route leg.

 *In some cases the system may begin monitoring a leg that is not the closest leg. This will normally occur when own ship manoeuvres abruptly toward or away from the closest leg, so that, temporarily, the bearing criteria are not met.*

Monitor Route		
Route Dngrs CPs		
Route		
dover-calais2		
Load Route		Clear Route
Ship State		
Turning To WPT6 (6/7)		
XTD	5.48 NM STBD	
XTD Limits	15 m	PORT
	28 m	STBD
Leg & Turn		Overall Settings
Leg Bearing	-----	
Leg DWOL	15.44 NM	
Leg TWOL	00:50:37	
Turn Radius	1.00 NM	
Plan ROT	17 °/min	
Planned SPD	18.0 kn	
Present SPD	18.3 kn	
Required ROT	17 °/min	
SPD MIN/MAX	14.4	19.9
ETA	01 Sep 2016 10:03	
Time Zone	UTC-00:30	
BTW	331.8°	
Next Leg DIST	14.62 NM	

During route monitoring, the ship's cross-track distance from the route is displayed and whether the ship is to the right or left of the track.

Where monitoring values are not currently valid the field displays a series of dashes.

The information displayed is as follows:

Route Summary

Name The name of the route currently monitored.

Ship State

- Ship State The state of ship on route e.g. 'Sailing To WPT2 (2/5)' denotes next waypoint on route and total number of waypoints.
- [XTD](#) Cross Track Distance is the distance in nautical miles from either Port or Starboard to anchor track.
- XTD Limits Shows the defined deviation limits from the monitored route at which an alarm is generated. Port and Starboard may have different limit values.

Leg & Turn

- Leg Bearing The bearing of the currently monitored route leg.
- Leg DWOL Distance to next wheelover leg.
- Leg TWOL Time to next wheelover leg, based on present ship speed.
- Turn Radius Turn radius shown as nautical miles
- Plan ROT Planned rate of turn in degrees per minute.
- Planned SPD Planned turn of speed in knots
- Present SPD Present speed in knots
- Required ROT Required rate of turn based on present ship speed
- SPD MIN/MAX Minimum and maximum planned speed for upcoming turn.
- ETA Estimated Time of Arrival at wheelover
- Time Zone UTC, or UTC with a plus or minus figure if the current time is set to local and a time zone offset has been applied.
- BTW Bearing to next waypoint.
- Next Leg DIST The distance to next leg in nautical miles

Overall

- Distance & Time To Go
Distance and time to go to the end of the route using distance along legs with own ship SOG for this leg and planned speeds for future legs.

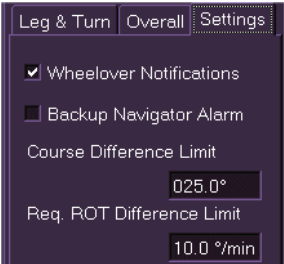
Leg & Turn	Overall	Settings
Distance & Time To Go		
28.43 NM	01:34:39	
ETA 10 Aug 2016 20:23		
Time Zone	UTC-00:30	
Route Summary INFO		
Distance	67.52 NM	
Duration	03:45:04	
Avg Speed	18.0 kn	
Modified	03 Aug 2016 22:17	
Route Description		

- ETA
Estimated Time of Arrival at the end of the route using own ship SOG for this leg and planned speeds for future legs.
- Time Zone
Time zone UTC (if Local time is selected the local offset is shown as a + or - e.g. UTC + 02:00)

Route Summary INFO

- Distance
The total distance covered by this route
- Duration
The total duration of the route at planned speed shown in hours and minutes.
- Avg Speed
The average speed of the vessel over the route.
- Modified
The date and time that the route was last modified.
- Route Description
If a description has been entered at Edit Route - Route Tab it will appear in this column.

Settings

Wheelover Notifications	If this box is ticked, alerts will be displayed in monitoring mode when the check box. If an Alert is not acknowledged after a timeout period of 30 seconds, the Course Change Warning Alert will be escalated to an Alarm.	
Backup Navigator Alarm	If this box is ticked the Backup navigator alarm is raised after a timeout period of 30 seconds, if the wheelover notifications are not acknowledged.	
Course Difference Limit	The maximum bearing angle that own ship may move from the route track defaults to 25.0°. If this value is exceeded, a Course Different Alert will be raised.	
Req ROT Difference Limit	The maximum rate of turn angle that own ship may move from the route track defaults to 10.0° /min. If this value is exceeded, a Course Different Alert will be raised.	

To change the **Settings** values left click in the respective field and move the trackball left (to decrease) or right (to increase), left click again to fix the value.

Monitoring a Route

To monitor a route do the following

1. Click on the **Load Route** button in the Route Summary area. The **Load Route** window appears with a list of all the previously saved routes, their name and last modification date.
2. Highlight the route to be monitored from the list and click on the **OK** button. The route appears on screen and if the route meets the monitoring criteria, the route data is displayed in the Monitor Route sub menu and Route Summary tab.

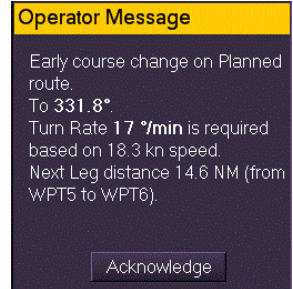
To clear a route:

With the route details shown in Monitor Route, click on the **Clear Route** button. The route and its data are removed from the screen and Monitor Route tab folder.

Course Change Messages

Alerts for course changes appear as Operator Messages above the **Show Menu** button while a route is being monitored.

When a course change message is first raised the **Operator Message** banner is shown with a yellow background and a warning alert is raised. If the message is not acknowledged after a period of time the alert level is escalated to an alarm and the Operator Message banner appears with a red background.



If the **Backup Navigator Alarm** is enabled in the Settings tab the alarm will be raised if the course change message has still not been acknowledged after 30 seconds.

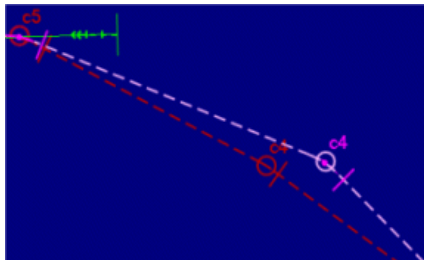
The Operator Message will be removed from the display when the message is acknowledged, or when a backup navigator alarm is generated.

Editing a currently Monitored Route

When a route is being monitored the route is rendered in the non-editable monitor colour (red). A currently monitored route can only be changed from the Edit Route folder, saved and then reloaded from the Monitor Route folder.

To change a currently monitored route, do the following:

1. To edit a currently monitored route, select Edit Route, and open the currently monitored route from the Load Route window.
2. When you are monitoring a route and open the same route for editing the system creates a duplicate route with the edit route mode superimposed over the monitored route in the editable colour (pink).



3. Make the required edits to the route, for details refer to Edit Route - Waypoints Tab. As the route is changed the screen shows the monitored route in the original position.

4. Save the changes made to the route. The system displays a warning stating that the route being saved is the currently loaded route for monitoring and that changes will not affect the monitored route, click the **OK** button.
5. Click the **Clear / New** button to remove the route from the Edit Route folder.
6. Navigate back to the Monitor Route tab folder and reload the revised route, the monitored route on screen is replaced with the new version.

Dangers

The Dangers tab folder enables the operator to view objects and areas that could endanger the safety of own ship on the currently monitored route.

WARNING!
TEMPORARY ROUTES ARE NOT SEPARATELY SAFETY CHECKED. THE OPERATOR MUST RELY ON OWN SHIP SAFETY REGION FOR DETECTING DANGERS WHILE OWN SHIP IS ON A TEMPORARY ROUTE.

The **Show Present Leg or Turn** button enables the operator to check for dangers and cautions at the current leg or turn of the monitored route. When the button is clicked the Leg or Turn at the specific area where ownship is on the monitored route expands. Any dangers and cautions related to that segment can be accessed from the navigation tree.

The Dangers information presented here is the same as the information in the Dangers tab folder of the Edit Route sub menu. For a description of dangers, cautions and route safety regions, see Edit Route - Dangers.



Settings

Display Safety Regions

The option of displaying the safety region for the monitored route can be made by ticking the check box. For information on the route safety region, refer to Edit Route - Dangers.

List Cautions

The option of listing cautions, in addition to dangers, for the monitored route can be made by ticking the check box.

Critical Points

The Critical Points tab folder enables you to select and view position and alert trigger details on critical points that have been generated in the Critical Points tab folder of the Edit Route menu.

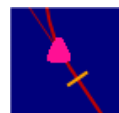
Routes can be loaded for monitoring and cleared in the same way as described for the Route tab folder. When a route is loaded, the Route area shows the name of the monitored route.

No data is displayed when a route is first loaded. To select the first CP on the route click on the < button. The field to the right of the < button will show the abbreviation CP1 (unless the CP label has been changed from the default, see Edit Route - Critical Points).

When a CP has been selected the folder shows the point's Latitude/Longitude position, its alert trigger and own ship proximity trigger (distance or time), the type of alert generated (Warning) and any CP description that has been generated. The bottom of the folder displays the selected CP [DTG](#) and [TTG](#) status.

To view position and alert trigger details on further CPs, click on the > button. The next CP in the route is selected and its data shown in the folder.

 *CPs are shown as squares in Monitor mode. When CPs are selected from the tab folder the screen symbol changes from a square to a rounded triangle.*



To centre the screen on the selected Critical Point, click on the **Goto** button. Own ship, along with all other chart and target positions, are moved in accordance.

Route	Dngrs	CPs
Route		
MikeCalDov		
Load Route	Clear Route	
Critical Point		
<	CP2	>
51°05.918' N		Goto
001°24.578' E		
Alert Trigger	Distance	
Ownship Proximity	1852 m	
Generates	Warning	
Description		
Critical Point Status		
DTG	15.48 NM	
TTG	01:29:42 HH:MM:SS	

Speed Planning

Speed Planning allows the operator to manually specify a plan for speeds to be used on remaining segments of the monitored route, and see what arrival times result from these plans. It also enables a desired arrival time (for any given waypoint) to be specified, and see recommended adjustments to planned speeds needed to achieve this arrival time.

Planned speeds or computed adjustments to these speeds may subsequently be used to control the ship's propulsion system. For information on propulsion control, refer to Chapter 3 'Propulsion' in the Supplementary Features User Guide 65900014.

To activate Speed Planning on a monitored route:

1. Load the route to be monitored from the Monitor Route - Route Tab.
2. From the Routes menu, open the **Speed Planning** window. Note that before speed planning begins the window displays no data on the currently monitored route.
3. Click on the **Edit Speed Plan** button at the bottom of the window. The Speed Planning Setup window appears on the chart display.

Speed Planning Setup

Speed Planning Setup allows the operator to create a speed plan that can be subsequently used to control the speed of the ship along the monitored route to any desired 'Arrival Waypoint'.

 *Own ship must be sailing on the monitored route before speed planning can commence, as defined in 'Ship State' on the Monitor Route - Route Tab.*

The Speed Planning Setup window includes the following areas:

- Arrival Time Planning - enables an arrival time for a waypoint to be selected.
- Current Leg Speed Command - lets the operator to choose whether the current ship's speed should be assumed for the current leg of the plan, or allow speed change.
- Speed Command Setting - lets the operator choose whether speed commands should be calculated (based on arrival time) or manually adjusted.
- Initialize Manual Speed Command - when set to **Manual**, provides a simple way to initialize all speed commands.

- **Speed Table** - shows planned speeds and limits for each leg and turn of the route.
- **Arrival Date/Time (UTC) and Arrival Time To Go** - displays arrival times for the various choices of speeds (planned speed, max speed, etc.).

Speed Planning Setup

Arrival Time Planning

Arrival Waypoint: WPT7

Desired Arrival Date/Time: 10 Aug 2016 20:40 UTC

00:11:11

Current Leg Speed Command

☒ Assume current speed

☐ Allow speed change

Speed Command Setting

☐ Manual

☒ Limited Required Speed

Initialize Manual Speed Command

Planned Speeds

Required Speeds

Required Speeds, limited

Leg/Turn	Planned Speed	MIN Speed	MAX Speed	Required Speed	Speed Command
Leg to WPT7	18.5 kn	16.5 kn	19.5 kn	18.5 kn	18.3 kn

	Planned	Latest Possible	Earliest Possible	Desired	Ordered
Arrival Date/Time(UTC)	10 Aug 2016 20:40	10 Aug 2016 20:41	10 Aug 2016 20:39	10 Aug 2016 20:40	10 Aug 2016 20:40
Arrival Time to Go	00:11:11	00:12:33	00:10:37	00:11:12	00:11:19

Begin Monitoring

Arrival Time Planning

The Arrival Time Planning area includes selection of the arrival waypoint and desired arrival date/time.

The **Arrival Waypoint** field defaults to displaying the last waypoint on the route plan. To change the arrival waypoint click on the drop down arrow, the list displays all the remaining waypoints along the monitored route. For example, if own ship is sailing to **WPT7** waypoint on the route, all waypoints from WPT7 onwards will be available for selection.

When a waypoint is selected, the desired arrival date/time field is calculated by assuming that ownship will complete the current leg at the current speed and complete the remaining legs at the planned speed. The system selects **Assume current speed** and **Limited Required Speed** options, and the speed table is updated accordingly.

The Desired Arrival Date/Time allows the operator to enter the date and time that they wish to arrive at the arrival waypoint. This value is then used to compute the Required Speed³⁴. Note that the Desired Arrival Date/Time value only has an effect if **Limited Required Speed** is selected.

To the right of this field is the desired arrival Time To Go before own ship reaches the end of the route.

1. To change the arrival date/time click in the field. The text changes to green (editable) and a navigation keypad appears.
2. Click on the left or right arrows to navigate to the data to be changed and with the text in highlight click on the up/down arrows to change the values.
3. Click **OK** when complete.



When the desired date/time data is changed, the system automatically updates the calculated time to end of route, the required speed values in the speed table, and possibly (depending on settings made in the Route Editor Table) the speed command values in the speed table.

Current Leg Speed Command

The Current Leg Speed Command area allows the operator to select how the speed of the current leg will be affected. It includes two settings:

Assume current speed and **Allow speed change**.

- Assume current speed forces the speed of the current leg to be equal to ownship's present ground speed.
- Allow speed change enables values other than ship's current ground speed to be used for the speed command on the current leg. If the Speed Command Setting is **Manual**, then speed commands may be edited for the current leg. If the setting is **Limited Required Speed**, then the system may change the speed command for the current leg to achieve the desired arrival time.

³⁴ Required Speed is the speed own ship needs to travel for a given route segment, such that the desired arrival date/time is achieved.

To change the leg speed command, click the radio button next to the option.

Speed Command Setting

The Speed Command Setting area allows the operator to select how the speed commands are entered into the plan. It includes two settings:

Manual and Limited Required Speed.

- Manual allows the operator to manually enter a speed command for each leg. When this option is selected the system will not compute the speeds necessary to arrive at the 'Arrival Waypoint' as entered in Desired Arrival Date/Time'. Once the Manual radio button has been selected, the **Initialize Manual Speed Command** buttons become active and the Leg/Turn values in the Speed Command column become editable.
- Limited Required Speed³⁵ instructs the system to compute the speed commands required to arrive at the 'Arrival Waypoint' based on the Desired Arrival Date/Time.

To change the Manual Speed Command settings, do the following:

1. Click the **Planned Speeds** button to make all speed commands for each segment match the planned speeds.
2. Click the **Required Speeds** button to make all speed commands for each segment match the required speeds, limited to Ownship's max speed.
3. Click the **Required Speeds, limited** button to match the required speeds, limited to the min and max speed for each segment.

MIN Speed	MAX Speed	Required Speed	Speed Command
16.5 kn	19.5 kn	18.3 kn	18.3 kn
16.5 kn	19.5 kn	18.6 kn	18.5 kn
16.5 kn	19.5 kn	18.6 kn	18.5 kn

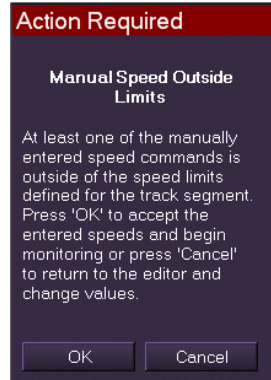
³⁵ Limited Required Speed is the required speed for each segment but limited to the minimum and maximum speeds of each segment.

To manually enter speed commands for each leg/turn segment:

1. Click in the required field of the **Speed Command** column for the Leg/Turn, the text changes to green (editable).
2. Move the trackball left to decrease the value, or right to increase. Left click again to exit edit mode.

If the speed command is outside the MIN/MAX speed limits the value is displayed in yellow.

If monitoring of the speed plan begins by clicking the **Begin Monitoring** button while any manually entered speed command is outside the limits, an **Action Required** message appears. To accept the entered speed click the **OK** button on the message; to cancel the monitoring and edit the speed command to be within the speed limits, click the **Cancel** button.



Arrival Date/Time (UTC) and Arrival Time to Go

The Arrival Date/Time (UTC) and Arrival Time To Go fields show the following data in their respective columns, based on speed values in the Leg/Turn segments:

- **Planned** - based on leg/turn speeds in Planned Speed.
- **Latest Possible** - based on leg/turn speeds in MIN Speed.
- **Earliest Possible** - based on leg/turn speeds in MAX Speed.
- **Desired** - based on leg/turn speeds in Required Speed.
- **Ordered** - based on leg/turn speeds entered in Speed Command.

Monitoring Speed Planning

When the required selections have been made to the speed plan click the **Begin Monitoring** button, the plan is locked and the system begins monitoring based on the speed plan.

The following read-only values, configured in the speed planning setup window, are displayed in the Speed Planning window:

- Speed Command Setting - the current speed command as selected in Speed Planning Setup.
- Arrival WPT - selected arrival waypoint, or last waypoint on route.
- Intended Arrival Time - the arrival date/time and TTG specified in the Ordered column of Speed Planning Setup.
- List of Leg/Turn segments and specified Speed Commands
- Estimated Arrival Time - the arrival time based on the speed commands presented in this window.

The screenshot shows the 'Speed Planning' window with the following elements:

- Speed Command Setting:** Radio buttons for 'Manual' (selected) and 'Limited Required Speed'.
- Arrival WPT:** A dropdown menu showing 'WPT9'.
- Intended Arrival Time:** A text box showing '10 Aug 2016 21:01 UTC' and a time box showing '00:27:44'.
- Table of Leg/Turn segments and Speed Commands:**

Leg/Turn	Speed Command
Leg to WPT7	18.3 kn
Turn at WPT7	18.6 kn
Leg to WPT8	18.6 kn
Turn at WPT8	18.6 kn
Leg to WPT9	18.6 kn
- Estimated Arrival Time:** A text box showing '10 Aug 2016 21:01 UTC' and a time box showing '00:27:44'.
- Edit Speed Plan:** A button at the bottom.

To change the speed command values click the **Edit Speed Plan** button, the Speed Planning Setup window reappears.

When speed orders and/or arrival times are changed in Speed Planning Setup the **Begin Monitoring** button must be clicked again in order to initiate the revised values.

ETA Calculator

The ETA Calculator window enables you to calculate the time, speed and distance between waypoints on a monitored route.

With a route loaded for monitoring, click on the **ETA Calculator** sub menu from the Routes menu. The window includes Monitor Route:

- **Distance** - the distance own ship must travel to the end of the monitored route.
- **Speed** - the calculated average speed to make the ETA indicated at end of monitored route, or for the selected waypoint.
- **Time** - the estimated time (in days, hours and minutes) to travel to the end of the monitored route.
- **ETA** - represents the ETA (date and time) of own ship at end of route.

If the ETA Calculator is opened when there is not a monitored route plan, the following default values apply:

- Distance defaults to 1.0NM
- Speed is own ship's current SOG.
- Time is the time it takes to travel the Distance based on the speed.
- ETA is the date and UTC time own ship is expected to arrive at the Distance based on the speed.

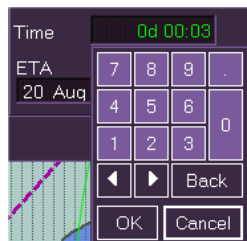
To select a different waypoint on the route:

1. Click on the **WPT** button, the following **Action Required** window lists the waypoints in the route and the current distance of each waypoint from own ship.
2. Select a waypoint from the list and click the **OK** button. The distance shown against the selected waypoint appears in the **Distance** field.

Name	Distance
WPT6	9.6 NM
WPT7	20.2 NM

To change the ETA Calculator values do the following:

1. To change the **Distance** or **Speed** values click in the respective fields, with the value shown as green move the trackball left, to decrease, or right to increase the value. When the distance and speed values are changed the Time and ETA values are automatically updated.
2. To change the **Time** value click to the left of the value, a numerical keypad appears below the field. Enter in the required time values using the keypad and click OK when complete.
When the Time value is changed the Speed and ETA values are automatically updated.
3. To change the **ETA** value click on the value to be changed, a navigation keypad appears. Click on the left or right arrows to navigate to the data to be changed and with the text in highlight click on the up/down arrows to change the values. Click OK when complete.
When the ETA value is changed the Speed and Time values are automatically updated.



Route ETA

The Route ETA (Estimated Time of Arrival) enables the following settings to be changed or selected on a monitored route:

- Waypoint selection - click on the drop down arrow to select a waypoint on the monitored route. The field to the right gives the calculated distance (in nautical miles) from own ship to the select waypoint.
- Speed - enables the speed for a route's present leg (based on the waypoint selection) and the speed for future legs to be changed, either from the speed based on own ship's SOG, or any planned speeds given when the route was edited, see Edit Route – Waypoints Tab. The planned speeds show 10.0 kn if no changes were made to the approaching and departing legs for each waypoint on the route.

Route ETA [Up Arrow] [Close X]

WPT6 [Down Arrow] 19.28 NM

Calculated ETA
10 Aug 2016 22:20
Time Zone UTC -00:30

[Hide options]

Speed for present leg

- SOG 18.3 kn
- Planned 18.0 kn
- Manual 0.0 kn

Speed for future legs

- SOG 18.3 kn
- Planned 18.0 kn
- Manual 0.0 kn

To change Route ETA settings do the following:

1. Manual speed defaults to 0.0 kn. To enter a speed for the present leg or future legs select the Manual radio button and click in the Manual field, the text changes to green (editable). Move the trackball right to increase the value and left click again to accept the value.
2. To change the speed for the present leg or future legs to the planned speed entered at the Edit Route menu select the **Planned** radio button.

Speed for future legs

- SOG 18.3 kn
- Planned 10.0 kn
- Manual 8.7 kn

Each leg of a route may have different speed settings selected.

When speed values are entered, or planned speeds selected, the system then calculates the ETA based on the selected speed values.

1. To hide the speed options click the **Hide options** button. The button changes to display the speeds for present leg and future legs.
2. Click the button again to return to the full Route ETA window.

Calculated ETA
22 Jun 2010 01:04
Time Zone UTC

[Speeds 18.3 kn, 20.7 kn]

Required Speed

Required Speed enables the user to specify a desired arrival time for any selected waypoint on a monitored route. When a desired arrival time is entered the system calculates own ship speed required to the present leg, and speed required for the remaining legs in order to achieve this arrival time.

To change the desired ETA and required speeds do the following:

1. To change the ETA:
 - i. Select the waypoint from where the speed calculations are to be made.
 - ii. Click inside the **Desired ETA** field on the specific data to be changed. The field data changes to green (editable), the selected data is highlighted and an editing window appears directly below the ETA field.
 - iii. To move the date or time back click on the Down arrow, to move the date or time forward click on the Up arrow. To move the highlight back or forward (e.g. from Month to Year) click on the side arrows.
 - iv. With the correct ETA data displayed click on the **OK** button.
2. When the desired arrival time is set the system calculates the speed required on the present leg and remaining legs of the route in order to achieve the specified ETA. The required speeds are shown in the **Calculated** fields.
3. To specify a speed for the current leg and remaining legs select the **Manual** radio buttons and click in the Manual fields, the text changes to green (editable). Move the trackball right to increase the value and left click again to accept the value.
4. Click the **Calculated** radio button to see the speed required to meet the desired ETA on the current leg and remaining legs based on the manual speeds entered.

Route Status

A summary of the active leg of a monitored route is shown in the Route Status window. The information in this window is also shown in the Route tab folder of the Monitor Route sub menu.

The information in the Route Status window includes the following:

Name	The name of the route currently monitored.
Route Progress	The state of ship on route e.g. 'Sailing To WPT6 (6/7)' denotes next waypoint on route and total number of waypoints.
XTD	XTD (Cross Track Distance) is the off track distance on either the Port side (PORT) or Starboard side (STBD) from the monitored route.
DWOL	Distance to go to the next wheelover leg.
TWOL	Time to go along the leg to next wheelover based on present ship speed.
ETA	Estimated Time of Arrival at the end of the route using own ship SOG for this leg and planned speeds for future legs (UTC or Local time).

Temporary Routes

A temporary route (temp route) can be created and displayed on screen, either independently, or in addition to a currently displayed planned route. The temp route is edited and monitored independently of the planned route via the Temp Route tab folder.

The Temp Route tab folder displays cross track distance (XTD) limits for Port and Starboard, speed, turn statistics and waypoint DTG default values. The speed value is taken from own ship's current SOG and the turn radius is a system configurable default value.

All temp routes originate from own ship's CCRP. A temp route can also transition to a previously planned route.

Creating and Editing a Temporary Route

To create and edit a temp route do the following:

1. Select Temp Route from the Route menu and click on the **Create/Edit** button. A short straight segment starting at the bow of the ship and in the direction of the ship's COG is drawn. The segment is displayed as an orange dotted line, underneath the COG dashed line. The length of the line segment represents the value shown in the Waypoint DTG field (default value 2000 metres). A waypoint circle is drawn at the end of the line segment and is labelled as **T0** (if **Show waypoint labels** is ticked in the Route Display Settings).
2. To add waypoints to the temp route move the cursor into the chart window, in Temp Route mode the letters TMP WPT are shown just beneath the cross hair.
3. Left click at the required position to create the next waypoint. A waypoint circle is drawn at the selected point and is labelled **T1**. A turn radius representing the value in the **Turn Radius** field is drawn between the waypoints. Further waypoints can be created in the same way.

Temp Route ▲ ✕

Overall

XTD Limits 60 m PORT
60 m STBD

Speed 18.3 kn

No Errors

Selected Turn

Turn Radius 1.00 NM

Turn Rate 17 °/min

Starting Distance

DWOL 1,523 m

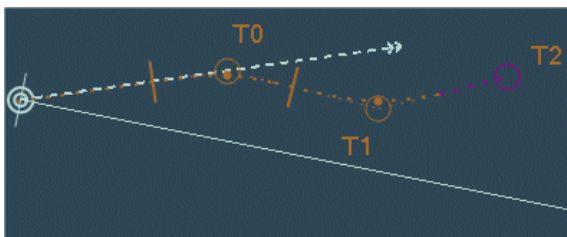
Waypoint DTG 2000 m

Edit Temp Route

Create/Edit Clear

Monitor Temp Route

Start



4. The Overall, Selected Turn or Waypoint DTG default values may be changed by clicking in the relevant fields and moving the trackball left or right to increase or decrease the values. The DWOL is changed by adjusting the Waypoint DTG. When own ship has passed the DWOL the field changes to displaying **Past** on a red background.

 *Temp routes are not normally the recommended means to make urgent manoeuvres, therefore increasing the Waypoint DTG is the preferred option when the temp route is to be used to make a significant course change.*

Monitoring a Temporary Route

The temp route must pass route validation before it can be monitored. If a temp route is invalid, a temporary prompt appears and validation errors must be repaired in Create/Edit mode before monitoring.

To monitor a temp route do the following:

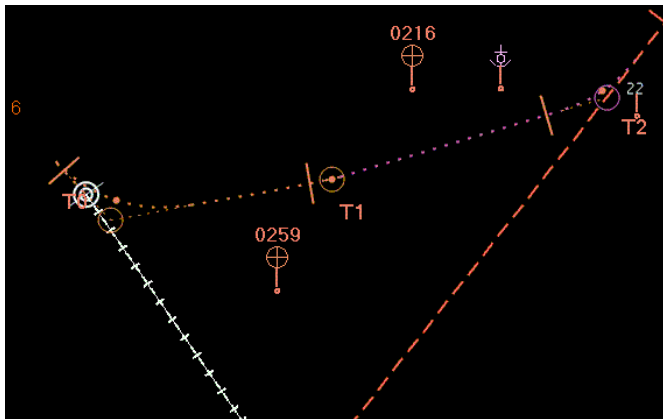
1. With a temp route created and validated, click on the **Start** button in the Monitoring Controls. The temp route now becomes the monitored route, the colour of the route changes to red and the Monitor Route window opens on the Route tab folder with Temporary Route in the monitored route field.
2. Own ship begins sailing along the first leg of the route towards **T1**. The Monitor Route tab folder displays the same monitoring values for a temp route as shown for planned routes, see Monitoring Routes.
3. To clear a non-monitored temp route from the chart window and Temp Route folder click on the **Clear** button. If there is a planned route loaded, the monitoring window will revert to displaying the ship's status against the planned route.

Transitioning a Temporary Route to a Monitored Route

A temp route may be used to transition own ship's course to a monitored route.

To transition a temp route to a monitored route do the following:

1. Load the route to be monitored from the Route tab folder of the Monitor Route window, see Monitor Route - Route Tab.
2. Create a temp route as described above. In Temp Route mode, move the cursor to the monitored route, the letters under the cursor change from TMP WPT to ADD RTP.
3. Click on any point on the monitored route. The system creates an additional waypoint which smoothly transitions the temp route to the monitored route.



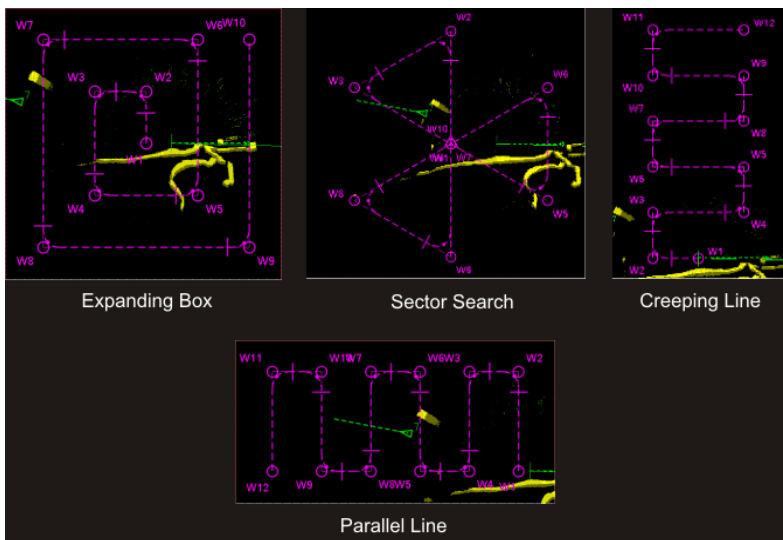
4. Click **Start** to begin monitoring the Temp Route. The Monitor Route, Route tab folder and the Routes button show the route monitoring status, e.g. **'Temp Route to Route 1'**. When own ship has sailed past the temp route the monitoring status changes to show the monitored route only.

Search and Rescue

Search and Rescue (SAR) patterns are specialized routes that can be used to patrol a given area.

The following SAR search patterns are supported (see descriptions and figure below):

- **Parallel Line** - formed from a series of parallel legs, moving out from left or right of the initial heading.
- **Creeping Line** - formed from a series of parallel lines at right angles to the initial heading, placed forward in the same direction as the initial heading.
- **Expanding Box** - formed from a series of expanding squares centred upon the start point of the search. The size of the square is increased every four legs.
- **Sector Search** - formed from a series of three equilateral triangles centred on the initial start position of the pattern.



Creating SAR Patterns

To create and edit SAR patterns click on **Search and Rescue** in the Routes menu.

The last SAR pattern selected will appear on the video circle and the following default values are applied to each SAR pattern at the time the Search and Rescue menu is displayed:

- Heading - based on ownship's current heading.
- Speed - set to 10 knots.
- ETD - set to the current time.
- Start Position - based on ownship's current position.

The SAR pattern is changed on the display by clicking on the SAR button that identifies the current pattern. The button pages through the pattern options described above.

To change the SAR default values the following:

The total distance and the time it would take to sail the SAR pattern depends on the route properties and pattern parameters.

1. To change the heading and speed left click in the field and move the trackball left to decrease the value, or right to increase. Left click again to accept the value.
2. To change the ETD, either:
 - i. Change the current date only by clicking on the drop down button to the right of the ETD field; a popup calendar appears with the current date highlighted. Navigate in the calendar to select the required start date.

Or:

- ii. Click inside the ETD field, the data changes to green (for editable day time setting) and an editing window appears directly below the field.

Route properties

Heading: 082.1°

Speed: 10.0 kn

ETD: 19 Jun 2010 01:39

ETA: 19 Jun 2010 03:26

Distance: 17.77 NM

Duration: 0d 01:46

No Errors Rhumb Line

Start Position

Lat: 50°57.500' N

Lon: 001°38.170' E

SAR pattern parameters

Creeping Line

Length: 10.0 NM

Width: 1.0 NM

Separation: 1.0 NM

Port Starboard Reset

Status

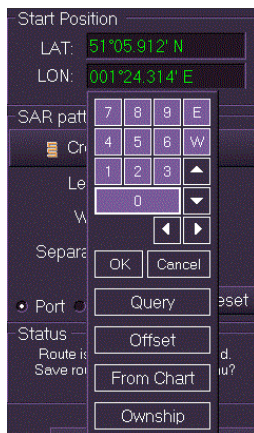
Route is currently being edited.
Save route before exiting menu?

Save Clear

ETD: 09 Jun 2010 20:35

OK Cancel

- iii. To move the date or time back click on the Down arrow, to move the date or time forward click on the Up arrow. To move the highlight back or forward (e.g. from Month to Year) click on the side arrows.
 - iv. With the correct ETD data displayed click the **OK** button.
3. To change the start position of the SAR pattern click in the LAT/LON data fields, the text becomes editable (green) and a drop down keypad appears. There are a number of ways of defining the start position.
 - i. Manually enter a Latitude/Longitude (LAT/LON) position by using the numbers and navigation buttons on the keypad and click **OK**. The first waypoint is moved to the entered position.
 - ii. To place the first waypoint at a specific geographic object select **Query**. Move the cursor to the display (a ? is added to the cursor) and left click; a Pick Report window appears with a list of objects in the immediate area (see Pick Report). Select the object from the list, the waypoint is repositioned over the chart object and a red circle filled with a red shaded background is drawn around the waypoint. Click **OK** on the Pick Report window to fix the waypoint at the chart object position.
 - iii. To place the first waypoint at own ship's CCRP select **Ownship**.
 - iv. To place the first waypoint at a selected location on the video circle, select **From Chart**. Move the cursor to the display (a ? is added to the cursor) and left click at the required location, the waypoint is repositioned to that location.
 - v. To specify a range or bearing for the first waypoint select **Offset**. An Offset window appears where you can set a range and bearing offset from the current position.



The following parameter default values apply to each SAR pattern:

Parameter	Default	Pattern
Length	5 NM	Creeping Line, Parallel Line
Width	2 NM	Creeping Line, Parallel Line, Expanding Box
Separation	1 NM	Creeping Line, Parallel Line Expanding Box
Sector Width	5 NM	Sector Search

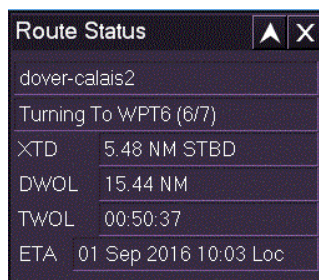
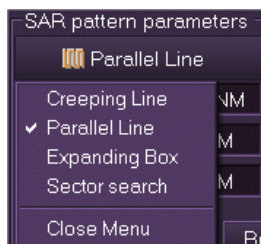
4. To change the pattern parameters refer to step 1 above.
5. To change the orientation of the SAR pattern click the **Port** or **Starboard** radio button.
6. To change the leg type from the default **Rhumb Line** click on the drop down button and select **Great Circle**.
7. To restore the setting values to the default parameters click the **Reset** button.
8. To clear a SAR pattern from the display click the **Clear** button.
9. To save changes made to a SAR pattern click the **Save** button and enter a name for the SAR pattern route.

When a SAR pattern is saved the system creates a route. This route can then be opened for monitoring and editing in the same way as other routes, see Monitor Route and Edit Route.

The route will also generate errors and warnings. If a SAR pattern route generates validation errors the **No Errors** button changes to **Errors** with a yellow background. Validation errors are rectified in the same way as described in Edit Route – Route Tab.

To clear a SAR pattern from the display click the **Clear** button. Any edits that have been made to the pattern will remain on the SAR window.

To display an edited SAR pattern that has been cleared either close and re-open the SAR window; or right click on the SAR pattern button, select another pattern and then re-select the edited pattern.



External Routes

The VisionMaster FT system can be configured to accept external routes from up to five external sources (for example, a GPS³⁶ system), providing they are transmitted to the system in an acceptable format.

External Route Validation

The external route is considered invalid if any of the following apply:

- The latitude of any waypoint is within one degree of a pole.
- There are fewer than two waypoints in the route.

All external routes are subjected to route validation. If an ERP is considered invalid, it is not displayed and a warning is raised notifying the operator of an attempt to import an invalid external route.

Default Attributes

If the waypoint or leg attributes of an external route are not specified, then system default values are used.

All attributes of external routes are read-only, with the exception of leg type and off-track alarm limit.

Monitoring External Routes

The External Routes menu is used to select the source of the external route, and to monitor the route. Only one external route can be displayed and monitored at a time. The following external route attributes are displayed on the External Routes menu:

- the ship's cross-track distance from the route and whether the ship is to the right or left of the track.
- the estimated amount of time and distance before reaching the TO-waypoint based on the current ground speed of the ship.
- the name of the TO-waypoint³⁷ while route monitoring.

The following functions are not provided for ERPs:

- track control
- return to planned route³⁸
- saving route

³⁶ Global Positioning System. A system by which receivers anywhere on earth can obtain accurate position data.

³⁷ The waypoint to which the ship is approaching.

³⁸ A return to planned route is a leg that joins a temporary route with a planned route.



The system is designed to display the “working” portion of the route received from an external source. This means that only a subset of the total number of legs and waypoints in the actual route will be displayed. This normally includes the route leg from the most recently passed waypoint, to a maximum of 9 subsequent route legs with their associated waypoints. The system automatically scrolls ahead in the route each time a new waypoint is reached.

Multi-node Support

External routes and associated source selection are distributed to all nodes on the network. Each node is able to display an external route independently.

Importing and Exporting a Route

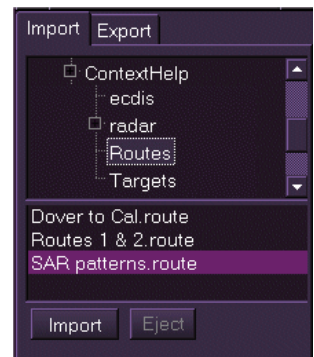
The Import/Export sub menu enables you to import or export routes that have been created on a VisionMaster FT. Routes not currently on a console can be imported from an external drive (usually a USB device), and existing routes can be exported to an external drive.

 *The import/export facility is usually done when operating from a single node. On a multi-node system a route saved on one node can be accessed and edited on any node on the network.*

Importing Routes

To import routes do the following:

1. If the external drive containing the route (or routes) to be imported is a USB memory stick connect the device to a USB port at the front of the VisionMaster PC.
2. From the Route Import/Export window click the **Import** tab. A navigation tree for the external device will be displayed in the field below.
3. Navigate to the folder on the external device where the route resides. The field below the navigation tree will show any valid route object files contained in the selected device.
4. Highlight the route file to select for import. Note that this file may contain multiple routes.
5. Click the **Import** button to import the selected route file to your node, if successful a temporary confirmation prompt appears. The imported route will be available for monitoring and editing from the Monitor/Edit Route tab.

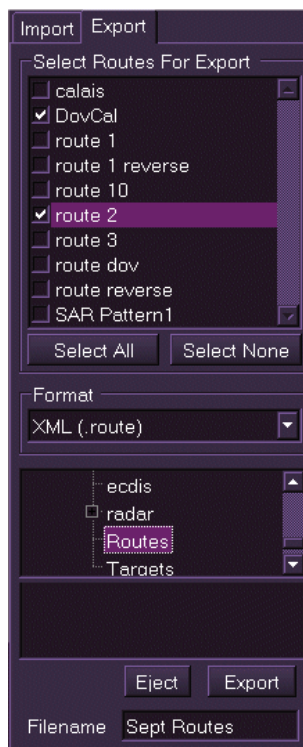


 *When importing routes, an Action Required window will appear to advise that any imported route that supported Warning or Alarm notifications, for approach to critical points, will no longer be available and will default to a warning level alert.*

Exporting Routes

To export routes do the following:

1. If the external drive where the route(s) are to be exported to is a USB memory stick connect the device to a USB port at the front of the VisionMaster PC.
2. From the Route Import/Export window click the **Export** tab. A navigation tree listing the routes that are on the workstation and available for export are displayed.
3. Select one or more routes for export by ticking the check boxes. Or to export all routes click the **Select All** button.
4. The navigation tree below the Format field enables you to navigate to the required folder on the external device where the route files are to be exported to.
5. Enter a file name for the routes in the **Filename** field.
6. Click the **Export** button to export the selected routes from your Workstation to the external device; if successful a temporary confirmation prompt appears.
7. Click the **Eject** button and remove the external device from the workstation.



Route Display Settings

The Route Display Settings sub-menu enables you to select the graphic display of labels associated with the displayed route.

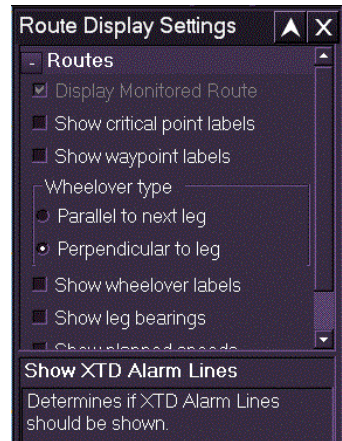
The following display settings are available:

- Display Monitored Route - displays the route currently being monitored. In ECDIS mode this check box cannot be switched off.
- Critical Point labels - displays a label for each critical point (CP1 etc.)
- Leg bearings - displays bearing data of each route leg in degrees
- Planned speeds - displays own ship's planned speed between each waypoint.
- Waypoint labels - displays a label for each waypoint (WPT1 etc.)
- Wheelover Type - determines how the wheelover lines are drawn:
 - Parallel to next leg - the wheelover line is drawn parallel to the next leg in the route.
 - Perpendicular to leg - the wheelover line is drawn at right angles to the route leg that approaches the associated turn.
- Wheelover labels - displays a numerical label for each wheelover (WO(2) etc.)
- Leg bearings - displays bearing data of each route leg in degrees.
- Planned speeds - displays own ship's planned speed between each waypoint.
- XTD Alarm Lines - displays a series of XTD lines on the safety region.

When all display options are ticked the route is displayed as shown below.



The bottom of the Route Display Settings window shows a description of the settings as the cursor moves over each setting.



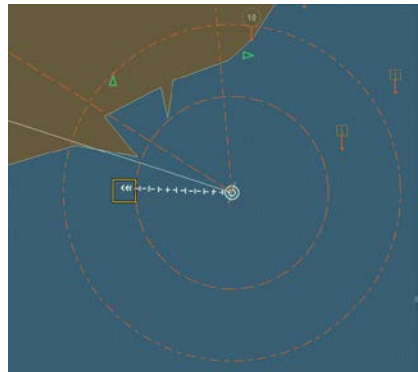
Chapter 9 Electronic Range and Bearing Lines

Two electronic bearing lines (EBL) and two variable range markers (VRM) are available in and can be displayed simultaneously or separately on the chart display.

When an EBL is turned “On” while its associated VRM is turned “Off”, a small line intersects the EBL at the specified VRM range. This represents an Electronic Range and Bearing Line (ERBL).

ERBLs display distance and bearing between objects, they are shown as a dashed orange line. VRMs display a range ring indicated by long orange dashes and is centred on the previously created EBL.

The first and second EBL and VRM have different mark/space ratios of dashes. Each EBL and its associated VRM are identified by having the same dashed space ratio for the line and ring.



When an ERBL is displayed the EBL bearing value (degrees) and VRM range value (nautical miles) are displayed to the right of the buttons on the EBL/VRM display.

An ERBL can be centred on the CCRP (carried), or offset to a referenced position (carried or dropped) for example, between own ship and an object, or positioned between any two objects on the display.

ERBL 1		▲	×
EBL 1	188.4° (346.4°)	↑	
VRM 1	1.85 NM		

Creating an EBL

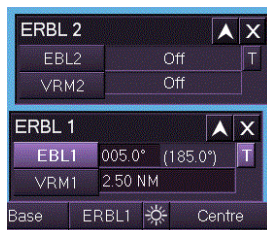
Each EBL can be turned on or off independently. Previous settings are maintained after they are switched off.

To turn on an EBL do the following:

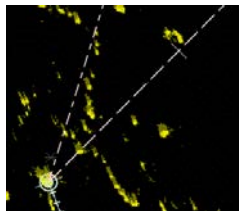
1. Left click on EBL 1 and/or EBL 2 buttons on the lower toolbar to access both EBL popup windows. The EBL 1 and EBL 2 windows are opened on the display.

Alternatively, turn the **EBL** rotary control on the control panel to switch on EBL1.

If no bearing value has been previously entered EBL 1 defaults to 5.0° starboard of ship's heading and EBL 2 defaults to 355° starboard. The EBL 1 and 2 caption also displays the current EBL reciprocal bearing in brackets. The EBL 1 and 2 caption also displays the current EBL reciprocal bearing in brackets.



2. Left click on the EBL1 or EBL2 caption button. The EBL button is highlighted bold and the last bearing value entered is displayed.
3. On the display the EBL is shown as a dashed line at a bearing angle dictated by the EBL readout. The range value of its associated VRM is also shown, with a line drawn at the point where the VRM intersects the EBL (see below), although the VRM is not shown.
4. To turn the EBL off, left click on the EBL button. The EBL lettering and button return to normal, the bearing value and the VRM range value are replaced by the **Off** caption, and the EBL is removed from the chart display.



Changing the ERBL Bearing

Bearings may be true (**T**) or relative (**R**). When **T** is selected the bearing value shown is always true with regard to North. When **R** is selected the bearing value is shown relative to own ship's heading, e.g. default EBL 1 will be 5.0° starboard of own ship.

There are three ways of changing an ERBL bearing.

To change the ERBL bearing do the following:

To manually change the bearing angle:

1. Position the screen cursor over the ERBL, and it changes to 
2. Left click on any point of the ERBL and hold down the key.
3. Move trackball left or right to change bearing. The readout changes in the EBL field and the reciprocal bearing automatically changes.
4. With the bearing correctly set release the left key to accept.

To change the bearing from the readout:

1. Left click in the EBL readout field. The readout text becomes editable (green).
2. Move the trackball left or right until the required readout is displayed.
3. Left click to accept new readout and exit edit mode.

To change the bearing from the Control Panel:

Turn the ERBL rotary control clockwise to increase the bearing angle or anti-clockwise to decrease the bearing angle.

 *If both ERBLs are switched off, turning the EBL rotary will automatically switch on EBL1. If EBL1 is switched off but EBL2 is on then turning the rotary will adjust the EBL2 bearing.*

Changing the ERBL Range

To change the ERBL range do the following:

1. Left click in the VRM readout field. The readout text becomes editable (green).
2. Move trackball left or right until the required readout is displayed. As the trackball is moved the VRM intersection line moves up or down the EBL.
3. Left click to accept new readout and exit edit mode.

ERBL 1				
EBL 1	166.4°	(346.4°)	T	
VRM 1	1.85 NM			

To change the ERBL range from the Control Panel:

Turn the VRM rotary control clockwise to increase the range, or anti-clockwise to decrease. Turning the VRM control changes the ERBL into a VRM/EBL (i.e. the VRM circle is drawn on the display).

 *If both VRMs are switched off, turning the VRM rotary control will automatically switch on VRM1. If VRM1 is switched off but VRM2 is on then turning the rotary control will adjust the VRM2 range.*

To change both the ERBL range and bearing:

1. Move the cursor to the intersection position of the ERBL and it changes to a bidirectional arrow indicator. 
2. Hold down left key and move trackball left or right to change the ERBL range and bearing. Bearing and range readout values automatically change as the ERBL is moved on the screen.
3. Release the left key to fix the ERBL range and bearing location.

Off-Centring, Carrying and Dropping an ERBL

Default position for ERBLs 1 & 2 is centred on own ship's CCRP. When centred, the ERBL can be offset, dropped, or its end point dropped. An ERBL is always carried unless it is “dropped” or “offset & carried”.

Initial options available by right clicking on the EBL/VRM buttons are:

- **Offset Origin** - moves ERBL to a location anywhere on the display. The ERBL is then in Carried mode (C).
- **Drop Origin (D)** - drops ERBL in a fixed ground reference location on the display regardless of stabilisation mode (ground or water referenced). As course and speed changes, the ERBL remains stationary at this fixed point.
- **Drop End Point (E)** - drops the EBL and VRM intersection (the ERBL end point) at a fixed, ground referenced location, but carries the origin with own ship. The range and bearing to the end point update every second. Drop End Point is only allowed when the ERBL origin is centred.

After Offset Origin or Drop Origin has been applied the following option becomes available:

- **Centre Origin** - moves the ERBL back to the position centred on own ship's CCRP.

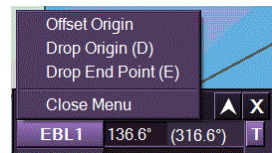
After Drop origin only has been applied the following option becomes available:

- **Carry Origin (C)** - the ERL origin is set at a fixed relative bearing from own ship if the ERL bearing is Relative (R). The ERL origin is set at a fixed true bearing if the ERL bearing is True (T).
- **Carried Mode (Offset origin or carried origin)** if the ERL is set to True bearing (T), the ERL will maintain its true bearing offset. If the ERL is set to Relative bearing (R) it will maintain a relative bearing offset from ownship. In both cases, the origin will move at the same velocity as ownship (i.e. carried). Switching the ERL bearing between relative (R) and True (T) in carried mode will also change the offset origin bearing between REL and True.

Switching the ERL bearing between relative (R) and true (T) in carried mode will also change the offset origin bearing between REL and TRUE.

To change the origin of an ERL do the following:

An ERL centred on own ship's CCRP may be offset by right clicking on the ERL button and selecting Offset Origin from the popup list.



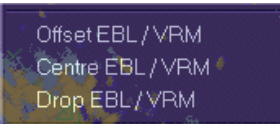
Where **Offset Origin** is selected:

1. Cursor changes to bidirectional arrow. The ERL and its associated VRM display the suffix **(C)**.
2. When an Offset is selected, the ERL is immediately positioned wherever the cursor position is on the video circle. Using the trackball move the ERL to the required offset location. When the ERL is offset the origin of the ERL is indicated by a white dot.
3. Left click to fix position, the ERL is now in **Carry** mode and moves with own ship velocity. Or right click to cancel and return the ERL to the CCRP.

Where **Drop Origin (D)** or **Drop ERL / VRM** is selected:

1. A white dot is displayed at the origin of the ERL and the ERL and its associated VRM caption are shown with the suffix **(D)**. Unlike Offset, the ERL does not move when the cursor moves. When the cursor is positioned over the ERL origin it changes to a bidirectional arrow.
2. To move the ERL. Left click and hold on the origin. Use trackball to move the ERL to required location, release to drop it. The ERL remains stationary in the selected location. Only True bearing is allowed with Drop Origin.

To re-position the ERL back to own ship's CCRP either right click on EBL button and select **Centre Origin** from the drop down window, or right click on the ERL dot and select **Centre EBL / VRM** from semi-transparent window.



Where **Drop End Point (E)** is selected from the EBL readout:

1. The EBL and VRM buttons are shown with the suffix **(E)**. As the ship moves, the ERL range and bearing are continually updated to the dropped end point.
2. To move the line or marker relative to own ship with the ERL range and bearing static select **Carry End Point (C)**.
3. Or to drop the ERL at the current position select **Drop Origin (D)** from the drop down window, or right click on the EBL origin and select **Drop EBL / VRM**.

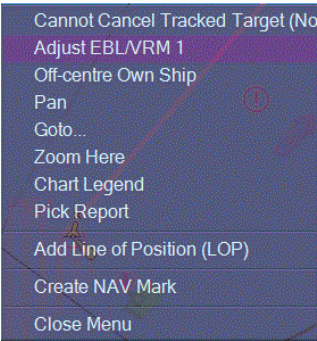


Dropping an EBL/VRM on the Display

An EBL/VRM may be dropped at any position on the chart display.

To drop an ERL/VRM right click at the required location and select **Adjust EBL/VRM1** from the context window. An EBL and VRM are created at the location, after a short period of time the EBL and VRM display the previously maintained settings

The range and bearing of the ERL can be adjusted on the display by moving the trackball.

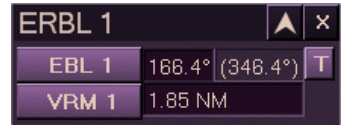


Variable Range Marker (VRM)

Each VRM can be turned on or off independently. Previous settings are remembered after being switched off. Default range values for VRMs is VRM 1 - 2.5 NM; VRM 2 - 4.5 NM.

To turn on a VRM do the following:

1. Left click VRM button. This becomes highlighted and the range value entered is displayed. The VRM is shown as a dashed circle centred on the CCRP. The size of the circle is shown by the VRM range readout.



Alternatively, turn the VRM rotary control on the control panel to switch on VRM1.

2. To turn the VRM off, left click the VRM button. The VRM is removed from the display and the range value is replaced by "Off".

To change the VRM range do the following:

There are two methods of changing the range of a VRM.

1. To change from the VRM readout, follow the procedure described in 'Changing the ERBL Range';

Or:

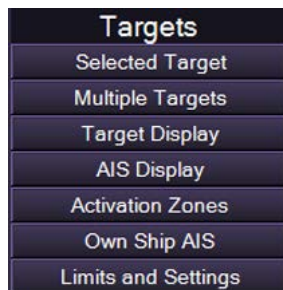
1. Position the cursor over the VRM circle line, the cursor changes to .
2. Left click and hold on any point of the circle line.
3. Move the trackball left or right to change the size of the circle. Range readout automatically changes in the VRM field.
4. When the range is correctly set left click to accept.

Chapter 10 Targets

The Targets facility provides information and management of all targets, including locally tracked targets and AIS targets³⁹.

To open the menu left click on the **Targets** button in the main menu list. The Targets sub-menu list is displayed with the following selection options:

- Selected Target, includes Target Data and AIS Info
- Multiple Targets
- Target Display
- AIS Display
- Activation Zones
- Own Ship AIS
- Limits and Settings
- PAD (Predicted Area of Danger) – if configured

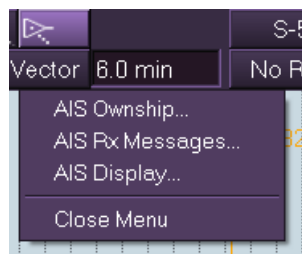


This chapter also includes information on the tracking and monitoring of targets, selecting a target for echo reference and target repair.

If your VisionMaster system is a stationary installation, the option to select a target for anchor watch will also be included. For information on this facility, see 'Target Anchor Watch' in Annex A 'Static Site'

The following AIS sub menu functions can also be accessed by right clicking on the AIS icon on the upper toolbar:

- AIS Ownship
- AIS Rx Messages
- AIS Display

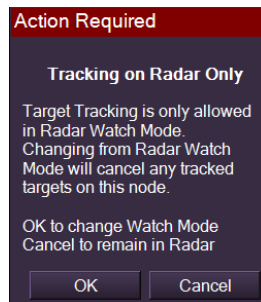


³⁹ Automatic Identification System. A system capability which enables ships and shore stations to obtain identifying and navigation information about other ships, using an automated transponder.

Tracking Targets

Target Tracking is available only in Chart Radar Watchmode, targets cannot be tracked in ECDIS.

If your VisionMaster is a TotalWatch system, any targets that are being tracked in Chart Radar will be cancelled if switched to ECDIS Watchmode. In this case an Action Required warning will appear for operator confirmation. Click on OK to confirm and switch to ECDIS mode.



Target Data received from TLB Sentence

If target data is being received from legacy radar equipment (for example, a BridgeMaster E [BME] or other radar hardware) via a port on the PCIO used for TLB communications, then target names may also be prefixed with the contents of the TLB message's label field in parentheses, with a space between this TLB name and the name assigned internally.

If this option has been configured (as described in section 8.9.1 '*Target Rename Input*' in Chapter 1 '*Configuration*' of the VMFT Ships Manual Volume 2) then the operator is still able to change the last part of the name as long as the correlated target does not have an AIS target associated with it.

Tracking Targets on a Multi-Node System

On a multi-node system target correlation information is distributed across all nodes to ensure target numbering is identical. Also, a target name that has been entered on a node is distributed to all other nodes on the system.

Where a target is correlated with a tracked target from an external input, such as a BridgeMaster E, AIS and local tracked targets take priority over the external input target, regardless of the display priority selected.

On ECDIS nodes all correlated targets in the multi-node system are displayed in both Standby and Transmit. An ECDIS also shows the combined activation state of AIS targets, i.e. if any node has activated an AIS target it will be shown as activated on an ECDIS. If an AIS target which has only been activated on one node is set to sleeping it will be shown in this state on the ECDIS.

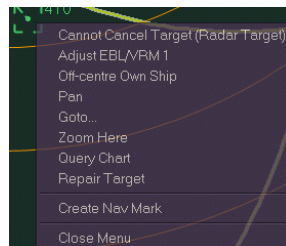


This will only apply when the AIS target is being tracked on one node. If another node on the system has the same AIS target activated then the ECDIS will continue to show that AIS activated.

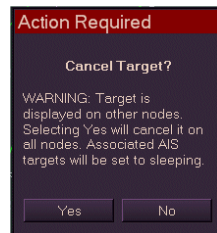
Cancelling Targets on a Multi-node System

A tracked target that has been acquired locally may be cancelled on the node that is tracking it; the target will also be shown as cancelled on an ECDIS node (providing the target is being tracked on one node only).

Targets that are being tracked on a Radar/Chart Radar node cannot be cancelled on an ECDIS node. If a cancellation is attempted on a target that is being tracked on a Radar node, by right clicking on the target, the following semi-transparent window informs the operator that the cancel action cannot be performed.



When a tracked target, acquired on an ECDIS is cancelled on the ECDIS node an **Action Required** message appears warning the operator that the target will be cancelled on all nodes on the system and that associated AIS targets will be set to sleeping.



Tracking Targets on a Dual Radar System

On dual radar, targets are acquired as described for a single system, providing the targets are within the tracking range (0.25NM to 40NM) for both transceivers.

Video from both transceivers is used to track targets, with a single vector displayed at the target position. The system displays the better of the target information obtained, based on a combination of reported accuracy information from the tracker, along with consideration of the number of times video has been seen or not seen for the target.

If the target passes into a blind arc of one radar but is still visible on the other, the target will continue to be tracked as normal without any alerts being raised. The same limits on maximum number of targets tracked apply as for a single radar system.

Tracked Targets Capacity

Single Node

Not relevant for ECDIS Watchmode

Multi- Node

The maximum number of targets that can be tracked on a multi-node system is 200.

If the number of tracked targets reaches 95% of the system maximum a caution is given; **System Tracks Almost Full**. If the number of targets reaches the maximum and the user attempts to acquire an additional target a **System Tracks Full** warning is raised and no further targets may be tracked on the nodes.

On a three node system each node may track up to 100 targets individually; but if the first node is tracking 50 targets and the second node 75 targets, the third node may only track up to 75 targets. In this case, the **System Tracks Full** warning would be raised when an attempt is made to acquire the 201st target, but the local **Tracks Full** warning would not be raised since none of the nodes have reached their maximum.

AIS Targets

AIS Rendering Conditions

AIS targets are only rendered when the following conditions apply:

- There is a valid position and heading for own ship
- **Enable Input** is checked in AIS Display
- The Sleeping Target filter setting is checked in AIS Display.
- AIS target messages are being received and are valid.
- Own ship's position in WGS84 ⁴⁰ datum is known.

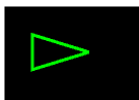
When AIS targets are not being rendered, received AIS transmissions continue to be stored so that known targets can be rendered quickly when conditions indicate rendering should proceed.

For information on enabling AIS input and setting AIS filter settings, including AIS objects, refer to AIS Display.

AIS Target States

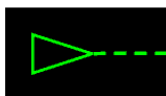
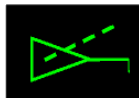
AIS targets ⁴¹ are usually displayed on the chart display as triangles (unless the AIS is a scaled ship symbol) and can be shown in one of the following states:

Sleeping



A sleeping target is smaller in size than an activated target and is never displayed with vectors.

Activated

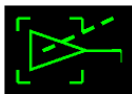


An activated target is displayed with heading and speed/course vector. The speed/course vector is a dashed line originating from the centre of the triangle, the length of line being proportional to the vector time.

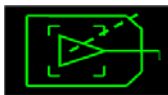
If heading data is missing or invalid the course vector is shown in place of the heading line. If neither heading nor COG data is available the triangle is orientated towards the top of the display area.

⁴⁰ World Geodetic System 1984 (WGS-84) is a chart datum model used by chart makers to map the earth's surface.

⁴¹ If the target has an AIS target associated with it and the AIS target has a name assigned, this name will be used and may not be changed. Names assigned to targets will be distributed across all nodes in the system.

**Activated
and
Selected**

When an activated target is selected a dashed square outline appears centred on the target origin and information on the target is shown in the AIS window.

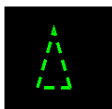


When an activated AIS target's length and beam exceed the standard AIS symbol triangle, the AIS triangle is drawn with the ship's outline around it. The ship's outline symbol is not displayed if any of the following apply:

1. When the reference point of the reported position is unavailable.
2. When the dimensions of the ship are unavailable.
3. When the beam of the outline is less than 7.5mm.
4. When the target's heading is not reported

When the AIS ship's outline is selected to display target tote information, the dashed square outline appears centred on the target origin and information on the target is shown in the AIS window.

 *An AIS ship's outline is NOT considered for CPA/TCPA infringements. These calculations will be taken from the AIS triangle symbol.*

**Not used in
collision
avoidance**

An AIS target symbol that is not used in collision avoidance calculations when SOG and/or COG are not available. Or when the Activate on CPA/TCPA/BCR setting is disabled in AIS Display.

The default state for a newly acquired target is sleeping.

The display of sleeping targets may be switched off from the AIS Display sub menu.

The following criteria will cause a sleeping target to become activated:

- When manually selected by the operator, see below.
- When the target infringes the [CPA/TCPA](#) limits or bow crossing criteria shown on the Target Data tab folder of the Selected Target sub menu.

 *This is providing the Activate on CPA/TCPA/BCR setting is enabled in the AIS Display window.*

- When the target enters an auto activation zone, see Activation Zones.

To manually activate an AIS target do the following

1. Left click on the AIS target, an activated AIS target will display a heading and speed/course vector. An AIS reference and automatically assigned target number will also be displayed, if enabled in the Identification area of Target Display.
2. To view data on an activated AIS target left click on the target again. A dotted green square appears around the target and the AIS details are displayed in the Target Data tab folder of Selected Target sub menu.



Changing an Activated Target to Sleeping

An activated, or activated and selected target can be manually set to sleeping, providing it doesn't infringe the criteria listed above.

To set a target to sleeping do the following:

1. Right click on an activated AIS target.
2. A semi-transparent window appears, left click on **Set to Sleeping**
3. The target is deactivated and its heading, speed/course data and identification data is removed from the screen. If the target was activated and selected the selection box remains around the target.
4. To reactivate a sleeping target left click on the target again, all previous target data is restored.



All AIS targets can be set to sleeping with one command from the AIS Display window, see 'Set All AIS Targets to Sleeping' in AIS Display.

AIS Target Display Capacity

The target processing capacity for rendering AIS targets and other AIS NAV symbols, such as [ATON](#), [SAR](#) and Base Station at any one time is 240.

If the number of AIS targets and AIS NAV symbols is near the maximum allowed (95%) an **AIS Almost Full** caution is raised.

An **AIS Exceeds Capacity** warning is raised when there are more than 240 AIS targets and AIS NAV symbols being reported to the system.

In the event of AIS display capacity being exceeded, only the closest 240 AIS targets to own ship are displayed and used for [CPA/TCPA](#). AIS targets further away will not be rendered until the maximum capacity has receded.

Active AIS Target Capacity

The maximum number of active AIS targets on a single node or multi-node is 40.

If the number of active AIS targets is near the maximum allowed (95%) **Active AIS Almost Full** is shown as a caution.

If the number of active AIS targets reaches the maximum an **Active AIS Full** warning is raised and no more AIS targets can be activated until one or more AIS targets are set to sleeping.

Activating AIS Targets when Capacity is Reached

VisionMaster allows for the activation of AIS targets (and associated tracking of any underlying radar target) even when the activated capacity has been reached (i.e. 40 activated AIS targets).

This is done by the system selecting the least navigationally significant target and automatically setting it to sleeping (with any underlying tracked target being cancelled).

When a sleeping AIS target is selected for activation whilst at capacity the system will determine which active AIS target is least significant and automatically set that target to sleeping. This will happen providing the target is not infringing CPA/TCPA or BCR/BCT alarm criteria, designated a target of interest by virtue of being selected for display in a target tote, or is currently in an auto-activation zone.

The following criteria are used for determining the least navigationally significant target:

1. First the system looks for targets that are 1 minute or more past TCPA, and within this group will drop the target at the greatest range from own ship.
2. If no active AIS targets are at least 1 minute past TCPA then the AIS target most distant from own ship will be set to sleeping.

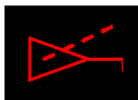
AIS targets can also be automatically dropped by the operator adjusting the Autodrop range lower than the default of 10 NM. For details, refer to 'AutoDrop Targets' in the Target Display section.

Target Alert States

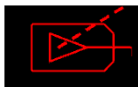
The following alert states apply to any AIS target in any state, (with the exception that sleeping targets do not raise the Lost alert):

- CPA/TCPA/BCR or Activation zone infringement
- Lost

CPA/TCPA/BCR or Activation zone infringement

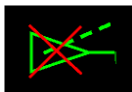


When an AIS target infringes the CPA/TCPA/BCR criteria, or when it enters an Activation zone, the target symbol and its heading/vector are rendered in flashing red.

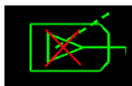


When the AIS scaled ship symbol is used the ship outline is also rendered in flashing red.

Lost



Activated targets that are deemed lost are rendered with a red cross through the AIS symbol. The target maintains its last heading and COG/SOG and will continue to be dead reckoned until the lost target alert is acknowledged.



The cross symbol flashes while the Lost Target alert is unacknowledged.

Note that lost AIS targets do not generate CPA/TCPA alarms.

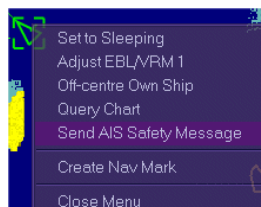
AIS targets in an Activation Zone will remain flashing red until the **AZ Entry** alert is acknowledged (see Alert Status Indicator). When the alert has been acknowledged the AIS symbol will revert to its normal (green) state, even when the target remains in the Activation Zone.

When **CPA/TCPA Limit** and **Bow Crossing Limit** alarms have been acknowledged the AIS symbol stops flashing, but the symbol remains red until the CPA/TCPA and Bow Crossing infringement limits no longer apply.

AIS Safety Messages

Safety messages can be sent from own ship to selected AIS targets. The safety message is sent using an AIS minimum Keyboard & Display (MKD) which can be accessed by either right clicking on the AIS target, or from the AIS INFO tab folder in the Selected Target sub menu.

For information on using the MKD to send safety messages, see AIS Info.



Multi-node Support for AIS Targets

In a multi-node system, one or more nodes may be responsible for interfacing with the device that provides AIS target and own ship AIS data. The system will make one node (with an interface to an AIS device) responsible for distributing the AIS target and own ship data to all other nodes.

WARNING!

IF A LOCAL NODE LOOSES COMMUNICATION WITH THE AIS DISTRIBUTING NODE, ALL AIS TARGETS ARE REMOVED FROM THE LOCAL NODE DISPLAY.

Classes and Types of AIS

There are two classes of AIS target, Class A and Class B, as well as different types of AIS used for shore stations (Base Stations), Aids to Navigation (ATON), AIS on search and rescue (SAR) aircraft and AIS Search and Rescue Transmitters (SART).

The AIS Display window allows the operator to filter the display of Class A and Class B AIS targets and also the types of AIS.

The table below describes the classes and types of AIS.

Class and Type	Description
Class A	Under the Safety Of Life At Sea (SOLAS) convention, all the following vessel types are required to install a Class A AIS transponder: • Upwards of 300 gross tonnage engaged on international voyages. • All passenger vessels engaged on international voyages. • Upwards of 500 gross tonnage not engaged on international voyages
Class B	Class B is intended for non-SOLAS commercial and recreational vessels.
Base Station	Base Stations enable the ship to shore / shore to ship transmission of information to be provided. Networked AIS Base Stations can assist in providing overall maritime domain awareness.
ATON	ATON enables the position and status of buoys and lights to be transmitted. In some cases, such as marking a wreck until a physical buoy can be deployed, a virtual ATON is created. A shore-based AIS system is configured to transmit AIS messages indicating the existence of an ATON at a specified location.
SAR Aircraft	Search and Rescue (SAR) Aircraft may use AIS to assist in their operations.
SART	Search and Rescue Transponder using AIS can be used to assist in determining the location of a vessel in distress.

Class and Type	Description
MOB	Man Overboard device designed to be carried by individual crew members and used in the event of a Man Overboard situation or other personal emergency. On activation, it transmits a message giving position and ID. Transmission will be picked up by own ship and also by other AIS equipped vessels within range.
EPIRB	Emergency Position Indicating Radio Beacon is used to alert search and rescue services in the event of an emergency. It does this by transmitting a coded message on the 406 MHz distress frequency via satellite and earth stations to the nearest rescue co-ordination centre.

Target Monitoring

All targets are monitored for Lost Target. Established tracked targets and AIS targets (both activated and sleeping) are monitored for [CPA/TCPA](#) and [BCR/BCT](#) infringements, using own ship's [CCRP](#) for reference. BCR/BCT infringements use own ship's bow for reference.

Lost Target

If the system loses track of a target then a Lost Target warning is raised for that target and an appropriate flashing symbol placed over the target, see Target Monitoring Symbols.

Lost Target alerts can be raised on all nodes and a lost target alarm range limit may be set, so that only lost targets within a specified limit from own ship will raise a Lost Target alert. For details refer to Limits and Settings.

On dual radar a Lost Target alert is raised if neither transceiver has seen video in the last six scans.

Any flashing Lost Target alert symbols stop flashing when acknowledged but the alert symbol remains centred over the lost target(s).

The alert symbol is automatically cleared if:

- the target ceases to report itself as lost; or
- the target is cancelled or dropped.

The Lost Target alert automatically clears when there are no lost targets.

CPA/TCPA and BCR/BCT Infringement Conditions

The conditions for a target to generate an infringement are:

- Both CPA/TCPA and BCR/BCT values are positive (i.e. target has not yet reached the closest point but will do so).
- Both CPA/TCPA and BCR/BCT values are less than or equal to the limits entered.

If an infringement is detected an alert is raised and an appropriate alarm symbol displayed flashing at the target's position.

Once the alert is acknowledged, any flashing alert symbols stop flashing but remain over the target(s) infringing the limits.

The alert symbol, flashing or not flashing, is removed when:

- The target no longer infringes the defined limits, for definition of limits see Limits and Settings.
- The target is cancelled or dropped.

The alert is cleared automatically when there are no targets infringing the defined limits.

The CPA/TCPA and BCR/BCT values for a target are shown on the Target Data tab folder of the Selected Target sub menu.

Target Monitoring Symbols

The system shows alarm monitoring symbols used for targets. The alarm symbols are coloured red and flash until acknowledged.

CPA/TCPA and bow crossing infringements
see Limits and Settings



Solid circle

Unacknowledged alert - flashing red

Acknowledged alert - solid red

Activation Zone -
acquiring



Dashed circle.- target manually selected
in Zone

Flashing red until Activation Zone
infringement is established.

Activation Zone
infringement - established



Small solid circle

Unacknowledged alert – flashing red

Activation Zone
infringement - established
and acknowledged



Small solid dot

Acknowledged alert – solid green

Lost Target



Crossed flashing red lines centred on
the current target symbol.

Only one alert symbol appears on a target at any one time. The order of precedence is:

1. CPA/TCPA/BCR
2. Lost Target
3. Activation Zone infringement

Although the audible alert may be temporarily or permanently muted (dependent on commissioning) the visual alert symbol will always apply, unless tracking has ceased, or the alert condition no longer applies.

Multi-Node Support

The same target monitoring limits (CPA/TCPA, bow crossing) are applied on all nodes in the system. These values are calculated on individual displays so that a target may, for example, have a different CPA/TCPA on each display, depending on the results from the target tracker.

Each node evaluates the alert conditions on the targets that have been processed by that node. Whenever a target alert is acknowledged on a node, all targets of the same number on other nodes will have their alert condition acknowledged. If other nodes have f alerts or targets not present on the acknowledging node, the alert condition for these targets remain unchanged.

Selected Target Functions

The Selected Target sub menu allows real time data on a selected target to be displayed. The Selected Target window will appear on the chart display.

When a target has been selected it is identified with a green broken line box, centred on the target origin for tracked targets and AIS targets.

For details on activating and tracking AIS targets, see AIS Targets.

The Selected Target sub menu divides into the following tab folders:

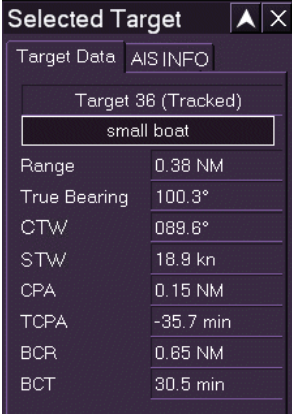
- Target Data
- AIS Info

Targets are identified by number, name or both, depending on the identification parameters selected in Target Display.

Target Data

The Target Data tab folder shows the following tracking data on a selected target:

- **Range** - the distance of the target from own ship's CCRP.
- **True Bearing** - the true bearing of the target from own ship's CCRP.
- **CPA** (Closest Point of Approach) - the [CPA](#) of the target from own ship's CCRP
- **TCPA** (Time to Closest Point of Approach) - the [TCPA](#) of the target from own ship's CCRP
- **BCR** (Bow Crossing Range) the [BCR](#) of the target from own ship's bow.
- **BCT** (Bow Crossing Time) the [BCT](#) of the target from own ship's bow.



Target 36 (Tracked)	
small boat	
Range	0.38 NM
True Bearing	100.3°
CTW	089.6°
STW	18.9 kn
CPA	0.15 NM
TCPA	-35.7 min
BCR	0.65 NM
BCT	30.5 min

If the system is in water stabilised mode (see Sensor Data Display) the following two fields are shown:

- **CTW** (Course Through Water) - the true [CSE](#) of target
- **STW** (Speed Through Water) - the true [STW](#) of target

If the system in ground stabilised mode the following two fields are shown:

- **COG** (Course Over Ground) - the true [COG](#) of target
- **SOG** (Speed Over Ground) - the true [SOG](#) of target

If the target approach point has passed, the CPA field continues to show the actual CPA value and the passing point is indicated by a TCPA with a minus value.

The BCR and BCT are only shown if both the crossing time and the distance are positive, i.e. a target is projected to cross own ship's bow but has not yet done so. If the target is NOT projected to cross own ship's bow then both fields are shown as dashed (--.).

If a target is lost or if a valid heading or speed for own ship is not available then any invalid target data, except the target number/name and its type, is shown in an orange warning colour. If the target is subsequently found or heading/speed becomes valid, the data reverts to its normal system colour.

Tracked targets can be named from the Target Data folder. To name a target:

1. Click in the target name field below the target identifier. The on screen keypad appears.
2. Enter a name for the target using the keypad, when finished click on the keypad **OK** button. The name entered appears in the Target name field, and if either **Name** or **Both** is selected in the Identification area of Target Display the name appears alongside the target on the chart display.

Target Data AIS

Where the selected target is an AIS the Target Data folder includes the target's current heading as additional data.

Target Data AIS INFO	
Target 20 (AIS)	
PRIDE OF KENT	
Range	2.62 NM
True Bearing	333.1°
COG	148.7°
SOG	18.3 kn
CPA	2.58 NM
TCPA	7.6 min
BCR	--.
BCT	--.
Heading	149.0°
Show Tracked Data	

AIS INFO

The AIS INFO tab folder displays alphanumeric information for an activated AIS target.

AIS targets are only shown in Transmit mode shown when there is a valid position and heading for own ship and **AIS Input** is enabled in the AIS Display window.

If a target is set to sleeping (see AIS Targets), its data is automatically removed from AIS Info.

When AIS targets are not shown, received AIS transmissions continue to be stored so that known targets can be rendered quickly when conditions indicate rendering should proceed.

When an AIS target has been selected the tab folder includes the following information:

- Target number assigned
- Name of target vessel (if known)
- Class A or B (targets prioritised in order of importance, see 'Classes and Types of AIS')
- Vessel [MMSI](#)

The button at the bottom of the AIS INFO tab folder enables AIS safety messages to be sent to selected AIS vessels (providing that AIS MKD Control has been enabled in the Configuration tool).

The AIS INFO folder also includes the following tabs containing additional AIS information:

- Dynamic
- Voyage
- Static

AIS Target Information

Information relating to a target can be displayed by a left click on the target. Relevant AIS Target information is then displayed in a Selected Target window.

Target Data	AIS INFO
Target 99	
HURTIGRUTEN	
Class	A
MMSI	000000102
Source	Direct
Type of the information:	
Dynamic	Voyage
Static	
Lat	50°58.698' N
Lon	001°37.000' E
RAIM	No
Accuracy	<10m
Time	Missing
COG	359.9°
SOG	0.0 kn
Heading	050.0°
Nav. Status	Underway
ROT	0.0 °/min
Send Safety Message	

Dynamic Data

The following dynamic data is displayed:

- Latitude/Longitude position of target
- RAIM ⁴² in Use Indication
- Position Accuracy
- Time ⁴³
- COG – the target's course bearing
- SOG – the target's speed over ground
- Heading
- Navigational Status - e.g. Underway or Fishing
- Rate Of Turn (in degrees per minute)

Class B AIS targets do not support Navigational Status, Rate of Turn, Draught, Destination, Estimated Time of Arrival, Special manoeuvring flag, IMO number, or Call sign and their support of safety messages is optional..

Voyage Data

The following voyage data is displayed (if no voyage data is available then **Missing**, **Unknown** or **Not Available** is displayed):

- Draught - maximum draught of vessel in metres.
- Haz. Cargo - information on any hazardous materials the vessel may be carrying.
- Destination (data not available for Class B targets)
- ETA - estimated time of arrival to destination.
- Special Maneuver - options are Not Available (default), Not engaged in Special Manoeuvre, and Engaged in Special Manoeuvre.

Dynamic	Voyage	Static
Draught	Missing	
Haz.Cargo	Unknown	
Destination	DOVER/CALAIS	
ETA	Missing	
Special Maneuver	Not Available	

Voyage data may initially be missing as it is transmitted less frequently than dynamic information.

⁴² RAIM (Receiver Autonomous Integrity Monitoring) provides integrity monitoring of GPS signals.

⁴³ The time, in seconds, that message data was acquired from the AIS. The time will increment up to a maximum of 60 seconds, before resetting to 0 or 1. The time incremental speed is dependent on the speed of the AIS target.

Static Data

The following static data is displayed (if no static data is available then **Missing** or **Unknown** is displayed):

- IMO number.
- Call Sign - vessel identification name (data not available for Class B targets).
- Length (in metres)
- Beam (in metres)
- Vessel Type - e.g. Cargo or Tanker
- EPFS (position sensor source, e.g. GPS)
- Location of antenna: Bow - configured offset distance from antenna to vessel bow in metres.
- Location of antenna: Centre Line - configured offset distance from antenna to centre line of vessel in metres.

Static data may initially be missing as it is transmitted less frequently than dynamic information.

Dynamic	Voyage	Static
IMO	555443210	
Call Sign	PO212SL	
Length	Missing	
Beam	Missing	
Vessel Type	Passenger	
EPFS	GPS	
Location of the antenna:		
Bow	Missing	
Centre Line	Missing	

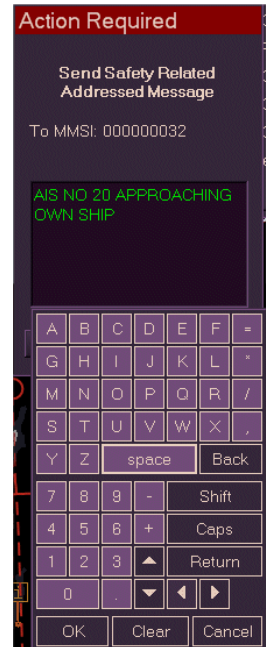
AIS Safety Messages

The AIS INFO tab includes the ability to send safety related messages from own ship to a selected AIS vessel.

Safety messages that have been sent from own ship are stored in the 'Message Tx' folder of Own Ship AIS sub menu.

To send a safety message, do the following:

1. From the chart display select the AIS vessel where you want the message sent to. Details of the selected AIS appear in the **AIS INFO** folder.
2. Click the **Send Safety Message** button at the bottom of the tab folder. An Action Required window appears with the vessel MMSI above the message field.
3. Move the screen cursor into the message field and left click, the AIS Minimum Keyboard & Display (MKD) appears below the field.
4. Enter a message using the MKD, note that the MKD only supports the input of uppercase format messages.
5. The MKD will be removed from the screen after a short period of inactivity. To re-enable the MKD left click in the message field again.
6. To clear a message press the **Clear** button, to cancel the send action press **Cancel**.
7. When you have compiled a message click the **OK** button, the MKD is removed from the screen, to return the MKD click in the message field again.
8. To send the message, click the **Send** button. When the message has been successfully sent to the AIS vessel a temporary prompt 'Message Sent' appears in the Prompts field.



Multiple Targets

The Multiple Targets menu can display information on up to eight activated AIS and tracked targets. The following summary data for each target, based on distance and time from own ship, is displayed:

- Target number (ID)
- [CPA](#) of target
- [TCPA](#) of target

CPA	Range	User	
	ID	CPA Δ	TCPA
	10	2.2 NM	0.8 min
	15	3.7 NM	3.0 min
	21	6.7 NM	9.6 min
	20	7.0 NM	13.3 min

If the target is AIS the left hand column displays an AIS triangle symbol adjacent to the target number.

The Multiple Targets menu is divided into three tab folders:

- CPA
- Range
- User

CPA tab folder displays only targets that have positive CPA/TCPA values, targets with negative CPA/TCPA values are excluded from the sorted list.

The targets in the Range tab folder are sorted on the target range from own ship.

The User tab folder lists the targets manually acquired or AIS targets activated and selected by the operator.

Targets are automatically removed from the tote if they are dropped or cancelled by the operator. A sleeping AIS target selected for the tote is automatically set to activated.

CPA	Range	User	
	ID	CPA	TCPA
	10	2.2 NM	-0.6 min
	11	0.0 NM	-8.2 min
	15	3.7 NM	1.6 min
	19	2.5 NM	< -99.9 min
	22	4.2 NM	-16.9 min
	20	6.9 NM	12.1 min

Automatic Sorting of Targets

Targets can be automatically sorted from the nearest to the furthest away from own ship by the following criteria:

- CPA (default)
- TCPA
- Range

To sort the targets by CPA click on the triangle symbol in the CPA button. To sort by TCPA click on the TCPA button to activate and then click the triangle symbol in the TCPA button.

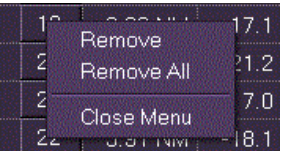
Selecting Targets for the User Folder

Any target manually selected from the chart display. For a target to be displayed in the User Folder it should only be selected whilst this folder is present. The list will include targets which are not established, in which case the CPA and TCPA information displayed for the target is shown as dashed until a vector is established.

CPA	Range	User	
ID	CPA	TCPA	
20	8.9 NM	10.4 min	
15	3.7 NM	0.0 min	
10	2.2 NM	-2.2 min	
18	2.2 NM	< -99.9 min	

Targets are automatically removed from the list if they are dropped or cancelled by the operator.

To remove a target from the User list right click on the target ID and select **Remove** from the window fly out. To remove all targets from the User folder select **Remove All** from the fly out.



Viewing Target Data from Multiple Targets

Any target in the multiple targets menu can be selected for display in the target data window.

To select a target click on the target ID (from any of the three tab folders), the Target Data folder from the Selected Target sub-menu is displayed with the target's information.

Target Display

The Target Display window shows the display parameters for all targets.

In addition to the Targets menu the target display window can be quickly accessed by right clicking on the AIS icon on the upper toolbar and selecting **Target Display**.

If the ECDIS has video overlay, targets are only displayed when the system is in Transmit. If the system is switched to Standby then all targets, with the exception of AIS targets, are dropped.

Targets can be tracked either manually or automatically by auto acquisition, see Activation Zones.

The Target Display window is divided into the following areas:

- Target Display (including Display Priority)
- Identification
- Past Position Dots
- AUTO Drop Targets
- Other (Vector Timeout)
- Number of Targets

Target Display

The **Display Targets** check box controls the viewing of all targets on the display. Tick the check box to view all targets (default), or untick to remove the targets from the display.

Display Priority can be toggled between AIS targets and tracked targets, the default selection is AIS Priority. Toggling between these options will control whether a correlated AIS/Tracked target is displayed as an AIS target or a tracked target. Refer to Targets and AIS Targets in the Targets Chapter. The display of uncorrelated targets is unaffected.

The screenshot shows the 'Target Display' window with the following settings:

- Target Display**
 - ☒ Display Targets
 - ☒ AIS Priority
 - ☐ Tracked Priority
- Identification**
 - ☒ Num ☐ Name ☐ Both ☐ Off
- Past Position Dots**
 - ☒ Display Past Positions
 - ☒ Connecting Line
 - Interval: 1 min
 - Total Time: 4 min
- AUTO Drop Targets**
 - ☐ Enable
 - Range: 10.0 NM
- Other**
 - ☒ Vector Timeout
- Number of Targets**
 - System Targets: 21
 - Local Tracked: 17

Identification

The target identification is displayed adjacent to each target's vector origin and remains visible as long as the target origin is visible. You can select the target identification to display one of the following:

- **Num** Target numbers only
- **Name**⁴⁴ Target names only (the number will be displayed if no name has been allocated).
- **Both** Target numbers and names (the name will be left blank if none has been allocated).
- **Off** No identification

Past Position Dots

This area enables the display and editing of past position dots for all targets, for information see Past Position Dots.

AUTO Drop Targets

This area enables auto drop targets to be enabled and the auto drop range to be adjusted, for information see 'AUTO Drop Targets'.

Other

The **Vector Timeout** check box should be ticked to ensure that the vector True/Relative setting matches the Trails mode after the vector timeout of 30 seconds, see 'Vector Modes'.

Number of Targets

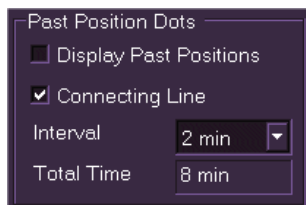
The Number of Targets area includes data:

- **System Targets** - this number represents all correlated targets processed on the node (locally tracked and AIS).
- **Local Tracked** - this number represents the total number of tracked targets only on the node.
- **Total Tracked** - appears on a multi-node system only. This number represents all the tracked targets on all nodes of the system.

⁴⁴ If the target has an AIS target associated with it and the AIS target has a name assigned, this name will be used and may not be changed. Names assigned to targets will be distributed across all nodes in the system.

Past Position Dots

When past position dots are switched on, dots are displayed on the screen indicating the past positions of all targets (with the exception of sleeping AIS targets).



As soon as a tracked target is acquired, or when an AIS target is activated, the past position data starts to build up. The number of dots displayed, up to a maximum of 4, is determined by the length of time the target has been tracked and the time interval selected.

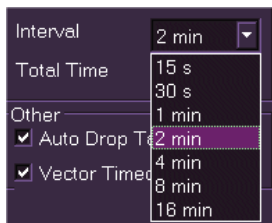
Past position dots are available in all presentation and motion modes providing the system has a working compass.

To turn past position dots on tick the **Display Past Positions** check box.

A thin dotted line connecting the target and its associated dots may be selected to be drawn. To turn the line on or off tick the **Connecting Line** check box.

To select the past position time interval do the following:

1. With the Past Position check box enabled click on the drop down arrow next to the interval time. The intervals are displayed ranging from 15 seconds to 16 minutes.
2. Select the time interval from the drop down list (the default time is 1 minute). The system changes to displaying the position dots in the selected time interval.

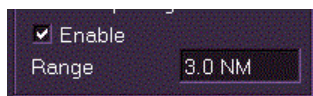


AUTO Drop Targets

The operator can enable an AUTO-drop mode in which individual AIS or tracked targets deemed not to be a threat to own ship are automatically dropped by the tracker (or set to sleeping for AIS) without an alarm being raised.

The system default for auto-drop mode is enabled and the setting stored when altered and restored at power on.

The AUTO drop range can also be adjusted between 3 NM and 99 NM. Reducing the auto drop range from the default of 10 NM enables the system to drop targets of less navigational significance more quickly than the default 10 NM auto drop.



1. To enable AUTO Drop tick the **Enable** check box.
2. To change the auto drop range click in the **Range** field and move the trackball left (to decrease) or right (to increase).

WARNING!

IT IS IMPORTANT TO NOTE THAT THE SELECTED AUTO DROP RANGE VALUE NEEDS TO BE CONSISTENT WITH MAINTAINING APPROPRIATE ANTI-COLLISION AND SITUATIONAL AWARENESS.

Tracked targets are dropped automatically if they meet all of the following criteria:

- The target is not in an auto-activation zone.
- The target is not currently selected for display in the Target tote.
- It does not infringe the [CPA/TCPA](#) or [BCR/BCT](#) alarm criteria.
- It is fully established i.e. it has a motion trend vector displayed.
- The TCPA is more than 3 minutes ago.
- The target is astern of own ship.
- The target's range is more than the defined auto drop range from own ship.
- The target has not been selected as echo reference

In addition to the auto-drop mode, tracked targets are always dropped without an alarm being raised if they meet any of the following criteria:

1. The target's range is greater than the maximum tracking range.
2. No good video data has been extracted for the target for the last 60 scans.
3. The system has been switched to standby.

Target AUTO Drop on Dual Radar

On dual radar, targets are AUTO dropped if they meet the following criteria (in addition to the criteria listed on the previous page):

- The target is astern of the transceiver connected to channel 1
- The range is more than the defined auto drop range from the transceiver connected to channel 1

In addition, tracked targets on dual radar are always dropped without an alarm being raised if they meet any of the following criteria:

- The range is more than 40.0 NM from all transceivers in transmit.
- No good video data has been extracted by either channel for the last 60 scans.
- Both radar channels have been switched to standby.

AIS Display

The AIS Display window includes:

- Settings All Nodes
- Filter Settings
- Other
- Target Count All Nodes

This may be quickly accessed from the main screen by left clicking on the **AIS** button on the upper toolbar.

Settings All Nodes

AIS Input

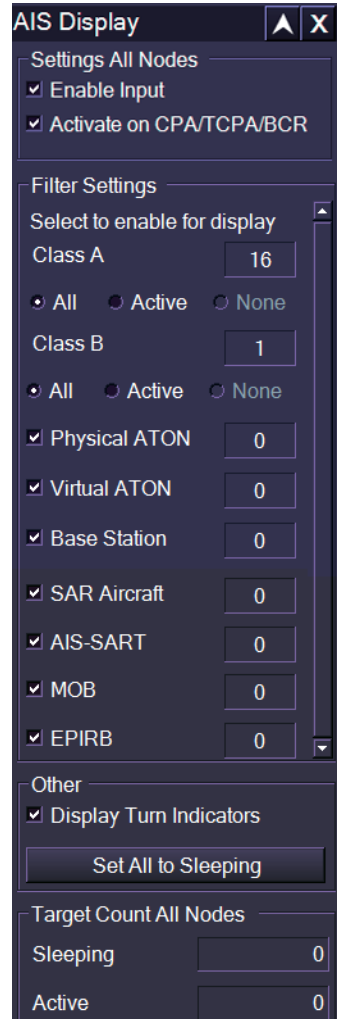
AIS input and the display of AIS targets is turned on or off on all nodes by ticking the **Enable Input** check box.

 *AIS Input can only be enabled when valid sensor data is being transmitted.*

Activate on CPA/TCPA/BCR

When this check box is enabled (default mode) a sleeping AIS target is automatically activated when the target infringes its CPA/TCPA or BCR limits shown in the Target Data tab folder.

If this setting is disabled all sleeping AIS targets are rendered as dotted lines (see 'AIS Rendering Conditions' in AIS Targets) and not activated when target data limits are infringed.



AIS Display

Settings All Nodes

- ☒ Enable Input
- ☒ Activate on CPA/TCPA/BCR

Filter Settings

Select to enable for display

Class A

☒ All ☒ Active ☐ None

Class B

☒ All ☒ Active ☐ None

- ☒ Physical ATON
- ☒ Virtual ATON
- ☒ Base Station
- ☒ SAR Aircraft
- ☒ AIS-SART
- ☒ MOB
- ☒ EPIRB

Other

- ☒ Display Turn Indicators

Target Count All Nodes

Sleeping

Active

WARNING!

THIS SETTING SHOULD NORMALLY BE ENABLED.

DISABLING AUTO-ACTIVATION FOR COLLISION AVOIDANCE MAY RESULT IN POTENTIALLY DANGEROUS TARGETS NOT RAISING AN ALERT

The option will be greyed out if the 'Show AIS and Tracked target CPA/TCPA' option on the Limits and Settings menu is unchecked.

If the operator attempts to disable this option while the Class A or Class B Active option is enabled then a warning is displayed that filtering will be removed i.e. "All" will be selected for both Class A & Class B targets.

Filter Settings

Filter Settings enables different types of AIS targets and AIS NAV Symbols to be displayed (ticked) or not displayed (unticked).

The system prioritises AIS targets into class A and class B vessels. The distinction is made based on the type of message received via the AIS transponder⁴⁵ installed on the originating vessel. For a description of Class A and Class B targets see '*Classes and Types of AIS*'.

Class A – Filter settings are available to display

- All targets
- Active targets only (ie not sleeping)
- No targets (None). This option will be greyed out and not selectable if the Activate on CPA/TCPA/BCR box is checked

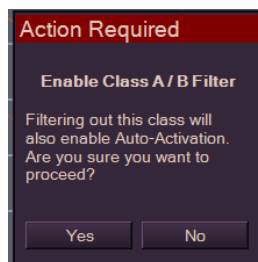
Class B - Filter settings are available to display

- All targets
- Active targets only (ie not sleeping)
- No targets (None). This option will be greyed out and not selectable if the Activate on CPA/TCPA/BCR box is checked

 *The "None" option is only available when Raise Alerts is deactivated from the Collision Avoidance section of the Limits and Settings menu.*

If the operator attempts to enable the Active option for Class A or Class B when the Activate on CPA/TCPA/BCR setting is disabled, an 'Action Required' prompt appears to inform that filtering out the deselected class will automatically enable Auto-Activation.

To proceed with target filtering click the **Yes** button. Sleeping targets for the selected filter class are removed from the screen and Activate on CPA/TCPA/BCR is enabled.



⁴⁵ An AIS transponder is a short range data radio unit which automatically transmits and receives vessel information.

Filter settings also enables the display of the following AIS NAV Symbols (if enabled in the system):

- **Physical ATON** - will display Aid to Navigation (ATON) objects
- **Virtual ATON** – will display virtual ATONs with GPS co-ordinates
- **SAR Aircraft** - will display Search and Rescue Aircraft
- **Base Station** - will display Base Station objects
- **AIS SART** - will display AIS Search and Rescue Transponders
- **MOB** - will display Man Over Board event
- **EPRIB** - will display Emergency Position Indicating Radio Beacons

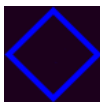
For a more detailed description of the AIS types listed above refer to *`Classes and Types of AIS`*.

If any filter settings are switched off the AIS button on the upper toolbar is displayed with an additional AIS icon in white outline, see AIS Input and Filter Button in *`Basic Operation of ECDIS`*.

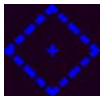
AIS NAV Symbols

The icons used for AIS NAV symbols appear blue on the chart display when the symbol is in the 'on position'. See the table below.

Physical ATON



Virtual ATON



SAR Aircraft



SAR Vessel (Only when Active)



AIS SART, MOB and EPIRB



Base Station



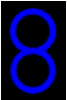
Off / Missing



ATON Symbols - Physical ATONs are drawn as solid lines, Virtual ATONs are drawn as dotted lines.

AIS ATON will indicate off position of floating aid with "off Posn", light failure with "Unlit" or Racon failure with "Racon err" in yellow text. The absence of a charted Physical ATON is indicated with a virtual dotted outline and with "Missing" in yellow text.

ATON Symbol Purpose Markers (Topmarks). The icons below indicate the purpose of the ATON Symbol and will appear, if available, immediately above it.

Racon		ATON Emergency Wreck Mark	
ATON North Cardinal Mark		ATON East Cardinal Mark	
ATON South Cardinal Mark		ATON West Cardinal Mark	
ATON Port Hand Mark		ATON Starboard Hand Mark	
ATON Isolated Danger		Safe Water	
Special Mark			

To view data on an AIS NAV symbol left click on the symbol, the selected object is identified on screen with a blue broken line box centred on the object and the Target Data tab folder of the **Selected Target** window appears showing tracked data on the object.



AIS Target Information

Information relating to AIS SART, MOB and EPIRB can be displayed by a left click of that particular target. Relevant information about this target is displayed in a Selected Target window. Within this window Nav. Status displays as either Active or Test, depending on whether in active or test mode.

Selected Target ▲ X

MOB

MMSI	972010001
Source	Direct
Lat	51°01.598' N
Lon	001°00.807' E
RAIM	No
Accuracy	>10m
Time	Missing
CTW	359.3°
STW	0.0 kn
Heading	-----
Nav. Status	ACTIVE

Last Safety Message Received

Time Received :
04 Mar 2016 09:37:20
MOB ACTIVE

View Safety Messages

Selected Target ▲ X

SART

MMSI	970010001
Source	Direct
Lat	51°01.598' N
Lon	001°00.807' E
RAIM	No
Accuracy	>10m
Time	Missing
CTW	359.3°
STW	0.0 kn
Heading	-----
Nav. Status	ACTIVE

Last Safety Message Received

Time Received :
04 Mar 2016 09:45:20
SART ACTIVE

View Safety Messages

Selected Target ▲ X

EPIRB

MMSI	974010001
Source	Direct
Lat	51°01.598' N
Lon	001°00.807' E
RAIM	No
Accuracy	>10m
Time	Missing
CTW	359.3°
STW	0.0 kn
Heading	-----
Nav. Status	ACTIVE

Last Safety Message Received

Time Received :
04 Mar 2016 09:25:04
EPIRB ACTIVE

View Safety Messages

Other

When the **Display Turn Indicators** check box is ticked the turn indicator for all activated AIS targets are displayed.

Set All AIS Targets to Sleeping

The **Set All to Sleeping** button allows you to set all AIS targets to sleeping based on the following criteria:

1. On a multi-node system, all AIS targets are set to sleeping on the Radar node that the command was made. The same AIS targets that may be activated on another Radar node will not be set to sleeping.
2. If the current watch mode is ECDIS then all AIS targets are set to sleeping on the node that the command was made, and on all other ECDIS nodes, providing that the target was activated on an ECDIS node, and that the target is not currently active on a Radar node.

Target Count All Nodes

The target count lists sleeping AIS targets and activated AIS targets, this target count includes all nodes on a multi-node system.

Test Tracked Targets

The Test Tracked Target facility provides a simulation that allows data to be entered for a test target that can then be tracked by the system. The tracked data can be used to compare with the test target data to assess the performance of the tracking system.

Test targets include fixed test pattern targets and a number of moveable test targets. The facility is available in all presentation and motion modes, providing the system has a working compass and is in Transmit mode.

Test targets can be displayed and tracked in exactly the same manner as live targets, although the system differentiates between test targets and tracked real targets.

Both fixed and moveable test targets are displayed on the screen as flashing green crosses. When test targets are on a large stationary letter X is displayed near the bottom of the chart display.



Test Tracked Targets ▲ X

Fixed Test Targets

☐ Display

Moveable Test Targets

Switch All Targets

OnOff

<Test Target 1>

☐ Target Active

Initial Position

Range3.0 NM

True Bearing36.0°

Velocity

Speed15.0 kn

True Course270.0°

Current Position

Range3.0 NM

True Bearing36.0°

ResetReset All

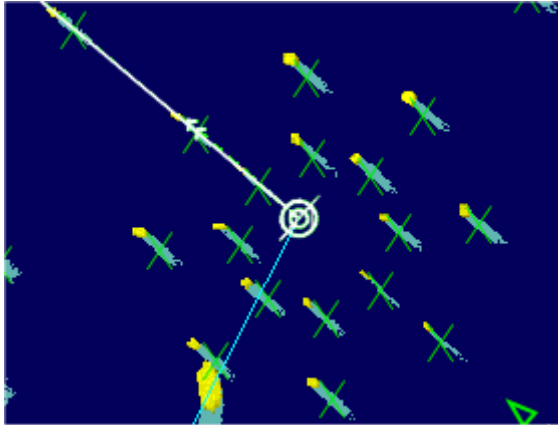
Reset All To Defaults

The Test Tracked Targets window is divided into the following areas:

- Fixed Test Targets
- Moveable Test Targets

Fixed Test Targets

The Fixed Test Targets area includes a **Display** check box. When this check box is ticked, test targets, which are stationary relative to own ship, are displayed on the chart display. See below.



The targets are generated every 45 degrees starting at 0 degrees relative to own ship's heading and increasing in 2 NM increments to 40 NM. The targets are a fixed size in both azimuth and range.

Moveable Test Targets

The number of user definable test targets is determined by the type of radar interface board installed in your VisionMaster system.

The table below defines the number of targets each interface board supports.

Interface Board	Number of Defined Targets	Test Targets
SC2	2	1 to 2
SC3	5	1 to 5

The current moveable test target is shown in a field below the Switch All Targets On/Off buttons, and defaults to **Test Target 1**. To select the next moveable test target, click the > button. If your system only includes two test targets, as defined in the table above, the > button will be greyed out when **Test Target 2** is selected.

Before the Moveable Test Targets are activated the initial position, which includes Range and True Bearing may be defined.

When moveable targets are active the target velocity and current position parameters may be defined.

The table below defines the Range, True Bearing, Speed and True Course default values and ranges.

Test Target	Display Range (0.3 to 40 NM)	True Bearing (0° to 359.9°)	Speed (0 to 75 kn)	True Course (0 to 359.9)
1	3.0 NM from turning unit	36°	15 kn	270°
2	3.0 NM from turning unit	108°	15 kn	180°
3	3.0 NM from turning unit	180°	15 kn	25°
4	3.0 NM from turning unit	252°	15 kn	90°
5	3.0 NM from turning unit	324°	15 kn	135°

Using Test Targets

To switch Fixed Test Targets on, tick the **Display** check box. A fixed test target pattern is displayed flashing on the chart display.

To switch on all moveable test targets, click the **On** button. The **Target Active** check box is automatically ticked and all moveable test targets are displayed on the chart display with decaying video trails, showing the history of the targets' movement.



To display only the moveable test target selected in the target field (e.g. **Test Target 1**) untick the Target Active check box. Other moveable test targets are removed from the screen, although their video trails remain.

To switch off all moveable test targets click the **Off** button.

Changing Moveable Test Target Parameters

When a moveable test target is inactive (Target Active box unticked), its initial position (range and true bearing) may be changed from the default parameters.

When a moveable test target is active (Target Active box ticked), its initial position remains the same while its current position updates. When active the target's velocity and current position may be changed from the default parameters.

To change any enabled test target parameters click in the field, the value changes to green (editable). Move the trackball left or right to change to the required value, left click in the field to set the new value and exit edit mode.

The three buttons at the bottom of the Test Targets window have the following functionality:

- **Reset** - resets the currently selected test target to it's initial position.
- **Reset All** - resets all moveable test targets to their initial positions.
- **Reset All To Defaults** - resets all moveable target parameters back to their default values.

Using Test Targets as a Training Exercise

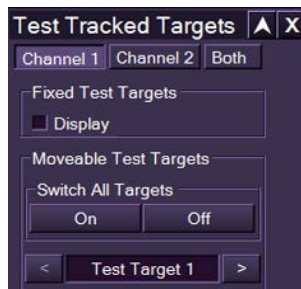
The following training exercise using movable test targets may be undertaken.

1. In order to make the CPA/TCPA calculations easier to visualize, it is advisable to make own ship stationary. To do this, right click on STW on the Sensor Data Display, and click **Select STW Source** from the drop down list. In the STW window select **MAN** sensor data source, fixed at 0.0.kn, and confirm selection.
2. Select **Test Tracked Targets** from the Targets menu and ensure the Fixed Test Targets **Display** check box is unticked.
3. In Moveable Test Targets select **Test Target 1** and tick the **Target Active** check box.
4. Adjust the speed and true course of Test Target 1 so that it is heading in an approximate direction towards own ship.
5. Select the test target on the screen by clicking on the beginning of its video trail. Click on the selected target again to display the **Target Data** tab for the selected test target.
6. Note the target's range and other attributes. Apart from Range and True Bearing all other target data will be displayed in amber. If the TCPA shows as a negative value, go back to the Test Targets window and re-adjust the target's true course accordingly.
7. As the test target moves closer to own ship and the TCPA moves towards zero, note how the range comes to match the calculated CPA.

Test Tracked Targets on Dual Radar

On dual radar, test targets can be displayed and tracked separately for each channel, or selected for display and tracking on both channels.

The Test Targets window for dual radar includes all the functionality described previously for single radar systems, but with the addition of three tab buttons: **Channel 1**, **Channel 2** and **Both**.



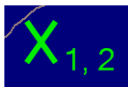
To enable test targets on a specific channel click the required Channel 1 or Channel 2 button and define the test target values as described in Test Tracked Targets.

 *If one radar channel is in Standby the test targets cannot be enabled on the channel in Standby. All settings on that **Channel** tab and **Both** tab will be disabled.*

When test targets are displayed on a specific channel the channel's number appears next to the large stationary **X** at the lower part of the chart display.

To enable test targets on both channels click the **Both** button, the window enables all test targets, fixed test targets and moveable targets for both channels to be switched on and off and **Reset All**, **Reset All To Defaults** to be made.

When test targets are displayed on both channels the numbers **1** and **2** appear next to the large stationary **X** at the lower part of the chart display.



Test Targets on Client/Server Radar

On a Client/Server Radar (CSR) the same test targets are applied to all Servers and therefore appear at all Clients on the system.

For example; If Client 1 is connected to Server 1, turning the display of moving test targets on at Client 1 will also turn the display on at Client 2, connected to Server 2, with the same settings.

If any Client node edits test target settings, the changes are immediately applied to all Servers and all other Clients displaying test targets.

On a CSR system the radar interface board (NFE card) in the Server processes the same number of definable test targets as a standard SC3 board, i.e. a maximum of 2.

Activation Zones

An activation zone is a defined annular or polygonal area of the display. Targets that enter an activation area are automatically activated and an AZ Entry alarm is raised.

There are two annular and two polygonal activation zones available, which can be turned on and off. The annular zone parameters are edited from the Activation Zones window, or on the display; the polygonal zone parameters are created and edited only on the display. When an activation zone is active the zone parameters are shown on the display as a solid green line. When an activation zone is being edited its line colour changes from green to light purple.

Any targets found in an activation zone are marked by a flashing activation zone symbol (see AIS Target Alarm States in AIS Targets) and an AZ Entry alarm is raised. The activation zone symbol is turned off when the AZ entry alarm is acknowledged, or the zone is turned off. The activation zone symbol is temporarily turned off if the zone is being edited.

Activation Zones

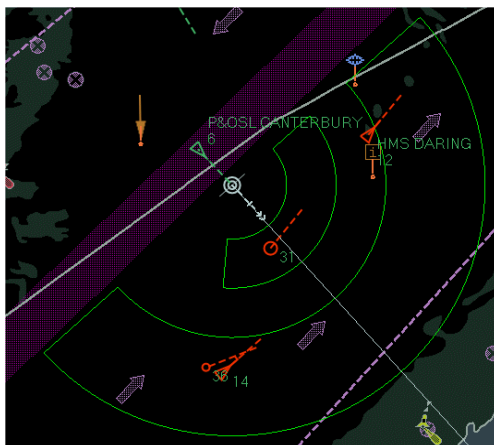
▲ X

Annular Zones

	Zone 1	Zone 2
Active	On	On
Edit	Off	Off
Bearing		
Start	055°	270°
End	150°	090°
Range		
Start	1.8 NM	8.0 NM
End	3.3 NM	10.0 NM

Polygonal Zones

	Zone 1	Zone 2
	New	New
Active	Off	Off
Edit	Off	Off



There is a limit on the number of targets within all active zones. An AZ Full alarm is raised when the next target enters the zone after the limit has been reached. The AZ Full alarm is cleared when the number of targets falls below the limit.

Annular Activation Zones

The initial annular zone definitions are as follows:

The initial system zone definitions are as follows:

- **Zone 1** 4 to 5 NM long distance units and 270° to 90°
- **Zone 2** 12 to 14 NM long distance units and 270° to 90°

An annular zone can be edited by changing its radial position and depth, and by changing its start bearing and end bearing within the limits defined below.

Activation Zone Limits		
Parameter	Min	Max
End Range (in long distance units)	1.0	40.0
Start Depth (in long distance units)	0.4	2.0
Bearing	6°	354°

To create activation zone parameters from the Activation Zones window do the following:

With the **Activation Zones** window opened and the zone active (On) click on the **Edit** button of the zone to be edited (Zone 1 or Zone 2). You can edit both the Bearing (the radial angle of the zone) and the Range (the depth of the zone).

To edit the zone bearing:

1. Click inside the **Start** field. The start degree number changes from white to green (editable).
2. Move the trackball left (to decrease the numerical degree) or right (to increase). If the zone is switched off (inactive) the zone appears on the display when the parameters are changed.
3. To change the **End** bearing repeat the procedure above.

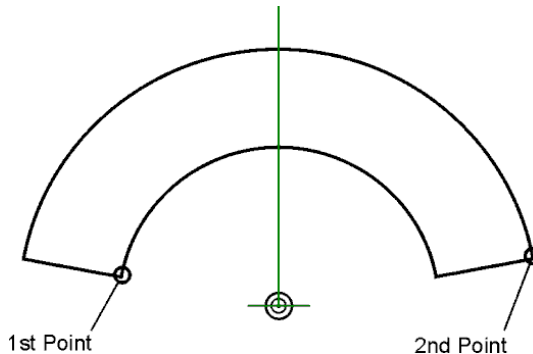
To edit the zone range:

1. Click inside the **Start** field. The start degree number changes from white to green (editable).

2. Move the trackball left to decrease the range of the zone from ownship, or right to increase the range from own ship. As the Start range is changed the End range numerical degree changes proportionally
3. To shorten or widen the zone range click in the **End** field and change the range as described above.

To create activation zone parameters directly on the chart display do the following:

1. Click on the **Edit** button of the zone to be edited (Zone 1 or Zone 2).
2. Move the cursor into the display and left click to create the first start point of the activation zone.
3. Move the cursor to the required end point of the zone, diagonally opposite the first point, which defines the bearing and range.



Polygonal Activation Zones

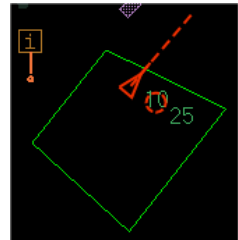
A polygonal zone is a randomly shaped zone constructed from operator defined zone points (maximum of 10), which are entered directly on to the chart display.

Polygonal lines may be drawn up to a maximum distance of 40 NM from own ship.

To create or edit a polygonal zone, do the following:

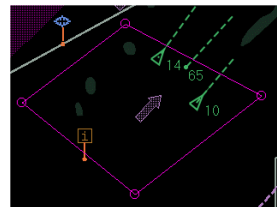
To create a polygonal zone:

1. Click on the **New** button of Zone 1 or Zone 2 and move the cursor to the desired location in the chart display. The cursor is shown with the letters **'Add'** below the cross hair and the 'New' button changes to **Cancel**, the Active and Edit buttons are disabled.
2. Left click in the display, the first zone point is created and is shown on the screen as a small purple circle.
3. Move cursor and left click again, a second zone point is created and the two circles are joined with a straight purple line. To create the polygonal shape continue the process, the last zone point (maximum of 10) must be entered at the first point. When the last zone point has been entered the polygonal shape is created. The zone point circles are removed, the zone line changes to green and the zone is auto activated.



To edit a polygonal zone:

1. Click the Edit **Off** button of the polygonal zone to be edited, the button changes to **Submit**. In edit mode all activation zones are displayed on the screen, with the zone to be edited shown in purple (edit mode) with all zone points displayed.
2. Move the cursor to the first point, the cursor changes to a bidirectional arrow indicator. Left click on the point, hold down the left button and use the trackball to drag the point to the required location on the screen. Repeat the process for all other zone points. Note that targets in an edited zone are not activated.
3. When the zone is changed to the required shape and position click the **Submit** button. The zone is activated (shown with a green line) and the Edit is switched off.



Own Ship AIS

The Own Ship AIS window includes the following three tab folders:

- Own Ship
- Message Rx
- Message Tx

The following describes data available on the Own Ship tab folder. For information on AIS safety messages that have been sent and received refer to Own Ship AIS Messages.

Own Ship

The Own Ship tab folder displays the following read only AIS data for own ship:

- Name of vessel
- Class (A or B)
- Vessel [MMSI](#)

The screenshot shows the 'Own Ship AIS' window with three tabs: 'Message Rx', 'Message Tx', and 'Own Ship'. The 'Own Ship' tab is active, displaying the following information:

Own Ship	
Name	SPERRY STAR
Class	A
MMSI	235112233
Detailed information:	
Dynamic	Voyage Static
LAT	51°04.703' N
LON	001°41.057' E
HDG	307.0°
COG	311.1°
SOG	18.3 kn
Status	Underway

Own Ship tab folder also includes the following tabs:

- Dynamic
- Voyage
- Static

All Own Ship AIS features shown in the tab folders will display read-only data if the 'Enable AIS MKD Control' is set to No (default setting) in the Configuration tool. If Own Ship AIS features have been enabled for operator selection the features that can be changed are described in the following sub sections.

Dynamic

The Dynamic tab includes the following data for own ship:

- LAT (Latitude position)
- LON (Longitude position)
- Heading (HDG) bearing
- [COG](#)
- [SOG](#)

- Status⁴⁶ - the navigational status of own ship includes the following states:
 - [Underway](#)
 - At anchor
 - Not under command
 - Restricted Manoeuvre
 - Constrain draught
 - Moored
 - Aground
 - [Fishing](#)
 - [Sailing](#)

If one of these states does not apply the Status field displays:
Unknown.

Voyage

The Voyage tab includes the following data for own ship:

- Draught
- Cargo
- Destination
- POB (only available if AIS MKD Control is enabled)
- ETA calculator, (for information on using the ETA calculator refer to 'ETA Calculator' in the Routes menu)
- Date & Time (UTC or Local)

Dynamic	Voyage	Static
Draught	Missing	
Cargo	Missing	
Dest	DOVER/CALAIS	
POB	1	
ETA		Calculate
09 Jul 2013 22:47 UTC		

All Voyage settings are editable if AIS MKD Control is enabled.

Static

The Static tab includes the following data for own ship:

- [IMO](#) number
- Call (i.e. name of own ship)
- Type⁵¹ (the vessel type can be selected from a drop down list).

Dynamic	Voyage	Static
IMO	987654321	
Call	SPERRY1	
Type	Pleasure	
Pleasure HSC Pilot SAR Tug Tender Pollution Law		

⁴⁶ Editable setting if AIS MKD Control is enabled.

Own Ship AIS Messages

The Own Ship AIS function includes tab folders for messages sent from own ship (**Message Tx**) and messages received from other vessels (Message Rx).

Message Tx

The Message Tx tab folder lists up to 50 safety messages that have been generated by own ship and sent to AIS vessels. In line with requirements all AIS messages must be in capital letters.

The Sent Messages field defines the number of messages in brackets and shows the first line of each message. Sent messages that have not been selected in Message Tx are shown in yellow.

The Message INFO field shows the message recipient, the time the message was sent and the full message content.

The following function buttons are included at the bottom of the tab folder:

- Send Addressed Message
- Send Broadcast Message

Safety messages can also be created and sent in the AIS INFO tab of Selected Target.

To send addressed safety messages do the following:

1. Click the **Send Addressed Message** button. A message popup window appears.
2. Click on the drop down arrow and select the message recipient from the list of AIS vessels.
3. Click in the message field and compose a message using the AIS MKD, for information refer to 'AIS Safety Messages' in AIS Info.
4. When the message is complete click OK and then the **Send** button. A temporary prompt 'Message Sent' appears and the message is listed in the Sent Messages field.

Message Rx Message Tx

Sent messages (4)

POS HAS ARRIVED IN PORT
 AIS POS IS HEADING TOWAR...
 PRIDE OF DOVER IS HEADIN...
 PRIDE OF DOVER HEADING T...

Message INFO

To Vessel : PEARL OF SCANDINAVIA
 Time Sent : 10 Jul 2013 03:02:05
 Message : AIS POS IS HEADING TOWARDS DOVER HARBOUR

Send Addressed Message
 Send Broadcast Message
 Select Target Delete

Action Required

Send Safety Related Addressed Message

P&OSL CANTERBURY ▼

P&OSL CANTERBURY
 PRIDE OF KENT
 P&OSL ACQUITANE
 PRIDE OF DOVER

Cancel Send

To send broadcast messages do the following:

1. To broadcast a message to all AIS vessels included in the message recipient list click the Send Broadcast Message button. A message popup window appears.
2. Click in the message field and compose a message using the AIS MKD, for information refer to 'AIS Safety Messages' in AIS Info.
3. When the message is complete click the OK and then Send button. A temporary prompt 'Message Sent' appears, the message is sent to all AIS vessels and is listed in the Sent Messages field.

Clicking on a previously sent message will change the Send Addressed Message button to Send Additional Message.

When a message sent to a specific vessel is selected from the Sent messages list the following additional function buttons are enabled:

- Select Target
 - Delete
1. To select the recipient of a safety message highlight the message in the Sent messages list, the Select Target button becomes enabled (note that this button is disabled if the message selected is a broadcast message).
 2. Click the Select Target button, the AIS target is selected on the chart display and the Target Data tab folder of Selected Target appears showing tracking data for the AIS.
 3. To delete a message from the Sent message list highlight the message and click the Delete button. The selected message is removed from the list.

Message Rx

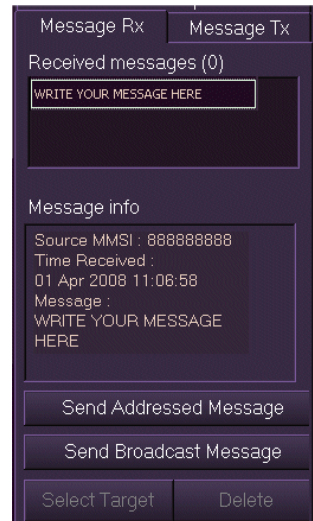
The Messages Rx tab folder displays messages that have been generated from an external device. The messages may for example have been sent from another ship in the area.

AIS messages are used to convey to the operator information that requires attention. When a message has been received the Message icon is displayed in orange, an audible indicator is given and the message is shown in the **Messages Rx** tab.



Left click to view information on the message. The MMSI number of the vessel that sent the message, the time the message was received and the message detail are displayed in the **Message INFO** window. When all messages have been selected the message icon returns to the standard system colour.

The function buttons at the bottom of the Message Rx tab folder work in the same way as described for Message Tx.



Limits and Settings

The Limits and Settings window is split into three sections given below;

1) Collision Avoidance

Raise Alerts –this check box should normally be ticked for alerts to be active. Removing the tick on this ECDIS will disable CPA and BCR alerts for AIS, external and tracked targets, If deactivated, an Action Required warning will appear for operator confirmation of the request. In addition, notification will appear in the Prompts Window and upper toolbar. Information will be updated in the AIS Display menu.

Closest Point of Approach – CPA/TCPA limits

Bow Crossing – BCR/BCT limits

2) Target Association

Standard and Loose Settings

Distance / Angle / Speed

3) Lost Target Alerts

Enablement and lost target range limit settings

A target is considered dangerous if it infringes the defined limits set in this window. When this happens an alert is raised, the alert is cleared automatically when there are no targets infringing the defined limits.

To change the infringement limits do the following.

1. Click inside the field to be changed. The value changes from white to green (editable).
2. Move the trackball left (to decrease the limit) or right (to increase). When the limit has been correctly defined left click to enter value and exit edit mode.

Limits and Settings [Up Arrow] [Close X]

Collision Avoidance

☒ Raise Alerts

Closest Point of Approach

CPA 2.0 NM

TCPA 12 min

Bow crossing

BCR 2.0 NM

BCT 12 min

Target Association

☐ Standard Setting

☒ Loose Setting

Distance 0.18 NM

Angle 2.0°

Speed 5.0 kn

Lost Target Alerts

☒ Raise Alerts

☒ Apply MAX Limit

MAX Limit 10 NM

Closest Point of Approach & Bow Crossing Limits

The system default values and the minimum/maximum infringement limits for CPA/TCPA and BCR/BCT are shown in the table below.

Parameter	CPA/BCR	TCPA/BCT
System default value	2 NM	12 minutes
Range of values	0.1 to 20.0 NM	1 to 99 minutes

Target Association

Target association (correlation) enables the system to decide if two targets displayed on one node are the same target or not. Most commonly this will occur for a radar tracked target which is also an AIS target. Tracked targets visible on a node can also be associated with each other, and if targets are received from an external source these will also be associated with other targets if appropriate. AIS targets are not associated with other AIS targets.

The difference in the target's range, bearing and velocity values must be less than the association limits for a target to be considered the same. If targets do associate then they will be shown with the same ID on all nodes. If targets change course, such that any of the values becomes greater than the limits, the target association will split and each target will then have a unique ID.

There are two defined settings for target association: **Standard** and **Loose**.

The default values for Standard and Loose settings and the minimum/maximum limits for Target Association are shown in the table below.

Target Association			
Parameter	Distance	Angle	Speed
Standard Setting	0.06 NM	1.0°	5.0 kn
Loose Setting	0.18 NM	2.0°	5.0 kn
Range of values	0.01 NM to 0.18 NM	0.1° to 3.6°	1.5 kn to 10 kn

If target association settings are changed the settings defined in the table above may be re-applied by ticking the **Standard Setting** or **Loose Setting** check boxes.

Note that setting these values too high may result in targets which are separate being considered the same target; whilst setting the values too low may mean that targets that are the same are not correlated, leading to multiple targets being displayed in the same position.

Lost Target Alerts

This area enables Lost Target alerts to be raised on all nodes and a lost target alert range limit set, so that any lost targets within a specified maximum limit from own ship will raise a Lost Target alert.

In ECDIS Watchmode, Raise Alerts is only enabled if Raise Alerts in the upper Collision Avoidance area is enabled (ticked). If the upper Raise Alerts checkbox is then disabled (unticked), the lower Raise Alerts setting remains ticked but becomes ghosted. This ghosted setting will become restored if the upper Raise Alerts checkbox is reactivated (ticked).

For a description of Lost Targets and the symbology used, see Target Monitoring.

The default maximum range limit distance is 10 NM. The minimum/maximum values are 0.1 NM to 100 NM.

Collision Avoidance Criteria

Collision avoidance must be carried out in strict compliance with the COLREG⁴⁷.

Relative velocity is fundamental to the activity of collision avoidance. The System calculates relative velocity in both ground and sea stabilisation modes and presents individual target CPA/TCPA data. This same data is used when evaluating whether a target is infringing the operator selected CPA/TCPA, bow crossing and target association limits. The system is designed in such a way as to minimise errors in the collision avoidance calculations which result from the sensors selected for stabilisation. In practice, however, different sensors may contribute to the possibility of errors in calculation and caution should be used when interpreting the data, particularly when ground stabilisation is selected.

⁴⁷ Convention of the International Regulations for the Preventing of Collisions at Sea

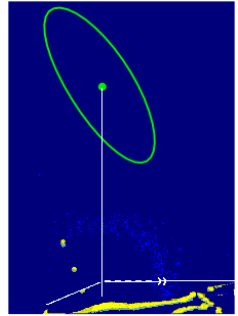
PADs

Predicted Areas of Danger (PAD) is an optional feature where outlines are drawn on the chart display to mark an area that needs to be avoided in order to prevent a CPA violation to own ship by an established tracked target or active AIS target.

The size and location of a PAD depends on own ship's CPA limit (see Limits and Settings) and speed, plus the target's position course and speed. For information on accessing data on targets refer to Selected Target.

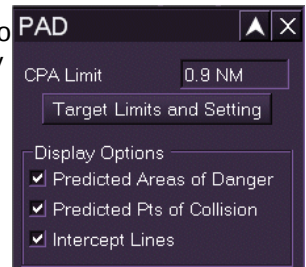
The boundary of a PAD associated with a target is drawn such that, if ownship were to change its course to move toward any given point on the boundary and the target were to continue with its current velocity, the target would be at the CPA limit when own ship reaches the PAD boundary.

PADs are only displayed for a target when the system can calculate the CPA of that target. If the CPA limit is changed, the shapes of PADs adjust accordingly. If own ship's CCRP crosses over a PAD boundary, the display of the PAD is disabled until the CCRP is no longer within its boundaries.



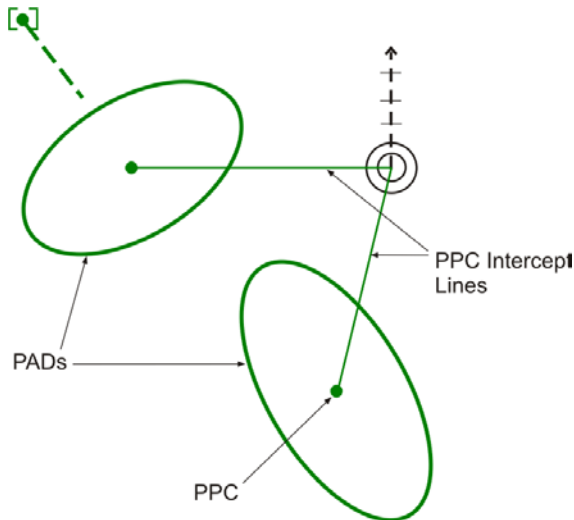
To select display options for PADs do the following.

1. Open the PAD sub menu. The window displays the current CPA limit for targets to own ship and enables the following display options to be selected:
 - Predicted Areas of Danger (PADs)
 - Predicted Points of Collision (PPCs)
 - Intercept Lines
2. To change a target's CPA limit click the **Target Limits and Settings** button, the Limits and Settings opens from where you can adjust the CPA limit.

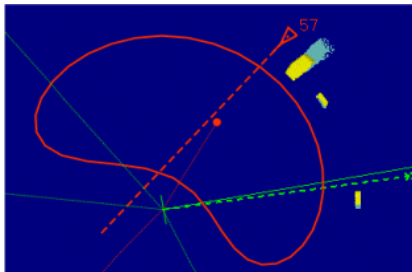


If all three display options have selected from the PAD menu the video circle chart display will display the following features additional to the PAD (see the figure below):

- PPCs - these are located within the boundaries of its associated PAD and are shown as a round dot marked on the target's course vector where own ship's CCRP may intercept the target.
- Intercept Lines - these are lines that connect ownship's CCRP to the PPC. This line represents the course of ownship, based on present speed, to intercept with the target at the PPC.



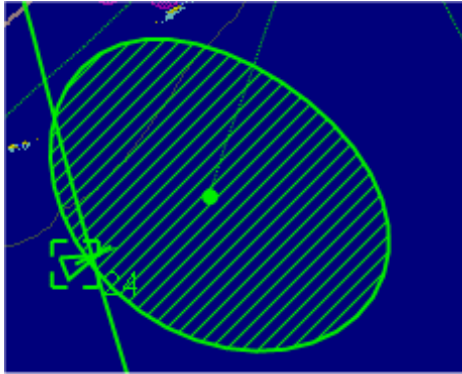
If a target associated with a PAD goes into an alarm state (i.e. the target and its vector flash red), the PAD and intercept lines will also flash red in sequence with the target. The shape of the PAD may also change as ownship and target approach each other, see below.



If ownship speed is greater or equal to target speed, then only one PAD is generated. If ownship speed is less than the target speed, then one of the following is generated:

- Two distinct PADs
- A merged PAD with two PPCs
- A donut-shaped PAD
- No PAD

When a target is manually selected (i.e. the target appears in the User tab of the Multiple Targets menu) a cross hatch will appear within the boundaries of the target's PAD.



Chapter 11 Radar

The Radar menu provides access to the following radar/video functions:

- Transceiver - enables switching the system between standby and transmit mode, pulse length selection and radar fine tuning to be made.
- Video - enables video processing controls and trails mode selection to be made.
- Interswitch –provides selection and information on transceivers connected to an Interswitch.



In addition to access via the Radar menu the following sub-menu functions can be quickly accessed from the upper toolbar area:

- To show the Transceiver window on the chart display right click on the Standby/Transmit icon and select **Transceiver Control..** (see Selecting Transmit Mode in Chapter 3 `Basic Operation of ECDIS).
- To show the Video window on the chart display right click on the radar video icon and select **Video Settings...** (see Radar Video Mode in Chapter 3 `Basic Operation of ECDIS).

Radar Settings

Transceiver

The Transceiver window displays the selected Transceiver (TCVR) alpha identity (A to F if a six-way Interswitch is connected, see Interswitch), its status (Master or Slave) and the scanner unit the transceiver is connected to (X-band or S-band).

The following controls are available when operating as a Master display:

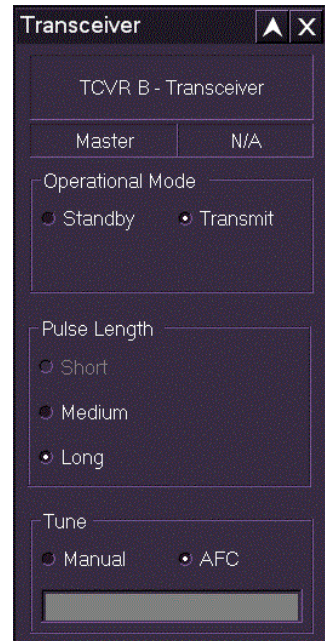
- switching the operational mode between standby and transmit
- changing the pulse length
- changing between AFC and manual tuning

If the Transceiver has been selected as a Slave at the Interswitch window the Pulse Length and Tune functions are unavailable.

Operational Mode

The system can be in one of two operational modes: Standby and Transmit. In addition, when the system is in standby following power up it may also be warming up⁴⁸.

 A slave display can only be switched to **Transmit** if its associated master display is in Transmit mode. If **Transmit** is selected on a slave display when its master is still in Standby (NOT transmitting), a prompt is displayed and the slave remains in Standby.



⁴⁸ Upon power-on of a “cold” transceiver, a warm up period is required to prevent damage to the magnetron before it can start transmitting.

The transceiver informs its connected display(s) if it is in the warm up process.

When a display is connected to a transceiver that is in warm up, either because of interswitching or from power-on, a textual status and a count appears in the Transceiver sub menu. The count starts at 0 and increment each second up to a maximum of 999. Only when the transceiver informs the connected display(s) that the warm up period has ended is the text and count removed and the normal standby text displayed. Transmit can be selected only when the warm up period has ended.

To switch between operational modes click the radio button adjacent to the mode.

1. In Transmit the white diagonal line on the transmit/standby icon is removed (see Getting Started with ECDIS, Standby Mode), the transceiver starts transmitting radar pulses and the ECDIS display can be enabled to show radar video, see Radar Video Mode
2. In Standby the white diagonal line on the transmit/standby icon re-appears, the pulse length selection and radar tuning adjustment are disabled and any active Radar Video is automatically switched off.

Pulse Length

The following pulse lengths are available, dependent on the range restrictions detailed below:

- Short Pulses (SP) are used at close range to improve the discrimination and range accuracy of received echoes.
- Long Pulses (LP) are used at long range to improve the ability of the radar to pick out targets at distance.
- Medium Pulse (MP) is a pulse length used as an optimum between discrimination and long range detection.

Pulse lengths are restricted to the following scale ratios:

- SP is available on the 1:30,000 scale ratio and below.
- MP is available in the 1:8,000 to 1:200,000 scale ratios.
- LP is available at 1.40,000 scale ratio and above.

Tune

For a Master display there are three tuning controls:

- [AFC](#) on/off
- Manual fine tune
- Coarse tune

In a multi-node system the coarse and fine tune levels are distributed and used by other nodes on the system.

For accurate tuning to be achievable, coarse tuning must have been correctly adjusted during initialisation. Refer to Chapter 2 'Diagnostics and Commissioning' in Volume 2 of the VMFT Ship's Manual.

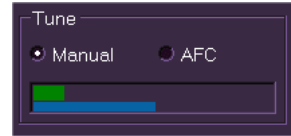
The current level of tuning is indicated by the shaded bar below the two modes. This bar indicates the level in percentage terms with 0% on the left, 100% on the right.

Manual Fine Tuning Adjustment

For manual fine tuning long pulse (LP) must be selected, ideally using a high scale ratio that shows a known target near to the edge of the display.

To manually fine tune do the following.

1. Click the **Manual** radio button. In manual mode the tuning indicator colour changes from grey to green.
2. Left click in the Tune bar to activate the control. The tune bar divides into two, the upper bar is the tuning indicator (shown in green), and the lower bar is the tuning control level indicator (shown in blue) which indicates how well the receiver is tuned.
3. Move the trackball left or right to adjust the tuning control (lower bar) until the maximum level is reached on the tuning indicator (upper bar). If distant targets are visible, use these for the final adjustment.
4. Left click to set the level and de-activate the bar. A right click will de-activate the bar but not set the new level.



Dual Radar – Transceiver

On a dual radar system the Transceiver window includes separate tabs for Channel 1 and Channel 2 where specific selections of Standby/Transmit mode, Pulse Length and Tune adjustment can be made for each channel.

If either transceiver is set to Standby a confirmation prompt is generated.

The Operational Mode, Pulse Length selection and tuning options are the same as described in the 'Transceiver' section.



Radar Overlay

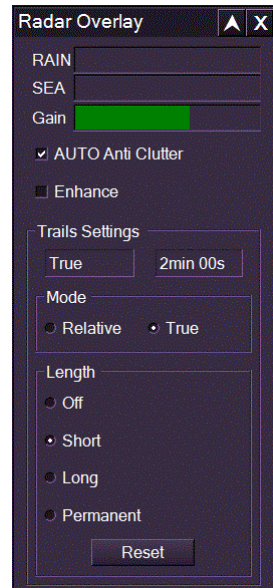
The Radar Overlay sub-menu enables the following settings and mode selections to be made:

- Video Processing Controls - enables adjustment of the Gain setting and the anti-clutter (RAIN and SEA) settings.
- AUTO Anti-Clutter and Enhance Video mode.
- Vector Mode - Relative or True
- Trails - selection of trail type.

For a description of the vector modes, see Vector Modes in Chapter 3, 'Basic Operation of ECDIS'.

Video Processing Controls

The current video processing level is indicated by the shaded bar adjacent to the control caption. All the video processing levels are shown in grey colour (non-editable) in Standby. In Transmit mode the Gain level is shown as green.



In open sea conditions, tick the **AUTO Anti-Clutter** check box to suppress RAIN and SEA clutter. This normally provides optimum detection by adapting the amount of clutter suppression applied to the varying characteristics of clutter returns.

- **Video GAIN**

Always adjust the **Gain** setting while on the longer scale ratios. A light background speckle should be present to achieve the best target detection and long range performance. A temporary reduction in gain can be beneficial when searching for targets in rain or snow conditions. Video gain is independently adjustable for Auto and Manual anti-clutter modes.

- **Anti Clutter (RAIN)**

Use the Anti-Clutter **RAIN** control to optimise suppression of rain clutter, i.e. balance the detection of targets within the clutter region (under the rain) with detection of those outside the clutter region.

Always use the control with great care. Excessive suppression can cause loss of small targets. It is often advantageous to use this control to search for targets in the clutter region, returning the control to zero after the search.

- **Anti Clutter (SEA)**

Use the Anti-Clutter **SEA** control to reduce sea clutter to an operational level where some residual clutter speckle is present. The setting must permit small targets, often of similar signal strength to the sea clutter returns to be detected.

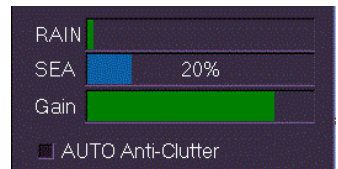
Always use the control with great care. Avoid setting the control to completely remove all sea clutter, as this will reduce the detection of small targets. The setting should be periodically checked as prevailing sea conditions change.

Manually Adjusting Video Gain and Anti-Clutter Controls

The video processing controls can be adjusted independently. The RAIN/SEA anti clutter levels can only be adjusted when the AUTO Anti-Clutter is switched off.

To manually adjust the Video GAIN, RAIN and SEA settings, do the following:

1. Tick the AUTO Anti-Clutter check box off.
2. Position the screen cursor over the control you wish to change.
3. Left click to make control bar active. The bar colour will appear blue.
4. Move the trackball left or right to move the bar to the gain/suppression level required, as the bar is adjusted the current percentage figure appears in the centre of the field. You can exit the adjustment and return to the previous setting by right clicking.
5. Left click to set the level and de-activate the bar adjustment. The bar will return to its green shaded state and the percentage figure disappears.
6. When AUTO Anti-Clutter check box is ticked after adjustment the RAIN and SEA Anti-Clutter settings appear grey.



 **IMPORTANT NOTE** – There are different stored values of Gain setting for AUTO Anti-Clutter and Manual, you will need different settings for each mode.

Enhanced Video Mode

A substantial improvement in the presentation of small and/or short range targets can normally be achieved by selecting the enhanced video mode. Enhanced Video Mode, stretches target returns in both range and azimuth. This facility is available on a scale ratio of 1:10,000 and above.

In estuary and open sea conditions, always use the enhanced video mode for best target detection. To enable enhanced video tick the **Enhance** check box.

CAUTION: ENHANCE CONTROL

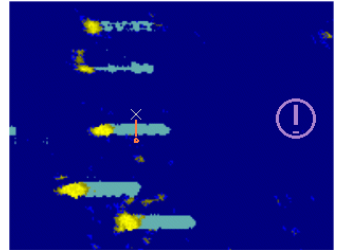
Use the Enhance Control with caution. If used on a low scale ratio it will reduce discrimination between close targets.

Trails

The display can be set to show decaying video trails, showing the history of targets' movements across the screen.

Trails are shown dependent on the trails mode setting selected:

- In **Relative** mode the trails indicate the movement of the targets relative to own ship.
- In **True** mode the trails have own ship's speed applied (ground based or water based).



Trails are only shown in Transmit Mode, not in Standby Mode.

The following Trails Modes are available:

- **SHORT**

High rate of decay giving a short trail. Actual trail length will depend on the range in use. See Trial Length Time table.



The trail time defaults to SHORT after power up.

- **LONG**

Low rate of decay giving a long trail. Actual trail length will depend on the range in use. See Trial Length Time table.

- **PERM**

Permanent trail which does not decay. When the trail length exceeds 60 minutes **>60min 0s** is displayed.

- **OFF**

Trails are removed from display.

- **RESET**

Resets the Trails time to zero and momentarily clears all existing trails from the display.

To reset the trails time click on the **Reset** button

Trail Length Time

The trail time shows the length of the trails in minutes and seconds. If the trails are still below their maximum length, a count-up time is shown, indicating how long they have been building up.

The selection of **Long** or **Short** Trails changes the trail time and is dependent on the scale ratio in use. When the scale ratio is changed the trail time restarts at zero before building up to the maximum time for the

scale ratio and trail type selected. If Permanent Trails mode is selected the trails do not decay.

When switching between trails length it takes as long as the new time selection for the trail time to be representative. For example, changing from 3 minutes on **Long** to 60 seconds on **Short** will take 60 seconds for the trails to represent how far the targets have moved. During this period the trails displayed are not representative of the displayed trail time and so the trail time is shown in the warning colour (yellowish-orange).

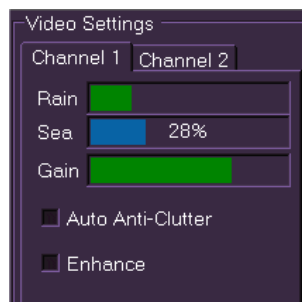
The table below lists the long and short maximum trail times, relative to the scale ratio.

Scale Ratio	Short Trail time	Long Trail time
1:3,000	10 sec	30 sec
1:4,000	15 sec	45 sec
1:15,000	30 sec	1 min 30 sec
1:50,000 and above	2 min	6 min

Dual Radar – Video

On a dual radar system the Video window includes separate tabs for Channel 1 and Channel 2 where specific selections of controls and Gain/anti-clutter adjustments can be made for each channel.

The video processing controls and trails settings are the same as described in the 'Video' section.



Interswitch

On a conventional radar system the Interswitch sub-menu is divided into the following areas: Request for Display and Status.

On a Dual Radar system or Client/Server Radar system the Interswitch sub menu will show slightly different information, see Interswitch on Dual Radar and Interswitch on Client/Server Radar for details.

Request for Display

The Request for Display area lists the Transceivers fitted to the system with their alpha identifier. The transceivers available for selection are highlighted; transceivers that are unavailable for selection are greyed out.

Up to six transceivers can be connected to up to six displays. The number of transceivers that may be set up is dependent on the interswitch status as follows:

When no interswitch is fitted to the system:

- the Master/Slave selection is fixed at commissioning with the system defaulting to Master.
- the transceiver identification is fixed at A.

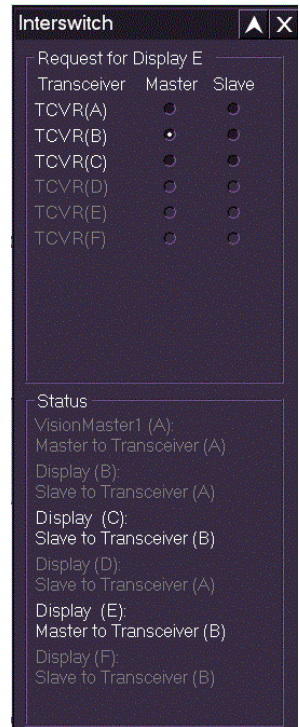
When an interswitch is fitted to the system:

- the master/slave display, display identifier and transceiver identification are determined from the interswitch.
- if the interswitch is two-way then only transceivers A and B may be set up.
- if the interswitch is six-way then all transceivers A, B, C, D, E and F may be set up.

To select the Master or Slave status of the available transceiver click the relevant radio button.

Status

The Status area displays the current transceiver settings for each Display set at the Request for Display area. Transceivers not available are shown greyed out and default to Slave.



Interswitch on Dual Radar

If your system is dual radar with an Interswitch, the Interswitch window enables each display radar channel to be associated with any one of the transceivers in the system. A transceiver can be selected from its associated channel as a Master for controlling that scanner unit, or as a Slave, if the other channel has selected the same transceiver as the Master.

If different transceivers are selected for each channel (e.g. TCVR (A) for Channel 1 and TCVR (B) for Channel 2) then both Transceivers may be set to **Master**. If the same transceiver is selected for both channels, then one channel must be set to **Slave**. For example, if Master is selected on TCVR (B) for Channel 2 where the same selection has been made for Channel 1, then Channel 1 will automatically switch to Slave.

The Status area displays the node identity with Dual Radar in brackets. The current Transceiver selection and Master/Slave status for each display are displayed below the node identity.



Interswitch on Client/Server Radar

On a Client/Server Radar (CSR) system the Interswitch window shows the Master/Slave status of the particular Client node, and enables a request for control of available transceivers to be made. Each transceiver will be connected to the system via a Server.

The Status area of the window lists the connection status of all the Clients networked to the system.

To request control of a transceiver, click its **Master** radio button. If another Client is currently in control of the transceiver that Client's status will change from **Master** to **Slave**. The change of transceiver control will be shown on the Interswitch window of all Client nodes in the system.

If two or more Clients request control of one transceiver at the same time, the issue of which node controls the transceiver is resolved by the Server connected to the transceiver.

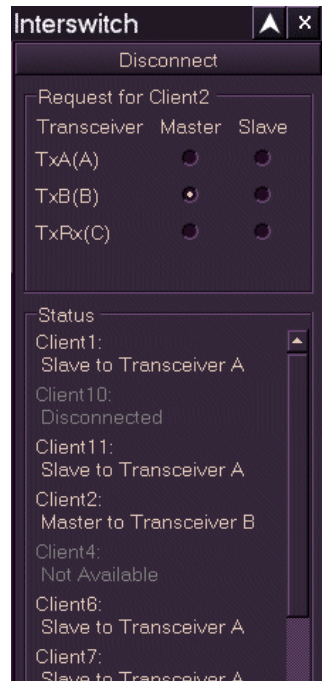
Each Server can supply data to a maximum of eight Clients. If a ninth Client requests a connection to the same transceiver an existing Client of the transceiver will be disconnected, providing the Client is a Slave and in Standby. If all eight Clients are in Transmit, a ninth Client will not be permitted to connect to the transceiver until one of the other Clients is set to Standby or disconnected.

Disconnecting and Reconnecting a Client

A disconnected Client has no connection to a transceiver via a Server. Whereas a Client in Standby can be immediately placed in Transmit, a disconnected Client must first be connected to a transceiver before it can be considered in Standby.

To disconnect a Client from its selected Transceiver click the **Disconnect** button. The status of the Client changes to Disconnected and the message **TCVR Disconnected** appears on the video circle.

To reconnect, select Master/Slave for the required transceiver. The status of the Client will change to Standby and, if Master is selected, the Transceiver will also be set to Standby.



Radar Alerts

The following series of radar alerts may be raised by the system.

Video Alerts

Low Video Level

The signal level of the video received from the transceiver is monitored at regular intervals when the display is in transmit. If the level falls below an optimal video level a low video alert is raised. The alert is cleared when:

- the monitored video level is greater than or equal to an optimum video level; or
- the radar is in standby.

Video Failed

A Video Failed alert is raised under the following conditions:

- If there is a detectable fault with the scan converter card such that it prevents the radar picture from being updated.
- If there is a detectable fault with the presentation of the radar video on the screen. (e.g. Texture Loss).

Video Failed is displayed in red on the chart when this alert is active.

Communications Alerts

Transceiver Communications

A TCVR comms alert is raised if a valid message has not been received from the transceiver for more than 4 seconds. The alert is raised regardless of the display's standby/transmit status.

PCIO Communications with Processor

A PCIO USB comms alert is raised within 10 seconds if the physical connection between the PCIO unit and Processor is broken.

PCIO Communications with SC board

An SC PCIO comms alert is raised within 10 seconds if the connection between the board and the PCIO unit is broken.

Interswitch Communications

An Interswitch comms alert is raised if the Interswitch is no longer communicating with the Processor.

Transceiver Alerts

Trigger Error

A trigger error alert is raised when the transceiver is in transmit and there are fewer valid triggers than expected.

Azimuth Error

An azimuth error alert is raised when the transceiver is in transmit and either:

- the number of azimuth pulses between heading markers is greater or less than a margin of error of 5 pulses centred on a nominal value of 4096 pulses. Or;
- the number of pulses per revolution is within the margin of error, but a small error persists for a period of time (e.g. 4095 pulses per rev are received continually). This will cause a picture clear.

Heading Marker Error

When the transceiver is in transmit an error alert is raised if a heading marker has not been received for more than 10 seconds. If a heading marker has not been received for more than 30 seconds the Master Display automatically switches the connected transceiver to standby.

Pulse Length Error

An error alert is raised if, after a delay no greater than 4 seconds, the display's requested pulse length does not match the pulse length of its connected transceiver.

Standby/Transmit Error

A Standby/Transmit error alert is raised if the state of the transceiver is different to that requested by the display.

Transceiver BITE

A Transceiver BITE alert is raised when there are failed BITE parameters. If the spark gap parameter fails, the Master display automatically switches the connected transceiver to Standby. This indicates a fault in the Transceiver which will require contacting your supplier or local dealer.

AFC Mode Error

An AFC Mode error alert is raised if the AFC mode of the transceiver does not match that of the displays.

Chapter 12 Brilliance

The Brilliance menu provides access to the following functions:

- Day Night Modes
- Brilliance Groups
- Chart Symbols
- Brightness Check



You can access the Brilliance sub-menus in one of two ways:

1. Left click on the Brilliance button in the main menu list to display the sub menu options.

Or:

2. Right click on the Brilliance Control icon in the lower popup toolbar and select from the list.

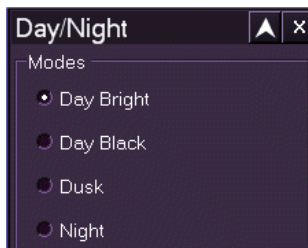
Day and Night Modes

The Day / Night modes function enables you to select the correct colour setting for optimum display purposes in various lighting conditions. The colour modes include two daylight settings, one dusk setting and one night time setting. The current setting is shown with its radio button highlighted.

To select a different setting click on the radio button to the left of the setting, the screen colours change relevant to the day, dusk or night mode selected.

Alternatively, click on the Up/Down **BRILL** buttons on the Control Panel to brighten or darken the colour setting.

If the colour setting is changed from Day Bright/Black or Dusk to Night the system displays a warning requesting confirmation of the change in setting. To confirm click the **Yes** button on the Warning window, or click the **No** button to cancel. If no confirmation is given within 10 seconds the system reverts to the previous colour setting.



Multi-node Settings

On a multi-node system changes to the day/night settings on one node are applied to all other nodes on the system.

The commissioning engineer may configure a node not to be affected or capable of making a global day/night setting change, and in this case the setting will be applied to the local node only.

Brilliance Groups

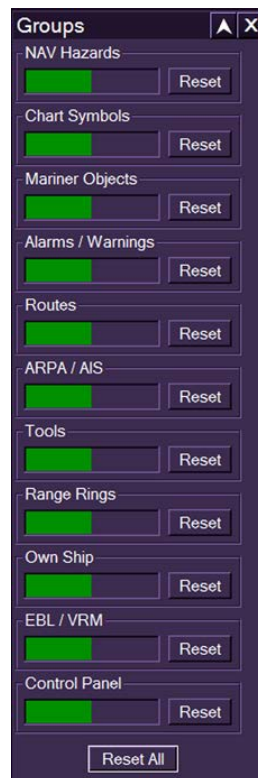
This feature enables you to independently adjust the brilliance of the following predefined groups:

- NAV Hazards
- Chart Symbols
- Mariner Objects
- Alarms / Warnings
- Routes
- ARPA / AIS data (to extinction)
- Tools (includes PI lines, rotating cursor, constant turn radius, etc.)
- Range Rings
- Own Ship (heading line)
- EBL / VRM
- Control Panel

To adjust an individual group or all groups do the following:

1. Position the screen cursor over the control you wish to change.
2. Left click to make control bar active. The bar colour will appear blue.
3. Move the trackball left or right to move the bar to the level required.
4. Left click to set the level and de-activate the bar adjustment. The bar will return to its previous shaded state and display the new level.

To reset an individual brilliance group back to the default setting click on the group's **Reset** button. To collectively reset all previously edited groups click the **Reset All** button at the bottom of the window.

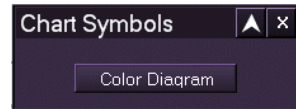


WARNING:

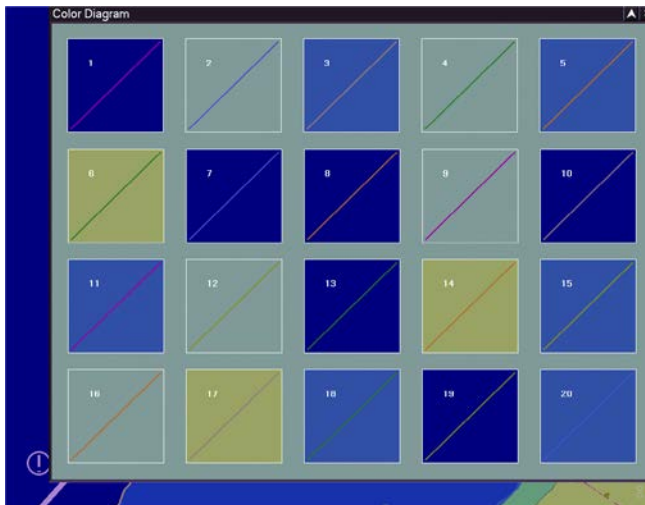
DO NOT ADJUST THE NAV HAZARDS OR CHART SYMBOLS BRILLIANCE GROUP FROM THE DEFAULT VALUE OR THIS WILL AFFECT THE ECDIS COLOUR CALIBRATION AND MAY INHIBIT VISIBILITY OF INFORMATION, PARTICULARLY IN NIGHT MODE.

Chart Symbols

The Chart Symbols window enables access to a colour diagram, which ensures that any adjustments made to the brightness and contrast settings on the VisionMaster monitor will enable the SENC data, such as coastlines, safety contour and other objects to be adequately displayed.



1. To adjust click on the **Color Diagram** button, a window appears over the screen with 20 different background colour options and a coloured diagonal line across each background colour.
2. While making any necessary brightness adjustments view the visibility of the diagonal line against the background colour. If the line becomes difficult to see the brightness/contrast setting is inadequate for SENC data to be displayed.



Brightness Check

The Brightness Check is a method of accurately setting the monitor's brightness control to an optimal setting.

The brightness check window contains a grey box within a black rectangle. When a brightness check is performed the operator adjusts the monitor controls while observing the grey box.

The LCD monitors used in the VisionMaster system have a single brightness control. A white index line, indicating the setting calibrated at system installation, is marked on the brightness control.



To perform the brightness check do the following:

1. Turn the brightness control so that the white index line is at the top position.
2. Turn the brightness control down (anti-clockwise) and observe the grey box in the centre of the window.
3. If the box is not visible, increase the brightness setting until it can be just distinguished in the window; or
4. If the box is clearly visible, leave the brightness control at the indexed setting.

After the brightness check adjustments have been made, the 'black level' of the monitor is correctly set. Use the brightness control only if further adjustment is required for visibility.

WARNING:

SYSTEM SHOULD BE KEPT IN ECDIS CALIBRATED POSITION (GREEN). USE OF THE BRIGHTNESS CONTROLS TO MOVE AWAY FROM THIS POSITION MAY INHIBIT VISIBILITY OF INFORMATION, PARTICULARLY IN NIGHT MODE.

Chapter 13 System

The System menu provides access to the following system facilities:

- User Profiles
- Options
- Diagnostics
- Commissioning
- Time Management
- Shutdown



The following optional functions will be available if selected at configuration:

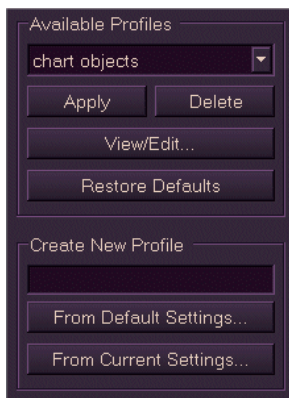
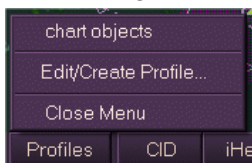
- NAVTEX
- Weather Fax
- Third Party Applications

For a description of these optional features, refer to Chapter 7 '*System Features*' in the Supplementary Features User Guide, 65900014.

User Profiles

The User Profiles submenu enables you to create, delete, apply, save, view and update profiles that contain node specific chart, route, and other display settings. Saved profiles are maintained by the system and are available after a system restart.

In addition to the System menu the User Profiles sub menu can be accessed by left clicking on the Profiles button in the lower toolbar area and selecting **Edit/Create Profile**.



Previously created and saved profiles can be selected in the **Available Profiles** selection drop down list. If no profiles have been created this field is blank.

If no new user profiles have been created the Apply, Delete and View/Edit buttons are greyed out.

New profiles can be created either from the currently active display settings or from the default system settings. A profile name must be entered in the **Create New Profile** field prior to creating a new profile.

Multi-Node Functionality

The collection of available user profiles is saved and retrieved in a database, shared between all nodes within a multi-node system. When a profile is applied, it is generally only applied to that particular node.

Most changes made to a user profile will only affect the profile on that node, exceptions to this are changes to the following:

- Chart Dangers
- Look Ahead Type
- Look Ahead Time
- Look ahead Distance
- Proximity Buffer Size (Added Breadth)
- Alarm on Chart Cautions

Charting Common | Chart Depths/Height menu

- Safety Depth
- Deep Contour
- Shallow Contour
- Safety Height
- Safety Contour.

Target Settings | Limits and Settings menu and AIS Display menu

- Enable AIS Input
- AIS Auto-activation
- CPA Limit
- TCPA Limit
- BCR Limit
- BCT Limit
- Lost target Alerts

If you change any of the above (Global) values to an applied profile on one node, this edited profile will be applied on all nodes. For information on changing a User Profile, see 'View/Edit Profiles'.

Create New Profile

When creating a new user profile, you have the option of selecting values for the various settings, and also the option of choosing whether or not a given setting is included in your profile. For example, a profile may be created that only contains display settings for routes, or one that only contains settings for charts. By default, all available settings are included in the profile.

To create a new profile, do the following:

1. Left click in the **Create New Profile** field. The screen keypad appears.
2. Enter a profile name, use the trackball to navigate to the relevant alpha-numeric keys and left click. When a profile name has been entered click the **OK** button on the keypad. The keypad is removed and the name entered in the **Create New Profile** field.
3. To create the new profile from system default settings click the **From Default Settings** button. The settings list appears with all chart and map features ticked in the **Selection** folder (see View/Edit Profiles).

Or:

4. To create the new profile based on the currently selected setting click the **From Current Settings..** button. The current settings for the profile selected in the Available Profiles list appear.
5. To edit the settings refer to View/Edit Profiles.

Available Profiles

Saved profiles in the Available Profiles list are viewed and edited in the same way as described in View/Edit Profiles.

When a profile is applied, the system updates the corresponding features with the setting values stored in the profile only on the node where the profile was applied.

To apply a user profile, do the following:

1. From the Profiles button in the lower toolbar:
 - a. Select the profile name from the popup list of previously created and saved profiles. A temporary prompt appears confirming that the profile has been applied.
2. From the User Profiles menu:
 - a. Select a previously created user profile from the Available Profiles drop down list.
 - b. Click the **Apply** button. A temporary prompt appears confirming that the profile has been applied.



To delete user profiles select the profile and click the **Delete** button. When a profile is to be deleted the system prompts to confirm, select **OK** to confirm the profile deletion

To restore all settings affected by a profile to their default values on an individual node click the **Restore Defaults** button. If successful a temporary prompt appears confirming default settings have been restored.

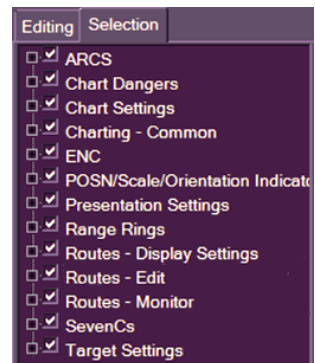
Viewing or Editing Profiles

To change a Profile's settings, with a Profile created and displayed in the **Available Profiles** field, click the **View/Edit** button. Two tab folders are available; **Editing** and **Selection**.

View/Edit Profile – Selection

The **Selection** tab folder lists all the profile groups that can be selected, once selected the group is listed in the **Editing** folder where user profile settings can be defined. A default user profile will have only the first five groups selected.

- **ARCS** - enables Off Screen Chart Policy to be enabled or disabled, see ARCS in View/Edit Profile - Editing.
- **Chart Dangers** - enables selection of an alert on chart cautions to be generated, and look-ahead and proximity buffer size adjustments to be made.
- **Chart Settings** – enables Other (as shown in the 'Other' display mode of Chart Settings) or Standard (as shown in the 'Standard' display mode of Chart Settings) to be selected.
- **Charting - Common** - defines depth, height, contour values and IMO display options, see Chart Depth/Heights.
- **C-Map** - enables coverage boundaries, light sector areas and notices to be selected.
- **ENC** - defines ENC chart settings.
- **Pos/Scale/Orientation Indicators** - enables selection of a Latitude/Longitude (L/L) grid.
- **Presentation Settings** – enables vector length (in minutes) to be defined and vector type (true or relative) to be selected.
- **Range Rings** – enables display of range rings.
- **Routes – Display Settings** - enables selection of monitored route display settings from the Display Settings menu.
- **Routes – Edit** - enables selection of monitored route display settings from the Edit Route menu.
- **Routes – Monitor** - enables selection of monitored route display



settings from the Edit Route menu.

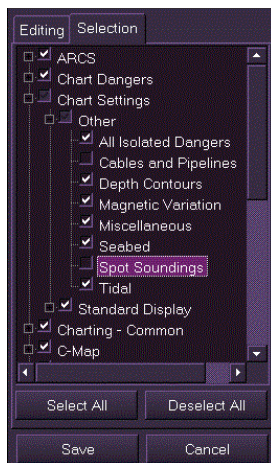
- **SevenCs** - enables selection of SevenCs chart features, see Chart Settings – Symbolology.
- **Target Settings** – enables various target settings to be selected.

To change profile selections do the following:

All features listed in the Profile Selection groups are selected by default. Features may be deselected, although once deselected in the Selection tab those features will not be available to edit in the Editing tab.

To deselect profile features:

1. To deselect individual profile features open the navigation tree by ticking the group sub menu check box and untick the check boxes of the individual features that are not required.
2. To select all the features in the **Selection** list click the **Select All** button, or to deselect all the features, including the selected profile settings, click the **Deselect All** button.
3. Click the **Save** button to confirm selection changes, or click the **Cancel** button to return to the previous screen.



View/Edit Profile – Editing

The features selected in the Selection tab folder will be available for editing in the Editing tab folder. Note that if a feature has been deselected in Selection it will not appear in the Editing folder.

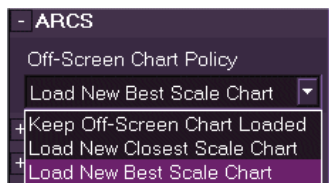
To edit a user profile, do the following:

1. To select or deselect a profile feature tick (or untick) the feature's check box.
2. To change a value (for example, distance or time):
 - a) Click in the required field, the text becomes green (editable).
 - b) Move the trackball left to decrease the value or right to increase the value, with the required value entered left click to exit edit mode.
3. To select from a number of feature options (for example, Distance and Time, or Vector type) select the radio button.
4. When custom settings have been made click on the **Save** button. The settings are saved and the menu returns with the edited profile highlighted in the Available Profiles list.
5. To cancel any profile setting changes click the **Cancel** button.



ARCS

The off-screen chart policy for ARCS charts defaults to **Load New Best Scale Chart**. To select another option click on the drop down arrow and select either **Keep Off-Screen Chart Loaded** or **Load New Closest Scale Chart** for list.



Options

The Options window displays a selection of common units which are displayed when the system is running, (e.g. meters, knots, degrees etc.)

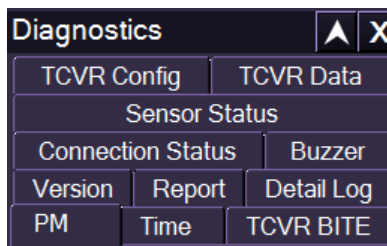
If the selection of units has not been enabled for the operator at commissioning (which is the default mode), then the Options window displays the units as read-only information.



Diagnostic Functions

Diagnostics

The **Diagnostics** menu includes the following which have functionality for a non-logged on user:



- **PM** (Performance Monitor) - can be enabled to monitor the performance of the system (default mode), or monitor the receiver.
- **Report** - enables reports to be generated and exported to an external device.
- **Detail Log**- enables individual Detail Logfiles to be viewed and a Detail Logzip file to be generated and exported to an external device.
- **Sensor Status** - displays the state of the data from the currently selected data source, as shown on the Sensor Data Display.
- **Connection Status** - displays the connection status of all nodes on a multi-node system.
- **Buzzer** - enables the Alarm buzzer to be tested.
- **Database** - this tab appears on Multi-Node and Client/Server Radar systems only and enables synchronization to the node assigned to include the master copy of the database.

The following diagnostic functions contain read-only information for the non-logged on user. For a description of these functions refer to Chapter 2 '*Diagnostics and Commissioning*' in Volume 2 of the VisionMaster FT Ship's Manual.

- **Time** - displays transmission time and total persisted runtime data.
- **TCVR Config** - displays configuration data on the currently selected transceiver.
- **TCVR Data** - displays pulse data, antenna RPM and heading marker data on the currently selected transceiver.
- **TCVR BITE** - displays test results from the transceiver [BITE](#) (when connected to a BridgeMaster (BM) E or BM II transceiver).
- **Version** - displays version information on system components.

When a user has logged in by entering a user name and password the following additional diagnostic features are available:

- **S/W** - displays version information of all operational system software, including charting data.

Performance Monitor

The Performance Monitor folder displays the current operational Transceiver (TCVR); selected from the Radar menu, see Interswitch Control.

Before using the Performance Monitor (PM) select the following operating parameters:

- Master Display (Interswitch systems)
- Transmit mode
- Radar Video on
- Gain setting at optimum level (if the setting is too low or too high the four tuning arcs may not be visible).

Performance Monitor Operation

A non-logged on user can operate the PM and adjust the monitor mode (Receiver or System) tune levels to determine if there has been a drop in performance.

In a multi-node system the PM monitor tuning settings are distributed and used by other nodes on the system.

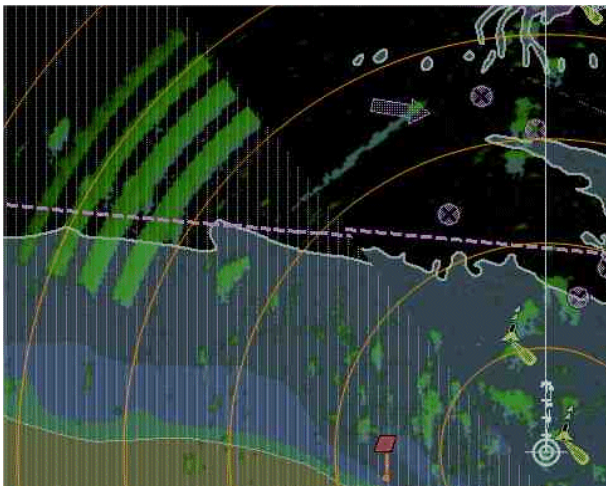
To turn on the performance monitor (PM) tick the check box next to On.

 *In Operator mode the PM switches off automatically after 10 seconds.*

If sector blanking is active the system displays a warning prompt informing the operator that sector blanking is inhibited while the PM is switched on.

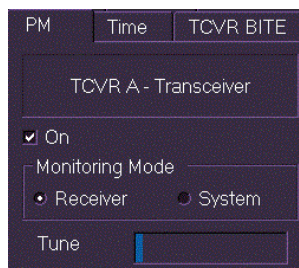
When the PM is operational and the monitoring mode tuning level is being adjusted, four arcs are shown on the chart display. These arcs are approximately 0.3NM apart and start at a range of between 6NM to 10NM. The arcs extend from 290° to 320° (S Band), or from 155° to 185° (X Band), with respect to the heading line, see the figure on the following page.

The precise bearing value will alter depending on the Heading line offset value.



To adjust the Performance Monitor, do the following:

1. Select Receiver monitoring mode by clicking the **Receiver** radio button. The current tuning level is shown as a green bar.
2. Left click in the Tune bar to activate the control and move the trackball to the left to set the tune bar to minimum. While adjustment is in progress the tuning bar colour changes to blue.
3. Slowly move the trackball to the right to display maximum presentation of the four PM arcs that should be visible in the following video sectors: 290° to 320° for S-band and 155° to 185° for X-band. The number of arcs displayed shows the current performance.
4. Select System monitoring mode and repeat steps 1 to 3.



 *The arcs are spaced at 5dB intervals. If during operation performance decreases below the second arc, it shows a 10dB drop in performance.*

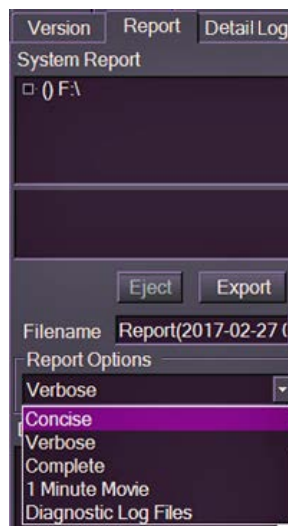
Report

The Report folder enables you to export a system fault report to an external device such as a USB memory stick. The Reports folder can be quickly accessed with a right click on the iHelp button. Right clicking on the iHelp button will also capture a screenshot of the current display, which is used to form part of the export option, see below.

If the Report folder is not accessed via iHelp, a screenshot of the display is also made when the Export button is clicked.

There are four types of export options available for reports, accessed by clicking on the Report Options drop down arrow:

- **Concise** - this option will generate a smaller report than verbose, making it easier to transfer over slow internet connections.
- **Verbose** - this default option contains the same information as the concise report, however more detail is included, making the report file larger.
- **Complete** - this option contains all verbose information, with the addition of log files, over a 24 hour period.
- **1 Minute Movie** - this option creates 120 screenshot files, taken every half second which comprise the 1 minute movie, the movie is then run from an .exe file which is created with the report.



 *As the 1 Minute Movie option creates a file that will be larger than 10Mb, this option should only be selected when the fault can best be described by a series of images.*

- **Diagnostic Log Files** - this option enables you to select one or more diagnostic log files. To export these files refer to the instructions below.

All fault report options are generated as single compressed file, with the file extension .rpt to distinguish it as a report file. In order to access the files within the report the file extension should be changed to .zip on the service desktop, or on a separate PC.

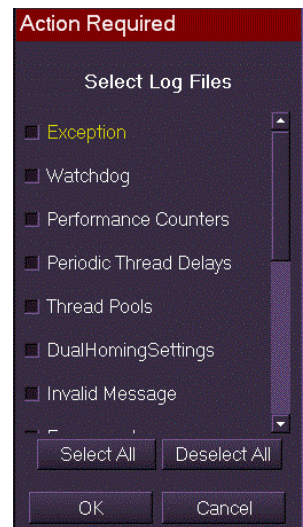
The system automatically generates a default filename for the report, based on the current date e.g. Report(2008-09-23).

To export a fault report, do the following:

1. Insert an external device into the PC and select the **Report** tab folder.
 2. The external drive will be listed in the first navigation window, this will typically be E:\. If any previous report files are on the device they will be listed in the window below the device navigation tree as .rpt files.
 3. To change the file name from the default of **Report (date)** click in the **Filename** field and, using the on-screen keypad, enter a name for the report. The name would typically be related to the fault, i.e. 'track fault' or 'video error 3'.
 4. Select the report type from the three options listed above.
 5. If required, enter a description of the report in the **Description** field.
 6. Click on the **Export** button to generate the report. While the export is in progress the Export button changes to display **Wait...** If successful a temporary prompt will appear confirming the export.
-  As the 1 Minute Movie option creates a file that will be larger than 10Mb, this option should only be selected when the fault can best be described by a series of images.
7. When complete click the **Eject** button before removing the external device.

To export diagnostic log files do the following:

1. Follow steps 1 to 3 in the previous procedure.
2. Select the **Diagnostic Log Files** from the Report Options drop down list.
3. If required, enter a description of the log files in the **Description** field.
4. Click on the Export button. An **Action Required** window appears listing all the available diagnostic log files.
5. Either select individual files by ticking their check boxes, or select all files by clicking the **Select All** button.
6. Click the **OK** button. While the export is in progress the **Export** button changes to display **Wait...** and is disabled. When the report is successfully exported a temporary prompt will appear confirming the export.



Detail Log

The system automatically logs details of all voyage data to a single relational database management system (RDBMS) located on the ship's network.

The following voyage data is logged to the database at a periodic default rate of 5 seconds:

- Sensor Information
- Own Ship Information
- Target Information
- Chart Information
- Node State

The following voyage data is logged to the database on an event-driven basis:

- Routes Information
- Announcements Information

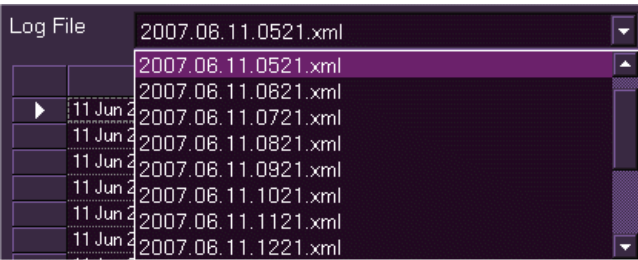
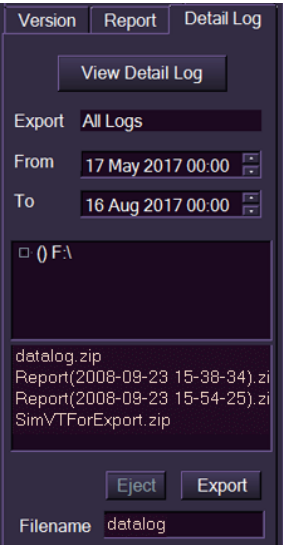
A copy of the configuration file is logged to the database on Node start up. On subsequent startups a copy of the configuration file is logged only if the file has changed.

View Detail Log

Individual log files can be selected from a list and their contents viewed in table format via the Detail LogViewer.

To view detail log files do the following:

1. Click on the View **Detail Log button**. The Log Viewer window appears on the chart display.
2. To view data on a specific log file click on the **Log File** arrow and select from the drop down list of xml files.



The Log Viewer window may include the following log types, listed as tabs:

- Announcement (alarms or warnings generated)
 - [CCRS](#)
 - Chart (with the system name in brackets)
 - LOP fix
 - Man overboard
 - Man Overboard User Modified Data
 - Node selection
 - Own Ship History Log
 - Prompt (list of prompts relevant to the named system)
 - Total Set & Drift Diagnostics
 - Track Control (if enabled).
3. To view log data on a specific type, click on the tab. The data displayed will include a timestamp and other information relevant to the log type selected.

VisionMaster FT Detail Log Viewer

CCRS | Announcement | Chart[VisionMaster] | Chart[vm10] | Chart[VM_IHELP] | OwnShipHistoryLog | Pror ◀ ▶

Log File: 2018.01.21.0812.xml

	Timestamp [UTC]	Latitude	Longitude	Heading	CourseOverGround	WaterS
1	21 Jan 2018 08:12:12	51°02.660' N	001°44.785' E	No Data	311.1°	19.6 kn
2	21 Jan 2018 08:12:17	51°02.677' N	001°44.754' E	No Data	311.1°	19.6 kn
3	21 Jan 2018 08:12:22	51°02.693' N	001°44.724' E	No Data	311.1°	19.6 kn
4	21 Jan 2018 08:12:27	51°02.710' N	001°44.693' E	No Data	311.1°	19.6 kn
5	21 Jan 2018 08:12:32	51°02.726' N	001°44.663' E	No Data	311.1°	19.6 kn
6	21 Jan 2018 08:12:37	51°02.743' N	001°44.633' E	No Data	311.1°	19.6 kn
7	21 Jan 2018 08:12:42	51°02.760' N	001°44.602' E	No Data	311.1°	19.7 kn
8	21 Jan 2018 08:12:47	51°02.777' N	001°44.572' E	No Data	311.1°	19.6 kn

Export Detail Log

A copy of the detail log file can be exported to an external device, such as a USB memory stick.

To export a detail log file do the following:

1. Insert an external device into the PC and click on the **Detail Log** tab folder.
2. Select the log type to be exported. This may be specific voyage data as listed above, or **All Logs**, which includes all available voyage data.

- 3. The time period that the export will cover defaults to 3 months back from the current date. To change the date and time period select the date/time values in the **From** and **To** fields and click on the up/down arrows to move the date/time forward or back.
- 4. Navigate to the external device sub directory where the detail log is to be exported to. If any previous log or report files are on the device they will be listed in the field below the device navigation tree as .zip files.
- 5. Enter a name for the log file in the **Filename** field.
- 6. Click the **Export** button. The system exports the log as a zip file, while the export is in progress the Export button changes to display **Wait...** If successful a temporary prompt will appear confirming the export.



 *This process may take a long time if all logs are being exported over an extensive period.*

- 7. When the process is complete the **Wait...** button returns to display **Export** and the zip file name appears in the window above the buttons. Click the **Eject** button before removing external device.

Sensor Status

The system determines the status for received sensor data for each of the four data types (HDG, STW, COG and SOG) in the Sensor Data Display.

If a multi-sensor interface is used to receive data from other sensors, in addition to a data type, then these sensors will also be shown in the table. For example, one interface may be used to receive COG, SOG, Depth and Wind sensor data.

Sensor Status		Buzzer
Sensor	Data State	
DBT		
GPS		
Gyro		
Log		
WIND		

Sensor Data States

The data state for each sensor is shown as a table in the Sensor Status tab folder. If the data is good the Data State column is shown as a green bar adjacent to the sensor.

If the data associated with one or more sensors becomes 'not recently sampled' (a degraded state resulting in the Cursor and/or Position displays showing this data in yellow) the Data State bar also displays as yellow after approximately 15 seconds.

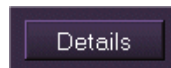
Sensor	Data State
DBT	
GPS	
Gyro	
Log	
WIND	

If the data associated with the sensor becomes not available (an unusable state resulting in the displays showing data in yellowish-orange) the Data State bar also displays as yellowish-orange after approximately 50 seconds.

The data state is restored to green when the sensor data becomes valid.

View Sensor Status Details

To view details on the sensor status click the **Details** button at the bottom of the window. A separate window displays the following sensor status details:



- Sensor abbreviation and its description, e.g. DBT (Depth)
- Interfaces, including port ID, used to receive the sensor data
- Type of data received by the sensor (e.g. Heading data from a Gyro)
- Current status of the sensor data, i.e. **Good**, **Nearly Available**, **Dead-Reckoned** or **Unavailable**.
- Unacknowledged Faults - any unacknowledged faults on the sensor data, e.g. **Uncompensated**, **Unaligned** etc. See 'Description of Sensor Data States' for a description of all fault conditions.
- Acknowledge button (**Ack**), which enables faults relevant to that sensor to be acknowledged.
- **Acknowledge All Faults** button. Click this button to acknowledge all outstanding sensor faults on the system.

Sensor Status Details						
Sensor	Interface	Data Type	Status	Unacknowledged Faults	Ack	
GPS (GPS)	Single-Sensor Interface for GPS via Visio...	Course Over Ground	Good	Uncompensated	Ack	
GPS (GPS)	Single-Sensor Interface for GPS via Visio...	Date and Time	Good	None	Ack	
GPS (GPS)	Single-Sensor Interface for GPS via Visio...	Position	Good	Uncompensated	Ack	
GPS (GPS)	Single-Sensor Interface for GPS via Visio...	Speed Over Ground	Good	Uncompensated	Ack	
Gyro (Gyro)	PCIO Sensor Interface for VisionMaster1 ...	True Heading	Good	Unaligned	Ack	
Log (Log)	PCIO Sensor Interface for VisionMaster1 ...	Speed Through Water	Good	None	Ack	

Condition to explain:	Dead-reckoned	A long period of time has passed since an actual measurement of the data was received. Since that time, the data has been adjusted	Acknowledge All Faults
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Description of Sensor Data States

The Sensor Status Details window also includes the option to view an explanation for all types of data states. To use this feature click the **Condition to explain** drop down button and select a data state from the list. The window parallel to the list gives an explanation of the selected data state.

The following table lists all data states and a description.

Data State	Description
Dead Reckoned	A long period of time has passed since an actual measurement of the data was received. Since that time, the data has been adjusted to make it correct for the current time. However, this adjustment (performed using a dead reckoning or estimation algorithm) may not be very accurate. When data is dead-reckoned, it is considered usable, but degraded.
Implausible	The data is not within reasonable limits or it is changing at an unreasonable rate. When this applies, the data is considered unusable.
Inaccurate	There is a possibility that the data is not accurate, based on some of the information being supplied by the sensor. For example, if position data is supplied in a datum other than WGS84, and the sensor does not supply the offset needed to adjust it to WGS84, the data will be considered inaccurate. When this applies, the data is considered usable, but degraded.
Invalid	The sensor providing the data is indicating that the data is not valid. When this applies, the data is considered unusable.
Manual	The data was manually entered. When this applies, the data is considered usable, but degraded.
Nearly Valid	The source of this data is indicating "Invalid" for some of the samples it is providing. If a higher percentage of samples are received with the "invalid" indication, then the data may be indicated as absolutely invalid, in which case it will be considered unusable. When "Nearly Invalid", data is considered usable, but degraded.
Nearly Unavailable	The system has received fewer than the expected number of samples over a recent timespan. If even fewer samples are received, the data may become "Unavailable", in which case it will be considered unusable. When "Nearly Unavailable", data is considered usable, but degraded.
Over the FOM Limit	Position sensors can be configured for a maximum figure of merit. If a position sensor indicates that its position data has a figure of merit greater than the configured maximum figure of merit, then the system will indicate that the data is "over the FOM limit", which results in the data being considered degraded.

Questionable	There is a possibility that the data is not valid, usually because no mechanism is being applied to ensure that the data was not corrupted during transmission. For example, this may be indicated if the NMEA messages providing the data have no checksum (if the system is configured to allow such messages). Questionable data is considered usable, but degraded.
Unaligned	The data is received in a form that requires alignment, and this alignment has not been performed yet. This would typically apply to heading data received via a synchro or stepper interface. When this applies, the data is considered unusable.
Unavailable	No data is being received from the source or too few samples have been received recently. When this applies, the data is considered unusable.
Uncompensated	The system could not adjust the data to be valid at the consistent common reference point (CCRP) for the ship. This adjustment is often referred to as a lever arm correction. This is easiest to understand as it applies to position data. When the system receives position data from a GPS, the position applies to the position of the GPS antenna, and must be adjusted to apply to the CCRP. If the system has no heading data, it cannot perform this adjustment. Compensation can also apply to course over ground and speed over ground. When data is Uncompensated, it is considered usable, but degraded.
Uncorroborated	The data does not match the data received via other sensors that provide the same type of data. When half or more than half of all sensors providing a given data type disagree with the data from one sensor, then that sensor is considered to be "not corroborated". For example, if we have 2 GPS sensors, and GPS1 disagrees with GPS2, then both will be "not corroborated". If we have 3 GPS sensors, and GPS2 and GPS3 agree with each other, but disagree with GPS1, then just GPS 1 will be "not corroborated". When data is Uncorroborated, it is considered usable, but degraded.

Connection Status on a Multi-Node System

The Connection Status folder determines the connection of each node on a system.

The connection state for all nodes on the system is shown as a table in the **Connection Status** tab folder. If a node is connected to the network the **Status** column is shown as a green bar adjacent to the node.

Connection Status		Buzzer
Node	Status	
VisionMaster1		
VisionMaster2		
VisionMaster3		
VisionMaster4		

If a node is switched off, or disconnected from the network, the Status bar adjacent to the node is displayed in yellowish-orange.

When the node is switched on or reconnected its status bar changes to green.

CAUTION:

The table shows the node connection status from the point of view of the node accessed, and therefore may not be a true indication of the current status. For example, if Connection Status is accessed from a node that is disconnected the table will show the other nodes with red status, even though these nodes may well have a valid connection.

Safe Mode

If your node has been configured to operate in Safe Mode, the node will automatically disconnect from the network and operate as a standalone node if it detects conditions on the network that prevent it from operating reliably.

The operator may also manually enter Safe Mode by clicking on the **Enter Safe Mode** button at the bottom of the Connection Status tab.

 This button only appears on nodes configured for Safe Mode.

When Safe Mode is entered the node will disconnect from the network and run as standalone, a permanent Alarm **'Safe Mode Activated'** is generated and the button at the bottom of the tab changes to **Leave Safe Mode**.

Connection Status		Buzzer
Node	Status	
VisionMaster1		
VisionMaster2		
VisionMaster3		
VisionMaster4		
Enter Safe Mode		

To restore normal network communications click on the button. The Safe Mode Activated warning is removed from the list of Alerts.

Connection Status on a Client/Server Radar System

On a Client/Server Radar (CSR) the Connection Status folder lists all the Clients and Servers on the system.

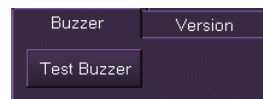
The status bar adjacent to the Client and Server displays its connection status in the same way as described previously for a Multi-Node system.

Connection Status		Buzzer
Node	Status	
Client1		
Client2		
Client4		
Client6		
Client7		
Client8		
Client9		
Client10		
Server1		
Server2		
Server3		

Buzzer

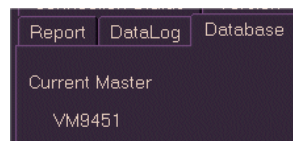
The Buzzer folder enables the user to test the operation of the buzzer, (the buzzer is located in the Console Monitor). To test click on the **Test Buzzer** button. The alarm buzzer should sound.

If there are any problems with the alarm buzzer refer to 'Announcements' in Chapter 1 'Configuration' in Volume 2 of the VisionMaster FT Ship's Manual.



Database

In a Multi-Node system or Client/Server Radar system, one node is designated to hold the master copy of a database. This database is used to record and share information around nodes and includes routes, PI lines, GoTo locations, radar maps, manual chart updates and User profiles.



For information on Database Synchronization see *Appendix A - 'Operational Functions specific to Multi-node and Client/Server Systems'* in Chapter 3 'Basic Operation of ECDIS'.

Dual Radar – Diagnostic Functions

On dual radar the following diagnostic functions contain read-only data for each channel:

- PM (Performance Monitor)
- TCVR Config
- TCVR Data
- TCVR BITE

To view the data for each channel click on either **Channel 1** or **Channel 2** tab buttons.

In PM (Performance Monitor) the monitoring mode (Receiver or System) tune levels may be separately adjusted for each transceiver channel.

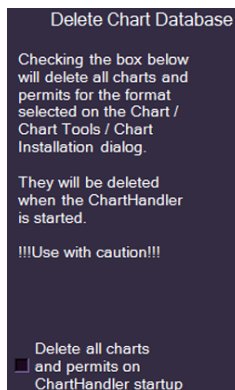
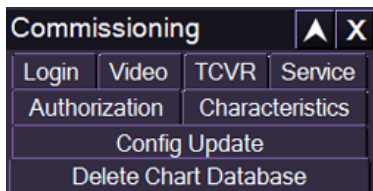
Channel 1	Channel 2
TCVR A - Transceiver	
Transceiver Type	BM E
Transceiver Band	X (3 cm)
Transmitter Power	10 kW
PM	Fitted
Slave Only	No

Commissioning Functions

Commissioning

The **Commissioning** menu includes the following functions:

- **Login** - enables a suitably qualified user to access locked system processes by entering a user name and password.
 - **TCVR** - displays a group of settings for all the transceivers which the display can operate.
 - **Video** - displays the video enablement settings and read only data transmitted by the transceiver.
 - **Config Update** - enables your system configuration to be exported to an external device, and a modified configuration imported back to the system.
 - **Authorization** - displays authorization information and product type for the node.
 - **Characteristics** - displays persistent static data relating to own ship that has been entered in system configuration
 - **Service** - displays Communications and PCIO service information on the system.
 - **Delete Chart Database** - provides the ability to delete chart databases. Tick the box at the bottom of the window in order to allow deletion of all charts and permits form the current database. On ticking the box an **Action Required** warning message will appear, click on yes to confirm this action.
-  **Note** - ticking the box, will not itself, delete the charts and permits. It is not until the ChartHandler is started that this will happen.



CAUTION

DO NOT tick this box or leave it ticked unless you intend to immediately start ChartHandler to confirm the deletion.

When a user has logged in by entering a user name and password the following additional commissioning features are available:

- **Security** - enables a logged on user to create a group of members (e.g. field engineer, ship admin or seaman).
- Additional Service diagnostic information, including CCRS, Sensors and Time Management.

For a description of the following Commissioning functions refer to Chapter 2 '*Diagnostics, Commissioning & Service Mode*' in Volume 2 of the VisionMaster FT Ship's Manual.

- Login
- TCVR
- Video
- Security
- Service (additional diagnostics)

Dual Radar – Commissioning Functions

On dual radar the following commissioning functions contain read-only data for each channel:

- TCVR

The Video tab folder includes separate enablement settings and read-only data for SC Board 1 and SC Board 2.

Authorization

The Authorization tab folder displays the current authorization status of the display.

If the authorization state is valid the following message is displayed at the top of the tab folder:

The system is fully authorized.

The authorization folder displays a five digit system PIN, which is encrypted when the system is initially commissioned. The PIN is contained on the Sperry Security Block, which is provided and installed when the system is commissioned.

The Sperry Security Block also contains the product type identifier for the node, (e.g. Total Watch or Chart Radar). This is shown in the **Product Type of This Node** field.

For a multi-node system, in addition to the security block, a security string is placed on all nodes in the system. The security string contains an encryption of the following:

- the System PIN
- he Product Type of the node, and if the system is a multi-node, the number of nodes for each product type (e.g. 2 Radars and 1 ECDIS).
 - the list of features that have been purchased. Any features purchased from the system provider are shown in the **Purchased Features** field. If no features have been purchased then **[None]** is shown.

Once a feature is purchased, it will be available on all nodes which are of a compatible product type.

Authorization

The system is fully authorized.

Temporary Authorisation Password:

Submit

PIN: 01125

Product Type of This Node:

TotalWatch

Product Types	Nodes
TotalWatch	1

Purchased Features

[None]

Unauthorized System

If the system is not authorized the tab folder states that the system is unauthorized and will revert to a degraded state of functionality, counting down from 7 days after the authorization initially failed.

 *When the system is in a degraded state there is no target tracking or chart data available.*

A temporary password can be supplied by your VisionMaster supplier on request. The password will contain:

- System PIN
- Product type identifier
- Expiration date (typically 30 days from the time it is requested).

Enter the password in the **Temporary Authorisation Password** field and click the **Submit** button. The system verifies the password and, if correct, the node is temporarily authorized and a PIN is displayed.

When a password has been entered and its expiry date has not yet been reached, the system will run as fully authorized.

When the node is running on a temporary password, a warning is given, repeated once per day, indicating when the password will expire. After the password expiry date has been reached, the node reverts to an unauthorized state.

If a security block authorization fails on any node, and this is not remedied by entry of a password the system will do the following:

- produce a warning every 15 minutes.
- run normally on that node until 7 days (calendar time) have passed since the authorization initially failed.
- operate in a state of degraded functionality after the 7-day period expires.

Authorization

Characteristics

The system is unauthorized, and will revert to a state of degraded functionality in 6 days and 20 hour(s).

Temporary Authorisation Password:

Submit

PIN: 00000

Product Type of This Node:

TotalWatch

Product Types	Nodes
TotalWatch	1

Purchased Features

[None]

Config Update

The Config Update feature enables the operator to export a copy of their system configuration to an external USB memory stick. When exported, the configuration is saved as a compressed file which can then be forwarded as an email attachment to your system supplier, or to Northrop Grumman Sperry Marine (NGSM) service control.

A modified configuration file can be imported to your system through the Config Update feature.

CAUTION:

The import or export of a system configuration file should only be implemented when requested to do so by your system supplier, or by NGSM service control. Also, a configuration from another VisionMaster system must NEVER be imported to your system.

Exporting a Configuration

To export a configuration, do the following:

1. Connect a USB memory stick to a USB port at the front of the VisionMaster PC. The device name appears in the **Import Configuration File** field.
2. Select the device name and click the **Export** button. A compressed file of the system configuration is exported to the device, and when complete a temporary prompt appears confirming that the file has been exported.
3. Click the **Eject** button and remove the memory stick from the VisionMaster PC.

The configuration file is saved as '**config.cfz**' which can be forward to the relevant authority.

Note that the compressed file is a standard zip file but the file extension is non-standard in order to bypass common email filters.



Importing a Configuration

To import a configuration, do the following:

1. Connect a USB memory stick to a USB port at the front of the VisionMaster PC. The device name appears in the **Import Configuration File** field.
2. Select the device. Any compressed configuration file that has been copied to the device will be displayed in the field below, i.e. **config.cfz**.
3. Highlight the file. The file will be shown in the **Filename** field.
4. Click the **Import** button. The system proceeds to import the configuration file to all nodes on the system. While the import process is taking place Import, Export and Eject are disabled and the Import button changes to **Wait..**. Note that the import process may take a long period of time.
5. When the import is complete a temporary prompt appears confirming that the file has been copied to all nodes on the system and the Import, Export and Eject buttons are re-enabled.
6. Click the **Eject** button and remove the memory stick from the VisionMaster PC.



Applying the Config Update

When a modified configuration has been imported, all the nodes on the system will require a re-start in order to apply the modified configuration, see Shutdown.

Note that if an exception is raised during start-up after importing a modified configuration, the system will automatically revert to the previous configuration at the next re-start.

Characteristics

The Characteristics tab folder displays persistent static data relating to own ship that has been entered in the system configuration.

The read only data includes own ship length, beam, height and maximum draft in metres, design speed, maximum speed in knots and maximum rate of turn in degrees per minute.

If more than one ship loading state has been configured, these will be selectable from the Loading State drop down list.

Alternate Bow in Use

If an alternate bow in use menu has been selected in the Configuration tool the **Alternate Bow in Use** check box is enabled.

Note that this feature is disabled if an external discrete output has been configured. For information on the alternate bow in use feature, see Alternate Bow in the 'Basic Operation' chapter.

When the alternate bow in use is selected the following changes take place:

- The system uses the alternate bow position as the reference point for all data relative to ownship. This includes, for example, the cursor readout and all position readouts.
- The heading marker offset for all top units is automatically adjusted by 180°.
- The radar remains in transmit without adverse effects, excluding re-building trails and re-acquiring targets.

The screenshot shows the 'Characteristics' tab in the ECDIS Configuration tool. It contains the following fields and values:

Field	Value
Length	800.0 m
Beam	40.0 m
Height	100.0 m
Max Draft	10.0 m
Design Speed	20.0 kn
Max Speed	30.0 kn
Max Rate of Turn	120.0 °/min
Loading State	Loaded (dropdown menu)
Alternate Bow in Use	☐ (disabled)

Service

The Service tab folder displays the following navigation tree items:

- Communications
 - Port Monitor
 - Port Logging
- PCIO
 - PCIO diagnostic form



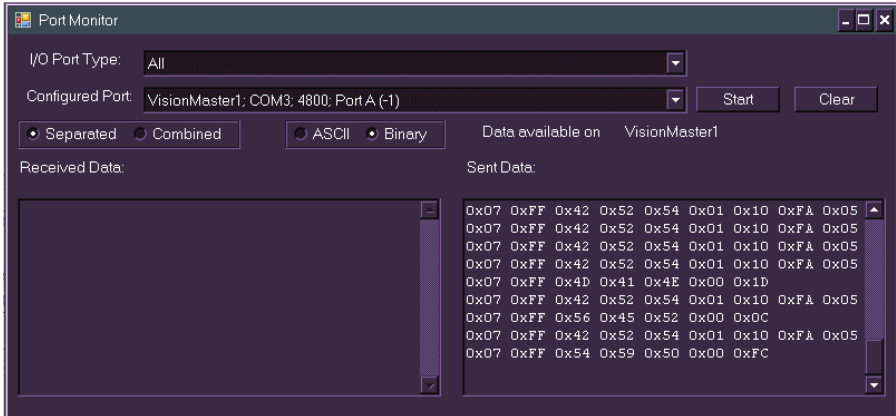
The Communications sub menu enables the following data to be viewed:

- Port Monitor - view data received from all ports or a selected port type and data sent from the display to the port. Available for display to a non-logged on user.
- Port Logging - enables data sent and received from a specified port to be captured and timestamped. Logged data can then be saved to an external device. Available for display to a non-logged on user.

Port Monitor

1. To view Port Monitor data click on the Communications + button, highlight Port Monitor in the tree menu and click on the **Display Selected** button at the bottom of the tab folder. A Port Monitor communications window is displayed which can be moved and scaled to suit.
2. The **I/O Port Type** defaults to viewing diagnostic data on all configured ports. To test the diagnostics on the control port only select **PCIO Control Port** from the drop down list. To test the diagnostics on all the serial ports on the PCIO select **PCIO Serial Port**. The **Configured Port** list will display the configured port or port types as selected in the I/O Port Type.
3. The Port Monitor window view options default to separate Received and Sent data fields and data viewed as ASCII. To change these default options click in the **Combined** button to view all data in the same field and click in the Binary button to view data as binary code.
4. With all required settings made click on the **Start** button. The Port Monitor window displays real time received and sent data for the selected port and the **Start** button changes to **Stop**.
5. To halt the port monitor process click on the Stop button. The port monitor stops its updating based on data being sent or received.

To clear the data from the Port Monitor window click on the **Clear** button.

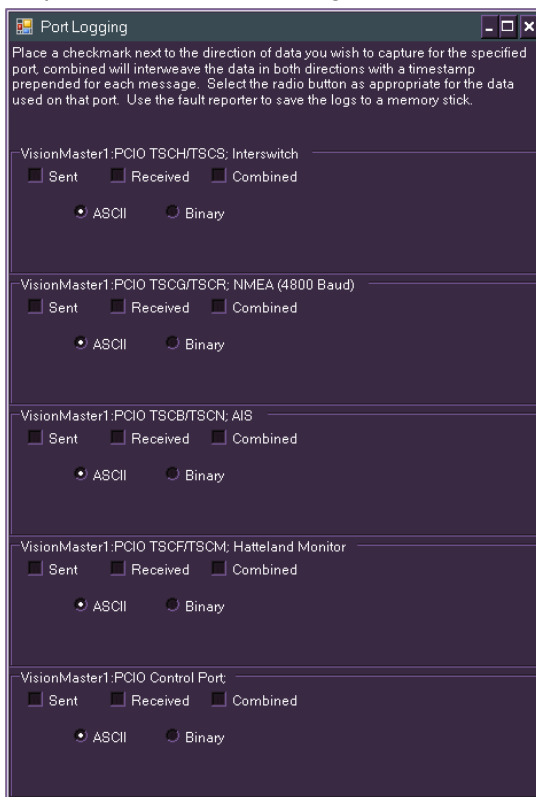


Port Logging

The Port Logging window lists all the currently configured ports on the system and provides the option to capture data for the specified port.

1. To access Port Logging click on the Communications + button, highlight Port Logging in the tree menu and click on the Display Selected button at the bottom of the tab folder. The Port Logging window is displayed which can be moved and scaled to suit.
2. The Port Logging window may include the following PCIO ports:
 - a. TSCJ/TSCT (COM Port 9, 4800 Baud)
 - b. TSCG/TSCT (COM Port 7, 4800 Baud)
 - c. TSCH/TSCS (COM Port 8, Interswitch)
 - d. TSCF/TSCM (COM Port 4, Monitor)
 - e. TSCC/TSCP (COM Port 6, Any)
 - f. TSCB/TSCN (COM Port 5, AIS)
 - g. PCIO Control Port (Serial Inputs 1,2 and 3, TSCA, TSCD, TSCE)
3. Click the radio button as appropriate for the data used on that port. The options are data sent from the port to the display, data received from the display to the port and combined data (interweaved in both directions). A timestamp is prepended to each data message.

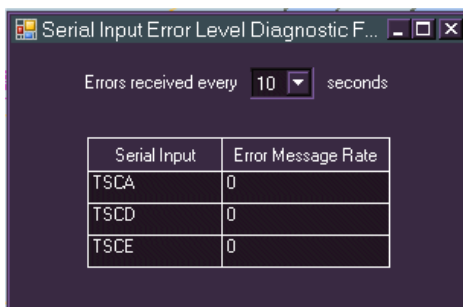
4. The data defaults to ASCII, to change the data to Binary click on the radio button.
5. Logged data may be saved to an external device (memory stick) via the Report tab folder in the Diagnostics menu.



PCIO Diagnostic Form

The PCIO diagnostics form records the error rate on received data from serial input ports TSCA, TSCD and TCSE (Serial Ports 1, 2 and 3) on the PCIO. If any data errors are received on these PCIO serial inputs the number of error messages over a selected time period appears against the serial input line. Any PCIO data errors are listed in a log file, which is included in a fault report. The PCIO Diagnostic Form is available for display to a non-logged on user.

1. To access, click on the **PCIO +** button, highlight PCIO diagnostic form in the tree menu and click on the **Display Selected** button at the bottom of the tab folder. A Serial Input Error Level Diagnostic Form is displayed. The form is a table with each line representing the PCIO serial inputs listed above.
2. The number of errors received in the default time of one second will appear on the serial input line. To change the time period over which the errors are received, click on the drop down arrow and select from 1 second, 10 seconds or 60 seconds.



Serial Input	Error Message Rate
TSCA	0
TSCD	0
TCSE	0

Time Management

The Time Management facility enables the operator to select local date and time and set a time zone offset from [GMT](#). The window also displays the sensor (e.g. [GPS](#)) which is used as the time source.

In addition to the System menu the Time Management window can be quickly accessed by left clicking on the date and time field in the lower popup toolbar.

The Time Management window is divided into three areas:

- **System Time** - enables the selection of [UTC](#) or local time, (local time represents time offset applied, if no time offset has been applied then both UTC and local time will be the same). The current time selected (UTC or Local) is displayed in the lower popup toolbar.

Time Management ▲ ×

System Time

• UTC 09 May 2008 23:50:17

• Local 09 May 2008 23:50:17

Local Offset

Direction • East • West

Hours 00

Minutes 00

Apply

Time Sync Source

GPS 09 May 2008 23:50:17

Select Source

13 Jun 2007 17:53:10 UTC

- **Local Offset** - enables the input of a local time offset from GMT in either an East direction (offset before GMT) or a West direction (offset after GMT).
- **Time Sync Source** - shows the selected time sensor used by the system to synchronize the date and time of all nodes, valid data is shown in green. The **Select Source** button enables selection of other time sources, if configured.

Local Offset

To set a local time offset do the following

1. Select the direction of the local time offset by clicking on the **East** or **West** radio buttons.
2. Enter the required time offset by clicking in the Hours and Minutes fields and moving the trackball to the right, left click again to exit the edit mode.
3. With the correct offset displayed click the **Apply** button. The Local time is adjusted to the time offset applied and the lower popup toolbar shows the local offset time.

Shutdown

The Shutdown facility enables the operator to shut down or restart a single node, or all nodes on the system.

 *In Operator mode, the **Service Mode** and **Service Mode All** buttons will be greyed out. They will only be available if the current operator is logged on as a Service Engineer.*

Restart System is selected if for whatever reason the operator requires to restart their particular node on the system. The node will first power down and then restart. Other nodes on the system will not be affected.

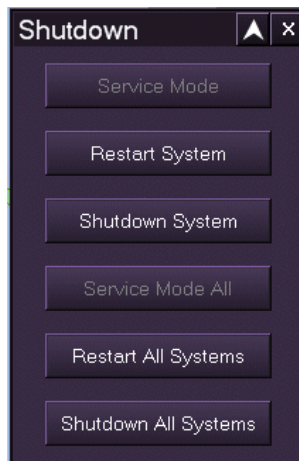
Shutdown System is only selected when the operator requires shutting down their particular node on the system for a prolonged period of time. Other nodes on the system will not be affected.

Restart All Systems is selected if for whatever reason the operator requires to restart all the nodes on the system.

When **Restart All Systems** is selected an **Action Required** message appears prompting to enter CONFIRM in the box below. To proceed enter CONFIRM (not case dependent) and click the OK button. All nodes on the system will first power down and then restart.

Shutdown All Systems is selected if for whatever reason the operator requires to shut down all the nodes on the system for a prolonged period of time.

When **Shutdown All Systems** is selected the Action Required message appears. Enter the same password as described above.



Annex A - Static Site

Static Site Description

Static Site is an optional facility that allows for a stationary installation. This is intended for small single node installations (for example, an oil rig) and larger multi-node, land based Vessel Traffic Services (VTS) installations.

When configured, a Static Site system will apply to all nodes in a multi-node system.

A Static Site may operate without a live compass or position input. Any alerts that are generated for non-static site systems will not apply to Static Site systems. However, it should be noted that Target Tracking is applicable to Chart Radar WatchMode and will not work for ECDIS nodes.

The following topics are covered in this Annex:

- Static Site Features - includes a table of features specific to Static Sites and a table of features not available to Static Sites.
- Static Heading - how to manually enter a static heading bearing.
- Static Position - how to enter a position value manually, or automatically update to a GPS position.
- Target Anchor Watch - enables an anchor watch to be assigned to a target.
- Target Based Range and Bearing - enables a displayed target's position to be taken as the EBL /VRM position.

Static Site Features

Features specific to a Static Site

The following table lists features specific to a Static Site facility.

Feature	Additional details
Target Anchor Watch	Verifies that vessels at anchor are not drifting by assigning an anchor watch to a target.
Target Based Range and Bearing	A displayed target's position is taken as the EBL /VRM origin.
Trusted Targets	Enables setting targets within a range as Trusted so they do not raise CPA/TCPA alerts

Features not available to a Static Site

The following table lists the features which are available in a standard radar/chart radar installation, but not available to a Static Site facility.

Feature	Additional details
Sensor Data Display	The only sensor data type available is Static Heading, which defaults to 000.0. Speed/course and set and drift values unavailable.
Routes	Routes are not available for Static Site.
Trial Manoeuvre	Trial Manoeuvre is not available for Static Site.
Display Settings	Ownship synthetics data and Next Turn EBL data unavailable. Only Latitude/Longitude (L/L) grid available in Display Settings.
NAV Tools	The following NAV tools are unavailable: ▪ Lines Of Position ▪ History Tracks ▪ Anchoring ▪ Man Overboard
Position Data	Static Position Only. Own ship dead reckoning and position offset unavailable.
Target Display Functions	Target Autodrop or Echo Reference selection unavailable.
Target Limits and Settings	Bow Crossing limits and settings unavailable.
Own Ship AIS	Own ship AIS data unavailable

Wide Screen Monitors on Static Site

When using a wide screen monitor in a Static Site set up, the left side of the screen will display an Alerts Side Panel. This panel has similar functionality to the Central Alert Management function, see Chapter 7- Alerts, but cover only those Alerts relevant to the local Static Site node.

Static Heading

On start up, the static heading value defaults to 000.0. As a Static Site may operate without compass input, the heading value is always displayed as green (valid).

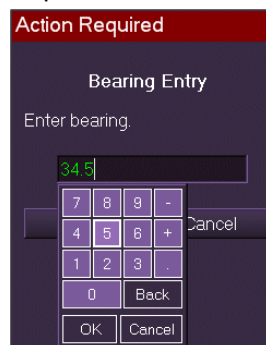
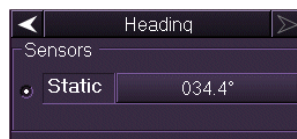


To obtain correct orientation of a static site picture in North Up the true bearing at which the heading line is pointing needs to be entered.

Any heading marker offset for a transceiver will also affect this setting and will consequently also need adjusting. For details see Chapter 2 '*Diagnostics, Commissioning and Service Mode*' section 3.3 'TCVR Settings', in the Ships Manual, Vol 2.

A heading value may be entered manually. To enter a heading bearing:

1. Right click on the HDG Sensor Data Display in the top left of the screen and tick **Select HDG Source..** The Heading Sensor window appears.
2. Click on the **Static** heading button, which shows the current value in white. An 'Action Required' window opens.
3. The 'Action Required' window prompts to enter a bearing. Either move the trackball left or right to scroll to the correct value and then left click. Or, enter the bearing value using the drop down keypad, click **OK** when complete.



The manually entered heading is saved in system memory and will persist when the system is re-started.

Heading Line

A heading line representing the bearing can be temporarily displayed by clicking and holding down on the **HL** button on the upper toolbar, next to the Static Heading. The heading line is removed from the screen when the button (left or right) is released.



Static Position

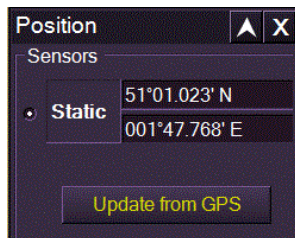
At start up, the static position Latitude/Longitude (L/L) values default to 00° North and 000° East. As a Static Site may operate without position input, the position value is always displayed as green (valid).

A position value may be entered manually, or automatically connect to a GPS sensor, if available, to obtain an initial position.

To enter a position bearing:

1. Navigate to the Position Sensor Data Display in the Sensors menu. The **Position** folder appears.
2. To update the static site position to the values defined by a GPS sensor click the **Update to GPS** button. The L/L values are entered.
3. To manually enter L/L values click in the Static fields. The text becomes editable (green) and the numeric keypad appears.
4. Enter the required L/L position from the keypad and click the keypad **OK** key. The values appear in the Static L/L fields and the keypad is removed.

The manually entered position is saved in system memory and will persist when the system is re-started.



Target Anchor Watch

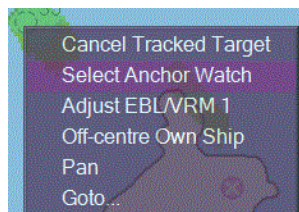
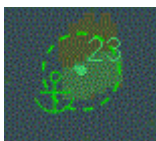
Target anchor watch enables the operator to verify that vessels at anchor are not drifting by assigning an anchor watch to a target.

An anchor watch comprises a dotted line circle centred on the target's anchor position, and a small anchor symbol next to the target's symbol.

Any targets may be selected for anchor watch. If a sleeping AIS target is selected, the AIS target is made active.

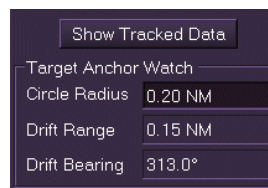
To create a target anchor watch, do the following:

1. Right click on the target to be selected for anchor watch. From the semi-transparent context window click **Select Anchor Watch**. An anchor watch circle is drawn, centred on the target's position.

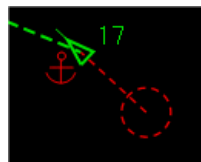


The anchor watch circle radius defaults to 0.20 NM. To change the radius for each target independently:

1. Select the target and navigate to the Target Data folder of the Selected Target sub menu. When Anchor Watch is enabled, this folder shows additional Target Anchor Watch data at the bottom of the window.
2. To change the radius left click in the **Circle Radius** field, hold down the left key and move the trackball left to decrease the circle size, or right to increase. The range is from 0.05 to 1.0 NM.



If a target exits its anchor watch area, the watch circle, anchor symbol and target bearing line change to a flashing red colour and a Target Anchor Drift warning is raised. When the Target Anchor Drift warning has been acknowledged, the symbol and lines stop flashing but continue to be shown in red.



To remove an individual anchor watch on a target right click on the target symbol and select **Remove Anchor Watch** from the semi-transparent context window.

To remove all anchor watch selections, navigate to Multiple Targets and select the **Anchor** tab. The anchor folder lists the ID number of all targets with an anchor watch, the radius of the watch circle and the target drift in percentage terms. Targets showing >100% drift in orange are outside the anchor watch area.

Click the **Remove All Selections** button at the bottom of the folder to remove all anchor watch selections from the Multiple Targets list and chart display.

Any Target Anchor Drift warnings associated with a target are cleared when the anchor watch selection is removed.

Multiple Targets

CPA Range User Anchor

	ID #	Radius	% Drift
	2	0.2 NM	>100%
	6	0.2 NM	18%
	10	0.2 NM	10%
	17	0.58 NM	>100%

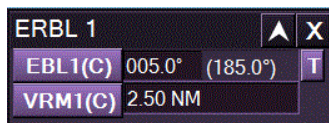
Remove All Selections

Target Based Range and Bearing

An ERBL may be dropped on a selected target . The target's position is then taken as the ERBL origin.

To drop an ERBL on a target:

1. Right click on the required target, this may be a tracked target or an activated AIS target, and select **Adjust EBL /VRM1** from the context menu. An EBL/VRM (carried) is created with its origin at the centre of the target and the ERBL window is activated.



2. To adjust the range and bearing of the ERBL move the trackball, left click to select the values. The ERBL origin continues to update with the target position, both while the range & bearing adjustment is taking place and also after the range & bearing values have been selected.

The range & bearing values of the ERBL remain constant after they are selected. The values of the ERBL may be re-adjusted at the EBL/VRM readout. For more details, refer to Chapter 11 Electronic Range and Bearing Lines .

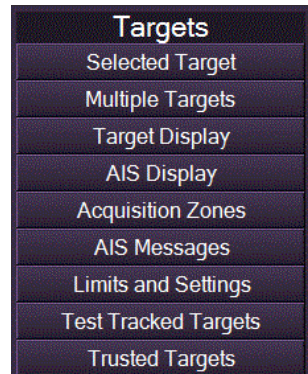
If the selected target is dropped or cancelled, the ERBL reverts back to normally offset and is dropped at the last target position.

Trusted Targets

The Trusted Targets feature allows an identified target within a defined range to be set as 'trusted', which will prevent [CPA/TCPA](#) alerts whilst it remains within the trusted range limit of the static site.

Select 'Trusted Targets' from the Targets main menu to open the Trusted Targets settings window.

 *The Trusted Targets feature must be enabled in configuration in order to appear as an option in the Targets main menu.*



Trusted Target List

The Trusted Targets window displays a list of the target ID and name (if available) of any targets added as a Trusted Target.

The following types of targets can be set as a Trusted Target:

- Tracked targets
- Active AIS targets
- External targets

A sleeping AIS target cannot have Trusted status, and an existing trusted AIS target will automatically disappear from the Trusted Target list if it is set to sleeping, unless the target is active on another node.

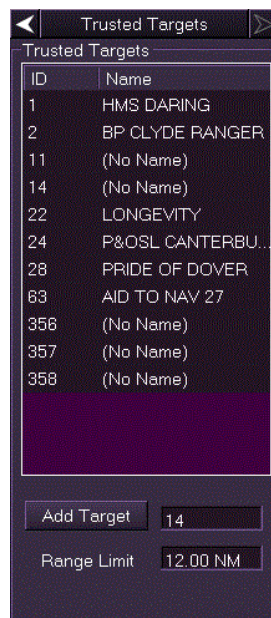
Range Limit

The Range Limit is the proximity to the Static Site in which a target may be set to trusted, and will not raise CPA/TCPA alerts if the target breaches CPA/TCPA limits.

The Range Limit can be set in the Trusted Targets window. The default range limit value is 0 NM, so that no targets can be accidentally set as trusted unless the range limit is changed. The maximum value that is set as a range limit is 40 NM.

If a trusted target is no longer within the defined range limit, whether by changing position or the range limit value is reduced, then the target is automatically removed as a Trusted Target and must be added again manually as a Trusted Target if it returns to within the trusted target range limit.

 *As an ECDIS can only see its own tracked targets, it may not always be possible to see all trusted targets that have been selected on other nodes in a multi node system, although they will be displayed globally in the Trusted Target list.*



Adding a Trusted Target

Only identified targets within the trusted target range limit are eligible to be added as a Trusted Target.

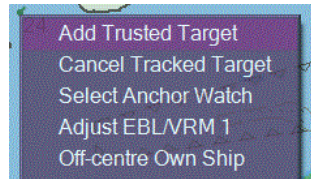
A target can be added as a Trusted Target by two methods:

1. Enter the target ID into the input box in the Trusted Targets window, and select the '**Add Target**' button. The target will be added to the Trusted Target list.

If 'Add Target' button is used and the target is not eligible to be set to trusted, a message will be displayed indicating the reason and the target will not be added.

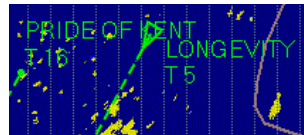
2. Right click on a target and select the option **'Add Trusted Target'** in the context menu. The target will be added to the Trusted Target list.

If the target is not eligible to be set as trusted, the right-click menu will not provide the option 'Add Trusted Target'



 *Targets with no name and causing CPA/TCPA alerts may still be identified targets eligible to be set to trusted, and can be determined by the availability of the 'Add Trusted Target' option in the right-click menu*

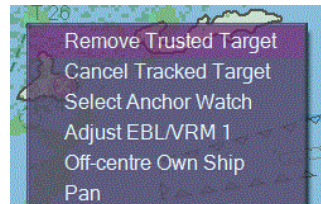
Once a target is added as trusted, a 'T' marker appears next to the target ID number. This 'T' marker disappears when the target is no longer a Trusted Target.



Removing a Trusted Target

A target can be removed as a Trusted Target by two methods:

1. Right click on the target in the Trusted Target list and select 'Remove'. Or:
2. Right click on the target in the chart display and select the option, **'Remove Trusted Target'** from the context menu.



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