

FURUNO

OPERATOR'S MANUAL

*Electronic Chart Display and
Information System (ECDIS)*

FEA-2107

FEA-2107-BB

MODEL FEA-2807

ECF

(Elemental Chlorine Free)

The paper used in this manual
is elemental chlorine free.

FURUNO ELECTRIC CO., LTD.

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• FURUNO Authorized Distributor/Dealer

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Important Notices

General

- The operator of this equipment must read and follow the descriptions in this manual. Wrong operation or maintenance can cancel the warranty or cause injury.
- Do not copy any part of this manual without written permission from FURUNO.
- If this manual is lost or worn, contact your dealer about replacement.
- The contents of this manual and equipment specifications can change without notice.
- The example screens (or illustrations) shown in this manual can be different from the screens you see on your display. The screens you see depend on your system configuration and equipment settings.
- Save this manual for future reference.
- Any modification of the equipment (including software) by persons not authorized by FURUNO will cancel the warranty.
- All brand and product names are trademarks, registered trademarks or service marks of their respective holders.

How to discard this product

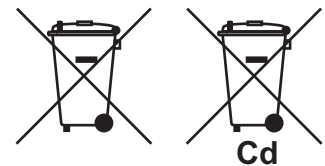
Discard this product according to local regulations for the disposal of industrial waste. For disposal in the USA, see the homepage of the Electronics Industries Alliance (<http://www.eiae.org/>) for the correct method of disposal. Tape the + and - terminals of battery before disposal to prevent fire, heat generation caused by short circuit.

How to discard a used battery

Some FURUNO products have a battery(ies). To see if your product has a battery, see the chapter on Maintenance. Follow the instructions below if a battery is used. Tape the + and - terminals of battery before disposal to prevent fire, heat generation caused by short circuit.

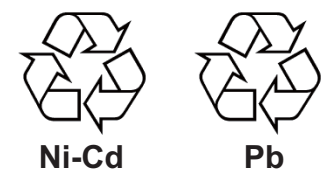
In the European Union

The crossed-out trash can symbol indicates that all types of batteries must not be discarded in standard trash, or at a trash site. Take the used batteries to a battery collection site according to your national legislation and the Batteries Directive 2006/66/EU.



In the USA



The Mobius loop symbol (three chasing arrows) indicates that Ni-Cd and lead-acid rechargeable batteries must be recycled. Take the used batteries to a battery collection site according to local laws.








In the other countries







There are no international standards for the battery recycle symbol. The number of symbols can increase when the other countries make their own recycling symbols in the future.

SAFETY INSTRUCTIONS

 WARNING	Indicates a condition that can cause death or serious injury if not avoided.
 CAUTION	Indicates a condition that can cause minor or moderate injury if not avoided.

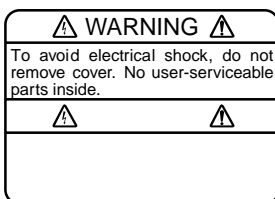
 Warning, Caution	 Prohibitive Action	 Mandatory Action
--	--	--

 WARNING
<p> Do not open the equipment.</p> <p>This equipment uses high voltage that can cause electrical shock. Only qualified persons can work inside the equipment.</p>
<p> Turn off power at switchboard if the something is dropped inside the equipment.</p> <p>Fire or electrical shock can result if the power remains on.</p>
<p> Turn off power at switchboard if the equipment is emitting smoke or fire.</p> <p>Fire or electrical shock can result if the power remains on.</p>
<p> Do not place liquid filled containers on the top of the equipment.</p> <p>Fire or electrical shock can result if a liquid spills into the equipment.</p>

 CAUTION
<p> Do not disassemble or modify the equipment.</p> <p>Fire, electrical shock or bodily injury can result.</p>
<p> Do not operate the equipment with wet hands.</p> <p>Fire or electrical shock can result.</p>
<p> Keep the equipment away from rain, water and water splash.</p> <p>Fire or electrical shock can result if water gets into the equipment.</p>
<p> Use the correct fuse.</p> <p>Use of a wrong fuse can cause bodily injury or fire.</p>
<p> The CPU board (PCG820 or 24P0100) in the processor unit has a lithium battery. The battery should only be replaced by a qualified technician.</p> <p>The battery may burst if it is the wrong type.</p>

WARNING LABEL

A warning label is attached to the processor unit. Do not remove the label. If the label is missing or damaged, contact a FURUNO agent or dealer about replacement.



Name: Warning Label (1)
 Type: 86-003-1011-0
 Code No.: 100-236-230

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Foreword

Congratulations on your choice of the FURUNO ECDIS FEA-2107, FEA-2107-BB, FEA-2807. We are confident you will see why the FURUNO name has become synonymous with quality and reliability.

For more than 60 years FURUNO Electric Company has enjoyed an enviable reputation for innovative and dependable marine electronics equipment. This dedication to excellence is furthered by our extensive global network of agents and dealers.

This equipment is designed and constructed to meet the rigorous demands of the marine environment. However, no machine can perform its intended function unless installed, operated and maintained properly. Please carefully read and follow the recommended procedures for operation and maintenance.

Features

The FEA-2107/FEA-2807 series ECDIS is the product of FURUNO's extensive experience in computer technology and marine electronics. It complies with IMO Resolution A.817(19), IEC 61174 and other related standards. The ECDIS displays electronic charts, nav lines, TT data, AIS targets and other navigation data on a high-resolution 19-inch or 20.1-inch (FEA-2107), or 23.1-inch display (FEA-2807). The FEA-2107-BB is supplied without a monitor, permitting use of the commercial monitor of your choice.

The main features of the ECDIS are

- Continuous monitoring of ship's position through multi-sensor Kalman filter processing using GPS, DPGS, SDME
- Route planning and route monitoring facilities
- Wide variety of warning facilities contribute to safer and more efficient navigation
- Radar image can be overlaid on electronic charts (option)
- Grounding warnings, safe depth contours
- Chart database loaded and updated using CD-ROMs
- Target data from TT/radar and AIS transponder to aid in collision avoidance

Version Number

06.xx_06.xx

Software Version No. and Chart Compliance

Product	Software version	Testing standard	Electronic Navigational Chart (ENC)	Raster Navigational Chart (RNC)	ECDIS Presentation Library	ENC Data Protection
FEA-2x07	x5.xx	IEC 61174ed2	S-57 Edition 3.1	S-61 Edition 1.0	S-52 PresLib edition 3.3	S-63 edition 1.0
	05.48 05.52 05.55	IEC 61174ed2	S-57 Edition 3.1,	S-61 Edition 1.0	S-52 PresLib edition 3.3, and support for S-57 Ed. 3.1.1	S-63 edition 1.0
			S-57 Edition 3.1.1 and			
			S-57 Maintenance Document (Cumulative) Number 8			
	06.xx	IEC 61174ed3	S-57 Edition 3.1,	S-61 Edition 1.0	S-52 PresLib edition 3.4	S-63 edition 1.1
			S-57 Edition 3.1.1 and			
S-57 Maintenance Document (Cumulative) Number 8						

You can find the latest ECDIS software maintenance on the internet, at the following address:

<http://www.furunodeepsea.com/products/contents/ecdis/software/index.html>

Virus Prevention

The ECDIS is not equipped with a virus checker. The ECDIS operates in real time; therefore, having a virus checker that periodically checks the equipment for viruses would increase the processing load, which can affect operation. However, you can prevent viruses by following the instructions in this section.

When you update a chart

The PC and medium (USB, floppy disk, etc.) used to download and store an update for an existing chart or a new chart may be infected with a virus. Check the PC and the medium for viruses with a commercial virus checker - **BEFORE** you connect them to the ECDIS. Be sure the virus checker contains the latest virus definition files.

When you back up data

When you back up data (route data, etc.) to a PC or medium (USB flash memory, floppy disk, etc.), check the PC and the medium for viruses with a commercial virus checker - **BEFORE** you connect them to the ECDIS. Be sure the virus checker contains the latest virus definition files.

Network connection

The ECDIS receives and displays information from various navigation equipment and radar via a LAN. The PC and other equipment connected to the network can carry viruses. To prevent the introduction of a virus to the LAN, **DO NOT** connect the ECDIS or HUB to an external network.

Do not install external programs in the ECDIS

Programs installed via an external network can carry viruses that cause ECDIS malfunction. **DO NOT** install any external programs in the ECDIS.

Virus Prevention

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1. Introduction

1.1 Contents of This Manual

This manual provides the following information:

- System configuration
- Screen interpretation and use of the control unit
- Set up before departure
- Rules to replace paper charts with electronic ones
- Chart material management
- Manual updates, which are used to manually enter Notices to Mariners and Navtex warnings
- Chart alert calculation
- Route planning and monitoring
- Various operator tools such as user charts, Notes and navigation tools
- Backup operations
- Common reference system
- Use of navigation sensors
- Use of Tracked Targets (TT)
- Use of AIS (Automatic Identification System) targets
- Radar overlay
- Various recording functions
- Essential information of the datum used by the charts and the ECDIS
- Steering related operations
- List of alerts

1.2 System Configuration

The ECDIS EC1000C Workstation, comprised of the components shown in the illustration below, displays electronic sea charts and operates as the user interface for the system.

The ECDIS processor is connected to various sensors, and performs navigation calculations and route monitoring. Connections to interfaces are typically made with a LAN (Local Area Network) Adapter.

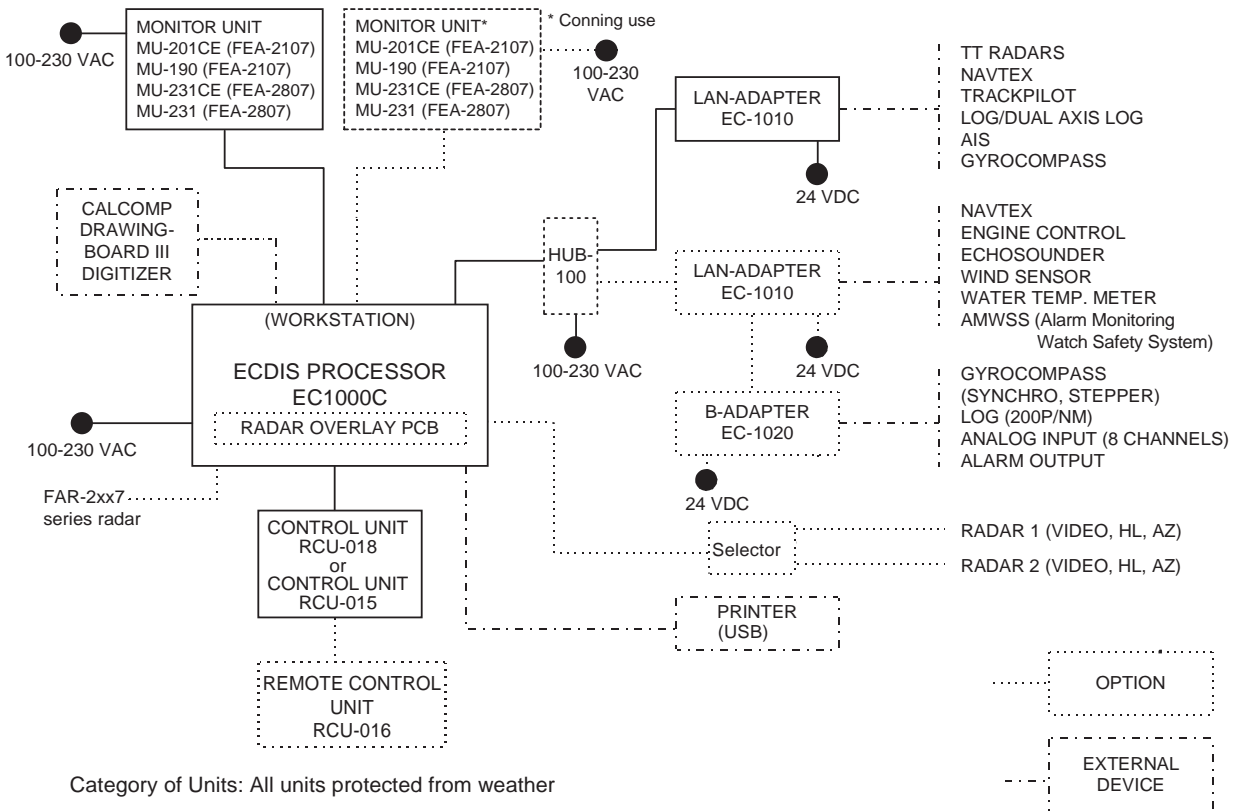
The ECDIS processor can be used for both route planning and route monitoring. If required, there can be additional identical ECDIS EC1000C Workstation(s) connected to the same LAN to share the tasks of the ECDIS. If the system incorporates more than one ECDIS EC1000C Workstation, one or more workstation(s) can be used as an user interface (with "full" usage rights) and one or more workstation(s) may be used as planning stations (usage rights as "planning").

If the system has two workstations connected together as multiple workstations, the system keeps data on the workstations harmonised and also tracks selections and settings made on any workstation.

Typically there can be the following kinds of configurations of workstations:

- Mode as **Single**, only one workstation is used in the system.
- Mode as **Multiple**, two workstations are used in the system, and usage rights and sensor source of workstations can be changed by the operator.

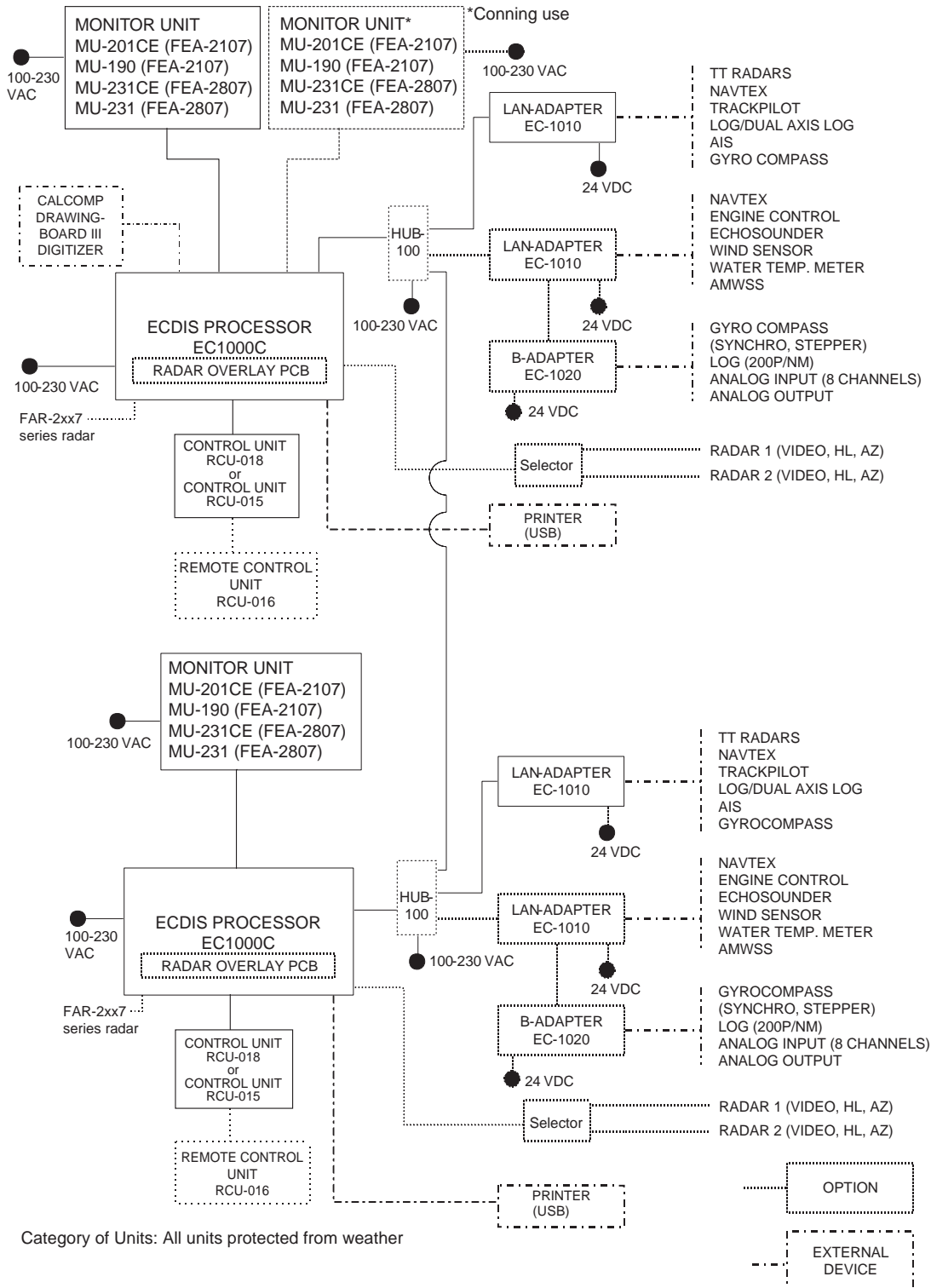
1.2.1 Single workstation



Single workstation with connection to navigation sensors

1.2.2 Multiple workstation configuration

In the multiple workstation configuration, there are two workstations connected together by a Local Area Network (LAN). In this configuration, one workstation is used as the "sensor source" for navigation sensors and the other workstation is used as the sensor source workstation that communicates with sensors, receiving and transmitting data from/to workstation via the LAN. In the multiple workstation configuration (two fully redundant navigation workstations), where navigation sensors are connected to two workstations, the sensor source may be changed and still receive and transmit information from/to the system and to/from navigation sensors.

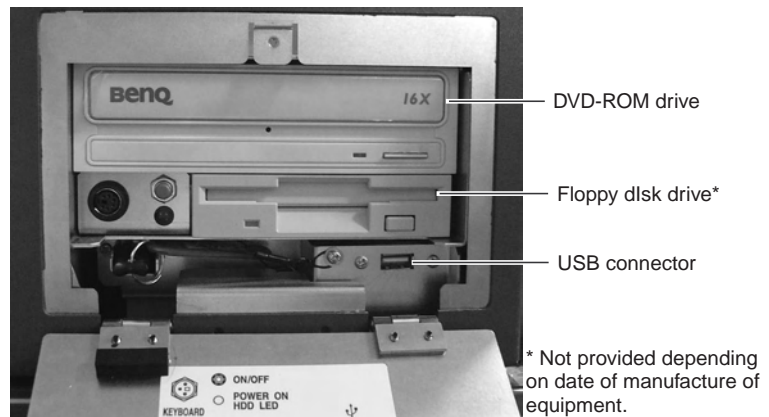


Multiple workstation with connection to navigation sensors

1.3 The Chart Processor Unit

The chart processor unit is the heart of the system, and is responsible for the loading, storing, updating and processing of electronic sea charts, with the DVD-ROM drive, floppy disk drive and USB memory. The DVD-ROM and floppy disk drives and USB connector are behind the lid on the front panel.

Note: Do not operate the ECDIS with a media (FD/CD/DVD/USB) inserted in its drive, to prevent damage to the drive and media. Remove media from its drive after usage. Insert media only to do operations such as backing up data, updating charts, and the like. After completion, remove the media from its drive and store it in its case, before using the ECDIS. Store media out of direct sunlight, in a place where temperature and humidity are moderate and stable.



1.4 How to Turn the Power On/Off

The system may be turned on by turning on the power switch at the rear of the processor unit then pressing the **POWER** switch on the Control Unit, until you feel a "click". The equipment releases a beep when the **POWER** switch is turned on. To turn off the system, reverse this sequence.

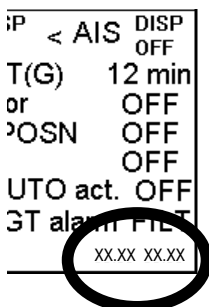
Note 1: The amount of resources used increases over time, sometimes slowing down operation. If operation seems to be slow, re-set the power, when use of the equipment is not required (when in port, etc.).

Note 2: If the ambient temperature is less than 0°C (32°F) when the power is applied, nothing appears on the display. This is because the heater is warming the chart processor unit. The display appears in approx. 10 minutes.

Note 3: Be sure all LAN cables are connected **BEFORE** turning on the power.

1.5 How to Find Version Number of ECDIS Software

The ECDIS software version number is displayed in the information area, next to the system configuration indication.



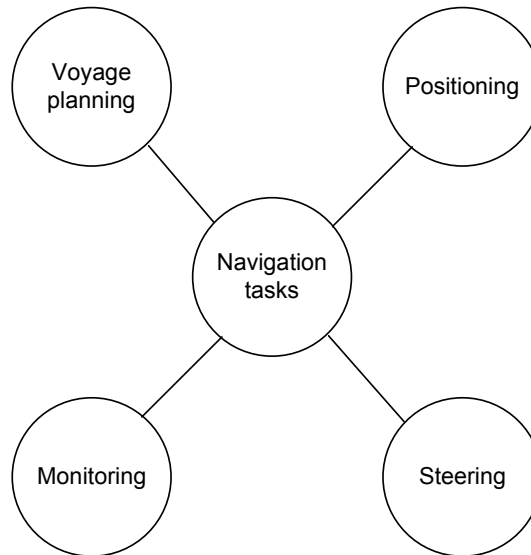
1.6 Diagnostics

The ECDIS has two types of diagnostic tests. One type (several tests) checks the functionality of the equipment and the other type calibrates the monitor. This manual provides only the instructions for testing the keyboard. For the diagnostic tests, see the service manual.

2. Navigation Tasks

2.1 Overview

Navigation tasks can be divided into four basic tasks:

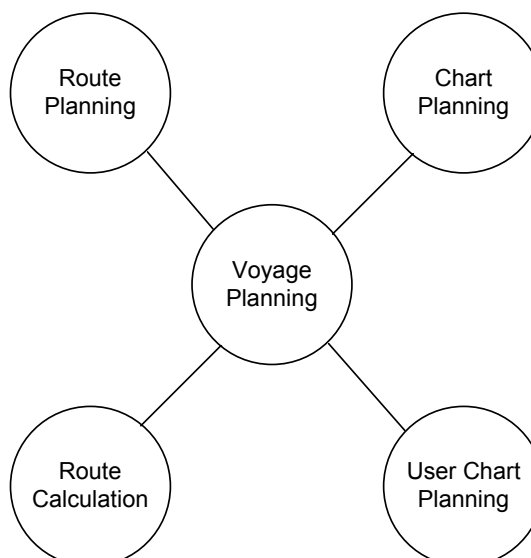


Navigation tasks

2.2 Voyage Planning

Voyage planning is the preparation phase for a coming voyage. Preparation includes route definition, route calculation and route optimization.

Required sea charts are also prepared in voyage planning, either by updating existing charts or creating new ones.



2. Navigation Tasks

2.2.1 Route planning

A route can be created two ways: Modify an existing route to create a new route or create a new route from scratch.

A route consists of the following:

- Position of each waypoint
- Turning instructions for each waypoint
- Safety limits between waypoints (channel limits)
- Safe water calculation based on safety limits
- Required steering accuracy for individual legs
- Speed restrictions for legs

Information notebook:

- Information pages to alert the operator to a given waypoint or a selected area.
- Automatic and/or manual notebook function to tell operator position-based information.

Voyage optimization parameters: See "voyage optimization" below.

2.2.2 Route calculation

Route calculation for voyage planning includes the following:

Route profile calculation:

- Distance between consecutive waypoints
- Course between waypoints
- Calculation of wheel over point
- Total distance
- Estimated time for voyage

Route check: Grounding alert based on available depth information in digital chart database.

Voyage optimization:

- Timetable optimization
- Optimization based on economical factors

The ECDIS processor calculates optimum speed and course between each waypoint, ETA, and fuel consumption, based on the defined data. There are four calculation strategies: Max. Speed, Timetable, Lowest Cost and Best Profit. In case of Great Circle sailing between two waypoints, the ECDIS calculates minimum and maximum latitudes, and if needed adds an extra waypoint(s) so as not to exceed minimum and maximum latitudes.

2.2.3 Chart planning

Chart planning consists of the following steps:

1. Load new S57 and ARCS charts.
2. Update existing S57 and ARCS charts.
3. Manage chart permits.
4. Manually update charts.

2.2.4 User chart planning

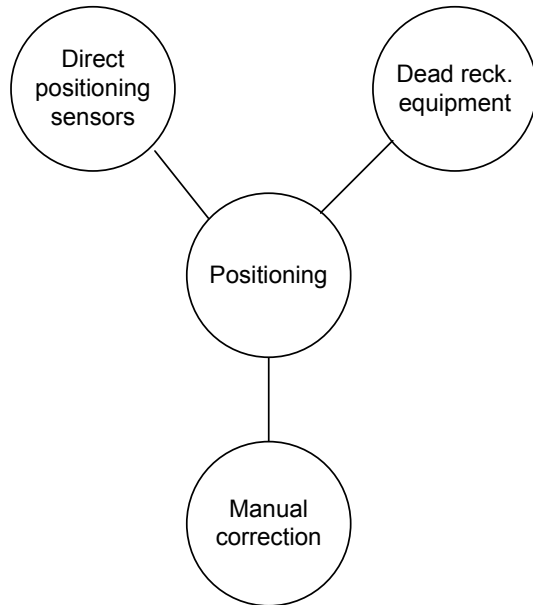
User chart planning consists of the following steps:

1. Create operator navigation charts.
2. Process chart alerts based on symbols, lines and areas of user chart.

2.3 Positioning

Positioning means using all available methods available to calculate and keep ship's position up-to-date during a voyage.

The calculation of ship's position is based on available navigation sensors. The system integrates valid information from different sensors and uses the Kalman filter technology for final position calculation.



2.3.1 Direct positioning sensors

Satellite navigation systems:

- GPS navigator
- GPS navigator with a differential correction, DGPS
- Local position-fixing systems

Radio navigation systems:

- Loran C

2.3.2 Dead reckoning equipment

Ship's heading measurement devices:

- Gyrocompass
- Magnetic compass
- GPS gyrocompass

Speed measuring devices:

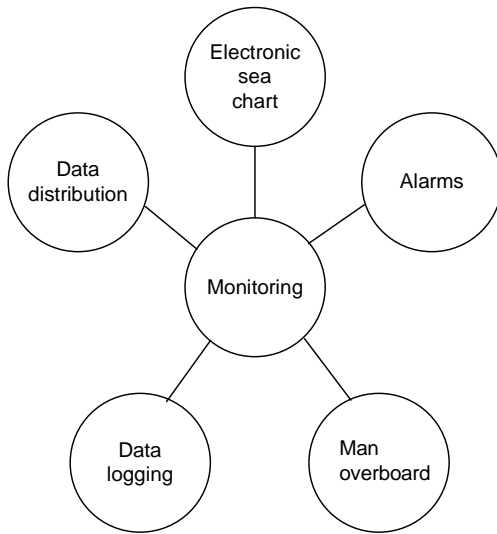
- Single-axis speed logs
- Dual-axis speed logs
- Radionavigation equipment
- Satellite navigation equipment

2.3.3 Manual correction

User-executed position correction where radar echoes and information from synthetic charts are combined and verified by the operator, and adjusted if necessary.

2.4 Monitoring

Monitoring means a continuous check of navigation data, operator actions and performance of the system. Another part of the monitoring is the display of electronic sea charts and conning information.



2.4.1 Display of electronic sea chart

The following information is available on the electronic sea chart:

- Own ship position
- Planned track
- Planned safety lines
- Ship's predictor (See the applicable chapter in the operator's manual for the trackpilots, issued separately.)
- Chart alerts
- Tracked Targets
- Chart information
- AIS targets

2.4.2 Alerts

The following alerts are incorporated:

- Route monitoring alerts
- Position calculation alerts
- Position monitoring alerts
- Waypoint approach alerts
- Alerts for sensor failure
- Alerts for system failure
- Alerts for incorrect operator action
- Alert based on chart database

2.4.3 Man overboard

Built-in man over board function records position at the time of man overboard, in one-touch operation.

2.4.4 Data logging

The following information may be logged:

- Past track history
- Events
- Dangerous targets
- Voyage recording

2.4.5 Data distribution

Data is distributed via the ECDIS's computer system.

3. ECDIS Display

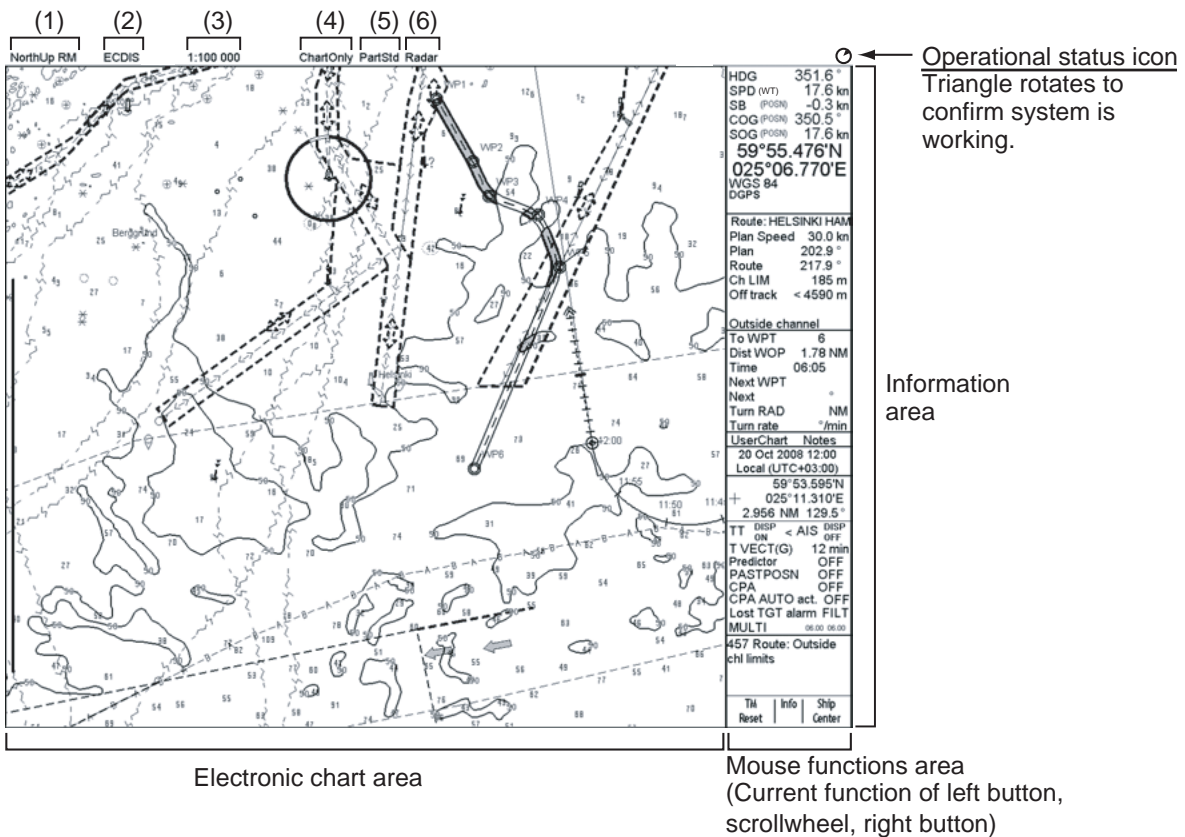
3.1 ECDIS Overview

The ECDIS (Electronic Chart Display and Information Systems) screen is divided into several areas. The **Status bar**, which is always shown at the top of the screen, mainly displays equipment status.

The boxes at the right side of the screen comprise the **Information areas**. They are permanently displayed and show information such as your ship's position, alerts generated by the system, workstation mode and cursor position. The operator may display the data of his or her choice in one of the information areas called a **Sidebar**. (See section 3.3.3 "Sidebar on user interface".) The bottom block in the information area is the **Mouse functions area**, and it shows the current left mouse button, scrollwheel and right mouse button functions, in that order from left to right.

The **Electronic chart area** takes up 7/8 of the ECDIS display.

- (1) Presentation mode
- (2) ECDIS mode
- (3) Chart scale
- (4) Chart only switch*¹
- (5) Name of display settings (DspBase, PartStd, Std, All, AllOther)*²
- (6) Radar selection (TT/radar video source)



*¹ Left-click to show information of ENC as selected by user in Chart Display settings. All other navigational information is removed from ECDIS chart display area until you release left mouse button.
 *²

- DspBase: When no options are checked on Standard page.
- PartStd: When some of options (not all) are checked on Standard page.
- Std: When all options are checked on Standard page and no options are checked on Other1/Other 2 pages.
- Other: When all options are checked on Standard page and some options (not all) are checked on Other1/Other2 pages.
- AllOther: When all options are checked on Standard page and all options are checked on Other1/Other2 pages.

Parts of the ECDIS display

3.2 Electronic Chart Area

The ECDIS can use the following types of charts:

- S-57 (IHO)
- S-63 (IHO)
- ARCS (UK-HO)
- CM-ENC (C-MAP)
- CM-93/2 (C-MAP)
- CM-93/3 (C-MAP)

The following information can also be displayed:

- Cursor (moved by trackball)
- Planned route
- EBL (Electronic Bearing Line) and VRM
- Own ship symbol with speed vector
- TT-acquired target
- AIS target

3.2.1 Electronic charts in ECDIS

The electronic navigational charts are displayed in the electronic chart area. There are two kinds of electronic navigational charts available for use in the ECDIS:

- S57ed3 ENC or CM-93 vector format
- ARCS raster format

Official paper charts may be replaced with S57ed3 ENC and ARCS charts. The operator should check the current situation in his or her flag country administration and if in doubt use the paper charts as the primary source of navigational information.

The ECDIS combines chart and navigational information. It should be noted that modern navigation systems (e.g., differential GPS) may offer more accurate positioning than what was used to position some of the surveys from which the electronic navigational chart was derived.

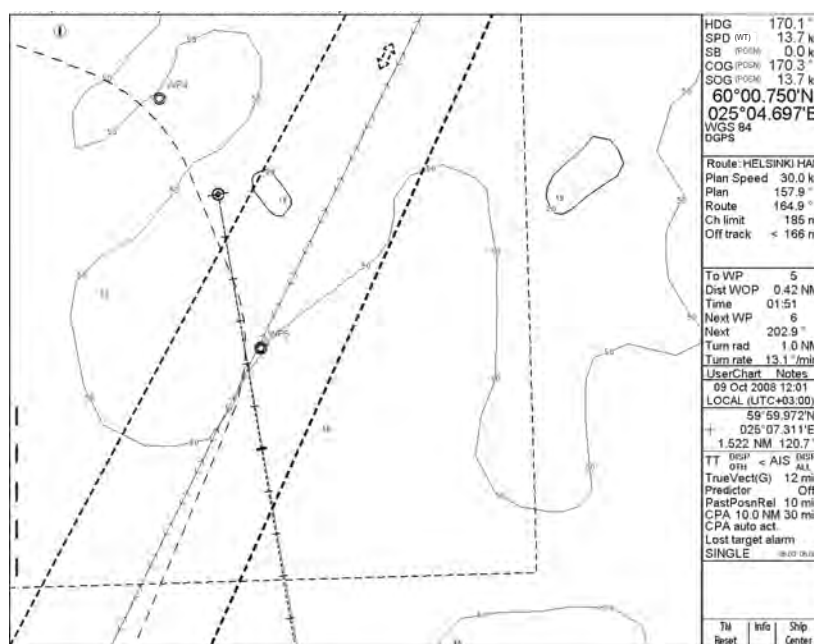
S57 vector format

ECDIS is compatible with S57 release 3 ENC format charts. ENC charts are converted to SENC for use with ECDIS.

When you open a chart, it is displayed with the default scale, called the compilation scale. The details for the chart are displayed in the electronic chart area and these can be modified. You can change the chart scale with the ZOOM IN and ZOOM OUT functions, and the scale range is 1:1,000 - 1:50,000,000.

CM-93: Compatibility with CM-93 format depends on commercial agreements. Some versions of this ECDIS are compatible and others are not. A security device called a dongle controls the compatibility. From CM-93 format the ECDIS generates SENC charts for use with ECDIS. The difference between S57ed3 ENC charts and CM-93 charts is that the CM-93 charts are from a private source and they cannot be used as a substitute for paper charts under any condition. To emphasize this point these charts are called "Non-ENC" charts in this manual.

CM-ENC: C-MAP produced official ENC chart that complies with the IHO's (International Hydrographic Organisation's) S-57 Edition 3 product specification. When used in an ECDIS, the ENC data improves the safety of navigation at sea.

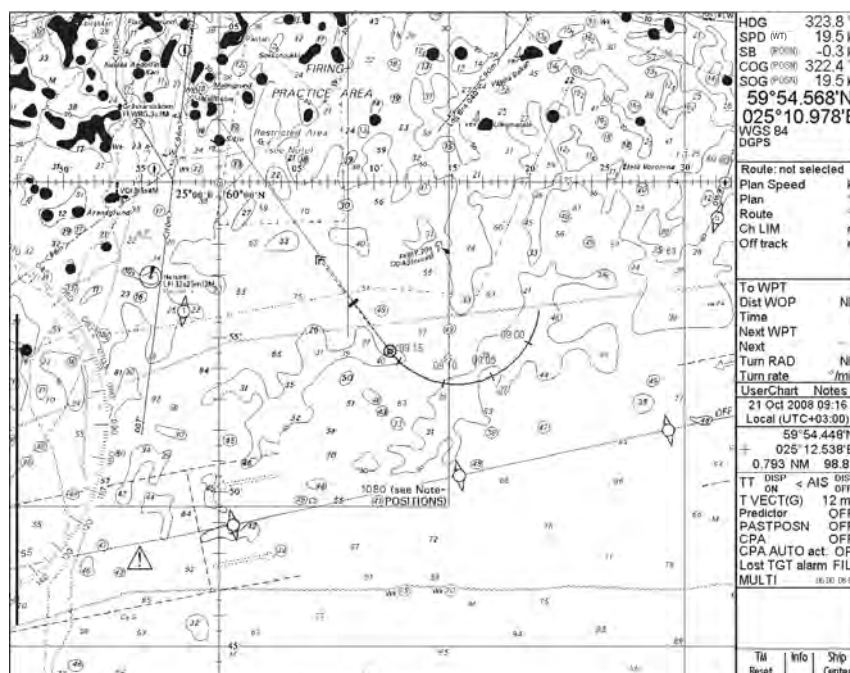


S57 vector chart

ARCS raster format

ARCS charts are digital reproductions of British Admiralty (BA) paper charts. They retain the same standards of accuracy, reliability and clarity as paper charts.

Zooming into the ARCS chart can be useful for magnifying a complex detail, however this decreases the density of the data displayed, and can give a false impression of the distance from danger. Therefore, magnification is limited to 2x the original paper chart's scale or 1/2 the original paper chart's scale.



ARCS raster format chart

3.3 User Interface

The user interface is defined as the areas that do not display the electronic chart, either raster chart or vector chart.

The user interface contains information about settings, parameters and selections used by the ECDIS. The nature of the information displayed can be either static (such as name of a certain window, fields in chart legend, units, etc.) or dynamic (such as position of your ship, time, operator selections, etc.).

3.3.1 Color palettes for user interface

There are several color palettes available for choosing colors for the chart background and information areas.

Setting	Background color of chart	Background color of information area
Day Bright	Light-blue	White
Day Blue	Light-blue	Dark-blue
Dusk	Blue	Black
Dusk Blue	Blue	Dark-blue
Night	Black	Black

With any palette selection except Day Bright, text is shown in different colors to help you distinguish between them. For example, dynamic data like your ship's position, time and items with direct control of parameters (scale, predictor time, etc.) is shown in green color.

To select a color palette, do the following:

1. Set the cursor in the electronic chart area.
2. Spin the scrollwheel to show Chart Display/Info/Standard Display in the mouse functions area.
3. Push the left mouse button to open the Chart Display dialog box.
4. If the "Chart page" is not selected, click an arrow tab in the dialog box to display it.
5. Put the cursor on Palette.
6. Spin the scrollwheel to select desired palette, referring to the table above, then push the scrollwheel.
7. Click the X at the top right corner of the dialog box to close the box.

Note: The display colors are changed to the Windows standard color palette whenever a USB memory device is inserted or removed. (When Windows initiates USB recognition procedures, the Windows standard color palette is restored.) To restore the ECDIS color palette, open the Chart Display menu and follow the procedure on this page.

3.3.2 Information area

The information area displays your ship's position, course and speed and the cursor's location on the chart

Information from the positioning sensors:

- HDG: Heading and its source if it is not true gyro.
- SPD: Water speed
- SB: Transversal speed, positive value to Starboard.
- COG: Course over ground and its source
- SOG: Speed over ground
- Latitude and longitude position of own ship
- Datum in use (WGS 72, WGS 84, European 1950, etc.), which is shown above positioning source.
- Positioning source: Dead Reckoning, GPS, DGPS, LORAN, FILTER, etc.

HDG	170.1 °
SPD (WT)	13.7 kn
SB (POSN)	0.0 kn
COG (POSN)	170.3 °
SOG (POSN)	13.7 kn
	60°00.750'N
	025°04.697'E
	WGS 84
	DGPS

Cursor position information:

- Latitude and longitude position of cursor displayed in selected datum.
- Range and bearing from your ship's position to cursor

	59°59.972'N
+	025°07.311'E
	1.522 NM 120.7 °

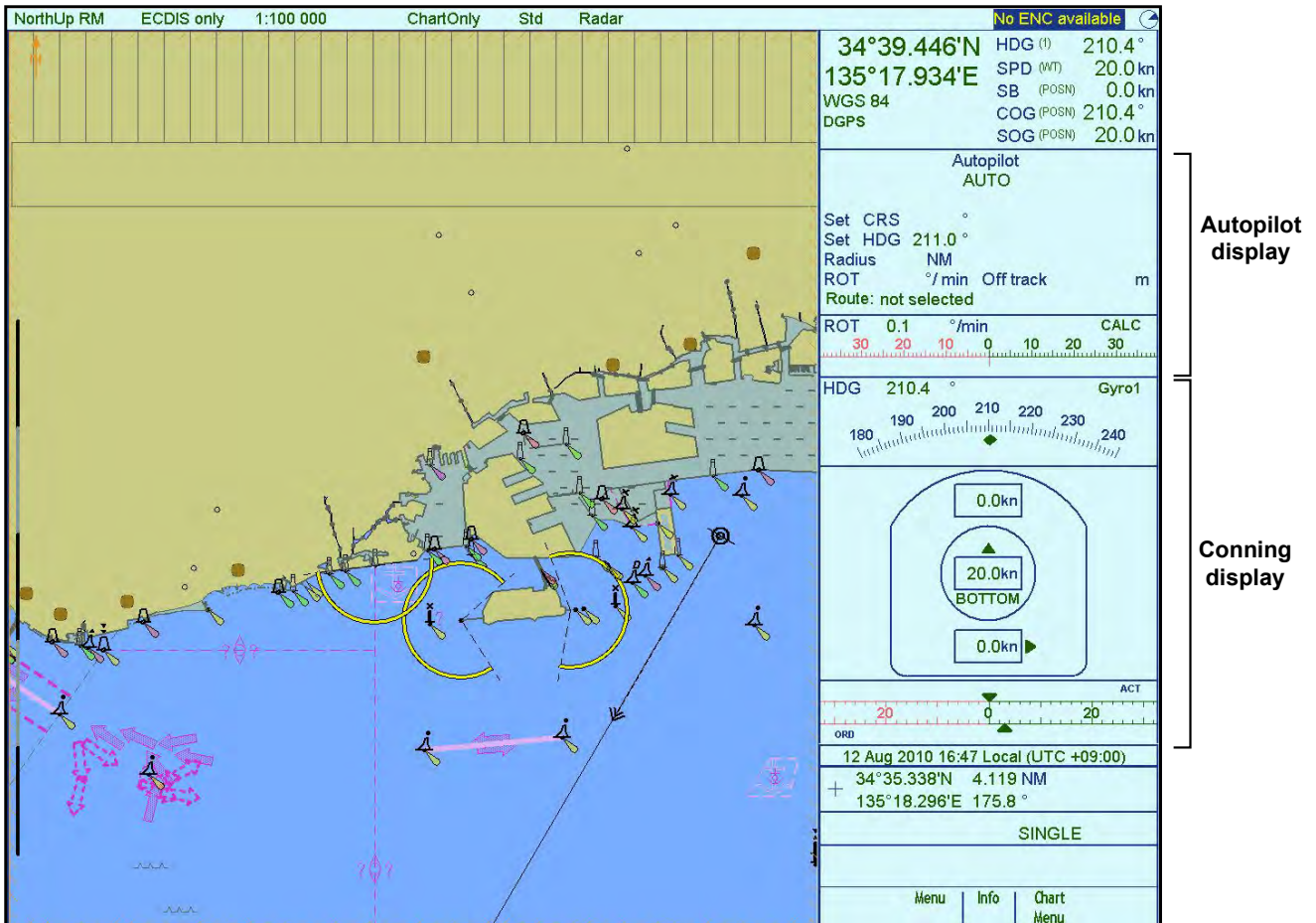
Note: The order of items in the position and cursor windows can change with the sidebar used. See the next page.

3. ECDIS Display

3.3.3 Sidebar on user interface

You may select what kind of information to display in the sidebar (right side) of the ECDIS. The options shown below are available and the content of the sidebar windows change with the devices and sensors connected to the system. The route display or autopilot display is always displayed. You can display one of them together with the conning display, docking display or chart legend. When two sidebars are active, the width of the information area is doubled, as shown below. The autopilot display is available when "Track Control" is set to "Yes".

- Route display
- Autopilot display
- Conning display
- Docking display
- Chart legend



Sidebar, with autopilot and conning display windows

How to open the sidebar

Sidebar(s) may be opened as shown below. Two sidebars may be displayed.

1. Put the cursor on the area shown.
2. "Select Sidebar" appears in the mouse functions area. See figure at right.
3. Click the right mouse button to show the sidebar menu on the display.
4. Spin the scrollwheel to select desired sidebar from the menu then push the scrollwheel.

To remove an item from the sidebar, deselect it following this procedure.

Note: The autopilot sidebar is shown when "Track Control" is set to "Yes".

The image shows a vertical sidebar menu on the right side of the ECDIS display. The menu items are: [Sidebar], Route (checked), Autopilot, Conning, Docking, Chart Legend, and Close. To the left of the menu, a box highlights a portion of the display data, including 'Plan Speed 30.0 kn', 'Plan 157.9°', and 'Route 164.9°'. An arrow labeled '1' points to this box. At the bottom of the sidebar, there is a 'Menu' button and a 'Select Sidebar' button. An arrow labeled '2' points to the 'Select Sidebar' button. Another arrow labeled '3' points to the sidebar menu itself.

HDG	170.1°
SPD (WT)	13.7 kn
SB (POSN)	0.0 kn
COG (POSN)	170.3°
SOG (POSN)	13.7 kn
60°00.750'N	
025°04.697'E	
WGS 84	
DGPS	
Route: HEL SINKUHAM	
Plan Speed	30.0 kn
Plan	157.9°
Route	164.9°
Ch limit	1.5 m
Off track	< 1.66 m
To WP	5
Distance to WP	0.42 NM
ETA	01:51
WP	6
Lead	1.0 NM
Rate	13.1°/min
Chart Notes	
Chart 2008 12:01	
L (UTC+03:00)	
59°59.972'N	
025°07.311'E	
1.522 NM 120.7°	
TT	DISP OFF < AIS
DISP	ALL
T VECT(G)	5 min
Predictor	OFF
PASTPOSN T	2min
CPA 10.0NM	30min
CPA AUTO act	FILT
Lost TGT alarm	FILT
SINGLE	xx.xx xx.xx

3. ECDIS Display

Information in route sidebar

The following information is shown in the route sidebar:

Information from route monitoring:

- **Route:** Name of monitored route
- **Plan Speed:** Planned speed to approach "To WPT".
- **Plan:** Planned course between previous WPT and "To WPT".
- **Route:** Calculated set course to follow the monitored route, including off track, drift and gyro error compensation.
- **Ch LIM:** Planned width of channel to approach "To WPT".
- **Off track:** Perpendicular distance the ship is from the intended track.
- **To WPT:** The waypoint that the ship is approaching.
- **Dist WOP (Wheel Over Point):** Distance to the point where rudder order for course change at "To WPT" is given.
- **Time:** Time to go to WOP (dd:hh:mm:ss).
- **Turn RAD:** Planned turning radius at "To WPT".
- **Turn rate:** Calculated rate of turn, which is based on current speed and planned turning radius.
- **Next WPT:** The WPT following the "To WPT".
- **Next:** Planned course between "To WPT" and "Next WPT".

The following information is calculated from data of positioning sensors and from route monitoring data:

- **Route**
- **Off track**
- **Dist WOP**
- **Time**
- **Next**

Route: HELSINKI	
Plan Speed	30.0 kn
Plan	202.9 °
Route	202.9 °
Ch LIM	185 m
Off track	< 2 m
To WPT 6	
Dist WOP	4.67 NM
Time	15:07
Turn RAD	1.0 NM
Turn rate	17.7 °/min
Next WPT	7
Next	250.1 °

Additional textual information is available if any of the following steering modes are in use.

The following steering modes are available with the FURUNO Autopilot FAP-2000. See the operator's manual for the trackpilots.

- "GOTO WPT", "GOTO WPT Great circle", "Ass. Appr enabled" and "Ass. Turn enabled" and "Assisted turn" in GOTO WPT mode
- "GOTO Track", "Track Great circle" and "Track Appr. Enabled", "Track Turn Enabled" and "Track Turn" in Go Track mode

The following steering modes are available with the TOKYO KEIKI Autopilot PR-6000. See the operator's manual for the trackpilots.

- "GOTO OS", "GOTO OS Great circle", "Ass. Appr. Enabled", "Ass. Turn enabled" and "Assisted turn" in GOTO OS mode
- "GOTO AW", "GoAW Great circle", "GoAW Appr. Enabled", "GoAW Turn Enabled" and "GOTO AW Turn" in Go Track mode

Permanent alerts are available in the following cases, regardless of the steering mode used:

- "Outside channel" is indicated by displaying the indication "Off track" in red and its value in orange.
- For the YOKOGAWA Autopilot PT-500A, "Out of gate" is colored orange. It indicates that if the ship continues using the current course the ship will be outside of the channel at wheel over point.
- "Autopilot Conflict" is only available with the YOKOGAWA Autopilot PT-500A.

Information in autopilot sidebar

The following information is shown in the autopilot sidebar.

- **Steering mode (below "Autopilot")**
- **Prog CRS:** If you use program track or program heading change steering modes, planned course is shown.
- **Set CRS:** Actual set course
- **Set HDG:** Actual set heading
- **Radius:** Actual set radius
- **ROT:** Value for ROT

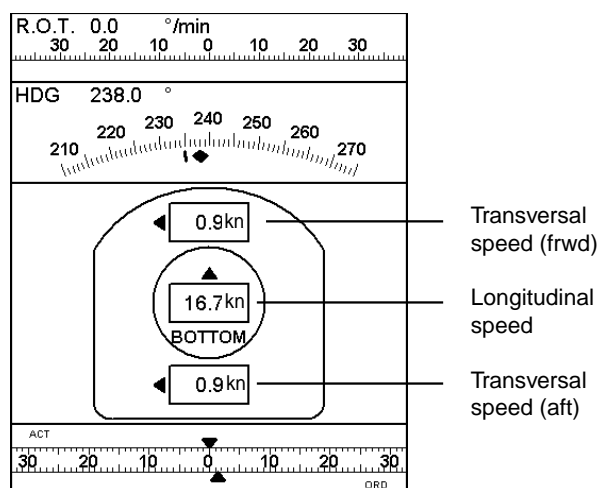
Autopilot			
RADIUS CONTROL			
Prog CRS	°	Cond.	MEDIUM
Set CRS	238.0 °	Perf.	MEDIUM
Set HDG	°		
Radius	0.3 nm		
ROT	53 °/min	Off track	< 118 m

- **Cond:** Setting for loading condition
- **Perf:** Setting for steering accuracy
- **Off track:** Distance from center line of planned route

Information in conning display sidebar

The following information is shown in the conning display sidebar:

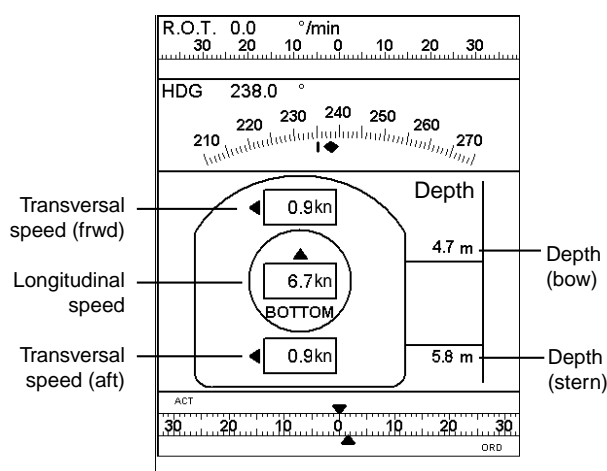
- **ROT indicator**
- **Heading indicator**
- **Speed indicators**
 - Longitudinal speed and source of speed
 - Transversal speed
- **Rudder angle indicator**



Information in docking sidebar

The following information is shown in the docking sidebar:

- **ROT indicator**
- **Heading indicator**
- **Speed indicators**
 - Longitudinal speed and source of speed
 - Transversal speed
- **Rudder angle indicator**
- **Depth below transducer**
 - On bow
 - On stern



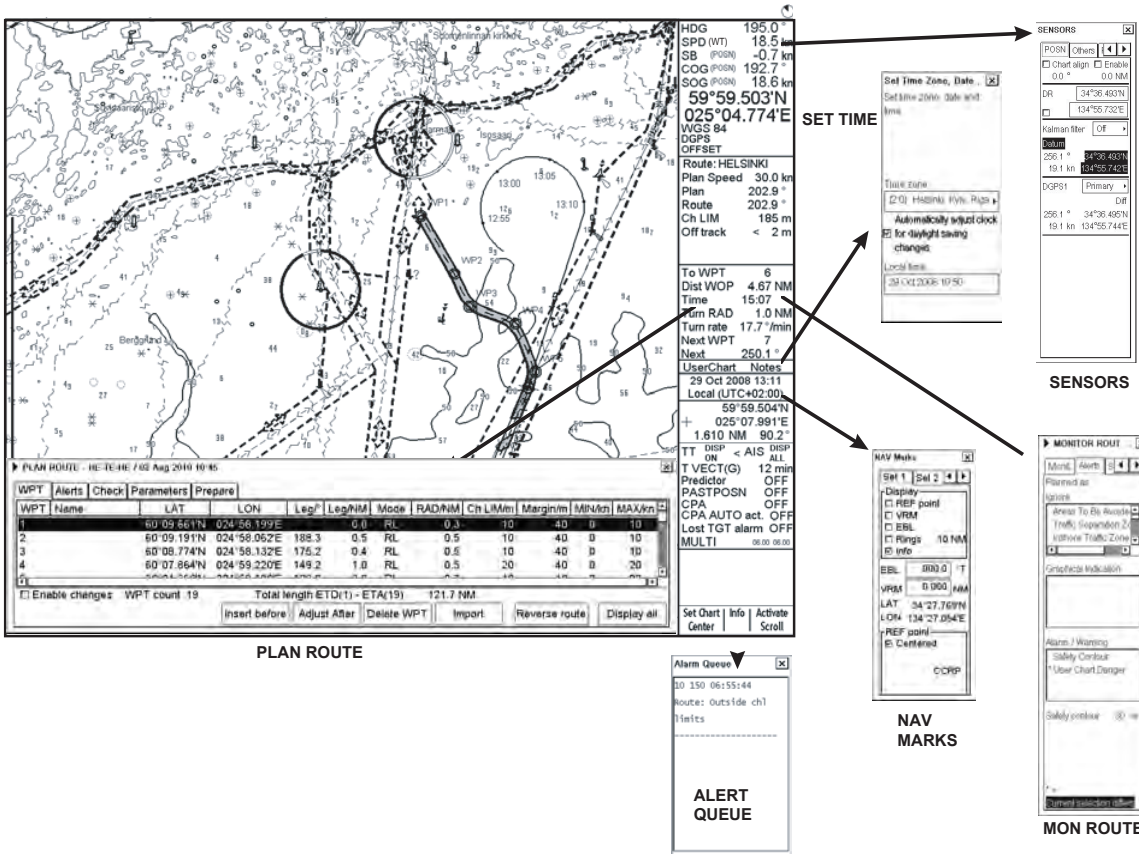
Information in chart legend sidebar

For detailed information see the chapters on vector charts and raster charts.

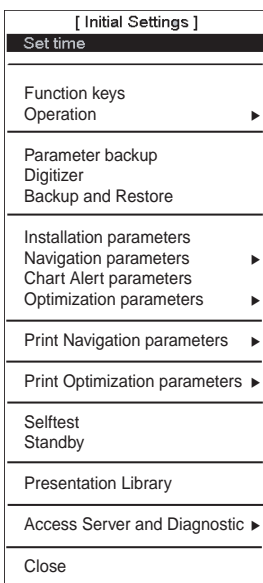
3. ECDIS Display

3.3.4 How to activate dialog boxes on the display

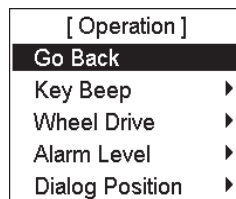
The dialog boxes provide information to the user or a means to change equipment settings. The boxes are activated by mouse-clicking over certain areas on the ECDIS display. Put the cursor on the appropriate area then click the right or left mouse button to display the corresponding dialog box on the ECDIS display. See the figure below to find the places and mouse button to click to get desired dialog boxes on the display. To close a dialog box, click the X at the top right corner of the dialog box. Note that only one dialog box may be shown at a time.



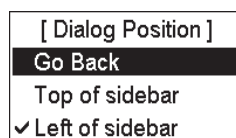
Depending on your system configuration, the dialog box can overlap route monitoring information or other information on the sidebar. In this case you can select where to open the dialog box, to the left of the sidebar or the top of the sidebar, where it won't interfere with route monitoring information.



1. Open the Initial Settings menu.
2. Select Operation from the menu.



3. Select Dialog Position.

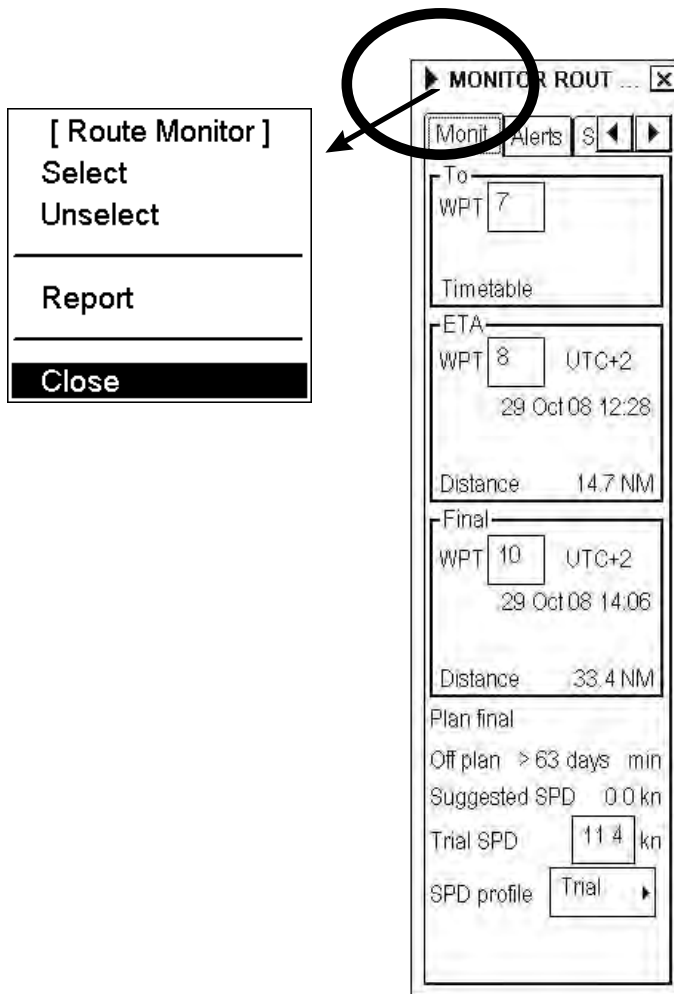


4. Select Left of sidebar to open dialog boxes left of the sidebar, or Top of sidebar to open the boxes on the sidebar. (Select "Left of sidebar" for TCS without conning display.)

Additional menu functions in dialog boxes

Dialog boxes that have a triangle at their upper left-hand corner contain a menu that provides additional functions. See the figure at right. Put the cursor on the triangle to show a menu from which to select additional functions.

Note: A menu will also appear if you try to activate a dialog box without choosing an option from the menu. (For route, user chart or Notes, see section 3.4 "How to Control Planning and Monitoring Modes".)



3.4 How to Control Planning and Monitoring Modes

A route, a user chart or Notes can be selected from the information area, in either the planning mode or the monitoring mode.

To select desired mode, put the cursor on the text Route, User Chart or Notes in the information area and click. A drop-down dialog box appears, where you can select either Monitor or Plan by clicking the appropriate button with the left mouse button. With User Chart or Notes, only the planning mode or the monitoring mode can be displayed in the status bar. (Display can be activated with a radio button. See the figure below.)

The screenshot displays an ECDIS interface with a chart showing a route. On the right side, there is a data panel with the following information:

HDG	195.0°
SPD (WT)	18.5 kn
SB (POBN)	-0.7 kn
COG (POBN)	192.7°
SOG (POBN)	18.6 kn
59°59.503'N	
025°04.774'E	
WGS 84	
DGPS	
OGPET	
Route: HELSINKI	
Plan Speed	30.0 kn
Plan	202.9°
Route	202.9°
Ch LIM	185 m
Off track	< 2 m

Below the data panel, there are three dialog boxes:

- Select Route:** Contains a 'Monitor' button, a dropdown menu with 'A', a 'Plan' button, and another dropdown menu with 'B'.
- Select Notes:** Contains a 'Monitor' button, a radio button labeled 'DISP', a dropdown menu with 'Notes1', a 'Plan' button, another radio button labeled 'DISP', and a dropdown menu with 'Notes2'.
- User Chart:** Contains a 'Monitor' button, a radio button labeled 'DISP', a dropdown menu with 'A1', a 'Plan' button, another radio button labeled 'DISP', and a dropdown menu with 'B1'.

At the bottom of the data panel, there are buttons for 'Set Chart | Info | Activate Center | Scroll'.

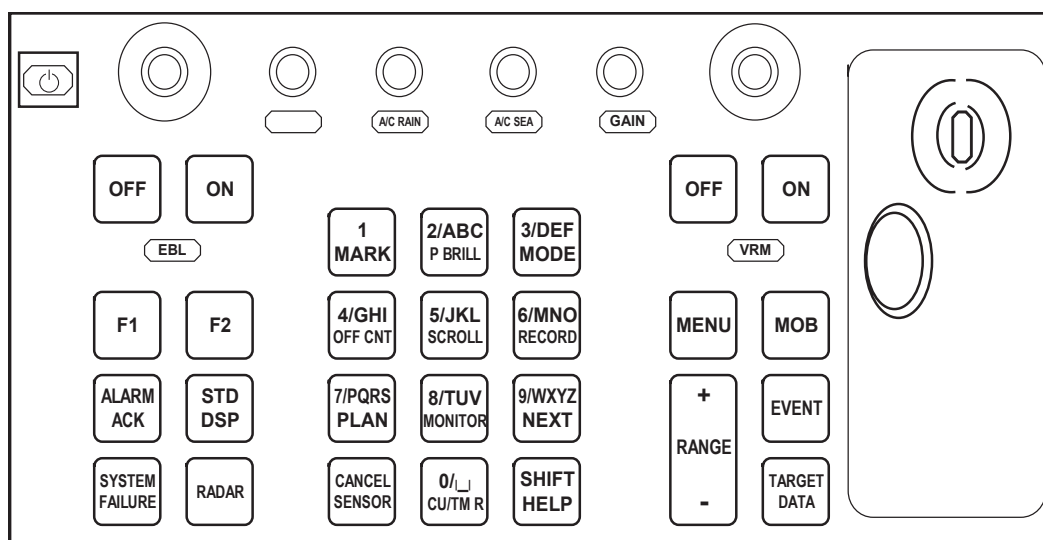
4. Control Units

4.1 How to Control the ECDIS

The operator controls the ECDIS with the Control Unit RCU-018 or the Control Unit RCU-015. Either unit is equipped with a trackball, right and left mouse buttons and a scrollwheel. The RCU-018 is additionally equipped with a keyboard. All functions of the ECDIS can be accessed using the trackball, mouse buttons and scrollwheel alone. To operate from a menu with the mouse, roll the trackball to select desired item, operate the mouse buttons or scrollwheel (depending on item) to select option then push the scrollwheel to confirm your selection.

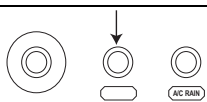
4.2 Control Unit RCU-018

The Control Unit RCU-018 consists of a keyboard, the trackball, scrollwheel and mouse buttons. The trackball functions like a mouse; the operator rolls the trackball and operates the left and right mouse buttons to access functions.



Layout of the Control Unit RCU-018

4.2.1 Control description

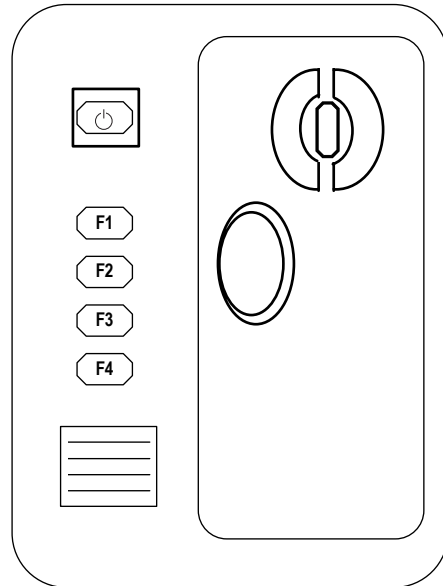
Key	Description
Power	Turns the system on/off. (This control does not switch the display on/off.)
VRM rotary encoder	Adjusts active VRM.
VRM ON	Activates and displays VRM 1 if none is displayed or VRM2 is active. Activates and displays VRM 2 if VRM1 is active.
VRM OFF	Inactivates and erases VRM 1 if both VRMs are displayed. Inactivates and erases VRM 2 if VRM1 is active.
EBL rotary encoder	Adjusts active EBL.
EBL ON	Activates and displays EBL1 if none is displayed or EBL 2 is active. Activates and displays EBL 2 if EBL1 is active.
EBL OFF	Inactivates and erases EBL1 if both EBLs are displayed. Inactivates and erases EBL 2 if EBL1 is active.
F1	Activates operator-defined function or menu.
F2	Activates operator-defined function or menu.
ALARM ACK	Alert acknowledgement for alerts generated by chart, navigation or steering calculation.
SYSTEM FAILURE	The red lamp behind the key lights and the buzzer sounds for system failure. Hit this key to silence the buzzer. The key remains lit until the reason for the problem is removed. System failure: control unit cannot communicate with EC-1000C. (EC-1000C is inoperative.)
RADAR	Displays Radar Overlay dialog box, which provides functions for adjustment of the radar picture.
STD DSP	Activates standard display presentation on the ECDIS. Restore monitor brilliance to calibrated state.
1/MARK	Displays the Nav. Marks dialog box, which mainly provides for activation/deactivation of various markers.
2/ABC/P BRILL	Adjusts control unit keyboard backlighting (dimmer).
3/DEF/MODE	Selects presentation mode: North-up TM, Route-up RM, Course-up RM, North-up RM, Course-up TM.
4/GHI/OFF CNT	Offcenters your ship's position to cursor location on the ECDIS display. Press again to return your ship's position to screen center.
5/JKL/SCROLL	Enables scrolling on charts, with the trackball active.
6/MNO/RECORD	Opens Voyage Record sub menu.
7/PRQS/PLAN	Opens Plan Route dialog box.
8/TUV/MONITOR	Opens Monitor Route dialog box.
9/WXYZ/NEXT	Opens "Next" page in multi-page dialog box.
CANCEL/SENSOR	Opens Sensors dialog box; closes open dialog box or window.
0/space CU/TM R	Returns your ship marker to screen center in TM and CU modes; inserts a space.
SHIFT/HELP	SHIFT: Shifts between lower case and upper case alphabets. HELP: Activates info/help. (Mouse must not be over input field.)
MENU	Displays the Main menu.
+ RANGE –	Adjusts chart scale.
MOB	Inscribes MOB mark on the screen.
EVENT	Records textual information fixed to your ship's position.
TARGET DATA	Shows target data for selected Tracked Target; provides data for selected chart area.
GAIN	Adjusts radar gain on the radar overlay.
A/C RAIN	Reduces rain clutter on the radar overlay.
A/C SEA	Reduces sea clutter on the radar overlay.
	Adjust backlight brilliance of ECDIS display(s). Color calibrated backlight brilliance can be set using "Standard Display" button or selecting desired "Palette" in the Chart page of the Display window.

4.3 Control Unit RCU-015

The Control Unit RCU-015 provides minimum configuration with controls that function as described below.

Power: Turns the system on/off. (This control does not switch the display on/off.)

F1-F4: Execute function assigned. Press more than two seconds to restore monitor brilliance to calibrated state.

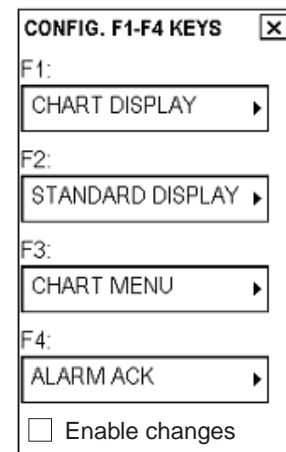


4.4 Hot Keys

Hot keys (F1-F4 on the Control Unit RCU-015 and F1 and F2 on the Control Unit RCU-018) are provided to call a desired function/menu when pressed. You may select desired function/menu from a predefined list. To select desired function/menu for each key, do the following

4.4.1 How to configure hot keys

1. Spin the scrollwheel to show Menu/Info/Chart Menu in the mouse functions area.
2. Click the left mouse button.
3. Spin the scrollwheel to select Initial Settings then push the scrollwheel.
4. Put the cursor on the triangle in the dialog box to show the Initial Settings menu.
5. Spin the scrollwheel to select Function keys then push the scrollwheel. The dialog box shown right (example: Control Unit RCU-015) appears.
6. Check Enable changes.



7. Put the cursor on the box for F1, F2, F3 or F4 as appropriate then spin the scrollwheel to select desired function or menu. The choices are
 - ALARM ACK: Acknowledge ECDIS-generated alert.
 - CHART DISPLAY: Opens Chart Display dialog box.
 - CHART MENU: Opens chart menu.
 - INITIAL SETTINGS: Display Initial Settings dialog box
 - MENU: Opens Main menu.
 - RADAR: Displays Radar Overlay dialog box.
 - RANGE-: Lowers chart scale.
 - RANGE+: Raises chart scale.
 - SCROLL: Scrolls display.
 - SENSORS: Opens Sensors dialog box.
 - SET CHART CENTER: Sets chart center as selected with the cursor.
 - SET SHIP CENTERED: Centers your ship's position.
 - SET SHIPOFFCENTER: Offcenters ship position to cursor location.
 - STANDARD DISPLAY: Calls up standard display; restores monitor brilliance to calibrated state.
 - SYMBOL DISPLAY: Opens Symbol Display dialog box.
 - TM RESET: Resets your ship's position in true motion.

4. Control Units

In the example in the figure at the bottom of page 4-3, the function of each hot key is as below:

F1: Opens **Chart Display** dialog box.

F2: Sets **Standard Display** settings on display.

F3: Opens **Chart** menu.

F4: **Acknowledges** alerts generated by ECDIS.

8. Click the X mark at the top right corner to close the dialog box.

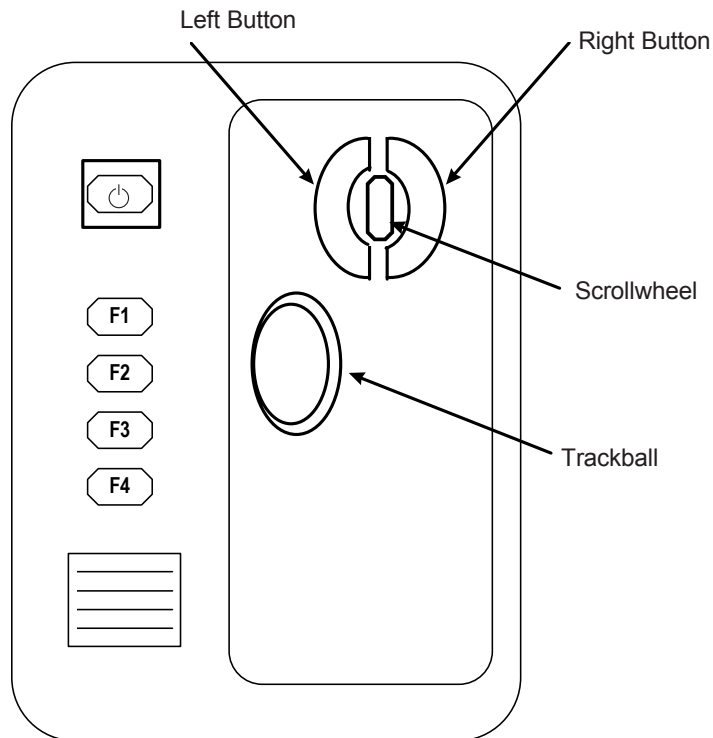
4.4.2 How to activate a menu or function with a hot key

Press the hot key corresponding to the menu or function you wish to activate.

4.5 Mouse Operations

4.5.1 Parts of the mouse

The mouse consists of the trackball, scrollwheel, left mouse button and right mouse button.



Mouse parts (pictured: RCU-015)

4.5.2 How to enter alphanumeric data

Alphanumeric input fields are activated for input by pointing with the mouse cursor and clicking the left mouse button. This action also displays minimum and maximum values beside the input field. You select the input value by spinning the scrollwheel then push the scrollwheel to accept the value. (Alphanumeric data may also be entered directly from the keyboard-equipped control unit.)

To change a specific digit or alphabet, roll the trackball to put the cursor to the left of the digit or character that you want to change then spin the scrollwheel to select appropriate alphanumeric character.

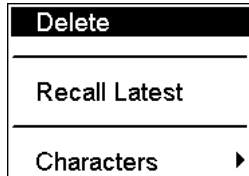
4.5.3 How to change co-ordinate polarity

By clicking co-ordinate polarity

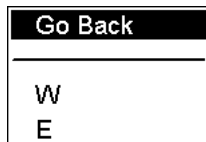
1. Put the cursor before the co-ordinate (N, S, E, W) then push the left mouse button.
2. Spin the scrollwheel to select desired polarity then push the scrollwheel.

By choosing polarity from drop-down menu

1. Put the cursor inside the input window.
2. Click the right mouse button to show the following window.



3. Select Characters and push the left mouse button. Your window should now look something like the one below. ("N" and "S" shown for latitude.)

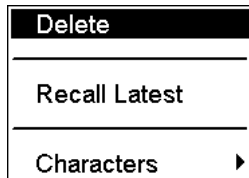


4. Spin the scrollwheel to select appropriate polarity then push the scrollwheel. The coordinate is changed and then the window is closed.

4.5.4 How to delete a character

A character can be deleted from text/numeric input field as follows:

1. Put the cursor to the right of the digit you want to delete then push the right mouse button.



2. Delete is selected – push the scrollwheel to delete the alphanumeric selected. The character is deleted and the window is closed.

4. Control Units

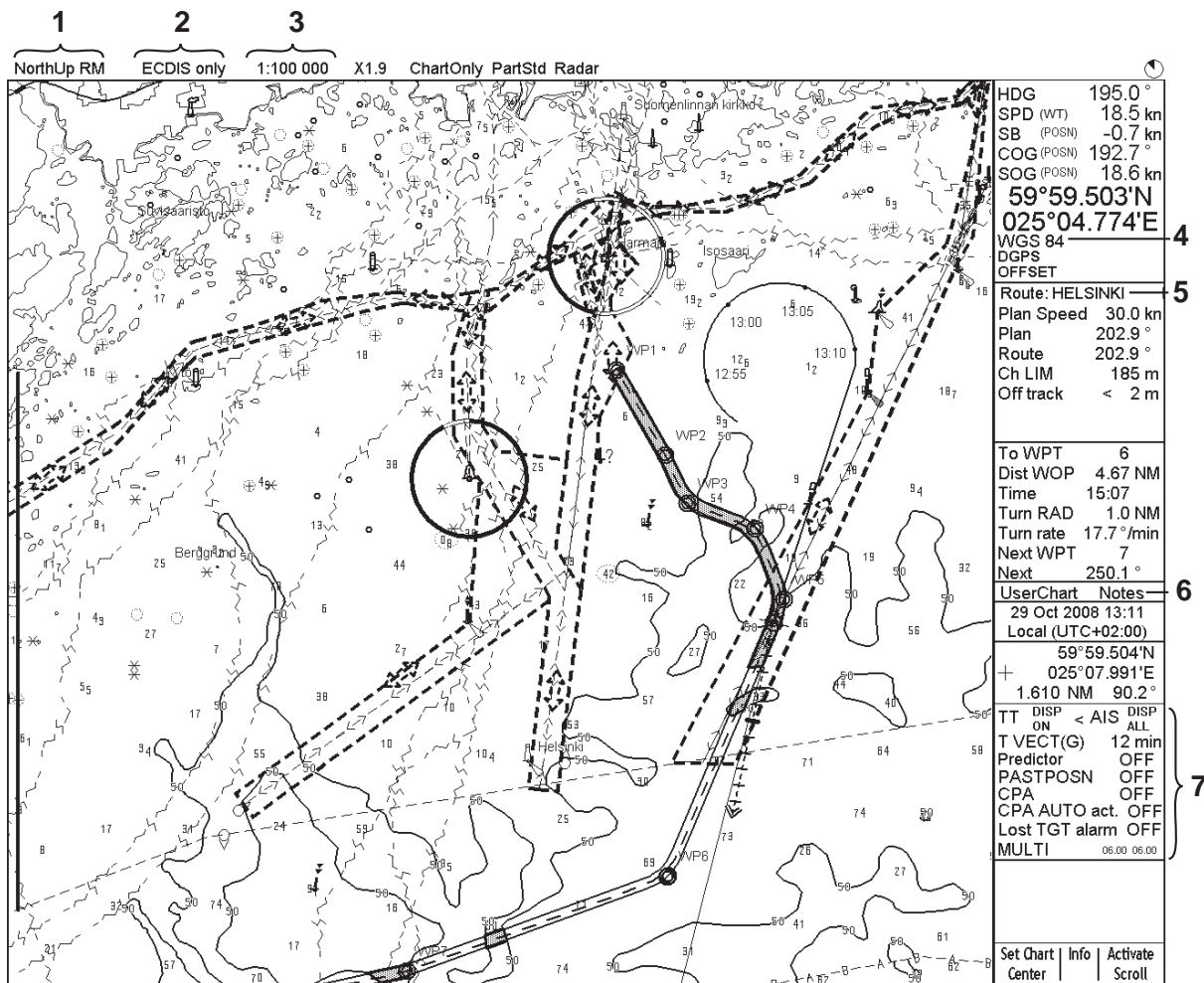
4.5.5 The scrollwheel

Items directly controlled by the scrollwheel

Selections can be made on the screen by pointing on the screen with the cursor then scrolling various options with the scrollwheel. When you put the cursor on a text or a numeric it turns green, purple or blue (depending on Palette in use) to indicate that the scrollwheel can be used to scroll options available or change the value of a numeric. Selection is confirmed by pushing the scrollwheel.

The following functions can be done directly on the screen. See the figure below for location.

1. Chart orientation
2. Operating mode
3. Chart scale
4. Datum for output coordinates
5. Route operations
6. User Chart and Notes operations
7. From top: TT/AIS On/Off, Vector length, Past position setting, CPA time setting, CPA auto activate setting, Lost target alarm setting, Workstation mode (in case of multiple workstations).



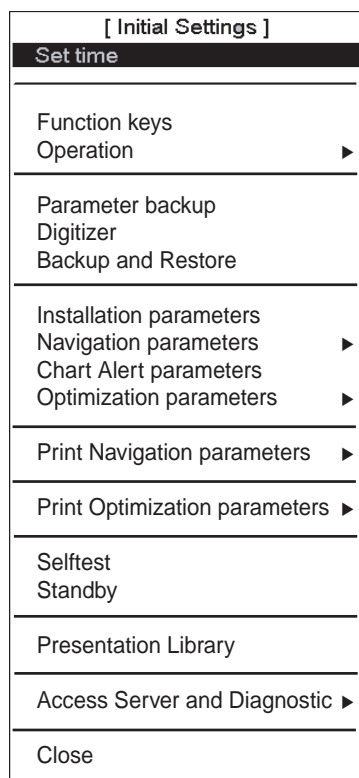
The procedure below shows you how to change the presentation mode from NorthUp TM to CourseUp RM.

1. Put the cursor on the text at the location shown by "1". in the figure above, and the color of the text changes from current color to gray.
2. Use the scrollwheel to scroll options until Course Up RM appears. As you scroll, the color of the text changes to purple or blue depending on the Palette in use.
3. Push the scrollwheel to confirm your selection. The text is displayed in its usual color.
4. When you move the cursor away from the text it is displayed in its usual color.

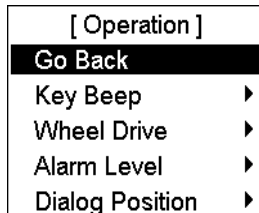
Scrollwheel incrementing direction

The scrollwheel incrementing direction can be selected to normal (forward) or reverse.

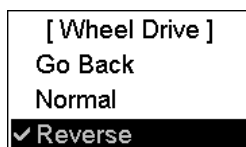
1. Open the Initial Settings menu.



2. Select Operation from the menu.



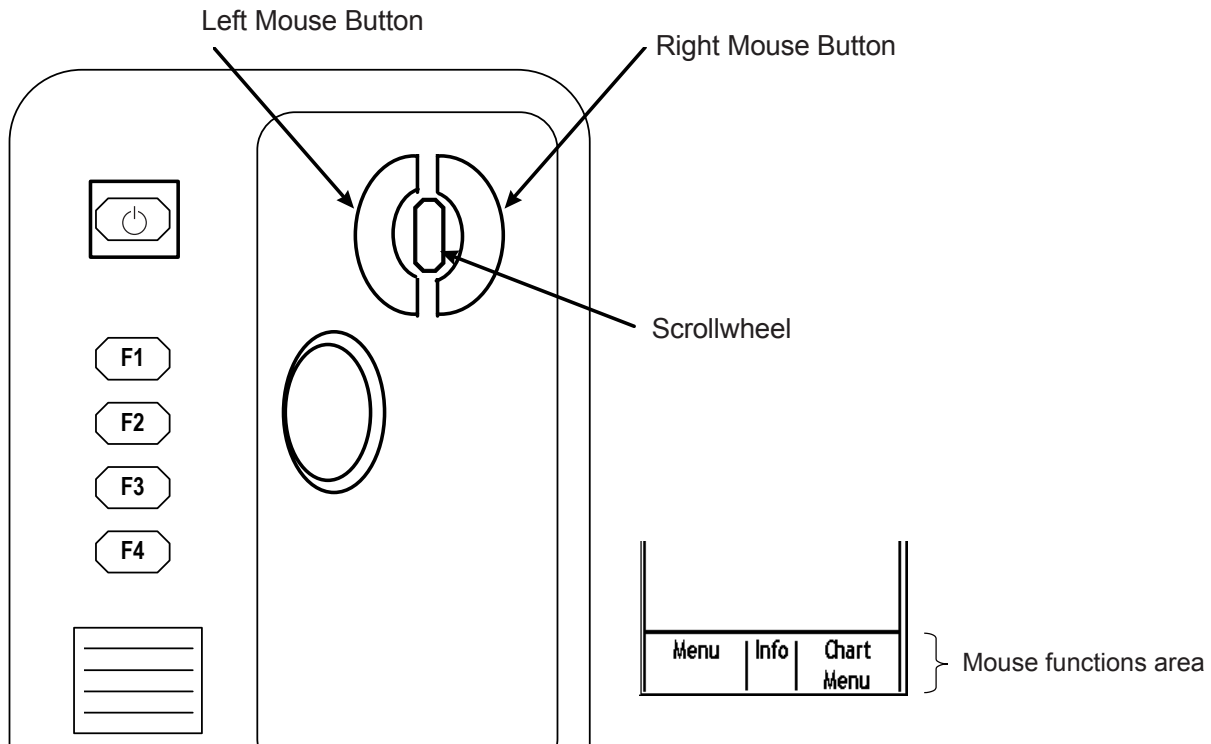
3. Spin the scrollwheel to select Wheel Drive then push the scrollwheel.



4. Spin the scrollwheel to select Normal or Reverse then push the scrollwheel.

4.5.6 How to call menus and functions by the mouse buttons

The mouse buttons can be used to call menus or functions on the display. At the lower right corner of the display the mouse functions area displays available function or menu name, as shown in the figure below. Spin the scrollwheel to select menu or function desired then push the left mouse button, scrollwheel or right mouse button as appropriate to access the menu or function desired. Available menus and functions depend on cursor location. (For more information, see section 3.3 "User Interface".)



LEFT MOUSE BUTTON

- Menu
- Range-
- TM/CU Reset
- Event
- Set Chart Center
- Show Value
- Symbol Display
- Chart Display

SCROLLWHEEL

- Info
- Info
- Info
- Info
- Info
- Info
- Info
- Info

RIGHT MOUSE BUTTON

- Chart Menu
- Range+
- ShipOffcenter
- MOB
- Activate Scroll
- NAV Marks
- Standard Display

Using the functions shown in the figure above as an example, the available functions with the mouse are as follows:

- "Menu" by pushing left mouse button
- "Info" by pushing scrollwheel
- "Chart Menu" by pushing right mouse button

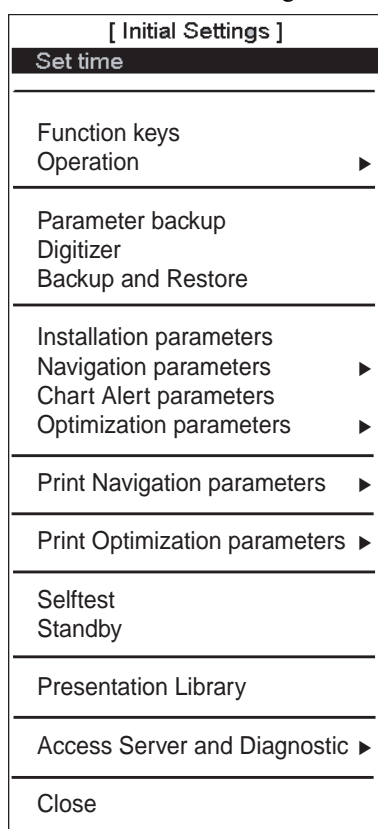
5. Standby Mode

5.1 How to Switch Standby Mode ON and OFF

The standby mode deactivates the audio alarms from the ECDIS. Use it while in harbour or other similar situation where use of the ECDIS is not required.

When you switch the Standby mode to ON, Human Interface, ARCS and S57 drawing processes are automatically restarted.

1. Spin the scrollwheel to show Menu/Info/Chart Menu in the mouse functions area then push the scrollwheel.
2. Spin the scrollwheel to select Initial Settings then push the scrollwheel.
3. Put the cursor on the triangle inside the Initial Settings dialog box, and the menu shown below appears.



4. Select Standby then push the scrollwheel.
5. The following window appears at the top of the ECDIS display to indicate that audio alarms are switched off.



To switch the Standby mode to OFF, that is, return to normal operation, select "BACK TO NORMAL MODE" with the cursor then push the left mouse button.

5. Standby Mode

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6. Set up Before Departure

6.1 How to Update Chart, Notes, User Chart, Chart Alerts

How to update chart material

Update your ARCS and S57 chart material before embarking on a new voyage. See Chapter 9 "Raster Chart Material" for ARCS charts and section 8.2 for S57 charts.

Display and approve dates for S57 charts and manual updates

Note: It is very important that you set the Display and Approve dates for S57 charts as the current date.

There may be features that require chart viewing dates or seasonal dates in S57 charts. Accordingly, if you have not set the Display and Approve dates as the current date there is a possibility that you may get a wrong presentation or some feature may be absent. See section 8.11 "Chart Viewing Dates and Seasonal Features of the Vector Chart" for the procedure.

How to create or update user chart

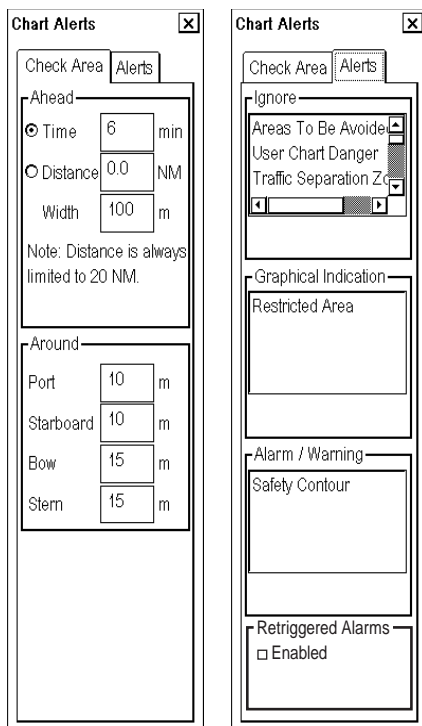
If necessary, create a new user chart or modify an existing one. See Chapter 15 "User Chart Control".

How to create or update Notes

If necessary, create a new Notes or modify an existing one. See Chapter 16 "Notes".

Chart alert calculation

Set chart alert areas suitable for your coming voyage. See Chapter 11 "Chart Alerts".



6.2 How to Create, Update a Route

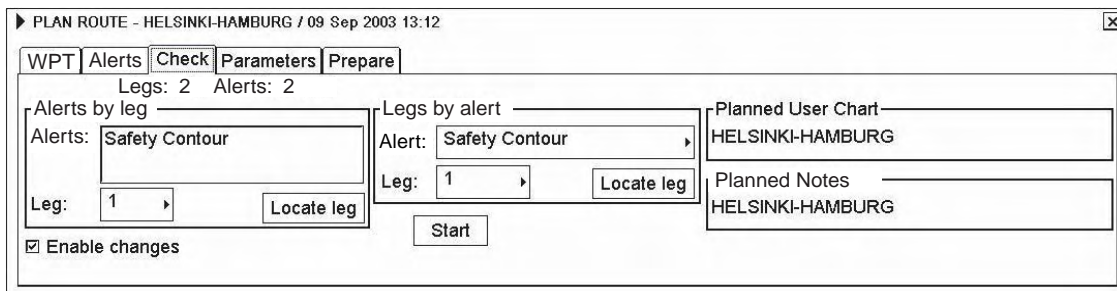
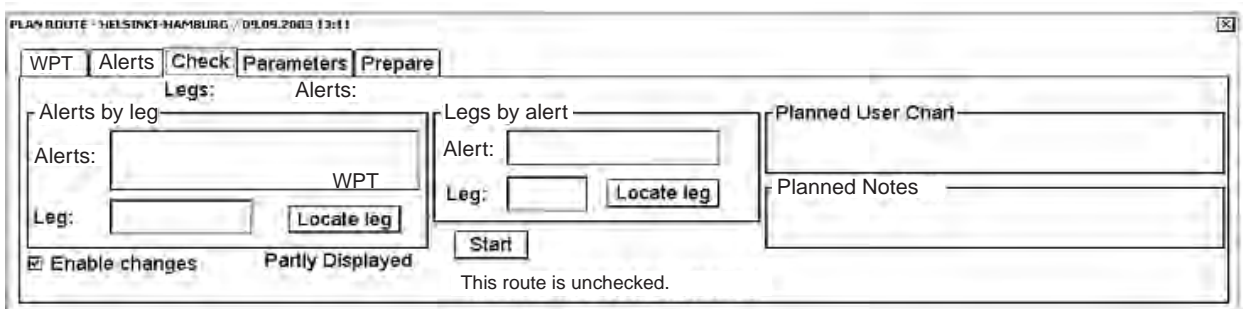
Create a new route or modify an existing one. See Chapter 13 "Route Planning".

6.2.1 How to check your route against chart alerts

Before you sail your route, you should always check your route against chart alerts. This is important because your S57 charts and manual updates may contain chart viewing dates information. You can check chart alerts from the Check page on the Plan Route dialog box. You can access this dialog box by clicking Route in the status bar, clicking the **Plan** button (to show the Plan Route dialog box) then clicking the Check tab.

The following information is stored with the route during route planning:

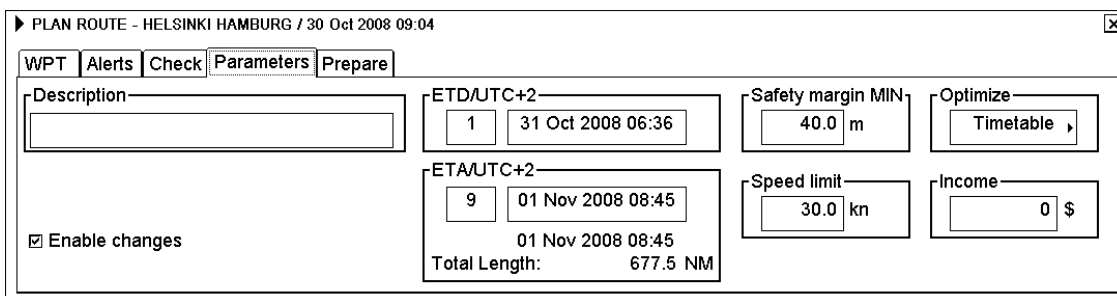
- Conditions for chart alerts during route monitoring, which include safety contour and other chart alerts.
- Name of the user chart to use during route monitoring together with the planned route.
- Name of the Notes to use during route monitoring together with the planned route.



To store selections on the Alerts page, click the **Start** button. Also, the name of the user chart and the name of Notes, which were selected during planning, are stored in routes.

6.2.2 How to recalculate timetable and ETA values

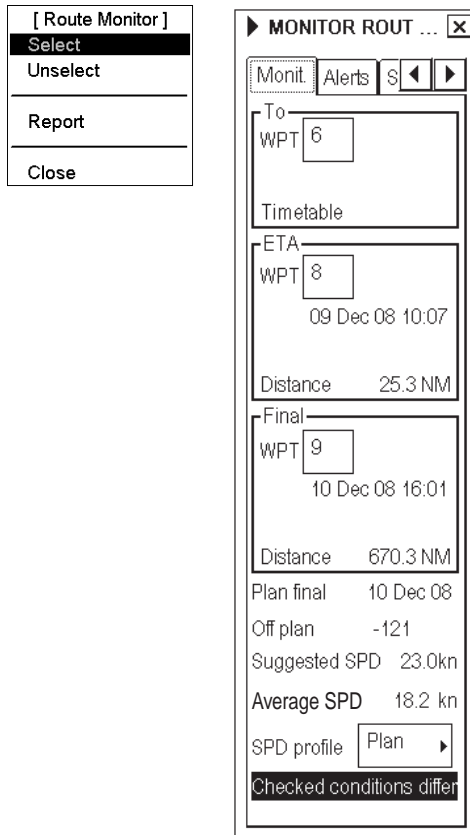
Timetable and ETA values can be recalculated from the Parameters page in the Plan Route dialog box. Minimally, set ETD to equal departure time, and perform desired optimization.



After checking the chart alerts and setting the ETD, cancel selection of the planned route in order to enable the selection of it as the route to be monitored. You can do this with "Unselect" in the Plan Route menu, or "Exchange with Monitor" on the same sub menu to select it directly as monitored route.

6.3 How to Check and Prepare Route to Monitor

Select a route for the next voyage: select Route from the menu then click the **Monitor** button. See section 14.2 "How to Select Route to Monitor".



If the text "Checked conditions differ" appears in the dialog box, this means that conditions selected during route planning were different than those selected for use during route monitoring. See section 6.3.3 "How to confirm checked conditions of the route plan" and section 6.3.4 "Planned user chart".

6.3.1 How to select To WPT

The system selects a To WPT automatically. Check that it is the correct one. Note that waypoint number 1 is not accepted. Use the Monitor Route dialog box to select a waypoint.

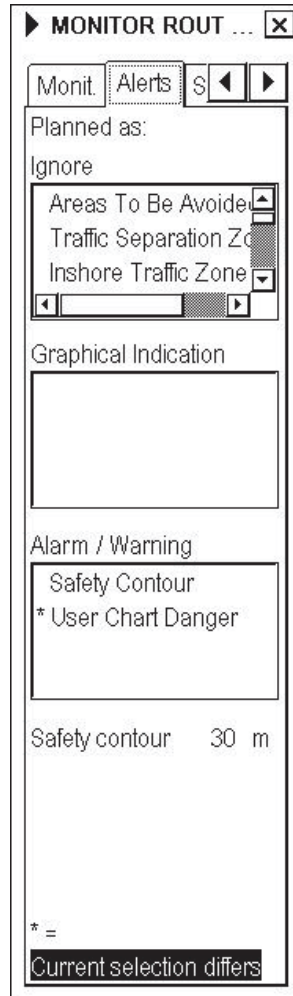
6.3.2 How to select final waypoint

This selection is used ONLY when the last waypoint should be different than the one defined last in your route. If necessary, use the Monitor Route dialog box to select the final waypoint.

6.3.3 How to confirm checked conditions of the route plan

You can check on the Alerts page if checked conditions are used with the route in route monitoring.

If the text "Current selection differs" is displayed, use Initial Settings>Chart alert parameters to make "Chart alerts" selections. Safety contours may be changed with the "Safety contour" field in the Display Settings. Select used condition during monitoring the same as planned. Differences between used and planned conditions are displayed with asterisks (*).

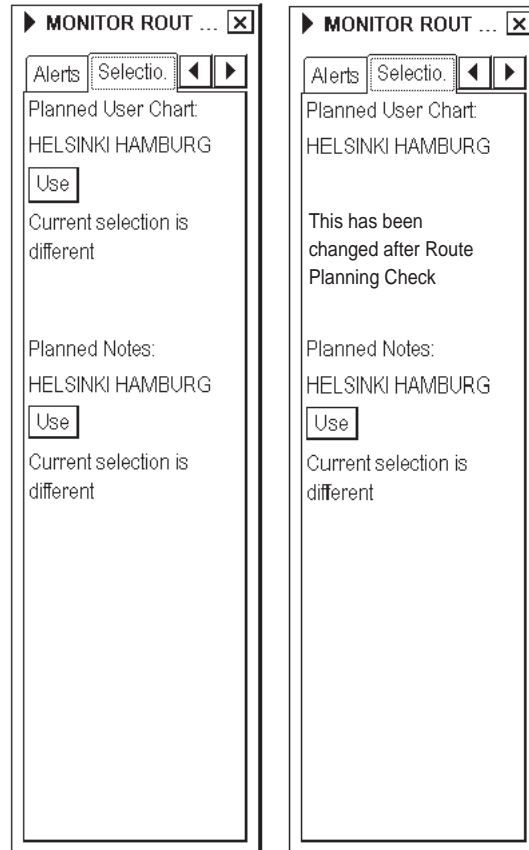


6.3.4 Planned user chart

To check if planned user chart is selected, open the Selections page in the Monitor Route dialog box to check that you have the correct user chart in the monitoring mode.

If the text "Current selection is different" is displayed, click the **Use** button to select user chart as monitoring mode.

If the text "This has been changed after Route Planning Check" is displayed, re-check your route against chart alerts.

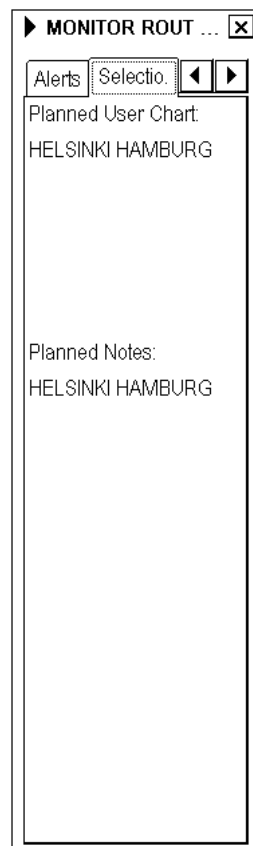


6.3.5 Planned Notes

To check if planned Notes is selected, open the Selections page in the Monitor Route dialog box to check that you have correct Notes in the monitoring mode.

If the text "Current selection is different" is displayed, click the **Use** button to select Notes as monitoring mode.

The text "This has been changed after Route Planning Check" informs you that Notes has been modified after route planning check.



6.4 Configuration of Navigation Sensors

The operator can select navigation sensors for use in navigation and view their current values. There are "pages" for speed and course and position. The figure below shows the SPD/CRS page.

The presence or absence of a checkmark in a checkbox shows whether the sensor is used for integrated navigation or not. If there is no value shown for a sensor, this means that the sensor is not valid. Note that the content of these pages depends on the sensors that are in use on the ship.

To display the Sensors dialog box, put the cursor on the position indication in the information area then right-click.

6.4.1 How to verify source of navigation sensors

In a multiple workstation environment, verify that the sensor sources indicated are the intended ones. This can be done on the Sensors dialog box.

SPEED settings (SPD/CRS page)

Select both Log and Dual log, if they are available, or select the one that is available, on the SPD/CRS (Speed/Course) page.

Note that manual speed should only be used in an emergency, when no other speed reference is available. Remember that position sensors are also available as speed sources. If neither Log nor Dual log is available, you can use a radar as the source for speed and course.

GYRO settings (SPD/CRS page)

Select Gyro1 or Gyro2 on the SPD/CRS page. In the typical installation Gyro1 is connected to a traditional gyrocompass, while Gyro2 receives gyro value from either an autopilot or a DGPS sensor.

Manual heading should only be used in an emergency, when no other heading source is available.

A rate gyro is always automatically selected.

Position sensors (POSN page)

On the POSN page of the Sensors dialog box, the data field of a position sensor contains a label(s) that indicates the type of the sensor. Primary-Secondary-OFF indicates sensor status and priority. (In the figure at right the primary sensor is DGPS, FURUNO.) Position in local datum, speed and course are also shown. If a differential signal is in use with a DGPS position the text "Diff" appears.

Position sensors have priority, indicated by "Primary" and "Secondary". Only one sensor can be primary while the others can be secondary or off position. After a sensor is turned off, its status is changed to secondary state. When a position sensor state is changed to primary and another sensor was primary, the sensor formerly primary becomes secondary.

SENSORS	
POSN	Others
<input type="checkbox"/> Chart align	<input checked="" type="checkbox"/> Enable
0.0 °	0.0 NM
DR	34°36.493'N
	134°55.732'E
<input type="checkbox"/>	
Kalman filter	Off
Datum	34°36.493'N
256.1 °	134°55.742'E
19.1 kn	
DGPS1	Primary
	Diff
256.1 °	34°36.495'N
19.1 kn	134°55.744'E

Select the "Primary" navigation sensor as the sensor that is considered to be most accurate and reliable. Set all other navigation sensors as "Secondary".

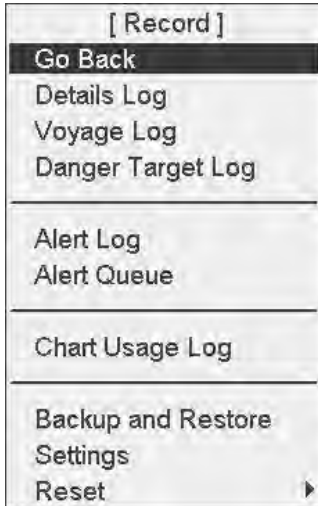
Kalman filter (POSN page)

The Kalman filter is an automatic process that calculates the most probable position based on position information from all position sensors. The filter uses in its process all sensors that are not selected to OFF. See section 19.8 "Filter Operation".

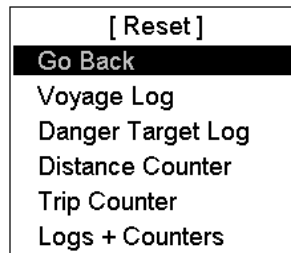
Alignment (POSN page)

The position alignment is a correction given by the chart align function. It is used to move the ship to the "correct" position. Normally turn this feature off in the start-up procedure. See section 19.9 "Position Alignment".

6.5 How to Reset Distance and Trip Counters



Record menu



Reset menu

To reset the distance and trip counters, do the following:

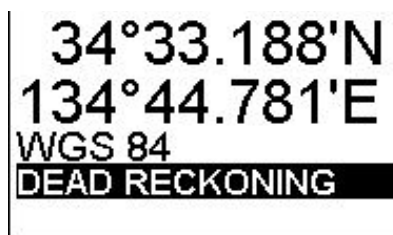
1. Spin the scrollwheel to show Menu/Info/Chart Menu in the mouse functions area then push the left mouse button.
2. Select Record then push the scrollwheel.
3. Select Reset then push the scrollwheel.
4. Select Distance Counter or Trip Counter as appropriate then push the scrollwheel.
Distance counter: Reset both Distance and Trip counters.
Trip counter: Reset Trip counter.
5. You are asked if you are sure to reset the selected counter. Click the **OK** button to reset.

6.6 How to Verify Datum

Datum is used to select between different models of the earth. It is essential that you use datum in a consistent way.

If you use paper charts together with electronic chart material, it is recommended that you use the same datum as your current paper chart to avoid misalignment between your electronic chart system and points taken or plotted on your current paper chart.

Once you have selected a datum, all numerical latitude-longitude position values are presented in your selected datum.



To change the datum:

1. Select the datum indication in the top box in the information area.
2. Spin the scrollwheel to select appropriate datum, the one that matches your paper charts, then push the scrollwheel.

Note: ARCS raster charts contain some rasterized position information, like scale bars on PA paper charts, which is true only if you have selected native datum of that ARCS chart.

7. Conditions Required to Replace Paper Charts

7.1 Introduction

Carriage requirements for adequate and up-to-date charts for a voyage can be found in SOLAS Chapter V/20 of 1974. In resolution A.817(19), IMO has specified how those requirements can be fulfilled with a device called ECDIS. In resolution A.817(19), Appendix 7 (RCDS 1998), IMO has specified how requirements of the V/20 of 1974 can be fulfilled when an ECDIS uses the RCDS (Raster Chart Display System) mode. The traditional alternative way to fulfil requirements of the SOLAS Chapter V/20 has been the use of paper charts.

If you use the type-approved version of this ECDIS (BSH type approval certificate number 6579 / 080 138 / 99) you may replace paper charts with electronic ones. If the following conditions are met, then your system fulfils IMO A.817(19).

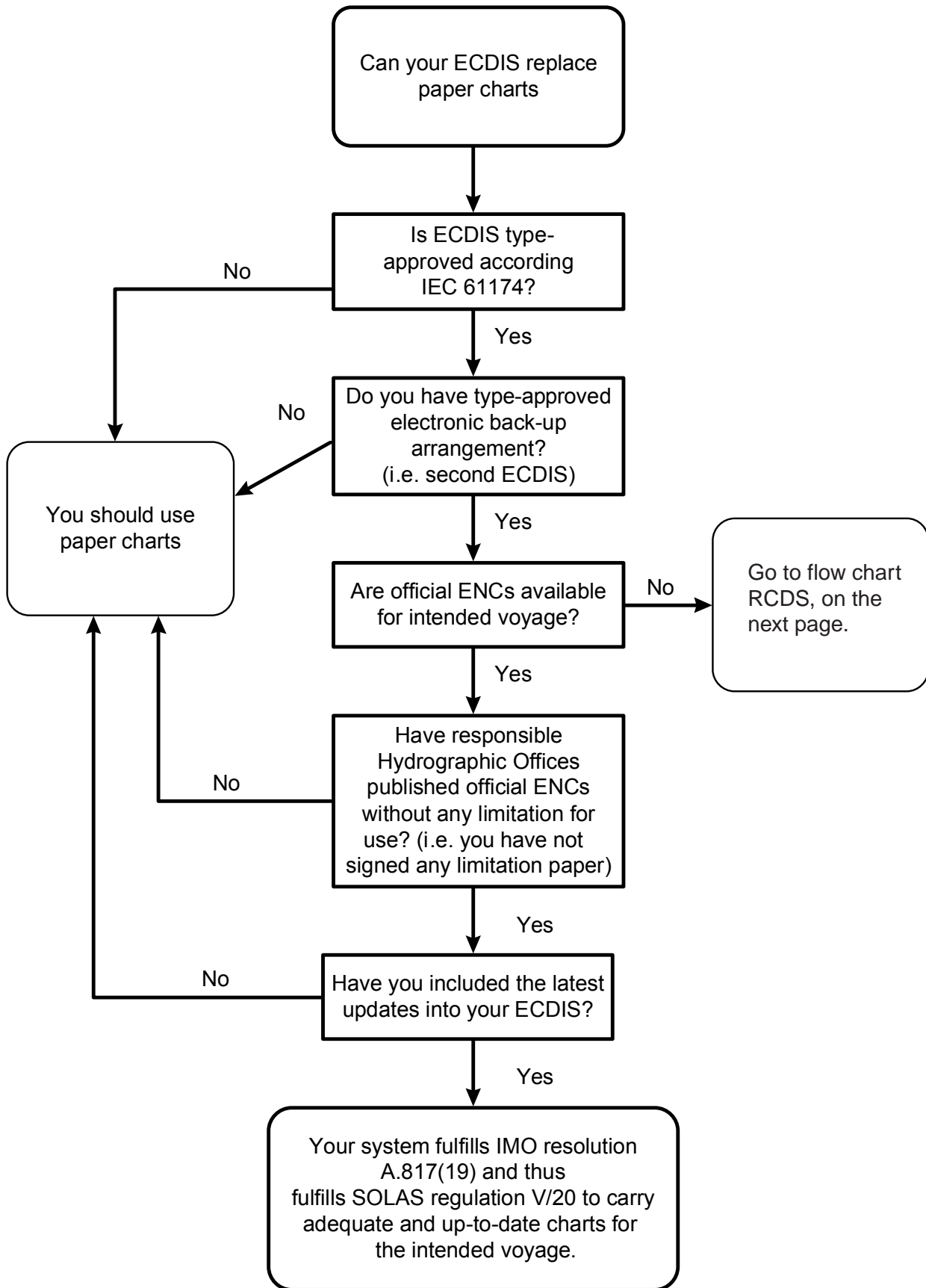
- Own ship area is covered with updated ENC charts.
- Your selected display area is covered with updated ENC charts.
- You have a backup system that fulfils IMO A.817 requirements. One example is a second ECDIS.

Note that ENC producers provide their conditions of use in the Publisher Notes, which you should always read when loading new material into the ECDIS. See section 8.3.2 "How to load S57 charts from a CD-ROM,, USB memory or LAN".

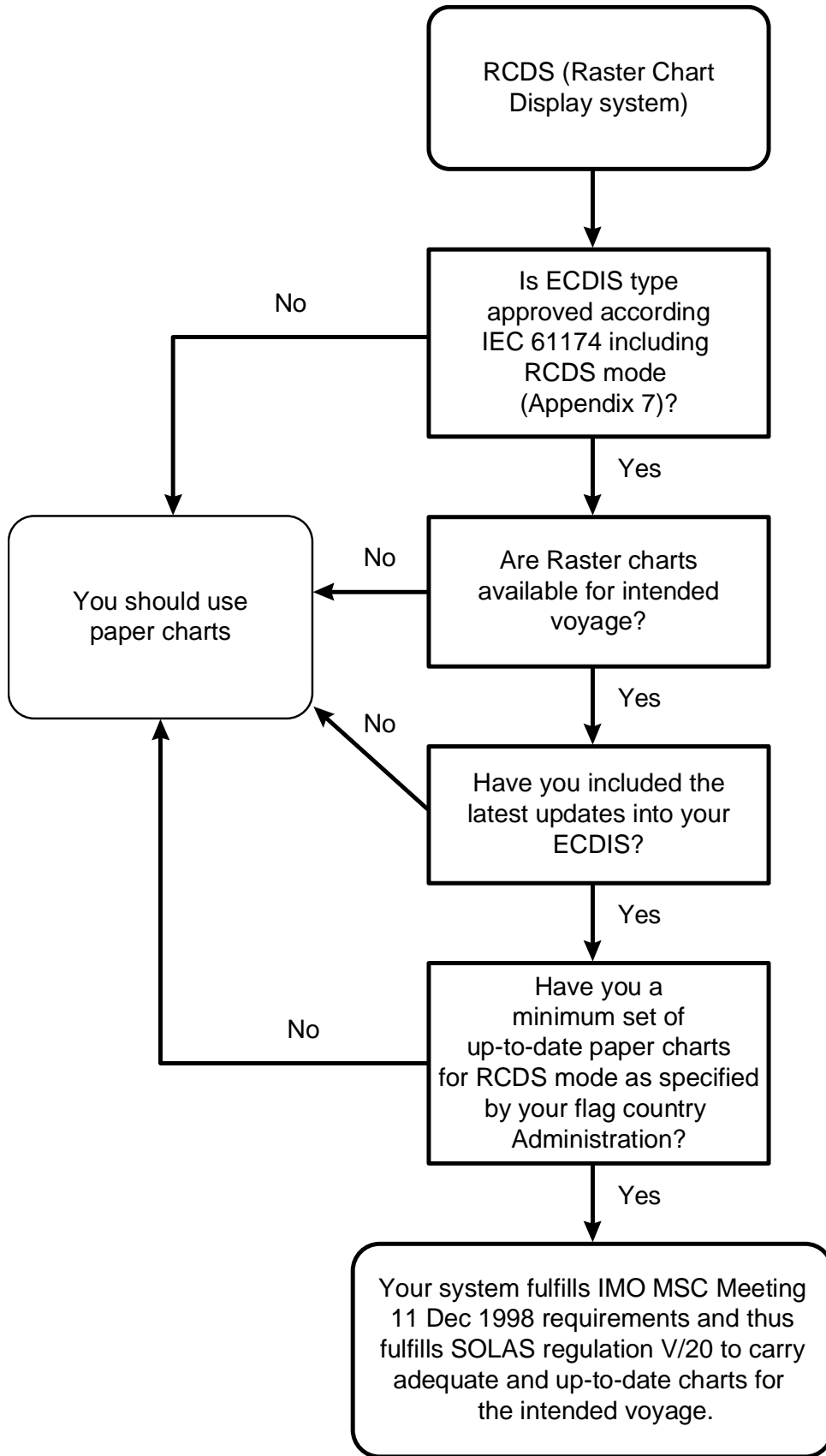
In areas where ENCs are not available, raster chart material called ARCS (from UK HO) can be used in the ARCS mode of this ECDIS, provided the following additional conditions are met:

- Own ship area is covered with updated ARCS charts.
- Your selected display area is covered with up-to-date ARCS charts.
- Appropriate folio of up-to-date paper charts is carried onboard and available, if required by your flag country administration.

7. Conditions Required to Replace Paper Charts



Data flow chart for replacing paper chart with ENC chart material



Data flow chart for replacing paper chart with Raster chart material

7.2 How to Detect ENC Coverage in S57 Chart Display

The electronic chart system can display more than one S57 chart cell at a time. This feature is called multi-cell display. If one S57 chart cell does not cover the whole display, the system opens more S57 chart cells for display, if appropriate cells for the displayed area are available. The status bar shows information about S57 chart cells displayed on the electronic chart display area. When automatic TM reset is active, the information is displayed with reference to your ship's position. If TM reset is OFF, the information is displayed with reference to current cursor position.

The possible indications are as follows:

RCDS Mode	
HDG	086.2 °
SPD (WT)	5.4 kn
SB (POSN)	0.2 kn
COG (POSN)	088.4 °
SOG (POSN)	5.2 kn
34°42.071'N	
135°17.566'E	
WGS 84	
GPS	

"RCDS mode" is shown in red text at the upper right-hand corner. This means that raster chart material is displayed on the electronic chart display area.

No ENC available	
HDG	086.4 °
SPD (WT)	5.4 kn
SB (POSN)	0.2 kn
COG (POSN)	088.7 °
SOG (POSN)	5.3 kn
34°42.070'N	
135°17.592'E	
WGS 84	
GPS	

"No ENC available" is shown in red text at the upper right-hand corner. This means that the S57 chart shown is not official ENC material. In this case you need to have an updated paper chart for navigation.

No indication	
HDG	000.0 °
SPD (WT)	20.6 kn
SB (POSN)	-18.6 kn
COG (POSN)	258.3 °
SOG (POSN)	19.0 kn
34°37.577'N	
134°59.679'E	
WGS 84	
DGPS	

"No indication" is shown at the upper right-hand corner: This means the S57 chart shown is official ENC material.

8. Vector Chart Material

8.1 Introduction

Theoretically a chart can be coded for use on a computer as raster or vector chart. Vector-coded charts are coded using a variety of techniques. One technique is called S57ed3 and it has been selected by IMO as the only alternative for SOLAS compliant electronic charts. An S57ed3-coded chart published by a government-authorised Hydrographic Office is called "ENC". An S57ed3-coded chart published by a private firm is called "NON ENC". Another vector coding technique is known as CM-93/2, and it is employed by the private firm C-MAP. All CM-93/2 charts are NON ENC. For further details about C-MAP charts, see Appendices 4 and 5. You can read more about ENC and related legal issues in Chapter 7. Hereafter, all references to vector chart material are referred to as "S57 charts" regardless of their source.

Sometimes you may wish to manually add Notices to Mariners or Navtex warnings into your S57 charts. This is called "manual updates". Manual updates are valid for both S57 and ARCS charts so you need to define them only once. Also, manual updates are valid for all scales so that you don't need to repeat them for charts published in different scales from the same area. See Chapter 10 "Manual Updates".

8.2 S57 Charts

8.2.1 Introduction

The electronic chart system is compatible with official IHO S57 release 3 chart material produced by Hydrographic Offices (HO). This material, when issued by a government-authorised Hydrographic Office, is called ENC (electronic navigational chart). Use, presentation and display of S57 charts are based on International Maritime Organisation (IMO), International Hydrographic Organisation (IHO) and International Electrotechnical Commission (IEC) regulations and rules (S52ed3.1). When this ECS (Electronic Charts System) uses an ENC chart (S57 release 3 chart produced by a government-authorised Hydrographic Office), it is an ECDIS as defined by IMO, IHO and IEC.

Some ENCs are encrypted to prevent unauthorised use. In this case, the user needs a permit to view the ENC. This permit could be entered manually from the Control Unit, loaded from a floppy disk, USB memory or loaded through telecommunications from an RENC.

Before any ENC can be used in the ECDIS, it is loaded into your hard disk and converted into the system's own internal format (SENC). Some parts of the charts may be date dependent, i.e., they are visible after a certain date or they are visible only for a limited period, etc. In the electronic chart system, you control all date-dependent objects with Display Until and Approve Until dates. In the paper chart world, the Preliminary and Temporary Notices to Mariners represent the date dependency described above for S57 charts.

An important part of ENCs are the updates. Hydrographic Offices can issue two kinds of updates:

- Incremental updates, which are small additions to original Base cells.
- Reissues and new editions, which are complete replacements of previous Base cells and their updates.

All updates are date stamped and they may also contain date-dependent parts. You control usage of updates in the electronic chart system from Display Until and Approve Until dates. Using Display Until and Approve Until dates, you can view your charts correctly drawn on any date in the past or in the future.

Chart material is stored in media such as CD-ROMs and floppies, electronically from LAN (Local Area Network) in which it could have arrived from RENCs, CD-ROMs or floppies. Such material can contain only basic cells, cells and updates or only updates. The electronic chart system contains as standard the software required to access CD-ROMs, floppies and LAN.

8. Vector Chart Material

Each S57 chart may contain additional links to textual descriptions or pictures, besides the chart itself. Typically additional textual descriptions and pictures contain important sailing directions, tidal tables and other traditional paper chart features that do not have any other method to be included into the S57 chart. This ECDIS copies these textual descriptions and pictures into its hard disk so the user may cursor-pick them for viewing purposes.

For how to interpret the S57 ENC chart display, see Appendix 2 "How to Interpret S57 Charts".

Definitions of terms

<i>Cell</i>	A cell is a geographical area containing ENC data. Each cell has a separate unique name. Hydrographic Offices divide their responsibility area by the cells that they publish.
<i>S57 chart</i>	A database, standardized as to content, structure and format, is issued for use with ECDIS without any authority of government-authorized Hydrographic Office. The difference of S57 chart and ENC is that non-ENC charts require complete up-to-date paper charts to be used as the primary aid to navigation.
<i>ENC</i>	A database, standardized as to content, structure and format, is issued for use with ECDIS on the authority of government-authorized Hydrographic Offices. The ENC contains all the chart information necessary for safe navigation and may contain supplementary information in addition to that contained in the paper chart (e.g., sailing directions) that may be considered necessary for safe navigation. The name of the coding standard for ENC is S57ed3.
<i>SENC</i>	A database resulting from the transformation of the ENC by ECDIS for appropriate use, updates to the ENC by appropriate means, and other data added by the mariner. It is this database that is actually accessed by the ECDIS for display and other navigational functions, and is the equivalent to an up-to-date paper chart. The SENC may also contain information from other sources.
<i>RENC</i>	A service provider offering ENC delivery and update service as defined in IHO standard S52e3. Often an RENC provides both CD-ROM and telecommunications-based service to ECDIS users. One example of an RENC is the RENC in Stavanger, Norway, operating under the marketing name PRIMAR.

8.2.2 Chart legend for S57 chart

The chart legend, which provides various data about the chart currently displayed, can be toggled on and off by placing the cursor in the sidebar, clicking the right mouse button, choosing Chart Legend from the menu then pushing the scrollwheel.

This system is capable of showing more than one S57 chart at a time. This feature is called the multi-chart display. If one S57 chart does not cover the whole display, the system will open more S57 chart cells for display, if appropriate cells for the displayed area are available. The chart legend shows information about S57 charts displayed on the electronic chart display area. The information is displayed with reference to own ship position if automatic TM reset is active, or with reference to the current position of the cursor if automatic TM Reset is OFF.

Cell name	FI4EIIQR
Navigational purpose	Approach
Issue date	20010201
Edition number	1
Last displayed update	019
Update issue date	20010724
Last update appl. date	20010201
Projection	Mercator
Horizontal datum	WGS 84
Vertical datum	
Sounding datum	Approximate mean sea level
	Mean lower low water springs
Quality of data	Zone of confidence A1
Magnetic var.	
Depth	metres
Height	metres

Cell name: Name of chart.

Navigational purpose: S57 charts are compiled for a variety of navigational purposes. The navigational purpose, for which an individual S57 chart has been compiled by a Hydrographic Office, is indicated in this field. Alternatives are: Overview, General, Coastal, Approach, Harbour and Berthing.

Issue date: Issue date of the Base cell of the chart.

Edition number: Edition number of the chart.

Last displayed update: Number of last update, which is visible on the chart screen.

Update issue date: Issue date of last update, which is visible on the chart screen.

Last update appl. date: Date to which the last update, which is visible on the chart screen, is effective.

Projection: Projection of the chart. The projection is always Mercator.

Horizontal datum: Horizontal datum of the chart data as published by the chart producer. By definition this must be WGS 84.

Vertical datum: Vertical datum of the chart.

Sounding datum: Datum used for soundings.

Quality of data: Quantitative estimate of the accuracy of chart features, given by the chart producer.

Magnetic var.: Amount of magnetic variation. A positive value indicates a change in an easterly direction and a negative value indicates a change in a westerly direction.

Depth: Unit of measurement for depth.

Height: Unit of measurement for height above sea level (for example, clearance height).

8.2.3 Permanent warnings for S57 charts

Permanent warnings help you keep the S57 charts up-to-date and these are shown at the top left corner on the screen. Only up-to-date S57 charts can be legal replacement for paper charts. Permanent warnings appear if the system detects a condition that may cause the use of charts that are not up-to-date.

Note: The system can assist in keeping RENC-received charts up-to-date. For charts that have been loaded from sources other than an RENC, the system is unable to know the exact up-to-date situation.

For details, see section 8.11 "Chart Viewing Dates and Seasonal Features of the Vector Chart".

Permanent Warning
At least one of used charts has more than 1 week "Approved Until" and/or "Displayed Until" and current date. Use Chart Menu - Set Chart viewing dates

You have loaded updates into your hard disk, but these updates are not included in the SENC. The name of the chart appears in orange in the chart catalogue.

Permanent Warning
At least one update is loaded in haddisk, but not in SENC format. Use Chart Menu - Chart Catalogue to check charts in orange color (see Operators manual)

Perform SENC conversion for these charts. See section 8.4.6 "How to use SENC convert window to initiate SENC conversion " for the procedure.

For details, see section 8.6.9 "How to find up-to-date status of an RENC Product List".

Permanent Warning
SSE 27: At least one of used charts is not up-to-date. Get or load latest updates from your RENC service. Use Chart Menu - Set Chart viewing dates to check charts

You have loaded an update that contained cancelled information for a chart, and you have selected not to remove the cancelled chart. This permanent indication reminds you about your intended use of a cancelled chart.

Permanent Warning
At least one of used charts is canceled
Use Chart Menu - Catalogue to check charts.
Use Chart Menu - Remove to remove canceled charts.

Consider removing the chart. For information on how to remove S57 charts, see section 8.5.4 "How to remove S57 chart cells from the system".

Chart permit has been removed after chart was converted to SENC.

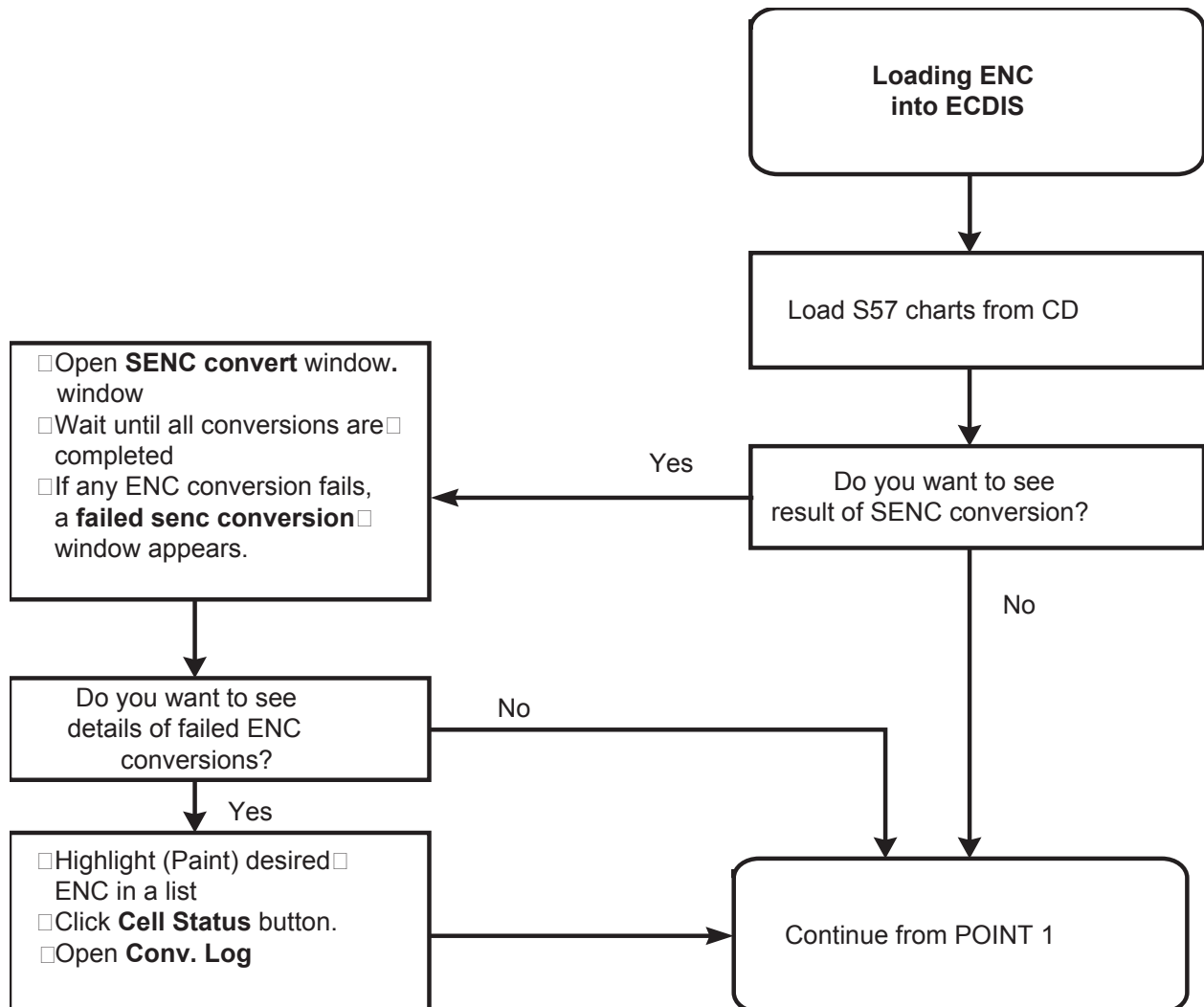
Permanent Warning
At least one of used charts may not be up-to-date because Permit has been removed since SENC conversion.
Use Chart Menu - Permits to load Permits

You have an expired permit for the chart. Remove permit or renew subscription for permit.

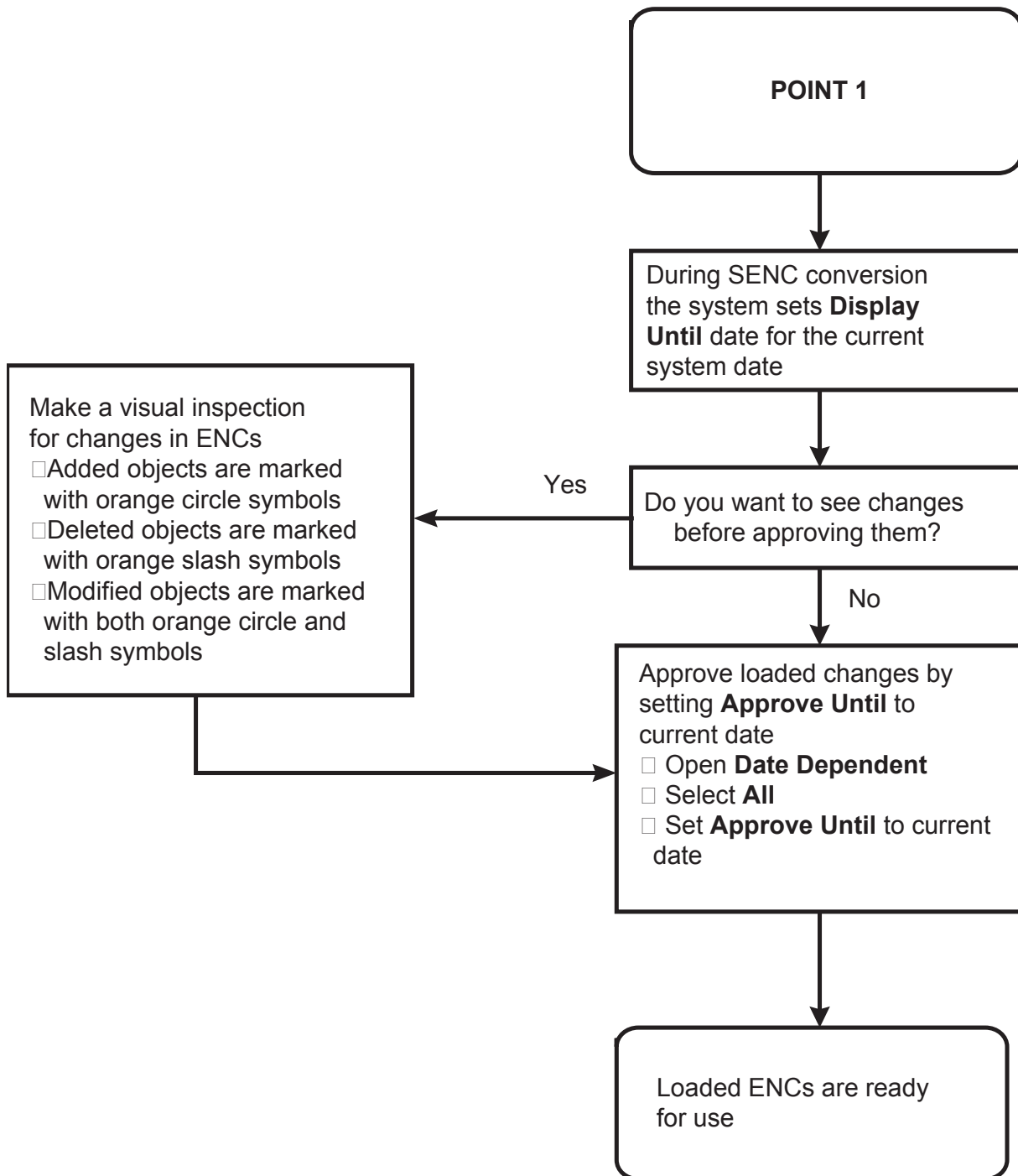
Permanent Warning
SSE 25: At least one of used charts may not be up-to-date, because Permit is expired. Consider renewing of your Permits. Use Chart Menu - Permits to check Permits

8.3 How to Load S57 Charts

8.3.1 Flow chart for loading S57 charts into ECDIS



Data flow chart, How to load S57 charts into ECDIS

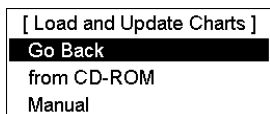
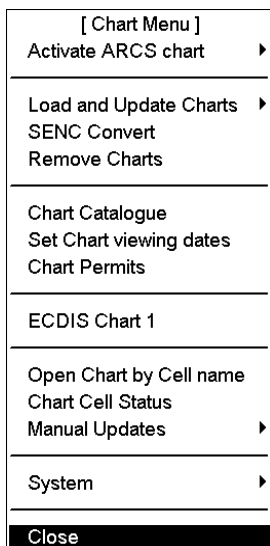


How to load S57 charts into ECDIS (continued)

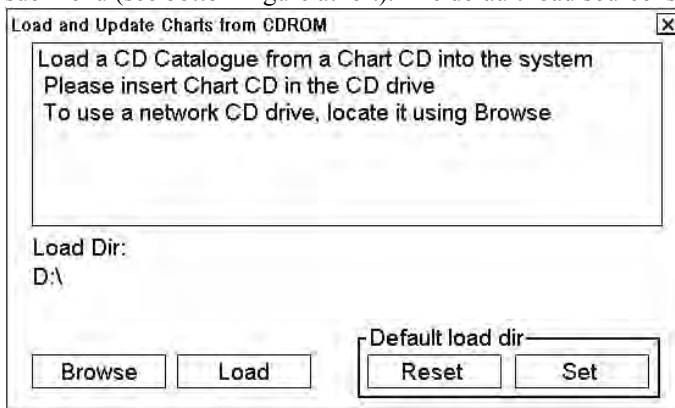
8.3.2 How to load S57 charts from a CD-ROM, floppy disk, USB memory or LAN

When you load S57 charts, by CD-ROM floppy disk, USB memory or LAN, the system first loads a CD-ROM catalogue, which stores certain information into your hard disk such as the position and edition number of cell ID. Then, the system asks which charts you want to load from the selected media. After building the CD-ROM catalogue, you can view the contents of it using the Chart Catalogue command in the Chart menu.

To load by CD-ROM catalogue, do the following:

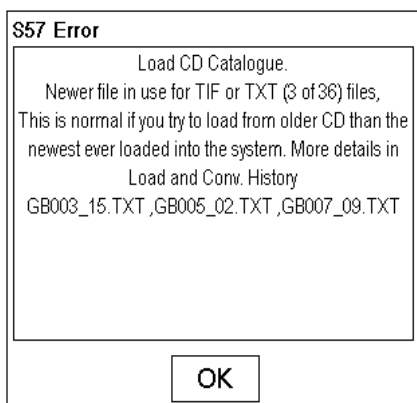


1. Insert CD-ROM or floppy disk in respective drive or connect USB memory. Spin the scrollwheel to show Menu/Info/Chart Menu in the mouse functions area then push the right mouse button.
2. Select "Load and Update Charts" from the menu and "from CD-ROM" from the sub menu (see bottom figure at left). The default load source is "from CD-ROM".



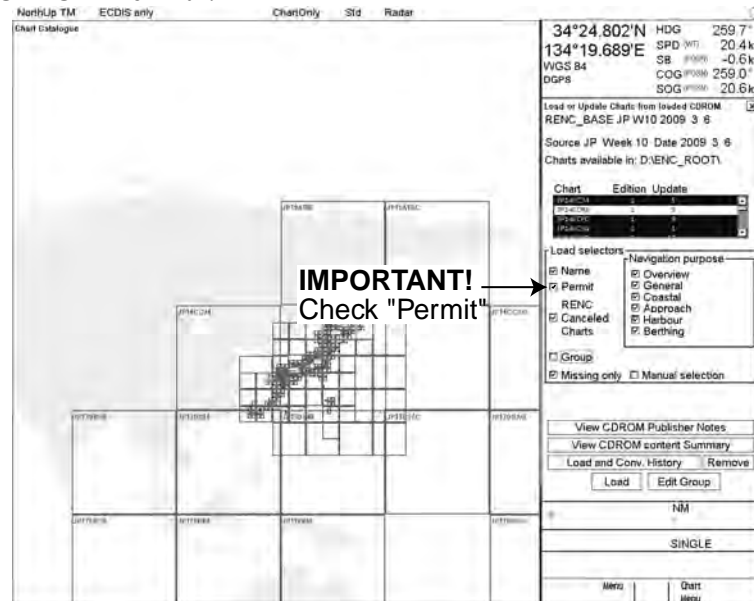
3. Click the **Load** button to load from a CD-ROM. (If you want to load from another ECDIS using LAN, you have to change Load Dir. Click the **Browse** button to select a new Load Dir.)

The ECDIS loads content summary, publisher notes and Product List from the CD-ROM then opens the Load or Update Charts from CD-ROM dialog box. The system automatically copies all text and pictures files associated with charts from the CD-ROM catalogue. The system keeps only the latest version of these. If your system already has newer text or pictures in use, you will get the notice below.



8. Vector Chart Material

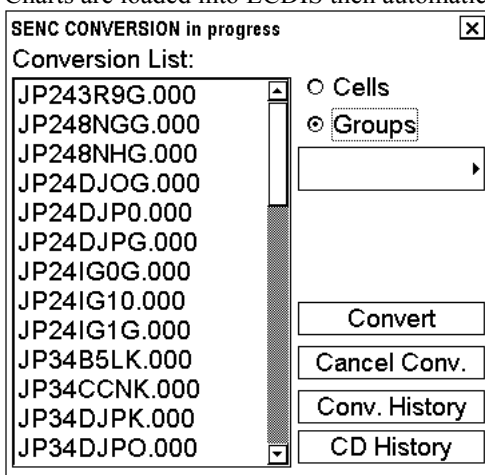
- In the Load or Update Charts from loaded CD-ROM window (see page 8-10), select the charts to load into the ECDIS. **BE SURE TO CHECK "Permit"**.



- Click the **Load** button to load charts into the ECDIS. See also "Interpretation of Load or Update Charts from loaded CD-ROM dialog box" on page 8-10.
- Before ECDIS starts loading charts (then automatically converts them into SENC format) you are asked to confirm this operation. Click the **OK** button.

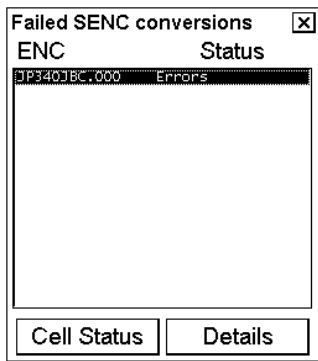


Charts are loaded into ECDIS then automatically converted to SENC format. The SENC Convert window appears.

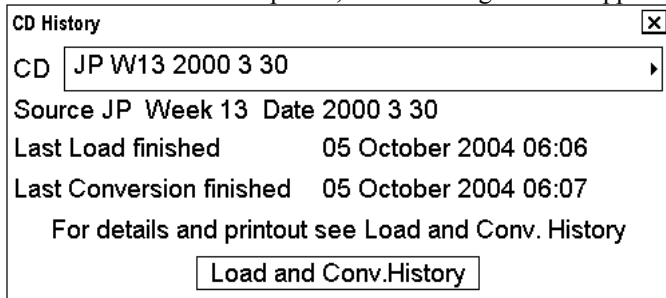


Note, that chart and/or its update(s) in the conversion list are ready for use after conversion of all charts/updates are completed.

- If an error is detected during conversion from ENC to SENC, the following window appears. To find the reason click the **Details** button.

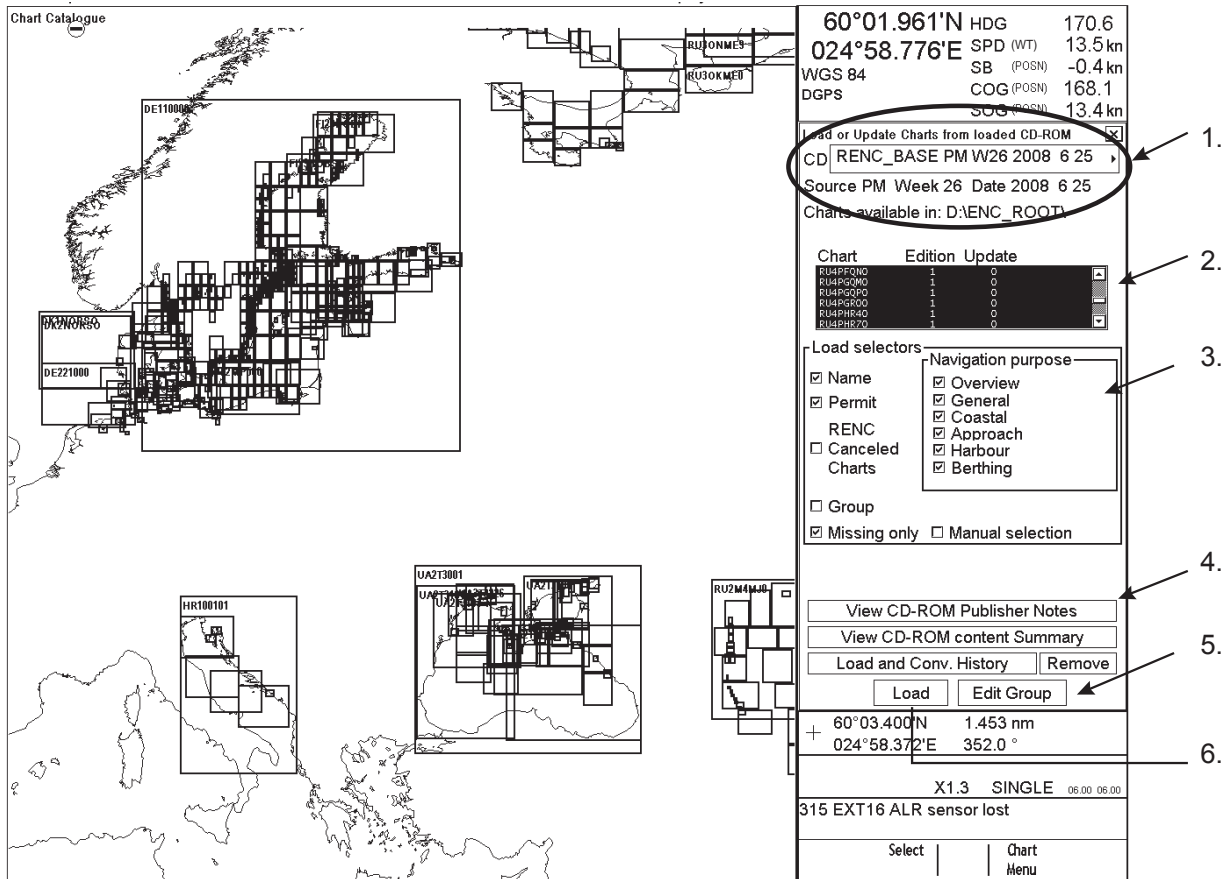


8. When conversion is completed, the following window appears.



9. Remove the CD-ROM (floppy or USB memory) and insert next CD-ROM (floppy or USB memory).
10. Do step 2 to 10 to repeat the procedure for remaining CD-ROM (floppy or USB memory).
11. After you have loaded all charts, insert "Update CD (floppy or USB memory)".
12. Do step 2 to 10 for the Update CD (floppy or USB memory).

How to interpret Load or Update Charts from loaded CD-ROM window

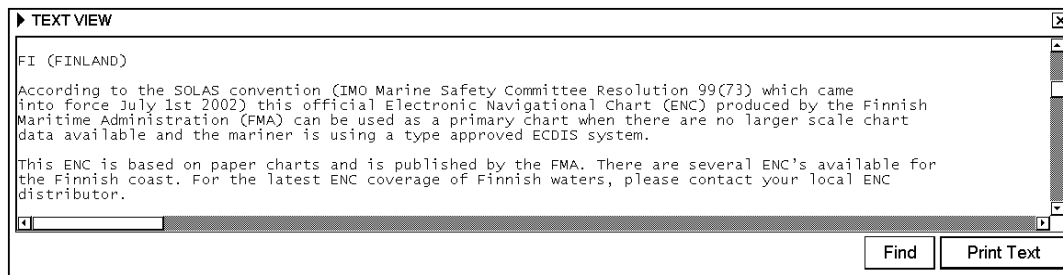


1. The source and edition date of the CD is displayed here.
2. A list of charts stored in the CD-ROM, edition number of the chart and the number of updates included in the chart.
3. In the **Load Selectors** field, you can select how to pick desired charts from the list:
 - **Name:** ECDIS will display chart names on graphical presentation if selected.
 - **Permit:** ECDIS will highlight the charts that are available in the CD-ROM and for which you have permits.
 - **RENC Canceled Charts:** ECDIS will show the charts on the display that are canceled on RENC and normally on CD-ROM.
 - **Group:** If you have predefined a group of charts, ECDIS will highlight those charts in the group that are available in the CD-ROM.
 - **Manual Selection:** You can highlight desired charts from the list.
 - **Missing only:** Loads and displays on the graphical presentation only charts and their updates that are not already loaded into the ECDIS.
4. The **View CD-ROM Publisher Notes** button is used to view important notices published by the chart producer. The **View CD-ROM content Summary** button is used to list charts available on CD-ROM. The **Load and Conv. History** button checks what is loaded and converted from the CD-ROM. The **Remove** button is used to remove the CD-ROM catalogue permanently from the ECDIS.
5. The **Edit Group** button is used to create and modify a group. See section 8.5.5 "How to group S57 chart cells".
6. The **Load** button is used to start loading charts.

Note: The system can make conversion into the SENC and set the "Display Until" date automatically. This is the recommended way. See section 8.4.2 "How to get automatic SENC conversion and display until date" for the procedure.

Publisher notes

You should read the text file associated with each catalogue. The text file typically contains **very important notices for the usage of the charts from the producing Hydrographic Office**. Click the View CD-ROM Publisher Notes button in the Load or Update Charts from loaded CD-ROM dialog box. To print a hard copy, use the **Print Text** button. Close the window by clicking the Close button (X).



Summary of contents of CD-ROM

You can view the summary of the contents of the CD-ROM. It contains information about charts you are going to load. Click the **View CD-ROM content Summary** button. You can print a hard copy with the **Print Text** button.

TEXT VIEW

Summary of CD Catalogue: RENC_BASE PM w48 2003 11 26 Source PM week 48 Date 2003 11 26

CellID	Edition	Base	First Update	Last Update
DK1MAGVA	3	0 / 2003 5 12		
DK2BORNH	9	0 / 2003 10 27		
DK2CHWGC	2	0 / 2001 8 3		
DK2CHWGG	3	0 / 2002 5 23		
DK2CHWGK	5	0 / 2002 12 20		
DK2CHWGO	3	0 / 2001 8 3		
DK2CHWGS	9	0 / 2003 6 23		
DK2CHGW	10	0 / 2003 2 24	2 / 2003 6 20	

Find Print Text

The TEXT VIEW screen shows information about the selected "CD-ROM". Each row contains:

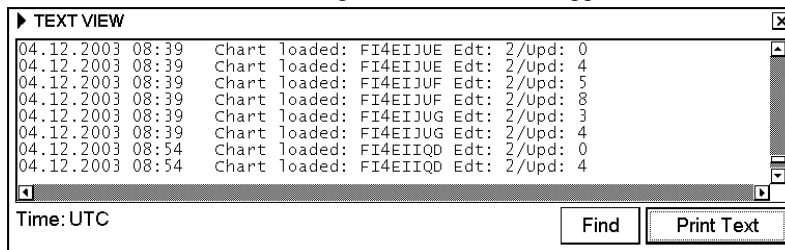
- Cell ID: Name of the chart
- Edition: Edition number of the chart
- Base: Included update number and issue date of Base cell of the chart
- First Update: Update number and issue date of the first update included
- Last Update: Update number and issue date of the last update included

8. Vector Chart Material

How to display load history of CD-ROM

You can view what is loaded from a CD-ROM using Load History, which is in the Load or update Charts from CD-ROM dialog box.

1. Show the Load or Update Charts from loaded CD-ROM dialog box. (See page 8-10.)
2. Select desired CD-ROM from the list of CD-ROMs.
3. Click the **Load and Conv. History** button.
4. A window that looks something like the one below appears.

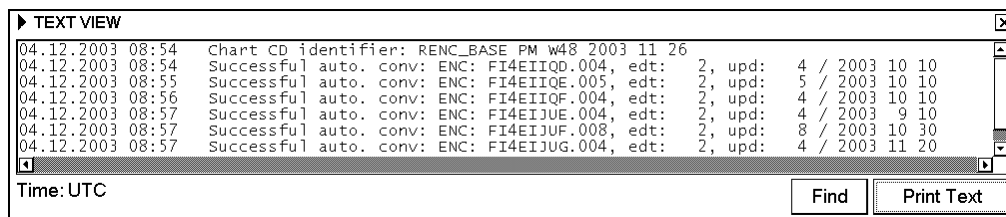


5. You can verify which charts are already loaded from the CD-ROM.

How to display conversion history of CD-ROM

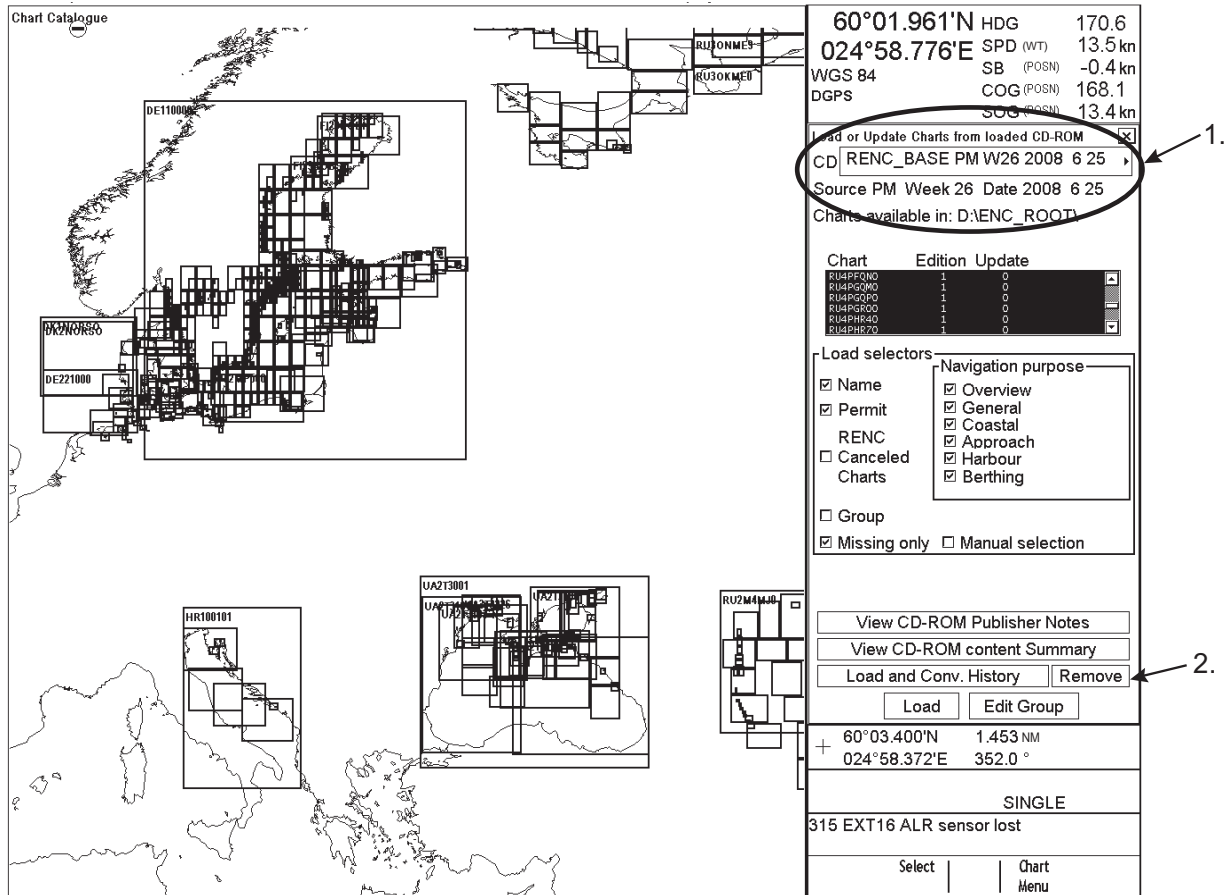
1. Show the Load or Update Charts from loaded CD-ROM dialog box. (See page 8-10.)
2. Select desired CD-ROM from the list of CD-ROMs.
3. Click the **Load and Conv. History** button.

A window that looks something like the one below appears.



You can verify which charts are already converted from the CD-ROM.

How to remove an unnecessary CD-ROM catalogue

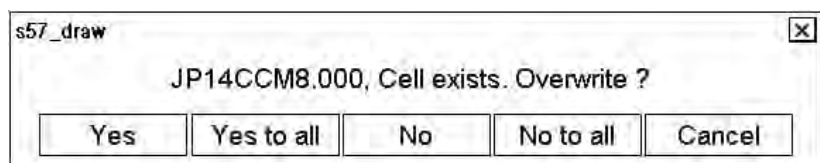


If you have unnecessary CD-ROM catalogues on your CD-ROM list, you can remove them as follows:

1. Show the Load or Update Charts from loaded CD-ROM dialog box. (See page 8-10.)
2. Select desired CD-ROM.
3. Use the **Remove** button to permanently remove selected CD-ROM catalogue from ECDIS.

Messages that control reload

If you try to load charts with the same edition already loaded into your hard disk or if you try to load the same update already loaded into your hard disk, you get the message shown right, after clicking the **Load** button.



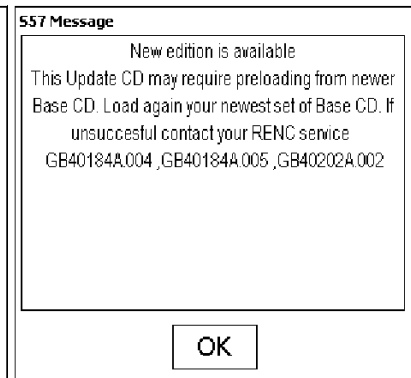
If you want to avoid the very time consuming task of reloading charts that you already have, then you should select the "No to all" option.

However if you want to reload charts, then select the "Yes to all" option.

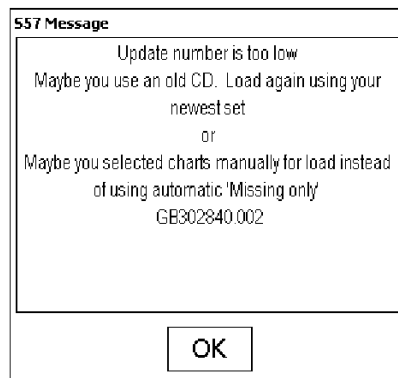
Messages that contain only notice

If you tried to load chart data that is older than you already have in your hard disk, you will get one of the following messages:

This indicates that you are using a newer edition of the chart mentioned in the box.



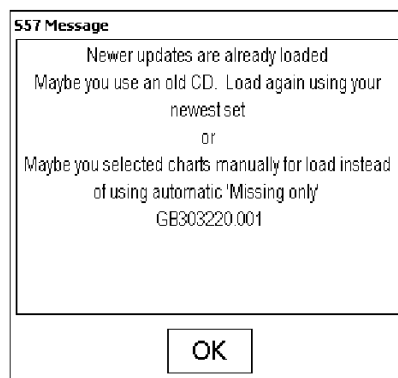
This indicates that you are using a newer reissue of the chart mentioned in the box, which includes this update.



This indicates that you are using a newer reissue of the chart mentioned in the box.



This indicates that you are using the updates mentioned in the box.



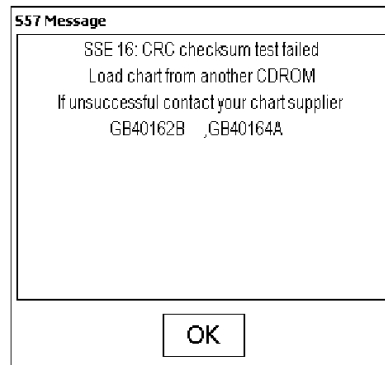
Note: You cannot replace chart data that is already in use unless you only replace the latest Base cell or update. If you want to reload older data again, you must first remove the chart from your hard disk. See section 8.5.4 "How to remove S57 chart cells from the system".

Messages that require careful attention

All messages in this section change the legal status of the charts in your system. Study these messages very carefully because you may need to use paper charts to fulfil SOLAS requirements.

Test before ENC to SENC conversion fails

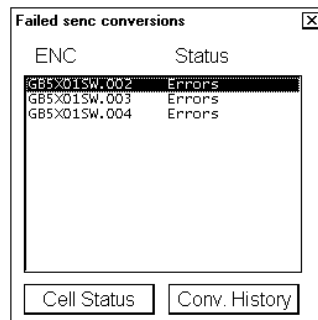
CRC checksum is tested before the SENC conversion and if it fails you get this message.



ENC to SENC conversion fails or detects errors

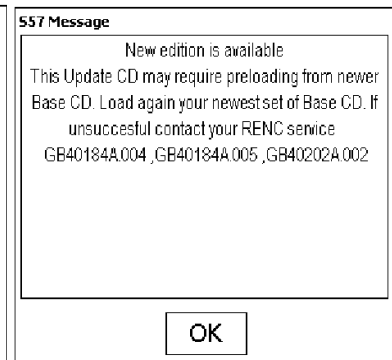
If the SENC conversions detect anything abnormal, you get this message.

See section 8.4 "S57 SENC Conversion Details".



A new edition of the chart has been published and you missed it

If you tried to load updates for a chart for which you do not have new enough Base cell or reissue in your hard disk, you get this message:

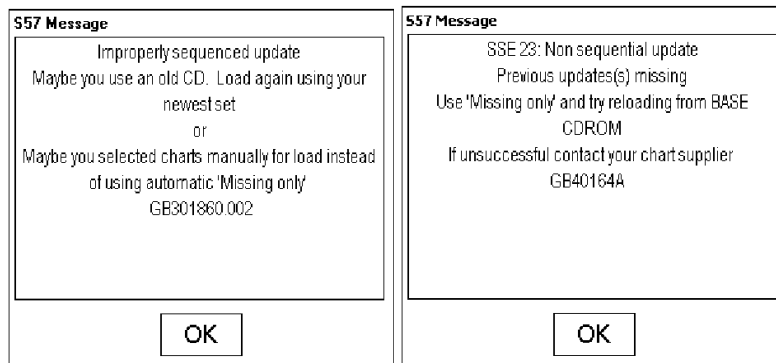


The message above clearly indicates that this chart is not up-to-date and thus it does not fulfil SOLAS requirements. Get the latest edition of the chart from the publisher immediately.

8. Vector Chart Material

You do not have all the published updates

If you tried to load updates and you missed one or more updates between updates already loaded into your hard disk and the updates that you are loading, you get this message.

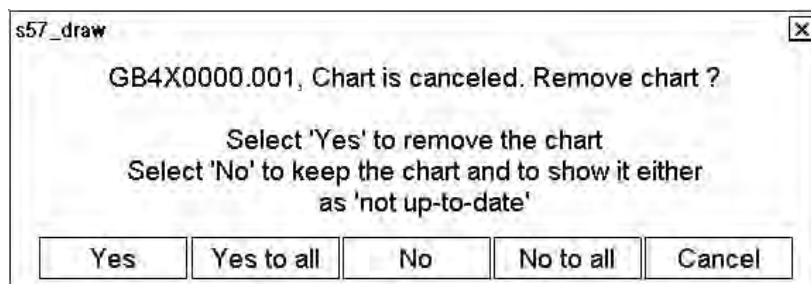


The message above indicates that you tried to load update numbers 3, 4 and 5 when at least update 2 and possibly update 1 were not available in your hard disk. Check the content of your CD-ROMs to find the missing update/updates or contact your chart supplier.

The message above clearly indicates that this chart is not up-to-date and thus it does not fulfil SOLAS requirements. Get the latest edition of the chart from the publisher immediately.

Unsafe chart has been cancelled by the publisher

If you load an update that contains instructions from the publisher to cancel the chart, you get this message.



Normally, you should accept the cancellation by clicking the **Yes** button. Then the system automatically removes the chart from the hard disk and from your chart screen.

You may elect to keep the chart although its publisher has informed you that the chart has been cancelled. A reason for keeping the chart might be that you do not have anything better available. In this case, click the **No** button. Then the system automatically removes the ENC status from the chart, because the chart does not conform to ENC standards.

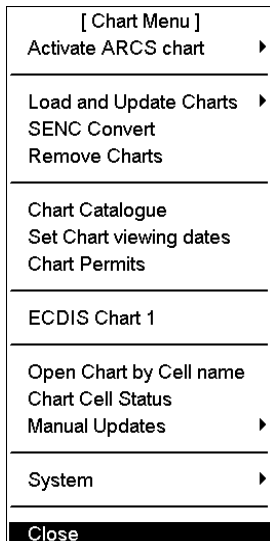
Note that the cancellation message above clearly indicates that the publisher says that this chart is unsafe for navigation and thus it does not fulfil SOLAS requirements. Get the latest edition of the chart from the publisher immediately to replace the unsafe cancelled chart.

8.3.3 How to load S57 charts that are not fully compliant with the IMO standards

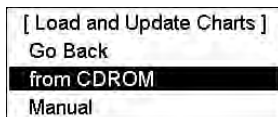
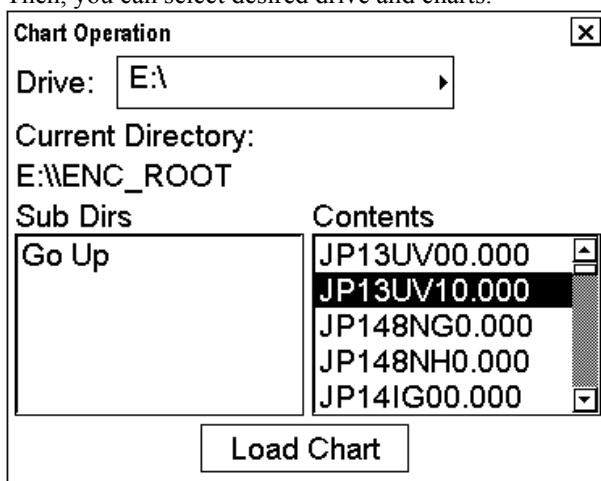
The ECDIS can, in some cases, load S57 charts that do not have full compliance with S57 standard coding for transfer media. Minimum requirements for loading manually is legally coded:

- XXXXXXXX.000 file, which includes a Base cell.
- XXXXXXXX.NNN file, in which NNN is a number from 001 to 999, and which includes an update.

To load charts without building a named "CD-ROM catalogue" do the following:



1. Spin the scrollwheel to display Menu/Info/Chart Menu in the mouse functions area then push the right mouse button.
2. Select Load and Update Charts from the menu and Manual from the sub menu. Then, you can select desired drive and charts.



3. When you are ready to load charts, click the **Load Chart** button.

The system may also make conversion into the SENC and setting of Display Until date automatically if you have set up for them. This can take a few minutes.

8.4 S57 SENC Conversion Details

S57 charts from Hydrographic Offices are called ENC. An ENC has to be converted into SENC format before it can be used in the ECDIS. The ECDIS can convert ENC into SENC format automatically. If the conversion is successful, the Failed SENC conversion window does not appear.

If the system fails to convert ENC into SENC or if the system detects a coding error in an ENC, the Failed SENC conversion window appears with a list of failed ENCs. In this window you can select any of the charts to see the reason for failure in conversion.

Normally the conversion is initiated automatically when a chart is loaded. Section 8.3 "How to Load S57 Charts" describes the loading process. Section 8.4.2 describes how to select automatic conversion. You can also initiate conversion from The SENC Convert window or from a cell status window.

8.4.1 How to speed up SENC conversion

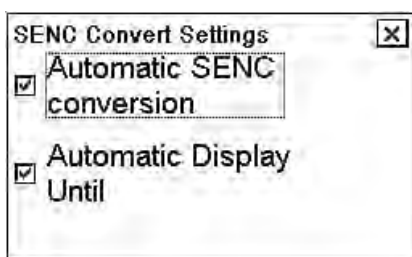
The SENC conversion speed depends on how many other tasks the system is occupied with. The system can conduct SENC conversion in the background during any other system operations, but you can greatly lessen the time for SENC conversion by doing the following:

1. Disable radar overlay by choosing radar overlay mode as "ECDIS only".
 - a) Place the cursor on Mode selection in the status bar.
 - b) Select "ECDIS only" and then push the scrollwheel.
2. Select display mode (upper left corner on the status bar) as True Motion.
3. Spin the scrollwheel to display Set Chart Center/Info/Active Scroll in the mouse functions area then push the left mouse button. Set chart center so ship is off the screen or TM reset is OFF.
4. Set the scale to 1:1,000 by displaying Range+ /Range- in the mouse functions area and pushing the appropriate mouse button to display 1:1,000.

8.4.2 How to get automatic SENC conversion and display until date

When you are loading new S57 charts, Base cells and/or their updates into your hard disk, they can be automatically converted to SENC format. Further, display dates can be set as issue dates automatically. Do the following to set these options:

1. Spin the scrollwheel to display Menu/Info/Chart Menu in the mouse function area then push the right mouse button.
2. Select System and SENC Convert Settings from the menu then push the scrollwheel to show the SENC Convert Settings dialog box.

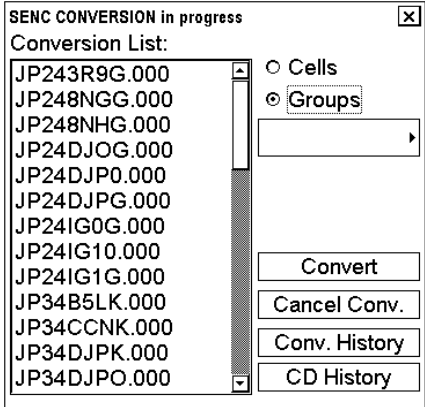


3. Check Automatic SENC conversion and Automatic Display Until.
4. Click the X at the top of the dialog box to close the box.

8.4.3 How to display progress of SENC conversion

If you want to view the progress of SENC conversion, display the SENC CONVERSION window as follows:

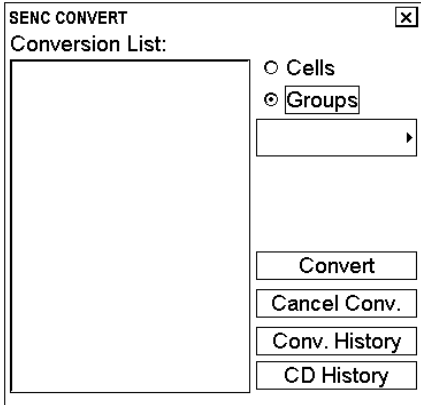
1. Spin the scrollwheel to display Menu/Info/Chart Menu in the mouse functions area then push the right mouse button.
2. Select SENC Convert from the menu then push the scrollwheel to show the SENC CONVERSION window.



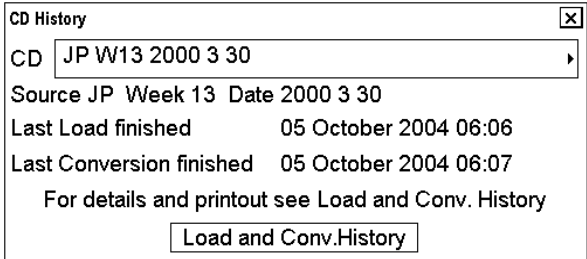
The example above shows a queue of unfinished SENC conversions.

Note 1: Chart(s) and/or its update(s) in the conversion list are ready for use after conversion of all charts/updates are completed.

Note 2: You can remove charts from the conversion list at any time. Use the cursor to highlight desired amount of chart names in the Conversion List. Click the **Cancel Conv.** button to remove those charts from the SENC conversion queue.



The example above shows that all SENC conversions have been finished. Then, you can see CD-ROM history by clicking the **CD History** button.



You can view the results of the finished SENC conversions by clicking **Load and Conv. History** button.

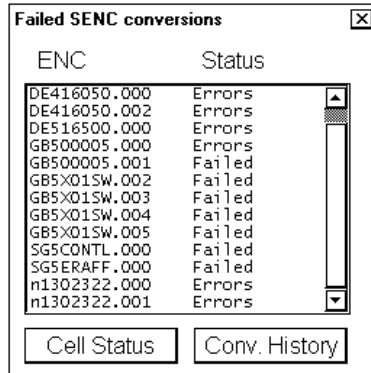
8.4.4 Failed SENC conversions window

If the system is unable to convert ENC into SENC without error or failure, the Failed SENC conversions window appears with a list of failed ENCs.

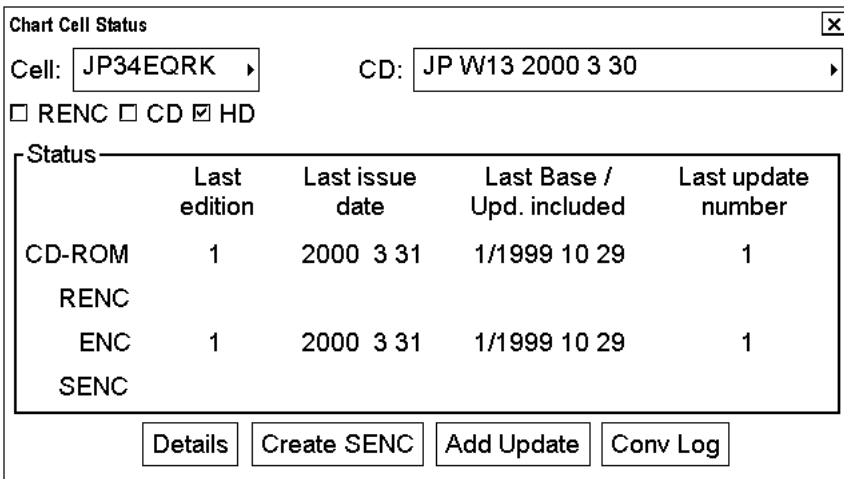
"Errors" in the Status column means that the system detected minor or major errors in the conversion of the ENC into the SENC. Use the **Conv. History** and **Cell Status** buttons to see if the error was minor or major. Major errors are indicated as NON ENC in the Conv. History. In the example below the status of errors together with NON ENC in the Conv History clearly indicate that this chart is not up-to-date and thus it does not fulfil SOLAS requirements. Get the latest edition of this chart from the publisher immediately.

"Failed" means that the system completely failed to convert the ENC into the SENC and thus the ENC cannot be used as it does not fulfil SOLAS requirements. Get the latest edition of this chart from the publisher immediately.

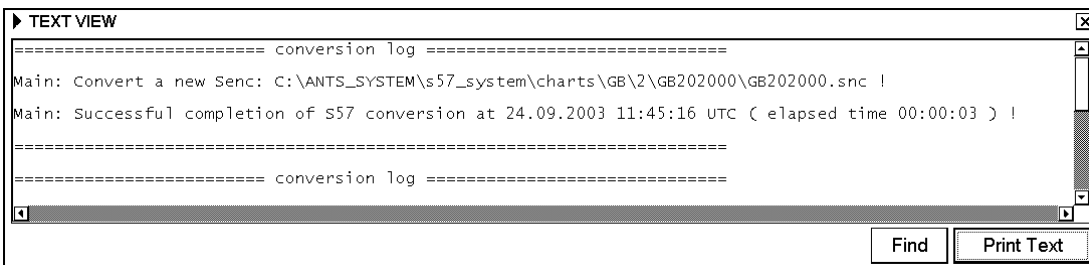
The **Conv. History** button is used to display the conversion log. The conversion log shows the status of converted ENCs. See section 8.4.5 "SENC conversion history log".



Click the **Cell Status** button, and a Chart Cell Status window appears.



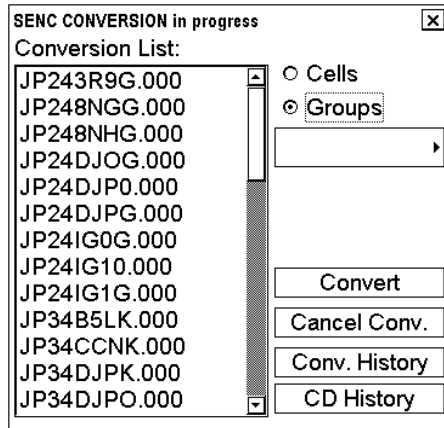
Then you can click the **Conv Log** button to view a detailed description of errors and failures detected during SENC conversion (see the example below).



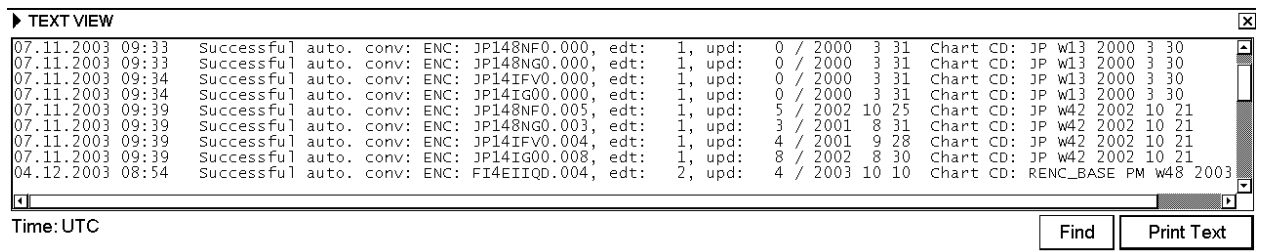
8.4.5 SENC conversion history log

The system automatically records the results of all conversions into the conversion history log. You can view the content of this log at any time by doing the following:

1. Spin the scrollwheel to display Menu/Info/Chart Menu in the mouse functions area then push the right mouse button.
2. Select SENC Convert from the menu then push the scrollwheel to show the SENC CONVERSION window.



3. After conversion (Conversion list is empty) is completed, click the **Conv. History** button to show a list of converted charts. (You can also activate the **Conv. History** from the "Failed SENC conversions" window.)



You can view the status of converted charts on the list, and also source if it is available.

4. Click the X at top right corner to close the window.

Below are examples of all possible results of conversion:

Perfect chart

Successful auto. conv: ENC: GB203000.000, edt: 1, upd: 0 / 1999 4 3

Perfect chart that is produced by a private chart producer (i.e., chart doesn't have ENC status)

A private chart cannot fulfil SOLAS requirements and you must refer to a paper chart as legal primary aid of navigation, when you navigate in the area covered by this chart.

Successful auto. conv: ENC: AS31MATT.000, edt: 1, upd: 0 / 1999 4 8 NON ENC

Conversion errors, but the chart is partly usable

Use cell status to check details of errors. The chart is still ENC.

Successful auto. conv with errors: ENCD-ROME416050.000, edt: 3, upd: 0 / 1998 6 12

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Conversion errors, but the chart is partly usable as NON ENC

Use cell status to check details of errors. The chart is no longer ENC if it was produced by a Hydrographic Office. You must refer to a paper chart as legal primary aid of navigation, when you navigate in the area covered by this chart.

Successful auto. conv with errors: ENC: n1302322.000, edt: 1, upd: 0 / 1999 1 4 NON ENC

Failed conversion

Chart is not usable and you cannot view the chart. You must refer to a paper chart as legal primary aid of navigation, when you navigate in the area covered by this chart.

Failed automatic conversion: ENCD-ROMK3EI0XE.000, edt: 1, upd: 0 / 1999 2 17

Failed conversion of an update

Chart is partly usable, but it is not up-to-date. Get the latest edition of the chart from its publisher. The chart is still ENC, but it no longer fulfils the SOLAS requirement. You must refer to a paper chart as legal primary aid of navigation, when you navigate in the area covered by this chart.

Failed auto. conv: ENC: GB500005.001, edt: 2, upd: 1 / 1997 9 26 Updating impossible before new edition of Base cell

Failed conversion. Checksum is not correct

Chart is not usable and you cannot view it. Try to reload the Base cell or update from the original media. If that doesn't work order a new CD-ROM from your chart supplier. You must refer to a paper chart as legal primary aid of navigation, when you navigate in the area covered by this chart.

Failed automatic conversion: ENC: SG5CONTL.000, edt: 1, upd: 0 / 1996 2 25 CHECKSUM ERROR

Failed conversion. Checksum of an update is not correct

Chart is partly usable, but it is not up-to-date. Try to reload the update from the original media. If that doesn't work order a new CD-ROM from your chart supplier. Note that the chart is still ENC, but it no longer fulfils the SOLAS requirement. You must refer to a paper chart as legal primary aid of navigation, when you navigate in the area covered by this chart.

Failed automatic conversion: ENC: GB5X01SW.002, edt: 1, upd: 2 / 2005 1 1 CHECKSUM ERROR

Failed conversion. At least one of the previous updates has failed in its SENC conversion

The system cannot accept additional updates unless all previous updates have been successfully converted to SENC. Chart is partly usable, but it is not up-to-date. Try to reload the failed previous update from the original media (in this example the failed previous update is GB5X01SW.002). If that doesn't work, order a new CD-ROM from your chart supplier. The chart is still ENC, but it no longer fulfils the SOLAS requirement. You must refer to a paper chart as legal primary aid of navigation, when you navigate in the area covered by this chart.

Failed automatic conversion: ENC: GB5X01SW.003, edt: 1, upd: 3 / 2005 9 8 PREVIOUS Update MISSING

Failed conversion. The Base cell has failed in its SENC conversion

The system cannot accept updates unless the Base cell has been successfully converted to SENC. Chart is not usable and you cannot view it. Try to reload the Base cell from the original media (in this example the failed Base cell is GB5X01SW.000). If that doesn't work, order a new CD-ROM from your chart supplier. You must refer to a paper chart as legal primary aid of navigation, when you navigate in the area covered by this chart.

Failed automatic conversion: ENC: GB5X01SW.001, edt: 1, upd: 1 / 1998 9 8 PREVIOUS Base CELL OR Update MISSING

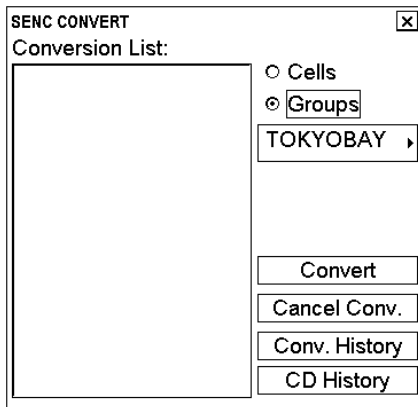
Note: Always read both the "Failed SENC conversion" dialog and "Conversion history log" very carefully, because they contain important information about the legal status of the charts. Specially note that a chart may lose its legal status to fulfil SOLAS requirements and you may need to refer to a paper chart as legal primary aid of navigation.

8.4.6 How to use SENC convert window to initiate SENC conversion

Normally automatic SENC conversion is selected and there is no need to initiate SENC conversions (from the SENC convert window). If you do not use the automatic SENC conversion, you need to manually initiate SENC conversion. Another case in which you need to manually initiate SENC conversion is if you upgraded or reloaded the ECDIS software from the ECDIS software CD-ROM.

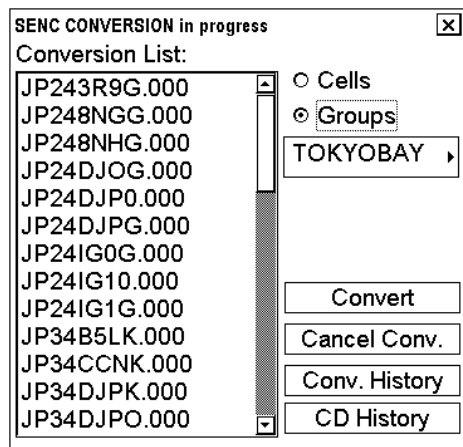
To initiate SENC conversions manually, do the following:

1. Spin the scrollwheel to display Menu/Info/Chart Menu in the mouse functions area then push the right mouse button.
2. Select SENC Convert from the menu to show the SENC CONVERT window.



3. Use the **Cells** button to select an individual chart, or use the **Groups** button to select a group of charts. Then, click the **Convert** button to initiate the SENC conversion of the charts.

"Convert" only converts those charts that are not currently converted into the SENC format. If your selected chart or all members of your selected group are already in the SENC format, the Conversion list remains empty. If all or some charts are not yet in the SENC format, they are added to the Conversion list (see the example below). If, for some reason, you need to force SENC conversion of an already converted chart, see section 8.14 "Other Features of Vector Charts".



Note 1: You may remove charts from the conversion list at any time. Use the cursor to highlight the charts to remove then click the **Select** button. Finally, click the **Cancel Conv.** button to remove selected charts from the SENC conversion queue.

Note 2: You can view the results of the finished SENC conversions at any time. Click the **Conv. History** button to view the conversion log.

8.5 Features of the Chart Menu

8.5.1 Overview of the chart menu

The Chart menu provides various features for processing charts. To display the menu, spin the scrollwheel to display Menu/Info/Chart Menu in the mouse functions area then click the right mouse button.

[Chart Menu]
Activate ARCS chart ▶
Load and Update Charts ▶
SENC Convert
Remove Charts
Chart Catalogue
Set Chart viewing dates
Chart Permits
ECDIS Chart 1
Open Chart by Cell name
Chart Cell Status
Manual Updates ▶
System ▶
Close

Activate ARCS chart: This function activates ARCS chart onto the screen. You have two options for how to open the chart on the display. "Ignore scale" opens an ARCS chart with the chart scale used the last time you opened an ARCS chart. "Sync scale" opens an ARCS chart with a scale that is as close as possible to the scale that was used with S57 charts.

Load and Update Charts: Load ENC's into your hard disk, using CD-ROMs, floppies or LAN (Local Area Network). See section 8.3 "How to Load S57 Charts".

SENC Convert: Convert ENC's (Base cells and/or updates) into the SENC format by individual cell or by groups of cells. See section 8.4.6 "How to use SENC convert window to initiate SENC conversion".

Remove Charts: Remove cells from your hard disk. See section 8.5.4 "How to remove S57 chart cells from the system".

Chart Catalogue: Manage S57 charts. See section 8.5.2 "Catalogue of S57 cells".

Set Chart viewing dates: View date dependency of the cells (RENC status query date, number of updates available, update display dates, update approve dates of the cells) in the SENC format. For more information, see section 8.11 "Chart Viewing Dates and Seasonal Features of the Vector Chart"

Chart Permits: Load permits for encrypted charts to enable their use in your ECDIS. Currently PRIMAR and C-MAP use encryption.

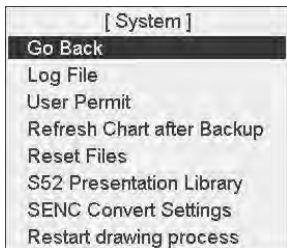
ECDIS Chart 1: Open the chart set "IHO ECDIS Chart 1". This function helps you familiarize yourself with the various chart symbologies used with the ECDIS. See section 8.12 "Symbology Used in Vector Charts".

Open Chart by Cell name: Open a S57 chart by its number. See section 8.9.2 "How to select charts to view".

Chart Cell Status: View status of the cells (edition number and date, number of updates of the cell) stored in your hard disk, CD-ROMs or RENC. You can compare that you have the latest cell with latest update in use. See section 8.14 "Other Features of Vector Charts".

Manual Updates: Update your charts manually.

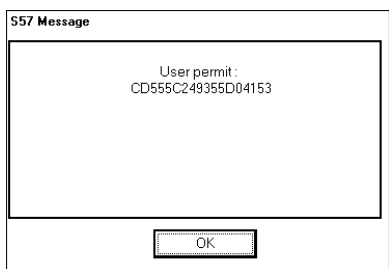
System



System contains a set of additional selections, and they are described below:

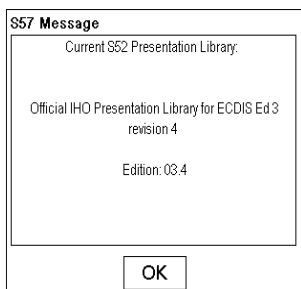
Log file: The log file contains various system events that might be useful when your system supplier tries to find the reason for unexpected behavior of the system reported by you.

User permit:



Check your user permit, which is used as your identifier in security systems such as PRIMAR and C-MAP. See the example at left.

S52 presentation library:



Confirm the S52 presentation library revision number for S57 charts. The current official Presentation library is shown in this example.

Refresh charts after backup: Refresh available charts and updates after someone backs up all charts and updates from another ECDIS to this ECDIS.

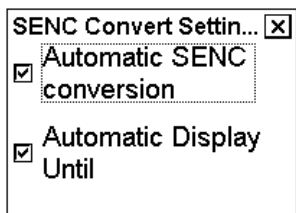
Reset files: For factory-use only. This feature demonstrates chart uploading and downloading.



If you accidentally select this option, you get the display shown left.

Click the **OK** button to escape.

SENC convert settings:



Enable or disable automatic SENC conversion and automatic display until date.

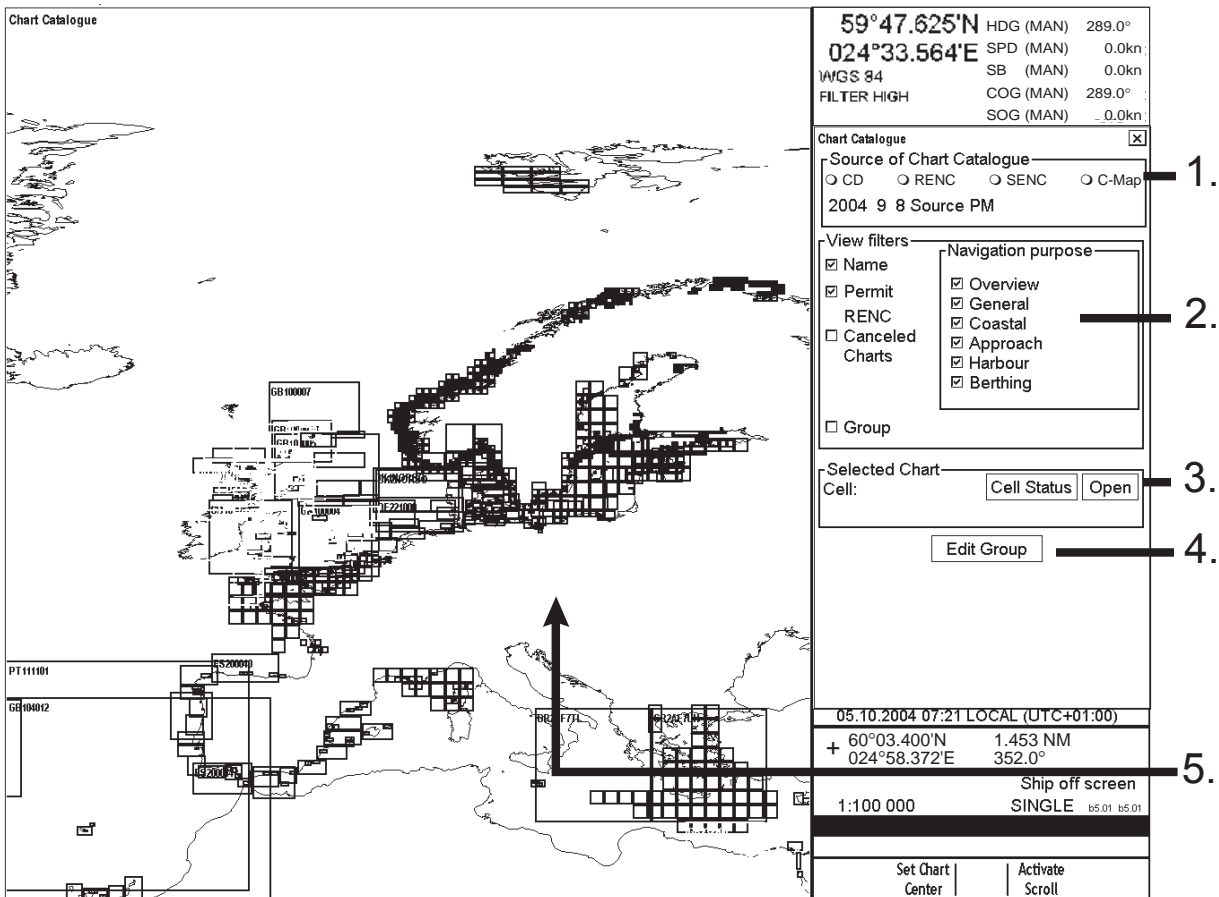
Restart drawing process: Redraw the screen. Use this feature if you are not able to move chart or zoom in/out.

8.5.2 Catalogue of S57 cells

An S57 catalogue is used to view graphical coverage of the charts stored in your hard disk, available in a named "CD-ROM" or available from an RENC. Available charts are displayed using their limits of charts. Sometimes the real coverage of a chart may be considerably less than its declared limits. To view information contained on a chart pick a location with the cursor.

To display the catalogue, do the following:

1. Spin the scrollwheel to display Menu/Info/Chart Menu in the mouse functions area then push the right mouse button.
2. Spin the scrollwheel to select Chart Catalogue then push the scrollwheel.



1. Source of Chart Catalogue

- **CD:** Display charts available in a named "CD-ROM".
- **RENC:** Display charts available from an RENC.
- **SENC:** Display charts stored in your hard disk in SENC format.
- **C-Map:** Display charts available from C-MAP. (If C-MAP charts are not installed, "C-Map" does not appear.)

2. View Filters

- **Name:** Display also cell names in graphical coverage display.
- **Permit:** Display only charts for which you have permit.
- **RENC Cancelled Charts:** Display charts that are cancelled in an RENC.
- **Group:** Display charts that are member of selected group.
- **Navigation purpose:** Display charts for selected navigation purpose (overview, general, coastal, approach, harbour, berthing).

3. Selected Chart

- **Cell:** Name of the chart
- **Cell Status:** Open Cell Status window.
- **Open:** Open selected chart to ECDIS display.

4. **Edit Group:** See section 8.5.5 "How to group S57 chart cells".

5. The **chart limit boxes** are color-coded as follows:

- Green** The chart is available for use in SENC format. If the source of the chart is an RENC then the chart is also up-to-date. If the source of the chart is something other than an RENC, then all loaded updates are included into the SENC.
- Orange** The chart is available for use in SENC format but the chart is either not up-to-date or has been cancelled. Either the SENC is from a former edition, the SENC is missing the latest updates or the chart has been cancelled.
- Red** If the chart is permit free, you do not have it available for use in SENC format and thus you cannot use the chart currently.
The chart requires a permit but you do not have the permit for the chart therefore you cannot use the chart currently.
- Blue** The chart is available either in ENC format, in SENC format for another software version or in SENC format for another ECDIS. For example, the chart is blue during SENC conversion and when you loaded a chart into the ECDIS and the system could not convert the chart into SENC format.
- Magenta** You have a permit to use the chart, but there is neither ENC nor SENC available on ECDIS, therefore you cannot use the chart currently.

8.5.3 How to display status and setting viewing dates of S57 chart cells and their updates

When you load S57 chart cell(s) and/or their updates, the system sets Display Until of S57 chart cell(s) as current date of the system. To set Approve Until as current date of the system, you must open the Set Chart viewing dates dialog box and perform Approve Until. You can view status and set viewing dates of S57 chart cells and their updates.

Select Set Chart viewing dates from the Chart menu to show the Chart Viewing date window.

Cell ID	RENC edt/ upd	SENC edt/ upd	Updates Displ. until	Updates Approv. until
FI3EIR1	1/ 3	1/ 3	2005 3 10	2005 3 10
FI49IHMJ	2/ 10	2/ 10	2005 3 10	2005 3 10
FI49IHMK	2/ 3	2/ 3	2005 3 10	2005 3 10
FI49IHML	2/ 9	2/ 9	2005 3 10	2005 3 10
FI49IHMS	2/ 1	2/ 1	2005 3 10	2005 3 10
FI4EIGLI	1/ 3	1/ 3	2005 3 10	2005 3 10
FI4EIGID	2/ 4	2/ 4	2005 3 10	2005 3 10
FI4EIGIK	2/ 2	2/ 2	2005 3 10	2005 3 10
FI4EIGIL	2/ 4	2/ 4	2005 3 10	2005 3 10
FI4EIHMI	1/ 7	1/ 7	2005 3 10	2005 3 10
FI4EIHMM	2/ 4	2/ 4	2005 3 10	2005 3 10
FI4EIHNN	1/ 6	1/ 6	2005 3 10	2005 3 10
FI4EIHND	1/ 11	1/ 11	2005 3 10	2005 3 10
FI4EIHNP	1/ 12	1/ 12	2005 3 10	2005 3 10
FI4EIHMQ	1/ 6	1/ 6	2005 3 10	2005 3 10
FI4EIHMR	2/ 4	2/ 4	2005 3 10	2005 3 10
FI4EIQN	1/ 3	1/ 3	2005 3 10	2005 3 10
FI4EIQO	1/ 3	1/ 3	2005 3 10	2005 3 10
FI4EIQP	1/ 4	1/ 4	2005 3 10	2005 3 10
FI4EIQQ	1/ 10	1/ 10	2005 3 10	2005 3 10
FI4EIQR	3/ 13	3/ 13	2005 3 10	2005 3 10
FI4EIQS	2/ 16	2/ 16	2005 3 10	2005 3 10
FI4EIQT	2/ 11	2/ 11	2005 3 10	2005 3 10
FI4EIQU	2/ 11	2/ 11	2005 3 10	2005 3 10
FI4EIQV	1/ 4	1/ 4	2005 3 10	2005 3 10
FI4EIQW	1/ 5	1/ 5	2005 3 10	2005 3 10

Latest RENC Product List	2005 2 23	Source PM
Oldest date	2005 3 10	2005 3 10
Newest date	2005 3 10	2005 3 10
Manual Updates	2005 3 10	2005 3 10

Display Until Approve Until

Sync Manual Update Dates
 All SENCs

SENC edt / upd: This column contains edition/update status from "SENC", i.e., loaded and converted in the ECDIS.

Updates Displ. until: "date until updates" is displayed. You can enter desired date by using the Display Until field. The number after the date shows the number of updates for the displayed cell (number of displayed updates / number of updates in SENC format).

Updates Approv. until: View the Date Until updates is approved. You can enter desired date by using the Approve Until field (number of approved updates / number of updates in SENC format).

The issue date of the Product List used is displayed as "Latest RENC Product List". An RENC Product List contains information about the charts stored in RENC and the date when the Product List was issued. If the ECDIS does not contain any Product List, then the date of the Product List is displayed as "—NVLD—".

The indication ">>>>" means that a chart is not up-to-date. The indication "<<<<" means that SENC contains newer information than the information in an RENC Product List. (You may need to load newer RENC Product List.) Cancelled charts are indicated as "cancelled" instead of "edtn/updn". If an SENC contains a cancelled chart, then the indication ">>>>" is replaced with "XXX".

Recommended settings in Chart viewing date are:

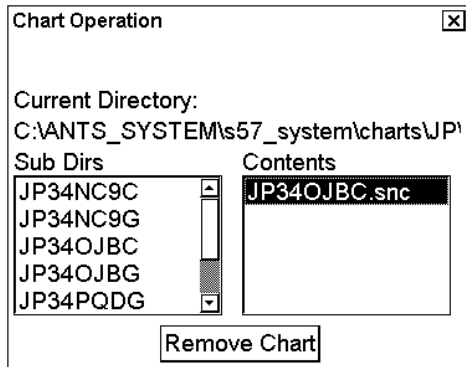
- Sync Manual Update Dates: ON position
- All SENCs: ON position

8.5.4 How to remove S57 chart cells from the system

How to remove specific chart cells from the system

To remove an S57 format vector chart cell from the system, do the following:

1. Select Remove Charts from the Chart menu.
2. Select chart cells to remove from the system. You can remove Base cell (000), updates (001...) and SENC format (.snc).



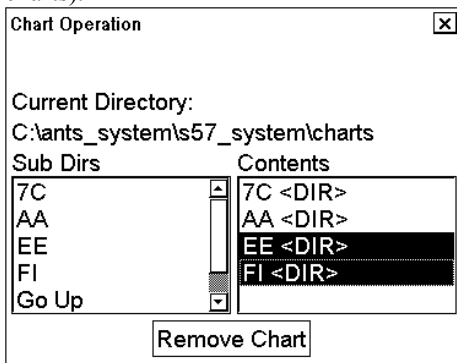
3. Press the **Remove Chart** button. The window shown below appears.



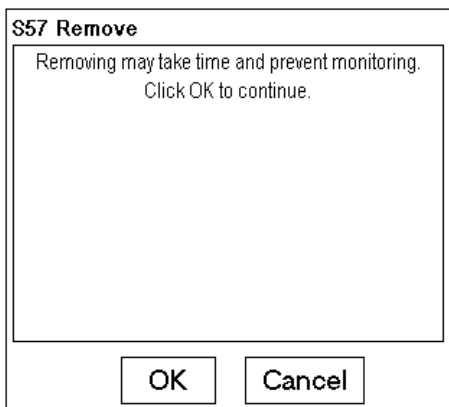
4. Confirm removal by clicking the **OK** button. The system will remove file(s) from the hard disk.

How to remove all chart cells from the system

1. Select Remove Charts from the Chart menu.
2. Select all directories in Contents list, except 7C<DIR> (background charts of system) and AA<DIR> (ECDIS 1 charts).



3. Press the **Remove Chart** button. The following window appears.



4. Confirm removal by clicking the **OK** button. The system then removes file(s) from the hard disk.

8.5.5 How to group S57 chart cells

You can define groups of S57 charts. This means you can collect related charts, for example, all cells that cover a route from Liverpool to New York or all cells available from a National Hydrographic Office.

You can make a group and define charts included to group using either "Chart Catalogue" or "Load or Update Charts from loaded CD-ROM" window.

How to group by load or update charts from loaded CD-ROM window

When you load or update S57 charts from CD-ROM, you are able to define a group in "Load or Update Charts from loaded CD-ROM" window. To do this, do the following:

1. Select Load or Update charts>From CD-ROM in the Chart menu to show the "Load or Update Charts from loaded CD-ROM" window.

Chart Catalogue

59°47.625'N HDG (MAN) 289.0°
 024°33.564'E SPD (MAN) 0.0kn
 WGS 84 SB (MAN) 0.0kn
 FILTER HIGH COG (MAN) 289.0°
 SOG (MAN) 0.0kn

Load or Update Charts from loaded CD-ROM [X]

CD JP W13 2000 3 30

Source JP Week 13 Date 2000 3 30
 Charts available in: E:\ENC_ROOT\

Chart	Edition	Update
JP3400N	1	1
JP3403P	1	1
JP3403B	1	1
JP3409K	1	1
JP3409D	1	1
JP3410S	1	1

Load selectors

Name
 Permit
 Canceled Charts
 Group
 Missing only
 Manual selection

Navigation purpose

Overview
 General
 Coastal
 Approach
 Harbour
 Berthing

View CD-ROM Publisher Notes
 View CD-ROM content Summary
 Load and Conv. History Remove
 Load Edit Group

+ 60°03.400'N 1.453 NM
 024°58.372'E 352.0°

TM reset off
 1:100 000 SINGLE 05.01 05.01

Range - | Range +

2. Click the **Edit Group** button.

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3. Click the **New Group** button.

The screenshot shows the ECDIS interface with the Chart Catalogue panel open. The 'New Group' button is highlighted in the bottom right corner of the panel. The panel displays various settings and options for chart management.

NorthUp RM ECDIS only ChartOnly Std Radar

Chart Catalogue

33°54.087'N HDG 221.3°
132°36.583'E SPD (WT) 21.4 kn
WGS 84 SB (POS) -0.7 kn
DGPS COG (POS) 221.0°
SOG (POS) 20.8 kn

Chart Catalogue

Source of Chart Catalogue
 CD RENC SENC

View filters

Name Permit
RENC Canceled
Charts Group

Navigation purpose
 Overview
 General
 Coastal
 Approach
 Harbour
 Berthing

Selected Chart
Cell: JP34NC8G Cell Status
Meganta - Only permit in system

Inside Outside
PC140003 PC140006
PC140004 PC140007
PC140005 PC140008
PC140009 PC140010

Remove Frame Close Edit Group
New Save As Text Remove

06 Aug 2010 13:24 Local (UTC +09:00)
+ NM
SINGLE
Select Chart Menu

The screenshot shows a 'Text Input' dialog box with the title 'New Group Name'. The text 'JAPAN' is entered into the input field. The 'OK' button is highlighted.

Text Input

New Group Name

JAPAN

OK

4. Enter a name for the group, click the **OK** button then click the **Add Frame** button.

The screenshot shows the ECDIS interface with the Chart Catalogue panel open. The 'Add Frame' button is highlighted in the bottom right corner of the panel. The panel displays various settings and options for chart management.

NorthUp RM ECDIS only ChartOnly Std Radar

Chart Catalogue

33°54.087'N HDG 221.3°
132°36.583'E SPD (WT) 21.4 kn
WGS 84 SB (POS) -0.7 kn
DGPS COG (POS) 221.0°
SOG (POS) 20.8 kn

Chart Catalogue

Source of Chart Catalogue
 CD RENC SENC

View filters

Name Permit
RENC Canceled
Charts Group

Navigation purpose
 Overview
 General
 Coastal
 Approach
 Harbour
 Berthing

Selected Chart
Cell: JP34NC8G Cell Status
Meganta - Only permit in system

Inside Outside
PC140003 PC140006
PC140004 PC140007
PC140005 PC140008
PC140009 PC140010

Remove Frame Close Edit Group
New Save As Text Remove

06 Aug 2010 13:24 Local (UTC +09:00)
+ NM
SINGLE
Select Chart Menu

5. Define a frame.

Chart Catalogue

59°47.625'N HDG (MAN) 289.0°
 024°33.564'E SPD (MAN) 0.0kn
 WGS 84 SB (MAN) 0.0kn
 FILTER HIGH COG (MAN) 289.0°
 SOG (MAN) 0.0kn

Load or Update Charts from loaded CD-ROM [X]
 CD JP W13 2000 3 30
 Source JP Week 13 Date 2000 3 30
 Charts available in: E:\NENC_ROOT\

Chart	Edition	Update
JP110V00	1	1
JP130V50	1	1
JP148NG0	1	2
JP148NG0	1	2
JP141G00	1	4
JP141G10	1	5

Load selectors

Navigation purpose

Name Overview
 Permit General
 RENC Coastal
 Canceled Approach
 Charts Harbour
 Berthing

Group JAPAN
 Missing only Manual selection

Edit group

Inside Outside

>> <<

Done
 Cancel

+ 60°03.400'N 1.453 NM
 024°58.372'E 352.0°
 TM reset off
 1:500 000 SINGLE 65.01 65.01

Select | Chart Menu

6. When you have completed the frame, click the Done button.

7. When you have completed the editing, click the Close Edit button.

Chart Catalogue

59°47.625'N HDG (MAN) 289.0°
 024°33.564'E SPD (MAN) 0.0kn
 WGS 84 SB (MAN) 0.0kn
 FILTER HIGH COG (MAN) 289.0°
 SOG (MAN) 0.0kn

Load or Update Charts from loaded CD-ROM [X]
 CD JP W13 2000 3 30
 Source JP Week 13 Date 2000 3 30
 Charts available in: E:\NENC_ROOT\

Chart	Edition	Update
JP110V00	1	1
JP130V50	1	1
JP148NG0	1	2
JP148NG0	1	2
JP141G00	1	4
JP141G10	1	5

Load selectors

Navigation purpose

Name Overview
 Permit General
 RENC Coastal
 Canceled Approach
 Charts Harbour
 Berthing

Group JAPAN
 Missing only Manual selection

Edit group

Inside Outside

JP138N00 JP131V00
 JP141G10 JP131V10
 JP148NG0 JP148NG0
 JP2403PG JP2403PG
 JP248NG0 JP248NG0

Add Frame Close edit
 New Group Remove Group

+ 60°03.400'N 1.453 NM
 024°58.372'E 352.0°
 TM reset off
 1:500 000 SINGLE 65.01 65.01

Select | Chart Menu

8. Vector Chart Material

8. Select Group as a qualifier for loading.

Chart Catalogue

59°47.625'N HDG (MAN) 289.0°
 024°33.564'E SPD (MAN) 0.0kn
 WGS 84 SB (MAN) 0.0kn
 FILTER HIGH COG (MAN) 289.0°
 SOG (MAN) 0.0kn

Load or Update Charts from loaded CD-ROM
 CD JP W13 2000 3 30
 Source JP Week 13 Date 2000 3 30
 Charts available in: E:\ENC_ROOT\

Chart	Edition	Update
JP2403B	13	2000/03/30
JP2403C	13	2000/03/30
JP2403D	13	2000/03/30
JP2403E	13	2000/03/30
JP2403F	13	2000/03/30
JP2403G	13	2000/03/30

Load selectors

Name
 Permit
 RENC
 Canceled
 Charts

Navigation purpose

Overview
 General
 Coastal
 Approach
 Harbour
 Berthing

Group JAPAN
 Missing only Manual selection

View CD-ROM Publisher Notes
 View CD-ROM content Summary
 Load and Conv. History Remove
 Load Edit Group

+ 60°03.400'N 1.453 NM
 024°58.372'E 352.0°
 TM reset off
 1:500 000 SINGLE 65.01 65.01

Select Chart Menu

9. Now you can load charts of the group by clicking the **Load** button.

How to group by chart catalogue window

The Chart Catalogue can be used to define a group as follows:

1. Select "Chart Catalogue" from the Chart menu.

Chart Catalogue

59°47.625'N HDG (MAN) 289.0°
 024°33.564'E SPD (MAN) 0.0kn
 WGS 84 SB (MAN) 0.0kn
 FILTER HIGH COG (MAN) 289.0°
 SOG (MAN) 0.0kn

Chart Catalogue
 Source of Chart Catalogue
 CD RENC SENC C-Map
 2004 9 8 Source PM

View filters

Name
 Permit
 RENC
 Canceled
 Charts

Navigation purpose

Overview
 General
 Coastal
 Approach
 Harbour
 Berthing

Group

Selected Chart
 Cell: Cell Status Open
 Edit Group

05.10.2004 07:21 LOCAL (UTC+01:00)
 + 60°03.400'N 1.453 NM
 024°58.372'E 352.0°
 Ship off screen
 1:100 000 SINGLE 65.01 65.01

Set Chart Center Activate Scroll

2. Click the **Edit Group** button followed by the **New** button.

3. Enter a name for the group then click the **OK** button.

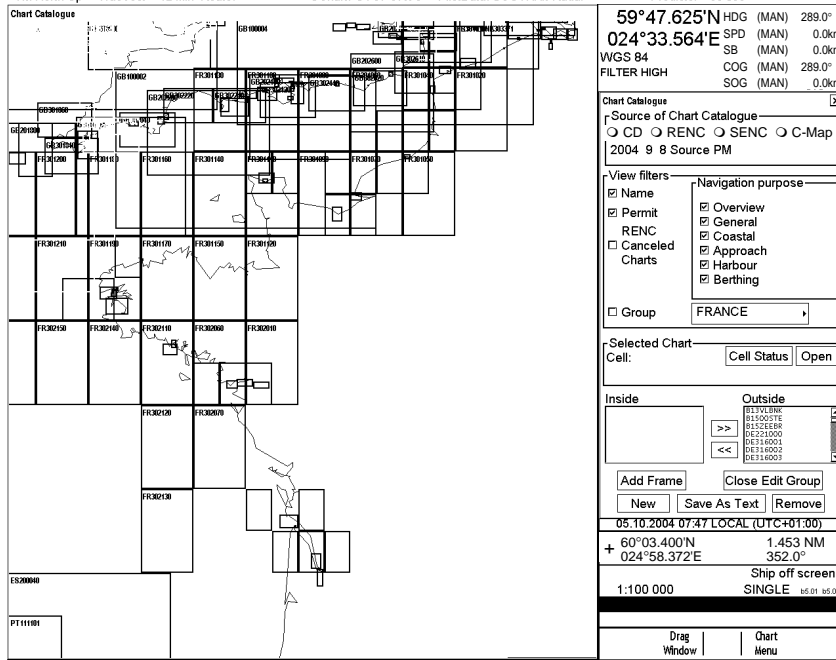


Chart Catalogue

59°47.625'N HDG (MAN) 289.0°
 024°33.564'E SPD (MAN) 0.0kn
 WGS 84 SB (MAN) 0.0kn
 FILTER HIGH COG (MAN) 289.0°
 SOG (MAN) 0.0kn

Chart Catalogue

Source of Chart Catalogue
 CD RENC SENC C-Map
 2004 9 8 Source PM

View filters

Navigation purpose

Name
 Permit
 RENC
 Canceled
 Charts

Overview
 General
 Coastal
 Approach
 Harbour
 Berthing

Group FRANCE

Selected Chart
 Cell: Cell Status Open

Inside Outside

Add Frame Close Edit Group
 New Save As Text Remove

05.10.2004 07:47 LOCAL (UTC+01:00)
 + 60°03.400'N 1.453 NM
 024°58.372'E 352.0°

Ship off screen
 1:100 000 SINGLE 05.01.05.01

Drag Window Chart Menu

Text Input

New Group Name

FRANCE

OK

4. Click the **Add Frame** button.

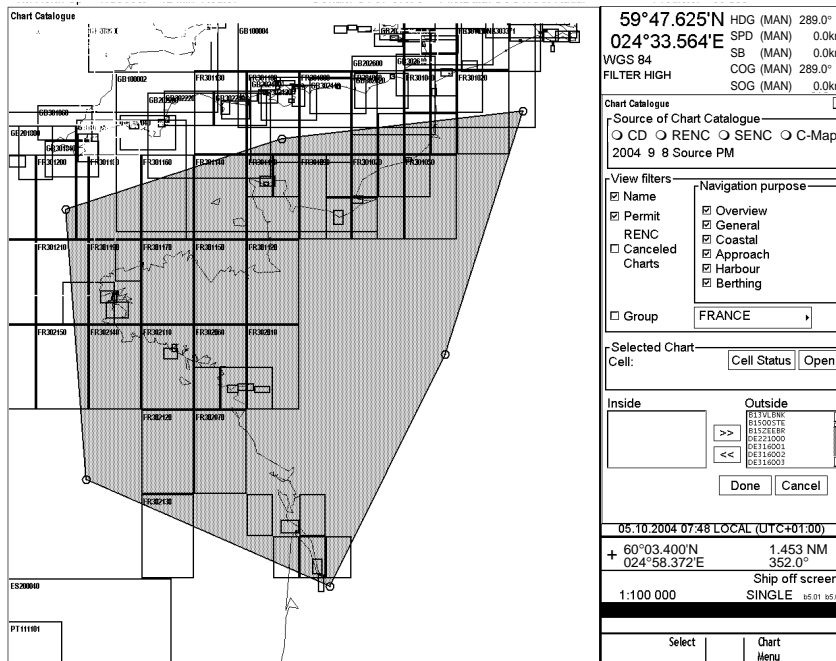


Chart Catalogue

59°47.625'N HDG (MAN) 289.0°
 024°33.564'E SPD (MAN) 0.0kn
 WGS 84 SB (MAN) 0.0kn
 FILTER HIGH COG (MAN) 289.0°
 SOG (MAN) 0.0kn

Chart Catalogue

Source of Chart Catalogue
 CD RENC SENC C-Map
 2004 9 8 Source PM

View filters

Navigation purpose

Name
 Permit
 RENC
 Canceled
 Charts

Overview
 General
 Coastal
 Approach
 Harbour
 Berthing

Group FRANCE

Selected Chart
 Cell: Cell Status Open

Inside Outside

Done Cancel

05.10.2004 07:48 LOCAL (UTC+01:00)
 + 60°03.400'N 1.453 NM
 024°58.372'E 352.0°

Ship off screen
 1:100 000 SINGLE 05.01.05.01

Select Chart Menu

5. Define the frame by using the left mouse button in the "Select" mode. Click the **Done** button when finished.

8. Vector Chart Material

- Select Group to view content of group in Chart Catalogue window.

Chart Catalogue

59°47.625'N HDG (MAN) 289.0°	
024°33.564'E SPD (MAN) 0.0kn	
WGS 84	SB (MAN) 0.0kn
FILTER HIGH	
COG (MAN) 289.0°	SOG (MAN) 0.0kn

Chart Catalogue X

Source of Chart Catalogue

CD RENC SENC C-Map

2004 9 8 Source PM

View filters

<input checked="" type="checkbox"/> Name <input checked="" type="checkbox"/> Permit <input type="checkbox"/> RENC <input type="checkbox"/> Canceled Charts <input checked="" type="checkbox"/> Group	<p>Navigation purpose</p> <input checked="" type="checkbox"/> Overview <input checked="" type="checkbox"/> General <input checked="" type="checkbox"/> Coastal <input checked="" type="checkbox"/> Approach <input checked="" type="checkbox"/> Harbour <input checked="" type="checkbox"/> Berthing
--	---

FRANCE

Selected Chart Cell: Cell Status Open

Edit Group

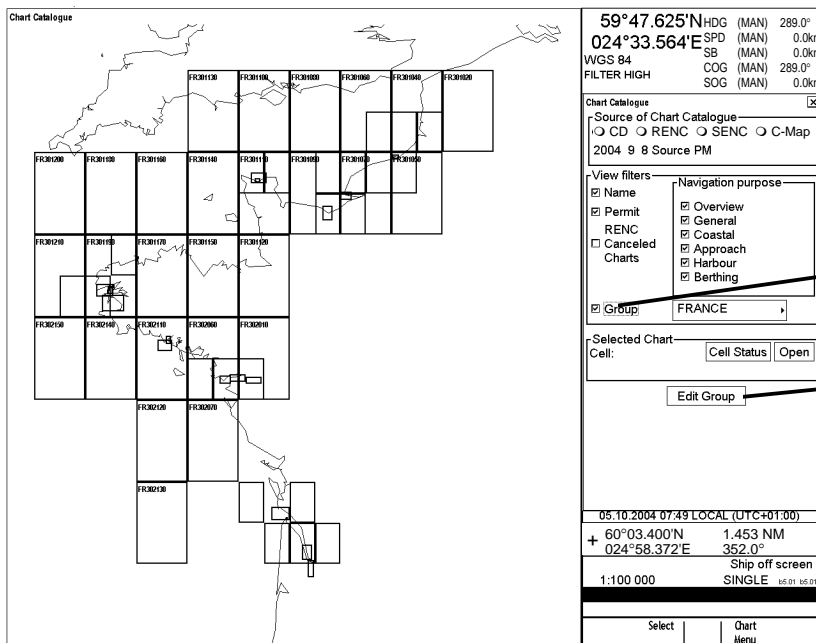
05.10.2004 07:49 LOCAL (UTC+01:00)	
+ 60°03.400'N	1.453 NM
+ 024°58.372'E	352.0°
Ship off screen	
1:100 000	SINGLE <small>05.07.05.01</small>

Select | Chart Menu

How to remove S57 chart cells from a group

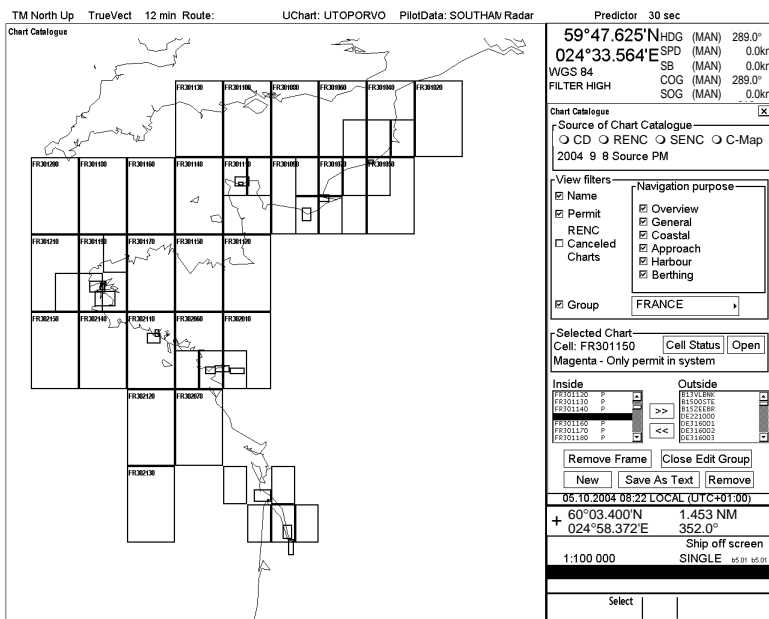
You can remove chart cells from a defined group as follows:

1. Select desired group then click the **Edit Group** button.



Select "Group" to activate a Group selection.
 Select desired group.
 Click "Edit Group".

2. Use the **Remove frame** button to define area for charts or pick charts individually from the list.



Use **Remove Frame** button to use Graphical catalogue, or pick individual cell using left mouse button (Select) then click ">>>" button.

3. When you select a cell, ">>>" appears between Inside and Outside at the right side of the screen. Click the icon.

8. Vector Chart Material

How to delete a group

You can delete a group as follows:

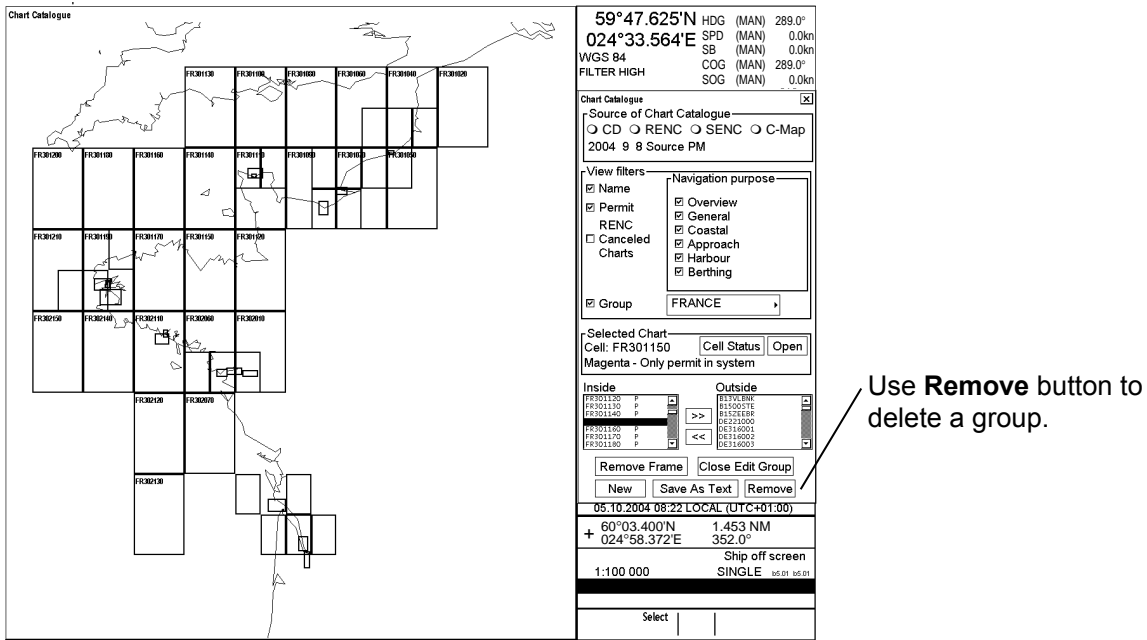


Chart Catalogue

59°47.625'N HDG (MAN) 289.0°
024°33.564'E SPD (MAN) 0.0kn
WGS 84 SB (MAN) 0.0kn
FILTER HIGH COG (MAN) 289.0°
SOG (MAN) 0.0kn

Chart Catalogue

Source of Chart Catalogue
 CD RENC SENC C-Map
2004 9 8 Source PM

View filters

Name Permit Overview General Coastal Approach Harbour Berthing

RENC Canceled Charts

Group FRANCE

Selected Chart
Cell: FR301150 Cell Status Open
Magenta - Only permit in system

Inside Outside

Remove Frame Close Edit Group

New Save As Text Remove

05.10.2004 08:22 LOCAL (UTC+01:00)

60°03.400'N 1.453 NM
+ 024°58.372'E 352.0°

Ship off screen
1:100 000 SINGLE 05.01 05.01

Select

How to display active group with catalogue

To view active group do the following:

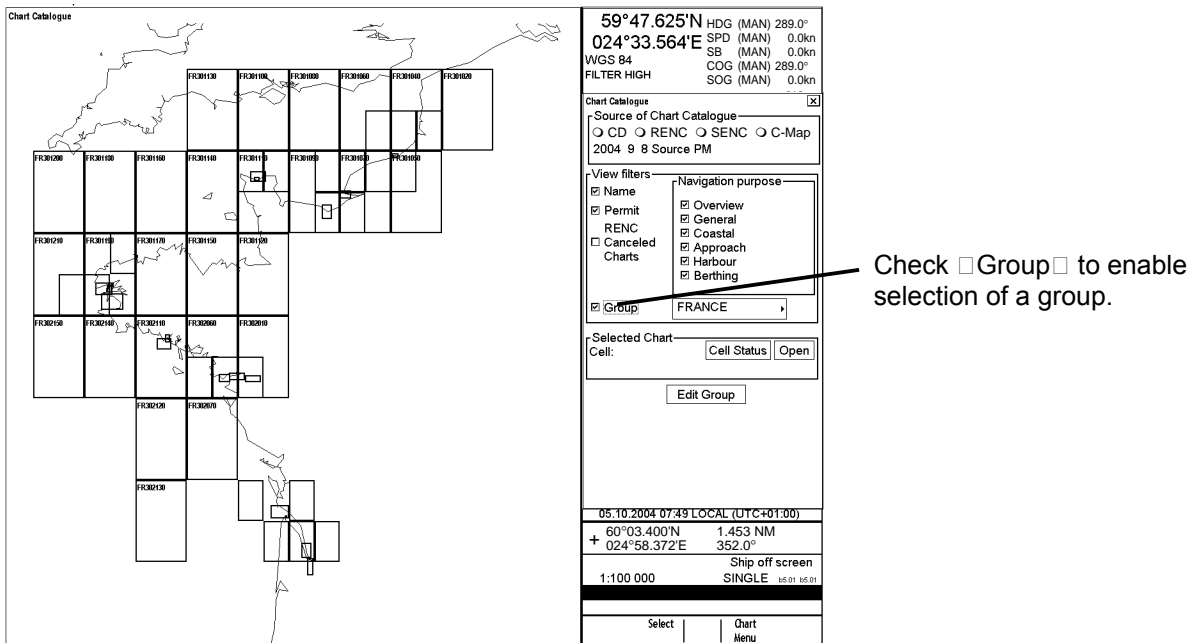


Chart Catalogue

59°47.625'N HDG (MAN) 289.0°
024°33.564'E SPD (MAN) 0.0kn
WGS 84 SB (MAN) 0.0kn
FILTER HIGH COG (MAN) 289.0°
SOG (MAN) 0.0kn

Chart Catalogue

Source of Chart Catalogue
 CD RENC SENC C-Map
2004 9 8 Source PM

View filters

Name Permit Overview General Coastal Approach Harbour Berthing

RENC Canceled Charts

Group FRANCE

Selected Chart
Cell: Cell Status Open

Edit Group

05.10.2004 07:49 LOCAL (UTC+01:00)

60°03.400'N 1.453 NM
+ 024°58.372'E 352.0°

Ship off screen
1:100 000 SINGLE 05.01 05.01

Select Chart Menu

Check "Group" selection and select desired group from list box.

8.6 S57 Chart Service from an RENC

8.6.1 Introduction

Before you can use an RENC service, you have to be authorized as a customer of an RENC. To be authorized you have to contact an official distributor (chart agent) of RENC. Then, the following services are available:

8.6.2 Permits

Permits are used to control the permission to use a chart. A permit in RENC security is connected to an edition.

Permits are issued as two different types:

- **Subscription permit.** These include updates for subsequent 12 months. It is assumed that a typical user is a SOLAS class ship, which is required to use up-to-date charts.
- **One-Off permit.** These include only updates up to the issue date of the permit. It is assumed that a typical user is a non-SOLAS class ship, which is not required to use up-to-date charts.

Each permit also includes the expiry date. The expiry date of a permit controls the ENC-to-SENC conversion. If the issue date of a chart or update is older or equal to the permit expiry date, then the system can convert an ENC into the SENC. There are no viewing time limits as used in some other security systems such as ARCS. The user has a right to view a chart forever and more over he has a right to convert a chart from its ENC format into SENC.

An RENC can issue permits in two formats:

- **"*.pmt" format.** This format does not include the applicable chart edition nor does it include applicable permit type.
- **PERMIT.TXT format.** This format includes the applicable chart edition as well as applicable permit type.

Both permit formats are fully operational, but the older "*.pmt" format creates confusion because it cannot support the user when chart edition changes.

The system displays warnings associated with expiry date. Examples are "will expire" warning 30 days before the expiry date and "have expired" after the expiry date. These warnings are relevant only for Subscription permits. Only the new PERMIT.TXT format has support to suppress irrelevant warnings associated with expiry date.

8.6.3 Product list

A Product List is maintained by an RENC. You can retrieve the Product List from an RENC via telecommunications or you can load it from the CD-ROM of an RENC. This list contains an up-to-date list of available charts and their edition/update status in an RENC. When you load a CD-ROM or use telecommunications to receive a Product List from an RENC, the ECDIS checks the issue date of the Product List. If the issue date indicates a newer Product List, then it is copied into the ECDIS. If the issue date indicates an older Product List, then ECDIS shows a notice to the user that newer Product List is already loaded.

8.6.4 Authentication

Normally the authentication process is invisible to the user. Only if the authentication fails, then the user gets a notice. From a user point of view, the authentication is similar to the CRC checksum test. If the CRC checksum test or authentication fails, then the chart is unusable.

Authentication uses a private key and a public key. A digital signature associated with each chart contains a private key. A public key is stored in the ECDIS and it is truly public. RENC may publish a new public key. This public key will be available as text by fax, by post, by front page of a newspaper, etc. and as a text file, for example, PRIMAR.PUB.

8.6.5 CD-ROM service

If you are using a CD-ROM service, you receive the following from an RENC:

- Base CD-ROM that contains all available Base cells in an RENC CD-ROM database when the CD-ROM was released.
- Update CD-ROM that contains all updates to the Base CD-ROM, but it will also contain any new Base cells and new edition and re-issues received from the contributing Hydrographic Offices. Update CD-ROM will be issued once a week.

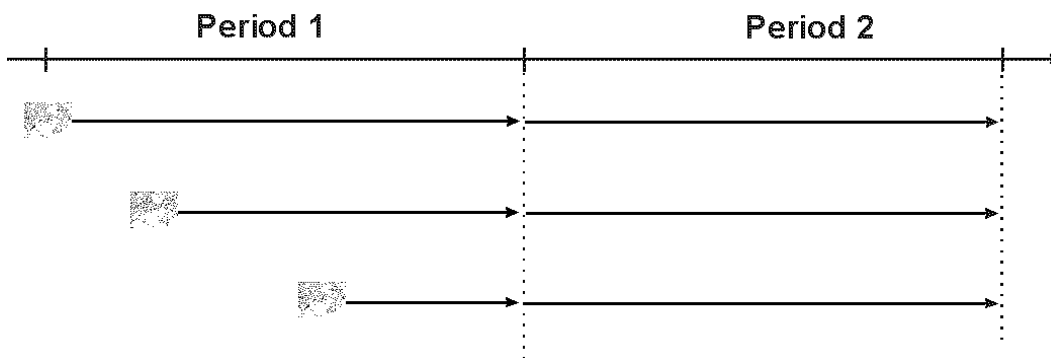
If you want to enlarge your chart coverage, you have to contact your distributor to order more permits for new charts.

8.6.6 Subscription types

Charts and their updates stored in RENC are decrypted and you have to get a key (permit) to load charts into the ECDIS. There are two different kinds of permits: subscription and one-off.

Subscription period is 12 months and it starts when you order first permit(s) from an RENC.

- User subscribes to an updating service
- Updating service has a renewable expiration date
- ENC is still available after expiration, but cannot apply any new information
- User will receive the following during the service period:
 - All updates issued to the ENC
 - Any re-issues for the ENC
 - Any new edition of the ENC



If you enlarge your chart coverage during your subscription period as shown above, the date of subscription expiration for all charts will be the same date.

One-Off

In the one-off permit, you order permit for chart and updates that are valid until date you order permit (i.e., chart is up-to-date when you ordered it). No more information can be retrieved for this chart, which is published after order date.

One-Off Current Edition: Permit for a chart that is based on data on the hard disk of the ECDIS.

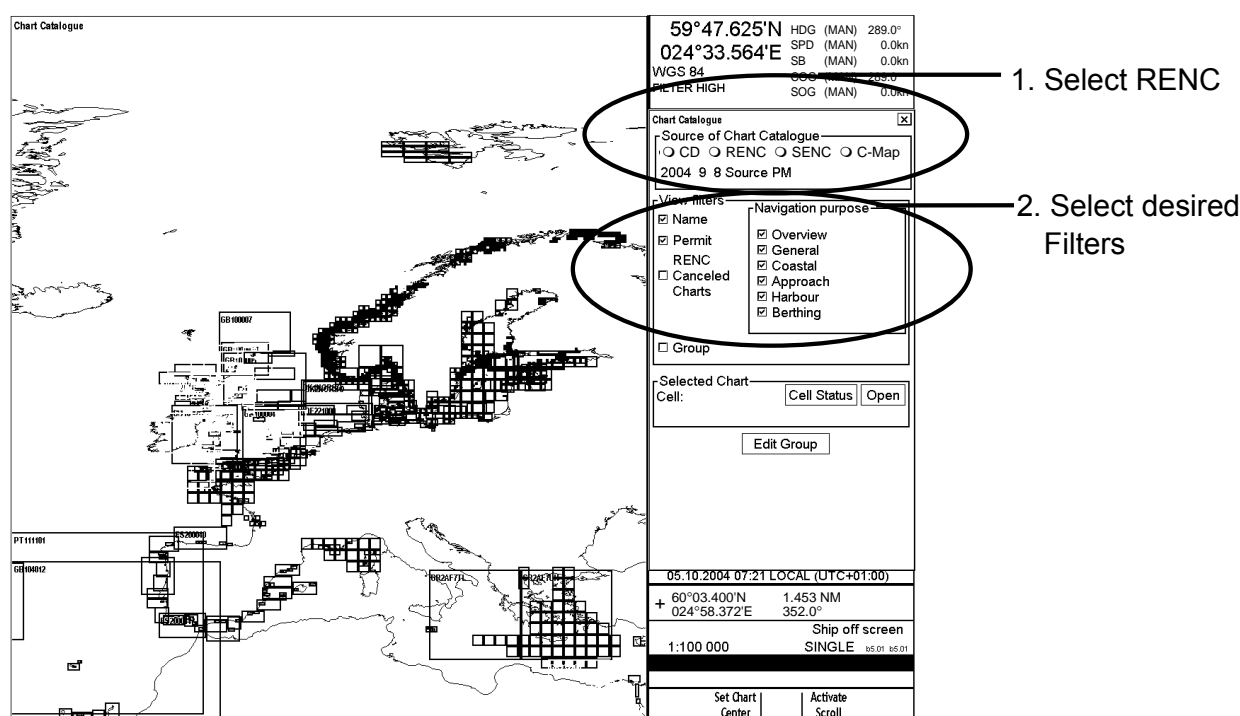
One-Off Latest Edition: Permit for a chart that is the latest available based on the Product List of an RENC.

8.6.7 Services provided by an RENC

How to display the coverage of an RENC service

To view the Product List in graphical presentation, use the catalogue, which you may display by opening the Chart menu and choosing Chart Catalogue. The catalogue of S57 charts shows when you last ordered the Product List from an RENC or loaded the latest Base or Update CD-ROM into the ECDIS.

Note: The ECDIS automatically keeps the latest available Product List. Thus the ECDIS does not load the Product List if it is older than the one already loaded into the ECDIS.



The chart limit boxes are color-coded as follows:

- Green** The chart is available for use in SENC format. If the source of the chart is an RENC, then the chart is also up-to-date. If the source of the chart is something other than an RENC, then all loaded updates are included into the SENC.
- Orange** The chart is available for use in SENC format but the chart is either NOT up-to-date or has been cancelled. Either the SENC is from a previous edition, the latest SENC update was missed or the chart has been cancelled.
- Red** If the chart is permit free, you do not have it available for use in SENC format and thus you cannot use the chart currently.
If the chart requires a permit and you do not have the permit for the chart, you cannot use the chart currently.
- Blue** The chart is available either in ENC format, in SENC format for another software version or in SENC format for another ECDIS. For example the chart is blue during SENC conversion and if you loaded a chart into the ECDIS and the system could not convert the chart into SENC format.
- Magenta** You have a permit to use the chart, but the chart is not available in SENC format and thus you cannot use the chart currently.

8.6.8 How to find up-to-date status of a chart from an RENC

To keep charts up-to-date, you should check for updates with an RENC weekly. The ECDIS compares charts used to Product List of an RENC. If a Permanent Warning appears on the chart display of ECDIS (at the upper left corner), this means that the charts used were checked against the Product List and at least one of the charts used is not up-to-date. See the Permanent Warning below.

Permanent Warning

SSE 27: At least one of used charts is not up-to-date. Get or load latest updates from your RENC service. Use Chart Menu - Set Chart viewing dates to check charts

The information of available charts and their up-to-date status is available both in the catalogue and in the Chart viewing dates window.

The easiest method to check if charts are up-to-date is to view the catalogue and check that the names of all required charts appear in green. The names of charts that are NOT up-to-date appear in orange. See "How to display the coverage of an RENC service" in section 8.6.7.

You can also use the Chart viewing dates window in the Chart menu when you have doubt that some charts are not up-to-date or the Permanent Warning shown above is displayed.

The screenshot shows the 'Chart viewing dates' window. It contains a table with columns: Cell ID, RENC edt/upd, SENC edt/upd, Updates Displ. until, and Updates Approv. until. Below the table are summary statistics, date input fields, and checkboxes.

Cell ID	RENC edt/upd	SENC edt/upd	Updates Displ. until	Updates Approv. until
GB40344A	19/ 1 >>>	17/ 4	2005 1 3 (-)	2005 1 3 (-)
GB40344B	24/ 1 >>>	18/ 0	2005 1 3 (-)	2005 1 3 (-)
GB40344E	10/ 2 >>>	9/ 0	2005 1 3 (-)	2005 1 3 (-)
GB40346A	13/ 3 >>>	12/ 3	2005 1 3 (-)	2005 1 3 (-)
GB40364A	6/ 3 >>>	5/ 1	2005 1 3 (-)	2005 1 3 (-)
GB40401S	-/ -	3/ 0	2005 1 3 (-)	2005 1 3 (-)
GB40484A	2/ 0	2/ 0	2005 1 3 (-)	2005 1 3 (-)
GB40484B	6/ 0 >>>	5/ 0	2005 1 3 (-)	2005 1 3 (-)
GB40484C	2/ 2 >>>	2/ 0	2005 1 3 (-)	2005 1 3 (-)
GB40484H	2/ 0 <<<	3/ 0	2005 1 3 (-)	2005 1 3 (-)
GB40486A	1/ 0	1/ 0	2005 1 3 (-)	2005 1 3 (-)
GB40502A	1/ 0	1/ 0	2005 1 3 (-)	2005 1 3 (-)
GB40502E	Cancelled XXX	16/ 4	2005 1 3 (-)	2005 1 3 (-)
GB40504A	1/ 2 >>>	1/ 1	2005 1 3 (-)	2005 1 3 (-)
GB40522A	Cancelled XXX	1/ 0	2005 1 3 (-)	2005 1 3 (-)
GB40582A	3/ 0 >>>	2/ 1	2005 1 3 (-)	2005 1 3 (-)
GB40582C	3/ 0 >>>	2/ 0	2005 1 3 (-)	2005 1 3 (-)
GB40584A	2/ 0 >>>	1/ 1	2005 1 3 (-)	2005 1 3 (-)
GB40584B	2/ 0 >>>	1/ 0	2005 1 3 (-)	2005 1 3 (-)
GB40612A	Cancelled XXX	1/ 0	2005 1 3 (-)	2005 1 3 (-)
GB40622A	1/ 2	1/ 2	2005 1 3 (-)	2005 1 3 (-)
GB40642A	3/ 0 >>>	1/ 0	2005 1 3 (-)	2005 1 3 (-)
GB40642B	8/ 1 >>>	4/ 0	2005 1 3 (-)	2005 1 3 (-)
GB40682A	2/ 0 >>>	1/ 0	2005 1 3 (-)	2005 1 3 (-)
GB40682B	7/ 4 >>>	6/ 0	2005 1 3 (-)	2005 1 3 (-)
GB40722D	2/ 1	2/ 1	2005 1 3 (-)	2005 1 3 (-)

Summary statistics:

Latest RENC Product List	2004 11 24	Source PM
Oldest date	2005 1 3	2005 1 3
Newest date	2005 1 3	2005 1 3
Manual Updates	2005 1 3	2005 1 3

Display Until: 05 Jan 2005 Approve Until: 05 Jan 2005

Sync Manual Update Dates

All SENCs

Manual Update Dates

Interpreting the chart viewing date window

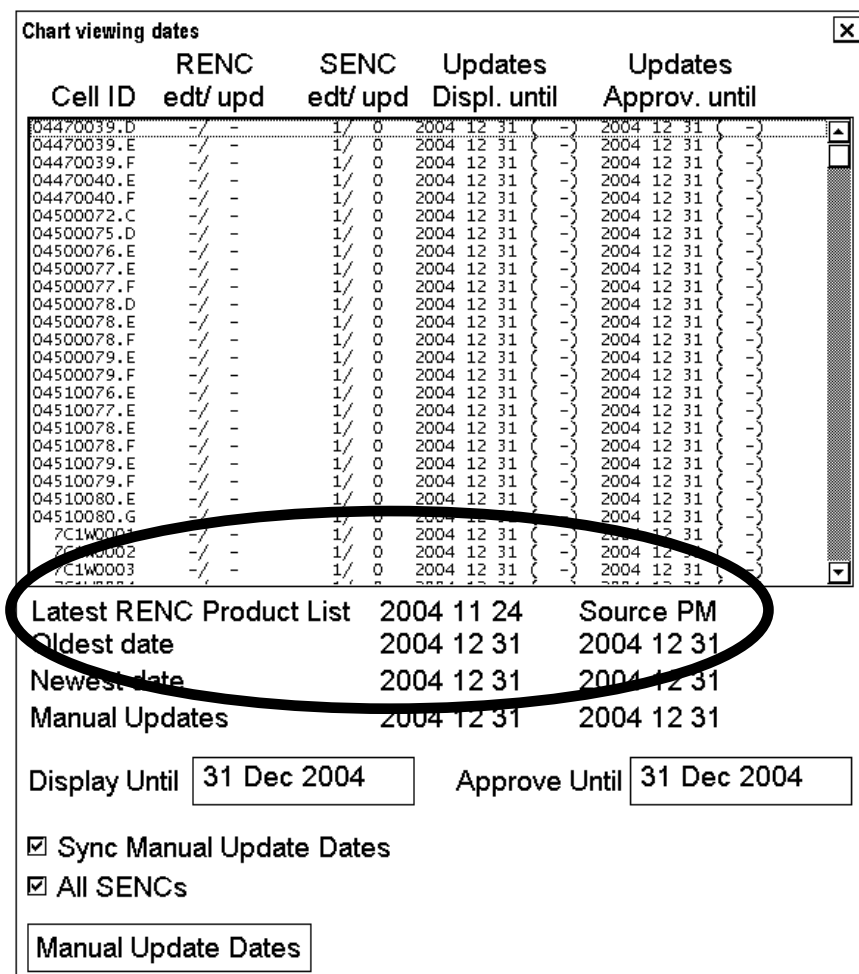
1. RENC edt / upd: The chart's edition and its update in an RENC appear here. The information is based on the last-ordered Product List.
2. SENC edt / upd: The chart's edition and its update in the ECDIS appear here.
3. If a chart is not available in an RENC but it is in the ECDIS the RENC edt/upd shows "- / -".
4. If a chart in the ECDIS is newer than the associated chart in an RENC, for example, the Chart viewing date window the RENC edt/upd field shows "2/ 8" and the SENC edt/ upd field shows "2/ 9".
5. Chart Displayed and Approved Until are set based on Updates number (Updates Displayed and Approved until as NVLD (Not Valid) indication).
6. If a chart in the ECDIS is older than the associated chart an RENC, for example, the RENC edt/upd field shows "1/ 21" and the SENC edt/ upd field shows "1/ 0".

8.6.9 How to find up-to-date status of an RENC Product List

The ECDIS periodically checks for the last time you ordered the Product List from an RENC. If the Product List is more than 30 days old, the ECDIS displays the S57 Message shown below:



To check the date when you last ordered the Product List of RENC, select "Chart viewing dates" from the Chart menu.



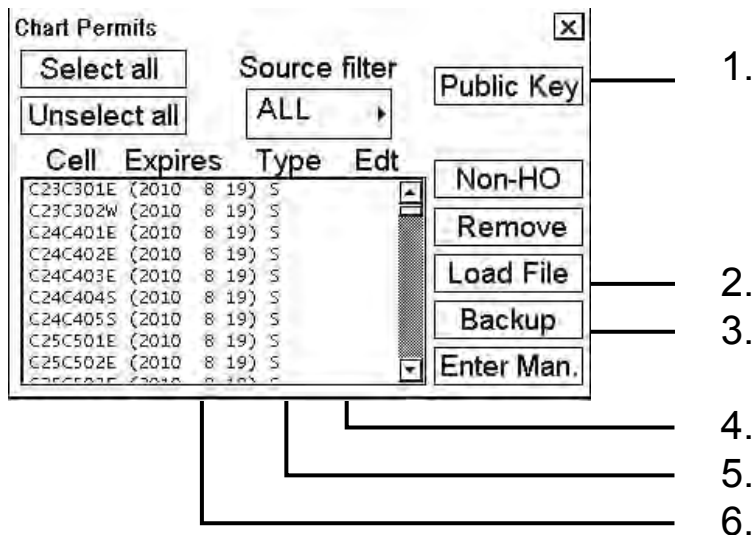
The date the Product List was last ordered is shown at the lower left corner of the Chart viewing dates window.

8.6.10 How to manage permits from an RENC

Permits are used to control the right to use a chart in the ECDIS. A permit in an RENC ENC service is connected to the edition of a chart. Permits are issued in two different types:

- **Subscription permit:** This type of permit includes updates for subsequent 12 months.
- **One-Off permit:** This type of permit includes only updates up to the issue date of the permit.

The expiry date of a permit controls the loading of Base charts and their updates to the ECDIS. The ECDIS will warn you when you are loading charts or updates that are issued less than 30 days before the expiration date of a permit. If a permit has expired, it is impossible to load a chart or its update that was issued after the expiration date of the permit. The user has a right to view a chart forever, but it will not complete the requirements for having up-to-date charts. To view the Chart Permits window, open the Chart menu and select Chart Permits.



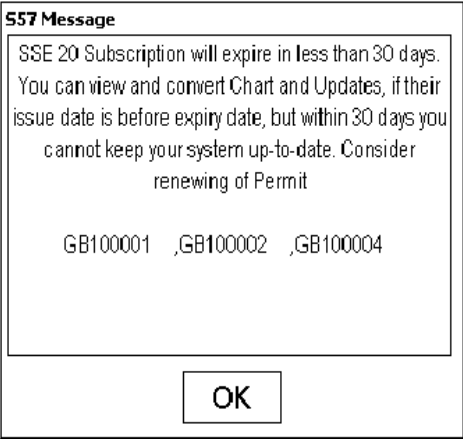
Description of the chart permits window

1. **Public Key** lets you view a public key or load a new one.
2. **Load File** enables downloading from an RENC when you receive permits from that RENC.
3. **Backup** makes a back-up copy of permits.
4. The **Edt** (Edition) field displays edition number of a chart to which the permit is valid. Note that when a new edition of a chart is issued a new permit is required. It is possible to have permits for different editions of the same chart.
5. The **Type** column shows type of permit held for a chart: S, Subscription or O, One-off.
6. The **Expires** column shows the expiration date of permits. All subscription-type permits will expire on the same date.

Subscription warnings

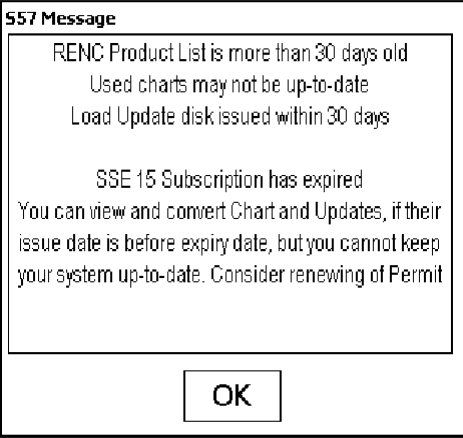
If you have at least one subscription-type permit, the system will automatically warn you about the expiration date of your subscription license.

Warning about soon-to-be-expired subscription is activated every 12 hours when it is less than 30 days from the expiration date.



Warning about expired subscription is activated every 12 hours after the subscription has expired.

Note: The top half of this message display provides a warning that the Product List is not up-to-date.



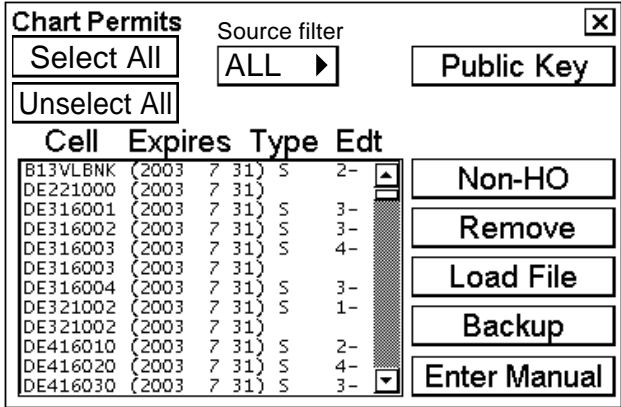
8.6.11 How to manage public key from an RENC, JHA

The procedure below shows how to manage a public key. There are two types of public keys:

- RENC: Primar, AVCS (file name: PRIMAR.PUB)
- JHA (file name: IHO.PUB)

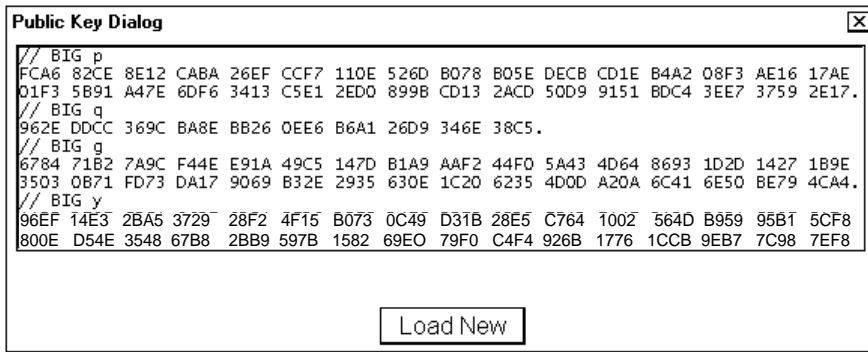
You must load a public key when you load a chart.

1. Select Chart Permits from the Chart menu.

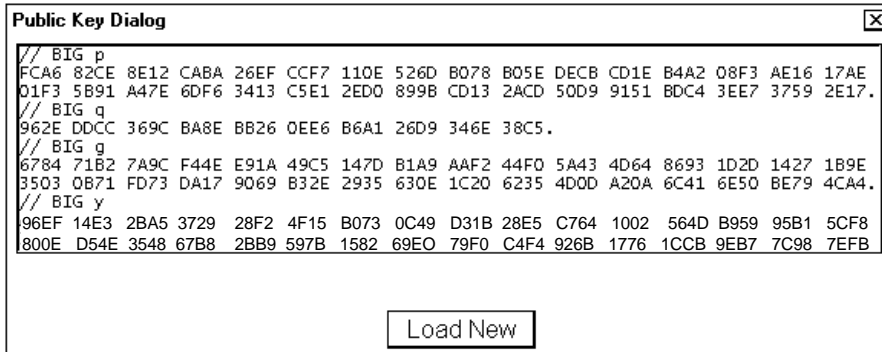


2. Click the **Public Key** button to show the Public Key Dialog box.

8. Vector Chart Material

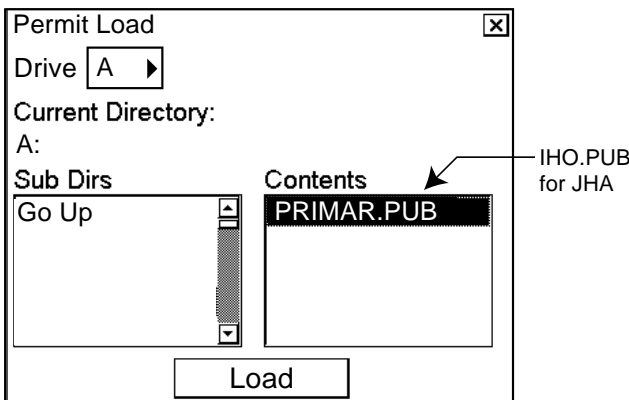


Public key dialog box for PRIMAR, AVCS

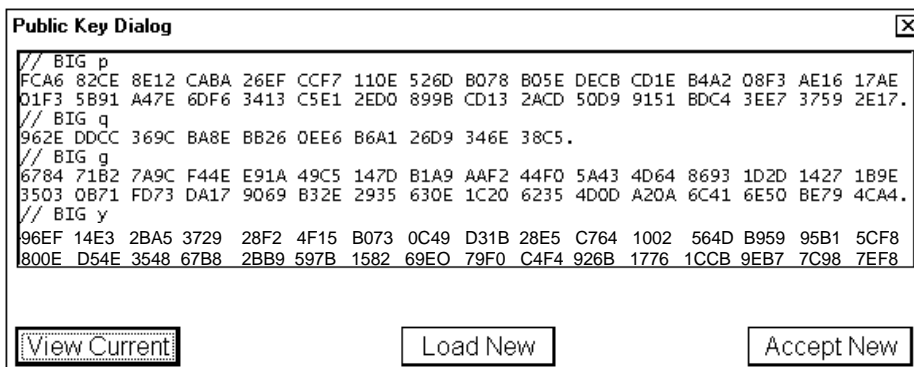


Public key dialog box for JHA

- Insert the floppy disk/CD-ROM/USB memory that contains the public key then click the **Load New** button to load a new public key. The "Permit load" dialog box appears.



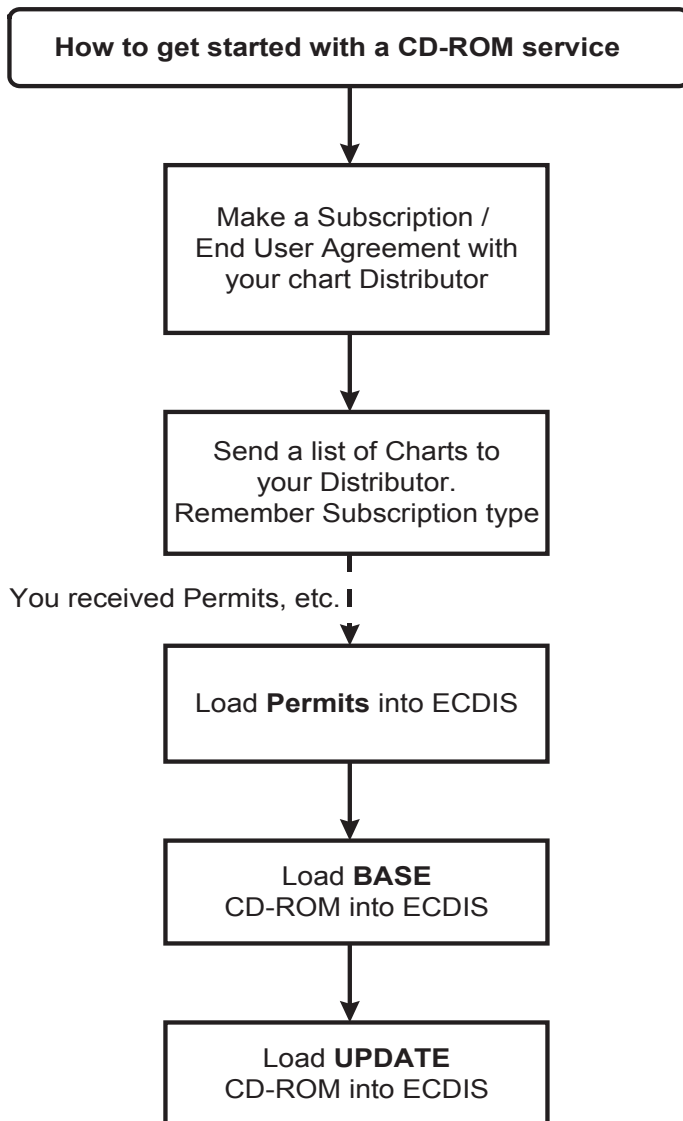
- Select "PRIMAR.pub" (or IHO.PUB) from the Contents window then click the **Load** button. The Public Key Dialog box appears, showing the contents loaded to the ECDIS.



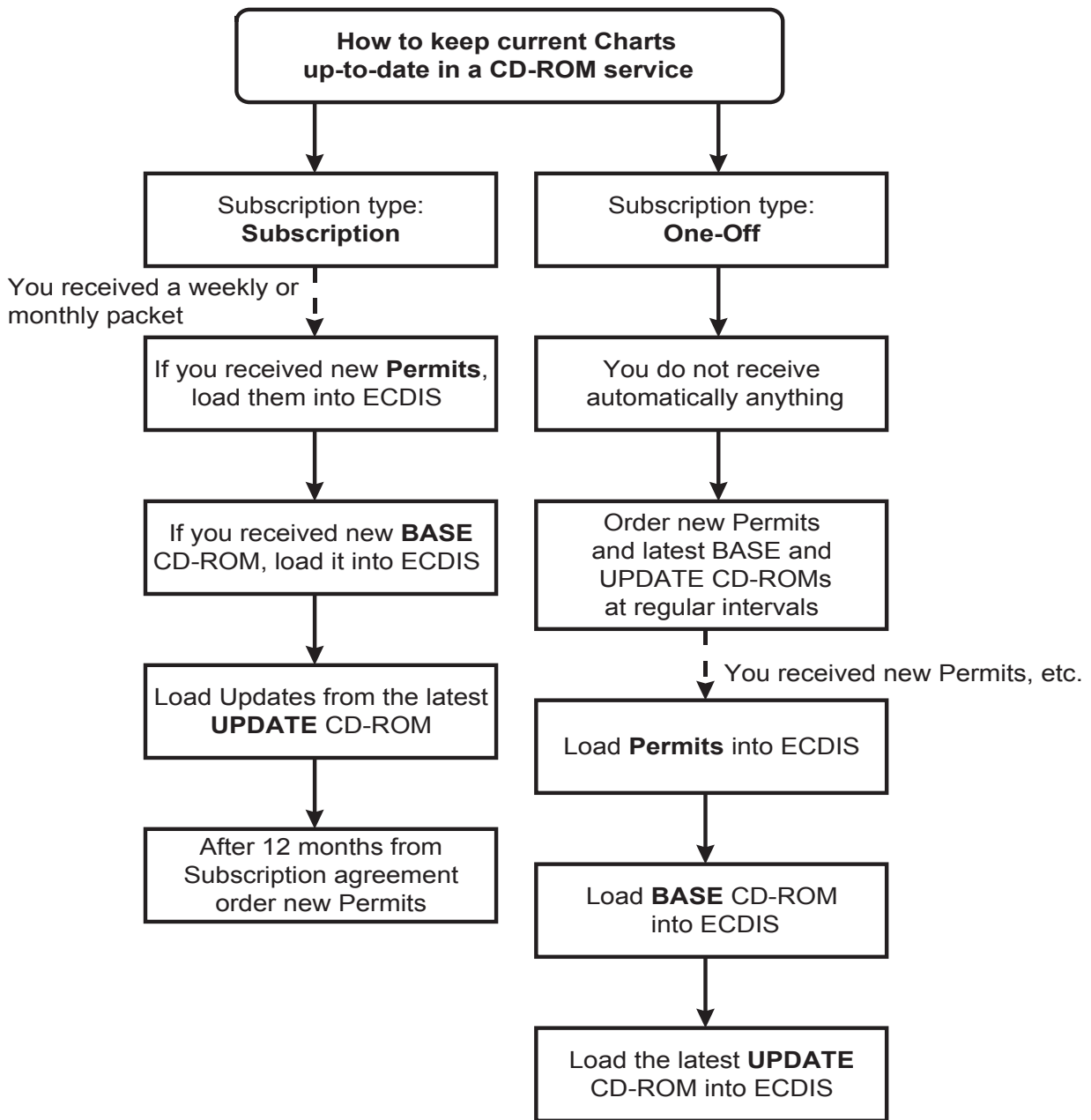
- To accept the contents, click the **Accept New** button to accept the new public key. (Click the X button if you don't accept.)

8.7 CD-ROM Service From an RENC

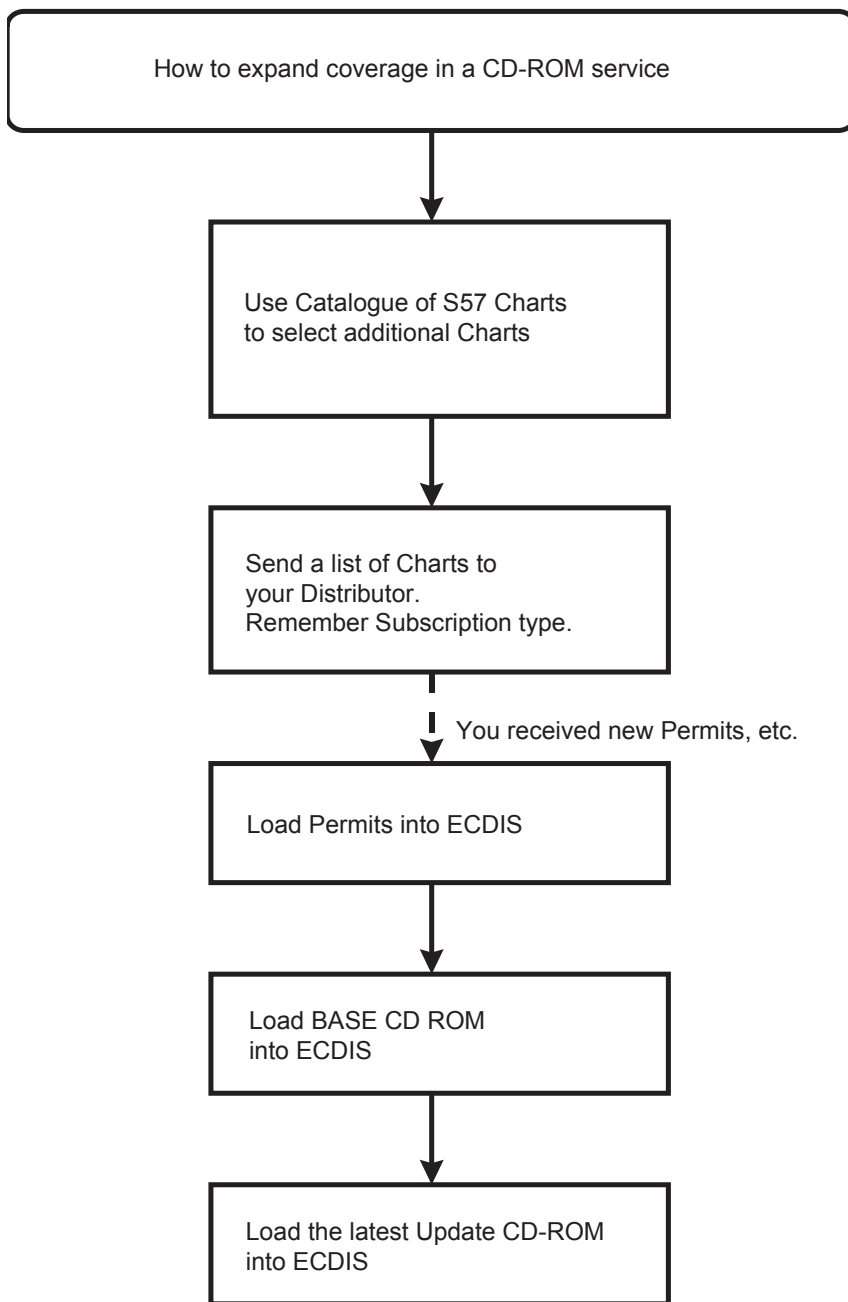
8.7.1 Flow table for how to get started with RENC-provided S57 charts



8.7.2 How to keep RENC-provided S57 charts up to date



8.7.3 How to expand chart coverage with an RENC

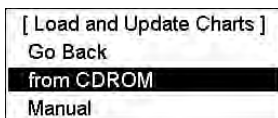
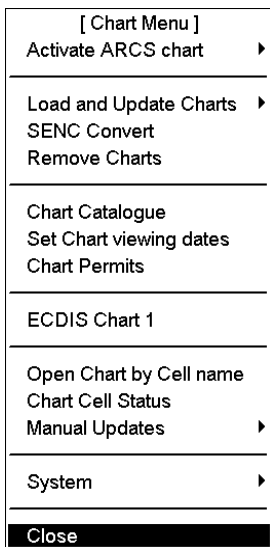


8.7.4 Base CD-ROM from an RENC

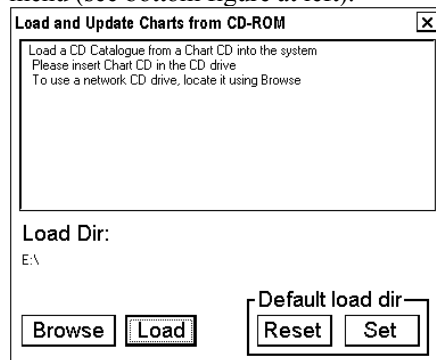
A Base CD-ROM from an RENC contains all the charts stored in an RENC when the CD-ROM was issued. When you load charts (using the CD-ROM catalogue) the following information is also loaded into the ECDIS hard disk:

- The Content Summary of the Base CD-ROM
- Publisher Notes
- Product List

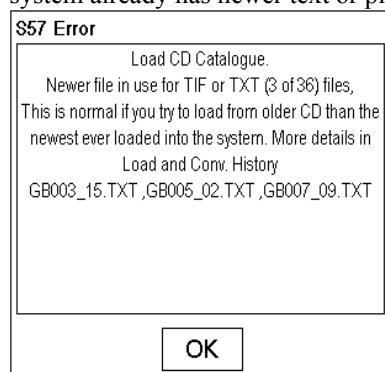
When you receive a new Base CD-ROM from an RENC, first load the Public Key, then load charts into the ECDIS as follows:



1. Insert CD-ROM or floppy disk in respective drive, or connect USB memory. Spin the scrollwheel to show Menu/Info/Chart Menu in the mouse functions area then push the right mouse button.
2. Select Load and Update Charts from the menu and "from CD-ROM" from the sub menu (see bottom figure at left).



3. Click the **Load** button to load from a CD-ROM. (If you want to load from another ECDIS using LAN, you have to change Load Dir. Click the **Browse** button to select a new Load Dir.)
4. The ECDIS loads content summary, publisher notes and Product List from the CD-ROM then opens the Load or Update Charts from CD-ROM dialog box. The system automatically copies all text and pictures files associated with charts from the CD-ROM catalogue. The system keeps only the latest version of these. If your system already has newer text or pictures in use, you will get the notice below.



- In the Load or Update Charts from loaded CD-ROM window, select the charts to load into the ECDIS, then click the **Load** button to load charts into the ECDIS.

Chart Catalogue

59°14.110'N HDG (MAN) 289.0°
 022°56.441'E SPD (MAN) 0.0kn
 WGS 84 SB (MAN) 0.0kn
 DGPS COG (MAN) 289.0°
 SOG (MAN) 0.0kn

Load or Update Charts from loaded CD-ROM

CD JP VV13 2000 3 30

Source JP Week 13 Date 2000 3 30

Charts available in: E:\ENC_ROOT\

Chart	Edition	Update
JP344NC96	1	4
JP344NC9K	1	2
JP3403B0	1	3
JP3403B6	1	4
JP3403B6	1	12
JP3403B6	1	7

Load selectors

Name Navigation purpose

Permit Overview

Canceled General

Charts Coastal

Group Approach

Missing only Manual selection Harbour

Berthing

View CD-ROM Publisher Notes

View CD-ROM content Summary

Load and Conv. History Remove

Load Edit Group

+ 60°03.400'N 1.453 NM
 024°58.372'E 352.0°

TM reset off

1:500 000 SINGLE ds.01 ds.01

Set Chart Activate
 Center Scroll

- Before ECDIS starts loading charts (then automatically converts them into SENC format) you are asked to confirm this operation. Click the **Yes** button.

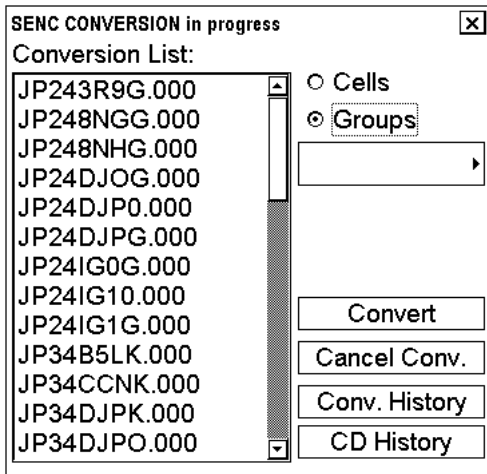
Load from CD

Loading may take time and prevent monitoring. Click OK to continue.

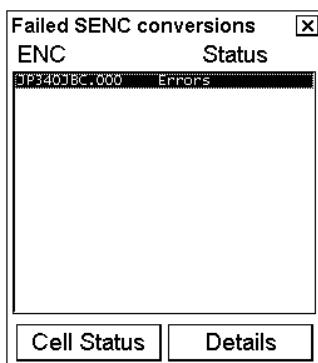
OK Cancel

8. Vector Chart Material

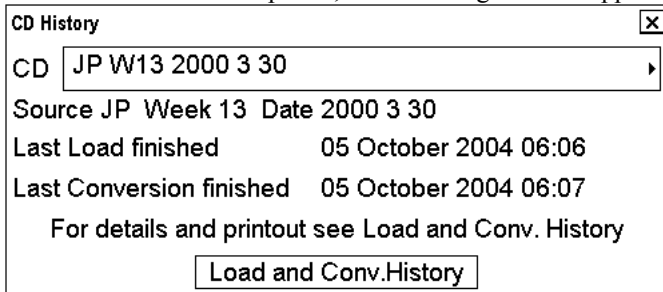
7. The SENC CONVERSION window appears. Charts are loaded into ECDIS then automatically converted to SENC format.



8. If an error is detected during conversion from ENC to SENC, the following window appears. To find the reason, click the **Details** button.



9. When conversion is completed, the following window appears.



For more information, see the section " How to display load history of CD-ROM" on page 8-12.

How to interpret load or update charts from loaded CD-ROM window

The screenshot shows the 'Chart Catalogue' window. On the left is a map of Japan with a grid of chart cells labeled with identifiers like JP41600, JP24050, etc. On the right is a control panel. At the top, it displays coordinates (59°14.110'N, 022°56.441'E) and various parameters (HDG, SPD, SB, COG, SOG). Below this is a section titled 'Load or Update Charts from loaded CD-ROM' with a dropdown menu showing 'CD JP W13 2000 3 30' and 'Source JP Week 13 Date 2000 3 30'. A table lists charts with columns for Chart, Edition, and Update. Below the table are 'Load selectors' including Name, Permit, RENC, Group, and Missing only. There are also buttons for 'View CD-ROM Publisher Notes', 'View CD-ROM content Summary', 'Load and Conv. History', 'Remove', 'Load', and 'Edit Group'. At the bottom, it shows scale (1:500 000) and other settings.

1. The source and edition date of the CD is displayed here.
2. A list of charts stored in the CD-ROM, edition number of the chart and the number of updates included in the chart.
3. In the **Load Selectors** field, you can select how to pick desired charts from the list:
 - **Name:** ECDIS displays chart names on graphical presentation if selected.
 - **Permit:** ECDIS highlights the charts that are available in the CD-ROM and for which you have permits.
 - **RENC Canceled Charts:** ECDIS displays charts on display that are canceled on RENC and normally on CD-ROM.
 - **Group:** If you have predefined a group of charts, ECDIS will highlight those charts in the group that are available in the CD-ROM.
 - **Manual selection:** You can highlight desired charts from the list.
 - **Missing only:** Loads and display on graphical presentation only charts and their updates that are not already loaded into the ECDIS.
4. **View CD-ROM Publisher Notes** button: View important notices published by the chart producer.
View CD-ROM content Summary button: List charts available on CD-ROM.
Load and Conv. History button: Check what is loaded and converted from the CD-ROM.
Remove button: Remove the CD-ROM catalogue permanently from the ECDIS.
5. The **Edit Group** button is used to create and modify a group. See section 8.5.5 "How to group S57 chart cells".
6. The **Load** button starts loading.

8.7.5 How to load an update CD-ROM from an RENC

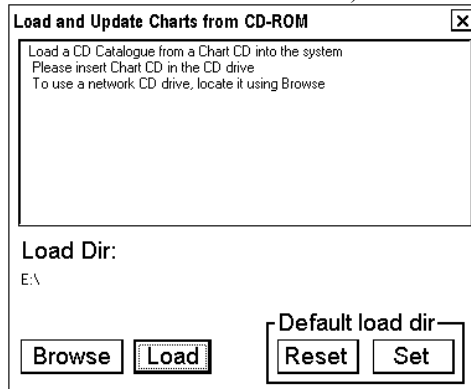
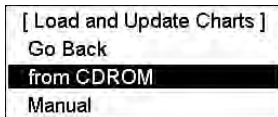
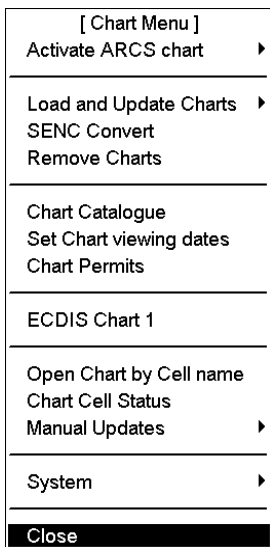
An Update CD-ROM from an RENC contains all the updates included for charts stored in an RENC when the latest Base CD-ROM was issued. When you load charts by a CD-ROM catalogue the following information is also loaded into the ECDIS hard disk:

- The Content Summary of the Update CD-ROM
- Publisher Notes
- The Product List

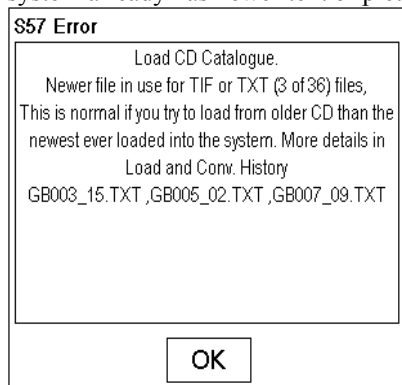
How to load an update CD-ROM from an RENC

When you receive a new Update CD-ROM from an RENC, first check that you have the correct Public Key, then load charts into the ECDIS as follows:

1. Insert CD-ROM, floppy disk or USB memory. Spin the scrollwheel to show Menu/Info/Chart Menu in the mouse functions area then push the right mouse button.
2. Select Load and Update Charts from the menu and "from CD-ROM" from the sub menu (see bottom figure at left). The default load source is from CD-ROM.
3. Click the **Load** button to load from a CD-ROM. (If you want to load from another ECDIS using LAN, you have to change Load Dir. Click the **Browse** button to select a new Load Dir.)



The ECDIS loads content summary, publisher notes and Product List from the CD-ROM then opens the Load or Update Charts from CD-ROM dialog box. The system automatically copies all text and pictures files associated with charts from the CD-ROM catalogue. The system keeps only the latest version of these. If your system already has newer text or pictures in use, you will get the notice below.



- In the Load or Update Charts from loaded CD-ROM window (see page 8-10), select the charts to load into the ECDIS, then click the **Load** button to load charts into the ECDIS.

Chart Catalogue

59°14.110'N HDG (MAN) 289.0°
 022°56.441'E SPD (MAN) 0.0kn
 WGS 84 SB (MAN) 0.0kn
 DGPS COG (MAN) 289.0°
 SOG (MAN) 0.0kn

Load or Update Charts from loaded CD-ROM [X]

CD JP W13 2000 3 30

Source JP Week 13 Date 2000 3 30
 Charts available in: E:\ENC_ROOT\

Chart	Edition	Update
JP340396	1	1
JP340397	1	1
JP340398	1	1
JP340399	1	1
JP340400	1	1
JP340401	1	1
JP340402	1	1
JP340403	1	1
JP340404	1	1
JP340405	1	1
JP340406	1	1
JP340407	1	1
JP340408	1	1
JP340409	1	1
JP340410	1	1
JP340411	1	1
JP340412	1	1
JP340413	1	1
JP340414	1	1
JP340415	1	1
JP340416	1	1
JP340417	1	1
JP340418	1	1
JP340419	1	1
JP340420	1	1
JP340421	1	1
JP340422	1	1
JP340423	1	1
JP340424	1	1
JP340425	1	1
JP340426	1	1
JP340427	1	1
JP340428	1	1
JP340429	1	1
JP340430	1	1
JP340431	1	1
JP340432	1	1
JP340433	1	1
JP340434	1	1
JP340435	1	1
JP340436	1	1
JP340437	1	1
JP340438	1	1
JP340439	1	1
JP340440	1	1
JP340441	1	1
JP340442	1	1
JP340443	1	1
JP340444	1	1
JP340445	1	1
JP340446	1	1
JP340447	1	1
JP340448	1	1
JP340449	1	1
JP340450	1	1
JP340451	1	1
JP340452	1	1
JP340453	1	1
JP340454	1	1
JP340455	1	1
JP340456	1	1
JP340457	1	1
JP340458	1	1
JP340459	1	1
JP340460	1	1
JP340461	1	1
JP340462	1	1
JP340463	1	1
JP340464	1	1
JP340465	1	1
JP340466	1	1
JP340467	1	1
JP340468	1	1
JP340469	1	1
JP340470	1	1
JP340471	1	1
JP340472	1	1
JP340473	1	1
JP340474	1	1
JP340475	1	1
JP340476	1	1
JP340477	1	1
JP340478	1	1
JP340479	1	1
JP340480	1	1
JP340481	1	1
JP340482	1	1
JP340483	1	1
JP340484	1	1
JP340485	1	1
JP340486	1	1
JP340487	1	1
JP340488	1	1
JP340489	1	1
JP340490	1	1
JP340491	1	1
JP340492	1	1
JP340493	1	1
JP340494	1	1
JP340495	1	1
JP340496	1	1
JP340497	1	1
JP340498	1	1
JP340499	1	1
JP340500	1	1

Load selectors

Name Overview

Permit General

RENC Coastal

Canceled Approach

Charts Harbour

Berthing

Group

Missing only Manual selection

View CD-ROM Publisher Notes

View CD-ROM content Summary

Load and Conv. History Remove

Load Edit Group

+ 60°03.400'N 1.453 NM
 024°58.372'E 352.0°

TM reset off
 1:500 000 SINGLE 45.01 45.01

Set Chart Center | Activate Scroll

Before ECDIS starts loading charts (then automatically converts them into SENC format) you are asked to confirm this operation.

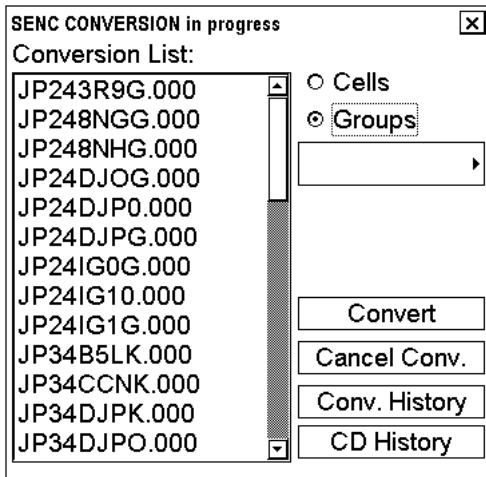
Load from CD

Loading may take time and prevent monitoring. Click OK to continue.

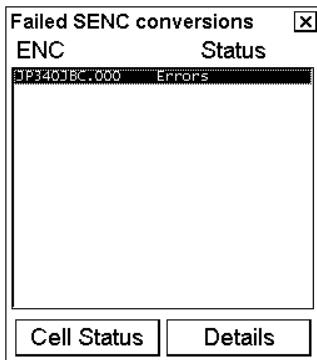
OK Cancel

8. Vector Chart Material

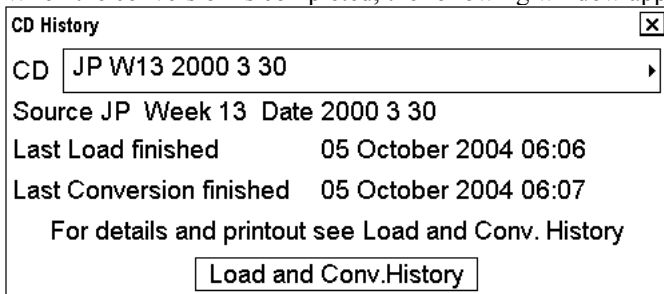
The SENC CONVERSION window appears. Charts are loaded into ECDIS then automatically converted to SENC format.



If an error is detected during conversion from ENC to SENC, the following window appears. To find the reason click the **Details** button.



When the conversion is completed, the following window appears.



For more information, see the section " How to display load history of CD-ROM" on page 8-12.

How to display coverage of a Base or Update CD-ROM from an RENC

Insert desired CD-ROM into CD-ROM drive. Open the Chart menu then select **Load or Update Charts** followed by **from CD-ROM**.

The screenshot shows the 'Chart Catalogue' software interface. On the left is a map of Europe with a grid of chart coverage cells. On the right is a control panel with the following sections:

- Navigation Data:**
 - 59°14.040'N HDG (MAN) 289.0°
 - 022°55.385'E SPD (MAN) 0.0kn
 - WGS 84 SB (MAN) 0.0kn
 - DGPS COG (MAN) 289.0°
 - SOG (MAN) 0.0kn
- Load or Update Charts from loaded CD-ROM:**
 - CD: RENC_BASE PM W48 2004 11 24
 - Source: PM Week 48 Date 2004 11 24
 - Charts available in: E:\RENC_ROOT\
- Chart List:**

Chart	Edition	Update
PL333030	9	0
- Load selectors:**
 - Name
 - Permit
 - Canceled Charts
 - Group
 - Missing only
- Navigation purpose:**
 - Overview
 - General
 - Coastal
 - Approach
 - Harbour
 - Berthing
- Buttons:** View CD-ROM Publisher Notes, View CD-ROM content Summary, Load and Conv. History, Remove, Load, Edit Group.
- Position and Scale:**
 - + 60°03.400'N 1.453 NM
 - 024°58.372'E 352.0°
 - TM reset off
 - 1:500 000 SINGLE 05.01 05.01
- Bottom Panel:** Select | Chart Menu

Sample coverage area when a CD-ROM catalogue is from a Base CD-ROM from an RENC

Note 1: Uncheck "Missing only" to see total content of CD-ROM.

Note 2: Check "Permit" to show only the cells that have a permit. These cells are colored magenta. Then, when you load a chart, only the cells that have a permit are loaded. During loading, these cells are colored blue. After the chart is SENC-converted, the color of the cells becomes green.

To show all cells, uncheck "Permit". Then, cells with permits are magenta and those without permits are red. When you load all cells, the color of all cells is blue. After SENC conversion, cells with permits are green and those without permits are blue.

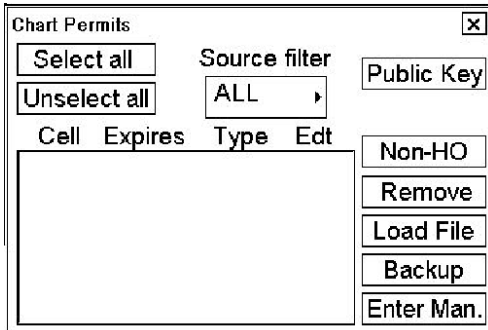
We recommend that you check "Permit" before loading a chart. This decreases loading time and you can soon know what cells can be used.

Note 3: When you update a chart, check "Missing only". The ECDIS loads only those cells that it does not already have. During the updating, cells are colored orange. After SENC conversion, the cells become green.

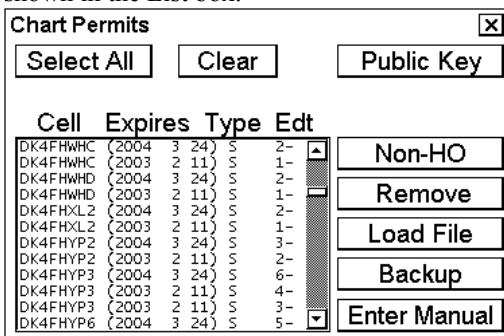
8.7.6 How to load an RENC-generated permit CD-ROM, floppy disk or USB memory

An RENC can deliver permits in a CD-ROM, floppy disk or USB memory. When you receive new permits from an RENC, you have to load them into the ECDIS. A permit is a key that is used to decrypt the chart you want to use in the ECDIS. To load permits, do the following:

1. Select Chart Permits from the Chart menu.

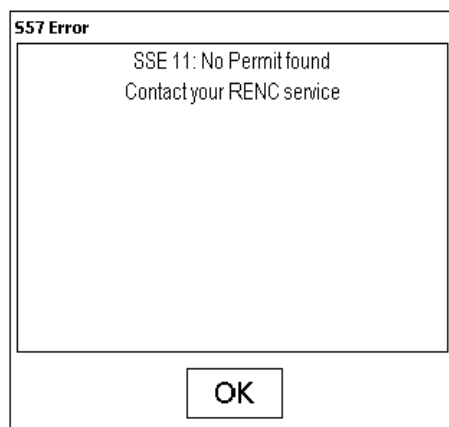


2. Click the **Load File** button.
3. Select CD-ROM from the Look-in box.
Permits are available in two formats.
 - **PERMIT.TXT** that contain permits and their editions and subscription types. This is the preferred format.
 - *.PMT, received from an RENC, contain permits, but no edition or subscription information. Note that the *.PMT format is used by the system for backup of permits. As a backup it contain also subscription type and edition.
 - Select suitable permit file and click the **Load** button to load permits.
4. The Chart Permits window displays permits that are loaded into the ECDIS. Check that all permit cells are shown in the List box.

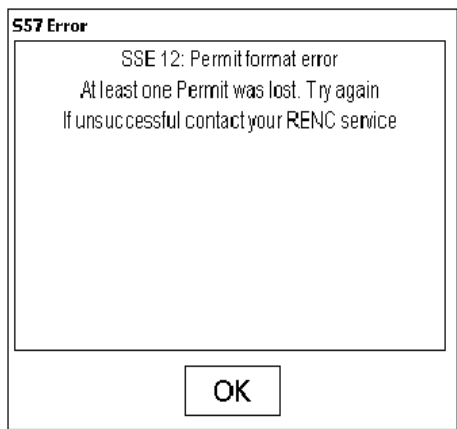


Messages that may appear when loading a permit

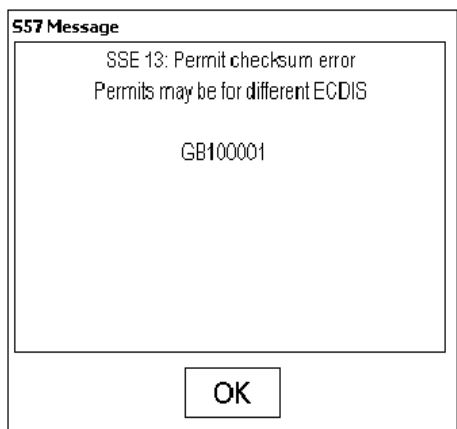
If you try to load a permit file that does not have any permit, you get the following message. Please contact RENC service to get new permit file.



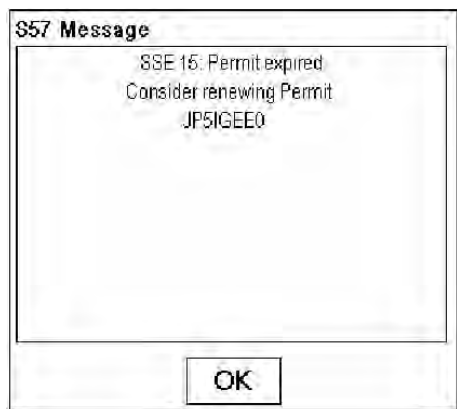
If one or more permit(s) has format error, you get the following message. Please contact RENC service to get the new permit file.



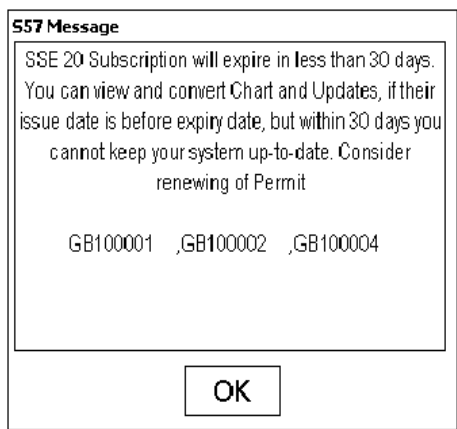
If you load permits from a different ECDIS, you get the following message. Check that you are loading permits to the correct ECDIS.



If you try to load expired permits, the following message appears.



Early warning of permits expiration.



8.8 RENC Security System

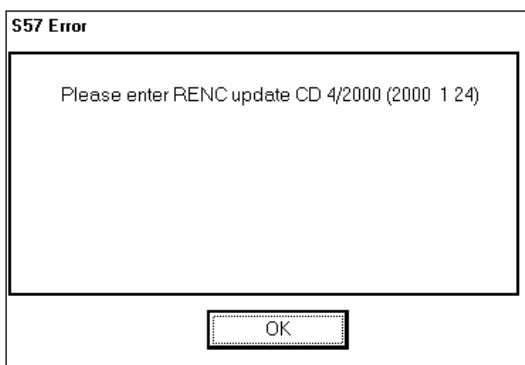
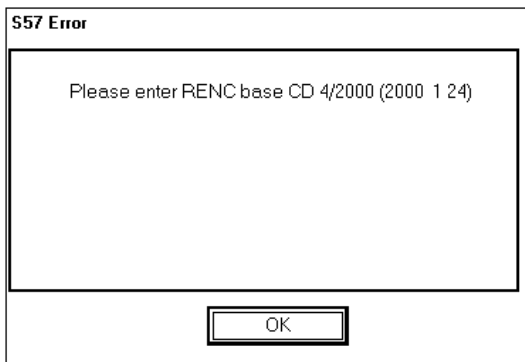
8.8.1 Standard messages in S57 chart load

When loading S57 charts into the ECDIS, messages appear to alert you to permits and authentication. These are described below and on the next several pages.

8.8.2 Additional messages in S57 chart load

Issue control of Base and Update CD-ROM from RENC

CD-ROMs from an RENC contain issue control. If you later use a CD-ROM catalogue created during loading of S57 charts, you get the following messages for a wrong CD-ROM.



Messages that contain only notice

If you tried to load charts for which you do not have permit, you will get this message:

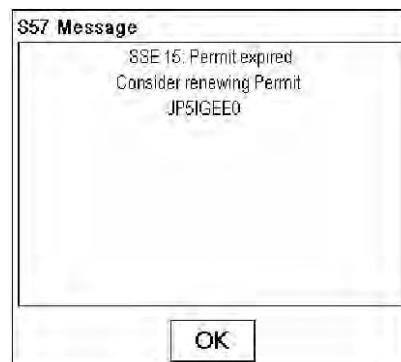


Messages that require careful attention

All messages in this section change the legal status of the charts in your system. Study these messages carefully because you may need to use paper charts to fulfil SOLAS requirements.

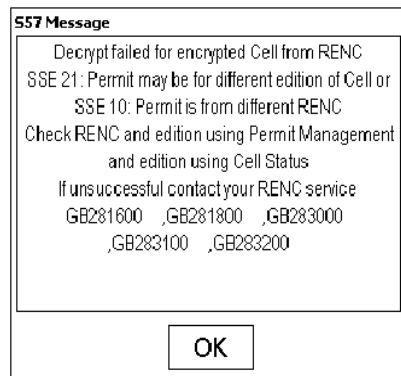
You do not have a valid permit

A chart was not converted into SENC because the permit for it has expired.



A chart was not converted into SENC because the permit is for a different edition.

You can check the edition of the permit with the Chart Permits window in the Chart menu and the edition of the chart with the Cell Status window.



A typical reason is that the chart has been updated too many times as a new edition instead of an update. Ask for new permits from your chart agent.

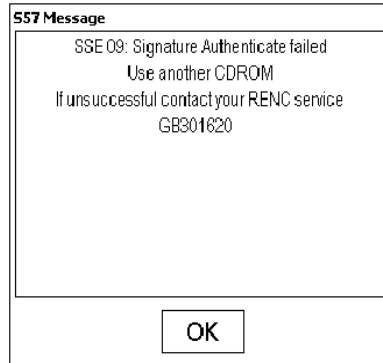
8. Vector Chart Material

Authentication of chart failed

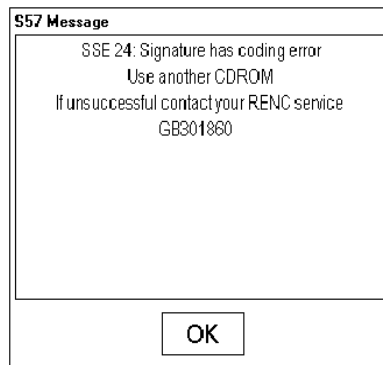
The chart was not loaded because of invalid Public key.



The chart was not loaded because of invalid Signature.



Coding error in Signature.



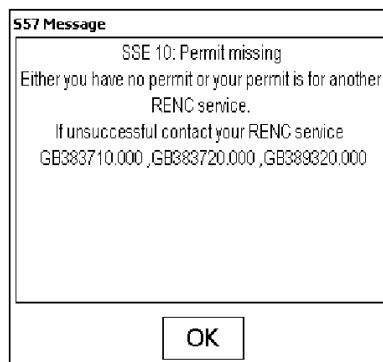
8.8.3 Standard messages in S57 SENC conversion

When converting S57 charts for use in the ECDIS, messages appear to alert you during the conversion. For details see section 8.4.5 "SENC conversion history log".

8.8.4 Additional messages in S57 SENC conversion

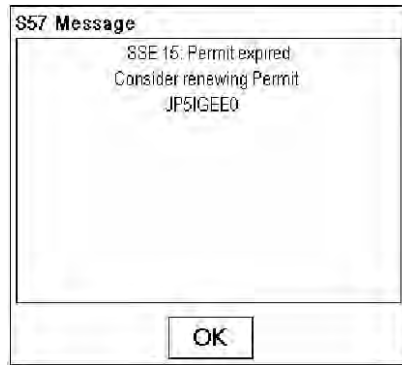
Messages that contain only notice

You do not have a permit.



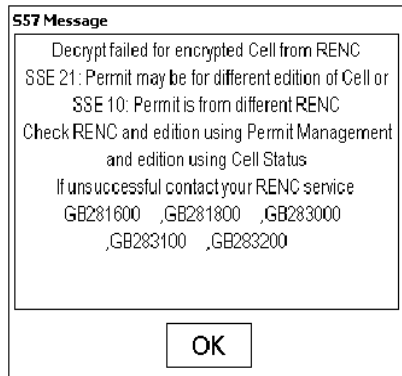
Messages that require careful attention

Permit for a chart has expired.



You have a permit, but it is valid for another edition of the cell or for another RENC service.

You can check the edition of the permit with the Chart Permits window and the edition of a chart with the Cell Status window, both in the Chart menu.



8.8.5 Changing service provider

If you change service provider for some reason, it is recommended that you remove all the charts from ECDIS before loading new charts of new service provider. See section 8.5.4 "How to remove S57 chart cells from the system".

8.9 Vector Chart Display

8.9.1 How to select the vector chart material to use

To activate S57 chart material onto the display, do the following:

1. Open the Chart menu then select Activate S57 chart.
2. Select Ignore Scale (show S57 chart in scale used previously to open an S57 chart) or Sync Scale (show S57 chart in same scale as ARCS chart).

8.9.2 How to select charts to view

How to select a chart from a catalogue

To select a chart for viewing from a catalogue, do the following:

1. Select Chart Catalogue from the Chart menu.
2. From the Chart Catalogue dialog box, use the cursor to select desired chart. See section 8.5.2 "Catalogue of S57 cells".
3. Click the **Open** button.

How to browse your charts

You may view S57 charts using different positions and different scales. The basic tools for browsing charts are **Range -**, **Range+**, **Set Chart Center**, **ShipOffcenter** and **TM/CU Reset**.

Activate Scroll allows you to look ahead from a place other than own ship's current position. Spin the scrollwheel to display Set Chart Center/Info/Activate Scroll in the mouse functions area. Put the cursor on a desired place on the chart then push the right mouse button. Keep the button pressed down while moving the cursor to desired place. Release right button to redraw the chart. You can repeat this operation until you have the desired area on the screen. When true motion reset is off, the indication "TM Reset off" or "Ship off screen" appears in the information area.

Set Chart Center allows you to look ahead from a place other than own ship's current position. Select Set Chart Center from the Main menu to display the dialog box shown right. Use the scrollwheel to set the latitude and longitude position for chart center then click the **Set Center** button.

Chart Center	
Lat:	60°07.499'N
Lon:	021°51.741'E
Set Center	

Note: The chart can also be centered (with less precise positioning) by placing the cursor at desired location, displaying Set Chart Center/Info/Activate Scroll in the dialog box and pushing the left mouse button.)

To turn off automatic true motion reset, display and click TM/CU Reset (in the guidance area). When true motion reset is off, the indication "Ship off screen" appears in the information area.

To restore own ship's position to the screen center, display TM/CU Reset/Info/ShipCenter in the mouse functions area then push the right mouse button.

Range - and **Range+** change the chart scale. If true motion reset is on, ZOOM IN and ZOOM OUT keep the relative position of the own ship with respect to the display. If true motion reset is off, ZOOM IN and ZOOM OUT keep the relative position pointed by the cursor with respect to the display.

The system automatically selects next larger or smaller scale. If a chart with larger compilation scale is available at your current viewing position, the message "Larger Scale Data Exists" appears.

How to look for charts around own ship

You can use either true motion or relative motion. In the true motion mode, own ship moves until it reaches the true motion reset borderline, where it jumps back to an opposite position on the screen based on ship's course. In the relative motion mode, own ship stays in a fixed position, while the chart moves on screen.

If, in the true motion mode, you reset own position with TM/CU Reset, own ship will immediately jump to the true motion reset position.

If, in the true motion mode, you use **ShipOffcenter**, your ship will go to that position on screen and continue true motion movement from that position. When your ship reaches the true motion reset borderline it automatically jumps to the true motion reset position.

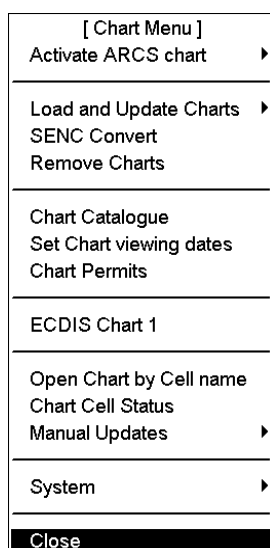
If, in the relative motion mode, you reset own position with TM/CU Reset, your ship will immediately jump to the true motion reset position and use that position as fixed position to stay on screen.

If you use relative motion, you can select a new fixed position for your ship by using ShipOffcenter.

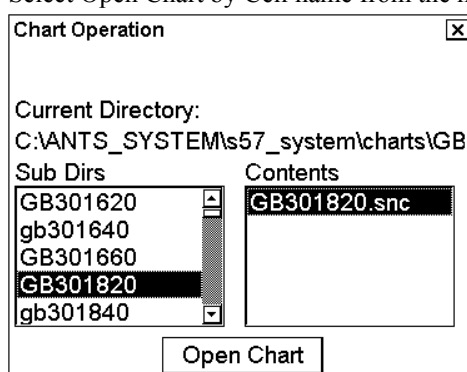
Use **Range -** and **Range+** to select desired chart scale.

8.9.3 How to select a chart by its name on the display

To activate a specific S57 chart cell onto the display, use Open Chart by Cell name menu in the Chart menu as follows:



1. Spin the scrollwheel to display Menu/Info/Chart Menu in the mouse functions area then push the right mouse button.
2. See if "Activate ARCS chart" is shown on the first line of the menu. If it is, go to step 5.
3. If the text "Activate S57 chart" is shown, select it and push the scrollwheel.
4. Select Open Chart by Cell name from the menu then push the scrollwheel.



5. Select desired chart from chart list dialog then click the **Open Chart** button.

The selected chart is automatically displayed in the electronic chart area.

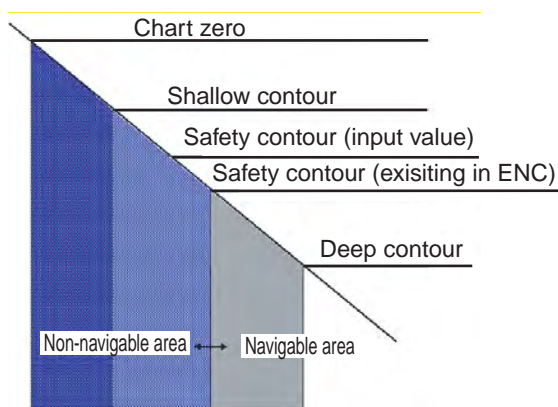
8.9.4 How to control visible chart features

The Chart Display dialog box contains several pages of chart features that you may adjust as appropriate. To display this dialog box, spin the scrollwheel to show Chart Display/Info/Standard Display in the mouse functions area then push the left mouse button.

How to set value for Shallow Contour, Safety Contour and Deep Contour

You can set values for Shallow Contour, Safety Contour and Deep Contour. This can be done on the Chart page of the Chart Display dialog box. Colors used for depth presentation are controlled by the setting values for Shallow Contour, Safety Contour and Deep Contour. See the illustrations below for multi-color and two-color presentations. Selection of multi- and two-color presentation can be done by selecting from the list box of "Depths" on the Chart page.

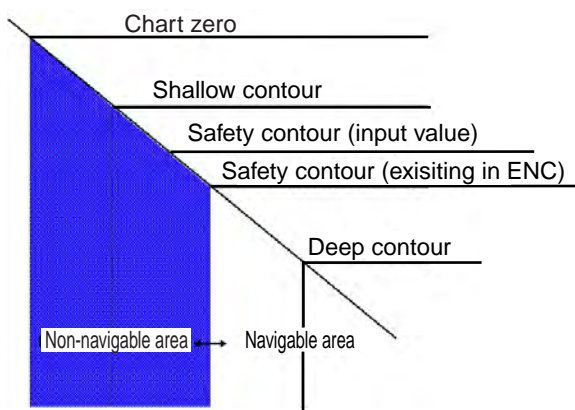
Multi-color presentation



In the multi-color presentation, four colors are used for depths. If the input Safety contour does not exist in the electronic chart, the system automatically selects the next deeper available depth contour as the safety contour. For example, the input value is 8 m, but there is no 8 m depth contour in the electronic chart. Then, the system selects the next deeper depth contour (10 m) as the safety contour. The depth contour value of 10 m is presented as the safety contour in this electronic chart.

The shallow contour is for possible visual color change inside the unsafe water area. The unsafe water areas are all shallower than the safety contours. Set the value for the shallow contour less than the value of the safety contour. For more information about color change, see the description on the next page.

Two-color presentation



In the two-color presentation unsafe water is shown in blue and safe water is shown in white.

If the safety contour does not exist in the electronic chart, the system automatically selects the next deeper available depth contour as the safety contour. For example, the input value is 8 m, but there is no 8 m depth contour in the electronic chart. Then, the system selects the next deeper depth contour (10 m) as the safety contour. The depth contour value of 10 m is presented as the safety contour in this electronic chart.

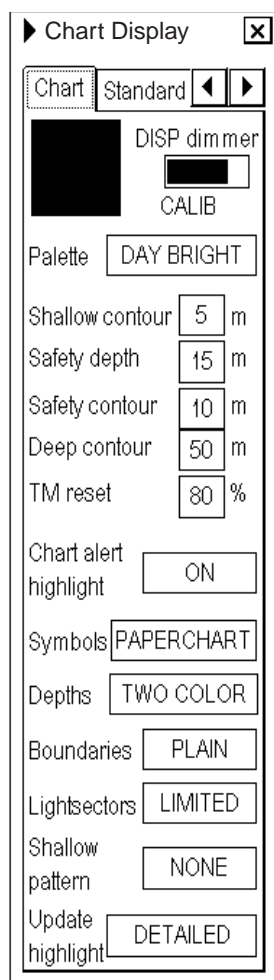


Chart page

Black and grey color symbol:



This symbol verifies that you can distinguish black (frame of symbol) and grey (inner part of symbol) colors with current contrast and brilliance settings.

DISP dimmer: Use this control to adjust dimming of the display. The text "CALIB" indicates that the dimmer setting is within the calibration values. Monitor brilliance is restored to calibrated state by doing the following:

1. Put the cursor on the calibration bar and spin the scrollwheel to show "CALIB".
2. Select "Set Std Display" from the menu.
3. Press and hold down any one of the F1-F4 keys more than two seconds on the Control Unit RCU-015.

Note: Use of the brightness control may inhibit visibility of information at night.

Palette: Select the appropriate palette for the display depending on the brightness of the bridge.

Shallow contour: Set the value of the shallow water contour. See "How to set value for Shallow Contour, Safety Contour and Deep Contour" on page 8-66.

Safety depth: Set the value of the safety depth. Spot soundings below the safety depth are highlighted.

Safety contour: Set the value of the safety contour. Visible safety contour is equal to set value or if the contour of set value is not available then the visible safety contour is next deeper contour than safety contour. See "How to set value for Shallow Contour, Safety Contour and Deep Contour" on page 8-66.

Note: The system uses the safety contour also for chart alerts.

Deep contour: Set the deep-water contour. For more information, see "Setting values for Shallow contour, Safety contour and Deep contour" on page 8-66.

TM reset: In the true motion mode, own ship moves until it reaches the true motion reset borderline (set here), then it jumps back to an opposite position on screen based on its course. Set the limit for TM reset (in percentage).

Chart alert highlight: Enable or disable highlight of chart alerts.

Symbols: Select how to display chart symbols. The options are:

Simplified: The shape of the symbols is of modern design and the sea mark symbols are filled in a color.

Paper Chart: The shape of the symbols imitates traditional symbols used in paper charts.

Depths: Set how to display different depth zones on the chart display. For more information, see "How to set value for Shallow Contour, Safety Contour and Deep Contour" on page 8-66.

For MULTICOLOR, the chart display uses four different colors for contours:

- Deeper than user-selected deep contour
- Between deep contour and user-selected safety contour
- Between safety contour and user-selected shallow contour
- Between shallow contour and coastline.

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For TWO COLOR, the chart display uses only two colors:

- Deeper than safety contour
- Shallower than safety contour

Boundaries: Set how to display boundaries of some chart features. The options are:

- **Plain:** The line styles are limited to plain solid and dashed lines.
- **SYMB:** Some of the line styles use symbols to highlight the purpose of a line.

Light sector: Set how to display light sectors. The options are:

- **Limited:** The length of a light sector is fixed at 25 mm independently of the displayed scale.
- **Full:** The length of a light sector represents its nominal range as defined by the chart producer.

Shallow pattern: Set how to display shallow water area. The options are:

- **None**
- **Diamond:** Provided to distinguish shallow water at night..

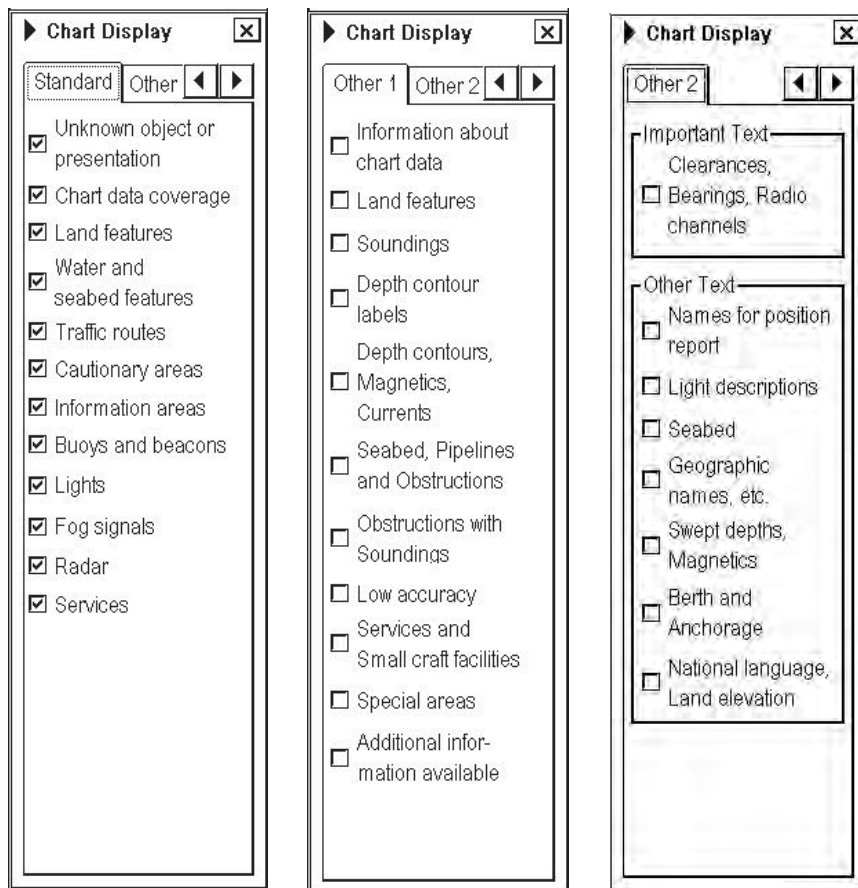
Update Highlight: Set how the updates are highlighted on the screen before they are approved by the user. The options are

- **Detailed:** The system tries to highlight updates so that only those objects that have visible changes are highlighted. Use this option to see the practical change of an update.
- **All effects:** The system highlights updates so that all the objects pertaining to updates are highlighted although some of them have not been changed.

"Standard, Other 1 and Other 2" pages

The Standard page contains chart features defined by IMO that comprise a standard display. You can recall the standard display at any time using a single action, by pressing the **STD DSP** key on the Control Unit RCU-018, or displaying Chart Display/Info/Standard Display in the mouse function area and pushing the right mouse button.

The Other 1 and Other 2 pages contain chart features for which you can control visibility and which are not part of IMO-defined standard display.



Note 1: To use the Info request feature, which provides information for cursor-selected chart feature, the associated chart feature must be turned on from the Standard page.

Note 2: To navigate between the pages in the Chart Display dialog box, click the appropriate arrow tab with the left mouse button or hit the **NEXT** key on the Control Unit RCU-018.

8.9.5 Display base

A subset of chart features is called the Display Base. As required by IMO, these features cannot be made invisible. The Display Base consists of the following chart features:

- Coastline (high water)
- Own ship's safety contour, which is set by the operator
- Indication of isolated underwater dangers of depths less than the safety contour that lie within the safe waters defined by the safety contour
- Indication of isolated dangers that lie within the safe water defined by the safety contour, such as bridges, overhead wires, etc., and including buoys and beacons whether or not these are being used as aids to navigation.
- Traffic routine systems
- Scale, range, orientation and display mode
- Units of depth and height

8.9.6 How to control visible navigation features

Visibility control of the navigation features is divided into five pages in the Symbol Display dialog box:

Route page: Controls planned and monitored route.

Tracking page: Controls past tracks and some other features.

Mariner page: Controls Notes and user charts.

Targets page: Controls TT and AIS targets.

General page: Controls own ship and target related things.

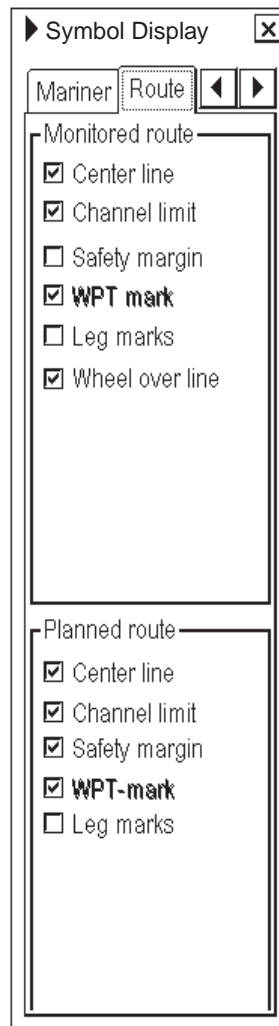
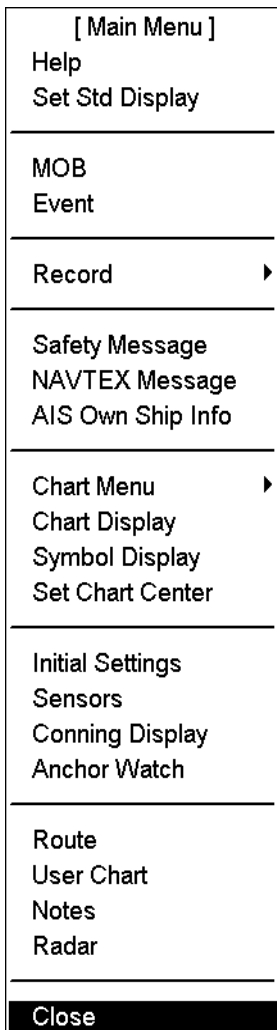
The user can define settings for chart details that are displayed on the chart area.

Route page

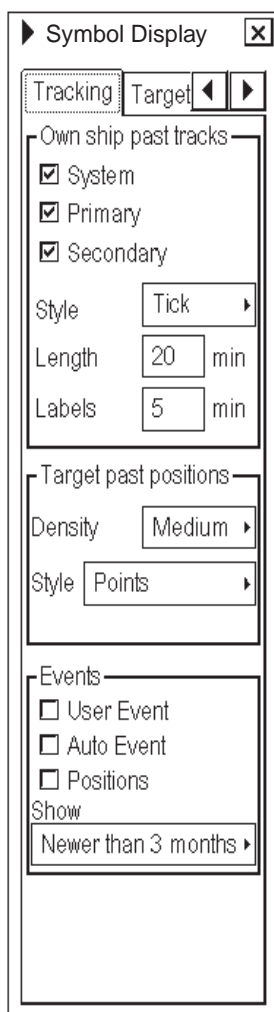
This page contains selections for route-related navigation features.

Monitored route: Select which part of monitored route to display.

Planned route: Select which part of planned route to display.



Open the main menu and select Symbol Display from the menu.



Tracking page

Past tracks

- **System:** Plot own ship's tracks using system-fed position.
- **Primary:** Plot own ship's past track with position fed from the primary sensor.
- **Secondary:** Plot own ship's past track with position fed from a secondary sensor.
- **Style:** Select time stamp position for past track (indicated by Tick or Point).
- **Length:** Select length of past track.
- **Labels:** Select label interval.

Target past positions

- **Density:** Select density of past position of points.
- **Style:** Select style of presentation of target's past position.

Events

These marks are based on voyage log records.

- **User Event:** Check to display event symbols on ECDIS, where the system has recorded an event based on conditions you have set (Type: User and Auto).
- **Auto Event:** Check to display automatically entered event symbols, where the system has recorded an event based on conditions you have set (Type: Ship and Alarm).
- **Positions:** Check to display the latitude and longitude of an event.

Note 1: MOB event is always visible.

Note 2: You can select period of time to display event marks in the list box "Show".

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The image shows a control panel titled "Symbol Display" with a close button (X) in the top right corner. Below the title bar, there is a "Targets" section with a list box containing "Mariner" and left and right arrow buttons. Underneath, there are three distinct control areas: 1) A "Color" section with a label "Color" and a dropdown menu currently showing "GREEN". 2) A "TT" section with a label "TT" and a dropdown menu currently showing "STD". 3) An "AIS" section with a label "AIS" and a text input field containing "5.0" followed by a unit label "%/min".

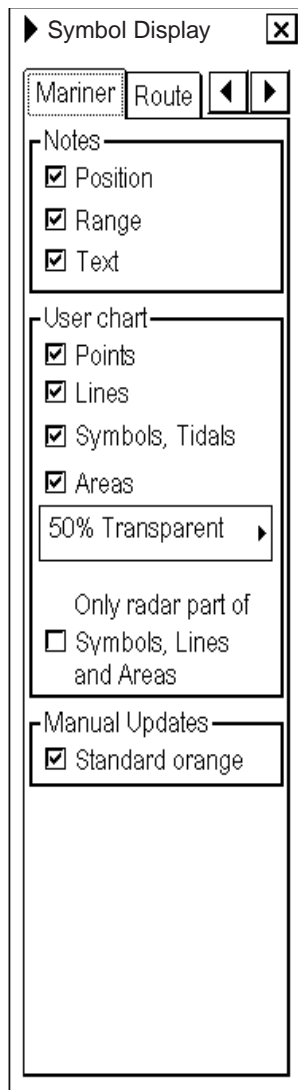
Targets page

Color: Select color of target from the list box.

TT: Select size of tracked target symbols to Std or Small.

AIS: ROT (°/min), limit to display AIS target with curved speed vector.

Note: Source of ROT must be ROT gyro on target vessel.



Mariner page

Notes

Position: Check to show positions of Notes records with symbols on the chart.

Range: Check to circumscribe Notes records with circles on the display. The size of a circle depends on the value set in Notes.

Text: Check to show text of Notes records on the chart.

User chart

Points: Check to show user points on user charts.

Lines: Check to show lines on user charts.

Symbols, Tidal: Check to show symbols and tides on user charts.

Areas: Check to show areas on the display. Color fill for the areas can be selected as transparent from 25% to 75% and as No color fill. If No color fill is selected, only the boundaries of the areas are visible.

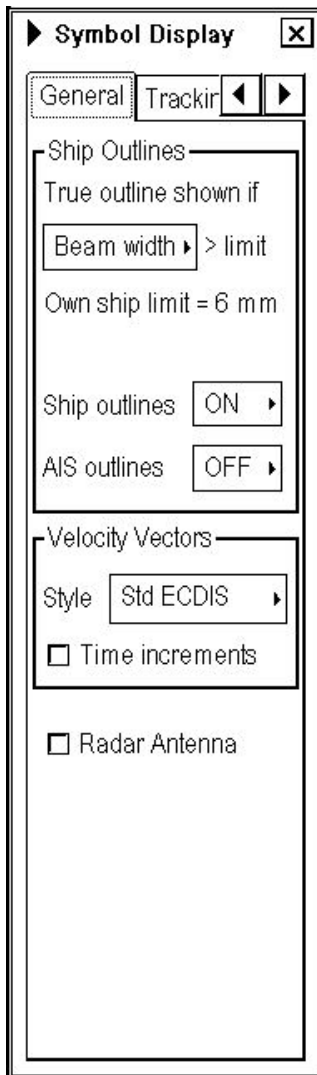
Display only radar of Lines, Symbols and Areas

If checked, only those Lines, Symbols and Areas are displayed that have user selection "on radar" activated for them in the user chart. This is used to view only that part of the user chart that will be sent to the radar connected to the system.

Manual Update

Check to show manual updates with orange symbols.

Note: Visibility of manual updates made as true symbols are controlled through Standard and Other pages of the Chart Display menu.



General page

Ship Outlines

True outline shown if "Beam width>6 mm / Length>6 mm". You can set whether width or length is used to set limit for displaying true symbol.

Ship outlines: Choose OFF or ON to show ship symbol minimized or scaled symbol, respectively.

AIS outlines: Choose OFF or ON to show AIS target symbol in same size or scaled symbol, respectively.

Velocity Vectors

Style: Select style for velocity vectors.

- Conventional (simplified symbol)
- Std ECDIS (minimized symbol)

Time increments: This controls both own ship and targets ticks. If ticks are too tightly spaced, because of display scale and speed of vessel/target, they are automatically removed from the display, until the spacing between ticks is enough to distinguish them separately.

Radar Antenna

Check to show position of radar antenna on the screen with the symbol "x".

8.9.7 How to store and recall chart display settings for visible chart and navigational features

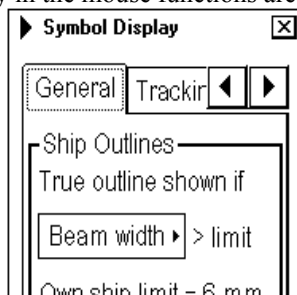
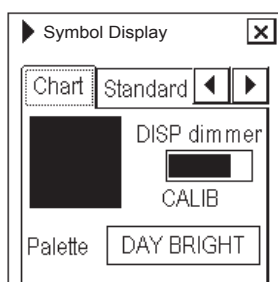
Chart display settings and symbol display settings use common settings, which means that when you select settings display settings the same file is selected for symbol settings.

You can define chart display and symbol display settings that are displayed over S57 charts cells. You can save these chart display settings to your hard disk and recall them whenever you need them.

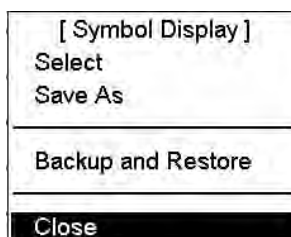
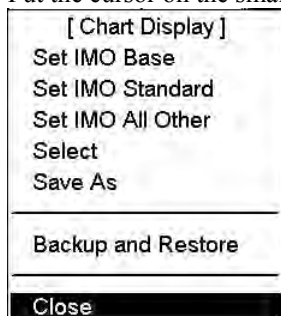
How to create new chart display settings

To create new settings for chart display, do the following:

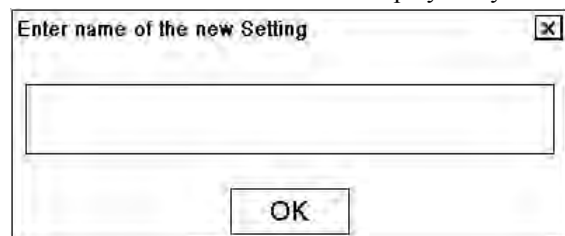
1. Display Chart Display/Info/Standard Display in the mouse functions area then push the left mouse button.



2. Put the cursor on the small triangle on the Chart Display or symbol dialog box.



3. Select "Save As" from the Chart Display or Symbol Display menu then push the scrollwheel.



4. Enter desired name and click the **OK** button in the dialog box.
5. Make your changes to both Chart Display and Symbol display settings. Note that you have to select "Save" from the menu before closing the dialog box. When you save new chart display settings, all titles previously saved (Symbol Display, Chart Display) are saved under the name selected here.

How to select chart display settings

1. Open the Chart Display or symbol Display dialog box and put the cursor on the triangle.
2. Choose "Select" from the menu and push the scrollwheel.
3. Select desired chart display settings from the list box.

How to save changes to chart display settings

1. Open the Chart Display or Symbol Display dialog box and put the cursor on the triangle.
2. Select Save from the menu to save current chart display settings.

8.9.8 Control of predefined IMO Chart Display Settings

There are three sets of predefined Chart Display Settings that can be used to display Charts with certain chart features. The predefined Chart Display Settings are as follows:

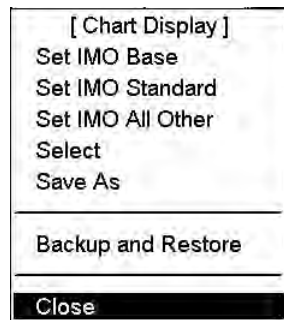
- IMO-Base
- IMO-Standard
- IMO-All Other

You can find display setting in use on upper status bar. See section 3.1 "ECDIS Overview".

To select desired IMO Chart Display Settings, do the following:



1. Open the Chart Display window, put the cursor on the black triangle on the Chart Display window then press the left mouse button.
2. Select **Set IMO Base**, **Set IMO Standard** or **Set IMO All Other** from the menu.



8.10 Sailing Directions, Tidal Tables, etc., Features of Vector Charts

Vector charts contain sailing directions, tidal tables and other textual and picture information that is not immediately visible on the chart. This information forms an integral part of the legal ENC chart that can fulfil SOLAS requirements and thus replace a paper chart. As a navigator you should check them as well as you check the visible chart when you do your planning and when you perform navigation.

Because these features are not permanently visible on the chart as they used to be in case of a paper chart, the ECDIS has special symbols to highlight the locations from which you can use the Info request to know additional information about the above-mentioned features. Below are examples of these symbols. See section 8.13 "How to Get Information About Vector Chart Objects".



A grey box is used to show that Tidal information is available for Info request by cursor selection.
Note: The visibility of the grey box symbol is controlled by the item "Depth contours, magnetics, currents" in the Other 1 page of the Chart Display dialog box.



A magenta-colored symbol is used to show that additional textual or picture information such as sailing directions are available from Info request by cursor selection.
Note: The visibility of the magenta symbol is controlled by the item "Additional information available" in the Other 1 page of the Chart Display dialog box.

8.11 Chart Viewing Dates and Seasonal Features of the Vector Chart

8.11.1 Introduction

Vector charts contain date-dependent features. Updating in general, including reissues, new editions and updates, creates date dependency. In addition to the obvious date dependency, some features of the S57 charts create additional date dependency. These features include "Date Start", "Date End", "Seasonal date start" and "Seasonal date end". Hydrographic Offices use these features to publish Temporary and Preliminary Notices to Mariners, as their paper chart equivalent updates are called. The ARCS equivalent is called T&P Notices. "Seasonal date start" and "Seasonal date end" are used for seasonal chart features such as summer-only sea marks, seasonal yacht race areas, etc.

You can efficiently use chart viewing date dependency in order to use the valid data for any given date applicable for your navigation or planning purposes. For example, you can check for existence of changes and restrictions weeks before they became valid. Date dependency is a part of the new electronic method to keep your chart up-to-date and valid for your intended use. Normally you should set Display Until and Approve Until once per week to keep your chart up-to-date.

Note: When you load charts and their updates into your system, the Display Until date is set as current date of the system. You must set the Approve Until date yourself. Make sure that you have set Display Until and Approve Until dates to the current date or to your planning date, whichever is applicable to your current usage of charts. For details on how to set Display/Approve date, see section 8.11.2 "How to approve and highlight vector chart updates". If the charts you are currently using have Display Until and/or Approved Until set more than 1 week from current system date, you will get the Permanent Message on your chart display.

Permanent Message

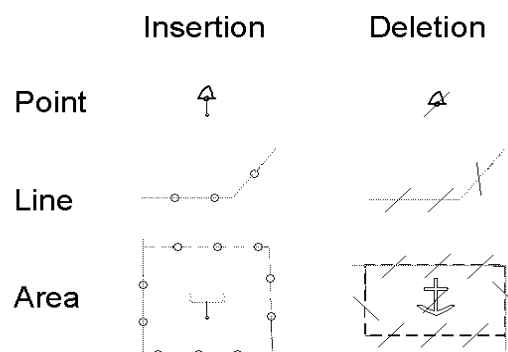
At least one of used charts has more than 1 week "Approved Until" and/or "Displayed Until" and current date. Use Chart Menu - Set Chart viewing dates

8.11.2 How to approve and highlight vector chart updates

Before you approve updates, you can display (highlight) updates that are included into S57 charts. Normally you have selected "Automatic Display Until" after the SENC conversion. In this case, after all the SENC conversions have been finished, all updates are automatically highlighted and you can view and approve them after viewing. For details, see section 8.11.4 "How to set "approve until" date".

If you want to review updates after the initial approval of the updates do the following:

1. Use Approve Until to set the begin date for the update highlight. See section 8.11.4 "How to set "approve until" date".
2. Use Display Until to set the end date for the update highlight. See section 8.11.3 "How to set "display until" date".
3. Review the changes. Added features are highlighted with orange circles. Removed features are highlighted with orange slashes. Changed features are highlighted with both orange circles and slashes. See the picture at right. For highlighted updates, see "An example of changes known to happen in the future" on page 8-81.
4. After reviewing, set Approve Until and Display Until back to the current system date.



8.11.3 How to set "display until" date

1. Open the Chart menu.
2. Select Set Chart viewing dates from the menu.
3. Set the cursor in the Display Until field, use the scrollwheel to set desired date, and confirm by pushing the scrollwheel.

Chart viewing dates X

Cell ID	RENC edt/ upd	SENC edt/ upd	Updates Displ. until	Updates Approv. until
04470039.D	-/-	1/ 0	2004 12 31	2002 10 29
04470039.E	-/-	1/ 0	2004 12 31	2002 10 29
04470039.F	-/-	1/ 0	2004 12 31	2002 10 29
04470040.E	-/-	1/ 0	2004 12 31	2002 10 29
04470040.F	-/-	1/ 0	2004 12 31	2002 10 29
04500072.C	-/-	1/ 0	2004 12 31	2002 5 22
04500075.D	-/-	1/ 0	2004 12 31	2002 5 22
04500076.E	-/-	1/ 0	2004 12 31	2002 5 22
04500077.E	-/-	1/ 0	2004 12 31	2002 5 22
04500077.F	-/-	1/ 0	2004 12 31	2002 5 22
04500078.D	-/-	1/ 0	2004 12 31	2002 5 22
04500078.E	-/-	1/ 0	2004 12 31	2002 5 22
04500078.F	-/-	1/ 0	2004 12 31	2002 5 22
04500079.E	-/-	1/ 0	2004 12 31	2002 5 22
04500079.F	-/-	1/ 0	2004 12 31	2002 5 22
04510076.E	-/-	1/ 0	2004 12 31	2002 5 22
04510077.E	-/-	1/ 0	2004 12 31	2002 5 22
04510078.E	-/-	1/ 0	2004 12 31	2002 5 22
04510078.F	-/-	1/ 0	2004 12 31	2002 5 22
04510079.E	-/-	1/ 0	2004 12 31	2002 5 22
04510079.F	-/-	1/ 0	2004 12 31	2002 5 22
04510080.E	-/-	1/ 0	2004 12 31	2002 5 22
04510080.G	-/-	1/ 0	2004 12 31	2002 5 22
7C1W0001	-/-	1/ 0	2004 12 31	1999 4 20
7C1W0002	-/-	1/ 0	2004 12 31	1999 4 21
7C1W0003	-/-	1/ 0	2004 12 31	1999 4 21

Latest RENC Product List	2004 11 24	Source PM
Oldest date	2004 12 31	1999 1 5
Newest date	2004 12 31	2004 8 18
Manual Updates	2004 12 31	2004 12 31

Display Until Approve Until

Sync Manual Update Dates
 All SENCs

8.11.4 How to set "approve until" date

1. Open the Chart menu.
2. Select Set Chart viewing dates from the menu.
3. Set the cursor in the Approve Until field, use the scrollwheel to set desired date, and confirm by pushing the scrollwheel.

Chart viewing dates X

Cell ID	RENC edt/ upd	SENC edt/ upd	Updates Displ. until	Updates Approv. until
04470039.D	-/-	1/ 0	2004 12 31	2004 12 31
04470039.E	-/-	1/ 0	2004 12 31	2004 12 31
04470039.F	-/-	1/ 0	2004 12 31	2004 12 31
04470040.E	-/-	1/ 0	2004 12 31	2004 12 31
04470040.F	-/-	1/ 0	2004 12 31	2004 12 31
04500072.C	-/-	1/ 0	2004 12 31	2004 12 31
04500075.D	-/-	1/ 0	2004 12 31	2004 12 31
04500076.E	-/-	1/ 0	2004 12 31	2004 12 31
04500077.E	-/-	1/ 0	2004 12 31	2004 12 31
04500077.F	-/-	1/ 0	2004 12 31	2004 12 31
04500078.D	-/-	1/ 0	2004 12 31	2004 12 31
04500078.E	-/-	1/ 0	2004 12 31	2004 12 31
04500078.F	-/-	1/ 0	2004 12 31	2004 12 31
04500079.E	-/-	1/ 0	2004 12 31	2004 12 31
04500079.F	-/-	1/ 0	2004 12 31	2004 12 31
04510076.E	-/-	1/ 0	2004 12 31	2004 12 31
04510077.E	-/-	1/ 0	2004 12 31	2004 12 31
04510078.E	-/-	1/ 0	2004 12 31	2004 12 31
04510078.F	-/-	1/ 0	2004 12 31	2004 12 31
04510079.E	-/-	1/ 0	2004 12 31	2004 12 31
04510079.F	-/-	1/ 0	2004 12 31	2004 12 31
04510080.E	-/-	1/ 0	2004 12 31	2004 12 31
04510080.G	-/-	1/ 0	2004 12 31	2004 12 31
7C1W0001	-/-	1/ 0	2004 12 31	2004 12 31
7C1W0002	-/-	1/ 0	2004 12 31	2004 12 31
7C1W0003	-/-	1/ 0	2004 12 31	2004 12 31

Latest RENC Product List	2004 11 24	Source PM
Oldest date	2004 12 31	2004 12 31
Newest date	2004 12 31	2004 12 31
Manual Updates	2004 12 31	2004 12 31

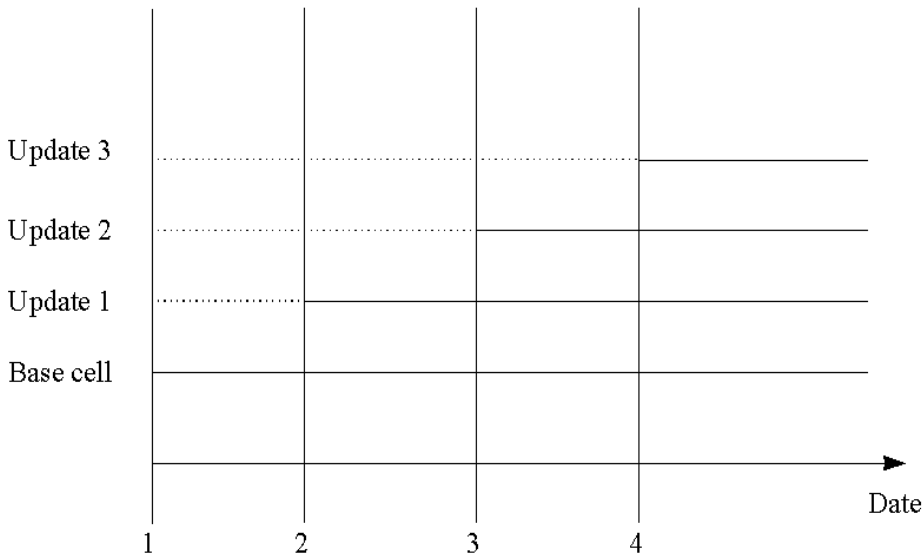
Display Until Approve Until

Sync Manual Update Dates
 All SENCs

8.11.5 About chart viewing date dependency of S57 standard

How the issue date of updates changes the visibility of the changes

Study the example below to understand the behavior of updates relative to date.



The figure above shows how updates are dependent on Chart viewing dates set in Display/Approve date settings by user. Actions 1 to 4 areas follows:

1. Base cell including three updates is converted into SENC. Display date is set as current date of the system. Approve date has to be set to current date.
2. The date on which update 1 was issued. Display and Approve dates have to be set to correct date in order to see the chart with update 1.
3. The date on which update 2 was issued. Display and Approve dates have to be set to correct date in order to see the chart with update 1 and update 2.
4. The date on which update 3 was issued. Display and Approve dates have to be set to correct date in order to see the chart with update 1, update 2 and update 3.

Note 1: In order to display charts with correct updated situation, **always** use current date during your voyage. If your voyage lasts more than one week, set current date at least once per week during your voyage.

Note 2: In order to display charts with correct updated situation during route planning, always use planned date of each waypoint to check your plan.

How temporary and preliminary notices to mariners behave with vector charts

In some cases the producer of a chart (Hydrographic Office) is aware of changes that will happen in the future. A Hydrographic Office is able to include this kind of update into the chart for later use. In the paper chart world, these changes are published in Preliminary and Temporary Notices to Mariners. In ARCS these are known as T&P Notices.

An example of changes known to happen in the future



Display/Approve date is set to 2005-01-02.
You can see a box-shaped Caution area on the screen.

Cal Status	Label	Updates Display	Index Approved
Cal ID	00000000	0000	0000



Display date is now set to 2005-09-08 and Approve date is 2005-9-09.
You can see a new area (Restricted Area) inserted into existing area (Caution Area).

Cal Status	Label	Updates Display	Index Approved
Cal ID	00000000	0000	0000



Display/Approve date is set to 2005-09-08.
You see only a Restricted Area without any Caution Area.

Cal Status	Label	Updates Display	Index Approved
Cal ID	00000000	0000	0000

Calendar	NMCI	2005-08	2005-08
Known date	NMCI	2005-08	2005-08
Manual Update		1999-02	1999-02
<input checked="" type="checkbox"/> Show Manual Update Dates		<input type="button" value="Clockwise"/>	<input type="button" value="Approve"/>
<input type="button" value="Manual Update Dates"/>	<input type="checkbox"/> All Over	<input type="button" value="Data"/>	<input type="button" value="Group"/> 0330134

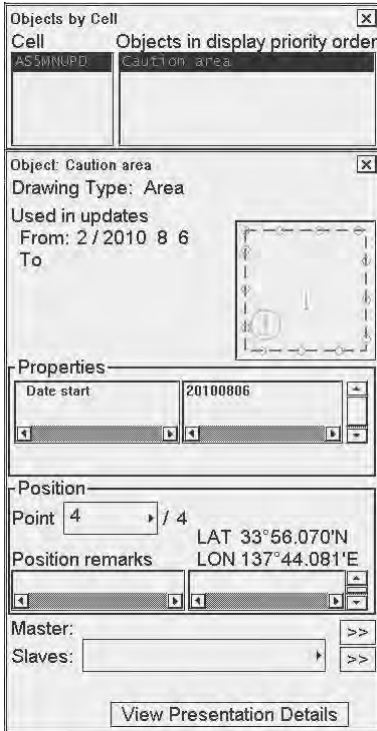
8. Vector Chart Material

How seasonal features are coded in vector charts

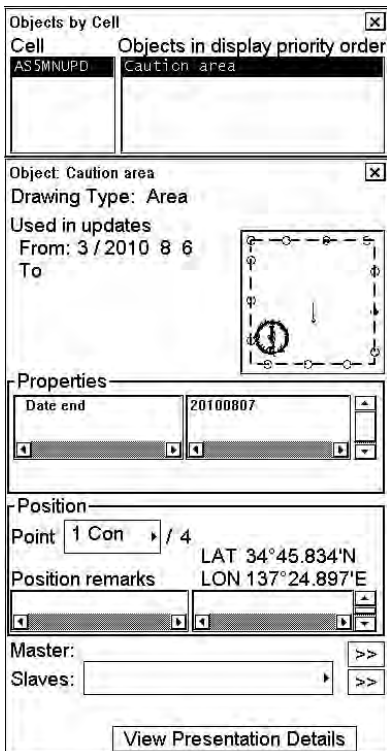
Some chart producers may define a chart feature to use seasonal date start and end as shown below.

- YYMMDD (Full date for date start and date end)
- --MMDD (The same date every year)
- --MM (The same month every year)

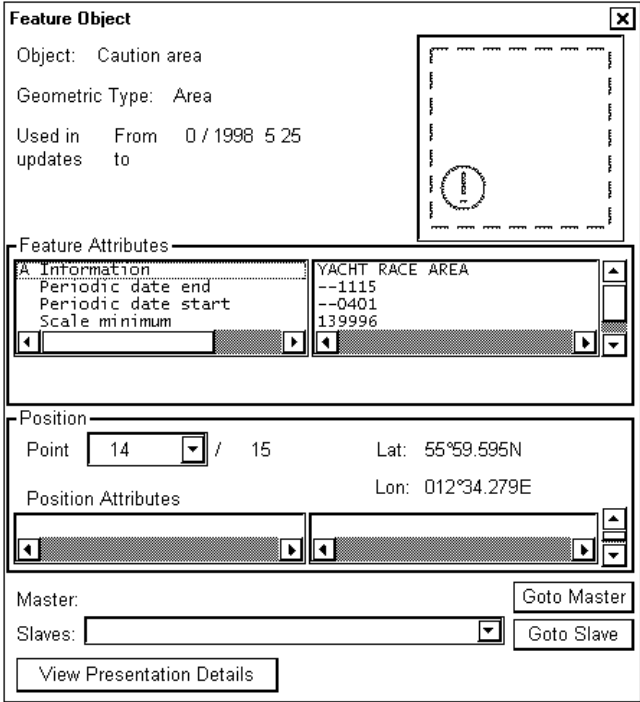
The example below shows how a user can find, using Info query (seasonal), the full date for starting date (YYYYMMDD).



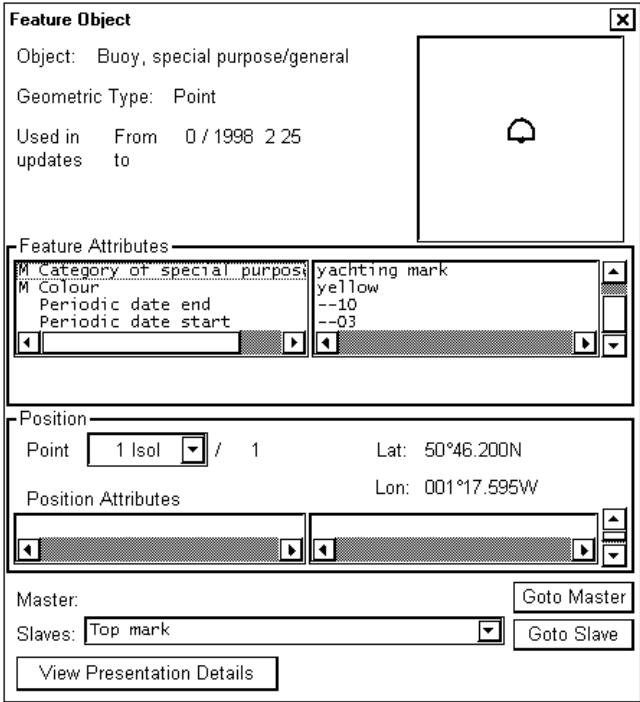
The example below shows how a user can find, using Info query (seasonal), the full date for ending date (YYYYMMDD).



The example below shows how a user can find, using Info query (seasonal), the starting and ending month and day in every year (--MMDD).



The example below shows how a user can find, using Info query (seasonal), the starting and ending month in every year (--MM).



8. Vector Chart Material

An example of a seasonal chart feature

The next two figures show a caution area that is valid from April 1 to November 15.

Date Dependent

Cell Status	Latest RENC status query	Updates Displayed until	Updates Approved until
n1300131	---NVLD--- (X)	1999 3 31 (6/ 6)	1999 3 31 (6/ 6)

Oldest date ---NVLD--- 1999 3 31 1999 3 31
 Newest date ---NVLD--- 1999 3 31 1999 3 31
 Manual Updates 1999 5 21 1999 5 21

Sync Manual Update Dates

 All Cells n1300131

Date Dependent

Cell Status	Latest RENC status query	Updates Displayed until	Updates Approved until
n1300131	---NVLD--- (X)	1999 4 1 (6/ 6)	1999 3 31 (6/ 6)

Oldest date ---NVLD--- 1999 4 1 1999 3 31
 Newest date ---NVLD--- 1999 4 1 1999 3 31
 Manual Updates 1999 5 21 1999 5 21

Sync Manual Update Dates

 All Cells n1300131

Display/Approve date has been set to to 1999-3-31.
 Caution Area is NOT displayed because the date is NOT valid for displaying it.

Display date has been set to to 1999-4-1.
 Caution Area is displayed because the date is valid for displaying it.

The figure below shows the attributes of the caution area in the example above, in the Info request window.

Objects by Cell

Cell	Objects in display priority order
AS5MNUPD	Caution area

Object: Caution area

Drawing Type: Area

Used in updates
 From: 2 / 2010 8 6
 To

Properties

Date start: 20100806

Position

Point 4 / 4
 Position remarks: LAT 33°56.070'N
 LON 137°44.081'E

Master: >>>
 Slaves: >>>

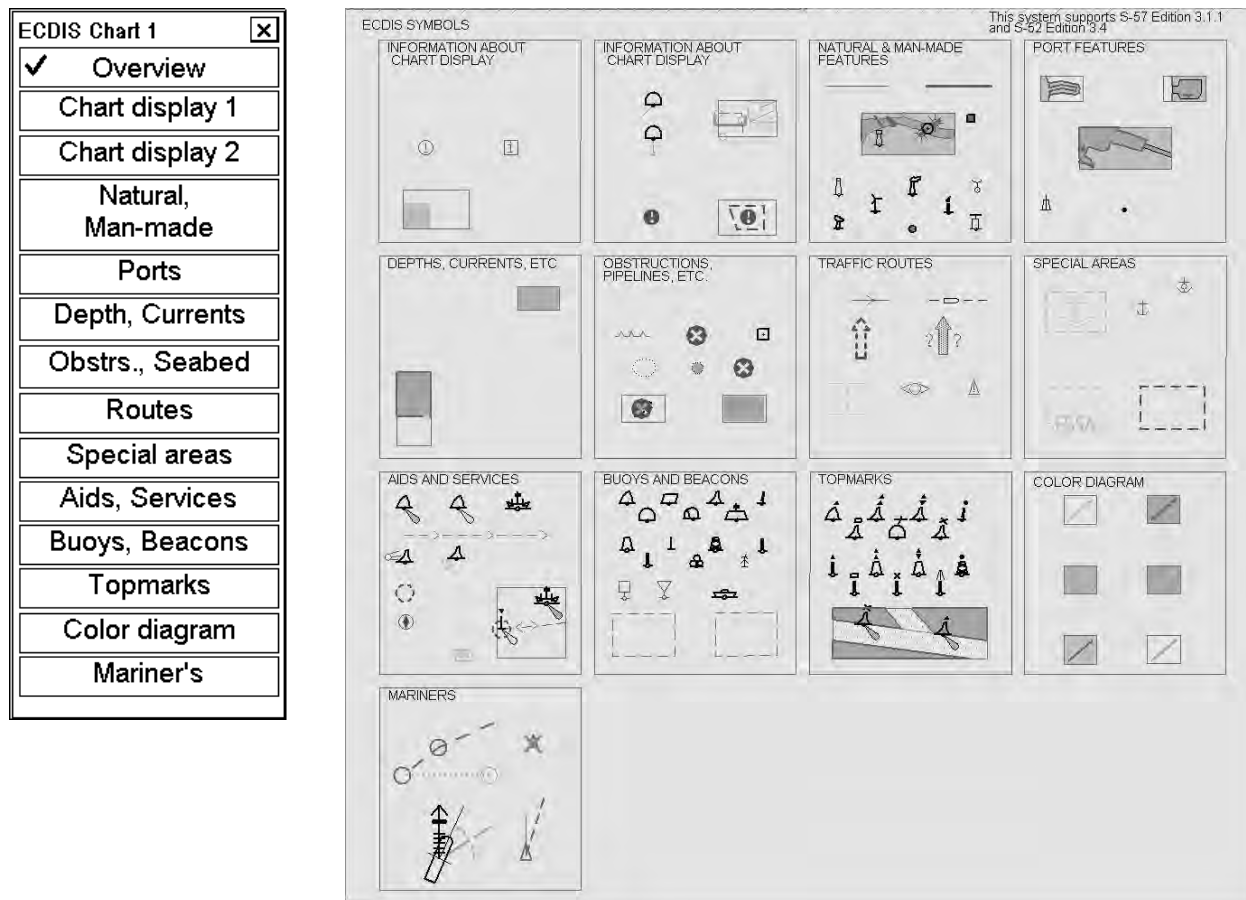
8.12 Symbology Used in Vector Charts

You can familiarize yourself with the symbology used by browsing IHO ECDIS Chart 1, which is included in this ECDIS. See section 8.9.4 "How to control visible chart features".

1. Open the Chart menu.
2. Select ECDIS Chart 1 from the menu then push the scrollwheel.
3. Select desired chart symbols from the submenu to show on the ECDIS.

Appendix 2 contains examples of plots with symbols.

The Return dialog window appears when you select something from the submenu of ECDIS Chart 1. When you close the Return dialog window, by clicking the X at the upper right corner, ECDIS Chart 1 will be closed and normal chart presentation is displayed.



An example of Overview chart

8.12.1 How to change presentation library used for vector chart features

The ECDIS uses the official IHO presentation library to draw vector charts. The presentation library is replaceable, but this feature is only intended to be used by qualified service personnel and type approval authorities.

When this manual was published, the official presentation library was "AML003_4.dai", based on "Official IHO presentation library for ECDIS S-57 Edition. 3.1.1 and S-52 Edition 3.4".

8.13 How to Get Information About Vector Chart Objects

The ability to cursor-select an object to find additional information about the object is an important function of the ECDIS. However, an unprocessed cursor selection, which does not discriminate or interpret and merely dumps on the interface panel all the information available at that point on the display, will normally result in pages of unsorted and barely intelligible attribute information.

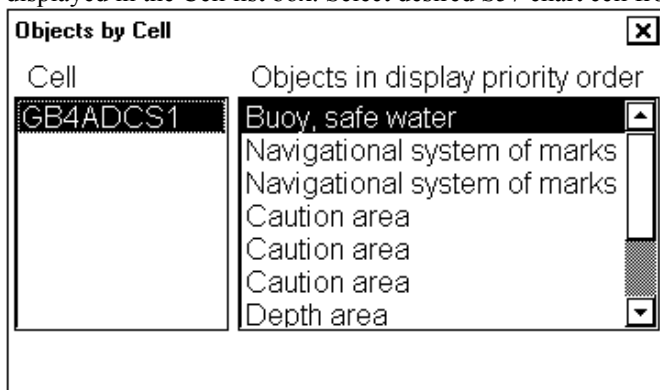
8.13.1 How to set visible vector chart features

The request for information about S57 chart objects is given only to objects that are selected for display by the user. For details, see section 8.9.4 "How to control visible chart features".

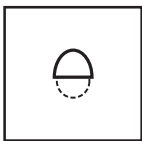
8.13.2 How to select desired object from the list of found objects

To specify desired SENC and object for information request, do the following:


1. Put the cursor on object desired.
2. Push the scrollwheel. Two windows appear: Objects by Cell and Object.
3. Use the Objects by Cell window to select desired chart cell and desired object from which you need information. If there are different navigation purpose S57 charts over the area where you are making an information request, you can select desired S57 chart cell from the Cell window. A list of S57 chart cells is displayed in the Cell list box. Select desired S57 chart cell from the list.



4. Select desired object from the Objects in display priority order list box. Selected object on the chart is shown with mark showing information in the Object window.




Detailed information for the selected object appears in the Object window.

Object: Buoy, special purpose/general	
Drawing Type: Point	
Used in updates	
From: 4 / 2005 9 22	
To	
	
Properties	
Buoy shape	spherical
Category of special pur	cable mark
Position	
Point	1 Isol /1
Position remarks	LAT 32°31.985'S
	LON 060°55.797'E
Master:	
Slaves:	
View Presentation Details	

- To close the windows, click the **CANCEL** key on the keyboard-equipped control unit, or click the X on the window you wish to close.

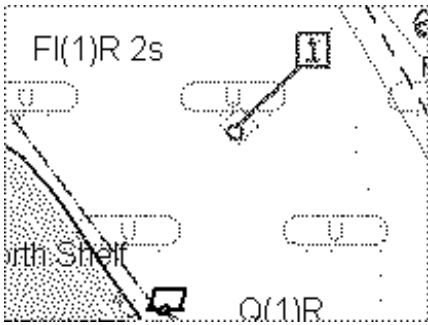
8.13.3 How to display properties of a vector chart object

After you have selected a vector chart object, you can view detailed information about it in the Object window:

Object: Beacon, special purpose/general	
Drawing Type: Point	
Used in updates	
From: 4 / 2005 9 22	
To	
	
Texts	
LFI(1)W 10s9m8M	
LFI(1)B 10s9m6M	
Properties	
Beacon shape	beacon tower
Category of special pur	general warning mark
Position	
Point	1 Isol /1
Position remarks	LAT 32°31.695'S
	LON 060°56.223'E
Master:	
Slaves:	Light
View Presentation Details	

8.13.4 About vector chart coding

Tidal information is available as a table



Object ✕

Object: Tidal stream panel data

Drawing Type: Point

Used in From 0 / 1998 11 10
updates to

◆

Properties

Object name	H
Textual description	GB0TG969.TXT
Tidal stream - panel value	O131 , HARWICH , HW , 297 , 0.2 , 335

[View content](#)

Position

Point 1 Isol / 1 Lat: 51°57.904N

TextView [-] [□] [✕] *16.802E

File Setting Text

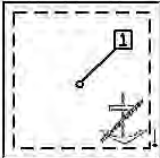
Tidal stream panel values:
0131 HARWICH HW

Hour	Dir[°]	Rate[kt]
-6	297	0.2
-5	339	1.0
-4	335	1.0
-3	341	0.9
-2	339	1.2
-1	338	0.8
0	327	0.3
1	156	0.7
2	154	1.5
3	159	1.4
4	156	1.1
5	161	0.7
6	235	0.1

Goto Master
Goto Slave

More information is available in text

Object: Restricted area
 Drawing Type: Area
 Used in updates
 From: 0 / 2010 2 9
 To



Properties

Scale minimum	21999
Textual description	GB0V7UPZ.TXT

[View content](#)

Position

Point: 33 Con /123
 LAT 51°56.695'N
 Position remarks: LON 001°18.375'E

TEXT VIEW

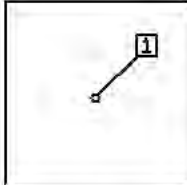
ANCHORING AND FISHING PROHIBITED

Anchoring and fishing are prohibited in, and within 60 metres of the channels and in the entrance to Felixstowe Docks.

[Find](#) [Print Text](#)

More information is available as a graphic

Object: Nautical publication information
 Drawing Type: Area
 Used in updates
 From: 1 / 2009 11 9
 To



Properties

Information	BEACONS IN THE SUEZ
Pictorial representation	GB3264BA.TIF

[View content](#)

PictView : Z1temp.tif - whole image on canvas

BEACONS IN THE SUEZ CANAL.
 The 90 metre depth contour throughout the canal is marked at varying intervals by buoyant beacons. Details of their shape, topmarks and lights are shown in the diagram below.

	Topmark	Light characteristics
East side	White with green boundary	Fixed green
West side	White with red boundary	Fixed red
Junction	Yellow and black horizontal bands	
Centre line	Yellow B; Andrew's cross	Isobase White cross

30°34.687'N
 032°15.000'E

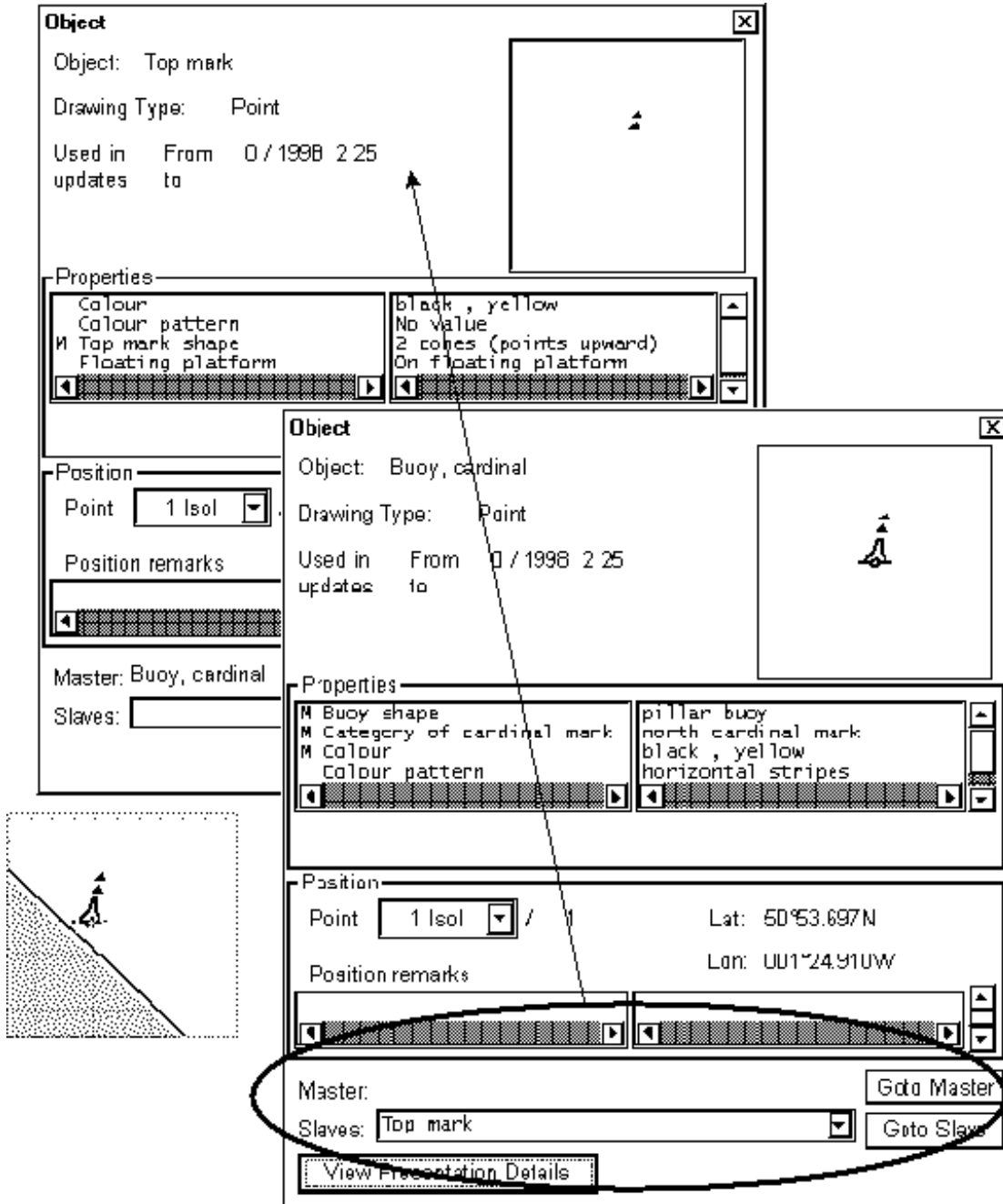
[Information Details](#)

SINGLE

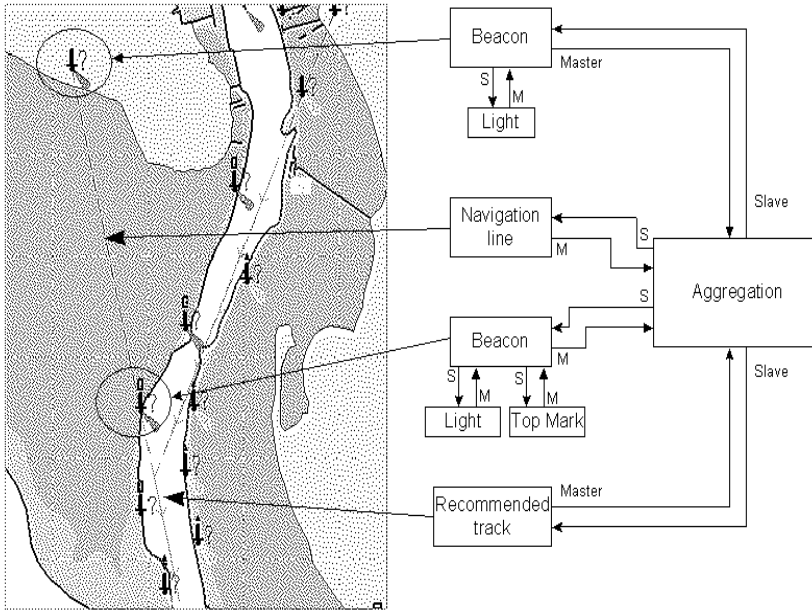
Linked objects

Often a group of chart objects are linked together. The most common example of this practice is a beacon or buoy, in which the body and the top mark are defined separately. Another example is lights and recommended track. Still another example is measurement mile. There are also other similar cases.

Body and top hat of a beacon or buoy



Recommended track defined by two beacons



Object
 Object: Recommended track
 Drawing Type: Line
 Used in From 0/1998 2 25 updates to

Properties
 Category of recommended track based on a system of fixed marks
 Orientation 345.50°
 Traffic flow inbound

Position
 Point 1 Con / 3 Lat: 50°50.541N
 Lon: 001°18.792W

Position remarks

Master: Aggregation Goto Master
 Slaves: Goto Slave

View Presentation Details

Object
 Object: Beacon, lateral
 Drawing Type: Point
 Used in From 0/1998 2 25 updates to

Properties
 Beacon shape No value
 Category of lateral mark port-hand lateral mark
 Colour red
 Conspicuous, visually not visually conspicuous

Position
 Point 1 Isol / 1 Lat: 50°50.624N
 Lon: 001°18.826W

Position remarks

Master: Aggregation Goto Master
 Slaves: Light Goto Slave
 Top mark

Object
 Object: Aggregation
 Drawing Type:
 Used in From 0/1998 2 25 updates to

Properties

Position
 Point / 0 Lat: 50°50.541N
 Lon: 001°18.792W

Position remarks

Master: Aggregation Goto Master
 Slaves: Navigation line Goto Slave
 Recommended track
 Beacon, lateral
 Beacon, special purpose/general

Object
 Object: Light
 Drawing Type: Point
 Used in From 0/1998 2 25 updates to

Properties
 Category of light leading light, front light
 Colour red
 Light characteristic occulting
 Signal group (2)

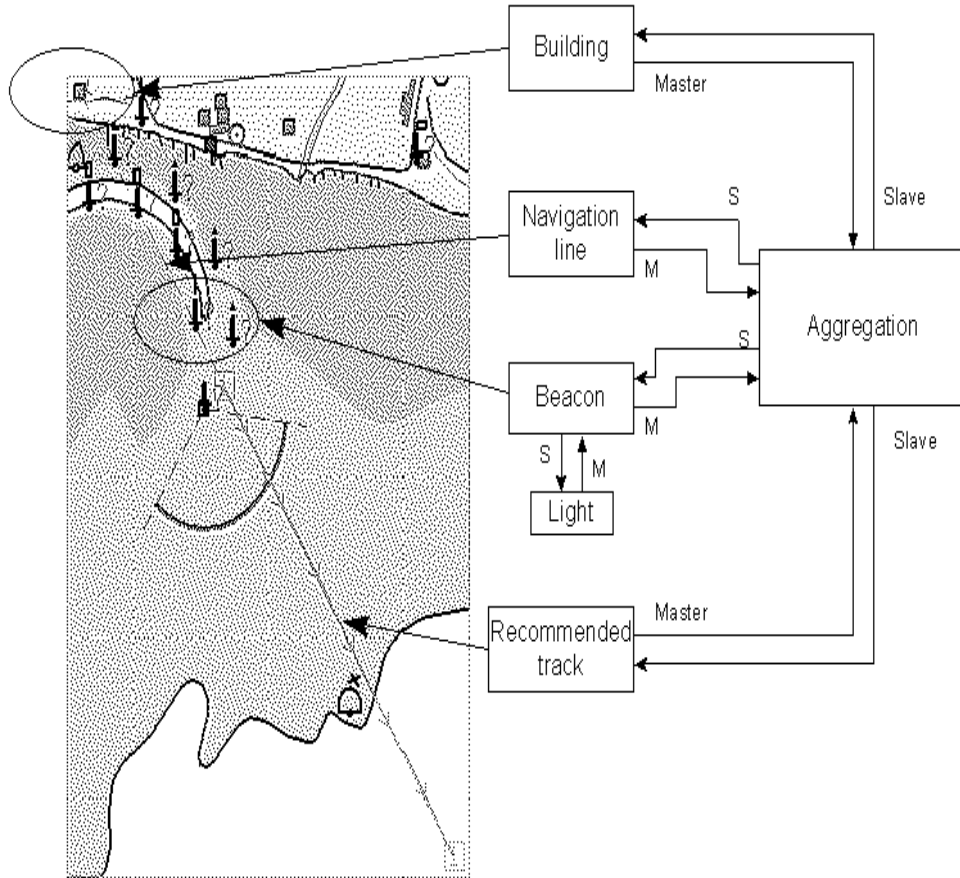
Position
 Point 1 Isol / 1 Lat: 50°50.624N
 Lon: 001°18.826W

Position remarks

Master: Beacon, lateral Goto Master
 Slaves: Goto Slave

8. Vector Chart Material

Recommended track defined by a building and a beacon



Object
Object: Recommended track
Drawing Type: Line
Used in From 0/1988 2 25 updates to

Properties
M Category of recommended track based on a system of fixed marks
M Orientation 324.00°
M Traffic flow inbound

Position
Point 2 Con / 2 Lat: 50°46.467'N
Lon: 001°21.246'W

Master: Aggregation Goto Master
Slaves: Goto Slave

Object
Object: Aggregation
Drawing Type:
Used in From 0/1988 2 25 updates to

Position
Point / 0 Lat: 50°46.962'N
Lon: 001°21.722'W

Master: Goto Master
Slaves: Building, single Goto Slave
Building, single
Navigation line
Recommended track

Object
Object: Beacon, special purpose/general
Drawing Type: Point
Used in From 0/1988 2 25 updates to

Properties
M Colour orange, red
M Colour pattern No value
M Information conspicuous, visually information Also Port hand lateral mark

Position
Point 1 Isol / 1 Lat: 50°46.934'N
Lon: 001°21.752'W

Master: Aggregation Goto Master
Slaves: Top mark Goto Slave

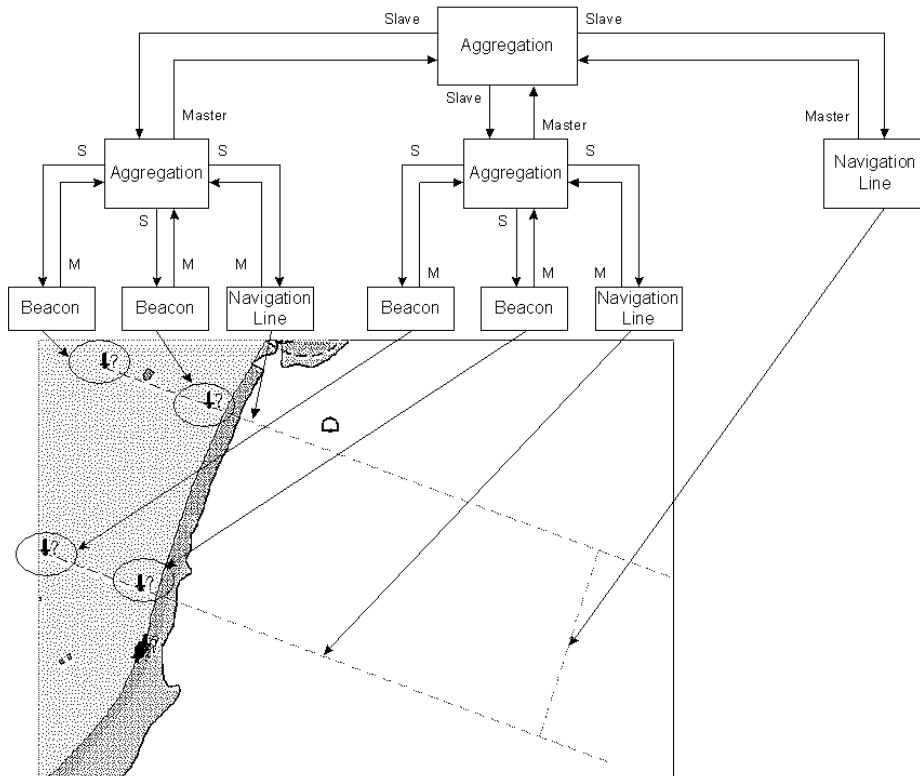
Object
Object: Top mark
Drawing Type: Point
Used in From 0/1988 2 25 updates to

Properties
M Information Pentagonal other shape (see INFO/M)
M Top mark shape

Position
Point 1 Isol / 1 Lat: 50°46.934'N
Lon: 001°21.752'W

Master: Beacon, special purpose/general Goto Master
Slaves: Goto Slave

Measurement mile



Object
 Object: Navigation line
 Drawing Type: Line
 Used in From 0 / 1998 11 10
 updates to

Properties
 M Category of navigation line
 W Orientation
 Transit time No value

Position
 Point 2 Con / 3 Lat: 52°00.955N
 Lon: 001°29.507E
 Position remarks

Master: Aggregation
 Slaves: [Goto Slave]
 [Goto Master]
 [View Presentation Details]

Object
 Object: Aggregation
 Drawing Type:
 Used in From 0 / 1998 11 10
 updates to

Properties

Position
 Point / 0 Lat: 52°00.152N
 Lon: 001°29.070E
 Position remarks

Master: [Goto Master]
 Slaves: Navigation line, Aggregation
 [Goto Slave]

Object
 Object: Aggregation
 Drawing Type:
 Used in From 0 / 1998 11 10
 updates to

Properties

Position
 Point / 0 Lat: 52°00.152N
 Lon: 001°29.070E
 Position remarks

Master: Aggregation
 Slaves: Beacon, special purpose/general, Navigation line
 [Goto Slave]
 [Goto Master]

Object
 Object: Beacon, special purpose/general
 Drawing Type: Point
 Used in From 0 / 1998 11 10
 updates to

Properties
 M Beacon shape
 W Category of special purpose mark with unknown purpose
 W Colour No value

Position
 Point 1 Isol / 1 Lat: 52°01.576N
 Lon: 001°26.596E
 Position remarks

Master: Aggregation
 Slaves: [Goto Slave]
 [Goto Master]

8.14 Other Features of Vector Charts

There are some functions or features that are not used on a daily or weekly basis, but sometimes there is a need to use them.

8.14.1 Cell status

Use the Chart Cell Status function in the Chart Menu to find out the status of individual cells in your system, in a CD-ROM or in an RENC.

Status of CD-ROM: This information is based on information in the CD-ROM catalogue you have loaded and selected here from the CD-ROM list box.

Status of RENC: This information is based on information in an RENC. One example of an RENC is PRIMAR. You get the status of cells in an RENC via telecommunications, if you have optional telecommunication installed in your system and you are a licensed user of an RENC.

Status of ENC: This information is based on information on the hard disk of the system. The ENC used here is S57ed3 delivery formatted chart. Before it can be displayed as a chart it has to be converted into the system's internal display format SENC.

Status of SENC: This information is based on information on the hard disk of the system. A SENC is the system's internal display format.

Chart Cell Status [X]

Cell: CD:

RENC CD HD

Status	Last edition	Last issue date	Last Base / Upd. included	Last update number
CD-ROM	1	2000 3 31	1/1999 10 29	1
RENC				
ENC	1	2000 3 31	1/1999 10 29	1
SENC	1	2000 3 31	1/1999 10 29	1

Use the **Conv Log** button to view a detailed conversion log of S57 chart cell.

8.14.2 S57 cell details

You may need to check when an update has been added into your ECDIS. Also you may need to check what was shown in your chart display three weeks ago. There are also many other cases where you need to find what was known by your ECDIS.

To view updates by their numbers, open the Chart menu, select Chart Cell Status to display the Chart Cell Status window then click the **Details** button. You will get a Chart Cell Details window, where you can view updates by their numbers.

To check any situation in the past, you can use the Displayed Update and Approved Update fields to specify update number.

Chart Cell Details ✕

Apply Cell: Z15IO140

Item: SENC RENC
 CD
 HD

Edition number	Update number	Issue date	Upd. appl. date
1	4	2009 3 20	2009 3 20
1	5	2009 11 27	
1	6	2009 12 24	
1	7	2010 6 11	

Displayed Update 2010 7 27

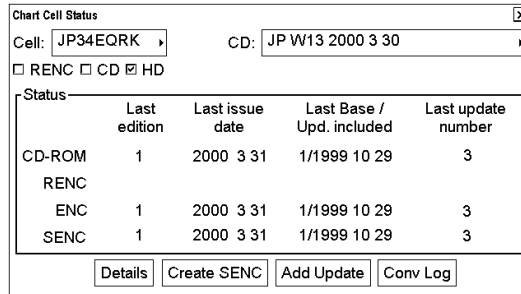
Approved Update 2010 7 27

Latest Update 7 2010 6 11

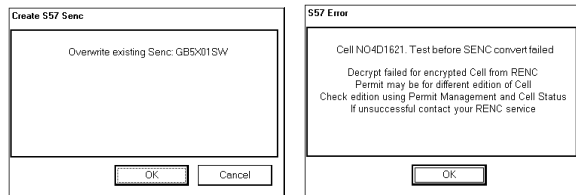
8.14.3 How to initiate SENC conversion from cell status window

The Chart Cell Status window in the Chart menu can be used to force a new SENC conversion for any chart cell that is already in the SENC format. Normally you do not need this feature, but it could be useful if, for example, you need to analyze why an update could not be converted.

Open the Chart menu, select Chart Cell Status then click the **Create SENC** button to initiate SENC conversion of the Base cell.



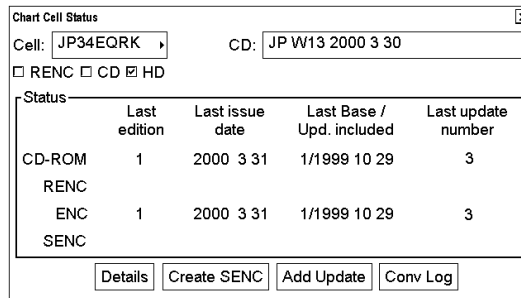
If the Base cell has already been converted to the SENC format, then the system asks you if it is OK to write over existing SENC.



Click the **OK** button to overwrite the existing SENC.

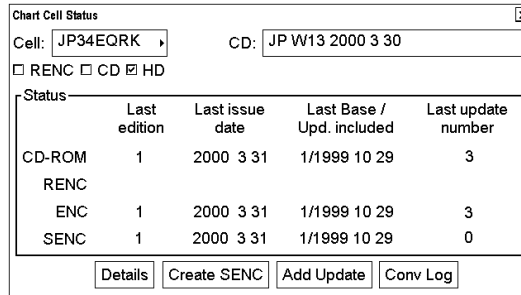
If the S57 Error window shown right appears, the permit for the chart is for another edition.

Then, the contents of the Cell Status window change as in this example at right.



Note that the SENC row is now empty.

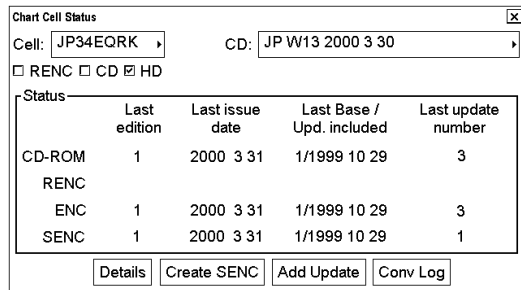
After the SENC conversion is completed, the contents of the Chart Cell Status window changes as in this example at right.



Note that the last update number for the SENC row is now 0 to indicate that only the Base cell is included into the SENC.

Now click the **Add Update** button to add an update in the SENC.

After the SENC conversion for the added update is completed, the contents of the Chart Cell Status window change as in the example at right.



Note that the last update number for the SENC row is now 1 to indicate that the first update has been added into the SENC.

Now click the **Add Update** button again to add the rest of the updates in the SENC. In this example you need to repeat it four times to get updates 2, 3, 4 and 5.

9. Raster Chart Material

9.1 ARCS Charts

Approximately 2,700 ARCS charts are available on 11 chart CD-ROMs, covering the world's major trading routes and ports. Regionally based chart CD-ROMs RC1 to RC10 contain standard BA navigation charts, while RC11 contains ocean charts at scales of 1:3,500,000 and smaller. ARCS charts are facsimile copies of BA paper charts, and as such share a common numbering system. New editions and new charts for ARCS and BA paper charts are issued simultaneously. They are supplied on each Weekly Update CD-ROM until incorporated into the chart CD-ROMs at the next issue.

Occasionally, it is necessary to issue new charts in advance of their intended date of validity, for example a change in regulations commencing on a future date. In such cases the current chart will co-exist with the new chart until the date of implementation, the earlier chart having the suffix "X" after the chart number. The system will allow access to both charts for the period of overlap by issue of new chart permits.

Sometimes you may wish to manually add Notices to Mariners or Navtex warnings into your ARCS charts. In this system this is called Manual Updates. Manual updates are valid for both ARCS and S57 charts so that you need to define them only once. Further, manual updates are valid for all scales so that you don't need to repeat them for charts published in different scales from the same area. For details, see Chapter 10 "Manual Updates".

9.1.1 Chart legend of ARCS chart

The chart legend provides information about edition date and updates of the displayed ARCS chart. To toggle the legend ON/OFF, put the cursor in the sidebar area, confirm that "Select Sidebar" appears in the mouse functions area then push the right mouse button. Then, select Chart Legend from the menu and push the scrollwheel to open or close the ARCS chart legend.

ARCS chart	
Chart Number :	2224
Country Of Origin:	United Kingdom
Latest NM:	1743/2001
Edition Date:	1998 12 10
Publication Date:	2001 5 3
WGS shift status:	Defined
Depth:	Metres
Height:	Metres
T&P Notices	
Details	
Warnings	

Chart Number: Number of current chart is shown in this field.

Country Of Origin: The country that produced the original chart.

Latest NM: Date of the latest Notice to Mariners included in the chart.

Edition Date: Date when the chart was issued.

Publication Date: Issue date of Update CD-ROM used to update the system.

WGS shift status: Datum shift between local datum and WGS-84 datum is known (=Defined), unknown, operator defined (=Undefined) or shift is known only some parts of chart (=Partially defined).

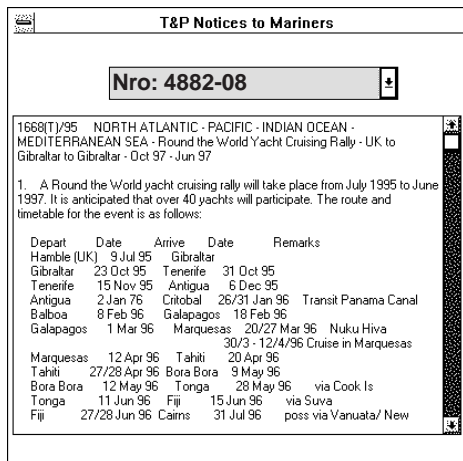
Depth: Unit of depth measurement.

Height: Unit used for indication of height above sea level (for example, clearance height).

9.1.2 T&P notices, details and warnings of ARCS

Access to view T&P Notices, which are details or warnings of ARCS, is contained in the ARCS chart legend mentioned on the previous page. At the lower part of the legend there are three buttons to activate a corresponding window. These are as follows:

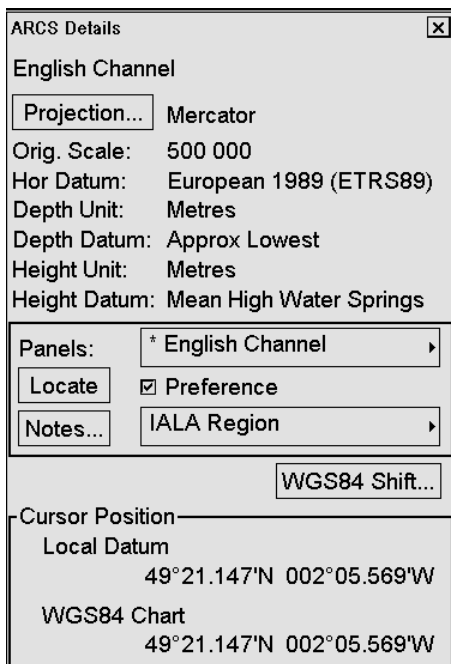
T&P notices



T&P Notices are also known as Temporary and Preliminary Notices to Mariners. Click the **T&P Notices** button to open a text window. This window provides chart information that does not warrant permanent chart correction.

Details

Click the **Details** button on the ARCS Chart Legend sidebar to open the ARCS Details dialog box, which shows detailed information about current chart.



Projection: Projection of current chart. Click the **Projection** button to find information about latitude of true scale and rotation angle.

Orig. Scale: The scale of the original paper chart is shown here.

Hor Datum: Horizontal datum used with current chart.

Depth Unit: Unit of depth used with current chart.

Depth Datum: Vertical datum of depth used with current chart.

Height Unit: Unit of measurement used to measure height of objects above sea level.

Height Datum: Vertical datum for objects located above sea.

Panels: Selects desired inset (Panel) from the combo box. This function also works in conjunction with Locate, Preference and Notes.

Locate: This function displays the inset selected in the Panels combo box.

Warnings

There could be warnings not included in Notices to Mariners. British Admiralty may release textual warnings for any chart and they are available here.

How to set preference for inset (panel)

If there are the different insets with the same position, the operator can select preferred inset, which displays your ship's position.

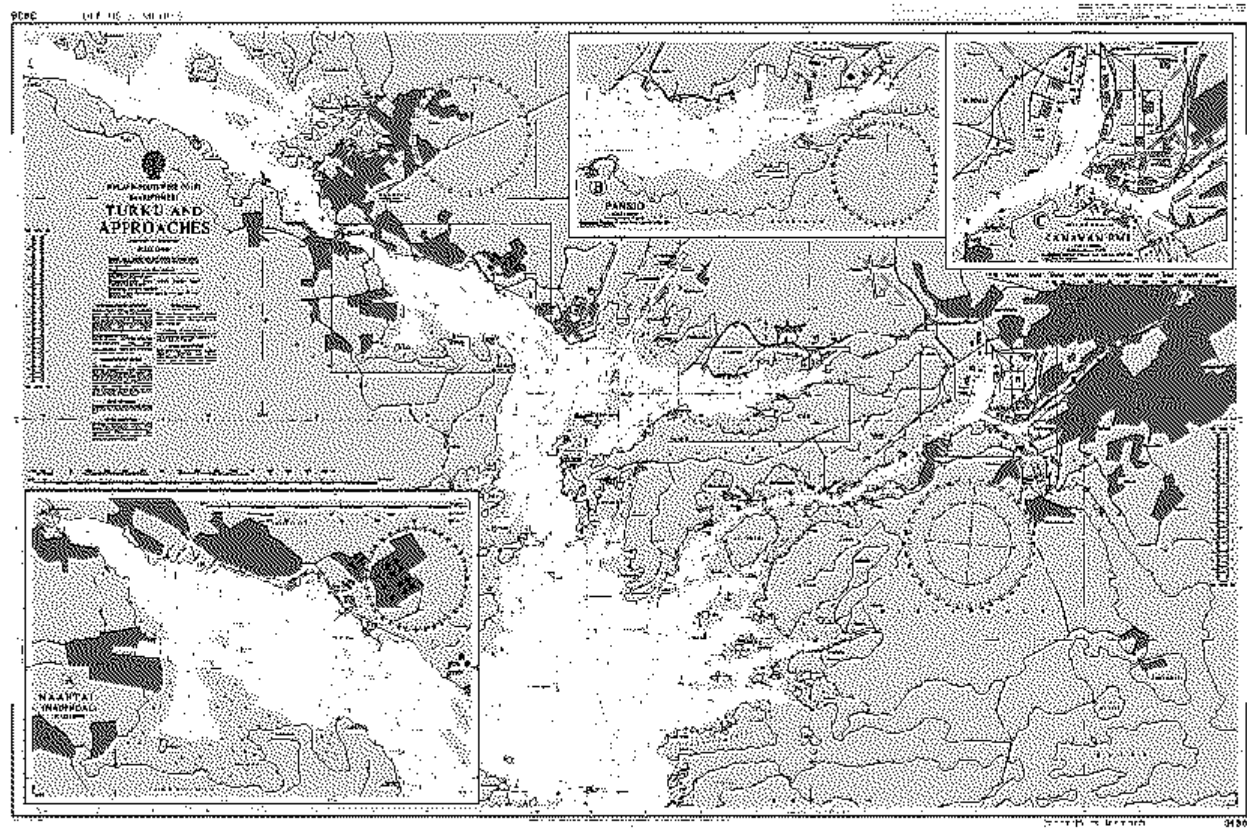
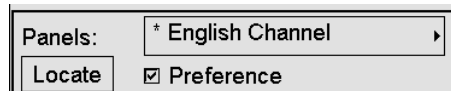


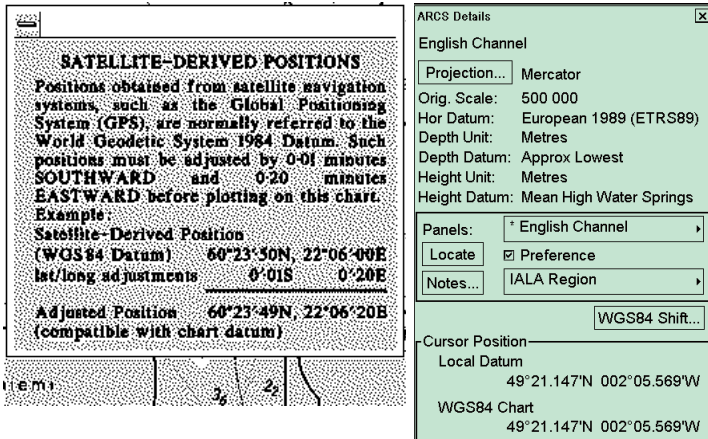
Chart with three insets

1. Put the cursor in the sidebar area, confirm that "Select Sidebar" appears in the mouse functions area then push the right mouse button.
2. Select Chart Legend from the menu then push the scrollwheel.
3. Click the **Details** button on the Chart Legend sidebar to open the ARCS Details dialog box.
4. Select desired inset from the Panels combo box. Check "Preference".



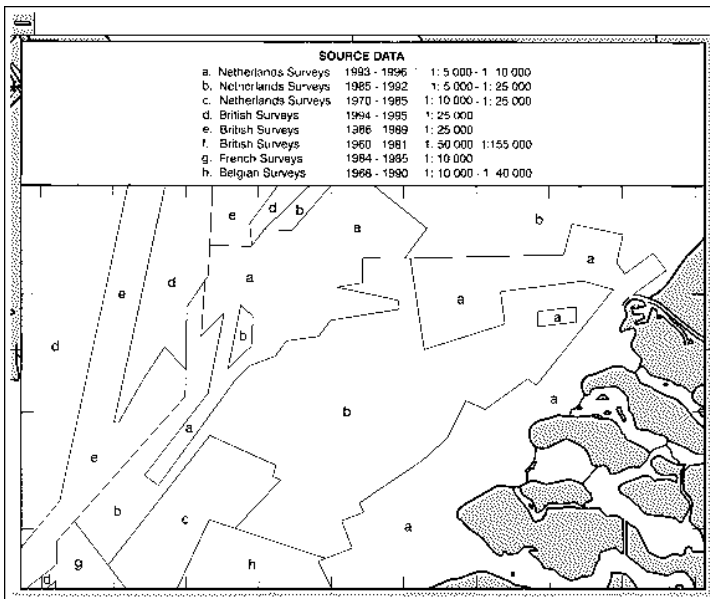
How to display notes of ARCS chart

The operator can select a desired item from the combo box in the ARCS Details dialog box in order to view notes for that item. After choosing the item from the Notes combo box, click the **Notes...** button, and a text window appears. To close the window, click the X at the right corner of the display.



Source Data Diagram (SDD)

A Source Data Diagram (SDD) consists of two parts: a graphic showing the areas covered by each type of source material from which the chart was compiled, and a tabulation, keyed to a graphic, giving details of source dates and scales. The layout of the graphic corresponds to the layout of the chart, and the borders of the diagram equate to the limits of the chart panels. If this option is selected, on the ARCS Details dialog box, it is possible to select (by the cursor) the ARCS chart to plot origin on SDD. If plot positions on SDD are not active, there is no SDD on the chart.



9.2 Datum and ARCS Charts

9.2.1 Difference between ARCS chart local datum and positions in WGS-84 datum

The difference between ARCS chart local datum and WGS-84 datum is known as WGS-84 Shift. For most of the ARCS charts this is known and the system can do the conversion automatically. For some ARCS charts, however, this is unknown and the operator must define the shift. For some ARCS charts this is partially known and the operator is responsible for defining the shift for the unknown areas of partially known ARCS charts. For details, see "How to specify operator WGS-84 shift" on page 9-9.

Further, see "Use with GPS" in the ARCS Navigator User Guide.

How the state of WGS shift is indicated permanently

No warning appears in the cursor window. The cursor position is shown in the operator-selected working datum. (See section 13.3 "How to Select Datum".)

60°02.573'N
028°38.994'E
99.39 NM 87.6°

The warning "WGS undef" appears (in red) in the Cursor window.

WGS 60°02.573'N
undef 028°38.994'E
99.39 NM 87.6°

The system still operates in the operator-selected working datum. However, the system is unable to correctly do the transformation between local paper chart datum and the operator-selected working datum.

The warning "WGS user" appears (in red) in the Cursor window.

WGS 59°49.895'N
user 028°53.349'E
106.6 NM 94.3°

The system still operates in the operator-selected working datum. However, the system uses the operator-defined WGS shift to perform the transformation between local paper chart datum and the operator selected working datum.

How to find WGS shift status of current chart

The ARCS chart legend contains a WGS shift status field. (To display the ARCS chart legend, put the cursor in the Sidebar, confirm that the mouse functions area shows Select Sidebar, push the right mouse button, select Chart Legend then push the scrollwheel.)

WGS shift is defined for this chart. All latitude and longitude positions of the cursor, routes, user charts, Notes, etc. are correctly displayed on this ARCS chart.

ARCS chart	
Chart Number :	2224
Country Of Origin:	United Kingdom
Latest NM:	1743/2001
Edition Date:	1998 12 10
Publication Date:	2001 5 3
WGS shift status:	Defined
Depth:	Metres
Height:	Metres
T&P Notices..	
Warnings...	
Details...	

9. Raster Chart Material

WGS shift is not defined for this chart. Latitude and longitude positions of the cursor, routes, user charts, Notes, etc. may not be correctly displayed on the current ARCS chart. You can use WGS shift to define correct transformation from WGS-84 co-ordinates to local datum of the current ARCS chart.

ARCS chart

Chart Number :	2264
Country Of Origin:	United Kingdom
Latest NM:	2276/2000
Edition Date:	1999 8 5
Publication Date:	2000 8 31
WGS shift status:	Not Defined
Depth:	Metres
Height:	Metres
<input type="button" value="T&P Notices.."/> <input type="button" value="Details.."/>	
<input type="button" value="Warnings..."/>	

WGS shift is partially defined for this chart. Some parts or panels of this chart do not have defined WGS shift. Latitude and longitude positions of the cursor, routes, user charts, Notes, etc. may not be correctly displayed on current ARCS chart. You can use WGS shift to define correct transformation from WGS-84 co-ordinates to local datum of the ARCS chart for the parts or panels of this chart that do not have defined WGS shift.

ARCS chart

Chart Number :	1358
Country Of Origin:	United Kingdom
Latest NM:	4003/2000
Edition Date:	1998 10 22
Publication Date:	2001 1 11
WGS shift status:	Partially Defined
Depth:	Metres
Height:	Metres
<input type="button" value="T&P Notices.."/> <input type="button" value="Details.."/>	
<input type="button" value="Warnings..."/>	

How to display cursor position in local datum of an ARCS chart

On demand you can view the cursor position in local datum of an ARCS chart. This is useful when you need to refer to the corresponding paper chart. You can access ARCS details with the **Details** button in the chart legend of ARCS.

In this example WGS-84 shift is defined for the current ARCS chart.

The Cursor Position window shows cursor position in local ARCS chart datum (indicated as Local Datum) and in WGS-84 datum as defined in the used ARCS chart (indicated as WGS84 Chart).

The screenshot shows the 'ARCS Details' dialog box for the 'English Channel' chart. The 'Projection...' is Mercator, 'Orig. Scale' is 500 000, 'Hor Datum' is European 1989 (ETRS89), 'Depth Unit' is Metres, 'Depth Datum' is Approx Lowest, 'Height Unit' is Metres, and 'Height Datum' is Mean High Water Springs. The 'Panels' dropdown is set to '* English Channel'. The 'Locate' button is active, and 'Preference' is checked. The 'Notes...' dropdown is set to 'IALA Region'. A 'WGS84 Shift...' button is visible. The 'Cursor Position' section shows the following data:

Cursor Position	
Local Datum	49°21.147'N 002°05.569'W
WGS84 Chart	49°21.147'N 002°05.569'W

Below the cursor position, the 'Cursor' section shows:

Cursor	
From Own Ship:	358.2 nm 112.3°
	60°04.159N 029°15.243E

Note: The Cursor window, below the ARCS Details dialog box, always shows cursor position in operator-selected working datum.

In this example WGS-84 shift is not defined for the current ARCS chart.

The Cursor Position window shows cursor position only in local ARCS chart datum (indicated as Local Datum).

The screenshot shows the 'ARCS Details' dialog box for the 'English Channel' chart, identical to the first screenshot. The 'Cursor Position' section shows the following data:

Cursor Position	
Local Datum	49°21.147'N 002°05.569'W
WGS84 Chart	49°21.147'N 002°05.569'W

Below the cursor position, the 'Cursor' section shows:

Cursor	
From Own Ship:	362.8 nm 112.2°
	60°03.261N 029°22.862E WGS undefi.

Note: The Cursor window, below the ARCS Details dialog box, shows the warning "WGS undefi" to indicate that the system is unable to do a correct transformation from local ARCS chart datum to the operator-selected working datum.

9. Raster Chart Material

In this example, WGS-84 shift is not defined for the current ARCS chart.

The Cursor Position panel shows cursor position in local ARCS chart datum (indicated as Local Datum) and in WGS-84 datum as defined by the operator WGS shift (indicated as WGS-84 User).

ARCS Details

English Channel

Projection... Mercator

Orig. Scale: 500 000

Hor Datum: European 1989 (ETRS89)

Depth Unit: Metres

Depth Datum: Approx Lowest

Height Unit: Metres

Height Datum: Mean High Water Springs

Panels: * English Channel

Locate Preference

Notes... IALA Region

WGS84 Shift...

Cursor Position

Local Datum
49°21.147'N 002°05.569'W

WGS84 Chart
49°21.147'N 002°05.569'W

Note: The Cursor window, below the ARCS Details dialog box, shows the warning "WGS undefi" to indicate that the system uses operator-defined transformation from local ARCS chart datum to the operator selected working datum.

Cursor

From Own Ship: 362.8 nm 112.2°

60°03.261N 029°22.862E WGS undefi.

How to display the value of WGS-84 shift

You can view the value of WGS-84 shift of the current ARCS chart. To do this, click the **Details** button on the ARCS Chart Legend sidebar to open the ARCS Details dialog box, then click the **WGS84 Shift...** button.

In this example the WGS-84 shift is defined for current ARCS chart.

Chart Shift: The latitude and longitude shifts between WGS-84 datum and the local datum.

Accuracy: This field contains accuracy as defined by the chart producer.

ARCS WGS84 Shift

Chart Shift: 00.010'N 00.190'E

Accuracy: Undefined Undefined

User WGS Shift

Active Reset 00.176'N 01.290'E

Enable

Changes

In this example WGS-84 shift is not defined in the current ARCS chart.

Chart Shift: "Undefined" indicates that this ARCS chart does not have defined WGS-84 shift.

Accuracy: This field contains accuracy as defined by the chart producer.

ARCS WGS84 Shift

Chart Shift: Undefined Undefined

Accuracy: Undefined Undefined

User WGS Shift

Active Reset 00.000'N 00.000'E

Enable

Changes

In this example WGS-84 shift is not defined in the current ARCS chart

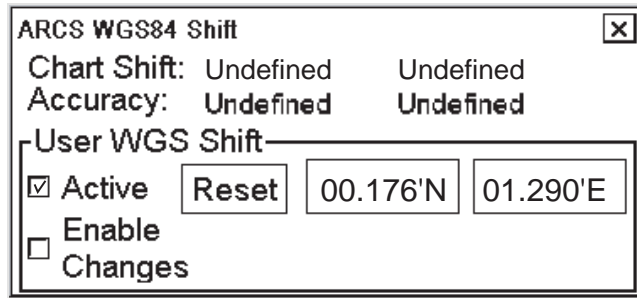
Chart Shift: "Undefined" indicates that current ARCS chart does not have defined WGS-84 shift.

Accuracy: This field contains accuracy as defined by the chart producer.

User WGS shift

The shifts between WGS-84 datum and the local datum as defined by the operator.

Active: Checked if the operator-defined WGS-84 shift is in use.



How to specify operator WGS-84 shift

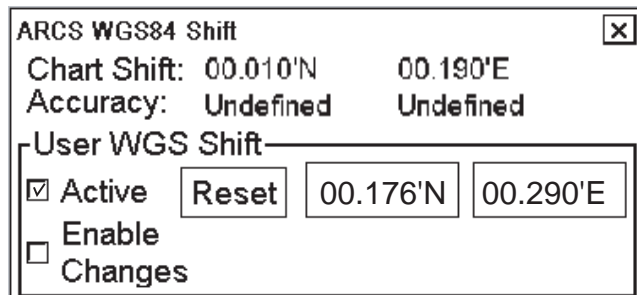
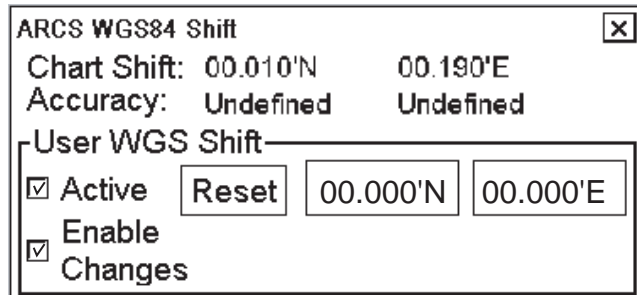
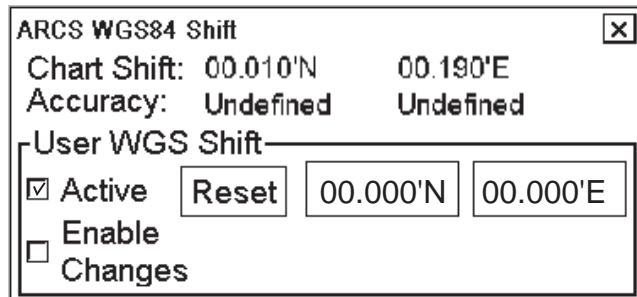
You can define WGS-84 shift for those ARCS charts that do not have defined WGS-84 shift. You cannot redefine WGS-84 shift for any ARCS chart for which it is defined by the chart producer.

To define operator WGS-84 shift do the following:

1. Click the **Details** button on the ARCS Chart Legend sidebar to open the ARCS Details dialog box.
2. Click the **WGS84 Shift...** button. Check Enable changes. Locate the cursor where desired. Check Active and Enable changes.

Use the **Reset** button to reset the values of the operator defined WGS-84 shift to zero.

Use Active to control use of operator defined WGS-84 shift. Check to activate operator-defined WGS-84 shift; uncheck to deactivate.



9.2.2 Permanent messages of ARCS

The system can help you to keep your ARCS charts up-to-date for the charts that you have received from ARCS. Producers of ARCS charts store up-to-date status on an ARCS Weekly Update CD-ROM (system Files). This information is loaded into the ECDIS when you update, either by permits or by active group. Based on this information, ARCS permanent messages are displayed to help you keep your ARCS charts up-to-date.

Chart is loaded from RCxx CD-ROM, but not updated using ARCS Weekly Update CD-ROM.

Perform update for the chart.

ARCS Permanent Message
This Chart is not up to date. UNSAFE FOR NAVIGATION
Reason: Missing update

Chart is not updated using an ARCS Weekly Update CD-ROM from which ARCS system files are loaded.

Use the correct ARCS Weekly Update CD-ROM to load updates for chart.

ARCS Permanent Message
This Chart is not up to date. UNSAFE FOR NAVIGATION
Reason: Chart not updated using current System files

Updates for the chart are not for the same edition as the chart. Load chart from the latest RCxx CD-ROM and update the chart using the latest Update CD-ROM.

ARCS Permanent Message
This Chart is not up to date. UNSAFE FOR NAVIGATION
Reason: Edition mismatch in last update (ARCS 03 or 04)

Chart is cancelled and no longer kept up-to-date by its producer.

ARCS Permanent Message
This Chart is not up to date. UNSAFE FOR NAVIGATION
Reason: Chart is canceled (Not in the System files)

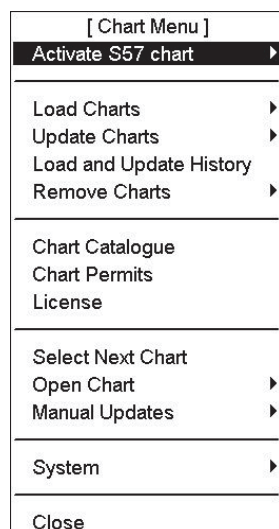
ARCS license has expired.

Contact chart agent to renew your license.

ARCS Permanent Message
Chart 259 cannot be seen
Reason: License expired (ARCS 10)

9.3 Chart Menu

The Chart menu is used for managing chart database.



Menu description

Activate S57 chart: The function activates an S57 chart onto the display. You have two options to select how to open a chart on the display. "Ignore scale" opens S57 chart cell with the scale that was used the last time you used an S57 chart. "Sync scale" opens a S57 chart with the scale that was used with ARCS charts.

Load Charts: User can load ARCS chart from a CD-ROM to the hard disk.

Update Charts: User can update ARCS charts stored in the hard disk. Updates are delivered weekly by British Admiralty, in a CD-ROM.

Load and Update History: You can view history of load and update actions for ARCS charts.

Remove Charts: User can remove charts from the hard disk.

Chart Catalogue: For managing ARCS charts. See section 9.11.2 "ARCS catalogue".

Chart Permits: Load permit from floppy disk or USB memory.

License: View license information of the current ARCS chart.

Select Next Chart: Select next chart in currently selected group.

Open Chart: User can open appropriate ARCS chart on the display.

Manual Updates: User can see manual updates made.

System:

- **ARCS Update Status:** Display information about ARCS Update CD-ROM that is loaded in the system.
- **S52 Presentation Library:** View information of presentation library used with manual updates.
- **Verify system files:** Compare loaded system files with files on Update CD-ROM.
- **Refresh Charts after backup:** Refresh charts after backup from another ECDIS.
- **Log File:** User can view log file including ARCS depending functions
- **Colors:** Display color sample.
- **Restart drawing process:** Redraw chart.

Close: Close menu.

9.4 ARCS Subscriptions

ARCS customers can subscribe to one of two service levels, ARCS Navigator or ARCS Skipper.

9.4.1 ARCS Navigator

ARCS Navigator operators receive a comprehensive weekly updating service on a CD-ROM that mirrors the Admiralty Notices to Mariners (NMs) used to correct Admiralty paper charts. The update information is cumulative, ensuring that only the most recent Update CD-ROM is necessary. ARCS Navigator license is valid for 12 months. During this period, weekly updates will be delivered on Weekly Update CD-ROMs. ARCS Navigator is intended for SOLAS class operators who require that their charts are up-to-date.

Content of ARCS Navigator pack:

- One (1) or more Chart CD-ROMs (RC1-RC11) containing ARCS charts
- One (1) Update CD-ROM containing the latest ARCS chart corrections
- One (1) floppy disk storing ARCS chart permits

9.4.2 ARCS Skipper

For the ARCS Skipper operator, the charts you have a license for were fully up-to-date at the day of sale. They can be updated for NMs whenever you like by buying a new ARCS Skipper license, which is again fully up-to-date for the day of sale.

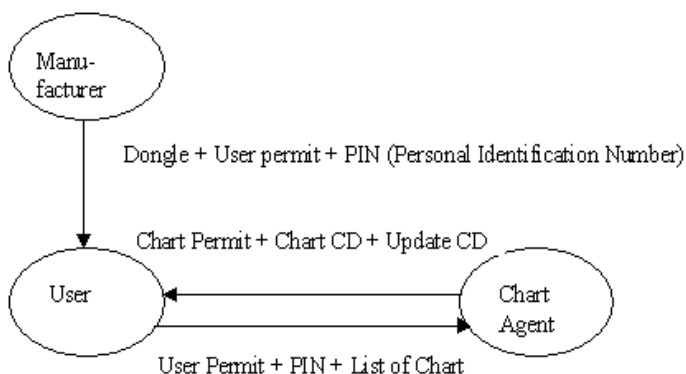
Content of ARCS Skipper pack:

- One (1) or more Chart CD-ROMs (RC1-RC11) containing ARCS charts
- One (1) Update CD-ROM containing the latest ARCS chart corrections
- One (1) floppy disk storing ARCS chart permits

Note: If you are holding more than one ARCS Skipper packs onboard, only one pack can be loaded into the ECDIS at a time.

9.4.3 ARCS license information

Licensee information, which is transferred between participants, is as shown below.



If ARCS format is active, you can select ARCS License from the Chart menu, with "License". License information is shown in the window. This window contains information about the license type and license number.

Licensee:
Vessel:
Company:

Host System:
User 758E23805A494153 (DONGLE)
PIN:
License Type:
License Number:

This license is only valid if the chart permits on this system are licensed to the person or company named above. If you are not the named person or do not represent the named company, you may be in breach of the license conditions relating to the use of these charts. If in doubt please contact your nearest ARCS supplier.

ARCS License information window

9.5 How to Get Started with ARCS Charts

Copy ARCS permit from floppy disk to USB memory. Then, do the following:

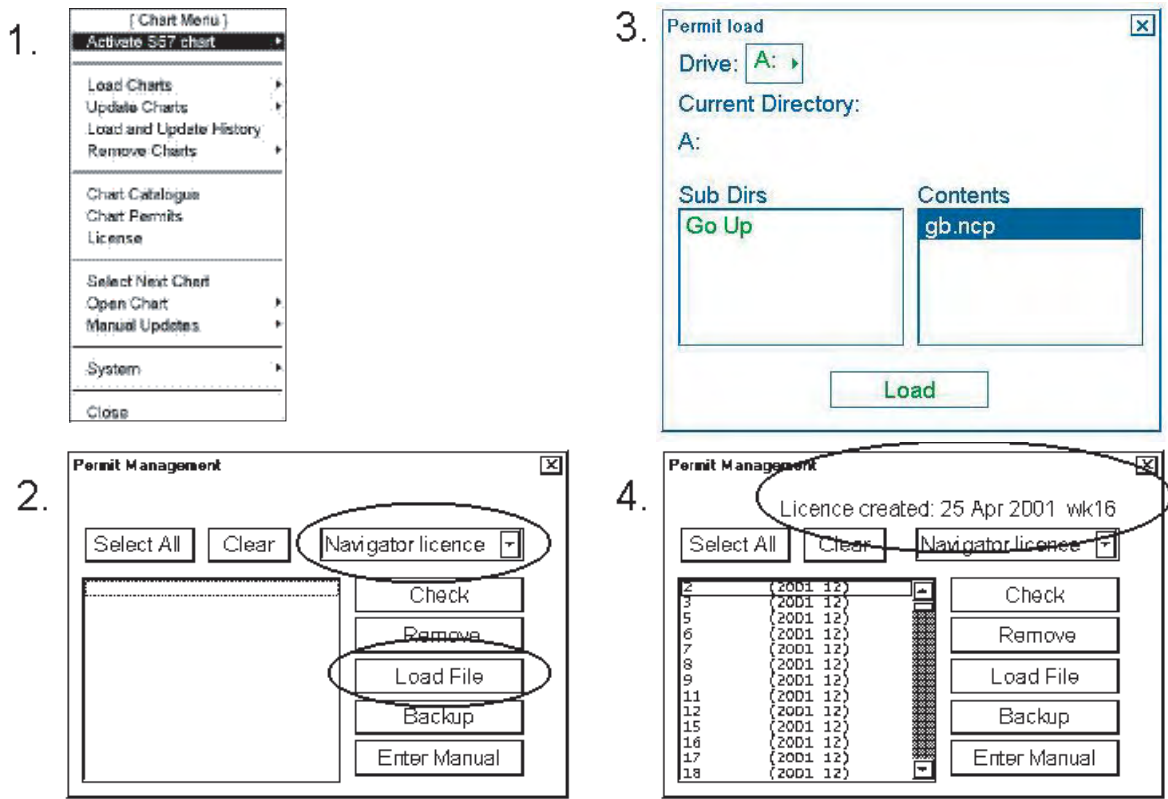
1. Load permit from USB memory by using Chart Permits in the Chart menu. See section 9.6 "How to Load, Remove Chart Permits for ARCS Navigator License".
2. Load System files from the latest ARCS weekly Update CD-ROM. See section 9.10 "How to Update ARCS Charts".
3. Load chart from ARCS CD-ROMs. See section 9.9 "How to Load a New ARCS Chart into the System".
4. Load update from a Weekly CD-ROM. See section 9.10 "How to Update ARCS Charts".
5. Open desired chart from the Chart menu by using the Open Chart or Chart Catalogue command.

For new Update CD-ROM, continue from step 3.

To put another chart in the system, continue from step 1.

9.6 How to Load, Remove Chart Permits for ARCS Navigator License

Permits are usually delivered in a floppy disk. Load the ARCS navigator license permits as follows:



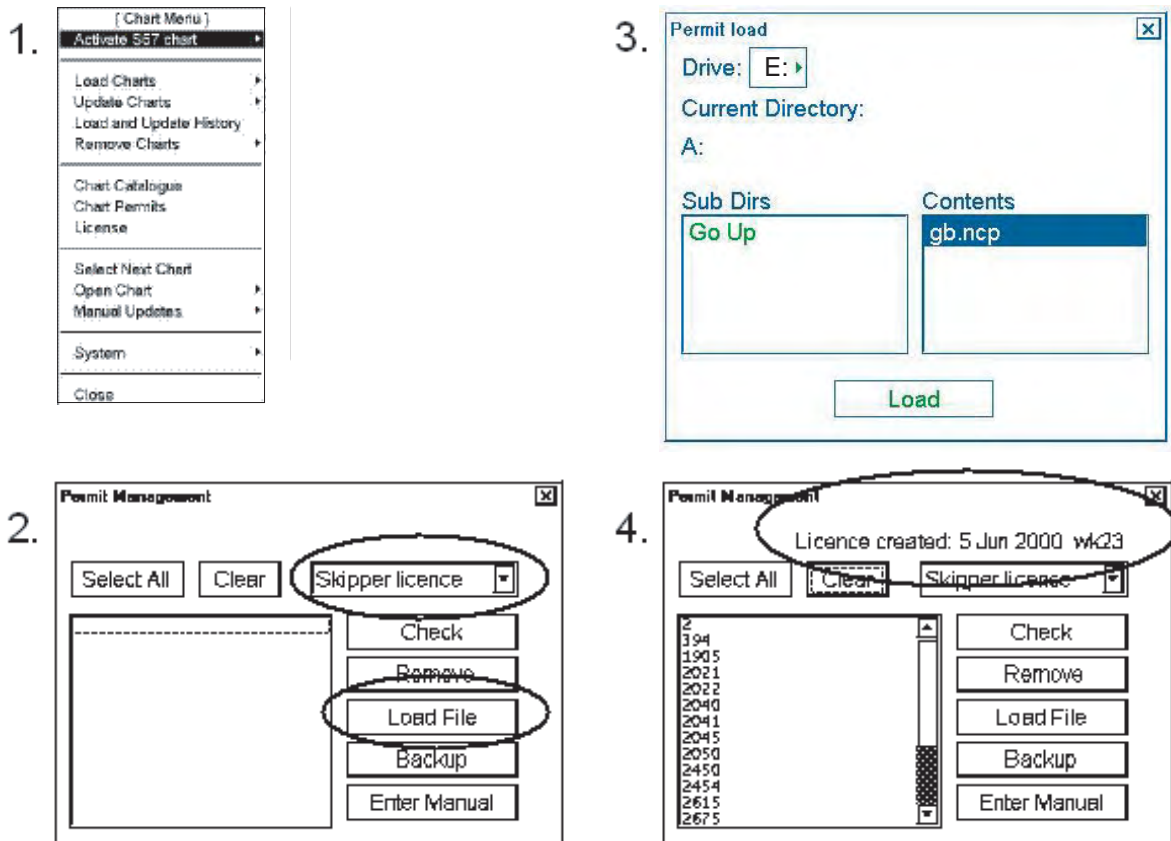
1. Copy ARCS permit from floppy disk to USB memory. Then, do the following:
2. Open the Chart menu then select Chart Permits from the menu.
3. Select Navigator license as the type of license. Insert a permit floppy disk in the floppy disk drive, or connect permit USB memory. Click the **Load File** button.
4. Select Gb.ncp then click the **Open** button.
5. Check in the Permit Management window that permits are displayed here with correct information. Close the window by clicking the X at the upper right side of the window.

Enter Manual button: This function enables manual entry of a permit string that is delivered, for example, by telex. After typing the string, the operator can accept it by clicking the **Add** button or reject it by clicking the X at the upper right side of the window.

Backup button: This button opens the "Save As" window, where the operator may make a backup copy from a chart permit file.

9.7 How to Load Chart Permits for ARCS Skipper License

Permits are usually delivered in a floppy disk. Copy permit file into a USB memory then load ARCS Skipper chart permits into the system as follows:



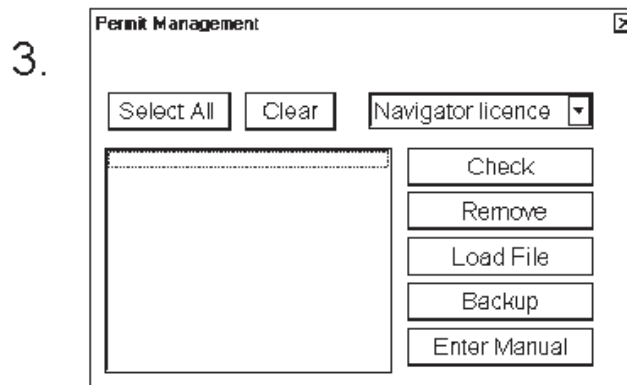
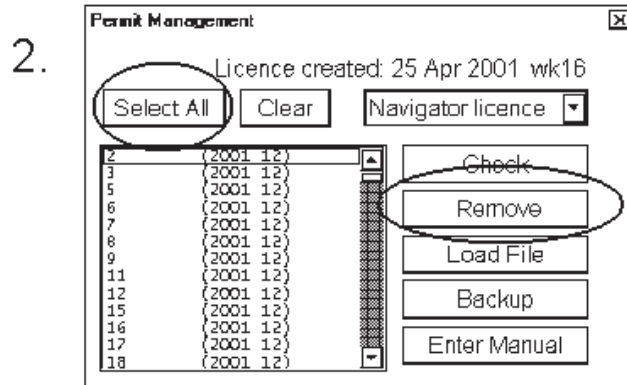
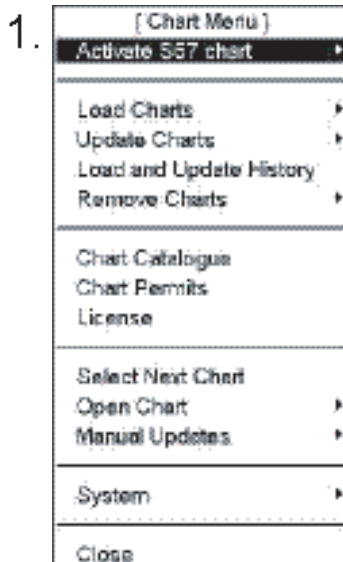
1. Open the Chart menu then select Chart Permits from the menu.
2. Select Skipper license as the type of license. Insert a permit floppy disk in the floppy disk drive, or connect permit USB memory. Click the **Load File** button.
3. Select gb.ncp then click the **Open** button.
4. Check in the Permit Management window that permits are displayed there with correct information. Close the window by pressing the **CANCEL** key on the Control Unit RCU-018 or clicking the X on the window.

Note: If you are holding more than one ARCS Skipper packs onboard, only one pack can be loaded into the ECDIS at a time. If you load a new ARCS Skipper permit into the ECDIS, you must load charts and weekly updates from CD-ROMs delivered with and listed in your License Agreement (also known as "Schedule A").

9.8 How to Remove Chart Permits

Normally you do not need to remove permits during normal operation. However, it may be necessary to remove chart permits from the system. Permits may be removed individually or collectively.

To remove chart permits, do the following:



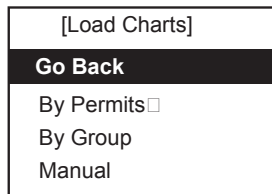
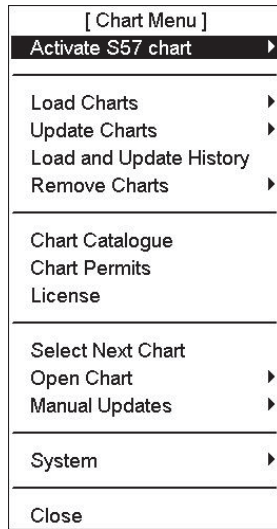
1. Open the Chart menu then select Chart Permits from the menu.
2. **To remove all permits**, click the **Select All** button then click the **Remove** button.
To remove an individual permit, use the cursor to select the permit then click the **Remove** button.
3. Check that selected permits have been removed. Close the window by clicking the X on the window.

9.9 How to Load a New ARCS Chart into the System

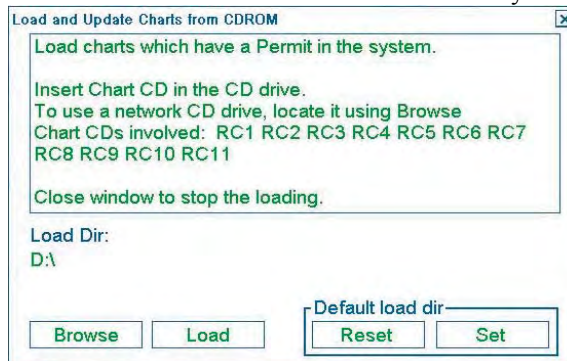
You may load a new ARCS chart into the system for which you have a permit, by the following methods.

- **Load by permit.** Load all the charts that are covered in your license. The system will load them automatically.
- **Load by active group.** Define a group of charts to be loaded into the system. It can be useful to define groups to make it easier to maintain your chart database.
- **Load manually.** Manually load charts into the system.

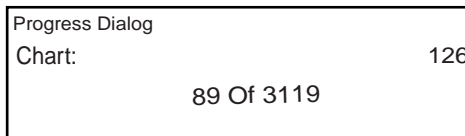
9.9.1 How to load ARCS charts by permits



1. Select Load Charts from the Chart menu and By Permits from the sub menu.



2. Insert desired CD-ROM into the CD-ROM drive then click the **Load** button. The progress indicator shows the number of charts loaded and the number of charts to be loaded.

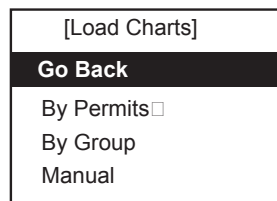
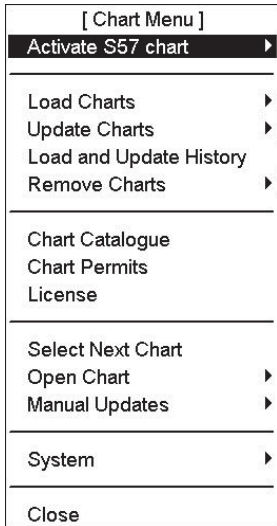


3. Repeat step 2 until you have loaded all the CD-ROMs covered in your license. After you have loaded all CD-ROMs, click the X on the ARCS Load window to close the window.

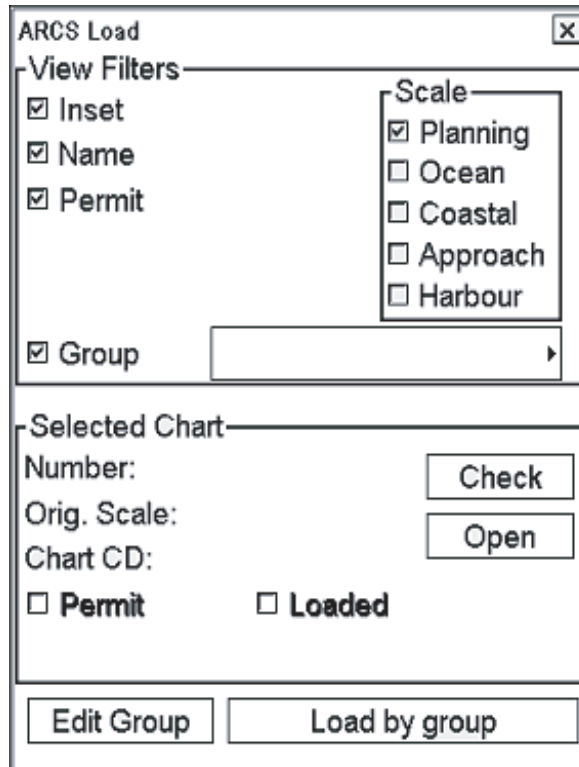
9.9.2 How to load ARCS charts by active group

Use "Loading by active group" when you want to load only ARCS charts that are in a group that you have defined. This is very useful if your license includes many charts from around the world and you are going to use only a part of those charts for which you have a permit. Simply define a group of charts you need for voyage then load them into the system. To load by active group, do the following:

1. Define a group, if one does not exist. See section 9.12 "How to Group ARCS Charts".
2. Set group as an active group. See "How to select an active group" on page.9-28.



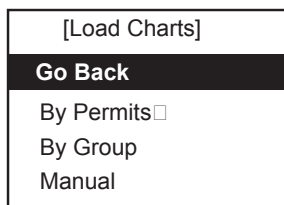
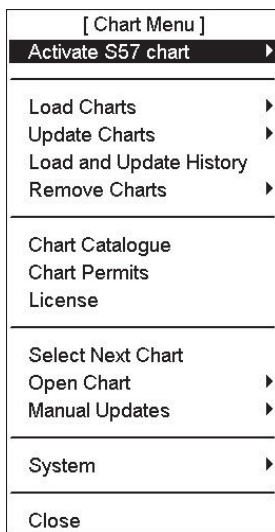
1. Select Load Charts from the Chart menu and By Group from the sub menu.
2. An ARCS Load window appears that shows active group and desired ARCS CD-ROMs.



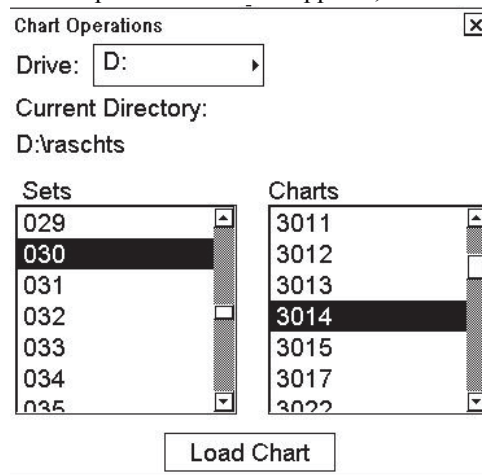
3. Insert desired CD-ROM in the CD-ROM drive then click the **Load by group** button.
4. Repeat until you have loaded all the CD-ROMs pertaining to the active group. After you have loaded all CD-ROMs, click the X on the ARCS Load window to close the window.

9.9.3 How to load ARCS charts manually

You can also load ARCS charts manually into the system as follows.

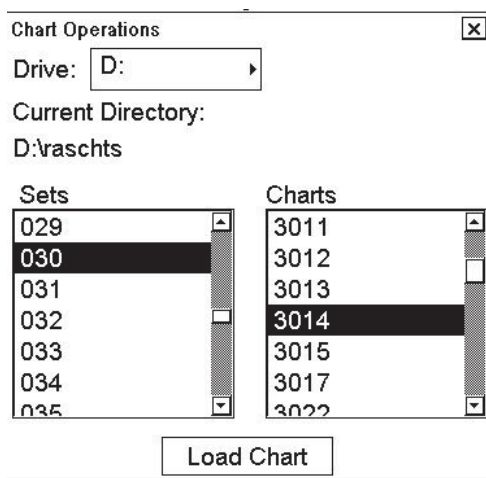


1. Insert desired ARCS CD-ROM into the CD-ROM drive.
2. Select Load Charts from the Chart menu and Manual from the sub menu. A Chart Operations window appears; select desired chart from the list box.



3. To load a chart into the system, click the **Load Chart** button.

Note: To use another CD-ROM drive connected in your network, select the desired drive from the Drive field.



D: Local CD-ROM drive

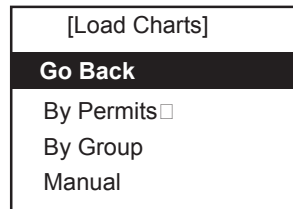
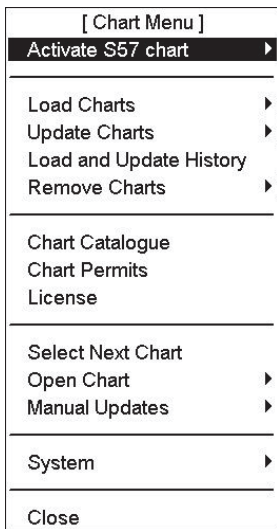
F: Other CD-ROM drive (from other ECDIS, connected via LAN)

9.10 How to Update ARCS Charts

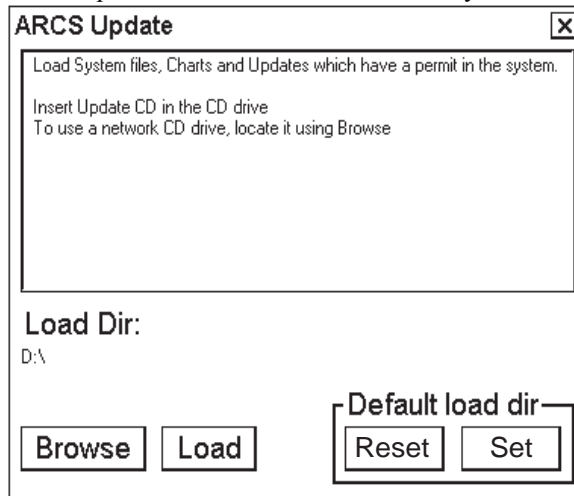
The updates are delivered separately in an Update CD-ROM. To update ARCS format raster chart into the system, you can use one of following procedures:

- **Update by permit.** You can update all the charts that are applicable to your license. The system will update them automatically.
- **Update by active group.** You can define a group of charts to be updated. It is useful to define groups to make it easier to maintain your database.
- **Loading updates manually.** You can manually select the charts that will be updated into the system.

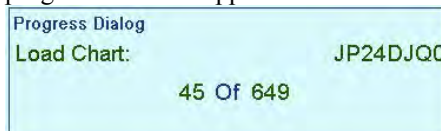
How to load updates by permits



1. Spin the scrollwheel to display Menu/Info/Chart Menu in the mouse functions area then push the right mouse button.
2. Select Update Charts from the menu and By Permits from the sub menu.



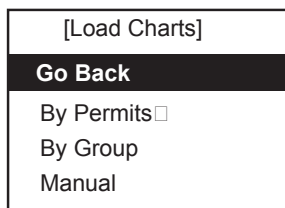
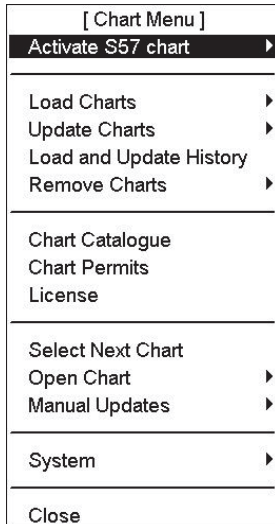
3. Insert Update CD-ROM to drive then click the **Load** button. A loading progress indicator appears.



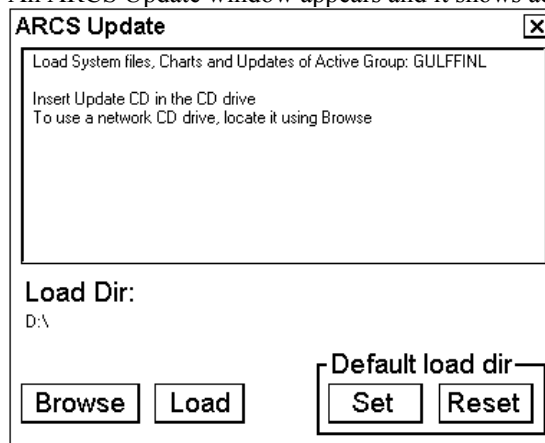
The system will automatically update charts for which you have a permit.

9.10.1 How to load updates by active group

Loading updates by active group is used when you want to update only ARCS charts that you have designed to include in a defined group. This is very useful if your license includes a lot of charts from around the world and you are going to use only a part of charts for which you have a permit. Define a group from charts you need for voyage and update them into the system. To update by active group, do as follows:



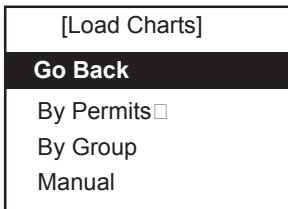
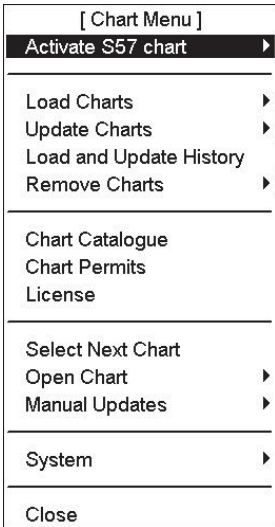
1. Define a group, if one does not exist. See section 9.12 "How to Group ARCS Charts".
2. Set group as an Active group. See "How to select an active group" on page 9-28.
3. Open the Chart menu, select Update Charts from the menu and By Group from the sub menu.
4. An ARCS Update window appears and it shows active group.



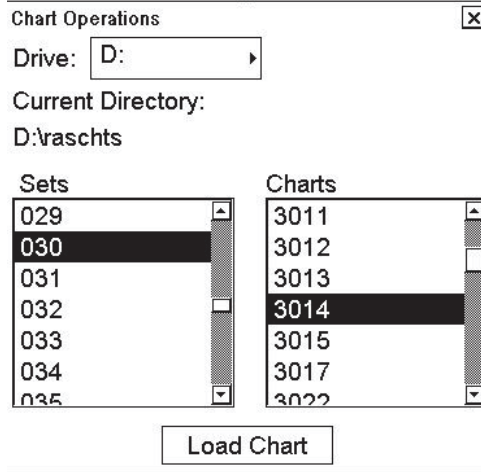
5. Insert Update CD-ROM in the CD-ROM drive then click the **Load** button.

9.10.2 How to load updates manually

You can also load updates for ARCS charts manually as follows:

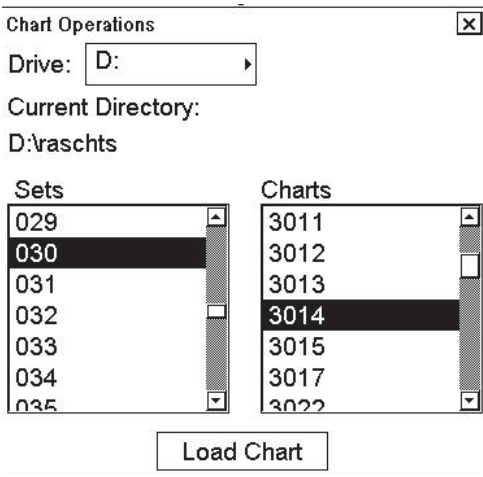


1. Insert Update ARCS CD-ROM into CD-ROM drive.
2. Open the Chart menu, select Update Charts from the menu and Manual from the sub menu.
3. The Chart Operations window appears; select desired chart from list box.



4. To load updates into the system, click the **Load Chart** button. To close this window, click the **OK** button.

Note: To use a different CD-ROM drive connected in your network, use the Drive field to select the appropriate CD-ROM drive.

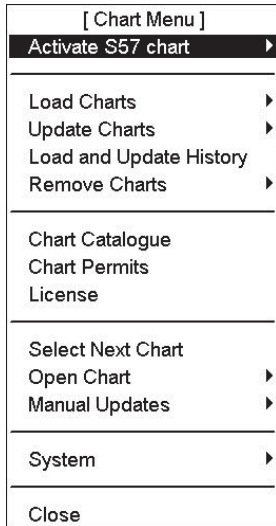


D: Local CD-ROM drive

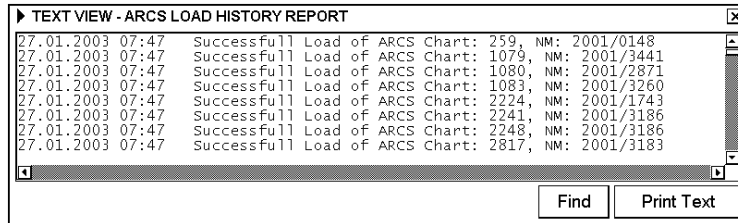
F: External CD-ROM drive

9.11 How to Display Chart Load and Update History of ARCS

You may view a history of all chart load and updates (Notices to Mariners) of ARCS. This information is stored in the ECDIS.



Open the Chart menu and select Load and Update History to show the log file for the loaded ARCS Update.

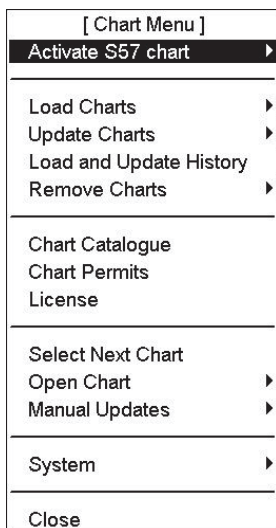


You can view all Notices to Mariners loaded to the ECDIS.

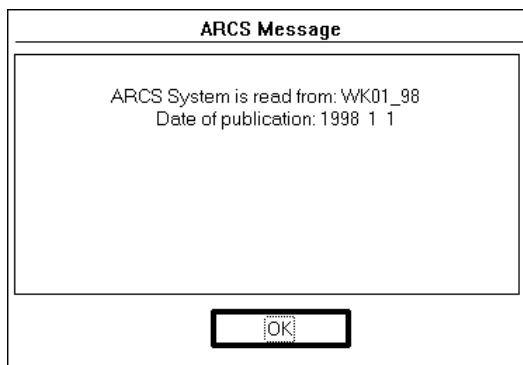
9.11.1 How to display update status of your ARCS charts

You can easily check which is the latest Update CD-ROM introduced to your system.

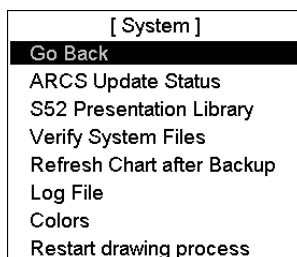
To view update status of ARCS charts, do the following:



Open the Chart menu, select System from the menu then select ARCS Update Status from the submenu. An ARCS Message window appears.

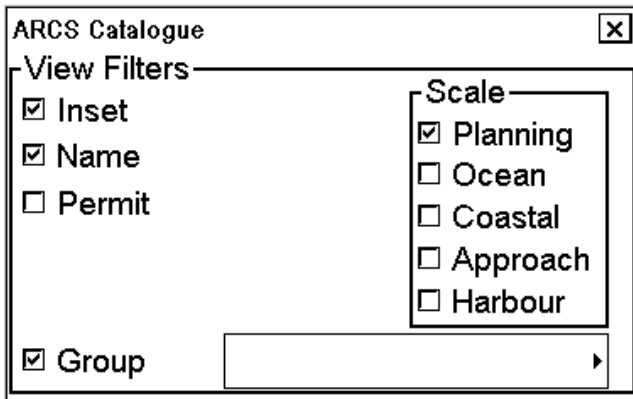


This dialog shows information about the Latest Update CD-ROM loaded into the system.



9.11.2 ARCS catalogue

The Chart Catalogue command in the Chart menu helps you manage ARCS charts. When you select this command, the ARCS Catalogue window opens in the electronic chart area and the ARCS Catalogue dialog box appears in the information area.



View filters window:

You may filter ARCS chart limits with "Scale" in the ARCS Catalogue dialog box. There are different categories for the ARCS charts depending on their scale. The categories are:

- Planning
- Ocean
- Coastal
- Approach
- Harbour

"Inset" displays insets contained in charts. "Name" displays ID number of charts. "Permit" displays limits only for charts that the system has a permit to use.

"Group" displays limits for operator defined group charts.

The ARCS catalogue displays chart limits in different colors. Each ARCS Weekly Update CD-ROM contains information for each chart available in UKHO with up-to-date information at the date of issue. When loading updates using by permits or by active group, this information is loaded into the ECDIS. This information is used to display limits of charts on the ARCS catalogue. The chart limit boxes are color coded as follows:

Color of chart limit	Meaning
Green	The chart is available for use and it is also up-to-date.
Orange	The chart has a valid permit and it is loaded on the hard disk, but it is not up-to-date. Update chart using the same weekly updates as displayed in the ARCS Catalogue information.
Red	Neither permit nor chart has been loaded onto the hard disk. Load permit, chart and updates.
Blue	The chart is not seen on the ECDIS. Possible reasons are: <ul style="list-style-type: none"> • Chart permit is for different edition of the chart. This may occur when a new edition of a chart has been issued, but either only new permit or only new chart has been loaded onto the hard disk. • Chart permit has expired. Contact your chart agent to renew the permit for the chart. • Content of the chart is corrupted. Load the chart and updates.
Magenta	A permit for the chart has been loaded, but the chart is not loaded on the hard disk. Chart cannot be seen on the ECDIS unless the chart is loaded into the ECDIS.

You can select a chart by clicking the limit of the chart in the ARCS Catalogue dialog box. The information about the selected chart is displayed in the Selected Chart field.

After you have clicked the limit of chart you get information of the chart in Selected Chart window as follows:

- **Number:** Chart number as stated on the corresponding paper chart.
- **Orig. Scale:** Scale of original paper chart.
- **Chart CD:** The number of the CD-ROM in which selected chart is stored.
- **Permit:** If selected there is permit in the ECDIS.
- **Loaded:** If selected chart is loaded into the ECDIS.
- Chart usability and Update Status (in the example at right the update is missing for orange color chart limit)

Selected Chart	
Number:	2248
Orig. Scale:	200 000
Chart CD:	RC3
<input checked="" type="checkbox"/> Permit	<input checked="" type="checkbox"/> Loaded
Orange - Update missing	

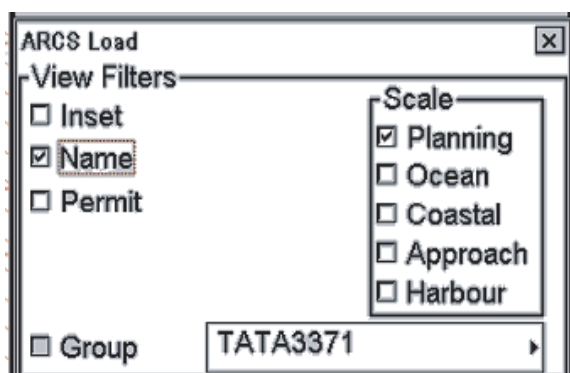
The Selected Chart window also contains several buttons for handling charts. The **Check** button checks if the edition and updates of the selected chart are valid. The **Open** button opens selected chart, if it has been loaded and the system has a permit for selected chart.

9.12 How to Group ARCS Charts

9.12.1 How to create an ARCS chart group

To create a ARCS chart group, do the following:

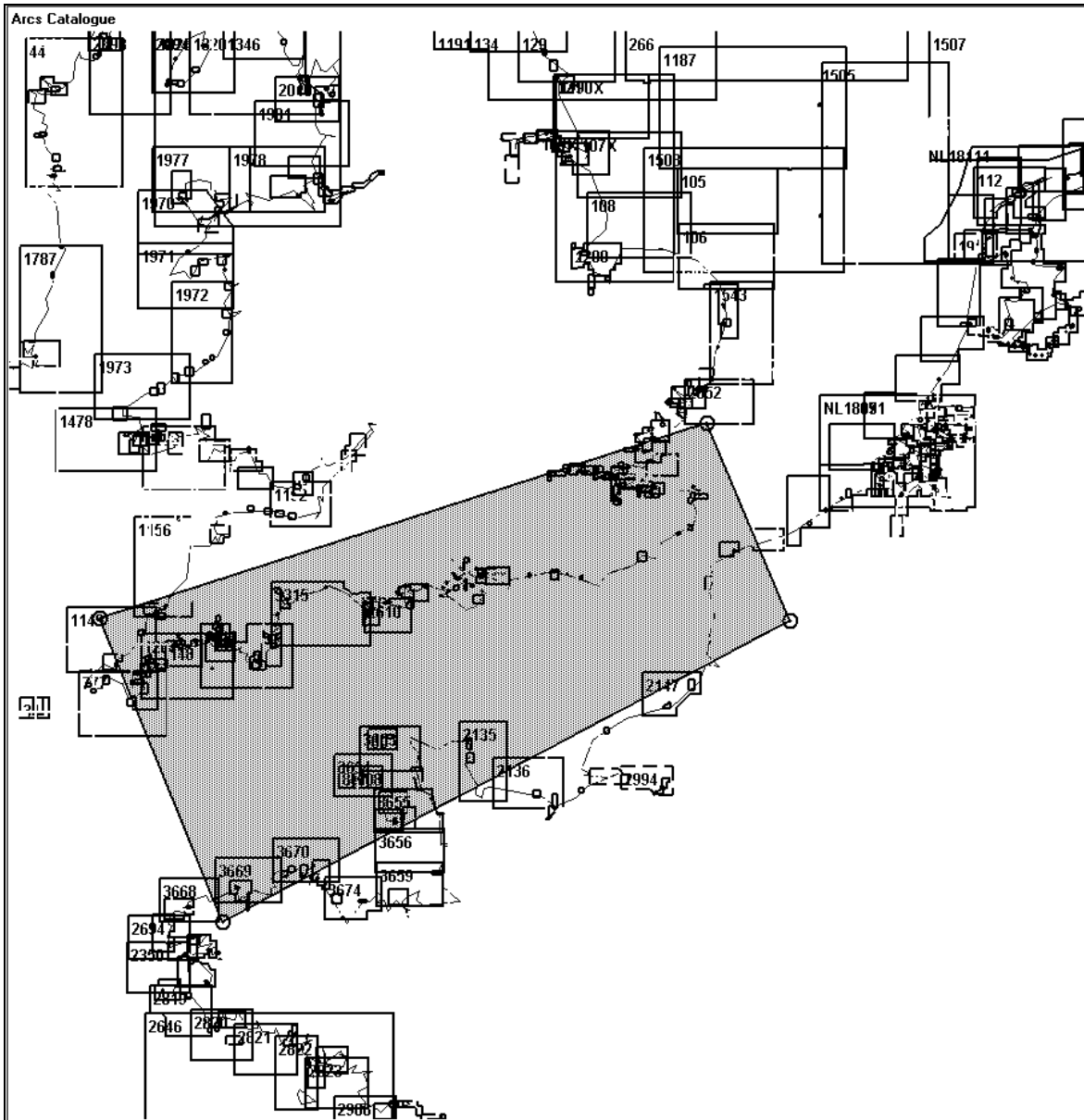
1. Open the Chart menu.
2. Select Chart Catalogue from the menu to show the ARCS Catalogue dialog box.
3. Click the **Groups** button to show the Group dialog box. See the figure below.
4. Click the **New** button, use the scrollwheel to create a name for the new group then click the **OK** button.



Entered group name (in the example above it is TATA3371) appears in the Edit Group field. Now you can define chart cells to include in this group, following the procedure on the next page.

9.12.2 How to add an ARCS chart to a group

After you have entered a name for the group, click the **Add Frame** button in the Group field. Select the area to group by moving the cursor to the desired location and clicking the left mouse button. Below is a sample group.



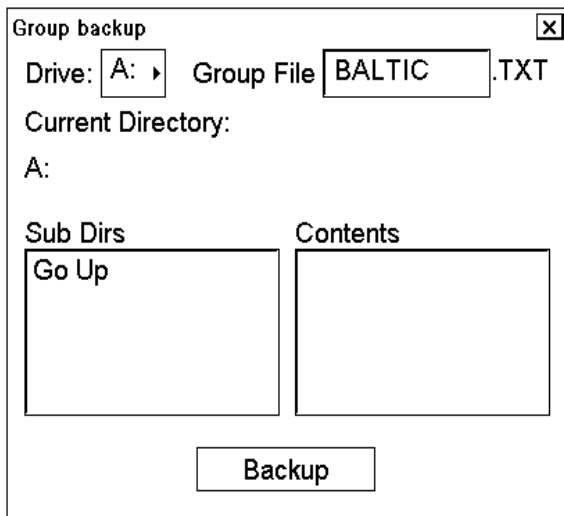
Charts that are inside the frame or intersect a frame limit are added to the group. When you have made your frame, click the **Done** button in the Group field. Chart cells that are selected into the defined group are displayed in the Inside list box in the Group window.

You can also add charts to your group by using the << (add) button. To add a chart, select the chart ID from the Outside list box then click the << button.

Note: Check the Permit box to have the system display only the chart cells for which you have permits.

After you have selected some charts to group, click the **Save** button to save the selected charts as a group.

You can also save your chart cells as a text file, if you want to have a list of chart cells in text format. To do this, click the **Save As Text...** button. The Save As window appears as below.

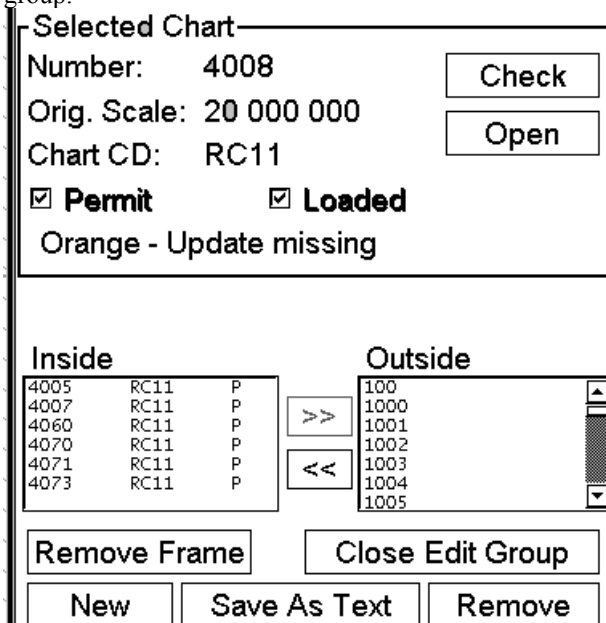


Select directory and drive where you want save your text file. You can use the Windows NotePad application to view and print a list of charts in a group.

9.12.3 How to remove ARCS charts from a group

You can remove charts from a group as follows:

1. Open the Chart menu. Select Chart Catalogue from the menu.
2. Click the **Groups** button in the Group window to show the Group window.
3. Select desired group from the Edit Group list box.
4. Select desired chart(s) from the Inside list box, by pointing the cursor and clicking the left mouse button.
5. Click the >> button. Selected chart is removed to the Outside list box and it is no longer a member of the group.



9.12.4 How to select an active group

You can make a group an active group as follows:

1. Open the Chart menu. Select Chart Catalogue from the menu.
2. Click Groups in the View Filters window.
3. Select desired group from the Edit Group list box.

9.12.5 How to remove a group

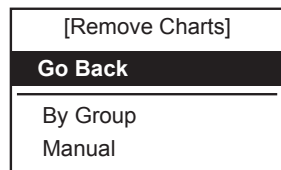
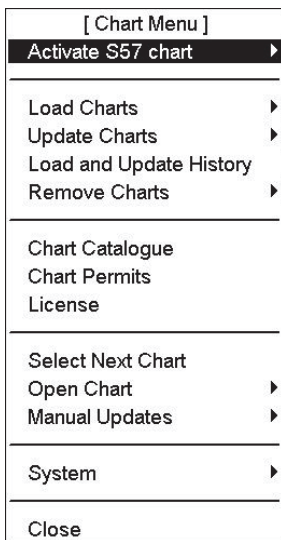
You can remove a group from the hard disk as follows:

1. Open the Chart menu. Select Chart Catalogue from the menu.
2. Select desired group from the Edit Group list box.
3. Click the **Edit Group** button followed by clicking the **Remove** button. Click the **OK** button to confirm.

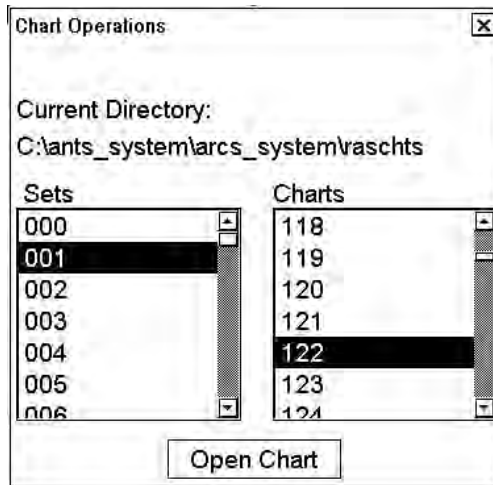
9.13 How to Remove ARCS Charts from the System

You can remove ARCS charts from the system, manually or by active group.

9.13.1 How to manually remove an ARCS chart

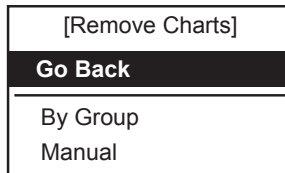
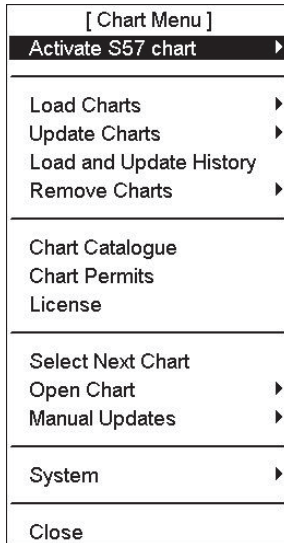


1. Open the Chart menu.
2. Select Remove Charts from the menu and Manual from the sub menu to show the Chart Operations window.

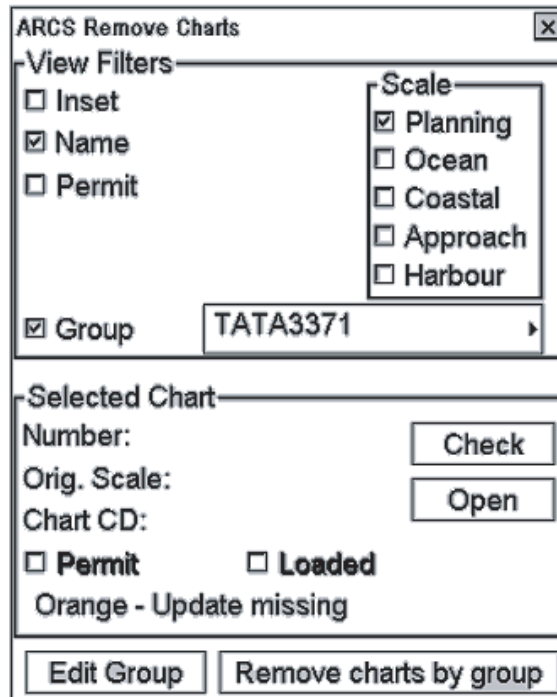


3. Select desired charts to remove them from the system.
4. Click the **Remove Chart** button to remove selected charts from the hard disk.

9.13.2 How to remove an ARCS chart group by "group"



1. Open the Chart menu.
2. Select Remove Charts from the menu and By Group from the sub menu to show the ARCS Remove Charts window.



3. Select group from Group List then select the chart you want to remove.
4. Click the **Remove charts by group** button. The system removes the ARCS charts from the hard disk that pertain to the active group.
5. Click the **OK** button.

9.14 ARCS Chart Display

9.14.1 How to display ARCS chart material

To display ARCS format raster chart material on the display, do the following:

1. Put the cursor just above the area where the ECDIS shows chart scale.
2. Spin the scrollwheel to show "Activate ARCS Chart" in the mouse functions area, then push the left mouse button to show ARCS charts on the display.

9.14.2 How to select ARCS chart datum

Datum is used to select between different models of the earth. It is essential that you use datum in a consistent way.

If you use paper charts together with electronic charts, it is recommended that you use the same datum as your current paper chart to avoid misalignment between your electronic system and points taken or plotted on your current paper chart.

Once you have selected a datum, all numerical latitude and longitude position values are presented in your selected datum.

Note: If you use ARCS raster chart material, the rasterized charts contain some rasterized position information. These positions, like scales in the edges of ARCS charts, are true only if you have selected native datum of that ARCS chart. Normally this is the natural situation, because you use ARCS together with corresponding official paper chart and because you have selected the datum that is equal to the official paper chart.

To find out native datum of ARCS chart, do the following:

1. Click the sidebar area in the information area, spin the scrollwheel to show Menu/ /Select Sidebar in the mouse functions area, push the right mouse button, select Chart Legend from the menu then push the scrollwheel.
2. Click the **Details...** button in the ARCS chart window to show the ARCS Details window.

ARCS chart	
Chart Number :	2224
Country Of Origin:	United Kingdom
Latest NM:	1743/2001
Edition Date:	1998 12 10
Publication Date:	2001 5 3
WGS shift status:	Defined
Depth:	Metres
Height:	Metres

ARCS Details	
Helsinki	
Projection...	Transverse Mercator
Orig. Scale:	20 000
Hor Datum:	World Geodetic System
Depth Unit:	Metres
Depth Datum:	Approx Mean Sea Level
Height Unit:	Metres
Height Datum:	Mean Sea Level
Panels:	+ Helsinki
Locate	<input checked="" type="checkbox"/> Preference
Notes...	Vertical Datums
WGS84 Shift...	
Cursor Position	
Local Datum	
60°07.566'N 024°56.612'E	
WGS84 Chart	
60°07.566'N 024°56.612'E	

In the Hor Datum field the native datum of the displayed ARCS chart is shown.

3. Put the cursor on Datum on the upper right corner of the ECDIS and select desired datum by spinning the scrollwheel and pushing it to confirm selection. Selected datum is shown on the status bar (at the top of the screen).

HDG	140.7 °
SPD (WT)	19.6 kn
SB (POSN)	-0.3 kn
COG (POSN)	139.6 °
SOG (POSN)	19.6 kn
59°57.871'N	
025°21.850'E	
WGS 84	
DGPS	

9.14.3 How to display other ARCS charts

How to select a chart from ARCS catalogue

You may use the ARCS Catalogue to display an ARCS format chart.

1. Open the Chart menu.
2. Select Chart Catalogue from the menu.
3. From the ARCS Catalogue dialog box, activate desired chart. For more information, see section 9.11.2 "ARCS catalogue".
4. Click the **Open** button.

Indication of availability of alternative charts such as S57 (ENC) or other suitable ARCS chart

The system has several indications to alert you to availability of charts. The indication is based on information available from the position of your ship if automatic TM reset is active, or from current position of cursor if automatic TM reset is off.

- **Larger RNC:** More detailed ARCS chart is available.
- **Equal RNC:** Same scale ARCS scale is available.
- **Larger ENC:** More detailed ARCS chart is available.
- **Equal ENC:** Same ENC compilation scale is available.
- **Smaller ENC:** Smaller ENC chart is available.

Note: When using ARCS, the system also recognises if ENCs are available over the specified area and indicates it with the texts shown above. This is important because under the current IMO rules only ENC charts can fully replace the traditional paper charts.

How to browse your ARCS charts

You may view S57 charts using different positions and different scales. The basic tools for browsing charts are **Range -**, **Range+**, **Set Chart Center**, **ShipOffcenter** and **TM Reset**.

Set Chart Center allows you to look ahead from a place other than own ship's current position. Select Set Chart Center from the Main menu to display the dialog box shown right. Use the scrollwheel to set the latitude and longitude position for chart center then click the **Set Center** button.

Note: The chart can also be centered (with less precise positioning) by placing the cursor at desired location, displaying Set Chart Center/Info/Activate Scroll in the dialog box and pushing the left mouse button.)

To turn off automatic true motion reset, display and click TM Reset (in the guidance area). When true motion reset is off, the indication "Ship off screen" appears in the information area.

To restore own ship's position to the screen center, display TM Reset/Info/ShipCenter in the mouse functions area then push the right mouse button.

Range - and **Range+** change the chart scale. If true motion reset is active, ZOOM IN and ZOOM OUT keep the relative position of your ship with respect to the display. If true motion reset is on, ZOOM IN and ZOOM OUT keep the relative position pointed by the cursor with respect to the display.

The system automatically selects next larger or smaller scale. If a chart with larger compilation scale is available at your current viewing position, the message "Larger Scale Data Exists" appears.

If the indication "Equal RNC" appears, this means that you have a chart with the same scale and overlapping with the displayed ARCS chart. When you reach an edge of a chart and the indication "Equal RNC" appears, this means you can switch to another chart with the same scale to the display by displaying Edit Insert/Info/Select Next in the mouse functions area and pushing the right mouse button. An overlapping chart with the same scale will be opened.

Searching for an ARCS chart around your ship

You can use either true motion or relative motion. In the true motion mode, your ship moves until it reaches the true motion reset borderline, where it jumps back to an opposite position on the screen based on ship's course. In the relative motion mode, your ship stays in a fixed position, while the chart moves on screen.

If, in the true motion mode, you reset own position with TM Reset, your ship will immediately jump to the true motion reset position.

If, in the true motion mode, you use ShipOffcenter, your ship will go to that position on screen and continue true motion movement from that position. When it reaches the true motion reset borderline, it will automatically jump to the true motion reset position.

If, in the relative motion mode, you reset own position with TM Reset, your ship will immediately jump to the true motion reset position and use that position as fixed position to stay on screen.

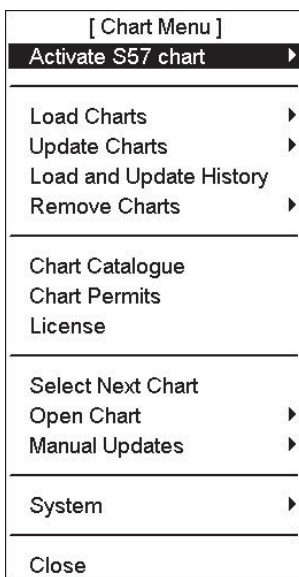
If you use relative motion, you can select a new fixed position for your ship by using ShipOffcenter.

Use **Range -** and **Range+** to select desired chart scale.

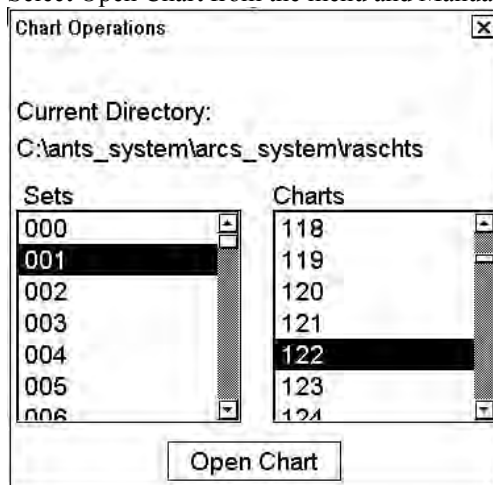
9.14.4 How to select an ARCS chart by its number

How to open an ARCS chart manually

To show a specific ARCS format raster chart, use the "Open Chart" function as follows:



1. Open the Chart menu.
2. See if the text "Activate S57 chart" appears on the first line of the menu. If it is displayed, then go to step 4.
3. If the text "Activate ARCS Chart" is shown, push the scrollwheel.
4. Select Open Chart from the menu and Manual from sub menu.

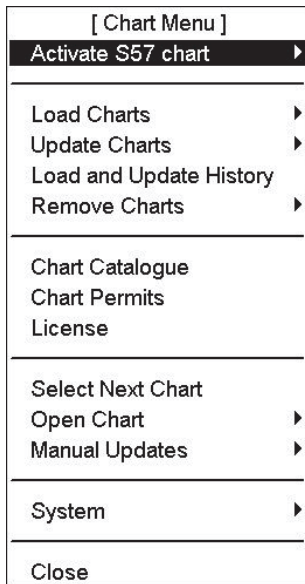


5. Select desired chart from the chart list dialog then click the **Open Chart** button.

The selected chart is automatically displayed in the electronic chart area.

How to open an ARCS chart by position

To open an ARCS chart by position of your ship or by chart center, if your display is in TM RESET OFF status, use the menu item "Open by position". Then you get a list of charts that cover current position. To open chart by position, do the following:



1. Open the Chart menu.
2. See if the text Activate S57 chart appears on the first line of the menu. If it is displayed, then go to step 4.
3. If the text Activate ARCS chart is shown, push the scrollwheel.
4. Select Open Chart from the menu and By Position from sub menu to show the ARCS Open window.

ARCS Open		
Position	Course	
59°53.766'N 024°38.326'E	NVLD	
Chart	Orig. Scale	nm's to edge
1079	55 000	3.8
1080	55 000	1.8
2241	200 000	5.3
2248	200 000	26.5
2817	750 000	77.4
259	1 500 000	160.8
4000	45 000 000	1431.2

Open Chart

5. Select desired chart from the list box then click the **Open Chart** button.

9.14.5 How to control ARCS chart features

The Display dialog box contains several pages to control visible chart features.

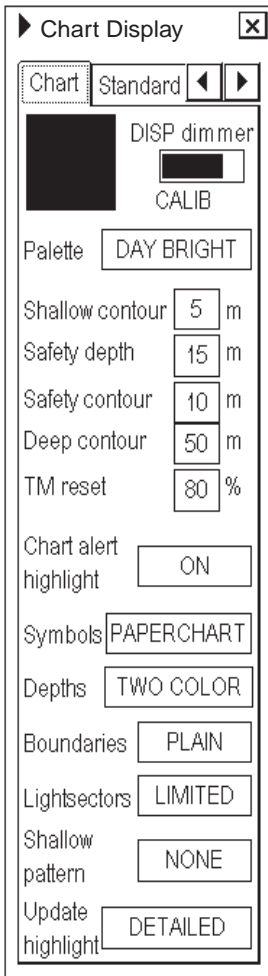


Chart page

Black and grey color symbol:



This symbol is used to verify that you can distinguish black (frame of symbol) and grey (inner part of symbol) colors with current contrast and brilliance settings.

DISP dimmer: Use this control to adjust dimming of the display. The text "CALIB" indicates that the dimmer setting is within the calibration values. Monitor brilliance is restored to calibrated state by doing the following:

1. Put the cursor on the calibration bar and spin the scrollwheel to show "CALIB".
2. Select "Set Std Display" from the menu.
3. Press and hold down any one of the F1-F4 keys more than two seconds on the Control Unit RCU-015.

Note: Use of the brightness control may inhibit visibility of information at night.

Palette: Select the appropriate palette for the display depending on the brightness of the bridge.

Shallow contour: Set the value of the shallow water contour. For more information, see "Setting values for Shallow contour, Safety contour and Deep contour" on page 8-66.

Safety depth: Set the value of the safety depth. Spot soundings below the safety depth are highlighted.

Safety contour: Set the value of the safety contour. Visible safety contour is equal to set value or if the contour of set value is not available then the visible safety contour is next deeper contour than safety contour. For more information, see "Setting values for Shallow contour, Safety contour and Deep contour" on page 8-66.

Note: The system uses the safety contour also for chart alerts.

Deep contour: Set the deep-water contour. For more information, see "Setting values for Shallow contour, Safety contour and Deep contour" on page 8-66.

TM reset: In the true motion mode, own ship moves until it reaches the true motion reset borderline (set here), then it jumps back to an opposite position on screen based on its course. Set the limit for TM reset (in percentage).

Chart alert highlight: Enable or disable highlight of chart alerts.

Note: ARCS charts are "photocopies" of original paper charts. One cannot change images of these photocopies. Selections of shallow contour, safety depth, safety contour, deep contour, symbols, depths, boundaries, light sectors, shallow pattern and Update highlight in Chart page control only visibility of add-on layer(s) on top of the ARCS chart image (manual updates are such an add-on layer). For more information about manual updates, see the chapter on manual updates.

Chart Alert highlight: Select ON/OFF to show/hide highlight of chart alerts.

Symbols: Select how to display chart symbols. The options are:

Simplified: The shape of the symbols is of modern design and the sea mark symbols are filled in a color

Paper Chart: The shape of the symbols imitates traditional symbols used in paper charts.

Depth: Set how to display different depth zones on the chart display.

For MULTICOLOR, the chart display uses four different colors for contours:

- Deeper than operator-selected deep contour
- Between deep contour and operator-selected safety contour
- Between safety contour and operator-selected shallow water contour
- Between shallow water contour and coastline.

For TWO COLOR, the chart display uses only two colors:

- Deeper than safety contour
- Shallower than safety contour

Boundaries: Set how to display boundaries of some chart features. The options are:

- **Plain:** The line styles are limited to plain solid and dashed lines.
- **SYMB:** Some of the line styles use symbols to highlight the purpose of a line.

Light sector: Set how to display light sectors. The options are:

- **Limited:** The length of a light sector is fixed at 25 mm independently of the displayed scale.
- **Full:** The length of a light sector represent its nominal range as defined by the chart producer.

Shallow pattern: Set how to display shallow water area. The options are:

- **None**
- **Diamond:** Provided to distinguish shallow water at night.

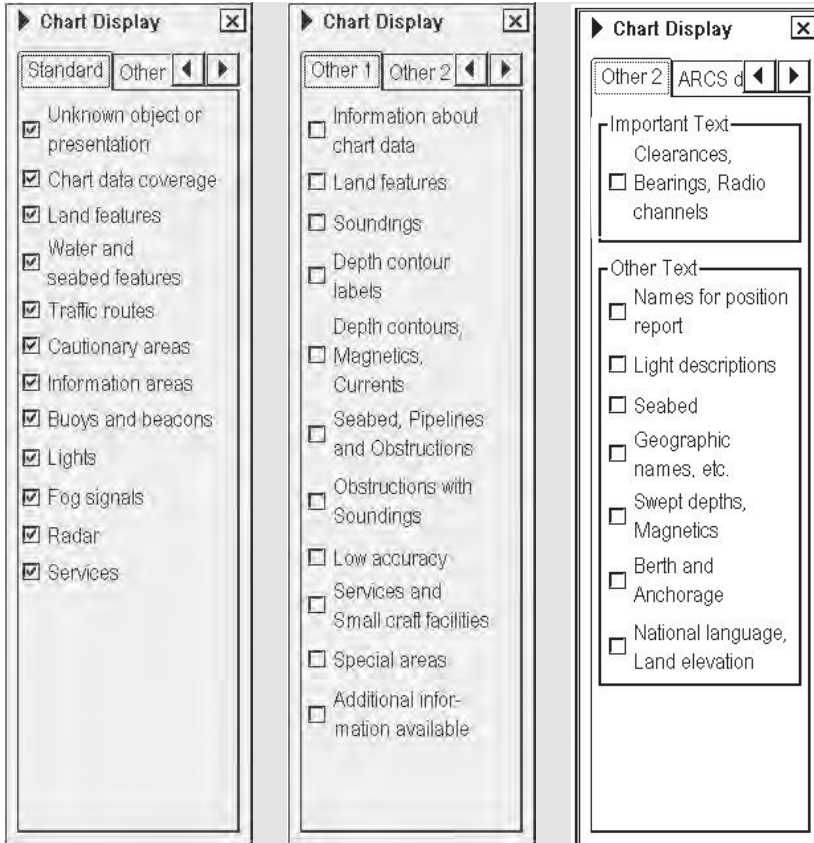
Update Highlight: Set how the updates are highlighted on the screen before you approve them. The options are

- **Detailed:** The system tries to highlight updates so that only those objects that have visible changes are highlighted. Use this option to see the practical change of an update.
- **All effects:** The system highlights updates so that all the objects pertaining to updates are highlighted although some of them have not been changed.

"Standard", "Other 1" and "Other 2" pages

The Standard page contains chart features defined by IMO that comprise a standard display. You can recall the standard display at any time using a single action, by pressing the **STD DSP** key on the Control Unit RCU-018 or displaying Chart Display/Info/Standard Display in the mouse function area and pushing the right mouse button.

The Other 1 and Other 2 pages contain chart features for which you can control visibility and that are not part of IMO-defined standard display.



Note 1: To use the Info request feature, which provides information for cursor-selected chart feature, the associated chart feature must be turned on from the Standard page.

Note 2: To navigate between the menus in the Chart Display dialog box, click the appropriate arrow tab with the left mouse button.

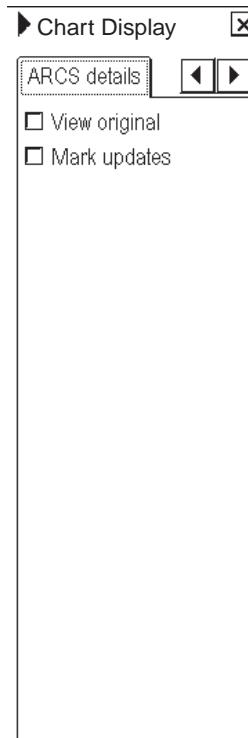
9.14.6 Display base

A subset of chart features is called the Display Base. As required by IMO, these features cannot be made invisible. The Display Base consists of the following chart features:

- Coastline (high water)
- Own ship's safety contour, which is selected by the operator
- Indication of isolated underwater dangers of depths less than the safety contour that lie within the safe waters defined by the safety contour
- Indication of isolated dangers that lie within the safe water defined by the safety contour such as bridges, overhead wires, etc., and including buoys and beacons whether or not these are being used as aids to navigation
- Traffic routine systems
- Scale, range, orientation and display mode
- Units of depth and height

ARCS details page

The ARCS details page provides details about current ARCS chart. To open this box, spin the scrollwheel to show Chart Display/Info/Standard Display in the mouse functions area then push the left mouse button. You can change pages by clicking the right mouse button (Select Next), clicking the arrow tabs in the dialog box.

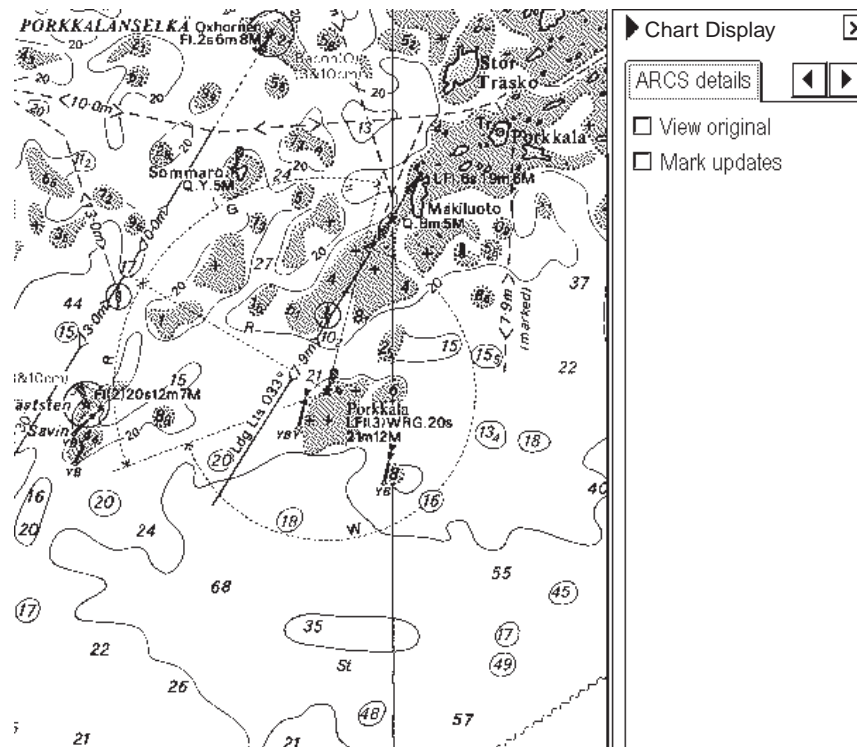


View original: Check to show current chart without displaying updated parts.

Mark updates: Check to show updated parts of chart with yellow rectangles.

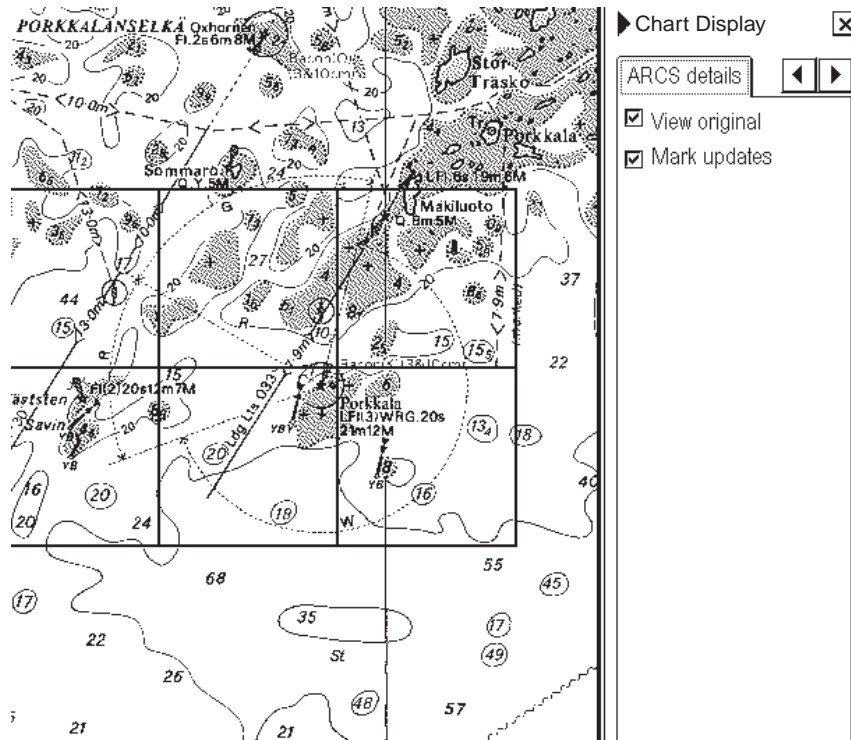
The figures below show how to find places on the chart that have been updated.

The ARCS chart that is displayed for "normal" use.



9. Raster Chart Material

The ARCS chart that is displayed as original edition and places that show updates are marked with a yellow rectangle.



9.14.7 How to control navigation features

Visibility control of the navigation features is divided into five pages in the Symbol Display dialog box.

Route page: Controls planned and monitored route.

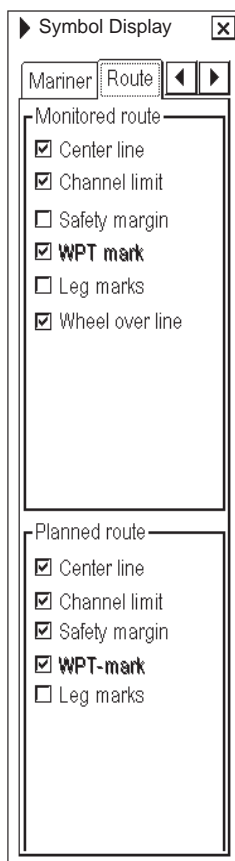
Tracking page: Controls past tracks and some other features.

Mariner page: Controls Notes and user charts.

Targets page: Controls TT and AIS targets.

General page: Controls own ship and target related things.

The operator can define settings for chart details that are displayed over the chart area



Route page

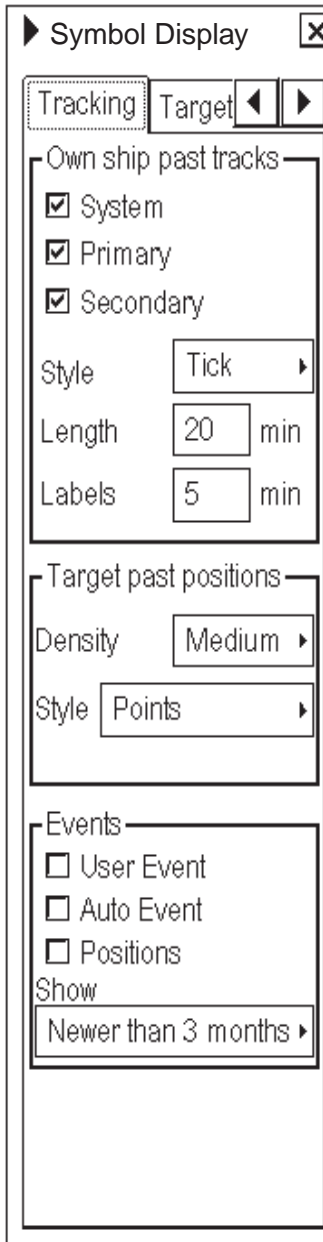
This page contains selection of route related navigation features

Monitored route: Select which part of monitored route to display.

Planned route: Select which part of planned route to display.

Note: WPT mark on both monitor and planned routes is permanently set to Std position.

Tracking page



Past tracks

- **Ship System:** Plot own ship's tracks using system-fed position.
- **Ship Primary:** Plot own ship's past track with position fed from the primary sensor.
- **Ship Secondary:** Plot own ship's past track with position fed from a secondary sensor.
 - **Style:** Set time stamp position for past track (indicated by Tick or Point)
 - **Length:** Set length of past track.
 - **Labels:** Set label interval.

Target past positions

- **Density:** Select density of past position of points.
- **Style:** Select style of presentation of target's past position.

Events

These marks are based on voyage log records. See section 24.4 "Voyage Log".

- **User Event:** Display event symbols on ECDIS, where the system has recorded an event based on conditions you have set (Type: User and Auto).
- **Auto Event:** Display automatically entered event symbols, where the system has recorded an event based on conditions you have set (Type: Ship and Alarm).
- **Positions** display the latitude and longitude of an event.

Note 1: MOB event is always visible.

Note 2: You can select period of time to display event marks in the "Show" list box.

▶ Symbol Display

Targets Mariner ◀ ▶

Color
Color GREEN ▶

TT
Size STD ▶

AIS
ROT 5.0 %/min

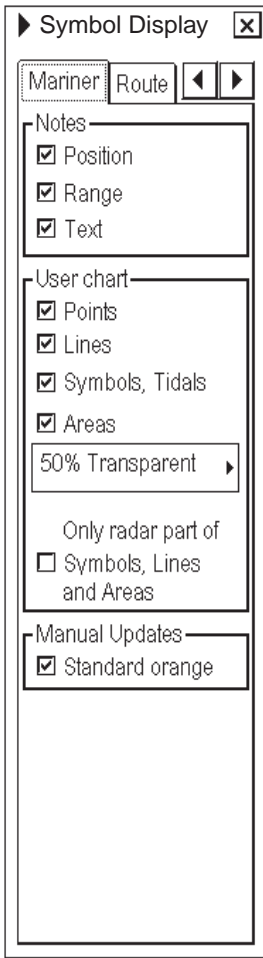
Targets page

Color: Select color of target from the list box.

TT: Select size of tracked target symbols to Std or Small.

AIS: ROT (°/min), limit to display AIS target with curved speed vector.

Note: Source of ROT must be ROT gyro on target vessel.



Mariner page

Notes

- **Position:** Check to show positions of Notes records with symbols on the chart.
- **Range:** Check to circumscribe pilot data records with circles on the display. The size of a circle depends on the value set in Notes.
- **Text:** Check to show text of Notes records on the chart.

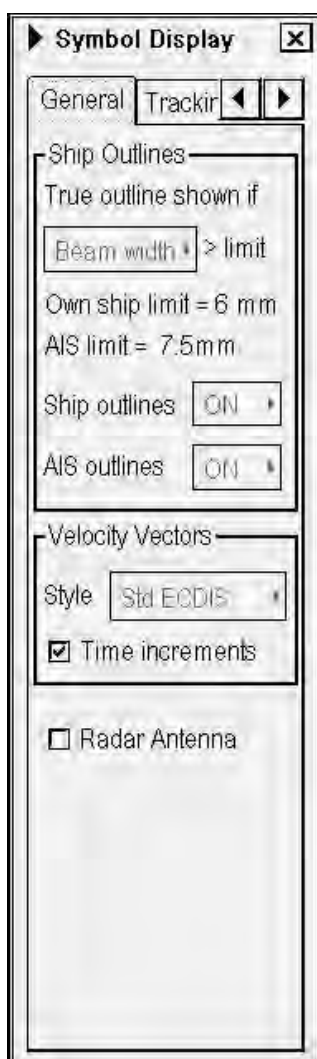
User chart

- **Points:** Check to show user points on user charts.
- **Lines:** Check to show lines on user charts.
- **Symbols, Tiduals:** Check to show symbols and tiduals on user charts.
- **Areas:** Check to show areas on the display. Color fill for the areas can be selected as transparent from 25% to 75% and as No color fill. If No color fill is selected, only the boundaries of the areas are visible.
- **Display only radar of Lines, Symbols and Areas:** If checked, only those Lines, Symbols and Areas are displayed which have user selection "on radar" activated for them in the user chart. This is used to view only that part of the user chart that will be sent to the radar connected to the system.

Manual Updates

Check to show manual updates with orange symbols.

Note: Visibility of manual updates made as true symbols are controlled through Standard and Other pages of the Chart Display menu.



General page

Ship Outlines

True outline shown if "Beam width > 6 mm / Length > 6 mm". You can set whether width or length is used to set limit for displaying true symbol.

Ship outlines: Choose OFF or ON to show ship symbol minimized or scaled symbol, respectively.

AIS outlines: Choose OFF or ON to show AIS target symbol in same size or scaled symbol, respectively.

Velocity Vectors

Style: Select style for velocity vectors.

- Conventional: (simplified symbol)
- Std ECDIS (minimized symbol)

Time increments: This controls both own ship and targets ticks. If ticks will be too tightly spaced, they will be automatically removed from display, until the spacing between ticks is enough to distinguish them separately. This depends on display scale and speed of vessel/target.

Radar Antenna

Check to show position of radar antenna with the symbol "x".

9.14.8 How to store and recall chart display settings for visible chart and navigational features

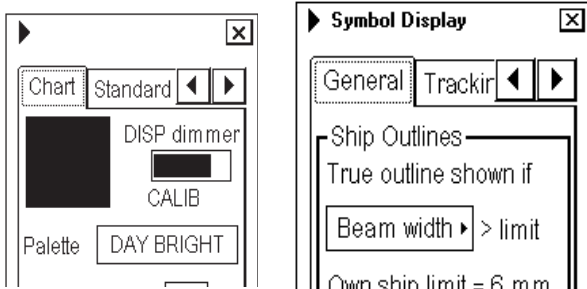
Chart display settings and Symbol display settings are using common settings, which means that when you select settings display settings the same file is selected for symbol settings.

You can define chart display and symbol display settings that are displayed over S57 charts cells. You can save these chart display settings to your hard disk and recall them whenever you need them.

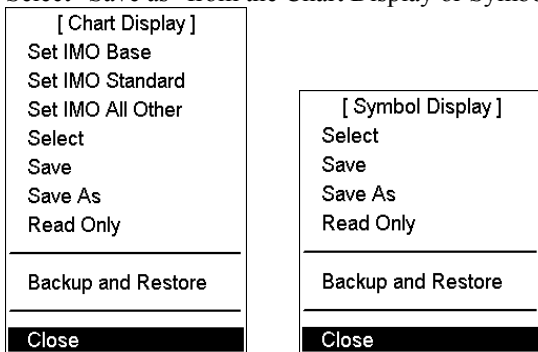
How to create new chart display settings

To create new settings for chart display, do the following:

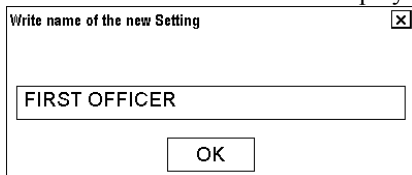
1. Display Chart Display/Info/Standard Display in the mouse functions area then push the left mouse button.
2. Put the cursor on the small triangle on the Chart Display or symbol dialog box.



3. Select "Save as" from the Chart Display or Symbol Display menu then push the scrollwheel.



4. Enter desired name for Chart Display Settings then click the **OK** button in the dialog box.



5. Make your changes both Chart Display and Symbol display settings. Note, that you have to select "Save" from the menu before closing dialog box.

How to select chart display settings

1. Open the Chart Display or Symbol Display dialog box and put the cursor on the triangle.
2. Choose "Select" from the menu then push the scrollwheel.
3. Select desired chart display settings from the list box.

How to save changes to chart display settings

1. Open the Chart Display or Symbol Display dialog box and put the cursor on the triangle.
2. Select Save from the menu to save current chart display settings.

10. Manual Updates

10.1 Introduction





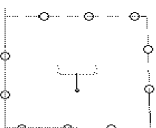
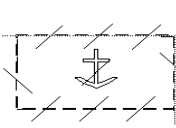
SOLAS requires that mariners keep their charts up-to-date for an intended voyage. Mariners receive chart corrections and other essential information for the area of their intended voyage as

- Notices to Mariners (by post, by email, by fax, etc.)
- Navtex warnings

Mariners should also keep the electronic charts in their ECDIS up-to-date. Regardless of the chart material used, the mariner must know which of these chart corrections are applied into their ECDIS charts and which of them needs to be added as manual updates.

Manual update may include deleting an already existing object, modifying a position or other characteristics of an already existing object or inserting of a new object. In this ECDIS, manual updates are stored in a common database that is used for both S57 and ARCS charts.

Mariners cannot permanently remove any of the official objects from the chart display. If a mariner needs to make obsolete any of the official objects he deletes them. Then, in practice, the deleted features are still visible, but they are displayed a certain way to indicate a deleted object.

	Insertion	Deletion
Point		
Line		
Area		

However, a mariner can remove objects that he has inserted himself.

Note that the manual updates have no automatic connection to any automatic update received later for S57 or ARCS charts. If a manual update itself became obsolete, because the official chart has been updated to include the update defined as a manual update, the mariner must himself delete the obsolete manual update in question.

This ECDIS records complete usage of manual updates. All deletions, modifications and insertions are recorded and time stamped. If the mariner wishes to see what kind of manual updates he had in the past, for example, two weeks ago, he uses Update History to specify the relevant date range. For details, see section 8.11 "Chart Viewing Dates and Seasonal Features of the Vector Chart".

10.2 Symbols to Use with Manual Updates

Manual updates can be used for the following purposes:

- Keep charts up-to-date using similar symbols as the real chart uses. We refer to these symbols as "True symbols".
- Keep charts up-to-date using conspicuous orange symbols reserved for this purpose. We refer to these symbols as "Orange symbols".

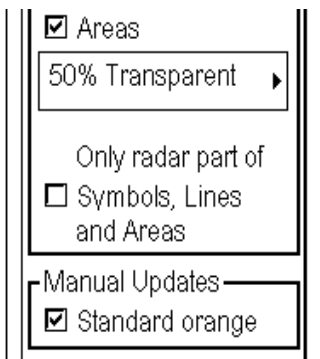
Add additional mariner information using conspicuous orange symbols reserved for this purpose.

Orange symbols are recommended because then you, your mates and pilots can easily find these symbols. Another benefit of the orange symbols is that they are very easy to insert. However, orange symbols do not cover all possibilities. Experienced operators can use true symbols to create their own cartography.

10.3 How to Display Manual Updates

10.3.1 How to control visibility of orange symbols from manual updates

The visibility of the orange symbols from manual updates is controlled on the Mariner pages of the Symbol Display dialog box.



On the Mariner page the item Manual Updates is selected (checked) to "Standard orange".

For chart alerts calculation, the following orange symbols can be detected and highlighted during route planning and route monitoring. The associated alert is "860 Safety contour".

- **Mariner Danger Highlight**
- **Mariner Foul Ground**
- **Mariner Isolated Danger**
- **Mariner Obstruction**
- **Mariner Under Water Rock**
- **Mariner Wreck**
- **Mariner Danger Highlight Line**
- **Mariner Danger Highlight Area**

10.3.2 How to control visibility of true symbols from manual updates

Chart features added by manual updates behave exactly as any other chart feature. For details, see section 8.9.4 "How to control visible chart features".

10.4 How to Control Chart Viewing Dates of Manual Updates

10.4.1 How to set current date for viewing

Manual updates operate like any other S57 chart that contains updates and other set chart viewing dates features.

When you accept manual updates as permanent, the system sets Display Until of manual updates as the current date of the system. To set Approve Until as the current date of the system, you must open the Set chart viewing dates window (in the Chart menu) and perform Approve Until. For details, see section 8.11 "Chart Viewing Dates and Seasonal Features of the Vector Chart". Recommended settings in the Chart viewing dates window are:

- Sync Manual Update Dates
- All SENCs

See the example below where Display Until and Approve Until are set as the system current date.

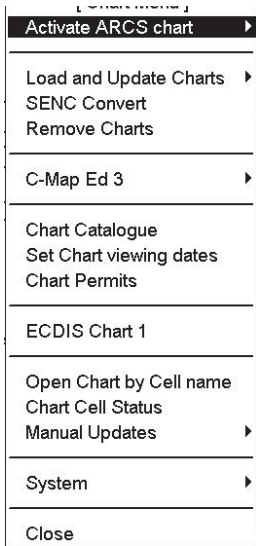
Chart viewing dates							
Cell ID	RENC edt/ upd	SENC edt/ upd	Updates Displ. until	Updates Approv. until			
04470039.D	-/-	1/ 0	2004 12 31	(-)	2004 12 31	(-)	
04470039.E	-/-	1/ 0	2004 12 31	(-)	2004 12 31	(-)	
04470039.F	-/-	1/ 0	2004 12 31	(-)	2004 12 31	(-)	
04470040.E	-/-	1/ 0	2004 12 31	(-)	2004 12 31	(-)	
04470040.F	-/-	1/ 0	2004 12 31	(-)	2004 12 31	(-)	
04500072.C	-/-	1/ 0	2004 12 31	(-)	2004 12 31	(-)	
04500075.D	-/-	1/ 0	2004 12 31	(-)	2004 12 31	(-)	
04500076.E	-/-	1/ 0	2004 12 31	(-)	2004 12 31	(-)	
04500077.E	-/-	1/ 0	2004 12 31	(-)	2004 12 31	(-)	
04500077.F	-/-	1/ 0	2004 12 31	(-)	2004 12 31	(-)	
04500078.D	-/-	1/ 0	2004 12 31	(-)	2004 12 31	(-)	
04500078.E	-/-	1/ 0	2004 12 31	(-)	2004 12 31	(-)	
04500078.F	-/-	1/ 0	2004 12 31	(-)	2004 12 31	(-)	
04500079.E	-/-	1/ 0	2004 12 31	(-)	2004 12 31	(-)	
04500079.F	-/-	1/ 0	2004 12 31	(-)	2004 12 31	(-)	
04510076.E	-/-	1/ 0	2004 12 31	(-)	2004 12 31	(-)	
04510077.E	-/-	1/ 0	2004 12 31	(-)	2004 12 31	(-)	
04510078.E	-/-	1/ 0	2004 12 31	(-)	2004 12 31	(-)	
04510078.F	-/-	1/ 0	2004 12 31	(-)	2004 12 31	(-)	
04510079.E	-/-	1/ 0	2004 12 31	(-)	2004 12 31	(-)	
04510079.F	-/-	1/ 0	2004 12 31	(-)	2004 12 31	(-)	
04510080.E	-/-	1/ 0	2004 12 31	(-)	2004 12 31	(-)	
04510080.G	-/-	1/ 0	2004 12 31	(-)	2004 12 31	(-)	
7C1W0001	-/-	1/ 0	2004 12 31	(-)	2004 12 31	(-)	
7C1W0002	-/-	1/ 0	2004 12 31	(-)	2004 12 31	(-)	
7C1W0003	-/-	1/ 0	2004 12 31	(-)	2004 12 31	(-)	
7C1W0004	-/-	1/ 0	2004 12 31	(-)	2004 12 31	(-)	

Latest RENC Product List	2004 11 24	Source PM
Oldest date	2004 12 31	2004 12 31
Newest date	2004 12 31	2004 12 31
Manual Updates	2004 12 31	2004 12 31

Display Until Approve Until

Sync Manual Update Dates
 All SENCs

10.5 Manual Update Editor with Orange Symbols



The manual update editor has the choices shown below and you can select one by choosing Manual Updates from the Chart menu.

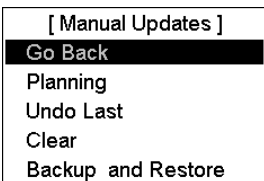
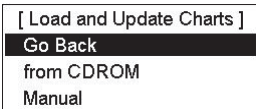
Planning: Operate with new manual updates.

Undo Last: Remove last accepted manual update planning session. By repeating Undo Last you can remove any amount of old manual update planning session.

Clear: Remove all manual updates in a single operation.

Backup and Restore: Make a backup or recall already recorded backup.

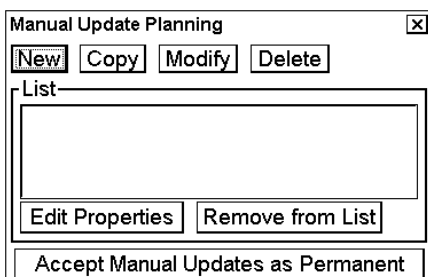
With an ARCS chart, you also have "Set chart viewing dates" to set viewing date of manual updates. Note that with S57 charts "Set chart viewing dates" is in the Chart menu.



10.5.1 How to plan manual updates

The manual update editor operates in sessions. You create a session when you activate the Manual Update Planning dialog box, displayed by choosing Manual Update from the Chart menu followed by Planning from the sub menu. You can freely delete, modify, copy or create chart objects. You terminate your session by clicking the **Accept Manual Updates as Permanent** button. The ECDIS then stores your manual updates permanently. If you need to leave your manual update session and discard all modifications made during the current session, click X in upper right corner.

Note: The manual update editor is only available in the North-up or Course-up orientation mode.



New, Copy, Modify, Delete: These buttons are used to collect chart objects into a list shown in the Manual Update Planning dialog box for further editing during current session of manual update planning. **New** creates an object from scratch. **Copy** creates an object using an existing object. **Modify** changes an existing object. **Delete** removes an existing object.

Edit Properties: You can edit properties of a selected (highlighted) chart object by using this button.

Remove from List: If you made a manual update by mistake, you can remove it if you haven't accepted it yet as permanent. You can remove it by choosing (highlighting) that chart object in the List then clicking this button.

10.5.2 How to insert new orange symbols

The mariner can insert a new object either using New or Copy in the Manual Update Planning dialog box. With New he creates a new feature from scratch. With Copy he uses an already existing object as an example for the newly inserted feature.

How to insert new orange symbols with "new"

When you want to create a new object from scratch, you start creating by clicking the **New** button in the Manual Update Planning dialog box to show the New Object window. Use the default Category Standard Orange to insert a new orange symbol. The detailed procedure is as follows:

4. Click **New** in the Manual Update Planning dialog box.

5. In the New Object dialog, select **Standard Orange** as the Category.

6. Click **Accept New Object** in the New Object dialog.

7. The Object: Mariner Danger Highlight window is displayed.

8. Click **Edit Position** in the Object: Mariner Danger Highlight window.

9. In the Position Edit dialog, click **Accept**.

10. Set the positions with cursor and push left mouse button. Click Accept button.

11. In the Object: Mariner Danger Highlight window, click **Edit Properties and values**.

12. In the Properties List and Value Edit: Mariner Danger ... dialog, click **Accept List and Values**.

13. In the Object: Mariner Danger Highlight window, click **Accept**.

14. The Manual Update Planning dialog box shows the new object: **CREATE: Mariner Danger Highlight**.

10. Manual Updates

1. Spin the scrollwheel to display Menu/Info/Chart Menu in the mouse functions area.
2. Push the right mouse button.
3. Select Manual Updates, push the scrollwheel, select Planning then push the scrollwheel.
4. Click the **New** button in a Manual Update Planning dialog box.
5. Select desired Drawing Type (Point, Line or Area), and select Category as Standard Orange.
6. Select desired Symbol from the Symbol list box.
7. Click the **Accept New Object** button.
8. Click the **Edit Properties** button.
9. Click the **Edit Position** button. Now you have two alternatives: If you want to add text, then continue from step 10. Otherwise go to step 14.
10. Use the cursor and the left mouse button to define position of symbol then click the **Accept** button.

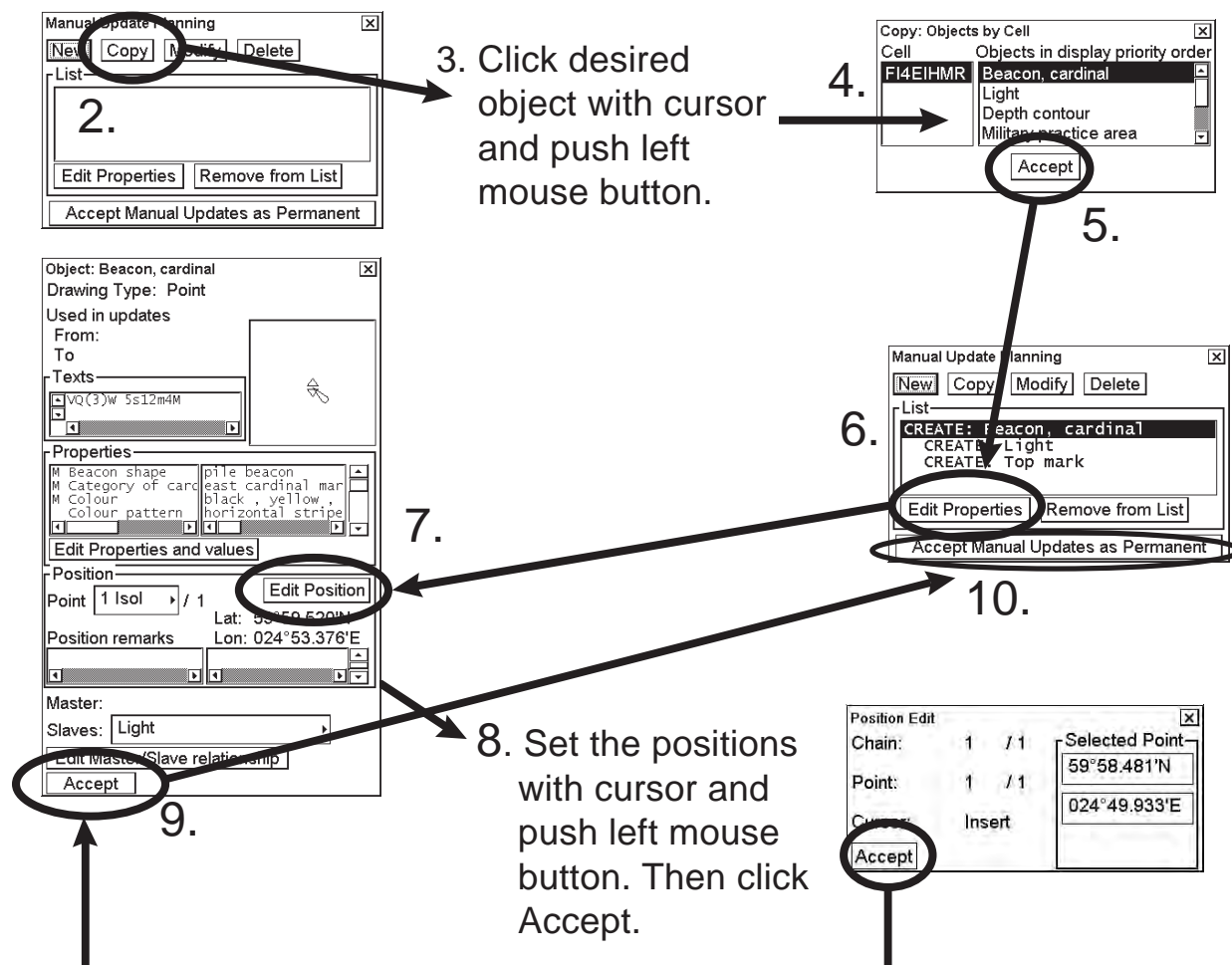
Note: Select the cursor mode according to drawing type as shown below.

<u>Drawing type</u>	<u>Cursor mode</u>
Point:	Set (Set Center)
Line:	Select Chain
	Select Point
	Insert Point
	Append Point
	Set Center
Area:	Select Chain
	Select Point
	Insert Point
	Append Point
	Set Center

11. If you would like to include textual information related to an orange symbol, click the **Edit Properties and values** button.
12. Highlight Information in the right side box then click the << button to move it to the left hand box then highlight it. Then, you can add textual information in the Property Value field. To enter text or numeric value, click inside the box, spin the scrollwheel to select character desired then push the scrollwheel. After entering all characters desired, click the **Accept List and Values** button.
13. Click the **Accept** button.
14. Click the **Accept Manual Updates as Permanent** button.

How to insert new orange symbols with "copy"

You can make new orange symbols by copying existing orange symbols. Then you pick up an orange symbol and make a copy of it. After copying you can modify position suitable for your purposes.

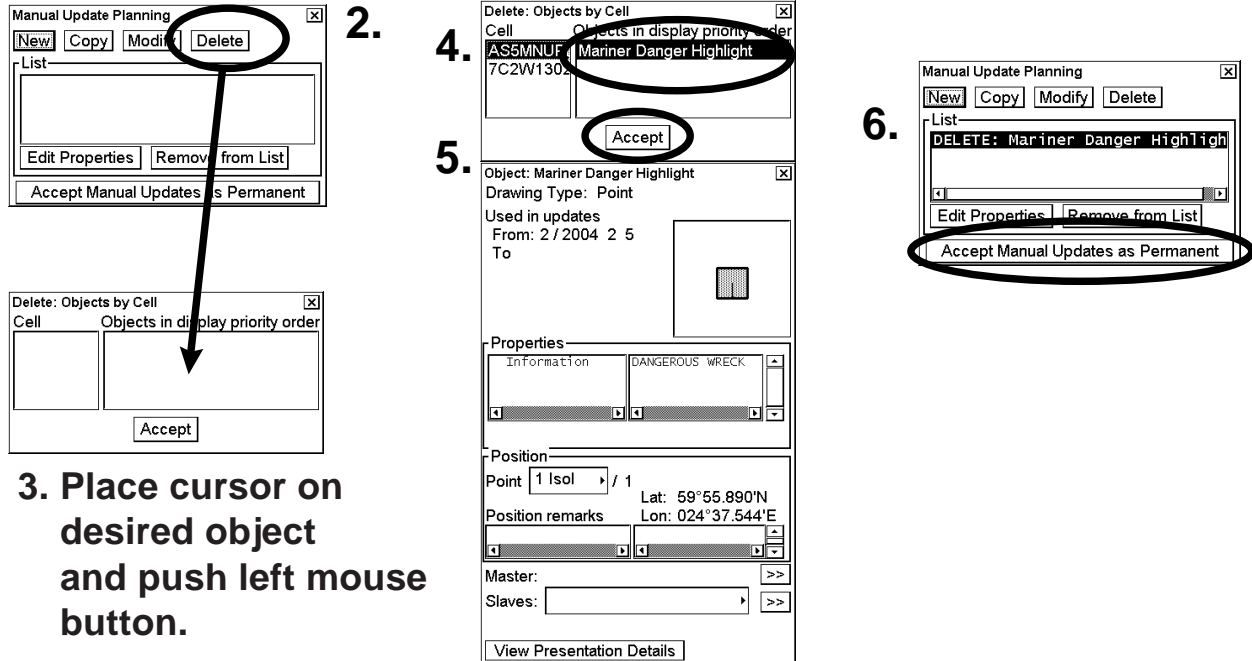


1. Follow steps 1-3 at the top of page 10-6 to display the Manual Update Planning dialog box.
2. Click the **Copy** button in the Manual Update Planning dialog box.
3. Put the cursor on the desired object then press left mouse button.
4. Select object from the Objects by Cell window. There can be more than one object in the area.
5. Click the **Accept** button.
6. New orange symbols are displayed in the list in the Manual Update Planning dialog box. Then click the **Edit Properties** button.
7. Click the **Edit Position** button.
8. Put the cursor on the desired location on the ECDIS display, push left button then click the **Accept** button. Repeat this until you have defined all points.
Note: You must set the cursor mode correctly in to determine position. The cursor mode available depends on drawing type.

Drawing type:	Cursor mode
Point	Set Fixed (Set Center)
Line:	Select Chain, Select Point, Insert Point, Append Point, Set Center
Area:	Select Chain, Select Point, Insert Point, Append Point, Set Center
9. Click the **Accept** button on the Master/Slaves window.
10. Click the **Accept Manual Updates as Permanent** button.

10.5.3 How to delete orange symbols

The mariner cannot permanently remove any of the official chart objects from the chart display. If the mariner needs to remove any of the official chart objects, he is allowed to mark them as deleted. In practice the deleted chart object is still visible, but it has a special presentation for a deleted object on top of it. To delete a chart object, do the following:



3. Place cursor on desired object and push left mouse button.

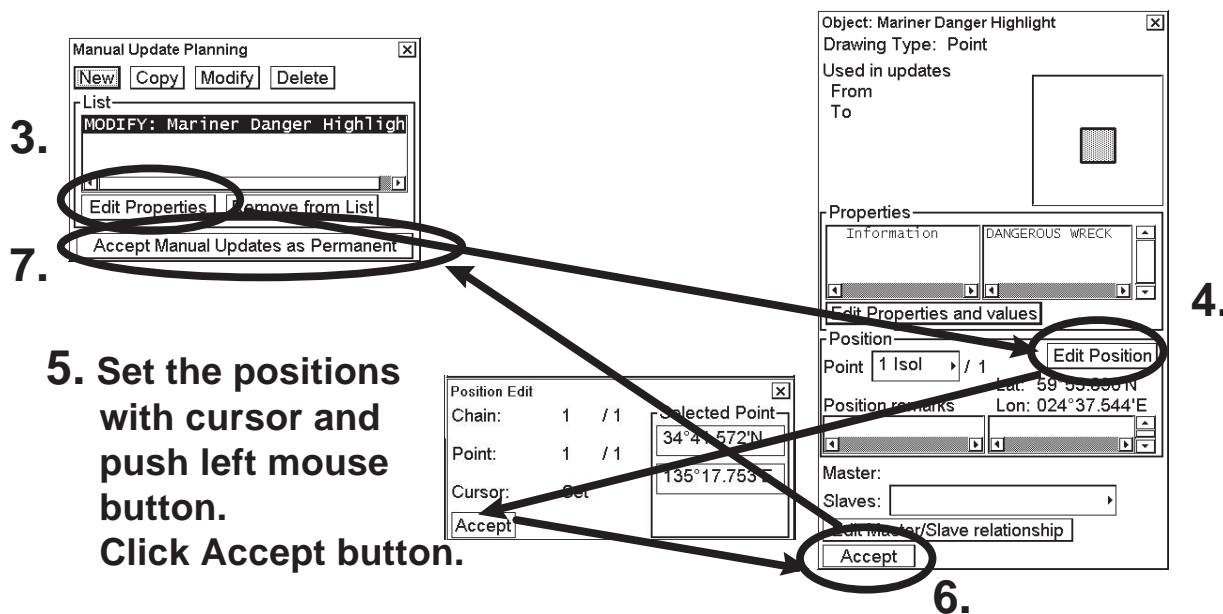
1. Follow steps 1-3 at the top of page 10-6 to display the Manual Update Planning dialog box.
2. Click the **Delete** button in the Manual Update Planning dialog box.
3. Put the cursor on the desired chart object and push the left mouse button.
4. Select the object from the Objects by Cell window that you wish to delete. You can also view data of each object before making your selection.
5. Click the **Accept** button.
6. Click the **Accept Manual Updates as Permanent** button to complete the deletion.

Note: If you deleted an official ENC chart object, a deletion mark is added over the original chart object that is still visible. If you delete a manual update chart object, it is removed from the chart display based on date of deletion.

10.5.4 How to edit position of orange symbols

An object can be a point, line or area.

- Point has only one point in its presentation.
- Line can consist of one or more chains. A chain consists of two or more points.
- Area consists of a line that is closed.



**5. Set the positions with cursor and push left mouse button.
Click Accept button.**

1. Follow steps 1-3 at the top of page 10-6 to display the Manual Update Planning dialog box.
2. Click the **Modify** button, click the object on the chart that you want to edit then click the **Accept** button.
3. Click the **Edit Properties** button. The Object window appears.
4. Click the **Edit Position** button.
5. Put the cursor on the desired location on the ECDIS display, push left button then click the **Accept** button. Repeat this until you have defined all points. See the next two pages for how to modify a chart object.
6. Click the **Accept** button on the Master/Slaves window.
7. Click the **Accept Manual Updates as Permanent** button.

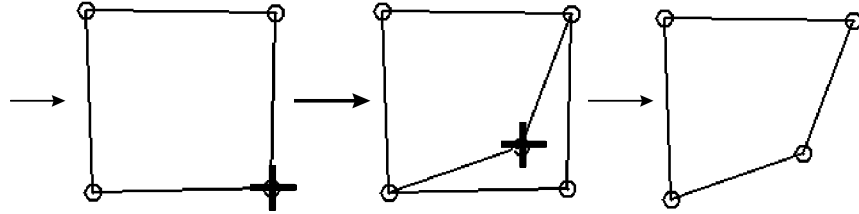
10.5.5 Examples of how to use orange symbols

How to modify a line

1) Activate Position Edit.

2) Place cursor on point to edit.

Position Edit		Selected Point	
Chain: 1 / 1		59°51.952'N	
Point: 1 Con / 4		024°32.370'E	
Cursor: Select Point			
Accept	Add New Point	Delete	



3) Keep left mouse button pushed down to modify a point.

How to set position for a point

This method is also applicable to insert or append new WPT points for existing chart features.

1) Activate Position Edit.

Position Edit		Selected Point	
Chain: / 1			
Point: / 4			
Cursor: Select Point			
Accept	Add New Point	Delete	



2) Insert a point with left mouse button pushed.

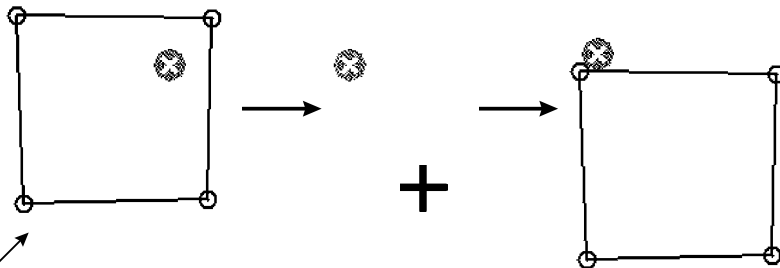
Position Edit		Selected Point	
Chain: 1 / 1		59°51.952'N	
Point: 1 Con / 4		024°32.370'E	
Cursor: Select Point			
Accept	Add New Point	Delete	

3) Change lat and lon if necessary. Choose digit with cursor and push thumbwheel and then spin it change digit.

How to define an area for an existing chart feature

1) Activate Position Edit.

Position Edit		Selected Point	
Chain: 1 / 1		59°51.952'N	
Point: 1 Con / 4		024°32.370'E	
Cursor: Select Point			
Accept	Add New Point	Delete	

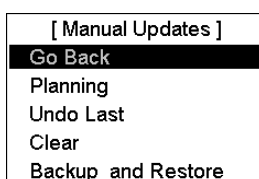
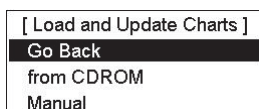
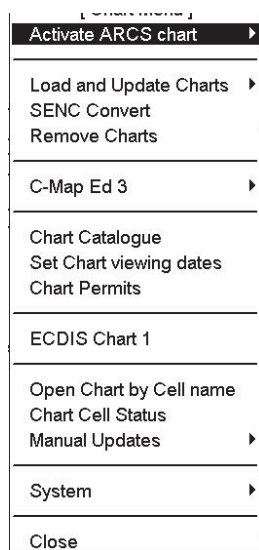


2) Choose "Set Center".

Position Edit		Selected Point	
Chain: 1 / 1		59°51.952'N	
Point: 1 Con / 4		024°32.370'E	
Cursor: Set Center			
Accept	Add New Point	Delete	

3) Place cursor on required point and push left mouse button.

10.6 Manual Update Editor with True Symbols



The manual update editor has the following features:

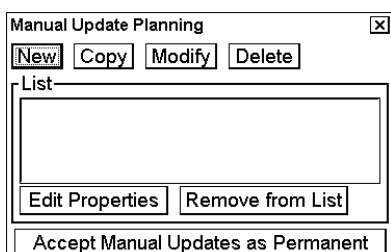
- **Planning:** Operate with new manual updates.
- **Undo Last:** Remove last accepted manual update planning session. By repeating Undo Last you can remove any amount of old manual update planning session.
- **Clear:** Remove all manual updates in a single operation.
- **Backup and Restore:** Make a backup or to recall already recorded backup.

With an ARCS chart, you also have "Set chart viewing dates" to set viewing date of manual updates. This is done with "Set Chart viewing dates" in the Chart menu.

10.6.1 How to plan manual updates

The manual update editor operates in sessions. You create a session when you activate the Manual Update Planning dialog box. You can freely delete, modify, copy or create chart objects until you feel finished with your session. Then, you terminate your session by clicking the **Accept Manual Updates as Permanent** button and the ECDIS stores your manual updates permanently. If you need to leave your manual update session and discard all modifications made during the current session, click X in upper right corner.

Note: The manual update editor is only available in the North Up or Course Up orientation mode.



New, Copy, Modify, Delete: These buttons are used to collect chart objects into a list shown in a Manual Update Planning dialog box for further editing during current session of manual update planning. **New** creates an object from scratch. **Copy** creates an object using an existing object as an example. **Modify** changes an existing object. **Delete** removes an existing object.

Remove from List: If you made a manual update by mistake, you can remove it if you haven't accepted it yet as permanent. You can remove it by choosing (highlighting) chart object in the List then clicking this button.

Edit Properties: You can edit properties of selected (highlighted) chart object by using this button.

10.6.2 How to delete chart objects

The mariner cannot permanently remove any of the official chart objects from the chart display. If mariner needs to remove any of the official chart objects he is allowed to mark them as deleted. In practice the deleted chart object is still visible, but it has a special presentation for a deleted object on top of it. To delete a chart object, do the following:

2. **3. Place cursor on desired object and push left mouse button.**

4. **5. Click the Accept button.**

6. **Accept Manual Updates as Permanent**

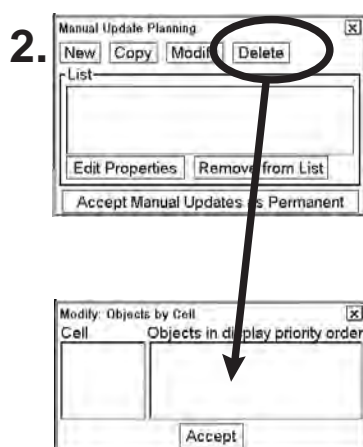
1. Follow steps 1-3 on page 10-6 to display the Manual Update Planning dialog box.
2. Click the **Delete** button in the Manual Update Planning dialog box.
3. Place cursor on desired chart object and push the left mouse button.
4. Select the object from the Objects by Cell window. Confirm data for selected object.
5. Click the **Accept** button.
6. Click the **Accept Manual Updates as Permanent** button to complete the deletion.

Note: If you deleted an official ENC chart object, a deletion mark is added over the original chart object that is still visible. If you delete a manual update chart object, then it is removed from the chart display based on date of deletion.

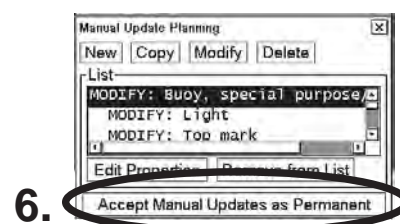
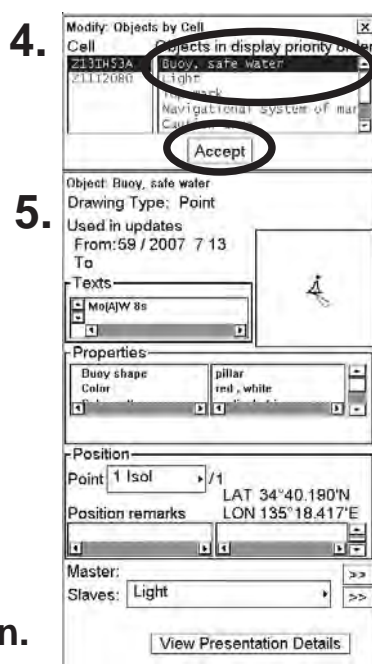
10.6.3 How to modify chart objects

The mariner cannot permanently remove from the chart display any of the official chart objects, but he can modify position and/or properties of chart objects. When the mariner modifies a chart object, the ECDIS will mark original chart object as deleted and a copy of original chart object as inserted.

1. Follow steps 1-3 on page 10-6 to display the Manual Update Planning dialog box.
2. Click the **Modify** button.
3. Put the cursor on the desired object then push the left mouse button.
4. Select the object from the Objects by Cell window. Confirm data for selected object.
5. Click the **Accept** button.
6. Click the **Edit Properties** button.
7. If you want to modify the position of the object, click the **Edit Position** button. Otherwise continue from step 13.
8. Put the cursor on the desired location on the ECDIS display, push left button then click the **Accept** button. Repeat this until you have defined all points.
9. Click the **Accept** button on the Master/Slaves window.
10. Click the **Accept Manual Updates as Permanent** button. If you want to modify also properties continue from step 10.
11. If you want to modify properties, also click the **Accept** button.
12. If you want to modify the properties of the object click **Edit Properties and values** button. Otherwise continue from step 9.
13. Pick from the list properties you want to modify and give them new values. You can also add new WPT properties or remove old.
14. Click **Accept List and values** to continue from step 5 or 11 again. Otherwise continue from step 9.



3. Place cursor on desired object and press left mouse button.



10. Manual Updates

11. **Edit Properties and values**

10. **Accept**

8. **Set positions with cursor and push left mouse button. Click Accept button.**

9. **Accept Manual Updates as Permanent**

12. **Accept List and Values**

10.6.4 How to insert new chart objects

The mariner can insert a new object either using New or Copy. With New he creates a new feature from scratch. With Copy he uses an already existing object as an example for the new feature.

How to insert new chart objects with "new"

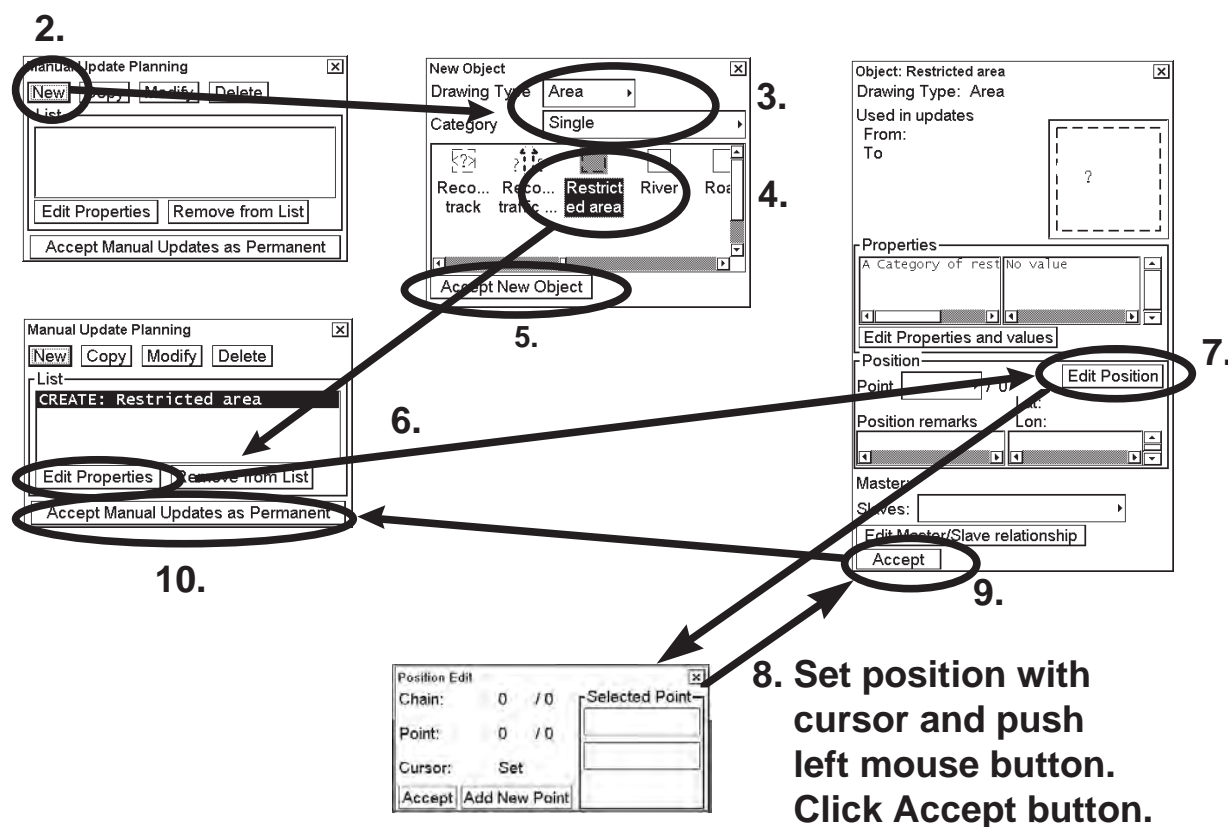
When you want to create a new object from scratch, you start creating by clicking the **New** button in the Manual Update Planning dialog box to show the S57 Object window. In this window you can select the geometric type of object (Point, Line or Area) and type of object:

Object type (category)

- **Standard orange.** This category is reserved for simple orange symbols.
- **Single.** All self-understandable chart objects that can be created based on a single selected chart object. Examples are different kind of restricted and warning areas, light ships, anchorage symbols, etc.
- **Nav Aid.** Nav Aid is a guided method to create navigational aids such as lights and buoys, because they consist of several objects put together with master and slave relationships.
- **Easy Lateral Sea Mark.** Guided method to create nav aid easily for any lateral sea marks.
- **Easy Cardinal Sea Mark.** Guided method to create nav aid easily for any cardinal sea marks.
- **Easy Other Sea Mark.** Guided method to create nav aid easily for any other sea marks.
- **Easy Obstruction.** Guided method to create obstructions.
- **Easy Light.** Guided method to create nav aid easily for any simple lights.

Example of how to insert a "restricted area"

1. Follow steps 1-3 on page 10-6 to display the Manual Update Planning dialog box.
2. Click the **New** button in the Manual Update Planning dialog box.
3. Select Area from the Drawing Type list box then select Single from the Category list box.
4. Select desired icon from the list of available chart objects.
5. Click the **Accept New Object** button. New object is displayed in the List.
6. Then, click the **Edit Properties** button.
7. Click the **Edit Position** button.
8. Put the cursor on the desired location on the ECDIS display, push left button then click the **Accept** button. Repeat this until you have defined all points.
9. Click the **Accept** button on the Master/Slaves window.
10. Click the **Accept Manual Updates as Permanent** button to finish.

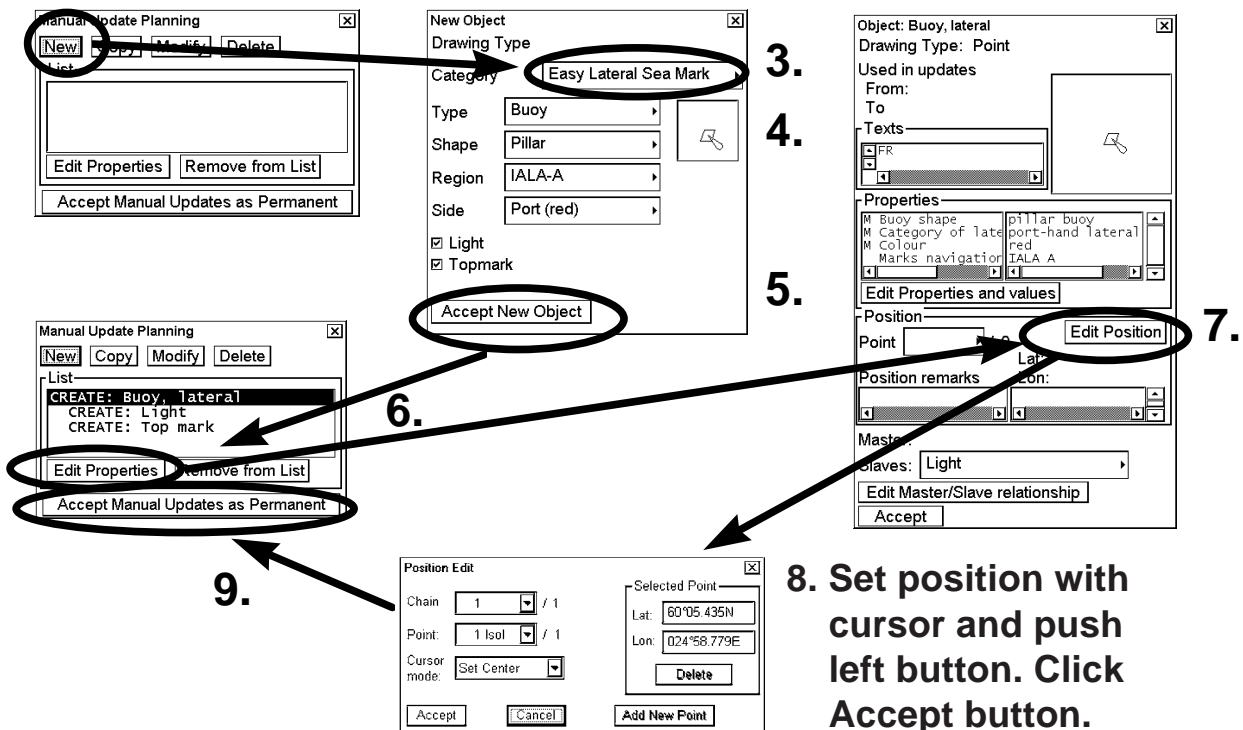


10. Manual Updates

Example of how to insert easy lateral sea mark

The method is similar also for easy cardinal sea marks, easy other sea marks, easy lights and easy obstructions.

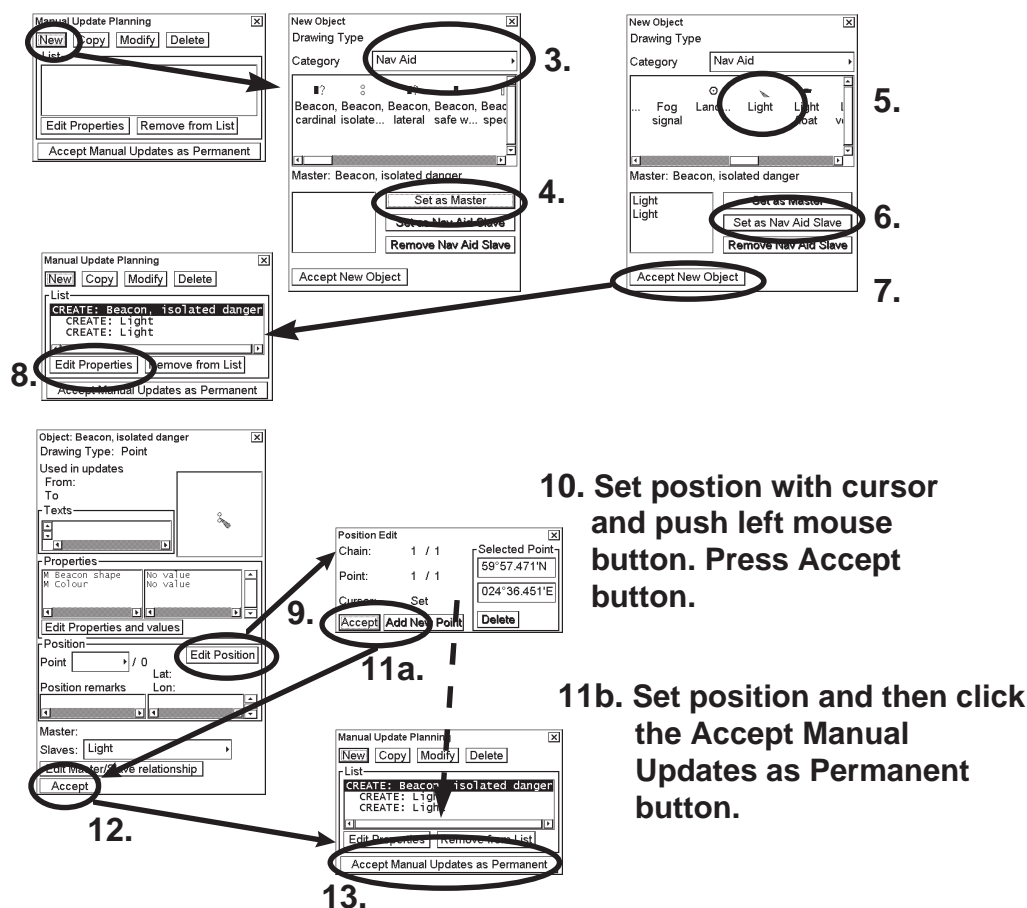
1. Follow steps 1-3 on page 10-6 to display the Manual Update Planning dialog box.
2. Click the **New** button.
3. Select Easy Lateral Sea Mark from the Category list box.
4. Select appropriate items from Type, Shape, Region and Side.
5. Click the **Accept New Object** button. New object is displayed in the List.
6. Then click the **Edit Properties** button.
7. Click the **Edit Position** button.
8. On the desired location on the ECDIS display push the left mouse button. Click the **Accept** button.
9. Click the **Accept Manual Updates as Permanent** button.



Example of how to insert a nav aid

A light is only a light - it also requires a support that could be a pile or buoy, etc. Body and top mark of a buoy are separated to enable a vast number of possible combinations.

1. Follow steps 1-3 on page 10-6 to display the Manual Update Planning dialog box.
2. Click the **New** button.
3. Select **Point** as Drawing Type; select **Nav Aid** as Category. Then use the cursor to select desired icon from the master object.
4. Click the **Set as Master** button.
5. When you have set a master object, you can define nav aid slaves for it. Use the cursor to select desired icon (for example, light) of a slave object.
6. Click the **Set as Nav Aid Slave** button. If you need more than one slave object continue from step 5.
7. When you are ready with master and its slave objects, click the **Accept New Object** button. The new object w/slave (two lights) is shown in the list box.
8. Then, set the position of your master and slave objects. Click the **Edit Properties** button.
9. Click the **Edit Position** button.
10. Put the cursor on desired location on the ECDIS display and the push the left mouse button.
11. Click the **Accept Manual Updates as Permanent** button (11b in the illustration on the next page), or click the **Accept** button (11a in the illustration on the next page).
12. Click the **Accept** button.
13. Click the **Accept Manual Updates as Permanent** button, and the object appears on the display at the position selected.



How to insert new chart objects with "copy"

You can make a new object by copying an existing one. Then you pick up an object and make a copy of it with all related properties. After copying, you can modify position and properties of copied object suitable for your purposes.

2. Click desired object with cursor and push left mouse button.

3. Click desired object with cursor and push left mouse button.

4. Select object from the Object by Cell window.

5. Click the **Accept** button.

6. New object is displayed in "List of". Then, click the **Edit Properties** button.

7. Click the **Edit Position** button.

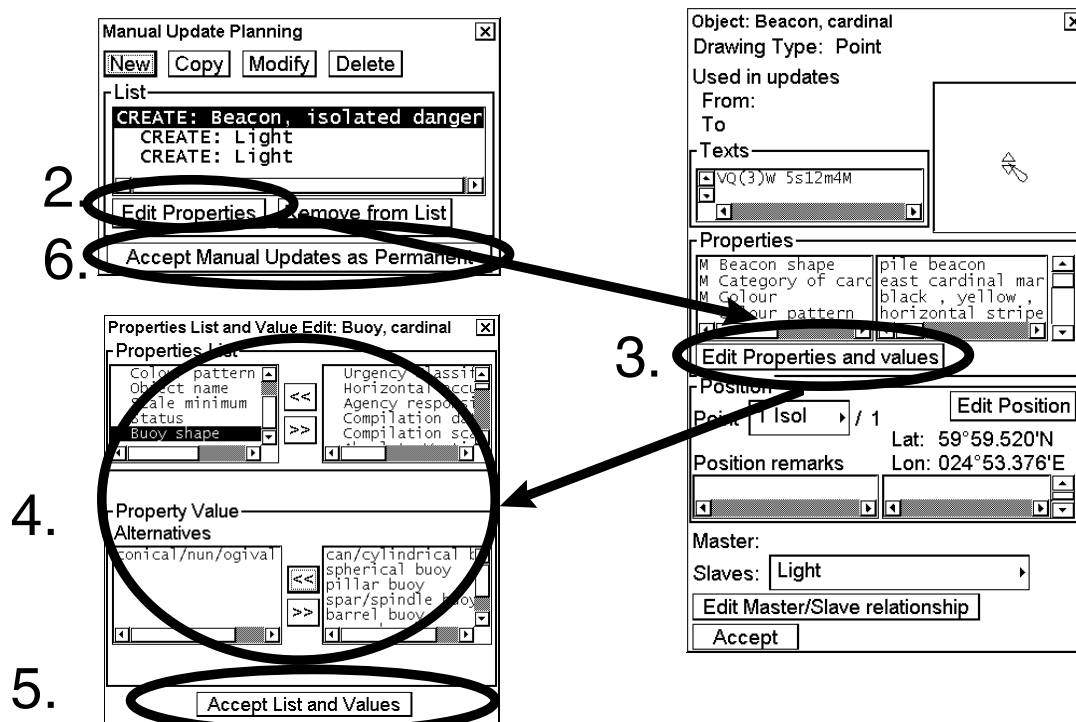
8. Set position with cursor and push left mouse button. Click **Accept** button.

9. Click the **Accept** button followed by the **Accept Manual Updates as Permanent** button. (If button is hidden by window, move the window.)

1. Follow steps 1-3 on page 10-6 to display the Manual Update Planning dialog box.
2. Click the **Copy** button in the Manual Update Planning dialog box.
3. Put the cursor on a desired object and click the left mouse button.
4. Select object from the Object by Cell window.
5. Click the **Accept** button.
6. New object is displayed in "List of". Then, click the **Edit Properties** button.
7. Click the **Edit Position** button.
8. Put the cursor on desired location on the ECDIS display. Click the left mouse button.
9. Click the **Accept** button followed by the **Accept Manual Updates as Permanent** button. (If button is hidden by window, move the window.)

10.6.5 How to edit properties of manually updated chart objects

How to edit properties of chart objects



1. Follow steps 1-3 at the top of page 10-6 to display the Manual Update Planning dialog box.
2. In the Manual Update Planning dialog box, click the **Edit Properties** button. An Object window appears.
3. Click the **Edit Properties and values** button. A Properties List and Values Edit window appears.
4. Add or remove features from/to the Properties List using >> and << buttons. To edit property value, highlight desired value in the Properties List, then you can edit in the Property Value field using the Alternatives field or enter Numeric or Textual value. If the Object has a linked object, you can also edit those values. Click the **Edit Master/Slaves relationship** button to edit them. Make desired modifications in the Master/Slave relationship edit window. After you have edited all the values of the linked objects, click the **Accept** button.
5. After you have edited all the values of the object you click the **Accept List and Values** button, if you want continue from step 2 with the object. Otherwise continue from step 4.
6. Click the **Accept Manual Updates as Permanent** button.

10. Manual Updates

How to edit position of chart objects

An object can be a point, line or area.

- A Point has only one point in its presentation.
- A Line can consist of one or more chains. A chain consists of two or more points.
- An Area consists of a line that is closed.

2.

5.

4. Set cursor on position and push left mouse button. Click Accept button.

3.

1. Follow steps 1-3 on page 10-6 to display the Manual Update Planning dialog box.
2. Press the **Modify** button, select object on the chart then click the **Edit Properties** button. An Object window appears.
3. Click the **Edit Position** button.
4. With the Position Edit window open, you can edit the position of the selected chart feature. For further details, see the next several pages.
5. Click the **Accept Manual Updates as Permanent** button.

Example of how to modify a line

1) Activate Position Edit.

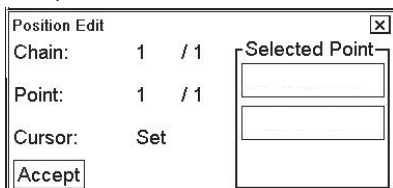
2) Place cursor on point desired.

3) Keep left mouse button pushed down when you modify position of a point.

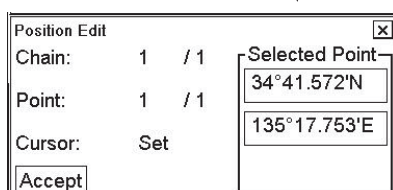
Example of how to set next WPT position for a point

The method is also applicable to insert or append new WPT points for existing chart features.

1) Activate Position Edit.



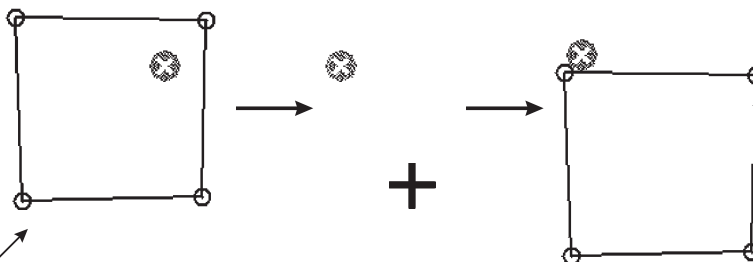
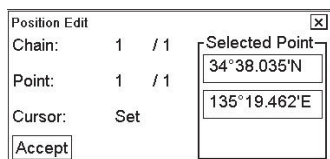
2) Insert point with left mouse button.



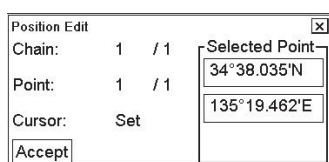
3) If necessary change lat and lon position. Place cursor on digit, push thumbwheel and then roll thumbwheel.

Example of how to define a new center point for an existing chart feature

1) Activate Position Edit.



2) Select "Set".



3) Place cursor on new required center point and push left mouse button.

10.7 How to Check Creation and Usage History of Manual Updates

You may need to check when a manual update has been added into your ECDIS. Also, you may need to check what was shown in your chart display, for example, what was shown three weeks ago. There are also many other cases when you need to know what was known by your ECDIS.

To check any situation in the past, you can use either Display Until and Approve Until to specify exact date of interest. Alternatively, you can specify directly the number of the manual update planning session. See below.

To open the Manual Update Chart viewing dates window, open the Chart menu, select Set Chart viewing dates, then click the **Manual Update Dates** button.

Manual Update Chart viewing dates		
Update	Display Until	Update
0 2003	05 Feb 2004	4
1 2004		
2 2004	Approve Until	Update
3 2004	05 Feb 2004	4
4 2004		

11. Chart Alerts

11.1 General

The ECDIS can detect areas where the depth is less than the safety contour or detect an area where a specified condition exists. If you plan a route or if prediction of your ship's movement goes across a safety contour or an area where a specified condition exists, the system will display a visual alert or sound an audio alarm to alert you to impending danger. For this function, the ECDIS utilises the chart database (S57 charts) stored on the hard disk in SENC format. **Note that the ECDIS calculates dangerous areas using the largest scale chart available, which may not be the visualised chart.**

You can select objects that are included for calculation of danger area (for example, restricted areas). A window lists the various areas that activate danger warnings.

You can also define your own safe area by creating a user chart area. The system can utilise these areas when calculating chart alerts. This is very useful with raster chart material such as ARCS.

The ECDIS can check the following for you:

- Predicted movement area of your ship
- Planned route with an easy to use locator function to find dangerous areas

The ECDIS will highlight the following for you:

- Dangerous areas inside predicted movement area of your ship
- Dangerous areas inside your monitored route
- Dangerous areas inside your planned route

Note: If any of the selected danger area alerts are in pending state, an alert for the same category of danger area will not cause a new alert. For example, there is a safety contour alert acknowledged but the condition currently exists. In this case, that safety contour alert will not generate a new visual or audio alert.

11.2 Chart Alert

Official S57 chart material contains depth contours that can be used for calculation of chart alerts. A chart database also includes different types of objects that the operator can use for chart alerts. The procedure for setting chart alerts is outlined below.

1. Select suitable safety contour for your ship. See section 11.2.1 "How to select safety contour".
2. Check that "Chart Alerts" is set for display. See section 11.2.3 "How to highlight chart alert areas". If you want chart alerts to be included in some other objects or areas, select them for indication or alert. See section 11.2.2 "How to select objects used in chart alerts".
3. In the route planning mode, define a new route or select an existing one. Make a chart alert calculation of the route if there are indications of danger areas in the route. See section 11.5 "Route Planning". Modify your route if necessary and do the chart alert calculation again.
4. Select route as monitored route.
5. Set watch sector for your ship. See section 11.4 "How to Activate Own Ship Check".

The system is now ready for chart alert calculation of monitored route.

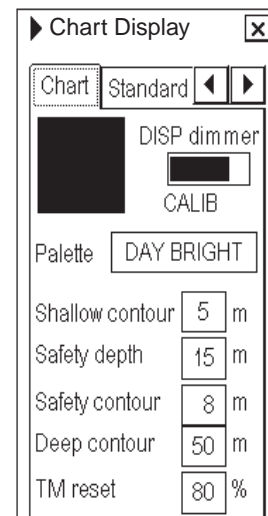
11. Chart Alerts

11.2.1 How to select safety contour

The operator selects a safety depth suitable for the ship. To select a suitable depth, do the following:

1. Spin the scrollwheel to display Chart Display/Info/Standard Display in the mouse functions area then push the left mouse button. If the Chart page is not displayed, click the Chart tab to display it.
2. Enter desired depth in the Safety contour field. In the example at right the safe water depth is set for 8 m.

Note: If the chart does not contain selected depth contour, the system will automatically select next deeper contour.

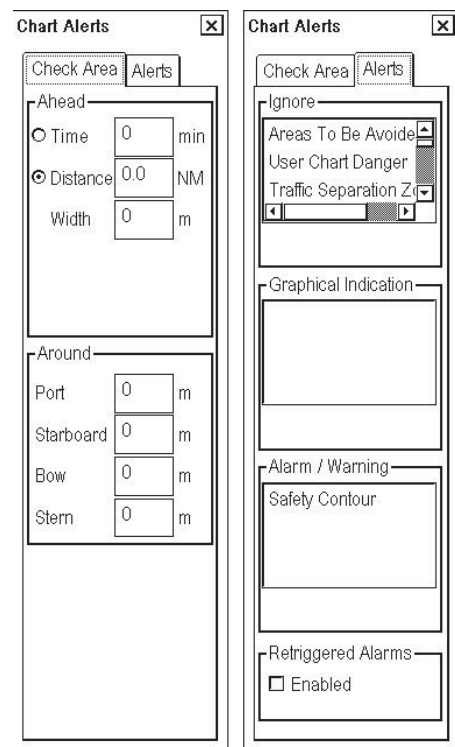


11.2.2 How to select objects used in chart alerts

You can also include calculation areas that have to be noted when sailing (for example, restricted areas). To include these areas in chart alerts, do the following:

1. Spin the scrollwheel to show Menu/Info/Chart Menu in the mouse functions area then push the left mouse button.
2. Select Initial Settings from the menu then push the scrollwheel.
3. Put the cursor on the triangle inside the Initial Settings dialog box to open the Initial Settings menu.
4. Select Chart Alerts parameters then push the scrollwheel.
5. Click the Alerts tab to show the Chart Alerts dialog box. In the Ignore box at the top of the window, use the left mouse button to click the alert item you wish to process.
6. Select what alert type you desire. Click the Indication button to display a visual alert, or Alert/Warning button to get the audio alarm. The item selected is moved from the Ignore box to the Graphical Indication or Alert/Warning box as appropriate.
7. To remove an alert, click it in the Indication or Alert box with the left mouse button then click the Ignore button. To change an alert method, click it in the Indication or Alert box with the left mouse button then click the Indication or Alert button as appropriate.
8. Click the Check Area tab with the left mouse button.

Time or Distance and Width are explained in section 11.4 "How to Activate Own Ship Check". Set them appropriately.



List of areas

There are areas that the ECDIS detects and provides the audio alarm or visual indication if ship's estimated position or planned or monitored route cross the area defined on the Chart Alerts page. You can select from the following areas:

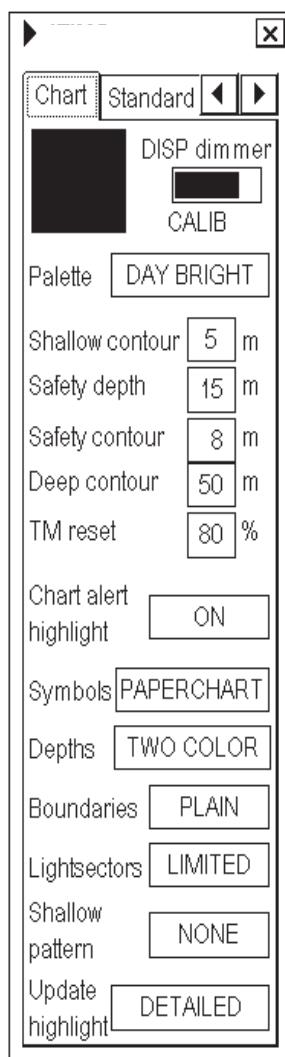
- "Safety Contour"
- "Areas To Be Avoided"
- "User Chart Danger Area"
- "Traffic Separation Zone"

- "Inshore Traffic Zone"
- "Restricted Area"
- "Caution Area"
- "Offshore Production Area"
- "Military Practice Area"
- "Seaplane Landing Area"
- "Submarine Transit Lane"
- "Anchorage Area"
- "Marine Farm / Aquaculture"
- "PSSA Area"

11.2.3 How to highlight chart alert areas

The user can elect to highlight chart alert areas. Follow the procedure below to turn alert area highlighting on.

1. Spin the scrollwheel to show Chart Display/Info/Standard Display then push the left mouse button.
2. Click the right or left arrow tab to select the Chart page, as shown right.
3. In the Chart Alert highlight box, select ON to highlight alert areas.



11.3 How to Insert User Chart Symbols, Lines and Areas in Chart Alert

Symbols

For user chart symbols, use the option Danger Symbol in the Symbol page of the Plan User Chart dialog box. To display this box, do the following:

1. Click UserChart in the information area to show the User Chart dialog box.
2. Click the **Plan** button.
3. Put the cursor on the black triangle on the Plan User chart dialog box the push the left mouse button.
4. Click Select or Create.
5. Select or enter user chart number then click the **OK** button.
6. Click the Symbol tab.

To include symbols in the chart alert, first check the Enables changes box then check the Danger Symbol box of the Plan User Chart dialog box. Danger Symbol must checked, otherwise danger symbols of a user chart cannot not be used in the chart alert. The dangerous symbol is drawn in red instead of dark yellow (color may be different depending on Palette in use). Also, it is necessary to create a user chart. See section 15.7 "How to Create a User Chart".

In the Symbol page, you can include symbols in the chart alert by checking Danger Symbol.

The screenshot shows the Symbol page of the Plan User Chart dialog box. It includes a text box containing the character 'X'. Below this is a 'Position' section with two input fields: the first contains '59°59.778'N' and the second contains '023°59.920'E'. There are three checked checkboxes: 'Dsp on radar', 'Danger Symbol', and 'Enable changes'. At the bottom of the form are three buttons labeled 'Add', 'Import', and 'Delete'.

Lines

To include lines in the chart alert, check the Danger Line box in the Line page of the Plan User Chart dialog box. Danger Line must checked, otherwise danger lines of a user chart cannot not be used in the chart alert. The dangerous line is drawn in red instead of dark yellow (color may be different depending on Palette in use).

In the Line page, you can include lines in the chart alert by checking Danger Line.

The screenshot shows the Line page of the Plan User Chart dialog box. It features a 'Route line' dropdown menu with a right-pointing arrow. Below it is an 'On Radar' checkbox. A 'Danger Line' checkbox is also present. There are two 'Start position' sections, each with latitude and longitude input fields; the first section contains '35°23.837'N' and '139°44.681'E'. There are also two 'End position' sections with identical input fields. At the bottom, there is a 'New start position' checkbox and three buttons labeled 'Add', 'Import', and 'Delete'.

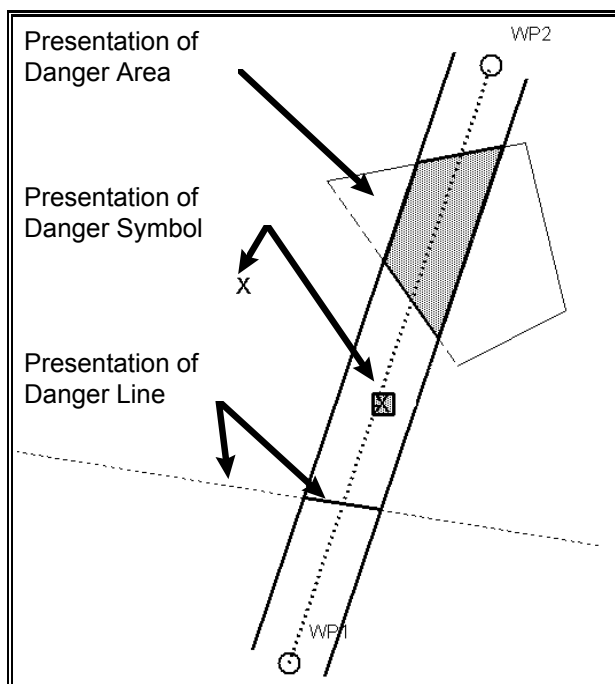
Areas

To include areas in the chart alert, check the Danger Area box in the Area page of the Plan User Chart dialog box. Danger Area must be checked, otherwise danger areas of a user chart cannot be used in the chart alert. The dangerous area is drawn in red instead of dark yellow (color may be different depending on Palette in use).

In the Area page, you can include areas in the chart alert by checking Danger Area.

Total	2
Name	MUSTAMAT
<input checked="" type="checkbox"/> On Radar	
<input checked="" type="checkbox"/> Danger Area	
<input type="button" value="Add"/> <input type="button" value="Import"/> <input type="button" value="Delete"/>	
Corner Points of Area	
Current	1
Total	6
60°22.138'N	
028°29.231'E	
<input type="button" value="Add"/> <input type="button" value="Delete"/>	

The figure below shows the behaviour of a danger symbol, line and area in the chart alert check.



11.4 How to Activate Own Ship Check

Calculation of your ship's predicted movement is done using watch sector from your ship's position. Sector size is defined by time and Width or by distance and Width. To set them, do the following:

1. Spin the scrollwheel to show Menu/Info/Chart menu in the mouse functions area then push the left mouse button.
2. Roll the wheel to select Initial Settings then push the scrollwheel.
3. Put the cursor in the Initial Settings dialog box to show the menu displayed at left.
4. Roll the scrollwheel to select Chart Alert parameters from the menu then push the scrollwheel.
5. Click the Check Area tab.

Chart Alerts [X]

Check Area Alerts

Ahead

Time 6 min

Distance 0.0 NM

Width 100 m

Note: Distance is always limited to 20 NM.

Around

Port 10 m

Starboard 10 m

Bow 15 m

Stern 15 m

6. Set the Time or Distance and Width as appropriate.
7. Click the X at the top right corner to close the dialog box.

The figure on the next page shows how a watch sector is displayed on the ECDIS display.

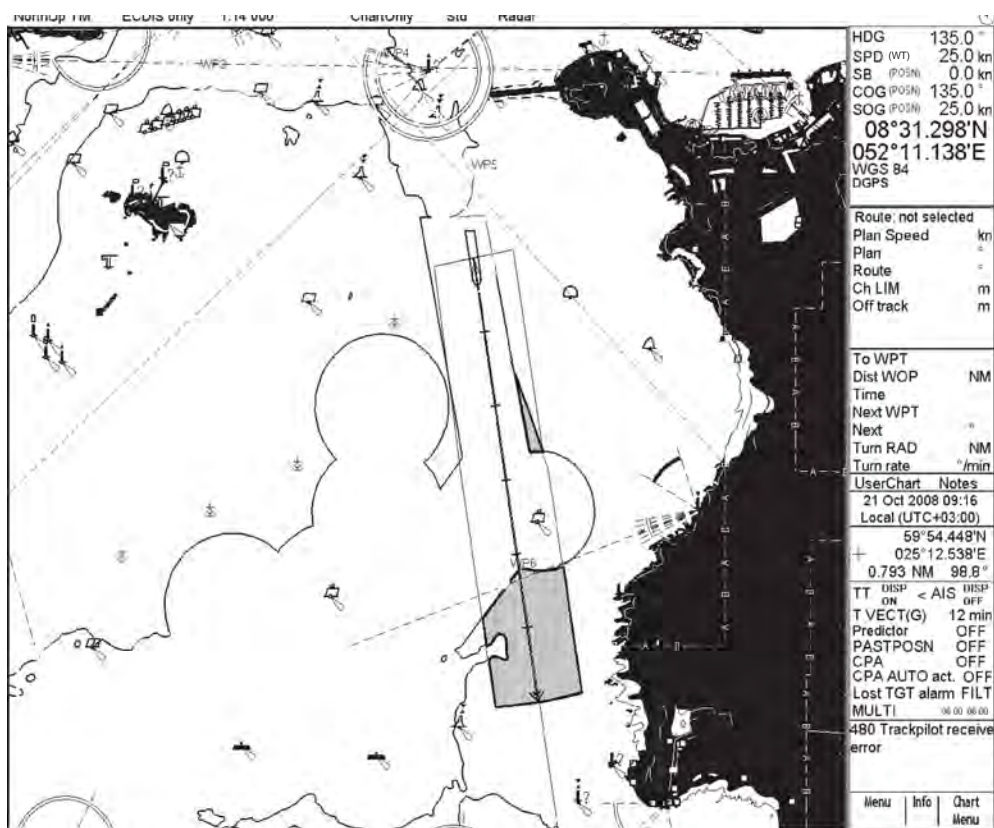
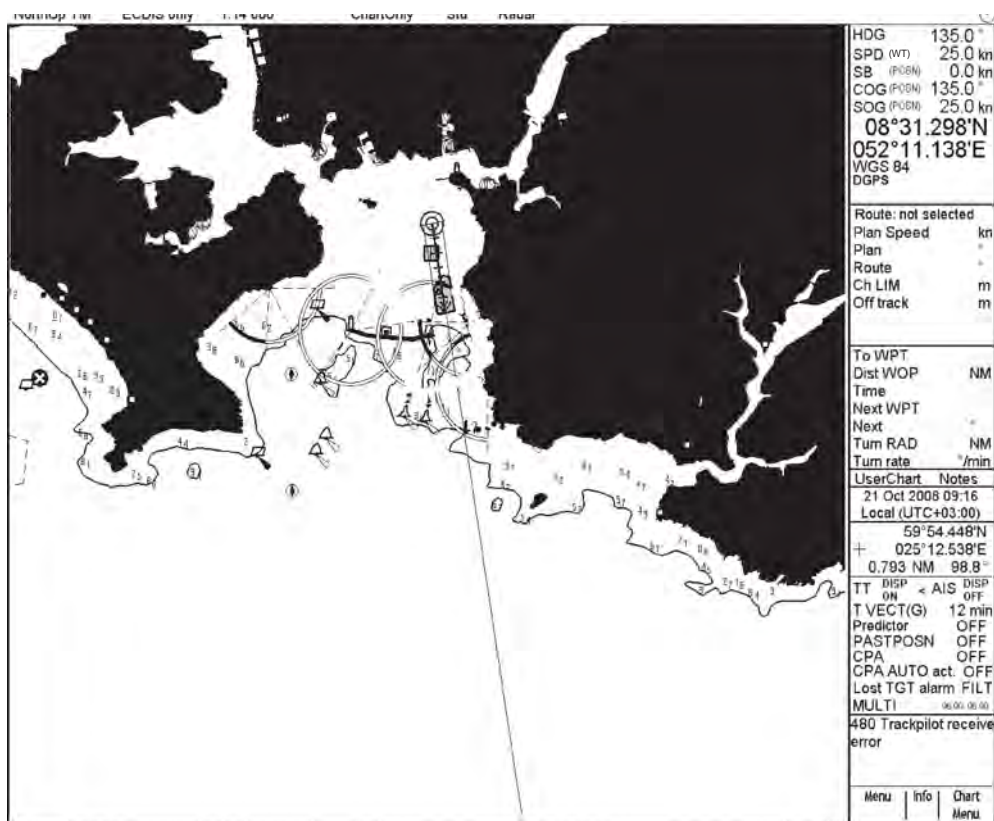


Chart alert always uses the largest scale chart available no matter which chart is selected for display.

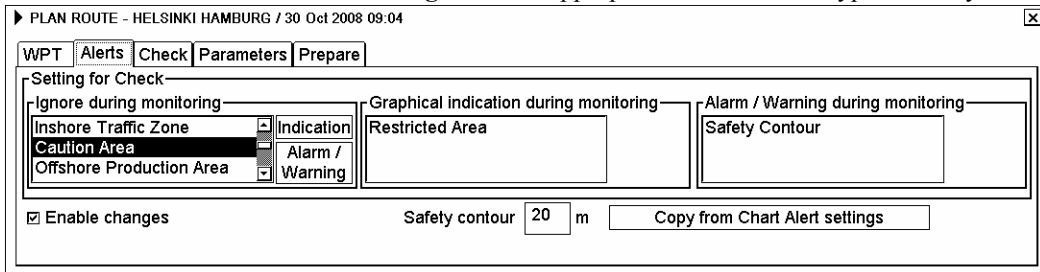
11.5 Route Planning

The system will calculate chart alerts using operator-defined channel limits for routes. Danger areas are shown highlighted if safety contour or operator-selected chart alert areas are crossed by the planned route. For more information on route planning, see the chapter on route planning.

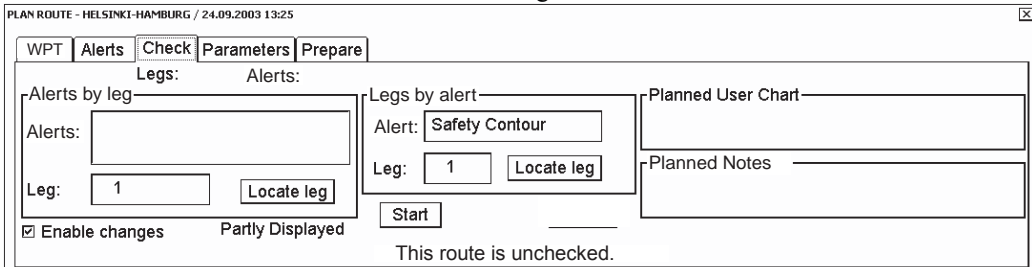
Note: If your voyage is going to take a long time or you are planning it much earlier than it is to take place, use display and approve dates corresponding to the dates you are going to sail.

You can generate a list of chart alerts that cross by the planned route. This can be done as follows:

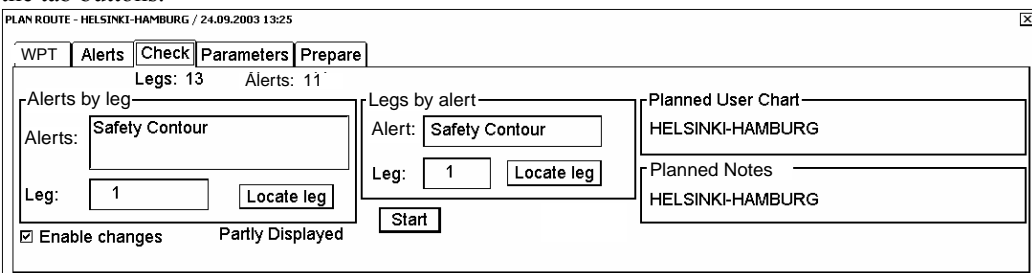
1. Enter the safety contour you want to use. See section 11.2.1 "How to select safety contour".
2. Plan a route; define waypoints and other necessary information. See the chapter on route planning.
3. Select dangerous objects to be monitored during route monitoring, on the Alerts page in the Plan Route dialog box, shown below.
 - a) Open the Plan Route dialog box by putting the cursor on Route in the information area and then clicking Plan. (See section 13.2 "Main Menu for Route Planning".)
 - b) Click the Alerts tab.
 - c) Check the Enable changes box, then click the alert to process from the Ignore during monitoring list then click the **Indication** or **Alarm/Warning** button as appropriate to select what type of alert you want.



4. Click the Check tab then click the **Start** button to generate a list of chart alerts.



The system will check a route leg by leg and when finished you will see the number of Legs and Alerts below the tab buttons.



The figure above shows the alerts to be monitored. If there are alerts included in the planned route, check alerts leg by leg, or check alerts by using category of alert.

11.5.1 How to find chart alerts leg by leg

After you have done chart alert calculation, the system is able to show you legs on the route where danger areas are located. All the alerts for each leg where alerts occur are shown in the Alerts list. The list of alerts is based on selections made in the Chart alert parameters sub menu. To find chart alerts by route leg, do the following:

1. In the Check page of the Plan Route dialog box, the Alerts by leg field has a selection box where you may select desired leg number.

PLAN ROUTE - HELSINKI-HAMBURG / 24.09.2003 13:25

WPT Alerts **Check** Parameters Prepare

Legs: 13 Alerts: 11

Alerts by leg
Alerts: Safety Contour
Leg: 1 **Locate leg**

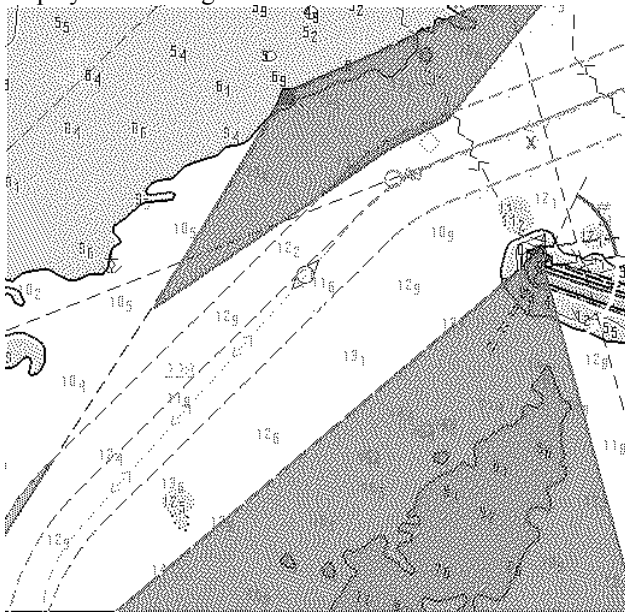
Legs by alert
Alert: Safety Contour
Leg: 1 **Locate leg**

Planned User Chart
HELSINKI-HAMBURG

Planned Notes
HELSINKI-HAMBURG

Enable changes Partly Displayed **Start**

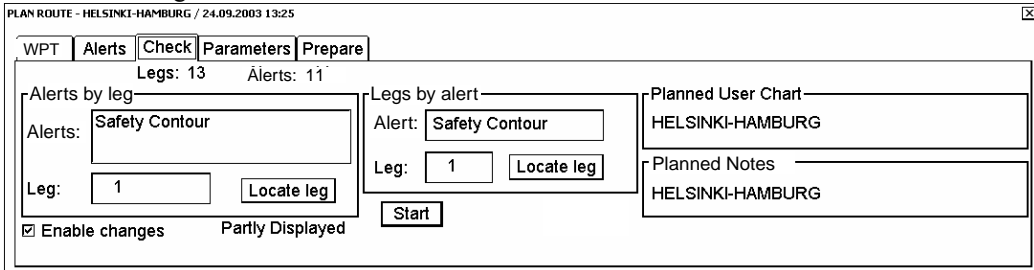
2. Select the Alert from the Alerts by leg field then click **Locate leg** button in the same field. The system will display selected leg on the electronic chart area as shown below.



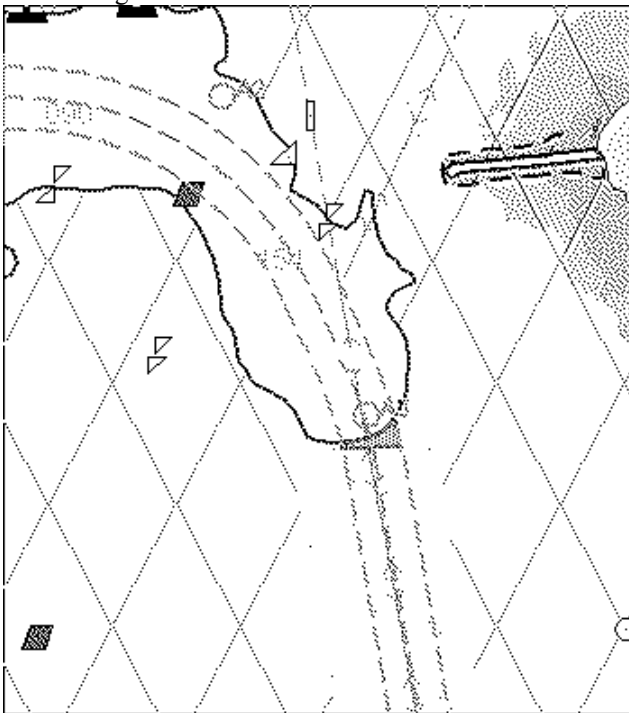
11.5.2 How to find chart alerts by category

After you have done chart alert calculation, the system is able to show you legs on the route where the chart alerts are located. The system can show alerts by their category. To find chart alerts for a route by alert category, do the following:

1. In the Check page of the Plan Route dialog box, the Legs by alert field has a selection box where you may select desired leg number.

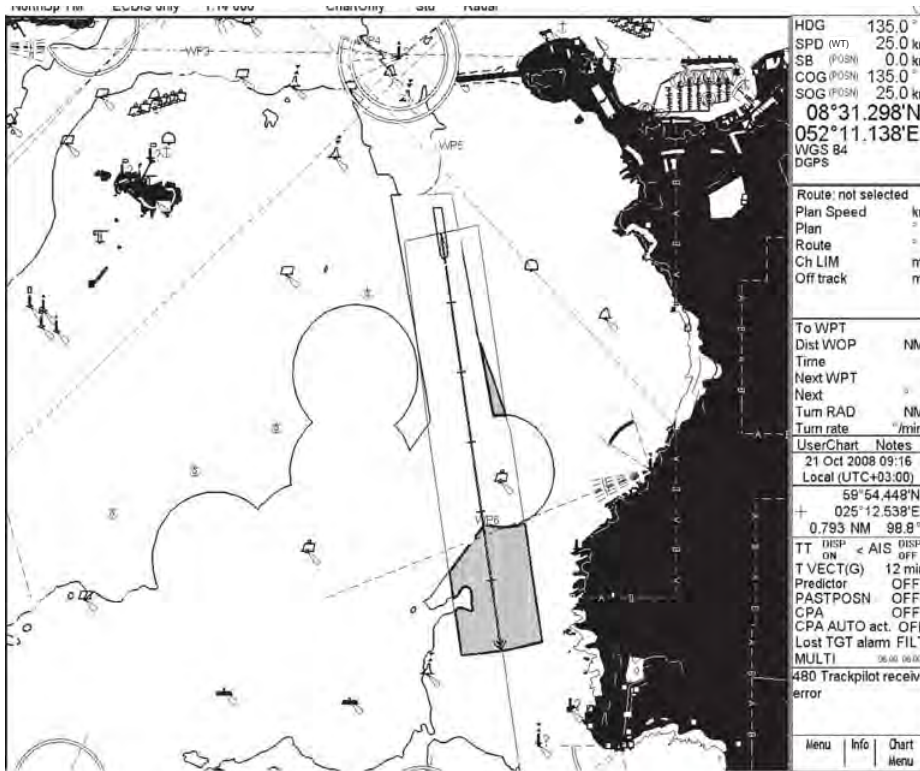


2. Select the leg number from the Leg field then click **Locate leg** button in that field. The system will display selected leg on electronic chart area as shown below.



11.6 Route Monitoring

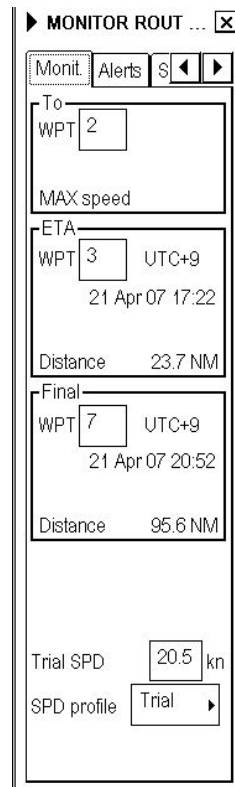
Route monitoring can be divided into two categories: your ship's estimated position and monitored route.



The figure above shows how the system highlights chart alerts inside channel limits of a monitored route and inside predicted movement area of your ship.

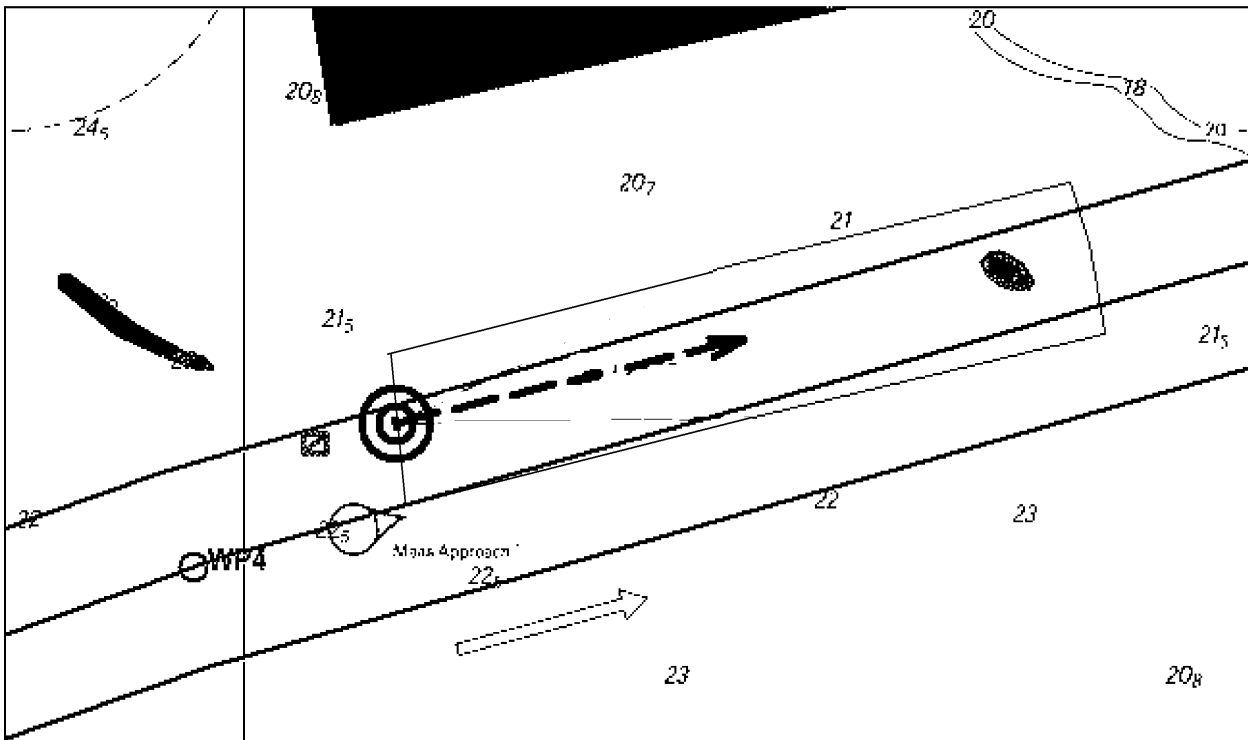
Note: The system has a route monitor that facilitates safe use of routes. You can check your route plan for safe water and you can attach a user chart and Notes that you intend to use together with a route plan. To show the route monitor, click Route in the information area then click the **Monitor** button (see section 14.2).

If the text "Checked conditions differ" appears at the bottom of the Monitor Route dialog box, use the Alerts page in this dialog box to verify the difference between actual and planned situation.



11.7 Chart Alert With ARCS Charts

In case of ARCS charts, the operator can define danger areas by using a user chart. The system can use user chart symbols, lines and areas and calculate chart alert from this material. For further details, see Chapter 15 "User Chart Control".



This figure shows a chart alert used with an ARCS chart. The chart alert calculation is done with route and predicted movement of your ship.

To get a chart alert with a user chart, when you start planning a future voyage, do the following:

1. Create a new user chart or select an existing one where lines and/or areas for chart alerts have been defined. See Chapter 15 for how to create a user chart.
2. Check that "Chart Alert Warning Area" is set for display. See section 11.2.3 "How to highlight chart alerts" for the procedure.
3. Select user chart danger area indication or alert position. See section 11.2.2 "Choosing objects used in chart alerts" for the procedure.
4. In the route planning mode, define a new route or select an existing one. Make a chart alert for the route if there are indications of danger areas along the route. Modify your route if necessary. See section 11.5 "Route Planning".
5. Select the route as monitored route, by using Exchange with Monitor in the Route menu.
6. Set watch sector for your ship. See section 11.4 "How to Activate Own Ship Check" for the procedure.

The system is ready for chart alerts based on user chart for monitored route, planned route and your ship.

12. Navigation Tools

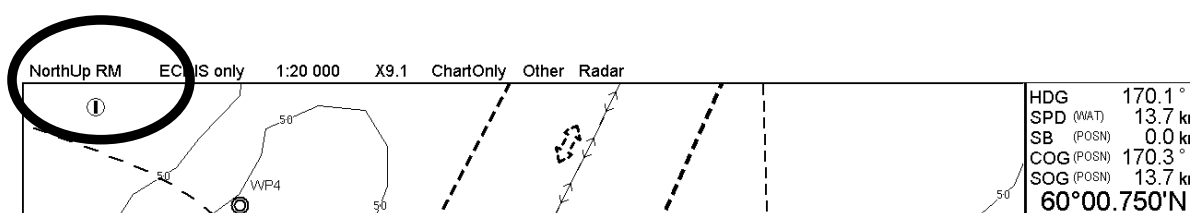
12.1 Display Mode and Chart Orientation

There are two display modes to present your ship's movement on the electronic chart. They are true motion, TM, and relative motion, RM. In the true motion mode, the ECDIS shows your ship's position and other "in motion" data such as radar targets moving on the earth-fixed chart background. In the relative motion display mode, the orientation of chart is set again when you press the **TM/CU RESET** button or the **SHIP OFF CENTER** button.

Note 1: In the route-up, RM display, the orientation is reset whenever the source is changed.

Note 2: The chart is redrawn in the route-up orientation when a new To WPT is set.

The display mode currently in use is shown at the top left corner on the screen.



The list below shows the display mode and chart orientation combinations available.

True Motion

- True Motion North-up
- True Motion Course-up

In the true motion display mode, the orientation of the chart is automatically reset when it reaches the TM reset boundary, or when you use the TM Reset function, accessed from the mouse functions area or the **CU/TM R** key on the keyboard-equipped unit.

Relative Motion

- Relative Motion North-up
- Relative Motion Course-up
- Relative Motion Route-up

In the Relative Motion display mode, the orientation of the chart is set again when you press **TM/CU RESET** button or when you press **SHIP OFF CENTER** button.

If you use route-up together with relative motion, the orientation is reset whenever the source of it has been changed.

The chart is redrawn in the Route-up orientation when the chart source is changed or a new To WP is set.

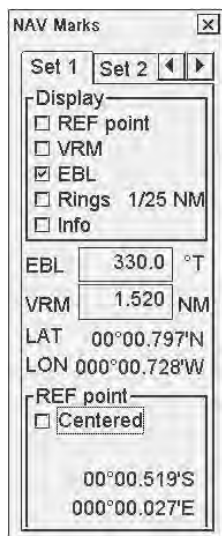
12.1.1 How to select display mode and chart orientation

Put the cursor on the orientation indication at the top left corner on the screen, spin the scrollwheel to select the orientation desired then push the scrollwheel.

12.2 Navigation Marks

Navigation marks consist of two sets of Reference Point, EBL, VRM, and four parallel index lines. Two sets of these marks are provided on the Nav. Marks dialog box, so that you can arrange each set according to a particular navigation operation. To display the Nav. Marks dialog box, spin the scrollwheel to display Show Value/Info/Nav Marks in the mouse functions area then push the right mouse button.

Note: If you are using the Control Unit RCU-018, the EBLs and VRMs can also be turned on or off from the keyboard.



Set 1 page

Display

REF point: Turn on/off the reference point on the electronic chart.

VRM: Turn on/off the VRM (Variable Range Marker), which is displayed around the reference point.

EBL: Turn on/off EBL (Electronic Bearing Line), which extends from the reference point.

Rings: Turn on/off the range rings, which circumscribe the reference point. The ring interval depends on scale of displayed chart.

Info: Turn on/off numerical information for VRM, EBL and reference point.

REF point

Centered: Center of VRM and EBL matched to ship position.

Set 2 page

Provides a second set of the items contained in Set 1.

12.2.1 How to shift the EBL

With control unit RCU-018

There are two EBLs, No. 1 and No. 2. Each EBL is a straight dashed line extending from your ship's position up to the edge of the screen. The long dashed line is the No. 1 EBL and the short dashed one is the No. 2 EBL. Press the **EBL ON** key to display either of the EBLs. Successive presses of the **EBL ON** key toggle the active EBL between No. 1 and No. 2. To adjust an EBL, use the EBL rotary encoder, above the **EBL OFF** and **EBL ON** keys. The EBLs can be turned on or off from the Nav Marks dialog box by checking or unchecking EBL on the Set 1 or Set 2 page.

Each EBL carries a range marker, or a short line crossing the EBL at right angles and its distance from the EBL origin is indicated at the VRM readout whether or not the corresponding VRM is displayed. The range marker changes its position along the EBL with the rotation of the VRM rotary encoder. The corresponding VRM must be turned off to use a range marker.

With control unit RCU-015

You have two methods available to adjust the EBL. You can directly enter a numeric value for the EBL on the Nav. Marks dialog box, or you can put the cursor on an EBL, then press and hold down the left mouse button while rotating the trackball. If you locate the cursor over the intersection of a VRM and an EBL, you can adjust them together, using the left mouse button and trackball. (Note that this can also be done from the keyboard-equipped Control Unit RCU-018.) The EBLs can be turned on or off from the Nav Marks dialog box by checking or unchecking "EBL" on the Set 1 or Set 2 page.

12.2.2 How to shift the VRM

With control unit RCU-018

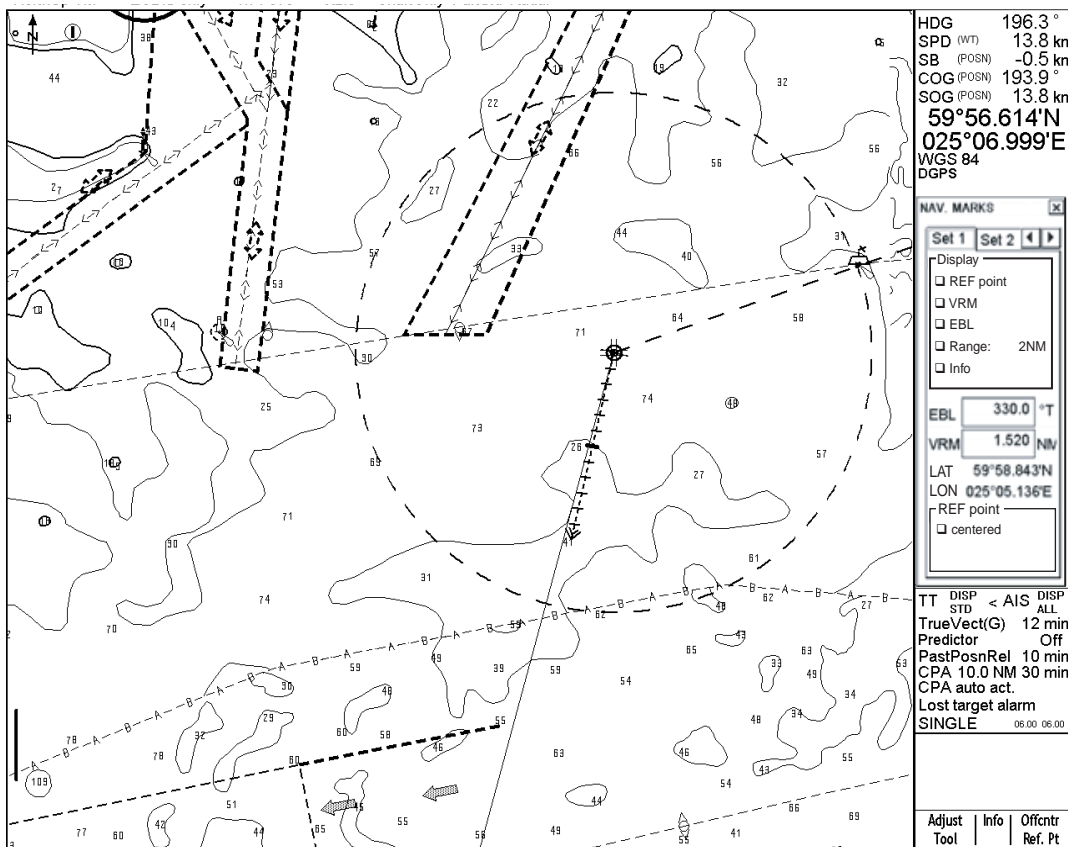
There are two VRMs, No. 1 and No. 2, which appear as dashed rings so that you can discriminate them from the fixed range rings. The two VRMs can be distinguished from each other by different lengths of their dashes. Press the **VRM ON** key to display either of the VRMs. Successive presses of the **VRM ON** key toggle the active VRM between No. 1 and No. 2. To adjust a VRM, use the VRM rotary encoder, above the **VRM OFF** and **VRM ON** keys.

With control unit RCU-015

You have two methods available to adjust the VRM. You can directly enter a numeric value for the VRM on the Nav. Marks dialog box, or you can locate cursor over the VRM, then press and hold down the left mouse button while rotating the trackball. If you locate the cursor over the intersection of a VRM and an EBL, you can adjust them together, using the left mouse button and trackball. (Note that this can also be done from the keyboard-equipped control unit.) The VRMs can be turned on or off from the Nav Marks dialog box by checking or unchecking "VRM" on the Set 1 or Set 2 page.

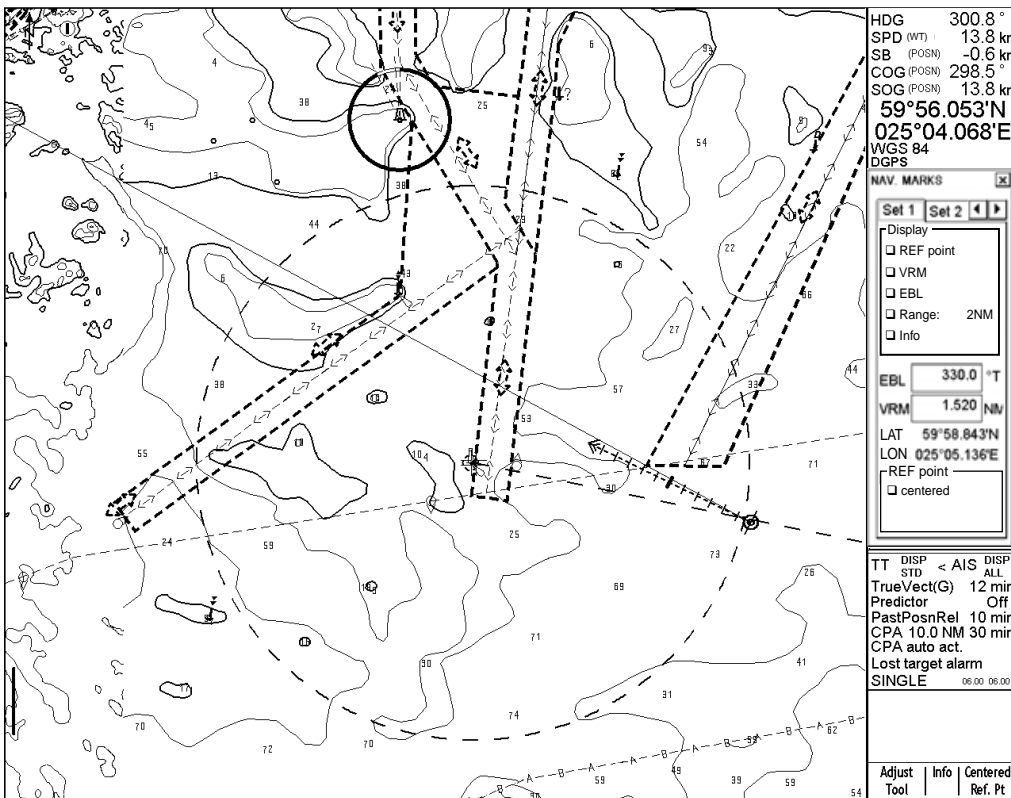
12.2.3 How to shift the reference point

The reference point, shown on the display with a cross mark (if turned on in the Nav Marks dialog box), is a specified location to which measurements of range and bearing are referred. To select the location for the reference point, open the Nav. Marks dialog box, check Centered, put the cursor at the location desired then push the right mouse button.

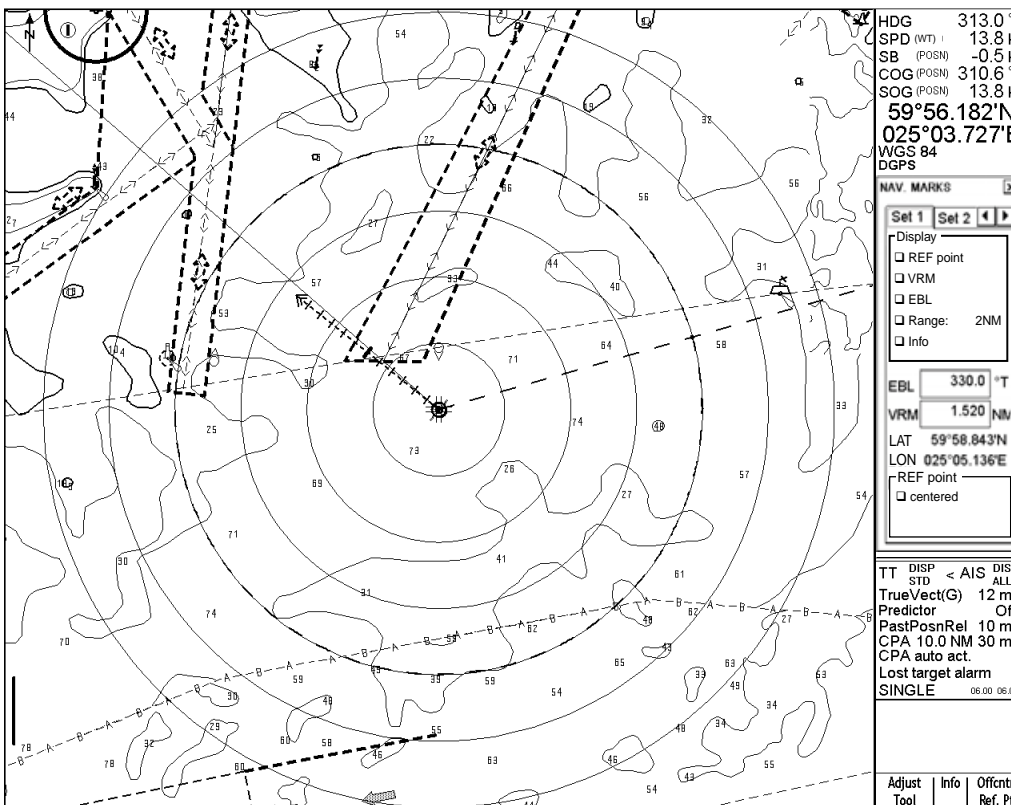


Centered reference point with Variable Range Marker (VRM) and Electronic Bearing Line (EBL)

12. Navigation Tools



Reference point off centered with Variable Range Marker (VRM) and Electronic Bearing Line (EBL)

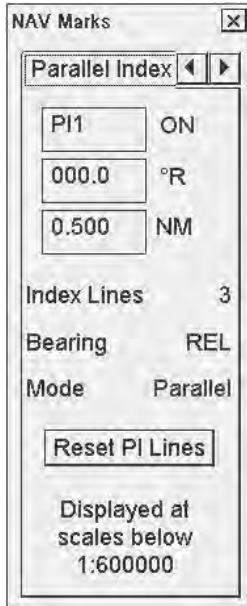


Centered reference point with range ring

12.2.4 How to adjust the parallel index lines

Parallel index lines are useful for keeping a constant distance between own ship and a coastline or a partner ship when navigating.

Controls for the parallel index lines are in the NAV Marks dialog box. To display the Nav. Marks dialog box, spin the scrollwheel to display Show Value/Info/Nav Marks in the mouse functions area then push the right mouse button. Open the Parallel Index page to adjust the parallel index lines. There are four sets of parallel indexes for use.



PI1- PI4: Select desired Parallel index (PI1-PI4) number in the list box: Put the cursor in the box, spin the scrollwheel to select then push the scrollwheel. Turn the parallel index line ON or OFF by placing the cursor on ON or OFF, spinning the scrollwheel then pushing the scrollwheel.

°R(T) (Bearing): Set line angle setting in the bearing box. Select °T(True) or °R(Relative).

NM (Distance): Set distance (NM) between lines.

Index Lines: Select number of index lines to display 1, 2, 3 or 6.

Mode: Set index line reference to own ship heading: parallel or perpendicular.

Reset PI Lines: Reset Bearing to relative 0 degrees, Distance to 1 NM and Mode to Parallel.

12.Navigation Tools

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13. Route Planning

13.1 Introduction

A route plan defines the navigation plan from starting point to the final destination. The plan includes:

- Route name
- Name, latitude and longitude of each waypoint
- Radius of turn circle at each waypoint (max. 200 waypoints)
- Safe channel limits
- Chart alert calculation based on channel limits against chart database and user chart danger
- Minimum and maximum speed for each leg
- The navigation method (rhumb line, great circle)
- Fuel saving
- ETD for the first waypoint
- ETA for the last waypoint
- Ship and environmental conditions affecting the ship speed calculation
- Name of the user chart to use during route monitoring together with this planned route
- Name of the Notes to use during route monitoring together with this planned route

Using the above-mentioned data, the system calculates speed, course and length for each leg, ETAs for each waypoint, fuel consumption and WOP for the Autopilot. It also calculates safe water areas based on operator-defined channel limits. The calculated data is displayed in tabular form that can be printed as a documented route plan and also stored in a file for later use. The route files thus formed contain the Autopilot commands for each waypoint.

The main functions of route planning are:

- Define waypoints
- Define turnings for each waypoint
- Define channel limits for each leg (a leg is the line connected between two waypoints). The channel limits are used to detect chart alerts when you are planning or monitoring your route.
- Define the speed for each leg
- Calculation for ETD and ETA
- Calculation for most economical sailing

Limitation of displayed route

If you have small-scale chart(s) on display having the whole eastern/western (0-180°E/0-180°W) hemisphere and a part of the other hemisphere on display, there is a limitation to display a route. To avoid this, set chart center so that the whole eastern/western hemisphere is not on display.

13.2 Main Menu for Route Planning

The main parameters for the route planning are:

- Latitude and longitude of the waypoint
- Channel limits to the waypoint
- Turning radius of the waypoint
- Maximum and minimum speed limits for a leg

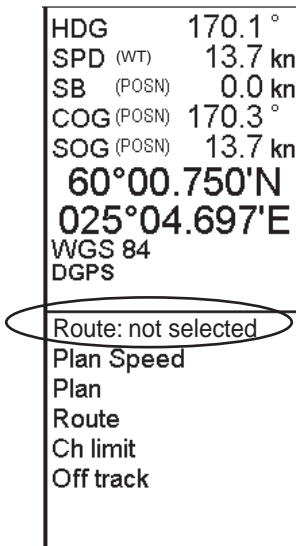
There are two phases for a route: Route Plan and Route Monitor. Route plan is used for planning the route and route monitor is used to control a route for monitoring.

To complete route planning, do the following:

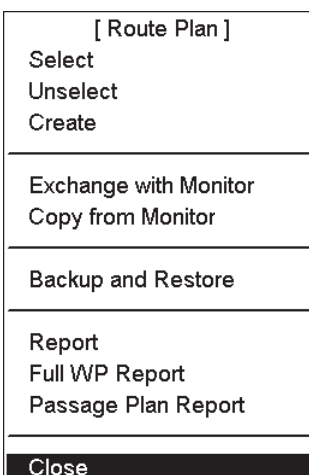
1. Create a new route or select an existing one. See section 13.4 "How to Create a New Route".
2. Modify your route if necessary. See section 13.5 "How to Modify an Existing Route".
3. Make chart alert (safe water) calculation. See section 13.4.3 "How to use the Check page".
4. Optimize your route. See section 13.6 "Route Optimization".

Description of Plan Route menu

1. Click Route in the information area.



2. Click the **Plan** button to open the Plan Route dialog box. The Plan Route dialog box appears together with the Plan Route menu, shown below. The Plan Route menu is where you select, unselect or create a route. If it is not shown, that is, a route has been selected, you can show it by placing the cursor on the triangle in the Plan Route dialog box.



Contents of Plan Route menu

Select: Select an existing route and edit it for use. Choose "Select" from the menu, push the scrollwheel, and a list box appears. Spin the scrollwheel to select appropriate route from the list box, push the scrollwheel to confirm then click the **OK** button.

Unselect: Deselect a route here. The operation is similar to how you select a route.

Create: Create a new route. An input box appears; enter name for new route, using the scrollwheel. The route name may have up to 30 alphanumeric characters. See also section 13.4 "How to Create a New Route".

Exchange with Monitor: This function exchanges planned and monitored routes. A planned route is used both as alternative route and as an editable route.

Note: Before using this function, set the next To WPT on the Prepare page of the Plan dialog box. If this is not done, and unintended waypoint could become the To WPT. If this occurs, right-click the TO WPT then enter correct WPT.

Copy from Monitor: Copy monitored route to plan route.

Backup and Restore: You can make a backup of a route to a floppy disk or USB memory or retrieve a route from a floppy disk or USB memory. See Chapter 17.

Report: Generate report of planned route.

Full WPT Report: Generate detailed report of planned route.

Passage Plan Report: Generate a combined report from active planned route and active Notes.

Note: To display a planned route, make sure that desired options of the planned route (Center line, Channel borders, WPT marks, Leg marks, etc.) are selected on the Route page in the Symbol Display dialog box. For the procedure, see the next page.

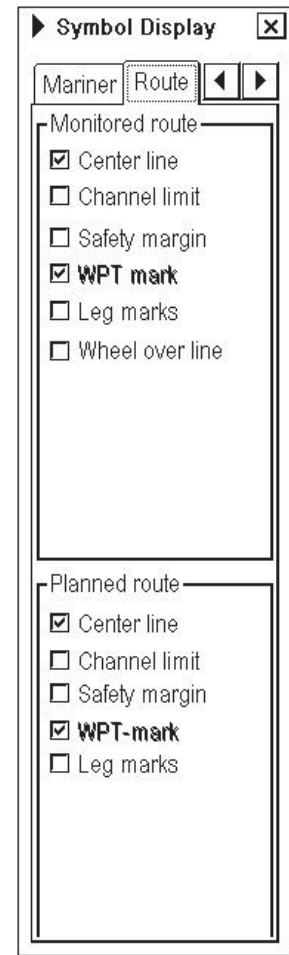
▶ PLAN ROUTE - HELSINKI HAMBURG / 10 Oct 2008 06:11

WPT	NAME	LAT	LON	Leg ^o	Leg/NM	Mode	RAD/NM	Ch LM/m	Margin/m	MIN/kn	MAX/kn
28		53°45.041'N	009°25.092'E	152.0	5.6	RL	0.7	385	40	0	22
29		53°39.286'N	009°32.274'E	143.5	7.2	RL	0.7	385	40	0	22
30		53°35.516'N	009°35.694'E	151.7	4.3	RL	0.7	385	40	0	22
31		53°32.539'N	009°46.297'E	115.2	7.0	RL	0.7	385	40	0	22

Enable changes
 WPT count 31
Total length 723.2 NM

13. Route Planning

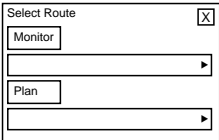
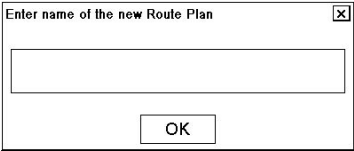
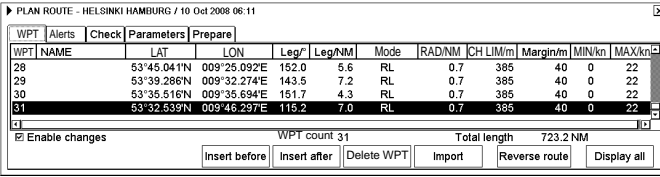
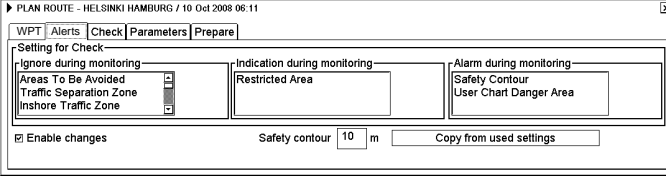
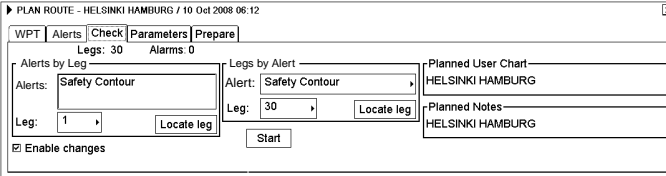
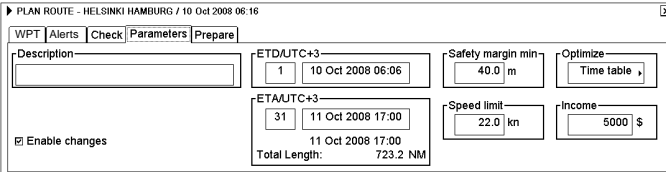
Spin the scrollwheel to show Symbol Display/Info/ in the mouse functions area then click the left mouse button to open the Symbol Display dialog box. Click the arrow tabs or right mouse button (or **NEXT** key on the keyboard-equipped control unit) to select the Route page.



13.3 How to Select Datum

Selection of datum is very important, especially if you manually enter latitude-longitude positions or if you use a digitizer. If you use the cursor to add and to modify waypoint locations, then you could use any datum, although it is recommended to use native datum of the chart. For details, see section 15.3 "How to Select Datum".

13.4 How to Create a New Route

2. 
5. 
6. 
7. 
8. 
9. 

To make a complete route for a voyage, do the following:

1. Click Route in the information area.
2. Click the **Plan** button to open the Plan Route dialog box.
3. Put the cursor on the triangle in the dialog box to show the Route Plan menu.
4. Select Create.
5. Enter a name (max. 30 alphanumeric characters) for the route by spinning the scrollwheel to select character desired and confirming desired character by pushing the scrollwheel. When name is ready, click the **OK** button.
6. Check Enable changes in the Plan Route dialog box. Select position of a waypoint by placing the cursor on the location desired on the electronic chart display then pushing the left mouse button. After entering a waypoint, edit Name, Steering mode, Radius, Channel limit, Safety margin and Speed (Min, Max) as appropriate in the Plan Route dialog box. (Put the cursor on an item, spin the scrollwheel to change value then push the scrollwheel.) Do this for all waypoints of your route.
7. Use the Alerts page to define safety contour and other specified conditions for checking the route. Select item from a list then click **Indication** (to get a visual indication), **Alarm** (to get the audio alarm) or **Ignore** (to remove check item) button as appropriate.
8. Use the Check page to detect areas where the depth is less than the safety contour or where specified conditions exist. The ECDIS can examine the chart database against planned route to make a list of alerts where a route crosses a safety contour or specified areas used in chart alerts. To create a list of alerts, click the **Start** button.
9. Use the Parameters page to enter Estimated Time of Departure (ETD) and Estimated Time of Arrival (ETA). If you are using Timetable optimizing, select desired optimizing mode from the Optimize window.

To print a waypoint report, open the Plan Route dialog box, put the cursor on the triangle to show the Plan Route menu, select Report or Full Report from the menu then push the scrollwheel. Click the **Print Text** button. (If you want to change the font size, put the cursor on the triangle, select font size then push the scrollwheel, before clicking the **Print Text** button.)

13.4.1 How to use the WPT page (processing waypoints)

PLAN ROUTE - HELSINKI HAMBURG / 10 Oct 2008 06:11

WPT	NAME	LAT	LON	Leg [°]	Leg/NM	Mode	RAD/NM	Ch LM/m	Margin/m	MIN/kn	MAX/kn
28		53°45.041'N	009°25.092'E	152.0	5.6	RL	0.7	385	40	0	22
29		53°39.286'N	009°32.274'E	143.5	7.2	RL	0.7	385	40	0	22
30		53°35.516'N	009°35.694'E	151.7	4.3	RL	0.7	385	40	0	22
31		53°32.539'N	009°46.297'E	115.2	7.0	RL	0.7	385	40	0	22

Enable changes
 WPT count 31 Total length 723.2 NM

Following fields and buttons can be found in the WPT page.

- Enable changes:** Check to edit waypoints.
Note: Routes can only be modified in the North-up or Course-up mode.
- WPT:** Waypoint number.
- NAME:** Name of waypoint.
- LAT:** Waypoint's latitude co-ordinate is displayed in selected datum.
- LON:** Waypoint's longitude co-ordinate is displayed in selected datum.
- Leg[°]** Bearing of leg
- Leg/NM:** Leg's length (nm)
- Mode:** Define steering mode, rhumb line or great circle, for each leg.
- RAD/NM:** Define turning radius for each waypoint.
- Ch LM/m :** Define channel limit for each leg.
- Margin/m** Define extension for channel to be checked against selected alerts.
- (Spd) MIN/kn:** Define minimum speed of ship used with a leg.
- (Spd) MAX/kn:** Define maximum speed of ship used with a leg.
- Insert before:** Insert a new waypoint before the current waypoint.
- Insert after:** Add a new waypoint after current waypoint. You can define direction and distance for next waypoint. (If the waypoint is the last waypoint in a route, the button name changes to **Insert after**. If the waypoint is the first through the 2nd to-the-last, the button name changes to **Adjust after**.)
- Delete WPT:** Delete current waypoint.
- Import:** Import new waypoints from already existing routes into your current route.
- Reverse route:** Reverse sailing order of the entire route.
- Display all:** Center line, channel borders, WPT marks and leg marks are made visible on the top of the electronic chart.

13.4.2 How to use the Alerts page

The Alerts page lets you define conditions along a route for which you want to be alerted, by visual or audible indication. (You cannot get both visual and audible indications for a condition.) You can select safety contour and chart alerts used to check the safety of the route. This allows you to check safety with conditions different from those selected for system use. This is useful when making a route for different loading or sailing conditions.

Enable changes

Check here in order to enable editing.

Note: A route may only be modified when using the north-up or course-up mode.

Ignore during monitoring

Chart objects in this list box are not used for chart alert calculation.

Graphical indication during monitoring

Chart objects in this list box are used for chart alert calculation. Only the visual alert is released.

Alarm/Warning during monitoring

Chart objects in this list box are used for chart alert calculation. Both visual and audio alarms of selected chart objects are generated by the system.

Safety contour

Safety contour depth selected for chart alert calculation.

Copy from Chart Alert settings

Copy system settings to here.

13.4.3 How to use the Check page

The Check page allows you to make safe water calculation for your route. You also store the names of the user chart and Notes to use during route monitoring together with planned route on this page. This storage happens when you activate the safe water calculation by pushing the **Start** button. They are stored under the names of the planned user chart and planned Notes.

The time used for the Chart Alert check is subject to the chart database and route distance. When the **Start** button is clicked, the dialog box shown right appears as a reminder. To continue, click the **OK** button.

If the selected scale for displayed chart(s) is smaller than 1:500 000, chart alert calculation is not performed. In this case use the scale range 1:1 000 – 1: 500 000.

Note 1: In order to display charts with correct updated situation, always use the current date during your voyage. If your voyage lasts more than one week, set the current date at least once per week during your voyage.

Note 2: In order to display charts with correct updated situation during route planning, always use planned date of each waypoint to check your plan.

13.4.4 How to use the Parameters page

The Parameters page allows you to set departure time and arrival time for your route. Also optimization type is selected on this page.

Enable changes: Check in order to enable editing.

Note: A route may only be modified when using the north-up or course-up mode.

Description: Enter note concerning the route.

ETD/UTC: Planned estimated time of departure from a specified waypoint.

ETA/UTC: First part is planned estimated time of arrival to last waypoint. ETA can be calculated between two specified waypoints. Second part is calculated ETA that may differ from planned ETA if it is impossible for them to agree with selected optimization method. Also total length of the route is displayed.

Safety margin MIN: Define extension for channel to be checked against selected alerts.

Speed limit: Set speed limit for a route.

Optimize: Optimize types are max. speed, timetable, max profit and min. cost. (Description is provided in section 13.6.1 "Available route optimization strategies".)

Income: Budget for this voyage. (Income * 1000\$)

Note: A route may only be modified when using the north-up or course-up mode.

How to optimize your route

After all waypoints are inserted and you have made safe water calculation, you can optimize your route. If not selected, then optimization will be done automatically with max. speed. If you want do optimization with specific strategy, see section 13.6.1 "Available route optimization strategies".

13.4.5 How to use the Prepare page

The Prepare page allows you to prepare for exchange of planned route with monitored route. Use this page if you are going to use the exchange function to select planned route as monitored route. If you do not use this page to define To WPT and Final WPT for steering in the planning mode, ECDIS will select the most suitable To WPT based on your ship's position and Final WPT based on waypoint selected on the Parameters page.

13.5 How to Modify an Existing Route

13.5.1 Parameters

The main parameters for route planning are:

- Latitude and longitude of the waypoint
- Channel limits to the waypoint
- Turning radius of the waypoint
- Maximum and minimum speed limits for a leg

13.5.2 How to change waypoint position

To change position of a waypoint, you have following alternatives:

- Enter latitude and longitude on the WPT page in the Plan Route dialog box.
- Enter distance and direction for next waypoint.
- Drag and drop waypoint using the left mouse button.

How to enter latitude and longitude in position field

1. Click Route in the information area then click the **Plan** button to open the Plan Route dialog box. Click the WPT tab to open the WPT page.
2. Check Enable changes then select desired WPT. Put the cursor in the Lat or Lon field as appropriate, spin the scrollwheel to set co-ordinates then push the scrollwheel to confirm.

How to enter distance and direction for next waypoint

The position of a waypoint can be defined using distance and direction between two waypoints.

1. Click Route in the information area then click the **Plan** button to open the Plan Route dialog box. Click the WPT tab to open the WPT page.
2. Check Enable changes then highlight number of WPT with the cursor then push the left mouse button.
3. Click the **Adjust after** button, and the following dialog box appears.

Current WPT: 1		Next WPT	
Name	PILOT	Direction of	<input type="text" value="111.9"/> °
Lat	50°45.372'N	Distance to	<input type="text" value="10.90"/> NM
Lon	001°09.031'W		

4. Enter Direction and Distance in respective box in the Next WPT field then click the **OK** button.

How to drag and drop a waypoint to a new position

1. Click Route in the information area then click the **Plan** button to open the Plan Route dialog box. Click the WPT tab to open the WPT page.
2. Check Enable changes then put the cursor on the waypoint you want to process.
3. Press and hold down the left mouse button while rolling the trackball to move the cursor to a desired position. Keep the button pressed down while you move the cursor and release it when the cursor is at desired position.

The screenshot shows the Plan Route dialog box with the WPT tab selected. The main area displays a route on a chart with waypoints 1 through 5. Waypoint 1 is at 60°04.208'N, 024°58.905'E. Waypoint 2 is at 60°02.615'N, 025°00.725'E. Waypoint 3 is at 60°01.731'N, 025°01.551'E. Waypoint 4 is at 60°01.259'N, 025°04.078'E. Waypoint 5 is at 59°59.026'N, 025°05.112'E. The route is shown as a solid line with a dashed line indicating a 30.0 km margin. The distance between waypoints 4 and 5 is 16.7M. The chart also shows a 259 deg turn at waypoint 4 and a 255 deg turn at waypoint 5.

WPT	NAME	LAT	LON	Leg ^f	Leg/NM	Mode	RAD/NM	CH lim/m	Margin/m	MIN/1kn	MAX/kn
1		60°04.208'N	024°58.905'E		0.0	RL	1.0	185	40	0	30
2		60°02.615'N	025°00.725'E	150.3	1.8	RL	1.0	185	40	0	30
3		60°01.731'N	025°01.551'E	155.0	1.0	RL	1.0	185	40	0	30
4		60°01.259'N	025°04.078'E	110.5	1.3	RL	1.0	185	40	0	30
5		59°59.026'N	025°05.112'E	153.0	1.1	RL	1.0	185	40	0	30

WPT count 8 Total length 32.6 NM

Buttons: Insert before, Adjust after, Delete WPT, Import, Reverse route, Display all

Right panel information:

HDG 266.7°
 SPD (WT) 13.8 kn
 SB (POSN) -0.5 kn
 COG (POSN) 264.4°
 SOG (POSN) 13.8 kn
 59°55.909'N
 025°05.174'E
 WGS 84
 DGPS

Route: Plan Speed kn
 Plan Route
 Ch limit m
 Off track m

To WP Dist WOP NM
 Time
 Next WP
 Next Turn rad NM
 Turn rate °/min

UserChart Notes
 10 Oct 2008 07:03
 LOCAL (UTC+03:00)
 59°53.026'N
 + 024°51.112'E
 7.628 NM 247.8°

TT DISP < AIS DISP
 OTH ALL
 TrueVect(G) 12 min
 Predictor Off
 PastPosnRel 10 min
 CPA 10.0 NM 30 min
 CPA auto act.
 Lost target alarm
 SINGLE 06:00 06:00

4. Drag and drop waypoint to next WPT position (in this case waypoint number 9 is taken to a next WPT position).

13.5.3 How to change other waypoint data

To change other data of a waypoint, such as name, steering mode, turning radius, min/max speed, do the following:

1. Put the cursor on a desired field and spin the scrollwheel to change data.
2. Push the scrollwheel to confirm changes.

13.5.4 How to add a new waypoint at the end of a route

There are two ways that you can add a new waypoint at the end of a route:

- Use the cursor and left mouse button to define position of a waypoint.
- Use the **Adjust after** button in the WPT page.

To add a new waypoint by using the left mouse button, do the following:

1. Click Route in the information area then click the **Plan** button to open the Plan Route dialog box. Click the WPT tab to open the WPT page. Check Enable changes.
2. Put the cursor in the electronic chart area on the location desired for a waypoint then push the left mouse button. The waypoint is added at the end of route.
3. Modify data of added waypoint. See section 13.5.3 "How to change other waypoint data" for the procedure.

To add a new waypoint by the Insert after button, do the following:

13. Route Planning

1. Click Route in the information area then click the **Plan** button to open the Plan Route dialog box. Click the WPT tab to open the WPT page. Check Enable changes.
2. Select last waypoint as current waypoint.
3. Click the **Insert after** button in the Waypoints page. Enter direction and distance for waypoint then click the **OK** button.

✕

Current WPT: 1		Next WPT	
Name	PILOT	Direction of	111.9 °
Lat	50°45.372'N	Distance to	10.90 NM
Lon	001°09.031'W		

13.5.5 How to insert a waypoint

If you want to insert a waypoint between two waypoints, use the **Insert before** button, on the WPT page. This inserts a waypoint next to current waypoint. For example, you want insert a new waypoint between waypoints 6 and 7. Select WPT 7 then click the **Insert before** button. The WPT is highlighted on the WPT list.

13.5.6 How to delete a waypoint

To delete a waypoint, do the following:

1. Click Route in the information area then click the **Plan** button to open the Plan Route dialog box. Click the WPT tab to open the WPT page. Check Enable changes.
2. Highlight the WPT number on the WPT list that you wish to delete, or put the cursor directly on the waypoint on the screen.
3. Click the **Delete WPT** button.

13.5.7 How to import waypoints from other routes

You can import waypoints from other routes to use them in the current route. To import waypoints do the following:

1. Click Route in the information area then click the **Plan** button to open the Plan Route dialog box. Click the WPT tab to open the WPT page. Check Enable changes.
2. Click the **Import** button, and the following dialog box appears.

3. In the Copy from window, put the cursor in the Route box, spin the scrollwheel to select the route from which to copy waypoints then push the scrollwheel.
4. Enter first waypoint to copy in "First WPT to copy". Spin the scrollwheel to select WPT number then push the scrollwheel.
5. Enter number of waypoints to copy in "Number of WPTs". Spin the scrollwheel to select desired number then push the scrollwheel.
6. Enter where to import waypoints. To enter them after a WPT in a route, enter waypoint number in the "Copy after WPT" box. If you want to enter them before a WPT in the route, enter waypoint number in the "Copy before WPT" box. Spin the scrollwheel to select desired number then push the scrollwheel.
7. Select copying order, Direct or Reverse. "Direct" copies the waypoints in their original order; "Reverse" copies them in reverse order. Spin the scrollwheel to select desired option then push the scrollwheel.
8. Click the **Copy** button.
9. When finished, click X at top right corner of the dialog box to close the dialog box.

13.5.8 How to import waypoints from external device (GP-80 or GP-90)

You can import waypoints from external device such as a GPS navigator, like FURUNO GP-80 or GP-90, to the current route. To import waypoints from an external device, do the following:

1. Click Route in the information area then click the **Plan** button to open the Plan Route dialog box. Click the WPT tab to open the WPT page. Check Enable changes.
2. Click the **Import** button. The following dialog box appears.

3. Enter where to import waypoints. To enter them after a WPT in a route, enter waypoint number in the "Copy after WPT" box (if applicable). If you want to enter them before a WPT in the route, enter waypoint number in the "Copy before WPT" box. Spin the scrollwheel to select desired number then push the scrollwheel.
4. Press the **Copy from ext. device** button.

When the text "Import from ext. device: Waiting messages" appears, you can start importing WPTs (from a GPS Navigator).

You can monitor progress of the importing as shown above.

When the importing is completed, the message "Transfer ready" message appears.

5. Click the **Done** button.
6. When finished, click X at top right corner of the dialog box to close the dialog box.

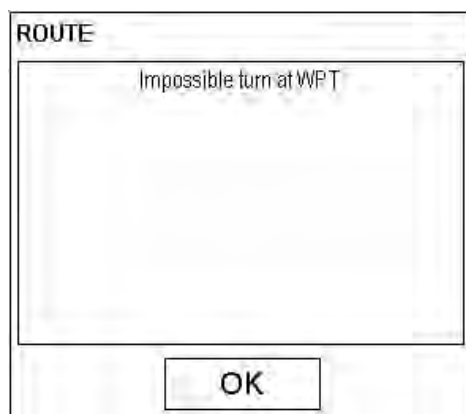
13.5.9 How to reverse sailing order of a route

You may reverse the order of waypoints in a planned route. Put the cursor on Route in the status bar then click the **Plan** button to open the Plan Route dialog box. Click the WPT tab to open the WPT page. Check Enable changes. Click the **Reverse route** button.

13.5.10 Geometry check of route

When you add a new waypoint, modify a waypoint or change other waypoint data, the message "Impossible turn at WPT" may appear (in red). It means that the geometry of route makes it impossible for the ship to sail along a certain leg. Typically it is enough if you do the following, on the WPT page in the Plan Route dialog box.

1. Decrease the radius of turn of the waypoint or one of its neighbors.
2. Change lat/lon position of the waypoint or its neighbors.



13.6 Route Optimization

13.6.1 Available route optimization strategies

After all waypoints are inserted, optimize the route from the Parameters page in the Plan Route dialog box. Optimization calculates all parameters for route steering (course and distance between two waypoints, maneuvering start point, WOP, etc.). There are four methods for optimization:

Max Speed: This calculation uses the maximum speed defined in the ship parameters and multiplies by all reduction factors (weather, ice, fouling, etc.) together with speed limits given for each waypoint to generate ETA.

Time Table: Calculates the speed required in order to arrive at the destination at the required ETA. Maximum speed is never exceeded.

Max. Profit: This calculation takes into account the fuel cost and the fixed cost of the ship and calculates the most profitable speed (highest profit per time unit).

Min. Cost: This calculation takes into account the fuel cost and the fixed cost of the ship and calculates the speed that gives the minimum total cost.

13.6.2 How to optimize a route

You can define Estimated Time of Departure (ETD), desired number of waypoints and Estimated Time of Arrival (ETA) on the Parameters page in the Plan Route dialog box to optimize your route.

1. Put the cursor on Route in the status bar then click the **Plan** button to open the Plan Route dialog box. Click the Parameters tab to open the Parameters page. Check Enable changes.
2. Select desired optimization strategy from the Optimize field. Spin the scrollwheel to select desired strategy then push the scrollwheel.
3. Enter speed limit, ETC/UTC and ETA/UTC (Max. speed not required) in respective boxes.

In case of optimization by "max. speed"

With entered EDT as reference, ETA is calculated with entered speed limit. ETA may be entered in the ETA/UTC box, however ETA is shown below it.

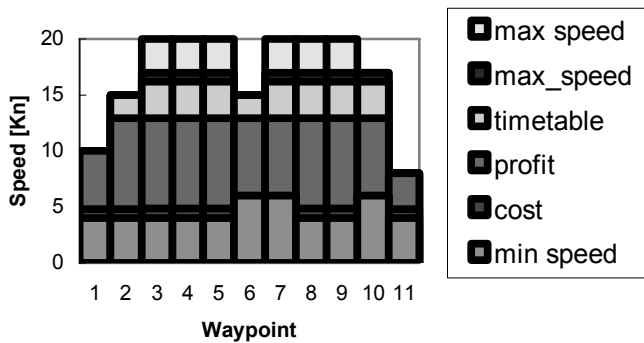
The monitor display shows ETD, speed limit and calculated ETA.

13.6.3 How to plan a speed profile

A speed profile is defined by general max. speed and optimization types. These values are given while planning a route. You can define speed limit and optimize type in the Parameters page of the Plan Route dialog box and in the WPT page of the Plan Route dialog box you can give min. and max. speed for each leg. The table and illustration below demonstrate how different optimize types and speed limits influence speed.

max speed (general)						17
WPT	min speed	cost	profit	timetable	Max speed	max speed
1	4	4.8	10.0	10.0	10	10
2	4	4.8	12.9	15.0	15	15
3	4	4.8	12.9	16.2	17	20
4	4	4.8	12.9	16.2	17	20
4	4	4.8	12.9	16.2	17	20
5	6	6.0	12.9	15.0	15	15
6	6	6.0	12.9	16.2	17	20
7	4	4.8	12.9	16.2	17	20
8	4	4.8	12.9	16.2	17 <td 20	
9	6	6.0	12.9	16.2	17	17
10	4	4.8	8.0	8.0	8	8

An Example of speed profile



13.7 WPT Report

This report is generated when you select Report from the Plan Route menu. To display the report viewer, click Route in the information area, click the **Plan** button, put the cursor on the triangle in the Plan Route dialog box, select Report then push the scrollwheel. To close the report viewer, click X in the right corner of the report viewer. You can print the report by clicking the **Print Text** button.

WPT report consists information of:

- Position of waypoints
- Planned speeds
- Planned courses
- Distances between waypoints. Distance is not directly calculated from LAT and LON values of WPTs location, but the distance is shorter distance compensated for planned radius for each waypoint.
- Estimated times of arrival (ETA)
- Planned fuel consumption
- Total distance of route. Distance is not directly calculated from LAT and LON values of WPTs location, but the distance is shorter distance compensated for planned radius for each waypoint.

TEXT VIEW - ROUTE PLANNING REPORT											
PLAN SUMMARY HELSINKI 24 Nov 2008 13:36 Datum: WGS 84											
WPT	LAT	LON	SPD	CRS	M	RAD	LEG	REMAIN	ETA (UTC+2)	HFO	DO
1	32°36.195'S	060°53.434'E				1.0			24 Nov 2008 13:29	0	0
2	32°36.035'S	060°56.322'E	15.2	86.3	RL	1.0	2.4	30.6	24 Nov 2008 13:39	0	0
3	32°35.715'S	061°00.238'E	15.2	84.5	RL	1.0	3.3	28.1	24 Nov 2008 13:52	1	0
4	32°35.597'S	061°06.792'E	15.2	88.8	RL	1.0	5.4	24.8	24 Nov 2008 14:13	1	0
5	32°32.253'S	061°07.611'E	15.2	11.7	RL	1.0	3.3	19.4	24 Nov 2008 14:26	1	0
6	32°27.553'S	061°16.343'E	15.2	57.6	RL	1.0	8.7	16.1	24 Nov 2008 15:01	2	0
7	32°25.236'S	061°20.210'E	15.2	54.8	RL	1.0	3.9	7.4	24 Nov 2008 15:16	3	0
8	32°21.867'S	061°18.821'E	15.2	340.7	RL	1.0	3.5	3.5	24 Nov 2008 15:30	3	0

Optimized for Timetable

	plan (\$)	hour (\$/h)	NM (\$/NM)
Income :	8000.0	3966.9	261.6
Cost :	2756.1	1366.7	90.1
Profit :	5243.9	2600.3	171.5

	(ton)	(ton/h)	(kg/NM)
Hfo :	3.1	1.5	100.0
Do :	0.4	0.2	13.2

ETD from waypoint 1 (UTC+2) 24 Nov 2008 13:29
ETA to waypoint 8 (UTC+2) 24 Nov 2008 15:30

Length : 30.6 NM
Time : 2.0 h

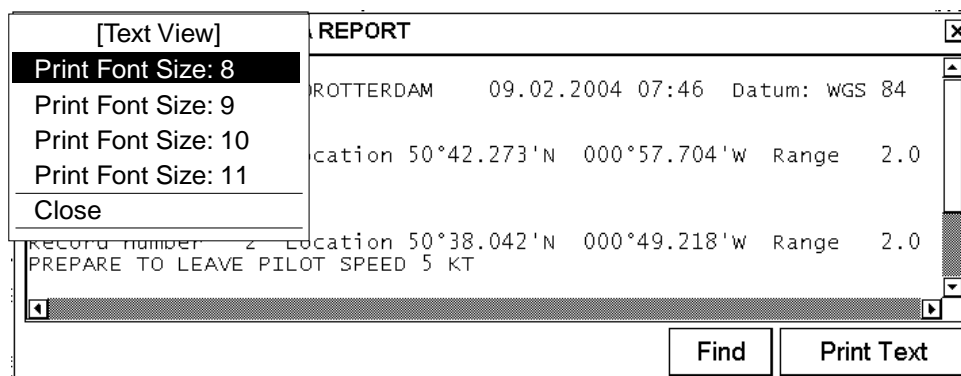
END OF DATA

Find Print Text

How to change size of font used in report

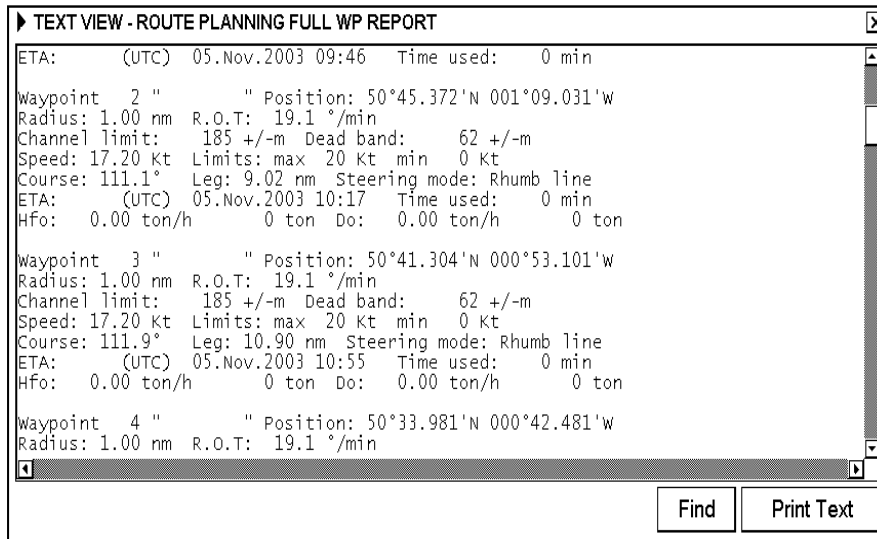
If you want to change the size of the font for the report:

1. Put the cursor on the triangle in the report window.
2. Select desired option from the list then push the scrollwheel.



13.8 Full WPT Report

The Full WPT Report provides detailed information on each waypoint in a plan route. To display the report viewer, click Route in the information area, click the **Plan** button, put the cursor on the triangle in the Plan Route dialog box, select Full WPT Report then push the scrollwheel. To close the report viewer, click X in the right corner of the report viewer. You can print the report by clicking the **Print Text** button.



13.9 Passage Plan Report

The Passage Plan report generates WPT report together with Notes report. The system automatically attaches Notes from the planning mode on the route plan when you select the Passage Plan report. To display the report viewer, click Route in the information area, click the **Plan** button, put the cursor on the triangle in the Plan Route dialog box, select Passage Plan Report then push the scrollwheel. To close the report, click X in the right corner of the report viewer. You can print the report by clicking the **Print Text** button.

The example below shows that a passage plan has been generated using the route plan "SOUTHAMPTON ROTTERDAM" and Notes generated for "SOUTHAMPTOROTTERDAM".

TEXT VIEW - ROUTE PLANNING REPORT

PLAN SUMMARY HELSINKI 24 Nov 2008 13:36 Datum: WGS 84

WPT	LAT	LON	SPD	CRS	M	RAD	LEG	REMAIN	ETA (UTC+2)	HFO	DO
1	32°36.195'S	060°53.434'E	15.2	86.3	RL	1.0	2.4	30.6	24 Nov 2008 13:29	0	0
2	32°36.035'S	060°56.322'E	15.2	84.5	RL	1.0	3.3	28.1	24 Nov 2008 13:39	0	0
3	32°35.715'S	061°00.238'E	15.2	88.8	RL	1.0	5.4	24.8	24 Nov 2008 13:52	1	0
4	32°35.597'S	061°06.792'E	15.2	11.7	RL	1.0	3.3	19.4	24 Nov 2008 14:13	1	0
5	32°32.253'S	061°07.611'E	15.2	57.6	RL	1.0	8.7	16.1	24 Nov 2008 15:01	2	0
6	32°27.553'S	061°16.343'E	15.2	54.8	RL	1.0	3.9	7.4	24 Nov 2008 15:16	3	0
7	32°25.236'S	061°20.210'E	15.2	340.7	RL	1.0	3.5	3.5	24 Nov 2008 15:30	3	0
8	32°21.867'S	061°18.821'E				1.0					

Optimized for Timetable

	plan (\$)	hour (\$/h)	NM (\$/NM)
Income :	8000.0	3966.9	261.6
Cost :	2756.1	1366.7	90.1
Profit :	5243.9	2600.3	171.5

	(ton)	(ton/h)	(kg/NM)
Hfo :	3.1	1.5	100.0
Do :	0.4	0.2	13.2

ETD from waypoint 1 (UTC+2) 24 Nov 2008 13:29
ETA to waypoint 8 (UTC+2) 24 Nov 2008 15:30

Length : 30.6 NM
Time : 2.0 h

END OF DATA

Find Print Text

An example of WPT report

TEXT VIEW - NOTES REPORT

NOTES HELSINKI 24 Nov 2008 15:24 Datum: WGS 84

Record number 1 Location 32°35.909'S 060°57.930'E Alert when passed.
CALL VTS USE CHANNEL 71

Record number 2 Location 32°33.769'S 061°07.252'E Range 0.5
DECREASE SPEED TO 7 kn BECAUSE LEAVING PILOT

END OF NOTES

Find Print Text

An example of Notes report

13. Route Planning

TEXT VIEW

PASSAGE PLAN

Route: HELSINKI, Notes: HELSINKI

24.11.2008 13:41 Datum: WGS 84

WPT		LAT	LON	Leg length	Cumul. length
1:		32°36.195'S	060°53.434'E	0.0	0.0
2:		32°36.035'S	060°56.322'E	2.4	2.4
	Notes (1):	32°35.903'S	060°57.930'E	1.37	3.8
	(Passing). Text:	CALL VTS USE CHANNEL 71			
3:		32°35.715'S	061°00.238'E	3.3	5.8
4:		32°35.597'S	061°06.792'E	5.4	11.2
	Notes (2):	32°34.230'S	061°07.127'E	0.6	11.8
	Text:	DECREASE SPEED TO 7 kn BECAUSE LEAVING PILOT			
5:		32°32.253'S	061°07.611'E	3.3	14.5
6:		32°27.553'S	061°16.343'E	8.7	23.2
7:		32°25.236'S	061°20.210'E	3.9	27.1
8:		32°21.867'S	061°18.821'E	3.5	30.6

Find Print Text

An example of a passage plan report. Notes text notes are placed between waypoints based on their position (in which leg defined Notes will be activated)

14. Route Monitoring

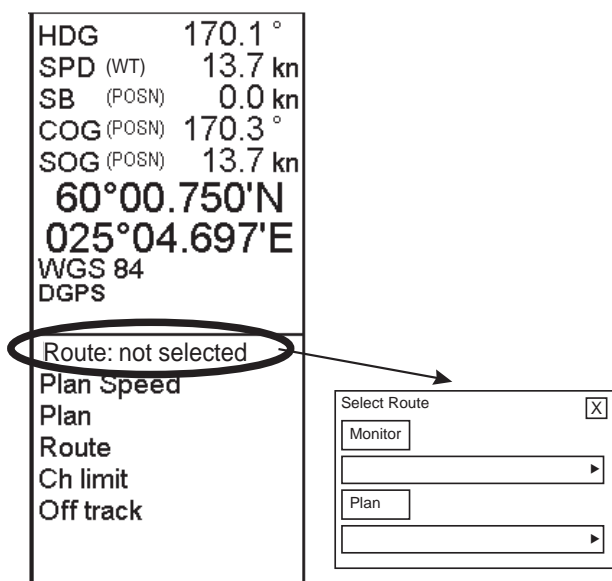
14.1 Introduction

Route monitor is a means for permanent monitoring of the ship's behavior relative to the monitored route. The information area displays the data on the ship's position relative to the monitored route. The monitored route consists of the following information, displayed in the electronic chart area:

- The route is displayed with a thick, red dashed line.
- The limits of channels of each leg are displayed with solid red lines. These limits are used to detect chart alerts when you are monitoring the route. For further details, see section 11.2 "Chart Alert".
- Each leg has information about planned speed and course to steer.

Note: In order to display charts with correctly updated situation, always use current date as Approve Until and Display Until during your voyage. If your voyage lasts more than one week, set current date at least once per week during your voyage. For details, see section 8.13.

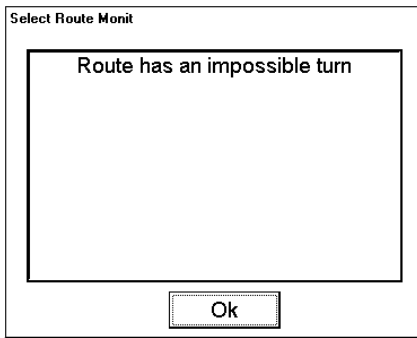
14.2 How to Select Route to Monitor



To select the route to monitor, click Route in the information area, put the cursor in the Monitor combo box, spin the scrollwheel to select route then push the scrollwheel.

14. Route Monitoring

Note 1: When you select a route for monitoring, the message shown below may appear when the geometry of the route makes it impossible to sail the ship. Select the Plan Route dialog box and make necessary modifications.



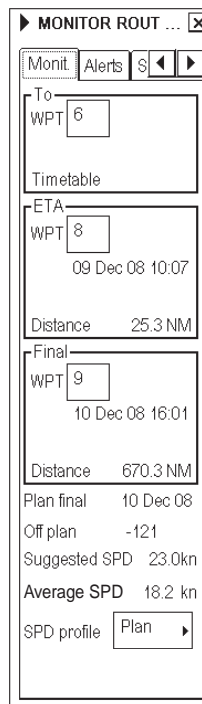
Note 2: Limitation of displayed route

If you have small-scale chart(s) on display that have the whole eastern/western (0-180°E/0-180°W) hemisphere and a part of the other hemisphere on display, there is a limitation to display a route. To avoid this, set chart center so that the whole eastern/western hemisphere is not on display.

Note 3: DNV mandates route checking. Mandatory route checking can be enabled from the Installation parameters – Trackpilot menu. See the Installation Manual.

14.3 How to Select To WPT

To display this dialog box, click Route on the information area then click the **Monitor** button.



When you have selected a route to monitor, the system selects a next waypoint automatically. Check that the To WPT is the desired one. The ECDIS will automatically advance to a next waypoint when you pass the To WPT.

The ECDIS automatically sets the last waypoint of your monitored route as the final waypoint.

To select a To WPT, do the following:

1. Click Route on the information area then click the **Monitor** button.
2. Put the cursor in the To WPT box then spin the scrollwheel to select desired WPT.
3. Push the scrollwheel to confirm your selection.

14.4 How to Select Final Waypoint

Normally you use the last waypoint in a monitored route as the final waypoint, and the ECDIS automatically does this when you select the route to monitor. However, sometimes you may prefer to use some other waypoint as the final waypoint of a monitored route.

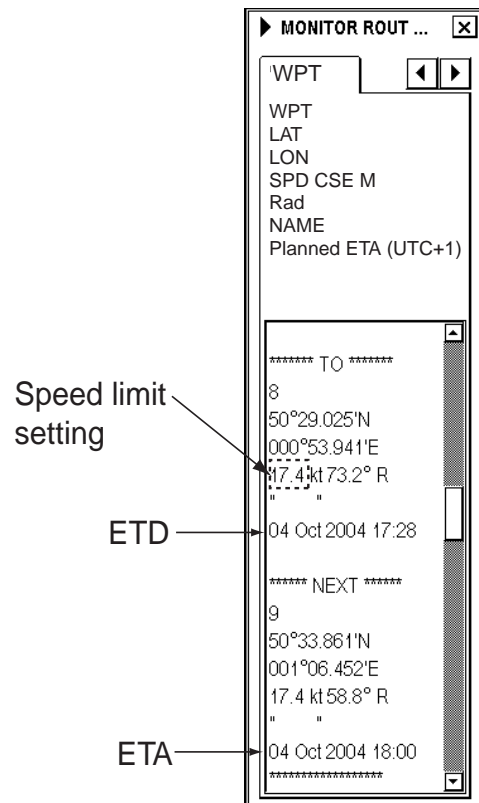
To select a waypoint as final waypoint, do the following:

1. Click Route in the information area then click the **Monitor** button.
2. Put the cursor in the Final WPT box then spin the scrollwheel to select a waypoint.
3. Push the scrollwheel to confirm your selection.

14.5 How to Display Waypoint Information

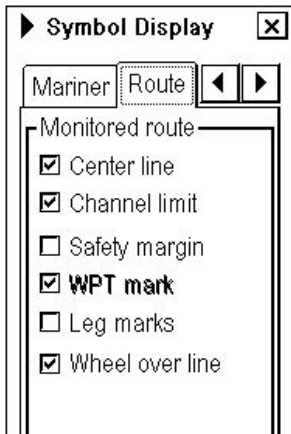
You can display waypoint information for the monitored route by clicking the Waypoints tab in the Monitor Route dialog box. This information is printed from the route planning information made for this voyage.

"To WPT" and "Next WPT" are indicated on this list.



14.6 How to Display a Route on the Electronic Chart Screen

To display a monitored route, make sure that desired options of the monitored route (center line, channel borders, WPT marks, leg marks and wheel over line) are selected on the Route page of the Chart Display dialog box.



To show this display, spin the scrollwheel to show Symbol Display/Info/ in the mouse functions area, push the left mouse button then click an arrow tab to display the Route menu.

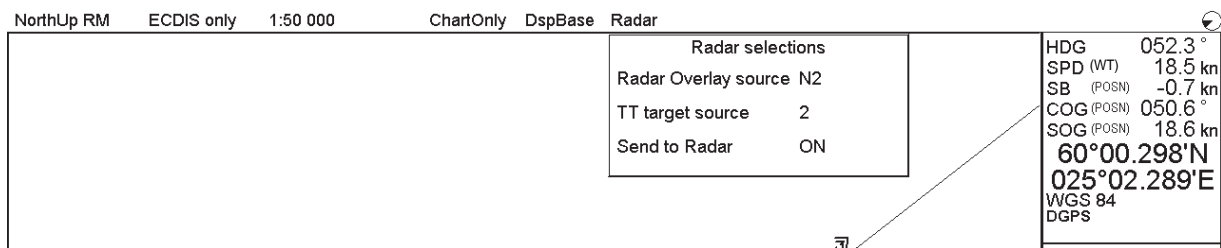
"WPT mark" enables display of a waypoint's number in a route.

"Leg marks" enables display of planned speed and planned course to steer in a route.

"Wheel over line" enables display of a line that denotes turn start line for a waypoint. This line appears when "WPT approach" is coming and disappears when turning has started.

14.7 How to Show a Route on the Radar Screen

If an ECDIS workstation is set as SINGLE mode, you have to define in the Radar Selections dialog box if the ECDIS is to send Route, User Chart and Notes to the radar. When Route, User Chart or Notes is selected to Monitor mode, information of Route, User Chart and Notes are sent to the radar if "Send to Radar" is set to "ON".



To change "Send to Radar" to ON or OFF, do the following:

1. Put the cursor on Radar in the status bar to show the Radar selections dialog box.
2. Put the cursor on ON (OFF) text in the "Send to Radar" field.
3. Spin the scrollwheel to select ON or OFF then push the scrollwheel.

14.8 Monitor Route Dialog Box

The monitor route dialog box facilitates safe use of routes. During route planning, you can check your route plan for safe water and you can attach a user chart and Notes that you intend to use together with a route plan.

The monitor route dialog box reminds you if

- You are using a route that you have not checked following a recent change to your route plan.
- You use a combination of a route plan, user chart and Notes that you did not plan to be used together.

If the conditions defined during route plan do not meet the conditions during route monitoring, Mon. Route appears in orange in the information area.

The following indications may appear on the Monitoring page:

"This route is unchecked".

Reminds you that you did not check the route plan after the route was modified.

Remedy: Check route plan for the route.

"Checked conditions differ" means that current conditions differ from set conditions of route plan.

Remedy: Use Alerts and Selections pages to set them as they were when the route was planned.

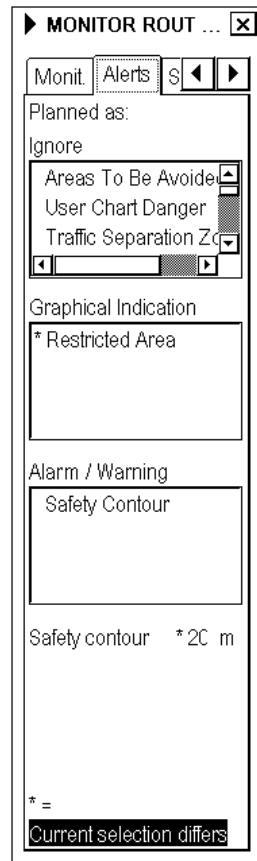
Dialog	To WPT	ETA WPT	Distance	Final WPT	Plan final	Off plan	Suggested SPD	Trial SPD	SPD profile	Status
Left	7	12	81.5 NM	20	06 Oct 04	-1608 min	22.1 kn	11.4 kn	Trial	This route is unchecked
Right	8		NM	20	05 Oct 04	-74 min	12.2 kn	11.4 kn	Trial	Checked conditions differ

14. Route Monitoring

The Alerts page may show the following message:

"* = **Current selection differs**" indicates which conditions are currently set differently as planned.

Remedy: Open Chart Alerts parameters to set them as they were at the time the route was planned.



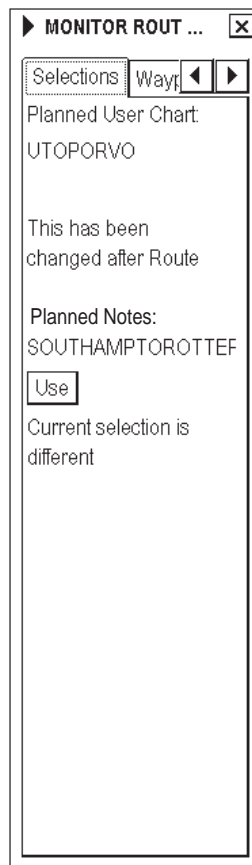
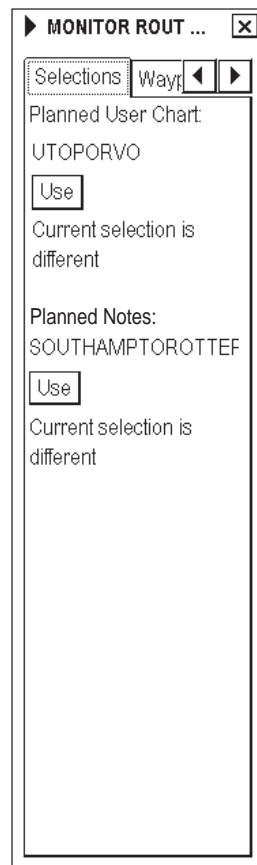
The Selection page may show the following messages:

"**Current selection is different**" This means the name of user chart and/or Notes in the monitoring mode is not the same as in the route planning check.

Remedy: Click the **Use** button to select user chart and/or Notes in the monitoring mode.

"**This has been changed after Route Planning Check**" This means that user chart and/or Notes was modified after the latest route planning check.

Remedy: Check route planning for the route with attached user chart and/or Notes.



14.9 How to Monitor a Route

You can monitor the route from the two Plan Speed windows in the information area.

Route: HELSINKI	
Plan Speed	30.0 kn
Plan	202.9 °
Route	202.9 °
Ch LIM	185 m
Off track	< 2 m

Upper window:

- **Plan Speed:** Planned speed to approach a "To WPT".
- **Plan:** Planned course between a previous WPT and a "To WPT". Note that if the gyro value is compensated and Gyro error correction and Gyro error compensation have been enabled in Ship and Route parameters in the Initial Settings menu, then the text "(corr)" appears (in orange) in the Plan field.
- **Route:** Calculated set course to follow the monitored route, including off track, drift and gyro error compensation.
- **Ch LIM:** Planned width of channel to approach a "To WPT".
- **Off track:** Perpendicular distance of the ship from the track.

Additional textual information is available if any of following steering modes are in use:

- **Waypoint mode:** "GOTO WPT", "GOTO WPT Great circle", "Ass. Turn enabled" and "Assisted turn"
- **Go Track mode:** "GOTO Track", "Track Great circle" and "Track Turn"

Permanent alerts are available regardless of the steering mode used and these are as follows:

- "Outside channel" is indicated by showing "Off track" in orange and its value in orange.
- "Out of gate" is shown in orange. Out of gate indicates that, if the ship continues using the current course, it will be outside of the channel at the wheel over point.

Below is an example with additional text information

Route: HELSINKI	
Plan Speed	30.0 kn
Plan	202.9 °
Route	202.9 °
Ch LIM	185 m
Off track	< 2 m
Goto WP	
Out of Gate	

To WPT	6
Dist WOP	4.67 NM
Time	15:07
Turn RAD	1.0 NM
Turn rate	17.7 °/min
Next WPT	7
Next	250.1 °

Lower window:

- **To WPT:** The waypoint that the ship is approaching.
- **Dist WOP:** Distance to the point where rudder order for course change at "To WPT" is given.
- **Time:** Time remaining until WOP (dd:hh:mm:ss).
- **Turn RAD:** Planned turning radius at "To WPT".
- **Turn rate:** Calculated rate of turn, which is based on current speed and planned turning radius.
- **Next WPT:** The WPT following the "To WPT".
- **Next:** Planned course to steer after "To WPT". Note that if the gyro value is compensated and Gyro error correction and Gyro error compensation have been enabled in the Ship and Route parameters in the Initial Settings menu, then the text "(corr)" appears (in orange) in the Plan field.

14. Route Monitoring

14.9.1 Information about steering mode on permanent route monitor windows

Information about the current steering mode is available on the Route monitor windows. The information shown depends on connected autopilot and the steering mode in use.

FURUNO Autopilot FAP-2000

The following steering mode information appears with the FAP-2000.

- **Waypoint mode:** "GOTO WPT", "GOTO WPT Great circle", "Ass. Appr. enabled", "Ass. Turn enabled" and "Assisted turn"
- **Go Track mode:** "GOTO Track", "Track Great circle" and "Track Appr. enabled", "Track Turn enabled", "Track Turn"

Route: HELSINKI Plan Speed 30.0 kn Plan 202.9 ° Route 202.9 ° Ch LIM 185 m Off track < 2 m Goto WPT	Route: HELSINKI Plan Speed 30.0 kn Plan 202.9 ° Route 202.9 ° Ch LIM 185 m Off track < 2 m Goto Track
---	---

For further information about steering with the FAP-2000, see the autopilot steering guide, issued separately.

Yokogawa Autopilot PT-500A (category C) and TOKYO KEIKI Autopilot PR-6000

The following information appears with the PR-6000 and PT-500A (category C).

- **Open Sea mode:** "GOTO OS", "GOTO OS Great circle", "GoOS Appr. enabled", "GoOS Turn enabled" and "GOTO OS turn"
- **All Waters mode:** "GOTO AW", "GOTO AW Great circle", "GoAW Appr. enabled", "GoAW Turn enabled" and "GOTO AW turn"

Route: HELSINKI Plan Speed 30.0 kn Plan 202.9 ° Route 202.9 ° Ch LIM 185 m Off track < 2 m Goto OS	Route: HELSINKI Plan Speed 30.0 kn Plan 202.9 ° Route 202.9 ° Ch LIM 185 m Off track < 2 m Goto AW
--	--

For further information about steering with the PT-500A and PR-6000, see the autopilot steering guide, issued separately.

YOKOGAWA Autopilot PT-500A (category B)

The following information appears with the PT-500A (category B):

- **NAVI:** "Autopilot Conflict", "Track", "Ass. Appr. enabled", "Ass. Turn enabled" and "Assisted turn"

Route: HELSINKI Plan Speed 30.0 kn Plan 202.9 ° Route 202.9 ° Ch LIM 185 m Off track < 2 m Track
--

For further information about steering with the PT-500A, see the autopilot steering guide, issued separately..

14.10 ETA (Estimated Time Of Arrival)

The estimated time of arrival to a waypoint is calculated by the ECDIS. The operator can select waypoint number and speed profile for calculation, in the Monitoring page of the Monitor Route dialog box.

To WPT: Indicates approaching "To WPT".

ETA WPT: Indicates waypoint number of special ETA waypoint and estimated time and distance to it.

Final WPT: Indicates waypoint number of final waypoint and estimated time and distance to it.

Monitored route is optimized using "Max Speed".

The screenshot shows the 'MONITOR ROUT ...' dialog box with the following fields and values:

- Monit. Alerts:** Includes left and right arrow buttons.
- To WPT:** 8
- ETA WPT:** 12, with a time of 04 Oct 04 18:58 and a distance of NM.
- Final WPT:** 20, with a time of 05 Oct 04 06:14 and a distance of 212.1 NM.
- Suggested SPD:** min
- Trial SPD:** 11.4 kn
- SPD profile:** Trial

SPD profile: There are three calculation strategies:

- **Plan:** The system calculates with optimization made in route planning.
- **Trial:** You can enter speed to test ETAs with different speeds.
- **Current:** The system calculates ETAs using average speed of last five minutes. Note that if the speed profile is selected as Current, own ship average speed (i.e., speed for calculation) the Trial speed box is replaced with the Average Speed box.

14. Route Monitoring

Average:

Select Average from the Speed profile box to enter desired speed for calculation of ETA at To WPT.

The speed profile is changed to Average speed. Enter average speed and the system will calculate ETAs.

The screenshot shows a window titled "MONITOR ROUTE ...". At the top, there are two tabs: "Monit" and "Alarms", with "Monit" selected. Below the tabs are three data sections, each with a "WPT" label and a numerical value in a text box:

- To WPT 7**: Includes a "Max speed" label.
- ETA WPT 12**: Includes a timestamp "06 Oct 04 18:58" and a "Distance 79.6 NM" label.
- Final WPT 20**: Includes a timestamp "07 Oct 04 07:47" and a "Distance 225.8 NM" label.

At the bottom of the window, there are several controls:

- A "min" label.
- A "Suggested SPD kn" label.
- A "Trial SPD" label with a text box containing "11.4" and a "kn" label.
- An "SPD profile" label with a dropdown menu showing "Trial" and a right-pointing arrow.

Time table optimization
displayed in route monitoring.

The screenshot shows a dialog box titled "MONITOR ROUTE ...". It has two tabs: "Monit." (selected) and "Alarms". The "Monit." tab contains the following information:

- To WP:** 7
- Timetable:** (empty field)
- ETA WP:** 12
- ETA:** 06 Oct 04 18:58
- Distance:** 81.5 NM
- Final WP:** 20
- ETA:** 07 Oct 04 07:48
- Distance:** 227.6 NM
- Plan final:** 06 0
- Off plan:** -1608 min
- Suggested SPD:** 22.1kn
- Trial SPD:** 11.4 kn
- SPD profile:** Trial
- Status:** This route is unchecked

Plan: This displays ETA at final WPT. Value also appears in the Parameters page of the Plan Route dialog box.

Off Plan: Indicates time difference between planned ETA and calculated ETA to final WPT.

Suggested SPD: The system calculates suggested speed so that ETA to the final WPT would be same as planned ETA if type of optimization was "Time table".

The table below shows how the system calculates ETAs.

Type of selected speed profile / optimization on Route Monitor dialog box	Used speed from current point to the To WPT	Used speed from the To WPT to the final WPT
Speed profile: Plan MAX SPEED	current average speed	planned leg speed
Speed profile: Plan TIMETABLE	current average speed	planned leg speed
Speed profile: Plan ECO: COST	current average speed	planned leg speed
Speed profile: Plan ECO: PROFIT	current average speed	planned leg speed
Speed profile: Trial	current trial speed	current trial speed
Speed profile: Current	current average speed	current average speed

14.11 Route Monitoring Alerts

Auto steering in use

352 Route: Illegal ETA WPT: Appears when the system cannot use the selected ETA waypoint. The reason might be corrupted or missing route file.

353 Route: Illegal To WPT: Appears when the system cannot use the selected "To WPT". The reason might be corrupted or missing route file.

354 Route: Illegal final WPT: Appears when the system cannot use the selected final waypoint. The reason might be corrupted or missing route file.

360 Route: WPT CHG disabled: Appears when you try to change next or final waypoint while the system is in automatic route steering. Leave automatic route steering then change the waypoint.

363 Route: Select disabled: Appears when you try to select a new route for route monitoring while the system is in automatic route steering. Leave automatic route steering then select a new route.

364 Route: Cancel disabled: Appears when you try to cancel current monitored route while the system is in automatic route steering. Leave automatic route steering then cancel the current route.

454 Route: End reached: Appears when own ship passes the last waypoint. The system cancels current route monitoring. Normally this alert only appears if alert 458 is left unacknowledged.

457 Route: Outside chl limits: Appears if own ship is outside the monitored channel.

Auto steering not in use

451 Route: WPT approach alarm: Appears when own ship is "x" minutes from the wheel over point of the next waypoint, "x" being the time specified.

458 Route: Last WPT approach: Appears when own ship arrives "x" minutes from the last waypoint, "x" being the time specified. Acknowledgement of this alert cancels current route monitoring.

15. User Chart Control

15.1 Introduction

User charts are simple overlay charts that the operator makes for his own purposes. They can be displayed on both the radar display and the electronic chart. These charts are intended for highlighting safety-related items like position of important navigation marks, safe area for the ship, etc. User charts areas can be used to activate alerts and indications based on operator-defined danger symbols, lines and areas. When route or estimated ship's position is going to cross a user chart symbol, line or area that is defined as a dangerous one, an alert or indication is generated by the system. For details about chart alerts, see Chapter 11 "Chart Alerts".

A user chart consists of points, lines and letter/number, symbols, etc. The number of elements for a user chart is limited as follows:

- 200 Points
- 2000 Lines
- 1000 Symbols (alphanumerics)
- 50 Areas; an area can have 20 corner points.

The user chart is displayed on the radar display and its position and shape are based on the ship's actual position. When your ship is moving in the area covered by the user chart, the elements of the user chart are superimposed on the radar overlay, with max. 80 nearest elements of drawing point displayed. The user charts can also be shown on the ECDIS display. In this way the radar display can be kept as "clean" as possible for radar target detection.

15.1.1 Objects of user charts

Below is a description of the objects used in a user chart.

- **Line:** You can define six different types of lines. Lines can be used in chart alert calculation and/or display on the radar:
 - **Navigation lines:** Displayed on both radar overlay and ECDIS. Navigation lines are reference lines for coastline.
 - **Coastline:** Displayed on the ECDIS display only. A coastal line is usually a well-defined (by chart digitizer) multi-segment line showing a coastline. The operator is able to create this type of line in case there is no suitable chart available over desired area in ARCS or S57 format.
 - **Depth contour:** Displayed on the ECDIS display only. A depth line shows the selected depth levels. The operator is able to create this type of line in case there is no suitable chart available over desired area in ARCS or S57 format.
 - **Route line:** Displayed on both radar overlay and ECDIS. Route lines are zones for anchoring, traffic separation lines, etc.
 - **NMT (Not More Than) line, NLT (Not Less Than) line:** A danger bearing or clearing line. Single line with an arrowhead directed at the base of a charted object. Displayed on ECDIS only.
- **Area:** User can define closed areas that the system can use to detect safe water areas. If route or estimated ship position is going to cross the area, the system generates a warning to the operator. These areas can be used to specify safe areas as defined by the master of the ship or by the policy of the ship's owner. They are always available regardless of the type of chart material used.
- **Symbols:** User selectable symbols can be displayed on both displays or on the ECDIS display only. Symbols are used to indicate buoys, lighthouses, fixed targets, wrecks, etc. Symbols can be used in chart alert calculation.
- **Tidals:** Displayed on the ECDIS display only. Tidals can be used to make own notes about tides at operator-defined points.
- **Points:** It doesn't itself have a symbol on the radar screen, but it is a very important element of a user chart. For details, see section 15.2 "What is a User Chart Point and How is it Used?"

15.1.2 Modes of user charts

A user chart can be selected for the monitoring mode, which means that it is displayed on the connected radar display and it can be used in chart alert calculation. Another user chart mode modifies the user chart planning mode. In the planning mode, a user chart is only displayed on the ECDIS display; it is not displayed on the connected radar nor is it used in chart alert calculation. It is possible to have both the monitored and planned user chart at the same time if separate plan and monitor units are used. Eventually the monitored and planned user charts copy the operation of monitored and planned routes. Below is an example of how to know which user chart is used for monitoring mode and which one is used in planning mode.

HDG	170.1 °
SPD (WT)	13.7 kn
SB (POSN)	0.0 kn
COG (POSN)	170.3 °
SOG (POSN)	13.7 kn
60°00.750'N	
025°04.697'E	
WGS 84	
DGPS	
Route: HELSINKI	
Plan Speed	30.0 kn
Plan	157.9 °
Route	164.9 °
Ch limit	185 m
Off track	< 166 m
To W/P	5
Dist WOP	0.42 NM
Time	01:51
Next W/P	6
Next	202.9 °
Turn rad	1.0 NM
Turn rate	13.1 °/min
UserChart Notes	
09 Oct 2008 12:01	
LOCAL (01:40:00)	
58°58.972'N	
025°07.311'E	
1.522 NM 120.7 °	
TT DISP	< AIS DISP
OTH	ALL
TrueVect(G)	12 min
Predictor	Off
PastPosnRel	10 min
CPA	10.0 NM 30 min
CPA auto act.	
Lost target alarm	
SINGLE	06:00 06:00

User Chart X

Monitor DISP

Plan DISP

The UserChart field in the information area, where the user chart can be selected for the monitoring or planning mode.

User chart dialog box and menu

Click UserChart in the information area then click **Plan** or **Monitor** button to open corresponding dialog box. If no User Chart has been selected, one of the menus shown below appears, along with appropriate dialog box.

If you want to make further selection from a menu and only the dialog box is shown, you can show the menu on the display by clicking the **Plan** or **Monitor** button again, or put the cursor on the triangle in the dialog box.

[User Chart]
Go Monitor mode ▶
Select Unselect Create
Backup and Restore Combine
Point report Line report Area report Symbols report Tidal report Full report Report for radar
Close

Go Monitor(or Plan) mode: The operator can switch user chart mode between plan and monitoring modes with Go Monitor(Plan) mode on the menu. Push the scrollwheel to show the sub menu shown below.

Go Monitor mode>Go Monitor mode: User chart used in planning mode can be switched directly to monitoring mode.

Go Plan mode>Go Plan mode: User chart used in monitoring mode can be switched directly to planning mode.

Select: Select user chart to use.

Unselect: Remove current user chart from active use.

Create: Create a new user chart.

Backup and Restore: Make backup copy of user chart or restore user chart from backup device.

Combine: Combine two or more user charts.

Point report: Generate report about points in a user chart.

Line report: Generate report about lines in a user chart.

Area report: Generate report about area objects in a user chart.

Symbols report: Generate report about symbols in a user chart.

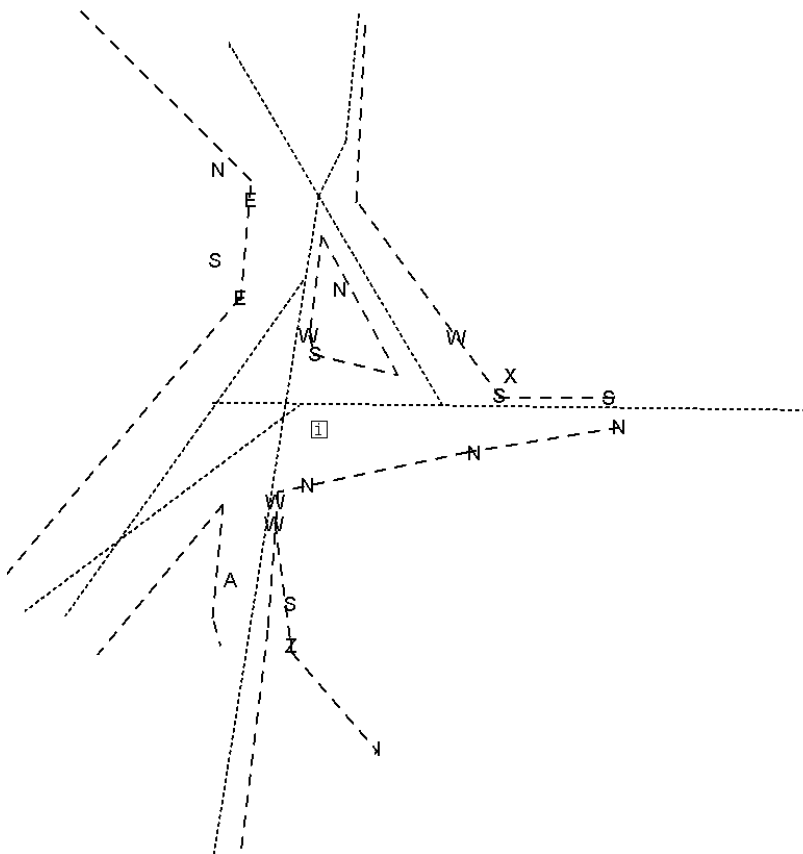
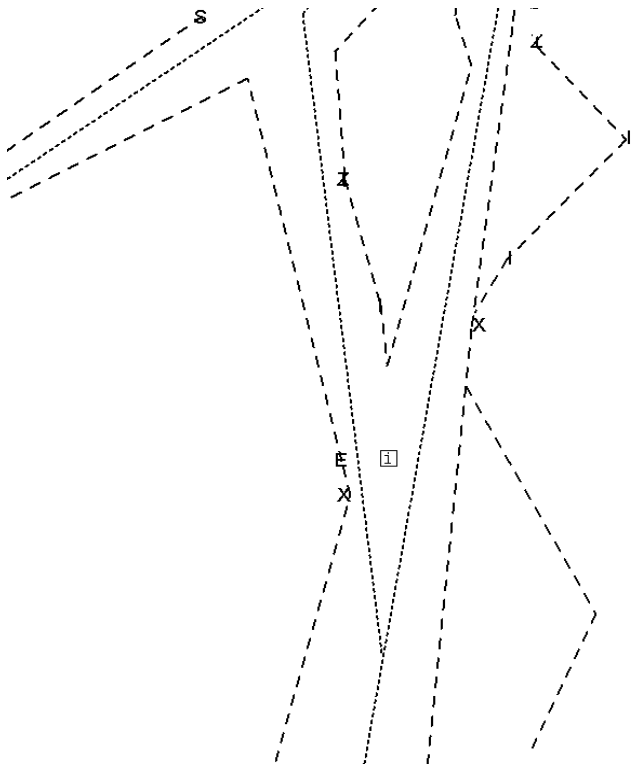
Tidal report: Generates report about tides in a user chart.

Full report: Generate report about all the objects in a user chart.

Report for radar: Generate report about all the objects in a user chart that are displayed on the radar screen.

[User Chart]
Go Plan mode ▶
Select Unselect
Backup and Restore
Point report Line report Area report Symbols report Full report Report for radar
Close

Below are some examples of sub-charts. Note the position used for points to collect the sub charts.



15.3 How to Select Datum

Selection of datum is very important, especially if you manually enter latitude-longitude positions from the control panel or keyboard or if you use digitizer. If you only use the cursor to add and to modify waypoint locations, then you could use any datum, although it is recommended to use native datum of the chart.

15.4 How to Select User Chart to use in Monitoring Mode

The user chart that is selected for the monitoring mode is indicated in the UserChart dialog box (left-click UserChart in the information area to show). To activate the monitoring mode and select a user chart for the monitoring mode, do the following:

HDG	170.1°
SPD (WT)	13.7 km
SB (P050)	0.0 km
COG (P050)	170.3°
SOG (P050)	13.7 km
60°00.750'N	
025°04.697'E	
WGS 84	
DGPS	
Route: HELSINKI	
Plan Speed	30.0 km
Plan	157.9°
Route	164.9°
Ch limit	185 m
Off track	< 166 m
To Wp	5
Dist WOP	0.42 NM
Time	01:51
Next Wp	6
Next	202.9°
Turn rad	1.0 NM
Turn rate	13.1°/min
UserChart Notes	
09/12/2008 12:01	
LOCAL (016403:00)	
59°58'9.2"E	
025°07'31.1"E	
1.522 NM 120.7°	
TT	DISP < AIS DISP
OTH	ALL
TrueVect(G)	12 min
Predictor	Off
PastPosnRel	10 min
CPA	10.0 NM 30 min
CPA auto act.	
Lost target alarm	
SINGLE	09:00 08:00

Put cursor here and roll scrollwheel to select User Chart in Monitor mode

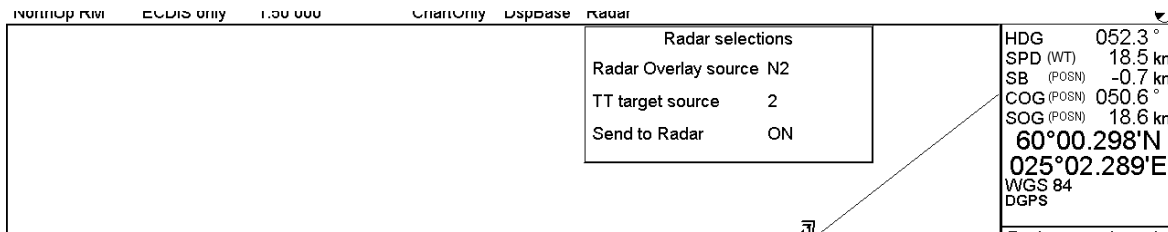
User Chart X

Monitor ⊙ DISP

Plan ○ DISP

15.5 How to Show a User Chart on the Radar Screen

If ECDIS workstation is set as SINGLE mode, you have to define on Radar Selection dialog box if the ECDIS sends Route, User Chart and Notes to radar. When Route, User Chart or Notes is selected to Monitor mode, information of Route, User Chart and Notes are sent to radar if "Send to Radar" is set "ON".

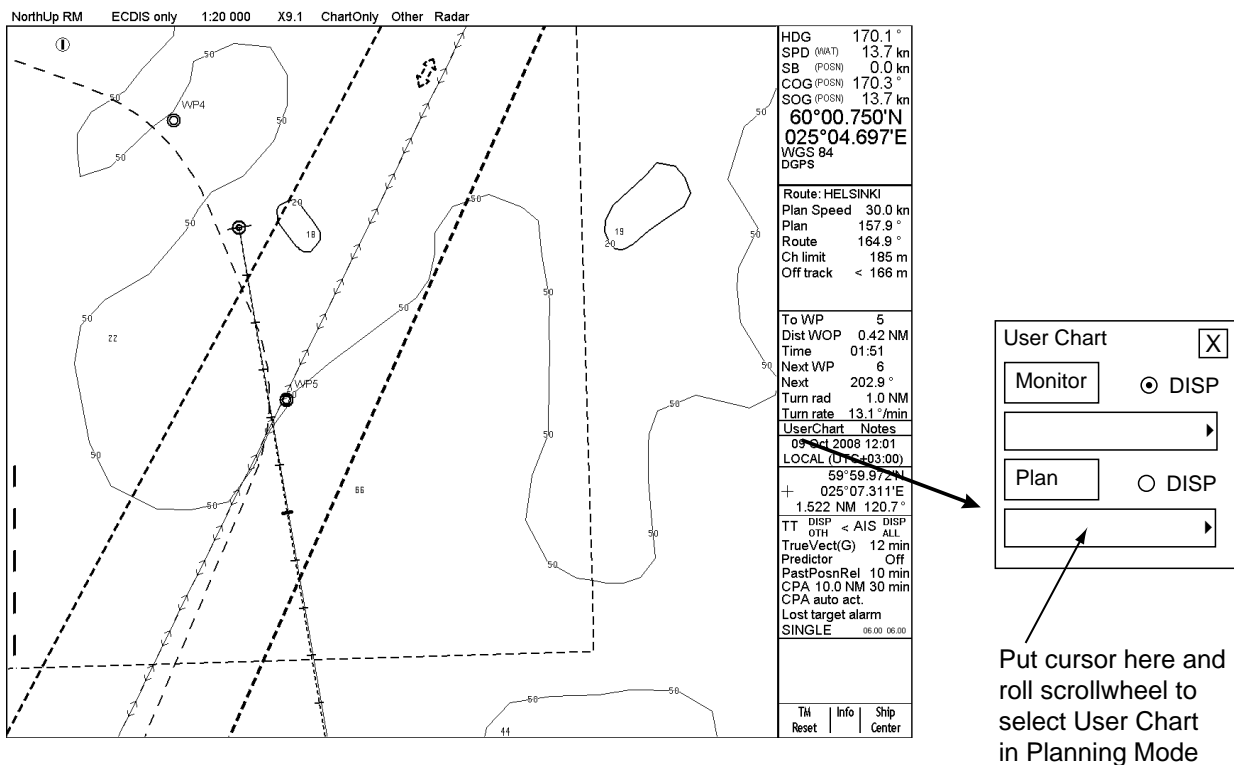


To change "Send to Radar" to ON or OFF, do the following:

1. Put the cursor on Radar in the status bar to show the Radar selections dialog box.
2. Put the cursor on ON (OFF) text in the "Send to Radar" field.
3. Spin the scrollwheel to select ON or OFF then push the scrollwheel.

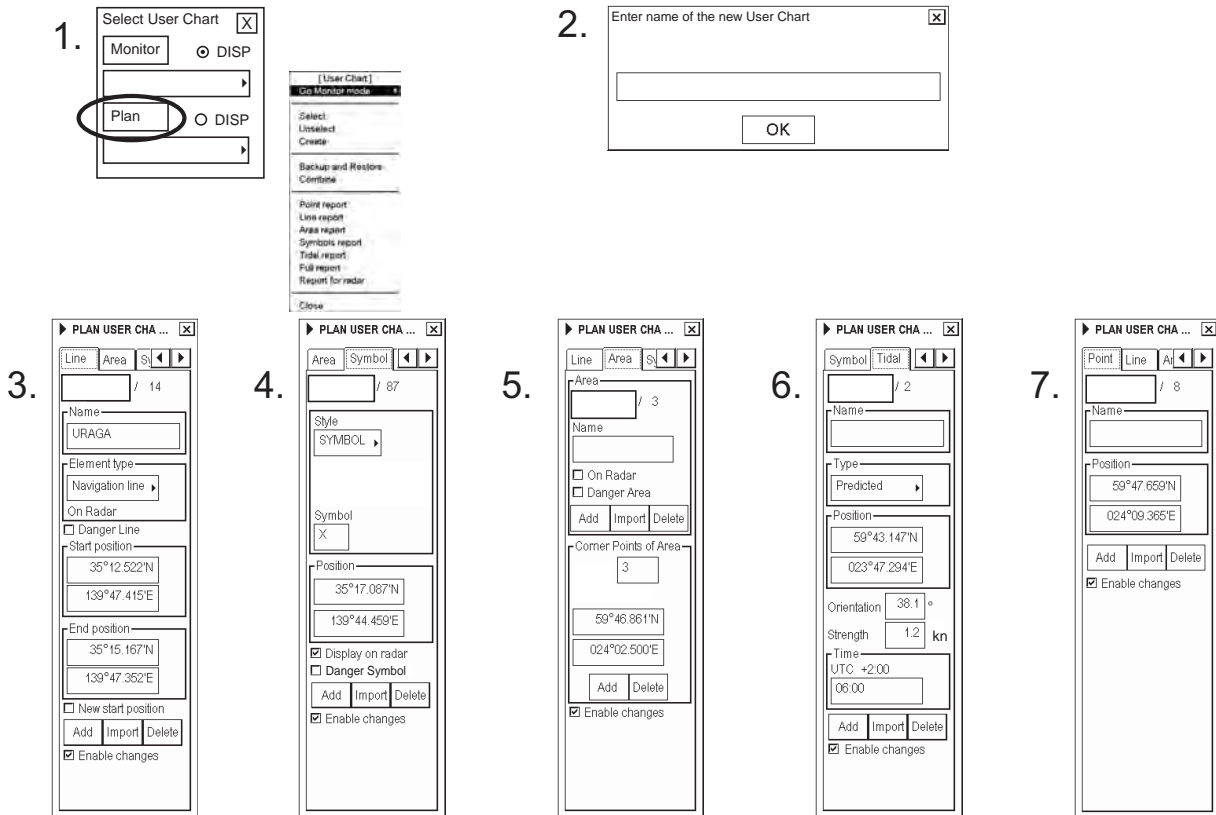
15.6 How to Select User Chart to use in Planning Mode

To activate the planning mode and select a user chart for the planning mode, do as shown in the illustration below.



15.7 How to Create a User Chart

You can create and modify a user chart when you have selected the planning mode of user chart.



Note: If you want to display a user chart on the electronic chart, make sure that Points, Symbols & Tiduals, Lines and Areas of User chart are checked on the on the User chart on the Mariner page of the Symbol Display menu.

To make a complete user chart, do the following:

1. Click UserChart in the information area then click the **Plan** button to show the Plan User Chart dialog box (in the information area).
2. Put the cursor on the triangle in the dialog box, select Create from the menu then push the scrollwheel. Enter a name for the user chart; spin the scrollwheel to select character and push it to confirm character. Repeat to complete the name. Click the **OK** button to finish.
3. Click the Line tab then check Enable changes. Use the scrollwheel to enter a name for the line in the Name field. Spin the scrollwheel in the Element type box to select line type then push the scrollwheel. To start a new line from a next WPT position, check "New start position". Check "Danger Line" if you want to use the line in chart alert calculation. Use the cursor to specify position for line point then push the left mouse button.
4. Click the Symbol tab then check Enable changes. Click the Add button then Define Style (Symbol or Label), Name and Symbol character in case of symbol. "Display on radar" is automatically selected; uncheck it if you do not want the symbol or label to appear on the radar display. Check "Danger Symbol" to use the symbol in chart alert calculation. Use the cursor to select position for symbol or label then push the left mouse button.
5. Click the Area tab then check Enable changes. To make a new area, click the **Add** button in the Area field. Define Name for area, define also if the area is to be displayed on the radar display (On Radar) and used in chart alerts calculation (Danger Area). Use the cursor to select position for points then push the left mouse button.
6. Click the Tidal tab then check Enable changes. To mark a tidal on the screen, use the mouse to locate the cursor then push the left mouse button. Define Name, Type, Orientation, Strength and Time for Tidal. The Tidal symbol is displayed only on the ECDIS display.
7. Click the Point tab then check Enable changes. Use cursor and left mouse button to define location of points.

15.7.1 Point page

The Point page lets you define points on a user chart. To select this page, push the right mouse button (Next Card) then click the tab with the left mouse button.

PLAN USER CHA... [X]

Point Line At [Left Arrow] [Right Arrow]

8 / 8

Name

Position

59°47.659'N

024°09.365'E

Add Import Delete

Enable changes

Point box: Show the current and total number of points.

Name: Name current point.

Position: Manually enter latitude and longitude of point in this box.

Add: Add new record next to current record with the same information.

Import: Select a user chart from which to import points.

Delete: Delete current point.

Enable changes: Check in order to modify user chart.

Note: The user chart may only be modified in the Course-up or North-up mode.

15.7.2 Symbol page

The Symbol page lets you draw symbols on a user chart. To select this page, push the right mouse button (Next Card), click the tab with the left mouse button or hit the **NEXT** key on the keyboard-equipped control unit.

- Symbol box:** Show the current and total number of symbols
- Style:** You can select either Label (displayed only on ECDIS) or Symbol (displayed also on TT display).
- Symbol:** Select symbol to use.
- Position:** Manually enter latitude and longitude of symbol in this box.
- Display on radar:** Check to also display the symbol on the radar screen.
- Danger Symbol:** Check to use symbol in chart calculation.
- Add:** Add new record to end of symbol list.
- Import:** Select a user chart from which to import symbols.
- Delete:** Delete current symbol.
- Enable changes:** Check in order to modify user chart.

Note: The user chart may only be modified in the Course-up or North-up mode.

15.7.3 Line page

The Line page lets you inscribe lines on a user chart. To select this page, push the right mouse button (Next Card), click the tab with the left mouse button or hit the **NEXT** key on the keyboard-equipped control unit.

Line box: Show the current and total number of line points.

Name: Name current line.

Element type: User can select appropriate line type from combo box. Available types are:

- Navigation line
- Route line
- Depth contour
- Coast line
- NMT line, known as clearing line - not more than
- NLT line, known as clearing line - not less than

Navigation and route lines may also be displayed on the radar screen. Depth contours, coast lines NMT lines and NLT lines are displayed only on the ECDIS screen.

Danger Line: Check to use line in chart alert calculation.

Start position: Manually enter starting latitude and longitude in this box.

End position: Manually enter ending latitude and longitude of line in this box.

New start position: Check to draw a new line. If unchecked, any newly entered line point will be connected to previous line.

Add: Add new record next to current record. User can either edit position by entering new coordinates or by showing new location with the trackball and left mouse button.

Import: Select a user chart from which to import lines.

Delete: Delete current record of line.

Enable changes: Check in order to modify user chart.

Note: The user chart may only be modified in the Course-up or North-up mode.

15.7.4 Tidal page

The Tidal page lets you inscribe tidal data on a user chart. To select this page, push the right mouse button (Next Card) then click the tab with the left mouse button.

The screenshot shows a dialog box titled "PLAN USER CHA...". It contains several input fields and controls:

- A "Symbol" dropdown menu set to "Tidal" with left and right arrow buttons.
- A "Tidal box" showing "1 / 5".
- A "Name" text input field.
- A "Type" dropdown menu set to "Predicted".
- A "Position" section with two text input fields: "33°49.537'N" and "132°40.748'E".
- An "Orientation" input field set to "31.1 °".
- A "Strength" input field set to "1.2 kn".
- A "Time" section with "UTC +2:00" and a text input field set to "06:00".
- Three buttons: "Add", "Import", and "Delete".
- A checked checkbox labeled "Enable changes".

- Tidal box:** Show the current and total number of tidal points.
 - Name:** Name current tide.
 - Type:** User can select type of tide here.
 - Position:** Manually enter latitude and longitude of tide in this box.
 - Orientation, Strength and Time:** You may enter speed, course and time for tide. Note that time of the tide is always in local time.
 - Add:** Add new record next to current record.
 - Import:** User is able to select from the list of user charts to import to current tidal file.
 - Delete:** Delete current record of tide.
 - Enable changes:** Check in order to modify user chart.
- Note:** The user chart may only be modified in the Course-up or North-up mode.

15.7.5 Area page

The Area page lets you inscribe areas on a user chart. To select this page, push the right mouse button (Next Card) then click the tab with the left mouse button.

PLAN USER CHA... [X]

Line Area Sy [Left Arrow] [Right Arrow]

Area

3 / 3

Name

On Radar

Danger Area

Add Import Delete

Corner Points of Area

2 / 4

61°11,644'N

025°41,167'E

Add Delete

Enable changes

Area window

When a operator defines an area for a user chart he adds an area object then gives a name and selects if it is displayed on radar and/or if it is used for safe water calculation (Danger Area).

- Area box:** Number of current area appears in this field. User can select area by editing desired number in the Current box or create new one.
- Name:** Name the current area.
- On Radar:** Check to also display the area on the radar display.
- Danger Area:** Check to include the current area in chart alert calculation.
- Add:** Set different area. Click button then set area.
- Import:** Import area.
- Delete:** Delete area.
- Corner Points of Area:** See description on next page.
- Enable changes:** Check in order to modify user chart.

Note: The user chart may only be modified in the Course-up or North-up mode.

How to add a new area to a user chart

An area of a user chart can be used, for example, to define a safe water area for display on the radar. To add a new user chart area, do the following:

1. Open the Area page as described on the previous page. Check Enable changes.
2. Click the **Add** button in the Area field.
3. Give a name for the area, check Danger Area to use it in chart alert calculation and check "On Radar" to show the area on the radar as well.
4. Define corner points on the electronic chart area using the cursor and the left mouse button.
5. To define more areas, continue from step 2.

How to select an area of a user chart to modify

In the Area field, Current indicates which area of a user chart is selected for modification. To modify another area, two methods are available:

- Enter desired area number of user chart object in the Rec box. To modify number, put the cursor in the Current box and use the scrollwheel to change desired number.
- Use the Info feature to find area. Put the cursor on the desired corner point of the area on the electronic chart then push the scrollwheel.

How to select position of corner point

The easiest way to move a corner point is to drag and drop it to a desired position. This can be done as follows:

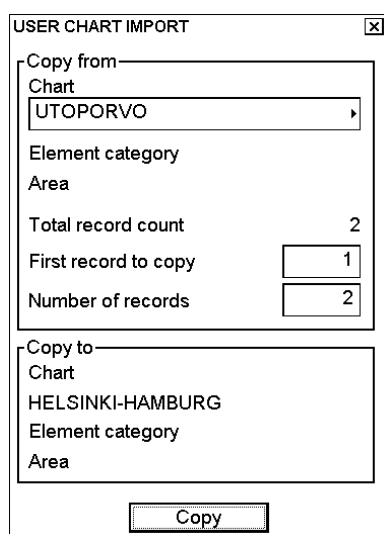
1. Open user chart then check Enable changes on the Plan User Chart dialog box.
2. Select appropriate chart scale so you can see desired area of user chart on display.
3. Put the cursor on the corner point you want to move to a next WPT position.
4. While pressing and holding down the left mouse button, roll the trackball to put the cursor on desired position. Keep the button held down while you move the cursor and release it when the cursor is at the position desired.

How to delete an area from a user chart

To completely delete an area from a user chart, check Enable changes on the Plan User Chart dialog box. Select desired area object to display from the Area field then click the **Delete** button.

How to import an area to a user chart

You can copy an area of a user chart from another user chart file to active user chart file. Open user chart desired with UserChart then check Enable changes on the Plan User Chart dialog box. (You may also import areas to a new chart.) Open the Areas page then do as follows:



1. Click the **Import** button in the Area field to show the User Chart Import dialog box appears.
2. Select a chart from which to copy areas in the Chart box; spin the scrollwheel to select a chart then push the scrollwheel.
3. "Total record count" shows the number of areas stored in selected user chart. Enter into the "First record to copy" field the area number from which you want to start copying.
4. Enter in the "Number of records" field how many areas you want copy into the active user chart file.
5. Click the **Copy** button to copy selected areas. If you do not want copy, click the X at the top right corner to quit.

15.7.6 How to add a new point, symbol, line or tidal to a user chart

In this manual the term "user chart object" refers to any point, symbol, line or tidal. The procedure for modifying a user chart object is common to all user chart objects. To select a user chart object to modify, open the appropriate user chart object page in the Plan User Chart dialog box. The Current field shows the user chart object currently selected for modification.

To modify user chart areas, use the Area page.

How to add a new user chart object

To add a new user chart object you have following methods available:

- Use the left mouse button (Edit Insert feature).
- Click the **Add** button in corresponding user chart object page.

To add a new user chart object by using the left mouse button, do the following:

1. Open desired user chart object page.
2. Put the cursor in the electronic chart on the desired position then push the left mouse button. New user chart object appears.
3. Modify data of added user chart object. For how to modify Point, Symbol, Line and Tidal data, see section 15.7.7 "How to change other data of point, symbol, line or tidal".

To add a new user chart object by using the Add button, do the following:

1. Open desired user chart object page.
2. Click the **Add** button in the selected user chart object page. This adds a new user chart object to the end of file, which is a copy of current user chart object.
3. Modify position of operator object. Modify position following "Changing position of a point, symbol, line or tidal," on the next page.
4. Modify other data of user chart object. For how to modify position, see section 15.7.7 "Changing other data of point, symbol, line or tidal".

How to select a point, symbol, line or tidal to modify

In this manual the term "user chart object" refers to any of point, symbol, line or tidal. The procedure for modifying a user chart object is common to all user chart objects. To select the user chart object to modify, open the appropriate user chart object page. In the Current field, the number indicates user chart object that is currently selected for modification. If you want to select a different number, do one of the following:

- Enter desired number of user chart object in the Current box. To change the number put the cursor in the Current box, spin the scrollwheel to select number then push the scrollwheel. Click the **OK** button.
- Use the Info feature to find area. Put the cursor on the desired corner point of the area on the electronic chart then push the scrollwheel.

How to change position of a point, symbol, line or tidal

You can change the position of a user chart object two ways:

- Enter latitude and longitude in the Position field.
- Drag and drop a user chart object with the left mouse button.

How to enter latitude and longitude in position field

1. Open desired user chart object page.
2. Select desired user chart object.
3. Enter co-ordinates in the Position field. To change a co-ordinate, put the cursor to the right of the digit to change, in the appropriate box, click the left mouse button, spin the scrollwheel to select desired value then push the scrollwheel. Note that lines have starting and ending point position fields.

15. User Chart Control

How to drag and drop a user chart object to change its position

1. Open desired user chart object page.
2. Put the cursor on the user chart object in the electronic chart area then press and hold down the left mouse button while rolling the trackball to position the user chart object.
3. Keep the button pressed down while you move the cursor and release it when the cursor is at the position desired.

15.7.7 How to change other data of point, symbol, line or tidal

To change other data of a user chart object, such as name, symbol, element type, do the following:

1. Select desired user chart object. For more information, see "How to select a point, symbol, line or tidal to modify" on page 15-15.
2. Put the cursor in desired edit box then use the scrollwheel to enter data. Push the scrollwheel to confirm.

15.7.8 How to delete a point, symbol, line or tidal

To delete a user chart object, do the following:

1. Open desired user chart object page.
2. Select user chart object to delete.
3. Click the **Delete** button in the selected user chart object page.

15.7.9 How to import points, symbols, lines or tidals from other user chart

User is able to select User chart objects from other user chart to import them to current User chart. To import User chart object do the following:

1. Open desired user chart object page.
2. Click the **Import** button. The dialog box shown right appears.
3. In the Chart box, select the chart from which to copy user chart objects.
4. The Element category field shows the category elements that will be copied.
5. In the First record to copy box, enter the number of the object from which to begin copying.
6. In the Number of records box, enter number of records to copy.
7. Click the **Copy** button to copy.

USER CHART IMPORT

Copy from

Chart
UTOPORVO

Element category

Symbol

Total record count 19

First record to copy 1

Number of records 19

Copy to

Chart
HELSINKI-HAMBURG

Element category

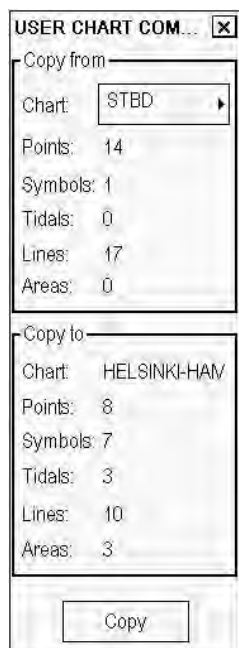
Symbol

Copy

15.8 How to Join Two or More User Charts

The ECDIS allows you to combine two or more user charts into one user chart. To join two or more user charts, do the following:

1. Click UserChart in the information area to show the User Chart dialog box.
2. Click the **Plan** button to show the Plan User Chart dialog box.
3. Put the cursor on the triangle in the Plan User Chart dialog box.
4. Select a chart with "Select" then press the **OK** button, or select "Create" and create a new chart.
5. Check Enables changes.
6. Put the cursor on the triangle in the Plan User Chart dialog box.
7. Select Combine then push the scrollwheel.

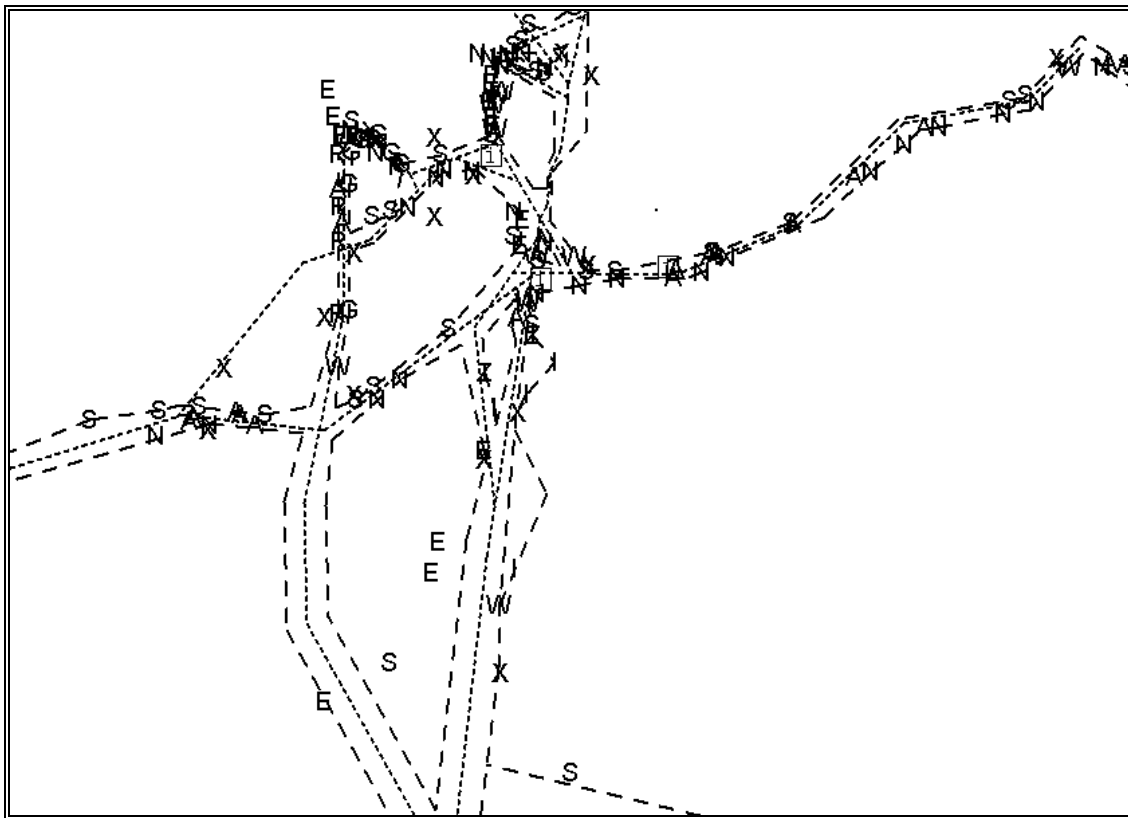
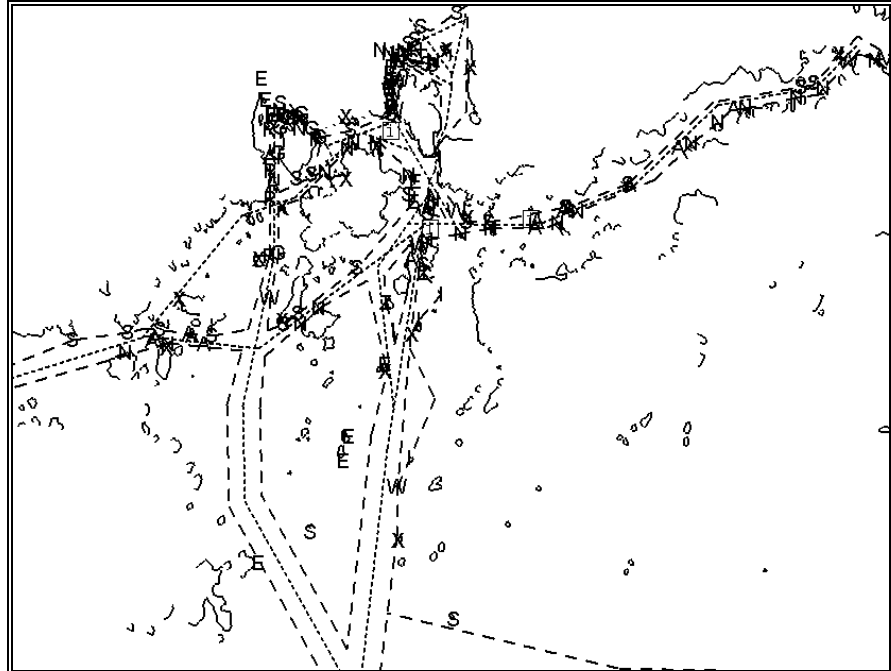
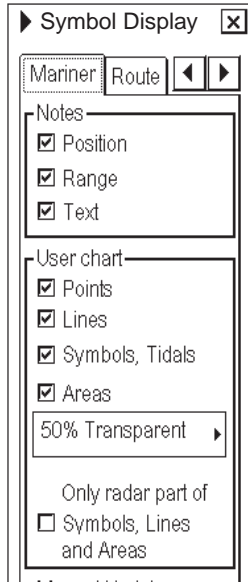


8. Select a chart with the Chart box in the Copy from window then push the scrollwheel.
9. Click the **Copy** button.

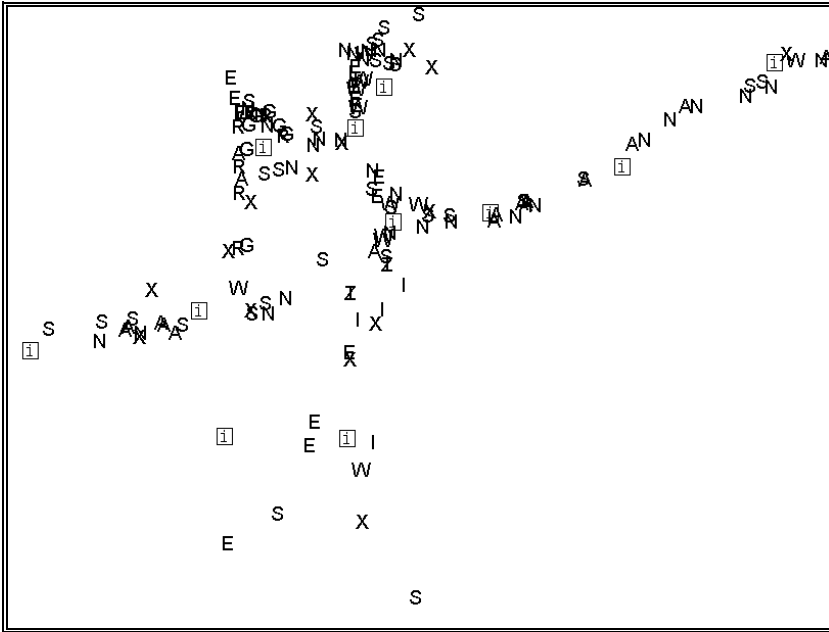
15.9 How to Display User Charts on ECDIS Display

User charts can be displayed on the ECDIS display, and you can select which chart objects to display from the Mariner page in the Symbol Display dialog box. Below are some examples from the same user chart with different selections.

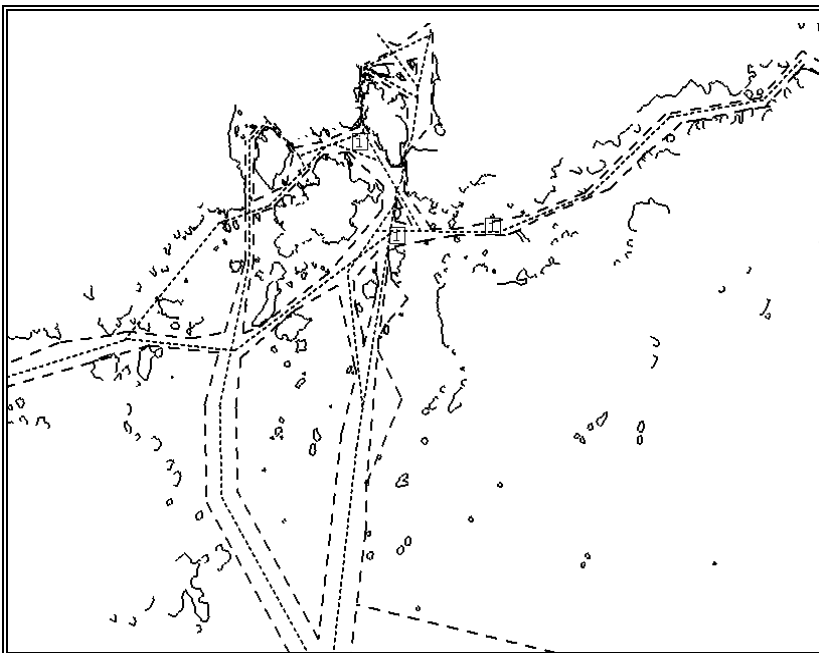
This user chart has all user chart objects displayed.



An example with only radar part of lines, symbols and areas displayed



An example with only symbols and points displayed. Note that this is also a very good example how many and where the points should be defined.



No symbols displayed

15.10 How to Back up User Charts to a Floppy Disk or USB Memory

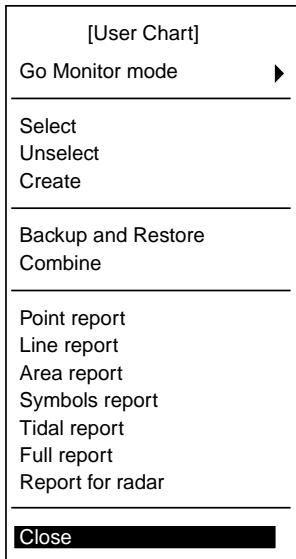
You may make backups of user charts. This feature is also useful for carrying user charts to other planning or navigation station. For further details, see section 17.5 "How to Back up a File to a Floppy Disk or USB Memory".

15.11 How to Restore User Charts from a Floppy Disk or USB Memory

This procedure can be used to read backup copies of any User Chart file if some data is lost during modification of Notes. The other usage is to read User Chart files originating from other planning or navigation station. For further details, see section 17.6 "How to Restore a File from a Floppy Disk or USB Memory".

15.12 Reports

You may generate a report for each chart object (point, line, area, symbol and tidal) as follows:



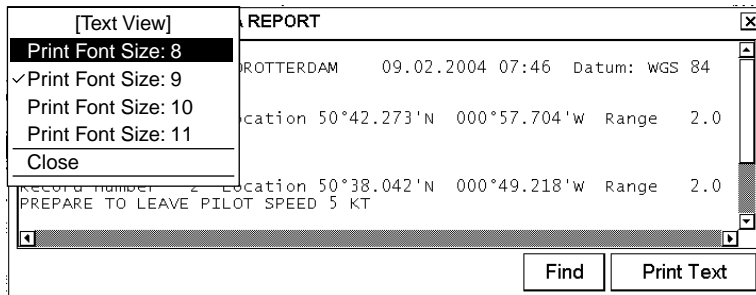
1. Click UserChart in the information bar then click the Plan button to show the Plan User Chart dialog box.
2. Put the cursor on the triangle in the dialog box to show the User Chart menu.
3. Select desired report from the report group then push the scrollwheel.
4. To print the report, click the Print Text button.

See the next page for sample reports.

How to change size of font in report

If you want to change the size of the font in a report hard copy, do the following:

1. Move the cursor onto the triangle in the report window.



2. Spin the scrollwheel to select desired font size from the list then push the scrollwheel.

Sample reports

```

TEXT VIEW - USER CHART REPORT
USER CHART UTOPORVO 09.02.2004 12:20 Datum: WGS 84 UTC +0:00

POINTS
1 59°55.482'N 024°15.544'E
2 59°49.584'N 023°33.924'E
3 59°50.325'N 023°19.729'E
    
```

Points report

```

TEXT VIEW - USER CHART REPORT
USER CHART UTOPORVO 09.02.2004 12:20 Datum: WGS 84 UTC +0:00

LINES
1 " " Route line On radar
  59°53.202'N 022°18.774'E
  59°53.202'N 022°18.774'E
2 " " Route line On radar
  59°54.422'N 022°39.572'E
  59°53.625'N 022°44.541'E
    
```

Lines report

```

TEXT VIEW - USER CHART REPORT
USER CHART UTOPORVO 09.02.2004 12:22 Datum: WGS 84 UTC +0:00

AREAS
Area: 1 "MUSTAMAT" Danger On Radar
  60°22.138'N 028°29.231'E
  60°20.241'N 028°32.886'E
  60°18.279'N 028°34.192'E
  60°17.873'N 028°31.682'E
  60°19.623'N 028°24.199'E
  60°21.669'N 028°23.382'E
Area: 2 "KOIRAKOS" On Radar
  60°09.938'N 028°25.403'E
    
```

Areas report

```

TEXT VIEW - USER CHART REPORT
USER CHART UTOPORVO 09.02.2004 12:23 Datum: WGS 84 UTC +0:00

SYMBOLS
1 59°28.308'N 020°48.724'E X LEIJONA On radar
2 59°45.043'N 022°18.709'E X OLYCKSBO On radar
3 59°55.048'N 022°36.432'E X GALTARNA On radar
4 59°54.820'N 022°39.572'E X LERHARU On radar
    
```

Symbols report

```

TEXT VIEW - USER CHART REPORT
USER CHART UTOPORVO 09.02.2004 12:20 Datum: WGS 84 UTC +0:00

POINTS
1 59°55.482'N 024°15.544'E
2 59°49.584'N 023°33.924'E
3 59°50.325'N 023°19.729'E
    
```

Full report

```

TEXT VIEW - USER CHART REPORT
2 59°49.584'N 023°33.924'E
  Displayed Lines:
  839 838 837 840 841 842 822 823 836 843
  821 820 817 838 835 816 824 819 844 815
  834 825 826 833 827 828 832 871 870 845
  814 846 809 810 811 916 917 812 854 806
  807 808 855 856 910 911 915 912 869 872
  813 909 805 847 857 914 913 908 848 804
  Displayed symbols:
  38 19 39 18 40 84 83 17 37 145
  16 41 143 139 140 142 141 113 112 82
3 59°50.325'N 023°19.729'E
  Displayed Lines:
    
```

Report for radar

15. User Chart Control

This page intentionally left blank.

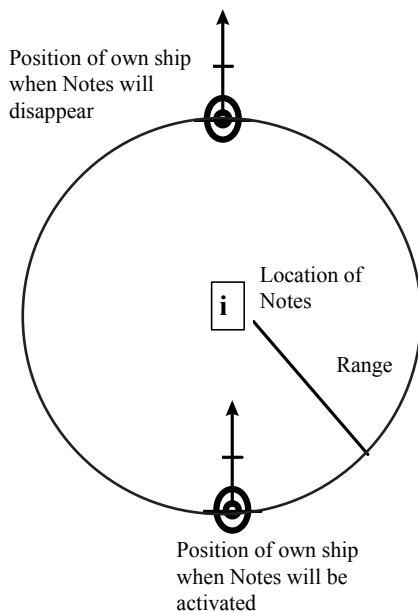
16. Notes

16.1 Introduction

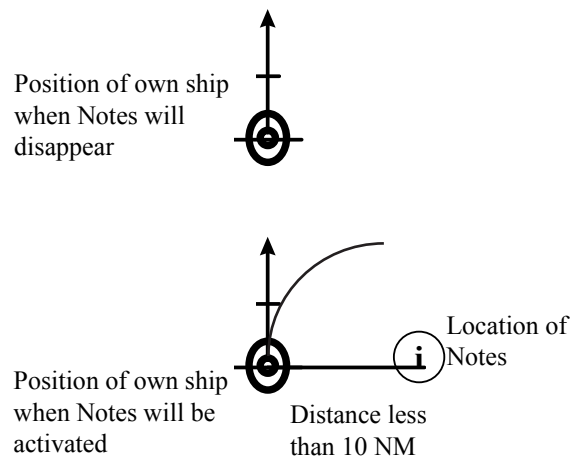
A navigation-related notebook is called "Notes". Notes is a "notebook data" file that provides messages for the operator relative to a specific ship position in the monitoring mode. The operator specifies the range for each Notes record. The ECDIS compares Notes range and your ship's position and displays Notes when your ship goes within the range set for the Notes. (See the figure below.)

The operator may assign a brief message that appears on the radar display together with the notice of the proximity of the relevant point.

While the ship sails, notebook pages (= records) in the selected Notes file are compared with your ship's position once per minute to select Notes. Further, when the ship has passed a waypoint, the system will make a comparison against your ship's position. If the system finds that you have arrived within a new Notes notebook page, it generates the alert "850 Notes: New Record".



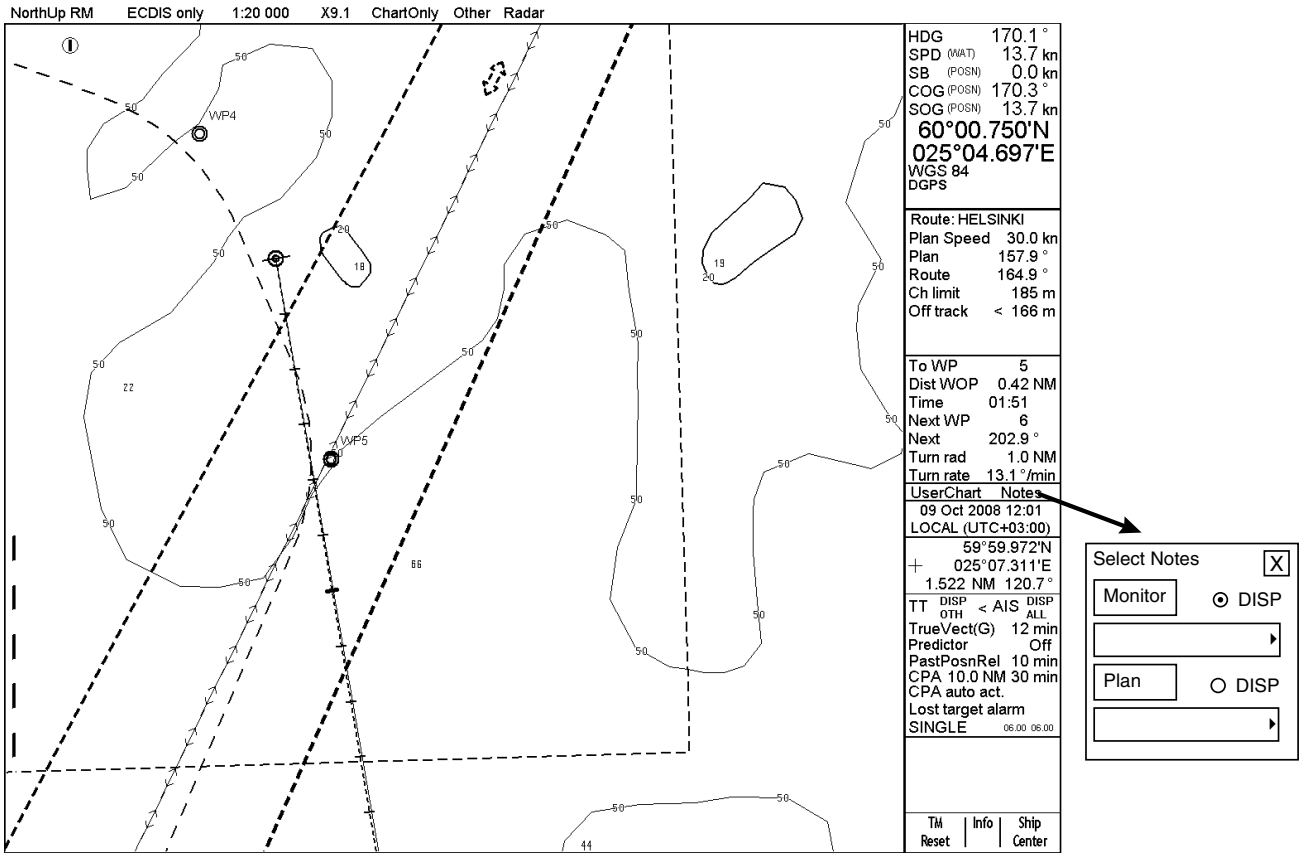
Alert mode "when entering range" selected



Alert mode "when passing" selected
(range automatically selected to 10 NM)

16.1.1 Notes modes

Notes can be selected for the monitoring mode, which means that Notes gives predefined messages for the operator relative to a specific ship position. Another mode is for modifying Notes in the planning mode. In the planning mode, Notes is used to define predefined messages relative to your ship's position. Eventually the monitored and planned Notes copy the operation of the monitored and planned routes. Below is an example of how to know which Notes is used in the monitoring mode and which is used in the planning mode.

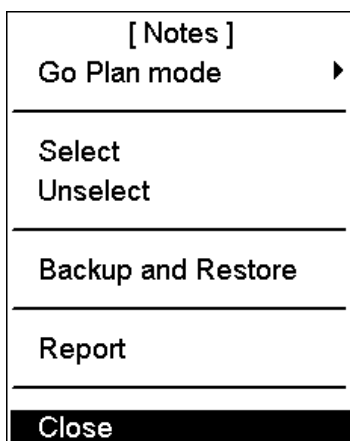


If the displayed Notes on the ECDIS display are the monitored Notes, then the text "Notes" is in black (or white depending on color scheme). If the displayed Notes on the ECDIS display are the planned Notes, then the text "Notes" is in orange. The name of the Notes is available in the dialog box for Select Notes. To select the Notes for the Monitor and Plan modes, click Notes to show the dialog box shown at the right side of the illustration above.

16.2 How to Use Notes

To prepare Notes, do the following:

1. Click Notes in the information area then click the **Plan** or **Monitor** button as appropriate. If no Notes is selected, the Notes menu (shown below) appears in addition to the Monitor Notes dialog box or Plan Notes dialog box.
2. If no menu appears, click the same button once more to open the menu.



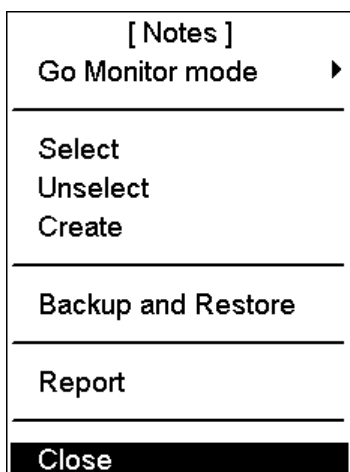
Go Monitor mode> Go Monitor mode, Notes used in the planning mode can be switched directly to the monitoring mode. Using **Go Plan mode> Go Plan mode**, Notes used in the monitoring mode can be switched directly to the planning mode.

Select: Selects Notes to use, monitor or planning mode.

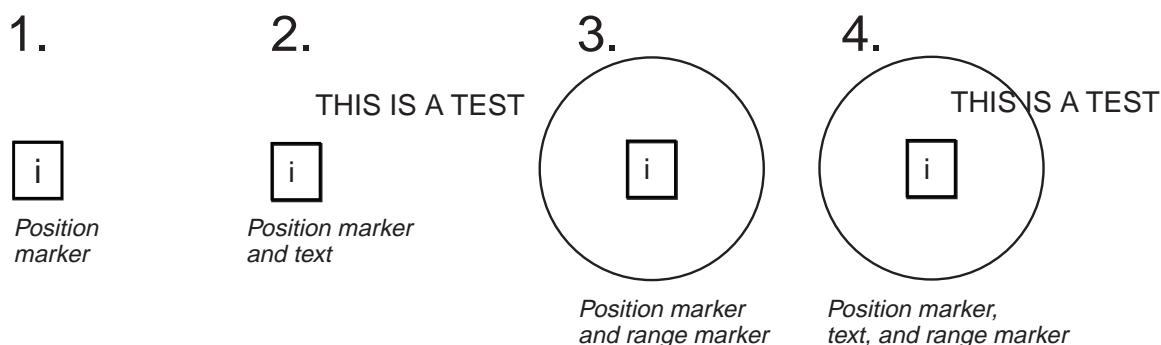
Unselect: Unselect removes Notes from active use.

Backup and Restore: User can make backup copy from Notes or restore from backup media.

Report: Generates tabulated report from selected Notes.



Note: If you want Notes to be displayed on the electronic chart, make sure that Notes options are turned on in the Mariner page of the Symbol Display dialog box.



Four different variations as examples of how Notes is presented on the chart area:

1. Position marker
2. Position marker and text
3. Position marker and range marker
4. Position marker, text and range marker

16.3 How to Select Notes to use in Monitoring Mode

Do as shown below to select Notes for use in the monitoring mode.

NorthUp RM ECDIS only 1:20 000 X9.1 ChartOnly Other Radar

HDG	170.1 °
SPD (WT)	13.7 kn
SB (POSN)	0.0 kn
COG (POSN)	170.3 °
SOG (POSN)	13.7 kn
60°00.750'N	
025°04.697'E	
WGS 84	
DGPS	
Route: HELSINKI	
Plan Speed	30.0 kn
Plan	157.9 °
Route	164.9 °
Ch limit	185 m
Off track	< 186 m
To WP	5
Dist WOP	0.42 NM
Time	01:51
Next WP	6
Next	202.9 °
Turn rad	1.0 NM
Turn rate	13.1 /min
UserChart	Notes
09 Oct 2008 12:01	
LOCAL (UTC+03:00)	
59°58.972'N	
+ 025°07.311'E	
1.522 NM 120.7 °	
TT DISP	OTH < AIS DISP ALL
TrueVect(G)	12 min
Predictor	Off
PastPosnRel	10 min
CPA	10.0 NM 30 min
CPA auto act.	
Lost target alarm	
SINGLE	08:00 08:00

Place cursor here, spin scrollwheel to choose Notes and push scrollwheel.

Select Notes X

Monitor DISP

Plan DISP

16.4 How to Send Notes to the Radar Screen

If ECDIS workstation is set as SINGLE mode, you have to define on the Radar Selection dialog box if the ECDIS sends Route, User Chart and Notes to the radar. When Route, User Chart or Notes is selected to the Monitor mode, information of Route, User Chart and Notes are sent to radar if "Send to Radar" is set "ON".

Radar selections	
Radar Overlay source	N2
TT target source	2
Send to Radar	ON

HDG	052.3 °
SPD (WT)	18.5 kn
SB (POSN)	-0.7 kn
COG (POSN)	050.6 °
SOG (POSN)	18.6 kn
60°00.298'N	
025°02.289'E	
WGS 84	
DGPS	

To change "Send to Radar" to ON or OFF, do the following:

1. Put the cursor on Radar in the status bar to show the Radar selections dialog box.
2. Put the cursor on ON (OFF) text in the "Send to Radar" field.
3. Spin the scrollwheel to select ON or OFF then push the scrollwheel.

16.4.1 Monitor Notes dialog box description

Current record page

If "View all records" is not selected (checked):

- Opens "Current Record" page.
- When the ship is within the range set for a Notes, the information of current record appears, something like the dialog box shown right.

Checking "Enable changes" always changes the monitor Notes mode to the plan Notes mode.

View record page

If "View all records" is selected:

- Opens "View Record" page.
- Select "View all records".
- You can view any Notes record by clicking the arrow keys.

Checking "Enable changes" always changes the monitor Notes mode to the plan Notes mode.

The image shows two side-by-side screenshots of the 'MONITOR NOTE ...' dialog box. The left screenshot is titled 'Current Record' and shows a record with ID '1 / 2', coordinates 'LAT 32°35.909'S' and 'LON 060°57.930'E', an alert set to 'when passing' within '10 NM', and a description 'CALL VTS USE CHANNEL 71'. At the bottom, there are buttons for 'Add', 'Import', and 'Delete', and two checkboxes: 'Enable changes' (unchecked) and 'View all records' (unchecked). The right screenshot is titled 'View Record' and shows the same record information. In this view, the 'View all records' checkbox is checked, and a 'Not Displayed' message is visible at the bottom of the dialog box.

View record box:

This indicates current number of active records.

LAT, LON:

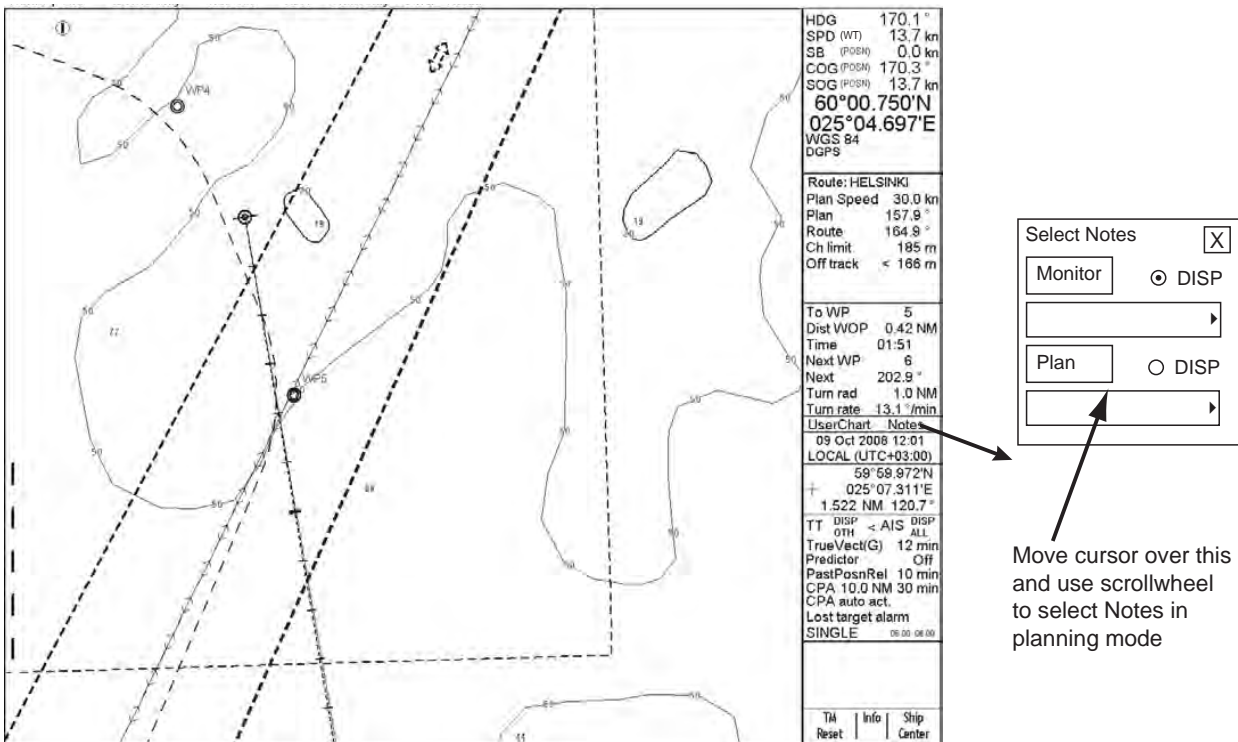
This indicates the latitude and longitude position of current record (LAT, LON).

Alert:

Control range for the system to activate current record of Notes.

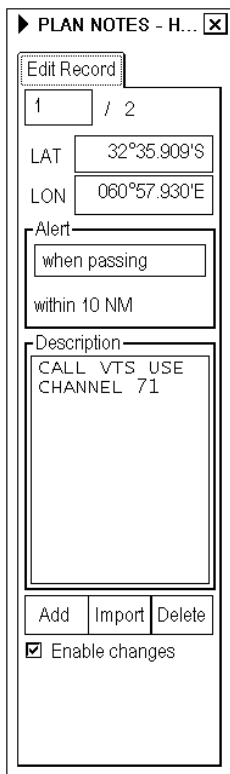
16.5 How to Select Notes to use in Planning Mode

If "Notes" in the information area is black (or white depending on color scheme) this means that the workstation is in the monitoring mode for Notes. To activate the planning mode and select Notes for the planning mode, do the following:



Move cursor over this and use scrollwheel to select Notes in planning mode

16.5.1 Plan Notes dialog box description



Edit Record box: Shows current number of active records.

LAT, LON: Latitude and longitude position of current record.

Alert: Range from own ship at which current Notes is activated on the screen or when passing notes distance is fixed to 10 NM.

Description: The operator may edit a Notes message record, which appears on the screen, after the ship has passed the calculated point. To edit the text, put the cursor in the text window, spin the scrollwheel to select character then push the scrollwheel.

Add: This function adds a new record next to current record. User can edit position by entering new co-ordinates or by choosing new location with the trackball then pushing the left mouse button.

Import: You may import an existing file (whole file or part of file), to current Notes file.

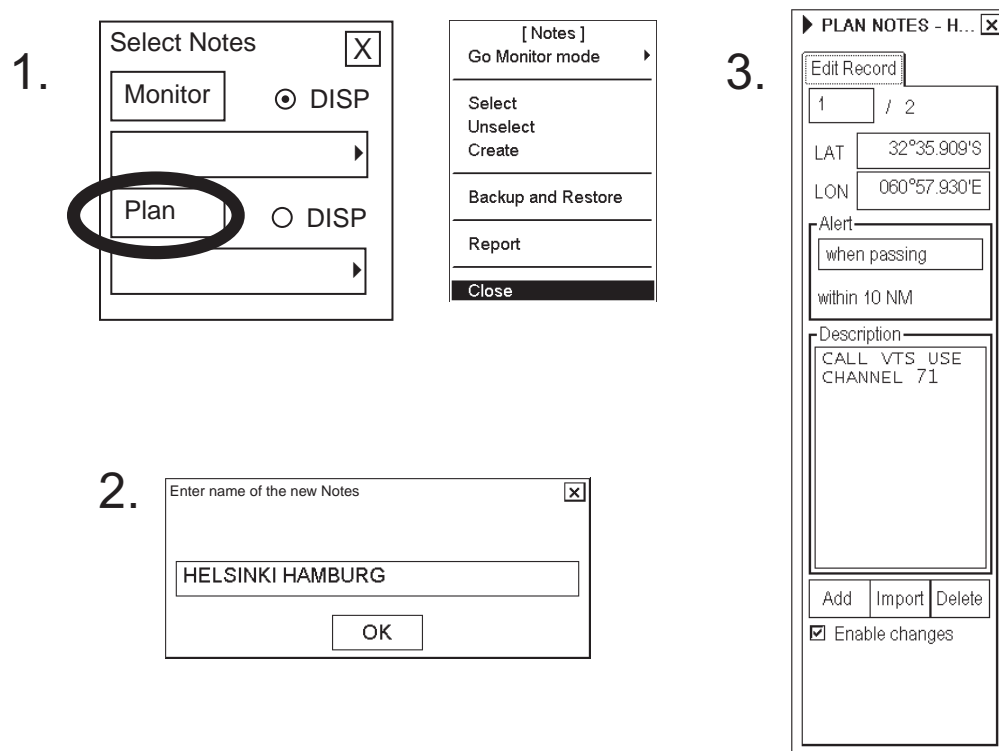
Delete: Deletes current record of Notes.

Enable changes: Check to enable changes.

Note: Notes may only be modified in the North-up or Course-up mode.

16.6 How to Create New Notes

You can create and modify Notes, and this can be done in the planning mode. It is recommended to use the true motion display mode while editing.



To create a new Notes, do the following:

1. Click Notes in the information area then click the **Plan** button to show the Plan Notes dialog box. Click the triangle mark, select Create from the menu then push the scrollwheel.
2. Enter a name for the Notes; spin the scrollwheel to select character then push the scrollwheel. Repeat to enter name desired then click the **OK** button.
3. In the Edit Record page of the Plan Notes dialog box, check "Enable changes". Roll the trackball to put the cursor on the location desired for Notes then push the left mouse button. In the Range box, enter the range from your ship at which to activate the Notes. To show text message on the screen, enter desired message in the Description window; spin the scrollwheel to select character and push the scrollwheel to confirm.

16.6.1 How to add new Notes record

To add a new Notes record the following choices are available:

- Using the left mouse button.
- Using the **Add** button in the Edit page.

To add a new Notes record by using the left mouse button:

1. Open the Edit page of the Plan Notes dialog box and check Enable changes.
2. Put the cursor on the location in the chart area where you want to add a new Notes, then push the left mouse button. New Notes record appears at the end of file.
3. Modify Range, Position, text message, etc. as appropriate.

16. Notes

To add a new Notes record by Add button:

1. Open the Edit page of the Plan Notes dialog box then check Enable changes.
2. Click the **Add** button. This adds a new Notes record to the end of record, and it is a copy of current Notes record.
3. Modify position of Notes record. For how to modify position, see section 16.6.3 "How to change Notes record position".
4. Modify other data of Notes record as appropriate. For how to modify other data in a Notes record, see section 16.6.4 "How to change other data of Notes record".

16.6.2 How to select Notes record to modify

The Current box in the Plan Notes dialog box shows the Notes currently selected for modification. To select a different Notes the following methods are available:

- Enter desired record number in the Current box, using the scrollwheel; spin the scrollwheel to select record number then push the scrollwheel.
- Put the cursor on desired Notes in the electronic chart area, then push the scrollwheel.

16.6.3 How to change Notes record position

To change the position of a Notes, two choices are available:

- Enter latitude and longitude in the Position field on the Edit page.
- Drag and drop Notes mark using the trackball and left mouse button.

How to enter latitude and longitude in position field

1. Open the Edit page of the Plan Notes dialog box then check Enable changes.
2. Select desired Notes, following section 16.6.2 "Choosing Notes record to modify".
3. Enter co-ordinate in Lat (Lon) field as appropriate. Spin the scrollwheel to change digit then push the scrollwheel to confirm.

How to drag and drop Notes to next WPT position

1. Open the Edit page of the Plan Notes dialog box then check Enable changes.
2. Use the trackball to put the cursor on the Notes you wish to move.
3. Press and hold down the left mouse button while rolling the trackball to position the Notes mark where desired. Keep the button pressed and held down while you move the cursor and release it when the cursor is at position desired.

16.6.4 How to change other data of Notes record

To change function range or character data of Notes, such as range and text, do the following:

1. Select desired Notes record, following section 16.6.2.
2. Put the cursor in the desired edit box, spin the scrollwheel to select desired value, then push the scrollwheel to confirm.

16.6.5 How to delete a Notes record

To delete a Notes record, do the following:

1. Open the Edit page of the Plan Notes dialog box then check Enable changes.
2. Select desired Notes record to delete, following section 16.6.2.
3. Click the **Delete** button.

16.6.6 How to import Notes from other routes

You may import Notes records from other Notes records as follows:

1. Open the Edit page of the Plan Notes dialog box then check Enable changes. Click the **Import** button to show the following dialog box.

NOTES IMPORT

Copy from

Notes
CORUNA

Total page count 2

First page to copy 1

Number of pages to copy 2

Copy to

Notes
HELSINKI HAMBURG

First page copied as page 2

Copy

2. In the Notes field, select the source Notes.
3. Enter first Notes record to copy in the First page to copy field.
4. Enter number of Notes records to copy in the Number of pages to copy field.
5. "Copy to Notes" shows where the Notes record is to be copied to and "First page copied as page" shows the number that the first record from the Notes source will be copied into the current Notes.
6. After confirming settings, click the **Copy** button to import Notes records.

16. Notes

This page intentionally left blank.

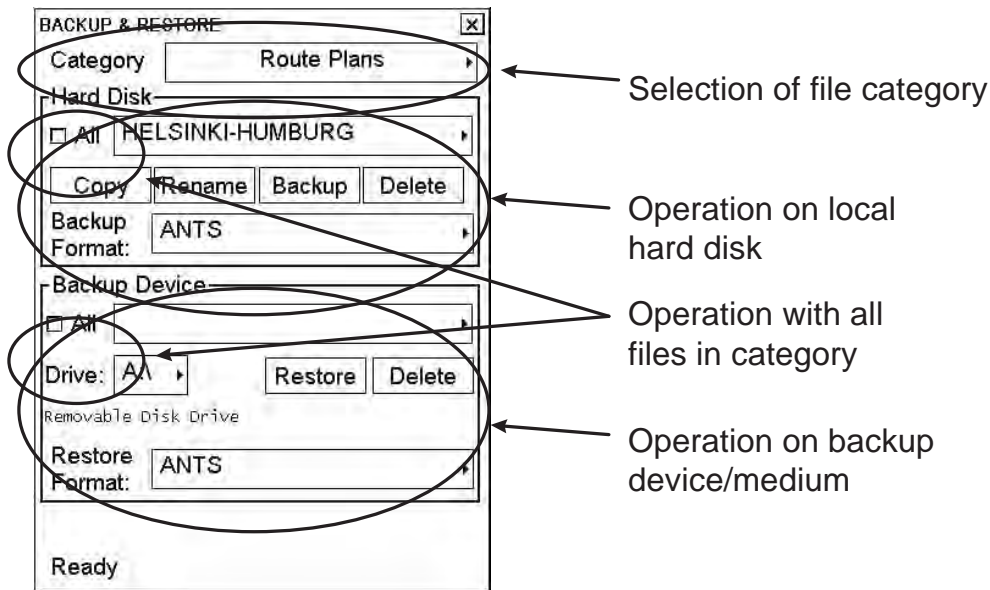
17. Backup Operations

17.1 Introduction

There are several menus from which the operator may initiate backup and restore functions. From those menus the operator may execute hard disk operations such as backup, copy, rename and delete. The operator may make backup copies to backup devices or restore from backup device to hard disk. These pushbuttons and menu commands, which are used to access the system's database, are listed below.

Note: If you use floppy disks, use only PC-formatted floppy disks.

The Backup & Restore dialog box is where backup and restore operations are initiated.



17.2 How to Select Appropriate File Category

The system automatically selects corresponding file depending on your selection. The categories consist of the following files:

- Route plans
- User Charts
- Notes
- Installation parameters
- Display Settings
- Paper Chart Setups
- Presentation Libraries
- Logs
- Manual Updates
- All Charts and Updates

You can select desired category from the File category box in the Backup & Restore dialog box. For the selected category, the system shows all the possible functions executable with the selected category.

17.3 How to Copy a File

You can make a copy of an original file using the Copy function in the Backup & Restore dialog box. To copy a file, do the following:

1. Select desired file category.
2. Select desired file from the Hard Disk field.
3. Click the **Copy** button.
4. Enter new name for selected file then click the **OK** button.

17.4 How to Rename a File

You can rename a file using the Rename function in the Backup & Restore dialog box. To rename a file, do the following:

1. Select desired file category from the Category field.
2. Select desired file from the Hard Disk field.
3. Click the **Rename** button.
4. Enter new name for selected file then click the **OK** button.

17.5 How to Back up a File to a Floppy Disk or USB Memory

You can make a backup from an original file to a floppy disk or USB memory. To make a backup of a file to a floppy disk or USB memory, insert a floppy disk in the disk drive or connect a USB memory, then do the following:

1. Select desired file category.
2. Select desired file from the Hard Disk field.
3. Select desired Drive from the Drive field.
4. Click the **Backup** button.

17.6 How to Restore a File from a Floppy Disk or USB Memory

You can restore a file with one stored on a floppy disk or USB memory. To restore a file stored on a floppy disk or USB memory, insert a floppy disk in the disk drive or connect a USB memory, then do the following:

1. Select desired file category.
2. Select desired Drive from the Drive field.
3. Select desired file from the Backup Device field.
4. Click the **Restore** button.

17.7 How to Delete a File

You can delete a file as follows:

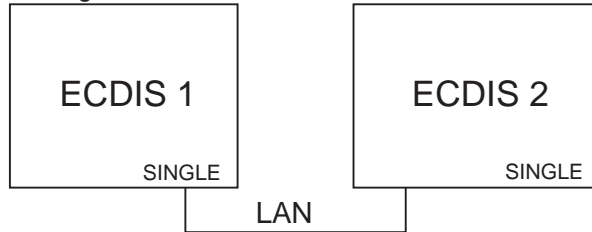
1. Select desired file category.
2. Select desired file from the Hard Disk field.
3. Click the **Delete** button.

17.8 How to Move a File to Planning or Navigation Station

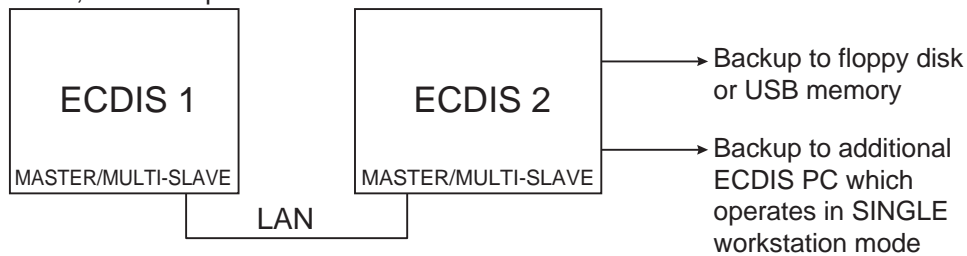
If there are two ECDIS workstations connected via a LAN, files can be moved from one workstation to another.

Note: The intention of the Backup function is to make a backup copy of a route, user chart, etc. to a backup medium. If you want to copy charts, routes, user charts, etc. between ECDIS workstations, it is recommended that you use the Restore function instead of Backup. For use of Backup, see the illustration below for when it is possible to use the Backup function.

Between ECDIS workstations when both workstations are set as single workstation mode



Between both workstations are set as Master/Slave or Multi-workstation mode, but backup is done to external device/media.

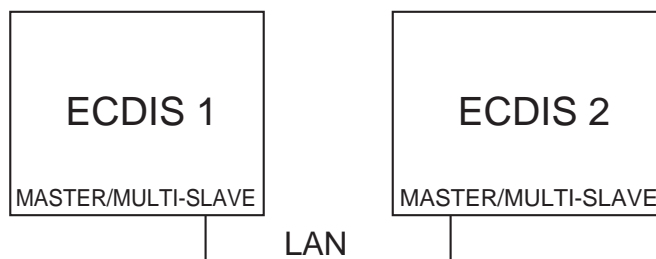


To use the Backup function:

1. Open desired menu.
2. From the menu, select the Backup and Restore command.
3. Select desired file from the Hard disk field.
4. Select backup drive from the Backup device field.
5. Press the **Backup** button.

The figure below shows when you should not use the backup function to copy files between ECDIS workstations. To copy files between ECDIS workstations use the Restore function. For more information, see section 17.9 "How to Read a File from Planning or Navigation Station" on the next page

DO NOT use the backup function between two ECDIS workstations when both workstations operate as master/slave or multi-mode (or one workstation mode indication is yellow (single))



17.9 How to Read a File from Planning or Navigation Station

If there are two ECDIS workstations connected via a LAN, it is possible to read files from planning station to navigation station and vice versa.

1. Select desired menu.
2. Select Backup and Restore command from menu.
3. Select backup drive from the Backup device field.
4. From the Backup Device field, select desired file.
5. Click the **Restore** button in the Backup Device field.

17.10 How to Load User Chart and Route Files of Former Vector System Format

Route and user chart files can be read in vector system format (Inc) files. When loading Inc format files, the ECDIS converts the files to the format used with the ECDIS. To do this, do the following:

1. Select desired menu.
2. Select Backup and Restore from the menu.
3. Select backup drive from the Backup device field.
4. From the Backup Device field, select desired file.
5. Click the **Restore** button in the Backup Device field.

17.11 How to Save User Chart and Route Files in Former Vector System Format

The Route and User chart files can be read in vector system format (Inc). When moving files from the ECDIS to a backup device the ECDIS converts the file to Inc format.

To do this:

1. Select desired menu.
2. Select Backup and Restore from the menu.
3. From the Hard Disk field, select desired file then select Backup file format as Inc.
4. Select backup drive from the Backup device field.
5. Click the **Backup** button in the Hard Disk field.

17.12 How to Save a Route as an ASCII Text File

Sometimes it is useful to save route information as an ASCII text file for use with some other application, or to restore some ASCII text produced by some other application to the ECDIS. For further details see Appendix 6.

The following formats are available for route backup and restore:

- ASCII PROPRIETARY
- ASCII POSITION (list of Latitude/Longitude values)
- ASCII WPT NAME POSITION (list of WPT names and Latitude/Longitude)
- ASCII POSITION WPT NAME (list of Latitude/Longitude and WPT names)
- ASCII FULL (all route related information)

To make a backup of a route in ASCII format, do the following:

1. Select the Backup and Restore command from the menu.
2. From the Hard disk field, select desired file.
3. Select desired backup format with Backup format.
4. Select backup drive in the Backup drive field.
5. Click the **Backup** button in the Hard Disk field.

17.13 How to Restore a Route from an ASCII Text File

Sometimes it is useful to restore to the ECDIS route information stored in an ASCII text file that was produced by some other application. For further details see Appendix 5.

The following formats are available for route backup and restore:

- ASCII PROPRIETARY
- ASCII POSITION, list of Latitude/Longitude values
- ASCII WPT NAME POSITION, list of WPT names and Latitude/Longitude
- ASCII POSITION WPT NAME list of Latitude/Longitude and WPT names
- ASCII FULL, all route related information

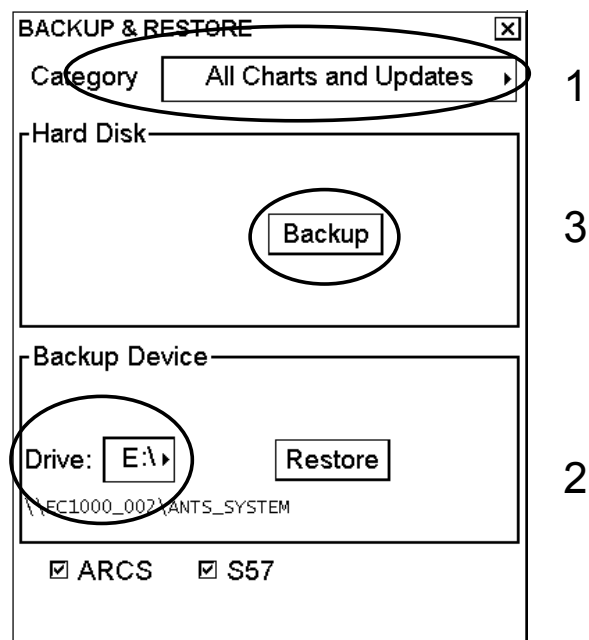
To restore a route using ASCII data, do the following:

1. Select the Backup and Restore command from the menu.
2. Select desired Backup Format.
3. Select backup drive from the Backup device field.
4. Select desired file.
5. Click the **Restore** button in the Backup Device field.

17.14 How to Back up Chart Material

The ECDIS lets you keep a chart database identical both in the hard disk of the ECDIS and the hard disk of the backup ECDIS. If you want to make a backup of chart material to backup ECDIS, open the Backup & Restore dialog box and do the following:

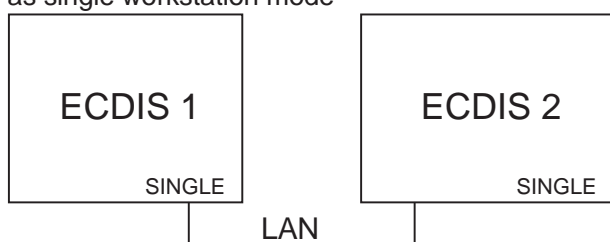
1. Select file category in the Category list box.
2. Select Drive for backup of ECDIS at Drive in the Backup Device window.
3. Click the **Backup** button.



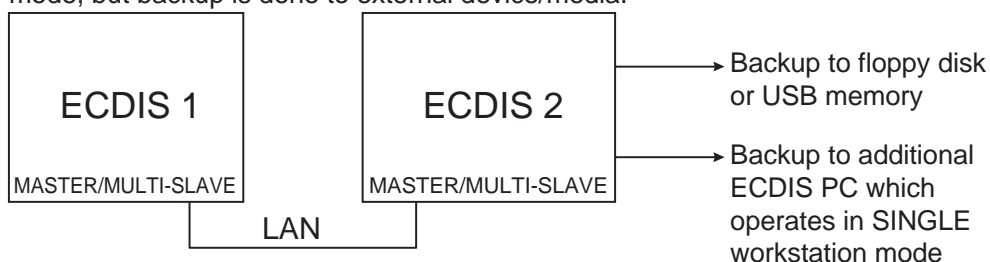
Note: To copy charts between ECDIS workstations, it is recommended that you use the Restore function instead of Backup. For use of Backup, see the illustration below for when it is possible to use the Backup function.

After the backup has been completed, the hard disk content of the backup ECDIS is identical with backup ECDIS. However, the backup ECDIS doesn't automatically start to use possible new material. To do this, open the Chart menu and select System>Refresh Charts after backup from the menu.

Between ECDIS workstations when both workstations are set as single workstation mode



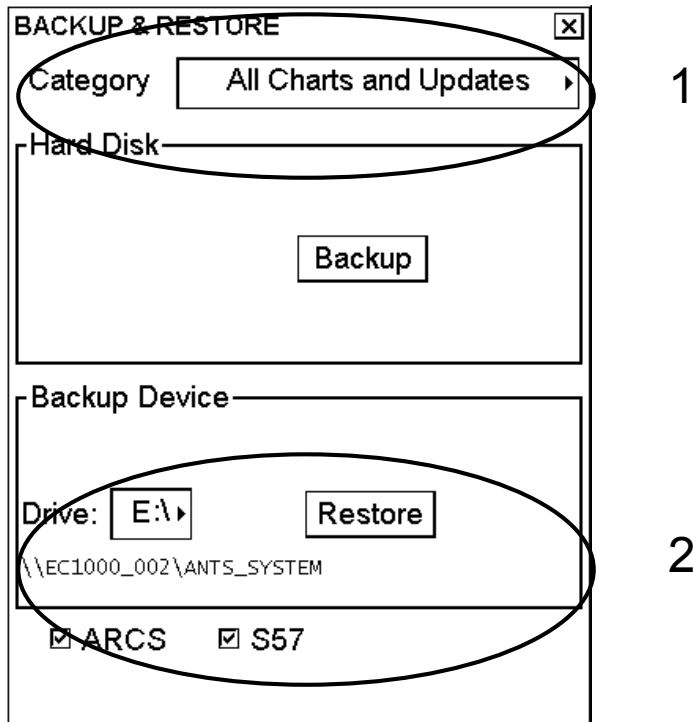
Between both workstations are set as Master/Slave or Multi-workstation mode, but backup is done to external device/media.



17.15 How to Restore Chart Material

The ECDIS lets you keep a chart database identical both in the hard disk of the ECDIS and the hard disk of backup the ECDIS. If you want restore a backup of some chart material from the backup ECDIS, open the Backup and Restore dialog box and do the following:

1. Select a file category from the Category list box.
2. At Drive in the Backup Device window, select the drive where the backup ECDIS is stored. Then, click the **Restore** button.



Note: After the restore has been completed, the hard disk content of the backup ECDIS is identical with backup ECDIS. However, the backup ECDIS doesn't automatically start to use possible new material. To do this, open the Chart menu and select System>Refresh Charts after backup from the menu.

18. Common Reference System (Multi-workstation mode)

18.1 Introduction

A system is comprised of one or more Workstation(s) and it is configured as follows:

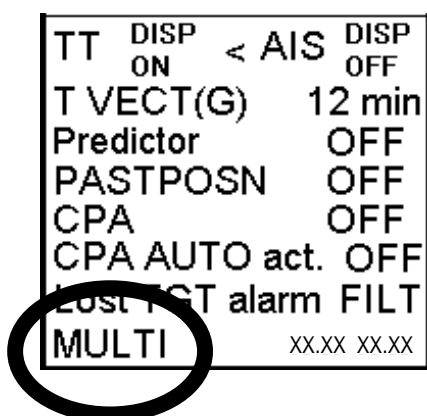
- Single workstation
- Multiple workstation (for example, navigation workstation and planning station)
- Multiple workstation (for example, navigation workstations)

An access server takes care of information shared inside the system to keep workstations consistent within the common reference system concept. The access server also monitors if a workstation has a right to make certain actions (for example if a workstation has usage rights to change monitored route for the system).

The common reference system concept includes the following features:

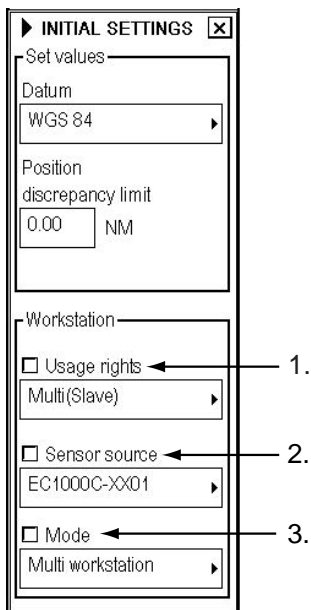
- Shared navigation sensors
- Shared alert management
- Shared chart databases for S57 (ENC) and ARCS
- Shared databases for routes, user charts, manual updates and Notes
- Some operator selections are shared (for example safety contour), while some other operator selections are defined separately for each workstation.
- User selections used for route planning are separate for each workstation

The Installation parameters of the system define if the system consists of more than one workstation and in which the access server is running. For further details see the service manual.



18.2 How to Control Common Reference System

If the system has a dual workstation, the following dialog box appears when choosing the Initial Settings menu. Open the box by moving the cursor onto the workstation mode indication and pushing the right mouse button.



1. **Usage rights:** The following options are available to request usage rights:
 - **Master:** Only this workstation can be used to make selections for the monitoring mode (for example, route monitor, user chart monitoring mode, etc.) and system use (for example, navigation sensors, Tracked Target source, etc.).
 - **Plan:** Only this workstation can access the planning mode (i.e., the other workstation is used for selections for the monitoring mode and system use).
 - **Multi (Slave):** This workstation shares usage rights in order to make selections for the monitoring mode and system use with the other Workstation set as Multi. Note that this is only a request for shared operation. If any other Workstation has been selected as Master, then you do not get Multi usage rights, but Slave usage rights. The difference between Slave and Plan usage rights is that Plan retains that status but Slave will be changed to Multi, if the current workstation holding Master usage rights is changed from Master to any other alternative.
2. **Sensor source:** This box shows the Workstation into which all the navigation sensors are connected. If you have a fully redundant system where all the sensors are connected to all workstations, you can select which workstation to use as a sensor source.
3. **Mode:** Normally, in a multi-workstation environment, this selection should always be "Multi workstation". The alternative selection is "Single workstation" and it is used for two purposes:
 - If you do not have more than one workstation powered, then this workstation is selected for "single workstation" mode.
 - If you want to use this workstation of your system temporarily as a totally independent separate workstation, then select "Single workstation" mode. Note that during the "Single workstation" mode the system does not use the common reference system concept, since everything you do is not shared by other workstations.

How to switch between single mode and multi mode

The operator may change the operating mode to "single" or "multi". Switch to single mode when conducting SENC conversion of S57 or C-MAP CM-93/2 charts. (All stations must be in the single mode in SENC conversion.)

1. Right-click MULTI in the information area.
2. Check Usage Rights and change from Multi(Slave) to Master.
3. Check Mode and change from Multi Workstation to Single Workstation.

18.2.1 Shared alert management

The common reference system concept provides that all alerts are indicated in all workstations and a single acknowledgement of alert from any workstation is enough to acknowledge the alert from all workstations.

18.2.2 Harmonized databases on workstations

When the multi-workstation mode is used, information between workstations is shared via the access server. The access server is responsible for harmonizing data on all workstations when any data listed below has been changed in one of the workstations.

- Chart data
- ARCS
- S57
- Manual updates
- Permits

Notes on harmonization

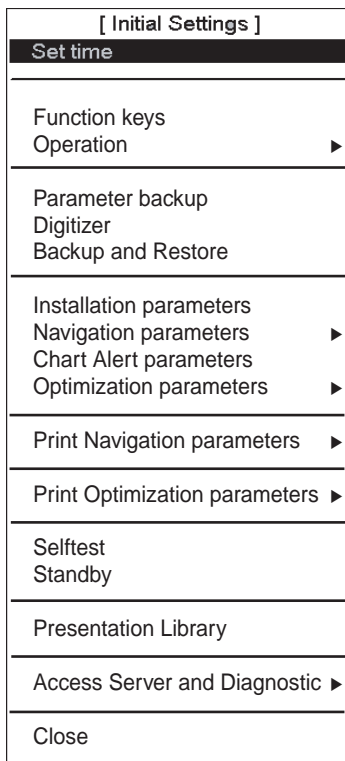
- If you have the multi-workstation mode in use, it is recommended that loading or updating of ARCS and S57 charts be made when the ship is NOT sailing on restricted waters, because harmonising of databases may cause delay in system operations. To load or update charts while sailing, switch to single-workstation mode. For how to change the mode, see section 18.5 "Mode of Workstations".
- In the multi-workstation mode, ECDIS charts are harmonized whenever a chart is loaded, removed, manually updated, viewing dates set, etc. If harmonization is executed between ECDIS units operating in the single-workstation mode, however, the ECDIS workstation having the latest "global_catalog.cat" is used for harmonization. This can cause loss of charts if, for example, the ECDIS workstation to be harmonized has more charts than the other ECDIS workstation but its global_catalog.cat is older than the ECDIS workstation with fewer charts.
- The date of modification of global_catalog.cat for both the S57 system and ARCS system is changed whenever respective charts are loaded, deleted, etc. Both chart systems are harmonized with the latest charts, with no order or priority. The date of global_catalog.cat is modified in the following instances: Permit loading, Permit removal, Chart loading, Chart update, Chart removal, Manual chart viewing dates, Manual update, etc.
- When ECDIS is installed or updated, global_catalog.cat of both the ARCS system and S57 system is deleted. After ECDIS is restarted, rebuild is executed to create a new global_catalog.cat, and the newly created file is time-stamped; for example, "Monday, January 01, 1601 9:00:00 AM". (This happens only when it and the S57_setup_file are deleted together. If only global_catalog.cat is deleted, the current time stamp is applied.)

This usually presents no problem with harmonization of S57 charts. However, if "Permanent Warning" appears during the rebuild, "Set chart viewing date" will be executed. When this occurs, the time stamp for global_catalog.cat is written over and its time stamp becomes older than the ECDIS time stamp. This causes the ECDIS to revert to the harmonized state directly after installation. To prevent this, "use" the time stamp obtained from "Set chart viewing date" and execute "Set chart viewing date" on the ECDIS on which to harmonize S57 charts. This will always give the most recent time stamp to the ECDIS to be harmonized.

- Do not turn off the power of an ECDIS unit when charts are being harmonized between two ECDIS units in the multi-workstation mode. The unit that was turned off may malfunction after activating the single-workstation mode.
- Turn off the radar overlay feature before conducting harmonization after loading or updating charts, to prevent the overload condition, which causes slow operation.
- For multi-workstation system, if charts are loaded and updated at Workstation A in the single mode then the mode is switched to multimode, charts are then automatically loaded to Workstation B for harmonization of charts. After harmonization is completed, charts must be refreshed at Workstation B, in the following operating sequence: Chart menu→System→Refresh charts after backup. This same operating procedure applies if charts are loaded and updated while the multi-workstation mode is active.

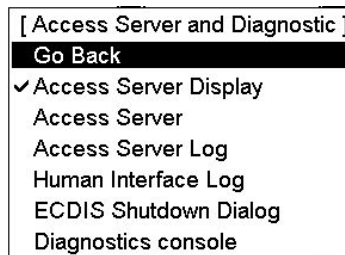
18. Common Reference System

You can set access server display options ON if you want to monitor access server windows to know harmonization status, whenever harmonization is completed by the system.



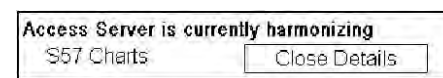
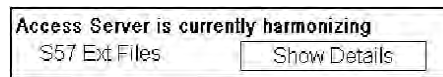
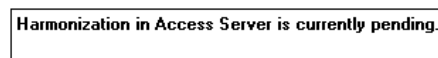
To set access server display ON/OFF, do the following:

1. Spin the scrollwheel to display Menu/Info/Chart Menu in the mouse functions area then push the left mouse button.
2. Select Initial Settings then push the scrollwheel.
3. Put the cursor on the triangle in the Initial Settings dialog box to show the menu shown left.
4. Select Access Server and Diagnostic from the menu then Access Server Display from the submenu.

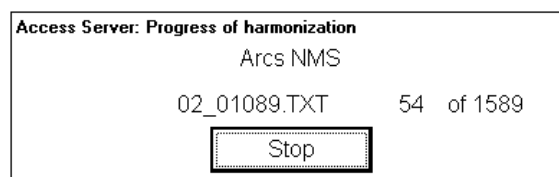


When access server windows are displayed, the messages shown below may appear.

If the system recognises that any data mentioned above has been changed in one workstation, the access server indicates the need for pending harmonisation, using the window shown right.



When the access server recognises that the editing, loading, updating, etc. session has been completed in one workstation, the access server starts harmonising databases in order to get databases identical on all workstations. The message "Access Server is currently harmonizing" appears to alert you to this action. If you click the **Show Details...** button, the "Progress of harmonization" window appears to give detailed information about harmonization progress. This window can be closed by clicking the **Close Details** button on the "Access server is currently harmonizing" window.



Note: The **Stop** button in the Progress of harmonization window stops the harmonization in case of system malfunction.

When route, user chart or Notes is selected for the planning mode, the access server locks it and rejects further selection of it in other workstations until "Enable changes" selection is removed or the Plan Route dialog box is closed.

Harmonising starts when "Enable changes" selection is unchecked or corresponding window(s) are closed. After harmonisation has been done, the route, user chart or Notes can be selected in another workstation for the planning mode.

18.2.3 Shared operator selections

The common reference system concept allows that some selections and settings made by an operator in one workstation are transferred to the other workstation. These are as follows:

- Route, user chart and Notes in monitoring mode
- Selected sensors in SPD/CRS and POSN pages (including position alignment of your ship and gyro correction) in the Sensors dialog box
- Settings for chart alerts and watch sector
- Settings of conditions for voyage and dangerous targets recordings
- Ship parameters (table of forwarding distance, optimization parameters and navigation parameters)
- Setting for position discrepancy limit

18.3 Usage Rights

A workstation can have different usage rights. Master and Multi (Slave) rights allow control of both planning and monitoring modes and navigation sensors. Slave (Multi) and Plan usage rights allow only control of the planning mode. Workstations can be set so that

- One has Master usage rights. The rest have Slave (Multi) or Plan usage rights.
- One or two have Multi (Slave) usage rights. The rest have Plan usage rights.

18.3.1 How to set usage rights as "master"

One single workstation can be selected to control the monitoring mode and navigation sensors. This means that this particular workstation is used to select route, user chart and Notes for the monitoring mode.

To configure the system so one workstation has usage rights set as Master, do the following:

1. Put the cursor below the Lost TGT alarm indication, confirm that Initial Settings is shown in the mouse functions area then push the right mouse button.
2. Check the Usage rights box and select Master from the List box.
3. The indication MASTER appears at the lower right hand corner on the selected workstation.
4. The indication SLAVE appears at the lower right hand corner on the other workstation.

INITIAL SETTINGS [X]

Set values

Datum
WGS 84

Position discrepancy limit
0.00 NM

Workstation

Usage rights
Master

Sensor source
EC1000C-0002

Mode
Multi workstation

MASTER ab.00 a5.00

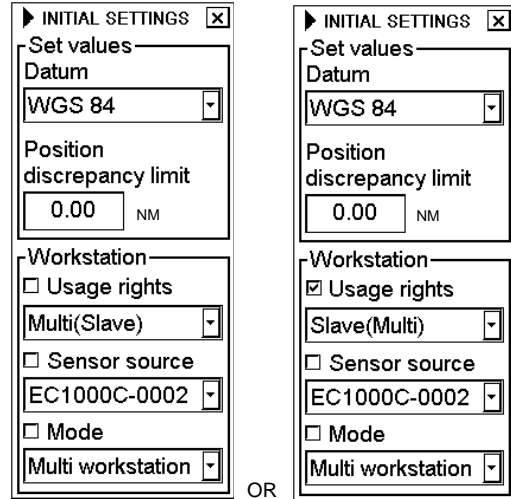
SLAVE ab.00 a5.00

18.3.2 How to set usage rights as "multi" or "slave"

Multiple workstations can be selected to control monitoring modes and navigation sensors. This means that these particular workstations are used to select route, user chart and Notes for monitoring modes. However, the multiple control requires that none of the other workstations is set for Master usage rights. If the other workstation is set for Master usage rights, then this workstation can be set only as Slave or Plan. The transition from Slave to Multi usage right is automatic. If later the usage right selections in the other workstation are changed, then the usage rights in this workstation is automatically set as Multi or Slave based on non-existence or existence of a Master usage rights workstation.

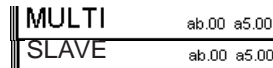
To configure the system so multiple workstations have usage rights set as Multi, do the following:

1. On the workstation for which you want to give Multi or Slave usage rights, put the cursor below the Lost TGT alarm indication, confirm that Initial Settings is shown in the mouse functions area then push the right mouse button.
2. Check the Usage rights box and select either Multi (Slave) or Slave (Multi) from the List box. First alternative indicates the selection and second alternative in parenthesis indicates the provisional selection. Provisional selection may be used by the system if new usage rights selections are made in the other workstation.



OR

If, based on your request, you got shared Multi usage rights, then the indication MULTI appears at the lower right-hand corner of display. If one of the workstations was already selected as Master, then the system cannot give you Multi usage rights. In this case the indication SLAVE appears at the lower right hand corner of display.



18.3.3 How to set usage rights as "plan"

A workstation can be set to control only the planning mode. This means that a particular workstation is used to edit route, user chart and Notes in the planning mode. Selection of Plan usage rights is done in the Installation Parameters of the ECDIS by service personnel. The operator is not able to set these usage rights.

Note that a workstation selected for Plan usage rights still has full viewing access to navigation sensors and to monitored routes, user charts, etc. This is important because it allows that operator(s) can monitor navigation.

To verify configuration of the system in which a selected workstation has usage rights set as Plan, do the following:

1. On the workstation for which you want to give Plan usage rights, put the cursor below the Lost TGT alarm indication, confirm that Initial Settings is shown in the mouse functions area then push the right mouse button.
2. Check Usage rights and select Plan from the list box.

The indication PLAN appears at the lower right hand corner of the display.

18.4 Sensor Source for the System

Normally the sensor source of a system is a single workstation to which all the sensors are connected. All workstations share the navigation sensors. The workstation selected as a sensor source is connected to all sensors. The workstations that can be used as sensor source are shown in the Sensor source list box in the Sensors dialog box.

Typically, the following kinds of installations for connecting sensors to the system are used:

- One workstation to which all the sensors are connected and the others have only one DGPS connected (minimum system configuration that fulfil IMO back-up arrangement for the ECDIS).
- Multiple workstations to which all the sensors are connected (fully redundant workstations)

Consult with the installer to know the installation method.

Note: If you have a fully redundant system where all the sensors are connected to all workstations, it is possible to have the same information available no matter which workstation is selected as the sensor source. If there is any difference in installation parameters due to different combination of sensors connected, the information available may vary when changing the sensor source. It is highly recommended that you change sensor source only when it is required (for example when you have some failure in communications, when hardware fails, etc.) and also to change the sensor source only when it is safe for navigation to do so. (Change of sensor source will take some time during which the system is not fully operational.)

To change sensor source, do the following:

1. On the workstation for which you want to set sensor source, put the cursor below the Lost TGT alarm indication, confirm that Initial Settings is shown in the mouse functions area then push the right mouse button.
2. Check Sensor source then select sensor source from the list box.

Communication program is started at the workstation specified as the sensor source responsible for receiving and transmitting data from/to sensors. The workstation selected as sensor source is also indicated at the top of the Sensors dialog box.

The screenshot shows the 'SENSORS' dialog box with a close button (X) in the top right corner. At the top, there are two tabs: 'SPD/CRS' and 'POSN'. Below the tabs, the dialog is divided into several sections, each with a checkbox and a numerical value:

- Manual speed: [] kn
- Dual log (water): > 0.5 kn, ^ 6.1 kn
- Dual log (bottom): kn, kn
- Radar: kn, °
- Manual heading: [] °
- Gyro 1: 298.2 °
- Gyro 2: °
- RateGyro (CALC): -54.2 °/min

18.5 Mode of Workstations

The system is designed so that information and operations are shared among workstations. Sharing requires that the access server be running in the specified workstation. (This is an installation parameter. See the Installation Manual.) The access server requires that the workstation be designated as multi workstation.

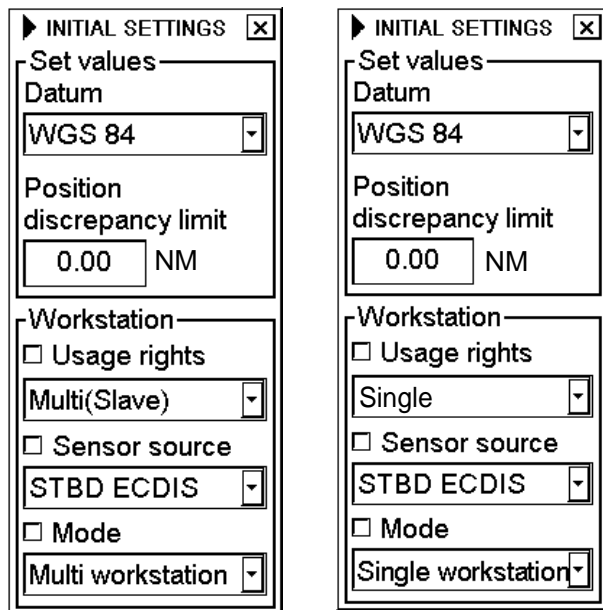
If something fails in a workstation or in the LAN connecting the workstations that prevents multi workstation operations, it is possible to switch the mode to single workstation. If the mode of a workstation that is defined in the installation parameters for the access server is set as a single workstation, the access server is stopped and the workstation continues as if they are separate individual ECDIS systems.

Note: When the mode is single workstation, no data are harmonised nor are information of operator selection shared between workstations.

18.5.1 How to change mode to single or multi workstation

To change sensor source, do the following:

1. On the workstation for which you want to set sensor source, put the cursor below the Lost TGT alarm indication, confirm that Initial Settings is shown in the mouse functions area then push the right mouse button.
2. Check Mode and select appropriate workstation from the List box.



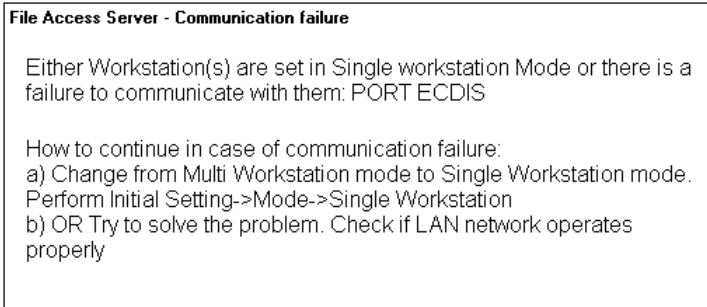
In this example, the workstation mode was changed from multi to single.

The selection Single workstation disables selections of usage rights and sensor source and stops the access server operations on the workstation. In the single workstation mode, the indication SINGLE appears at the lower right hand corner in yellow.

SINGLE ab.00 a5.00

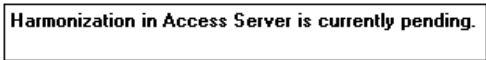
18.6 Troubleshooting

If something fails while the access server is harmonizing workstations, the following window appears to indicate that harmonising has failed.



What to do if pending access server window remains on screen

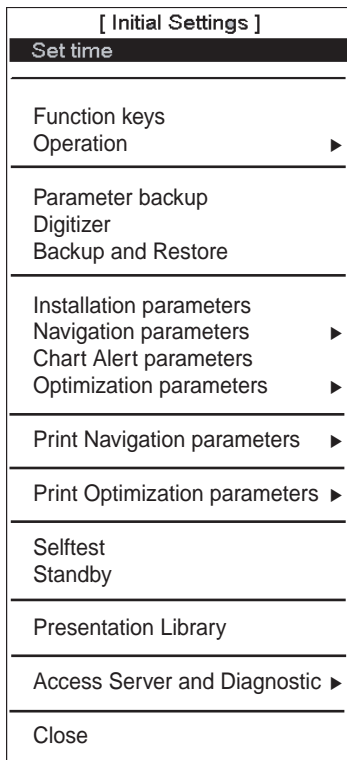
The window below indicates that operation of the access server is pending.



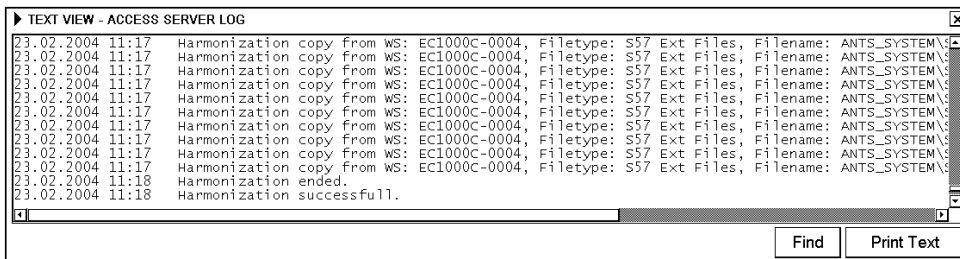
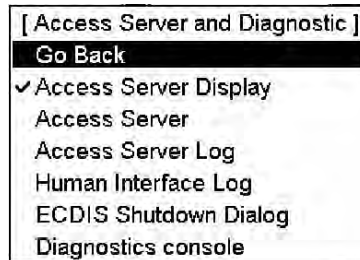
This means that you have not closed all windows. To solve this, click the **Cancel** button several times to erase all windows from the ECDIS display.

18.6.1 Access server log

The access server log is used to analyze and diagnose access server operations. Service personnel can use this log to check the access server for proper operation. To access the access server log, do the following:

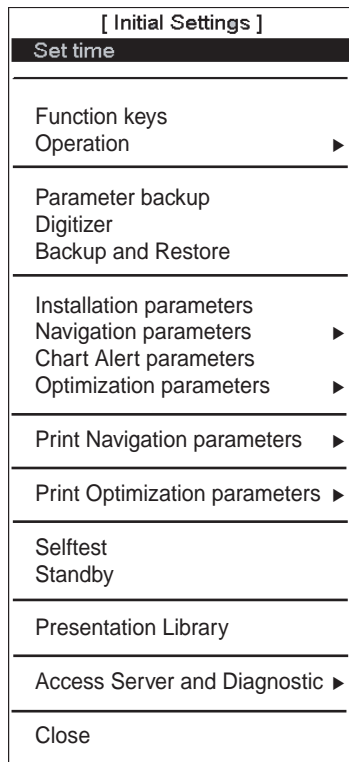


1. Put the cursor below the Lost TGT alarm indication, confirm that Initial Settings is shown in the mouse functions area then push the right mouse button.
2. Put the cursor on the triangle in the dialog box to display the menu shown left.
3. Select Access Server and Diagnostic from the menu and select Access Server Log from the sub menu.

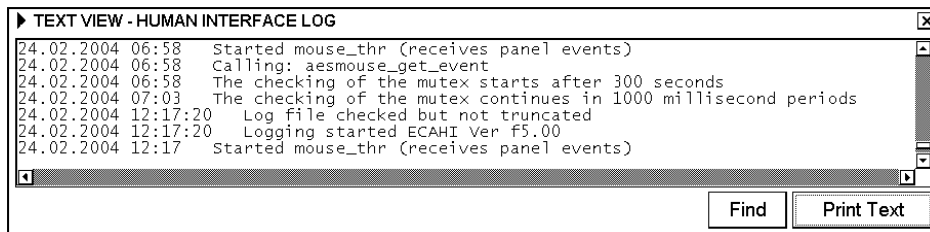
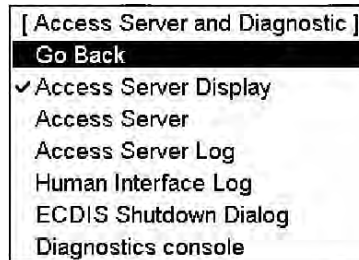


18.6.2 Human interface log

The human interface log is used to analyse and diagnose system operations. Service personnel can use this log to check the system for proper operation. To activate the human interface log, do the following:



1. Put the cursor below the Lost TGT alarm indication, confirm that Initial Settings is shown in the mouse functions area then push the right mouse button.
2. Put the cursor on the triangle in the dialog box to display the menu shown left.
3. Select Access Server and Diagnostic from the menu and select Human Interface log from the sub menu.



19. Navigation Sensors

19.1 Common Reference

Sensors that are used for position (like EPFS, dual-axis log and radar) have a common reference point, which is located on the conning position.

- The values of center and conning positions depend on size and geometry of the ship.
- Offsets from Antenna Position to Conning Position of Position Sensors depend on the location of position sensor antennas.
- Offsets from Antenna Position to Conning Position of Radars depend on the location of the radar antennas.
- Offset of transducer position to Conning Position of dual-axis log depend on the location of dual axis log's transducer.

All the values are maintained in the Installation parameters. During commissioning of the system, the installing engineer will set all the values for the system. End users have limited access to the Installation parameters. These parameters are controlled with a password. The Authorizing key disc is a floppy that contains the necessary key to allow editing of the installation parameters.

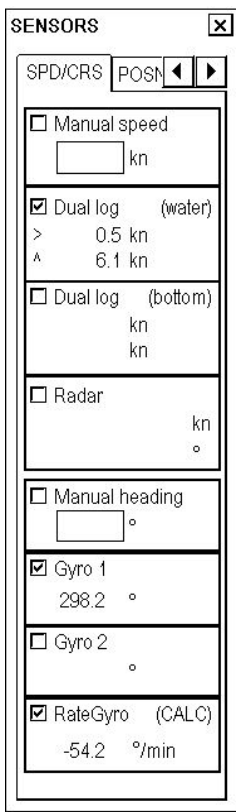
19.2 How to Select Navigation Sensors

The operator can select navigation sensors to use for navigation and view their current values on the Sensors dialog box. To access this dialog box, put the cursor on the Position field in the information area then push the right mouse button.

Checkbox status shows whether the sensor is used for integrated navigation or not. If there is no value shown for a sensor this means that the sensor is not valid. Note that the content of these pages depends on sensors that are in use on the ship.

19.2.1 Sensors dialog box description

SPD/CRS page



Source: In a multiple workstation environment, verify that the sensor source indicated at the top of dialog box is the intended one.

Manual speed: If checked, operator can enter value (kn) for speed. (This is used only if there are no other speed or SOG sensors selected.)

Log: If checked, a log is used as water speed source. "(no pulse)" is used to indicate that a log device with closed contact relay interface using 200 pulses/nm does not give any pulses and thus the speed might be wrong. If Log is selected and "no pulse" condition is detected, then the system generates the alert "405 Log data unreliable".

Note: If you have a dual-axis Doppler log that can measure both water and bottom track, then installation parameters can be set to receive water tracking as log device.

Dual log (water): If checked, a dual-axis log is used as speed and course source. "(water)" is used to indicate that this information is from the water track of the dual-axis log.

Dual log (bottom): If selected, a dual-axis log is used as speed and course source. "(bottom)" is used to indicate that this information is from the bottom track of the dual-axis log.

Radar: If checked, radar is used as speed and course source. The following indications appear to denote source:

- (bottom):** Log operating in bottom tracking mode.
- (water):** Log operating in water tracking mode.
- (posit.):** Position receiver such as GPS.
- (manual):** Manual speed
- (reftgt):** Tracked Target

Manual heading: If selected, the operator enters heading manually. Note that this is used only if there are no other sensors selected.

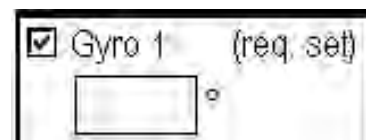
Gyro1: Heading source is a gyrocompass. "(mag)" means the source is magnetic heading. True heading source has no indication. If the source of Gyro1 is a gyro with synchro or stepper interface, the indication "(req. set)" appears when you need to set a new initial value for the gyro.

Gyro2: True heading source has no indication. If you have both gyro1 and gyro2 selected and their value differs more than 5°, the system generates the alert "404 Gyro data unreliable".

Rate Gyro: Heading source is a Rate of Turn gyro. "(CALC)" means the rate of turn is calculated from gyro movement.

Setting initial value of gyro1:

Initial setting of gyro1 is not necessary if it outputs serial data. However, if it is of synchro or stepper type, you will need to set initial gyro value. If gyro1 requires initial value, then the indication "(req. set)" is displayed. Use the scrollwheel to enter initial value. After you enter a value "req. set" disappears.



POSN page

The field of a position sensor contains a label (here DGPS-1st and GPS+ZDA) that indicates the name of the sensor; a status (primary/secondary/off) that indicates if the sensor is used or not; position at conning position and local datum; speed and course that has (mag) if the course is referenced to magnetic north. A DGPS position sensor has additional text Diff, if differential signal is in use. Latitude and longitude values will appear in orange and with additional text in the following conditions:

- Kalman filter has excluded the sensor from its estimated position. Additional text is "Excluded".
- Received position from position sensor is in another datum as set to be received in the ECDIS. Additional text is "Datum".
- If position sensors have position discrepancy active. Additional text is "Discrepancy".

Enable: Check to align chart, using the "drag and drop" feature.

Chart Align: Alignment is automatically selected if the operator has defined position offset by using the chart align feature. The offset values are given in nautical miles and degrees. If position alignment is used, the operator is reminded of it every 30 minutes by the alert "411 ChartAlign: over 30 min".

DR: The system automatically selects dead reckoning if there are no valid and selected position sources and if there are valid and selected speed and course sources. If the system has selected dead reckoning, then the operator can enter a next WPT position for the ship in the Lat and Lon fields.

Kalman filter: The Kalman filter calculates estimated position using all valid and selected position, speed and course sensors. Select On to activate this feature.

The screenshot shows the POSN page with the following details:

- SPD/CRS:** POSN
- Chart Align:** 0.0 °, 0.0 NM
- DR:** 50°28.224'N, 000°50.123'E
- Kalman filter:** On
- DGPS-1st:** Primary
- GPS+ZDA:** Sec
- LORAN:** Off

Position data for each sensor is shown in orange text:

- DGPS-1st: 078.7 °, 50°28.225'N, 12.5 kn, 000°50.130'E
- GPS+ZDA: 078.7 °, 50°28.225'N, 12.5 kn, 000°50.104'E
- LORAN: 078.7 °, 50°28.225'N, 12.5 kn, 000°50.095'E

Position sensors have priority, which is indicated as "primary" or "secondary". Only one sensor can be primary while the others can be secondary or off. If a position sensor is changed from secondary to primary state and another position sensor was selected as primary, then that sensor previously selected to primary state is then automatically selected to secondary state. When the position source is changed because of priorities and signal validity to another position source, then you get the alert "409 Position source change". Note that alert 409 is active only when the Kalman filter is off because the filter has its own process to calculate estimated position and in that process priority given by primary and secondary is not used.

If a DGPS is selected as primary or secondary, and its status changes from "no Diff" to "Diff" or from "Diff" to "no Diff" the system generates the alert "727 DGPS pos. Source change" (alert numbers are from 727 to 732 depending on position receiver).

"Pri no alert" and "Sec no alert" can be selected from the DPGS box if you want to disable the alert "727 DGPS pos. source change". These selections are intended for the area where the differential coverage is fading. One example is if you sail along coastline but you are so far away that the differential signal changes its status very often.

The system generates the alert "738 Datum mismatch" (alert numbers are from 738 to 743 depending on the position receiver) if output datum of a selected position sensor (status other than Off) is changed from WGS-84 to another datum or if selected position sensor does not send datum message. Additional text "datum" appears, in orange. Further, lat/lon values for the position sensor turn orange. If the position sensor is also used for system position, Kalman filter and your ship's position (Lat/Lon values and datum used) are indicated in orange. If output datum of a selected position sensor is changed from no datum message or another datum to WGS-84 and the operator has used the selection Primary or Secondary, then the system generates the alert "744 Datum change" (alert numbers are from 744 to 749 depending on position receiver).

Note: The ability to check datum of position is a relatively new feature for position receivers. It was introduced in standard IEC 61162-1 Ed2, published in July 2000. Only EPFS (for example GPS or DGPS) which has "IEC 61162-1 Ed 2 (2000-7)" indicated in their type approval certificate can support the ECDIS to detect datum mismatch.

The system generates the alert "407 Position discrepancy" if there is discrepancy in position. Together with this alert, the system shows the text "Discrepancy" in orange in the POSN page for a position sensor that has position discrepancy active.

Other page

Set and Drift: See the description below.

Wind: Wind (True or North) speed (kn or m/s) and direction are displayed. Note that true wind is wind relative to your ship heading. For further details, see section 19.11 "Wind Sensor".

Depth below trans: Depth from hull at bow and aft to bottom. A depth alert value may be entered to alert you to shallow depth.

Temperature: Water surface temperature.

Water current: Tide at current position.

AIS targets: Status of AIS data. Check Danger & Lost Alms to get alert for dangerous or lost target.

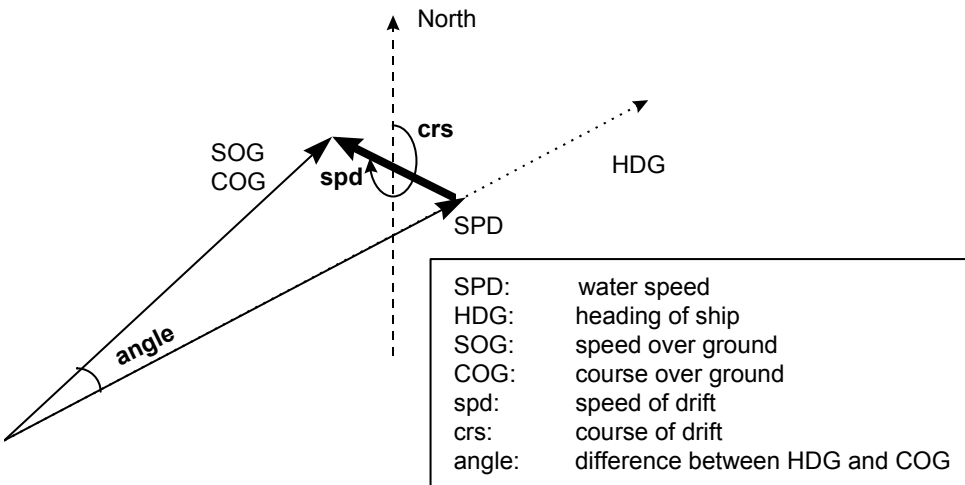
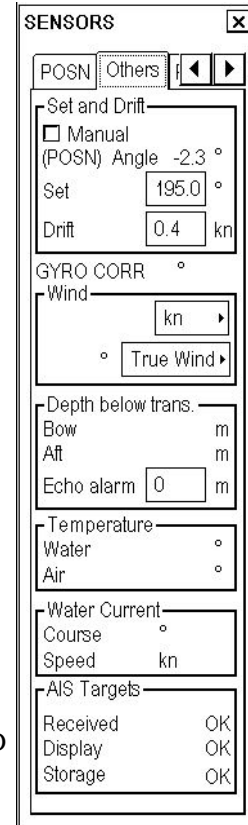
Set and drift: Check the Manual box to manually set speed and course of drift. Note that you can select manual drift only if there are no automatic sources for SOG and COG. In other words, you have neither a dual-axis log nor any position receiver available.

Angle = Difference between heading and COG

Spd = Speed component of the drift vector

Crs= Course component of the drift vector

Vector defined by (SOG and COG) is equal to vector sum of vectors defined by (SPD and HDG) and (set and drift).

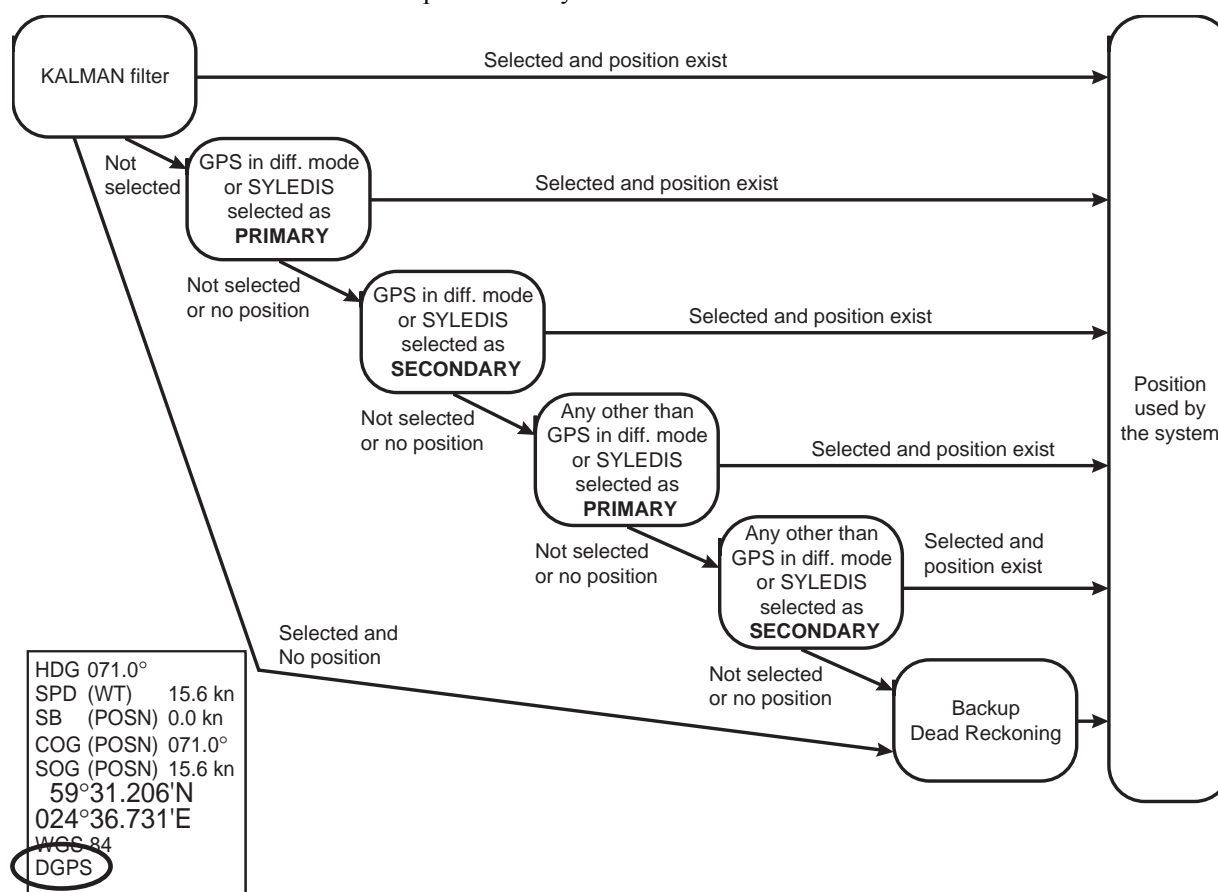


19.3 Source of Position

The figure below shows how the source for position is selected. The Kalman filter uses all position sensors that have either primary or secondary as input for its calculation. DGPS and SYLEDIS position sensors are considered more accurate than other position sensors.

The latitude and longitude position is shown at the upper right corner on the ECDIS display, and in the example below the position source is DGPS. Other indications that may be displayed in the position area are as follows:

- **NO POSIT:** Appears (in red) when no dead reckoning sensors are selected and valid.
- **DEAD REC:** Shown (in red) when position source is dead reckoning.
- **DGPS, GPS: LORAN, DECCA or SYLEDIS:** Name of position source.
- **LOST DGPS:** Shown (in red) when the operator-selected DGPS device has lost the DGPS signal.
- **FIL LOST DGPS:** Shown (in red) when the Kalman filter is in use and the operator-selected DGPS device has lost the DGPS signal.
- **FILTER HIGH:** Shown when the position source is the Kalman filter with high-precision position sensor.
- **FILTER:** Shown when position source is the Kalman filter without high-precision position sensor.
- **BAD FILTER:** Shown (in red) when position source is the Kalman filter and the filter has excluded at least one of the selected sensors because of poor accuracy.



If the system changes the source of position because of lost sensor data or the differential mode is changed on a DGPS device, the system immediately generates the alert "409 Position source change". If the Kalman filter is used, the system generates the alert "410 Filter: POSN source CHG" after a time out period of 90 sec.

If a selected DGPS sensor changes its operation mode and its status is primary or secondary, then the system generates the alert "727 DGPS pos. source change" (727 for first sensor, 728 for second, etc.). These alerts are not generated if the operator has selected Pri no alert or Sec no alert.

If source of position includes a position sensor that is in datum mismatch condition, the latitude, longitude and selected datum are displayed in red.

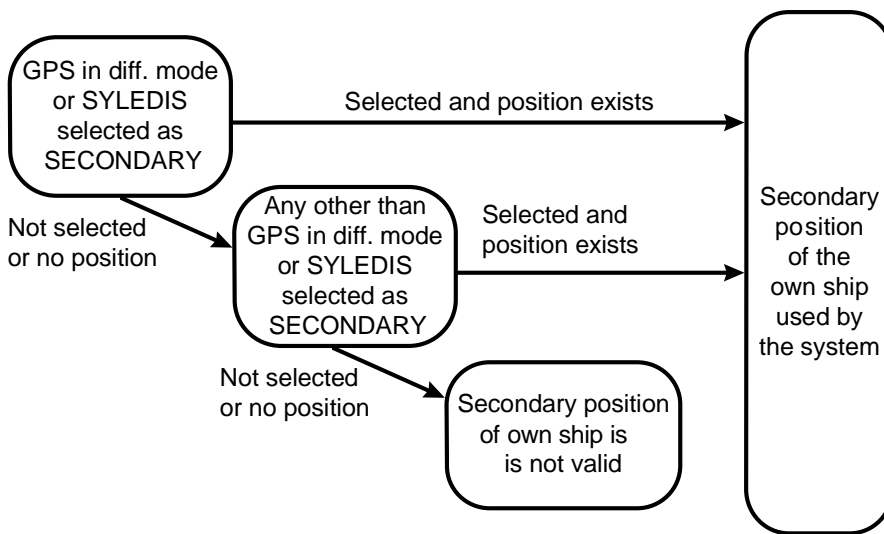
19.4 Primary and Secondary Positions of Own Ship

The system has three different positions for your ship: System position, primary position and secondary position:

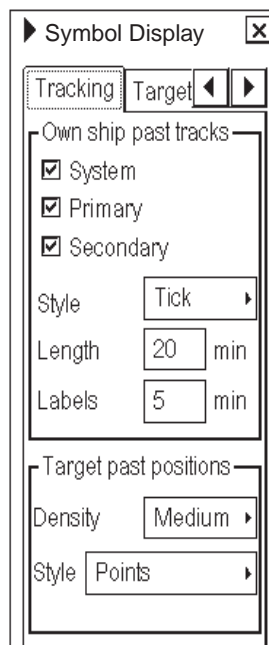
- System position: Used for navigation and steering. See section 19.3 "Source of Position".
- Primary position: Position generated by position source selected as primary position source.
- Secondary position: Position generated by position source selected as secondary position source.

The position source for primary position of your ship is selected either as Primary or as Pri no alert on the POSN page of the Sensors dialog box.

The position source for secondary position of your ship is selected either as Secondary or as Sec no alert on the POSN page of the Sensors dialog box. Secondary position of your ship is not available as latitude/longitude value for the operator.

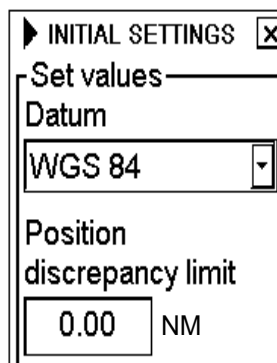


System, primary and secondary positions of your ship may be plotted on the ECDIS display with the Past tracks feature. You can control their visibility from the Tracking page of the Symbol Display dialog box, shown right. In this example, past tracks are plotted using Ship system position, Primary and Secondary position sources.



19.5 Position Discrepancy Alert

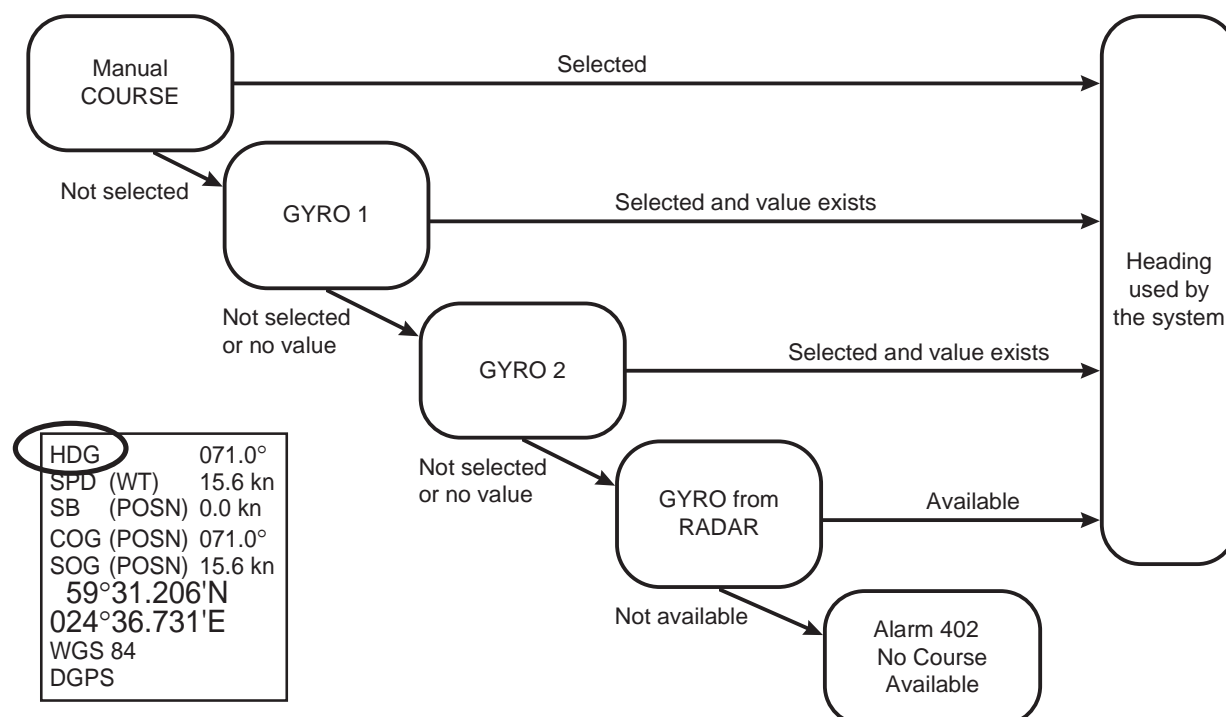
You can activate the alert "407 Position discrepancy" from the Initial Settings dialog box. The alert is active between primary position and any secondary positions. Note that the alert is also effective between your ship's position and any positions, since ECDIS compass position discrepancy between position used by system (your ship's position) and any individual position sensor selected as primary or secondary source of position. To deactivate the alert set limit as 0.00.



19.6 Source of SOG, COG, Speed, Heading, ROT, Drift and Docking Speed Components

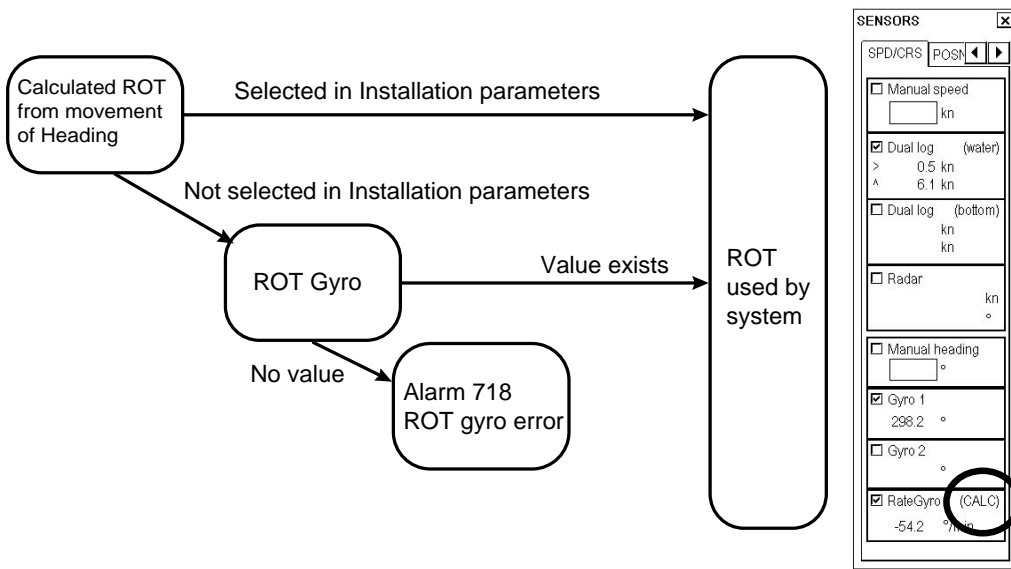
The figure below shows how various sources of navigation data are selected. "SOG, COG" is speed over ground and course over ground, respectively. "Speed" is speed over water, "Drift" is the difference between speed over water and speed over ground. Docking speed components are bow speed (transversal), stern speed (transversal) and center speed (longitudinal).

Heading used by the system is shown at the upper right corner of the ECDIS display. In the example shown below, heading is received from a gyrocompass and it is shown without additional text, meaning the value is referenced to true North. Additional gyro-related text that may appear are "(mag)" if the value is referenced to magnetic North, "(man)" if the value has been manually entered; or "(corr)", which is displayed in orange, if the value includes gyro correction.



ROT used by the system is shown in the SPD/CRS page of the Sensors dialog box. The Rate Gyro field shows the text "(calc.)" when the system calculates ROT from movement of heading. No text is shown when the value is received from an ROT gyro.

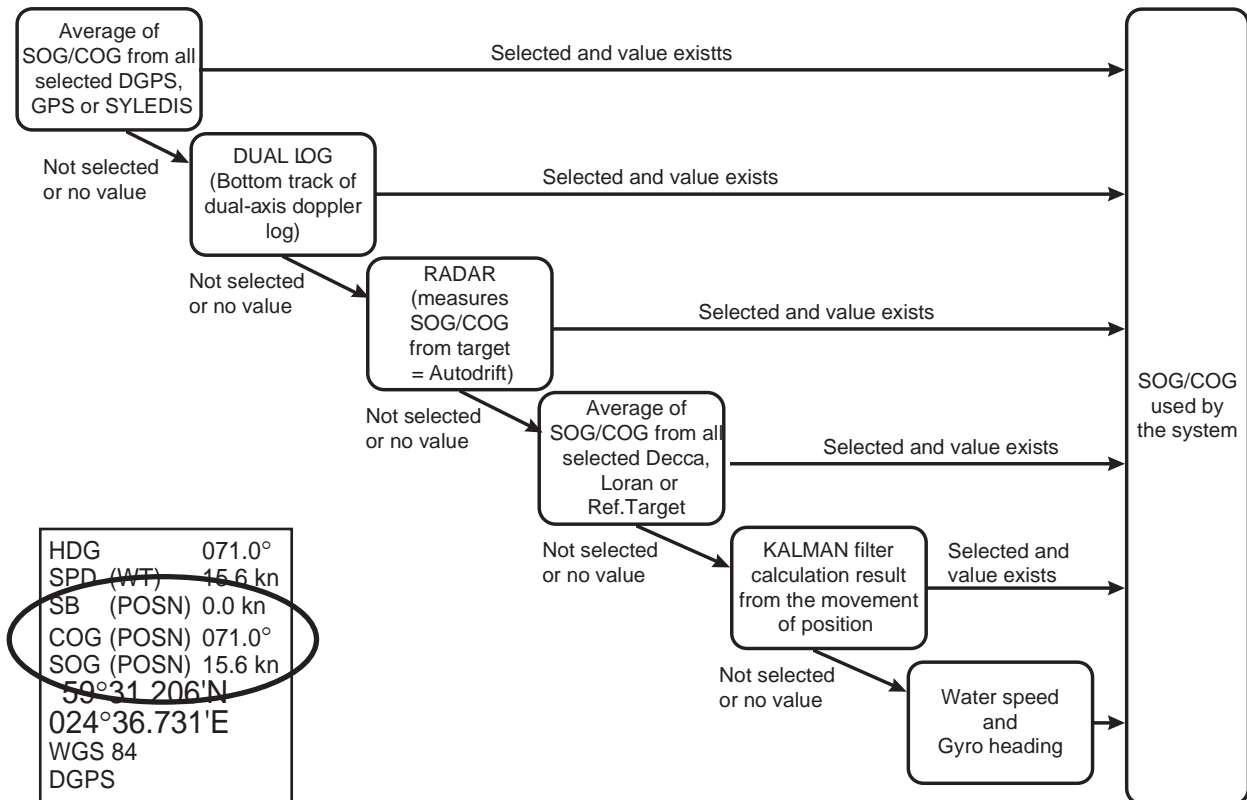
19. Navigation Sensors



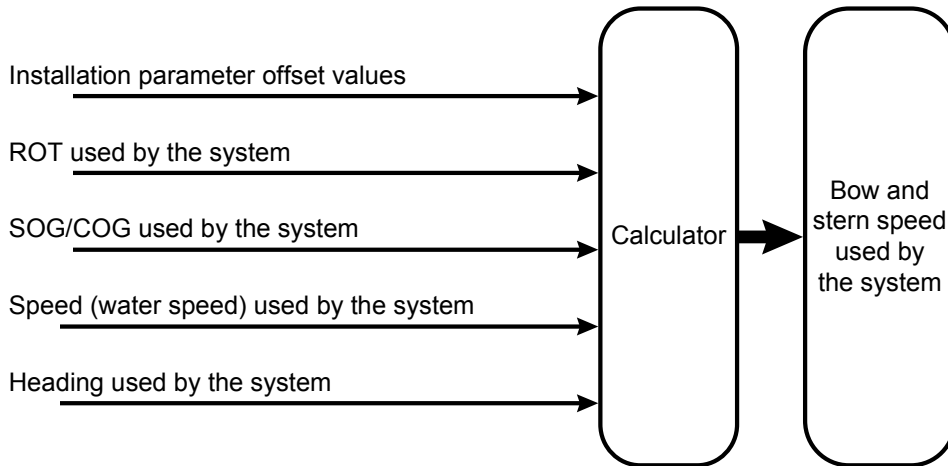
SOG/COG used by the system is shown at the upper right corner of the ECDIS display. In the example below, COG and SOG are from selected position sensors and this is indicated with the text "(pos)". Other text that denote SOG/COG source are

- (BOT): Bottom tracking dual-axis log
- (CALC): Speed calculated from SOG
- (WT): Water tracking log
- (RDR): Mixed sources of COG and SOG in the connected radar
- (POSN): Average of selected position sensors
- (FILTER): Kalman filter
- (MAN): Manual entry

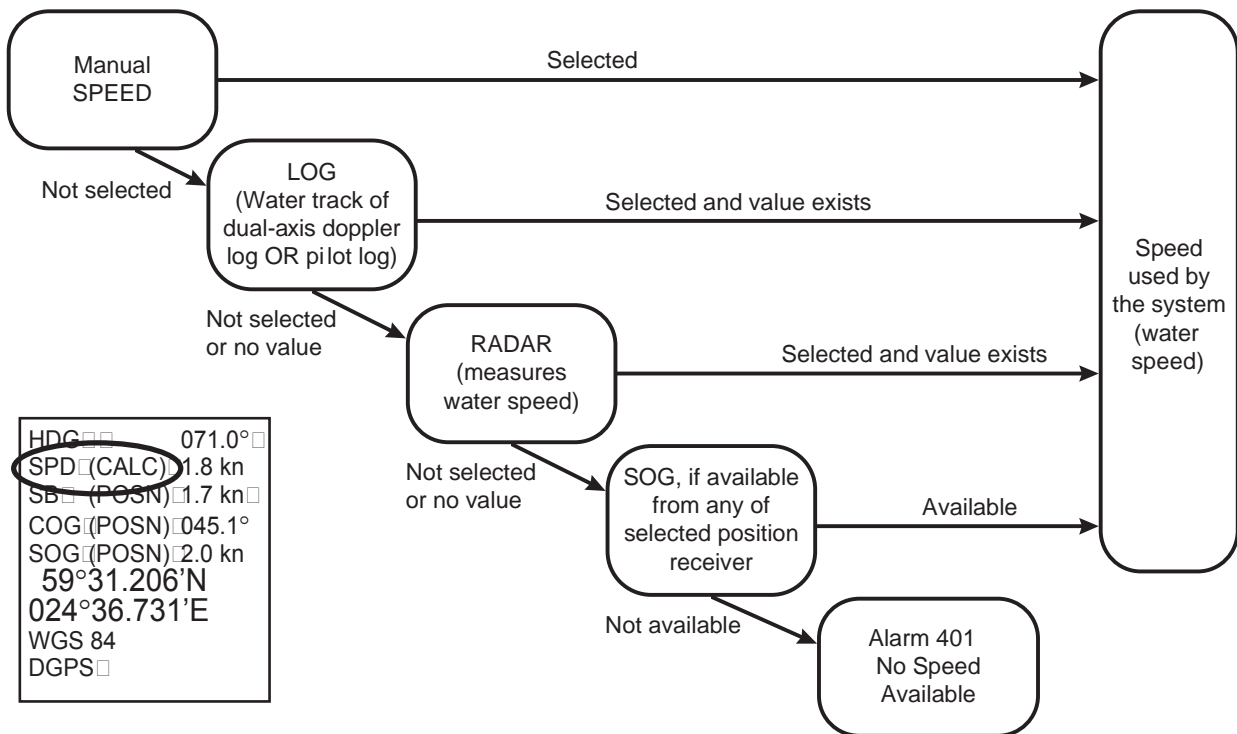
Note that (pos), (bot), (wat) and (man) could come from direct interfaces of the system or from the connected radar.



The figure below show the source of docking speed components used for the predictor.



The figure below shows the source of water speed is used for drift calculation.

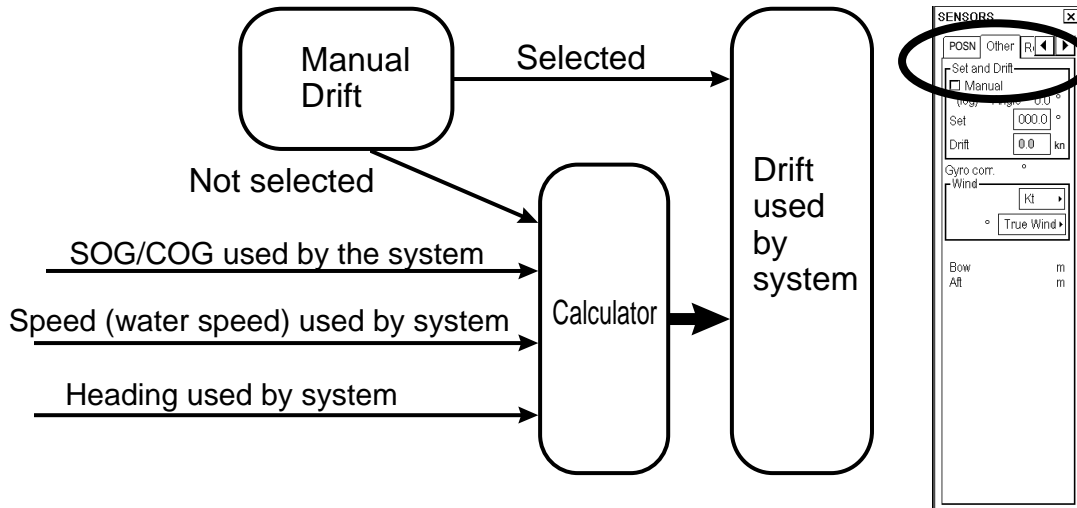


HDC	071.0°
SPD (CALC)	1.8 kn
SB (POSN)	1.7 kn
COG (POSN)	045.1°
SOG (POSN)	2.0 kn
59°31.206'N	
024°36.731'E	
WGS 84	
DGPS	

19. Navigation Sensors

Drift used by the system is shown in the Other page of the Sensors dialog box. In the example below, set and drift have been entered manually since the Manual box is checked. Other text that may appear to show source of set and drift are

(LOG): Log or dual-axis log
(POSN) Position sensor
(FILTER): Kalman filter
(MAN): Manual entry.



Alert related to SOG, COG, speed, heading, ROT, drift and docking speed components

It is possible that the operator has not selected any speed or heading sensors, or that the selected sensors do not have any valid values. This kind of a situation is critical for the system, because it cannot even perform dead reckoning. When no speed source is available, the system generates the alert "401 No speed available". When no heading source is available the system generates the alert " 402 No heading available".

The system may find that SOG and/or COG from the sensors are unreliable, at which time it generates the alert "413 SOG&COG unreliable". Note that the source of SOG and COG is not only speed and course sensors, but the source can also be position-fixing equipment. For more information about source priority for SOG/COG, see section 19.6 "Source of SOG, COG, Speed, Heading, ROT, Drift and Docking Speed Components".

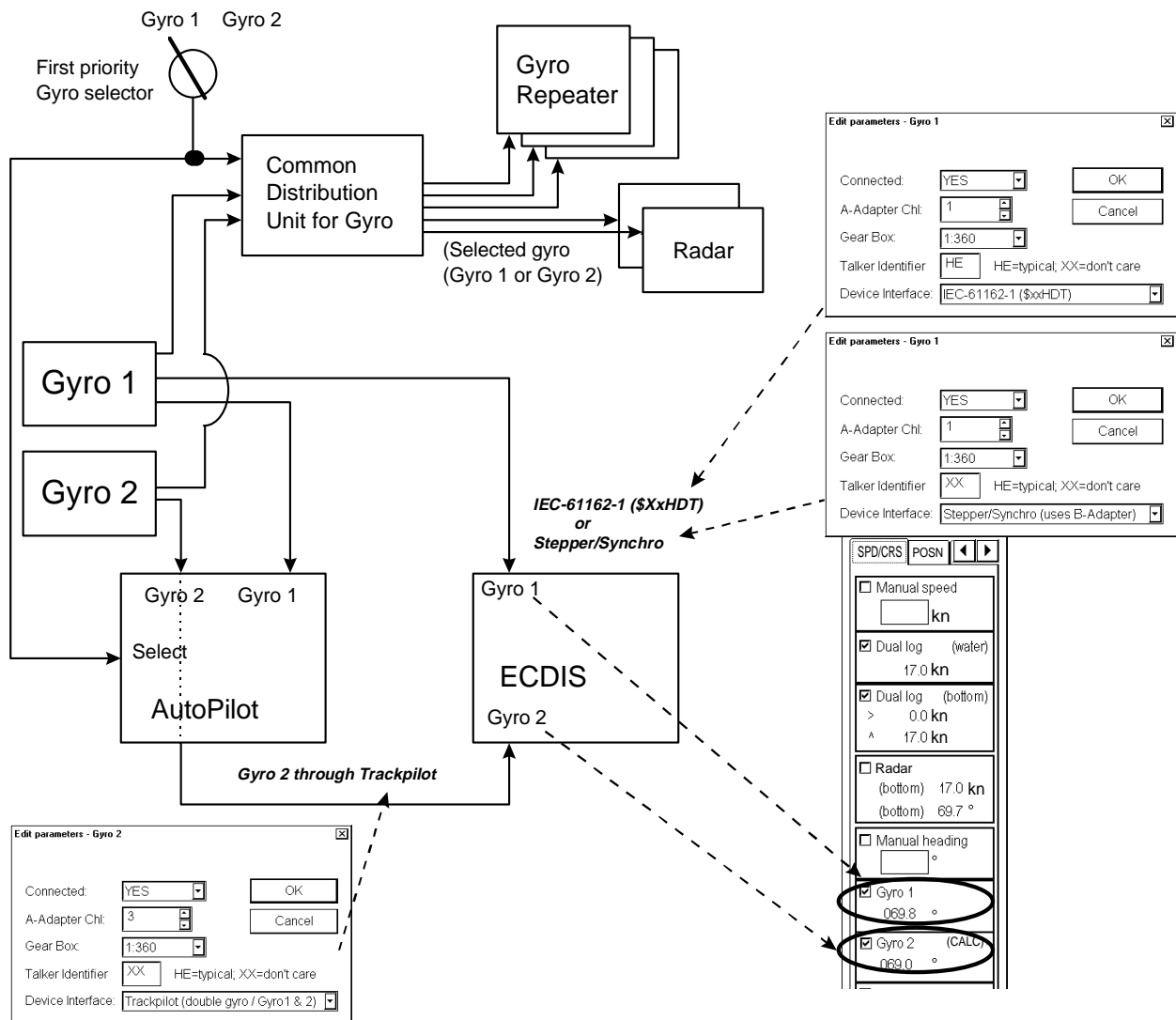
Verify and select valid sensors in the SPD/CRS and POSN pages of the Sensors dialog box for SOG and COG used by the system.

19.7 Dual Gyro Interface for DNV NAUT-AW

DNV NAUT-AW requires dual gyro interface for a track control system, which consists of the ECDIS and the Autopilot FAP-2000. The benefit of this arrangement is that loss of a single gyro does not interrupt track control. The track control system can continue smoothly with a backup gyro.

Dual gyro interface is accomplished by connecting two gyros (Gyro 1 and Gyro 2) directly to the Autopilot FAP-2000. A selection switch (first priority Gyro selector) is used to select heading source for Autopilot FAP-2000, ECDIS and common gyro distribution unit. The ECDIS indicates the state of "First priority Gyro Select selector" switch on the Speed/Course page of the Sensors dialog box, with the text indication "active" or "backup" in the Gyro 1 or Gyro 2 field.

Smoothing is added for smooth transition (i.e., without unexpected large rudder movements) from one gyro source to another gyro source. This smoothing is used both for operator-requested changes (i.e., operator change position of "First priority Gyro Select selector") and for automatic changes (i.e., automatic continuation with backup source).



Gyro data distribution for track control system

19.7.1 Indication of gyro source

Information area

Possible gyro source indications, which appear at the upper right corner, are as follows:

- (1): Heading used by the ECDIS is from Gyro 1.
- (2): Heading used by the ECDIS is from Gyro 2.
- (cor1): Heading used by the ECDIS is from Gyro 1 and that gyro correction has been used
- (cor2): Heading used by the ECDIS is from Gyro 2 and that gyro correction has been used
- (mg1): Heading used by the ECDIS is from Gyro 1 which is a magnetic compass
- (mg2): Heading used by the ECDIS is from Gyro 2 which is a magnetic compass

HDG (2)	071.0°
SPD (WT)	15.6 kn
SB (POSN)	0.0 kn
COG (POSN)	071.0°
SOG (POSN)	15.6 kn
	59°31.206'N
	024°36.731'E
	WGS 84
	DGPS

Above is an example where "First priority Gyro selection" switch is in state Gyro 2.

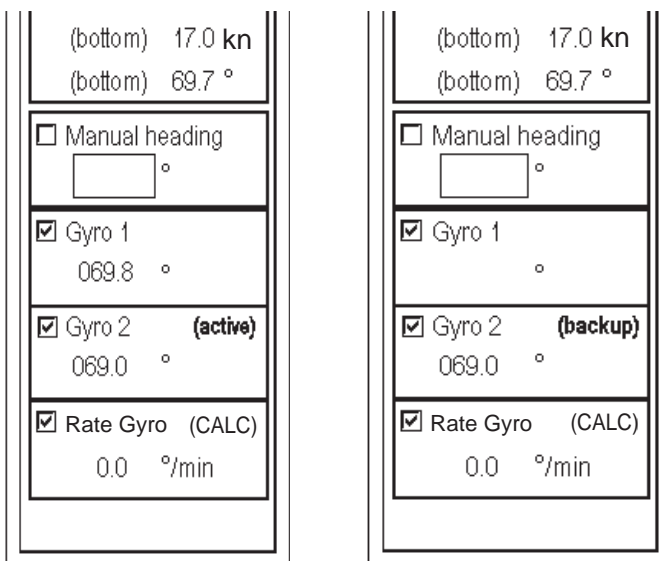
Sensors dialog box

The SPD/CRS page of the Sensors dialog box shows gyro indication as follows:

- (active): The system uses value from this gyro which is selected by "First priority Gyro Select selector".
- (backup): The system uses value from this gyro which is NOT selected by "First priority Gyro Select selector"

In the example screen at left in the figure below, heading information from Gyro 2 is used by the Autopilot FAP-2000 and the ECDIS. The indication "(active)" in the Gyro 2 field indicates that the system uses operator-selected gyro as source of heading (State of "First priority gyro selector" switch). In this case the text "(2)" appears at the upper right corner.

In the example screen at right in the figure below, heading value from Gyro 1 is lost. In this case, the system automatically selects Gyro 2 to be used as the source of heading. The indication "(backup)" in the Gyro 2 field means that a backup gyro is used.



19.7.2 Gyro-associated alerts

When no gyro value is received from gyro selected by "First priority gyro selection", alert AL 10 (Missing working gyro) is generated at the Autopilot FAP-2000.

When no gyro value is received from a gyro not selected by "First priority gyro selection", alert AL 11 (Reference gyro missing or Compass comparison alert) is generated at the Autopilot FAP-2000. Note that alert AL 11 is activated also if the deviation between Gyro 1 and Gyro 2 is too large (default is 12°).

ECDIS generates alert 705 for missing Gyro 1 and alert 706 for missing Gyro 2. If the deviation between gyro 1 and gyro 2 is over 5°, then ECDIS generates the alert 404 Gyro data unreliable.

19.8 Filter Operation

The ECDIS has an automatic multi-sensor Kalman filter for position. The filter can calculate estimated position using all operative position sensors.

To view position sensor status, put the cursor on the Position indication, confirm that Sensors appears in the mouse functions area then push the right mouse button.

Operator can manually include or exclude sensors. Remaining sensors (= sensors with any selection other than OFF) are included in the filter processing. The purpose of this filter is to continuously monitor the position given by each individual sensor to determine if the sensor is reliable or not. Also selected gyro and log sensors are included into this analysis. The filter knows the behavior of different types of sensors (Loran, Decca, GPS, DGPS, etc.). The result of the processing is a smoothed position that is used as final position of the ship. The filter eliminates all "position jumps" in the final position even if there is a position jump in a sensor. (A position jump is caused by line change in Decca, loss of differential signal with DGPS, etc.)

The filter can be selected or deselected by switching it ON or OFF. When switching filter state from ON to OFF, new start position of the filter is set as an average value of the enabled sensors (sensors with any selection other than OFF). Change the filter state from OFF to ON, and the filter continues processing from current position.

When the filter is selected, alerts are generated if the system does not have a valid position available. No alerts are generated for position jumps of the position sensors selected for use with the filter as long as the filter is able to estimate a reliable position based on selected position sensors. If there is a change in the availability of the sensor selected with the Kalman filter and if the filter cannot continue the same level of position accuracy, then the system generates the alert "410 Filter: POSN source CHG". This change of available sensor may or may not affect the operation of the filter.

The filter requires at least one position sensor and one course sensor (i.e., gyro) selected and valid in order to operate. The filter has one main alert "400 Filter: POSN unreliable". This alert means that the filter is not able to calculate the position from the connected sensors. This can happen if there is only one position sensor connected and the position generated by it becomes unreliable or if there are more position sensors but they are deviating too much. The alert can appear also if the speed/course sensor (Log or Gyro) is found to be unreliable. Note that the filter indicates unreliable position sensor by showing position in red.

If the filter is used without automatic route steering then, in case of alert 400, only the filter itself is set in the OFF state. After generating the alert 400, the system will use its normal method to select position source from available sensors. Normally, this causes a jump in the position. After the alert 400 is generated, the operator should evaluate which sensor caused the problem, disable the bad sensor then turn the filter ON again.

The Kalman filter is designed to support automatic route steering and thus it requires that you have some speed. If the speed is less than the value set in the installation parameters (for example, 4 kn), the system generates the alert "408 Filter: SPD below 4 kn". If you don't use automatic route steering, the system also selects the filter as OFF after generating the alert 408. With automatic route steering, the system keeps the filter selected, but repeats alert 408.

The system can check that each selected position sensor is within the position discrepancy limit set by the operator. (For further details, see section 19.5 "Position Discrepancy Alert".) If a position sensor has position discrepancy active, it is automatically excluded from the Kalman filter. This feature enables the operator to control how much discrepancy there can be between the Kalman filter position and any position sensor.

19.8.1 Filter and automatic route steering

The filter can operate based on only one position sensor and one gyro. However, this minimum selection is not suitable for automatic route steering or program track, which both require an independent speed source. With automatic route steering, the minimum selection is for GOTO WPT:

- One position sensor, gyro and log or
- Two position sensors and gyro
- And for GOTO Track:
 - One high-precision position sensor, gyro and log or
 - One high-precision position sensor, secondary position sensors and gyro

Source of position indicates what kind of sensors the filter is using for position calculation. The permanent indication is shown at the top right hand corner:

- FILTER: There is no high-precision position sensor selected and available for the filter.
- FILTER HIGH: There is a high-precision position sensor selected and available for the filter. It is possible to use track steering modes that require accurate position (GOTO Track, Program Track).

Filter state, automatic route steering and alert

Filter state, automatic route steering and alert

Alert	Meaning
400 Filter: POSN unreliable	The filter is not able to calculate the position from the connected sensors.
406 Route: CRS jump possible	Generated after alert 2000 is displayed. It reminds you that if you want to continue automatic route steering you need to select one of the position sensors. Then, most probably your ship will perform a turn as a consequence of next WPT position.
470 Disabled: Needs filter on	You tried to enable automatic route steering without Kalman filter positioning.
475 Route: Needs filter ON	Filter is lost during automatic route steering.
476 Route: Needs log sensor	Log device is lost during automatic route steering and your remaining log selection doesn't meet minimum requirements.
490 Disabled: Needs log sensor	You tried to enable automatic route steering without an independent speed source.
491 Disabled: Needs diff pos.	You tried to enable automatic route steering for GOTO Track mode without a high-precision sensor.
492 Route: Needs diff pos.	You lost a high-precision sensor in automatic steering, GOTO Track mode, and remaining sensor doesn't meet the minimum requirements for high-precision sensor.
493 ProgTrack: Needs Filter ON	You lost the Kalman filter position during program track.
494 ProgTrack: Needs diff pos.	You lost a high-precision position sensor during program track and remaining sensor doesn't meet the minimum requirements for high-precision sensor remaining selection doesn't meet the minimum.
495 ProgTrack: Needs log sensor	You lost a log device during program track and your remaining log devices selections don't meet the minimum requirements.

About alert "400 Filter: POSN unreliable"

If the filter is used with automatic route steering then, in case of alert "400 Filter: POSN unreliable", all position sensors and the filter itself are switched OFF and the system continues with backup dead reckoning, based on selected speed/course sensors. In this case it is recommended that you leave automatic route steering and continue using a more traditional steering mode until you find the reason why alert 400 was generated. If you don't leave automatic route steering, the system will repeat alert "475 Route: Needs filter ON" every 15 seconds.

After the alert 400 is generated, the operator should leave automatic route steering and evaluate which sensor caused the problem. If the ship position from a position sensor is acceptable, switch it on. Don't select any sensor that causes jumping. Then, you can turn the filter ON again and continue automatic route steering.

19.9 Position Alignment

The position alignment feature functions to fine-tune ship's position by using radar overlay, radar echo target and ECDIS chart material.

If position alignment is in use, the ECDIS will generate the following alert every 30 minutes to remind the operator to align position: "342 ChartAlign: over 30 min".

19.9.1 Position alignment by means of the ECDIS

If the radar echo targets' symbols are not positioned correctly, there is either position error or gyro error or some combination of these errors.

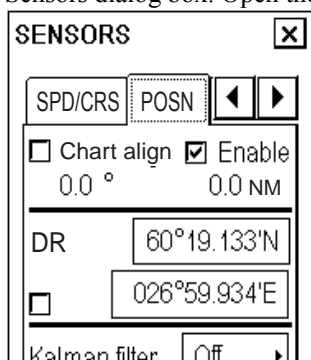
Position may be aligned on the ECDIS display by moving your ship's position or by moving a Tracked Target's position. Moving is done by dragging and dropping your ship symbol or Tracked Target to desired location. Drag and drop means that you place the object on desired location by rolling the trackball while pressing and holding down the left mouse button then "anchoring" the object by releasing the left mouse button.

Note: If the radar overlay is on the ECDIS display when position alignment is done, then

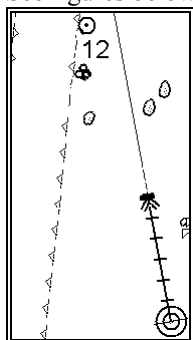
- Mode of radar overlay is temporarily changed to "Radar over Chart".
- ECDIS temporarily uses radar overlay color also for your ship and Tracked Target symbols.

To align position, do the following:

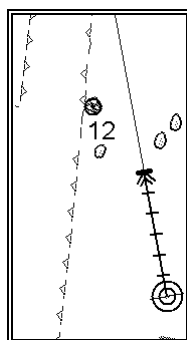
1. Select desired chart material (ARCS or S57).
2. Select suitable radar target manually for tracking.
3. Put the cursor on the position indication in the information area then push the right mouse button to display the Sensors dialog box. Open the POSN page, then check Enable chart align.



4. Use the trackball and the left mouse button to drag and drop a symbol or suitable chart detail on a radar target. See figures below.



Before position alignment

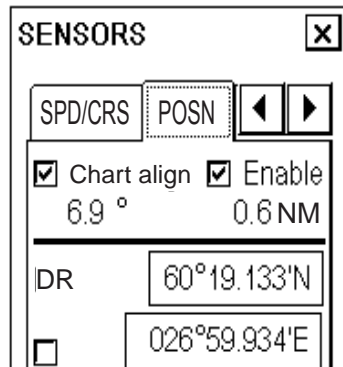


After position alignment

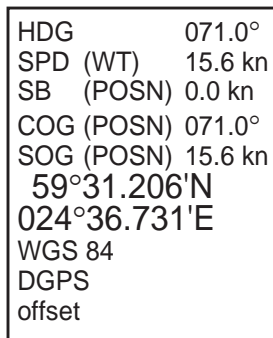
19. Navigation Sensors

5. If the position source is dead reckoning, the position set with chart alignment is the new start position for dead reckoning. In this case, there is no offset and the text indication "offset" does not appear. If the position source is something other than dead reckoning, then the indication "offset" is displayed at the upper part of the information area. Also the range and bearing of the offset are shown in the POSN page of the Sensors dialog box. See the figure below.

You can see range and bearing of the offset in the POSN page of the Sensors dialog box.



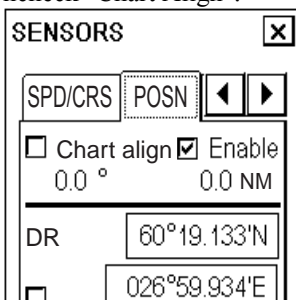
The indication OFFSET appears on the ECDIS display.



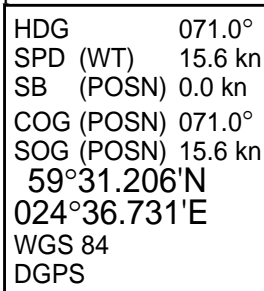
19.9.2 How to reset position alignment

To reset position alignment, do as follows:

1. Open the Sensors dialog box then open the POSN page.
2. Uncheck "Chart Align".



3. Check that the indication "offset" is not shown in the upper part of the information area, to the right of the position source indication.



19.10 Gyro Error Correction

Typical gyro error sources are installation error, speed/latitude error and dynamic settling error. Typically you detect gyro error on a user chart superimposed on the TT picture, on Tracked Target drawn on the ECDIS display or on radar overlay drawn on the ECDIS display.

Gyro error correction is used to remove the difference between the chart north and the gyro north.

Gyro error can be corrected totally or partially in the gyrocompass system itself. Many gyrocompass systems have automatic speed/latitude correction, which may use automatic or manual input for speed and latitude. Some gyrocompass systems also include correction for dynamic settling error.

Automatic gyro error correction based on tabled speed/latitude correction can be used, if the gyrocompass itself does not make any corresponding correction.

Gyro error compensation can be used to:

- Correct user chart on radar screen
- Correct Tracked Target positions on the ECDIS display
- Correct radar overlay drawn on the ECDIS display
- Compensate courses used in route monitoring and automatic route steering.

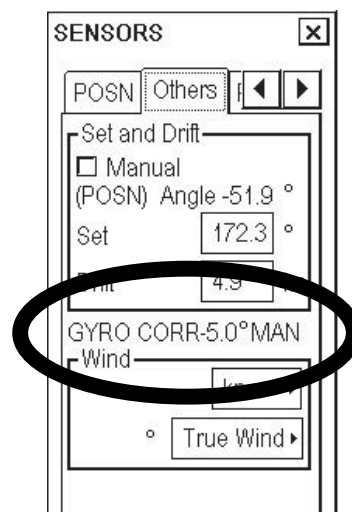
If you have enabled Gyro error correction (see the next page) and if this correction has modified the value of your ship heading, then this condition is always visible in the information area. Orange "(corr)" means the gyro value has been corrected.

HDG	071.0°
SPD (WT)	15.6 kn
SB (POSN)	0.0 kn
COG (POSN)	071.0°
SOG (POSN)	15.6 kn
	59°31.206'N
	024°36.731'E
	WGS 84
	DGPS

If you have enabled both Gyro error correction from ship parameters and Gyro error compensation from route parameters, then Plan and Next in the information area display show compensated values, as shown in the example at right. Also, course to steer (used by automatic route steering) is compensated in this case.

Route:	XCXXC	To WPT	5
Plan Speed	30.0 kn	Dist WOP	2.85 NM
Plan	68.8 °	Time	43:51
Route	68.3 °	Turn RAD	3.0 NM
Ch LIM	500 m	Turn rate	1.2 °/min
Off track	> 4976 m	Next WPT	6
		Next	70.7 °

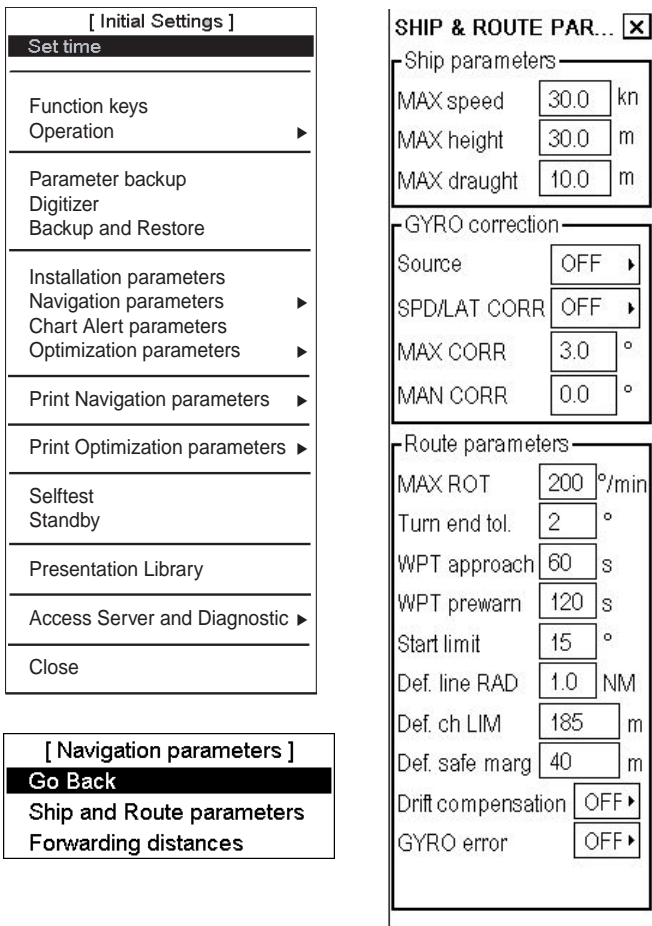
The current value of gyro correction and its method are displayed in the Other page of the Sensors dialog box as shown in the example at right. "Table" means speed/latitude table is the source for gyro correction; "Manual" indicates manual entry of gyro correction.



19.10.1 How to enable gyro error correction

To enable gyro error correction, which is effective for radar, ECDIS and route steering, do the following:

1. Spin the scrollwheel to display Menu/Info/Chart Menu in the mouse functions area, push the left mouse button, select Initial Settings from the menu then push the scrollwheel.
2. Put the cursor on the triangle in the Initial Settings dialog box, select Navigation Parameters from the menu then push the scrollwheel.
3. Select Ship and Route parameters from the sub menu then push the scrollwheel.
4. Put the cursor in the Gyro error correction box, spin the scrollwheel to select Auto then push the scrollwheel. This enables automatic gyro correction.



Gyro correction related settings in Ship and Route parameters dialog box

Gyro correction field

Source:

Off: Disables any gyro error correction.

Auto: Enables automatic gyro correction based on tabled speed/latitude.

Manual: Enables manual gyro error correction, in the Manual gyro correction field.

SPD/LAT CORR. Selects the automatic gyro error compensation based on tabled speed/latitude correction. Gyro error correction must be set for Auto for Gyro spd/lat error to be effective.

Max CORR.: Sets limit for maximum correction allowed. Typical value is 3 degrees.

Man CORR.: Adjusts gyro error manually. Note that to enable this function you have to switch Gyro error correction to the Manual position.

Route parameters field

GYRO error (compensation): Select ON if set courses in route steering are corrected for gyro error.

19.11 Wind Sensor

ECDIS can display and output wind data in the following three formats:

Apparent: Wind meter-measured wind speed and direction.

Wind angle reference: Heading

North: True wind angle, true wind speed

Wind angle reference: True North

Theoretical: True wind angle, true wind speed

Wind angle reference: Heading

The illustration below shows wind speed and direction with given ship data.

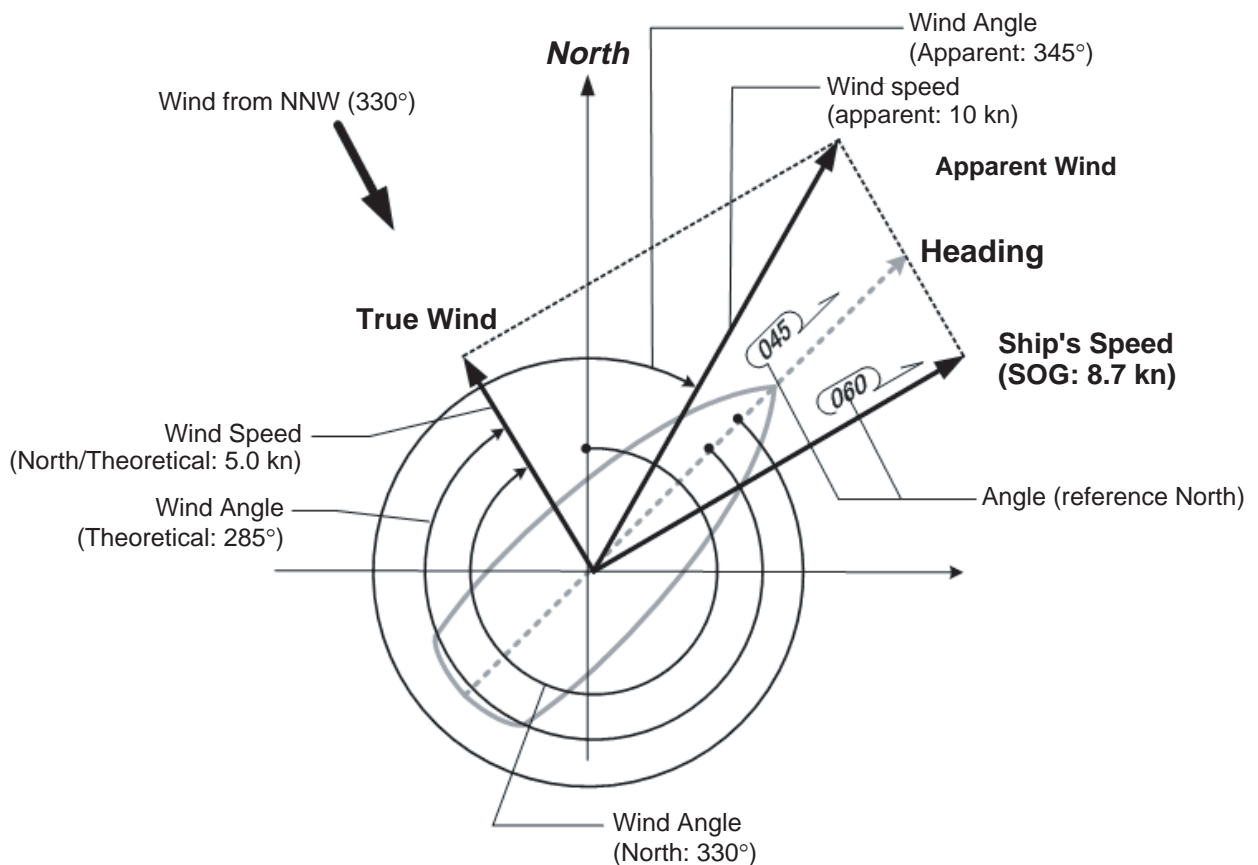
The wind values are as shown below.

Ship information:

COG: 60° SOG: 8.7 kn

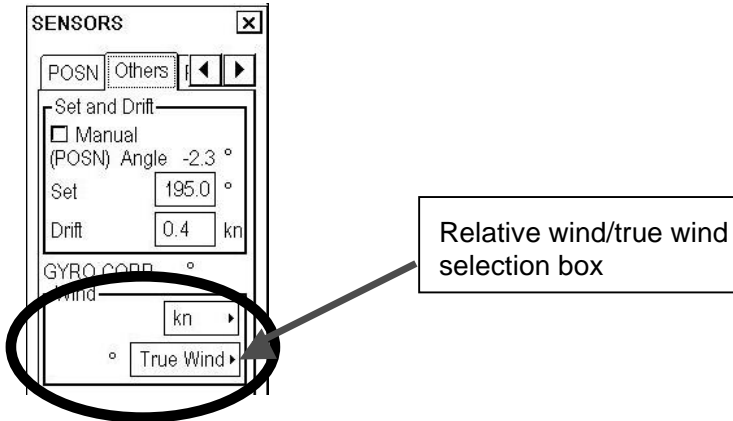
Heading: 45°

	Wind angle	Wind speed
Apparent:	345°	10 kn
North:	330°	5 kn
Theoretical:	285°	5 kn



19. Navigation Sensors

True wind or Relative wind may be selected from the Other dialog box in the Sensors menu.



19.11.1 Installation parameter for wind sensor

There are installation parameters for a wind sensor:

- Source of True wind (Setting for inputted serial data)
- Display format (Relative wind, true wind)
- Output format to radar (output format to radar)

The tables that follow describe the above-mentioned parameters. Greyed options are default settings.

Source of true wind

Option	Description
Receive (R)elative/Apparent Wind and Calculate True Wind	R(Relative) is extracted from the MWV sentence, read as Apparent data and North and Theoretical are calculated.
Receive (T)heoretical Wind(HDG) and Calculate True Wind	T(True) is extracted from the MWV sentence, read as Theoretical data and North and Apparent are calculated.
Receiver (T)rue Wind(North) and use it directly	T(True) is extracted from the MWV sentence, read as North data and Apparent and Theoretical are calculated.

Display format

Option	Option in Sensor dialog box	
	Rel wind	True wind
Display Rel(=Theoretical) or True(=North)	Theoretical	North
Display Rel(=Apparent) or True(=North)	Apparent	North
Display Rel(=Apparent) or True(=Theoretical)	Apparent	Theoretical

Output to radar

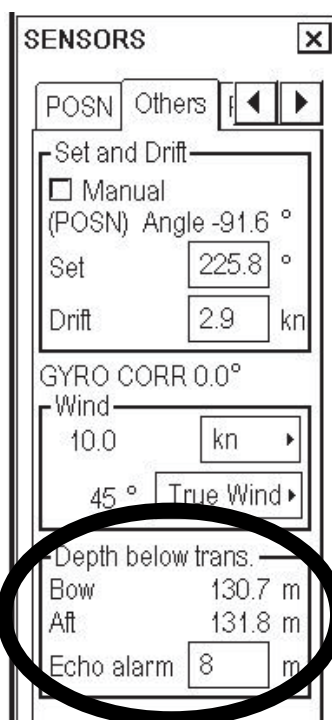
Option	Description	
Output T(=True/North) only	The reference field of the MWV sentence is T(True) and North data is output.	
Output T(=True/Theoretical) only	The reference field of the MWV sentence is T(True) and Theoretical data is output.	
Output R(=Rel/Apparent) only	The reference field of the MWV sentence is R(Relative) and Apparent data is output.	
Output R(=Rel/Theoretical) only	The reference field of the MWV sentence is R(Relative) and Theoretical data is output.	
The output sentence of the items below changes according to setting of Rel Wind and True Wind.	Option on Sensor dialog box	
	Rel Wind	True Wind
Output T(=True/North) or R(=Apparent)	The reference field of the MWV sentence is R(Relative) and Apparent data is output	The reference field of the MWV sentence is T(True) and North data is output.
Output T(=True/North) or R(=Theoretical)	The reference field of the MWV sentence is R(Relative) and Theoretical data is output.	The reference field of the MWV sentence is T(True) and North data is output.
Output T(=True/Theoretical) or R(=Apparent)	The reference field of the MWV sentence is R(Relative) and Apparent data is output.	The reference field of the MWV sentence is T(True) and Theoretical data is output.

19.12 Depth Sensor

The depth output from a depth sensor (for example, echo sounder) is shown on the Other page in the Sensors dialog box.

The content of the Other page in the Sensor menu depends on sensors connected.

In this example there are two transducers (bow and aft) installed.



The system displays depth value as depth below the transducer. If required, you can activate an alert, in the Echo alert box, based on the depth below the transducer. If the measured depth is less than the set at Echo alert, the system generates the alert "320 Depth below limit".

19.13 ROT Sensor

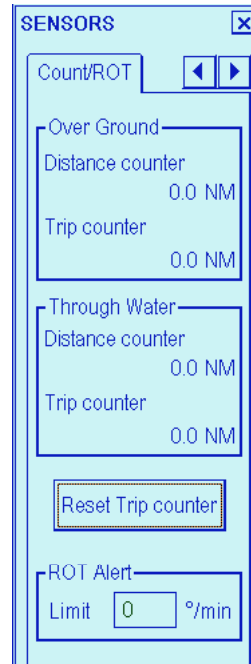
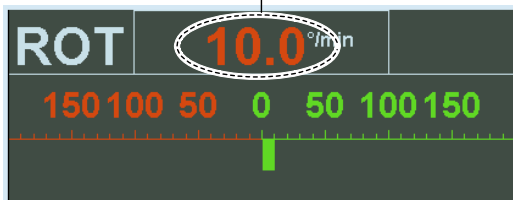
You can get an alert when the ship's ROT is above the specified ROT. Open the Sensors dialog box and click the Count/ROT tab. Enter the limit in the Rot Alert input box.

When the ROT is higher than the value specified for 10 seconds the alert "819 ROT over limit" appears.

If the ROT stays lower than the specified value for 30 seconds after the acknowledgement of the alert, the alert indication is erased.

On the conning display, the ROT indication is red when the ROT Alert function is active and the ROT is higher than the set value.

ROT indication in red when ROT alert function is active and ROT is higher than specified value.



19.14 Sensor-related Alerts

The following alerts, which are not described elsewhere, are related to sensors.

"355 Radar Comm. Error": Lost connection to radar 1. As a consequence the system loses Tracked Targets and speed/course available from radar.

"356 Radar Comm. Error": Lost connection to radar 2. As a consequence the system loses Tracked Targets and speed/course available from radar.

"357 Radar Comm. Error": Lost connection to radar 3. As a consequence the system loses Tracked Targets and speed/course available from radar.

"358 Radar Comm. Error": Lost connection to radar 4. As a consequence the system loses Tracked Targets and speed/course available from radar.

"371 Radar source changed": Lost connection to the radar that is the source of Tracked Targets and speed/course information. Then, if other radars exist, the system selects one of them as the new source of Tracked Targets and speed/course information and the system generates alert 371.

"701 B-Adapter Error": Lost connection to B-Adapter, which is an interface to various navigation sensors.

"702 Engine Control Comm Error": Lost connection to engine control, which could be an interface to various navigation sensors.

"705 Gyro Error": Lost connection to gyro1 sensor.

"706 Gyro Error": Lost connection to gyro2 sensor.

"708 Log Error": Lost connection to log sensor.

"709 Dual Axis Log Error": Lost connection to dual-axis log sensor.

"710 Echo Sounder Error": Lost connection to echo sounder sensor.

"711 Wind Sensor Error": Lost connection to wind sensor.

"712 Position Eq Error": Lost connection to position sensor No. 1.

"713 Position Eq Error": Lost connection to position sensor No. 2.

- "714 Position Eq Error"**: Lost connection to position sensor No. 3.
- "715 Position Eq Error"**: Lost connection to position sensor No. 4.
- "716 Position Eq Error"**: Lost connection to position sensor No. 5.
- "718 ROT gyro error"**: Lost connection to ROT gyro sensor.
- "721 Radar system Error"**: Displayed if radar No. 1 reports internal failure.
- "722 Radar system Error"**: Displayed if radar No. 2 reports internal failure.
- "723 Radar system Error"**: Displayed if radar No. 3 reports internal failure.
- "724 Radar system Error"**: Displayed if radar No. 4 reports internal failure.
- "819 ROT over limit"**: Ship's ROT is higher than a set value.

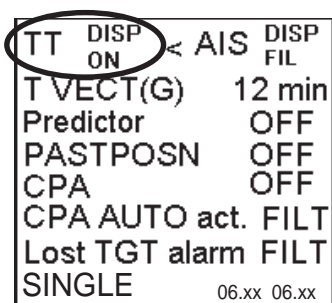
19. Navigation Sensors

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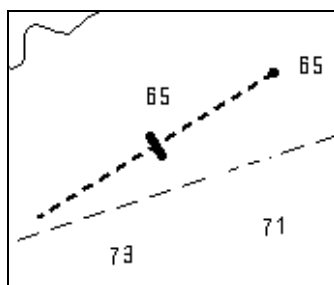
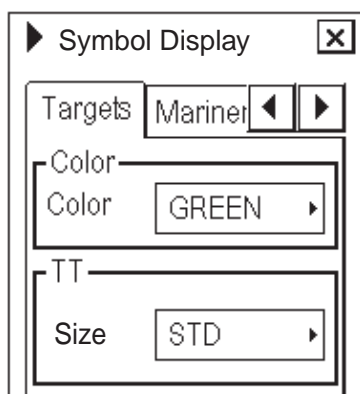
20. Tracked Targets (TT) Functions

20.1 How to Show, Hide Tracked Targets and Select Color and Size of TT Symbol

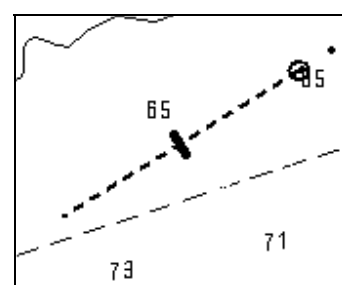
Do the procedure below to show TTs on the ECDIS display and set their color and size.



1. Put the cursor on the text "TT" in the information area then left-click to select one of the options (AUTO, MAN, OFF).
2. Spin the scrollwheel to display Symbol Display/Info in the mouse functions area then push the left mouse button.
3. Click an arrow tab in the Symbol Display dialog box until the Targets page appears, if it is not already displayed.
4. Select desired color for TT symbol from the Color list box.
5. Select desired tracked symbol size from the Tracked Tgt Size list box.



Small TT symbol



STD TT symbol

Note 1: The ECDIS display can show up to 100 tracked targets. The alert "642 TT storage 95% full" is given when 95 tracked targets are on display. The alert "643 TT storage 100% full" is given when 100 tracked targets or more are on display.

Note 2: AIS and tracked targets viewing limitations are as below.

- AIS and tracked targets are displayed on top of chart 1:1,000,001 for S57 charts.
- AIS and tracked targets are displayed on top of chart 1:1,900,001 for ARCS charts. This allows display of AIS and tracked targets on top of the largest scale ocean charts (original scale 1:3,500,000) when they are zoomed to overscale.

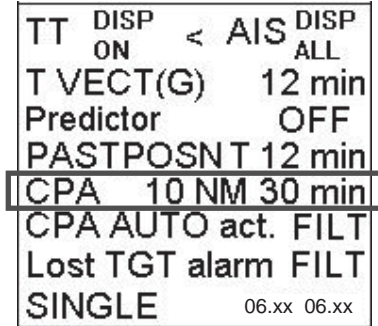
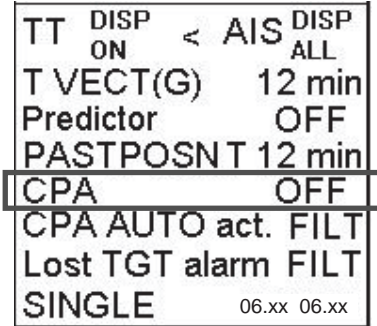
20.2 Dangerous Tracked Targets

A dangerous tracked target is displayed on the ECDIS as a blinking target symbol in red color. The ECDIS has its own definition for dangerous target limits, thus a radar may show a target as dangerous while ECDIS shows it as safe and vice versa.

20.3 How to Set CPA and TCPA Limits

You can set the CPA and TCPA limits used by the ECDIS in the information area.

1. Put the cursor on the text "CPA OFF" then left-click to get distance and time fields.
2. Put the cursor on the CPA distance value and use the scrollwheel to set distance for CPA.
3. Put the cursor on the TCPA time value and use the scrollwheel to set time for CPA.



20.4 Danger Alarm for Dangerous Tracked Targets

You can enable or disable the danger alarm (buzzer) for dangerous tracked targets as follows:

1. Put the cursor on the text CPA then right-click to show the Target alerts dialog box.



2. Check Danger alarm in the TT window to get the audio alarm for dangerous tracked targets.

20.5 Lost Tracked Targets

A lost tracked target is displayed on the ECDIS as a blinking target symbol in green and dark yellow alternately.

20.5.1 Lost tracked target alarm (buzzer)

Put the cursor on the text OFF, FILT or ALL (whichever is shown) in the Lost TGT alarm line, spin the scrollwheel to select desired option then left click to confirm selection.

The FILT option lets you set additional conditions for lost tracked targets. See the dialog box below.

To set the conditions for the lost target alarm, put the cursor on the setting of "Lost TGT alarm" then right-click to show the lost target alarm dialog box.

Lost target alarm	
AIS	
<input type="checkbox"/> MAX range	0.0 NM
<input type="checkbox"/> MIN ship speed	0.0 kn
<input type="checkbox"/> Exclude class B	
<input type="checkbox"/> MIN ship length	0.0 m
TT	
<input type="checkbox"/> MAX range	0.0 NM
<input type="checkbox"/> MIN ship speed	0.0 kn

Set desired additional conditions (Max range and Min. ship speed).for lost tracked targets in the TT window.

20.6 How to Display True or Relative Speed Vectors

Targets vector can be displayed relative to own ship's heading **R Vect** or with reference to the North (true vector stabilised to Ground, **T Vect(G)** or True vector stabilised to Sea, **T Vect(S)**). All presentation modes can be used with relative motion or true motion.

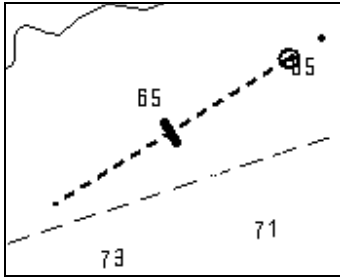
Vector time (or the length of vectors) and presentation mode can be set on the information area Put the cursor on the item you wish to change, spin the scrollwheel to select setting then push the scrollwheel. See the at right for location of vector-related items.

TT DISP	<	AIS DISP
ON		ALL
T VECT(G)		12 min
Predictor		OFF
PASTPOSNT		12 min
CPA	10 NM	30 min
CPA AUTO act.		FILT
Lost TGT alarm FILT		
SINGLE		
06.xx 06.xx		

TT DISP	<	AIS DISP
ON		ALL
T VECT(G)		12 min
Predictor		OFF
PASTPOSNT		12 min
CPA	10 NM	30 min
CPA AUTO act.		FILT
Lost TGT alarm FILT		
SINGLE		
06.xx 06.xx		

20.7 How to Display Tracked Target Data

On the ECDIS display, put the cursor on a desired TT then push the scrollwheel.



TT on ECDIS screen

TGT DLG 1	
TT	TT
98	1
BRG 272.6	277.0 °T
RNG 1.0	0.6 NM
COG 240.0	°T
SOG 14.0	kn
CPA 1.0	NM
TCPA 2.6	min
BCR 0.6	NM
BCT 40.0	min
Tracking	Query

TT display window

TGT DETAILS	
TT	
TT	13
BRG	217.1 °T
RNG	1.5 NM
COG	232.5 °T
SOG	19.4 kn
CPA	0.9 NM
TCPA	57.3 min
BCR	1.0 NM
BCT	26.0 min
Tracking	
34°07.587'N	
132°53.195'E	

Expanded TT display

The basic target display dialog for a tracked target consists of the following information:

- Target's number
- Bearing (BRG) and distance (RNG) of the target from own ship
- Speed Through Water (STW) and true course (CRS) of the target, when using True Vectors (S) or COG and SOG when using other speed vector modes.
- CPA and TCPA. Note that if TCPA has a negative value, this means that you have already passed the closest point and the tracked target is going away from own ship.
- Bow Crossing Range (BCR) and Bow Crossing Time (BCT)

The detailed target display dialog for a TT displays the contents of the basic TT display plus the following information. To display detailed information, push the left mouse button.

- **Status of target.** Status can be Query, Tracking or Lost. "Query" indicates a new target for which there is not yet enough tracking history to have target speed, course, CPA and TCPA available.
- **Position of target** (Lat, Lon)

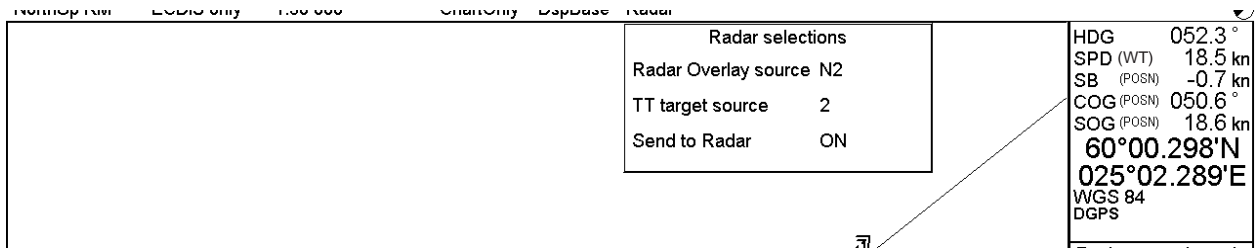
User can set Closest Point of Approach (CPA), and Time for CPA (TCPA) to define dangerous TT. CPA and TCPA limits are common for ECDIS display and danger target log function of TT and AIS targets. On the ECDIS display, a dangerous tracked target blinks in red color.

Note that the CPA and TCPA limits are only for ECDIS. A radar has its own setting for dangerous targets and thus a target that is dangerous on the radar display can be safe on ECDIS and vice versa. If a TT is within the CPA, it is shown as a dangerous TT on the ECDIS display.

TT DISP	ON	<	AIS DISP	ALL
T VECT(G)	12 min			
Predictor	OFF			
PASTPOSNT	12 min			
CPA	10 NM	30 min		
CPA AUTO act.	FILT			
Lost TGT alarm	FILT			
SINGLE	06.xx 06.xx			

20.8 Source of Tracked Targets

Tracked targets on ECDIS can be monitored from one source at the time. To find the source of tracked targets, put the cursor on Radar in the status bar.

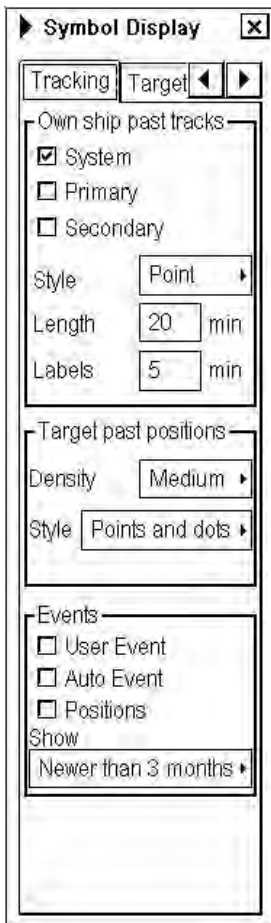


To change the source of radar targets, put the cursor on Radar in the status bar to show the Radar selections dialog box. Put the cursor on "tracked target source" number, spin the scrollwheel to select desired source then push the scrollwheel.

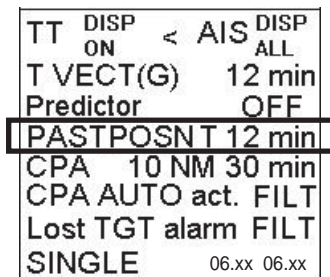
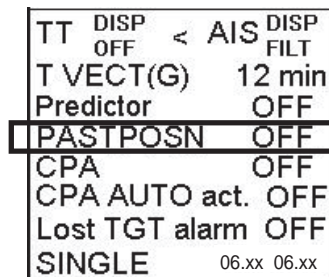
Note: The source for TT and radar echo must be the same. If not, the TT symbol may not be correctly placed on the radar echo. "Radar" (in the status bar) appears in yellow characters on blue background (default color arrangement) to alert you when the source is not the same.

20.9 Displaying Past Positions of Tracked Targets

Past Positions (or the length of trace) and presentation mode can be set on the information area, at the locations circled in the illustration below.



1. Put the cursor on the text "PASTPOSN OFF" then left-click to show a time value.
2. Put the cursor on the time value, spin the scrollwheel to set value then push the scrollwheel to set.



3. Spin the scrollwheel to display Symbol Display/Info in the mouse functions area the push the left button to show the Symbol Display dialog box.
4. Click an arrow tab in the dialog box to show the Tracking page. Select Density (Sparse, Medium, Dense) to define density of points and Style to define points style (Points, Points and dots).

20.10 Tracked Target Recording Functions

Target recording is used to record tracked target information to the danger targets log. For more information about recording a dangerous target, see section 24.5 "Danger Target Log".

20.11 Tracked Target Related Alerts

The alert "355 Radar comm. error" indicates failure to receive data from connected radars. The alert "371 Radar source changed" informs that the system has automatically changed the source of radar targets from current source to a new source. The reason for automatic change is that the communication with current source has failed.

21. AIS Target Functions

21.1 Introduction

An AIS transponder can be connected to the ECDIS to display AIS targets received from an AIS transponder. The ECDIS can store up to 1,500 AIS targets in its storage buffer. When this buffer becomes full of AIS targets, the alert 639 is generated to alert you that the storage buffer is full. The storage buffer contains automatic dead reckoning for all AIS targets, which is based on reported Speed Over Ground (SOG), Course Over Ground (COG), Rate Of Turn (ROT) and heading. The storage buffer also contains calculation of range, bearing, CPA, TCPA, etc. The CPA and TCPA limits set for dangerous targets are common for TT and AIS targets.

ECDIS can display AIS targets that are within the operator-defined range (max. range is 48 nm). The maximum number of targets that can be displayed is 240 and the operator may select the number of targets to display. For details, see section 21.3 "How to Display AIS Targets".

The frequency for update of AIS transponder-sent data depends on speed and course of tracked AIS target. The table below shows the IMO standardized reporting rates for the AIS transponder. Based on the table below, the ECDIS defines which AIS targets are in tracking or lost. When you acknowledge the lost target alert, the AIS symbol is removed from the ECDIS display. If a lost target is not acknowledged, the AIS symbol is automatically removed as shown in table below.

Type of Ship	IMO nominal reporting interval	Lost target indication (reporting interval >)	Pre-set rate for automatic removal of lost target
Class A: speed between 0-14 kn	10 s	50 s	430 s
Class A: speed between 14 - 23 kn	6 s	30 s	430 s
Class A: speed greater than 23 kn	2 s	10 s	430 s
Class A: anchored, moored, not under control or grounded, speed between 0-3 kn	3 min	10 min	36 min
Class A: anchored, moored, not under control or grounded, speed greater than 3 kn	10 s	50 s	36 min
Class B: CS speed between 0 – 2 kn	3 min	10 min	36 min
Class B: CS speed greater than 2 kn	30 s	150 s	430 s
Class B: SOTDMA speed between 0 – 2 kn	3 min	10 min	36 min
Class B: SOTDMA speed between 2 - 14 kn	30 s	150 s	430 s
Class B: SOTDMA speed between 14 - 23 kn	15 s	75 s	430 s
Class B: SOTDMA speed greater than 23 kn	5 s	25 s	430 s
Class A and Class B: no speed available	N/A	10 min	36 min
ATON	3 min	10 min	30 min
SAR	10 s	50 s	430 s
Base station	10 s	50 s	430 s
SART	N/A	10 min	30 min

An AIS transponder "sees" all ships fitted with an AIS transponder belonging to either

- Class A AIS
- Class B AIS

21. AIS Target Functions

Additionally the AIS transponder receives messages other than messages from ships:

- AIS Base station
- AIS on airborne SAR craft
- AIS on ATON (AIS aid to navigation)

There can be several hundreds or several thousands AIS targets, and of those only a few will be significant for your ship. To remove unnecessary AIS targets from the ECDIS display, the feature "active and sleeping AIS targets" is available. Initially any new AIS target received by an AIS transponder is not-active (= "sleeping"). Such non-active targets are shown with a small triangle. The operator can pick any AIS target and change it from non-active to active. Active AIS targets are shown with a large triangle with speed vector, headline, rot indicator, etc. Further, the operator can pick active AIS targets and change their status to non-active.

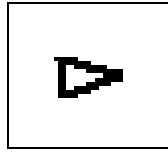
An indication of AIS target display capacity limit is given well before it is reached. When 95% of the operator-set limit is reached for displayed AIS targets, the alert "636 AIS display 95% full" appears. When the operator-set limit is reached, the alert "637 AIS display 100% full" appears.

An indication of AIS target processing capacity limit is given well before it is reached. The alert "638 AIS storage 95% full" is given when 95 percent of 1,500 targets are in the storage buffer and the alert "639 AIS storage 100% full" is given when 1,500 targets or more are in the storage buffer.

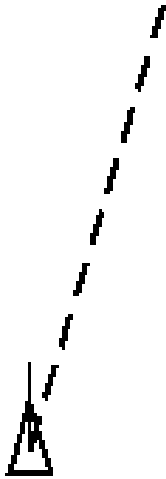
ECDIS generates AIS-related alerts and these are "Alert 632: AIS Dangerous target" and "Alert 633: Lost AIS target". Only active AIS targets generate alerts. The operator can enable or disable AIS target alerts as desired. The feature "active and sleeping AIS targets" is very effective for focusing on only those AIS targets which need supervision. The ECDIS further eases the task of the operator by automatically changing non-active targets to active targets, if they meet the dangerous target limits set by CPA and TCPA.

21.2 AIS Symbols on ECDIS

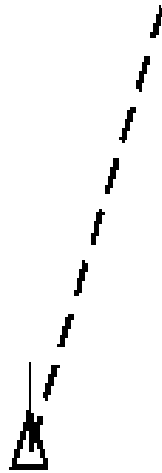
Below you can find symbols used for AIS in different status:



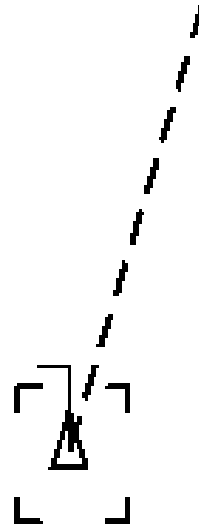
Sleeping AIS target



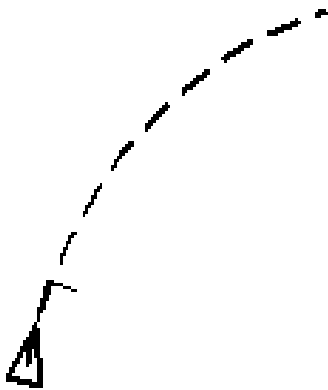
AIS dangerous target blinking red until acknowledged, then it is displayed as red symbol.



Active AIS target



Selected AIS target turning to port



AIS target turning starboard, ROT is measured by ROT gyro

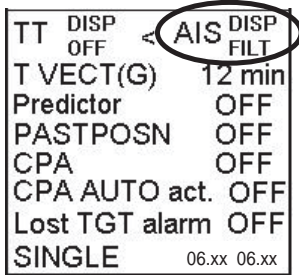


ATON symbol



Lost AIS target, red X-sign blinking above AIS symbol until acknowledged

21.3 How to Display AIS Targets



Targets that are being tracked by an AIS transponder can also be displayed on the ECDIS display. To do this;

Put the cursor on the text AIS in the information area then push the left mouse button to select an option (DISP OFF, DISP FIL, DISP ALL).

The maximum number of AIS targets on the ECDIS display is 240. The number of AIS targets on display can be limited by filtering AIS targets (option **DISP FIL**), then the max. number of AIS target on display is user defined. For more information, see section 21.4 "How to Filter AIS Targets".

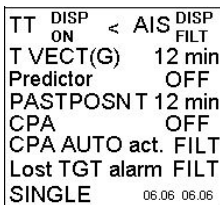
Maximum range of AIS target from own ship on ECDIS display is 48 NM. Range of AIS target can be limited by filtering AIS targets (option **DISP FIL**), then the max. Range of AIS target is user defined. For more information, see section 21.4 "How to Filter AIS Targets".

If the number of AIS targets on the ECDIS display exceeds the limit, then "Priority" selection is used to select AIS targets on the ECDIS display. For details, see section 21.4 "How to Filter AIS Targets".

Note: Notification of AIS target display capacity limit is given well before it is reached. When 95% of the operator-set limit is reached for displayed AIS targets, the alert "636 AIS display 95% full" appears. When user set limit is reached, the alert "637 AIS display 100% full" appears.

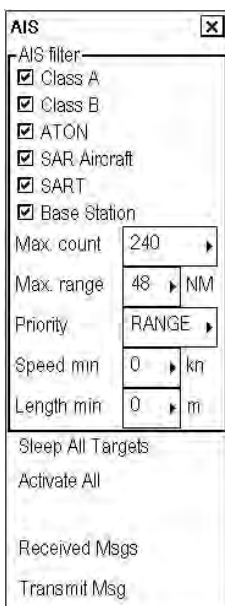
Notification of AIS target processing capacity limit is given well before it is reached. The alert "638 AIS storage 95% full" will be given when 95 percent of 1500 targets are in storage buffer and the alert "639 AIS storage 100% full" will be given when 1500 targets or more are in the storage buffer.

21.4 How to Filter AIS Targets



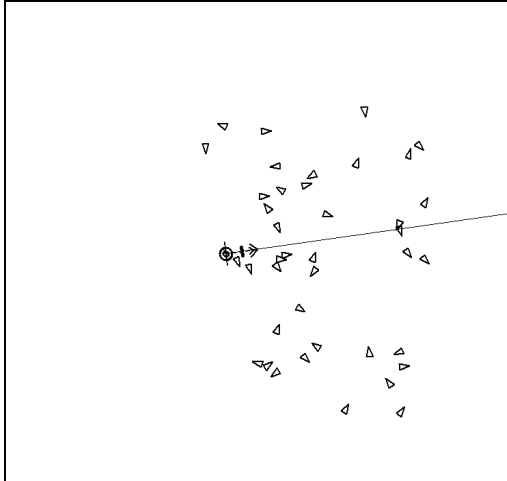
Right-click the AIS setting indication in the information area to show the AIS filter page, shown below.

1. Check desired categories of AIS targets to be displayed in "AIS filter" field.
2. Select maximum number and maximum range of AIS symbols on display
3. Select "Priority", spin the scrollwheel to select the filtering method desired (CPA, TCPA or RANGE) then push the scrollwheel or the left button. Examples of how the AIS filter works are shown in the illustrations on the next few pages.
4. Set min speed and length for displayed AIS target.
Note that the item "Speed min" does not filter ATON and Base station.
The item "Length min" does not filter ATON, SAR Aircraft, SART and Base Station.

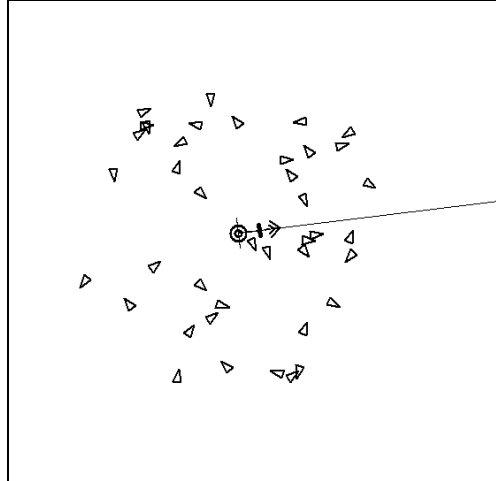


21. AIS Target Functions

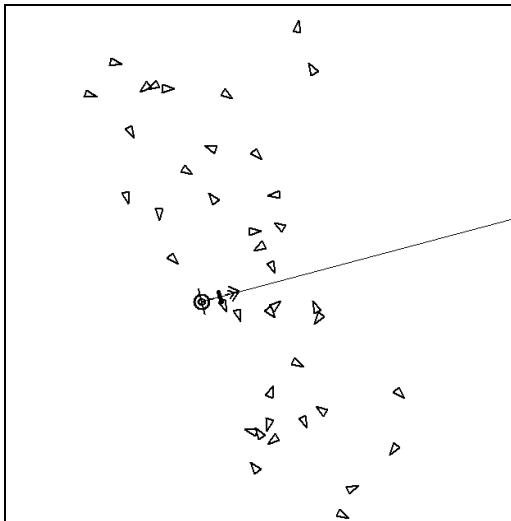
Below are examples of how targets are filtered using various filtering methods.



Filtered by TCPA



Filtered by Range

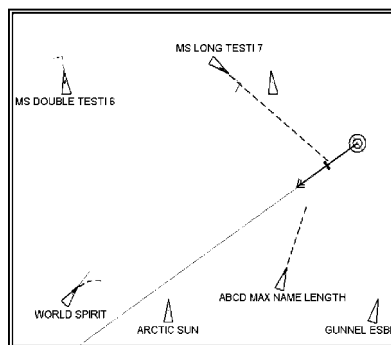
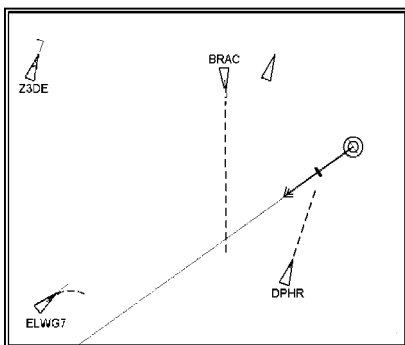


Filtered by CPA

Note: AIS and tracked target viewing limitations are as follows:

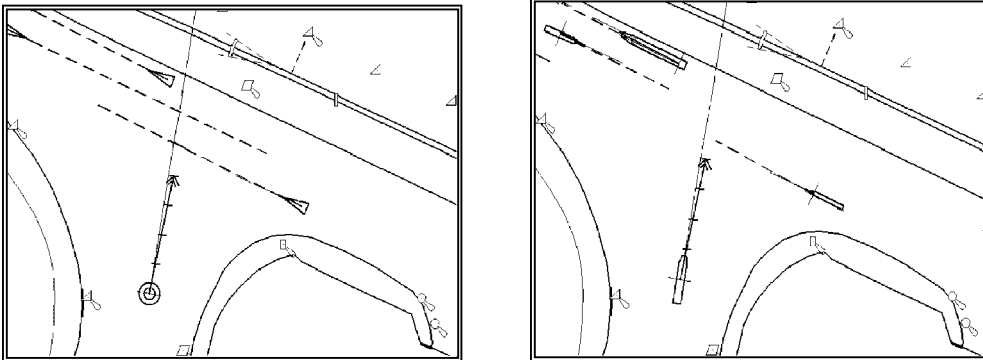
- AIS and tracked targets are displayed on top of chart 1:1,000,001 for S57 charts.
- AIS and tracked targets are displayed on top of chart 1:1,900,001 for ARCS charts. This allows display of AIS and tracked targets on top of the largest scale ocean charts (original scale 1:3,500,000) when they are zoomed to "overscale".

The left illustration shows the call signs of targets and the right illustration shows the names of targets.



21. AIS Target Functions

The right illustration shows AIS targets with "Outlines" and the left illustration shows AIS targets with "point symbols". AIS targets are displayed as true scale symbol if the displayed chart scale is larger than set with "Outlines" limit (length > 7,5 mm) on the Tracking page in the Symbol Display dialog box and your own ship are displayed as true symbol scale if the size of the true scale symbol is larger than 6 mm on the chart display.



21.5 How to Set CPA and TCPA Limits

A dangerous AIS target is one whose CPA and TCPA are within the range of the CPA and TCPA limits set in the information area. A dangerous AIS target is displayed as a blinking target symbol in red as long as you acknowledge the "AIS dangerous target" alert. Then the target symbol is displayed in red color.

You can enable or disable the audio alert for dangerous targets. See section 21.7 "Danger Alarm for Dangerous AIS Targets".

You can set CPA and TCPA limits used by the ECDIS, in the information area.

1. Put the cursor on the text "CPA OFF" then left-click to get the distance and time fields.
2. Put the cursor on the distance value and use the scrollwheel to set distance for CPA.
3. Put the cursor on the time value and use the scrollwheel to set time for CPA.

TT DISP	<	AIS DISP
OFF		FILT
T VECT(G)		12 min
Predictor		OFF
PASTPOSN		OFF
CPA		OFF
CPA AUTO act.		OFF
Lost TGT alarm		OFF
SINGLE		06.xx 06.xx

TT DISP	<	AIS DISP
ON		ALL
T VECT(G)		12 min
Predictor		OFF
PASTPOSNT		12 min
CPA		10 NM 30 min
CPA AUTO act.		FILT
Lost TGT alarm		FILT
SINGLE		06.xx 06.xx

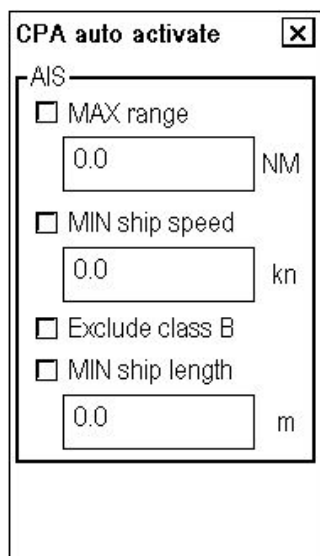
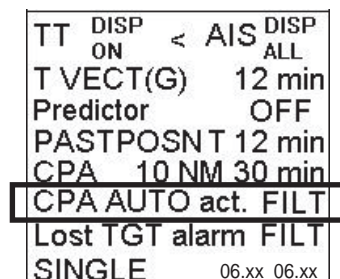
21.6 CPA Auto Activation

You can get automatic activation of a sleeping AIS target when it is within the set CPA limit. The options are OFF, FILT or ALL.

- OFF activates no AIS targets inside the CPA limit
- ALL activates all AIS targets inside the CPA limit
- FILT activates the AIS targets inside CPA limit that meet the conditions set for CPA auto activate.

Select the setting for CPA auto activation as follows:

1. Put the cursor on the text "CPA auto act". then left-click to select desired option (OFF, FILT, ALL).
2. For FILT, you can set additional conditions for AIS targets. Put the cursor on the text "CPA auto act". then right-click to open the CPA auto activate dialog box.



3. Set desired additional conditions for auto activation of AIS target (sleeping target->active target).

21.7 Danger Alarm for Dangerous AIS Targets

You can enable or disable the danger alarm (buzzer) for dangerous AIS targets as follows:

1. Set the cursor on the text "CPA" then right-click to get the Target alerts dialog box.

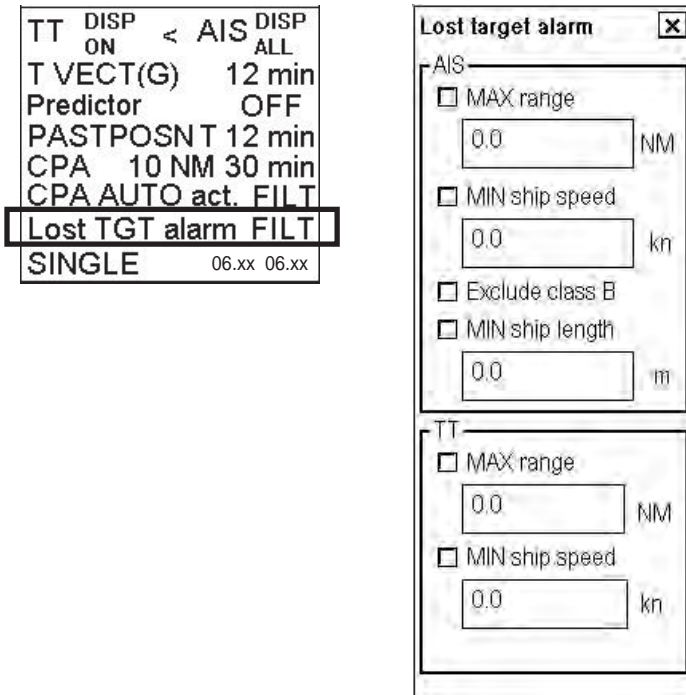


2. Check or uncheck Danger alarm in the AIS window.

21.8 Lost AIS Target Alarm

A lost AIS target is indicated with an X through the AIS target symbol. When alert "633: Lost AIS target" is acknowledged, AIS symbol will be removed from display. If alert "633: Lost AIS target" is not acknowledged in a certain time, lost AIS target symbol will be automatically removed from display. For details, see section "21.1. Introduction".

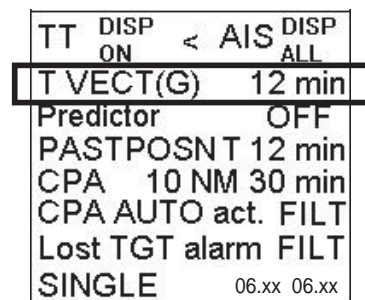
1. Put the cursor on the text "Lost target alarm" then left-click to select desired option (OFF, FILT, ALL).
2. For FILT, you can set additional conditions for lost AIS target. Put the cursor on the text "Lost TGT alarm" then right-click to open the CPA auto activate dialog box. Set desired additional conditions for lost AIS targets in the AIS field (Max range, Min. ship speed, Exclude class B and Min. ship length).



21.9 How to Display True or Relative Speed Vectors

AIS target's relative vector is displayed relative to your ship's velocity vector, RVECT, ground stabilized relative to own ship, which means that the own ship velocity vector disappears and the target vectors are the result of target and own ship course and speed. True speed vector modes are TVECT (G), true ground stabilized or TVECT (S), true sea stabilized.

Vector time (or the length of vectors) and mode can be set on the status bar, at the locations circled in the illustration below.



21.10 AIS Target Related Alerts

"636 AIS display 95% full": Shown when 95% of user set limit reached.

"637 AIS display 100% full": Shown when user set limit is reached.

"638 AIS storage 95% full": Given when 95 percent of 1500 targets are in the storage buffer

"639 AIS storage 100% full": Given when 1500 targets or more are in the storage buffer.

"737 AIS receive error": Warns that data from an AIS transponder is not correctly received.

21.11 How to Display AIS Target Data

Put the cursor on a desired AIS target then push the scrollwheel. The AIS Target Dialog window appears, similar to the one shown below.



AIS target on ECDIS display

▶ TGT DLG 1		<input type="checkbox"/>
AIS (A) <input checked="" type="checkbox"/>		
ZICZAC		
BRG	236.5	°T
RNG	11.7	NM
COG	303.1	°T
SOG	15.0	kn
CPA	10.7	NM
TCPA	-18.6	min
BCR	-12.9	NM
BCT	-46.7	min
Tracking		
59°54.401'N		
24°40.618'E		
GPS		
HDG	302.4	°T
ROT	-14	°/min
ty Using Er		

AIS target dialog window

The Target Dialog window displays the following information for an AIS target:

AIS Target Name or Call Sign

BRG: True bearing from own ship

RNG: Distance from own ship

COG: Course over Ground of the target

CRS: True Course (when using TVect (S) mode)

SOG: Speed over Ground of the target

STW: Speed Through Water (when using TVect (S) mode)

CPA and TCPA

BCR, BCT: Bow Closest Range, Bow Closest Time

Status of target: indicates target status

LAT and LON of target

HDG: heading

ROT: Rate of Turn of target

Target status

21. AIS Target Functions

If more information is needed, put the cursor in the Target Dialog window then push the left mouse button to get the Target Details window.

Note: Availability of data in the Target Details window is subject to the content the AIS transponder reports.

▶ TGT DETAILS		✕
AIS (A)	<input checked="" type="checkbox"/>	Active
ZICZAC		
BRG	236.5	°T
RNG	11.7	NM
COG	303.4	°T
SOG	15.0	kn
CPA	10.8	NM
TCPA	-18.4	min
BCR	-13.0	NM
BCT	-46.8	min
Tracking		
59°54.398'N		
24°40.627'E		
		GPS
HDG	302.7	°T
ROT	-14	°/min
Vay Using Engine		
Age	1.2s	Draught 6.5 m
Dest. CRUISING		
ETA 12 Nov 14:30		
Length	99 m	Width 15 m
Ref Bow	85m	Port 7 m
IMO#		
MMSI	090054821	
G, HS or MP category		

The operator can set Closest Point of Approach (CPA), and Time to CPA (TCPA) to define dangerous AIS targets. CPA and TCPA limits are common for ECDIS display and danger target log function of TT and AIS targets. The ECDIS display shows a dangerous AIS target with its symbol blinking, in red.

Note that the CPA limit is only for ECDIS. AIS has its own setting for dangerous targets and thus a target that is dangerous on the AIS display can be safe on ECDIS and vice versa. If an AIS target is within the CPA and TCPA settings, it is shown as a dangerous AIS target on the ECDIS display.

TT DISP	<	AIS DISP
ON		ALL
T VECT(G)		12 min
Predictor		OFF
PAST POSNT		12 min
CPA	10.0 NM	30 min
CPA AUTO act.		FILT
Lost TGT alarm		FILT
MULTI		06.00 06.00

If an AIS target locates within the CPA and TCPA values, it is shown as a dangerous AIS target on the ECDIS display. Note that the same situation occurs with tracked targets.

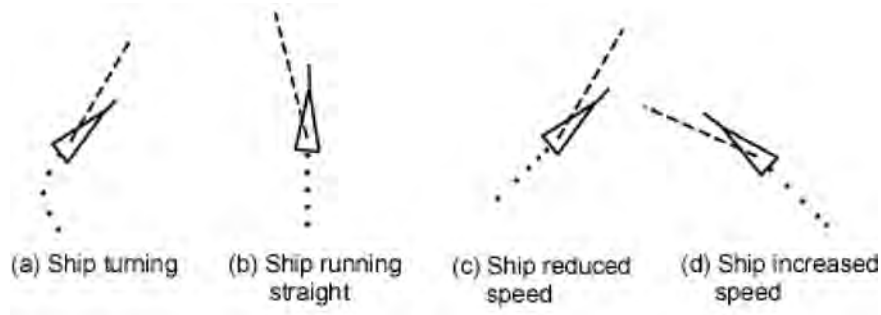
Note1: If your ship's position is based on Dead Reckoning, then CPA/TCPA and BCR/BCT values are not calculated and not displayed.

Note2: If TCPA has a negative value it means that you have already passed the closest point and the AIS target is going away from your ship.

21.12 How to Display AIS Target Past Positions

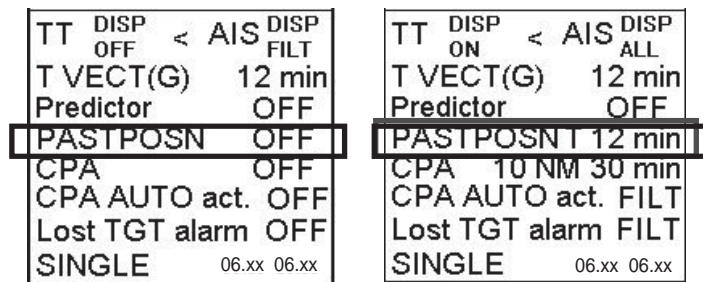
The past position display shows equally time-spaced dots marking past positions of activated AIS targets. A new dot is added at preset time intervals until the preset number is reached. If a target changes its speed, the spacing will be uneven. If it changes course, its plotted course will not be a straight line.

Past Positions (or the length of trace) and presentation mode can be set on the information area, at the locations circled in the illustration below.

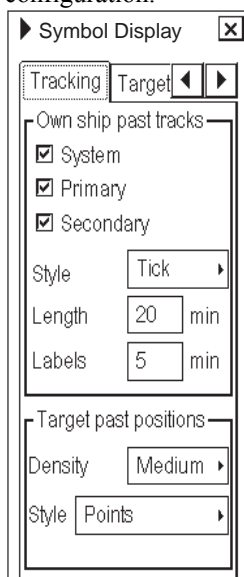


Sample past position displays

1. Put the cursor on the text "PASTPOSN OFF" then left-click to get the time field.
2. Put the cursor on the time value and the scrollwheel to set value.

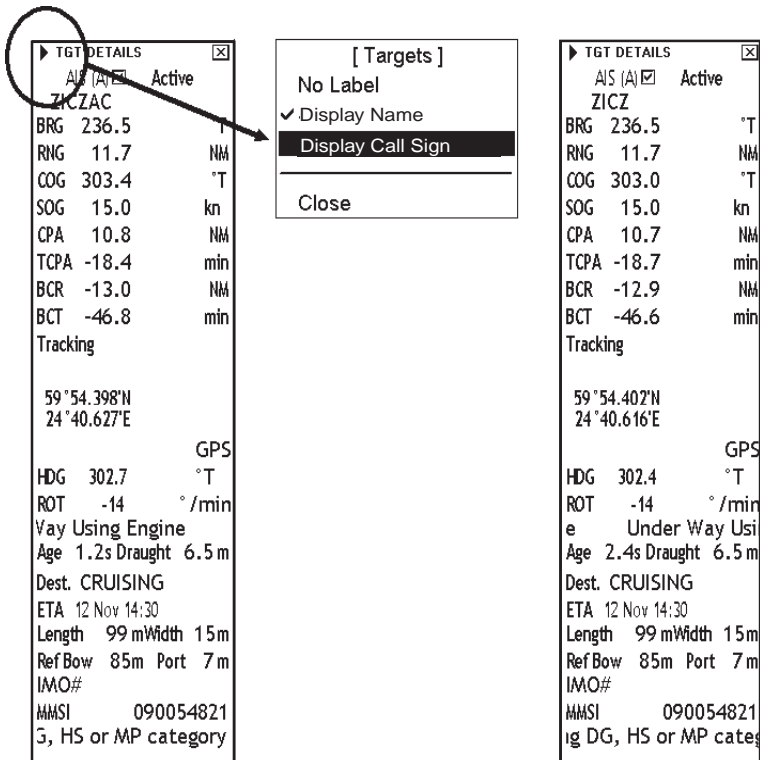


3. Spin the scrollwheel to display Symbol Display/Info/Standard Display in the mouse functions area then push the left mouse button. Set the length of track (in minutes).
4. To modify the style of target past positions, put the cursor over the time indication and right-click to open the Display Settings dialog box. Click an arrow tab in the dialog box to show the Tracking page. Select Density (Sparse, Medium, Dense) to define density of points and Style (Points, Points and dots) to set point configuration.



21.13 How to Display Name or Call Sign of AIS Target

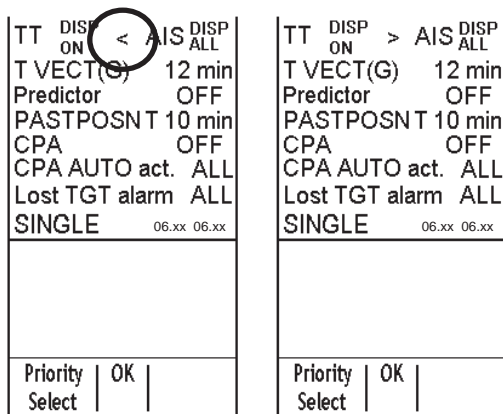
You can display either the name or call sign of AIS targets on the ECDIS display. Put the cursor in the upper left corner of the Target Dialog window then select No Label, Display Name or Display Call Sign as desired. See the figure below for how the data display changes when changing from call signs to names and vice versa.



21.14 Priority Selection Between TT and AIS

You can select whether TT or AIS has priority to display target data. This is useful when you have both TT and AIS symbols for the same target.

1. Put the cursor on the location shown below.



2. Use the left button to get "<" sign to select AIS symbol for priority for AIS target, push left button once more to get ">" sign to select priority for TT symbol target.

21.15 How to Display AIS Interface Status

You can verify the status of the AIS interface on the Other page in the Sensors dialog box. The lower part of this page is reserved for AIS interface monitoring.

- **Received:** Whether data from AIS transponder is correctly received or not (Status: OK or Error).
- **Display:** Whether maximum number of AIS targets set for display on the ECDIS has been exceeded within the defined maximum range or not (Status: OK or Overflow).
- **Storage:** Whether maximum number of AIS targets for storage has been exceeded or not (Status: OK or Overflow).

The screenshot shows the 'SENSORS' dialog box with the following settings and status:

- Other** (selected) | Record | Navigation icons
- Set and Drift**
 - Manual (log) Angle -1.9 °
 - Set: 009.0 °
 - Drift: 0.7 kn
- GYRO CORR 0.0°
- Wind**
 - 0.1 kn
 - 332 ° True Wind
- Depth below trans.**
 - Bow: 44.9 m
 - Aft: 44.9 m
 - Echo alarm: 9 m
- Temperature**
 - Water: -0.5 °
- AIS Targets**
 - Received: OK
 - Display: OK
 - Storage: OK

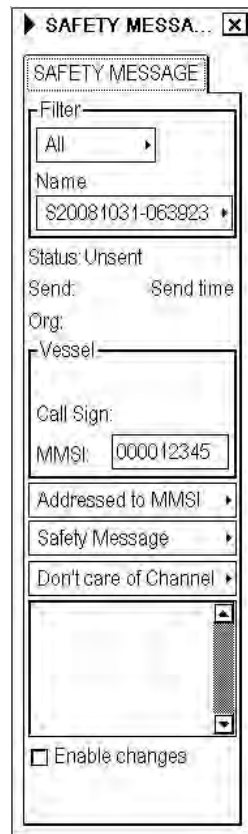
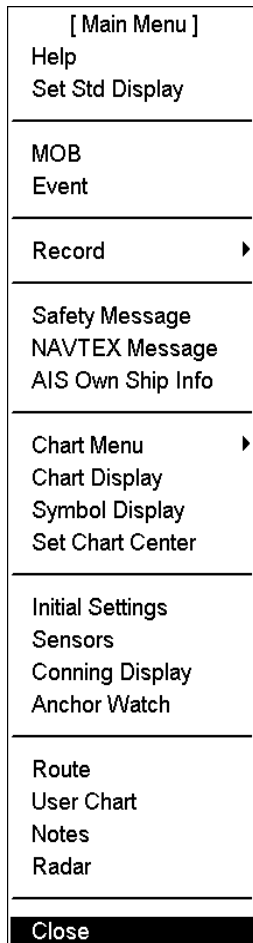
21.16 AIS Safety Message

21.16.1 Introduction

You may send and receive messages via the VHF link, to a specified destination (MMSI) or all AIS-equipped ships in the area. Messages can be sent to warn of safety of navigation, for example, an iceberg sighted. Routine messages are also permitted. Short safety related messages are only an additional means to broadcast safety information. They do not remove the requirements of the GMDSS.

To open the Safety message dialog box, which is where all phases of AIS safety messages are initiated, do the following:

1. Display Menu/Info/Chart Menu in the mouse functions area then push the left mouse button to open the Main menu.
2. Select Safety Message from the menu then push the scrollwheel.

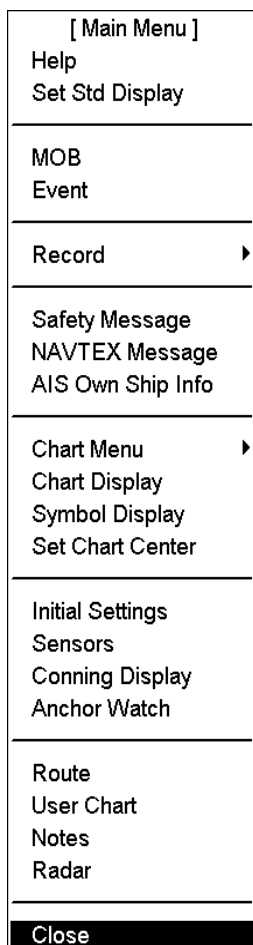


The Safety Message dialog box contains the following items:

- Filter:** Select category of messages to show in the Safety Message menu.
- Name:** Each message has an individual name based on time of creation or time of receiving of message.
- Status:** Display status of selected safety message.
- Send:** Display date and time when message is sent.
- Org:** Original message name is displayed here if selected safety message is reply for received message.
- Vessel:** AIS target related information is displayed in this field.
- Address:** Select how to send a safety message.
- Msg Type:** Select message format.
- Channel:** Specify channel for transmitting.

21.16.2 How to create a new safety message

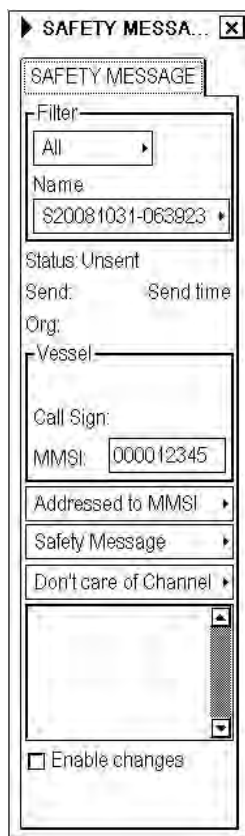
You can create a safety message on the ECDIS for transmission by the AIS transponder. This can be done as follows:



1. Display Menu/Info/Chart Menu in the mouse functions area then push the left mouse button to open the Main menu.
2. Select Safety Message from the menu then push the scrollwheel.
3. The Safety message dialog box appears. Put the cursor on the triangle in the dialog box to show the submenu.



4. Select Create Message from the menu and push the scrollwheel.



5. Check Enable changes.
6. Put the cursor in the "Addressed to" box, which is below the Vessel window. Spin the scrollwheel to select "Addressed to MMSI" or "Broadcast to All" as appropriate then push the left mouse button to get MMSI number. Select "Broadcast to All" to send to all nearby AIS transponder-equipped ships. To send to a specific vessel, enter MMSI of ship, in the MMSI input box.
7. Use the Msg Type box, which is below the "Addressed to" box to select message type; Safety Message for safety message, Binary Message for routine message.
8. At the Channel box, select channel over which to broadcast your message. Four choices are available.

21. AIS Target Functions

9. Enter the text of your message in the window below the Channel box. The number of characters that may be entered depends on message type.

Safety message broadcast: 161 characters
Binary message broadcast: 156 characters
Safety message addressed to MMSI: 156 characters
Binary message addressed to MMSI: 151 characters

10. To send the message, put the cursor on the triangle to show the sub menu, select Send Message then push the scrollwheel.

If the message is sent successfully, the status is changed from Unsent to Sent.

How to get vessel information for an addressed safety message

You can find vessel information for an addressed safety message. This is useful when you want to send a safety message to a specific vessel. To get vessel information, do as follows:

1. Display Menu/Info/Chart Menu in the mouse functions area then push the left mouse button to open the Main menu.
2. Select Safety Message from the menu then push the scrollwheel.
3. Put the cursor on a desired AIS target on the ECDIS chart then push the left mouse button to get MMSI number, call sign and ship name of the target. Call sign and MMSI of the vessel selected are shown in the Vessel field in the Safety Message dialog box.
4. To send a message to the vessel, select Addressed from the Address box then set other items. See the procedure on the preceding page.

21.16.3 How to display a received safety message

When a message is received by AIS, it is indicated on the ECDIS with the alert "634 AIS message received". To read the message, do the following:

SAFETY MESSAGE

SAFETY MESSAGE

Filter: Unread

Name: S17052004-104716

Status: Unread

Vessel: FURUNO
Call Sign: SIMULAT
MMSI: 636009927

Addressed to MMSI: [dropdown]
Safety Message: [dropdown]
[dropdown]

ENGINE IS NOT RUNNING

Enable changes

1. Display Menu/Info/Chart Menu in the mouse functions area then push the left mouse button to open the Main menu.
2. Select Safety Message from the menu then push the scrollwheel to show the dialog box shown left.
3. Check Enable changes.

The Safety Message dialog box shows the message received by the AIS transponder.

21.16.4 How to reply to a safety message

To reply to a safety message, do as follows:

[Main Menu]
Help Set Std Display
MOB Event
Record ▶
Safety Message NAVTEX Message AIS Own Ship Info
Chart Menu ▶ Chart Display Symbol Display Set Chart Center
Initial Settings Sensors Conning Display Anchor Watch
Route User Chart Notes Radar
Close

1. Display the Safety Message dialog box then check Enable changes.

▶ SAFETY MESSAGE
✕

SAFETY MESSAGE

Filter: Unread ▶

Name: S17052004-104716 ▶

Status: read

Vessel: FURUNO

Call Sign: SIMULAT

MMSI: 636009927

Addressed to MMSI: ▶

Safety Message: ▶

Don't care of Channel: ▶

ENGINE IS NOT
RUNNING

Enable changes

2. In the Filter field, select Received from the upper box and the message to reply to from the Name box.
3. Select Message Type and Channel. See section 21.16.2 "How to create a new safety message" for the procedure.
4. Enter your reply in the text window.
5. Put the cursor on the triangle to open the sub menu.
6. Select Send Message then push the scrollwheel.

21.17 AIS Own Ship Info

Own ship information (voyage related data and ship related data) sent by the AIS transponder can be modified in ECDIS. To view or modify own ship information, do following:

1. Display Menu/Info/Chart Menu in the mouse functions area then push the left mouse button to open the Main menu.
2. Select AIS Own Ship Info from the menu then push the scrollwheel to show the AIS Own Ship Info dialog box, consisting of the "Voyage" and "Own Ship" pages.

[Main Menu]
Help
Set Std Display
MOB
Event
Record ▶
Safety Message
NAVTEX Message
AIS Own Ship Info
Chart Menu ▶
Chart Display
Symbol Display
Set Chart Center
Initial Settings
Sensors
Conning Display
Anchor Watch
Route
User Chart
Notes
Radar
Close

AIS Own Ship Info [X]

Voyage | **Own Ship**

Own Ship Static Data

Type: 31

Description

Vessel Towing

MMSI: 431000406

Name
FURUNO

Call Sign
SIMULAT

Length: 250 m

Width: 38 m

Ref Bow: 10 m

Ref Port: 19 m

AIS Own Ship Info [X]

Voyage | **Own Ship**

Voyage Data

Navigational Status
Under way (engine) ▶

Persons: 0

MAX draught: 5.9 m

Destination
OITA<=>KOBE

ETA
11 Jun 2009 22:00

Enable changes

3. If you need to change any information, check the "Enable changes" box then modify desired field.

Note: Messages transferred between ECDIS and AIS follow the AIS specification standard IEC-61162. Messages used in communications are VDO, SSD and VSD. The VDO message uses the following types of messages:

- Class A target; message types are 1-3 and 5
- Class B target; message types are 19 or 24

Note: This function requires an AIS transponder.

22. NAVTEX Messages

22.1 Introduction

NAVTEX (Navigational Telex) is an international automated medium frequency direct-printing service for delivery of navigational and meteorological warnings and forecasts, as well as urgent marine safety information to ships.

NAVTEX messages can be read and written in ECDIS.

The position of NAVTEX data can be marked on the screen, with the NAVTEX icon. If the ECDIS recognizes the position, the NAVTEX icon appears at that position. To show the NAVTEX icon, open the Symbol Display dialog box, select the Targets page and check Position in the Events window.

The screenshot displays an ECDIS interface with a map of Japan on the left and a data panel on the right. The map shows a coastline with a small icon labeled "NAVTEX icon" on the coast. The data panel contains the following information:

34°07.316'N	HDG	230.3°
133°06.849'E	SPD (PT)	21.2 kn
WGS 84	SB (POSN)	-0.3 kn
DGPS	COG (POSN)	229.6°
	SOG (POSN)	21.0 kn

Below this is a table with columns: Route: not selected, Plan Speed, Plan, Route, Ch LIM, Off track, To WPT, Dist WOP, Time, Turn RAD, Turn rate, Next WPT, Next.

The "NAVTEX Message" section includes:

- Filter: All (395)
- Name: R20101026-061358
- Message Code: 518 kHz / HA24
- Type: Navigational warning
- Status: Read
- Message text: 252110 UTC OCT 10 JAPAN NAVTEX N.W. NR 2401/2010 KII SUIDO, SOUTHWARD. GUNNERY, 242300Z TO 250800Z
- L/L: 33° 29.600'N 134° 48.800'E

At the bottom, it shows the date and time: 26 Jan 2011 07:53 Local (UTC +02:00), coordinates: 33°44.964'N 137°21.890'E 96.0°, and a "MULTI" status with a "779 LANadapter1 version error" message.

22.2 How to Receive NAVTEX Messages

When a Navtext message is received in ECDIS, the alert "798 NAVTEX message received" appears. To display a NAVTEX message, do as follows:

[Main Menu]
Help
Set Std Display
MOB
Event
Record ▶
Safety Message
NAVTEX Message
AIS Own Ship Info
Chart Menu ▶
Chart Display
Symbol Display
Set Chart Center
Initial Settings
Sensors
Conning Display
Anchor Watch
Route
User Chart
Notes
Radar
Close

1. Display Menu/Info/Chart Menu in the mouse functions area then push the left mouse button to open the Main menu.
2. Select NAVTEX Message from the menu then push the scrollwheel.

3. In the Filter field, select Unread.

Note: The Lat/Lon field contains a list of lat/lon coordinates found from NAVTEX message using artificial intelligence. Typically such coordinates show the point or area of interest for the NAVTEX message.

23. Radar Overlay

23.1 Introduction

The optional radar overlay has the radar echo image overlaid on the ECDIS chart display. The radar overlay video can be received by ECDIS two ways:

- Via a radar overlay card fitted in the ECDIS
- Via LAN from FAR-2x07 radars

This ECDIS has many features to support exact match in scale and orientation of the chart and radar echo image. Exact match of the radar echo image and chart is an essential security feature. If the radar echo image and the chart display match, then the mariner can rely on what he sees and the mariner also gets a very good confirmation that his navigation sensors (such as gyro and position receivers) operate properly and accurately. However, if the mariner is unable to achieve exact match, it is a very strong indication that something is wrong and he should not rely on what he sees.

This ECDIS can use radar echo image in several operator selectable modes. The "ECDIS only" mode operates without the radar echo image. The "ECDIS and radar" mode operates using the rules for the type-approved ECDIS to visualize the radar echo image. The "radar over chart" mode draws the radar echo image on top of the chart. This mode should only be used temporarily because legally the equipment is not an ECDIS that can legally replace paper chart when operating with "Radar over chart". The "radar video only" mode should only be used temporarily to check radar echo presentation, because the equipment is not an ECDIS that can legally replace paper chart when operating with the "radar video only" mode.

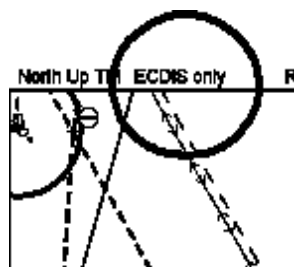
Selected scale of displayed chart also defines scale of radar overlay. When you change the chart scale, the scale of the radar overlay is automatically changed. The maximum range of the radar overlay is 24 nautical miles.

The rule of thumb for range of displayed area:

- Chart scale 1:10,000 is almost equal to traditional radar range of 0.75 NM
- Chart scale 1:20,000 is almost equal to traditional radar range of 1.50 NM

23.2 How to Activate Radar Overlay on the ECDIS

The radar overlay can be output to the ECDIS and shown on its display. Like details on vector charts, the radar overlay can be displayed or removed from the chart display. You can select how to display the radar overlay with the Radar selector on the status bar. To activate the radar overlay, put the cursor on the mode selector (location circled below), spin the scrollwheel to select "ECDIS and Radar", "Radar over Chart" or "Radar video only" in the status bar then push the left mouse button.



23.3 How to Select Source of Radar Overlay

23.3.1 Radar overlay via LAN from FAR-2x07 radars

Put the cursor on Radar in the status bar to show the Radar selections window. The item "Radar overlay source" shows the current source for the radar overlay. In the example display below the source is MAST X. If there are more than one radar video source available, you can change the radar overlay source by clicking Radar Overlay source then spin the scrollwheel to select a source.

Radar

Radar selections	
Radar Overlay source	MAST X
TT target source	2
Send to Radar	ON

23.3.2 Radar overlay via radar overlay card inside ECDIS

If there is more than one radar video source available and they are connected to the ECDIS, you can use external switch to select desired source of the radar video overlay. Selected source is displayed on the Radar Overlay dialog box.

Radar

Radar selections	
Radar Overlay source	MAST X
TT target source	2
Send to Radar	ON

RADAR OVERLAY ✕

Radar Overlay source

Gain

Process

IR	<input type="text" value="IR 2"/>
Clean	<input type="text" value="OFF"/>
EchoAverage	<input type="text" value="EAV OFF"/>
Echo stretch	<input type="text" value="ES OFF"/>

Noise

Transparency

In case of LAN Radar Overlay

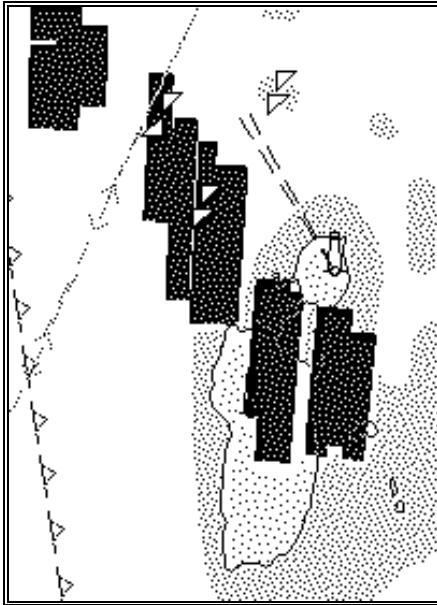
23.3.3 Radar overlay display modes

You can select from the following presentation modes with the radar overlay:

ECDIS only: Only chart is displayed on the ECDIS.

ECDIS and radar: With S57 chart material, the radar echo image is mixed into the chart so that some chart features lie above or beneath the radar image. This presentation follows the drawing rules of the Standard S52ed3.1 of IHO. If you use the ARCS chart material, the radar image is drawn on top of the chart.

Radar over chart: Radar echo image is drawn on top of the chart.

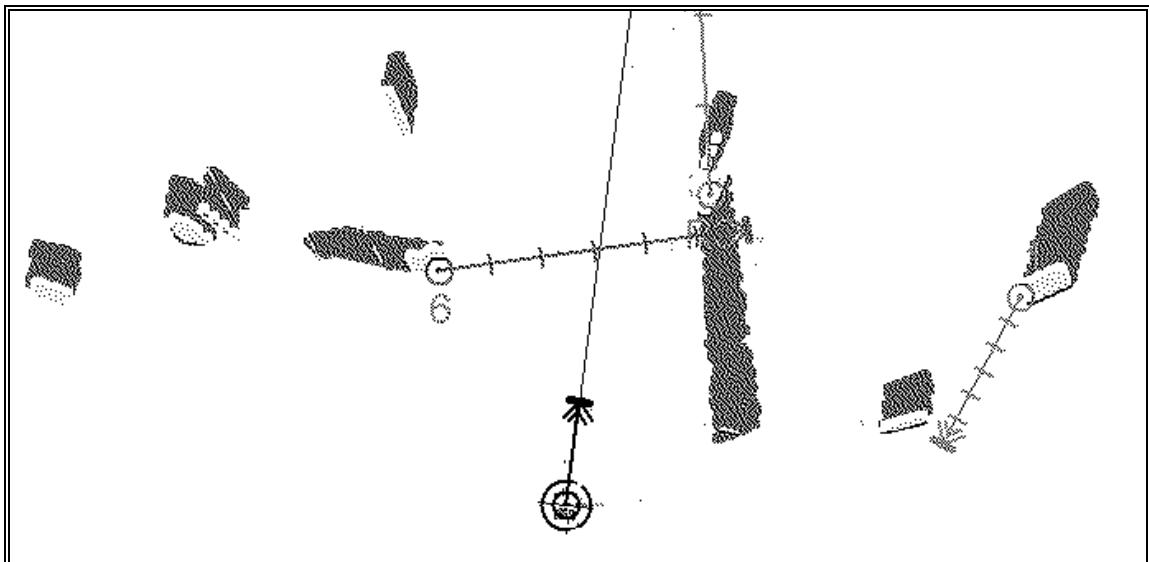


ECDIS and radar presentation



Radar over chart presentation

Radar video only: Only the radar echo image is drawn on the ECDIS display.



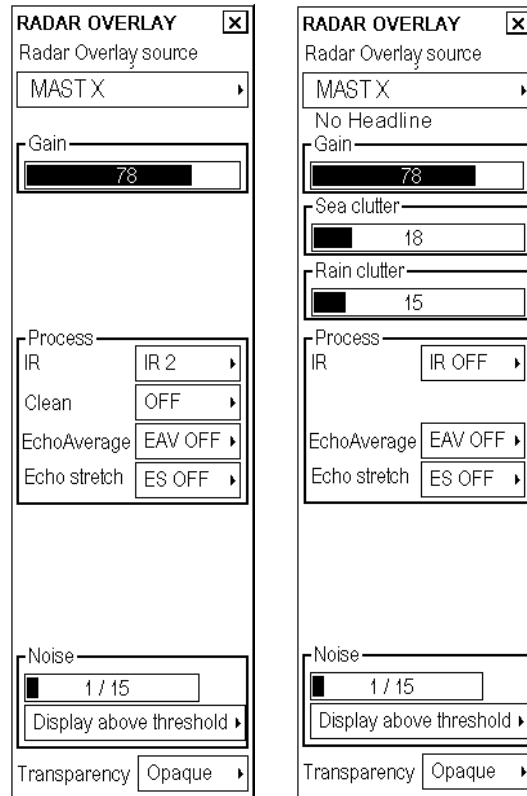
23.4 How to Adjust the Radar Overlay (Radar Overlay dialog box)

The Radar Overlay dialog box has controls for adjustment of the radar image - gain, sea clutter, rain clutter, interference rejector, echo stretch, and echo average.

Note 1: Sea clutter and rain clutter controls are not available in the Radar Overlay dialog box if the radar video is received through LAN from FAR-2x07 radars. Sea clutter and rain clutter are controlled on the TT display that controls the transmitter.

Note 2: Gain, sea clutter and rain clutter are independent from the same controls of any radar display. Therefore, their optimum position may be different from those on the radar display.

Note 3: If the ECDIS fails to receive heading, trigger or azimuth signal from the radar transceiver, it is indicated in the Radar Overlay dialog box. In the right-hand figure the indication "No Headline" is displayed, indicating no heading signal.



(for LAN radar overlay) (for radar overlay card)

23.4.1 Radar overlay source

Indicates source of current radar overlay.

23.4.2 Gain

The Gain control is used to set the sensitivity of the radar echo image. When you adjust the gain, "Noise" is automatically switched ON in order to display low-level radar images.

Note: After adjusting the gain, check and readjust the sea clutter because these two controls affect one another.

23.4.3 Sea clutter

The sea clutter control removes sea clutter from the radar echo image. When you adjust the sea clutter, "Noise" is automatically switched ON in order to display low-level radar images. If you have radar overlay video through LAN from FAR-2x07 radar, use the sea clutter control on the radar.

Note: After adjusting the sea clutter, check and readjust the gain because these two controls affect one another.

23.4.4 Rain clutter

The rain clutter control removes rain clutter from the radar echo image. If you get radar overlay video through LAN from FAR-2x07 radar, use the rain clutter control on the radar. When you adjust the rain clutter, "Noise" is automatically switched ON in order to display low-level radar images.

23.4.5 How to control video processing

Interference rejector: The interference rejector suppresses mutual radar interference that may occur in the vicinity of another shipborne radar operating in the same frequency band. Three options are available: OFF, IR1 and IR2. Select suitable level to reduce interference from other radars. Select OFF when no noise exists, so as not to miss weak targets.

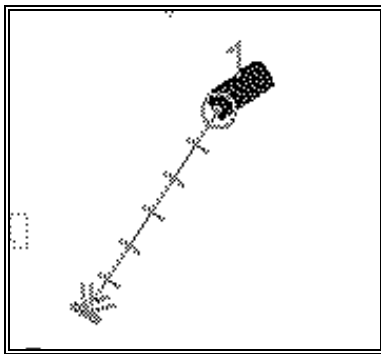
Echo average: You can turn echo averaging on or off. Scan-to-scan correlation averages echoes over successive picture frames to distinguish real target echoes from sea clutter. The choices are EAV1, EAV2, EAV3 and OFF.

EAV1: Helps distinguish targets from sea clutter and suppress brilliance of unstable echoes.

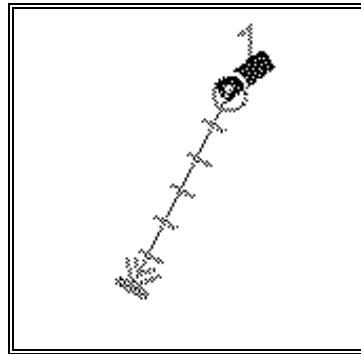
EAV2: Distinguishes small stationary targets such as navigation buoys.

EAV3: Stably displays distant target.

Echo stretch: Echo stretch emphasizes radar echo to increase detectability of targets. "ES1" emphasise both noise and target level echoes while "ES2" emphasizes only target level echoes.



Echo stretch ES2



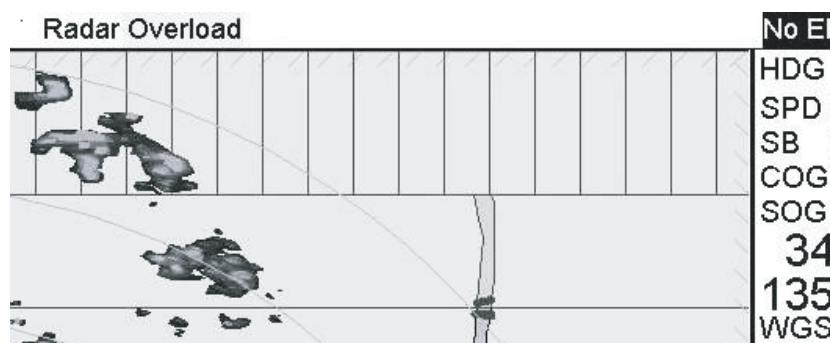
Echo stretch OFF

Clear: Removes noise from the screen. Select LOW or HIGH according to amount of noise. Select OFF when no noise exists.

Noise: Radar echoes can be displayed with gradation of green color.

23.4.6 Echo overload condition

When the number of targets on the screen exceeds the capacity of the CPU, the warning "Radar Overload" appears in yellow on the status bar. The gain is temporarily lowered automatically then gradually raised. If the overload condition continues, the above-mentioned process is repeated. If this occurs, lower the gain (from the keyboard or the GAIN dialog box) to erase the Radar Overload indication.

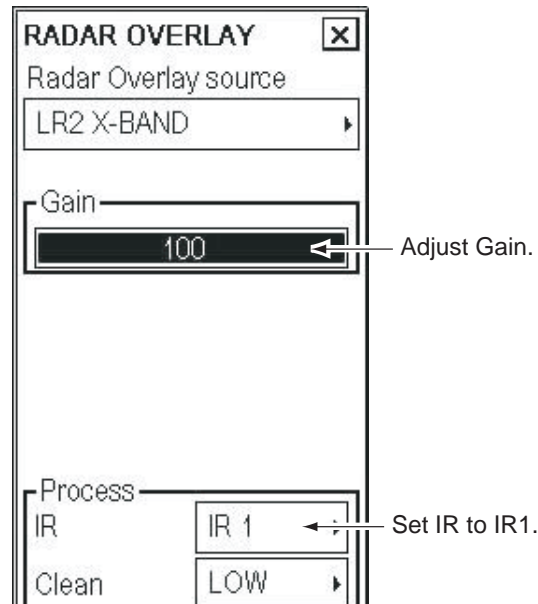


When the overload condition occurs, do the following:

23. Radar Overlay

- Adjust controls (gain, sea clutter, rain clutter, interference rejector, etc) on the radar to obtain proper radar image.
- On the radar overlay dialog box, do the following:
 - a) Set IR to IR1.
 - b) Adjust the Gain control to properly set the gain.

Note: The condition of the radar echo changes with adjustment of range, etc. on the radar. When the overload condition occurs, adjust the gain on the radar to obtain proper picture.



23.4.7 Transparency

Transparency controls "see through" behavior of the radar overlay. The option "Opaque" superimposes radar echoes on the chart display without modifying their color. "25%" displays radar echoes somewhat faintly, and "75%" displays radar echoes very faintly. It is recommended to use 25% or 50% when navigating narrow channels, so as not to conceal landmasses.

23.5 Operational Differences Between ECDIS only Mode and Modes with Radar Overlay

There are some operational differences between ECDIS only mode and modes with Radar Overlay.

- Scale indication in nautical miles when using Radar Overlay
- Scale maximum with Radar Overlay video is 24 NM

23.6 How to Adjust Radar Overlay to Match Positions of Chart Features

23.6.1 Error sources of radar echo image and chart display mismatch

There are several reasons why the radar echo image and chart display do not match exactly. The mismatch is a combination of several reasons and removing one reason doesn't solve the mismatch perfectly. There is a fundamental difference between the radar echo image and corresponding chart feature. The radar echo is a reflection from the real life target and the actual position of the real life target is the front edge of the radar echo. Therefore, the radar echo should start from the chart feature and existed as far as the radar pulse length goes.

Bearing error sources:

- Gyro
- Inaccurate chart
- Improper installation parameters (radar overlay bearing offset)

Position error sources

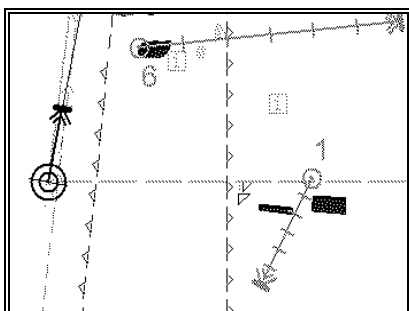
- Inaccurate position
- Position offset
- Inaccurate chart
- Wrong datum
- Datum offset with ARCS material
- Improper installation parameters (conning position offset, position receiver antenna offset, radar overlay range offset, datum selected for position receiver)

23.6.2 Error sources for radar echo image and TT mismatch

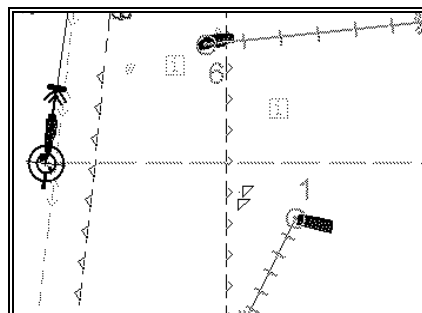
There are several reasons why the radar echo image and tracked target symbols do not match exactly.

1. Different gyro value at radar display and at ECDIS.
2. Improper installation parameters (radar overlay bearing offset, radar overlay range offset, conning position offset).

The example below shows how different gyro value set at radar display and at ECDIS affect the display of the ECDIS.



Different gyro value at radar and ECDIS



Equal gyro value at radar and ECDIS

23.6.3 How to compensate for bearing error

Bearing error can be compensated on the Ship and Route Parameters dialog box. To show this box, open the menu, select Initial Settings, Navigation parameters, and Ship and route parameters.

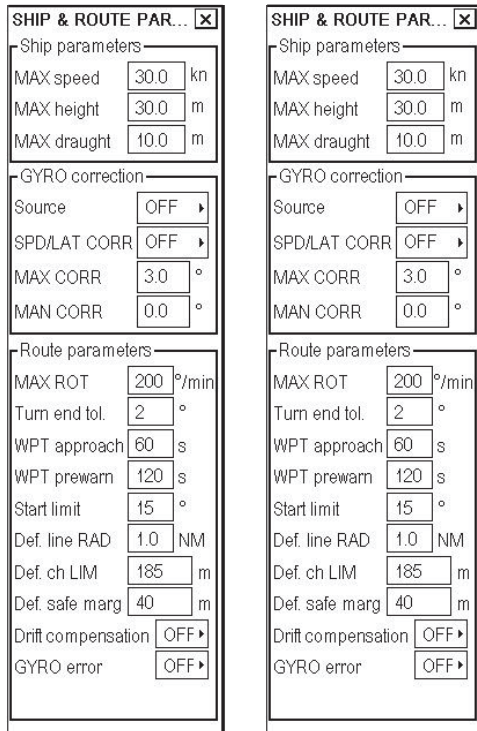
There are two ways to compensate for gyro-induced bearing error:

1) Manual

Adjust value of manual gyro correction.

2) Table-based gyro speed/latitude correction (Note that the ECDIS's built-in correction facility doesn't correct dynamic error, settling time after course change, etc.)

Turn On Gyro speed/latitude correction in the Ship and Route Parameters dialog box.



Drift compensation, Gyro error not available with some autopilots.

No manual gyro correction (left-hand figure)

- TT and radar overlay match perfectly.
- Chart features and radar overlay have some mismatch.

Manual gyro correction in use (right-hand figure)

- TT and radar overlay match perfectly.
- Chart features and radar overlay match perfectly.

23.6.4 How to compensate for position error

How to verify position and alignment

See section 19.9.1 "Position alignment by means of the ECDIS".

How to verify correct datum used in positioning

It is very important that output co-ordinates of a position device is the same as the ECDIS expects to receive, otherwise you may get incorrect position in the ECDIS. Verify in position device configurations that output of co-ordinates is WGS-84 and also check in the installation parameters of the ECIDS that it is set to receive position in WGS-84 datum.

23.7 Radar Overlay Related Alerts

Alerts generated by Radar Overlay are related to ECDIS workstation where Radar overlay card is located. This means that Radar overlay related alerts on first ECDIS workstation starts with alert number 100 and Radar overlay related alerts on the No.2 ECDIS starts with alert number 200.

Alert number 100: RADOV NO HEADLINE 6/13

NO HEADLINE AVAILABLE FOR RADAR
OVERLAY. CHECK CONNECTORS AND
CABLING FOR RADAR OVERLAY.

Alert number 101: RADOV NO AZIMUTH 6/13

NO AZIMUTH AVAILABLE FOR RADAR
OVERLAY. CHECK CONNECTORS AND
CABLING FOR RADAR OVERLAY.

Alert number 102: RADOV NO TRIGGER 6/13

NO TRIGGER AVAILABLE FOR RADAR
OVERLAY. CHECK CONNECTORS AND
CABLING FOR RADAR OVERLAY.

Alert number 103: RADOV NO VIDEO 6/13

NO VIDEO AVAILABLE FOR RADAR
OVERLAY. CHECK ADJUSTMENT OF GAIN ON
ON RADAR OVERLAY. CHECK CONNECTORS
AND CABLING FOR RADAR OVERLAY.

Alert number 104: RADOV NO GYRO 6/13

NO HEADING REFERENCE AVAILABLE FOR
RADAR PROCESSOR WHICH IS SOURCE FOR
RADAR OVERLAY. CHECK RADAR PROCESSOR.

Alert number 105: RADOV HW FAILURE 6/13

RADAR OVERLAY HARDWARE FAILURE.
SWITCH POWER ON/OFF. REINSTALL
ECDIS SW.

Alert number 106: LAN RADAR CONNECT FAILURE 6/13

INDICATION WHILE LAN CONNECTION FOR
RADAR FEATURES IS ESTABLISHED BETWEEN
ECDIS PROCESSOR AND RADAR PROCESSOR.

Alert number 107: LAN RADAR DLL FAILURE 6/13

FAILURE TO ESTABLISH LAN CONNECTION
FOR RADAR FEATURES BETWEEN ECDIS
PROCESSOR AND RADAR PROCESSOR.
CHECK LAN CONNECTORS AND CABLES
POWER ON/OFF AND REINSTALL ECDIS SW.

23. Radar Overlay

Alert number 110: TT DANGEROUS TARGET 2/9

TT DANGEROUS TARGET FOUND.

Alert number 111: TT TARGET IN ACQ ZONE 6/13

TT TARGET IN ACQUISITION ZONE.

24. Recording Functions

24.1 Introduction

The ECDIS records various voyage-related items like movement and position of your ship and dangerous radar targets (from radar). These items are recorded in the following logs:

Voyage log: Records entire voyage, i.e., a sailing of a route from first point to the last.

Details log: Records position, speed and course once every minute.

Danger Targets log: Records tracked target data.

Chart Usage log: Records information of used charts in display.

Alert log: Records alerts generated by the system.

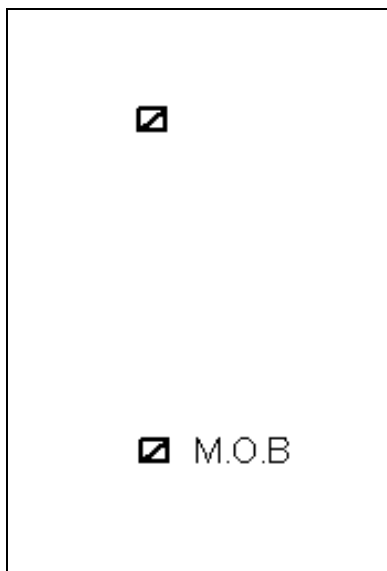
The operator may print the contents of any log.

24.2 Events and Man Overboard Functions

The Events and Man Overboard (MOB) functions are accessed with the mouse. Spin the scrollwheel to display Event/Info/MOB in the mouse functions area then push the left or right mouse button as appropriate.

Left mouse button (Event): Records an event to the logbook. The EVENT dialog box appears, where you can write a comment (up to 48 alphanumeric characters) for an event. The comment is displayed in the electronic chart area if Events is selected for display in the Tracking page of the Chart Display dialog box.

Right mouse button (MOB): Records MOB position to the logbook.



*The ECDIS can display Events and MOB.
These events are also recorded into the Voyage log.*

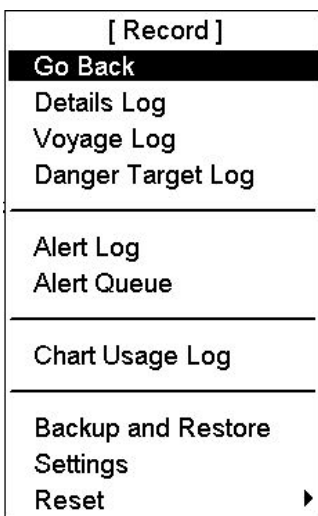
24.3 Details Log

The details log contains voyage information of the last 12 hours. Various information is recorded in the Details log once per minute.

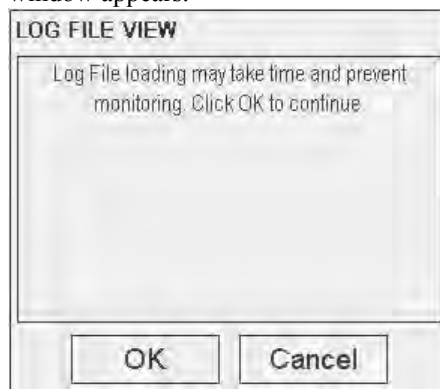
- Date and time
- Position of your ship as output by selected navigator.
- Alignment (range, bearing) values, if used.
- Speed over ground and course over ground.
- Heading.
- Gyro correction value, if used.

24.3.1 How to show the details log

To open the Details log, do as follows:



1. Spin the scrollwheel to show Menu/Info/Chart Menu in the mouse functions area then push the left mouse button.
2. Select Record from the menu then push the scrollwheel.
3. Select Details Log from the menu then push the scrollwheel. The following window appears.



4. Confirm that you want to open the log by clicking the **OK** button. Otherwise click the **Cancel** button. The system will start viewing program of log.

You may print the entire log or a desired part. To change print font size, put the cursor on the triangle and select desired font size. To print the log, click the **Print Log** button. To print whole log, select **Print All** from the menu.

Date	Time	Type	Lat	Lon	Align/nm	Align/°	Sog/kt	Cog/°	Hdg/°	Corr./°
03 Mar 2006	07:43:10	Auto	52°07.779'N	003°18.222'E	0.0	0.0	10.6	2.1	353.2	-3.0
03 Mar 2006	07:42:10	Auto	52°07.618'N	003°18.108'E	0.0	0.0	11.1	48.7	30.5	-3.0
03 Mar 2006	07:41:10	Auto	52°07.535'N	003°17.861'E	0.0	0.0	10.5	75.7	67.9	-3.0
03 Mar 2006	07:40:10	Auto	52°07.564'N	003°17.580'E	0.0	0.0	10.6	113.4	105.2	-3.0
03 Mar 2006	07:39:10	Auto	52°07.686'N	003°17.379'E	0.0	0.0	11.0	160.2	142.5	-3.0
03 Mar 2006	07:38:10	Auto	52°07.861'N	003°17.348'E	0.0	0.0	10.6	189.2	179.9	-3.0

File name: details.log Time: LOCAL (UTC +2:00) Datum: WGS 84

First 1000 Prev 1000 Last 445

Use **First 1000**, **Prev 1000**, **Next 1000** and **Last xxx** buttons to select desired time to be listed in log viewer.

Note: You can make a user chart from this log. See section 24.10 " How to Make a User Chart from a Log (past track)".

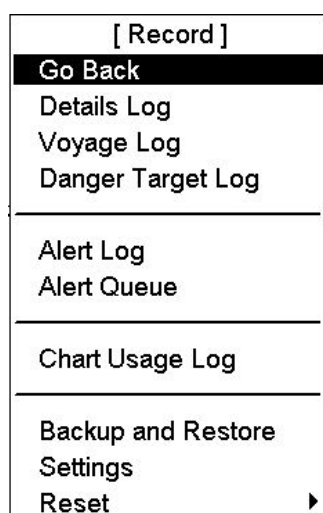
24.4 Voyage Log

The voyage log holds data for the entire voyage, recording the following data:

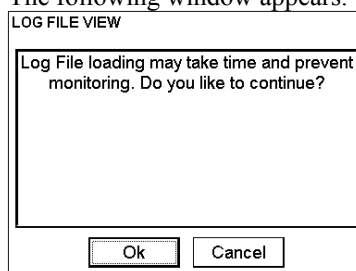
- Changes of course and speed. User can define limits for course change and speed change of your ship to be recorded. This data is filed in the log as type "Ship".
- User is able to define time period, how often there is a recording regardless of course or speed changes. (For example, once per 4 hours). This data is filed in the log as type "Auto".
- Man Over Board event. This data is filed in the log as type "MOB".
- Standard event. This data is filed in the log as type "User".
- Alerts generated by the system. User is able to select alerts, which are recorded into the Voyage log. This data is filed in the log as type "Alert".
- Positions. This data is filed in the log as type "Posdev".

24.4.1 How to show the voyage log

To open the Voyage log, do the following:



1. Spin the mouse scrollwheel to show Menu/Info/Chart Menu in the mouse functions area then push the left mouse button
2. Select Record from the menu then push the scrollwheel.
3. Select Voyage Log from the menu then push the scrollwheel. The following window appears.
4. The following window appears.



5. Confirm that you want to open the log by clicking the **OK** button. Otherwise click the **Cancel** button. The system will start viewing program of log.

You may print the entire log or a desired part. To change print font size, put the cursor on the triangle and select desired font size. To print the log, click the **Print Log** button. To print whole log, select **Print All** from the menu.

LOG FILES - VOYAGE LOG													
Date	Time	Type	Lat	Lon	Sog/kt	Cog/°	Hdg/°	Cor/°	Wind/	Wind/°	Dist/nm	Depth/m	Description
03 Mar 2006	07:40:10	Ship	52°07.564'N	003°17.580'E	10.6	113.4	105.2	-3.0	NVLD	NVLD	264.7	NVLD	
03 Mar 2006	07:39:10	Ship	52°07.686'N	003°17.379'E	11.0	160.2	142.5	-3.0	NVLD	NVLD	264.5	NVLD	
03 Mar 2006	07:38:10	Ship	52°07.861'N	003°17.348'E	10.6	189.2	179.9	-3.0	NVLD	NVLD	264.3	NVLD	
03 Mar 2006	07:37:10	Ship	52°08.013'N	003°17.486'E	10.7	230.5	217.2	-3.0	NVLD	NVLD	264.1	NVLD	
03 Mar 2006	07:36:10	Ship	52°08.079'N	003°17.756'E	11.6	282.2	254.6	-3.0	NVLD	NVLD	263.9	NVLD	
03 Mar 2006	07:35:10	Ship	52°08.031'N	003°18.029'E	10.6	304.8	291.9	-3.0	NVLD	NVLD	263.8	NVLD	

File name: voyage.log Time: LOCAL (UTC +2:00) Datum: WGS 84

Enable changes

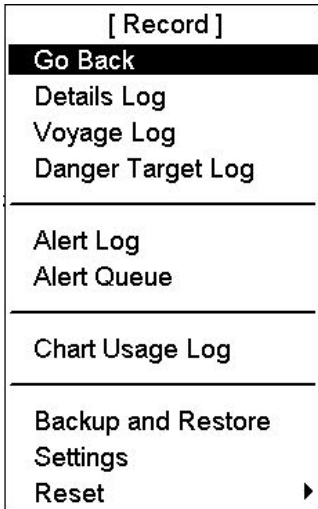
Use **First 1000**, **Prev 1000**, **Next 1000** and **Last xxx** buttons to select desired time to be listed in log viewer.

Note 1: You can add a description to a log entry. Check Enable changes then enter description desired in the text box, using the scrollwheel.

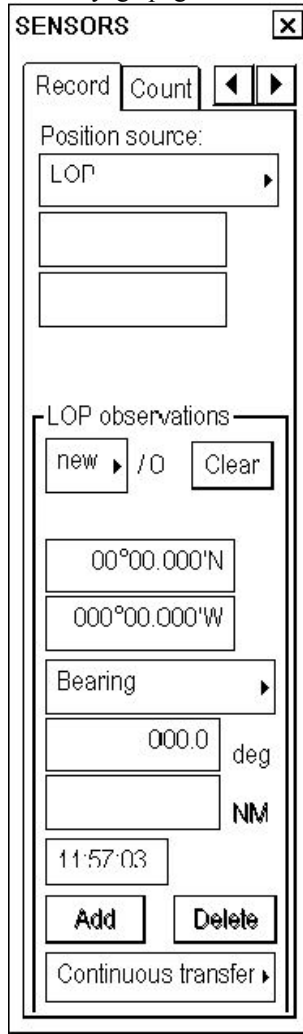
Note 2: You can make a user chart from this log. See section 24.10 "How to Make a User Chart from a Log (past track)".

24.4.2 How to set conditions for logging

The operator can define limits for course change and speed change of your ship to be recorded and also time period for automatic logging. To set them, do the following:



1. Spin the scrollwheel to show Menu/Info/Chart Menu in the mouse functions area then push the left mouse button.
2. Select Record from the menu then push the scrollwheel.
3. Select Settings from the menu then push the scrollwheel.
4. If the Voyage page is not already open, click the Voyage tab to open it.



5. Set desired limits for speed and course and also logging interval, using the scrollwheel. When the speed or course changes by the amount set here, a log entry is made.
6. Select alerts (alert numbers) to record, in the Alerts window. For alert numbers and their meanings, see Chapter 30 "Alerts".

24.4.3 How to reset voyage log for next voyage

The voyage log can be emptied. See section 24.3.7 "Resetting (emptying) voyage and danger target logs". A backup copy of the voyage log can be made. See section 24.8 "How to Make Backup Copy from".

24.4.4 Recording positions

The operator may manually save positions to the Voyage log in various ways. These are:

- Direct sensor position (GPS, Loran, etc.)
- Positions calculated by the system (in example below such are Kalman filter and Dead reckoning)
- User observations. (Visual, astronomical and MFDF. MFDF is Medium Frequency Direction Finder.)

The screenshot shows a dialog box titled "SENSORS" with a close button (X) in the top right corner. Inside the dialog, there is a "Record" tab and a "Count" field with left and right arrow buttons. Below this is a "Position source:" dropdown menu currently set to "DGPS-1st". Underneath the dropdown are two text input fields: the top one contains "60°19.222'N" and the bottom one contains "027°00.404'E".

An example of saving direct position or position calculated by the system

This screenshot is identical in layout to the previous one, showing the "SENSORS" dialog box. However, the "Position source:" dropdown menu is now set to "FURUNO". The latitude and longitude values remain "60°19.222'N" and "027°00.404'E".

An example of saving position based on operator observation

First you should locate the position of your observation on the ECDIS chart. Use, for example, the two separate EBL and VRM available in the Nav Marks dialog box. Open the Sensors dialog box then click the Record tab. Select appropriate method from the Device list box. In case a User Observation is selected, put the cursor on the desired location on the ECDIS display then press the left mouse button. The latitude/longitude position of the cursor is then copied to the Lat and Lon fields. If you are satisfied, then click the **Record** button to save the position observation into the Voyage log. If you wish you can also enter Lat and Lon values manually.

Position fixes defined by Line of Position (LOP)

A plotted line on which a vessel is located, determined by observation or measurement of the range or bearing to an aid to navigation or other charted element. Two or more simultaneous observations can be combined to produce an estimate of the ship's current position. If the position is based on only two observations, it is an "estimated position" (EP); otherwise it is called a fix.

Line of Position (LOP) can be found in the Sensors dialog, Record tab as one of the Position Sources. A maximum of 6 observations can be entered to obtain a fix.

24. Recording Functions

Basic operation

Coordinates of the aid to navigation can be entered into dialog boxes or they can be selected graphically on the chart:

- **S57:** Click on a charted object (beacon, light, buoy etc.). Description of the object appears above coordinate boxes.
- **ARCS:** Click anywhere in the chart.

Default values for bearing and range are approximated from ship's current position information. The time of observation is stopped when the object is selected.

Click the **Add** button to include the observation in the fix computation. The counter shows "new/1", and a second observation may be entered. The word "new" indicates that the observation currently displayed is not yet included in the fix computation, and it appears as a dashed line or ring on the chart. The added observations can be edited or deleted after selecting them in the counter.

When at least two measurements are entered, the EP or fix is computed and the coordinates are shown in the top part of the dialog, and a position symbol appears on the chart. In the case of an EP, the letters "EP" are shown on the right side of the coordinates. If a valid position estimate cannot be obtained, a message is displayed under the coordinates. This may happen, for example, if the lines / circles have multiple crossings that are far apart, or if two lines are nearly parallel or don't intersect at all. The accuracy limit (estimated standard error) is 1.0 NM.

If the estimate is valid, the **Record** button can be clicked to record the current position estimate in the voyage log. Discrepancy between LOP result and ship position is also recorded in the log. (This information may be viewed by Info query on the position event symbol on the chart – which is displayed if position event display is on in chart display settings.) If dead reckoning is active, the **Use for DR** button is visible and clicking it will make the LOP position a new starting point for DR.

Time transfer

If the observations are not simultaneous, they should be transferred to a common time. Transferring is based on dead reckoning of ship movement. If a position line (or ring) is transferred, the letters TPL are shown beside its timestamp on the chart. The method of transfer may be selected in the bottom of the dialog. "Transfer to latest" transfers the measurements as if they were all made at the time of the newest measurement. "Continuous transfer" transfers all measurements to real time. "Transfer off" can be used to check where the measurement origins are. The position estimate and the record function follow the same logic, which means that "Transfer off" shows a position that has no relevance and "Transfer to latest" sends an old position to the voyage log (timestamp in the log does not match the position).

Timeouts

The observations cannot be used long after they were made because dead reckoning is inaccurate.

- One minute after the latest measurement it is labeled as a "DR" (dead reckoned position)
- Computed position times out in 5 minutes after the latest measurement.
- An observation times out in 10 minutes, after which it disappears without any notice to the user.

24.5 Danger Target Log

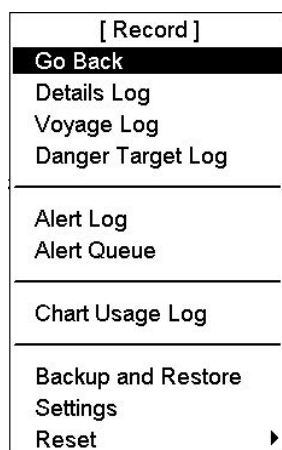
The Danger Target log stores information about targets that are received from a TT and/or targets that are received from an AIS transponder (AIS targets).

If a tracked target or AIS target is within the set CPA and TCPA, information of all tracked targets (including non-dangerous targets) are recorded into the Danger Target log. This data is as follows:

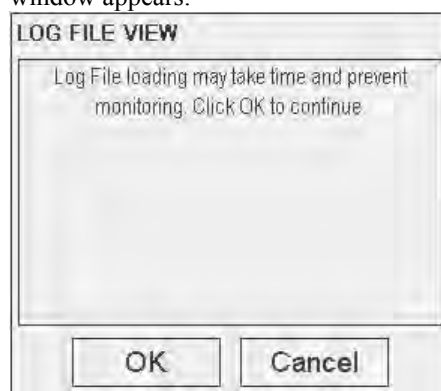
- Date and time, index of target (number of tracked target on radar or IMO MMSI number from AIS transponder).
- CPA and TCPA of both AIS and tracked targets
- Position (Lat, Lon), speed (Spd) and course (Crs) of both AIS and tracked targets.
- Heading (Hdg) information of AIS target.

24.5.1 How to show the danger target log

To open the Danger Target log, do the following:



1. Spin the scrollwheel to show Menu/Info/Chart Menu in the mouse functions area then push the left mouse button.
2. Select Record from the menu then push the scrollwheel.
3. Select Danger Target Log from the menu then push the scrollwheel. The following window appears.



4. Confirm that you want to open the log by clicking the **OK** button. Otherwise click the **Cancel** button. The system will start viewing program of log.

You may print the entire log or a desired part. To change print font size, put the cursor on the triangle and select desired font size. To print the log, click the **Print Log** button. To print whole log, select **Print All** from the menu.

LOG FILES - DANGER TARGETS LOG											
Date	Time	Type	Lat	Lon	Spd/kt	Cse/°	Hdg/°	Cpa/nm	Tcpa/nm	Index	
16.02.2004	15:03:10	ARPA	64°47.360'N	063°07.802'E	15.8	57.9	NVLD	3.0	-21.9	10	
16.02.2004	15:03:10	ARPA	64°47.808'N	062°59.943'E	16.5	59.7	NVLD	0.7	-3.4	9	
16.02.2004	15:03:10	ARPA	64°48.645'N	062°55.301'E	14.9	110.6	NVLD	0.7	-3.7	8	
16.02.2004	15:03:10	ARPA	64°47.512'N	062°58.965'E	16.2	58.1	NVLD	0.2	-2.8	7	
16.02.2004	15:03:10	ARPA	64°47.329'N	062°58.966'E	16.4	59.2	NVLD	0.1	-3.9	6	
16.02.2004	15:03:10	ARPA	64°47.480'N	063°02.603'E	16.2	58.4	NVLD	1.3	-10.9	5	

File name: target.log Time: LOCAL (UTC +2:00) Datum: WGS 84

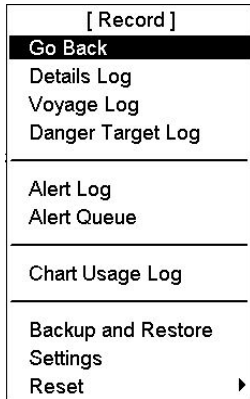
First 1000 Prev 1000 Last 519

Use **First 1000**, **Prev 1000**, **Next 1000** and **Last xxx** buttons to select desired time to be listed in log viewer.

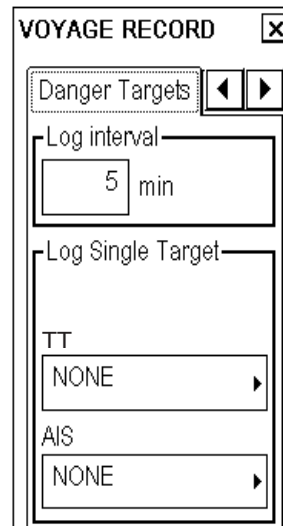
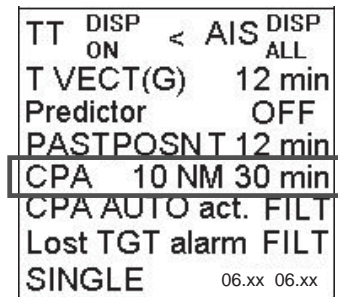
Note: You can make a user chart from this log. See section 24.10 "How to Make a User Chart from a Log (past track)".

24.5.2 How to set conditions for viewing and logging of danger targets

The operator may set Closest Point of Approach (CPA), Time to CPA (TCPA) and Log interval for viewing dangerous tracked target and AIS targets on the ECDIS display. A dangerous tracked target or AIS target is blinking and its color is green and red alternately. User can also alternatively log only information of a single selected tracked target or AIS target.



1. Spin the scrollwheel to show Menu/Info/Chart Menu in the mouse functions area then push the left mouse button.
2. Select Record from the menu and Settings from the submenu.
3. If the Danger Targets page is not already open, click the Danger Targets tab to open it.



Set desired limits for CPA, TCPA and log interval. Note that these limits are only for ECDIS; a radar has its own setting for dangerous targets and thus a target that is dangerous at a tracked target display can be safe on the ECDIS and vice versa. If a tracked target is inside the CPA and TCPA, it is shown as a dangerous tracked target on the ECDIS display. "Log interval" defines the time period for logging.

Note: The operator may select logging of the track of a single AIS and/or tracked target, if he selects in the Log Single Target window the desired number from the tracked target and/or AIS box. If this option is selected, only information of the target(s) selected is recorded.

24.5.3 How to save past track of a selected tracked target or AIS target

To save past track of selected tracked target or AIS target, do the following:

1. Find number of tracked target or name of AIS target, by placing the cursor on the target and pushing the scrollwheel.
2. Select Settings from the Record menu then open the Danger Targets page.
3. In the Log Single Target window, select tracked target number and/or AIS target name from the tracked target and AIS boxes.

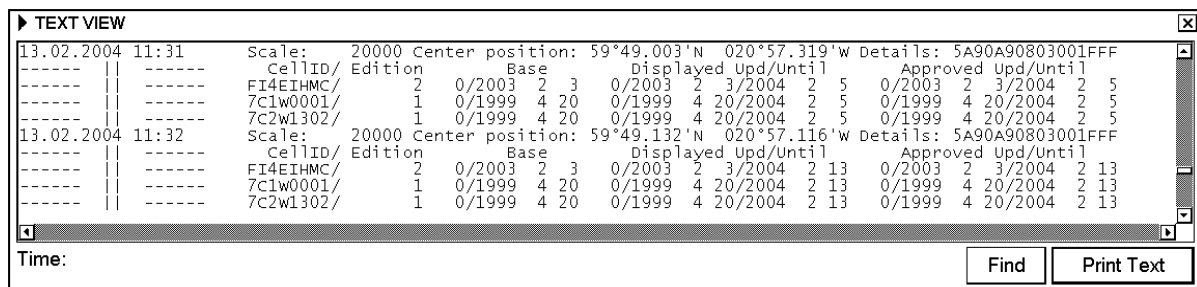
You can make a user chart from the danger target log. See section 24.10 "How to Make a User Chart from a Log (past track)".

Note: By choosing a single target only the selected target's information is recorded. If you want to record information of all danger targets, remove selection from the boxes in the Log Single Target window.

24.6 Chart Usage Log

The chart usage log stores which charts were displayed on the ECDIS chart display area or which were used for chart alerts. The following information is recorded in the chart usage log:

- Chart ID
- Chart edition
- The latest update included to chart
- Displayed Updates Until
- Approved Updates Until
- Center position of display (Lat, Lon).
- Scale of chart display
- Details of chart selected for display

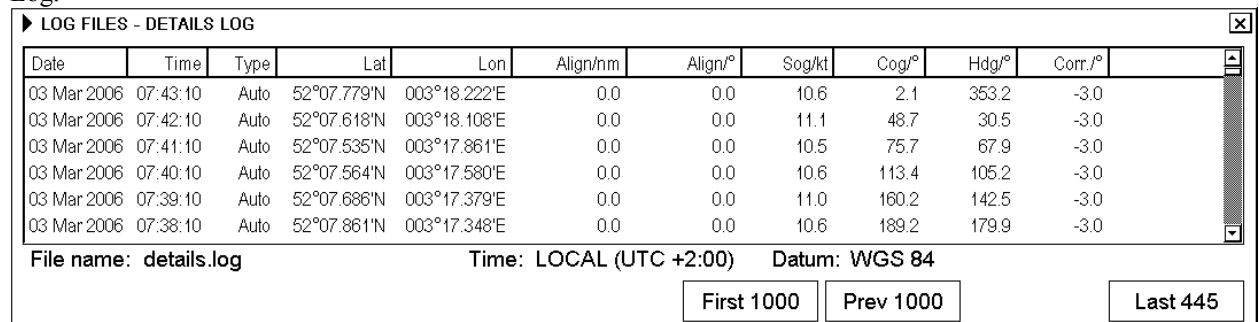


24.7 How to Print Logs

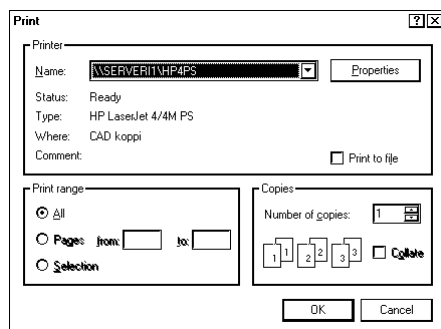
This procedure is the same if you make User Chart from Details, Voyage or Danger Targets log.

24.7.1 How to print entire log

1. Open the Main menu, select Record then select appropriate Log item. The example below shows the Details Log.



2. Put the cursor on the triangle to show Log File menu and select Print Log.
3. To print a log, click the **Print Log** button. To print whole log, select **Print All** from the menu. The Print dialog box appears.

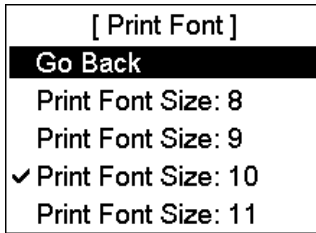


4. Click the **OK** button to print the entire log.

How to change font size for hard copy of logs

In each log (Details, Voyage or Danger Targets log) you can select font size for printed version. To change font size, do the following:

1. Open desired log.
2. Put the cursor on the triangle at the upper left corner and select Print Font.

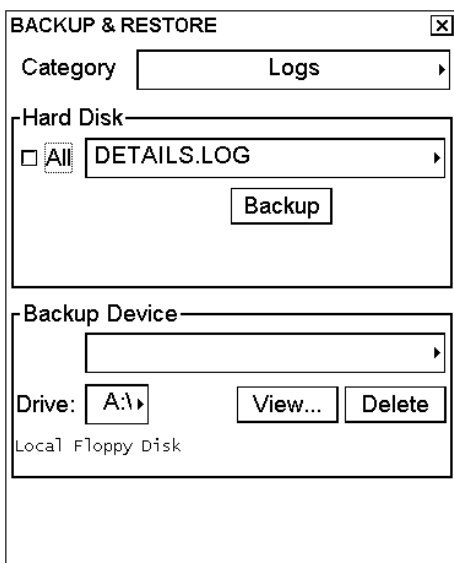


3. Select desired font size.

24.8 How to Make Backup Copy from Logs

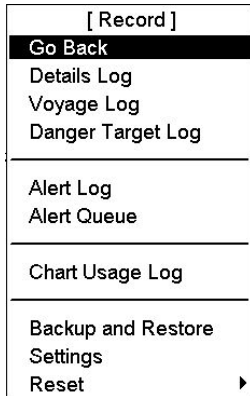
If necessary you can make a backup copy of ECDIS logs onto a floppy disk or a USB memory as follows:

1. Spin the scrollwheel to show Menu/Info/Chart Menu in the mouse functions area then push the left mouse button.
2. Select Record from the menu then push the scrollwheel.
3. Select Backup and Restore from the menu then push the scrollwheel. The Backup and Restore dialog box appears.

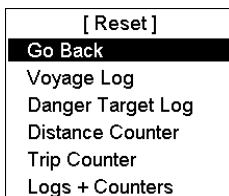


24.9 How to Reset (emptying) Voyage and Danger Targets Logs

It may be useful to reset (empty) the Voyage and Danger Targets logs when you are starting a new voyage. If necessary, make a backup copy before resetting. To reset a log, do the following:



1. Spin the scrollwheel to show Menu/Info/Chart Menu in the mouse functions area then push the left mouse button.
2. Select Record from the menu then push the scrollwheel.
3. Select Reset from the menu then push the scrollwheel.
4. Select the log to reset from the menu then push the scrollwheel.
5. The system will ask you if you are sure to reset selected log. Click the **OK** button to reset the selected log.



24.10 How to Make a User Chart from a Log (past track)

You may create a user chart from any log among Details, Voyage and Danger Target. The past track of the Danger Log target is useful for making a user chart from a single target.

1. Spin the scrollwheel to show Menu/Info/Chart Menu in the mouse functions area then push the left mouse button. Select Record from the menu then push the scrollwheel.
2. Select the log (Details, Voyage, Danger Target) from which you want to make a user chart then push the scrollwheel.



3. Click the **OK** button to continue.
4. Select the log entries that you want to use to create a user chart.

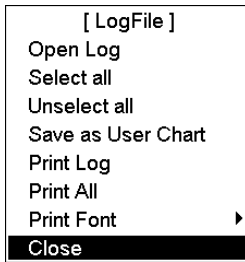
Date	Time	Type	Lat	Lon	Align/m	Align°	Sog/kt	Cog°	Hdg°	Corr.°
03 Mar 2006	07:43:10	Auto	52°07.779'N	003°18.222'E	0.0	0.0	10.6	2.1	353.2	-3.0
03 Mar 2006	07:42:10	Auto	52°07.618'N	003°18.108'E	0.0	0.0	11.1	48.7	30.5	-3.0
03 Mar 2006	07:41:10	Auto	52°07.535'N	003°17.861'E	0.0	0.0	10.5	75.7	67.9	-3.0
03 Mar 2006	07:40:10	Auto	52°07.564'N	003°17.580'E	0.0	0.0	10.6	113.4	105.2	-3.0
03 Mar 2006	07:39:10	Auto	52°07.686'N	003°17.379'E	0.0	0.0	11.0	160.2	142.5	-3.0
03 Mar 2006	07:38:10	Auto	52°07.861'N	003°17.348'E	0.0	0.0	10.6	189.2	179.9	-3.0

File name: details.log Time: LOCAL (UTC +2:00) Datum: WGS 84

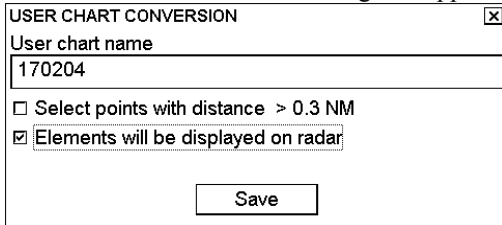
First 1000 Prev 1000 Last 445

24. Recording Functions

- Click the triangle and select "Save as User Chart" to show log.



- The User Chart Conversion dialog box appears.



This dialog box contains the following fields:

User chart name: Enter name for the user chart.

Select points with distance > 0.3 NM: Check to have the system filter the selected log so that the minimum distance between points in the user chart is 0.3 nm.

Elements will be displayed on radar: Check to display the chart on the radar screen.

- Click the **Save** button.

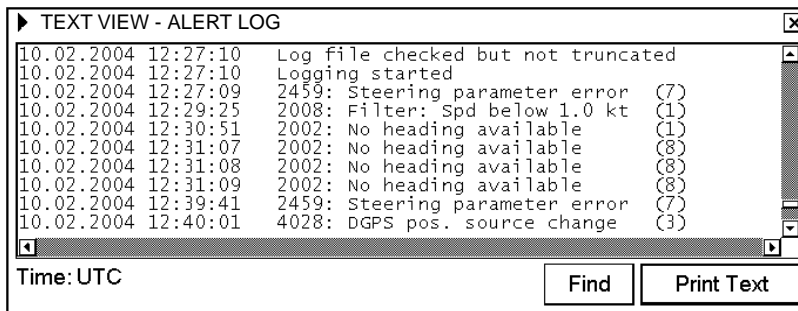


- Confirm creation of user chart by clicking the **OK** button.

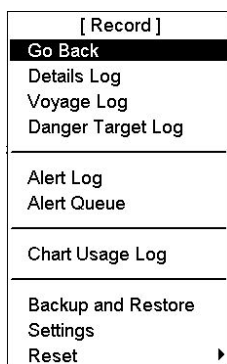
Note: If your selected range for conversion from log to user chart contains periods of invalid ship's positions, then the user chart has a gap in the line for these periods.

24.11 Alert Log

The Alert log collects and records alarms generated by the system. You may view a list of generated alarms using the Alert log.



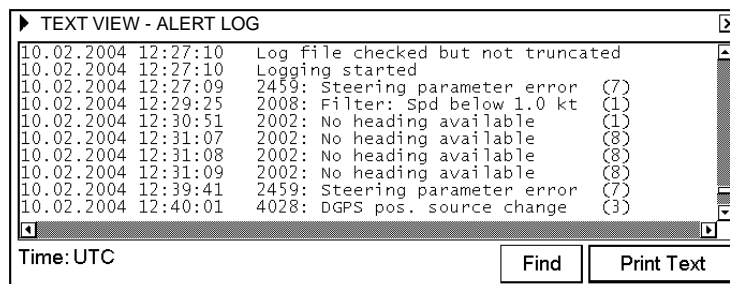
To open the log, do as follows:



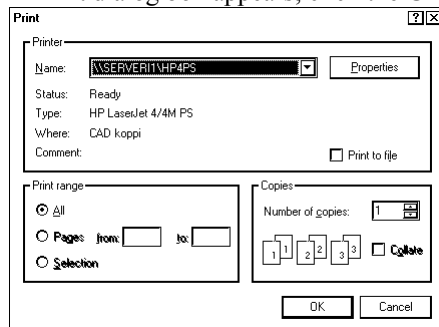
1. Spin the scrollwheel to show Menu/Info/Chart Menu in the mouse functions area then push the left mouse button. Select Record from the menu then push the scrollwheel.
2. Select Alert Log from the menu then push the scrollwheel to show the Alert log.

24.11.1 How to print the latest alert

1. Open the Record menu following step 1 in the above procedure.
2. Select Alert Log from the menu then push the scrollwheel.

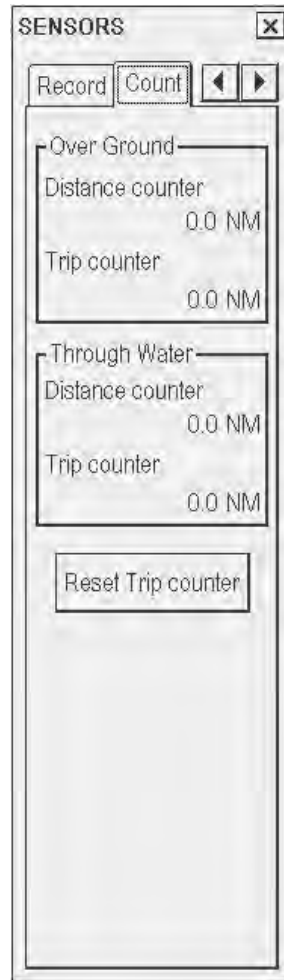


3. Click the **Print Text** button.
4. A Print dialog box appears; click the **OK** button to print (complete log).



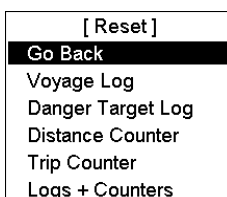
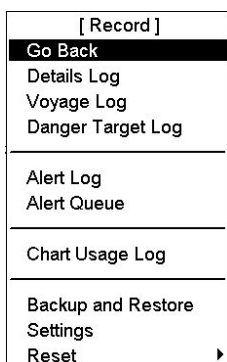
24.12 Distance and Trip Counters

Distance and trip counters have separate fields for both through water and over ground distances. This information is available on the Count page of the Sensors dialog box, shown right. To reset the distance trip counter, click the **Reset trip counter** on the Count page. The trip counter can also be reset from the Record menu as shown below.



24.12.1 How to reset distance and trip counters

It is useful to reset the distance counter when you are starting a new voyage.



To reset the distance and trip counters, do the following:

1. Spin the scrollwheel to show Menu/Info/Chart Menu in the mouse functions area then push the left mouse button. Select Record from the menu then push the scrollwheel.
2. Select Reset from the menu then push the scrollwheel.
3. Select Distance Counter from the submenu then push the scrollwheel.
4. You are asked if you are sure to reset the distance and trip counters; click the **OK** button to reset those counter.

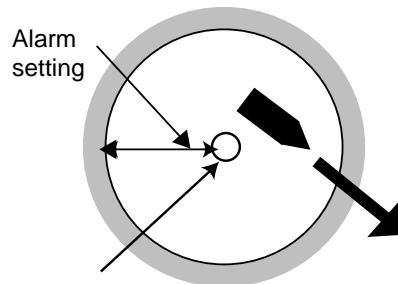
To reset only the trip counter, do the following:

1. Spin the scrollwheel to show Menu/Info/Chart Menu in the mouse functions area then push the left mouse button. Select Record from the menu then push the scrollwheel.
2. Select Reset from the menu then push the scrollwheel.
3. Select Trip Counter from the submenu then push the scrollwheel.
4. You are asked if you are sure to reset the trip counter; click the **OK** button to reset the trip counter.


25. Anchor Watch

25.1 Introduction

The anchor watch feature checks to see if your ship is drifting when it should be at rest. Set the limit for the anchor watch on the menu. If your ship drifts more than the distance set, the alert "874: Anchor watch" appears.

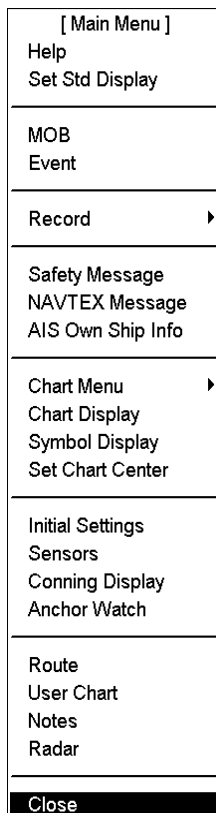


Your ship's position, where you start the anchor watch.

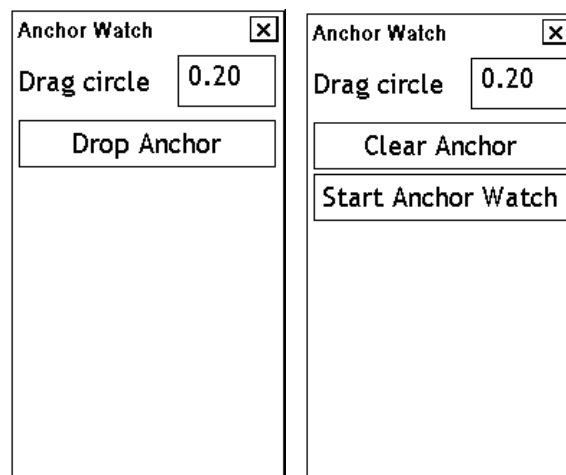
 : Alarm triggered

25.2 How to Activate Anchor Watch

To activate the anchor watch:



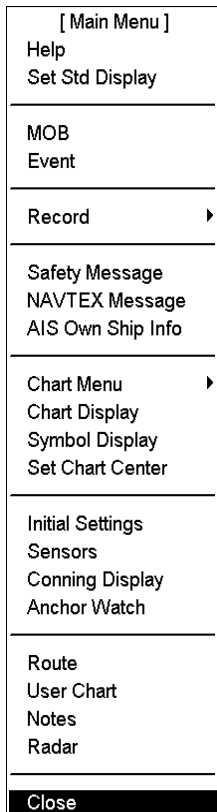
1. Open the main menu.
2. Select Anchor Watch.
3. Enter desired value in the Drag circle field.
4. Drop the anchor then click the **Drop Anchor** button.
5. To start anchor watch, click the **Start Anchor Watch** button.



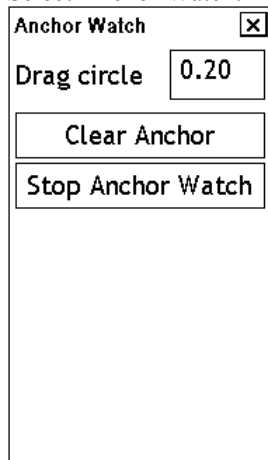
If your vessel travels more than the distance set here, the alert "874: Anchor watch" appears. To continue to use the anchor watch, click the **Clear Anchor** button to set the alarm about your current position.

25.3 How to Deactivate Anchor Watch

To deactivate the anchor watch:



1. Open the main menu.
2. Select Anchor Watch.



3. Click the **Stop Anchor Watch** button to deactivate the anchor watch.

26. Datum

26.1 General

Datum is a mathematical model of the earth based on which a sea chart is produced. If the datum of a position sensor and that of a sea chart are different, a transformation has to be made somewhere in the system. Not doing so can result in errors of several sea miles. The difference between two datums is never constant, but depends on position. This means that the difference between WGS-84 and local datum, generally used in paper charts, is not generally valid with electronic sea charts.

26.2 Paper Charts

Datums used in paper charts have been traditionally national datums for historical reasons. Many paper charts do not have a marked datum, therefore compatibility with electronic charts may be complicated. In some paper charts, the correction terms are printed in lieu of datum, for correction of the WGS-84 system satellite locations. The correction terms are usable but only with the paper chart in question.

26.3 Electronic Sea Charts

Until now, electronic sea charts have generally been based on rasterizing or vectorizing of paper charts, resulting in the respective transfer of the local datum.

Exceptions are

- The ARCS (raster) material includes polynomials for each chart, making it possible for the ECS system to solve the difference between the WGS-84 datum and the local datum with an accuracy sufficient for authority responsibility. In some charts, the mentioned difference is not known with sufficient accuracy, resulting in displaying a permanent warning window when displayed in ARCS compatible systems.

WGS	59°59.972'N
undefi.	025°07.311'E
1.522 NM	120.7 °

- ENC vector material that according to S57 standard has to be produced by a National Hydrographic Office in the WGS-84 datum.

26.4 Positioning Devices and Datum

In early days of electronic positioning devices, datums received little attention because the commonly used systems utilised special charts (like Decca charts). Later on, data output was added to these systems, but still no attention was paid to datums and the position errors were considered as an inaccuracy of the system. With the spread of the GPS, however, datum has become better known. An accurate position is of no value if co-ordinates are in a wrong datum. GPS satellites utilize the WGS-84 datum. However, the WGS-84 datum is not a general solution for all positioning systems, due to differences between electronic sea chart system and the chart material displayed.

26.5 ECDIS and Datum

The true ECDIS uses ENC material, produced to standards using WGS-84 datum. Positioning devices connected to the ECDIS must work in the WGS-84 datum. IMO requires that the ECDIS must give an alert if the datum of a positioning device is not the WGS-84. In practice this is impossible, because the standard used by positioning devices (IEC 61162, previously NMEA 0183) does not include a datum message. Consequently, the classification societies only approve a positioning device interfaced with the ECDIS in which datum cannot be changed (i.e., is always WGS-84).

Note: The ability to check datum of position is a relatively new feature for position receivers. It was introduced in standard IEC 61162-1 Ed2, published in July 2000. Only an EPFS (for example GPS or DGPS) that has "IEC 61162-1 Ed 2 (2000-7)" indicated in its type approval certificate can support the ECDIS to detect datum mismatch.

26.6 ECDIS and User Selectable Local Datum

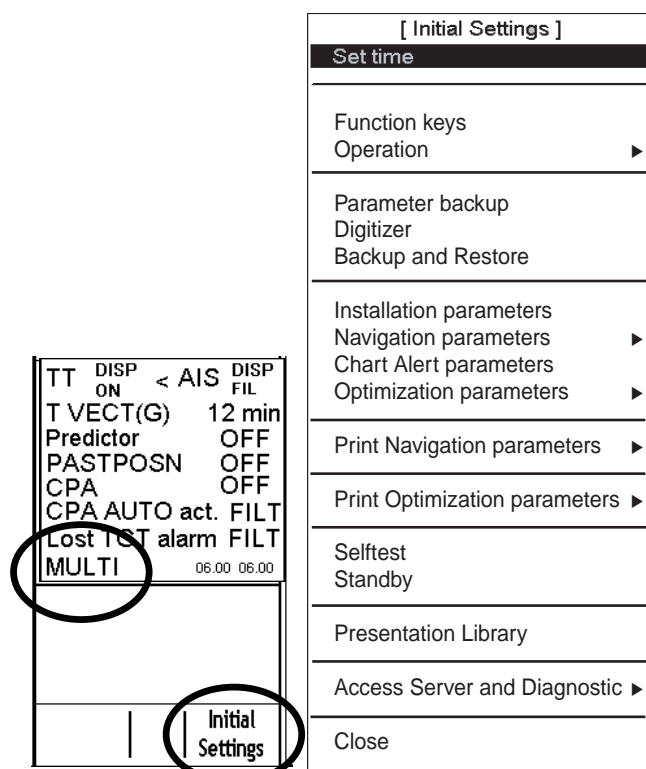
The ECDIS allows the operator to change viewed datum. This selection of the datum does not change anything inside the ECDIS for navigation calculation processes or for electronic sea chart display processes. But it changes the numerical values of positions displayed on the ECDIS display into the operator-selected datum. This is very useful, especially if you like to plot positions from the ECDIS on a traditional paper chart.

27. Parameters Setup

27.1 Parameters

The Initial Settings menu in the Initial Settings dialog box contains the installation parameters, navigation parameters and optimization parameters that define the configuration of the ECDIS and operative parameters that are either used to control steering and navigation calculation or used during route planning.

To open the Initial Settings menu, do the following:



1. Put the cursor on the text SINGLE, PLAN, SLAVE, MULTI or MASTER (whichever is shown) on the lower right corner of the information area, confirm that Initial Settings appears in the mouse functions area, then push the right mouse button to open the Initial Settings dialog box.
2. Put the cursor on the triangle in the Initial Settings dialog box to show the Initial Settings menu.

27.1.1 Parameter-related menus

How to set time

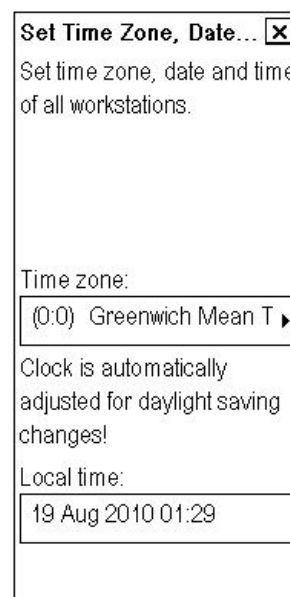
Put the cursor on the date and time presentation on right-hand side of ECDIS display.

- Use the left mouse button to display UTC time and local time alternately.
- Use the right mouse button to change time zone and/or time.

Note: The time zone field always shows the time difference between UTC time and local time without adjustment for daylight savings time.

To set the time, the following conditions must be met:

- Kalman filter should be OFF.
- Turn off any track steering mode (GOTO WPT or GOTO Track).



27. Parameters Setup

Parameter backup

User can make backup copy of parameters. See Chapter 17 for details.

Installation parameters

The ECDIS system parameters are set by the installation parameters.

Note: Access to the installation parameters requires a password. For details see the installation manual.

Navigation parameters

Parameters for your ship and routes. For more information about setting navigation parameters, see "Ship parameters" and "Route parameters" on page 27-3.

Optimization parameters

This function is used to define parameters for speed and fuel consumption. For details, see section 27.1.6.

Print navigation parameters

Prints navigation parameters to default printer.

Print optimization parameters

Prints optimization parameters to default printer.

27.1.2 How to access the installation parameters

The installation parameters command is used to set installation parameters for the system. These parameters are concerned with hardware configurations and set-up. They need only be set during installation and if sensor configuration changes. Installation parameters are described in detail in the Installation Manual.

27.1.3 How to select datum

Datum is used to select between different models of the earth. It is essential that you use Datum in a consistent way. See also section 26.5 "ECDIS and Datum".

If you use paper charts together with electronic chart material, it is recommended that you use the same datum as your current paper chart to avoid misalignment between your electronic system and points taken or plotted on your current paper chart.

Once you have selected a datum, all numerical latitude-longitude position values are presented in your selected datum.

Note: If you use ARCS raster chart material, rasterized charts contain some rasterized position information. These positions, like scales in the edges of ARCS charts, are true only if you have selected native datum of that ARCS chart. Normally this is the natural situation, because you use ARCS together with matching official paper chart and because you have selected as datum the datum of your matching official paper chart.

To select datum do the following:

1. Put the cursor on the datum indication at the upper right corner of the display.
2. Spin the scrollwheel to select appropriate datum then push the scrollwheel.

HDG	140.7 °
SPD (WT)	19.6 kn
SB (POSN)	-0.3 kn
COG (POSN)	139.6 °
SOG (POSN)	19.6 kn
	59°57.871'N
	025°21.850'E
	WGS 84
	DGPS

27.1.4 Navigation parameters settings

The purpose of navigation parameters is set the basic parameters for the ship. These parameters are relative to ship steering and they are very important to get correct function of the integrated navigation system. They must be maintained carefully. Modification requires a good knowledge of the parameters' importance.

In order to edit Ship and Route parameters, do the following:

1. Put the cursor on the text SINGLE, PLAN, SLAVE, MULTI or MASTER (whichever is shown) on the lower right corner, then push the right mouse button to open the Initial Settings dialog box.
2. Select Navigation parameters then push the scrollwheel.
3. Select Ship and Route parameters from the menu then push the scrollwheel.

Ship parameters

Max speed: Maximum speed the ship can do.

Max height: Max. height of ship above sea level.

Max draught: Max. draught of ship.

GYRO correction

Source: Select method of gyro error correction, auto, manual or off.

Spd/lat corr.: Select On or Off.

Max corr.: enter max. value for correction.

Man corr.: enter value for manual gyro correction.

Route parameters

MAX r.o.t.: Indicate the maximum rate of turn of the ship.

Turn end tol.: Define the window for the detection of the end of turn. Typical values are between 2 to 4 degrees.

WP approach*: Set the alert time before approaching the wheel over point.

WP prewarn*: Set the alert time before approaching the wheel over point. It should be well in advance of the WPT approach alert time.

Start limit: Set the maximum approach angle against planned course in order to accept start of automatic route steering.

Def. line rad: Define the default value of radius between waypoints during automatic route steering.

Def. ch limit: Define the default value of channel limit.

Def. safe marg: Define the default value of extension for channel to be checked against selected alerts.

Drift compensation: Enable/disable the drift compensation during automatic route steering.

Gyro ERROR: Enable/disable the gyro error compensation of set course during automatic route steering.

SHIP & ROUTE PAR... [X]	
Ship parameters	
MAX speed	30.0 kn
MAX height	30.0 m
MAX draught	10.0 m
GYRO correction	
Source	OFF ▾
SPD/LAT CORR	OFF ▾
MAX CORR	3.0 °
MAN CORR	0.0 °
Route parameters	
MAX ROT	200 °/min
Turn end tol.	2 °
WPT approach	60 s
WPT prewarn	120 s
Start limit	15 °
Def. line RAD	1.0 NM
Def. ch LIM	185 m
Def. safe marg	40 m
Drift compensation	OFF ▾
GYRO error	OFF ▾

*FURUNO FAP-2000
or YOKOGAWA PT-500A*

SHIP & ROUTE PAR... [X]	
Ship parameters	
MAX speed	30.0 kn
MAX height	30.0 m
MAX draught	10.0 m
GYRO correction	
Source	OFF ▾
SPD/LAT CORR	OFF ▾
MAX CORR	3.0 °
MAN CORR	0.0 °
Route parameters	
MAX ROT	200 °/min
Turn end tol.	2 °
WPT approach	60 s
WPT prewarn	120 s
Start limit	15 °
Def. line RAD	1.0 NM
Def. ch LIM	185 m
Def. safe marg	40 m

*TOKYO KEIKI
PR-6000*

* Protected with password/key protection.

27.1.5 Forwarding distances

The forwarding distance is the distance the ship travels straight after the steering command is given to the autopilot. This distance may vary with a different required radius of turn. The logic to verify the correct distance is to perform a maneuver of 90 degrees (Port and Starboard), with a SMALL RADIUS (0.3 nm), and verify from the radar, using the curved EBL, if the turn goes "long" or is too "sharp". The parameter should also be verified with a different radius. (Most important radius values are between 0.3 to 1.0 nm). You can define set of Forwarding Distances both for "Go To Track" and "Go To WPT" steering modes.

Note: Forwarding distances are entered during the installation and are protected by password/key protection.

How to set forwarding distances for FAP-2000

You can define set of Forwarding Distances both for "Go To Track" and "Go To WPT" steering modes.

In order to edit forwarding distances parameters, do the following:

1. Put the cursor on the text SINGLE, PLAN, SLAVE, MULTI or MASTER (whichever is shown) on the lower right corner, then push the right mouse button to open the Initial Settings dialog box.
2. Put the cursor on the triangle in the Initial settings dialog box, select Navigation parameters then push the scrollwheel.
3. Select Forwarding distance then push the scrollwheel.
4. Check Enable changes to modify desired set of Forwarding Distances.

FORWARDING DISTANCES			
GO TO TRACK GO TO WP			
Port			
Radius /nm	Speed		
	- 7.5 kn	7.5 - 15.0 kn	15.0 kn-
- 0.5	0.052	0.054	0.053
0.6 - 1.1	0.053	0.055	0.056
1.2 -	0.034	0.056	0.064
Starboard			
Radius /nm	Speed		
	- 7.5 kn	7.5 - 15.0 kn	15.0 kn-
- 0.5	0.052	0.053	0.053
0.6 - 1.1	0.052	0.053	0.056
1.2 -	0.038	0.054	0.067
<input checked="" type="checkbox"/> Enable changes			

Normally these parameters are entered during sea trial but can also be modified later on. See the next page.

How to set forwarding distances for TOKYO KEIKI PR-6000

In order to edit forwarding distances parameters, do the following:

1. Put the cursor on the text SINGLE, PLAN, SLAVE, MULTI or MASTER (whichever is shown) on the lower right corner, then push the right mouse button to open the Initial Settings dialog box.
2. Put the cursor on the triangle in the Initial settings dialog box, select Navigation parameters then push the scrollwheel.
3. Select Forwarding distance then push the scrollwheel.
4. Check "Enable changes" to modify desired set of Forwarding Distances.
5. To operate without XTE gain, check "Service state". When service state is checked, the dialog box shown right appears.
6. After doing forwarding distances, be sure to uncheck "Service state".

FORWARDING DISTANCES			
GO TO AW / GO TO OS			
Port			
Radius /nm	Speed		
	- 9.4 kn	9.4 - 18.8 kn	18.8 kn-
- 0.5	0.140	0.155	0.170
0.6 - 1.1	0.100	0.090	0.120
1.2 -	0.120	0.100	0.110
Starboard			
Radius /nm	Speed		
	- 9.4 kn	9.4 - 18.8 kn	18.8 kn-
- 0.5	0.140	0.155	0.170
0.6 - 1.1	0.100	0.090	0.120
1.2 -	0.120	0.100	0.110
<input checked="" type="checkbox"/> Enable changes <input checked="" type="checkbox"/> Service state			

<p>Warning</p> <p>Service state</p> <p>XTE gain is set as zero for tuning of Forwarding distances</p>
--

How to set forwarding distances for Yokogawa PT-500A (category B)

In order to edit forwarding distances parameters, do the following:

1. Put the cursor on the text SINGLE, PLAN, SLAVE, MULTI or MASTER (whichever is shown) on the lower right corner, then push the right mouse button to open the Initial Settings dialog box.
2. Put the cursor on the triangle in the Initial settings dialog box, choose Navigation parameters then push the scrollwheel.
3. Choose Forwarding distance then push the scrollwheel.
4. Check "Enable changes" to modify desired set of Forwarding Distances.

FORWARDING DISTANCES			
TRACK			
Port			
Radius /nm	Speed		
	- 8.3 kn	8.3 - 16.6 kn	16.6 kn-
- 0.5	0.052	0.040	0.055
0.6 - 1.1	0.053	0.102	0.106
1.2 -	0.034	0.056	0.064
Starboard			
Radius /nm	Speed		
	- 8.3 kn	8.3 - 16.6 kn	16.6 kn-
- 0.5	0.052	0.043	0.053
0.6 - 1.1	0.052	0.104	0.107
1.2 -	0.038	0.054	0.067
<input type="checkbox"/> Enable changes			

How to set Forwarding distances for Yokogawa PT-500A (category C)

In order to edit forwarding distances parameters, do the following:

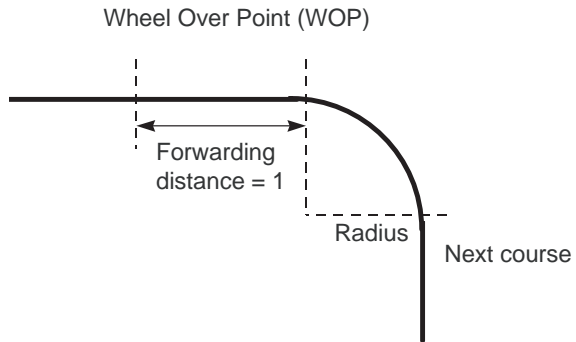
1. Put the cursor on the text SINGLE, PLAN, SLAVE, MULTI or MASTER (whichever is shown) on the lower right corner, then push the right mouse button to open the Initial Settings dialog box.
2. Put the cursor on the triangle in the Initial settings dialog box, choose Navigation parameters then push the scrollwheel.
3. Choose Forwarding distance then push the scrollwheel.
4. Check "Enable changes" to modify desired set of Forwarding Distances.
5. To operate without XTE gain, check "Service state". When service state is checked, the dialog box shown right appears.
6. After doing forwarding distances, be sure to uncheck "Service state".

FORWARDING DISTANCES			
GO TO AW / GO TO OS			
Port			
Radius /nm	Speed		
	- 9.4 kn	9.4 - 18.8 kn	18.8 kn-
- 0.5	0.140	0.155	0.170
0.6 - 1.1	0.100	0.090	0.120
1.2 -	0.120	0.100	0.110
Starboard			
Radius /nm	Speed		
	- 9.4 kn	9.4 - 18.8 kn	18.8 kn-
- 0.5	0.140	0.155	0.170
0.6 - 1.1	0.100	0.090	0.120
1.2 -	0.120	0.100	0.110
<input type="checkbox"/> Enable changes <input type="checkbox"/> Service state			

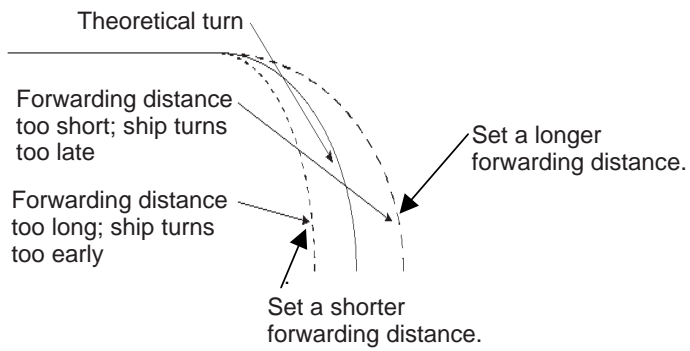
Warning	
Service state	
XTE gain is set as zero for tuning of Forwarding distances	

27. Parameters Setup

Normally these parameters are entered during sea trial but can also be modified later on. See figures below:



How forwarding distance is defined



Influence of forwarding distance on ship's turn

27.1.6 Optimization parameters setting

The optimization parameters are used in optimization calculation. Therefore these parameters must be defined before calculation.

In order to modify optimization parameters, do the following:

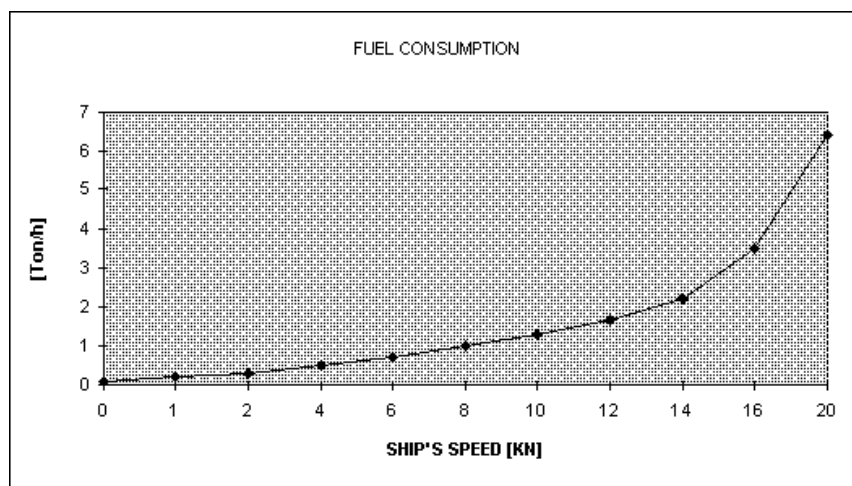
1. Spin the scrollwheel to show Menu/Info/Chart Menu in the mouse functions area then push the left mouse button.
2. Select Initial Settings and push the scrollwheel.
3. Put the cursor on the triangle in the Initial Settings dialog box to show the Initial Settings menu.
4. Select Optimization parameters from the menu then push the scrollwheel.
5. Select Planning parameters from the menu then push the scrollwheel.
6. Modify optimization parameters by placing the cursor in the desired edit box and using the scrollwheel to set value. Push the scrollwheel to confirm.

PLANNING OPTIMIZATION PARAMETERS		
Cost		
Hour	HFO	DO
\$/h	\$/ton	\$/ton
<input type="text" value="1200"/>	<input type="text" value="75"/>	<input type="text" value="90"/>
Speed	HFO	DO
kn	ton/h	ton/h
0.0	0.000	0.000
2.0	0.600	0.100
4.0	0.850	0.100
6.0	1.100	0.100
8.0	1.400	0.100
10.0	1.750	0.100
12.0	2.000	0.100
14.0	2.400	0.100
16.0	2.800	0.100
18.0	3.300	0.100
20.0	4.000	0.100

Note 1: HFO: Heavy fuel oil, DO: Diesel oil

Note 2: It is not necessary to enter leading zero ("0").

This is a very important data table that contains ship's fuel consumption with the different speeds. There are 11 different speeds available to define fuel consumption on those specific speeds. Prior to entering data in the form, prepare the following graphic in order to find those 11 points.



Set 11 points on the graphic as explained above. Transfer those 11 points to the table in the ECDIS. Use more points where the curve bends more.

Example: 3.5 KN = 0.72 Ton / Hour HFO

Use the second graphic for diesel oil, if diesel oil consumption is relative to the speed.

27. Parameters Setup

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28. Color Calibration

28.1 Color Calibration Settings

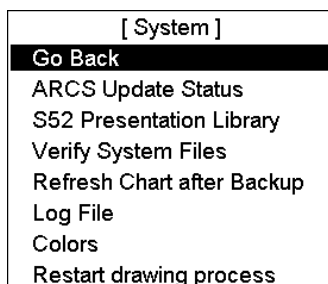
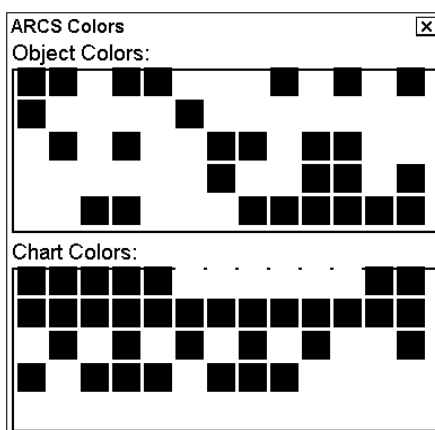
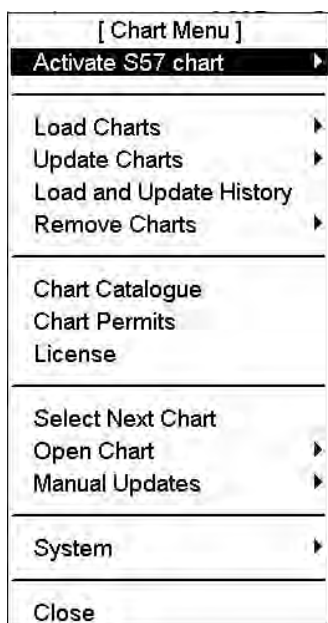
Note: Use of the brilliance control (with FURUNO-supplied monitor) may adversely affect the visibility of information on the night display.

28.1.1 Color test for ARCS charts

You may want to adjust brilliance. You have a tool to check that you can clearly see all details of the charts. For ARCS chart this tool is Colors.

1. Spin the scrollwheel to show Menu/Info/Chart Menu in the mouse functions area, then push the right mouse button.
2. Select System from the menu then push the scrollwheel.
3. Select Colors from the submenu then push the scrollwheel.

In the ARCS Colors window, you can see if individual colors can be distinguished when viewing. This lets you see how light levels may affect the visibility of the chart.

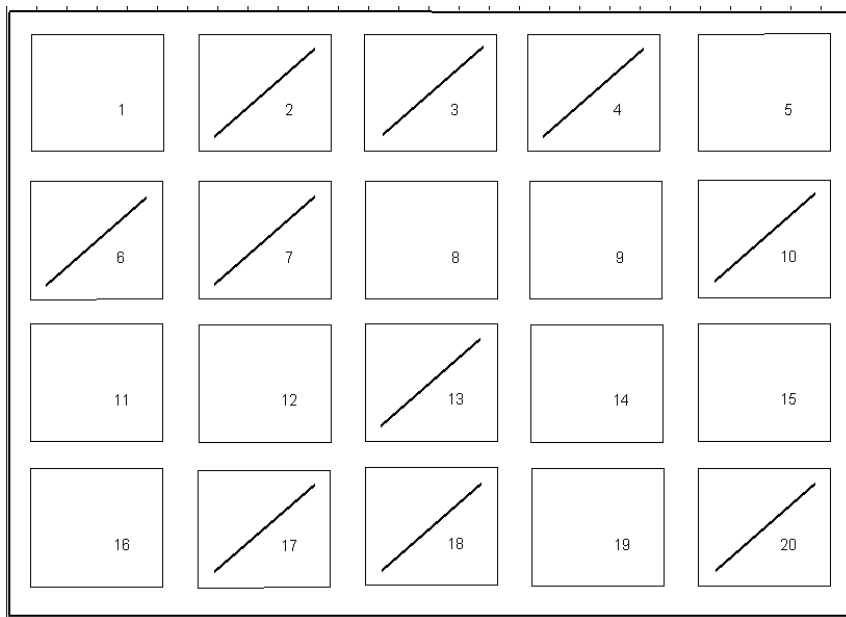


28.1.2 Color differentiation test for S57 charts

You may want to adjust brilliance. You have a tool to check that you can clearly see all details of the charts. For ARCS chart this tool is Colors. For S57 charts this tool is the color differentiation test diagram.

The color differentiation test diagram is a part of ECDIS chart 1 and you can use it as follows:

1. Spin the scrollwheel to show Menu/Info/Chart Menu in the mouse functions area then push the right mouse button.
2. Select ECDIS Chart 1 from the menu then push the scrollwheel.
3. Select "Color diagram" from the submenu then push the scrollwheel.
4. A diagonal line should be present in each of the twenty (1-20) boxes if color differentiation is proper.



Color diagram

5. Press each button in the Return dialog at the left side of the screen to display corresponding symbol.
6. Click the X button to quit.

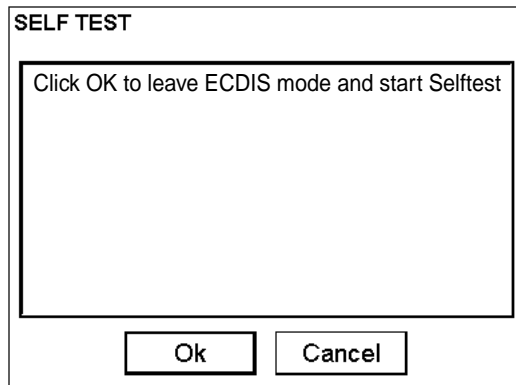
28.1.3 Gray scale test

Set brilliance and contrast to calibrated positions. Use the gray scale test to visually inspect neutral shades of grey.

Note: During any self-test, the ECDIS becomes inoperative and this is indicated by sounding the buzzer and flashing the lamp in the **SYSTEM FAILURE** key on the keyboard-equipped control unit.

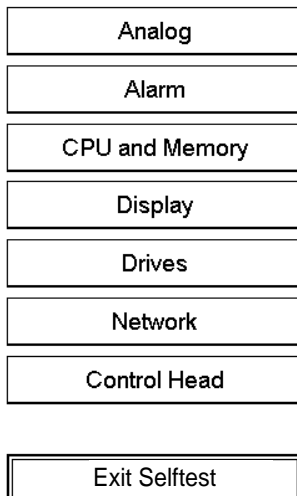
To activate the grey scale test, do the following:

1. Spin the scrollwheel to show Menu/Info/Chart Menu in the mouse functions area then push the left mouse button.
2. Select Initial Settings from the menu then push the scrollwheel.
3. Put the cursor on the triangle in the dialog box, select Selftest from the menu then push the scrollwheel.



4. Click the **OK** button. The system will end normal operation and start the self-test mode.

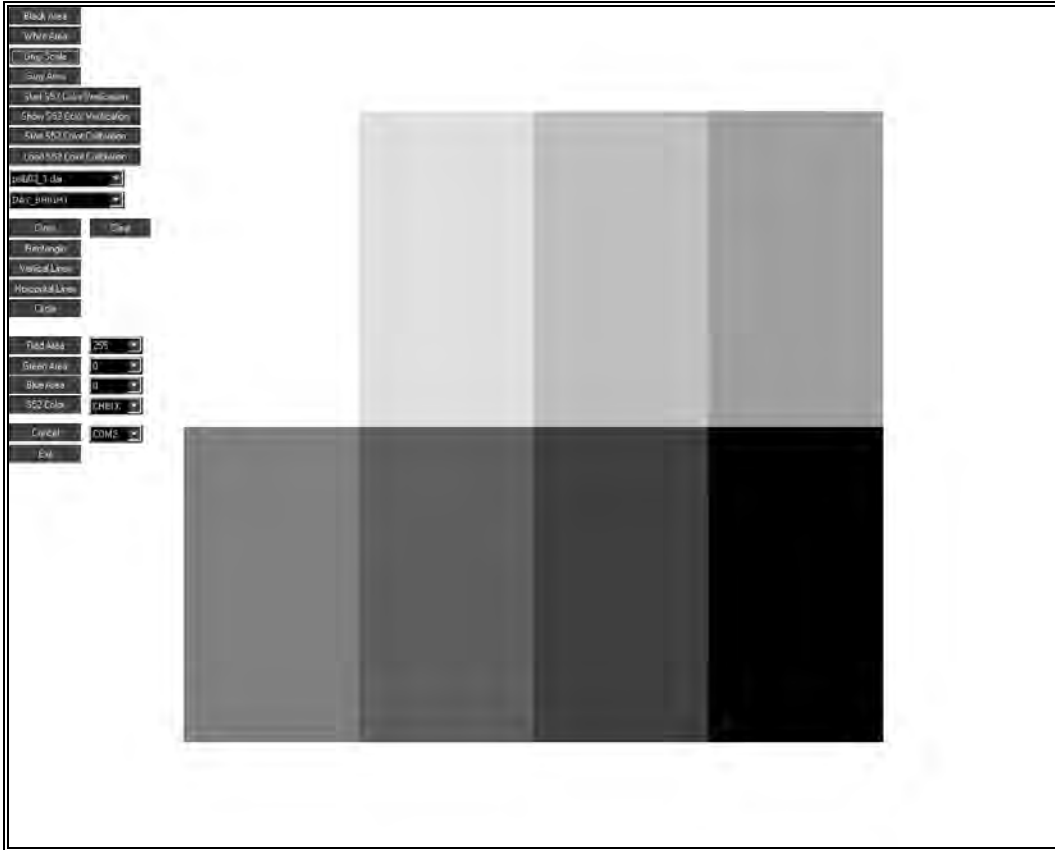
Self Test



5. Select **Display** then push the left mouse button.

28. Color Calibration

- Click the **Gray Scale** button at the upper left-hand corner of display with the left mouse button, and the following display appears:



Grey scale test pattern

- Check for proper display of gray shades. If the menu at the left side has disappeared, roll the trackball rightward to display it.
- Click the **Exit** button with the left mouse button to close the display.
- Click the **Exit Test** button to exit the test mode. The system will then start normal operation.

29. Conning Display

29.1 System Configuration

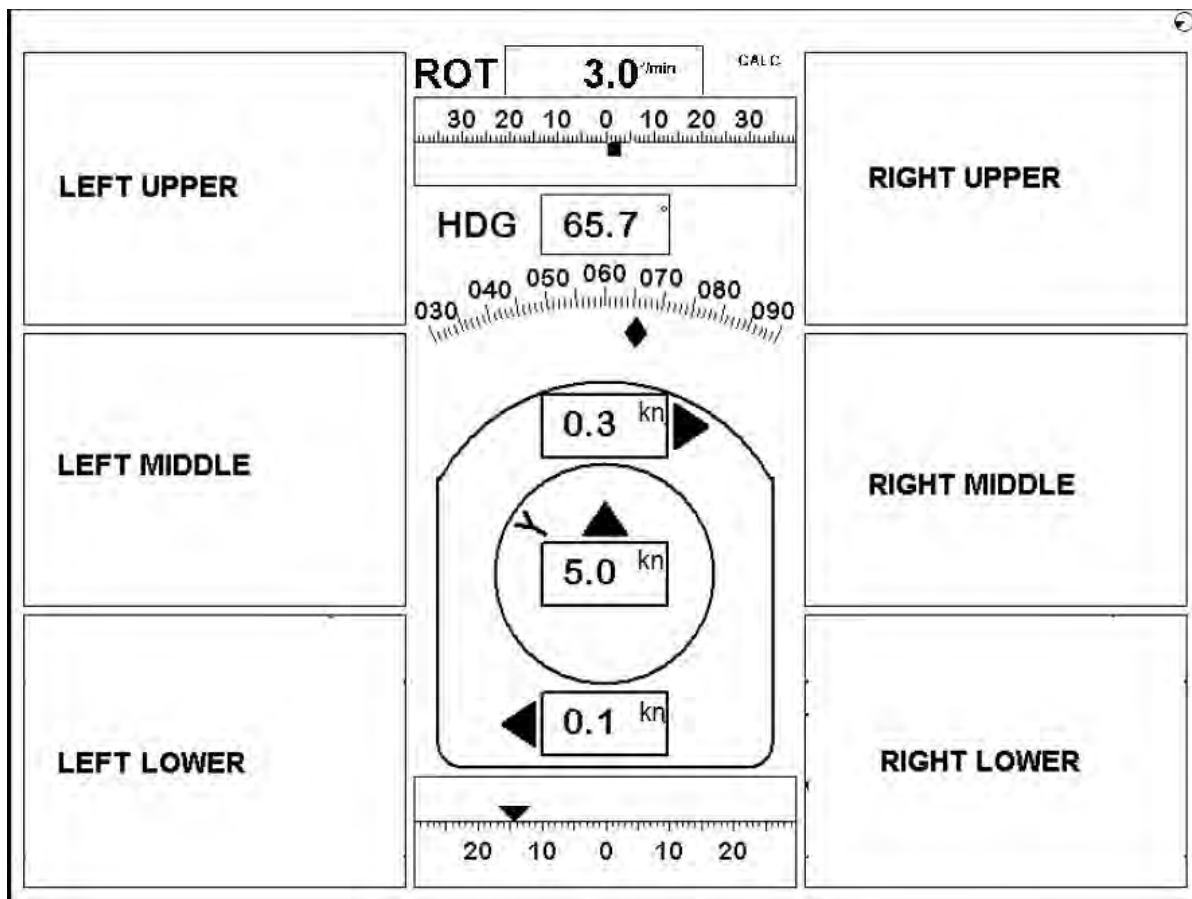
The ECDIS can receive data from various sensors. It can adopt information output by the sensors in either analog or digital format, make navigation calculations from the data display and show the results on the conning display (option).

The ECDIS can be connected to up to 16 sensors (two LAN adapters, eight sensors/adapters), which output analog data and up to eight sensors that output serial data.

Data displayed on the conning display depends on the settings in the ECDIS and the conning display configuration set in the installation parameters, where you can arrange the layout of the conning display.

There are six predefined places on the conning display where you can specify data to display. The center of the conning display is fixed to show information defined by the manufacturer. For more information about how to process these windows, see the description of the installation parameters in the installation manual.

The figure below shows the locations of operator-defined windows. The content of the windows are defined in the installation parameters.



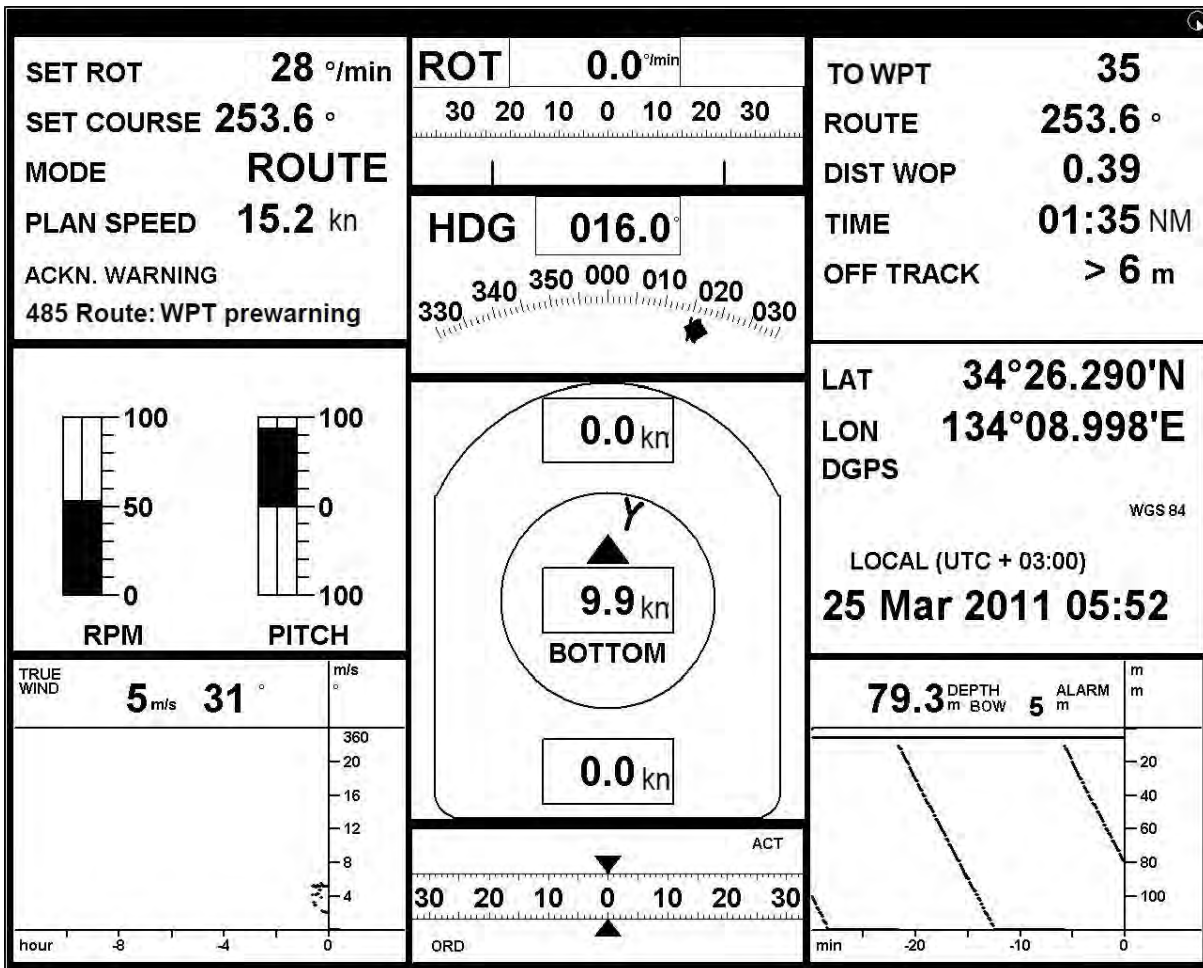
Conning display

29.2 Display Interpretation

The conning display shows collected data from different sensors, and the data below is available for display. However, this depends on which sensors are installed and connected on board the ship.

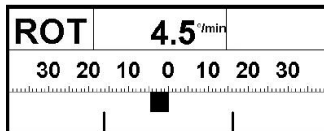
Typically information which is displayed on the conning display are received from following sensors:

- Position sensors
- Wind sensor
- Gyro
- Rate of turn gyro
- Log
- Dual-axis log
- Rudder
- Propellers
- Thrusters



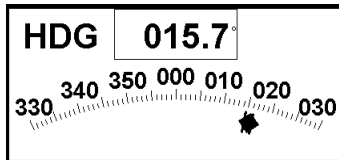
Typical layout of conning display in navigate mode

29.2.1 ROT window



The ROT window monitors actual ROT, which is displayed in digital format in the upper center box and analog format in the center of the window. The text "CALC" appears when ROT is calculated by the system. The scale is available from 35 to 90 degrees, and is set at installation, with installation parameters. For further details, see Chapter 19 "Navigation Sensors".

29.2.2 Heading window

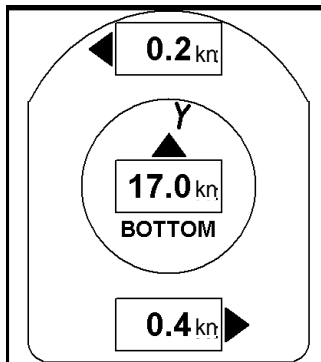


The heading window shows the following information:

- Gyro course, both in digital and analog formats.
- Diamond figure shows heading in graphical format.

For further details, see Chapter 19 "Navigation Sensors".

29.2.3 Speed window

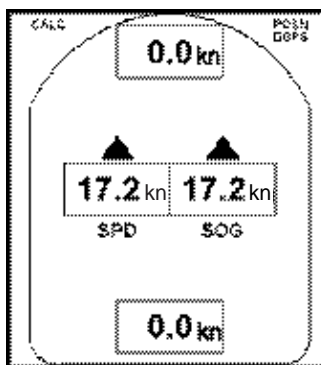


The speed window shows the following information:

- Bow speed
- Longitudinal speed
- Stern speed
- Direction of true wind relative to your ship. (True wind must be selected on the menu to get true wind.)
- Source of speed indicator (BOTTOM in example)

This window shows center speed, single speed readout.

For further details, see Chapter 19 "Navigation Sensors".



Speed window shows speed through water (SPD) and Speed Over Ground SOG

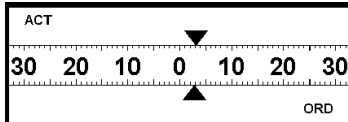
Source of SPD is shown upper left corner and source of SOG is shown upper right corner.

This window shows center speed, dual speed readout.

Note: There are two different sizes in the vertical direction for the Speed window. The size of the Speed window depends on of Rudder window selected.

For how to set the speed window, see the installation manual.

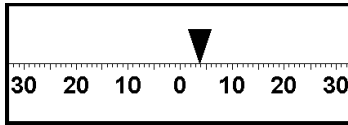
29.2.4 Rudder window



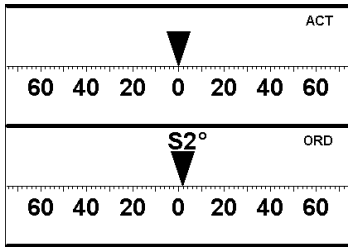
The rudder window shows the following information:

First rudder and source of the first rudder. In this example the source is actual rudder (ACT).

Second rudder and source of the second rudder. In this example the source is ordered rudder (ORD).

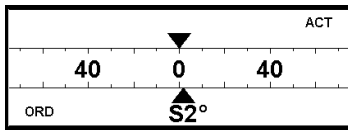


In this example only one rudder is connected.



Double rudder window for actual and order rudder.

To get this window, the size of the speed window should be set to "small size or small with double window". For information, see the installation manual.



Double rudder window for actual and order rudder. Numerical value for ordered rudder position available.

29.2.5 Position window



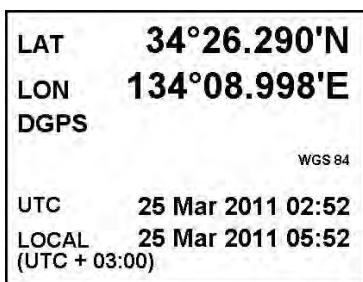
Local time



UTC time

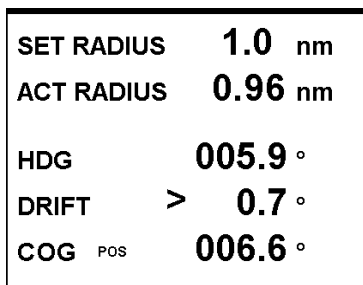
The position window shows the following information:

- LAT and LON of your ship's position
- Source of your ship's position. See Chapter 19 "Navigation Sensors".
- Local time and/or UTC time depending on selection made during the installation. Current date and time used in the ECDIS.



UTC time and local time

29.2.6 Drift and radius window



The drift and radius window shows the following information:

- SET RADIUS: Current set radius on Autopilot FAP-2000.
- ACT RADIUS: Current radius of turn.
- HDG: Current heading
- DRIFT: Direction and angle of drift.
- COG: Course over ground and its source.

29.2.7 Autopilot FAP-2000 window

SET ROT	28 °/min
SET COURSE	253.6 °
MODE	ROUTE
PLAN SPEED	15.2 kn
ACK WARNING	
2485 Route: WP prewarning	

The Autopilot FAP-2000 window displays the following information:

- **SET ROT:** Current set rate of turn based on current speed and set turning radius.
- **SET COURSE:** Current set course.
- **MODE:** Indicates selected steering mode.
- **PLAN SPEED:** Planned speed in current leg of the monitored route.
- **ACK. WARNING:** Steering-related alerts displayed in lower status bar of ECDIS are also displayed on the conning display.

This is called the Autopilot FAP-2000 existed window, where the following additional information is available:

SET RADIUS	0.5 nm
PROG CRS	015.0 °
SET COURSE	006.9 °
SET HDG	006.9 °
MODE	Prg Track Turn
ACK WARNING	

- **SET RADIUS:** Indicates selected radius for turn.
- **PROG CRS:** Course after turn designed by program course change or program track steering mode.
- **SET COURSE:** Current set course.
- **SET HDG:** Calculated heading for ship based on SET COURSE and DRIFT. This information is available when the program track steering is in use
- **MODE:** Current turning mode.

Autopilot FAP-2000 order window for DNV specification

SET COURSE	xxx.x deg
SET RADIUS	x.x NM
SET ROT	xxx.x deg/min
SET SPEED	xx.x kn
MODE	(steering mode)
ACK. WARNING	(steering related warning)

29.2.8 Route window

TO WP	35
ROUTE	253.6 °
DIST WOP	0.39 nm
TIME	01:35
OFF TRACK	> 6 m

Route window

TO WP	2
ROUTE	006.2 °
DIST WOP	0.07 nm
TIME	00:23
OFF TRACK	> 2 m
NEXT	010.6 °
RADIUS	1.0 nm

Route with next leg

When you have selected a route to monitor, the route window shows the following information:

TO WPT: The waypoint your ship is approaching.

ROUTE: Calculated set course to follow the monitored route including off track, drift and gyro error compensation.

DIST WOP: Distance to Wheel Over Point (WOP)

TIME: Time left to reach WOP

OFF TRACK: Distance to center line of route

An example of a route with a next leg window, where the following additional information is available:

- **NEXT:** Planned course to steer after "To WPT".

Note: The text "(corr)" in orange is displayed beside NEXT to indicate that the value of the planned course to steer after "To WPT" is compensated for gyro error correction. This condition exists if "Gyro error correction" has been enabled in the Navigation parameters, gyro value is compensated for gyro error correction and gyro error compensation have been enabled in Navigation parameters.

- **RADIUS:** Planned turning radius of "To WPT".

Route windows for DNV specification (Norwegian ship classification body)

PRESENT LEG	WPT NO	1
DIST TO WOP	0.66 NM	
TIME TO WOP	02:17	
BRG TO WOP	021.8 °	
OFF TRACK	56 m	
TRACK LIMIT	101 m	

(1)

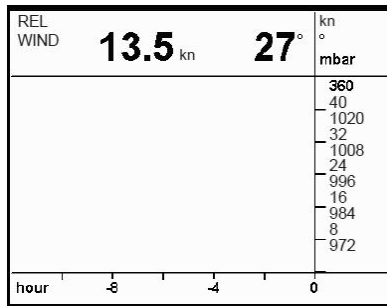
NEXT LEG	WPT NO	2
NEXT RADIUS	0.3 NM	
NEXT COURSE	009.8 °	
NEXT LEG DIST	3.2 NM	
NEXT LEG TIME	0:11:19	
REMAINING DIST	42.9 NM	
REMAINING TIME	5:27:11	

(2)

(1) Route present leg C

(2) Route next leg

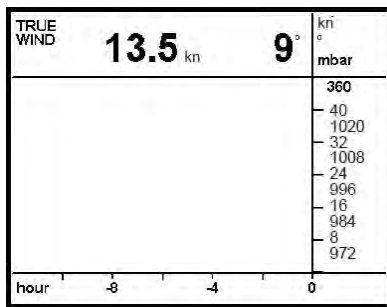
29.2.9 Weather and wind window



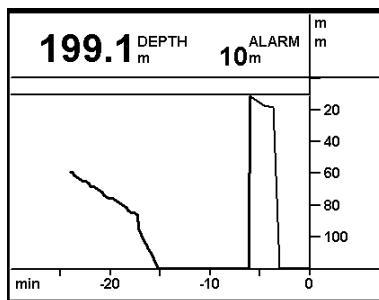
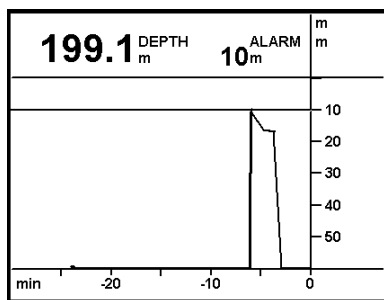
The weather and wind window shows

- Wind direction, true or relative
- Wind speed
- Air pressure (optional)

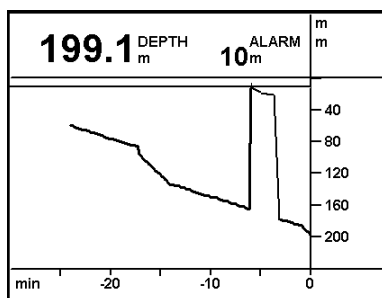
Weather conditions of last 12 hours are shown.



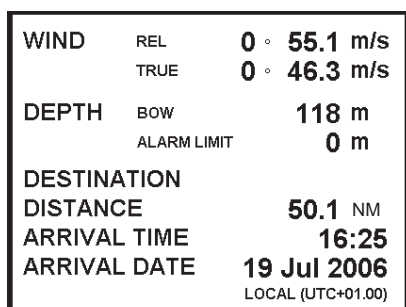
29.2.10 Depth window



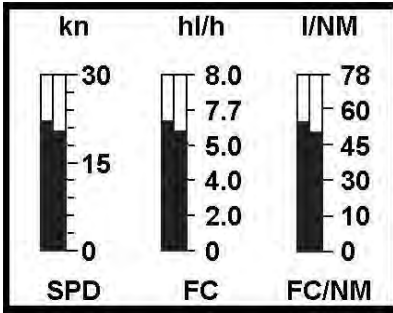
The depth window shows, in digital and analog formats, the latest 30 minutes of depth data fed from an echo sounder. Three depth scales are available: 50 m, 100 m and 200 m. Depth alert limit is also shown.



29.2.11 Combined wind, depth and destination window (for DNV specification)



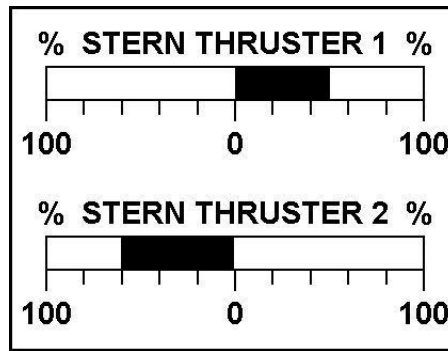
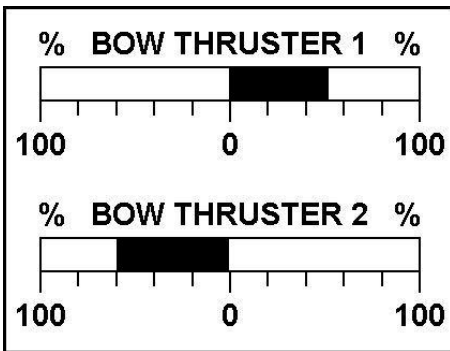
29.2.12 Fuel consumption window



The fuel consumption window displays three sets of indications that show ship's speed, fuel consumption per hour and fuel consumption per nautical mile. Each indication has two vertical bars. The bar on the left shows planned speed or fuel consumption and the bar at right shows actual situation.

29.2.13 Thruster window

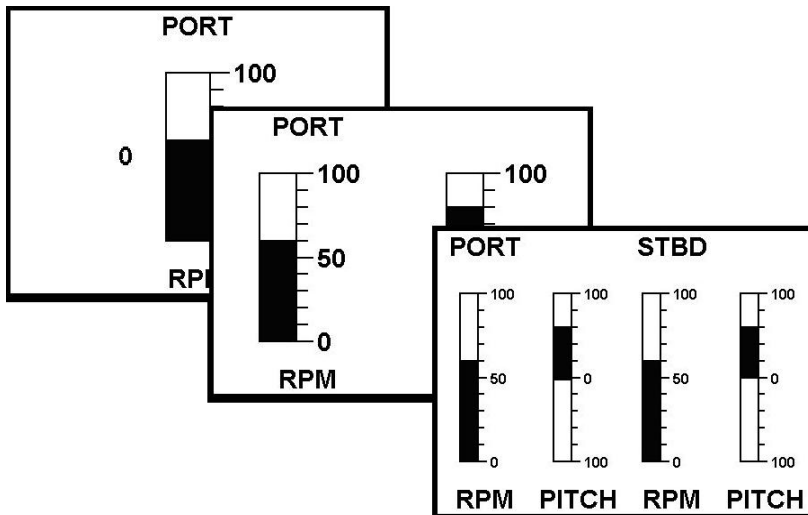
Two types of thruster windows (bow and stern) are available and one is selected during the installation. The content of this window is defined with Thrusters 1-4 in the Installation parameters.



29.2.14 Propellers window

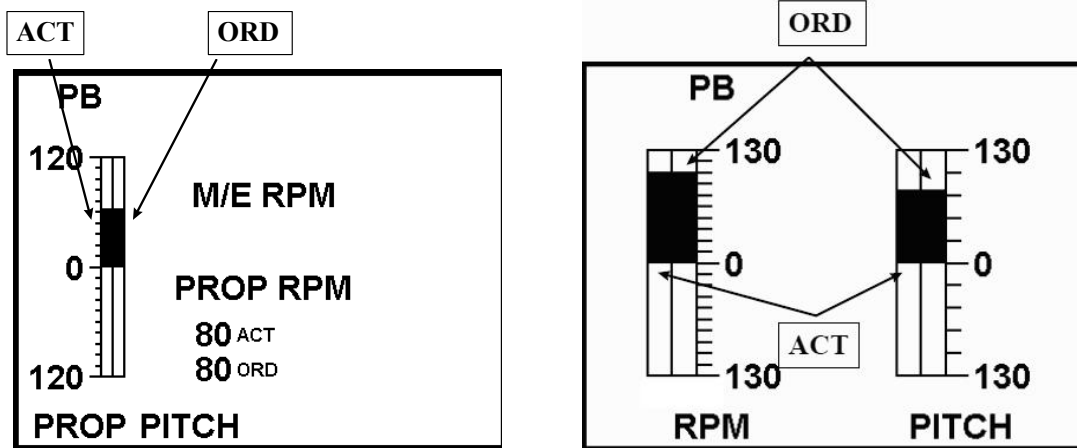
Propulsion RPM and pitch

Three different types of propellers windows are available and one is selected during the installation. The content of this window is defined with Propellers 1-4 in the Installation parameters.



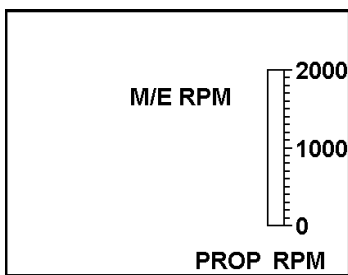
Propulsion with actual and ordered information

You can select during installation actual and ordered information of propeller using Engine Control Device Type "IEC 61162-1 (MAN B+W, \$xxXDR, \$xxRPM)".

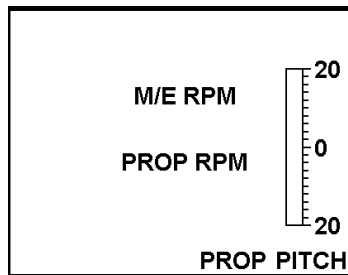


Propulsion with main engine (for DNV specification)

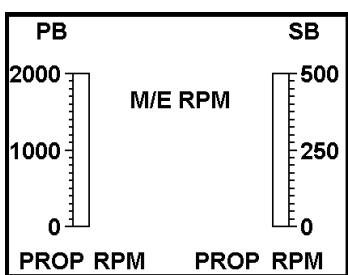
Four different types of propellers windows are available and one is selected during the installation. The content of this window is defined with Propellers 1-4 in the Installation parameters.



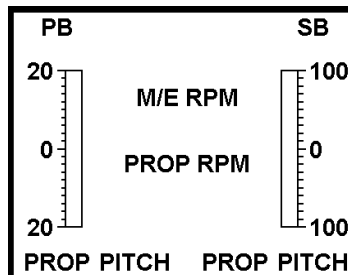
Single



Single CPP



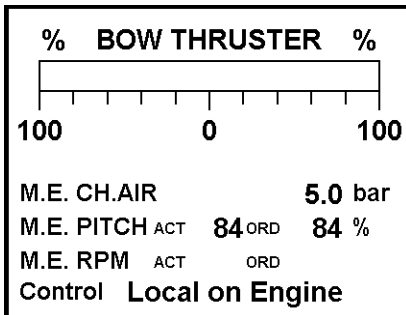
Dual



Dual CPP

Thruster and propulsion information with control position & source of ordered r.p.m. and pitch

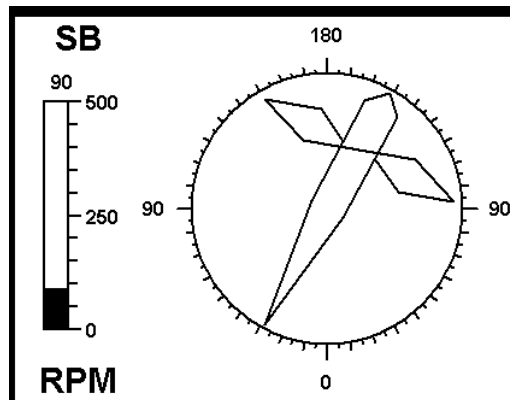
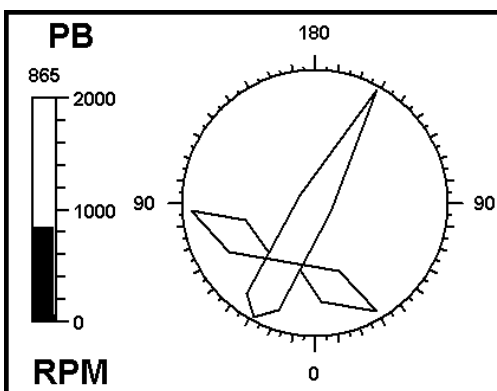
You can select during installation ordered RPM and Pitch and Control Position using Engine Control Device type "IEC 61162-1 (MAN B+W, \$xxXDR, \$xxRPM)"



Select "Bow thruster and Propeller" on Conning Display.

29.2.15 Azimuth propulsion window

Two different types of azimuth propulsion windows are available and one is selected during the installation. The content of this window is defined with Azimuth in the Installation parameters.



29.2.16 Speedpilot window

ROUTE		Timetable
PLAN LEG		10.0 kn
SUGGESTED		10.5 kn
SPEEDPILOT		PLAN
ACTUAL	POS	10.5 kn
SET		kn
PLAN	8.2	10.5 kn

ROUTE		Timetable
PLAN LEG		10.0 kn
SUGGESTED		10.5 kn
SPEEDPILOT		SET
ACTUAL	POS	10.5 kn
SET	8.2	10.5 kn
PLAN		kn

ROUTE		Timetable
PLAN LEG		10.0 kn
SUGGESTED		10.5 kn
SPEEDPILOT		OFF
ACTUAL	POS	10.5 kn
SET		kn
PLAN		kn

The speedpilot window displays the following data:

- **ROUTE:** Optimization type for monitored route.
- **PLAN LEG:** Planned speed for current leg (based on plan).
- **SUGGESTED:** If optimization type is "timetable", then this indicates suggested speed to keep the timetable. For other optimization types this is blank.
- **SPEEDPILOT:** Selected mode in Speed Pilot, OFF, SET or PLAN.
- **ACTUAL:** Speed and source of the speed used by the speedpilot.
- **SET:** Set position of handle and set speed of speedpilot during operation mode SET of the speedpilot. Blank during other operation modes.
- **PLAN:** Set position of handle and set speed of speedpilot during operation mode PLAN of the speedpilot. Blank during other operation modes.

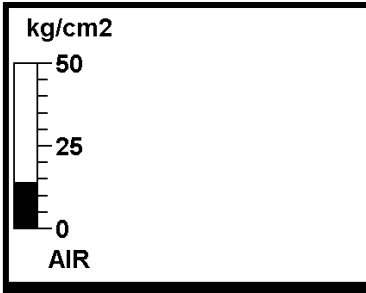
The last row is reserved for alert indication. The speedpilot display shows alerts as ALnn, where nn is the number of the alert. The conning display shows the speedpilot alert as self-explanatory text.

29.2.17 Message window

14 RADAR SUPPLY FAILURE
16 WATER TIGHT DOORS
16 WATER TIGHT DOORS
18 STEERING GEAR ALARM
20 GMDSS ALARM
22 SPEED INFO MISSING

The message window is available with connection of a central alert unit (option), and it shows various alerts generated by the central alert unit.

29.2.18 Main engine start air pressure window



This window shows engine starting air pressure.

29.2.19 Alarm messages window

```

709 Dual-Axis Log (BT) error
206 LAN Radar Connect Failure
209 RadOv No Echo Data
    
```

This window shows all active or pending alerts in priority order. For more information, see section 30.12 "List of Alerts".

29.2.20 Propulsion and thruster window (for DNV specification)

```

PORT PROPULSION
  100 RPM PITCH 100 %
STBD PROPULSION
  100 RPM PITCH 100 %

BOW THRUSTER 100 %
STERN THRUSTER 100 %
    
```

```

PORT PROPULSION
ACT 100 RPM PITCH ACT 100 %
ORD 100           ORD 100 %

Control   Local on Engine
BOW THRUSTER 100 %
STERN THRUSTER 100 %
    
```

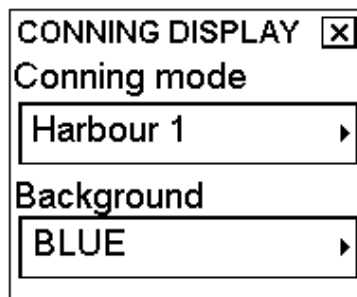
29.3 Modes for Conning Display

The conning display shows data collected from different sensors and also data from ECDIS and Autopilot processors. There are four different conning display modes; Harbour 1 mode, Harbour 2 mode, Navigate 1 mode and Navigate 2 mode, and one of these modes may be selected from a dialog box. The parameters for each display mode are selected during the installation, on the Installation parameters.

29.3.1 How to select mode for conning display

You may select the conning display mode from the Conning Display dialog box. Spin the scrollwheel to display Menu/Info/Chart Menu in the mouse functions area, push the left mouse button, select Conning Display from the menu, select conning display mode from the Conning mode list box then push the scrollwheel.

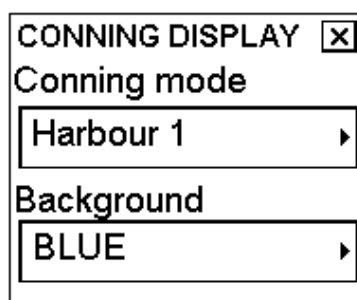
The conning display window appears in where you can select desired conning mode.



29.3.2 How to select background color of conning display

You may select the background color for the conning display. Spin the scrollwheel to display Menu/Info/Chart Menu in the mouse functions area, push the left mouse button, select Conning Display from the menu, select conning display mode from the Background list box then push the scrollwheel.

Select the background color from the Background list box.



29.3.3 Changing color palette of conning display

The conning display is using the same color palette as the ECDIS. When you change color palette of the ECDIS you also change the palette of the conning display.

1. Spin the scrollwheel to show Chart Display/Info/Standard Display in the mouse functions area.
2. Push the left mouse button to show the Chart Display dialog box.
3. If the Chart page is not active, click an arrow tab in the dialog box several times to display it.
4. Select palette scheme from the Palette list box; spin the scrollwheel to select a palette and push the scrollwheel to confirm.

29.4 Use of ECDIS Display for Conning Display

If you have only one monitor, it is possible to use it for both an ECDIS display and a Conning display, if ECDIS software installation has been done for "ECDIS with Conning Display (1 display unit)". Then you can switch between ECDIS display and Conning Display.

29.4.1 How to activate conning display

To enable swapping between ECDIS display and Conning Display you have to configure "Conning Display" function to one of four function keys. Below is example where F2 is used to activate Conning Display on ECDIS monitor.

CONFIG. F1-F4 KEYS <input type="checkbox"/>	
F1:	<input type="text" value="CHART DISPLAY"/>
F2:	<input type="text" value="CONNING DISPLAY"/>
F3:	<input type="text" value="ALARM ACK"/>
F4:	<input type="text" value="STANDARD DISPLAY"/>
<input type="checkbox"/> Enable changes	

To switch ECDIS display to Conning Display, press F2 key (this example) on Control Head. If you want to back to ECDIS display you can press any key except Alert Ack. Or System Failure on Control Head.

30. Alerts

30.1 Introduction

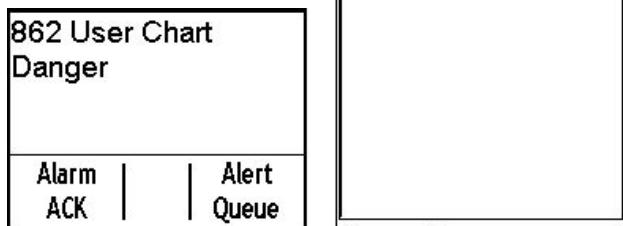
FEA-2x07 is designed to meet requirements set on paper "IMO MSC 252, xxx" issued by IMO.

Alerts generated by ECDIS can be divided into three categories:

- **Alert:** Only the most urgent alerts that need your attention. The alert initially flashes in red, and an audio alarm sounds until acknowledged. After acknowledgement, the alert is shown in plain text and the audio alarm stops.
- **Warning:** The most of alerts are in this category. In addition to text on flashing yellow background, a short beep generated by ECDIS, if not acknowledged in 60 seconds, then continuous beep until acknowledged (or short beep repeated every 60 seconds).
- **Caution:** Few alerts only having only text on flashing yellow background without audible sound.

30.2 Overview

Alerts are displayed at the lower right corner. To acknowledge an alert, push the left button. To display the Alert Queue, push the right button.



There are three kind of alerts generated by the ECDIS. To see a list of alerts, see section 30.12 "List of Alerts".

30.3 Alerts Generated by Navigation Calculation

Navigation calculation generates the following alerts:

- Error detected in any sensor
- Radar communication error
- Software alerts, etc.

30.4 Alerts Generated by Chart Calculation

Chart calculation generates the following alerts:

- New Notes notebook page available
- Chart alarms based on S57 charts
- Chart alarms based on user chart's dangerous symbols, lines and areas

30.5 Alerts Generated by Steering Calculation

Note that all steering-related functions are available only if the ECDIS processor is also connected to the optional Autopilot processor. Some of the alerts such as Outside Channel limit are also available without an Autopilot. Without the Autopilot processor, all alerts generated by steering calculation appear in the same alert queue as alerts generated by navigation calculation.

30.6 Alerts Generated by Radar Overlay

Alerts generated by Navigation Calculation, Chart Calculation and Steering calculation are common for each workstation (i.e. they can be seen on each workstation's alert queue with same alert number). Alerts generated by Radar overlay are generated locally on workstation where failure happens (i.e. they can only be seen on workstation where it happens). Each workstation has own alert numbers for alerts generated by radar overlay.

Alert range is Alert 100 - Alert 111, for ECDIS workstation number 1.

Alarm range is Alert 200 - Alert 211, for ECDIS workstation number 2.

Alarm range is Alert 150 - Alert 161, for ECDIS workstation number 3.

Alarm range is Alert 250 - Alert 261, for ECDIS workstation number 4.

It is possible to view alert queue of ECDIS system on Conning display. Window on Conning Display is called Alert message window, where all active or pending alerts of system are shown in priority order. If in the system there are more than one ECDIS workstation and more than one Radar overlay installed, to distinguish which Radar overlay is source of alarm they have own set of alert in use.

For example: "100 RadOv No Headline" for 1st workstation

"200 RadOv No Headline" for 2nd workstation

30.7 Alert Priority System

The permanently visible alert is the top most urgent alarm at any moment.

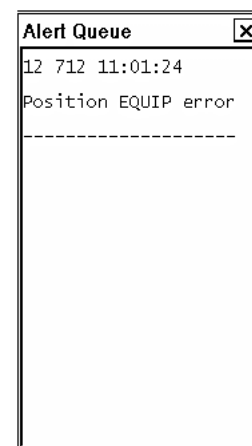
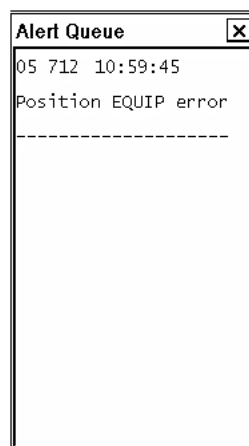
- Alarms have priority from 1 to 2 to control urgency. Priority 1 is the highest. When an alarm appears, a buzzer is continuously sounding until alarm is acknowledged. Section 33.12 "List of Alerts" shows the priorities for each alarm with following syntax: "/1" at the end first line means priority = 1, "/1/8" at the end of first line means that priority is = 1, if unacknowledged and priority = 8, if acknowledged but the state of alarm still exists. Unacknowledged alarm is shown in black text (or white depending on color scheme) on red background flashing. Acknowledged alarm that still exists is shown on red background on alert area and alert queue.
- Warnings have priority from 3 to 6 with same kind of syntax as alarms. When a warning appears a short beep sound is generated. Unacknowledge warning is shown in black text (or white depending on color scheme) on yellow background flashing and acknowledged alarm that still exists is shown on yellow background. If warning is not acknowledged after 60 seconds continuously beep sound is generated until acknowledged. Acknowledged warning that still exists is shown on yellow background on alert area and alert queue.
- Cautions have priority 7 with the same syntax as alarms. A caution appears only as a text on flashing yellow background with a short beep. Acknowledged caution that still exists is shown on yellow background on alert area and alert queue. (See section 30.8 "Indications for Doubtful Integrity" for details.)

You may view the alarms in the Alert Queue. Put the cursor on the alarm text then push the right mouse button. See the example below.

How to read the Alarm:

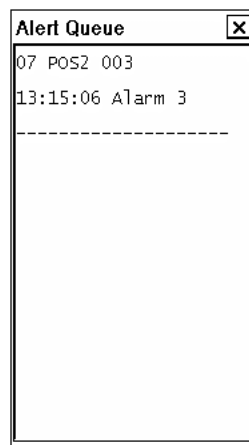
- First digit "05" indicates alarm priority.
- Second three digits "712" indicate alarm number.
- Third six digits indicate time.
- Text indicates reason of alarm "Position source change".

The example shows how alarm 712 changes its priority from 05 to 12 after it is acknowledged.



How to read the Alert Queue for an alert from a connected sensor:

- First digit "07" indicates alarm priority.
- Second four characters "POS2" indicate source. In this example sensor connected to serial line (POS2 = Position equipment 2).
- Third three digits indicate number from ALR.
- Next six digits indicate arrival time of ALR.
- Followed characters are text from ALR



30.8 Indications for Doubtful Integrity

There are a few cautions that have to indicate which are sources of doubtful integrity. These kind of cautions are "404 Gyro data unreliable", "405 Log data unreliable", "407 Position discrepancy" and "413SOG/COG data unreliable".

When any of above caution is on, doubtful value itself is yellow. In addition to this a short beep is generated and flashing yellow indication until acknowledged.

Following values themselves are turned yellow in upper right corner when there is doubtful integrity:

- LAT & LON values of own ship position
- Gyro value
- Speed value
- SOG/COG values

Following values in Sensor page turn yellow when there is doubtful integrity:

- Position sensors (position discrepancy)
- position sensors (filter exclude)
- Gyro sensor
- Log sensor
- SOG/COG sensors (dual axis log and position sensors)

30.9 Alert Reporting to Central Alert Management

An "ALR transmit and ACK receive" communication is available for Central Alert Management (=CAM). In this interface all alerts are reported to CAM. This interface is based on IEC 61162-1 and IEC 80/520/INF.

Based on rules set by IMO MSC 252(83) Central Alert Management can remotely acknowledge some of the alerts and the rest get remote buzzer silence for 30 seconds. The communication with Central Alert management is supervised and if fault is detected then alert "90 CALA OUTPUT CON LOST" is created.

30.10 Alert Reception from Connected Sensors

An "ALR receive and ACK transmit" communication is available for every serial line of ECDIS. This is intended for sensors reporting to ECDIS. ALR message from the sensor includes information about alert on sensor. This alert is presented through the normal alert system of this ECDIS. When you acknowledge it then an ACK message is sent to the sensor to perform remote acknowledge.

This interface is based on IEC 61162-1 and IEC 80/520/INF. The communication with the sensor is supervised and if fault is detected then alert "ALARM SENSOR LOST including number 70-85 (depending of serial channel) and source indication label (for example AIS, POS1 etc.) is created

30.11 Backup Navigator Alert

Track Control System (=TCS) standard IEC 62065 require "Backup Navigator Alert". It is intended to be connected to Central Alarm System. The idea behind the IEC 62065 requirement for "Backup Navigator Alarm" is that if the navigator on duty cannot handle the situation (i.e. he does not have time enough to check and to acknowledge all track control related alarm) then more person(s) are called automatically to the bridge. Alarm Transfer System included into Central Alarm System will then transfer "Backup Navigator Alarm" to intended person(s).

If, during Track Control (= Program track, GOTO Track, GOTO WPT, "Track", "GOTO OS", "GOTO AW" etc.), the alert "2451 Route: WP approach alarm" is not acknowledged within 30s of wheel-over line, the "Backup Navigator Alarm" is released.

"Backup Navigator Alarm" is related to following alarms (Furuno FAP-2000, YOKOGAWA PT-500A or TOKYO KEIKI PR-6000):

Alert "**400 Filter: POSN unreliable**"

Alert "**408 Filter: SPD below xx KN**"

Alert "**410 Filter: POSN source CHG**"

Alert "**451 Route: WPT approach alarm**"

Alert "**458 Route: Last WPT approach**"

Alert "**497 Route: Stop - Sensor Fail**"

Alert "**705: Gyro error**"

Alert "**706: Gyro error**"

Alert "**708: Log error**"

Alert "**708: Dual axis log (WT) error**"

Alert "**709: Dual axis log (BT) error**"

Alert "**712...716: Position equipment error**"

Alert "**727...731: Lost DGPS**"

Alert "**733: Radar spd/crs error**"

Alert "**755: Gyro error (Trackpilot)**"

Alert "**488 Track Control Stopped**"

"Backup Navigator Alert" related only with FURUNO FAP-2000 Autopilot

- Alert "**489 Route: Changed to Goto WP**"
- Alert "**496 ProgTrack: Stop - Sensor Fail**"

"Backup Navigator Alert" related only with TOKYO KEIKI PR-6000 Autopilot.

Alert "**489 Route: Changed to GOTO WP**"

If ECDIS is a part of a Track Control System, the "Backup Navigator Alert" should be connected. If ECDIS is NOT part of Track Control System, then "Backup Navigator Alert" is not generated.

30.12 List of Alerts

30.12.1 Navigation alerts

Alert number 320: DEPTH BELOW LIMIT /2/9

ECHO SOUNDER INDICATES WATER DEPTH
BELOW TRANSDUCER TO EXCEED SPECIFIED
SAFE LIMIT.

Alert number 400: FILTER: POSN UNRELIABLE /1/-

ECDIS IS NOT ABLE TO ESTIMATE A
RELIABLE POSITION. VERIFY AND SELECT
SPEED AND POSITION SENSORS THROUGH
'SENSORS' FUNCTION.

Alert number 401: NO SPEED AVAILABLE /1/8

NO VALID SPEED SENSOR HAS BEEN FOUND.
VERIFY AND SELECT SPEED SENSORS IN
'SENSORS' BUTTON

Alert number 402: NO HEADING AVAILABLE /1/8

NO VALID HEADING SENSOR HAS BEEN
FOUND. VERIFY AND SELECT HEADING
SENSORS IN 'SENSORS' FUNCTION.

Alert number 404: GYRO DATA UNRELIABLE /7/14

IF YOU HAVE BOTH GYRO1 AND GYRO2
SELECTED AND IF THEY VALUE DIFFERS
MORE THAN 5 DEGREES ALERT IS
GENERATED. VERIFY AND SELECT HEADING
SENSORS IN 'SENSORS' FUNCTION.

Alert number 405: LOG DATA UNRELIABLE /7/14

LOG GIVES 0 KN SPEED, WHICH DOES NOT
CORRESPOND WITH OTHER SPEED SENSORS.
VERIFY AND SELECT SPEED SENSORS IN
'SENSORS' FUNCTION.

Alert number 406: ROUTE: CRS JUMP POSSIBLE /5

SYSTEM HAS AUTOMATICALLY CHANGED TO
DEAD RECKONING. IF YOU NOW SELECT
"ON" A POSITION SENSOR YOU MAY GET A
JUMP FOR COURSE. CHANGE FROM ROUTE
STEERING TO MANUAL STEERING OR CHECK
POSITION VERY CAREFULLY BEFORE
CHOOSING "ON".

Alert number 407: POSITION DISCREPANCY /7/14

 SYSTEM HAS DETECTED MORE DIFFERENCE
 THAN SET LIMIT BETWEEN OWN SHIP
 PRIMARY AND SECONDARY POSITIONS OR
 BETWEEN OWN SHIP AND ANY SENSOR
 POSITION. CHECK POSITION SENSORS

Alert number 408: FILTER: SPD BELOW xx KN /3/10

 KALMAN FILTER REQUIRED THAT THE
 SPEED OF THE OWN SHIP IS MORE THAN
 SPEED LIMIT SET IN ECDIS
 INSTALLATION PARAMETERS. IF ROUTE
 STEERING WAS NOT USED, THEN KALMAN
 FILTER HAS BEEN SET AUTOMATICALLY
 OFF BY THE SYSTEM.

Alert number 409: POSN SOURCE CHANGED /5

 POSITION SOURCE OF OWN SHIP PRIMARY
 POSITION HAS BEEN CHANGED
 AUTOMATICALLY TO ANOTHER SOURCE THAN
 BEFORE. VERIFY NEW SOURCE.

Alert number 410: FILTER: POSN SOURCE CHG /5 or /12

 DGPS POSITION SENSOR USED IN FILTER
 POSITIONING HAS CHANGED ITS
 OPERATION MODE FROM NORMAL TO
 DIFFERENTIAL OR FROM DIFFERENTIAL TO
 NORMAL

Alert number 411: CHARTALIGN: OVER 30 MINUTES /3

 IF POSITION ALIGNMENT IS USED THEN
 USER IS REMINDED OF IT EVERY 30 MIN.

Alert number 412: GYRO CORR. SOURCE CHANGED /5

 IF SOURCE OF GYRO CORRECTION IS
 CHANGED BY SYSTEM. CHECK THAT
 CORRECTION IS VALID.

Alert number 413: SOG&COG DATA UNRELIABLE /7/14

 SOG AND/OR COG DATA FROM SENSORS IS
 UNRELIABLE. VERIFY AND SELECT
 SPEED/COURSE AND POS SENSORS IN
 'SENSORS' FUNCTION. IF REASON IS
 FAST MANOEUVRE, LIMIT CAN BE
 INCREASED BY SETTING "MAX RATE OF
 TURN" LIMIT OVER 150 DEG/MIN.

30. Alerts

Alert number 352: ROUTE: ILLEGAL ETA WPT /4

ETA WAYPOINT DOESN'T EXIST IN ROUTE
FILE OR ETA WAYPOINT IS NOT BETWEEN
NEXT AND FINAL WAYPOINT.
VERIFY IN 'ROUTE MONITOR' THAT A
VALID ROUTE IS SELECTED.

Alert number 353: ROUTE: ILLEGAL TO WPT /4

NEXT WAYPOINT DOESN'T EXIST IN ROUTE
FILE. VERIFY IN 'ROUTE MONITOR'
THAT A VALID ROUTE IS SELECTED.

Alert number 354: ROUTE: ILLEGAL FINAL WPT /4

FINAL WAYPOINT DOES NOT EXIST IN
ROUTE FILE. VERIFY IN 'ROUTE MONI-
TOR' THAT A VALID ROUTE IS SELECTED.

Alert number 355: RADAR COMM. ERROR /5/12

ECDIS CANNOT COMMUNICATE WITH RADAR 1
VERIFY THAT
'AUTOTRACKING ON' AND 'INS ON' ARE
DECLICKED ON THE RADARS.

Alert number 356: RADAR COMM. ERROR /5/12

ECDIS CANNOT COMMUNICATE WITH RADAR 2
VERIFY THAT
'AUTOTRACKING ON' AND 'INS ON' ARE
DECLICKED ON THE RADARS.

Alert number 357: RADAR COMM. ERROR /5/12

ECDIS CANNOT COMMUNICATE WITH RADAR 3
VERIFY THAT
'AUTOTRACKING ON' AND 'INS ON' ARE
DECLICKED ON THE RADARS.

Alert number 358: RADAR COMM. ERROR /5/12

ECDIS CANNOT COMMUNICATE WITH RADAR 4
VERIFY THAT
'AUTOTRACKING ON' AND 'INS ON' ARE
DECLICKED ON THE RADARS.

Alert number 360: ROUTE: WPT CHG DISABLED /4

NEXT WAYPOINT CANNOT BE CHANGED
DURING ROUTE STEERING. CHANGE FROM
ROUTE STEERING MODE BEFORE CHOOSING
A NEW NEXT WAYPOINT.

Alert number 361: CHART ALIGN: EXECUTING /6

IF CHART ALIGNMENT IS DONE BY MEANS
OF SELESMAZ RADAR, ALERT IS
DISPLAYED WHEN YOU DEFINE ALIGNMENT.

- Alert number 363: ROUTE: SELECT DISABLED /4

A NEW ROUTE CANNOT BE SELECTED DURING
ROUTE STEERING. USE 'RADIUS CONTROL'
TO OVERRIDE ROUTE STEERING BEFORE
CHOOSING A NEW ROUTE.
- Alert number 364: ROUTE: CANCEL DISABLED /6

A ROUTE CANNOT BE CANCELED DURING
ROUTE STEERING. USE 'RADIUS CONTROL'
TO OVERRIDE ROUTE STEERING BEFORE
CANCELING THE ROUTE.
- Alert number 365: MANUAL GYRO NOT SELECTED /4

SELECT MANUAL HEADING IN SENSORS
SPD/HDG PAGE.
- Alert number 366: MANUAL SPEED NOT SELECTED /4

SELECT MANUAL SPEED IN SENSORS
SPD/HDG PAGE.
- Alert number 367: MANUAL DRIFT DISABLED /4

MANUAL DRIFT VALUE CAN ONLY BE
INSERTED WHEN NO SENSORS PROVIDE
SPEED OVER GROUND DATA.
USE 'SENSORS' BUTTON TO VERIFY
AND SELECT SENSORS TO BE USED.
- Alert number 371: RADAR SOURCE CHANGE /5

MASTER RADAR FOR ECDIS HAS BEEN
CHANGED. VERIFY NEW SOURCE OR
TRACKED TARGETS
- Alert number 372: CHARTALIGN: NO LINE AVAIL /3

TO PERFORM CHART ALIGN WITH A
RADAR THERE MUST BE TRANSFERRED USER
CHART'S LINES IN THE RADAR.
CHECK THAT YOUR CURRENT USER CHART
HAS LINES AND THAT THEY ARE VISIBLE
ON RADAR DISPLAY
- Alert number 380: USERCHART: FILE READ ERR /4

CANNOT READ USER CHART IN MONITOR
MODE. MOVE USER CHART TO PLAN MODE
TO MAKE POSTPROCESSING AGAIN FOR
USER CHART.

30. Alerts

Alert number 381: USER CHART: NEED POINTS /4

USER CHART HAS MORE THAN 60 LINES OR
20 SYMBOLS AND IT DOES NOT CONTAIN
ANY POINTS. USE 'USER CHART' MENU
TO SELECT A VALID USER CHART OR ADD
POINTS TO CURRENT USER CHART

Alert number 382: USERCHART: FILE NOT FOUND /4

CANNOT READ USER CHART IN MONITOR
MODE. MOVE USER CHART TO PLAN MODE
TO MAKE POSTPROCESSING AGAIN FOR
USER CHART.

Alert number 390: ROUTE: FILE READ ERROR /4

CANNOT OPEN ROUTE IN MONITOR MODE.
OPEN ROUTE IN PLAN MODE TO MAKE SOME
MODIFICATION OF WPT DATA IN WPT PAGE.
FOR EXAMPLE CHANGE RADIUS OF ANY WPT.

Alert number 391: ROUTE: FILE READ ERROR /4

CANNOT READ ROUTE IN MONITOR MODE.
MOVE ROUTE TO PLAN MODE TO MAKE SOME
MODIFICATION OF WPT DATA IN WPT PAGE.
FOR EXAMPLE CHANGE RADIUS OF ANY WPT.

Alert number 392: ROUTE: FILE NOT FOUND /4

CANNOT READ ROUTE IN MONITOR MODE.
MOVE ROUTE TO PLAN MODE TO MAKE SOME
MODIFICATION OF WPT DATA IN WPT PAGE.
FOR EXAMPLE CHANGE RADIUS OF ANY WPT.

Alert number 454: ROUTE: END REACHED /3

YOU HAVE PASSED THE FINAL WAYPOINT
OF YOUR MONITORED ROUTE. CURRENT
MONITORED ROUTE HAS AUTOMATICALLY
CANCELLED

Alert number 457: ROUTE: OUTSIDE CHL LIMITS /2/9

SHIP IS OUTSIDE CHANNEL LIMITS
SPECIFIED FOR CURRENT LEG OF ROUTE.
CHECK SHIP POSITION AND ROUTE

Alert number 459: STEERING PARAMETER ERROR /6

TRACKPILOT PARAMETER HAS AN ERROR IN
ITS CONTENTS. CHECK AGAIN
INSTALLATION PARAMETERS OF ECDIS.

Alert number 480: TRACKPILOT RECEIVE ERROR /5/12

 ECDIS CANNOT RECEIVE ANY DATA FROM
 TRACKPILOT. CHANGE "MAIN STEERING"
 -SELECT OR TO ANY OTHER POSITION THAN
 AUTOP. CHECK AND VERIFY TRACKPILOT
 OPERATION BEFORE NEW TRY

Alert number 488: TRACK CONTROL STOPPED /3

 CONNECTION TO THE TRACKPILOT HAS
 BEEN LOST WHILE THE SYSTEM PERFORMED
 ONE OF THE INTEGRATED STEERING MODES:
 - GOTO TRACK
 - GOTO WPT
 - PROGRAM TRACK
 CURRENT STEERING MODE CANNOT CONTINUE
 CHECK NEW STEERING SITUATION

Alert number 600: PARAM CHANGE DISABLED /3

 INSTALLATION PARAMETERS CANNOT BE
 CHANGED IF THE ROUTE STEERING IS ON
 OR THE KALMAN FILTER IS IN USE.
 CHECK THE SITUATION AND TRY AGAIN.

Alert number 601: PARAM CHANNEL CONFLICT /4

 IF IN INSTALLATION PARAMETERS THERE
 ARE MORE THAN ONE DEVICE USING SAME
 CHANNEL AND IF IN THAT CASE NO OTHER
 DEVICES ARE ALLOWED FOR PARALLEL USE,
 THEN ALERT 3001 APPEARS.
 NOTE: IN SOME SPECIAL CASE MORE THAN
 ONE DEVICES CAN IN PARALLEL USE SAME
 CHANNEL (FOR EXAMPLE LOG + DAX)

Alert number 610: FILTER: INIT ERROR /4

 INITILATION OF FILTER FAILED. CHECK
 SELECTED POSITIONING SENSORS. TRY
 SWITCH FILTER ON.

Alert number 632: AIS DANGEROUS TARGET /2/9

 AIS TARGET HAS MET DANGEROUS TARGET
 LIMIT SET BY CPA AND TCA

Alert number 633: LOST AIS TARGET /5

 NO Update INFORMATION RECEIVED FROM
 TRACKED AIS TARGET WITHIN DEFINED
 REPORTING INTERVAL OF SHIP TYPE

Alert number 634: AIS MESSAGE RECEIVED /3 or /10

 AIS MESSAGE RECEIVED.

30. Alerts

Alert number 636: AIS DISPLAY 95% FULL /6/13

WHEN 95% OF DISPLAY CAPACITY FOR AIS
TARGETS ARE IN USE.

Alert number 637: AIS DISPLAY 100% FULL /5/12

WHEN 100% OF DISPLAY CAPACITY FOR AIS
TARGETS ARE IN USE.

Alert number 638: AIS STORAGE 95% FULL /6/13

WHEN 95% OF STORAGE CAPACITY FOR AIS
TARGETS ARE IN USE.

Alert number 639: AIS STORAGE 100% FULL /2/9

WHEN 100% OF STORAGE CAPACITY FOR AIS
TARGETS ARE IN USE.

Alert number 640: TT DANGEROUS /2/9

TT HAS MET DANGEROUS TARGET
LIMIT SET BY CPA AND TCA

Alert number 641: TT LOST /6/13

TT HAS REPORTED TT LOST.

Alert number 642: TT STORAGE 95% FULL /6/13

WHEN 95% OF STORAGE CAPACITY FOR TRACKED
TARGETS ARE IN USE.

Alert number 637: TT STORAGE 100% FULL /5/12

WHEN 100% OF DISPLAY CAPACITY FOR TRACKED
TARGETS ARE IN USE.

Alert number 700: NO SENSOR PARAMETERS /5

SENSOR PARAMETER FILES ARE MISSING.
LOAD INSTALLATION PARAMETERS OF
ECDIS. IF REQUIRED USE BACKUP COPY
OF PARAMETERS.

Alert number 701: B-ADAPTER ERROR /6/13

B-ADAPTER DOES NOT OPERATE DUE TO A
SYSTEM FAULT. SWITCH OFF MAIN
CIRCUIT BREAKER THEN ON AGAIN.
CALL SERVICE IF FAILURE STILL EXISTS

Alert number 702: ENGINE CONTROL COMM ERROR /6/13

CONNECTION TO ENGINE CONTROL HAS
BEEN LOST. CHECK THAT CONNECTION IS
OK.

- Alert number 706: GYRO ERROR /5/12

GYRO1 DATA IS NOT RECEIVED CORRECTLY
USE 'INITIAL SETTINGS' MENU TO SET
GYRO AGAIN. IF FAILURE STILL
EXISTS, USE 'SENSORS' SPEED/POSITION
PAGE TO SELECT VALID SENSORS.
- Alert number 707: GYRO ERROR /5/12

GYRO2 DATA IS NOT RECEIVED CORRECTLY
USE 'SENSORS' SPEED/POSITION PAGE TO
SELECT VALID SENSORS.
- Alert number 708: LOG ERROR /5/12

LOG DATA IS NOT RECEIVED CORRECTLY.
USE 'SENSORS' SPEED/COURSE
TO SELECT VALID SENSORS
- Alert number 708: DUAL AXIS LOG (WT) ERROR /5/12

DUAL AXIS LOG DATA IS NOT RECEIVED
CORRECTLY. USE SPEED/COURSE PAGE
TO SELECT VALID SPEED SENSORS.
- Alert number 709: DUAL AXIS LOG (BT) ERROR /5/12

DUAL AXIS LOG DATA IS NOT RECEIVED
CORRECTLY. USE SPEED/COURSE PAGE
TO SELECT VALID SPEED SENSORS.
- Alert number 710: ECHO SOUNDER ERROR /6/13

ECHO SOUNDER DATA IS NOT RECEIVED
CORRECTLY.
VERIFY ECHO SOUNDER OPERATION.
- Alert number 711: WIND SENSOR ERROR /6/13

WIND SENSOR DATA IS NOT RE CEIVED
CORRECTLY.
VERIFY WIND SENSOR OPERATION.
- Alert number 712: POSITION EQUIPMENT ERROR /5/12

POSITION EQUIPMENT 1 DATA IS NOT
RECEIVED CORRECTLY. USE 'SENSORS'
POSITION TO SELECT VALID POS SENSOR.
- Alert number 713: POSITION EQUIPMENT ERROR /5/12

POSITION EQUIPMENT 2 DATA IS NOT
RECEIVED CORRECTLY. USE 'SENSORS'
POSITION TO SELECT VALID POS SENSOR.

30. Alerts

Alert number 714: POSITION EQUIPMENT ERROR /5/12

POSITION EQUIPMENT 3 DATA IS NOT
RECEIVED CORRECTLY. USE 'SENSORS'
POSITION TO SELECT VALID POS SENSOR.

Alert number 715: POSITION EQUIPMENT ERROR /5/12

POSITION EQUIPMENT 4 DATA IS NOT
RECEIVED CORRECTLY. USE 'SENSORS'
POSITION TO SELECT VALID POS SENSOR.

Alert number 716: POSITION EQUIPMENT ERROR /5/12

POSITION EQUIPMENT 5 DATA IS NOT
RECEIVED CORRECTLY. USE 'SENSORS'
POSITION TO SELECT VALID POS SENSOR.

Alert number 717: POSITION EQUIPMENT ERROR /5/12

POSITION EQUIPMENT 6 DATA IS NOT
RECEIVED CORRECTLY. USE 'SENSORS'
POSITION TO SELECT VALID POS SENSOR.

Alert number 718: ROT GYRO ERROR /5/12

ROT GYRO DATA IS NOT RECEIVED
CORRECTLY. VERIFY ROT GYRO DEVICE.

Alert number 719: PITCH&ROLL SENSOR ERROR 6/13

PITCH&ROLL DATA IS NOT RECEIVED
CORRECTLY. VERIFY SENSOR FOR
PITCH&ROLL DATA.

Alert number 727: DGPS POS. SOURCE CHANGE /5/12

DGPS POSITION SENSOR IN CHANNEL
NUMBER 1 HAS CHANGED ITS OPERATION
MODE FROM NORMAL TO DIFFERENTIAL OR
FROM DIFFERENTIAL TO NORMAL. CHECK
SENSORS AND IF REQUIRED SELECT MORE
SUITABLE POSITION SENSOR.

Alert number 728: DGPS POS. SOURCE CHANGE /5/12

DGPS POSITION SENSOR IN CHANNEL
NUMBER 2 HAS CHANGED ITS OPERATION
MODE FROM NORMAL TO DIFFERENTIAL OR
FROM DIFFERENTIAL TO NORMAL. CHECK
SENSORS AND IF REQUIRED SELECT MORE
SUITABLE POSITION SENSOR.

Alert number 729: DGPS POS. SOURCE CHANGE /5/12

DGPS POSITION SENSOR IN CHANNEL
NUMBER 3 HAS CHANGED ITS OPERATION
MODE FROM NORMAL TO DIFFERENTIAL OR
FROM DIFFERENTIAL TO NORMAL. CHECK
SENSORS AND IF REQUIRED SELECT MORE
SUITABLE POSITION SENSOR.

Alert number 730: DGPS POS. SOURCE CHANGE /5/12

DGPS POSITION SENSOR IN CHANNEL
NUMBER 4 HAS CHANGED ITS OPERATION
MODE FROM NORMAL TO DIFFERENTIAL OR
FROM DIFFERENTIAL TO NORMAL. CHECK
SENSORS AND IF REQUIRED SELECT MORE
SUITABLE POSITION SENSOR.

Alert number 731: DGPS POS. SOURCE CHANGE /5/12

DGPS POSITION SENSOR IN CHANNEL
NUMBER 5 HAS CHANGED ITS OPERATION
MODE FROM NORMAL TO DIFFERENTIAL OR
FROM DIFFERENTIAL TO NORMAL. CHECK
SENSORS AND IF REQUIRED SELECT MORE
SUITABLE POSITION SENSOR.

Alert number 732: DGPS POS. SOURCE CHANGE /5/12

DGPS POSITION SENSOR IN CHANNEL
NUMBER 6 HAS CHANGED ITS OPERATION
MODE FROM NORMAL TO DIFFERENTIAL OR
FROM DIFFERENTIAL TO NORMAL. CHECK
SENSORS AND IF REQUIRED SELECT MORE
SUITABLE POSITION SENSOR.

Alert number 733: RADAR SPD/CRS ERROR /5/12

RADAR SELECTED AS SPD AND CRS
SOURCE IS NOT RECEIVED CORRECTLY
USE 'SENSORS' SPEED/COURSE TO SELECT
VALID SPD/CRS SENSORS

Alert number 734: SPEEDPILOT RECEIVE ERROR /5/12

DATA FROM SPEEDPILOT IS NOT RECEIVED
CORRECTLY. CHECK CONNECTION OF
SPEEDPILOT.

Alert number 735: B-ADAPTER INTERFACE ERROR /5/12

B-ADAPTER DATA IS NOT RECEIVED
CORRECTLY DUE TO INTERNAL SOFTWARE
ERROR IN COMMUNICATION PROGRAM.
TO RESTART COMMUNICATION PROGRAM,
OPEN INSTALLATION PARAMETERS OF
ECDIS AND CLICK OK WITHOUT CHANGING
ANY PARAMETERS. OR RESTART ECDIS.

30. Alerts

Alert number 736: AMWSS COMM ERROR /6/13

COMMUNICATION WITH AMWSS FAILS.
CHECK CONNECTION TO AMWSS

Alert number 737: AIS RECEIVE ERROR /6/13

DATA FROM AIS IS NOT RECEIVED
CORRECTLY. CHECK CONNECTION TO
AIS

Alert number 738: DATUM MISMATCH /6/13

POSITION SENSOR IN CHANNEL NUMBER 1
OUTPUTS POSITION ANOTHER DATUM AS
SET IN ECDIS INSTALLATION PARAMETERS
CHECK, THAT SENSOR OUTPUTS POSITION
IN WGS 84 DATUM.

Alert number 739: DATUM MISMATCH /6/13

POSITION SENSOR IN CHANNEL NUMBER 2
OUTPUTS POSITION ANOTHER DATUM AS
SET IN ECDIS INSTALLATION PARAMETERS
CHECK, THAT SENSOR OUTPUTS POSITION
IN WGS 84 DATUM.

Alert number 740: DATUM MISMATCH /6/13

POSITION SENSOR IN CHANNEL NUMBER 3
OUTPUTS POSITION ANOTHER DATUM AS
SET IN ECDIS INSTALLATION PARAMETERS
CHECK, THAT SENSOR OUTPUTS POSITION
IN WGS 84 DATUM.

Alert number 741: DATUM MISMATCH /6/13

POSITION SENSOR IN CHANNEL NUMBER 4
OUTPUTS POSITION ANOTHER DATUM AS
SET IN ECDIS INSTALLATION PARAMETERS
CHECK, THAT SENSOR OUTPUTS POSITION
IN WGS 84 DATUM.

Alert number 742: DATUM MISMATCH /6/13

POSITION SENSOR IN CHANNEL NUMBER 5
OUTPUTS POSITION ANOTHER DATUM AS
SET IN ECDIS INSTALLATION PARAMETERS
CHECK, THAT SENSOR OUTPUTS POSITION
IN WGS 84 DATUM.

Alert number 743: DATUM MISMATCH /6/13

POSITION SENSOR IN CHANNEL NUMBER 6
OUTPUTS POSITION ANOTHER DATUM AS
SET IN ECDIS INSTALLATION PARAMETERS
CHECK, THAT SENSOR OUTPUTS POSITION
IN WGS 84 DATUM.

Alert number 744: DATUM CHANGE /5

 POSITION SENSOR IN CHANNEL NUMBER 1
 HAS CHANGED OUTPUT POSITION FROM
 ANOTHER DATUM TO WGS 84 DATUM.

Alert number 745: DATUM CHANGE /5

 POSITION SENSOR IN CHANNEL NUMBER 2
 HAS CHANGED OUTPUT POSITION FROM
 ANOTHER DATUM TO WGS 84 DATUM.

Alert number 746: DATUM CHANGE /5

 POSITION SENSOR IN CHANNEL NUMBER 3
 HAS CHANGED OUTPUT POSITION FROM
 ANOTHER DATUM TO WGS 84 DATUM.

Alert number 747: DATUM CHANGE /5

 POSITION SENSOR IN CHANNEL NUMBER 4
 HAS CHANGED OUTPUT POSITION FROM
 ANOTHER DATUM TO WGS 84 DATUM.

Alert number 748: DATUM CHANGE /5

 POSITION SENSOR IN CHANNEL NUMBER 5
 HAS CHANGED OUTPUT POSITION FROM
 ANOTHER DATUM TO WGS 84 DATUM.

Alert number 749: DATUM CHANGE /5

 POSITION SENSOR IN CHANNEL NUMBER 6
 HAS CHANGED OUTPUT POSITION FROM
 ANOTHER DATUM TO WGS 84 DATUM.

Alert number 750: RADAR ANTENNA ID ERROR /6/13

 CHECK CORRECT CONNECTION OF RADAR 1.

Alert number 751: RADAR ANTENNA ID ERROR /6/13

 CHECK CORRECT CONNECTION OF RADAR 2.

Alert number 752: RADAR ANTENNA ID ERROR /6/13

 CHECK CORRECT CONNECTION OF RADAR 3.

Alert number 753: RADAR ANTENNA ID ERROR /6/13

 CHECK CORRECT CONNECTION OF RADAR 4.

Alert number 755: GYRO ERROR(TRACKPILOT) /5/12

 GYRO DATA ON TRACKPILOT IS MISSING.
 AL 10 IS ALSO ACTIVE ON TRACKPILOT'S
 CONTROL PANEL. MONITOR SITUATION ON
 TRACKPILOT.

30. Alerts

Alert number 756: AFT ECHO SOUNDER ERROR /6/13

DATA FROM AFT ECHO SOUNDER IS NOT
RECEIVED CORRECTLY. CHECK COMMUNI-
CATION BETWEEN ECDIS AND ECHO SOUNDER.

Alert number 757: WATER CURRENT ERROR /6/13

DATA OF WATER CURRENT IS NOT
RECEIVED CORRECTLY. CHECK COMMUNI-
CATION BETWEEN ECDIS AND SOURCE OF
WATER CURRENT DATA.

Alert number 758: WATER TEMPERATURE ERROR /6/13

DATA OF WATER TEMPERATURE IS NOT
RECEIVED CORRECTLY. CHECK COMMUNI-
CATION BETWEEN ECDIS AND SOURCE OF
WATER TEMPERATURE DATA.

Alert number 759: LAN ADAPTER 1 ERROR /6/13

LAN ADAPTER 1 IS NOT COMMUNICATING
CORRECTLY WITH ECDIS. SWITCH POWER
OFF/ON ON LAN ADAPTER 1.

Alert number 760: LAN ADAPTER 2 ERROR /6/13

LAN ADAPTER 2 IS NOT COMMUNICATING
CORRECTLY WITH ECDIS. SWITCH POWER
OFF/ON ON LAN ADAPTER 1.

Alert number 761: LAN ADAPTER 3 ERROR /6/13

LAN ADAPTER 3 IS NOT COMMUNICATING
CORRECTLY WITH ECDIS. SWITCH POWER
OFF/ON ON LAN ADAPTER 1.

Alert number 762: LAN ADAPTER 4 ERROR /6/13

LAN ADAPTER 4 IS NOT COMMUNICATING
CORRECTLY WITH ECDIS. SWITCH POWER
OFF/ON ON LAN ADAPTER 1.

Alert number 763: ECDIS IP ERROR FOR LANADA /5/12

IF ECDIS IP-ADDRESS FOR LAN ADAPTERS
IS DIFFERENT BETWEEN WINDOWSXP CONTROL
PANEL AND ECDIS

Alert number 764: LAN FAIL FOR LAN ADAPTER /5/12

UNEXPEXED LAN ERROR -> MAYBE LAN
CABLE OR HUB BROKEN/DISCONNECTED.
ECDIS CONTINUE OPERATION WITHOUT
INTERFACES. FIX THE PROBLEM AND
RESTART THE ECDIS. CHECK IP ADDRESSES

Alert number 765: NO LAN ADAPTER INSTALLED /5/12

 INSTALLATION MISTAKE. "NO LAN
 ADAPTER(S) DEFINED. INSTALL ECDIS
 SW AGAIN.

Alert number 766: LAN ADAPTER 1 PARAM ERROR /6/13

 INSTALLATION MISTAKE. INSTALL ECDIS
 SW AGAIN.

Alert number 767: LAN ADAPTER 2 PARAM ERROR /6/13

 INSTALLATION MISTAKE. INSTALL ECDIS
 SW AGAIN.

Alert number 768: LAN ADAPTER 3 PARAM ERROR /6/13

 INSTALLATION MISTAKE. INSTALL ECDIS
 SW AGAIN.

Alert number 769: LAN ADAPTER 4 PARAM ERROR /6/13

 INSTALLATION MISTAKE. INSTALL ECDIS
 SW AGAIN.

Alert number 770: ECDIS IP ERROR FOR RADAR /5/12

 IF ECDIS IP-ADDRESS FOR LAN RADAR IS
 DIFFERENT BETWEEN WINDOWSXP CONTROL
 PANEL AND ECDIS. CHECK IP ADDRESSES.

Alert number 771: LAN FAIL FOR RADAR /5/12

 UNEXPEXTED LAN ERROR -> MAYBE LAN
 CABLE BROKEN/DISCONNECTED.
 FIX THE PROBLEM AND RESTART THE ECDIS.

Alert number 772: LAN RADAR 1 CONN ERROR /5/12

 ECDIS FAILED TO COMMUNICATE WITH LAN
 RADAR 1. CHECK IP ADDRESSES BOTH FOR
 LAN RADAR ON ECDIS AND ON RADAR.

Alert number 773: LAN RADAR 2 CONN ERROR /5/12

 ECDIS FAILED TO COMMUNICATE WITH LAN
 RADAR 2. CHECK IP ADDRESSES BOTH FOR
 LAN RADAR ON ECDIS AND ON RADAR.

Alert number 774: LAN RADAR 3 CONN ERROR /5/12

 ECDIS FAILED TO COMMUNICATE WITH LAN
 RADAR 3. CHECK IP ADDRESSES BOTH FOR
 LAN RADAR ON ECDIS AND ON RADAR.

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Alert number 775: LAN RADAR 4 CONN ERROR /5/12

ECDIS FAILED TO COMMUNICATE WITH LAN
RADAR 4. CHECK IP ADDRESSES BOTH FOR
LAN RADAR ON ECDIS AND ON RADAR.

Alert number 776: AIR TEMPERATURE ERROR /6/13

DATA OF AIR TEMPERATURE IS NOT
RECEIVED CORRECTLY. CHECK COMMUNI-
CATION BETWEEN ECDIS AND SOURCE OF
AIR TEMPERATURE DATA.

Alert number 777: AIR PRESSURE ERROR /6/13

DATA OF AIR PRESSURE IS NOT
RECEIVED CORRECTLY. CHECK COMMUNI-
CATION BETWEEN ECDIS AND SOURCE OF
AIR PRESSURE DATA.

Alert number 778: AIR HUMIDITY ERROR /6/13

DATA OF AIR HUMIDITY IS NOT
RECEIVED CORRECTLY. CHECK COMMUNI-
CATION BETWEEN ECDIS AND SOURCE OF
AIR HUMIDITY DATA.

Alert number 779: LAN ADAPTER1 VERSION ERROR /6/13

VERSION OF LAN ADAPTER 1 SOFTWARE IS
NOT THE SAME WITH ECDIS SOFTWARE.
LOAD CORRECT VERSION OF SOFTWARE TO
LAN ADAPTER.

Alert number 780: LAN ADAPTER2 VERSION ERROR /6/13

VERSION OF LAN ADAPTER 2 SOFTWARE IS
NOT THE SAME WITH ECDIS SOFTWARE.
LOAD CORRECT VERSION OF SOFTWARE TO
LAN ADAPTER.

Alert number 781: LAN ADAPTER3 VERSION ERROR /6/13

VERSION OF LAN ADAPTER 3 SOFTWARE IS
NOT THE SAME WITH ECDIS SOFTWARE.
LOAD CORRECT VERSION OF SOFTWARE TO
LAN ADAPTER.

Alert number 782: LAN ADAPTER VERSION ERROR /6/13

VERSION OF LAN ADAPTER 4 SOFTWARE IS
NOT THE SAME WITH ECDIS SOFTWARE.
LOAD CORRECT VERSION OF SOFTWARE TO
LAN ADAPTER.

Alert number 783: LAN ADAPTER PARAM CONFLICT /5/12

ID OF LAN ADAPTER ON ECDIS IS INCORRECT
OR PARAMETER "F" ON LAN ADAPTER IS
INCORRECT. CHECK THE PARAMETERS.

Alert number 784: RUDDER1 ERROR /6/13

 DATA OF RUDDR 1 IS NOT
 RECEIVED CORRECTLY. CHECK COMMUNI-
 CATION BETWEEN ECDIS AND SOURCE OF
 RUDDER 1 DATA.

Alert number 785: RUDDER2 ERROR /6/13

 DATA OF RUDDR 2 IS NOT
 RECEIVED CORRECTLY. CHECK COMMUNI-
 CATION BETWEEN ECDIS AND SOURCE OF
 RUDDER 2 DATA.

Alert number 786: RUDDER3 ERROR /6/13

 DATA OF RUDDR 3 IS NOT
 RECEIVED CORRECTLY. CHECK COMMUNI-
 CATION BETWEEN ECDIS AND SOURCE OF
 RUDDER 3 DATA.

Alert number 787: RUDDER4 ERROR /6/13

 DATA OF RUDDR 4 IS NOT
 RECEIVED CORRECTLY. CHECK COMMUNI-
 CATION BETWEEN ECDIS AND SOURCE OF
 RUDDER 4 DATA.

Alert number 788 SYSTEM FROZEN /3
 APPEARS AS AN EARLY WARNING INDICATION
 THAT THE SYSTEM MAY ENTER STATE OF FREEZE.
 IF THIS ALERT WILL BE GENERATED
 FREQUENTLY, CONTACT TO FURUNO SERVICE.

Alert number 789: PROPELLER1 ERROR (ACT) /3/10

 DATA OF PROPELLER 1 IS NOT
 RECEIVED CORRECTLY. CHECK COMMUNI-
 CATION BETWEEN ECDIS AND SOURCE OF
 PROPELLER 1 DATA.

Alert number 793: PROPELLER1 ERROR (ORD) /6/13

 DATA OF PROPELLER 1 IS NOT
 RECEIVED CORRECTLY. CHECK COMMUNI-
 CATION BETWEEN ECDIS AND SOURCE OF
 PROPELLER 1 DATA.

Alert number 797: PROPELLER CONTR.POS ERROR /6/13

 DATA OF PROPELLER CONTROL POSITION
 IS NOT RECEIVED CORRECTLY.

Alert number 798: NAVTEX MESSGE RECEIVED /3/10

 NEW NAVTEX MESSAGE IS RECEIVED.

30. Alerts

Alert number 830: EXT. NAVIGATION EQ ERROR /4

EXTERNAL NAVIGATION EQUIPMENT IS
REPORTED HAVING ERROR.

Alert number 831: EXT. NAVIGATION EQ ERROR /4

EXTERNAL NAVIGATION EQUIPMENT IS
REPORTED HAVING ERROR.

Alert number 832: EXT. NAVIGATION EQ ERROR /4

EXTERNAL NAVIGATION EQUIPMENT IS
REPORTED HAVING ERROR.

Alert number 833: EXT. NAVIGATION EQ ERROR /4

EXTERNAL NAVIGATION EQUIPMENT IS
REPORTED HAVING ERROR.

Alert number 834: EXT. NAVIGATION EQ ERROR /4

EXTERNAL NAVIGATION EQUIPMENT IS
REPORTED HAVING ERROR.

Alert number 835: EXT. NAVIGATION EQ ERROR /4

EXTERNAL NAVIGATION EQUIPMENT IS
REPORTED HAVING ERROR.

Alert number 836: EXT. NAVIGATION EQ ERROR /4

EXTERNAL NAVIGATION EQUIPMENT IS
REPORTED HAVING ERROR.

Alert number 837: EXT. NAVIGATION EQ ERROR /4

EXTERNAL NAVIGATION EQUIPMENT IS
REPORTED HAVING ERROR.

Alert number 838: EXT. NAVIGATION EQ ERROR /4

EXTERNAL NAVIGATION EQUIPMENT IS
REPORTED HAVING ERROR.

Alert number 839: EXT. NAVIGATION EQ ERROR /4

EXTERNAL NAVIGATION EQUIPMENT IS
REPORTED HAVING ERROR.

Alert number 840: EXT. NAVIGATION EQ ERROR /4

EXTERNAL NAVIGATION EQUIPMENT IS
REPORTED HAVING ERROR.

Alert number 850: NOTES: NEW RECORD /3
NEW NOTES HAS BEEN ACTIVATED.

30.12.2 Chart alerts

Alert number 860:	SAFETY CONTOUR	/2/9
Alert number 861:	AREAS TO BE AVOIDED	/5/12
Alert number 862:	USER CHART DANGER AREA	/5/12
Alert number 863:	TRAFFIC SEPARATION ZONE	/5/12
Alert number 864:	INSHORE TRAFFIC ZONE	/5/12
Alert number 865:	RESTRICTED AREA	/5/12
Alert number 866:	CAUTION AREA	/5/12
Alert number 867:	OFFSHORE PRODUCTION AREA	/5/12
Alert number 868:	MILITARY PRACTICE AREA	/5/12
Alert number 869:	SEAPLANE LANDING AREA	/5/12
Alert number 870:	SUBMARINE TRANSIT LANE	/5/12
Alert number 871:	ANCHORAGE AREA	/5/12
Alert number 872:	MARINE FARM/AQUACULTURE	/5/12
Alert number 873:	PSSA AREA	/5/12
Alert number 874:	ANCHOR WATCH	/5/12

30.12.3 Steering alerts with FURUNO Autopilot FAP-2000

Alert number 451: ROUTE: WPT APPROACH ALARM /1 or /7

 WAYPOINT IS NOW BEING APPROACHED.
 CLICK 'ACKN. WARNING' TO ACCEPT THE
 TURN.

Alert number 452: ROUTE: TURNING DISABLED /1

 WHEELOVER POINT HAS BEEN PASSED
 WITHOUT 'ACKN. WARNING* 'RADIUS
 CONTROL' MODE HAS THEN AUTOMATICALLY
 BEEN INITIATED

Alert number 454: ROUTE: END REACHED /3

 CLICK 'ACKN. WARNING' TO ACCEPT THE
 END OF ROUTE STEERING.

Alert number 455: ROUTE: OFF COURSE /6/13

 REQUIRED 'SET COURSE' FOR NEXT
 WAYPOINT EXCEEDS THE 'LOWER
 OFFCOURSE' OR 'HIGHER OFF COURSE'
 LIMIT OF PLANNED COURSE. ACCEPT THE
 SITUATION BY CLICKING 'ACKN. WARNING'

30. Alerts

Alert number 456: ROUTE: WPT APPROACH ERROR /5

'TIME TO WOP' HAS CHANGED SINCE 'WPT APPROACH' ALERT WAS ACKNOWLEDGED, POSSIBLY DUE TO A POSITION JUMP. VERIFY POSITION AND SPEED SENSORS IN 'SENSORS' PAGE

Alert number 458: ROUTE: LAST WPT APPROACH /1 or /7

FINAL WAYPOINT OF THE ROUTE IS REACHED. AUTOMATICALLY INITIATE 'RADIUS CONTROL' MODE, AND CANCEL THE ROUTE.

Alert number 460: PILOT: ROT WILL BE EXCEED /6/13

THE RADIUS SENT TO AUTOPILOT IS EXCEEDING THE MAXIMUM LIMIT FOR TURNRATE. INCREASE THE RADIUS, OR REDUCE SPEED.

Alert number 461: ROUTE:ROT WILL BE EXCEED /6/13

WAYPOINT IS BEING APPROACHED WITH TOO HIGH SPEED FOR THE PLANNED RADIUS, CAUSING MAX. TURNRATE TO BE EXCEEDED. REDUCE THE SPEED OR INCREASE RADIUS BY OVERDRIVING WITH 'MAN. SET COURSE'.

Alert number 464: ROUTE: NO SELECTED ROUTE /4

NO ROUTE HAS BEEN SELECTED, AND ROUTE STEERING CANNOT BE INITIATED. SELECT A ROUTE AND NEXT WAYPOINT THROUGH 'ROUTE MONITOR' PUSHBUTTON.

Alert number 465: ROUTE: ILLEGAL WPT /4

ROUTE STEERING CANNOT START FROM WAYPOINT 1. USE 'ROUTE MONITOR' PUSHBUTTON TO SELECT "TO WPT" TO BE 2 OR HIGHER.

Alert number 467: DISABLED: STEERING OFF /3

TRACKPILOT IS IN 'STEERING OFF' MODE, AND STEERING COMMANDS CANNOT BE EXECUTED. STEERING MUST BE ENABLED AT THE MAIN STEERING SELECTOR

Alert number 468: DISABLED: OUT OF COURSE /3

ROUTE STEERING CAN ONLY BE INITIATED WHEN SHIPS COURSE IS WITHIN THE 'GOTO WPT LIMIT' FOR 'GOTO WPT' OR WITHIN THE 'GOTO TRACK LIMIT' FOR 'GOTO TRACK'. USE 'RADIUS CONTROL' MODE TO STEER WITHIN THE LIMITS.

Alert number 469: TRACKPILOT: OFF COURSE /6/13

 TRACKPILOT DOES NOT STEER WITHIN
 LIMITS OF 'COURSE TO STEER' COMMAND'.
 VERIFY TRACKPILOT FUNCTIONS.

Alert number 470: DISABLED: NEEDS FILTER ON /3

 'ROUTE STEERING' MODE CAN BE USED
 ONLY WHEN 'FILTER' IS ON AND THERE
 ARE ENOUGH SPEED, HEADING AND
 POSITION SENSORS. VERIFY AND SELECT
 POSITION SENSORS IN 'SENSORS' PAGE

Alert number 475: ROUTE: NEEDS FILTER ON /3/10

 THIS IS A WARNING THAT YOU ARE USING
 ROUTE STEERING WITHOUT FILTERED
 POSITION AVAILABLE. VERIFY AND
 SELECT POSITION SENSORS IN 'SENSORS'

Alert number 476: ROUTE: NEEDS LOG SENSOR /3/10

 THIS IS A WARNING THAT YOU ARE USING
 ROUTE STEERING WITH ONE POSITION
 DEVICE AND WITHOUT ANY LOG DEVICE.
 VERIFY AND SELECT SENSORS IN 'SENSORS'

Alert number 477: DISABLED: OUT OF CHANNEL /3

 'GOTO WPT' OR 'GOTO TRACK' CAN ONLY
 BE INITIATED WHEN SHIP IS WITHIN
 CHANNEL LIMIT OF MONITORED ROUTE.

Alert number 478: ROUTE: NEEDS GOOD POSIT. /3/10

 THIS IS WARNING THAT YOU ARE USING
 GOTO WPT STEERING MODE WITHOUT
 DIFF. POSITION AND POSITION
 DISCREPANCY LIMIT BETWEEN PRIMARY
 AND SECONDARY SENSORS IS EXCEEDED.
 THIS IS REPEATED EVERY 2 MINUTES
 UNTIL AFTER 10 MINUTES "ALERT 497"
 APPEARS.

Alert number 485: ROUTE: WPT PREWARNING /5 or /7

 WAYPOINT IS SOON BEING APPROACHED.

Alert number 489: ROUTE: CHG TO GOTO WPT /5

 SYSTEM CANNOT CONTINUE GOTO TRACK
 MODE BECAUSE KALMAN FILTER POSITION
 IS LOST OR NO LOG SENSOR IS
 AVAILABLE KALMAN FILTER

30. Alerts

Alert number 490: DISABLED: NEEDS LOG SENS. /3

'ROUTE STEERING' MODE CAN BE USED
ONLY WHEN THERE IS AN INDEPENDENT
SPEED SOURCE. ALTERNATIVES ARE A
LOG OR TWO POSITION RECEIVERS

Alert number 491: DISABLED: NEEDS DIFF POS. /3

'GOTO TRACK' MODE CAN BE USED ONLY
IF A HIGH-PRECISION POSITION SENSOR
IS IN USE WITH KALMAN FILTER.

Alert number 492: ROUTE: NEEDS DIFF POS. /5/12

'GOTO TRACK' MODE CANNOT CONTINUE
WITHOUT A HIGH-PRECISION POSITION
SENSOR. STEERING MODE IS
AUTOMATICALLY CHG "GOTO WPT" WITH
ALERT 489:ROUTE: CHG TO GOTO WPT

Alert number 493: PROGTRACK: NEEDS FILTER ON /3/10

A WARNING THAT YOU ARE USING PROGRAM
TRACK WITHOUT FILTERED POSITION
AVAILABLE.

Alert number 494: PRGTRACK: NEEDS LOG SENS. /3/10

A WARNING THAT YOU ARE USING PROGRAM
TRACK WITHOUT A LOG SENSOR OR
WITHOUT TWO POSITION SENSORS

Alert number 495: PROGTRACK: NEEDS DIFF POS. /5/12

A WARNING THAT YOU ARE USING PROGRAM
TRACK WITHOUT A HIGH-PRECISION
POSITION SENSOR

Alert number 496: PRGTRACK: STOP-SENSOR FAIL /3

GYRO, SPEED AND/OR POSITION DATA IS
NOT RECEIVED CORRECTLY.

Alert number 497: ROUTE: STOP-SENSOR FAIL /3

GYRO, SPEED AND/OR POSITION DATA IS
NOT RECEIVED CORRECTLY.

Alert number 498: USE MANUAL RUDDER CONTROL /5/12

CHANGE IMMEDIATELY TO DIRECT CONTROL
OF RUDDER. THIS ALERT IS REMINDER
THAT TRACKPILOT HAS LOST GYRO
HEADING. IT IS REPEATED EVERY TWO
MINUTES.

Alert number 499: DISABLED: NEEDS GOOD POS /5

 'ROUTE STEERING' MODE CANNOT BE
 ACTIVATED WITHOUT DIFF. POSITION AND
 IF POSITION DISCREPANCY LIMIT IS
 EXCEEDED.

Alert number 501: ROUTE: NEED HIGHER SPEED /3/10

 THIS IS WARNING THAT SPEED IS BELOW
 LIMIT SET FOR KALMAN FILETER. IT IS
 AVAILABLE TOGETHER "ALERT 408".
 "ALERT 501" IS REPEATED EVERY 2
 MINUTES UNTIL AFTER 10 MINUTES
 "ALERT 497" APPEARS.

Alert number 502: DISABLED: NEED HIGHER SPD /3

 THIS IS WARNING THAT SPEED IS BELOW
 LIMIT SET FOR KALMAN FILETER. IT IS
 AVAILABLE TOGETHER "ALERT 2008"
 TO ACTIVATE ROUTE STEERING USE
 HIGHER SPEED .

Alert number 503: PRGTRACK: NEED HIGHER SPD /3/10

 THIS IS WARNING THAT SPEED IS BELOW
 LIMIT SET FOR KALMAN FILETER. IT IS
 AVAILABLE TOGETHER "ALERT 408".
 "ALERT 503" IS REPEATED EVERY 2
 MINUTES UNTIL AFTER 10 MINUTES
 "ALERT 496" APPEARS.

Alert number 504: PRGTRACK: USE RADIUS CTRL. /5/12

 THIS IS INSTRUCTION TO CHANGE
 STEERING MODE. THIS ALERT IS
 GENERATED IF THERE ARE NOT
 SUFFICIENT SENSORS AVAILABLE TO
 CONTINUE PROGRAM TRACK

Alert number 505: ROUTE: USE GOTO WPT /5/12

 THIS IS INSTRUCTION TO CHANGE
 STEERING MODE. THIS ALERT IS
 GENERATED IF THERE ARE NOT
 SUFFICIENT SENSORS AVAILABLE TO
 CONTINUE GOTO TRACK

Alert number 506: ROUTE: USE RADIUS CTRL. /5/12

 THIS IS INSTRUCTION TO CHANGE
 STEERING MODE. THIS ALERT IS
 GENERATED IF THERE ARE NOT
 SUFFICIENT SENSORS AVAILABLE TO
 CONTINUE GOTO WPT OR GOTO TRACK

30. Alerts

Alert number 507: ROUTE: NEED SOG/COG REF. /5/12

'GOTO TRACK' MODE CANNOT CONTINUE
WITHOUT SOG/COG REFERENCE AVAILABLE
FROM POSITION SENSOR OR BOTTOM TRACK
OF DUAL AXIS LOG.

Alert number 508: DISABLED: NEED SOG/COG REF. /3

GOTO TRACK STEERING MODE CANNOT BE
ACTIVATED WITHOUT SOG/COG REFERENCE
AVAILABLE FROM POSITION SENSOR OR
BOTTOM TRACK OF DUAL AXIS LOG

Alert number 509: PROG TRACK: NEED SOG/COG REF. /5/12

'PROGRAM TRACK' MODE CANNOT CONTINUE
WITHOUT SOG/COG REFERENCE AVAILABLE
FROM POSITION SENSOR OR BOTTOM TRACK
OF DUAL AXIS LOG.

Alert number 510: DISABLED: OUT OF TURN /3

GOTO TRACK OR GOTO WPT STEERING MODE
CANNOT BE ACTIVATED IF THE ROUTE
MONITORING OF THE SYSTEM DETECTS
THAT ROUTE MONITOR IS in TURN, BUT
OWN SHIP LOCATION IS OUT OF TURN.
CHECK AND SET CORRECT "TO WPT" AGAIN
FOR ROUTE MONITORING.

Alert number 516: TRACKPILOT: DRIFT LIMIT /5/12

IF THE TRACKPILOT NEEDS MORE THAN A
SET LIMIT TO COMPENSATE DRIFT (THE
LIMIT IS AVAILABLE IN INSTALLATION
PARAMETERS FOR TRACK MODE (MAX DRIFT
COMPENSATION). THIS ALERT IS
REPEATED EVERY 5 MINUTES, IF THE
CONDITION CONTINUES.

30.12.4 Steering alerts with YOKOGAWA Autopilot PT-500A Cat. B

Alert number 451: ROUTE: WPT APPROACH ALERT /1/8

WAYPOINT IS NOW BEING APPROACHED.
CLICK 'ACKN. WARNING' TO ACCEPT THE
TURN.

Alert number 452: ROUTE: TURNING DISABLED /1

WHEELOVER POINT HAS BEEN PASSED
WITHOUT 'ACKN. WARNING* 'RADIUS
CONTROL' MODE HAS THEN AUTOMATICALLY
BEEN INITIATED

- Alert number 455: ROUTE: OFF COURSE /6/13

SYSTEM NEEDS MORE THAN A SET LIMIT TO
KEEP THE TRACK. THIS ALERT IS REPEATED
EVERY 5 MINUTES.
- Alert number 456: ROUTE: WPT APPROACH ERROR /5

'TIME TO WOP' HAS CHANGED SINCE 'WPT
APPROACH' ALERT WAS ACKNOWLEDGED,
POSSIBLY DUE TO A POSITION JUMP.
VERIFY POSITION AND SPEED SENSORS
IN 'SENSORS' PAGE
- Alert number 458: ROUTE: LAST WPT APPROACH /1/8

FINAL WAYPOINT OF THE ROUTE IS
REACHED. LEAVE NAVI MODE BEFORE
ACKNOWLEDGED ALERT.
- Alert number 460: PILOT: ROT WILL BE EXCEEDED /6/13

THE RADIUS SENT TO AUTOPILOT IS
EXCEEDING THE MAXIMUM LIMIT FOR
TURNRATE. INCREASE THE RADIUS, OR
REDUCE SPEED.
- Alert number 461: ROUTE: ROT WILL BE EXCEEDED /6/13

WAYPOINT IS BEING APPROACHED WITH
TOO HIGH SPEED FOR THE PLANNED
RADIUS, CAUSING MAX. TURNRATE TO BE
EXCEEDED. REDUCE THE SPEED OR
INCREASE RADIUS BY OVERDRIVING WITH
'MAN. SET COURSE'.
- Alert number 468: DISABLED: OUT OF COURSE /3

ROUTE STEERING CAN ONLY BE INITIATED
WHEN SHIPS COURSE IS WITHIN THE
'TRACK LIMIT' FOR 'TRACK. USE 'AUTO'
OR 'HAND' MODE TO STEER WITHIN
THE LIMITS.
- Alert number 469: AUTOPILOT: OFF COURSE /6/13

AUTOPILOT DOES NOT STEER WITHIN
LIMITS OF 'COURSE TO STEER' COMMAND'.
VERIFY AUTOPILOT FUNCTIONS.
- Alert number 470: DISABLED: NEEDS FILTER ON /3

'ROUTE STEERING' MODE CAN BE USED
ONLY WHEN 'FILTER' IS ON AND THERE
ARE ENOUGH SPEED, HEADING AND
POSITION SENSORS. VERIFY AND SELECT
POSITION SENSORS IN 'SENSORS' PAGE

30. Alerts

Alert number 471: AP MODE CONFLICT - USE AUTO/4/11

YOU HAVE TRIED TO ACTIVATE TRACK
STEERING OR YOU HAVE REACHED THE END
OF THE ROUTE, BUT YOU HAVE NOT LEFT
'TRACK' MODE CHANGE IMMEDIATELY TO
AUTO' MODE

Alert number 475: ROUTE: NEEDS FILTER ON /3/10

THIS IS A WARNING THAT YOU ARE USING
ROUTE STEERING WITHOUT FILTERED
POSITION AVAILABLE. VERIFY AND
SELECT POSITION SENSORS IN 'SENSORS'

Alert number 476: ROUTE: NEEDS LOG SENSOR /3/10

THIS IS A WARNING THAT YOU ARE USING
ROUTE STEERING WITH ONE POSITION
DEVICE AND WITHOUT ANY LOG DEVICE.
VERIFY AND SELECT SENSORS IN 'SENSORS'

Alert number 485: ROUTE: WPT PREWARNING ALERT /5/12

WAYPOINT IS SOON BEING APPROACHED.

Alert number 497: ROUTE: STOP-SENSOR FAIL /3

GYRO, SPEED AND/OR POSITION DATA IS
NOT RECEIVED CORRECTLY.

Alert number 506: ROUTE:USE AUTO CONTROL /5/12

THIS IS INSTRUCTION TO CHANGE
STEERING MODE. THIS ALERT IS
GENERATED IF THERE ARE NOT
SUFFICIENT SENSORS AVAILABLE TO
CONTINUE TRACK MODE

Alert number 511: ROUTE:AUTO RESUME DISABLE /3

IF ALERT 471 HAS BEEN GENERATED
AND LATER CONDITION FOR ALERT 471
DISAPPEARS WITHOUT CHANGING STEERING
MODE FROM "NAVI" TO "AUTO" OR "HAND".
FIRST CHANGE STEERING MODE TO "AUTO"
OR "HAND" AND CHECK THAT PRECONDITIONS
FOR ROUTE STEERING ARE FULFILLED.

Alert number 512: USE NFU RUDDER CONTROL /3/10

RUDDER SERVO UNIT CANNOT BE
CONTROLLED BY YOKOGAWA STEERING
CONTROL UNIT, THIS ALERT IS GENERATED
TO CHANGE NON FOLLOW UP CONTROL OF
RUDDER(S). FIRST CHANGE USING SYSTEM
SELECTOR SWITCH FROM "FU" TO "NFU" AND
THEN USE NON-FOLLOW UP STEERING LEVER
TO CONTROL RUDDER(S).

Alert number 514: ROUTE: NAVI COMPLETE TURN /5/12

 THIS IS INSTRUCTION TO CHANGE
 STEERING MODE. THIS ALERT IS
 GENERATED IF THERE ARE NOT
 SUFFICIENT SENSORS AVAILABLE TO
 CONTINUE TRACK MODE AFTER TURN.

Alert number 515: CONFLICT-NAVI COMPL. TURN /5/12

 THIS IS INSTRUCTION TO CHANGE
 STEERING MODE FROM NAVI TO AUTO.
 THIS ALERT IS GENERATED IF AUTOPILOT
 CANNOT CONTINUE TRACK MODE. TURN IS
 COMPLETED WITH PLANNED RADIUS.
 CONTINUE AUTO MODE AFTER TURN.

Alert number 516: AUTOPILOT: DRIFT LIMIT /5/12

 IF THE AUTOPILOT NEEDS MORE THAN A
 SET LIMIT TO COMPENSATE DRIFT(THE
 LIMIT IS AVAILABLE IN INSTALLATION
 PARAMETERS FOR TRACK MODE (MAX DRIFT
 COMPENSATION)). THIS ALERT IS
 REPEATED EVERY 5 MINUTES, IF THE
 CONDITION CONTINUES.

30.12.5 Steering alerts with YOKOGAWA Autopilot PT-500A Cat. C

Alert number 451: ROUTE: WPT APPROACH ALERT /1/8

 WAYPOINT IS NOW BEING APPROACHED.
 CLICK 'ACKN. WARNING' TO ACCEPT THE
 TURN.

Alert number 452: ROUTE: TURNING DISABLED /1

 WHEELOVER POINT HAS BEEN PASSED
 WITHOUT 'ACKN. WARNING* 'RADIUS
 CONTROL' MODE HAS THEN AUTOMATICALLY
 BEEN INITIATED

Alert number 455: ROUTE: OFF COURSE /6/13

 SYSTEM NEEDS MORE THAN A SET LIMIT TO
 KEEP THE TRACK. THIS ALERT IS REPEATED
 EVERY 5 MINUTES.

Alert number 456: ROUTE: WPT APPROACH ERROR /5

 'TIME TO WOP' HAS CHANGED SINCE 'WPT
 APPROACH' ALERT WAS ACKNOWLEDGED,
 POSSIBLY DUE TO A POSITION JUMP.
 VERIFY POSITION AND SPEED SENSORS
 IN 'SENSORS' PAGE

30. Alerts

Alert number 458: ROUTE: LAST WPT APPROACH /1/8

FINAL WAYPOINT OF THE ROUTE IS
REACHED. LEAVE NAVI MODE BEFORE
ACKNOWLEDGED ALERT.

Alert number 460: PILOT: ROT WILL BE EXCEEDED /6/13

THE RADIUS SENT TO AUTOPILOT IS
EXCEEDING THE MAXIMUM LIMIT FOR
TURNRATE. INCREASE THE RADIUS, OR
REDUCE SPEED.

Alert number 461: ROUTE:ROT WILL BE EXCEEDED /6/13

WAYPOINT IS BEING APPROACHED WITH
TOO HIGH SPEED FOR THE PLANNED
RADIUS, CAUSING MAX. TURNRATE TO BE
EXCEEDED. REDUCE THE SPEED OR
INCREASE RADIUS BY OVERDRIVING WITH
'MAN. SET COURSE'.

Alert number 468: DISABLED: OUT OF COURSE /3

ROUTE STEERING CAN ONLY BE INITIATED
WHEN SHIPS COURSE IS WITHIN THE
'TRACK LIMIT' FOR 'TRACK. USE 'AUTO'
OR 'HAND' MODE TO STEER WITHIN
THE LIMITS.

Alert number 469: AUTOPILOT: OFF COURSE /6/13

TRACKPILOT DOES NOT STEER WITHIN
LIMITS OF 'COURSE TO STEER' COMMAND'.
VERIFY TRACKPILOT FUNCTIONS.

Alert number 470: DISABLED: NEEDS FILTER ON /3

'ROUTE STEERING' MODE CAN BE USED
ONLY WHEN 'FILTER' IS ON AND THERE
ARE ENOUGH SPEED, HEADING AND
POSITION SENSORS. VERIFY AND SELECT
POSITION SENSORS IN 'SENSORS' PAGE

Alert number 471:...AP MODE CONFLICT - USE AUTO/4/11

YOU HAVE TRIED TO ACTIVATE TRACK
STEERING OR YOU HAVE REACHED THE END
OF THE ROUTE, BUT YOU HAVE NOT LEFT
'TRACK' MODE CHANGE IMMEDIATELY TO
AUTO' MODE

Alert number 475: ROUTE: NEEDS FILTER ON /3/10

THIS IS A WARNING THAT YOU ARE USING
ROUTE STEERING WITHOUT FILTERED
POSITION AVAILABLE. VERIFY AND
SELECT POSITION SENSORS IN 'SENSORS'

Alert number 476: ROUTE: NEEDS LOG SENSOR /3/10

 THIS IS A WARNING THAT YOU ARE USING
 ROUTE STEERING WITH ONE POSITION
 DEVICE AND WITHOUT ANY LOG DEVICE.
 VERIFY AND SELECT SENSORS IN 'SENSORS'

Alert number 480: AUTOPILOT RECEIVE ERROR /5/12

 AUTOPILOT AND ECDIS CANNOT COMMUNICATE
 TOGETHER. CHANGE STEERING MODE TO
 'AUTO'.

Alert number 485: ROUTE: WPT PREWARNING ALERT /5/12

 WAYPOINT IS SOON BEING APPROACHED.

Alert number 488: STEERING: STOP-SYSTEM FAIL /3

 AUTOPILOT AND ECDIS CANNOT COMMUNICATE
 TOGETHER. CHANGE STEERING MODE TO
 'AUTO'.

Alert number 489: ROUTE: CHANGED TO GOSEA /5

 IF ALERT 492 OR 507 HAS BEEN
 VALID FOR 10 MINUTES. STEERING MODE
 IS AUTOMATICALLY CHANGED TO GOSEA

Alert number 497: ROUTE: STOP-SENSOR FAIL /3

 GYRO, SPEED AND/OR POSITION DATA IS
 NOT RECEIVED CORRECTLY.

Alert number 505: ROUTE: USE GOSEA /5/12

 THIS IS INSTRUCTION TO CHANGE
 STEERING MODE. THIS ALERT IS
 GENERATED IF THERE ARE NOT
 SUFFICIENT SENSORS AVAILABLE TO
 CONTINUE GOSEA

Alert number 506: ROUTE: USE AUTO CONTROL /5/12

 THIS IS INSTRUCTION TO CHANGE
 STEERING MODE. THIS ALERT IS
 GENERATED IF THERE ARE NOT
 SUFFICIENT SENSORS AVAILABLE TO
 CONTINUE TRACK MODE

Alert number 511: ROUTE: AUTO RESUME DISABLE /3

 IF ALERT 471 HAS BEEN GENERATED
 AND LATER CONDITION FOR ALERT 471
 DISAPPEARS WITHOUT CHANGING STEERING
 MODE FROM "NAVI" TO "AUTO" OR "HAND".
 FIRST CHANGE STEERING MODE TO "AUTO"
 OR "HAND" AND CHECK THAT PRECONDITIONS
 FOR ROUTE STEERING ARE FULFILLED.

30. Alerts

Alert number 512: USE NFU RUDDER CONTROL /3/10

RUDDER SERVO UNIT CANNOT BE
CONTROLLED BY YOKOGAWA STEERING
CONTROL UNIT, THIS ALERT IS GENERATED
TO CHANGE NON FOLLOW UP CONTROL OF
RUDDER(S). FIRST CHANGE USING SYSTEM
SELECTOR SWITCH FROM "FU" TO "NFU" AND
THEN USE NON-FOLLOW UP STEERING LEVER
TO CONTROL RUDDER(S).

Alert number 515: CONFLICT TC STOP - USE AUTO. /5/12

SYSTEM CANNOT PERFORM TRACK STEERING
MODE. FIRST CHANGE MODE FROM "NAVI"
TO "AUTO" THEN CHECK THAT
PRECONDITIONS FOR ROUTE STEERING
ARE FULFILLED

Alert number 516: AUTOPILOT: DRIFT LIMIT /5/12

IF THE AUTOPILOT NEEDS MORE THAN A
SET LIMIT TO COMPENSATE DRIFT(THE
LIMIT IS AVAILABLE IN INSTALLATION
PARAMETERS FOR TRACK MODE (MAX DRIFT
COMPENSATION)). THIS ALERT IS
REPEATED EVERY 5 MINUTES, IF THE
CONDITION CONTINUES.

30.12.6 Steering alerts with TOKYO KEIKI Autopilot PR-6000

Alert number 451: ROUTE: WPT APPROACH ALARM /1 or /7

WAYPOINT IS NOW BEING APPROACHED.
CLICK 'ACKN. WARNING' TO ACCEPT THE
TURN.

Alert number 452: ROUTE: TURNING DISABLED /1

WHEELOVER POINT HAS BEEN PASSED
WITHOUT 'ACKN. WARNING* 'RADIUS
CONTROL' MODE HAS THEN AUTOMATICALLY
BEEN INITIATED

Alert number 455: ROUTE: OFF COURSE /6/13

ACTUAL 'HEADING' FOR NEXT
WAYPOINT EXCEEDS THE 'LOWER
OFFCOURSE' OR 'HIGHER OFF COURSE'
LIMIT OF PLANNED COURSE. ACCEPT THE
SITUATION BY CLICKING 'ACKN. WARNING'

Alert number 456: ROUTE: WPT APPROACH ERROR /3

 'TIME TO WOP' HAS CHANGED SINCE 'WPT APPROACH' ALERT WAS ACKNOWLEDGED, POSSIBLY DUE TO A POSITION JUMP. VERIFY POSITION AND SPEED SENSORS IN 'SENSORS' PAGE

Alert number 458: ROUTE: LAST WPT APPROACH /1 or /7

 FINAL WAYPOINT OF THE ROUTE IS REACHED. LEAVE RC MODE BEFORE ACKNOWLEDGED ALERT.

Alert number 460: PILOT: ROT WILL BE EXCEED /6/13

 THE RADIUS SENT TO AUTOPILOT IS EXCEEDING THE MAXIMUM LIMIT FOR TURNRATE. INCREASE THE RADIUS, OR REDUCE SPEED.

Alert number 461: ROUTE: ROT WILL BE EXCEED /6/13

 WAYPOINT IS BEING APPROACHED WITH TOO HIGH SPEED FOR THE PLANNED RADIUS, CAUSING MAX. TURNRATE TO BE EXCEEDED. REDUCE THE SPEED OR INCREASE RADIUS BY OVERDRIVING WITH 'MAN. SET COURSE'.

Alert number 464: ROUTE: NO SELECTED ROUTE /4

 NO ROUTE HAS BEEN SELECTED, AND ROUTE STEERING CANNOT BE INITIATED. SELECT A ROUTE AND NEXT WAYPOINT THROUGH 'ROUTE MONITOR' PUSHBUTTON.

Alert number 465: ROUTE: ILLEGAL WPT /4

 ROUTE STEERING CANNOT START FROM WAYPOINT 1. USE 'ROUTE MONITOR' PUSHBUTTON TO SELECT "TO WPT" TO BE 2 OR HIGHER.

Alert number 468: DISABLED: OUT OF COURSE /3

 ROUTE STEERING CAN ONLY BE INITIATED WHEN SHIPS COURSE IS WITHIN THE LIMIT FOR 'GOTO OS' OR WITHIN THE LIMIT FOR 'GOTO AW'. USE 'AUTO' MODE TO STEER WITHIN THE LIMITS.

Alert number 470: DISABLED: NEEDS FILTER ON /3

 RC STEERING MODE CAN BE USED ONLY WHEN 'FILTER' IS ON AND THERE ARE ENOUGH SPEED, HEADING AND POSITION SENSORS. VERIFY AND SELECT POSITION SENSORS IN 'SENSORS' PAGE

30. Alerts

Alert number 471: RC/NAV-TC STOP - USE AUTO /4/11

ECDIS AND TOKYO KEIKI AUTOPILOT CANNOT
PERFORM TRACK STEERING MODE. FIRST
CHANGE MODE FROM "RC" TO "AUTO"
THEN CHECK THAT PRECONDITIONS
FOR ROUTE STEERING ARE FULFILLED.

Alert number 475: ROUTE: NEEDS FILTER ON /3/10

THIS IS A WARNING THAT YOU ARE USING
ROUTE STEERING WITHOUT FILTERED
POSITION AVAILABLE. VERIFY AND
SELECT POSITION SENSORS IN 'SENSORS'

Alert number 476: ROUTE: NEEDS LOG SENSOR /3/10

THIS IS A WARNING THAT YOU ARE USING
ROUTE STEERING WITH ONE POSITION
DEVICE AND WITHOUT ANY LOG DEVICE.
VERIFY AND SELECT SENSORS IN 'SENSORS'

Alert number 478: ROUTE: NEEDS GOOD POSIT. /3/10

THIS IS WARNING THAT YOU ARE USING
GOTO OS STEERING MODE WITHOUT
DIFF. POSITION AND POSITION
DISCREPANCY LIMIT BETWEEN PRIMARY
AND SECONDARY SENSORS IS EXCEEDED.
THIS IS REPEATED EVERY 2 MINUTES
UNTIL AFTER 10 MINUTES "ALERT 497"
APPEARS.

Alert number 480: TRACKPILOT RECEIVE ERROR /5/12

TRACKPILOT AND ECDIS CANNOT COMMUNICATE
TOGETHER. CHANGE STEERING MODE TO
'AUTO'.

Alert number 485: ROUTE: WPT PREWARNING /5 or /7

WAYPOINT IS SOON BEING APPROACHED.

Alert number 488: TRACK CONTROL STOPPED /3

TRACKPILOT AND ECDIS CANNOT COMMUNICATE
TOGETHER. CHANGE STEERING MODE TO
'AUTO'.

Alert number 489: ROUTE: CHG TO GOTO GOSEA /5

IF ALERT 492 OR 507 HAS BEEN
VALID FOR 10 MINUTES. STEERING MODE
IS AUTOMATICALLY CHANGED TO GOTO GOSEA

Alert number 490: DISABLED: NEEDS LOG SENS. /3

'RC' STEERING MODE CAN BE USED
ONLY WHEN THERE IS AN INDEPENDENT
SPEED SOURCE. ALTERNATIVES ARE A
LOG OR TWO POSITION RECEIVERS

Alert number 492: ROUTE: NEEDS DIFF POS. /5/12

 'GOTO AW' MODE CANNOT CONTINUE
 WITHOUT A HIGH-PRECISION POSITION
 SENSOR. STEERING MODE IS
 AUTOMATICALLY CHANGED TO "GOTO GOSEA" WITH
 ALERT 489: ROUTE: CHG TO GOTO GOSEA

Alert number 497: ROUTE: STOP-SENSOR FAIL /3

 GYRO, SPEED AND/OR POSITION DATA IS
 NOT RECEIVED CORRECTLY.

Alert number 501: ROUTE: NEED HIGHER SPEED /3/10

 THIS IS WARNING THAT SPEED IS BELOW
 LIMIT SET FOR KALMAN FILTER. IT IS
 AVAILABLE TOGETHER "ALERT 408".
 "ALERT 501" IS REPEATED EVERY 2
 MINUTES UNTIL AFTER 10 MINUTES
 "ALERT 497" APPEARS.

Alert number 505: ROUTE: USE GOSEA /5/12

 THIS IS INSTRUCTION TO CHANGE
 STEERING MODE. THIS ALERT IS
 GENERATED IF THERE ARE NOT
 SUFFICIENT SENSORS AVAILABLE TO
 CONTINUE GOTO AW

Alert number 506: ROUTE: USE AUTO CTRL. /5/12

 THIS IS INSTRUCTION TO CHANGE
 STEERING MODE. THIS ALERT IS
 GENERATED IF THERE ARE NOT
 SUFFICIENT SENSORS AVAILABLE TO
 CONTINUE GOTO OS OR GOTO AW

Alert number 507: ROUTE: NEED SOG/COG REF. /5/12

 'GOTO AW' MODE CANNOT CONTINUE
 WITHOUT SOG/COG REFERENCE AVAILABLE
 FROM POSITION SENSOR OR BOTTOM TRACK
 OF DUAL AXIS LOG.

Alert number 510: DISABLED: OUT OF TURN /3

 GOTO AW OR GOTO OS STEERING MODE
 CANNOT BE ACTIVATED IF THE ROUTE
 MONITORING OF THE SYSTEM DETECTS
 THAT ROUTE MONITOR IS IN TURN, BUT
 OWN SHIP LOCATION IS OUT OF TURN.
 CHECK AND SET CORRECT "TO WPT" AGAIN
 FOR ROUTE MONITORING.

30. Alerts

Alert number 511: ROUTE:AUTO RESUME DISABLE /3

IF ALERT 471 HAS BEEN GENERATED
AND LATER CONDITION FOR ALERT 471
DISAPPEARS WITHOUT CHANGING STEERING
MODE FROM "RC" TO "AUTO" OR "HAND".
FIRST CHANGE STEERING MODE TO "AUTO"
OR "HAND" AND CHECK THAT PRECONDITIONS
FOR ROUTE STEERING ARE FULFILLED.

Alert number 512: USE NFU RUDDER CONTROL /3/10

RUDDER SERVO UNIT CANNOT BE CONTROLLED
BY STEERING CONTROL UNIT, THIS ALERT IS
GENERATED TO CHANGE NON-FOLLOW UP
CONTROL OF RUDDER(S). FIRST CHANGE USING
SYSTEM SELECTOR SWITCH FROM "FU" TO "NFU"
THEN USE NON-FOLLOW UP STEERING LEVER
TO CONTROL RUDDER(S).

Alert number 514: ROUTE: USE AUTO CONTROL /5/12

THIS IS INSTRUCTION TO CHANGE
STEERING MODE. THIS ALERT IS
GENERATED IF THERE ARE NOT
SUFFICIENT SENSORS AVAILABLE TO
CONTINUE TRACK MODE AFTER TURN.

Alert number 515: CONFLICT-NAVI COMPL. TURN /5/12

SYSTEM CANNOT PERFORM TRACK STEERING
MODE. FIRST CHANGE MODE FROM "RC"
TO "AUTO" THEN CHECK THAT
PRECONDITIONS FOR ROUTE STEERING
ARE FULFILLED

Alert number 517: DISABLED IN TURN /3

CURRENT LOCATION OF SHIP IS IN TURN OF
MONITORED ROUTE. STEER TO LINEAR PART
OF MONITORED ROUTE TO ACTIVATE TRACK
STEERING MODE

Alert number 518: DISABLED NOT ACCEPTED /3

30 SECONDS TIMEOUT PERIOD WAS PASSED
WHEN PRESSING "NAV" AND "ENABLE SWITCH"
BUTTONS ON TOKYO KEIKI CONTROL PANEL. AFTER
SELECTION "GOTOOS" OR "GOTOAW" ON ECDIS
YOU HAVE 30 SECONDS TO "NAV" AND "ENABLE
SWITCH" BUTTONS ON TOKYO KEIKI CONTROL PANEL,
OTHERWISE ALERT 518 IS GIVEN. ANOTHER
REASON CAN BE THAT VESSEL HAS MOVED INTO
TURNING PART OF A MONITORED ROUTE BEFORE
PRESSING "NAV" AND "ENABLE SWITCH"
BUTTONS ON TOKYO KEIKI CONTROL PANEL.

Alert number 519: TRACKPILOT: XTE COMP. LIM /5/12

 TRACK CONTROL SYSTEM IS UNABLE TO GET
 VESSEL TO APPROACH THE TRACK. ALERT IS
 TRIGGERED IF VESSEL IS OUTSIDE
 CHANNEL LIMIT AND IF CROSS TRACK
 ERROR IS STILL INCREASING.

30.12.7 Radar overlay related alerts

Alert number 100: RADOV NO HEADLINE 6/13

 NO HEADLINE AVAILABLE FOR RADAR
 OVERLAY. CHECK CONNECTORS AND
 CABLING FOR RADAR OVERLAY

Alert number 101: RADOV NO AZIMUTH 6/13

 NO AZIMUTH AVAILABLE FOR RADAR
 OVERLAY. CHECK CONNECTORS AND
 CABLING FOR RADAR OVERLAY

Alert number 102: RADOV NO TRIGGER 6/13

 NO TRIGGER AVAILABLE FOR RADAR
 OVERLAY. CHECK CONNECTORS AND
 CABLING FOR RADAR OVERLAY

Alert number 103: RADOV NO VIDEO 6/13

 NO VIDEO AVAILABLE FOR RADAR
 OVERLAY. CHECK ADJUSTMENT OF GAIN ON
 ON RADAR OVERLAY. CHECK CONNECTORS
 AND CABLING FOR RADAR OVERLAY

Alert number 104: RADOV NO GYRO 6/13

 NO HEADING REFERENCE AVAILABLE FOR
 RADAR PROCESSOR WHICH IS SOURCE FOR
 RADAR OVERLAY. CHECK RADAR PROCESSOR

Alert number 105: RADOV HW FAILURE 6/13

 RADAR OVERLAY HARDWARE FAILURE.
 SWITCH POWER ON/OFF. REINSTALL
 ECDIS SW.

Alert number 106: LAN RADAR CONNECT FAILURE 6/13

 INDICATION WHILE LAN CONNECTION FOR
 RADAR FAILS BETWEEN ECDIS PROCESSOR
 AND RADAR PROCESSOR.
 CHECK LAN CONNECTORS AND CABLES
 POWER ON/OFF AND REINSTALL ECDIS SW.

30. Alerts

Alert number 107: LAN RADAR DLL FAILURE 6/13

FAILURE TO ESTABLISH LAN CONNECTION
FOR RADAR FEATURES BETWEEN ECDIS
PROCESSOR AND RADAR PROCESSOR.
RESTART ECDIS AND RADAR. REINSTALL
ECDIS SW. IF NECESSARY.

Alert number 109: RADOV NO ECHO DATA 6/13

NO RADAR VIDEO AVAILABLE. CHECK
CONNECTION TO RADAR 1.

Alert number 200: RADOV NO HEADLINE 6/13

NO HEADLINE AVAILABLE FOR RADAR
OVERLAY. CHECK CONNECTORS AND
CABLING FOR RADAR OVERLAY

Alert number 201: RADOV NO AZIMUTH 6/13

NO AZIMUTH AVAILABLE FOR RADAR
OVERLAY. CHECK CONNECTORS AND
CABLING FOR RADAR OVERLAY

Alert number 202: RADOV NO TRIGGER 6/13

NO TRIGGER AVAILABLE FOR RADAR
OVERLAY. CHECK CONNECTORS AND
CABLING FOR RADAR OVERLAY

Alert number 203: RADOV NO VIDEO 6/13

NO VIDEO AVAILABLE FOR RADAR
OVERLAY. CHECK ADJUSTMENT OF GAIN ON
ON RADAR OVERLAY. CHECK CONNECTORS
AND CABLING FOR RADAR OVERLAY

Alert number 204: RADOV NO GYRO 6/13

NO HEADING REFERENCE AVAILABLE FOR
RADAR PROCESSOR WHICH IS SOURCE FOR
RADAR OVERLAY. CHECK RADAR PROCESSOR

Alert number 205: RADOV HW FAILURE 6/13

RADAR OVERLAY HARDWARE FAILURE.
SWITCH POWER ON/OFF. REINSTALL
ECDIS SW.

Alert number 206: LAN RADAR CONNECT FAILURE 6/13

INDICATION WHILE LAN CONNECTION FOR
RADAR FAILS BETWEEN ECDIS PROCESSOR
AND RADAR PROCESSOR.
CHECK LAN CONNECTORS AND CABLES
POWER ON/OFF AND REINSTALL ECDIS SW.

Alert number 207: LAN RADAR DLL FAILURE 6/13

 FAILURE TO ESTABLISH LAN CONNECTION
 FOR RADAR FEATURES BETWEEN ECDIS
 PROCESSOR AND RADAR PROCESSOR.
 RESTART ECDIS AND RADAR. REINSTALL
 ECDIS SW. IF NECESSARY.

Alert number 209: RADOV NO ECHO DATA 6/13

 NO RADAR VIDEO AVAILABLE. CHECK
 CONNECTION TO RADAR 2.

Alert number 150: RADOV NO HEADLINE 6/13

 NO HEADLINE AVAILABLE FOR RADAR
 OVERLAY. CHECK CONNECTORS AND
 CABLING FOR RADAR OVERLAY

Alert number 151: RADOV NO AZIMUTH 6/13

 NO AZIMUTH AVAILABLE FOR RADAR
 OVERLAY. CHECK CONNECTORS AND
 CABLING FOR RADAR OVERLAY

Alert number 152: RADOV NO TRIGGER 6/13

 NO TRIGGER AVAILABLE FOR RADAR
 OVERLAY. CHECK CONNECTORS AND
 CABLING FOR RADAR OVERLAY

Alert number 153: RADOV NO VIDEO 6/13

 NO VIDEO AVAILABLE FOR RADAR
 OVERLAY. CHECK ADJUSTMENT OF GAIN ON
 ON RADAR OVERLAY. CHECK CONNECTORS
 AND CABLING FOR RADAR OVERLAY

Alert number 154: RADOV NO GYRO 6/13

 NO HEADING REFERENCE AVAILABLE FOR
 RADAR PROCESSOR WHICH IS SOURCE FOR
 RADAR OVERLAY. CHECK RADAR PROCESSOR

Alert number 155: RADOV HW FAILURE 6/13

 RADAR OVERLAY HARDWARE FAILURE.
 SWITCH POWER ON/OFF. REINSTALL
 ECDIS SW.

Alert number 156: LAN RADAR CONNECT FAILURE 6/13

 INDICATION WHILE LAN CONNECTION FOR
 RADAR FAILS BETWEEN ECDIS PROCESSOR
 AND RADAR PROCESSOR.
 CHECK LAN CONNECTORS AND CABLES
 POWER ON/OFF AND REINSTALL ECDIS SW.

30. Alerts

Alert number 157: LAN RADAR DLL FAILURE 6/13

FAILURE TO ESTABLISH LAN CONNECTION
FOR RADAR FEATURES BETWEEN ECDIS
PROCESSOR AND RADAR PROCESSOR.
RESTART ECDIS AND RADAR. REINSTALL
ECDIS SW. IF NECESSARY.

Alert number 159: RADOV NO ECHO DATA 6/13

NO RADAR VIDEO AVAILABLE. CHECK
CONNECTION TO RADAR 3.

Alert number 250: RADOV NO HEADLINE 6/13

NO HEADLINE AVAILABLE FOR RADAR
OVERLAY. CHECK CONNECTORS AND
CABLING FOR RADAR OVERLAY

Alert number 251: RADOV NO AZIMUTH 6/13

NO AZIMUTH AVAILABLE FOR RADAR
OVERLAY. CHECK CONNECTORS AND
CABLING FOR RADAR OVERLAY

Alert number 252: RADOV NO TRIGGER 6/13

NO TRIGGER AVAILABLE FOR RADAR
OVERLAY. CHECK CONNECTORS AND
CABLING FOR RADAR OVERLAY

Alert number 253: RADOV NO VIDEO 6/13

NO VIDEO AVAILABLE FOR RADAR
OVERLAY. CHECK ADJUSTMENT OF GAIN ON
ON RADAR OVERLAY. CHECK CONNECTORS
AND CABLING FOR RADAR OVERLAY

Alert number 254: RADOV NO GYRO 6/13

NO HEADING REFERENCE AVAILABLE FOR
RADAR PROCESSOR WHICH IS SOURCE FOR
RADAR OVERLAY. CHECK RADAR PROCESSOR

Alert number 255: RADOV HW FAILURE 6/13

RADAR OVERLAY HARDWARE FAILURE.
SWITCH POWER ON/OFF. REINSTALL
ECDIS SW.

Alert number 256: LAN RADAR CONNECT FAILURE 6/13

INDICATION WHILE LAN CONNECTION FOR
RADAR FAILS BETWEEN ECDIS PROCESSOR
AND RADAR PROCESSOR.
CHECK LAN CONNECTORS AND CABLES
POWER ON/OFF AND REINSTALL ECDIS SW.

Alert number 257: LAN RADAR DLL FAILURE 6/13

 FAILURE TO ESTABLISH LAN CONNECTION
 FOR RADAR FEATURES BETWEEN ECDIS
 PROCESSOR AND RADAR PROCESSOR.
 RESTART ECDIS AND RADAR. REINSTALL
 ECDIS SW. IF NECESSARY.

Alert number 259: RADOV NO ECHO DATA 6/13

 NO RADAR VIDEO AVAILABLE. CHECK
 CONNECTION TO RADAR 4.

30.12.8 External sensor related alerts

An "ALR receive and ACK transmit" communication is available for every serial line of ECDIS. This is intended for sensors reporting to ECDIS. ALR message from the sensor includes information about alert on sensor.

The communication with the sensor is supervised and if fault is detected then alert "ALARM SENSOR LOST including number 70-85 (depending of serial channel) and source indication label (for example AIS, POS1 etc.) is created.

For example:

Alert number 70: XXXX ALARM SENSOR LOST /7/14

 COMMUNICATION FAULT DETECTED WITH
 SENSOR CONNECTED TO CHANNEL 1.

Etc.

Alert number 90: CALA OUTPUT CONN. LOST /7/14

 . THE COMMUNICATION WITH CENTRAL ALERT
 MANAGEMENT IS SUPERVISED AND IF FAULT
 IS DETECTED.

Alert number XXXX: "XXXX" + "NUMBER" + "TEXT" /7/14

 FROM EXTERNAL SOURCE "XXXX" INDICATES
 SOURCE.

30.12.9 Retriggered alarms

Retriggered alarm/alert is used together with route steering. If there are some changes in the sensors connected to TCS that may affect route steering, a retriggered alarm occurs. These "reminder" alarms can be:

- Lost of heading in autopilot
- Loss of speed data
- Low speed
- Loss of SOG/COG reference
- Loss of position
- Loss of differential position
- Loss of differential position and position discrepancy

The reminders are generated at certain time interval and eventually route steering is stopped, or in lost differential position is changed to Goto WP.

When a warning appears a short beep sound is generated. Unacknowledge warning is shown in black text (or white depending on color scheme) on yellow background flashing and acknowledged alarm that still exists is shown on yellow background. If warning is not acknowledged after 60 seconds beeps sound continuously until acknowledged.

31. Maintenance and Troubleshooting

Periodic checks and maintenance are important for proper operation of any electronic system. This chapter contains maintenance and troubleshooting instructions to keep optimum performance and the longest possible life of the equipment. Before attempting any maintenance or troubleshooting procedure please review the safety information below. If you cannot restore normal operation after following the troubleshooting procedures do not attempt to check inside any unit; there are no operator-serviceable parts inside. Any repair work should be referred to a qualified technician.

	WARNING
	<p>ELECTRICAL SHOCK HAZARD Do not open the equipment.</p> <p>Only qualified personnel should work inside the equipment.</p>

NOTICE
<p>Do not apply paint, anti-corrosive sealant or contact spray to coating or plastic parts of the equipment.</p> <p>Those items contain organic solvents that can damage coating and plastic parts, especially plastic connectors.</p>

31.1 Maintenance

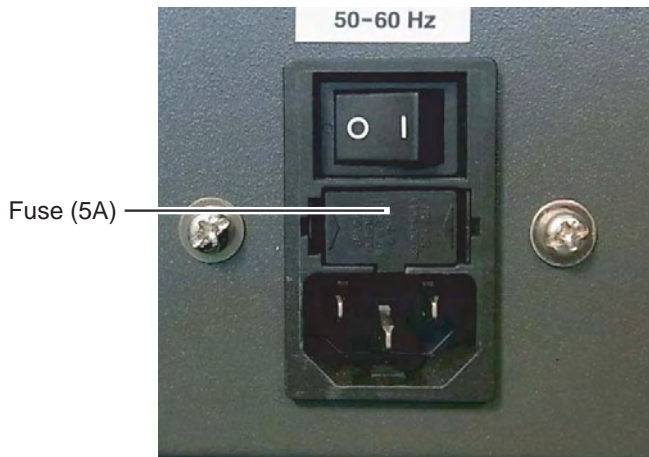
Regular maintenance is essential to good performance. A regular maintenance program should be established and should at least include the items shown in the table below.

Interval	Check point	Check and measures	Remarks
When needed	FURUNO-supplied LCD monitor and processor unit	Dust or dirt may be removed from the cabinet with a soft cloth. Water-diluted mild detergent may be used if desired. DO NOT use chemical cleaners to clean the display unit; they may remove paint and markings. To clean the LCD, wipe the LCD carefully to prevent scratching, using tissue paper and an LCD cleaner. To remove dirt or salt deposits, use an LCD cleaner, wiping slowly with tissue paper so as to dissolve the dirt or salt. Change paper frequently so the salt or dirt will not scratch the LCD. Do not use solvents such as thinner, acetone or benzene for cleaning. Also, do not use a degreaser or an antifog solution, as they can strip the coating from the LCD.	Do not use chemical-based cleaners to clean either unit. They can remove paint and markings.
3 to 6 months	Cabling	Check that all cabling is firmly connected and is not damaged.	

31.2 How to Replace the Fuse

The 5A fuse located at the back of the processor unit protects the system from overcurrent and internal fault. If the power cannot be turned on, check if the fuse has blown. If it has blown, find out the cause before replacing the fuse. If it blows again after replacement, contact your dealer for advice.

Name	Type	Code No.
Fuse (5A)	FGB0-A 5A AC125V	000-549-064



⚠ WARNING

Use the proper fuse.

Use of a wrong fuse can damage the equipment or cause fire.

31.3 How to Replace the Battery

The CPU Board (PCI-951-5S-RS-R40 or OP0100) in the processor unit contains a lithium battery that preserves data when the power is turned off. When the voltage of the battery is low the time is wrong, all default settings are restored, etc. When this occurs, have the battery replaced by a qualified technician, at your earliest convenience.

31.4 Troubleshooting

The troubleshooting table below provides common faults and the remedy with which to restore normal operation. If you cannot restore normal operation do not check inside the equipment - there are no operator-serviceable parts inside.

Troubleshooting

If...	then...	Remedy
the power cannot be turned on	<ul style="list-style-type: none"> power connector may have loosened. ship's mains is off. fuse has blown. 	<ul style="list-style-type: none"> Check connector. Check ship's mains. Replace fuse.
the power can be turned on but nothing appears on the display	<ul style="list-style-type: none"> brilliance is too low. the ambient temperature is less than 0°C (32°F). 	<ul style="list-style-type: none"> Adjust brilliance. The heater is warming the chart processor unit. The display appears in approx. 10 minutes.
the ECDIS program doesn't start. The message "No connection to dongle". appears	<ul style="list-style-type: none"> dongle connected to printer or USB port may have loosened. 	<ul style="list-style-type: none"> Check connection of dongle.
monitored route is not displayed	<ul style="list-style-type: none"> route has not been selected. monitor route has not been selected to be visible above the chart. 	<ul style="list-style-type: none"> Select route as monitored. Open Route page of Symbol Display dialog box and select Monitor route parts.
planned route is not displayed	<ul style="list-style-type: none"> route has not been selected. planned route has not been selected to be visible above the chart. 	<ul style="list-style-type: none"> Select route as planned. Open Route page of Symbol Display dialog box and select planned route parts.
symbol of user chart cannot be erased	<ul style="list-style-type: none"> "Enable changes" is not selected. two or more symbols may be superimposed on each other. 	<ul style="list-style-type: none"> Select "Enable changes" in User Chart dialog box. Click Delete button on Symbol page several times.
position cannot be found	<ul style="list-style-type: none"> sensors are not selected in the Sensors dialog box. LAN adapter cable may have loosened. 	<ul style="list-style-type: none"> Check sensor selections in Sensors dialog box. Connect LAN adapter cable.

(Continued on next page)

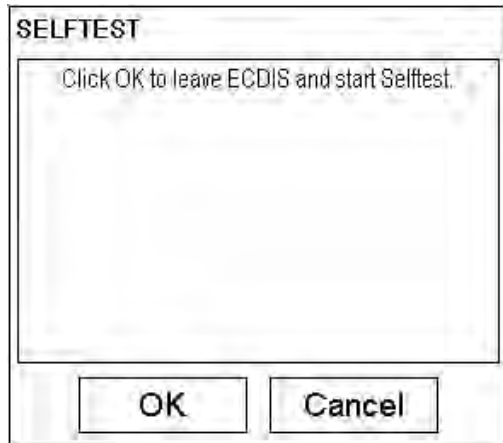
Troubleshooting (continued from previous page)

If...	then...	Remedy
ARCS chart cannot be displayed	<ul style="list-style-type: none"> • ARCS display mode is not activated. • license has expired. 	<ul style="list-style-type: none"> • Activate ARCS charts display mode: Open Chart menu and select Activate ARCS Charts from the menu. • Renew ARCS license.
S57 chart cannot be displayed	<ul style="list-style-type: none"> • S57 chart display mode is not activated. 	<ul style="list-style-type: none"> • Activate S57 charts display mode: Open Chart menu and select Activate S57 Charts from the menu.
you cannot convert CMAP charts because of "permit missing"	<ul style="list-style-type: none"> • if ECDIS software has been updated then C-MAP permit information has been lost. 	<ul style="list-style-type: none"> • Define correct subscription of CMAP charts again by selecting correct zones or areas.
past track is not displayed	<ul style="list-style-type: none"> • past track is not selected to be visible. 	<ul style="list-style-type: none"> • Open Tracking page of Symbol Display dialog box and select Past track of System.
monitored user chart is not displayed on ECDIS display	<ul style="list-style-type: none"> • user chart is not selected to be visible. • user chart display is selected for planning mode. 	<ul style="list-style-type: none"> • Open Mariner page of Symbol Display dialog box and select User Chart's parts. • Unselect user chart in planning mode.
user chart is not displayed on radar display	<ul style="list-style-type: none"> • user chart is not selected in monitoring mode. • ECDIS has failed to post process chart for radar. • LAN Adapter cable may have loosened. 	<ul style="list-style-type: none"> • Select user chart in monitoring mode. • Close User Chart dialog box to activate post processing for user chart. • Connect LAN adapter cable.

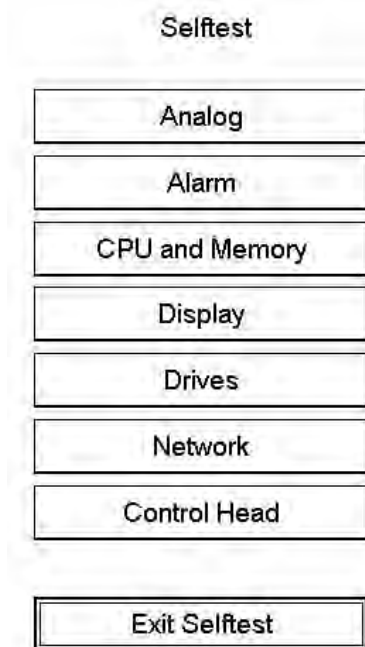
31.5 Keyboard Test

In addition to the color calibration tests mentioned in Chapter 28, the ECDIS provides a keyboard test that the operator may use to check the keyboard of the Control Unit RCU-018 and the hot keys of the Control Unit RCU-015. (Other diagnostic tests are also provided, on the self-test menu, however these are intended for service technicians. For further details, see the service manual.)

1. Spin the scrollwheel to show Menu/Info/Chart Menu in the mouse functions area, then push the left mouse button.
2. Select Initial Settings and push the left mouse button.
3. Put the cursor on the triangle in the dialog box to show the Initial Settings menu.
4. Select Selftest then push the left mouse button. You are asked if it is OK to leave ECDIS and start the self-test.

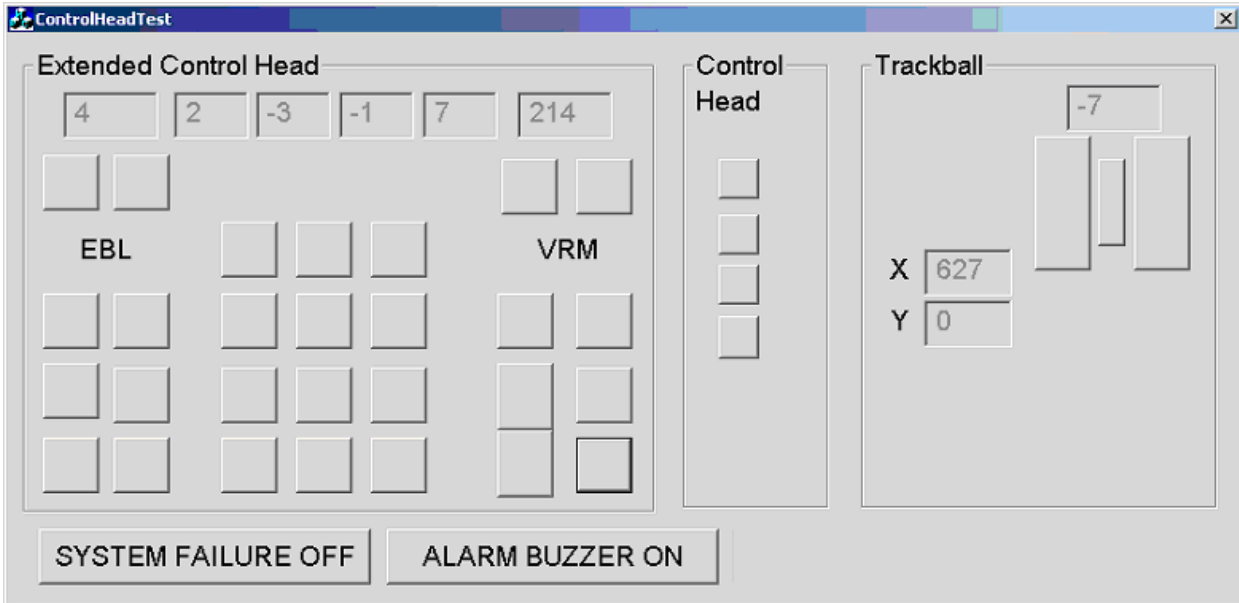


5. Click the **OK** button to show the self-test menu. As the message on the screen says move the cursor leftward and upward then push the left mouse button.



31. Maintenance and Troubleshooting

- Click the **Control Head** button to show the control head-checking screen.



- Push each key, mouse button and scrollwheel. The perimeter of the on-screen key, button or scrollwheel blackens if the pushed item is functioning normally. (For the Control Unit RCU-015, push the hot keys. Their on-screen location is in the Control Head window.)
- Operate radar-related controls (EBL and VRM rotary encoders, A/C RAIN, A/C SEA and GAIN). The figure in the corresponding on-screen location becomes larger or smaller with control operation.
- Operate the trackball. The trackball's X and Y location is shown in the X and Y boxes.
- Spin the scrollwheel. Confirm that the figure in the box above the scrollwheel's on-screen location is appropriate with spin direction.
- Click the **ALARM BUZZER ON** button. Confirm that the buzzer sounds. Click the button again to silence the buzzer.
- Click the **SYSTEM FAILURE OFF** button. Thirty seconds after the button is clicked the buzzer sounds and the **SYSTEM FAILURE** key flashes. Click the button again to stop the flashing and silence the buzzer.
- Click the **Exit Selftest** button to quit the test.

31.6 Consumable Parts

The table below lists all the consumable parts in the processor unit. Replace these parts before their expected expiration.

Consumable parts








Part	Type	Code No.	Expected life
Processor cooler assy.	2806KL-04W-B69-B50	000-173-837-10	17,500 hours
	ASYG-FAN-FU-HEATSINK*	000-173-401-10	60,000 hours
Chassis fan	AD0812LB-A73GL	000-165-008-00	60,000 hours
Lithium battery (on CPU board)	CR2032	000-159-662-10	3 years
	CR-2450*	—	10 years
Power supply	UPF250-AA-BG	000-165-006-11	60,000 hours
Hard disk	MHW2040AC	000-169-321-10	20,000 hours

The expected life figures are typical values. Actual life depends on usage and ambient temperature.

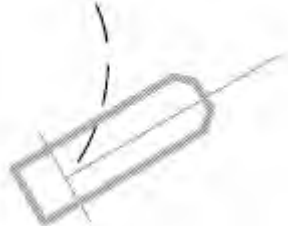
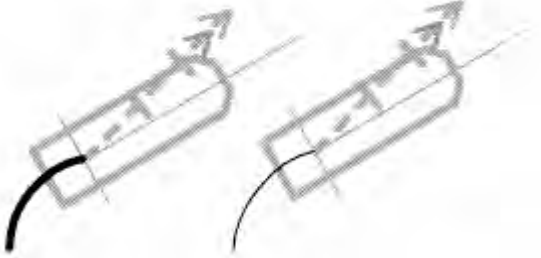
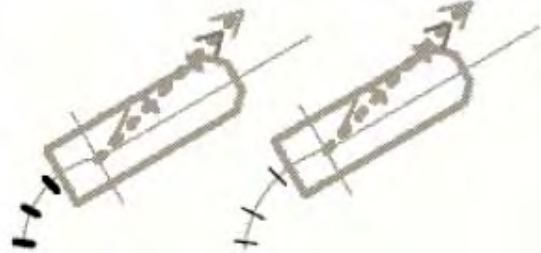
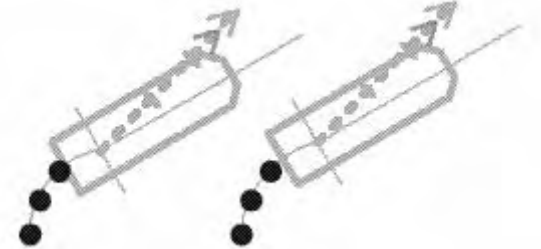




*On CPU Board 24P0100




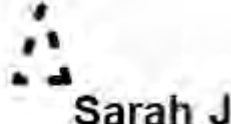







Appendix 1: Symbols and Abbreviations

A1.1 Symbols

IEC 62288 reference	Symbol name and description	Symbol graphic(s)
1.1 a	<p>Own ship – true scaled outline</p> <p>This can be displayed when based on user selection either beam width or length is more than 6 mm</p>	
1.1 b	<p>Own ship – simplified symbol</p>	
1.2	<p>Radar antenna position</p> <p>This symbol indicates location of the radar antenna.</p> <p>Select if position of radar antenna is displayed with symbol X by Symbol Display dialog.</p>	
1.3	<p>Heading line</p> <p>This line originates from CCRP.</p> <p>CCRP: Consistent Common Reference Point</p>	
1.4	<p>Beam line</p> <p>This line passed through the CCRP.</p>	
1.6 b	<p>Velocity vector – time increments</p>	
1.6 c	<p>Velocity vector – stabilisation indicator</p> <p>Ground stabilisation is indicated by double arrowhead and water stabilisation is indicated as single arrowhead.</p>	

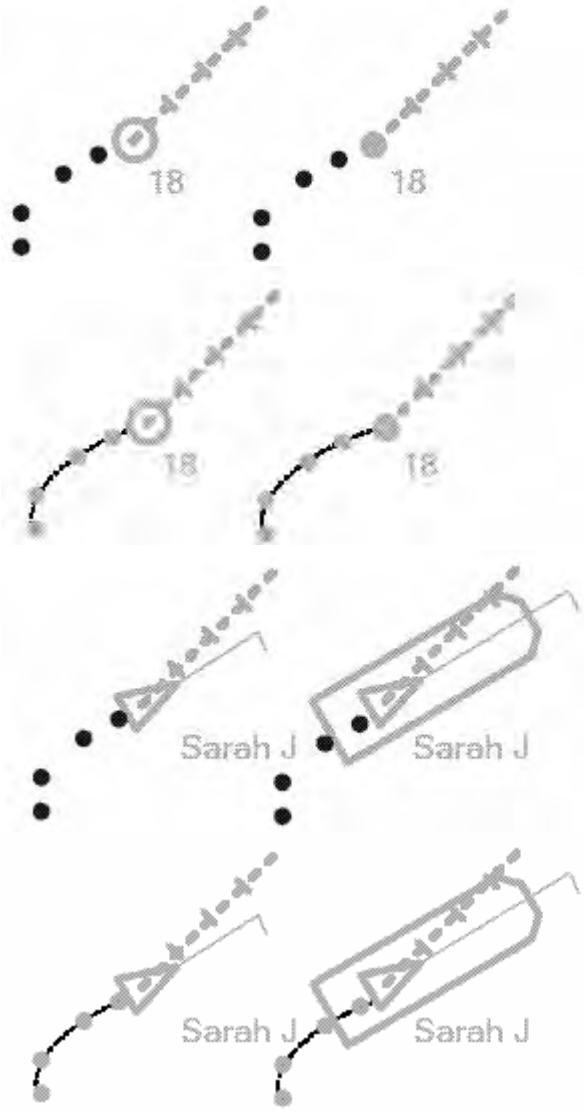


Appendix 1: Symbols and Abbreviations

1.6 d	<p>Path predictor (Only for own ship)</p>	
1.7 a	<p>Past track System past track is indicated by thick line. Raw sensor primary past track is indicated by thin line. Raw sensor secondary past track is indicated by grey thin line.</p>	
1.7 b	<p>Past track – time increments Time increments are presented as single lines perpendicular to the past track.</p>	
1.7 c	<p>Past track – past positions Past positions are drawn as small filled circular symbols.</p>	
2.1 a	<p>Radar targets in acquisition state</p>	 5 mm in diameter
2.2 a	<p>Tracked radar targets TT: Std or small user selection by Symbol Display</p>	 3 mm in diameter
2.2 b	<p>Tracked radar targets – alternative TT: Std or small user selection by Symbol Display</p>	 2 mm in diameter
2.2 c	<p>Tracked radar targets – dangerous target Dangerous target symbol is red and it flash until acknowledged</p>	 5 mm in diameter

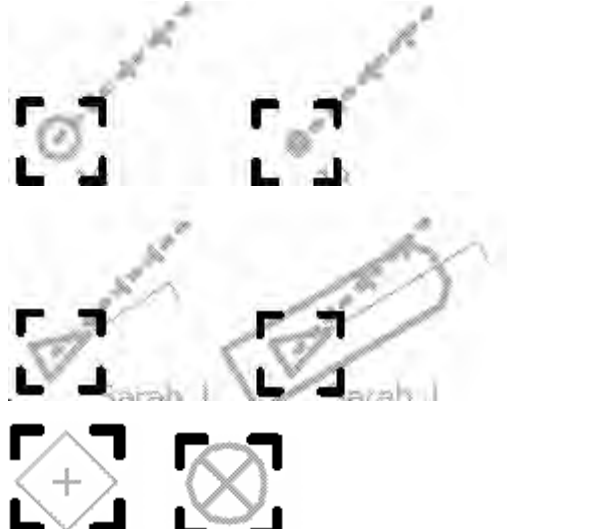
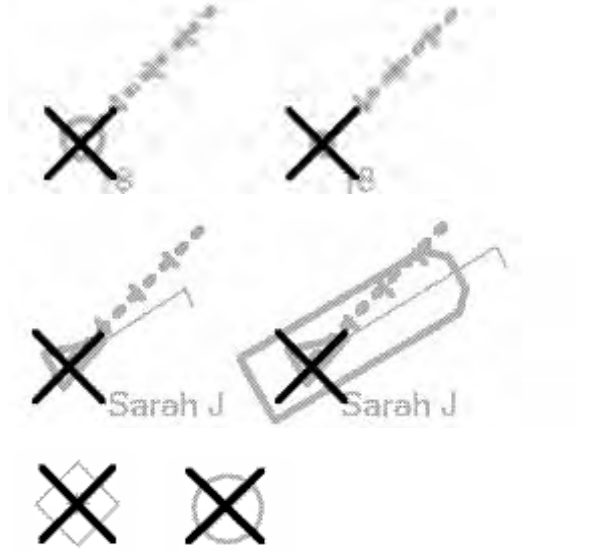


<p>2.4</p>	<p>Sleeping AIS targets Orientation is towards heading (or COG if heading unknown).</p> <p>If both heading and COG are unknown the orientation is toward top of display</p>	
<p>2.5 a</p>	<p>Activated AIS targets Activated target may show name or call sign Orientation is towards heading (or COG if heading unknown).</p> <ul style="list-style-type: none"> If both heading and COG are unknown the orientation is toward top of display 	  
<p>2.5 b</p>	<p>Activated AIS targets – true scaled outline - This can be displayed when based on user selection either beam width or length is more than 7.5 mm - AIS outline: ON/OFF</p>	
<p>2.5 c</p>	<p>Activated AIS targets – dangerous targets Dangerous target symbol is red and it flash until acknowledged</p>	 
<p>2.7 a</p>	<p>Activated AIS targets – heading lines</p>	 
<p>2.7 b</p>	<p>Activated AIS targets – heading lines – turn indicators</p>	 

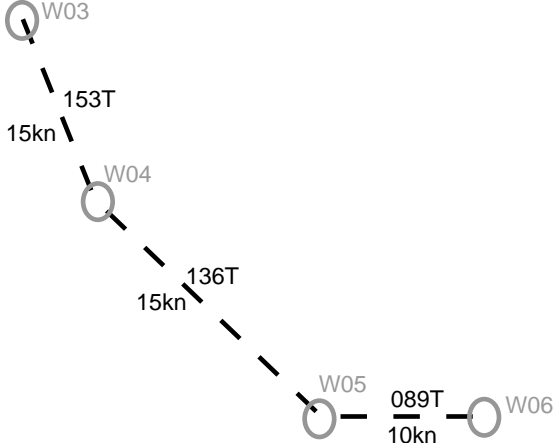
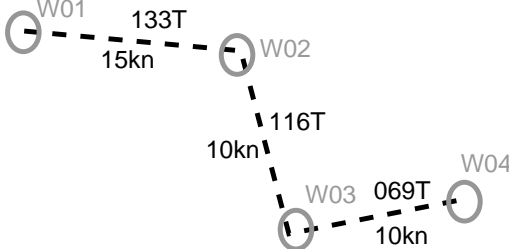
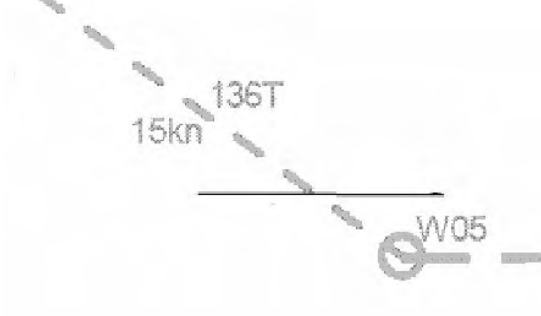

Appendix 1: Symbols and Abbreviations

<p>2.8 a</p> <p>Velocity vectors</p> <p>- Radar target</p> <p>- AIS target</p>		
<p>2.8 b</p> <p>Velocity vectors – time increments</p> <p>- Radar target</p> <p>- AIS target</p>		
<p>2.8 d</p> <p>Velocity vectors – path predictor</p>		

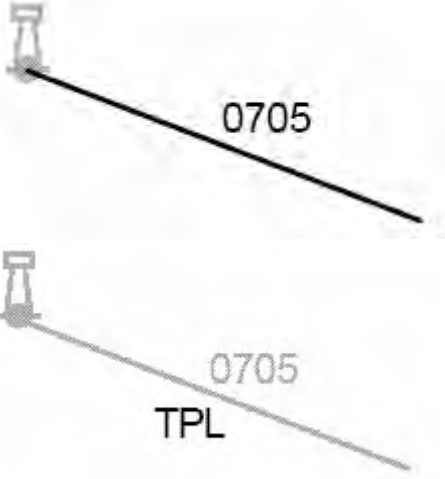
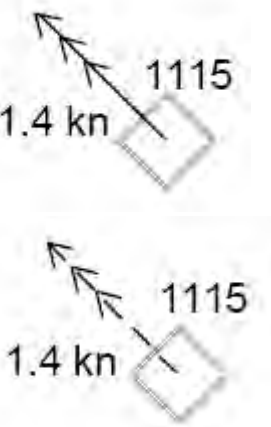
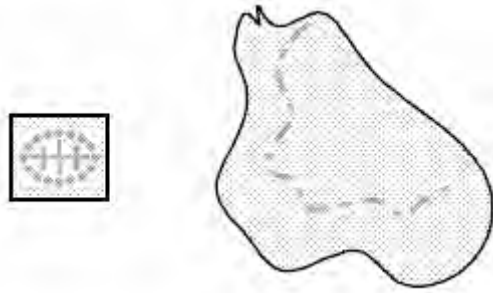
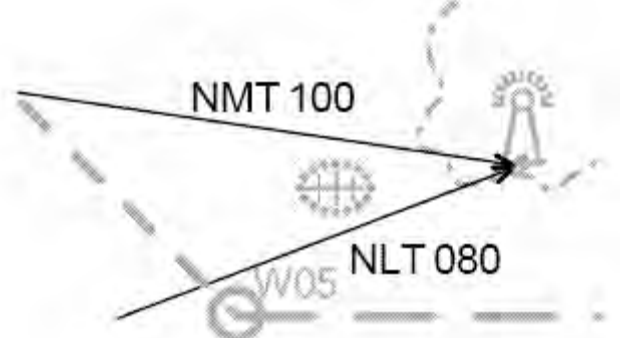
<p>2.9</p>	<p>Target past positions</p>	 <p>The diagram illustrates target past positions using several symbols and labels. At the top, there are two curved paths of dots, each with a central circle containing a minus sign and the number '18'. Below these are two more curved paths of dots, each with a central circle containing a plus sign and the number '18'. At the bottom, there are two paths of dots, each with a central triangle containing a plus sign and the name 'Sarah J'. The paths are shown as dashed lines with arrows indicating direction.</p>
<p>2.10</p>	<p>AIS aid to navigation (ATON) Real ATON is without "V" and visual ATON is with "V" An ATON in off position is red</p>	 <p>Two diamond-shaped symbols are shown. The first is a simple diamond with a plus sign inside. The second is a diamond with a plus sign and a 'V' inside.</p>
<p>2.11</p>	<p>AIS search and rescue transmitter - SART</p>	 <p>A circle with an 'X' inside, representing the SART symbol.</p>

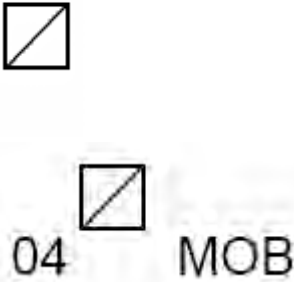

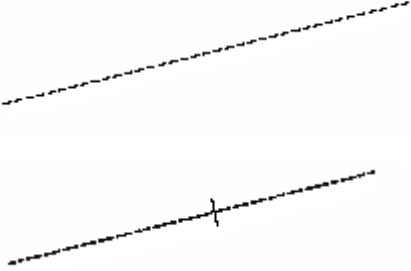

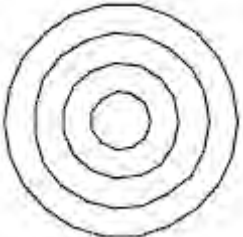
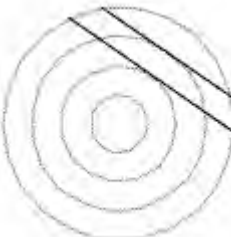
Appendix 1: Symbols and Abbreviations

2.12	<p>Selected targets</p>	
2.13	<p>Lost targets Lost target symbol is red and it flash until acknowledged</p>	
3.1 a	<p>Waypoint</p>	
	<p>Next waypoint</p>	

<p>3.1 b</p>	<p>Routes - Monitor Monitored route leg lines are dashed Leg lines may indicate planned speed and bearing.</p>	
<p>3.1c</p>	<p>Routes - Planned Planned route leg lines are dotted Leg lines may indicate planned speed and bearing.</p>	
<p>3.1 f</p>	<p>Wheel over position</p>	
<p>3.2</p>	<p>Plotted positions Plotted position includes some labels. Type is DR, EP or Fix (Fix is without label). Examples of source labels are GNSS: G GPS: G DGPS: dG Loran: L etc.</p>	

Appendix 1: Symbols and Abbreviations

<p>3.3</p>	<p>Line of position Abbreviation is LOP. Label TPL is used to indicate measurement transferred by dead reckoning.</p>	
<p>3.4</p>	<p>Tidal stream User defined tidal stream symbols are available as part of UserChart. Actual tidal stream use solid vector and predicted tidal stream use dashed vector.</p>	
<p>3.5</p>	<p>Danger highlight Route Plan, Route Monitor and own ship Chart Alarm search area use danger highlight to indicate violation against user-selected dangers.</p>	
<p>3.6</p>	<p>Danger bearing Also called by traditional name "clearing line". User defined clearing line symbols are available as part of UserChart.</p>	

<p>3.7</p>	<p>Event marker Event markers indicate events recorded into the Voyage record. Man over board event has label MOB.</p>	
<p>4.1</p>	<p>User cursor</p>	
<p>4.2</p>	<p>Electronic bearing line (EBL) Second example show with range marker.</p>	
<p>4.3</p>	<p>Variable range marker (VRM)</p>	
<p>4.4</p>	<p>Range rings</p>	
<p>4.5</p>	<p>Parallel index lines</p>	

A1.2 Abbreviations

Abbreviation	Meaning
ACK	Acknowledge
ACQ	Acquire
Act	Activate
AIS	Automatic Identification System
ANT	Antenna
AP	Autopilot
ARCS	Admiralty Raster Chart System
AUTO	Automatic
AVAIL	Available
AZ	Acquisition zone
BCR	Bow Crossing Range
BCT	Bow Crossing Time
BRG	Bearing
BRILL	Brilliance
CAL	Calibrate
CALC	Calculated
CCRP	Consistent Common Reference Point
CCRS	Consistent Common Reference System
CDROM	Compact Disc Read Only Memory
Ch	Channel
CHG	Change
COG	Course Over the Ground
CORR	Corrected / Correction
CPA	Closest Point of Approach
CPU	Central Processing Unit
CRS	Course
CTW	Course Through the Water
DGPS	Differential GPS
DISP	Display
DIST	Distance
DR	Dead Reckoning
E	East
EBL	Electronic Bearing Line
ECDIS	Electronic Chart Display and Information System
ENC	Electronic Navigational Chart
EP	Estimated Position
EQUIP	Equipment
ERR	Error
ETA	Estimated Time of Arrival

Abbreviation	Meaning
ETD	Estimated Time Of Departure
EXT	External
FILT	Filter / Filtered
GC	Great Circle
GND	Ground
GPS	Global Positioning System
GZ	Guard Zone
HDG	Heading
HL	Heading Line
HSC	High Speed Craft
IBS	Integrated Bridge System
ID	Identification
INS	Integrated Navigation System
L/L	Latitude / Longitude
LAT	Latitude
LIM	Limit
LON	Longitude
LOP	Line Of Position
MAN	Manual
MAX	Maximum
MIN	Minimum
MMSI	Maritime Mobile Services Identity Number
MOB	Man Overboard
N	North
NAV	Navigation
NLT	Not Less Than
NMT	Not More Than
NUC	Not Under Command
OS	Own Ship
Oth	Other
PAST POSN	Past Positions
PI	Parallel Index Line
POSN	Position
R	Relative
RAD	Radius
RAIN	Anti Clutter Rain
REF	Reference / Echo reference
REL	Relative
RENC	Regional ENC Co-ordinating Centre
RL	Rhumb Line
RM	Relative Motion
RNG	Range

Appendix 1: Symbols and Abbreviations

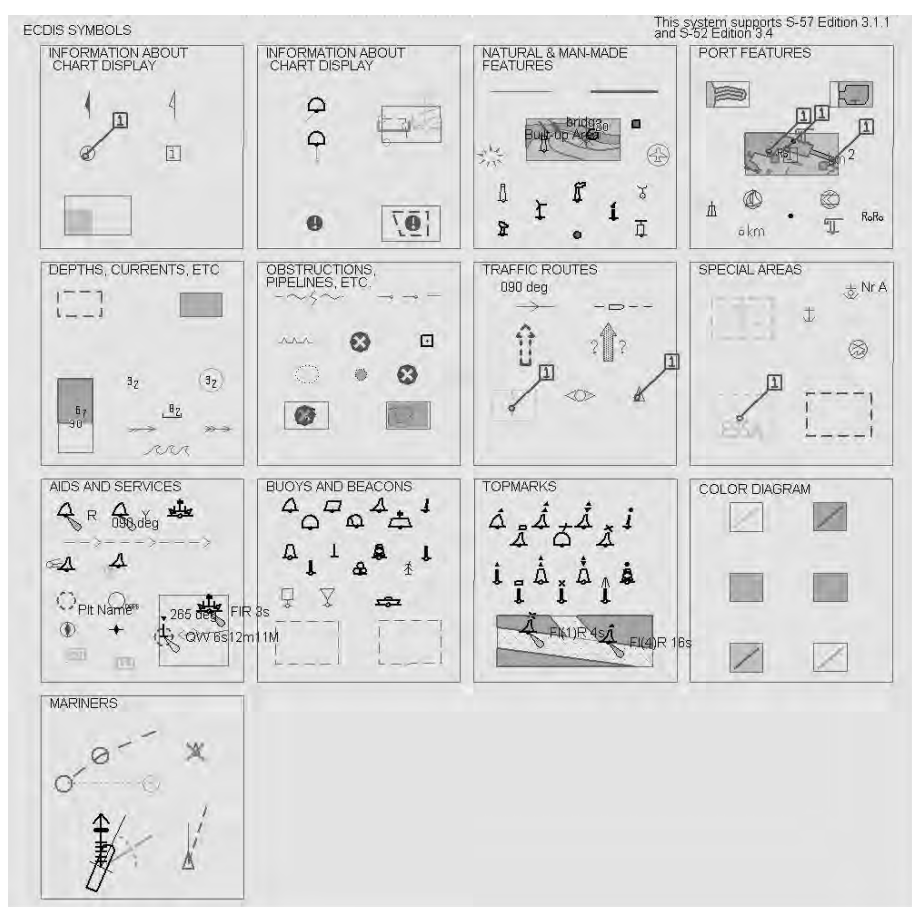
Abbreviation	Meaning
ROT	Rate Of Turn
RX	Receive
S	South
S57	IHO Special publication 57
SART	Search And Rescue Transponder
SB	Transversal Speed
SEA	Anti Clutter Sea
SENC	System ENC
SOG	Speed Over the Ground
SPD	Speed
STAB	Stabilized
STBD	Starboard
Std	Standard
STW	Speed Through the Water
SYM	Symbol
T	True
TCPA	Time to CPA
TGT	Target
TM	True Motion
TPL	Transferred Line Of Position
TT	Target Tracking / Tracked Target
TX	Transmit
UTC	Coordinated Universal Time
VECT	Vector
VRM	Variable Range Marker
W	West
WAT	Water
WGS	World Geodetic System
WOP	Wheel Over Point
WPT	Waypoint

Appendix 2: IHO ECDIS Chart 1

International Hydrographic Organization (IHO) has published a set of charts where you can find examples of symbology used in S57 charts. You can study them by using the "Info/Help" feature and by switching different layers ON and OFF in the Chart Display dialog box. Everything is visible if you set all layers for "Standard" or "Other" in the Other 1 and Other 2 pages in the Chart Display dialog box.

To open the IHO ECDIS Chart 1 on the display, do the following:

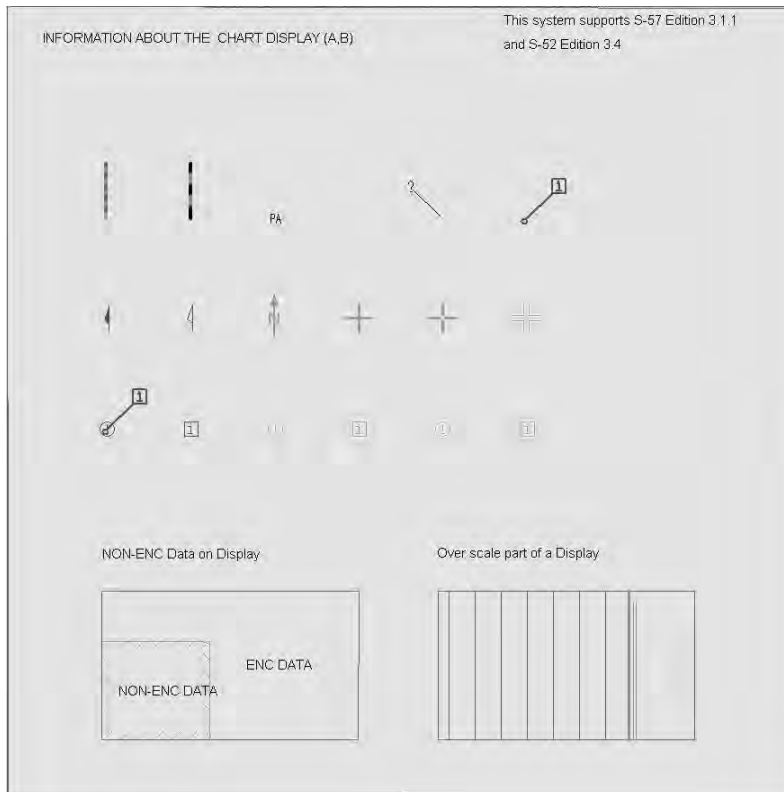
1. Spin the scrollwheel to show Menu/Info/Chart Menu in the mouse functions area then push the right mouse button.
2. Roll the wheel to choose ECDIS Chart 1 from the menu then push the scrollwheel.
3. Choose Overview from the menu then push the scrollwheel.



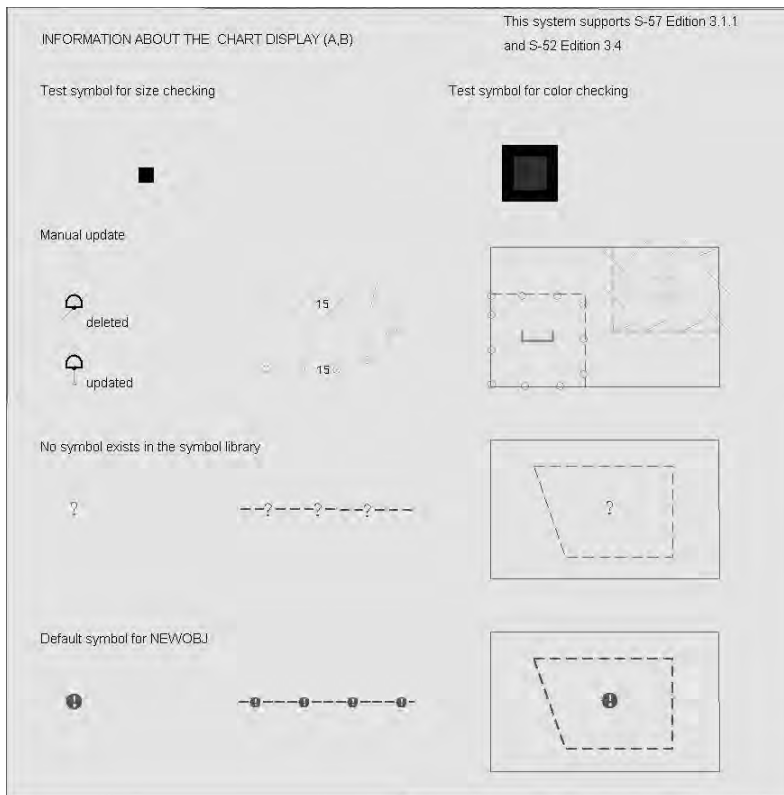
4. Spin the scrollwheel to choose desired item then push the scrollwheel.

See the next several pages for the display associated with each dialog box item.

Appendix 2: IHO ECDIS Chart 1



Information about the chart display 1



Information about the chart display 2

Appendix 2: IHO ECDIS Chart 1

DEPTHS, CURRENTS, ETC. (H, I) This system supports S-57 Edition 3.1.1 and S-52 Edition 3.4

dredged area

swept area swept to 4.5

unsurveyed incompletely surveyed

quality of data (zone A1)

quality of data (zone B)

quality of data (zone D)

tidal stream data

area of depth less than safety contour

quality of data (zone u)

low accuracy

low accuracy

drying line 0.5 0.2 0.2

shallow contour 0.2 0.2

safety contour

deep contour

2 or 4 colours for symbolizing of depth areas

Depths, Currents, etc.

SEABED, OBSTRUCTIONS, PIPELINES, ETC. (J, K, L) This system supports S-57 Edition 3.1.1 and S-52 Edition 3.4

fishing facility

cable, submarine

pipeline, oil

pipeline, water

obstruction line

danger line

danger line, low accuracy

fouled area

area of wrecks or obstructions

seabed area

sand waves

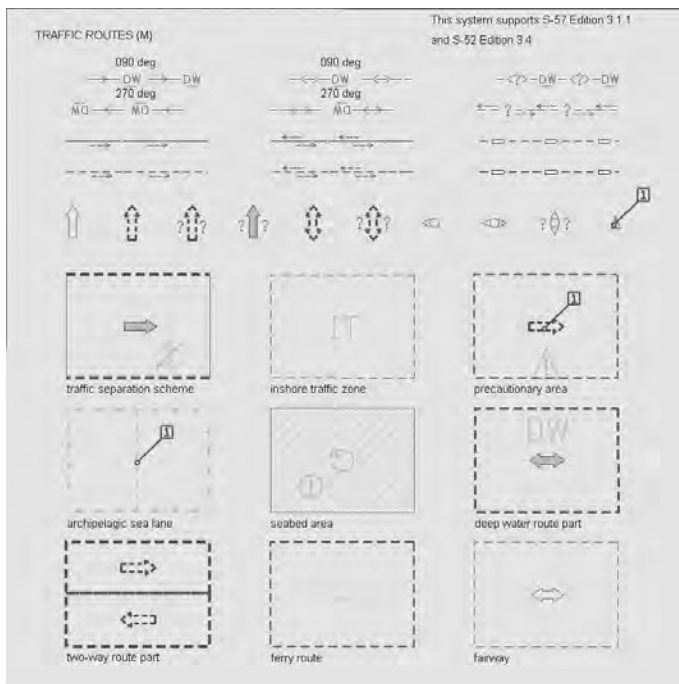
restricted area

cable area

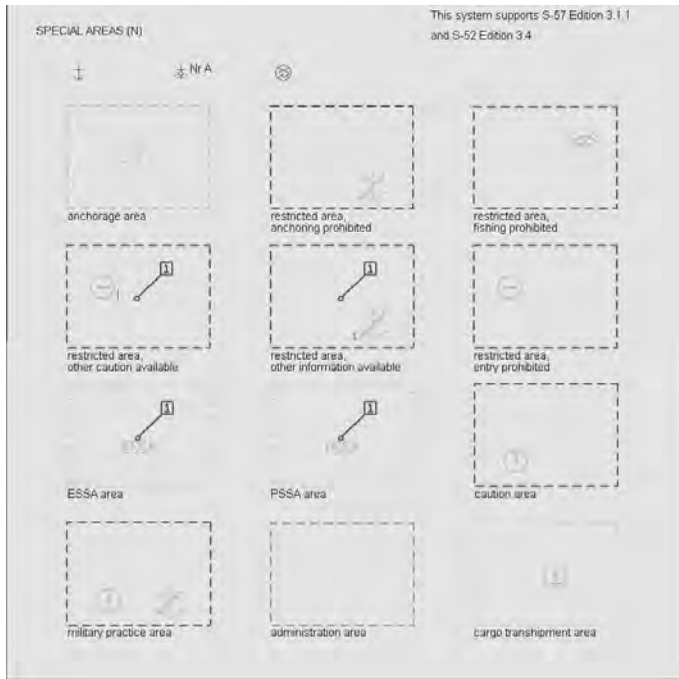
pipe area, oil

pipe area, water

Seabed, Obstructions, Pipelines, etc.

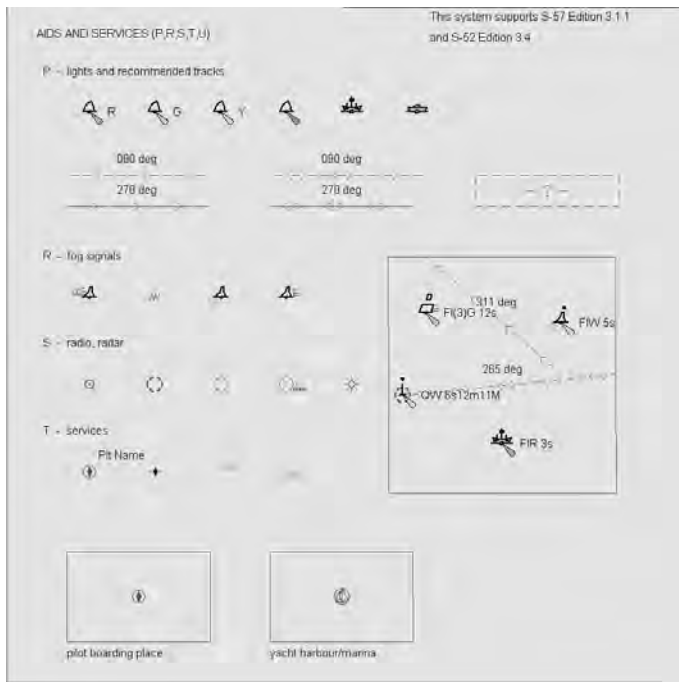


Traffic routes

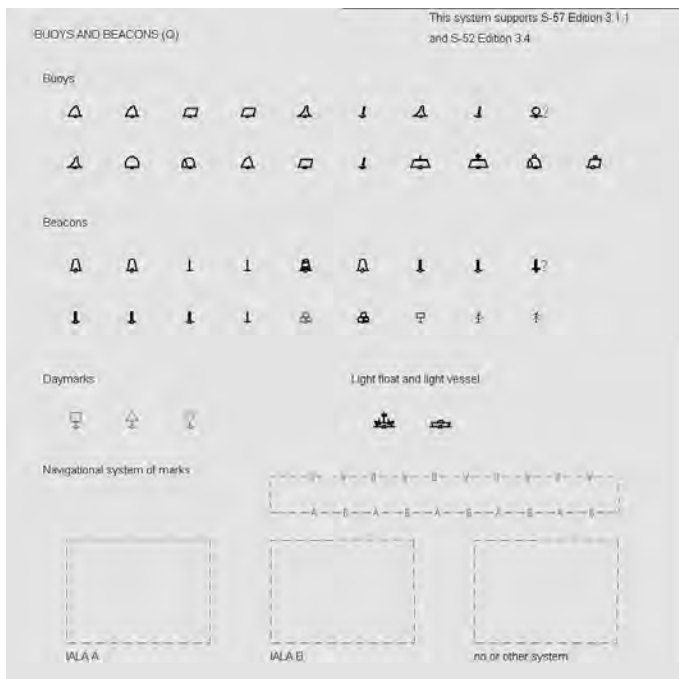


Special areas

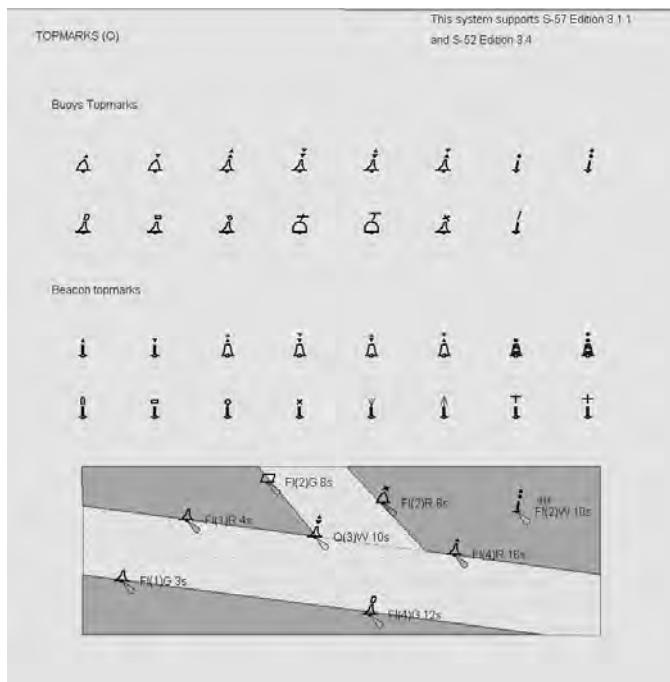
Appendix 2: IHO ECDIS Chart 1



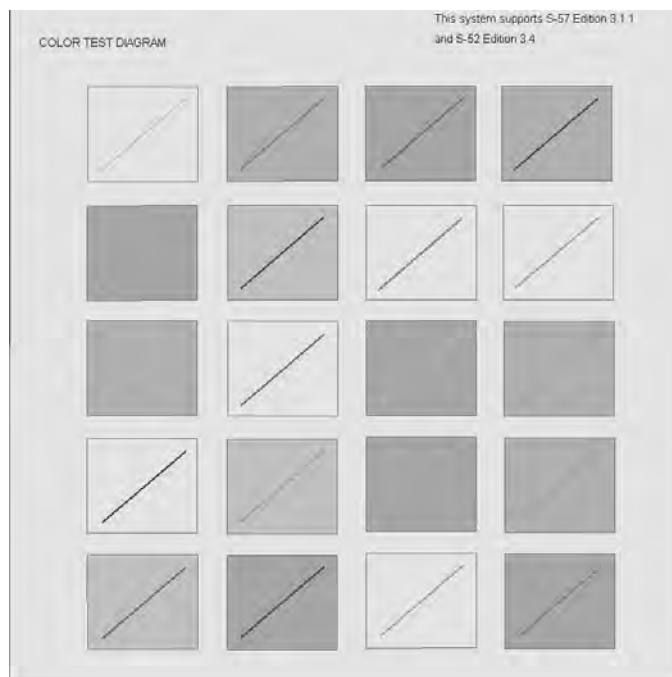
Aids and Services



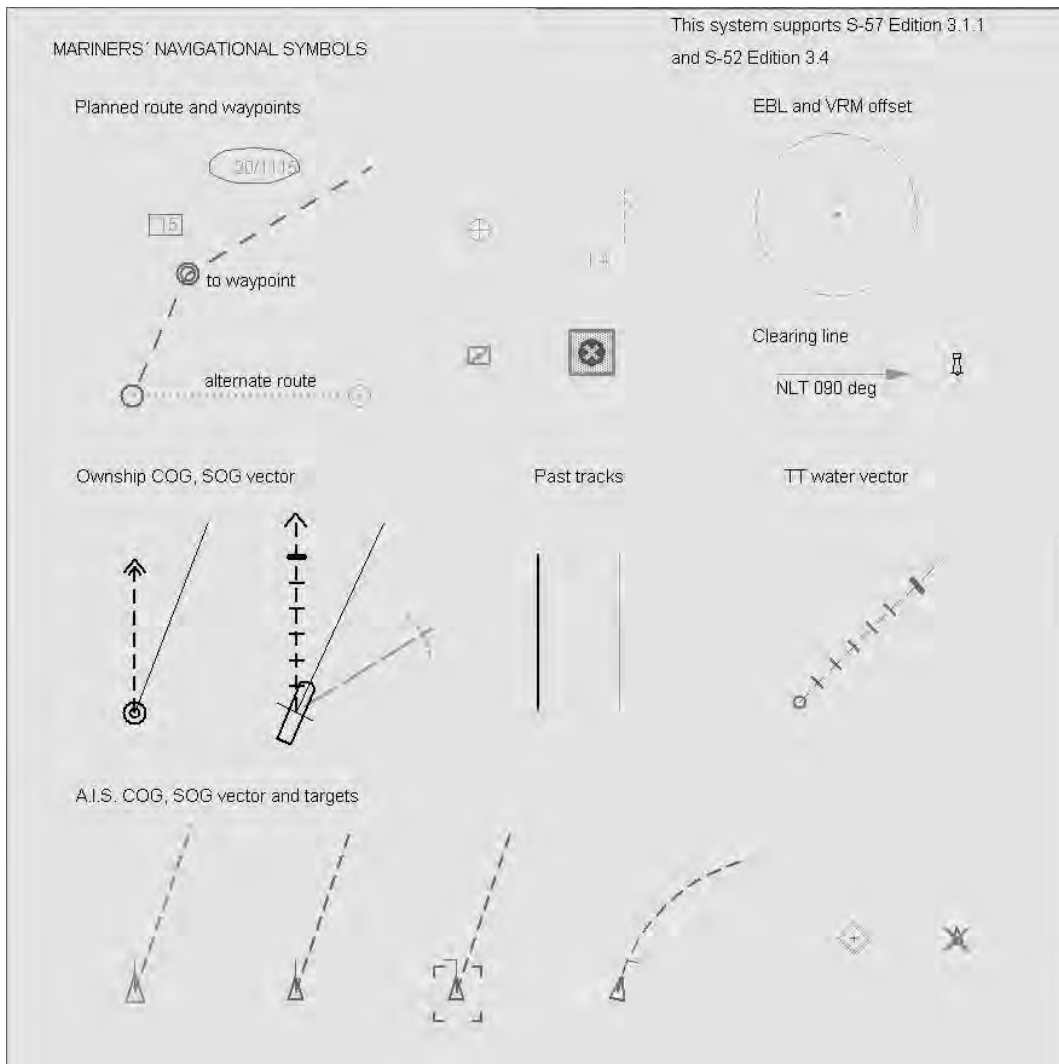
Buoys and Beacons



Topmarks



Color test diagram

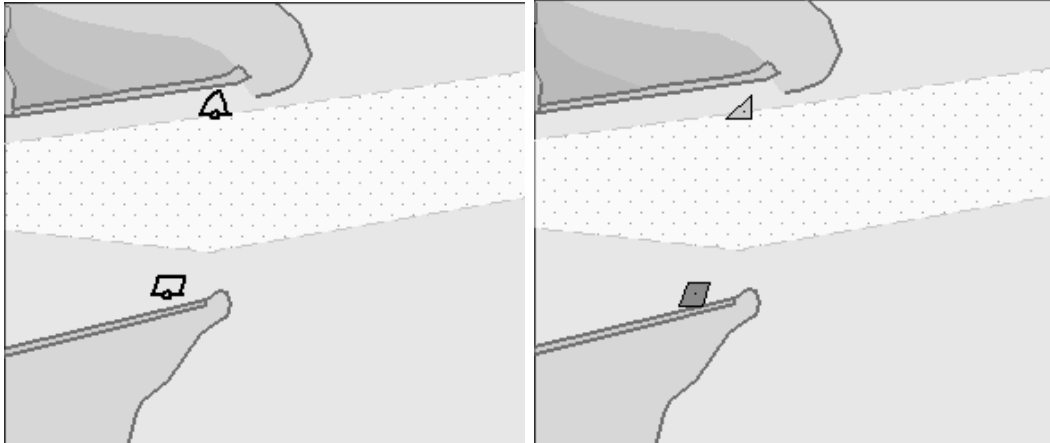


Mariners' navigational symbols

Appendix 3: Interpreting S57 Charts

The following examples give you a short introduction to the features of S57 charts.

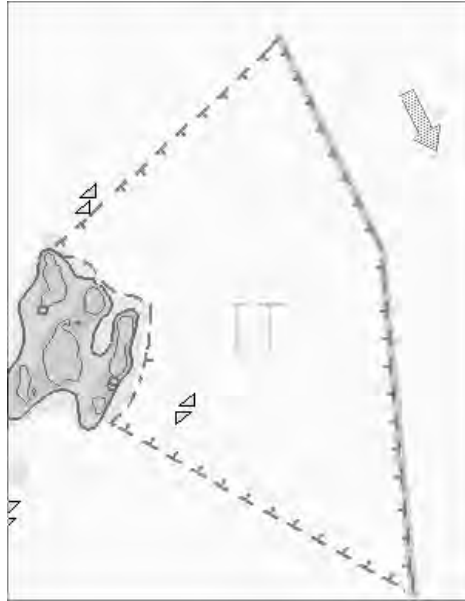
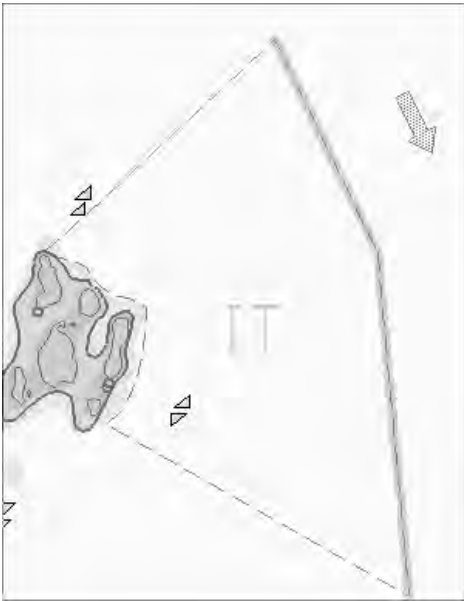
Paper chart or simplified symbols



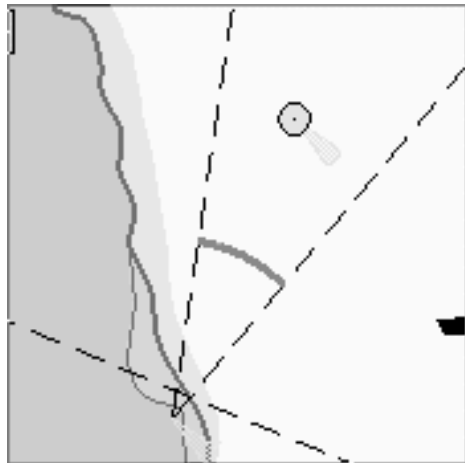
Two color or multi-color depth



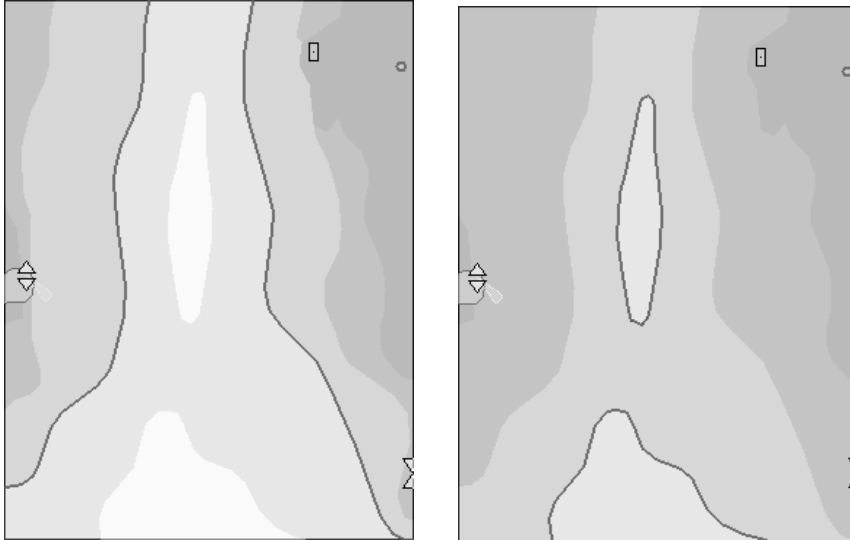
Plain or symbolized boundaries



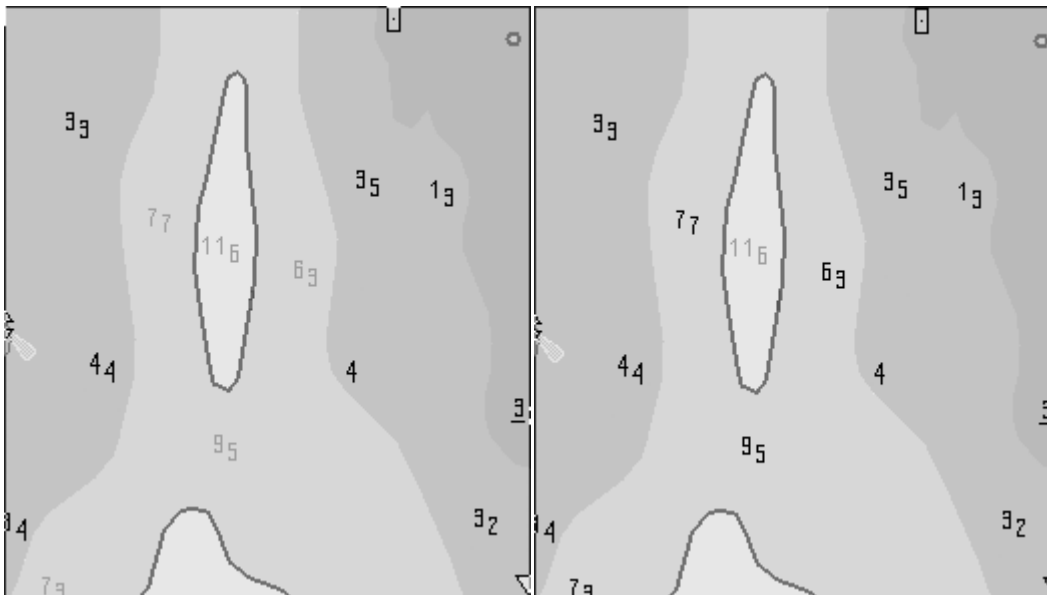
Limited or full light sectors



Shallow, safety and deep contours



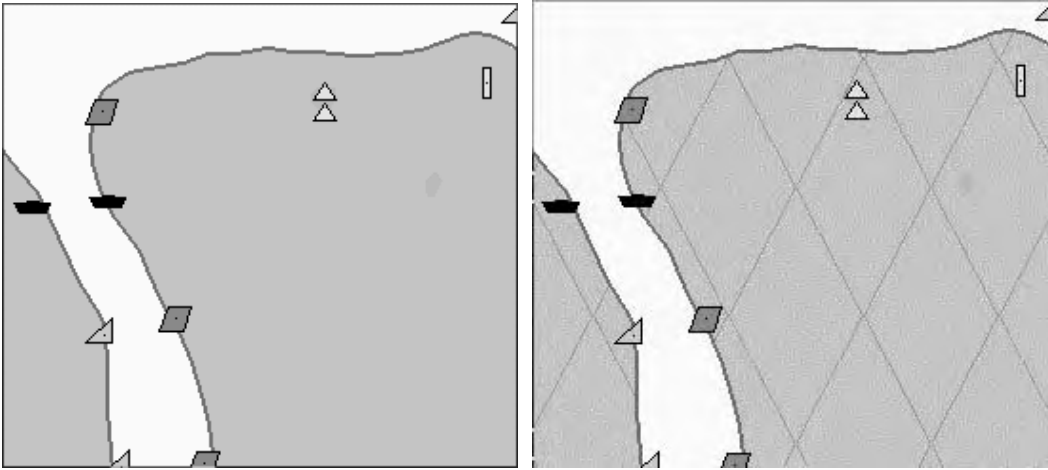
Shallow = 2m, Safety = 5m and Deep = 10m Shallow = 5m, Safety = 10m and Deep = 20m



Safety depth = 6m

Safety depth = 10m

Shallow pattern



Items on Standard page of Chart Display dialog box

Unknown object or presentation

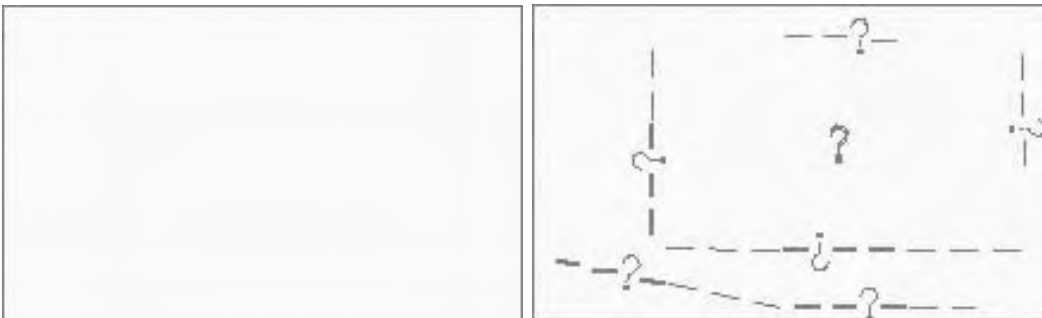
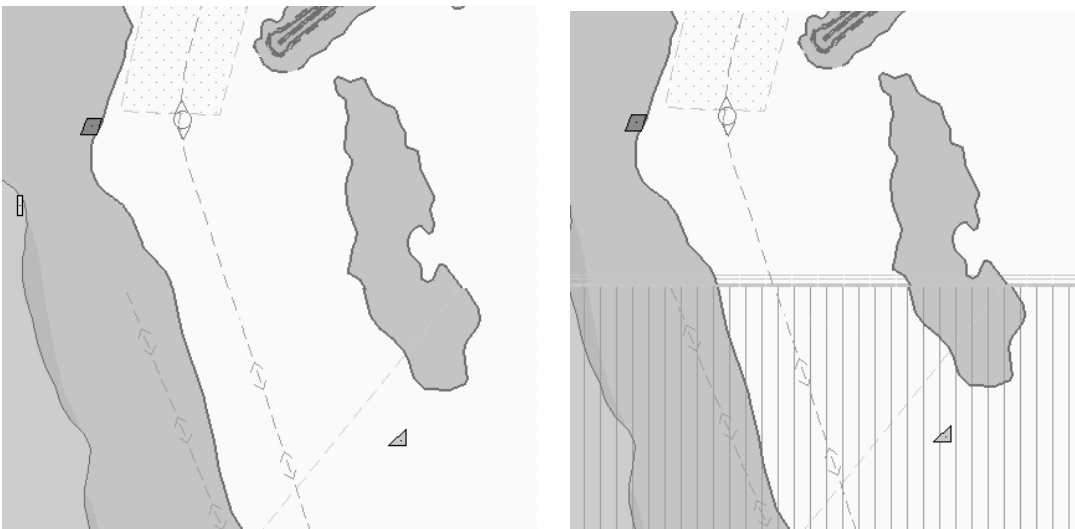


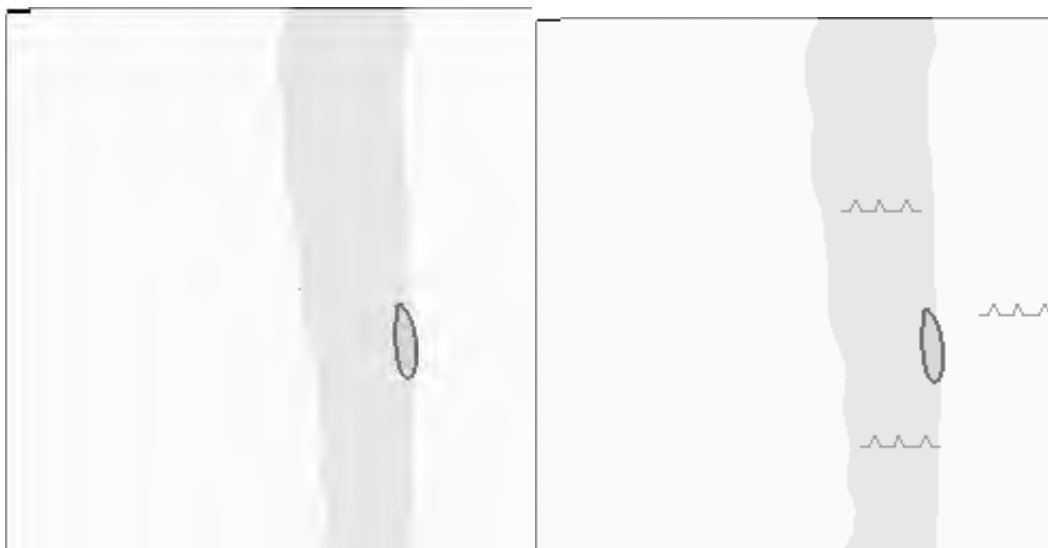
Chart data coverage



Land features



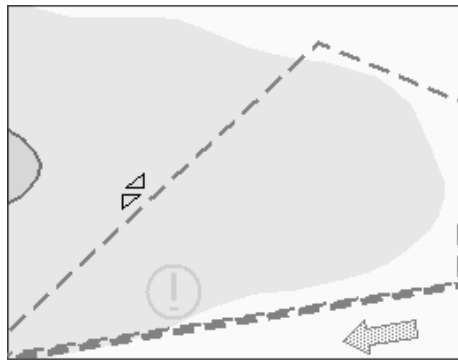
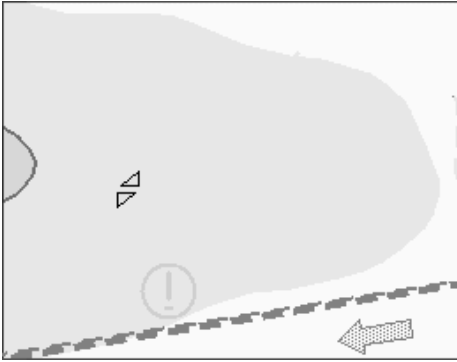
Water and seabed features



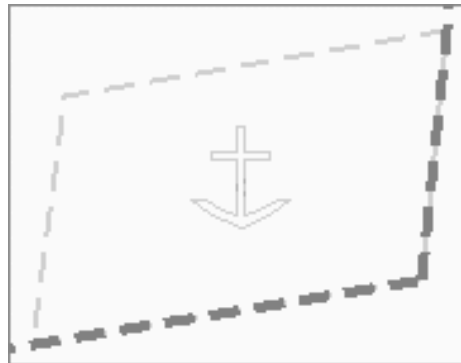
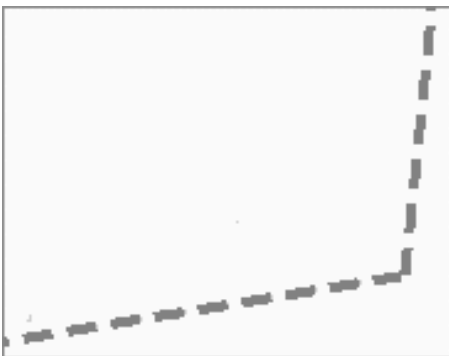
Traffic routes



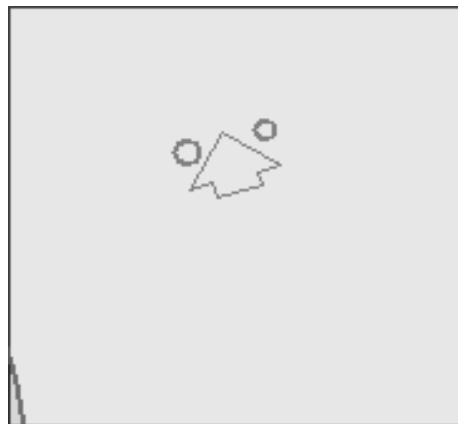
Cautionary areas



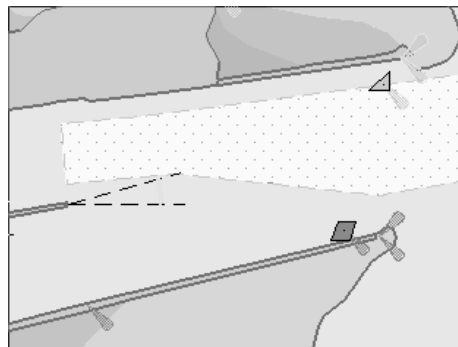
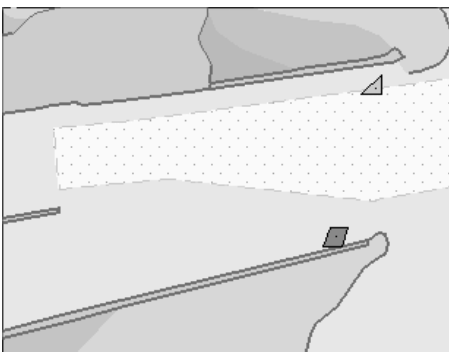
Information areas



Buoys and beacons



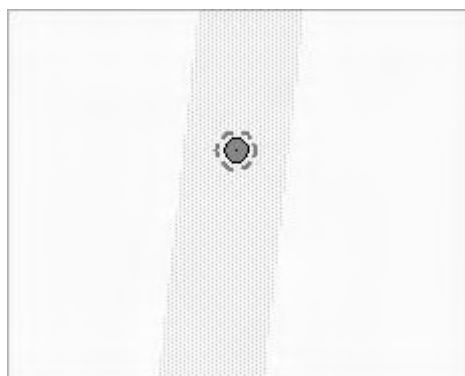
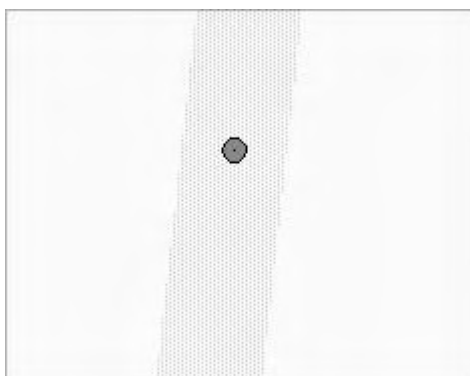
Lights



Fog signals



Radars

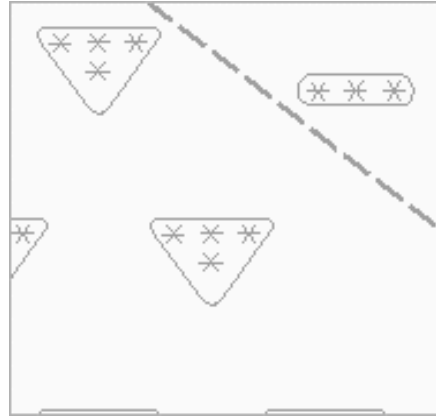
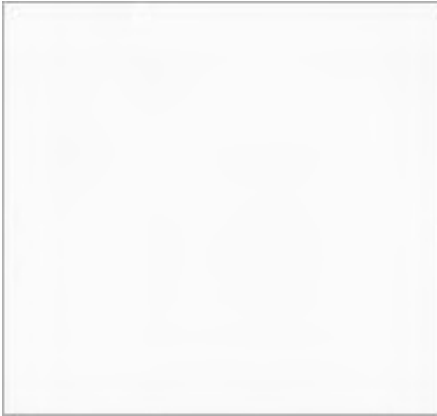


Services



Items on Other page in Chart Display dialog box

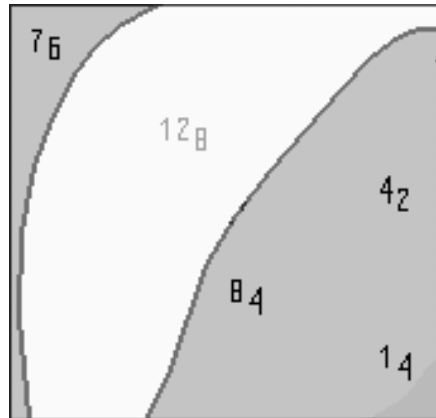
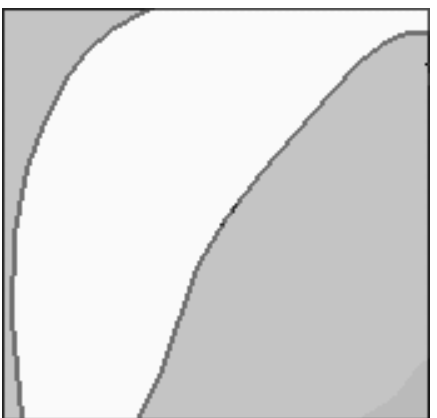
Information about chart data



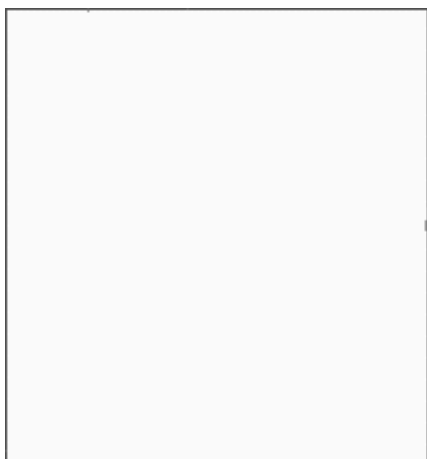
Land features



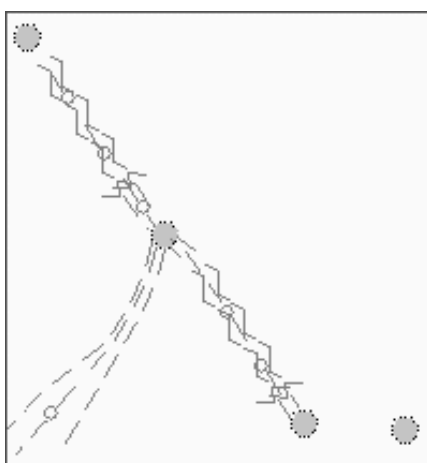
Soundings



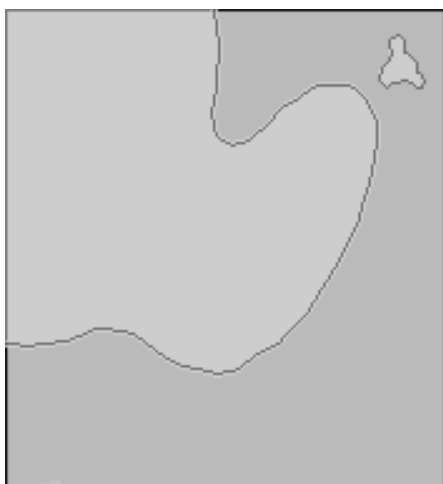
Depth contours, current magnetic



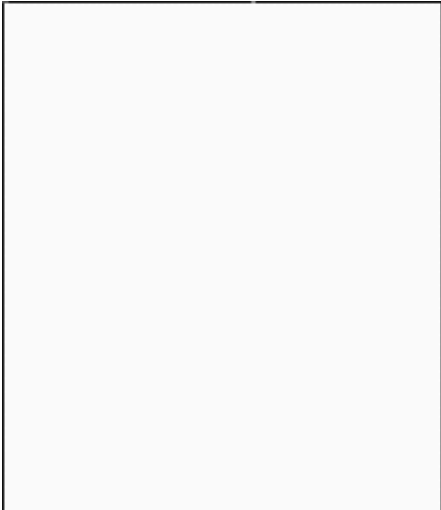
Seabed and obstructions



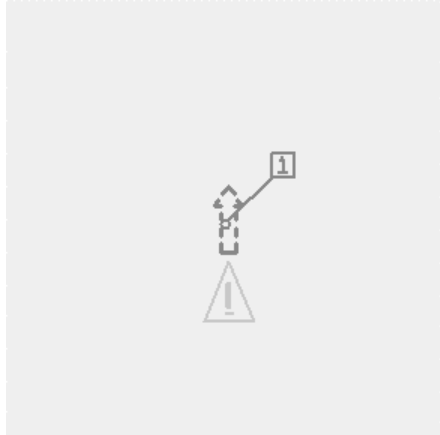
Services and small craft facilities



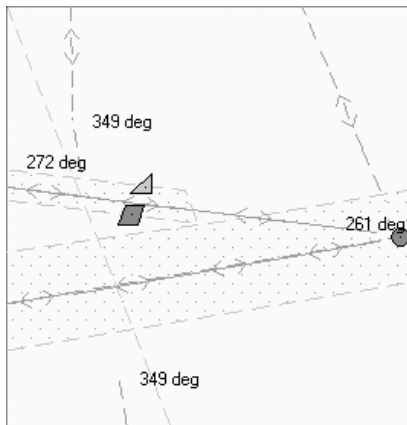
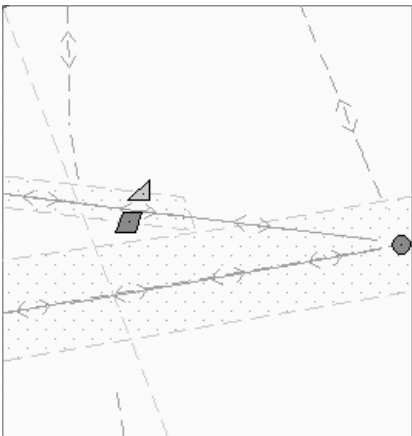
Special areas



Additional information available

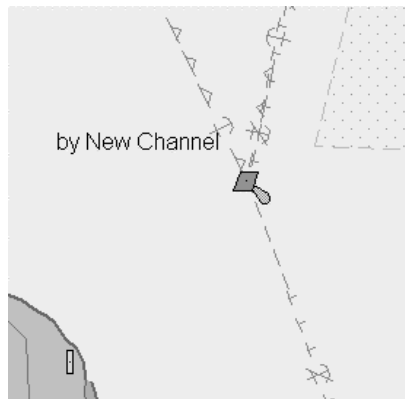
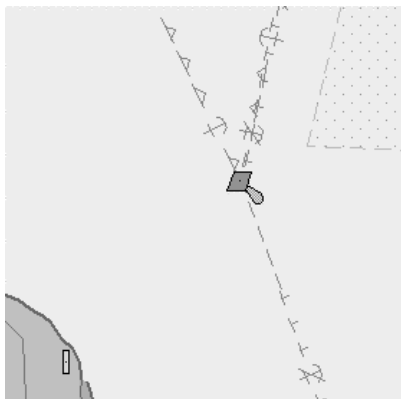


Important text

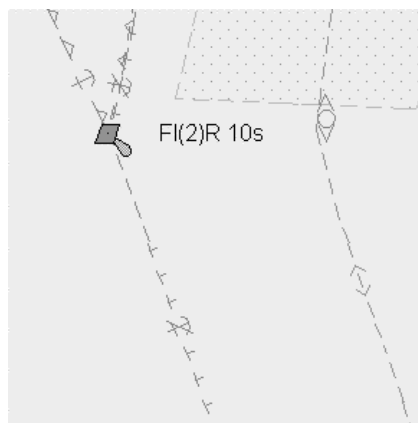


Text on Other page in Chart Display dialog box

Names for position reporting



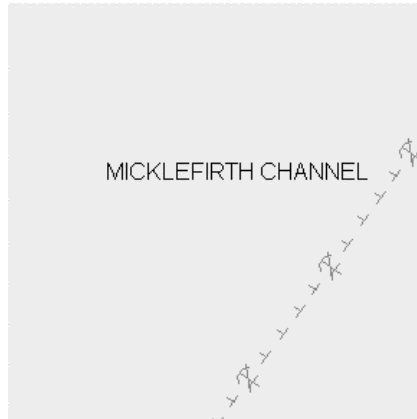
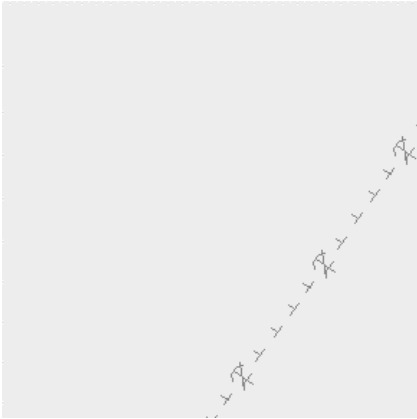
Light descriptions



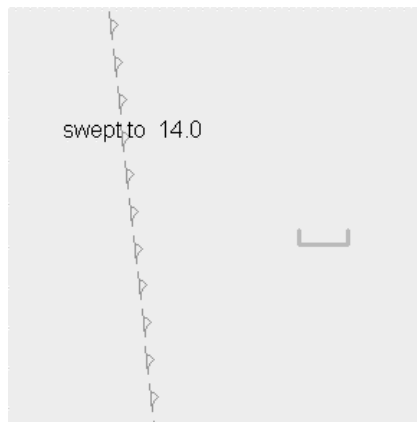
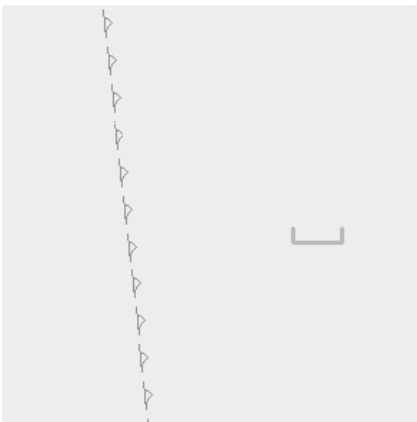
Nature of seabed



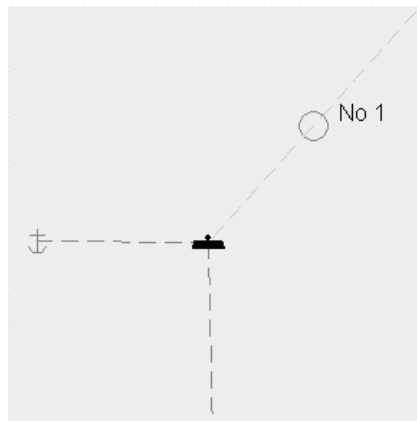
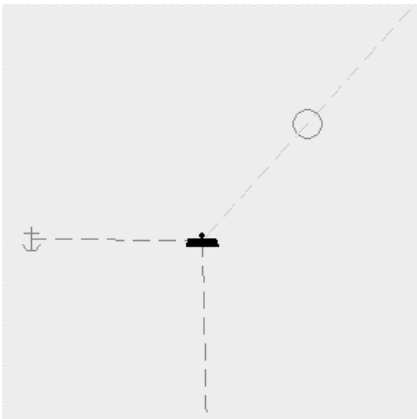
Geographic names, etc.



Swept depths, magnetics



Berth and anchorage numbers



Appendix 4:

C-MAP CM-93/3 Charts

A4.1 C-MAP Cartographic Service

Your ECDIS system has the capability of using and displaying the latest CMAP CM-93/3 worldwide vector chart database. These charts are fully compliant with the latest IHO S-57 3.1 specifications.

In order to prepare the system for use with the C-MAP CM-93/3 database, there are a number of things that must be done.

A4.1.1 How to register the system at C-MAP Norway

Your system has the capability to use the CM-93/3 database. To do so an Aladdin eToken (supplied by C-MAP) must be connected to the system (if the system has and supports USB). The eToken provides the system with a unique System ID that enables C-MAP to issue correct licenses. The actual System ID can be found on the eToken itself, on the back of the installation CD box or on a sticker placed on the equipment. This ID must be provided on all chart orders, either by email (license@C-MAP.no) or by fax +4751 464701

A4.1.2 How to order charts

A chart order may be sent together with system registration as described above. It is essential that the required information be sent to C-MAP when ordering charts for a system. C-MAP issues order forms specifying the information that is required, and contains vital information that will allow C-MAP to monitor and maintain your licenses throughout the lifetime of the system. Charts can be ordered by Zone, Area or Cell and these can be seen on our Internet pages at www.C-MAP.no or by downloading the Chart Product Catalogue also available on the web site. Price quotations can be obtained via your chart dealer or direct from your local C-MAP office. Once the license order has been prepared it should be emailed to license@C-MAP.no or faxed to C-MAP Norway AS (+47 51 464701).

A4.1.3 How to apply for licenses

Once the order has been received at C-MAP, a license will be generated and transmitted back to the operator. This may be in the form of a single alphanumeric string (16 characters), or in the form of a file called PASSWORD.USR. Once this license has been received it should be input using the License Administrator software designed and supplied by the ECDIS/ECS manufacturer. There are two types of licenses, purchase and subscription. Purchase licenses are valid indefinitely while subscription licenses need to be renewed every 12 months from the start of the subscription. Failure to renew a subscription will result in the charts becoming unavailable.

A4.1.4 Troubleshooting

If you are having problems installing your software or charts please check the following before contacting C-MAP:

- That you have registered the WORLD database in the GDBADMIN application.
- That the registered WORLD database is available.
- That you have correctly typed the license string.

Contact Information: For information or help please call your nearest C-MAP Office (details can be found on the reverse side of the C-MAP chart CO box) or contact C-MAP Norway:

C-MAP Norway AS Post Box 212 Hovlandsveien 5 379 Egersund Norway

Tel. +4751464700 Fax.+4751464701

Email: technical@C-MAP.no

A4.2 Chart Subscription Service

A4.2.1 C-MAP service

There are three different services available through C-MAP Cartographic service that can be used in FURUNO ECDIS FEA-2x07. Two of them are using CM-93/3 format. These data sets contain two databases:

- CM-ENC (SENC delivery), Official Electronic Navigational Charts distributed by C-MAP on DVD.
- Global Chart Database, which is available on CM93/3 professional CD-ROM. This database contains chart data original produced both by C-Map and Hydrographic Office.
- Global Chart Database, which is available on CM93/3 professional+ DVD. This database contains chart data original produced both by C-Map and Hydrographic Office.

Note: CM-ENC is available. If you change CD-ROM service to DVD service, you need to also have a new license for the DVD service. Contact your chart agent or C-MAP for details.

Additionally, the previous CM-93/2 Global Chart Database is compatible for use with the FEA-2x07.

A4.2.2 What is SENC delivery?

ENCs can be distributed as ENC delivery or SENC delivery. Both deliveries can be used in FEA-2x07.

In ENC delivery charts are distributed directly from source like PRIMAR, IC-ENC, JHA etc. They are delivered onboard in ENC format (using S-57 and S-63) then charts are loaded into ECDIS. For more information, see section 8.6 "S57 Chart Service from an RENC"

In SENC delivery charts are converted from ENC to SENC before delivery to onboard and loading to ECDIS. A CM-ENC delivery is SENC delivery.

Important notice!

If you are using both services (ENC and SENC deliveries) having the same chart name loaded into ECDIS through both deliveries, priority of displaying the chart is in ENC delivery.

Chart Updates for ENC delivery are only for charts of ENC delivery and chart updates for SENC delivery is only for charts of SENC delivery. You have to keep charts up-to-date separately.

If you change from ENC delivery to SENC delivery, remove old charts from ECDIS before loading charts from new delivery.

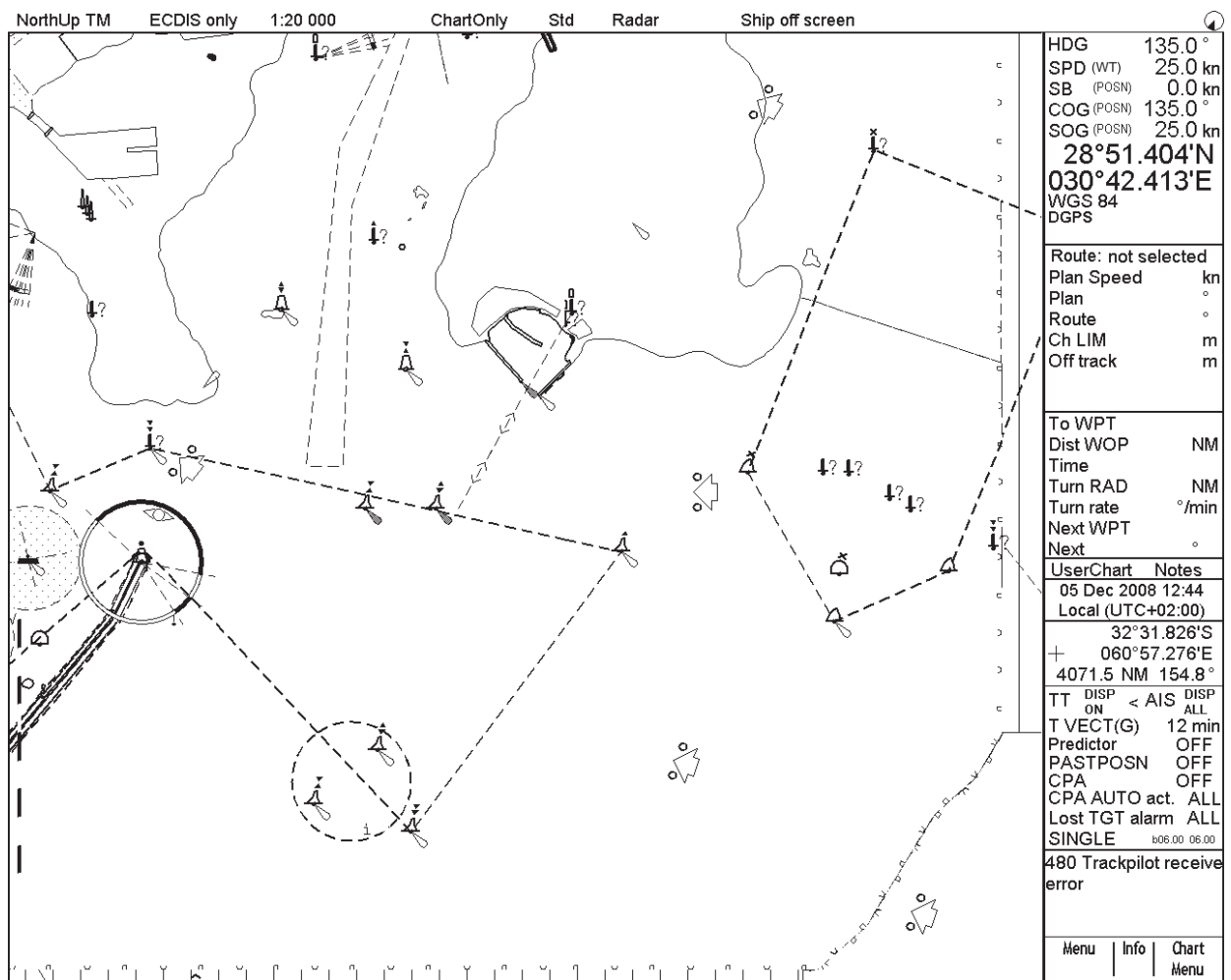
When using any C-MAP chart, the indication "Non ENC Data" appears at the upper right corner on the ECDIS display.

A4.2.3 CM-ENC service (SENC delivery)

Chart data distributed through the service is S57 ed.3.0 or ed. 3.1 coded ENC in CM-ENC format.



When using charts loaded and updated using CM-ENC service, on ECDIS there are no indications at the top right corner.



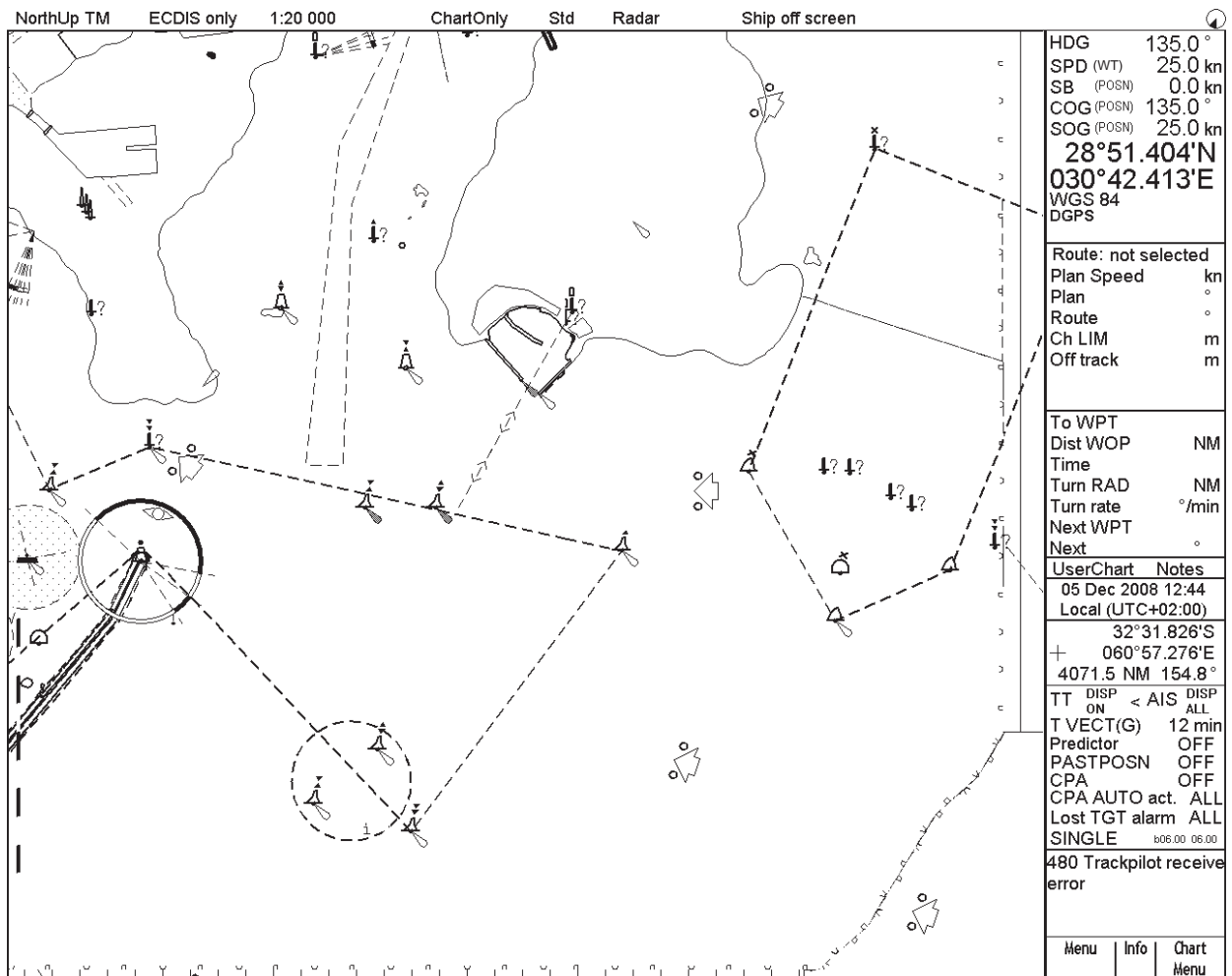
A4.2.4 RENC service

RENC service produced by Primer or IC-ENC is considered to legally fulfil SOLAS requirements as primary aid of navigation. National Hydrographic Organization (NHO) may have arranged similar subscription service as RENC on its own waters.

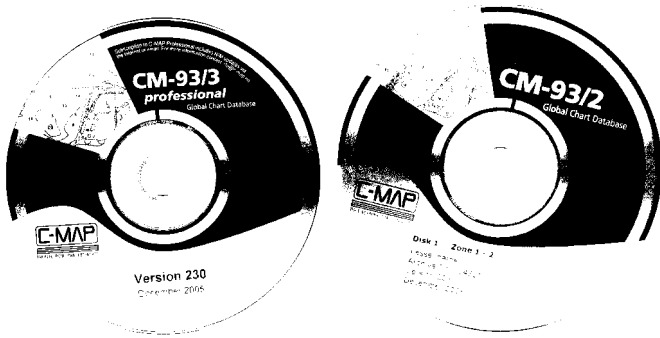
Chart data distributed through the service is S57 ed.3.0 or ed. 3.1-coded ENC.



When using charts loaded and updated using RENC or NHO service, on ECDIS there are no indications at the top-right corner.



A4.2.5 CM-93/3 Prof, CM-93/3 Prof+ and CM-93/2 services



When using any of mentioned above you will always have indication "No ENC Available" at the top right corner of ECDIS. If there is indication "No ENC Available" you have to refer paper charts in navigation.

NorthUp TM ECDIS only 1:20 000 ChartOnly Std Radar Ship off screen No ENC available

HDG	135.0°
SPD (WT)	25.0 kn
SB (POSN)	0.0 kn
COG (POSN)	135.0°
SOG (POSN)	25.0 kn
	28°51.404'N
	030°42.413'E
	WGS 84
	DGPS
Route: not selected	
Plan Speed	kn
Plan	°
Route	°
Ch LIM	m
Off track	m
To WPT	
Dist WOP	NM
Time	
Turn RAD	NM
Turn rate	°/min
Next WPT	
Next	
UserChart Notes	
05 Dec 2008 12:44	
Local (UTC+02:00)	
32°31.826'S	
+ 060°57.276'E	
4071.5 NM 154.8°	
TT DISP	< AIS DISP
ON	ALL
T VECT(G)	12 min
Predictor	OFF
PASTPOSN	OFF
CPA	OFF
CPA AUTO act.	ALL
Lost TGT alarm	ALL
SINGLE	b06.00 06.00
480 Trackpilot receive error	
Menu	Info Chart Menu

A4.3 CM93/3 Chart Display

A4.3.1 Introduction

CM93/3 charts are vector charts displayed together with ENC (S57) and CM93/2 charts. These charts have the priority order shown below.

1. CM- ENC
2. CM93/3 Prof and CM93/3 Prof+
3. CM93/2

If there is available the same navigational purpose charts over the area, priority is as shown above. Areas where ENC is not available CM-ENC are shown, CM93/3 Prof or CM93 Prof+ and CM93/2 are available, CM 93/3 is displayed. Areas where ENC and CM93/3 Prof or CM93/3 Prof+ are not available CM93/2 is displayed.

The chart legend, which provides various data about the chart currently displayed, can be toggled on and off by placing the cursor in the sidebar, clicking the right mouse button, choosing Chart Legend from the menu then pushing the scrollwheel.

This system is capable of showing more than one S57 chart at a time. This feature is called the multi-chart display. If one S57 chart does not cover the whole display, the system will open more S57 chart cells for display, if appropriate cells for the displayed area are available. The chart legend shows information about S57 charts displayed on the electronic chart display area. The information is displayed with reference to your ship's position if automatic TM reset is active, or with reference to the current position of the cursor if automatic TM Reset is OFF.

Cell name	Z12AS430
Navigational purpose	Coastal
Issue date	20030206
Edition number	3
Last displayed update	64
Update issue date	20030206
Last update appl. date	20051116
Projection	Mercator
Horizontal datum	WGS 84
Vertical datum	Mean sea level
Sounding datum	Mean sea level
Quality of data	Zone of confidence U
Magnetic var.	
Depth	metres
Height	metres

Cell name: Name of chart.

Navigational purpose: S57 charts are compiled for a variety of navigational purposes. The navigational purpose, for which an individual S57 chart has been compiled by a Hydrographic Office, is indicated in this field. Alternatives are Overview, General, Coastal, Approach, Harbour and Berthing.

Issue date: Issue date of the Base cell of the chart.

Edition number: Edition number of the chart.

Last displayed update: Number of last update, which is visible on the chart screen.

Update issue date: Date to which the last update, which is visible on the chart screen, is effective.

Last update appl. date: Issue date of last update, which is visible on the chart screen.

Projection: Projection of the chart. The projection is always Mercator.

Horizontal datum: Horizontal datum of the chart data as published by the chart producer. By definition this must be WGS 84.

Vertical datum: Vertical datum of the chart.

Sounding datum: Datum used for soundings.

Quality of data: Quantitative estimate of the accuracy of chart features, given by the chart producer.

Magnetic var.: Amount of magnetic variation. A positive value indicates a change in an easterly direction and a negative value indicates a change in a westerly direction.

Depth: Unit of measurement for depth.

Height: Unit of measurement for height above sea level (for example, clearance height).

A4.3.2 How to select CM93/3 chart material to use

Do the procedure below to display CM93/3 charts in the ARCS mode.

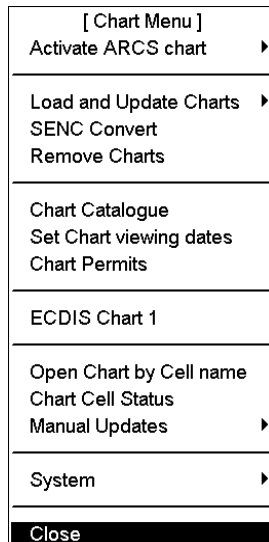
1. Open the Chart menu and select Activate S57 chart.
2. Select Ignore Scale (use same scale as used on previously loaded CM93/3 chart) or Sync Scale (use scale currently used for ARCS chart).

A4.3.3 How to select charts for viewing

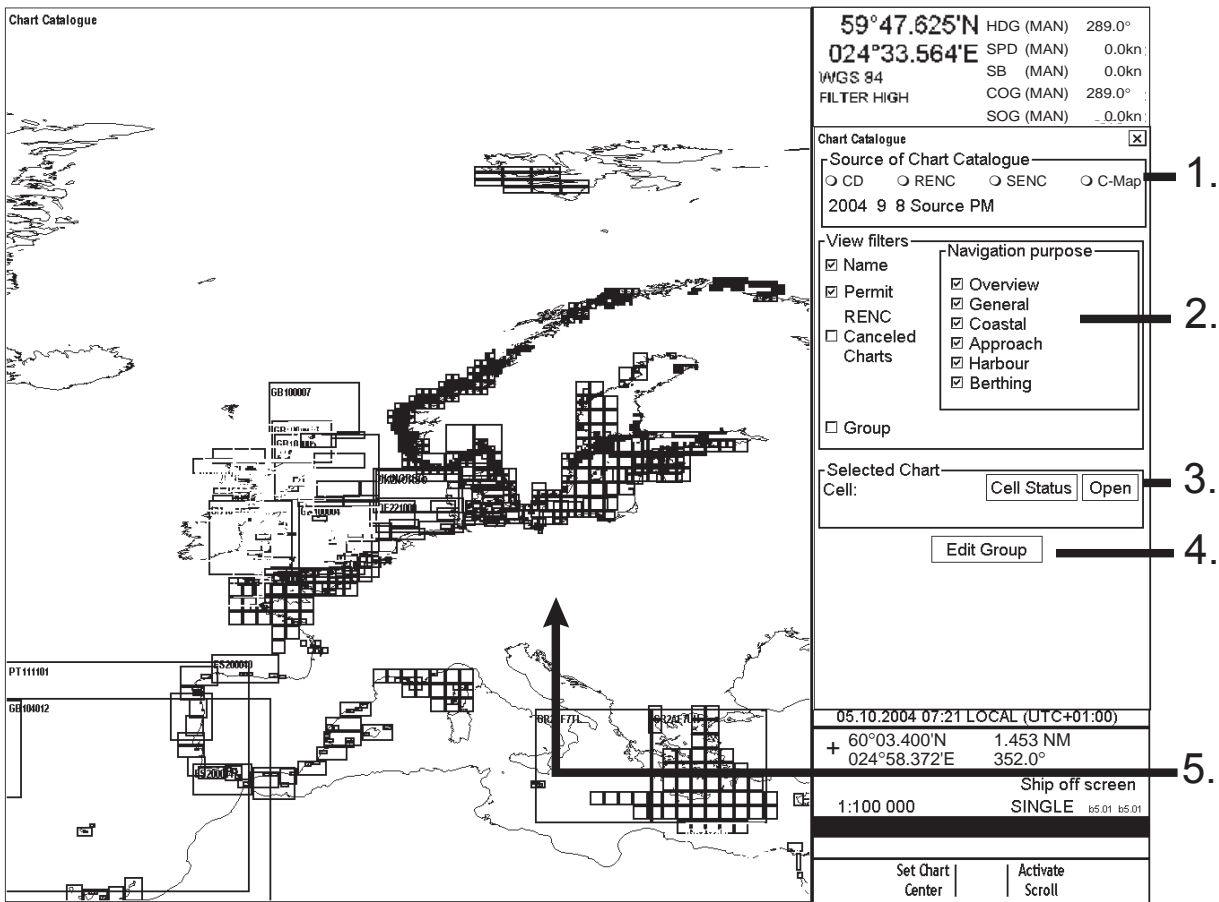
How to select a chart from a catalogue

To select a chart for viewing from a catalogue, do the following:

1. Select Chart Catalogue from the Chart menu.
2. From the Chart Catalogue dialog box, use the cursor to select desired chart.
3. Click the **Open** button.
4. To display the catalogue, spin the scrollwheel to display Menu/Info/Chart Menu in the mouse functions area then push the right mouse button.



5. Spin the scrollwheel to select Chart Catalogue then push the scrollwheel.



1. Source of Chart Catalogue

- CD: Display charts available in a named "CD-ROM".
- RENC: Display charts available from an RENC.
- SENC: Display charts stored in your hard disk in SENC format.
- C-Map: Display charts available from C-Map. (If C-Map charts are not installed, "C-Map" does not appear.)

2. View Filters

- Name: Display also cell names in graphical coverage display.
- Permit: Display only charts for which you have permit.
- RENC Cancelled Charts: Display charts that are cancelled in an RENC.
- Group: Display charts that are member of selected group.
- Navigation purpose: Display charts for selected navigation purpose (overview, general, coastal, approach, harbour, berthing).

3. Selected Chart

- Cell: Name of the chart
- Cell Status: Opens Cell Status window.
- Open: Opens selected chart to ECDIS display.

4. Group: For further details, see section 8.5.5 "How to group S57 chart cells".

5. The **chart limit boxes** are color-coded as follows:

- Green** The chart is available for use in SENC format. If the source of the chart is an RENC then the chart is also up-to-date. If the source of the chart is something other than an RENC, then all loaded updates are included into the SENC.
- Orange** The chart is available for use in SENC format but the chart is either not up-to-date or has been cancelled. Either the SENC is from a former edition, the SENC is missing the latest updates or the chart has been cancelled.
- Red** If the chart is permit free, you do not have it available for use in SENC format and thus you cannot use the chart currently.
The chart requires a permit but you do not have the permit for the chart therefore you cannot use the chart currently.
- Blue** The chart is available either in ENC format, in SENC format for another software version or in SENC format for another ECDIS. For example, the chart is blue during SENC conversion and when you loaded a chart into the ECDIS and the system could not convert the chart into SENC format.
- Magenta** You have a permit to use the chart, but the chart is not available in SENC format and thus you cannot use the chart currently.

How to browse your charts

You may view CM-93/3 charts using different positions and different scales. The basic tools for browsing charts are Range-, Range+, Active scroll, Set Chart Center, Ship Center(Ship Offcenter) and TM/CU Reset.

Activate Scroll allows you to look ahead from a place other than own ship's current position. Spin the scrollwheel to display Set Chart Center/Info/Activate Scroll in the mouse functions area. Move cursor to desired place on chart then push the right mouse button. Keep button pressed down while moving cursor over desired place. Release right button to get chart redrawn. You can repeat this until you have desired area on screen. When true motion reset is off, the indication "TM/CU Reset off" or "Ship out of dsp" appears in the information area.

Set Chart Center allows you to look ahead from a place other than own ship's current position. Select Set Chart Center from the Main menu to display the dialog box shown right. Use the scrollwheel to set the latitude and longitude position for chart center then click the **Set Center** button.

Note: The chart can also be centered (with less precise positioning) by placing the cursor at desired location, displaying Set Chart Center/Info/Activate Scroll in the dialog box and pushing the left mouse button.)

To restore own ship's position to the screen center, display TM/CU Reset/Info/ShipOffcenter in the mouse functions area then push the left mouse button.

Range - and **Range+** change the chart scale. If true motion reset is active, ZOOM IN and ZOOM OUT keep the relative position of your ship with respect to the display. If true motion reset is on, ZOOM IN and ZOOM OUT keep the relative position pointed by the cursor with respect to the display.

The system automatically selects next larger or smaller scale. If a chart with larger compilation scale is available at your current viewing position, the message "Larger Scale Data Exists" appears.

How to look for charts around your ship

You can use either true motion or relative motion. In the true motion mode, your ship moves until it reaches the true motion reset borderline, where it jumps back to an opposite position on the screen based on ship's course. In the relative motion mode, your ship stays in a fixed position, while the chart moves on screen.

If, in the true motion mode, you reset own position with TM/CU Reset, your ship will immediately jump to the true motion reset position.

If, in the true motion mode, you use ShipOffcenter, your ship will go to that position on screen and continue true motion movement from that position. When it reaches the true motion reset borderline, it will automatically jump to the true motion reset position.

If, in the relative motion mode, you reset own position with TM/CU Reset, your ship will immediately jump to the true motion reset position and use that position as fixed position to stay on screen.

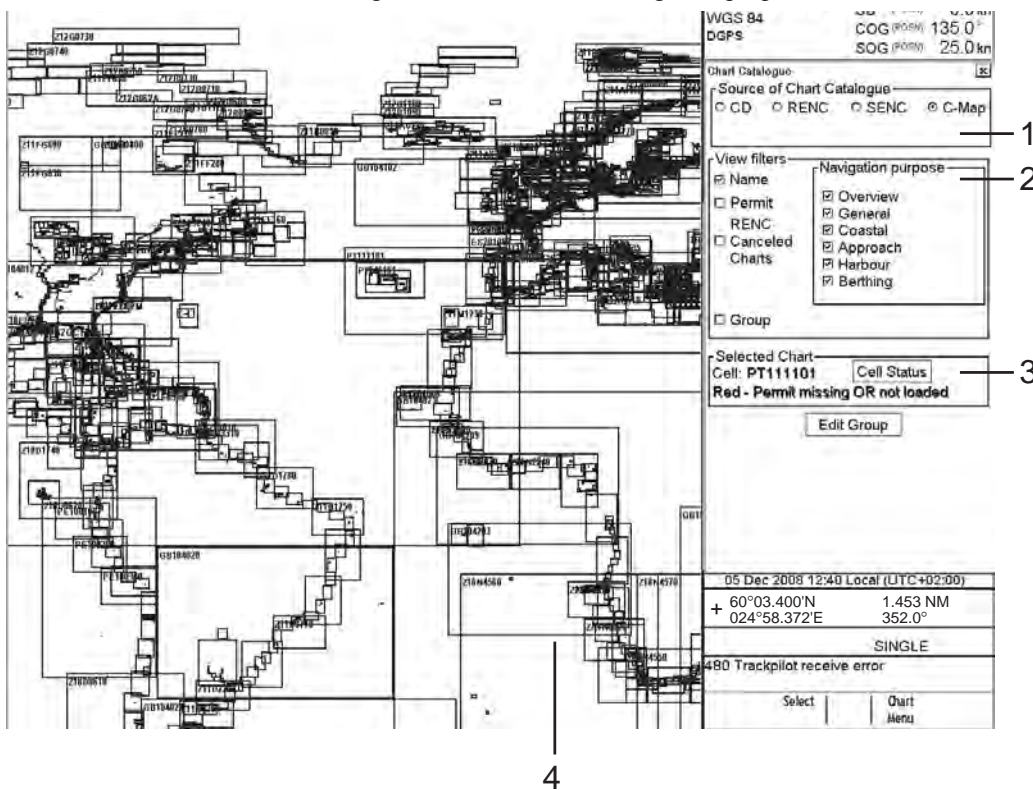
If you use relative motion, you can select a new fixed position for your ship by using ShipOffcenter.

Use Range - and Range+ to select desired chart scale.

A4.3.4 Chart catalogue of C-MAP charts

You can use the chart catalogue to graphically view content of loaded C-MAP database(s) into ECDIS.

1. Open the Chart menu and select Catalogue.
2. Select "Source of Chart Catalogue" as C-MAP. Use Navigation purpose selection to view desired charts.



3. Charts for which you possess a valid license are marked in green. Charts for which you have no license or the license has expired are shown as red borderlines.

1. Source of Chart Catalogue

- **CD:** Display charts available in a named "CD".
- **RENC:** Display charts available from an RENC.
- **SENC:** Display charts stored in your hard disk in SENC format.
- **C-MAP:** Display charts of CM93 ed. 3 chart database stored on ECDIS.

2. View Filters

- **Name:** Display also cell names in graphical coverage display.
- **Permit:** Display only charts for which you have permit.
- **RENC Cancelled Charts:** Display charts that are cancelled in an RENC.
- **Group:** Display charts that are member of selected group.
- **Navigation purpose:** Display charts for selected navigation purpose (overview, general, coastal, approach, harbour, berthing).

3. Selected Chart

- **Cell:** Name of the chart
- **Open:** Opens selected chart to ECDIS display.

4. The chart limit boxes are color-coded as follows:

Green You can view chart on ECDIS.

Red You cannot view chart on ECDIS, because license is missing or license has expired for the chart.

5. Cell Status:

Opens cell status window.

A4.4 How to Manage C-MAP Charts

A4.4.1 Licensing system used by the C-MAP

The licensing system used with CM-93/3 professional/+ charts is based on the serial number of eToken.

The eToken is connected to USB port on the ECDIS and it identifies ECDIS for CM-93/3 professional/+ charts. It must be connected to ECDIS always when using CM-93/3 professional/+ charts.

The following information is needed to apply for subscription of CM-93/3 professional+ charts:

- Company Name:
- User Name:
- Dongle ID (available on tag of eToken):
- Reason for License (sale, development, demo)
- Coverage required (World, Zone x, Area x, cell x)
- Duration of license (3 month or 1 year)
- Database version (available on CD-ROM label):

Based on this information, C-MAP is able to process a code that is delivered onboard as a text string or a file called "password usr".

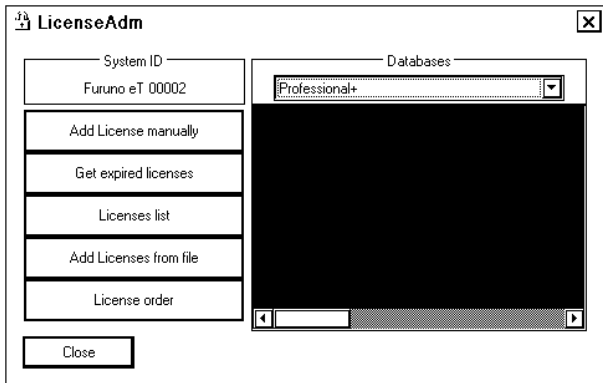
A4.4.2 Introduction

Below are the steps necessary for ordering CM-93/3 professional/+ charts.

1. Find eToken ID. See section A4.4.3 "System ID for C-MAP".
2. Define your subscription and deliver this information to your chart agent together with System ID information.
3. You will receive C-MAP database(s) on CD-ROM or DVD. Load Database(s) into ECDIS. See section A4.5.1 "Load of CM93/3 database to ECDIS".
4. You will receive License(s) for C-MAP database(s) either in file or character string. See A4.6 "License of CM93/3".

A4.4.3 System ID for C-MAP

Each ECDIS has individual eToken connected to USB. Find eToken ID in the following sequence:
Menu → Chart Menu → C-MAP Ed3 → Licenses



It is indicated as System ID.

A4.5 CM93/3 Database

There are three different CM93/3 Databases that can be loaded into ECDIS:

- CM93/3 Professional, available on CD-ROM
- CM93/3 Professional+, available on DVD
- CM-ENC, available on DVD

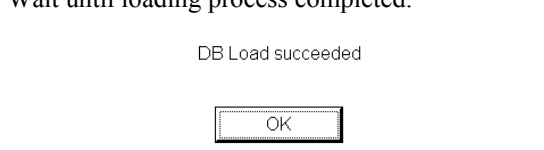
A4.5.1 How to load CM93/3 database to ECDIS

Charts are available on CM93/3 professional CD-ROM. To load them from CD to ECDIS, do as follows:

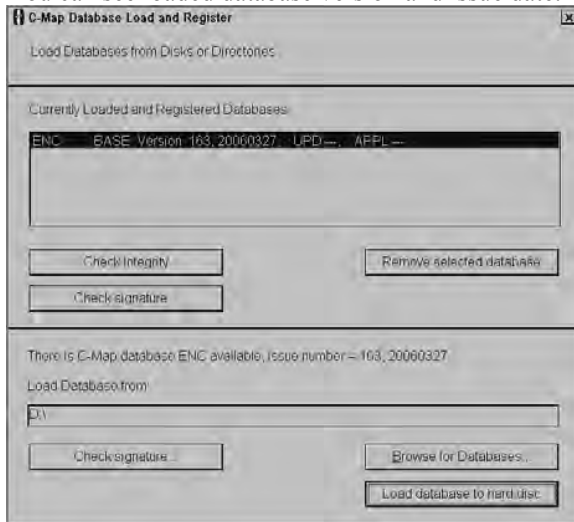
1. Menu -> Chart Menu -> C-Map Ed3 -> Load and register for use. The following dialog box appears; insert CD/DVD.



2. Click **Load database to hard disc** button.
3. Wait until loading process completed.



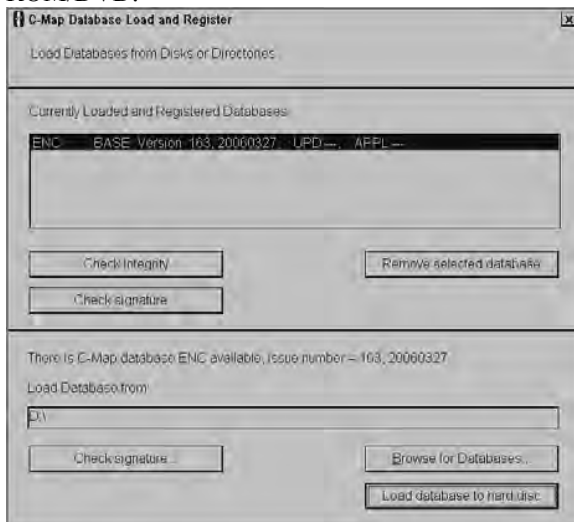
- You can see loaded database version and issue date.



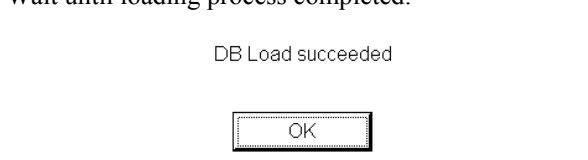
A4.5.2 How to use multiple databases

It is possible to use CM93/3 Professional, CM93/3 Professional+ and CM-ENC databases at the same time at the same workstation.

- Menu -> Chart Menu -> C-Map Ed3 -> Load and register for use. The following dialog box appears, insert CD-ROM/DVD.

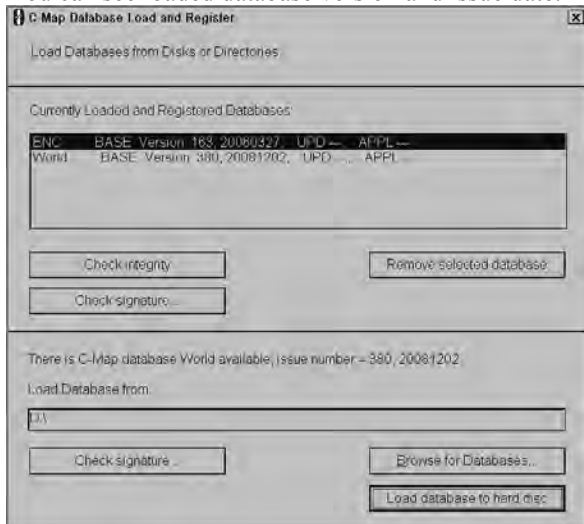


- Click **Load database to hard disk** button.
- Wait until loading process completed.



Appendix 4: C-MAP CM-93/3 Charts

You can see loaded database version and issue date.



Above is an example where CM-ENC and CM93/3 Professional + databases are loaded into ECDIS.

A4.6 License of CM93/3

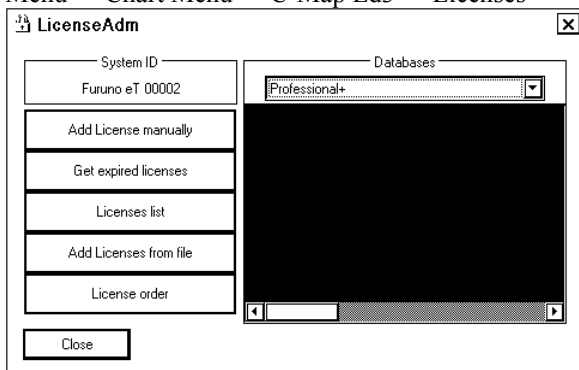
To view charts of C-Map database(s), you need to load license for database. For each database (CM93/3 Professional, CM93/3 Professional + and CM-ENC) C-Map generates own license.

A4.6.1 How to create license order to file

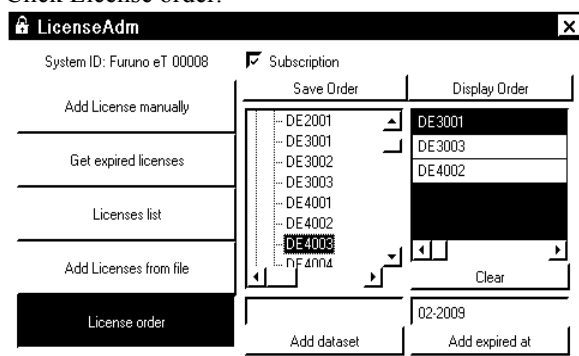
To get access to CM93/3 chart data base, you have to order a code that is sent to C-Map directly or through Chart agent. The code defines coverage of charts you can display on ECDIS.

To order code do as follows:

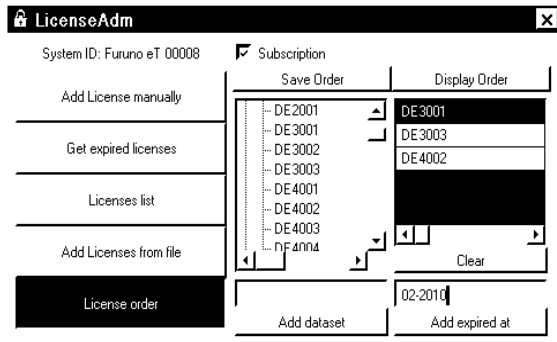
1. Menu -> Chart Menu -> C-Map Ed3 -> Licenses



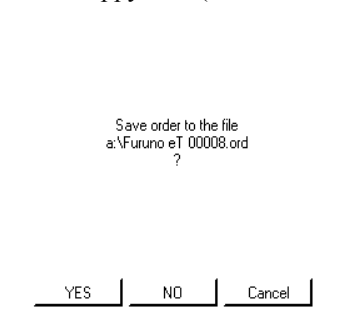
2. Click License order.



3. Select desired Hydrographic Office. First open sub folder by clicking + sign, then double click desired charts in left hand side list box. Selected charts are shown in list box right hand side.
4. Enter desired expiry date in "Add expired at". Note that you have to overwrite existing date by entering the whole date.



5. Insert floppy disk (or other removable media) to store order.



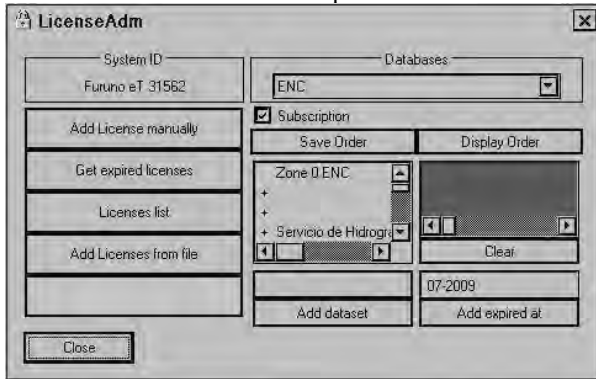
6. Send the order file to Chart Agent of yours or directly to C-Map.

A4.6.2 How to add license from file

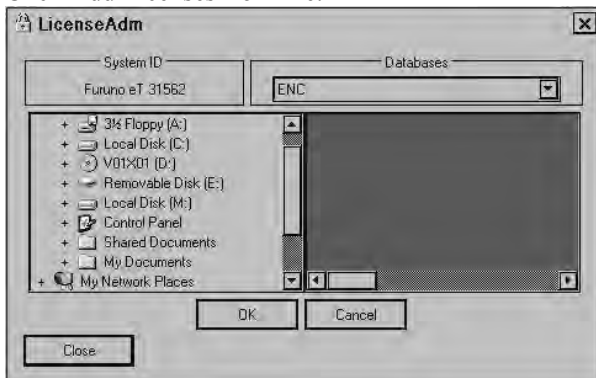
To get access to CM93/3 chart data base, you have to enter a code that is received from C-Map directly or through Chart agent. The code defines coverage of charts you can display on ECDIS.

To enter code do as follows:

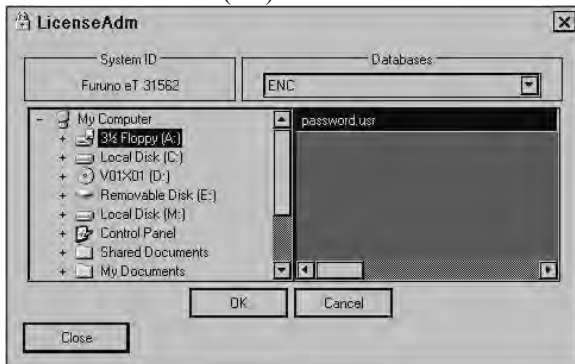
1. Menu -> Chart Menu -> C-Map Ed3 -> Licenses



2. Click Add Licenses from file.



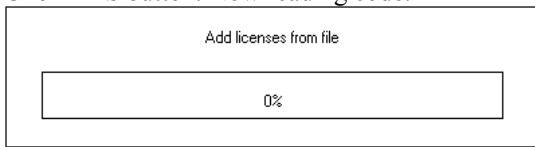
3. Select desired drive (A:\).



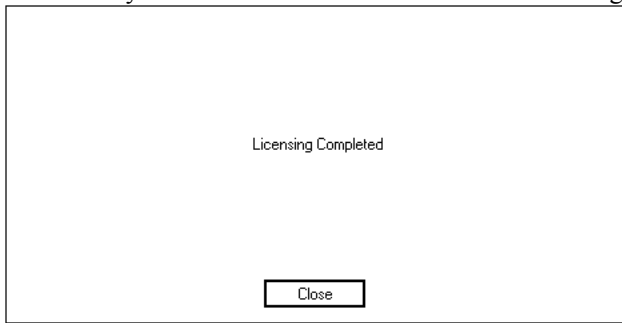
4. Click OK button. You have to confirm load of new code



- Click **YES** button. Now reading code.



- Successfully loaded code will be indicated with following dialog box.

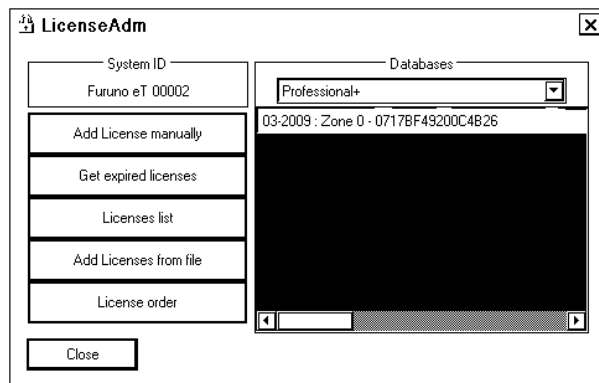


- Click **Close** button.



If the above dialog box appears it indicates that there is mismatch between chart database and password.usr. Check that you have password.usr that is delivered to you to be used together with CM-93/3 professional CD-ROM.

You can see in License Adm dialog box listed your licenses.



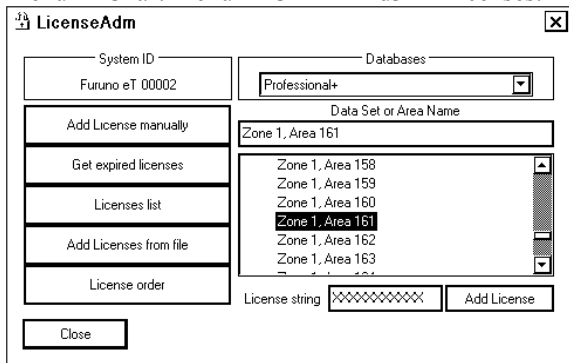
License for Zone 0 has been loaded in this system.

- Click **Close** button to close dialog box.

A4.6.3 How to add license manually

If you receive license as a "License string", you can enter this string manually into ECDIS. To enter code, do as follows:

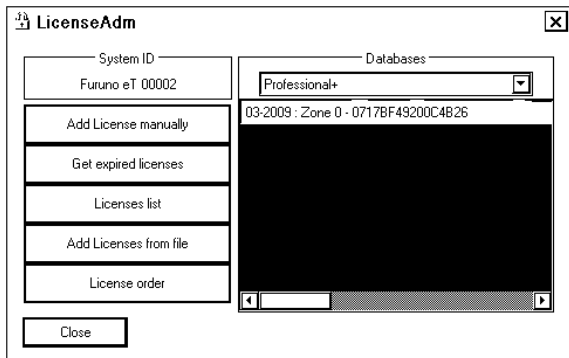
1. Menu -> Chart Menu -> C-MAP Ed3 -> Licenses.



2. Add string received from C-MAP to the "License string" field then click the **Add License** button.



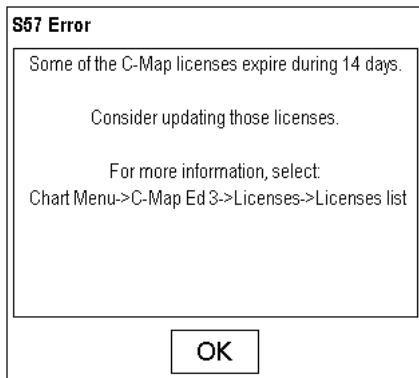
3. Click the **Licenses list** button to see entered licenses.



4. Close the "LicenseAdm" dialog box by clicking the X sign in upper right corner.

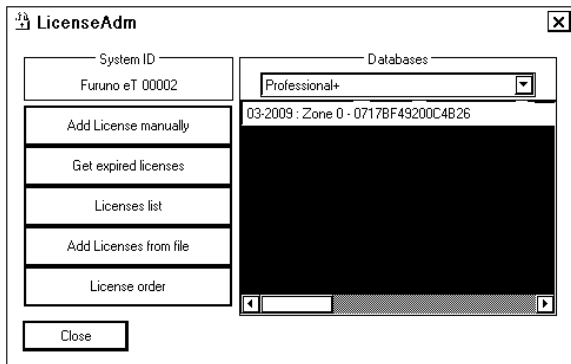
A4.6.4 How to renew a license

As an early warning, a following dialog box appears to remind you expiration of C-Map license.



This indication is shown 14 days before expiration.

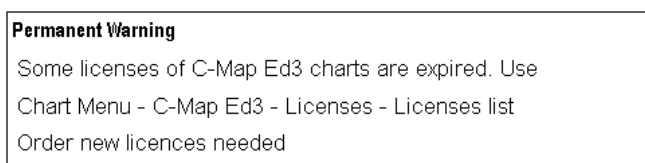
Expiry date of license can be seen in License Adm. Dialog box.



In this case expiry of license takes place end of February.

When warning of license(s) expiration appears, contact your chart agent to renew your C-MAP license(s).

After expiration, charts of expired license(s) are displayed for two months of period. The following Permanent Warning dialog box is displayed.



After this period of time charts won't be displayed.

A4.7 How to Keep Charts up to Date

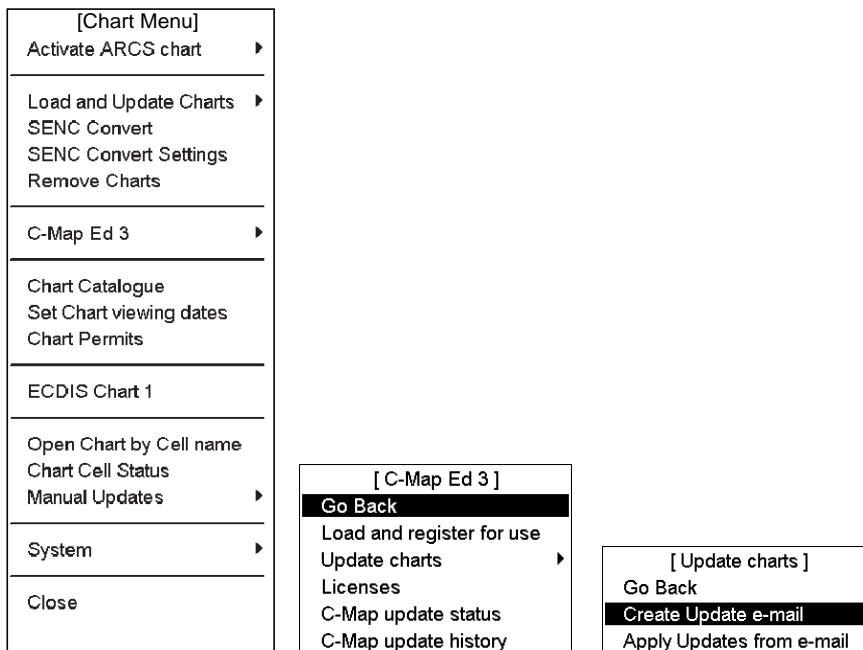
During subscription time of period, you will receive CM-93/3 Professional CD-ROM onboard three times. To keep up-to-date between CD issuing period, you can use Real Time Updating service.

ECDIS users do not have possibility to connect to the internet directly from the ECDIS. They are able to create an update order file from the ECDIS and send this by email directly to updates@c-map.no. This automatic email server will process the update request, prepare the updates and automatically return them. The end user can then copy these updates floppy disk, USB memory stick or CD-ROM and apply them to the ECDIS.

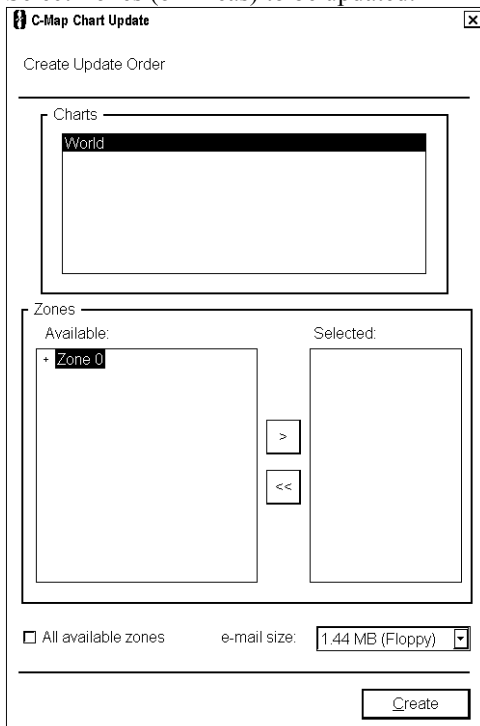
A4.7.1 How to create update order file

You can create an update order file as follows:

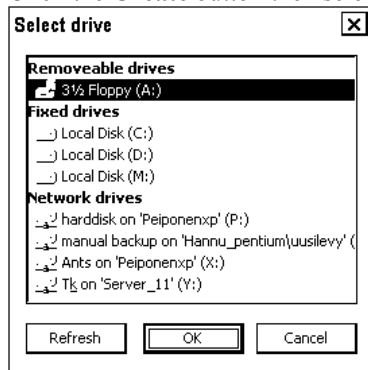
1. Open the Chart menu and select C-MAP Ed 3 from the menu. Select Update Charts in C-MAP Ed 3 menu.



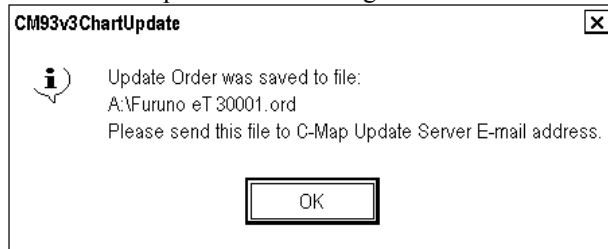
2. Select Zones (or Areas) to be updated.



- Click the **Create** button then select the drive where to save the Chart Update Order file.



- When Chart Update Order file is generated and saved to destination, the following dialog box appears:

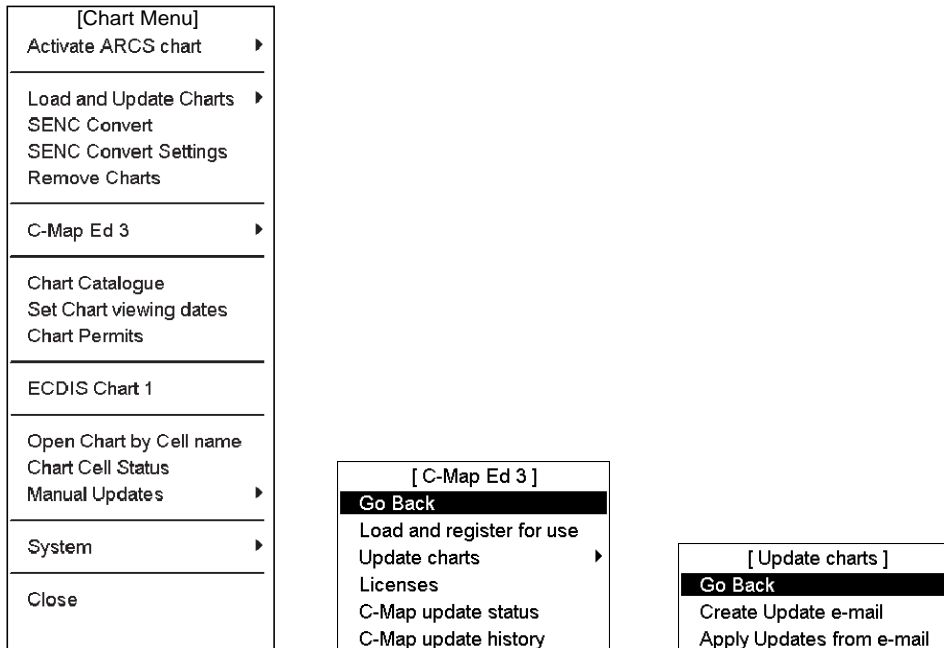


- Click the **OK** button. Update order file to address updates@C-MAP.no
- You will receive updates for your request automatically.

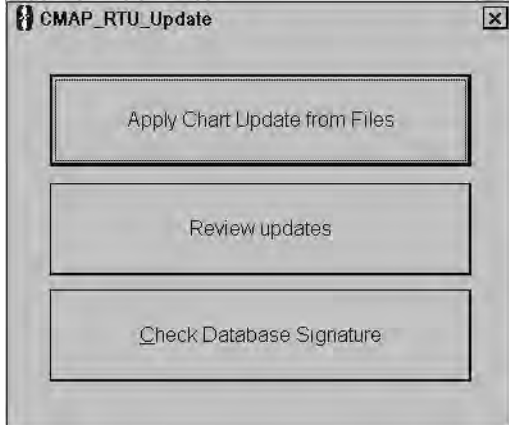
A4.7.2 How to load chart updates from the file

When you have received an update file via e-mail, then you can load it to ECDIS.

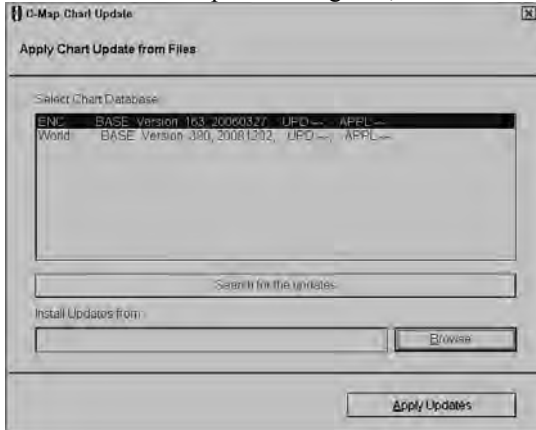
1. Open the Chart menu and select C-MAP Ed 3 in the menu. Select Update Charts in C-MAP Ed 3 menu and Apply Updates from e-mail in Update charts menu.



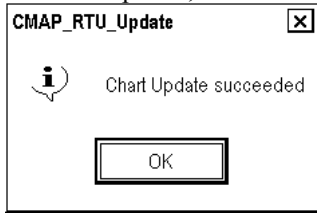
2. In C-MAP RTU Update dialog box, click the **Apply Chart Update from Files** button.



3. In C-MAP Chart Update dialog box, select drive where updates are saved and click the **Apply Updates** button.



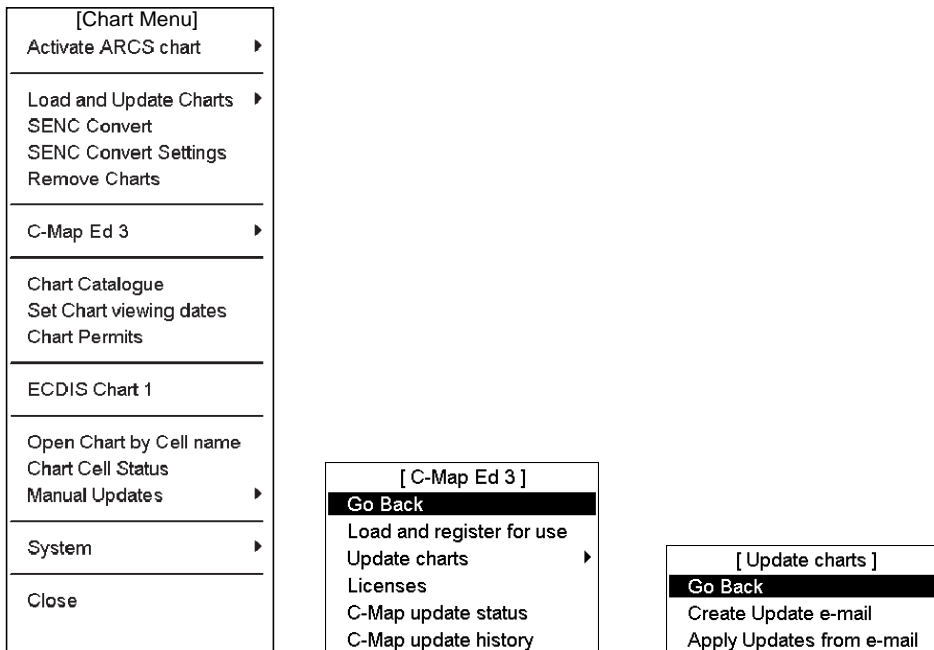
- When completed, the following dialog box appears. Click the **OK** button.



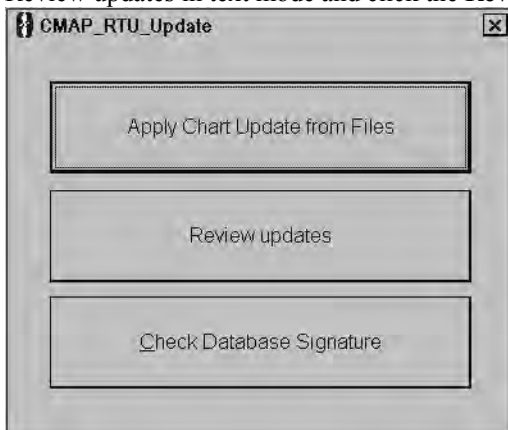
A4.7.3 How to review chart updates

You can see a list of changes for every updated chart as follows:

- Open the Chart menu and select C-MAP Ed 3 in the menu. Select Update Charts in C-MAP Ed 3 menu and Apply Updates from e-mail in Update charts menu.

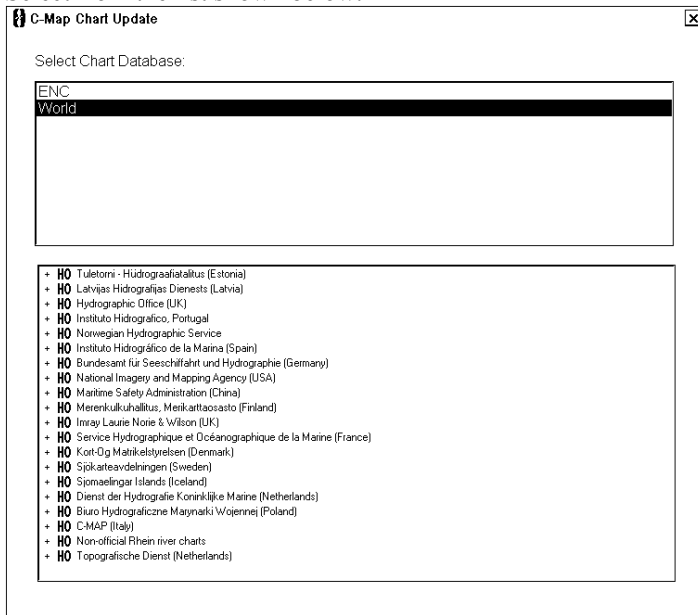


- Review updates in text mode and click the **Review updates** button.

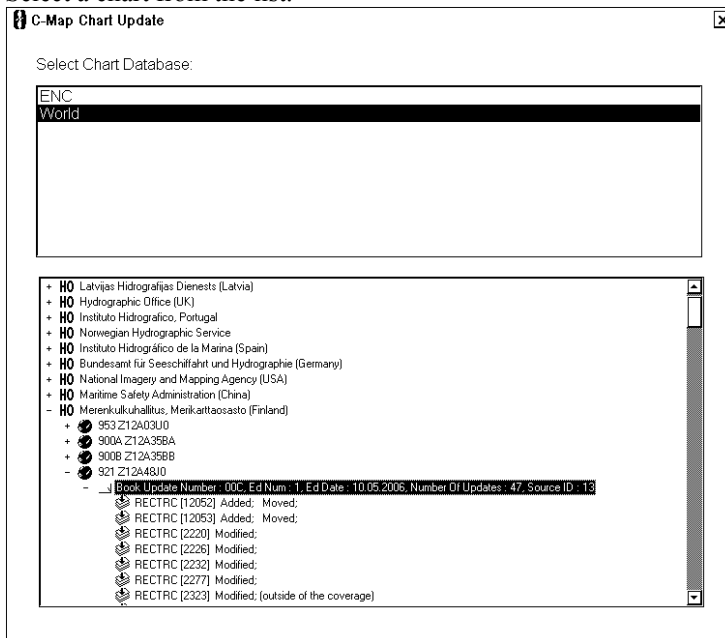


Appendix 4: C-MAP CM-93/3 Charts

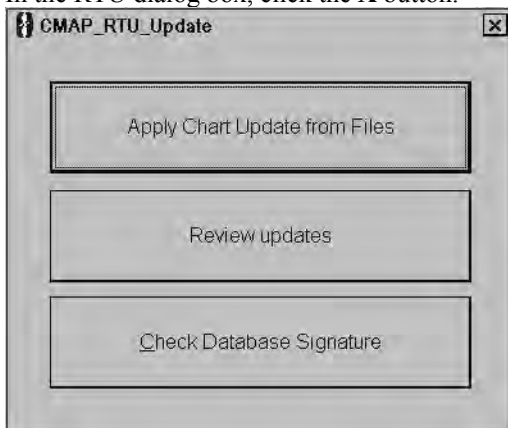
3. Select from the list shown below.



4. Select a chart from the list.

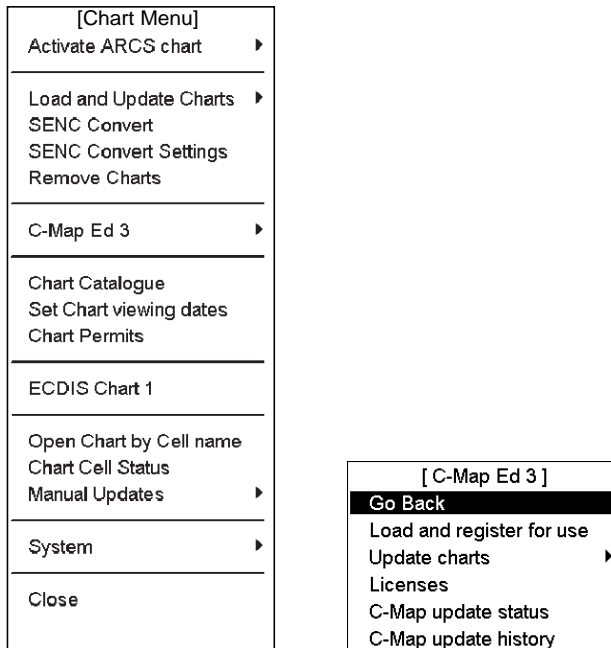


5. Click the X button.
6. In the RTU dialog box, click the X button.

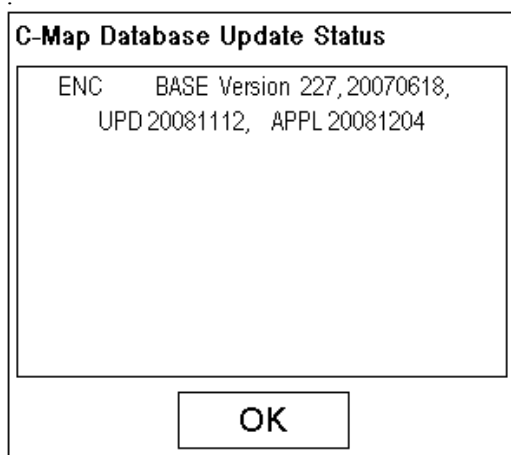


A4.7.4 How to view update status of CM93/3 charts

1. Open the Chart menu and select C-Map Ed 3 from the menu. Select C-Map Update Status in C-Map Ed. 3 menu.



2. C-Map Database Update Status dialog appears.



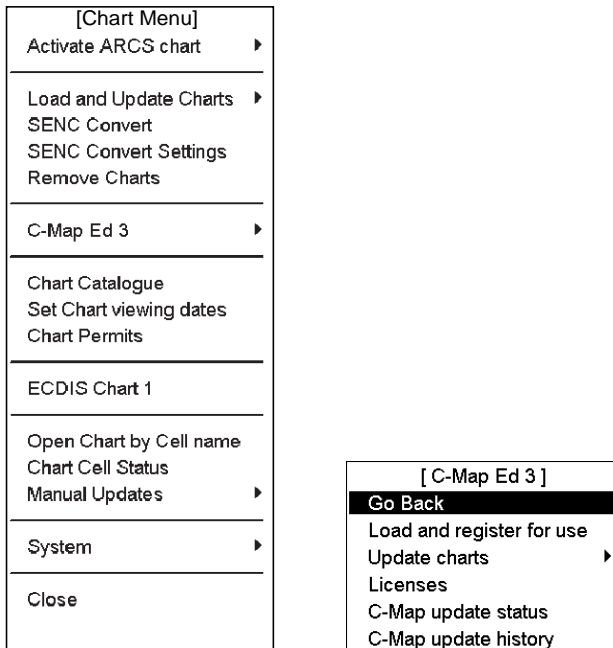
The Following information is available:

- Database version number (ENC version 227)
- Date of Update file processed (UPD 20081112) for database above using RTU
- Date of Update file loaded to ECDIS (APPL 20081204)

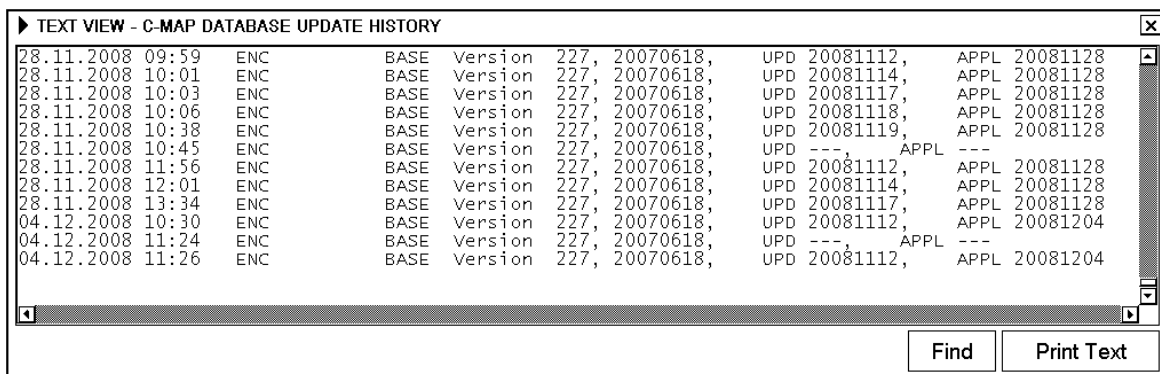
3. Click OK to close dialog.

A4.7.5 How to view update history of CM93/3 charts

1. Open the Chart menu and select C-Map Ed 3 from the menu. Select C-Map Update Status in C-Map Ed. 3 menu.



2. C-Map Database Update history viewer appears.



The following information is available:

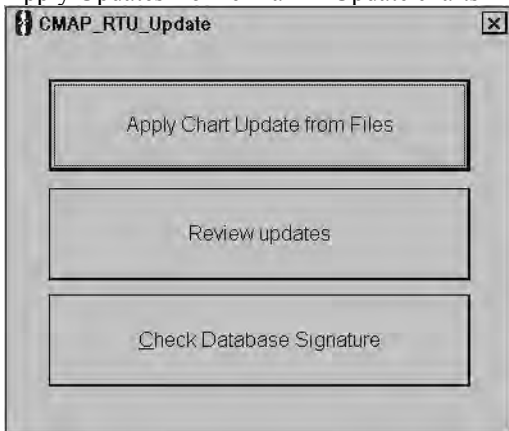
- Loading date of Database with version number (ENC BASE version 227, date)
- Date of Update file processed (UPD) for database above using RTU
- Date of Update file loaded to ECDIS (APPL)

3. Click OK to close dialog.

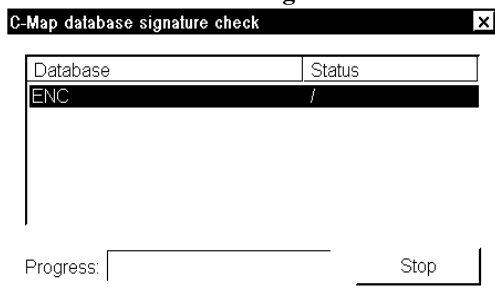
A4.7.6 How to check database signature

To check database signature, do as follows:

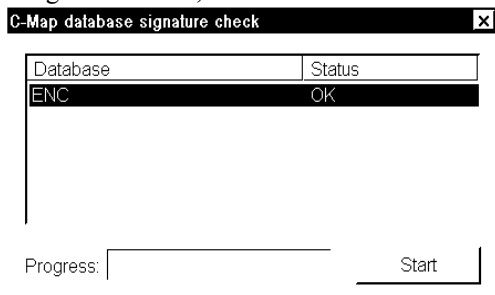
1. Open the Chart menu and select C-MAP Ed 3 in the menu. Select Update Charts in C-MAP Ed 3 menu and Apply Updates from e-mail in Update charts menu.



2. Click **Check Database Signature** button.



3. If signature is OK, check will end to status "OK"

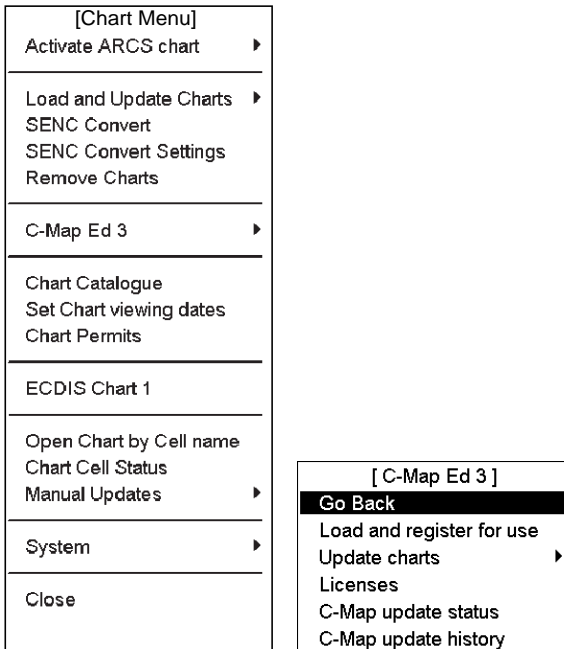


If not, contact your chart agent to get database on another DVD or CD.

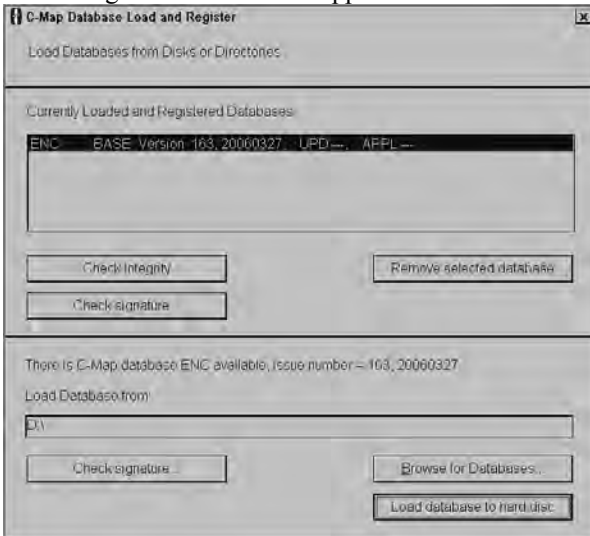
A4.8 How to Remove CM93/3 Charts

You can remove CM93/3 charts from ECDIS using Unregister. This will remove license and entire database from ECDIS.

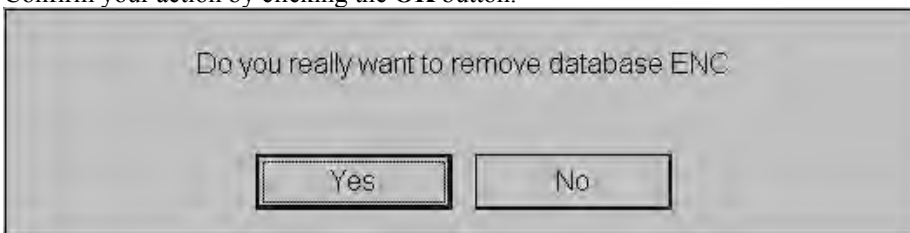
1. Open the Chart menu and select C-MAP Ed 3 from the menu. Select Load and register for use from the C-MAP Ed 3 menu.



2. The dialog box shown below appears. Select desired database.



3. Confirm your action by clicking the **OK** button.



4. Close CM-93/3 Database Administrator dialog box by clicking X in upper right corner.

Appendix 5: C-MAP CM-93/2 Charts

A5.1 C-MAP Charts

A5.1.1 Introduction

This electronic chart system is also compatible with C-MAP vector chart format CM-93 charts, available from C-MAP Norway A/S. This material is used like Hydrographic Offices S57ed3 charts, but it doesn't have ENC status as defined by IMO, IHO and IEC and thus it cannot be used to replace paper charts.

CM-93 format is encrypted to prevent unauthorised use, therefore the operator needs an authorisation code to view any CM-93 chart. This authorisation code is entered manually.

Before any CM-93 chart can be used in the ECDIS, it is loaded into your hard disk and converted into the system's own internal format (SENC). CM-93 charts can be updated only by loading a newer complete set of CM-93 charts. CM-93 chart material is stored into two CD-ROMs.

For further details on CM-93 charts, see the chapter on vector chart material.

Note: SENC conversion must be done in the single workstation mode. For how to switch from multi-mode to single mode, see the procedure in section 18.2 "How to Control Common Reference System". Further, turn the radar overlay off. See section 23.2 "How to Activate Radar Overlay on the ECDIS" for the procedure.

A5.1.2 S57 chart legend with C-MAP charts

S57 chart legend	
Cell name	04140023
Navigational purpose	Approach
Issue date	19990115
Edition number	1
Last displayed update	000
Update issue date	19990115
Last update appl. date	
Projection	Mercator
Horizontal datum	WGS 84
Vertical datum	
Sounding datum	
Quality of data	
Magnetic var.	
Depth	metres
Height	metres

An example of chart legend with C-MAP chart

A5.2 How to Manage C-MAP charts

A5.2.1 Licensing system used by the C-MAP

The licensing system used with C-MAP is based on serial numbered CD-ROMs and authorisation codes received from C-MAP Norway A/S. You select either required C-MAP areas or zones and your electronic chart system generates a operator code based on your selection, the serial number of the serial numbered C-MAP CD-ROM and the hardware identifier of your electronic chart system. You send the operator code to C-MAP Norway A/S and they send to you an authorisation code. You enter the received authorisation code into the system then you can load and convert the CM-93 charts into your system.

A5.2.2 How to get started with C-MAP charts

1. Select automatic conversion into the SENC and setting of Display and Approve update dates automatically. See section A5.2.8 "Automatic display until setting".
2. Define your subscription of C-MAP charts. See section A5.2.4 "Defining subscription of C-MAP charts".
3. Load C-MAP charts by CD-ROM catalogue. See section A5.2.5 "Loading C-MAP charts from a CD-ROM into the system".

A5.2.3 How to keep C-MAP charts up to date

At regular intervals C-MAP will reissue its charts to keep them up-to-date. There are neither edition number nor update number in C-MAP charts, so the system recognises changed charts using issue date of the chart.

The procedure for loading the reissue is the same as loading of the C-MAP charts for the first time. If loaded chart is already in the hard disk with older issue date, the system loads selected newer chart automatically. Other possible messages when loading C-MAP charts are explained in the section A5.2.5 "Loading C-MAP charts from a CD-ROM into the system".

If you get a new release of a C-MAP CD-ROM, do the following:

1. On the Chart menu, turn off automatic SENC conversion and turn on Automatic Display Until.
2. Load C-MAP charts by CD-ROM catalogue. See section A5.2.5 "Loading C-MAP charts from a CD-ROM into the system".

A5.2.4 How to define subscription of C-MAP charts

Before you can be an authorized operator of C-MAP charts you must do the following:

1. Purchase CD-ROM(s) of C-MAP from your chart agent.
2. Load serial number of C-MAP into the ECDIS.
3. Select charts that you want to use in the ECDIS, by zones or areas.
4. Generate operator code. This code is used to identify your chart folio for the producer of C-MAP.
5. Send operator code to your chart agent.

Based on operator code information, the producer of C-MAP charts is able to generate permission for the charts you have selected. You will receive an authorization code from the producer of C-MAP charts.

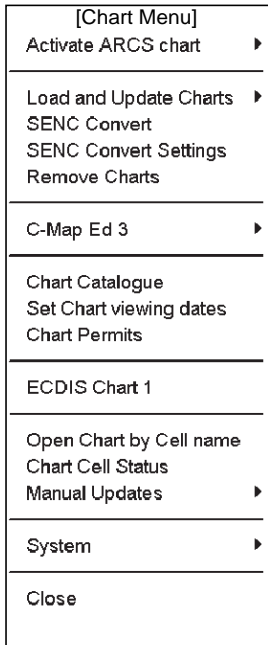
After receiving an authorization code, do the following:

1. Enter authorization code into the ECDIS.
2. Use the function "Load by CD-ROM catalogue" to select which chart to load.
3. Build a group of required C-MAP charts.
4. Load C-MAP charts using the function "View loaded CD-ROM catalogue".

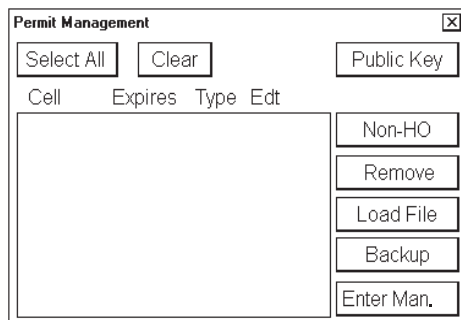
How to load serial number of CD-ROM

Each CD-ROM has an individual serial number that is used to identify the operator of C-MAP charts. In order to load the serial number into the ECDIS, do the following:

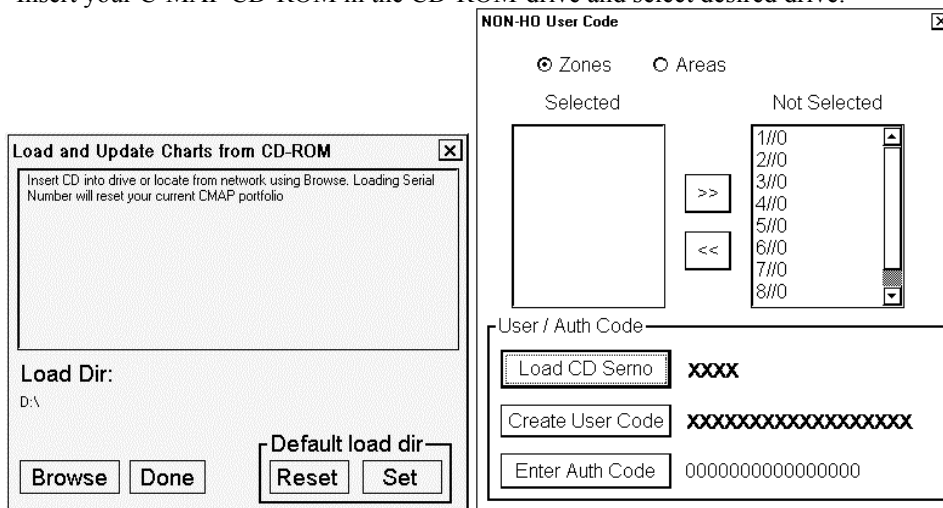
1. Spin the scrollwheel to show Menu/Info/Chart Menu in the mouse functions area then push the right mouse button.
2. Select **Chart Permits** from the menu then push the scrollwheel.



3. Click the **Non-HO** button to show the following window..



4. In the NON-HO User/Auth Code window, click the **Load CD Ser no.** button.
5. Insert your C-MAP CD-ROM in the CD-ROM-drive and select desired drive.



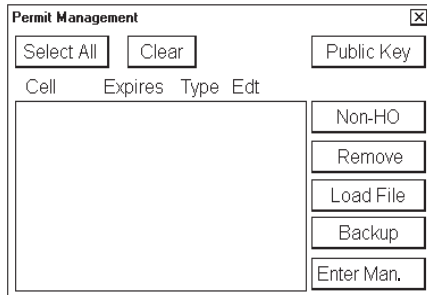
6. The CD-ROM serial number is shown in the SerNo field.

How to define subscription by zones

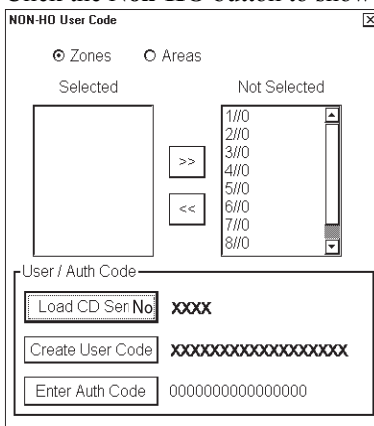
The contents of the CD-ROM are divided into nine zones (1/0 - 9/0) and each zone has been divided in various numbers of areas (1/1 - 1/16...9/1 - 9/2). A various number of charts are included into each area. You can specify the charts you want to have in your chart folio either by zones or by areas.

To define subscription by zones, do the following:

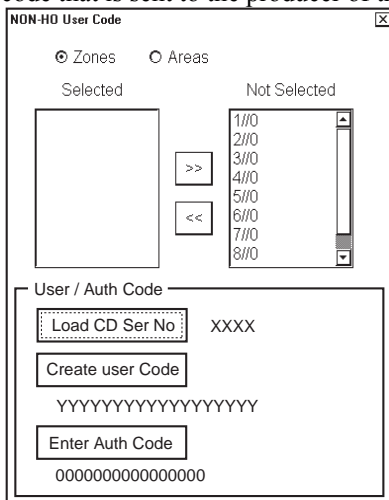
1. Spin the scrollwheel to show Menu/Info/Chart Menu in the mouse functions area then push the right mouse button.
2. Select Chart Permits from the menu then push the scrollwheel.



3. Click the **Non-HO** button to show the following window.



4. Click the **Zones** radio button.
5. Highlight desired zones in the Not Selected box then click << button to move them into the Selected list box.
6. To create operator code for selected zones, click the **Create User Code** button. The ECDIS generates a operator code that is sent to the producer of the C-MAP charts.



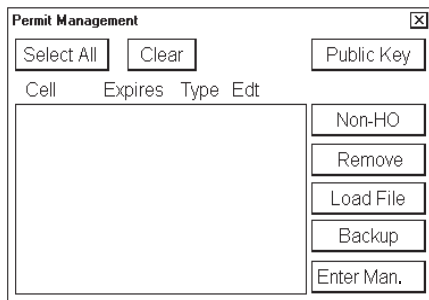
7. The operator code is shown in the Create User Code field.

How to define subscription by areas

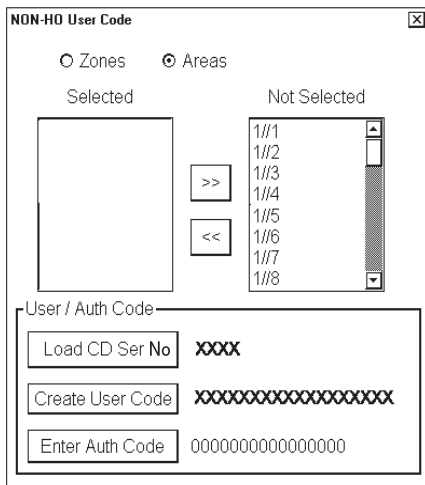
The contents of a CD-ROM are divided into nine zones (1/0 - 9/0) and each zones has divided various number of areas (1/1 - 1/16 ... 9/1 - 9/2). The various number of charts are included by Area. You can define a chart you would like to have in your chart folio either by zones or by areas.

To define subscription by areas, do the following:

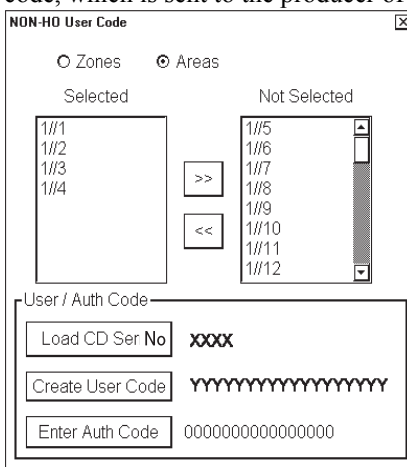
1. Spin the scrollwheel to show Menu/Info/Chart Menu in the mouse functions area then push the right mouse button.
2. Select Chart Permits from the menu then push the scrollwheel.



3. Click the **Non-HO** button to show the following window.



4. Click the **Areas** radio button.
5. Highlight desired zones in the Not Selected box then click << button to move them into the Selected list box.
6. To create operator code for selected zones, click the **Create User Code** button. The ECDIS generates a operator code, which is sent to the producer of the C-MAP charts.

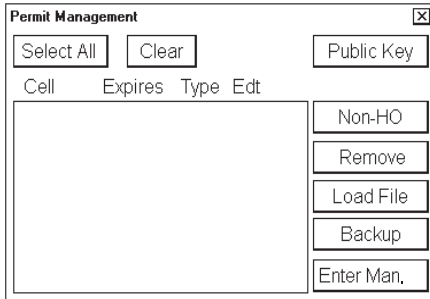


7. The operator code is shown in the Create User Code field.

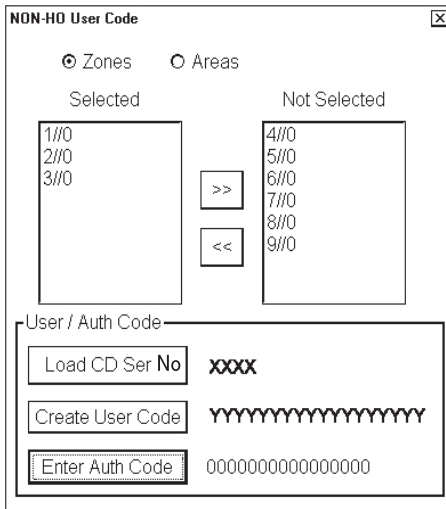
How to enter authorisation code

An authorisation code allows you to define your subscription to C-MAP. Based on your operator code you receive an authorisation code from C-MAP. You have to enter this string into the ECDIS, following the procedure below.

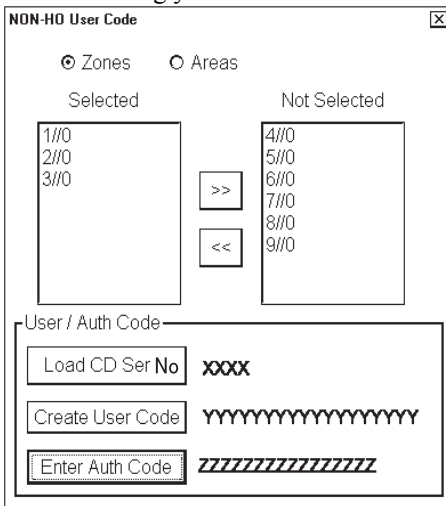
1. Spin the scrollwheel to show Menu/Info/Chart Menu in the mouse functions area then push the right mouse button.
2. Select Chart Permits from the menu then push the scrollwheel.



3. Click the **Non-HO** button to show the following window.



4. Click the **Enter Auth Code** button.
5. Enter the string you received from C-MAP.



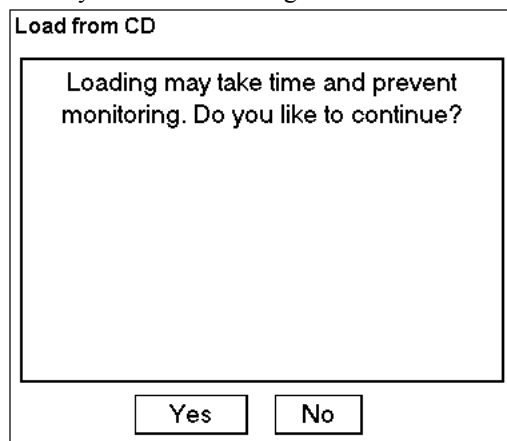
6. After entering authorisation code, you are ready to load and view desired charts into the ECDIS.

A5.2.5 How to load C-MAP charts from a CD-ROM into the system

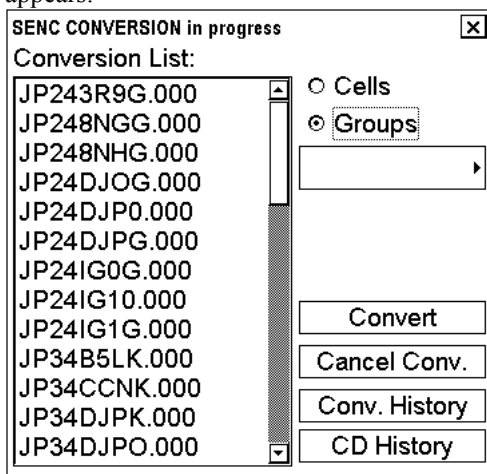
When you load C-MAP charts by CD-ROM catalogue, the system first loads a CD-ROM catalogue, which stores certain information into your hard disk such as cells ID, their position and edition number, from your LAN (Local Area Network) connection, floppy disk, USB memory or CD-ROM. After that the system asks which charts you want to load from the CD-ROM.

To load by CD-ROM catalogue do the following:

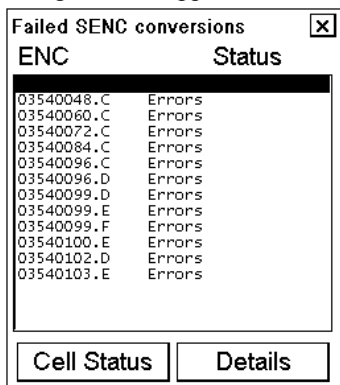
- Insert CD-ROM to drive. Spin the scrollwheel to show Menu/Info/Chart Menu in the mouse functions area then push the right mouse button.
- Select Load and Update Charts from the Chart menu and "from CD-ROM" from the sub menu.
- The ECDIS loads content summary, publisher notes and Product List from the CD-ROM then opens the Load or Update Charts loaded from CD-ROM dialog box.
- Uncheck "Missing only" then click the **Load** button. The system automatically copies all text and pictures files associated with charts from the CD-ROM catalogue.
- Before ECDIS starts loading charts (then automatically converts them into SENC format) you are asked if you are ready to start the loading.



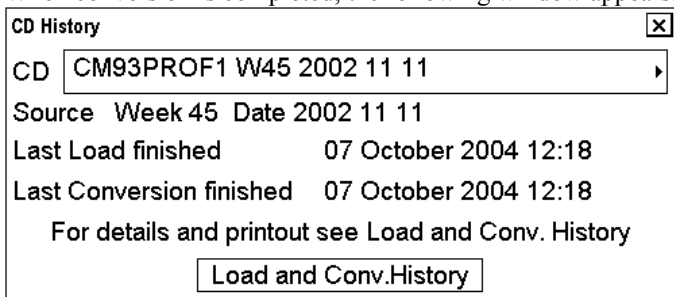
- Charts are loaded into ECDIS then automatically converted to SENC format and the SENC Convert window appears.



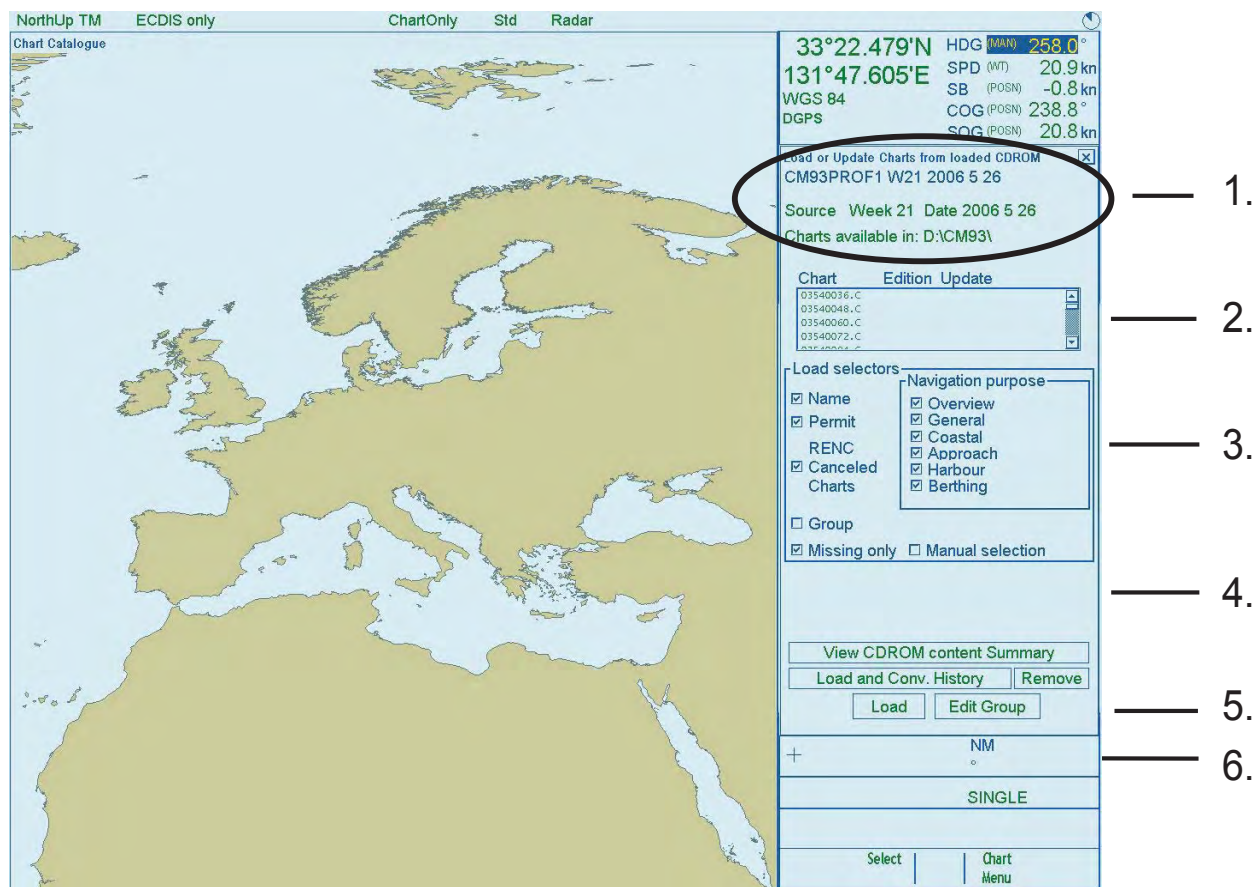
If an error is detected during conversion from ENC to SENC, the following window appears. To find the reason click the **Details** button.



When conversion is completed, the following window appears.



How to interpret load or update charts from loaded CD-ROM window



1. The source and edition date of the CD is displayed here.
2. A list of charts stored in the CD-ROM, edition number of the chart and the number of updates included in the chart.

3. In the **Load Selector** field, you can select how to pick desired charts from the list:
 - **Name:** ECDIS will display chart names on graphical presentation if selected.
 - **Permit:** ECDIS will highlight the charts which are available in the CD-ROM and for which you have permits.
 - **RENC Canceled Charts:** ECDIS will display charts on display, which are canceled on RENC and normally on CD-ROM.
 - **Group:** If you have predefined a group of charts, ECDIS will highlight those charts in the group, which are available in the CD-ROM.
 - **Manual Selection:** You can highlight desired charts from the list.
 - **Missing only:** Loads and displays on graphical presentation only charts and their updates, which are not already loaded into the ECDIS.
4. **View CD-ROM Publisher Notes** button is used to view important notices published by chart producer, **View CD-ROM content Summary** button is used to list charts available on CD-ROM and **Load History and Conv. History** button check what is loaded and converted from the CD-ROM. The **Remove** button is used to remove the CD-ROM catalogue permanently from the ECDIS.
5. The **Edit Group** button is used to create and modify group. For more information, see A5.2.7 "Grouping S57 chart cells".
6. The **Load** button is used to start loading.

Note: The system can make conversion into the SENC and set the "Display Until" date automatically. This is the recommended way. For how to do this, see section 8.4.2 "How to get automatic SENC conversion and display until date".

How to display CD-ROM contents summary

You can view the Summary of the contents of the CD-ROM. It contains information about charts you are going to load.

1. Spin the scrollwheel to show Menu/Info/Chart Menu in the mouse functions area then push the right mouse button.
2. Select Load and Update Charts from the menu and "from CD-ROM" from the sub menu. Click the **Load** button.
3. Click the **View CD-ROM content Summary** button.

A viewer shows information about the selected "CD-ROM".

CellID	Edition	Base	First Update	Last Update	Source	PM	Week	Date
DK1MAGVA	3	0 / 2003	5 12					
DK2BORNH	9	0 / 2003	10 27					
DK2CHWGC	2	0 / 2001	8 3					
DK2CHWGG	3	0 / 2002	5 23					
DK2CHWGK	5	0 / 2002	12 20					
DK2CHWGO	3	0 / 2001	8 3					
DK2CHWGS	9	0 / 2003	6 23					
DK2CHGW	10	0 / 2003	2 24					

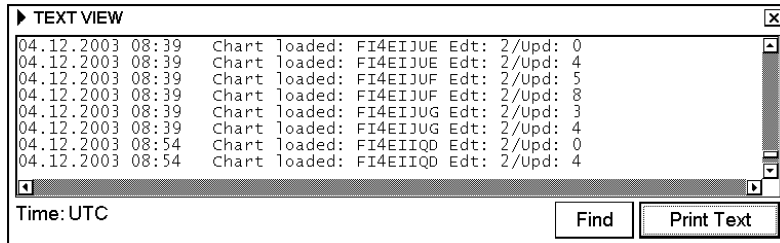
Each row contains:

- Cell ID: Name of the chart
 - Edition: Edition number of the chart
 - Base: Included update number and issue date of Base cell of the chart
 - First Update: Update number and issue date of the first update included
 - Last Update: Update number and issue date of the last update included
4. If you want to make a hard copy of the Publisher Notes, click the **Print Text** button.
 5. To close this window, click the X in the upper right corner.

How to display load history of CD-ROM

You can view what is loaded from a CD-ROM using the Load History in Load or Update Charts from CD-ROM.

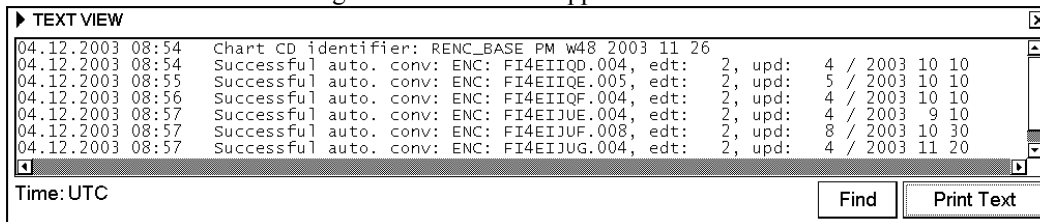
1. Spin the scrollwheel to show Menu/Info/Chart Menu in the mouse functions area then push the right mouse button.
2. Select Load and Update Charts from the menu and "from CD-ROM" from the sub menu. Select desired CD-ROM from the list of CD-ROMs.
3. Click the **Load and Conv. History** button.
4. A window that looks something like the one below appears.



5. You can verify which charts are already loaded from the CD-ROM.

How to display conversion history of CD-ROM

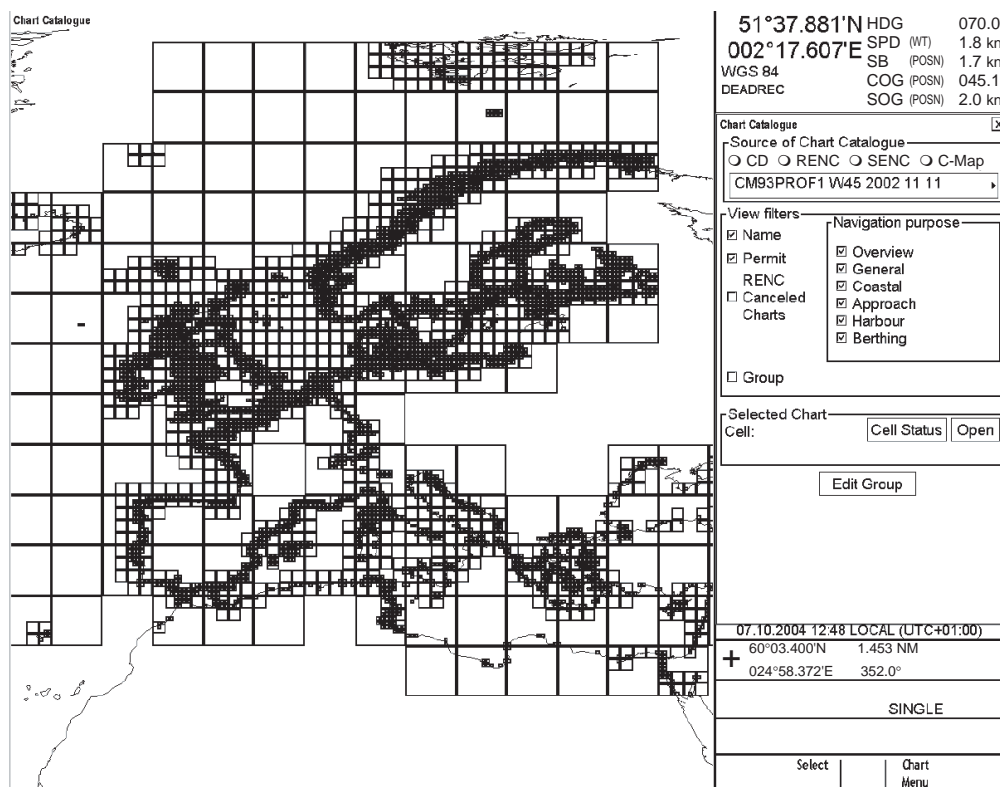
1. Spin the scrollwheel to show Menu/Info/Chart Menu in the mouse functions area then push the right mouse button. Open the Load or Update Charts from CD-ROM dialog box.
2. Select Load and Update Charts from the menu and "from CD-ROM" from the sub menu. Select desired CD-ROM from the list of CD-ROM.
3. Click the **Load and Conv. History** button.
4. A window that looks something like the one below appears.



5. You can verify which charts are already converted from the CD-ROM.

A5.2.6 Catalogue of S57 cells with C-MAP charts

A S57 catalogue is used to view your cells stored into your hard disk or named "CD-ROM catalogues". You view limits of cells in the S57 catalogue window. It is possible to pick any cell to see information for it (cell, update's number) by going over its limit with the cursor.



1. Source of Chart Catalogue

- **CD-ROM:** Display charts available in a named "CD-ROM".
- **RENC:** Display charts available from an RENC.
- **SENC:** Display charts stored in your hard disk in SENC format.

2. View Filters

- **Name:** Display also cell names in graphical coverage display.
- **Permit:** Display only charts for which you have permit.
- **RENC Cancelled Charts:** Display charts, which are cancelled in an RENC.
- **Group:** Display charts, which are member of selected group.
- **Navigation purpose:** Display charts for selected navigation purpose (overview, general, coastal, approach, harbour, berthing).

3. Selected Chart

- **Cell:** Name of the chart
- **Cell Status:** Opens Cell Status window.
- **Open:** Opens selected chart to ECDIS display.

4. Group:

For further details, see section A5.2.7 "Grouping S57 chart cells".

5. The **chart limit boxes** are color-coded as follows:

- Green** The chart is available for use in SENC format. If the source of the chart is an RENC then the chart is also up-to-date. If the source of the chart is something other than an RENC, then all loaded updates are included into the SENC.
- Orange** The chart is available for use in SENC format but the chart is either not up-to-date or has been cancelled. Either the SENC is from a former edition, the SENC is missing the latest updates or the chart has been cancelled.
- Red** If the chart is permit free, you do not have it available for use in SENC format and thus you cannot use the chart currently.
The chart requires a permit but you do not have the permit for the chart therefore you cannot use the chart currently.
- Blue** The chart is available either in ENC format, in SENC format for another software version or in SENC format for another ECDIS. For example, the chart is blue during SENC conversion and when you loaded a chart into the ECDIS and the system could not convert the chart into SENC format.
- Magenta** You have a permit to use the chart, but the chart is not available in SENC format and thus you cannot use the chart currently.

A5.2.7 How to group S57 chart cells

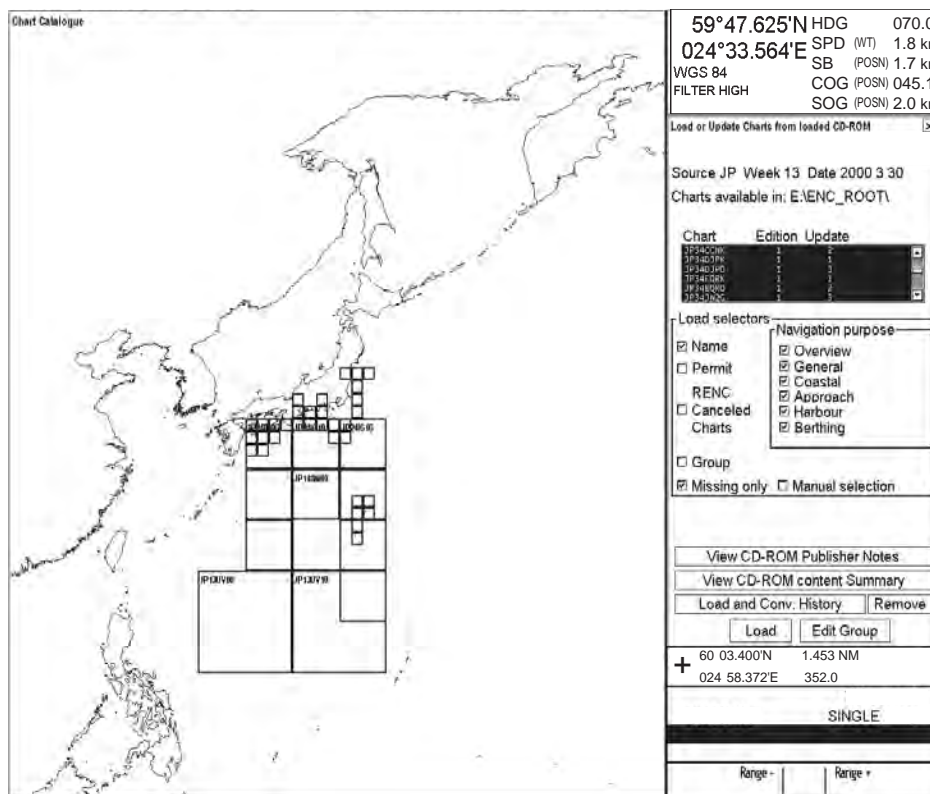
You can define groups of S57 charts. This means you can collect related charts, for example, all cells that cover a route from Liverpool to New York or all cells available from a National Hydrographic Office.

You can make a group and define charts included to group using either "Chart Catalogue" or "Load or Update Charts from loaded CD-ROM" window.

How to group S57 cells with load or update charts from loaded CD-ROM window

When you load or update S57 charts from CD-ROM, you are able to define a group in "Load or Update Charts from loaded CD-ROM" window. To do this, do as follows:

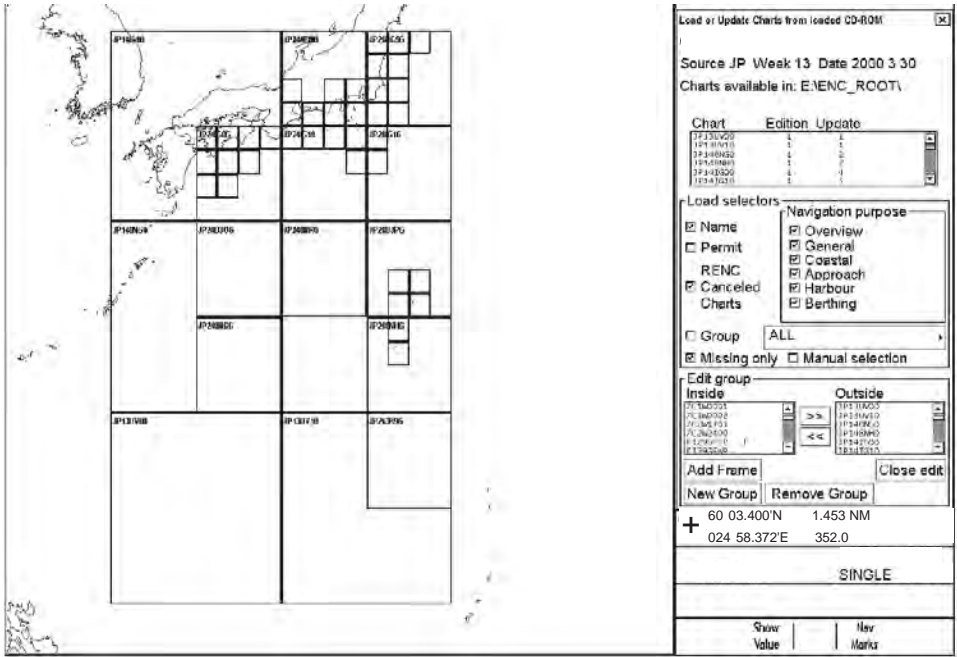
1. Select Load or Update charts>From CD-ROM in Chart menu. A "Load or Update Charts from loaded CD-ROM" window appears



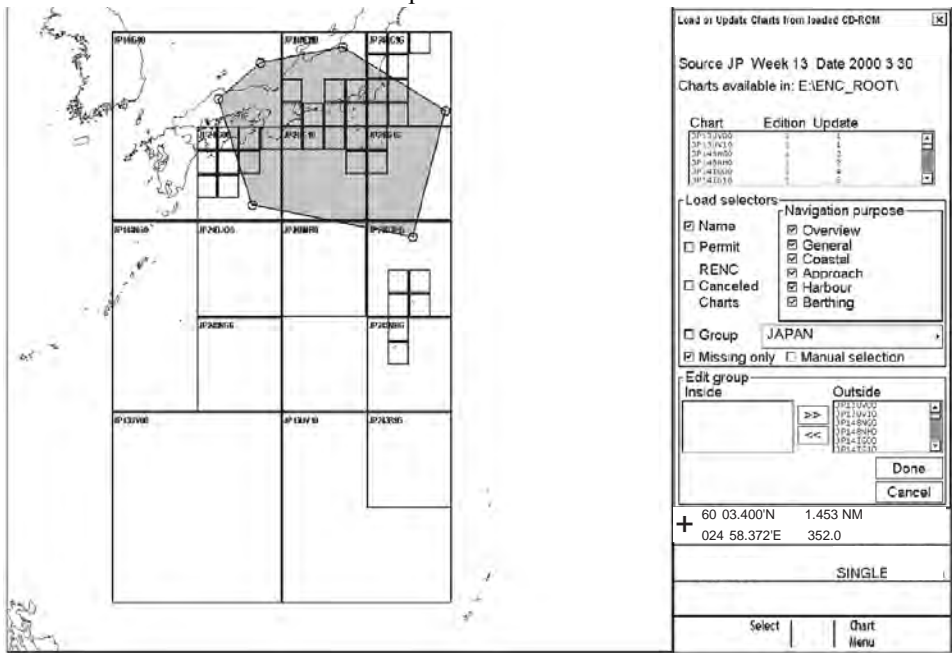
2. Press the **Edit Group** button.
3. Press the **New** button.
4. Enter group name.

Appendix 5: C-MAP CM-93/2 Charts

5. Press the **Add Frame** button.

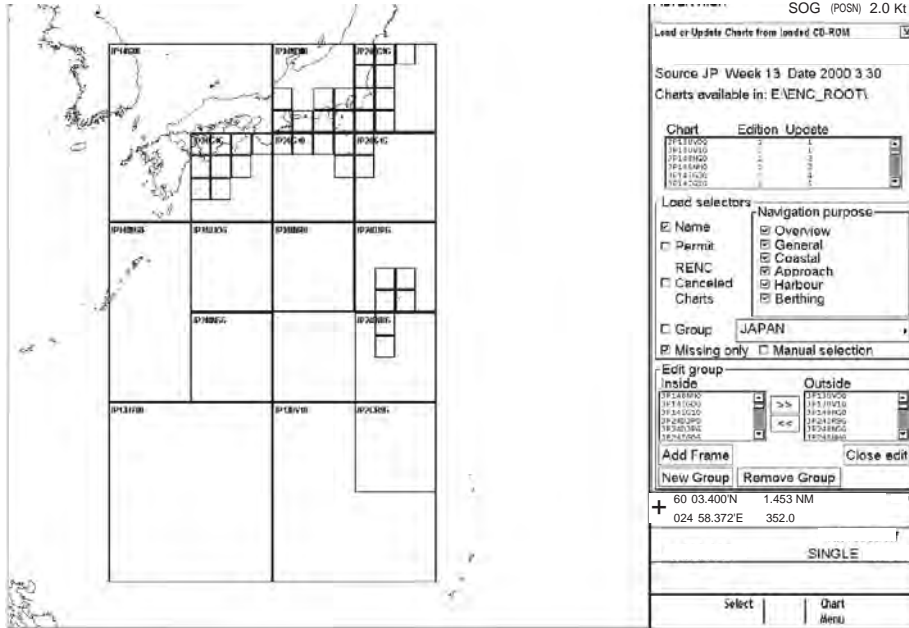


6. Use the trackball to define frame then push the left mouse button.

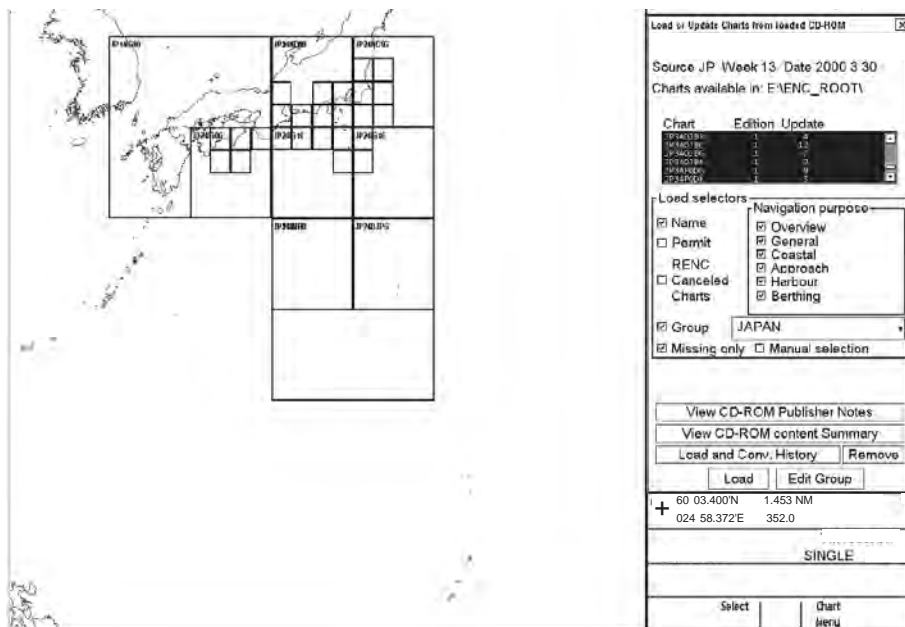


7. Click the **Done** button.

8. Press the **Close Edit** button to finish.



9. Select the group to load.



10. Press the **Load** button to load chart.

How to group S57 cells with Chart catalogue window

Chart Catalogue can be used to define a group as follows:

1. Select "Chart Catalogue" from the Chart menu.

The screenshot shows the Chart Catalogue window. The map on the left displays a grid of S57 cells over a coastal region. The right-hand panel contains the following information:

- Coordinates: 59°47.625'N HDG (MAN) 289.0°, 024°33.564'E SPD (MAN) 0.0kn, WGS 84 SB (MAN) 0.0kn, FILTER HIGH COG (MAN) 289.0°, SOG (MAN) 0.0kn
- Chart Catalogue: Source of Chart Catalogue (CD, RENC, SENC, C-Map), 2004 9 8 Source PM
- View filters: Name, Permit, RENC, Canceled Charts, Group
- Navigation purpose: Overview, General, Coastal, Approach, Harbour, Berthing
- Selected Chart: Cell Status, Open
- Edit Group button
- 05.10.2004 07:21 LOCAL (UTC+01:00)
- 60°03.400'N 1.453 NM, 024°58.372'E 352.0°
- 1:100 000 Ship off screen SINGLE
- Set Chart Center, Activate Scroll

2. Press the **Edit Group** button then click the **New** button.
3. Enter name for Group.

This screenshot shows the Chart Catalogue window with the 'Edit Group' dialog box open. The map on the left shows a grid of S57 cells. The right-hand panel is similar to the previous screenshot but includes the 'Edit Group' dialog box with the following details:

- Group name: FRANCE
- Selected Chart: Cell Status, Open
- Buttons: Add Frame, Close Edit Group, New, Save As Text, Remove
- 05.10.2004 07:47 LOCAL (UTC+01:00)
- 60°03.400'N 1.453 NM, 024°58.372'E 352.0°
- 1:100 000 Ship off screen SINGLE
- Drag Window, Chart Menu

Text Input

New Group Name

FRANCE

OK

4. Press the **Add Frame** button.

Chart Catalogue

59°47.625'N HDG (MAN) 289.0°
 024°33.564'E SPD (MAN) 0.0kn
 WGS 84 SB (MAN) 0.0kn
 FILTER HIGH COG (MAN) 289.0°
 SOG (MAN) 0.0kn

Chart Catalogue

Source of Chart Catalogue
 CD RENC SENC C-Map
 2004 9 8 Source PM

View filters

Name

Permit

Canceled Charts

Group

Navigation purpose

Overview

General

Coastal

Approach

Harbour

Berthing

FRANCE

Selected Chart

Cell:

Inside

Outside

>>

<<

Done Cancel

05.10.2004 07:48 LOCAL (UTC+01:00)

+ 60°03.400'N 1.453 NM
 024°58.372'E 352.0°

Ship off screen

1:100 000 SINGLE b5.01 b5.01

Select | Chart Menu

5. Define frame using left mouse button in "Select" mode then click the **Done** button.

6. Select Group to view content of group in Chart Catalogue window.

Chart Catalogue

59°47.625'N HDG (MAN) 289.0°
 024°33.564'E SPD (MAN) 0.0kn
 WGS 84 SB (MAN) 0.0kn
 FILTER HIGH COG (MAN) 289.0°
 SOG (MAN) 0.0kn

Chart Catalogue

Source of Chart Catalogue
 CD RENC SENC C-Map
 2004 9 8 Source PM

View filters

Name

Permit

Canceled Charts

Group

Navigation purpose

Overview

General

Coastal

Approach

Harbour

Berthing

FRANCE

Selected Chart

Cell:

05.10.2004 07:49 LOCAL (UTC+01:00)

+ 60°03.400'N 1.453 NM
 024°58.372'E 352.0°

Ship off screen

1:100 000 SINGLE b5.01 b5.01

Select | Chart Menu

How to delete a group

You can delete a defined group as follows:

The screenshot shows the Chart Catalogue interface. On the left is a map with a grid of chart cells labeled with identifiers like FR30130, FR30140, etc. On the right is a control panel. At the top, it shows coordinates: 59°47.625'N, 024°33.564'E. Below that are various filter options like 'Source of Chart Catalogue' (CD, RENC, SENC, C-Map) and 'View filters' (Name, Permit, RENC, Canceled Charts, Group). The 'Group' filter is currently set to 'FRANCE'. At the bottom of the control panel, there are buttons for 'Remove Frame', 'Close Edit Group', 'New', 'Save As Text', and 'Remove'. An arrow points to the 'Remove' button with the text 'Use Remove button to delete a group.'

How to display active group with catalogue

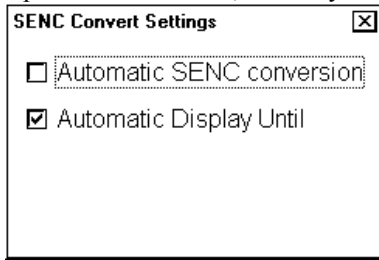
To view active group do the following:

The screenshot shows the Chart Catalogue interface. On the left is a map with a grid of chart cells. On the right is a control panel. At the top, it shows coordinates: 59°47.625'N, 024°33.564'E. Below that are various filter options like 'Source of Chart Catalogue' (CD, RENC, SENC, C-Map) and 'View filters' (Name, Permit, RENC, Canceled Charts, Group). The 'Group' filter is currently set to 'FRANCE'. At the bottom of the control panel, there is an 'Edit Group' button. An arrow points to the 'Group' checkbox with the text 'Check [] Group [] to enable selection of a group.'

A5.3 Automatic Display Until Setting

Display data may be set to system data automatically.

1. Open the Chart menu, select System and SENC Convert Settings to show the following window.

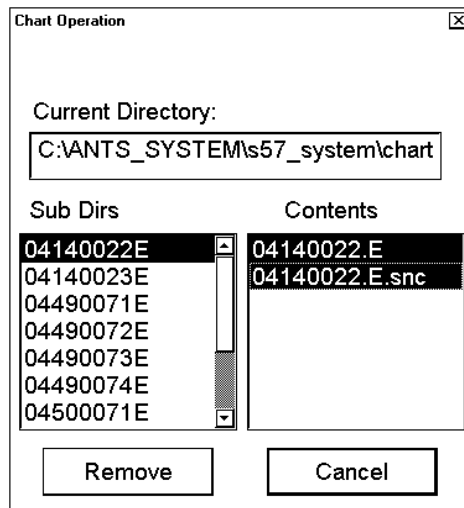


2. Check Automatic Display Until.

A5.4 How to Remove C-MAP Charts from the System

To remove C-MAP charts from the system, do the following:

1. Open the Chart menu.
2. Select Remove Charts from the menu then push the scrollwheel. The window shown right appears.
3. Select desired chart cells to remove them from the system. You can remove native data (A, B, CD-ROM; E, F or Z) or SENC format (snc).
4. Click the **Remove** button to remove selected C-MAP charts from your hard disk.



A5.5 How to Display Status and Date Dependency of S57 Chart Cells and their Updates

When you load S57 chart cell(s) and/or their updates, the system sets Display Until of S57 chart cell(s) as current date of the system. To set Approve Until as current date of the system, you must open the Set Chart viewing dates window and set it there. You can view status and date dependency of S57 chart cells and their updates as follows:

1. Open the Chart menu, select Set Chart viewing dates from the menu then push the scrollwheel.
2. The Set Chart viewing date window appears.

Chart viewing dates						
Cell ID	RENC edt/ upd	SENC edt/ upd	Updates Displ. until		Updates Approv. until	
FI3EIR1	1/ 3	1/ 3	2005	3 10 (-)	2005	3 10 (-)
FI49IHMJ	2/ 10	2/ 10	2005	3 10 (-)	2005	3 10 (-)
FI49IHMK	2/ 3	2/ 3	2005	3 10 (-)	2005	3 10 (-)
FI49IHML	2/ 9	2/ 9	2005	3 10 (-)	2005	3 10 (-)
FI49IHMS	2/ 1	2/ 1	2005	3 10 (-)	2005	3 10 (-)
FI4EIGII	1/ 3	1/ 3	2005	3 10 (-)	2005	3 10 (-)
FI4EIGIJ	2/ 4	2/ 4	2005	3 10 (-)	2005	3 10 (-)
FI4EIGIK	2/ 2	2/ 2	2005	3 10 (-)	2005	3 10 (-)
FI4EIGIL	2/ 4	2/ 4	2005	3 10 (-)	2005	3 10 (-)
FI4EIHMI	1/ 7	1/ 7	2005	3 10 (-)	2005	3 10 (-)
FI4EIHMM	2/ 4	2/ 4	2005	3 10 (-)	2005	3 10 (-)
FI4EIHMN	1/ 6	1/ 6	2005	3 10 (-)	2005	3 10 (-)
FI4EIHMO	1/ 11	1/ 11	2005	3 10 (-)	2005	3 10 (-)
FI4EIHMP	1/ 12	1/ 12	2005	3 10 (-)	2005	3 10 (-)
FI4EIHMQ	1/ 6	1/ 6	2005	3 10 (-)	2005	3 10 (-)
FI4EIHMR	2/ 4	2/ 4	2005	3 10 (-)	2005	3 10 (-)
FI4EIIQN	1/ 3	1/ 3	2005	3 10 (-)	2005	3 10 (-)
FI4EIIQO	1/ 3	1/ 3	2005	3 10 (-)	2005	3 10 (-)
FI4EIIQP	1/ 4	1/ 4	2005	3 10 (-)	2005	3 10 (-)
FI4EIIQQ	1/ 10	1/ 10	2005	3 10 (-)	2005	3 10 (-)
FI4EIIQR	3/ 13	3/ 13	2005	3 10 (-)	2005	3 10 (-)
FI4EIIQS	2/ 16	2/ 16	2005	3 10 (-)	2005	3 10 (-)
FI4EIIQT	2/ 11	2/ 11	2005	3 10 (-)	2005	3 10 (-)
FI4EIIQU	2/ 11	2/ 11	2005	3 10 (-)	2005	3 10 (-)
FI4EIIQV	1/ 4	1/ 4	2005	3 10 (-)	2005	3 10 (-)
FI4EIIQW	1/ 5	1/ 5	2005	3 10 (-)	2005	3 10 (-)

Latest RENC Product List	2005 2 23	Source PM
Oldest date	2005 3 10	2005 3 10
Newest date	2005 3 10	2005 3 10
Manual Updates	2005 3 10	2005 3 10

Display Until Approve Until

Sync Manual Update Dates
 All SENCs

Recommended settings in this window are:

- Sync Manual Update Dates: ON position
- All SENCs: ON position

RENC edt / upd: The "RENC" column contains edition/update status from Product List.

SENC edt / upd: The "SENC" column contains edition/update status from "SENC", i.e., loaded and converted in the ECDIS.

Updates displ. until: View the date until updates is displayed. You can enter desired date by using the Display Until input box. The number after date shows the number of updates done for the displayed cell (number of displayed updates/number of updates in SENC format).

Updates approv. until: View the date until updates is approved. You can enter desired date by using the Approve Until input box (number of approved updates/number of updates in SENC format).

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Appendix 6: How to Backup Routes

A6.1 How to Backup and Restore Routes in ASCII Format

Sometimes it is useful to save some information about a route as an ASCII text file for use with some other application, or use some ASCII format-generated route in the ECDIS. ECDIS can generate an ASCII text file from a route. ECDIS can also generate a route from an ASCII text file. The following formats for route backup & restore are available:

ASCII PROPRIETARY

ASCII POSITION: List of Latitude/Longitude values

ASCII WPT NAME POSITION: List of WPT names and Latitude/Longitude

ASCII POSITION WPT NAME: List of Latitude/Longitude and WPT names

ASCII FULL: All route related information

ORION WEATH. ROUTING: compatible to import-export route information from/to Orion Pro

To make backup from a route in ASCII format, do the following:

1. Put the cursor on Route in the status bar then click the **Plan** button to open the Plan Route dialog box.
2. Put the cursor on the triangle in the dialog box, select Backup and Restore from the menu then push the scrollwheel.
3. In the Hard Disk field, select desired file from the list box and desired backup format with Backup Format.
4. Select backup drive from Drive in the Backup Device field. Click the **Backup** button to create backup file.

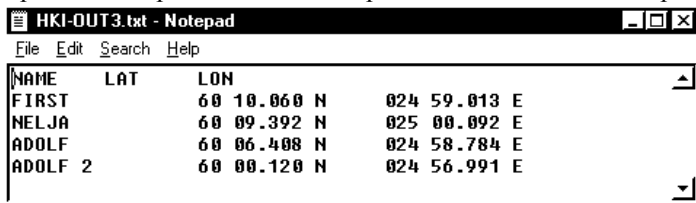
To restore a route, do the following:

1. Follow steps 1 and 2 above to open the Backup and Restore dialog box.
2. Select desired Backup Format.
3. Select backup drive in the Backup Device field and select desired file with the list box in the same field.
4. Click the **Restore** button.

A6.2 How to Export Routes into an Excel File

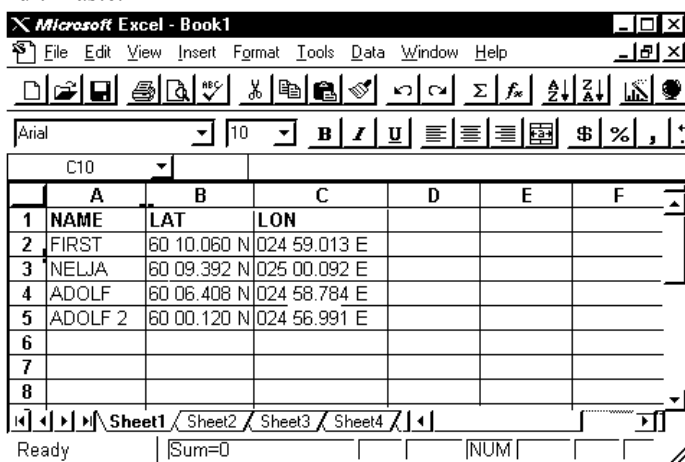
Below is an example of how to export waypoints' name and latitude/longitude values to a Microsoft Excel table.

1. Put the cursor on Route in the status bar then click the **Plan** button to open the Plan Route dialog box. Put the cursor on the triangle in the dialog box, select Backup and Restore from the menu then push the scrollwheel.
2. In the Hard Disk field, select desired route then select desired Backup Format (ASCII WPT NAME POSITION).
3. Select backup drive (A:\ or E:\) from the Backup Device field then insert floppy disk, or connect USB memory. Click the **Backup** button.
4. Move floppy disk or USB memory to computer where you can run Notepad and MS Excel applications.
5. Open the Notepad software then open the route selected at step 2.



Content of Notepad looks something like this.

6. Copy text to the clipboard: Edit>Select All then Edit>Copy.
7. Open the MS Excel software. Open a new Excel file then copy text from the clipboard to the MS Excel: Edit>Paste.

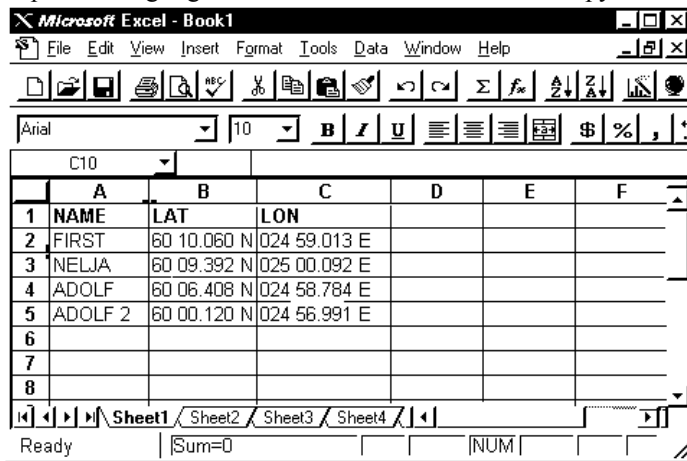


Content of MS Excel looks something like the one above.

A6.3 How to Import Routes from Excel File into ECDIS

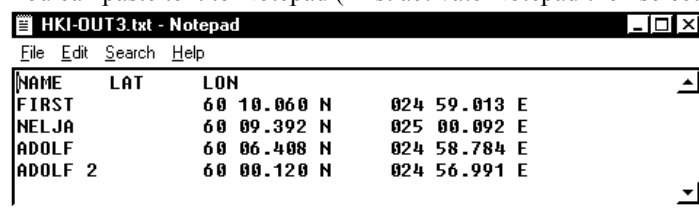
Below is an example of how to import waypoints' name and latitude/longitude values from a Microsoft Excel table into ECDIS. Limit the length of waypoint names to eight alphanumeric characters and route names to 30 alphanumeric characters.

1. Open the MS Excel that contains the route data you want to import to the ECDIS. Copy desired columns to the clipboard: Highlight data in MS Excel then select >Copy.



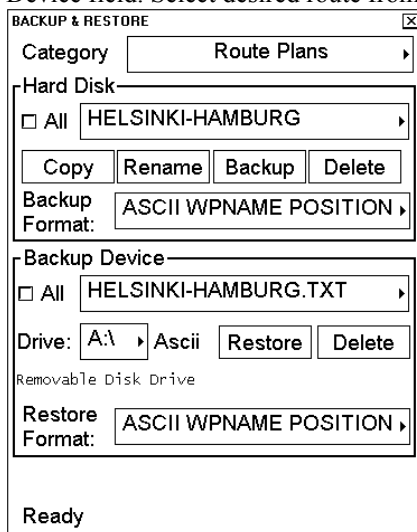
Content of MS Excel may look something like this.

2. You can paste text to Notepad (First activate Notepad then select Edit>Paste)



Content of Notepad looks something like this.

3. Put the cursor on Route in the status bar then click the **Plan** button to open the Plan Route dialog box. Put the cursor on the triangle in the dialog box, select Backup and Restore from the menu then push the scrollwheel.
4. In the Backup Device field, select desired Restore Format (ASCII WPT NAME POSITION).
5. Insert floppy disk into disk drive, or connect USB memory. Select backup drive (A:\ or E:\) from the Backup Device field. Select desired route from the list box in the Backup Device field then click the **Restore** button.



6. ECDIS generates new route, which has same name as text file.

Appendix 6: How to Backup Routes

Below is an example where you can see which fields are from text file and which fields are using default values generated by the ECDIS.

The screenshot displays the 'PLAN ROUTE - HELSINKI HAMBURG' window with a table of waypoints and a 'SHIP & ROUTE PAR...' parameters window. Annotations identify fields as either 'From text file' or default values.

WPT	NAME	LAT	LON	Leg°	Leg/NM	Mode	RAD/NM	CH LIM/m	Margin/m	MIN/kn	MAX/kn
28		53°45.041'N	009°25.092'E	152.0	5.6	RL	0.7	385	40	0	22
29		53°39.286'N	009°32.274'E	143.5	7.2	RL	0.7	385	40	0	22
30		53°35.516'N	009°35.694'E	151.7	4.3	RL	0.7	385	40	0	22
31		53°32.539'N	009°46.297'E	115.2	7.0	RL	0.7	385	40	0	22

WPT count: 31 Total length: 723.2 NM

Buttons: Insert before, Adjust after, Delete WPT, Import, Reverse route, Display all

SHIP & ROUTE PAR...

Ship parameters

- Max speed: 22.0 kn
- Max height: 30.0 m
- Max draught: 10.0 m

Gyro correction

- Source: Auto
- Spd/lat corr.: Off
- Max corr.: 3.0 °
- Man corr.: 0.0 °

Route parameters

- Max r.o.t.: 200 °/min
- Turn end tol.: 5 °
- WP approach: 60 s
- WP prewarn: 90 s
- Start limit: 15 °
- Def. line rad: 0.3 NM
- Def. ch limit: 185 m
- Def. safe marg: 40 m
- Drift compensation: On
- Gyro error comp: On

A6.4 How to Backup and Restore Routes in Orion Pro Weather Route Format

A6.4.1 How to export a route from ECDIS to Orion Pro

To make backup from a route in format, which can then be imported to Orion Pro weather routing program, do the following:

1. Put the cursor on Route in the status bar then click the **Plan** button to open the Plan Route dialog box.
2. Put the cursor on the triangle in the dialog box, select Backup and Restore from the menu then push the scrollwheel.
3. In the Hard Disk field, select desired file from the list box and **Orion weath. routing** format with Backup Format.
4. Select backup drive from Drive in the Backup Device field. Click the **Backup** button to create backup file.

The screenshot shows a dialog box titled "BACKUP & RESTORE". It has a close button in the top right corner. The dialog is organized into several sections:

- Category:** A dropdown menu currently showing "Route Plans".
- Hard Disk:** A section containing a list box with "LIVERPOOL-NEW YORK" selected, and buttons for "Copy", "Rename", "Backup", and "Delete".
- Backup Format:** A dropdown menu currently showing "ORION WEATH. ROUTING".
- Backup Device:** A section containing a list box with "All" selected, a "Drive:" dropdown menu showing "A:\", and buttons for "Restore" and "Delete".
- Restore Format:** A dropdown menu currently showing "ANTS".
- Removable Disk Drive:** A label positioned below the Backup Device section.
- Ready:** A status indicator at the bottom of the dialog.

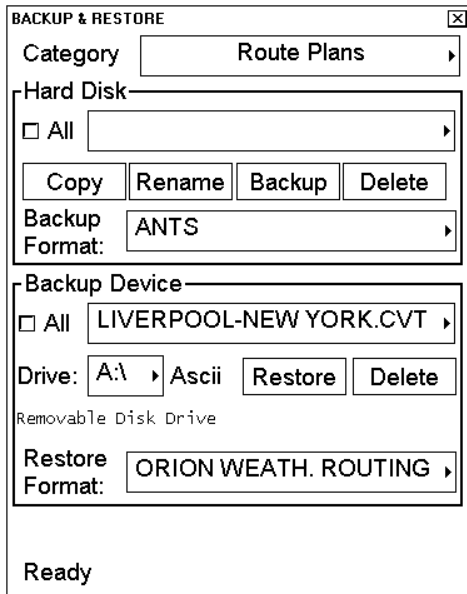
Note that following information is transferred with route:

- WPT number
- Latitude
- Longitude
- Steering mode (Rhumb Line or Great Circle)

A6.4.2 How to import a route from Orion Pro

To restore a route in format of Orion Pro weather routing program to ECDIS, do the following:

1. Put the cursor on Route in the status bar then click the **Plan** button to open the Plan Route dialog box. Put the cursor on the triangle in the dialog box, select Backup and Restore from the menu then push the scrollwheel.
2. In the Backup Device field, select desired Restore Format (ORION WEATH. ROUTING).
3. Insert floppy disk into disk drive in the processor unit. Select backup drive (A:\ or E:\) from the Backup Device field. Select desired route from the list box in the Backup Device field then click the **Restore** button.



4. ECDIS generates new route that has same name as text file.

Note: The following information is transferred with route:

- WPT number
- Latitude
- Longitude
- Steering mode (Rhumb Line or Great Circle)

Appendix 7: Menu Tree

Main menu, S57 chart mode

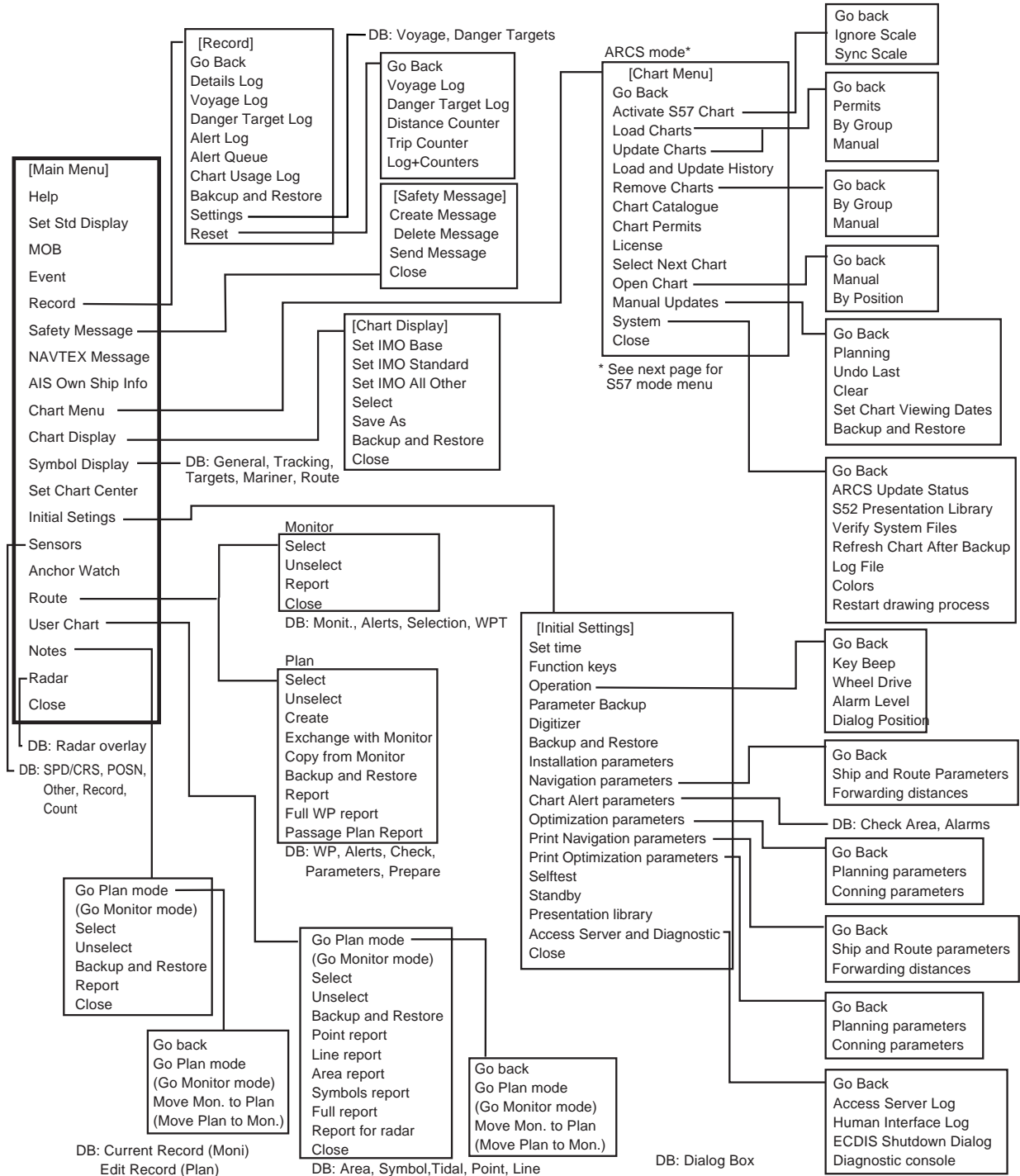
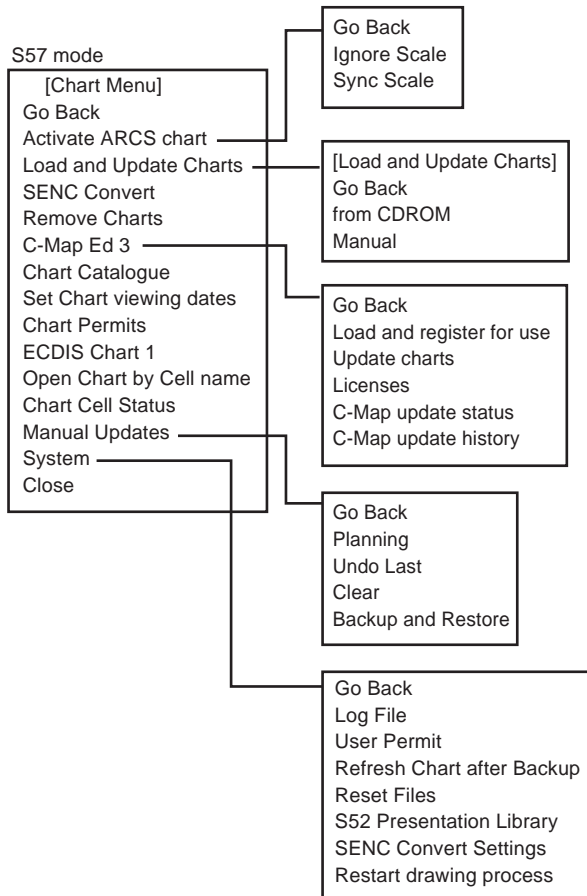


Chart menu, S57 mode



Appendix 8: Digital Interface

A8.1 Data Sentences

A8.1.1 Input sentences

ACK, ALR, DBT, DPT, DTM, GGA, GLL, GNS, HDT, MTW, MWV, NRX, OSD, RMC, ROT, THS, TTM, VBW, !AIVDM, !AIVDO, VHW, VTG, ZDA

A8.1.2 Output sentences

ABM, BBM, DTM, GLL, MWV, RTE, SSD, VSD, WPL

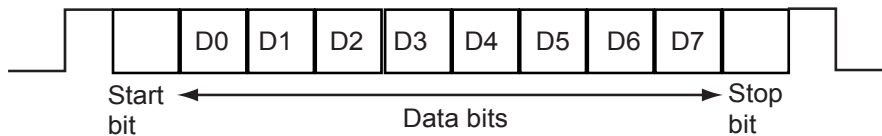
A8.1.3 Data reception

Data is received in serial asynchronous form in accordance with the standard referenced in IEC 61162-2.

The following parameters are used:

Baud rate: 38,400 bps: HDT, THS, !AIVDM, !AIVDO and \$AIALR. All other sentences: 4800 bps

Data bits: 8 (D7 = 0), Parity: none, Stop bits: 1



DPT – Depth

Recipient of sentences:

Expected nominal interval of sentences: 5 s

Alarm generated if message not received: 22 s ±2 s

\$-DPT,x.x,x.x,x.x*hh<CR><LF>



1. **Water depth relative to transducer, in meters**
2. Offset from transducer, in meters (see notes 1 and 2)
3. Maximum range scale in use
4. **Checksum**

NOTE1 "positive"=distance from transducer to water-line.
 "-"=distance from transducer to keel.
 NOTE2 For IEC applications the offset should always be applied so as to provide depth relative to the keel.

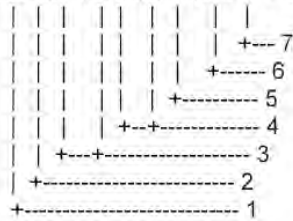
DTM - Datum reference

Recipient of sentences:

Expected nominal interval of sentences: 15 s

Alarm generated if message not received: 60 s ±10 s

\$--DTM,ccc,a,x.x,a,x.x,a,x.x,ccc*hh<CR><LF>



1. **Local datum W84 - WGS84**
 W72 - WGS72
 S85 - SGS85
 P90 - PE90
 999 - User defined
 IHO datum code
2. Local datum subdivision code
3. Lat offset, min, N/S
4. Lon offset, min, E/W
5. Altitude offset, m
6. Reference datum W84 - WGS84
 W72 - WGS72
 S85 - SGS85
 P90 - PE90
7. **Checksum**

Appendix 8: Digital Interface

GGA - Global positioning system (GPS) fix data

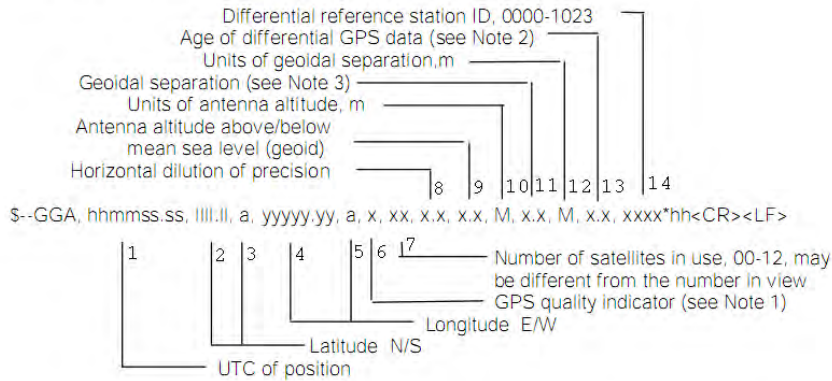
Recipient of sentences:

Expected nominal interval of sentences: 1 - 5 s

Alarm generated if message not received: 22 s ±2 s

8.3.35 GGA – Global positioning system (GPS) fix data

Time, position and fix-related data for a GPS receiver.



NOTE 1 All GPS quality indicators in headings 1 through 8 are considered "valid". The heading "0" is the only "invalid" indicator. The GPS quality indicator field should not be a null field.

- 0 = fix not available or invalid
- 1 = GPS SPS mode
- 2 = differential GPS, SPS mode
- 3 = GPS PPS mode
- 4 = Real Time Kinematic. Satellite system used in RTK mode with fixed integers
- 5 = Float RTK. Satellite system used in RTK mode with floating solution
- 6 = Estimated (dead reckoning) mode
- 7 = Manual input mode
- 8 = Simulator mode

NOTE 2 Time in seconds since last SC104 type 1 or 9 update, null field when DGPS is not used.

NOTE 3 Geoidal separation: the difference between the WGS-84 earth ellipsoid surface and mean sea level (geoid) surface, " - " = mean sea level surface below the WGS-84 ellipsoid surface.

The following fields are not applicable:

1. UTC of position
7. Number of satellites in use
8. HDOP
9. Antenna altitude
10. Units of antenna altitude
11. Geoidal separation
12. Units of geoidal separation
13. Age of differential GPS data
14. Differential reference station

GLL - Geographic position - latitude/longitude

Recipient of sentences:

Expected nominal interval of sentences: 1 - 5 s

Alarm generated if message not received: 22 s ± 2 s

`$**GLL,III,III,a,yyyyy.yyy,a,hhmmss.ss,a,x,*hh<CR><LF>`
 1 2 3 4 5 6 7

1. Latitude (0.00000 - 9000.00000)
2. N/S
3. Longitude (0.00000 - 18000.00000)
4. E/W
5. UTC of position (no use)
6. Status (A=data valid V=data invalid)
7. Mode indicator (A=Autonomous D=Differential S=Simulator)

NOTE 1: Positioning system indicator

A= Autonomous

D= Differential

E= Estimated (dead reckoning)

M= Manual input

S= Simulator

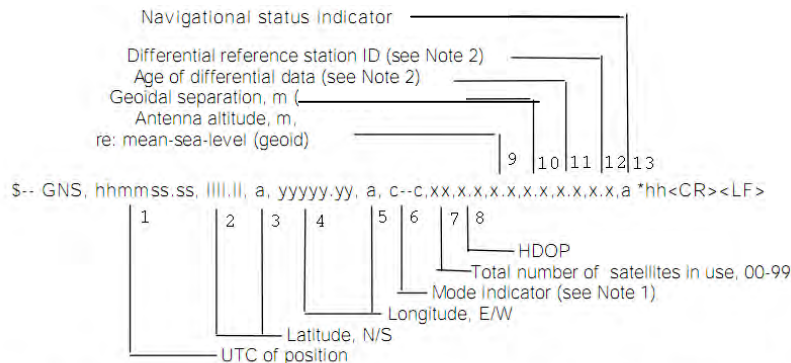
N = Data not valid

GNS - GNSS fix data

Recipient of sentences:

Expected nominal interval of sentences: 1 - 5 s

Alarm generated if message not received: 22 s ± 2 s



NOTE 1 Mode Indicator. A variable length valid character field type with the first three characters currently defined. The first character indicates the use of GPS satellites, the second character indicates the use of GLONASS satellites and the third indicate the use of Galileo satellites. If another satellite system is added to the standard, the mode indicator will be extended to four characters, new satellite systems should always be added on the right, so the order of characters in the mode indicator is: GPS, GLONASS, Galileo, other satellite systems in the future. The characters should take one of the following values:

- A = Autonomous. Satellite system used in non-differential mode in position fix
- D = Differential. Satellite system used in differential mode in position fix
- E = Estimated (dead reckoning) mode
- F = Float RTK. Satellite system used in real time kinematic mode with floating integers
- M = Manual input mode
- N = No fix. Satellite system not used in position fix, or fix not valid
- P = Precise. Satellite system used in precision mode. Precision mode is defined as: no deliberate degradation (such as selective availability) and higher resolution code (P-code) is used to compute position fix. P is also used for satellite system used in multi-frequency, SBAS or Precise Point Positioning (PPP) mode
- R = Real Time Kinematic. Satellite system used in RTK mode with fixed integers
- S = Simulator mode

The mode indicator should not be a null field.

NOTE 2 Age of differential data and Differential Reference Station ID:

The following fields are not applicable:

1. UTC of position
7. Number of satellites in use
8. HDOP
9. Antenna altitude
10. Geoidal separation
11. Units of geoidal separation
12. Differential reference station ID
13. Navigational status indicator

Appendix 8: Digital Interface

HDT – Heading, True

Recipient of sentences:

Expected nominal interval of sentences: 0.2 - 1 s

Alarm generated if message not received: 12 s \pm 2 s

```
$--HDT,x.x,T*hh<CR><LF>
  |  |  |
  |  | +----- 2
+---+----- 1
```

1. *Heading, degrees true*
2. *Checksum*

MTW - Water temperature

Recipient of sentences:

Expected nominal interval of sentences: 5 s

Alarm generated if message not received: 22 s \pm 2 s

```
$--MTW,x.x,C*hh<CR><LF>
  |  |  |
  |  | +----- 2
+--+----- 1
```

1. *Temperature, degrees C*
2. *Checksum*

MWV - Wind speed and angle

Recipient of sentences:

Expected nominal interval of sentences: 5 s

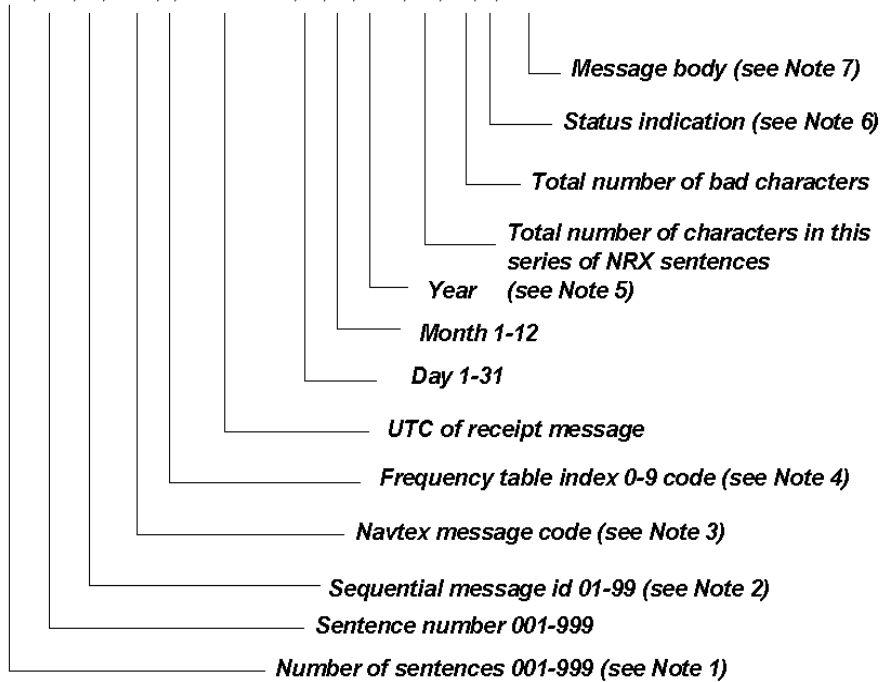
Alarm generated if message not received: 22 s \pm 2 s

```
$--MWV,x.x,a,x.x,a,A*hh<CR><LF>
  |  |  |  |  |  |
  |  |  |  |  | +----- 6
  |  |  |  | +----- 5
  |  |  | +----- 4
  |  | +----- 3
  | +----- 2
+----- 1
```

1. *Wind angle, 0 to 359 (degrees)*
2. *Reference, R=relative, T=true*
3. *Wind speed*
4. *Wind speed units, KN/M/N*
5. *Status, A=data valid, V=data invalid*
6. *Checksum*

NRX - NAVTEX received data

\$--NRX,xxx,xxx,xx,aaax,x,hhmmss.ss,xx,xx,xxxx,x.x,x.x,A,c-c*hh<CR><LF>



NOTE 1 The function code is used to further identify the purpose of the sentence. The meaning of the function code is as follows:

- 0 – request messages for the given mask
- 1 – set/report the storage mask
- 2 – set/report the printer mask
- 3 – set/report the INS mask
- 4 to 9 – reserved for future use

NOTE 2 The frequency indicator identifies the frequency that the NAVTEX message was received on:

- 1 = 490 kHz
- 2 = 518 kHz
- 3 = 4209,5 kHz
- 4 through 9 are reserved for future use

NOTE 3 The transmitter coverage area mask is defined as a 32 bit hex field where the least significant bit represents transmitter coverage area 'A', the next bit is 'B' and so on up to bit 25 which is 'Z'. Bits 31 through 26 are reserved for future use and should be set to zero. To select a transmitter coverage area its corresponding bit should be set to one. To deselect a transmitter coverage area its corresponding bit should be set to zero.

NOTE 4 The message type mask is defined as a 32 bit hex field where the least significant bit represents message type 'A', the next bit is 'B' and so on up to bit 25 which is 'Z'. Bits 31 through 26 are reserved for future use and should be set to zero. To select a message type its corresponding bit should be set to one. To deselect a message type its corresponding bit should be set to zero.

NOTE 5 When another device (for example an INS) wishes to set one or more of the bit masks it sends one or more NRM sentences to the NAVTEX receiver. When another device wishes to determine the current values of the bit masks it sends a query sentence to the NAVTEX receiver as follows:

\$--CRQ,NRM*hh<CR><LF>

On receiving this query, the NAVTEX receiver will respond with one NRM sentence for each mask type and frequency combination that it supports. For example, a NAVTEX receiver which supports separate storage, printer and INS masks for each of three receiver frequencies will return a total of nine NRM sentences in response to the above query.

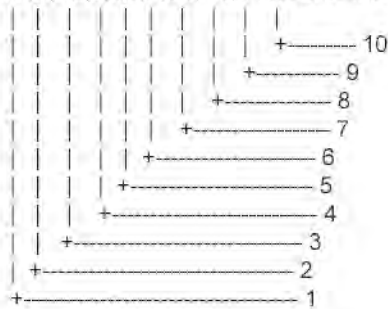
OSD - Own ship data

Recipient of sentences:

Expected nominal interval of sentences: 5 s

Alarm generated if message not received: 22 s ± 2 s

\$--OSD,x.x,A,x.x,a,x.x,a,x.x,x,x,a*hh<CR><LF>



1. Heading, degrees true
2. Heading status: A=data valid, V=data invalid
3. Vessel course, degrees true
4. Course reference, B/M/W/R/P (see note)
5. Vessel speed
6. Speed reference, B/M/W/R/P (see note)
7. Vessel set, degrees true---Manually entered
8. Vessel drift (speed) ---Manually entered
9. Speed units, K(km/h) / N(Knots) / S(statute miles/h)
10. Checksum

NOTES - Reference systems (speed/course):

- B* = bottom tracking log
- M* = manually entered
- W* = water referenced
- R* = radar tracking (of fixed target)
- P* = positioning system ground reference

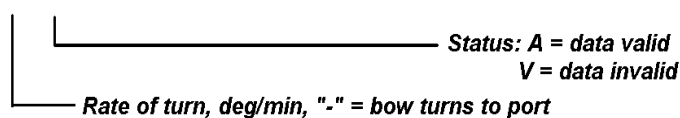
ROT - Rate of turn

Recipient of sentences:

Expected nominal interval of sentences: 1 s

Alarm generated if message not received: 12 s ± 2 s

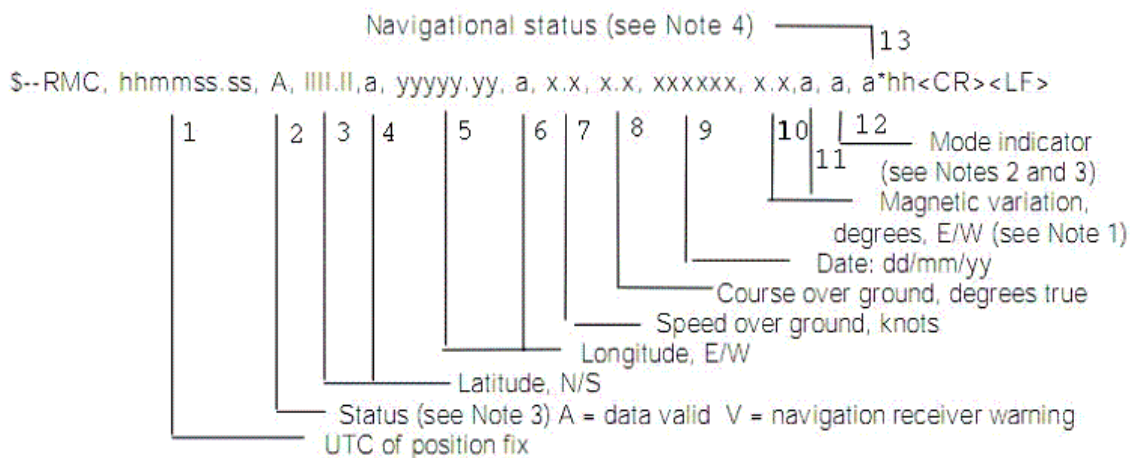
\$--ROT, x.x, A*hh<CR><LF>



RMC - recommended minimum specific GNSS data**Recipient of sentences:**

Expected nominal interval of sentences: 1 - 5 s

Alarm generated if message not received: 22 s ± 2 s



NOTE 1 E = Easterly variation subtracts from True course
W = Westerly variation adds to True course

NOTE 2 Positioning system Mode Indicator:

- A = Autonomous. Satellite system used in non-differential mode in position fix;
- D = Differential. Satellite system used in differential mode in position fix;
- E = Estimated (dead reckoning) mode;
- F = Float RTK. Satellite system used in real time kinematic mode with floating integers;
- M = Manual input mode;
- N = No fix. Satellite system not used in position fix, or fix not valid;
- P = Precise. Satellite system used in precision mode. Precision mode is defined as: no deliberate degradation (such as selective availability) and higher resolution code (P-code) is used to compute position fix. P is also used for satellite system used in multi-frequency, SBAS or Precise Point Positioning (PPP) mode;
- R = Real time kinematic. Satellite system used in RTK mode with fixed integers;
- S = Simulator mode.

NOTE 3 The positioning system mode indicator field supplements the positioning system status field, the status field should be set to V = Invalid for all values of indicator mode except for A= Autonomous and D = Differential. The positioning system mode indicator and status fields should not be null fields.

NOTE 4 The navigational status indicator is according to IEC 61108 requirements on 'Navigational (or Failure) warnings and status indications'. This field should not be a NULL field and the character should take one of the following values:

- S = Safe when the estimated positioning accuracy (95 % confidence) is within the selected accuracy level corresponding to the actual navigation mode, and/or integrity is available and within the requirements for the actual navigation mode, and/or a new valid position has been calculated within 1 s for a conventional craft and 0,5 s for a high speed craft.
- C = Caution when integrity is not available.
- U = Unsafe when the estimated positioning accuracy (95 % confidence) is less than the selected accuracy level corresponding to the actual navigation mode, and/or integrity is available but exceeds the requirements for the actual navigation mode, and/or a new valid position has not been calculated within 1 s for a conventional craft and 0,5 s for a high speed craft.
- V = Navigational status not valid, equipment is not providing navigational status indication.

The following fields are not applicable:

1. UTC of position fix
9. Date
10. Magnetic variation
11. degrees, E/W
13. Navigation status

VBW - Dual ground/water speed

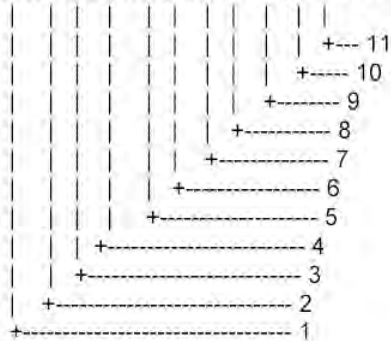
Recipient of sentences:

Expected nominal interval of sentences: 5 s

Alarm generated if message not received: 22 s ±2 s

VBW - Dual ground/water speed

\$--VBW,x.x,x.x,A,x.x,x.x,A,x.x,A,x.x,A*hh<CR><LF>



1. Longitudinal water speed, knots
2. Transverse water speed, knots
3. Status: water speed, A=data valid V=data invalid
4. Longitudinal ground speed, knots
5. Transverse ground speed, knots
6. Status: ground speed, A=data valid V=data invalid
7. Stern transverse water speed, knots
8. Status: stern water speed, A=data valid V=data invalid
9. Stern transverse ground speed, knots
10. Status: stern ground speed, A=data valid V=data invalid
11. Checksum

NOTE 1 Transverse speed: "-" = port,

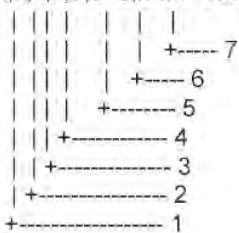
Longitudinal speed: "-" = astern.

NOTE 2 The status field should not be a null field.

!AIVDM – AIS VHF data link message

Expected nominal interval between sentences: as specified by IMO for AIS transponder

!AIVDM,x,x,x,a,s--s,x*hh<CR><LF>



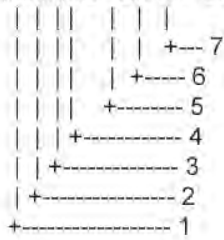
1. Total number of sentences needed to transfer the message, 1 to 9
2. Message sentence number, 1 to 9
3. Sequential message identifier, 0 to 9
4. AIS channel Number
5. Encapsulated ITU-R M.1371 radio message*
6. Number of fill-bits, 0 to 5
7. Checksum

*= Message no. 1, 2, 3, 5, 6, 8, 12, 14, 18, 19 are used.

!AIVDO – UAIS VHF data-link Own-vessel report

Expected nominal interval between sentences: as specified by IMO for AIS transponder

!AIVDO,x,x,x,a,s--s,x*hh<CR><LF>



1. Total number of sentences needed to transfer the message, 1 to 9
2. Message sentence number, 1 to 9
3. Sequential message identifier, 0 to 9
4. AIS channel Number
5. Encapsulated ITU-R M.1371 radio message*
6. Number of fill-bits, 0 to 5
7. Checksum

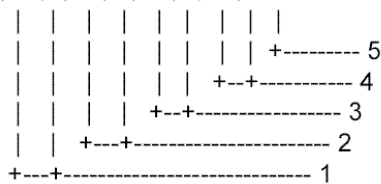
*= Data are MMSI no., navigation status, ETA, destination, draught, type of ship, call sign, ship's name and GPS antenna position.

VHW – Water speed and heading

Expected nominal interval of sentences: 1 - 5 s

Alarm generated if message not received: 12 s ±2 s

\$--VHW,x,x,T,x,x,M,x,x,N,x,x,K*hh<CR><LF>



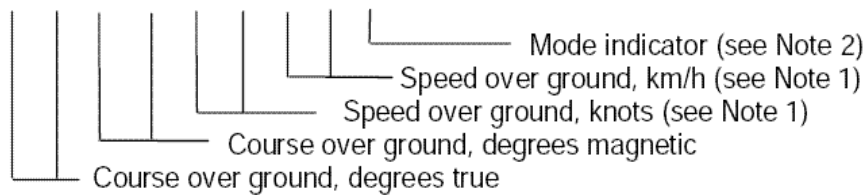
1. Heading, degrees true
2. Heading, degrees magnetic
3. Speed, knots
4. Speed, km/h
5. Checksum

VTG - Course over ground and ground speed**Recipient of sentences:**

Expected nominal interval of sentences: 1 - 5 s

Alarm generated if message not received: 22 s \pm 2 s

\$--VTG, x.x, T, x.x, M, x.x, N, x.x, K,a*hh<CR><LF>



NOTE 1 The speed over the ground should always be non-negative.

NOTE 2 The mode indicator provides status information about the operation of the source device (such as positioning systems, velocity sensors, etc.) generating the sentence, and the validity of data being provided. The possible indications are as follows:

A = Autonomous mode;

D = Differential mode;

E = Estimated (dead reckoning) mode;

M = Manual input mode;

P = Precise. Satellite system used in precision mode. Precision mode is defined as: no deliberate degradation (such as selective availability) and higher resolution code (P-code) is used to compute position fix. P is also used for satellite system used in multi-frequency, SBAS or Precise Point Positioning (PPP) mode;

S = Simulator mode;

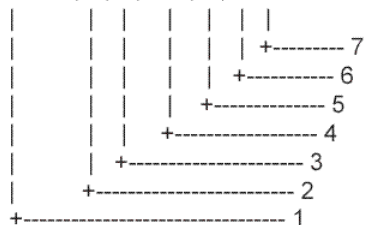
N = Data not valid.

The mode indicator field should not be a null field.

ZDA - Time and date**Recipient of sentences:**

Expected nominal interval of sentences: 5 s

\$--ZDA,hhmmss.ss,xx,xx,xxxx,xx,xx*hh<CR><LF>

**1. UTC****2. Day, 01 to 31 (UTC)****3. Month, 01 to 12 (UTC)****4. Year (UTC)**

5. Local zone hours, 00h to +-13h

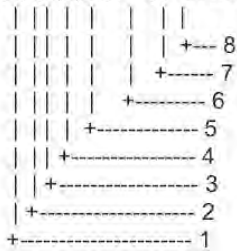
6. Local zone minutes, 00 to +59
as local hours**7. Checksum**

BBM - AIS broadcast binary message

Transmit of sentences:

Expected nominal interval of sentences: on demand

!-BBM,x,x,x,x,xx,s--s,x*hh<CR><LF>



1. Total number of sentences needed to transfer the message, 1 to 9
2. Message sentence number, 1 to 9
3. Sequential Message identifier, 0 to 9
4. AIS channel for broadcast of the radio message
5. VDL message number(8,14,19 or 21), see ITU-R M.1371
6. Binary data
7. Number of fill-bits, 0 to 5
8. Checksum

DPT – Depth

Transmit of sentences:

Expected nominal interval of sentences: 5 s

\$-DPT,x,x,x,x,x,x*hh<CR><LF>



1. Water depth relative to transducer, in meters
2. Offset from transducer, in meters (see notes 1 and 2)
3. Maximum range scale in use
4. Checksum

NOTE1 "positive"=distance from transducer to water-line.

"-"=distance from transducer to keel.

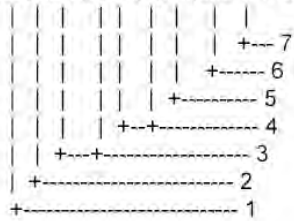
NOTE2 For IEC applications the offset should always be applied so as to provide depth relative to the keel.

DTM - Datum reference

Transmit of sentences:

Expected nominal interval of sentences: 26 s

\$--DTM,ccc,a,x,x,a,x,x,a,x,x,ccc*hh<CR><LF>



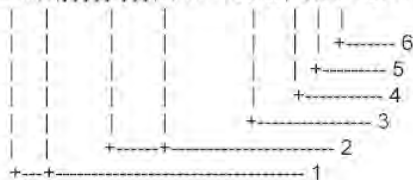
1. **Local datum W84 - WGS84**
 W72 - WGS72
 S85 - SGS85
 P90 - PE90
 999 - User defined
 IHO datum code
2. Local datum subdivision code
3. Lat offset, min, N/S
4. Lon offset, min, E/W
5. Altitude offset, m
6. Reference datum W84 - WGS84
 W72 - WGS72
 S85 - SGS85
 P90 - PE90
7. **Checksum**

GLL - Geographic position - latitude/longitude

Transmit of sentences:

Expected nominal interval of sentences: 2 s

\$-GLL,III,III,a,yyyyy.yyy,a,hhmmss.ss,A,a*hh<CR><LF>



1. **Latitude, N/S**
2. **Longitude, E/W**
3. UTC of position
4. **Status: A=data valid, V=data invalid**
5. **Mode indicator (see note)**
6. **Checksum**

NOTE Positioning system Mode indicator:

- A = Autonomous**
- D = Differential**
- E = Estimated (dead reckoning)
- M = Manual input
- S = Simulator
- N = Data not valid

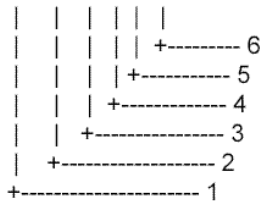
The Mode indicator field supplements the Status field. The Status field shall be set to V=invalid for all values of Operating Mode except for A=Autonomous and D=Differential. The positioning system Mode indicator and Status field shall not be null fields.

MWV - Wind speed and angle

Transmit of sentences:

Expected nominal interval of sentences: 5 s

\$--MWV,x,x,a,x,x,a,A*hh<CR><LF>



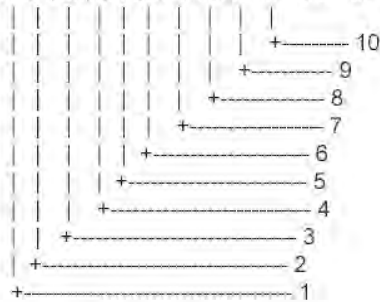
1. Wind angle, 0 to 359 (degrees)
2. Reference, R=relative, T=true
3. Wind speed
4. Wind speed units, KN/M/N
5. Status, A=data valid, V=data invalid
6. Checksum

OSD - Own ship data

Transmit of sentences:

Expected nominal interval of sentences: 5 s

\$--OSD,x,x,A,x,x,a,x,x,a,x,x,x,x,a*hh<CR><LF>



1. Heading, degrees true
2. Heading status: A=data valid, V=data invalid
3. Vessel course, degrees true
4. Course reference, B/M/W/R/P (see note)
5. Vessel speed
6. Speed reference, B/M/W/R/P (see note)
7. Vessel set, degrees true---Manually entered
8. Vessel drift (speed) ---Manually entered
9. Speed units, K(km/h) / N(Knots) / S(statute miles/h)
10. Checksum

NOTES - Reference systems (speed/course):

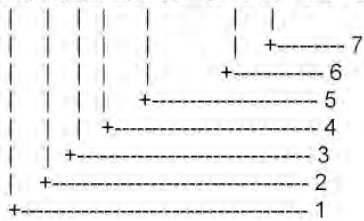
- B** = bottom tracking log
- M** = manually entered
- W** = water referenced
- R** = radar tracking (of fixed target)
- P** = positioning system ground reference

RTE – Routes

Transmit of sentences:

Expected nominal interval of sentences: on demand

\$--RTE,x.x,x.x,x.a,c--c,c--c,.....,c--c*hh<CR><LF>

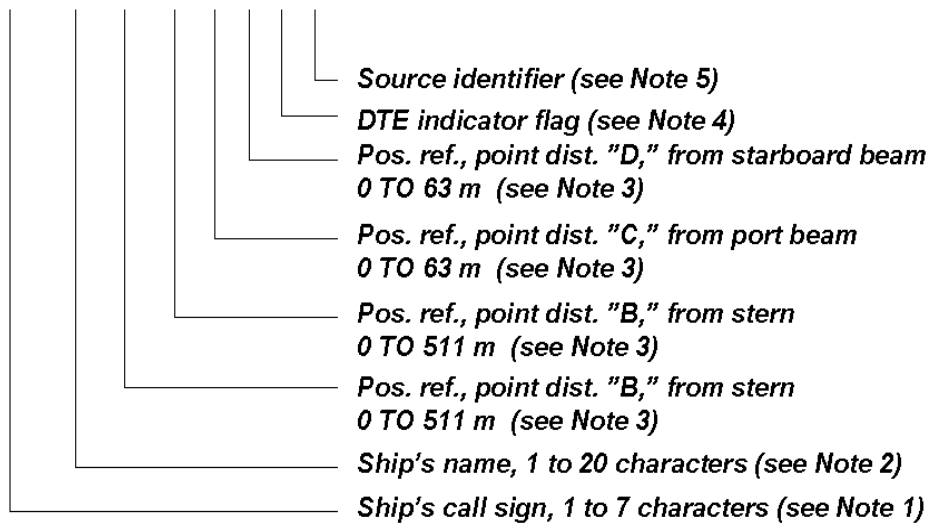


1. Total number of messages being transmitted
2. Message number
3. Message mode:
 - c=complete route, all waypoints
 - w=working route, first listed waypoint is "FROM", second is "TO" and remaining reset of route
4. Route identifier
5. Waypoint identifier
6. Waypoint "n" identifier
7. Checksum

SSD -AIS ship static data**Transmit of sentences:**

Expected nominal interval of sentences: on demand

\$-SSD,c-c,c-c,xxx,xxx,xx,xx,c,aa*hh<CR><LF>



NOTE 1 Ship's call sign. A null field indicates that the previously entered call sign is unchanged. The string of characters "@@@@@@" is used to indicate that the call sign is not available.

NOTE 2 The characters that can be used in the name are listed in the ITU-R M.1371, 6-bit ASCII. Some of the acceptable characters in this 6-bit ASCII table are the reserved characters within this standard IEC 61162-1, Table 1. These characters should be represented using the "A" method (see 7.1.3). A null field indicates that the previously entered name is unchanged. The string of characters "@@@@@@@@@@@@@@@@@@" is used to indicate that the ship's name is not available.

NOTE 3 These are the four dimensions from the bow, stern, port beam, and starboard beam to the horizontal reference point on the ship for which the current "position reports" are valid. The sum of A + B is the length of the ship in metres, and the sum of C + D is the width of the ship in metres. Refer to the ITU-R M.1371, Message 5, "reference point for reported position and dimensions of ship." If the reference point of "reported position" is not available, but the dimensions of the ship are available: A = C = 0 and B > 0 and D > 0. If neither the reference point for the reported position nor the dimensions of the ship are available: A = B = C = D = 0 (default). Use of a null field for A, B, C, and/or D indicates that the previously entered dimension for that parameter is unchanged. In many cases, the ship's reference point for "reported position" will be the location of the positioning antenna.

NOTE 4 The DTE indicator is an abbreviation for data terminal equipment indicator. The purpose of the DTE indicator is to inform distant receiving applications that, if set to "available," the transmitting station conforms, at least, to the minimum keyboard and display requirements. The DTE indicator is only used as information provided to the application layer – indicating that the transmitting station is available for communications. On the transmitting side, the DTE indicator may be set by an external application using this sentence. DTE indicator flag values are:

0 = Keyboard and display are a standard configuration, and communication is supported.

1 = Keyboard and display are either unknown or unable to support communication.

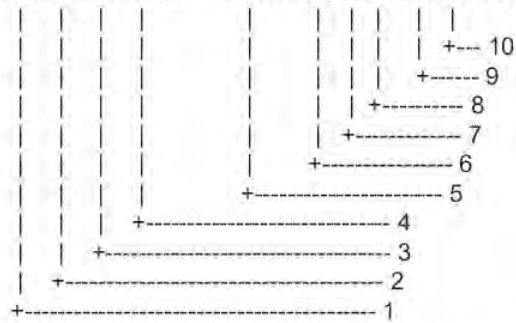
NOTE 5 The source identifier contains the talker ID of the equipment at this location.

VSD - UAIS voyage static data

Transmit of sentences:

Expected nominal interval of sentences: on demand

\$--VSD,x.x,x.x,x.x,c--c,hhmmss.ss,xx,xx,x.x,x.x*hh<CR><LF>



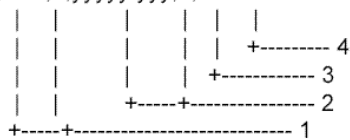
1. Type of ship and cargo category, 0 to 255
2. Maximum present static draught, 0 to 25.5 Meters
3. Persons on-board, 0 to 8191
4. Destination, 1-20 characters
5. Estimated UTC of arrival at destination
6. Estimated day of arrival at destination, 00 to 31(UTC)
7. Estimated month of arrival at destination, 00 to 12(UTC)
8. Navigational status, 0 to 15
9. Regional application flags, 0 to 15
10. Checksum

WPL - Waypoint location

Transmit of sentences:

Expected nominal interval of sentences: on demand

\$--WPL,lll.lll,a,yyyyy.yyy,a,c--c*hh<CR><LF>



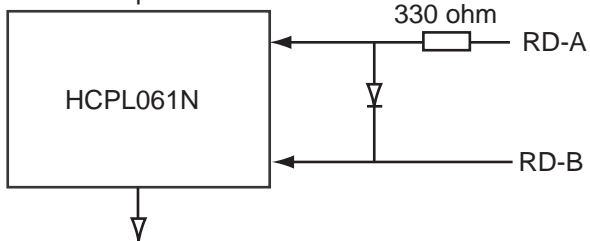
1. Waypoint latitude, N/S
2. Waypoint longitude, E/W
3. Waypoint identifier
4. Checksum

A8.2 Serial Interface

A8.2.1 Input ports

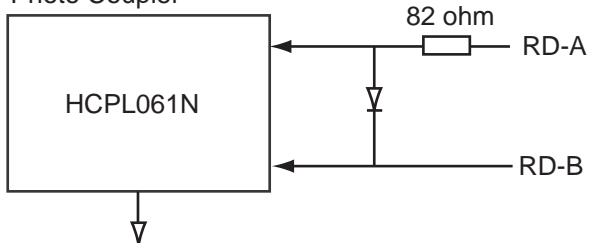
Log, wind, depth and navigation sensors

Photo Coupler



AIS transponder, heading

Photo Coupler



Absolute maximum rating

Input

Forward current: 50mA

Reverse voltage: 3V

Output

Supply voltage: 7V

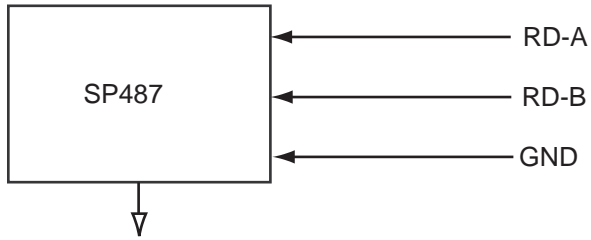
High level output voltage: 7V

Low level output current: 50mA

A8.2.2 Input/output ports

Input port (RD-A, RD-B)

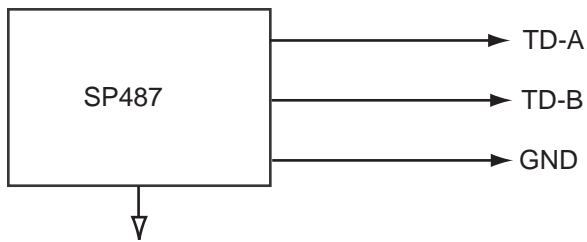
Isolated RS485 Transceiver



Logical High: $A-B > +0.2V$
Logical Low: $A-B < -0.2V$

Output port (TD-A, TD-B)

Isolated RS485 Transceiver



Logical High: $A-B > +4.0V$
Logical Low: $A-B > -4.0V$

Appendix 9: Parts List and Parts Location

A9.1 Parts List

FURUNO

Model	FEA-2807/FEA-2807/FEA-2107/ FEA-2107-BB/FEA-2107
Unit	Chart Processor Unit EC-1000C Control Unit RCU-018 Control Unit RCU-015 Monitor Unit MU-201CE Monitor Unit MU-231CE
Ref.Dwg.	
Blk.No.	

ELECTRICAL PARTS LIST

2011/5

SYMBOL	PRINTED CIRCUIT BOARD/ ASSY. TYPE	CODE NO.	REMARKS
CHART PROCESSOR UNIT EC-1000C			
EMC Filter		FN 2080-6/06	
DVD-ROM Drive		GDR-H30N	
Floppy Disc Drive*1		FD-235HF	
Hard Disk		MHW2040AC	
SDRAM DIMM Board*2		77.G1136.44G ME1GU72CD2P	
BACKPLANE Board		PCI-5S-RS-R40	
Power Supply		UPF250-AA-BG	
CPU Board Assy.*2		PCG-820GV 24P0100	
PWR ON Board		24P0092	
Processor Cooler Assy.*2		2806KL-04W-B69-B50 ASYG-FAN-FU-HEATSINK	
Chassis Fan		AD0812LB-A73GL	
CONTROL UNIT RCU-018			
PNL Board		03P9343	
BUZ Board		03P9362	
Trackball Assy.		TA4726N	
CONTROL UNIT RCU-015			
PNL Board		03P9344	
Trackball Assy		TA4726N	
MONITOR UNIT MU-201CE			
Noise Filter		5220.0123.1	
Power Supply		HYPERION OBL03 131	
DVI I/F Board		FPI NO SW	
LCD Unit		NL128102AC31-02	
Backlight Unit		201LHS02	
Inverter Board		AC1458	
Connector Board		AC1457	
MONITOR UNIT MU-231CE			
Noise Filter		5220.0123.1	
Power Supply		HYPERION OBL03 131	
DVI I/F Board		FPI NO SW	
LCD Unit		FLC59UXC8V-04	
Backlight Unit		FLCL-23	
Inverter Board		AC-1366	
FAN		F62LM-012K-0	
FAN Drive Board		FAN CONTROLLER	

*1 Not provided depending on date of manufacture.

*2 Type of board depends on date of manufacture.

Appendix 9: Parts List and Parts Location

ELECTRICAL PARTS

Model	FEA-2807
Unit	Monitor Unit MU-231

PRINTED CIRCUIT BOARD	Code No.
OZP-120-12/15-J06	-
26P0023 (PSW board)	-
ESSIP33A-1C (AD board)	-
26P0013	-
LCD	Code No.
LQ231U1LW32, 26S0062	-
FAN	Code No.
MFB52A-12HA-001, 26S0028 (FAN1)	-
109P0612H755, 26S0063 (FAN2/FAN3)	-

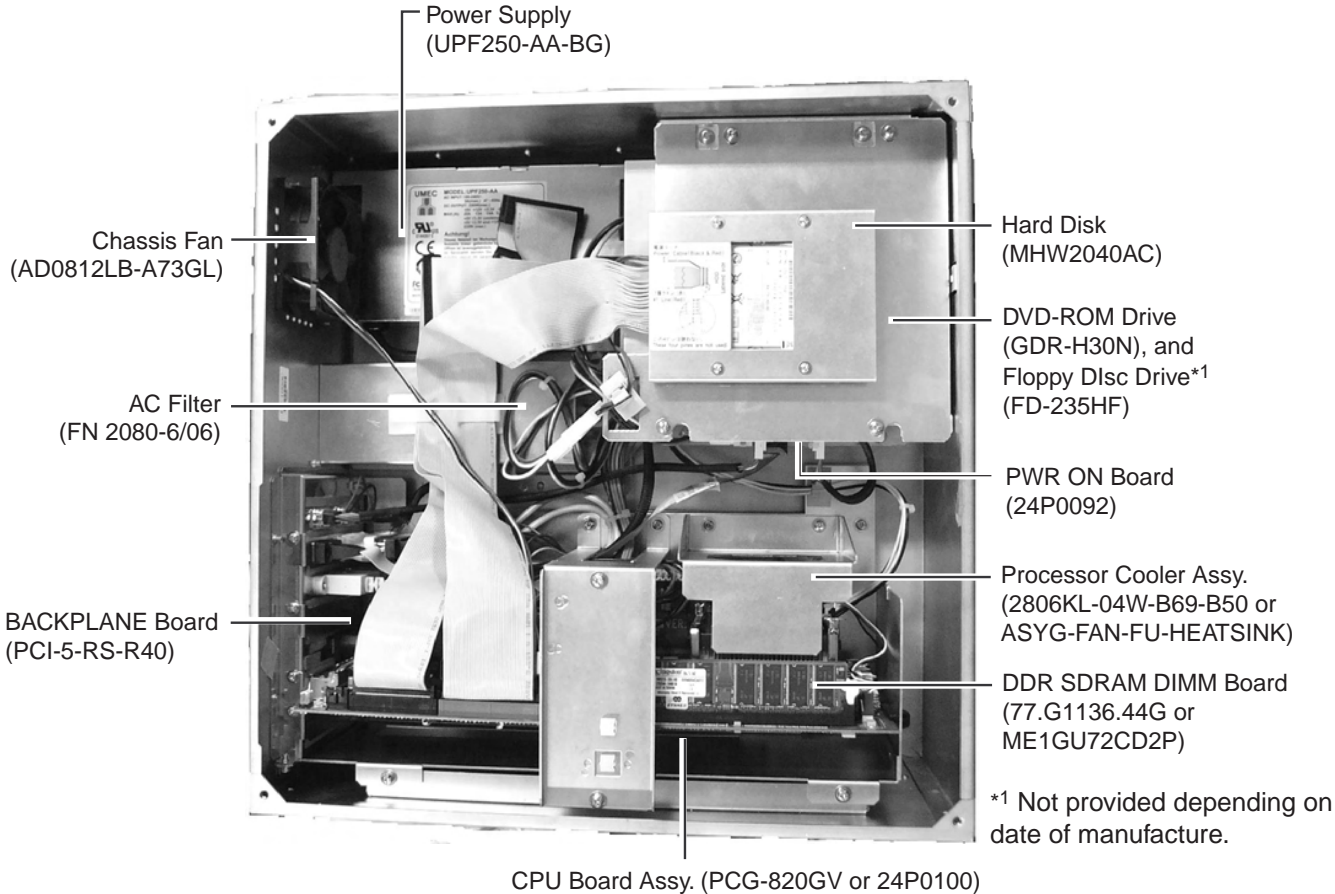
ELECTRICAL PARTS

Model	FEA-2107
Unit	Monitor Unit MU-190

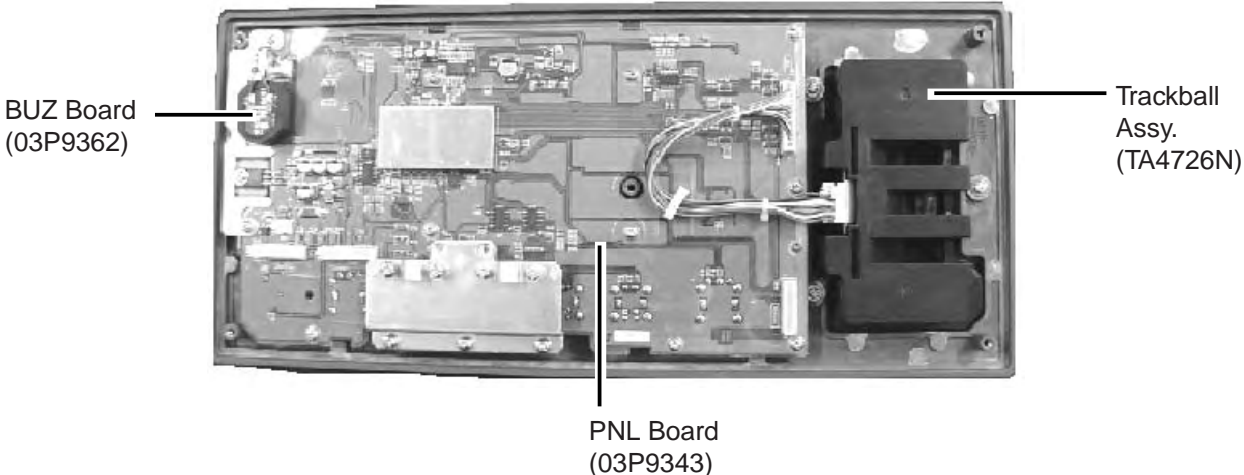
PRINTED CIRCUIT BOARD	Code No.
OZP-120-12/15-J06	-
26P0023 (PSW board)	-
ESSIP33A-1C (AD board)	-
26P0013	-
LCD	Code No.
LQ190E1LX51, 26S0027	-
FAN	Code No.
MFB52A-12HA-001, 26S0028 (FAN1)	-
LQ0DDB0094, 26S0048 (FAN4)	-

A9.2 Parts Location

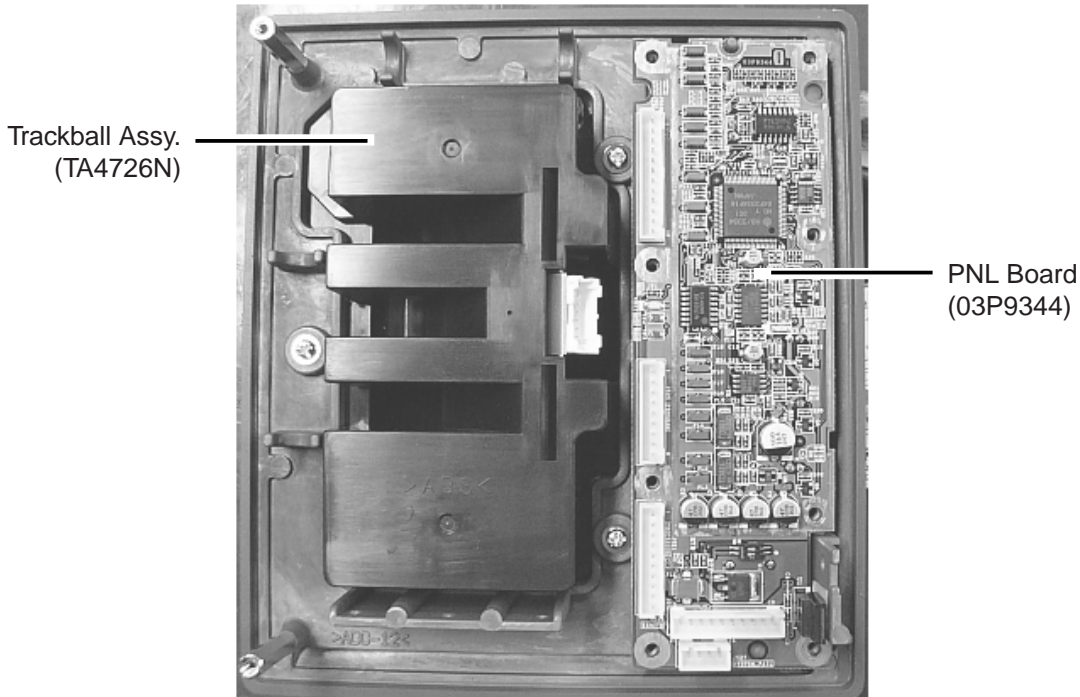
A9.2.1 Chart processor unit EC-1000C



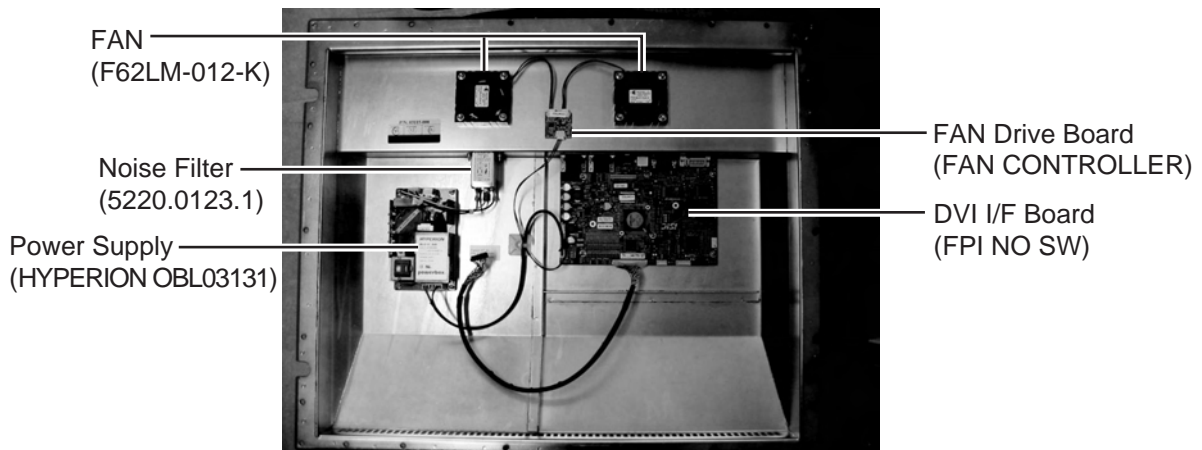
A9.2.2 Control unit RCU-018



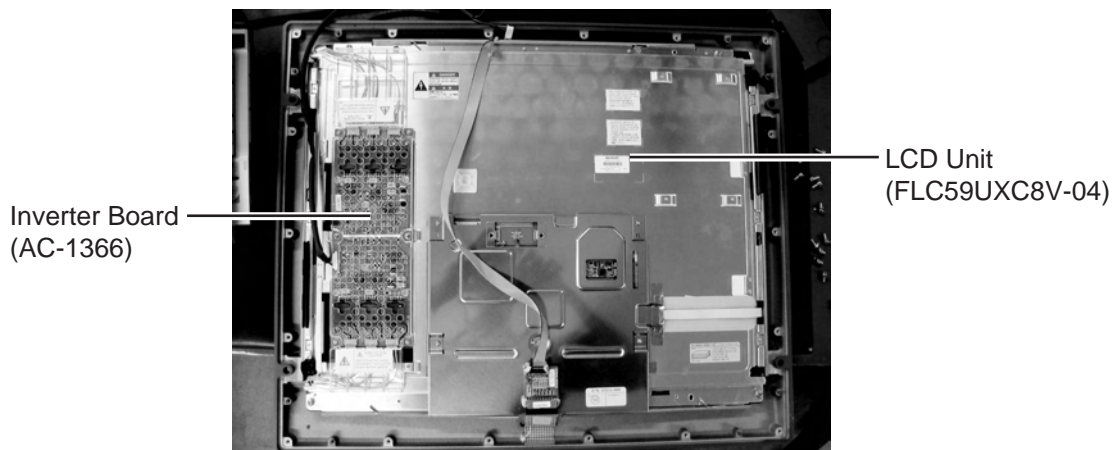
A9.2.3 Control unit RCU-015



A9.2.4 Monitor unit MU-231CE

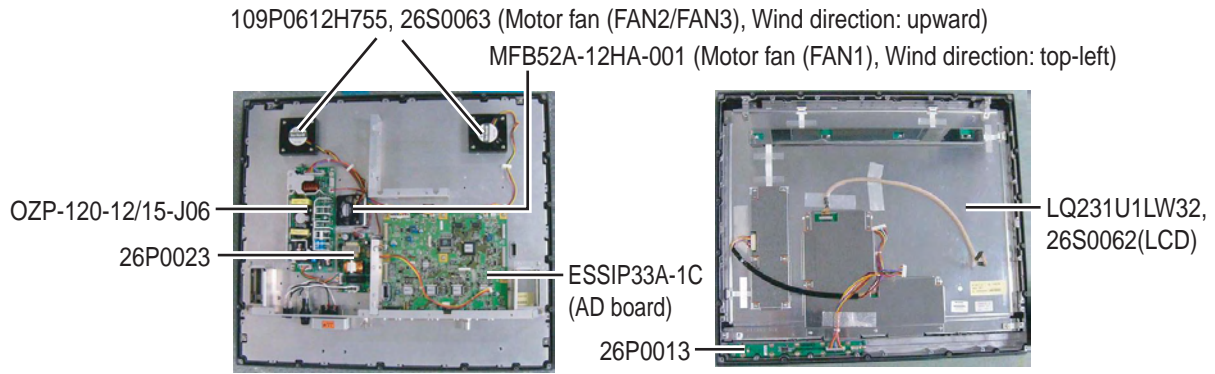


Display unit MU-231CE, inside rear cover



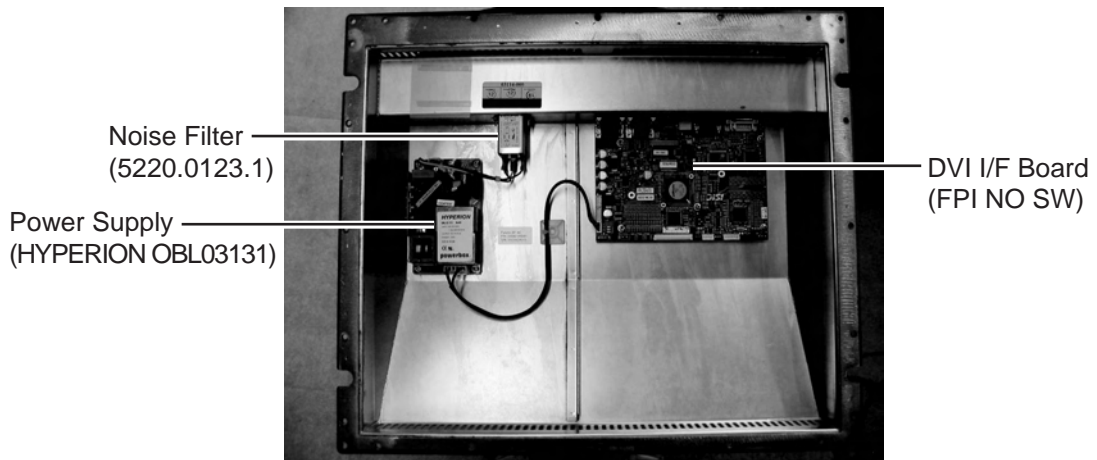
Monitor unit MU-231CE, rear cover removed

A9.2.5 Monitor unit MU-231

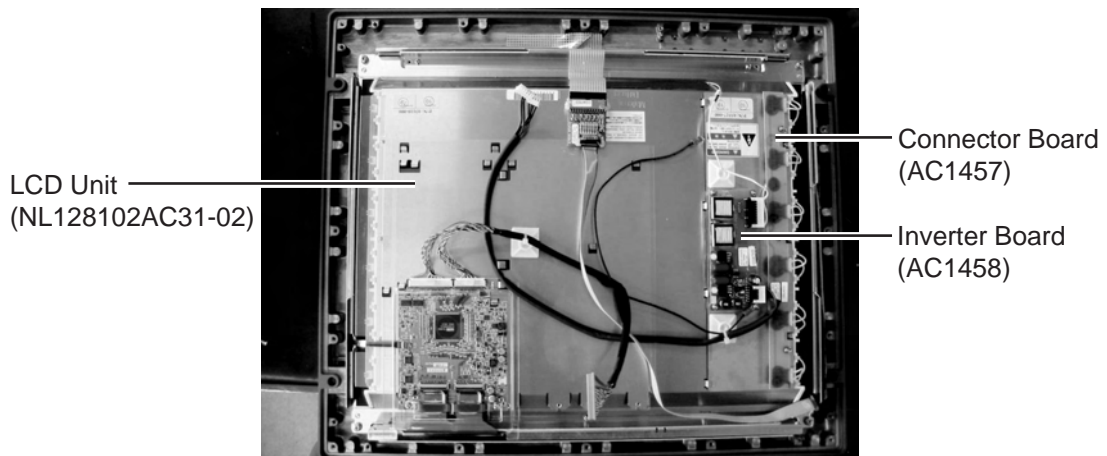


Monitor unit MU-231

A9.2.6 Monitor unit MU-201CE

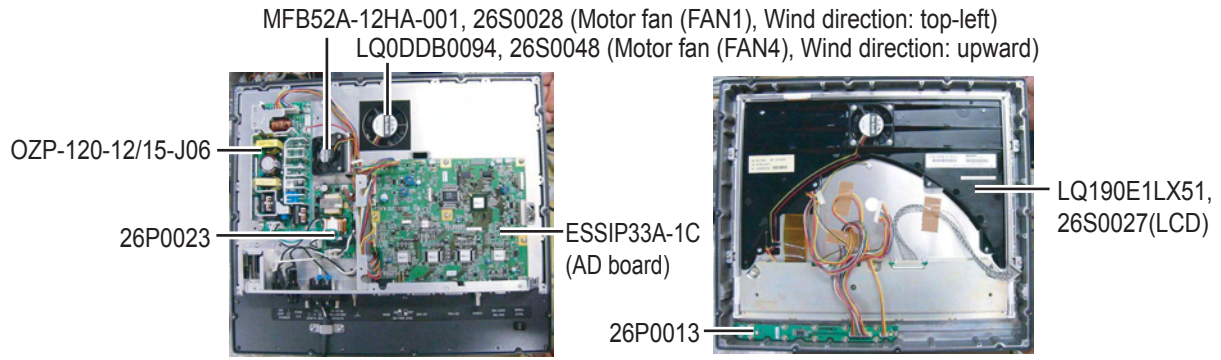


Monitor unit MU-201CE, inside rear cover



Monitor unit MU-201CE, rear cover removed

A9.2.7 Monitor unit MU-190



Monitor unit MU-190

**SPECIFICATIONS OF
ELECTRONIC CHART DISPLAY AND INFORMATION SYSTEM (ECDIS)
FEA-2107/FEA-2107-BB/ /FEA-2807**

1. General

This equipment is designed with up-date computer technology to comply the IMO/IHO performance standards for Electronic Chart Display and Information System (ECDIS). It displays selected information from SENC* with positional information from navigation sensors to assist the operator in route planning and route monitoring, and indicates additional navigation-related information.

This ECDIS series is mainly comprised of

- 1) ECDIS Processor
- 2) Control Unit (type according to system configuration)
- 3) 19-inch, 21.1-inch or 23.1-inch Monitor (monitor is supplied locally in case of FEA-2107-BB)
- 4) LAN Adapter (serial signal interface), and
- 5) ECDIS B Adapter (analog signal interface, option)

One single ECDIS processor can be used for both route planning and route monitoring. An additional identical ECDIS processor, which is used for route planning, can be separately installed to fulfill backup arrangements for replacing of the paper charts. It will be connected to the principal Processor with Local Area Network (LAN) of ETHERNET type.

2. Display Unit Characteristics

Type:	FEA-2107: Type MU-201CE, 21.1-inch LCD, Type MU-190, 19-inch LCD FEA-2807: Type MU-231CE, 23.1-inch LCD, Type MU-231, 23.1-inch LCD
Pixel:	MU-190: 1280x1024 pixel (SXGA) MU-201CE: 1280X1024 pixel (SXGA) MU-231CE/MU-231: 1600x1200 (USGA)
Video Input	Analog RGB signal, 0.7Vpp, 75 ohm Separate sync or sync on green horizontal sync signal: 15-100 Hz (auto) vertical sync signal: 30-100 Hz (up to 1280x1024) 30-60 Hz (up to 1600x1200)
DVI-D/I	1 channel, pixel clock 25-162 MHz
Control I/O	RS-232C D-sub 9-pin, 19.2 Kbps
RS485	2 x D-sub 9-pin daisy chain, 19.2 Kbps

3. Display Items

Chart materials:	- IHO/IMO S57 edition-3 ENC vectorized material - BAARCS rasterized material - C-MAP CM-93/2 vectorized material
Own Ship Display:	Own ship mark and numeral indication or lat/lon, speed and course
ARPA Target Display:	Range, bearing, speed, course, CPA and TCPA of selected ARPA radar target
Radar Overlay Picture:	Option, under development

Others:	Own ship position in lat/lon, speed, course, waypoint information, route monitoring Information, chart Information in use, several alarm Information
4. Display Mode	True motion north up, True motion, course up, Relative motion north up, Relative motion course up, Relative motion head up Relative motion route up
5. Other Display Features	<ul style="list-style-type: none">- Chart zoom in and zoom out- EBL, VRM, parallel cursor- One touch activation of standard display- Selection of symbol, etc.- Electronic chart update- AIS safety message- Navtex message- AIS own ship info
6. User Chart	<ul style="list-style-type: none">- User chart creation (max. 2000 lines, max 1000 symbols)- User chart overlaid on electronic map- User chart may be transferred to radar screen
7. Position Calculation	<ul style="list-style-type: none">- Navigation by results of positioning found with external sensor- Dead reckoning with gyro and log- Highly accurate position with combination of gyro, log, external Sensor and Kalman filter
8. Navigation Planning	<ul style="list-style-type: none">- Planning by Rhumb line, Great circle- Route creation- Route data may be transferred to radar
9. Automatic Navigation	<ul style="list-style-type: none">- Automatic navigation with Trackpilot (option)
10. Route Monitoring	<ul style="list-style-type: none">- Off-track display- Waypoint arrival alarm- Shallow depth alarm
11. Navigation Recording	<ul style="list-style-type: none">- Latest 12 hours of navigation data may be recorded (time, position, position correction value, bearing, speed, etc.)
12. Pilot Data	<ul style="list-style-type: none">- Creation and display of pilot data- Pilot data may be transferred to radar (radar must be able to display such data)
13. Other Features	<ul style="list-style-type: none">- MOB (Man Overboard) (Position, etc. at time of man overboard are recorded and MOB mark is displayed on the screen)
14. Data I/O Interface	<u>Standard interface</u> <ul style="list-style-type: none">- Gyro interface: serial data (IEC 61162-1 HDT)- Speed log: serial data (IEC 61162-1 VBW)- Position sensor: serial data (IEC 61162-1(or 2) GLL, VTG, ZDA) GPS, DGPS, Lora C, etc., two units)- Radar: ARPA, two units- Alarm output: Relay contact signal (Short: alarm generated)

Optional interface

- Gyrocompass: analog signal (synchro or step)
- Speed log: analog signal (200 p/m)
- Navigational echosounder: serial data (IEC 61162-1 DBT)
- Wind indicator: serial data (IEC 61162-1 MWV)
- Position sensor: serial data
- 2 lines of alarm output, alarm output selection

15. Power Supply

Display unit	MU-190: 100-230 VAC, single phase, 50-60 Hz, 0.7-0.4A MU201CE: 100-230 VAC, single phase, 50-60 Hz, 0.6-0.4A MU-231/MU231CE: 100-230 VAC, single phase, 50-60 Hz, 0.6-0.4A
Processor unit, control unit	100-230 VAC, single phase, 50-60 Hz, 1.5-0.5A
LAN adapter	24 VDC, 0.15 A
B adapter	24 VDC, 0.20 A

16. Environmental Conditions

Useable temperature	Control unit/processor unit/display unit: -15°C to +55°C
Relative humidity	93% ±3% (+40°C)
Vibration	- From 2 Hz-5 Hz to up to 13.2 Hz: ±1 mm ±10% - 13.2Hz-100Hz: max velocity 7 m/s ²
Waterproofing	Display unit: IXPS Processor unit: IPX0 Other units: IPX0

17. Color

Display unit: N3.0 Newton No. 5
Chassis: 2.5GY5/1.5
Processor unit: 2.5GY5

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Declaration of Conformity



0735

We **FURUNO ELECTRIC CO., LTD.**

(Manufacturer)

9-52 Ashihara-Cho, Nishinomiya City, 662-8580, Hyogo, Japan

(Address)

declare under our sole responsibility that the product

ELECTRONIC CHART DISPLAY AND INFORMATION SYSTEM FEA-2107, FEA-2107-BB and FEA-2807

(Model name, type number)

to which this declaration relates conforms to the following standard(s) or normative document(s)

IMO Resolution A.694(17)	IEC 61174 Ed. 3.0: 2008
IMO Resolution MSC.232(82)	IEC 62288 Ed. 1.0: 2008
IMO Resolution MSC.191(79)	IEC 60945 Ed. 4.0: 2002
IMO Resolution MSC.97(73)-(HSC-Code 2000)13	IEC 61162-1 Ed. 4.0: 2010
	IEC 61162-2 Ed. 1.0: 1998
	IEC 61993-2 Ed. 1.0: 2001

(title and/or number and date of issue of the standard(s) or other normative document(s))

For assessment, see

- EC Type Examination (Module B) Certificate No. BSH/4612/4301921/11 issued by Federal Maritime and Hydrographic Agency (BSH), The Federal Republic of Germany.
- EC Quality System (Module D) Certificate No. BSH/4613/02206/1602/10 issued by Federal Maritime and Hydrographic Agency (BSH), The Federal Republic of Germany.

This declaration is issued according to the provisions of European Council Directive 96/98/EC on marine equipment modified by Commission Directive 2009/26/EC and 2010/68/EC.

On behalf of Furuno Electric Co., Ltd.

Takahiko Kusuda
Manager, QMS Secretariat
Quality Assurance Department

Nishinomiya City, Japan
August 2, 2011

(Place and date of issue)

(name and signature or equivalent marking of authorized person)