



1832150102

**OPERATOR'S MANUAL**

**SIMRAD**

**CP31/CX33**

Chartplotter

183-2150-102

06354.20

English

### **Important information and warnings!**

To activate the MOB 'MAN OVERBOARD' function, press and hold the [MOB] key for 2 seconds (further information on page III).

Insert or remove C-MAP cartridges ONLY through SETUP menu or when unit is off.

All electronic navigation equipment is subject to external factors beyond the control of the manufacturer. Therefore such equipment must be regarded as an aid to navigation. The prudent navigator will, for that reason, never rely on a single source for position fixing and navigation.

## About this manual

The technical data, information and illustrations contained in this publication were to the best of our knowledge correct at the time of going to print.


We reserve the right to change specifications, equipment, installation and maintenance instructions without notice as part of our policy of continuous development and improvement. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form, electronic or otherwise without prior permission from Simrad AS. No liability can be accepted for any inaccuracies or omissions in the publication, although every care has been taken to make it as complete and accurate as possible.

This manual combines operating and installation information on the models listed below. All models have the same keypad layout, but their function may not be accessible in all models. We recommend that you familiarise yourself with the information pertaining to the product that you have purchased prior to installation or use. This will facilitate full understanding of the many operating features and ensure straightforward installation.

<b>Features</b>	<b>CP31</b>	<b>CX33</b>	<b>CX33-E</b>
Chartplotter	•	•	•
SDGPS	•	•	•
Echosounder		Optional	•
Display	6" TFT color	6" TFT color	6" TFT color
	* Acrylic front lens	Front glass with bonded display	Front glass with bonded display
*) Certain conditions may cause temporary condensation built-up on the inner side of the display.			

## MOB 'MAN OVERBOARD' function

- MOB** In case someone falls overboard, press the [MOB] key and hold for 2 seconds (or activate an external MOB switch - hold for 5 seconds).
- CLR** Press [CLR] to confirm and reset the alarm if activated by mistake.
- ENT** Press [ENT] to make all relevant data available for an efficient rescue operation:

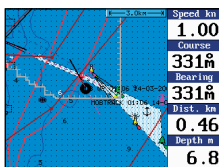
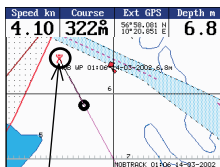
**MOB Page 1:** The Chart 1 display will provide a graphical impression of a man  floating in the water at the MOB position together with a course line from actual position to the incident. The data field (if activated) will provide information of: current speed, course, bearing, distance to MOB position, and current depth.

**PAGE MOB Page 2:** The Chart 2 display will appear with the same type of information as MOB Page 1.

**PAGE MOB Page 3:** Data display will provide information of: Course, Bearing and Distance to MOB position, time elapsed since the incident occurred - first in seconds and then in minutes - if “\*” is shown instead of numbers of minutes, means that the elapsed time has exceeded 9999 minutes. The two lines after the TIME shows the MOB position in Lat/Long.

**PAGE MOB Page 4:** Data display will provide information of: Date, time and position of MOB incident.

**PAGE** *Toggle between the four pages:*



MAN OVERBOARD	
C296.0	B 296.0
DIST 0.00nm	
TIME 5min	
MOB 56°57.415N	
POS 10°23.902E	
Stop MOB: GOTO 3	

MAN OVERBOARD	
DATE	30-08-2004
TIME	08:17:30
MOB	56°57.415N
POS	10°23.902E



### To turn MOB navigation off (two ways):

Either press [GOTO], [3] or... press [MENU], [4], [2].

To recall last MOB position, see section 9.4.

## Sections

- 1 Product introduction and short description of how to use this manual. Safety warnings. How to get started, including: Dedicated function keys and short description of common functions.
- 2 System description. Overview of key functions and menu layout. Initial start-up. Turn power on/off.
- 3 Chart operation. List of info windows. GOTO menu with start of navigation modes. PLOT menu with choice of plotting and inserting waypoints, routes, lines, etc. Starting and stopping a track trailing the ship when sailing out and use as safe return route. Chart setup of chart and C-MAP functions - go to Appendix C for more information on C-MAP attributes.
- 4 Position menu. Describes different ways of obtaining a reliable position. Information of various positioning systems and how accurate they are. Speed diagram and Dual Speed display.
- 5 Waypoint / route menu. Read where to find (and maybe edit) all the waypoints, routes, tracks, lines and targets stored in the internal memory and how to make new routes from the waypoints in the waypoint list.
- 6 Pilot menu & navigation examples describe what information is available during navigation and setting anchor.
- 7 The ECHO menu and its related functions are only for CX33-E, except section 7.10 'Depth & temperature diagram' which applies to all the models i.e. CP31, CX33 and CX33-E.
- 8 The engine menu will provide a graphical engine monitoring system, which is compatible with engines outputting data via NMEA2000®.
- 9 Miscellaneous menu is where you will find special features, together with 'Data transfer' to/from a PC-Planner, via NMEA interface or transfer data to store on a DataCard for safekeeping.
- 10 Setup menu is where you set up parameters, return do default settings and check out the interface connections, including SimNet control.
- 11 Installation - how to physically install boxes, cables, transducers and other devices. Check for troubleshooting and specifications.

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## I.1 Introduction and system familiarization

Congratulations on your purchase of **SIMRAD CP31/CX33 Chartplotter / CX33-E Chartplotter with Echosounder** - a combination of the latest GPS and SDGPS receiver technology and detailed cartography, plus: the CX33-E model also features a high performance echosounder; all in a unique slim-line design with a bright 6" TFT color display.

The **chart system** includes a built-in world chart for rough planning and overview. The choice of chart system best suitable for Simrad's Chartplotters was carefully singled out to be the C-MAP mini cards NT+ or NT MAX. The optional C-cards are available world-wide at your local Simrad dealer.

The **Global Positioning System** is at this time and age the most common system used for navigation and positioning all over the world. Not only for maritime use, but also for land-based applications and aviation. The satellite-based system has been developed and is operated by the US Department of Defense in order to provide an accurate and reliable service, which include a 24-hour global coverage.

The GPS system consists of approx. 24 satellites which orbit around the Earth at an altitude of approx. 20,200 km.

The satellites transmit perfectly synchronized data. However, depending on the position, the signals will reach the receiver at a slightly different time. By adding the measured time difference to the known position of the satellites it is possible to calculate the ship's position to within a few meters.

The **SimNet** data and control network provides high speed data transfer and control between Simrad products that are integrated as a total navigation, steering and communication system on board.






The **echosounder system (CX33-E)** with selectable frequencies will provide an impression of Bottom expansion, VRM expansion, A-scope and White line.

**DS33-CX Dual Station** for the CP31/CX33/CX33-E is available with a 6" bright TFT color display. The main unit and the dual station are identical in design and operation.

**How to use this manual?** It is a good idea to make yourself familiar with the key functions, menu structure and rotation of pages (screens) described in chapter 2 before you start out, and then proceed with section 2.7 Initial start-up. For quick location of a certain term, please check the "Glossary of terms" and the "Index" at the back of the manual. Also, "How to get started" further on in this chapter will give you a quick introduction to some of the many features you have access to.


The display examples shown in this manual are not always an exact copy of what you will see on the screen, as the presentation depends on your system configuration and choices of setup.

How to interpret special marked key symbols etc. in the manual:

-  Either the + (plus) or - (minus) key may be applied.
-  Alpha-numeric keys for insertion of figures.
-  Alpha-numeric keys for insertion of letters.
-  Emphasizes important points.
-  Indicates that you should press the keys [2] and [3] to obtain what is written in *italic* next to the key.

## 1.2 Safety summary

**Precaution:** Do not open the equipment, only qualified persons should work inside the equipment. If the glass in the screen breaks, be carefull not to cut yourself on the sharp edges of the glass pieces.

 The lifetime of the internal battery is minimum 5 years. **If not exchanged before it goes flat, all data in the unit's memory will be lost.** We strongly recommend that you frequently store your data on a Simrad DataCard. For exchange of battery, call your local Simrad workshop.

**Power source, fuse and power cable:** Check that the DC power supplied to the unit is within the range of 10 to 32 volts. Note that the appropriate fuse must be employed (see the fuse rating in section 11.12 Specifications). Ensure that the power cord is firmly attached.

**Grounding:** To reduce electrical interference and risk of electrical shock, properly ground the unit to the ship's ground using the ground screw at the rear of the unit. Good grounding should also be exercised for any equipment connected to the CP31/CX33/CX33-E.

**Cleaning:** Do not use any kind of strong solvents e.g. spirit, alcohol, gasoline or oils.

**Software:** The software version of the main unit (see start-up display) should always be informed in a service situation.

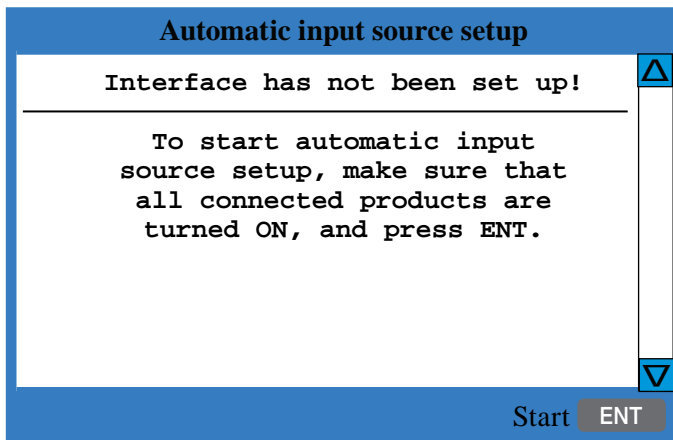
## I.3 How to get started

When starting up for the very first time, the first time after loading a new software or after a master reset: Make sure that all hardware installation and electrical connections are completed in accordance to the installation instructions.

**PWR**

*Press and hold the [PWR] key until you have a picture on the screen*

The system will perform a software update and check for communication activity. When finished, a new start-up window will be presented on the screen:



After making sure that all connected products are turned ON:

**ENT**

*Press [ENT] to start automatic input source setup, - if a new product is connected later on, refer to section 10.5 Interface setup.*

New window: Automatic input source setup listing Data type, Group and Source of connected units.

**ENT**

*Press [ENT] to continue*

**ENT**

*Press the [ENT] key to accept warning when the system is ready - go to [MENU], [8], [2] if you wish to make adjustments to the interface setup.*



Heading is only available if a compass was detected at start-up.

Your present position will automatically be updated within a few minutes. When ready, the ship symbol on the chart will flash, the position coordinates will stop flashing, and the \*\*\* will be replaced by actual course and speed figures.

### 1.3.1 Dedicated function keys

**CHART** Short press will toggle between:

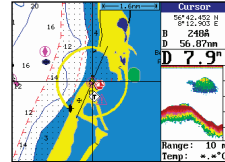
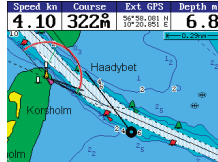
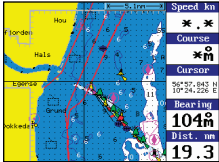


Chart + data field at the right side or top, or... sounder field (CX33-E).

**CHART** Long press will toggle between:

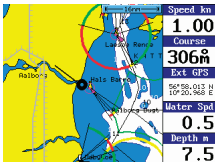


Chart 1

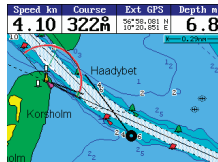
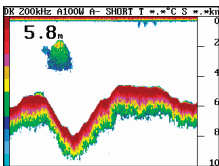
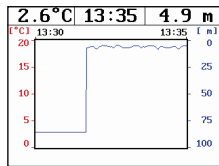


Chart 2

**ECHO** Short press will call up Echo50/200kHz or Depth & temp. diagram:

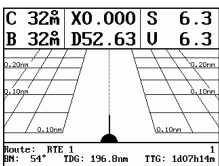


CX33-E

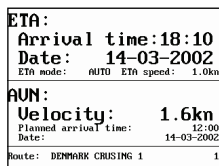


CP31/CX33

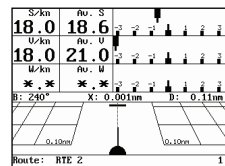
**PILOT** Short press will toggle between:



Highway



ETA & AVN



Trim & highway

**PAGE** Press the [PAGE] key to toggle between four user-selectable pages.

### 1.3.2 Chart and chart functions

**CHART** Press the [CHART] key to call up Chart 1  
- see chart examples in section 1.3.1.

#### C-MAP cartridges (standby)

Press [MENU], [8], [CHART] whenever inserting or removing a C-MAP card.

#### Select and adjust chart range

Press one of the numeric keys 1 - 9 to select a range (and chart level).

Key **9** will select the largest range and key **1** the smallest. Use the +/- keys to adjust range in smaller steps.

#### Cursor and info windows

Press the cursor key to activate the cross hair cursor on the chart. Place the cursor on a C-MAP object e.g. a buoy or light to call up a small data window with details on the object. The data window will stay on screen for about 10 seconds or till cursor is moved. Press [ENT], [2] to access further details on C-MAP objects or user data i.e. waypoints, routes, etc.

Press [CLR] to switch off cursor function. The ship symbol will now automatically 'home' and stay on screen.

#### Find nearest tide station and port services

1. Press cursor key (to activate)
2. Press [ENT], [3]
3. Move cursor up/down to select e.g. the Port/Marina symbol
4. Locate alternative port with the +/- keys, and press [ENT]
5. Press [ENT], [2] for more details on the facilities at the selected port.

#### Navigate to cursor (point and go)

1. Move the cursor to where you wish to go (first point)
2. Press [GOTO], [1] to start navigation.
3. You can now move the cursor to the next point and when ready to change leg, just press [GOTO], [2].

#### How to plot or insert waypoints and marks

- With cursor OFF (press [CLR])

Press [PLOT] and choose from:

[PLOT] Plot ship's position as mark.

- [1] Insert ship's position. You can change the lat/lon figures, the symbol and the symbol's size and color.

- [3] Insert specific waypoint. Suggested name, symbol, etc. can be altered.
- [6] Plot ship's position as target.

• With cursor activated on the chart you also have access to:

- [2] Plot waypoint - cursor position.
- [6] Plot cursor position as target.

### **How to make a route on the chart**

1. Place the cursor on the position for the first routepoint.
2. Press [PLOT], [4]: Make route.
3. Move cursor to next destination and press [PLOT] - (repeat).
4. Press [ENT] when ready to save the route. You can enter a new name for the route, change type and color for the course line.
5. Press [ENT] to accept and save the route.

### **How to make a route from existing waypoints stored in the WP list**

1. Press [MENU], [3], [2] to call up the route list.
2. Press [CLR] Make new route from WP list.
3. Move cursor up/down to select the WP position for the first routepoint, and press [PLOT].
4. Repeat point 3 to add new WP positions to the route (the last routepoint in the right column is always empty, allowing that a new final routepoint can be added later on).
5. When the route is completed, press [ENT] to accept and go to Edit route.
6. In the Edit route display, you can give the route a new name, change type and color for the course line, etc.
7. Press [ENT] to accept changes and save the route.
8. Press [MENU] to go to the route list, which will provide an overall view of the total of routes stored in the CP31/CX33/CX33-E.

### **How to edit a route - rubberbanding**

• To move a point:

1. Place cursor on the point you wish to move.
2. Press [ENT], [1], [2].
3. Move cursor to new location.
4. Press [ENT] to complete.

• To insert a new point:

1. Place cursor on the leg where the new point is to be inserted.
2. Press [ENT], [1], [2].
3. Move cursor to where the new routepoint is to be placed.
4. Press [ENT] to complete.

**How to start waypoint navigation (two ways)**

- Place cursor on the symbol of the WP you wish to go to:
  1. Press [GOTO], [2].
  2. Press [ENT] to start navigation.
- Without placing cursor on the symbol of the WP you wish to go to:
  1. Press [GOTO], [2].
  2. Use the +/- keys to select the WP you wish to go to.
  3. Press [ENT] to start navigation.

**How to start route navigation (two ways)**

- Place cursor on the routepoint you wish to go to first:
  1. Press [GOTO], [3].
  2. Select direction in route: Forward or Reverse.
  3. Press [ENT] to start navigation.
- Without placing cursor on the routepoint you wish to go to first:
  1. Press [GOTO], [3].
  2. Use the +/- keys to select the name of the route.
  3. Use the cursor to go to routepoint number, and select which one you wish to go to first by means of the +/- keys.
  4. Select direction in route: Forward or Reverse.
  5. Press [ENT] to start navigation.

**Advance or stop navigation**

- Press [GOTO], [1] to advance to next point in the route.
- Press [GOTO], [3] to stop navigation.

**Start and stop track**

1. Press [PLOT], [7].
2. Before tracking is started, you can give the track a new name, make changes to track interval, track line type and color.
3. Press [ENT] to start track.
4. When you wish to stop tracking, press [PLOT], [8], [ENT].

### 1.3.3 Echosounder / Fishfinder (CX33-E)

**ECHO**

*Press the [ECHO] key to call the echosounder display  
- see display examples in section 1.3.1.*

**Select and adjust echosounder range**

Press one of the numeric keys 1 - 9 to select a fixed range. Key **9** will select the largest range and key **1** the smallest. Use the +/- keys to adjust range in smaller steps. Key 0 will select Auto Range.

**A-scope** - Press [ENT], [2] to toggle A-scope on/off. The strength of the actual echo is indicated by both width and color intensity.

**Change frequency** - Press [ENT], [1] to toggle between 50 and 200 kHz.

**Gain** - Adjust gain with cursor left/right to just below the point where you begin to see speckles of 'noise' on the screen.

**Bottom lock display\*** - Press [ENT], [4] Bottom lock is a combination of standard echo display and extended area around the bottom.

**Zoom display\*** - Press [ENT], [5] The expansion is a combination of standard echo display and extended area around the VRM - Variable Range Marker.

**Shift display\*** - Press [ENT], [6] when operating in deep waters. Select the range for an expansion window. The expansion window can automatically follow a changing bottom or be set manually by the +/- keys.

\*Return to standard echosounder display by pressing [ENT], [3].

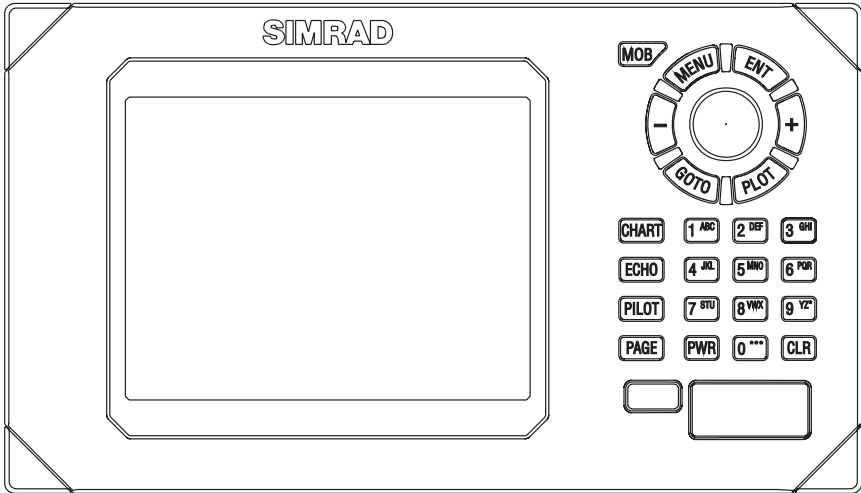
**Transmit power off** - Press [ENT], [ECHO] to stop transmission in order to observe noise picked up by the transducer or reduce power consumption.

**Echo setup** (presentation) - Press [ENT], [9] to access the setup display for either 50 or 200 kHz. Press [ENT] to confirm changes, or leave the setup without having made any changes by pressing [MENU].

**Echosounder setup** - Press [MENU], [8], [ECHO] when you need to make any general settings, selecting a transducer or selecting demo mode etc.

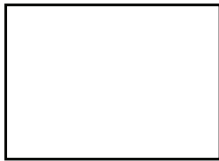


## 2. Fundamentals & initial start-up

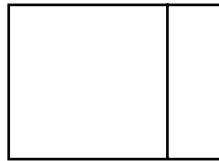


### 2.1 Fundamentals of the display and page system

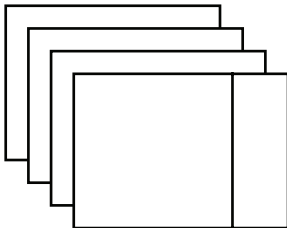
The CP31/CX33/CX33-E has a multi-function screen and data presentation system with full screen or a split screen with chart and data.



Full screen.



Split screen.



There are four preset pages which can be set up to the presentation you prefer - see next page.

**Toggle between the four pre-set pages manually:**

**PAGE** Press the [PAGE] key - again and again - to toggle between the 4 pre-set pages, which as default are: Chart 1 with info field, Position, Highway, Depth & temperature diagram or Echo 200kHz (CX33-E) displays.

The pre-set pages can also be toggled from an external switch - refer to section 11.7 Optional connections.

**Toggle between the four pre-set pages automatically:**

**PAGE** Hold the [PAGE] key depressed for two seconds to start a rotation of the 4 pages in intervals of 5 seconds - this interval can be changed, refer to section 10.4. Press [PAGE] again to return to normal operation.

**Example of how to change a pre-set page:**

For instance, if you are in the process of making a track, you may want to exchange the Highway display with the Tracking display.

**PAGE** *Press the [PAGE] key until the Highway display appears*

**MENU** *Call up the menu bar, and...*


**3,5** *then call up the Tracking display*



The same display can be selected for view in more than one page if it is selected via the menu. The hotkeys: [CHART], [ECHO] and [PILOT] will jump to the page with the desired display - if it's there, and if it's not: it will be exchanged with the display in the active page.

## 2.2 Key functions

Some of the key functions are general and can be applied at any time, other key functions are related to a certain menu(s) and can only be applied when in the appropriate menu.

- CHART** Hotkey to Chart 1 display. Toggles between chart display and split screen with chart and data. Hold for 2 seconds to change to Chart 2.
- ECHO** Hotkey to Depth & temperature display or Echo (CX33-E) display.
- PILOT** Hotkey to Highway display. Toggles between Highway, ETA & AVN, Trim & highway displays.
- PAGE** Toggles between four pre-selected pages (screens). Hold 2 seconds for automatic rotation of the four pre-selected pages. A new, single press will resume normal operation.
- MENU** Turns the menu bar on/off. Exits any data display without taking any action.
- ENT** Opens for/confirms insertion and editing of data. Calls up information on marks, waypoints, etc. on chart together with several INFO windows. Gives access to setup displays.
-  Moves cursor in data displays and charts + activates cursor on chart. Moves left/right/up/down in the menu system. Additional for CX33-E: Adjusts gain (left/right) and moves VRM (up/down) in echo display.
- MOB** Hold 2 seconds to activate the MOB - “Man overboard” function, which starts a track and provides guidance back to the MOB position.
- GOTO** Activates GOTO menu with choice of navigation modes.
- PLOT** Activates PLOT menu with choice of plotting and inserting waypoints, routes, lines etc. together with starting or stopping a track of own ship.
- +/-** Changes chart or echosounder (CX33-E) range i.e. + (plus) zooms out for better overview (larger range) and - (minus) zooms in for greater chart details (smaller range). Toggles between available values.

**0-9** The alpha-numeric keys inserts and selects data in data displays. Keys 1-9 are also Quick-range keys, which each represent a fixed chart range or echosounder (CX33-E) range. Key 0 will center the cursor/ship on the chart or activate auto range in sounder mode (CX33-E).

**CLR** Turns cursor off (and centers ship) on chart display. Deletes data in enter or edit mode.

**PWR** Power on - hold key depressed till you have a picture on the screen. Calls up a window where you can adjust the brightness in the screen, background light in keypad, and select Daylight displays, Night display or custom made color palettes. Hold 2 seconds to turn the power off.

## 2.3 Menu bar

**MENU** *Toggles the menu bar on/off*

To fit the complete menu bar across the screen, some of the menus have been abbreviated. However, the last selected menu will be highlighted, and if it's an abbreviation of the menu, then the complete menu title is written above the menu bar.

PILOT							
<b>1</b> CHART	<b>2</b> POS	<b>3</b> WP/RTE	<b>4</b> PILOT	<b>5</b> ECHO	<b>6</b> ENG	<b>7</b> MISC	<b>8</b> SETUP
			<b>1</b> Highway				
			<b>2</b> Waypoint navigation, etc.				

Having selected e.g. 4:PILOT from the menu bar, its associated menus will drop down. Key in the number next to the function you wish to call forward, or use the cursor key to highlight the function and press [ENT].

If you want to switch to a different menu, use the cursor key left/right to move to the adjacent menu.

Most functions in the menus are general, and can be called forward at any time. Inactive functions in the menu will have a different color (normally preset red) from the rest of the functions.

The menu bar will disappear from the screen at the selection of a function, or by pressing the [MENU] key. Besides, if not used, it automatically turns off after 30 seconds.

## 2.4 Menu layout

<div style="text-align: center;">1</div> <div style="text-align: center;">CHART</div>	<div style="text-align: center;">2</div> <div style="text-align: center;">POS</div>	<div style="text-align: center;">3</div> <div style="text-align: center;">WP/RTE</div>
<div style="text-align: center;">1</div> Chart 1 1:26400000 <div style="text-align: center;">2</div> Chart 2 1:6600000	<div style="text-align: center;">1</div> Position <div style="text-align: center;">2</div> Dual speed <div style="text-align: center;">3</div> Speed, course & depth <div style="text-align: center;">4</div> Speed diagram <div style="text-align: center;">5</div> Satellites <div style="text-align: center;">6</div> SDGPS	<div style="text-align: center;">1</div> Waypoints <div style="text-align: center;">2</div> Routes <div style="text-align: center;">3</div> Route calculation <div style="text-align: center;">4</div> Lines <div style="text-align: center;">5</div> Tracks <div style="text-align: center;">6</div> Targets

The PILOT menu is dynamic and will adapt to the function which is currently active - see below.

<div style="text-align: center;">4</div> <div style="text-align: center;">PILOT</div>
<div style="text-align: center;">1</div> Highway <div style="text-align: center;">2</div> Waypoint navigation <div style="text-align: center;">3</div> Route navigation <div style="text-align: center;">4</div> Track navigation <div style="text-align: center;">5</div> Anchor guard <div style="text-align: center;">6</div> Trim & Highway <div style="text-align: center;">7</div> Set & Drift

<div style="text-align: center;">4</div> <div style="text-align: center;">PILOT</div>
<div style="text-align: center;">1</div> Highway <div style="text-align: center;">2</div> Stop navigation <div style="text-align: center;">3</div> WP advance <div style="text-align: center;">4</div> Restart to approaching point <div style="text-align: center;">5</div> ETA & AVN <div style="text-align: center;">6</div> Trim & Highway <div style="text-align: center;">7</div> Set & Drift

When this PILOT menu appears, then one of the Navigation modes is active.

5 ECHO	6 ENG	7 MISC
<p>1 Echo 50kHz (CX33-E)</p> <p>2 Echo 200kHz (CX33-E)</p> <p>3 Depth &amp; temperature diagram</p> <p><b>CP31:</b></p> <p>1 Depth &amp; temperature diagram</p>	<p>1 Engine status</p> <p>2 Fuel and transmission</p> <p>3 Battery status</p> <p>4 2nd Engine status</p> <p>5 2nd Fuel and transmission</p> <p>6 2nd Battery status</p>	<p>1 Wind</p> <p>2 Decca lanes</p> <p>3 Loran C</p> <p>4 MOB data</p> <p>5 DSC info</p> <p>6 Data transfer</p>




















8 SETUP
<p><b>CHART</b> C-MAP cartridge</p> <p><b>ECHO</b> Echosounder setup (CX33-E)</p> <p><b>PILOT</b> Pilot/Position setup</p> <p>1 Speed alarm, units &amp; language</p> <p>2 Interface setup</p> <p>3 Palette setup</p> <p>4 Factory settings</p>

When selecting a sub-menu in the SETUP menu, the display will always appear in a pop-up window, so once you have accepted the changes / or decide to just exit the display, then the display will disappear from the screen.

It will not stay on as part of the page system, as you have no use for this type of display in the page system.

## 2.5 Choice of symbols

Waypoints and other points appearing on the screen can be marked by one of 18 symbols + 8 event marks in small or large symbols:

	Waypoint		Beacon		Marker		Starboard
	Red buoy		Fish		North		Port
	Green buoy		Platform		South		MOB
	Wreck		Rock awash		East		EVENT 4 (1 of 8 types in diamond shape)
	Danger		Harbour		West		

## 2.6 Naming of routes, points etc.

First select the key with the desired letter, then you can either repeat the keystrokes, which will toggle between e.g. A,B,C,1, or once you have selected one letter you can go back and forth in the alphabet by means of the +/- keys. Use the cursor key to go to next space or to go back one space if you make a mistake.

Depending on the selected language, the 0 (zero) key will hold special characters e.g. Æ Ø Å Ä Ö Ü Ñ, and the 9 (nine) key will hold: (empty space) . -

Press the [CLR] key to delete everything from cursor position and to the right of cursor in that row.

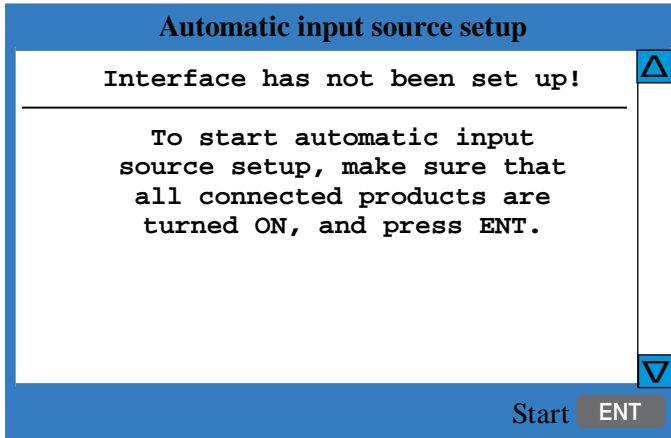
## 2.7 Initial start-up

When starting up for the very first time, the first time after loading a new software or after a master reset: Make sure that all hardware installation and electrical connections are completed in accordance to the installation instructions.

**PWR**

*Press and hold the [PWR] key until you have a picture on the screen*

The system will perform a software update and check for communication activity. When finished, a new start-up window will be presented on the screen (see example on next page).




After making sure that all connected products are turned ON:

**ENT** Press [ENT] to start automatic input source setup, - if a new product is connected later on, refer to section 10.5 Interface setup.

New window: Automatic input source setup listing Data type, Group and Source of connected units.

**ENT** Press [ENT] to continue

**ENT** Press the [ENT] key to accept warning when the system is ready - go to [MENU], [8], [2] if you wish to make adjustments to the interface setup.

 Heading is only available if a compass was detected at start-up.

**PWR** Press [PWR] again to adjust the lighting in the screen and select day or night display etc., move around in display by means of the cursor key and change settings with +/- keys, and...

**ENT** Confirm with [ENT]

The unit will now perform a fully automatic start-up and find the correct position without further data entries. The start-up phase is completed when a position appears in the position display - see section 4.1.



The echosounder function (CX33-E) has a demo program, which can be activated in the Echosounder setup display, refer to section 10.2.

- ☞ When a transducer has been installed and selected, and the Echosounder function is set up and ready to perform, please make sure that the demo mode is switched OFF.

### Select display language:

**MENU** *Call up the menu bar, and...*

**8,1** *press [8], [1] to call up the language display*



*Press up on the cursor to go to the bottom line in the display*

**+/-** *Select language*

**ENT** *Confirm entry*

## 2.8 Turn power on

Starting up for the first time, or after loading a new software, or after a master reset - see section 2.7.

When starting up at any other time:

**PWR** *To turn on the CP31/CX33,/CX33-E, press and hold the [PWR] key until you have a picture on the screen*

**ENT** *Press [ENT] when the system is ready*

## 2.9 Turn power off

**PWR** *Call up INFO window, and...*

**PWR** *Press and hold until the curtains begin go close*

The CP31/CX33/CX33-E is now turned off. All the data and setups are saved and stored in the internal memory and, of course, will be available next time the unit is turned on.

## 2.10 Simrad WR20 Remote Commander (optional)

The WR20 is the first remote control that can both display and control the electronics on board when connected to the SimNet system. You can remotely command your NavStation with full MOB control from anywhere within a range of 100 m. You will have seamless control of pilot and navigation. You can make VHF calls from the WR20 and much, much more.

### The new WR20 - your perfect helmsman

- Small rugged waterproof handset
- Display size: 35x25mm (1.4"x1.0")
- Weight: 150 g
- Bluetooth Class 1
- Rechargeable Li-Ion battery
- Backlit keypad
- Keypad lock
- Handy neck strap
- Environment: -10 to +55°C (-14 to +131°F)
- Dimensions H:133mm (5.2"), W:55mm (2.2"), D:32mm (1.3")



### 3. Chart menu

<b>1</b>	<b>CHART</b>
<b>1</b>	Chart 1 1:26400000
<b>2</b>	Chart 2 1:6600000

☞ For safety reasons, navigation with electronic charts should always be combined with authorized paper charts.

#### 3.1 Charts

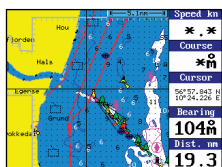
**MENU** *Call up the menu bar, and...*  
**1,1** *press [1] and [1] to call up Chart 1*

**MENU** *Call up the menu bar, and...*  
**1,2** *press [1] and [2] to call up Chart 2*

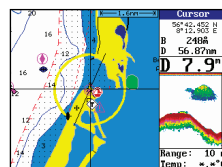
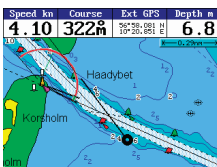
The chart display opens for the built-in world chart, as well as the optional, detailed C-MAP electronic chart system, which of course will require that a C-MAP NT+ or NT MAX C-card is inserted in the drawer below the keypad.

- CHART** Hotkey to chart functions:
1. Jumps to page with Chart 1 if present in the page system.
  2. Jumps to page with Chart 2 if Chart 1 is not in the page system.
  3. Inserts Chart 1 in active page if no chart is in the page system.
  4. Toggles between data fields, and sounder panel (CX33-E).
  5. Hold [CHART] key for 2 seconds to toggle between Chart 1 and Chart 2.

**CHART**



**CP31/CX33/CX33-E:**  
 Chart + data field at right side or top.



**CX33-E:**  
 Chart + sounder field.

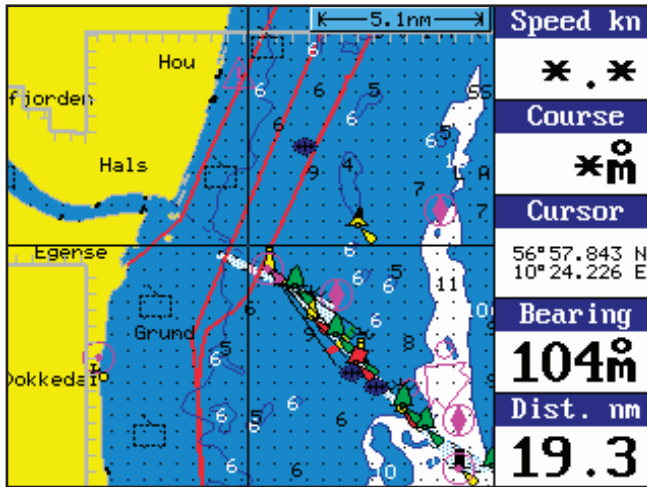


Chart range indicator (5.1nm) can be set ON/OFF in “Chart setup” under “General”, see section 3.3.

During chart update/redraw a progress bar will cover the chart range indicator.

### 3.1.1 Data field on chart

The data field in the chart display (with cursor off) will give you the ship’s current speed, course and \*position in lat/long together with water speed and depth indication.

\*)Refer to section 4.1 Status indicator and accuracy.

With cursor on, the data field will give you the ship’s current speed and course; the cursor position in lat/long, bearing and distance from actual position to cursor position.

### 3.1.2 Ship symbol



The ship symbol indicates the present position on the chart and the vector informs of the actual heading (input from compass) or true course (course over ground). There is a built-in autohome function which automatically moves the chart to maintain the ship symbol in the display (with cursor off).

0 \*\*\*

Press [0] to instantly center the ship on the chart (with cursor off)

### 3.1.3 Cursor function

With chart display active:



Press the cursor key to activate the chart cursor (cross hairs)

**CLR**

Press [CLR] to turn the chart cursor off



The chart cursor will automatically switch off if not used in the last five minutes. The chart will update and bring the ship's position to the center of the screen.



Use the cursor key to move cursor in any direction on the screen - the chart will automatically adjust when cursor reaches the edge of the screen.

**0 \*\*\***

Press [0] to instantly center the cursor on the chart (with cursor on)



In data displays the cursor will be shown in form of either a ruling box around the active field, or the active field will be highlighted.

### 3.1.4 Range or zoom function

With chart display active:

**1-9**

Press one of the numeric keys to quickly change the chart scale:

[1] = 1:600

[2] = 1:2,000

[3] = 1:6,000

[4] = 1:20,000

[5] = 1:60,000

[6] = 1:200,000

[7] = 1:600,000

[8] = 1:2,000,000

[9] = 1:6,600,000

**-**

Press the minus key to zoom in for details (smaller range)

**+**

Press the plus key to zoom out for overview (greater range)

Using the extended level range will give the best result when changing chart range. First use one of the numeric keys (Quick-Range 1-9) to select the required chart, then 'fine tune' the range within the same chart level by using the +/- keys. Depending on the actual chart, you can zoom in or out two to three times before the extended

level range is switched off and the chart changes to a new level of details.



The extended level range can be toggled OFF/ON in chart setup (default = ON). See section 3.3 Chart setup.

Chart details may not be available in all scales in all areas. Non-covered areas will be marked as hatched or all blue/white with coordinate grid (when Grid is set to AUTO (default) in chart setup), depending on the actual scale - see section 3.3 Chart setup for more details in regard to what can be shown on the chart and what you may choose not to have shown.

The **built-in world chart** can be zoomed up/down in six steps, from a scale of approx. 1:33,000,000 to 1:2,000,000.

An **over-zoom function** enables you to zoom beyond the chart, which automatically is switched off and replaced by a lat/long coordinate grid. In this mode, the scale can go down to 1:600.

## 3.2 Chart quick menu

Access the chart quick menu from active chart display. The functions available depends on the actual situation - refer to the following sections i.e. 3.2.1 to 3.2.7.

### 3.2.1 Cursor inactive

**ENT**

With chart in active page, and with cursor off, press [ENT] to *call up the quick menu* with the following to choose from:

Scale: 1:6600000	Actual chart scale
No user data at ship's position	
<b>1</b> Edit user data	Inactive function
<b>2</b> Chart info	Refer to Appendix C
<b>3</b> Find nearest port services	Refer to Appendix C
<b>4</b> Bearing and dist from A to B	Inactive function
<b>8</b> Tidal current prediction	Refer to Appendix C
<b>9</b> Chart setup	Refer to section 3.3
<b>0</b> Ship to center	
<b>PAGE</b> More user data	
<b>MENU</b> Exit	Exit info window

**0**

*Ship to center* will update the chart and place the ship's position in the center of the chart display.

**PAGE**

*More user data* will toggle between available data on the ship's position.

### 3.2.2 Cursor active but not placed on any object or data

**ENT** With chart in active page, and cursor active but not placed on any object or user data, press [ENT] to *call up the quick menu* with the following to choose from:

Scale: 1:6600000	Actual chart scale
No user data at cursor position	
<b>1</b> Edit user data	Inactive function
<b>2</b> Chart info	Refer to Appendix C
<b>3</b> Find nearest port services	Refer to Appendix C
<b>4</b> Bearing and dist from A to B	
<b>8</b> Tidal current prediction	Refer to Appendix C
<b>9</b> Chart setup	Refer to section 3.3
<b>0</b> Cursor to center	
<b>PAGE</b> More user data	Inactive function
<b>MENU</b> Exit	Exit info window

**4** *Bearing & dist. from A to B* will quickly provide the bearing and distance from your current cursor position (A) to an arbitrary point (B). Move cursor to point B and see the calculation in the small info window. Press [MENU] to exit the function.

**0** *Cursor to center* will update the chart and place the cursor position in the center of the chart display.



### 3.2.3 Cursor placed on waypoint

**ENT**

With chart in active page, and cursor placed on a waypoint, press [ENT] to *call up the quick menu* with the following to choose from:

WP found		
Name: WP 1 LAT 57°15.504N LON 9°17.249E		
<b>1</b>	Edit user data	
<b>2</b>	Chart info	Refer to Appendix C
<b>3</b>	Find nearest port services	Refer to Appendix C
<b>4</b>	Bearing and dist from A to B	Refer to section 3.2.2
<b>8</b>	Tidal current prediction	Refer to Appendix C
<b>9</b>	Chart setup	Refer to section 3.3
<b>0</b>	Cursor to center	Refer to section 3.2.2
<b>PAGE</b>	More user data	
<b>MENU</b>	Exit	Exit info window

**1**

*Edit user data* opens for a new info window:

Waypoint		
<b>1</b>	Edit	Edit name, symbol, color etc.
<b>2</b>	Move	Move waypoint with cursor
<b>CLR</b>	Delete	Delete waypoint
<b>MENU</b>	Exit	Exit info window

**PAGE**

*More user data* will toggle between available data on cursor's position

### 3.2.4 Cursor placed on route leg or line section

**ENT** With chart in active page, and cursor placed on a route leg or line section, press [ENT] to *call up the quick menu* with the following to choose from:

Route leg found:		5-6
Name: RTE 1		
Leg:	B130°	34.26nm
Total:	5 legs	143.1nm
<b>1</b>	Edit user data	
<b>2</b>	Chart info	Refer to Appendix C
<b>3</b>	Find nearest port services	Refer to Appendix C
<b>4</b>	Bearing and dist from A to B	Refer to section 3.2.2
<b>8</b>	Tidal current prediction	Refer to Appendix C
<b>9</b>	Chart setup	Refer to section 3.3
<b>0</b>	Cursor to center	Refer to section 3.2.2
<b>PAGE</b>	More user data	
<b>MENU</b>	Exit	Exit info window

**1** *Edit user data* opens for a new info window:

Route leg		
<b>1</b>	Edit leg	Open new info window to edit route leg
<b>2</b>	Insert point	Move cursor to insert new point
<b>3</b>	Edit	Open new info window to edit route
<b>CLR</b>	Delete	Delete the whole route
<b>MENU</b>	Exit	Exit info window

**PAGE** *More user data* will toggle between data on routepoint and route leg.

### 3.2.5 Cursor placed on routepoint or linepoint

**ENT**

With chart in active page, and cursor placed on a routepoint or linepoint, press [ENT] to *call up the quick menu* with the following to choose from:

Routepoint found		5
Name: RTE 1		
From start: 108.8nm		
To end: 34.26nm		
<b>1</b>	Edit user data	
<b>2</b>	Chart info	Refer to Appendix C
<b>3</b>	Find nearest port services	Refer to Appendix C
<b>4</b>	Bearing and dist from A to B	Refer to section 3.2.2
<b>8</b>	Tidal current prediction	Refer to Appendix C
<b>9</b>	Chart setup	Refer to section 3.3
<b>0</b>	Cursor to center	Refer to section 3.2.2
<b>PAGE</b>	More user data	
<b>MENU</b>	Exit	Exit info window

**1**

*Edit user data* opens for a new info window:

Routepoint		
<b>1</b>	Edit point	Open new info window to edit routepoint
<b>2</b>	Move point	Move point with cursor
<b>CLR</b>	Delete point	Delete routepoint
<b>3</b>	Add point	Add point to route - in beginning or at end.
<b>4</b>	Edit	Open new info window to edit route
<b>5</b>	Delete	Delete the whole route
<b>MENU</b>	Exit	Exit info window

**PAGE**

*More user data* will toggle between data on routepoint and route leg.

### 3.2.6 Cursor placed on trackpoint

Trackpoints are not as easily recognized as Routepoints, you may have to move the cursor along on the track to locate a trackpoint.

**ENT**

With chart in active page, and cursor placed on a trackpoint, press [ENT] to *call up the quick menu* with the following to choose from:

Trackpoint found	3	
Name: TRACK 1		
Total: 836 points - 83.6nm		
<b>1</b>	Edit user data	
<b>2</b>	Chart info	Refer to Appendix C
<b>3</b>	Find nearest port services	Refer to Appendix C
<b>4</b>	Bearing and dist from A to B	Refer to section 3.2.2
<b>8</b>	Tidal current prediction	Refer to Appendix C
<b>9</b>	Chart setup	Refer to section 3.3
<b>0</b>	Cursor to center	Refer to section 3.2.2
<b>PAGE</b>	More user data	
<b>MENU</b>	Exit	Exit info window

**1**

*Edit user data* opens for a new info window:

Trackpoint		
<b>CLR</b>	Delete point	Delete trackpoint
<b>1</b>	Delete points from A to B	See below
<b>2</b>	Edit	Open new info window
<b>3</b>	Delete	Delete the whole track
<b>MENU</b>	Exit	Exit info window

Press [1] to delete points from A to B - move cursor to point B, and press [ENT] to delete all trackpoints between cursor position on chart and point B.

**PAGE**

*More user data* if cursor is placed on a MOB track you can toggle between data on MOB symbol and data on MOB track. The symbol

and track are edited separately.

### 3.2.7 Cursor placed on target

**ENT**

With chart in active page, and cursor placed on a target symbol, press [ENT] to *call up the quick menu* with the following to choose from:

Target found		
Name: TARGET 1 LAT 57°02.825N LON 7°45.555E		
<b>1</b>	Edit user data	
<b>2</b>	Chart info	Refer to Appendix C
<b>3</b>	Find nearest port services	Refer to Appendix C
<b>4</b>	Bearing and dist from A to B	Refer to section 3.2.2
<b>8</b>	Tidal current prediction	Refer to Appendix C
<b>9</b>	Chart setup	Refer to section 3.3
<b>0</b>	Cursor to center	Refer to section 3.2.2
<b>PAGE</b>	More user data	
<b>MENU</b>	Exit	Exit info window

**1**

*Edit user data* opens for a new info window:

Target		
<b>1</b>	Edit	Edit name, color, position etc.
<b>2</b>	Move	Move point with cursor
<b>CLR</b>	Delete	Delete target
<b>MENU</b>	Exit	Exit info window

**PAGE**

*More user data* will toggle between available data on cursor's position

### 3.2.8 GOTO menu

**GOTO** Shortcut to navigation modes:

Select NAV mode	
<b>1</b>	Cursor
<b>2</b>	Waypoint
<b>3</b>	Route
<b>4</b>	Track
<b>5</b>	Anchor guard
<b>MENU</b>	Exit

To select “Cursor” navigation will require that Chart 1 or Chart 2 is selected and the cursor is active.

“Waypoint”, “Route” and “Track” navigation requires that a waypoint, route or track is stored in the memory.

(Navigation can also be initiated via the PILOT menu).

For further details on the different NAV modes, refer to chapter 6. Pilot menu & navigation examples.

**Anchor guard** - when setting anchor, a pre-set alarm distance will be activated, so in case the ship is drifting too far away from the anchored position, the system will initiate a visual and acoustic alert - refer to section 6.3 Anchor guard.

If pressing the [GOTO] key while one of the NAV modes is active, this pop-up window will appear on the screen:

Navigation is ON	
<b>1</b>	Advance
<b>2</b>	Restart to approaching point
<b>3</b>	Turn NAV OFF
<b>MENU</b>	Exit

Press [1] to advance to next waypoint in the route (Route navigation). Press [2] if you for some reason have drifted off course and wish to restart navigation from your actual position to the approaching point.

### 3.2.9 PLOT menu

The CP31/CX33/CX33-E is designed to make navigation easy and safe. Waypoints can easily be plotted with a single keystroke, or be inserted via the keypad. Making routes and drawing lines are done directly on the chart. Very straightforward, uncomplicated and with a high level of confidence as you can follow your actions 'live' on the chart.

**PLOT** Call up the PLOT menu with the following to choose from:

PLOT new data	
<b>PLOT</b>	Plot mark - ship
<b>1</b>	Insert mark - ship
<b>2</b>	Plot waypoint - cursor
<b>3</b>	Insert waypoint
<b>4</b>	Make route
<b>5</b>	Draw line
<b>6</b>	Plot target
<b>7</b>	Start track
<b>8</b>	Stop track
<b>9</b>	Set vertical mark (CX33-E)
<b>MENU</b>	Exit

**PLOT** From any display: Plot and save mark on ship's position, including actual depth indication. Preset name sequence: SHIP 1, SHIP 2 etc.

**1** From any display: Plot and save waypoint. Ship's position is suggested, but you can key in a new position from keypad, change the location name (cf.section 2.6), or change the symbol (cf.section 2.5) and the color (select with +/- keys). Any changes made will be new presets for plotting/insertion of ship's position.

**2** From active chart display with cursor on: Plot and save cursor position as a waypoint. Preset name sequence: WP 1, WP 2 etc.

**3** From any display: Plot and save waypoint. The position coordinates are filled with zeroes, so you can key in the position you want from

the keypad, change the location name (cf.section 2.6), or change the symbol (cf.section 2.5) and the color (select with +/- keys). Any changes made will be new presets for plotting/insertion of the cursor position.

- From active chart display with cursor on: Same options as above, except that the zeroes in the position coordinates have been exchanged with the cursor position.

- CX33-E: From active echo display: Plot and save waypoint from echogram. Move cursor and press [ENT] to register spot as waypoint, including actual depth indication. Name, symbol, color etc. can be changed.

4

From active chart display with cursor on: You can quickly make a route by means of the cursor and the [PLOT] key. The present cursor position will be the first position of the route you are about to make. Move cursor to next position, and press [PLOT]. Continue in this manner until the route is completed.

Existing waypoints can be used for making the route, simply by placing the cursor on the waypoints and plot the positions. In case you make a wrong plot, press [CLR] to erase the last plotted position. Save the route with [ENT] or exit the function with [MENU] to abandon the route.



Do not use the exact position of buoys, markers etc. as waypoints and routepoints. The high accuracy of the system may result in a collision when sailing in the dark or navigating with an autopilot.

5

From active chart display with cursor on: To draw lines or to make a route is the same procedure, please see above.

6

From active chart display: With cursor on, plot target at cursor position and with cursor off, plot target at ship's position.

After plotting the target it will be saved in the memory, and you can edit the target later on, either via the menu (cf.section 5.7) or directly from the chart (cf.section 3.2.7).

7

From any display: Call up info window to start track. To change default values, see section 5.5.

8

From any display: Call up info window to stop track, see section 5.5.

9

CX33-E: From active echo display: Plot vertical marker (line) at the current ping in the echo display.



### 3.3 Chart setup

The settings are dedicated to the chart in the active page and does not affect the second chart. The C-MAP features available in the chart setup will depend on the type of C-card used i.e. NT MAX (all features) or NT+ (refer to section 3.3.2 and Appendix C).

ENT

9


With chart active, *press* [ENT], [9] *to load the chart setup* for the selected chart (1 or 2)

◀ GOTO		General	Presentation	Dep	▶ PLOT
Display mode					FULL <span>▲</span>
Orientation					NORTH UP
Rotation resolution					15°
Motion					RELATIVE
Quick chart info					ON
Cursor 5 min.time-limit					ON
Auto chart select					ON
Extended level range					OFF
Show range					WITH BACKGROUND
Tidal currents					ICON
Value added data					ON
Human dictionary					ON
Grid					AUTO
Boundary lines					AUTO
Mixing levels					OFF
Declutter					OFF <span>▼</span>
MENU		Exit		Accept ENT	

The tabs indicate which groups are available in each display mode e.g. the above example shows that in FULL display mode you have access to the groups in black: General, Areas and User data. The two groups in red i.e. Presentation and Depth are only adjustable in CUSTOM display mode. See further on in this chapter for more details.

+/-

*Select display mode:* FULL, CUSTOM, SIMPLE, FISHING, LOW, GRID

- PLOT** *Go to the next group*
- GOTO** *Step back to the previous group*
-  *Scroll up/down in the chart settings*
- +/-** *Toggle between available settings*
- ENT** *Confirm changes and return to chart, or...*
- MENU** *Abandon Chart setup and return to chart without making any changes*

### 3.3.1 Display modes in the chart setup

There are 6 different display modes to choose from: FULL, CUSTOM (default), SIMPLE, FISHING, LOW, and GRID mode. When a group is shown in red or a function is shown in light grey it means that it is not available in the selected display mode. The default settings in the various display modes are:

**Group: General** - specification of chart display in general

The available functions are according to display example on previous page for all display modes, except for GRID, which has three adjustable functions:

Motion = RELATIVE  
Cursor 5 min. time-limit = ON  
Show range = WITH BACKGROUND




**Group: Presentation** - specifies presentation of marine and land topics.

The default settings in this group are fixed in all display modes, except for \*Custom where it is possible by the user to turn a feature ON (shown on the chart) or OFF (not shown on the chart), etc. - see next page.

C-MAP features are not available in GRID display mode.

C-MAP features	Full	*Custom	Simple	Fishing	Low
<b>Marine:</b>					
Names	ON	ON	ON	ON	OFF
Nav-Aids	INT	INT	INT	INT	INT
Lights	ON	ON	ON	ON	OFF
Light Sectors	ON	ON	OFF	OFF	OFF
Signals	ON	ON	ON	ON	OFF
Buoys	ON	ON	ON	ON	OFF
Attention Areas	ON	ON	ON	ON	OFF
Tides, currents	ON	ON	ON	OFF	OFF
Nature of seabed	ON	ON	OFF	ON	OFF
Ports	ON	ON	ON	OFF	OFF
Tracks, routes	ON	ON	OFF	OFF	OFF
Name tags	OFF	OFF	OFF	OFF	OFF
<b>Land:</b>					
Natural features rivers	ON	ON	ON	OFF	OFF
Natural features	ON	ON	OFF	OFF	OFF
Cultural features	ON	ON	OFF	OFF	OFF
Landmarks	ON	ON	ON	OFF	OFF
Traffic	ON	ON	OFF	OFF	OFF
Points of interest	ON	ON	OFF	OFF	OFF

**Group: Depth** - specifies the presentation of depth lines, levels, etc. on chart. The default settings in this group are fixed in all display modes, except for \*Custom where it is possible by the user to alter the features. The color indication for depth levels 1, 2 and 3 is determined by the color palette in the SETUP menu. C-MAP features are not available in GRID display mode.

C-MAP features	Full	*Custom	Simple	Fishing	Low
Soundings	ON	ON	ON	ON	OFF
Underwater objects	ON	ON	ON	ON	ON
<b>Depth Lines</b>					
Depth Lines	ON	ON	ON	ON	OFF
Depth Lines>	0000m	0000m	0000m	0000m	0000m
Depth Lines<	9999m	9999m	5m	9999m	5m
<b>Depth Areas</b>					
Depth	ON	ON	ON	ON	OFF
Level 1 	0-002m	0-002m	0-002m	0-002m	0-002m
Level 2 	2-009m	2-009m	2-009m	2-009m	2-009m
Level 3 	9-MAX	9-MAX	9-MAX	9-MAX	9-MAX
<b>Depth tags</b>	OFF	OFF	OFF	OFF	OFF
<b>Depth range</b>					
<b>Min</b>	0000m	0000m	0000m	0000m	0000m
<b>Max</b>	9999m	9999m	9999m	9999m	9999m

**Group: Areas** - defines the presentation of different areas on chart. The default settings in this group are the same for all display modes, except GRID, which do not include C-MAP features. The features can be changed from FILLED to CONTOUR:

C-MAP features	All display modes
Land areas	FILLED
Depth areas	FILLED
Caution areas	FILLED
Dredged areas	FILLED

**Group: User data** - user defined objects can be visible or invisible on chart. The default settings in this group are the same for all display modes and any change of the default settings will be applied in all display modes.

Chart features	Defaults and choice of settings	
Waypoints	All the features in the user data that are set as default to ON= shown on chart, can be changed to OFF= not shown on chart.	
Non active waypoints		ON
Waypoint names		ON
Waypoint depths		ON
Routes	Non active routes and tracks, all lines and all targets are default to: AS SELECTED= the choices made for a particular route etc via the menu e.g. MENU, 3, 2, ENT, ENT - Edit route, where 'Course line' can be set ON or OFF.	
Non active routes		AS SELECTED
Route names	ON	
Tracks	Non active routes and tracks, all lines and all targets are default to: AS SELECTED= the choices made for a particular route etc via the menu e.g. MENU, 3, 2, ENT, ENT - Edit route, where 'Course line' can be set ON or OFF.	
Non active tracks		AS SELECTED
Track names	ON	
Lines	'AS SELECTED' can also be changed to 'ALL ON'= shown on the chart, or 'ALL OFF'= not shown on the chart.	
Lines		AS SELECTED
Line names		ON
Targets		
Targets		AS SELECTED
Target names		ON

### 3.3.2 Description of chart features

**Auto chart select** - When sailing with 'Auto chart select' ON and cursor turned off, the range will automatically change to match the chart which is available. But when set to OFF, then the selected range will remain, also when sailing 'out of the chart'.

**Boundary lines** - will indicate available C-MAP chart areas.

**Caution areas** - can be set to FILLED or CONTOUR.

FILLED= The caution areas will be filled with a preset color from C-MAP.

CONTOUR= The caution areas will be shown with a contour line only and the fill will be the same as the background/water color on the chart.

**Cursor 5 min. time-limit** - can be set ON or OFF. When set to ON, the chart cursor will automatically turn off if not used in a period of five minutes.

**Declutter** - when set to ON there will be no overlapping text on the chart e.g. Names, Spot soundings etc.

**Depth: Level 1, 2 and 3** - are identified by different colors. The number of meters in the levels can be changed. The colors are preset in the Palette setup.

**Depth areas** - can be set ON or OFF= Not shown on chart.

FILLED - the depth areas will be filled with the color preset in the Palette setup.

CONTOUR - the depth areas will be marked by a contour line only, and the fill will be the same as the background/water color on the chart.

**Depth lines** - can be set ON or OFF= Not shown on chart.

**Depth range (NT MAX only)** - insert a minimum and maximum range to define the underwater area from where you want to see objects on the chart.

**Depth tags (NT MAX only)** - shows the depth on underwater objects. Can be set ON or OFF on the chart.

**Dredged areas** - can be set to FILLED or CONTOUR.

FILLED= The dredged areas will be filled with a preset color from C-MAP.

CONTOUR= The dredged areas will be shown with a contour line only, and the fill will be the same as the background/water color on the chart.

**Extended level range** - will enable changing range 3-4 steps within the same chart level after having selected the range via a numeric key.

**Grid** - the LAT/LON grid can be set to ON or AUTO

ON= The LAT/LON grid will be visible on the chart display all the time.

AUTO= The LAT/LON grid will appear on the chart display when there is no actual chart available in the selected scale.

The color of the grid is preset in the Palette setup.

**Human dictionary** - when set to ON, the shown information will be written in more clear and understandable text.

**Land areas** - can be set to FILLED or CONTOUR.

FILLED= The land areas will be filled with a preset color in the Palette setup.

CONTOUR= The land areas will be shown with a contour line only and the landfill will be the same as the background/water color on the chart.

**Land settings** - can all be set ON=Shown on chart or OFF=Not shown on chart.

**Marine settings** - can all be set ON or OFF, except for **Nav-Aids** which can be set to INTERNATIONAL, INT. SIMPLIFIED, US, US SIMPLIFIED or OFF.

**Nav-Aids** - include Lights, Light Sectors, Signals and Buoys.

INTERNATIONAL (Lights, Light Sectors, Signals, Buoys) - will present Nav-Aids in 'real life' shapes and colors for quick visual recognition (as per official INT1 standard paper chart presentation).

INT. SIMPLIFIED (Signals, Buoys) - the NavAids will be shown in generic symbols for minimum visual clutter on-screen.

US (Lights, Light Sectors, Signals, Buoys) - will present NavAids in simplified shapes and real colors (as generally found on NOAA paper charts).

US SIMPLIFIED (Signals, Buoys) - the NavAids will be shown in generic symbols for minimum visual clutter on-screen.

OFF - will shown no Nav-Aids on the chart.

**Mixing levels** - when set to ON, the number of blank chart areas will be reduced, as the C-MAP library will find the missing area in a different level to cover the blank area otherwise left on the screen. However, when using this feature, chart re-draw time will be increased a little.

**Name tags** - shows a name/number next to buoy and beacon icons on the chart. Can be set ON or OFF.

**Orientation** - can be set to NORTH UP, COURSE UP or NAV UP, and the mode can be RELATIVE or TRUE motion.

NORTH UP - the chart will always be presented as north up.

COURSE UP - the chart will automatically turn, so your actual course (COG) is up. If chart cursor is active it will stop the chart from rotating, press [CLR] to turn cursor off. If a compass is connected, the reference will automatically

change to heading (compass).

NAV UP - the chart will automatically turn, so your bearing to destination is up. If chart cursor is active it will stop the chart from rotating, press [CLR] to turn cursor off.

RELATIVE motion - the 'ship' is positioned at the center of the screen and the chart will move.

TRUE motion - the 'ship' will move across the chart.

**Points of interest** - when set to ON, you can obtain information on special attractions. Place the cursor on the chart symbol to call up an info window and press [ENT] to call up information on the attraction.

**Quick chart info** - placing the chart cursor on a C-MAP object will activate a small info window with details on the object. Info window will automatically close after 10 seconds or when cursor is moved away.

**Rotation resolution** - can be set to adjust the chart for each 5, 10, 15, 20 or 25° changes in relation to present course or heading.

**Show range** - can be set to WITH BACKGROUND, ON or OFF:

WITH BACKGROUND - will add a small line to the chart display indicating that the length of the line equals a certain number of nautical miles/km - the indication is highlighted with a background color.

ON - same as above, but without background color.

OFF - indication is not shown on chart.

**Soundings** - can be set to ON or OFF.






ON - the information will be shown as selected i.e. in feet, fathoms or meters.

OFF - soundings are not shown on chart.

**Tidal currents (NT MAX)** - can be set to ICON, ON, OFF:

ICON - will show icons (a diamond shape with the letter c in it). Place the cursor on the icon to call up an info window, then press [ENT] to call up tidal current information on the location.

ON - will indicate the speed and direction of the current by means of colored arrows, as shown below:

0 to 0.1 kn -		Green
0.2 to 1.0 kn -		Green
1.1 to 2.0 kn -		Yellow
2.1 to 3.0 kn -		Yellow
3.1 to 9.9 kn -		Red

**Traffic** - when set to ON, the chart will indicate roads, railroads, etc.

**Underwater objects** - can be set ON or OFF.

**Value added data** (NT MAX only) - when set to ON, additional data on wrecks, cables and pipelines, sailing directions, bathymetric info, etc. will be available.



## 4. Position menu

<b>2</b>	
POS	
<b>1</b>	Position - see section 4.1
<b>2</b>	Dual speed - see section 4.2
<b>3</b>	Speed, course & depth - see section 4.3
<b>4</b>	Speed diagram - see section 4.4
<b>5</b>	Satellites - see section 4.5
<b>6</b>	SDGPS - see section 4.6

### 4.1 Position display

**MENU** Call up the menu bar, and...

**2,1** load the Position display

Datum 000 WGS 1984	Log 1 0.0nm	Log 2 0.0nm	Datum currently selected.
<b>LAT 56°52.792 N</b> <b>LOX 9°50.296 E</b>			Trip log 1 and 2. Position with three decimals in minutes.
Speed <b>0.0kn</b>	Course <b>359°</b>	Compass <b>⊗°</b>	Speed over ground. Course, magnetic or true.
Internal POS GPS A	UTC time 9:20:50	UTC date 15-01-2006	Depth or Compass from external sensor.

#### UTC or local time and date

Time and date in UTC - Universal Time Coordinates - is equal to standard time in London (GMT). UTC is not affected by the local summertime adjustments.

**Position update** - if, for some reason, there is no position update from GPS or external sensor, the displayed position will start to flash and an alarm will be activated to alert the operator. Reset the 'Position missing' alarm by [CLR]. The alarm can be set ON/OFF - see section 4.5. The displayed position will stop flashing once normal position update is resumed.

**Internal POS** - indicates the source of position data i.e. Internal, External or DeadReckoning.

**GPS A** - Status indicator for reception of satellites:  
a (A)= good, b (B)= acceptable, c (C)= fair, or \*= no update - see also "Status indicator and accuracy" below.

With connected DGPS receiver:

dGPS= differential data received.

DGPS= differential data received and used for corrections.

SDGPS= satellite differential data received and used for corrections.

### **Status indicator and accuracy**

Small letters (a,b,c,) indicate that SA is active, and the position accuracy is expected to be better than 100 meters in 95% of the time. Capital letters indicate that SA is OFF, and the position accuracy is then expected to be 15 meters or better in 95% of the time.

dGPS indicates that differential data is received from external receiver.

DGPS or SDGPS indicates that the position is corrected by the differential data. The accuracy will typically be 2-5 meters for DGPS and 3-7 meters for SDGPS.

In order to utilize the high accuracy of the GPS system, it is necessary to align the lat/long calculations to the paper charts you are using. Refer to Position setup display on next page.



When using C-MAP electronic charts, the datum will be aligned automatically.

### Position display setup

The general Position setup e.g. Display position as: LAT/LON, Decca or Loran C, etc. is placed in the SETUP menu (section 10.3).

ENT

From position display, press [ENT] to load Position display setup:

## Pos display setup:

Datum: 000: World Geodetic System 1984

Log 1: 00000.0nm

Log 2: 00000.0nm

Additional data: COMPASS



*Go to the function you wish to change*

CLR

*Reset log*

0-9

*Key in new values, or...*

+/-

*Toggle between available values*

ENT

*Confirm editing and return to the Position display*

**Datum** - is preset to WGS 1984 (World Geodetic System 1984), but can be changed to any of the 118 datums listed in Appendix B e.g. to match old paper charts or trackplotter data from RS2500/RS4000 (datum #002 European 1950).

The position in the position display and NMEA output (GLL+GL2) will refer to the selected datum. To select a new datum: place the cursor next to "Datum" and key in a new number or go two spaces to the right (000) and leaf through the datum list with +/-.



The datum in the chart display is fixed i.e. WGS84.

**Log** - reset log or insert alternative start figure by altering the value in the "Log 1" and/or "Log 2" line. Press [CLR] to reset the figure, and press the numeric keys 0-9 to alter the figure.

**Additional data** - can be set to COMPASS, DEPTH or ANT. HEIGHT. COMPASS will show heading from connected sensor. DEPTH will be shown when depth data is received from connected depth instrument, or will be shown from built-in echosounder (CX33-E). ANT. HEIGHT will indicate the actual antenna altitude (height above sea level).

## 4.2 Dual speed display (trawling speed display)

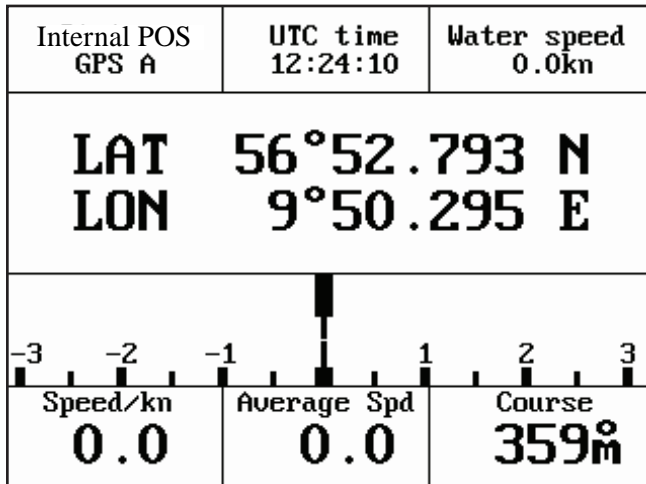
The analogue differential speed indicator will show how much the present speed varies from the average speed. If the difference exceeds +/- 3 knots (or km/h or miles/h), an arrow will appear which will be pointing out of the scale.

MENU

Call up the menu bar, and...

2,2

load dual speed display



Water speed readout from connected log transducer.

Position with three decimals in minutes.

Analogue differential speed indicator (scale).

Dynamic speed with short filtering time is reacting quickly to changes, but is also more unsteady.

Average speed with long filtering time gives a very stable reading.

Course over ground, magnetic (m) or true (°).

### How to reset dual speed:

ENT

Open for change

ENT

Reset dual speed

- or exit function with [MENU] without making any changes.

### 4.3 Speed, course & depth

**MENU**

*Call up the menu bar, and...*

**2,3**

*load Speed, course & depth display*

Speed over ground	<b>18.0kn</b>
Course	<b>71m</b>
Depth below keel	<b>12.4m</b>

- Speed over ground can be changed from the Position display settings to show Speed through water: Press [MENU], [8], [PILOT], go to the line “Display speed as: SOG”, press the [+] key to toggle to STW, press [ENT] to accept the change. The top line in the display will now show Speed through water.
- Course can be shown as magnetic or true. Toggle between the two settings from the Position display: Press [MENU], [8], [PILOT], go to the line “Course and bearing as: MAGNETIC”, press the [+] key to toggle to TRUE, press [ENT] to accept the change. The middle part of the display will now show True course e.g. 17°.
- CP31/CX33: To obtain a depth readout in this display will require that a depth sensor is connected. DEPTH\* will be shown when depth data is received from connected depth instrument.  
\*) DBK Depth Below Keel, DBT Depth Below Transducer or DBS Depth Below Surface.
- CX33-E: Depth below keel can be changed from the Echosounder setup to show Depth below surface or Depth below transducer. Press [MENU], [8], [ECHO], go to the line “Display: DEPTH BELOW KEEL”, press the [+] key to toggle to DEPTH BELOW SURFACE or DEPTH BELOW TRANSDUCER, press [ENT] to accept the change. The new setting will be shown in the lower part of the display.

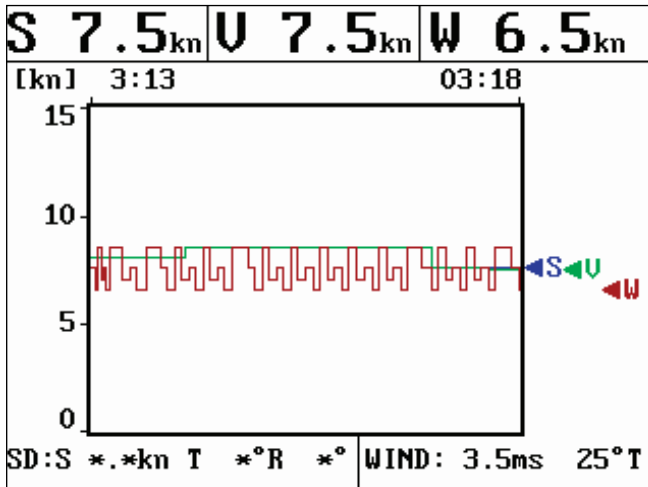
## 4.4 Speed diagram

**MENU**

Call up the menu bar, and...

2,4

load "Speed diagram"



S= Speed over ground.

V= Velocity towards waypoint.

W\*= Speed through water.

SD (Set and drift)\*= Speed and direction, true or relative.

WIND\*= Speed and direction.

\* Connection to external sensors is required.

**ENT**

Call "Speed diagram setup"

- see next page.

# Setup speed diagram

Scale for speed, max:	0005kn
Scale for speed, min:	+000kn
Speed over ground (SOG):	<input checked="" type="checkbox"/> ON
Velocity made good (V):	<input checked="" type="checkbox"/> ON
Water speed (W):	<input checked="" type="checkbox"/> ON
Time interval:	5 MIN.

The scale for the speed diagram can be adjusted in this display.

Time interval can be set in intervals from 5 minutes to 3 hours and freeze.



*Go to the function you wish to change*

**+/-**

*Key in new figure or change setting*

**ENT**

*Confirm entry and return to Speed diagram*

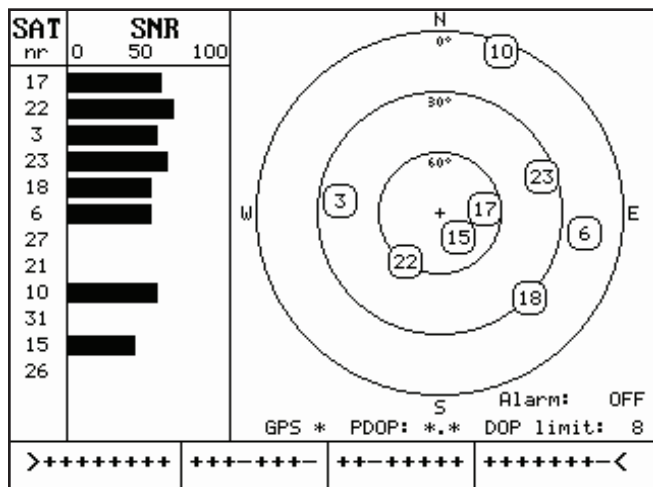
## 4.5 Satellite status

MENU

Call up the menu bar, and...

2,5

load satellite status display



The display will show which satellites are currently being used for computation of data. It will show their position together with SNR - Signal to Noise Ratio. The bottom line shows the status of all the satellites in the GPS system, starting from left to right with the numbers 1 to 32.

**Satellite status** (bottom line):

- + indicates the satellite is healthy.
- excluded or non-existing satellite.
- 0 satellite data is faulty.
- \* satellite is manually excluded.

You may want to exclude a satellite manually in case a particular satellite is disturbing the navigation:

ENT

Open for change, and...



Place the cursor on the satellite in the bottom line you wish to exclude

-

The minus key will exclude the satellite, and...

+

the plus key will reinstate it

ENT

Confirm entry



### Position update alarm

“Alarm” in the satellite status display is preset to “OFF”. If the received position data is invalid, the position shown in the position display will start to flash. A position update alarm can be set ON/OFF from the satellite status display [MENU],[2],[5]:

ENT *Open for change*

+/- *Toggle alarm ON/OFF*

ENT *Confirm entry*

☞ *Reset the alarm by [CLR].*

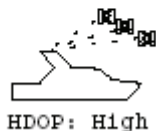
**Status indicator:** GPS\* - see section 4.1.

### HDOP, PDOP and DOP limits

The value of HDOP (horizontal dilution of precision) expresses “the quality” of the satellite geometry in relation to 2D positioning and a fixed antenna altitude.



PDOP (position dilution of precision) is equivalent to 3D positioning. The values will typically stay between 1.3 and 8. The lower the value the higher the “quality”. A poor geometry might produce a value of more than 20.



If preset DOP limit is exceeded (indicated by \* in the position display) it will cause the position updating to stop until it once again is within the limit.

The DOP limit can be changed manually, but should not be set to higher than 8 (default), as this may result in poor accuracy i.e. false position. To change the DOP limit from the satellite status display [MENU], [2], [5] :

ENT *Open for change*

● *Go to DOP limit (6-20), and...*

0-9 *Insert new limit*

ENT *Confirm entry*

## 4.6 SDGPS information

The SDGPS - satellite differential GPS - is preset to full automatic operation, which means that the system will utilize the position corrections from either differential GPS stations or satellite differential GPS signals from WAAS, EGNOS or MSAS (refer to section 4.6.1).

MENU

*Call up the menu bar, and...*

2,7

*load SDGPS setup display*

<b>SDGPS setup:</b>			
SDGPS select mode:			PASSIVE
Uses corrections from:			*****
CHANNEL 1: sat.no.:	****	****	
Corrections:			NONE
Integrity messages ok:			NO
Range used for position fix:			NO
Type 0 warning received:			NO
CHANNEL 2: sat.no.:	****	****	
Corrections:			NONE
Integrity messages ok:			NO
Range used for position fix:			NO
Type 0 warning received:			NO
Ignore type 0 warnings:			NO

ENT

*Open for change*



*Go to the function you wish to alter (see below)*

+/-

*Toggle the function*

ENT

*Confirm entry*

**SDGPS select mode** determines which differential corrections can be used in the position determination:

**AUTO** mode: Local area DGPS corrections are used when available. If not available, then SDGPS corrections are used (if these are available).

**MANUAL** mode: SDGPS corrections are used (if available). Local area DGPS corrections are not used.

**PASSIVE** mode: SDGPS corrections are never used.

**Uses corrections from** - indicates which differential corrections (DGPS or SDGPS) are currently used for position determination.

**CHANNEL 1: sat.no.** - indicates which satellite number and name is currently tracked/searched by channel 1, and what is the tracking state.

**Corrections** - indicates if corrections are being received on this channel. If YES: is the quality of the reception sufficiently high for the corrections to be usable.

**NONE:** no corrections are received.

**RECEIVED:** corrections are received, but of insufficient quality.

**USABLE:** corrections are received and of sufficient quality.

**USED:** corrections received on this channel are used in the position determination.

**Integrity messages ok** - the SDGPS system will transmit messages concerning the integrity of the GPS satellites. This line will indicate whether such messages are received and reliable.

**Range used for position fix** - if the receiver is tracking a particular SDGPS satellite, it “knows” the distance to that satellite. This line will indicate whether the distance is used in the position determination.

**Type 0 warning received** - if an SDGPS satellite is not operating according to specifications it will transmit a so-called “Type 0 warning”. In this situation, the receiver will not use any information that it might receive from that satellite. Until the SDGPS system is declared operational, the SDGPS satellites will always transmit Type 0 warnings.

☞ It is possible (but not recommendable) to override the Type 0 warnings - refer to last line in SDGPS setup: “Ignore type 0 warnings: NO” should be changed to “YES”.

### 4.6.1 Satellites in SDGPS system

The SDGPS system consist of eight orbiting geostationary satellites and is designed to form a seamless global augmentation system consisting of Waas (USA), EGNOS (Europe) and MSAS (Japan). If all three parts would become operative at the same time, there would be no performance problem. However, since WAAS is the only system currently in normal operation, the WAAS correction signals can have a negative effect on receivers operating in Europe and Far East outside the intended WAAS coverage area. In these areas, we recommend that the 'SDGPS select mode' is changed from 'AUTO' to 'PASSIVE'.



Refer to Addendum no. 183-0002-000 (included in the package) for up-to-date information on the current status of the SDGPS system.

Number	Name	System	Area
120	AOR-E	EGNOS - EU	Atlantic ocean region east
122	AOR-W	WAAS - US	Atlantic ocean region west
124	ARTEMIS	EGNOS - EU	
126	INMARSAT	EGNOS - EU	
129	MTSAT-1	MSAS - JAPAN	
131	IOR	EGNOS - EU	Indian ocean region
134	POR	WAAS - US	Pacific ocean region
137	MTSAT-2	MSAS - JAPAN	

#### Tracking state

The letter indicating the tracking state will appear immediately after the satellite number in the display.

*Letter indication:*      - means that the receiver is:

S	searching for satellite.
D	trying to synchronize to data stream.
C	code locked to signal.
P	phase locked to signal.

## 5. Waypoint / route menu

<b>3</b>	
WP/RTE	
<b>1</b>	Waypoints - see section 5.1
<b>2</b>	Routes - see section 5.2
<b>3</b>	Route calculation - see section 5.3
<b>4</b>	Lines - see section 5.4
<b>5</b>	Tracks - see section 5.5 and 5.6
<b>6</b>	Targets - see section 5.7

### 5.1 Waypoints stored in the memory

The waypoint list will appear in alphabetical order and will include the waypoint's position in lat/long. To edit one of the stored waypoints:

**MENU**



**3,1**

*Call up the menu bar, and...  
load waypoint list*


Waypoint:	WP 2		
x WP 1	57°14.853N	9°51.966E	
x WP 10	55°59.954N	10°47.247E	
x WP 11	55°59.203N	11°15.562E	
<b>x WP 2</b>	<b>57°20.289N</b>	<b>10°01.404E</b>	
x WP 3	57°24.990N	10°15.561E	
x WP 4	57°24.990N	10°39.831E	
x WP 5	57°14.490N	10°58.708E	
x WP 6	57°01.385N	11°06.798E	
x WP 7	56°50.773N	10°47.921E	
Number of stored waypoints:	11		

**A-Z**

*Insert name of waypoint you wish to edit, or...*

- +/-** *Leaf through waypoints with +/- keys or up/down cursor*
- ENT** *Open for editing*
-  *Place the cursor on the function you wish to change*
- 0-9** *Key in new figures, or...*
- +/-** *toggle between available values*
- PLOT** *Move the position to ship's position*
- ENT** *Confirm entry and return to WP list*
-  *Plot new waypoints with the [PLOT] key - refer to section 3.2.9.*

### 5.1.1 Delete waypoints via menu

- MENU** *Call up the menu bar, and...*
- 3,1** *load waypoint list*
- +/-** *Select the waypoint you wish to delete*
- ENT** *Open for editing*
- GOTO** *Delete waypoint*
- CLR** *Confirm that you want to delete the selected waypoint, if not sure: press [MENU] to exit the display without having made any changes.*
-  *Edit waypoints directly on the chart via info windows, refer to section 3.2.3.*

## 5.2 Routes stored in the memory

The route list will keep a record of all the saved routes in the system. It will provide information on number of waypoints in the route etc. Existing routes can be altered via the route list - see further on in this chapter, or directly on the chart via info windows - refer to sections 3.2.4 and 3.2.5. To delete a route - refer to section 5.2.1.



Making new routes can be done directly on the chart with the PLOT function - refer to section 3.2.9, or from the WP list using existing waypoints - refer to section 5.2.2.

**MENU**

*Call up the menu bar, and...*

**3,2**

*load route list display*

Route: <b>DENMARK</b>	
<b>DENMARK</b>	<b>219</b>
<b>LONG ROUTE 1</b>	<b>948</b>
<b>Number of stored routes:</b>	<b>2</b>
<b>CLR Make new route from WP list</b>	

**+/-**

*Toggle through the stored routes with the +/- keys, or...*

**A-Z**

*Select route by entering its name*



*Move the cursor up/down to select a specific route*

**ENT**

*Call up the details on highlighted route  
- see next page.*

Route:	DENMARK			0001
Course line:	—	█	ON	
XTE line:	.....	█	OFF	
1:	RHUMBLINE	70°	5.4nm	5.4nm
2:	RHUMBLINE	90°	7.6nm	13.0nm
3:	RHUMBLINE	42°	5.4nm	18.4nm
4:	RHUMBLINE	0°	5.4nm	23.8nm
5:	RHUMBLINE	50°	6.7nm	30.5nm
6:	RHUMBLINE	349°	5.5nm	36.0nm
Number of points in route:				219
MENU Exit			Edit	ENT

This display provides information on course line, XTE line, route legs, route points etc.

ENT

Call up the *Edit route display* - if you wish to make any changes. (Editing a route currently used for navigation is not possible)

<b>Edit route:</b>				
Settings for total route:				
Name:	DENMARK			
Course line:	—	█	ON	
XTE:	00.11nm	.....	█	OFF
Navigation mode:	RHUMBLINE			
Settings for route leg: 1 - 2				
XTE:	00.11nm			
Navigation mode:	RHUMBLINE			
Direction in route: FORWARD				
Show route as: NAVIGATION				
PLOT Routepoints			Delete	GOTO
MENU Exit			Accept	ENT

Setting the Course line to OFF in this display will make the route invisible on the screen. Put it back on the screen by setting it ON again. The course line and XTE line can be changed in color - there are a total of 15 colors to choose from together with 9 different line types.



If the XTE distance is not the same in all legs, the value will be \*.\* instead of the 00.10nm. Navigation mode can be either RHUMB-LINE or GREAT CIRCLE, or... if not set to the same in all legs in a route, the mode will be: COMPOSITE.

**Direction in route** can be set to either FORWARD or REVERSE direction.

**Show route as** can be set to either NAVIGATION for navigational data in the route display (example on the previous page), or POINTS for a list of routepoints together with the position in lat/long and the XTE limit of each point.



*Place the cursor on the function you wish to change*

0-9

*Key in new figures, and...*

+/-

*toggle between available values*

- if no more alterations are required, go to [ENT], or you can insert/remove routepoints from the route by entering a new display:

PLOT

*Open for the function: Remove/insert routepoints*

+/-

*Existing routepoints can be removed, by using the +/- keys to highlight the routepoint you wish to remove, and press [CLR]*

CLR



*New routepoints can be added to the route by using the cursor to go up/down in the WP list to select the position you wish to add to the route, then...*

+/-

*By means of the +/- keys highlight the routepoint where you wish the new position should be placed in the route, and press [PLOT]*

PLOT

- the last point in the RtePt panel is empty, and as such will allow you to enter a new final routepoint.

ENT

*Confirm modification of route and return to the Edit display*  
- or abandon modification by pressing [MENU]

ENT

*Confirm editing*

MENU

*Return to route list*

### 5.2.1 Delete route via menu

**MENU**

*Call up the menu bar, and...*

**3,2**

*load route list display*

**+/-**

*Select the route you wish to delete*

**ENT**

*Call up the details on highlighted route*

**ENT**

*Open for editing*

**GOTO**

*Delete route*

**CLR**

*Confirm that you want to delete the selected route, if not sure: press [MENU] to exit the display without having made any changes.*



*Edit routes directly on the chart via info windows, refer to section 3.2.4 and 3.2.5.*

### 5.2.2 Make new route from WP list

When you have a number of waypoints stored in the WP list which would be convenient to link together as a route it is easily done via the route list.

**MENU**

*Call up the menu bar, and...*

**3,2**

*load route list display*

**CLR**

*Make new route from waypoint list*



*Use the cursor to go up/down in the WP list to select the position you wish to add to the route, then...*

**+/-**

*By means of the +/- keys you can control where the highlighted position is placed in the route, press [PLOT]*

**PLOT**

*- the last point in the RtePt panel is empty, and as such will allow you to enter a new final routepoint. Once a WP position is transferred to the routepoint section, there is no longer any connection between the position and the waypoint in the WP list.*

Select the next position and press [PLOT]. Continue in this manner until the route is completed. In case you make a wrong plot, you can delete the routepoint by highlighting the RtePt number by means of

the +/- keys and then press [CLR] to remove the point from the route.

Display example:

Route: RTE 1		0000
Waypoint: WP 1		
Waypoint / position		RtePt
↑ WP 1 56°57.000N 10°25.000E		1
↓ WP 10		
WP 2		
WP 3		
WP 4		
<b>PLOT</b> Insert pos.	Delete RtePt	<b>CLR</b>
<b>MENU</b> Abandon	Accept	<b>ENT</b>

**ENT**

Save the route with [ENT] and go to the Edit display  
- or leave the function with [MENU] to abandon the route.

In the Edit route display you can set up the route preferences you need and also change the name of the route.



Place the cursor on the function you wish to change

**0-9**

Key in new figures, and...

**+/-**

toggle between available values

**ENT**

Confirm editing

**MENU**

Return to route list

### 5.3 Route calculation





To stay well informed during navigation, the Route calculation display will provide information on how long it takes to go from one point to another, total distance, arrival time etc.

**MENU**

*Call up the menu bar, and...*

**3,3**

*load route calculation display*

Route calculation:		
Route:	RTE 2	
Course line:		 ON
XTE:		 OFF
Route point A:		0001
Route point B:		0002
ETA speed:	13.8kn	AUTO
Total distance from A to B: 0.16nm		
Time to go from A to B: 0m42s		
Arrival time: 13:18		
Date: 15-01-2006		

**+/-**

*Toggle between available routes in the memory*



*Go to Routepoint A, and...*

**0-9**

*Select the first routepoint (A) from where you wish to start the calculation in the route, and then select the second point (B)*

Present speed is automatically used for calculating the arrival time, but if required, an alternative speed can be inserted:

**ENT**

*Open for change*

**0-9**

*Key in a new speed value*

**+/-**

*Toggle between AUTO and MANUAL*

**ENT**

*Confirm entry*

## 5.4 Lines stored in the memory

The line list will keep a record of all the saved lines in the system. It will provide information on number of line sections in line etc. 'Lines' are used for defining a certain area on the chart e.g. a fishing ground, a shipwreck, large rocks, restricted areas etc., or defining a channel to sail through narrow passages, making your own coast line or for whatever reason you could use a drawing on the chart.



To draw new lines you need a chart in the active window, place the cursor where you wish to start the line, and press [PLOT]. Then follow the instructions in the info windows. Refer to section 3.2.9. Lines can also be edited directly on the chart via info windows, refer to section 3.2.4 and 3.2.5.

**MENU**

*Call up the menu bar, and...*

3,4

*load line list display*

- only plotted lines saved in the memory can be called forward.

+/-

*Toggle through the stored lines with the +/- keys, or...*

A-Z



*Select line by entering its name*



*Move the cursor up/down to select a specific line*

ENT

*Call up the details on highlighted line*

Line:	<b>LINE 1</b>	0001
Line:		 ON
1:	57°59.698N	10°03.056E
2:	57°51.479N	9°49.722E
3:	57°42.048N	9°29.722E
4:	57°31.389N	9°11.944E
5:	57°33.762N	8°51.944E
6:	57°33.762N	8°31.945E
7:	57°44.410N	8°27.500E
Number of sections in line:		9
<b>MENU</b>	Exit	Edit <b>ENT</b>

This display indicates how many line sections are used for the drawing.



*Leaf through the line points by moving cursor up/down*

**ENT**

*Call up the Edit line display - if you wish to make changes.*

Turning “Line” OFF will make the line drawing invisible on the screen. Put it back on the screen by turning it ON again.



*Place the cursor on the function you wish to change i.e. name, line type or color*

**+/-**

*Toggle between available values*

**ENT**

*Confirm editing*

**MENU**

*Return to line list*

### 5.4.1 Delete lines via menu

**MENU**

*Call up the menu bar, and...*

**3,4**

*load line list display*

**+/-**

*Select the line you wish to delete*

**ENT**

*Call up the details on highlighted line*

**ENT**

*Open for editing*

**GOTO**

*Delete line*

**CLR**

*Confirm that you want to delete the selected line, if not sure: press [MENU] to exit the display without having made any changes.*



*Edit lines directly on the chart via info windows, refer to section 3.2.4 and 3.2.5.*



**Type** of track line i.e. full, dotted, etc. has 9 different types to choose from in 15 different colors.

### To stop track:

**PLOT**

*Call up the PLOT menu, and....*

**8**

*Load Stop track pop-up window*

**ENT**

*Stop the highlighted track*

## 5.6 Tracks stored in the memory

All tracks (of more than 1 trackpoint) will automatically be stored in the memory. To see which tracks are registered, you can scroll through the list by:

**MENU**

*Call up the menu bar, and...*

**3,5**

*load track list display*

**+/-**

*Toggle through the stored tracks with the +/- keys, or...*

**A-Z**


*Select track by entering its name*



*Move the cursor up/down to select a specific track*

**ENT**

*Call up the details on highlighted track*

Track:	<b>TRACK 2</b>
Tracking:	<b>ON</b>
Display track:	<b>ON</b>
Update:	<b>DISTANCE</b>
Interval:	<b>0.500nm</b>
Trackpoints:	<b>10</b>
Type:	
<b>MENU</b> Exit	Edit <b>ENT</b>

Example:  
Active track



**ENT** *Open for change*

“Display track” can be set ON/OFF, where OFF will make it invisible on the screen. Turn ON to put it back on the screen.

**+/-** *Toggle between available values*

**ENT** *Confirm changes*

**MENU** *Return to track list*

### 5.6.1 Delete tracks via menu

**MENU** *Call up the menu bar, and...*  
**3,5** *load track list display*


**+/-** *Select the track you wish to delete*

**ENT** *Call up the details on highlighted track*

**ENT** *Open for editing*

**GOTO** *Delete track*

**CLR** *Confirm that you want to delete the selected track, if not sure: press [MENU] to exit the display without having made any changes.*

 Edit tracks directly on the chart via info windows, refer to section 3.2.6.

## 5.7 Targets stored in the memory

The target display can show bearing and distance of up to three targets at a time in relation to the vessel e.g. harbors or important navigational points. A target is a fixed point on the chart which can be plotted by the cursor or from the ship's position - refer to section 3.2.9, or keyed in via the keypad - refer to section 3.2.7.

### Set up targets







The plotted target position is automatically preset to actual position of ship, or to cursor position when the chart display is active and the cursor is on - see INFO windows, section 3.2.7.

MENU

*Call up the menu bar, and...*

3,6

*load target display*

Targets :			
Name:	TARGET 1		ON
Position:	56°56.833N	10°25.584E	
B	127		D0.858nm
Name:	TARGET 2		ON
Position:	56°57.874N	10°23.692E	
B	325		D0.625nm
Name:	TARGET 3		ON
Position:	56°56.196N	10°20.624E	
B	240		D2.338nm

Make the target invisible on the screen by turning it OFF.

Put it back on the screen by turning it ON again.



*Select the target you wish to change or replace with a different target by moving the cursor up/down*

+/-

*Leaf through the targets in the memory*

ENT

*Open for change, and...*



*Place cursor where you wish to make a change i.e. name, color etc.*

A-Z

*Key in new values, alphabetical or*

0-9

*numerical*

**+/-** *Toggle between available values*

**ENT** *Confirm entry*

### 5.7.1 Delete target via menu


**MENU** *Call up the menu bar, and...*  
**3,6** *load target display*

**+/-** *Select the target you wish to delete*

**ENT** *Open for editing*

**GOTO** *Delete target*

**CLR** *Confirm that you want to delete the selected target, if not sure: press [MENU] to exit the display without having made any changes.*

 *Edit targets directly on the chart via info windows, refer to section 3.2.7.*



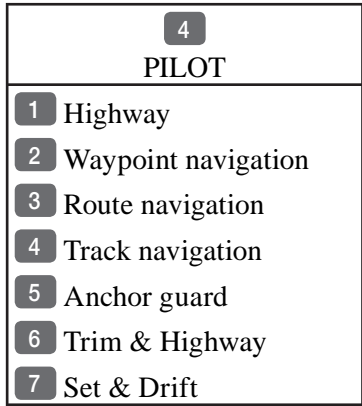
## 6. Pilot menu - with NAV inactive

<b>4</b>	
<b>PILOT</b>	
<b>1</b> Highway	- see section 6.1
<b>2</b> Waypoint navigation	- see section 6.5.2
<b>3</b> Route navigation	- see section 6.5.3
<b>4</b> Track navigation	- see section 6.5.4
<b>5</b> Anchor guard	- see section 6.3
<b>6</b> Trim & Highway	- see section 6.2.7
<b>7</b> Set & Drift	- see section 6.2.8

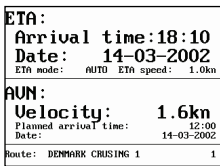
This PILOT menu will appear when there is no navigation mode active.

See also section 6.2 Pilot menu - with NAV active, section 6.3 Anchor guard, section 6.4 MOB navigation and 6.5 Navigation examples.

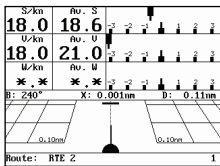
**PILOT**



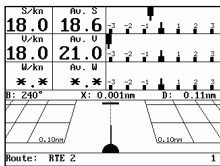
⇒



⇒



⇒



### 6.1 Highway display

- MENU** *Call up the menu bar, and...*
- 4,1** *load Highway display*

Since there is no navigation mode active, you will receive the legend: NAVIGATION IS OFF. To enter the basic Navigation setup display:

- ENT** *Load Navigation setup*  
- see display example next page.

Before starting out in one of the navigation modes, it may be a good idea to check out the Navigation setup display and see if the default settings will suit your need.

Navigation setup:		
Anchor alarm distance:	00.50nm	
WP circle alarm:	00.10nm	OFF
WP and cursor navigation:		
XTE alarm:	00.10nm	ON
Navigation mode:	RHUMBLINE	
Route navigation:		
XTE alarm:		OFF
Auto waypoint shift:	WP-circle	
Track navigation:		
XTE alarm:	00.10nm	OFF
Auto trackpoint shift:	WP-circle	
Navigation mode:	RHUMBLINE	

+/-

*Toggle between available values, or...*

0-9

*key in a new alarm limit*

ENT

*Confirm entry*

**Anchor alarm distance** - When setting anchor, check/change the preset alarm distance, etc., so you will be warned in case you drift too far from the anchored position. The alarm distance can be set to anywhere between 0.01 and 9.99nm. See also section 6.3 Anchor guard. The alarm will automatically reset once you are inside the limits again.

**WP circle alarm** - forms a circle around each waypoint, and the alarm distance can be set to anywhere between 0.01 and 9.99nm. The waypoint alarm will be activated when you reach the circle or the perpendicular line - **WP line alarm** - crossing through the waypoint. When “Auto waypoint shift” is set to “WP-circle” it will override the “WP circle alarm” function.

**XTE alarm** - forms a corridor along the ideal track. When crossing one of the boundaries the XTE alarm will be activated.

The **alarm** will automatically reset once you are inside the limits again. The alarm distance can be set to anywhere between 0.01 and 9.99nm.



In Route navigation the XTE alarm value can be specified for each route leg - see section 5.2.

**Navigation mode** - RHUMBLINE navigation is used for shorter distances, and GREAT CIRCLE for long trips, especially when crossing at high latitudes. COMPOSITE navigation is used when all the legs in a route are not set to the same navigation mode.

**Auto waypoint shift** - can be set to WP-circle, WP-line or OFF. When set to WP-circle, the system will change to the next waypoint in the route after passing the circle line (border). When set to WP-line, the system will change to next waypoint in the route after passing the waypoint line (border). When “Auto waypoint shift” is set to WP-circle, then the alarm function at the waypoint’s circle will not be activated.

## 6.2 Pilot menu - with NAV active

4 PILOT	
1 Highway	- see section 6.2.1
2 Stop navigation	- see section 6.2.3
3 WP advance	- see section 6.2.4
4 Restart to approaching point	- see section 6.2.5
5 ETA & AVN	- see section 6.2.6
6 Trim & Highway	- see section 6.2.7
7 Set & Drift	- see section 6.2.8

This PILOT menu will appear when navigation mode is active.

If the selected navigation mode is Waypoint navigation, then point 3: WP advance will not be available and therefore the color of the text will differ from the rest of the menu text.

See also section 6.1 Pilot menu - with NAVin active, section 6.3 Anchor guard, section 6.4 MOB navigation and 6.5 Navigation examples.

## 6.2.1 Highway display

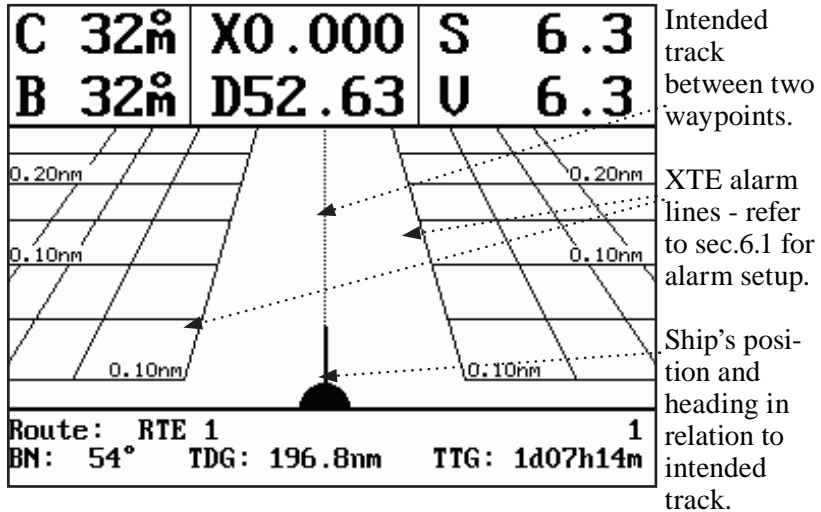
**MENU**

*Call up the menu bar, and...*

4,1

*load Highway display*

With navigation mode active, the highway display will provide a graphical steering display:



C: Course over ground

X: XTE - Cross-track-error

S: Speed over ground

B: Bearing to approaching point

D: Distance to approaching point

V: Speed towards point

Route: Name/number of active route and approaching routepoint

BN: Bearing to next point

TDG: Total distance to go to end of route

TTG: Total time to go to end of route



## 6.2.2 Navigation setup

If you wish to make any changes in the navigation setup, you can quickly enter the navigation setup display by pressing [ENT] from the highway display (graphical steering display).

**ENT**

*Quick access to navigation setup from active highway display, or... -refer to display example and description of functions in section 6.1.*

## 6.2.3 Pilot mode - Turn NAV off

**MENU**

*Call up the menu bar, and...  
turn off navigation mode*

4,2

## 6.2.4 Pilot mode - Waypoint advance

**MENU**

*Call up the menu bar, and...  
activate shift to next waypoint*

4,3

-it will require that navigation mode is active and that “a next waypoint” exists.

## 6.2.5 Pilot mode - Restart to approaching point

**MENU**

*Call up the menu bar, and...  
activate restart to approaching point*

4,4

-if you for some reason have drifted off course and wish to restart navigation from your actual position to the approaching point.

## 6.2.6 Pilot mode - ETA & AVN

**MENU**

*Call up the menu bar, and...  
load the ETA & AVN display*

4,5

-it will require that navigation mode is active - see display example next page.

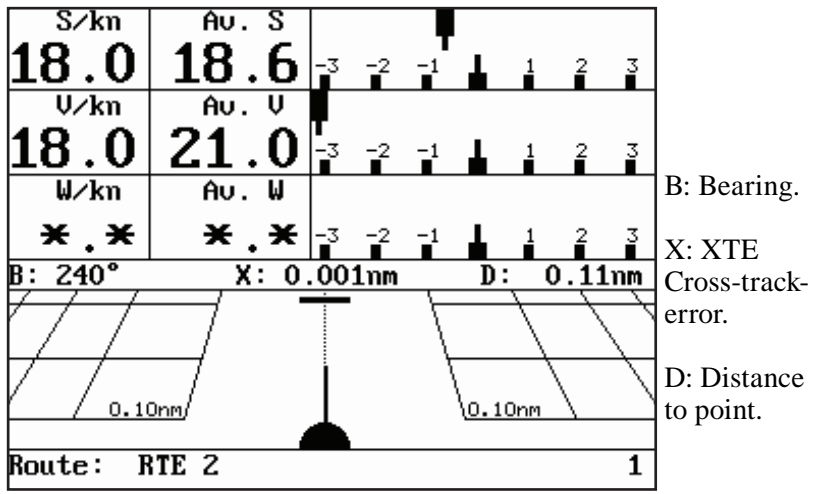


### 6.2.7 Pilot mode - Trim & highway display

☞ Some of the readings rely on data from external log and compass.

The Trim & highway display will provide information on actual and mean speed, velocity and water speed - see also section 6.2.8 Set & drift display.

**MENU** *Call up the menu bar, and...*  
**4,6** *load the Trim & highway display*



**ENT** *Open for change*

**ENT** *Reset mean speed indication in display*

### 6.2.8 Pilot mode - Set & drift

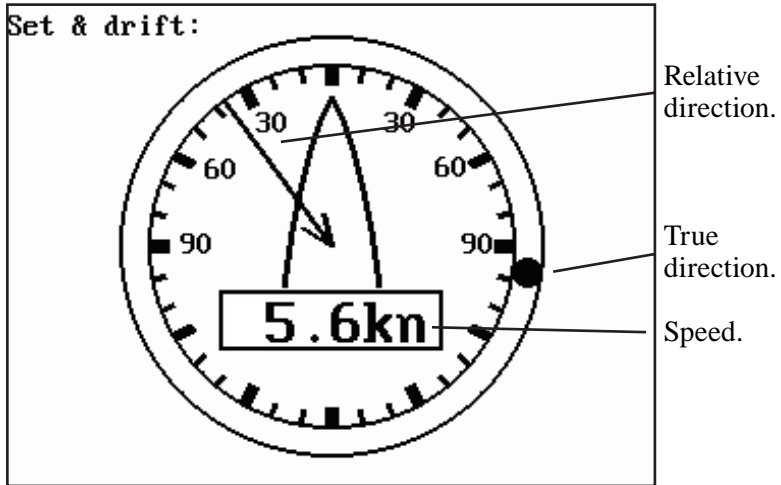
☞ The readings rely on data from external log and compass.

**MENU**

*Call up the menu bar, and...*

4,7

*load the Set & drift display*



The set & drift display will show how fast the current is moving in knots; in what direction (true) it is moving and what direction in relation to the vessel (relative).

☞

To obtain information on actual and mean speed, velocity and water speed - see the Trim & highway display in section 6.2.7.

## 6.3 Anchor guard

**MENU**

*Call up the menu bar, and...*

**4,5**

*activate the anchor guard function*

-the chart display will provide an impression of the vessel's position in relation to the alarm circle.

**MENU**

To check/change the preset alarm distance:

*Call up the menu bar, and...*

**4,1**

*load the highway display*

**ENT**

*Enter the navigation setup display*



*Move cursor to the Anchor alarm distance*

**0-9**

*Enter new value with numeric keys*

**ENT**

*Confirm the change*

### To turn Anchor guard off again:

**GOTO**

*Call up the GOTO menu, and...*

**3**

*turn anchor guard off*

## 6.4 MOB alarm and navigation

The MOB - Man overboard - alarm and display will be activated if you press the [MOB] key on the keypad and hold it depressed for two seconds, or activate an external MOB switch (hold five seconds). The MOB display will provide all relevant data for an efficient rescue operation - refer to details on page III.

### To turn the MOB function off again:

**GOTO**

*Call up the GOTO menu, and...*

**3**

*turn the MOB function off*

### To check the last activated MOB position:

**MENU**

*Call up the menu bar, and...*

**7,4**

*select MOB data*

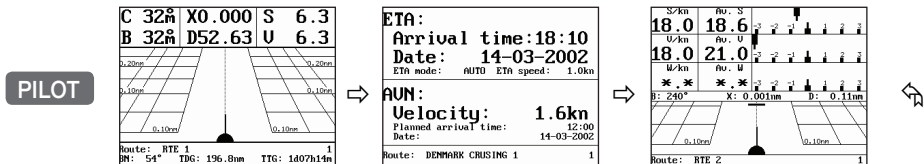
## 6.5 Navigation examples

- 6.5.1 Chart/cursor navigation.    6.5.2 Waypoint navigation.  
 6.5.3 Route navigation.            6.5.4 Track navigation.

Relevant for all navigation modes are:

- the highway display with graphical steering - section 6.2.1.
  - the ETA & AVN display with Estimated Time of Arrival and Approximate Velocity Necessary to reach a given point at a specific time - section 6.2.6.
  - the \*Trim & highway display with information on actual and mean speed over ground, velocity (VMG) and water speed - section 6.2.7.
  - the \*Set & drift display with indication of how fast the current is moving in knots, in what direction (true) it is moving and what direction in relation to the vessel (relative) - see section 6.2.8.
- \* These readings rely on data from external log and compass.

With the [PILOT] key you can toggle between:



### 6.5.1 Chart / cursor navigation

Cursor navigation is the easiest and most straightforward way of navigation - point and go!

**CHART** *Shortcut to chart display*



*Press the cursor key to activate the cursor, then move the cursor to your destination*

**GOTO** *Call up "Select NAV mode" window, and...*

**1** *select "Cursor"*

A course line will now be drawn from actual position (ship's position) to destination point (cursor's position).



Next destination: While on the way, you can easily *move the cursor to the next destination*, and when ready to change navigation leg...

**GOTO**

Press [GOTO] and [2] to...

2

“Restart to approaching point”

- a new course line will be drawn from ship's position to destination.

### To turn NAV mode off again:

**GOTO**

Press [GOTO] and [3] to...

3

“Turn NAV off” from active chart display

or...

**MENU**

Press [MENU] and [4], [2] to...

4,2

“Stop navigation” via the menu

## 6.5.2 Waypoint navigation

There are two ways of activating Waypoint navigation:  
From the chart display using [GOTO] or from the menu system.

### From the chart:

**CHART**

Shortcut to chart display



Place cursor on destination waypoint

**GOTO**

Select NAV mode, and...

2

Select Waypoint

This will activate the pop-up window “Navigate to WP” - now follow the procedures from the ☞ a few lines further ahead, or press [ENT] to start navigation.

**From the menu:****MENU***Call up the menu bar, and...***4,2***select Waypoint navigation*

This will activate the pop-up window “Navigate to WP” from where you can choose which waypoint you wish to sail to:



*Use the cursor to scroll up/down in the waypoint list, or place cursor on the WP number, and...*

**+/-***Scroll up/down with +/- keys, or...***0-9***Key in the number of the waypoint you wish to sail to***ENT***Start navigation*

A course line will now be drawn from ship’s position to destination waypoint.

**To turn NAV mode off again:****GOTO***Press [GOTO] and [3] to...***3***“Turn NAV off” from active chart display**or...***MENU***Press [MENU] and [4], [2] to...***4,2***“Stop navigation” via the menu*



### 6.5.3 Route navigation

To start Route navigation will require that at least one route is stored in the memory. Refer to section 3.3.9 PLOT function.

When navigating in a route, you will have a graphical steering display to navigate by, see section 6.2.1. Know your ETA - Estimated Time of Arrival, and your AVN - Average Velocity Necessary, see section 6.2.6. Call up the Set & drift display, see section 6.2.8.

There are two ways of activating Route navigation:  
From the chart display using [GOTO] or from the menu system.

#### From the chart:

**CHART**

*Shortcut to chart display*




*Place cursor on the routepoint you wish to start your navigation from*

**GOTO**

*Select NAV mode, and...*

**3**

*Select Route*

This will activate the pop-up window “Navigate in route” with the selected routepoint as first destination - now follow the procedures from the  a few lines further ahead, or press [ENT] to start navigation.

#### From the menu:

**MENU**

*Call up the menu bar, and...*

**4,3**

*select Route navigation*



This will activate the pop-up window “Navigate in route” from where you can choose which route you wish to select for navigation:

**+/-**

*Scroll up/down in the route list until the correct route number / name appears*



*Use the cursor to move around in the window if anything needs to be changed - such as Direction in route, etc.*

**0-9**

*Key in the number of the first routepoint you wish to sail to*

**ENT***Start navigation*

A course line will now be drawn from ship's position to the first route point.

**GOTO**

Pressing [GOTO] from chart display during navigation will activate an INFO window with the following functions to choose from:

1. Advance (to next route point)
2. Restart to approaching point (in case you have drifted off course)
3. Turn NAV OFF

**MENU****4**

Pressing [MENU] and [4] from an active data display during navigation will give access to the following displays / features:

1. Highway
2. Stop navigation
3. WP advance (to next route point)
4. Restart to approaching point (in case you have drifted off course)
5. ETA & AVN
6. Trim & highway
7. Set & drift

### 6.5.4 Track navigation

A track is created by a series of trackpoints connected by track lines. Using a track for navigation is somewhat like navigating in a route with many waypoints.

- ☞ To start Track navigation will require that at least one track is stored in the memory. Tracks which are not yet completed can not be used for navigation. Refer to section 5.5 Start / Stop track.

When navigating in a track, you can use the chart or the Highway display to navigate by, see section 6.2.1. Know your ETA - Estimated Time of Arrival, and your AVN - Average Velocity Necessary, see section 6.2.6. Call up the Set & drift display, see section 6.2.8.

There are two ways of activating Track navigation:  
From the chart display using [GOTO] or from the menu system.

#### From the chart:

**CHART**

*Shortcut to chart display*



*Place cursor on the track at the point where you wish to start your navigation from*

**GOTO**

*Select NAV mode, and...*

**4**

*Select Track*

This will activate the pop-up window “Navigate in track” - now follow the procedures from the ☞ a few lines further ahead, or press [ENT] to start navigation.

#### From the menu:

**MENU**

*Call up the menu bar, and...*

**4,4**

*select Track navigation*

- ☞ This will activate the pop-up window “Navigate in track” from where you can choose which track you wish to select for navigation:

**+/-**

*Scroll up/down in the track list until the correct track number / name appears*



*Use the cursor to move around in the window if anything needs to be changed - such as Direction in track, etc.*

**0-9**

*Key in the number of the first trackpoint you wish to sail to*

**ENT**

*Start navigation*

A course line will now be drawn from ship's position to the first point of destination.

**GOTO**

Pressing [GOTO] from chart display during navigation will activate an INFO window with the following functions to choose from:

1. Advance (to next trackpoint)
2. Restart to approaching point (in case you have drifted off course)
3. Turn NAV OFF

**MENU****4**

Pressing [MENU] and [4] from an active data display during navigation will give access to the following displays / features:

1. Highway
2. Stop navigation
3. WP advance (to next trackpoint)
4. Restart to approaching point (in case you have drifted off course)
5. ETA & AVN
6. Trim & highway
7. Set & drift

## 7. ECHO menu

The ECHO menu and its related functions are mainly for CX33-E i.e. only section 7.10 applies to the models CP31 and CX33.

### CP31:

5	
ECHO	
1	Depth & temperature diagram - see section 7.10

### CX33:

5	
ECHO	
1	<b>Echo 50kHz</b> - not available in this model.
2	<b>Echo 200kHz</b> - not available in this model.
3	Depth & temperature diagram - see section 7.10

### CX33-E:

5	
ECHO	
1	Echo 50kHz - see section 7.2
2	Echo 200kHz - see section 7.2
3	Depth & temperature diagram - see section 7.10

## 7.1 Echosounder operation

The echosounder function of the CX33-E determines the distance between its transducer and underwater objects such as fish, lake bottom or sea bed. It does this by utilizing the fact that an ultrasonic wave transmitted through water travels at a nearly constant speed of 4800 feet (1500 meters) per second. When a sound wave strikes an underwater object such as fish or sea bottom, part of the sound wave is reflected back toward the source. Thus by calculating the time difference between the transmission of a sound wave and the reception of the reflected sound wave, the depth to the object can be determined.

The entire process begins in the display unit. Transmitter power is sent to the transducer as a short pulse of electrical energy. The electrical signal produced by the transmitter is converted into an ultrasonic signal by the transducer and transmitted into the water. Any reflected signals from intervening objects (such as a fish school) are received by the transducer and converted back into an electrical signal. It is then amplified in the amplifier section, and finally, displayed on the screen.

The picture displayed is made up of a series of vertical scan lines (pings), one for each transmission. Each line represents a 'snapshot' of what has occurred beneath the boat. The series of snapshots are accumulated side by side across the screen, and the resulting contours of the bottom and fish between the bottom and surface are displayed.

### Selecting echosounder displays

The CX33-E provides various types of echosounder displays: standard echogram, A-scope, bottom expansion (zoom), VRM expansion and shift mode. Each display has its special advantages. Select the appropriate setup for the echosounder display in the presentation "Setup" and "Echosounder setup" displays, considering current sea area and target fish.

## 7.2 Echosounder display

Low and high frequency echosounder display can be set up separately. The low frequency display will show deep water bottom contours, and the high frequency display will show the mid-water section with trawl targets or bait fish in a higher resolution.

As an example:

**MENU**

*Call up the menu bar, and...*

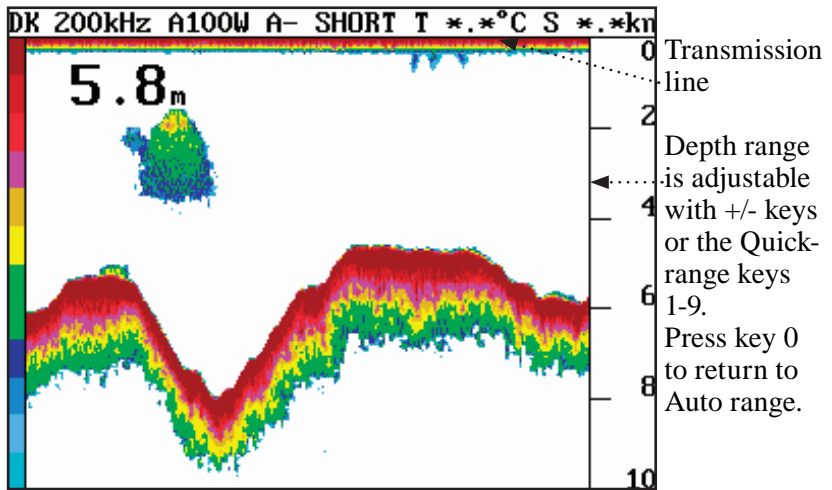
**5,2**

*load the Echo display for 200kHz, or...*

**ECHO**

*Hotkey to Echo display i.e. jumps to page with Echo 50kHz or Echo 200kHz display; if none: inserts the last active Echo display in active page - see display example next page.*

This is the basic presentation mode (standard display) for observing fish schools and sea bed. Some surface noise may appear just below the transmission line.



The data field is preset to show: Actual depth **\*DK**, transmit power **A100W** (set to AUTO), transmission pulse length **A- SHORT** (set to AUTO), see section 7.6.

Water temperature **T** in Celcius or Fahrenheit (in 1/10 degrees), water or SOG speed **S** in knots or kilometers/hour or miles/hour - units can be changed in Setup for units (MENU,8,1).

\*) Actual depth i.e. Depth below **Keel/Surface/Transducer** - settings can be changed in Echosounder menu (MENU,8,ECHO).



*Press cursor left/right to adjust gain*

ENT

9

*Press [ENT], [9] to load the Presentation setup related to active echo display 50kHz or 200kHz - (see section 7.6)*



*Use the cursor to go to the function you wish to change the value for*

+/-

*Toggle between available values*

ENT

*Confirm changes*

## 7.3 Variable range marker

VRM – Variable Range Marker – refers to a horizontal black line shown on the display screen. The user can measure the range to targets shown on the display screen by use of the VRM. The depth to the VRM can be seen in the left side of the screen. This function is

not available if VRM expansion is ON.

From active echo display:



*Activate the Variable Range Marker function, and...*



*Move the VRM up/down*

**+/-**

*Adjust the range by means of the +/- keys*

**CLR**

*Turn VRM off again*

## 7.4 Echo quick menu

A number of echo features can easily be accessed from the Echo quick menu.

From active echo display:

**ENT**

*Call up the Echo quick menu with access to the following features:*

Echo quick menu	
<b>1</b>	Change frequency
<b>2</b>	Hide A-scope
<b>3</b>	Standard Echo display
<b>4</b>	Bottom lock display
<b>5</b>	Zoom display
<b>6</b>	Shift display
<b>9</b>	Presentation setup
<b>ECHO</b>	Transmit power off
<b>MENU</b>	Exit

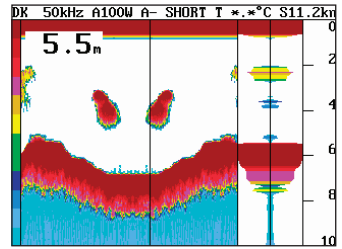
**1**

*Change frequency* will toggle between 50 or 200 kHz displays (Airmar transducers) to suit the task. 200 kHz is for general purpose and offers optimum discrimination and a narrow transmitter beam. 50 kHz is for searching in a wider area, determining bottom conditions and going the deepest.



2

*Hide/Activate A-scope* The amplitude scope at the right side of the echo display indicates the precise amplitude or strength of the last received ping (sounding), which often can be used for determining individual species of fish or hardness of the bottom.

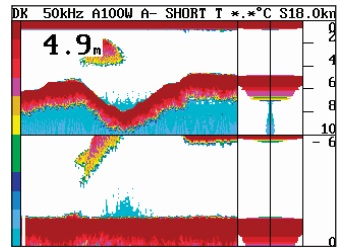


3

*Standard Echo display* Return to the basic presentation mode (standard display) from echo display with an added feature e.g. bottom expansion, VRM expansion, etc.

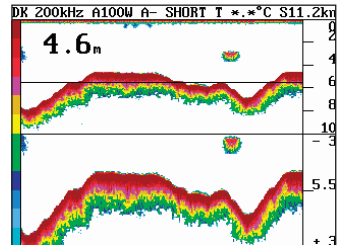
4

*Bottom lock display* The advanced bottom lock and expansion feature ensures a reliable depth readout and provides a compressed standard display in the upper half of the display. The bottom area can be magnified for better separation of echoes. The actual range of the expansion window can be adjusted in the Presentation Setup.



5

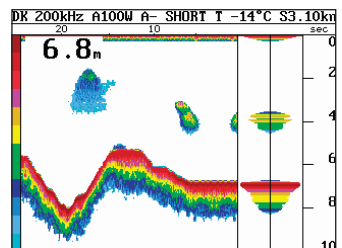
*Zoom display* This feature will provide an expanded view of the area near the Variable Range Marker (see section 7.3) which will give a better separation of echoes. The actual range of the expansion window can be adjusted in the Presentation Setup.



The zoom level can be selected in steps, ranging from 1 to 50 meters, or converting to feet or fathoms (refer to Setup for units, section 10.4).

6


*Shift display* This feature can be applied when operating in deep waters. Select the range for an expansion window. The expansion window can automatically follow a changing bottom or be set manually by the +/- keys.



- 9** *Presentation setup* Load the setup related to active echo display, see section 7.6.
- ECHO** *Transmit power off* Stop transmission in order to observe noise picked up by the transducer.
- MENU** *Abandon the Echo quick menu without making any changes*

## 7.5 Plot waypoint or event mark via PLOT menu

From active echo display:

- PLOT** *Call up the PLOT menu* with the following to choose from:
  - 9** *Set vertical mark* will plot a vertical marker (line) at the current ping.
    - or you can plot the position of a given echo on the chart:
  - 3** *Insert waypoint* will activate a cursor on the echo display
  -  *Move cursor to the echo which position you wish to place as a waypoint*
  - ENT** *Press [ENT] to register the waypoint on the echo display*

A new info window will open where you can change the name of the waypoint, adjust the position if necessary, change symbol and color of the waypoint. When satisfied with the information in the info window:

- ENT** *Press [ENT] to save waypoint*

## 7.6 Presentation setup


The general Echosounder setup e.g. Selecting transducer, Alarm settings, Demo mode etc. is placed in the SETUP menu (section 10.2).

The echo setup in this chapter are the most common settings for adjusting the presentation of the high or low frequency echo picture.

ENT

9

Press [ENT], [9] to load the Presentation setup related to active echo display 50kHz or 200kHz

Setup 200kHz:	
Range start:	000 m
Range:	AUTO 25 m
Gain:	050%
White line:	OFF
Expansion window:	6 m
TVG:	Normal (20 log R)
Ping to ping filter:	ON
Signal threshold:	OFF
Color threshold:	 OFF
Depth grid:	OFF
Transmit pulse length:	AUTO
Transmit power:	AUTO
Scroll synchronization:	TIME
Scroll speed:	HIGH



Use the cursor to go to the function you wish to change the value for

0-9

Key in new figures, or...

+/-

Toggle between available values

ENT

Confirm changes, or...

MENU

Abandon changes and exit display

**Range start** – allows the user to set the displayed depth range to begin at some point below the surface. For example, a 100 meter displayed range can be “phased” downwards, so that the screen shows a 100 meter section beginning at, say, 200 meters and going to 300 meters depth.

**Range** – refers to the distance shown from the top to the bottom of the display screen. Selecting **Auto range** will cause the CX33-E to

change the basic range setting(s) to keep the displayed bottom in the lower half of the display. For instance, as your boat moves into deeper waters, the system will automatically switch to a deeper range, always keeping the displayed bottom in the lower half of the display. **Manual range** allows the operator to set the range displayed on the screen.

**Gain** – is another way of saying “sensitivity”, or possibly “volume”. Increasing the gain setting of the CX33-E will allow you to see smaller and deeper targets. If the gain is set too high, however, you will begin to see “noise” and unwanted targets. Generally speaking, you want to set the gain control just below the point that you begin to see speckles of “noise” between surface and the bottom on the screen.

**White line** – is a control which places a white/black line at the displayed sea floor and blanks out 4 pixels just below the line. The purpose of this is to help the user detect targets, such as fish, which are very close to the sea floor and whose echoes tend to merge with those of the sea floor itself.

**Expansion window (zoom level)** – can be selected in eight steps, ranging from 1 to 50 meters, or converted to feet or fathoms (refer to Setup for units, section 10.4). This function allows you to take a closer look at a particular section of the water underneath your boat. You can expand the view near the bottom (Bottom expansion) or near the Variable Range Marker (VRM expansion).

**TVG** – Time Varying Gain – is a control that allows the CX33-E to make corrections for most of the losses and absorption that occurs as sound energy passes through sea water. There are three settings to choose from, Normal, Special and OFF.

The setting “Normal (20 log R) is for general fish finding at depths down to 50m (150’) and it will also give a uniform bottom echo presentation at shallow, mid and deep water.

The setting “Special (40 log R) will adjust the TVG to show the same echo strength for a given size fish at varying depths.

The OFF position is used for net sounders. In OFF position the TVG is inactive which means that the sounder operates with a fixed gain between each transmitter pulse. Auto range is switched to manual.

**Ping to ping filter** – can be set to either on or off. With the filter “off”, then each received echo will be reflected on the screen. Whereas with the filter “ON”, the system will compare every two


echoes received and only reflect on the screen what is received from both echoes, which will give a more uncluttered recording.

**Signal threshold** – can be set to ON to eliminate the appearance of unwanted noise. The threshold level is automatic and the feature should be used with caution, as it may eliminate small fish and small unidentified objects on the screen.

**Color threshold** – the color threshold function allows the “weaker” targets and noise which may be shown on the display screen to be eliminated from the display. These targets are usually shown in the weaker target colors such as blues and greens. The Color threshold allows you to choose not to display the blues, or the blues and greens, etc. Doing this will leave only the stronger targets on the display screen.

**Depth grid** - enables a more precise reading of depth and target relations across the screen.

**Transmit pulse length** – can be set OFF to observe noise in the water (Auto range will switch to manual mode). Set to AUTO, the optimum setting will be applied according to the water depth. Or it can be set manually, if a specific pulse length is required:

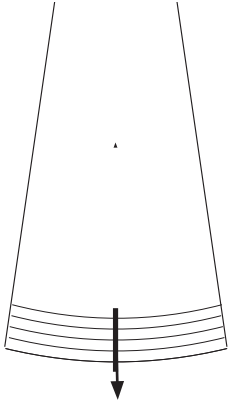
SHORT	less than 10m deep water
MEDIUM	between 10 and 50 m deep water
LONG	more than 50m deep water
<p> <i>A long pulse will reach deeper but give less resolution.</i></p>	

**Transmit power** – should normally be left on AUTOMATIC. The modes available are: AUTO, 600W, 100W, 10W and OFF.

**Scroll synchronization** – the screen can be updated on the basis of time or distance (when data from last ping appears on the display).

**Scroll speed** – is the ping rate and movement of the presentation of echoes on the screen, moving from right to left. It is adjustable (Low, Medium, High, Freeze), to allow the user to show a longer “history” on the display screen, if desired.

## 7.7 How the echosounder works

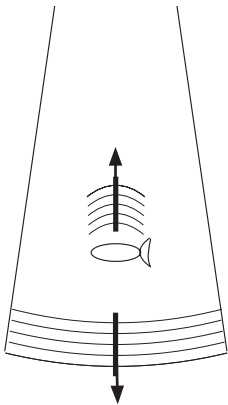


*Fig. 1 Transmitted 'ping' from the transmitter/receiver.*

When the CX33-E is turned on, the processor begins to send electrical pulses to the transducer. The ceramic resonators in the transducer has a special property which enables it to change dimensions slightly when a varying voltage is applied.

The voltage is thus converted to mechanical vibrations (sound waves) which are then transmitted down through the water.

See Fig. 1.



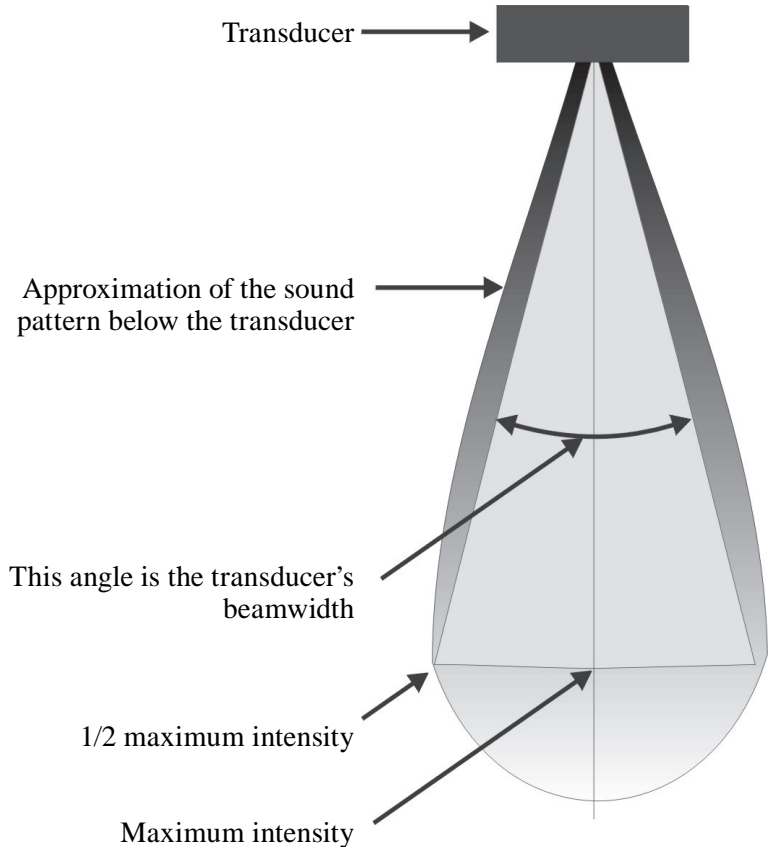
*Fig. 2 The up arrow indicates: Echo returning to the receiver.  
The down arrow indicates: Transmitted pulse.*

The sound waves move through the water until they encounter a change in density, such as a fish or the bottom. This causes the sound waves to 'echo' back up through the water. When the reflected sound waves (echoes) hit the transducer, the ceramic disk vibrates at the same frequency. This generates a varying voltage between the disk surfaces. This voltage goes back up through the cable to the receiver. The CX33-E processes the signals and presents them on the display screen.

See Fig. 2.

## 7.8 Transducer beamwidth

The transducer mounted to the hull of your vessel serves as both a 'speaker' when transmitting, and as a 'microphone' when the echosounder is receiving. Similar to the way a flashlight focuses light, most of the sound from your transducer is focused downwards with a smaller amount going out to the sides. The amount of focusing of the sound beam is expressed as a 'beamwidth'.



*Fig. 3 A representation of a transducer beamwidth.*

The center of the sound beam is the most intense, then as you move out towards the sides of the sound beam there is a point where the intensity of the sound is half what it was in the center. The distance moved is the 'beamwidth'. See Fig. 3.

## 7.9 Effects of the vessel's speed

The presentation of fish on the CX33-E depends directly on the vessel's speed, as well as on the depth of the fish. When the vessel is at rest, the echo traces will appear stretched and flattened. As the vessel's speed becomes greater, the echo traces will become shorter and more arched. The reason for this change in appearance is that as the vessel speed increases, fewer number of sound 'pings' strike each fish. A low vessel speed will provide the most accurate information of where fish are located.

## 7.10 Depth & temperature diagram

CP31/CX33: The depth and temperature "instrument" provides a graphical presentation of depth and water temperature from external equipment in relation to time or distance.

CP31/CX33:

**ECHO**

*Hotkey to Depth & temperature diagram* i.e. jumps to page with actual display; if none: inserts the last active Depth & temperature diagram in active page, or select via menu:

CP31:

**MENU**

*Call up the menu bar, and...*

**5,1**

*activate Depth & temperature diagram*

- display example next page.

CX33:

**MENU**

*Call up the menu bar, and...*

**5,3**

*activate Depth & temperature diagram*

- display example next page.

CX33-E: The depth and temperature "instrument" provides a graphical presentation of depth and water temperature in relation to time or distance.

CX33-E:

**MENU**

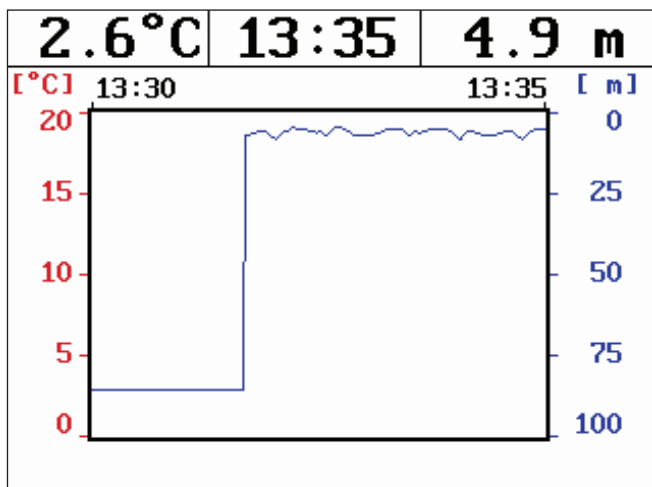
*Call up the menu bar, and...*

**5,3**

*activate Depth & temperature diagram*

- display example next page.





Present water temperature and depth.

Depth over time or distance.

Temperature over time or distance.

ENT

*Call Setup for Depth*

## Setup for Depth:

Scale for depth: 0 -> 100 m

Color for depth:

Scale for temperature: 0 -> 20 °C

Color for temperature:

Interval of screen: TIME

Time interval: 5 MIN.



*Go to the function you wish to change*

0-9

*Key in new figures, or...*

+/-

*change settings*

ENT

*Confirm changes*

**Scale for depth** - there are six depth scales to choose from, ranging from 0 -> 10m to 0 -> 3000m. Toggle between values with +/- keys.

**Color** - for depth and temperature can be changed. Toggle between available colors by means of the +/- keys.

**Scale for temperature** - can be set to 0 -> 10°, 0 -> 20°, 0 -> 30°, 10 -> 20°, and -10 -> 10°.

**Interval of screen** - the interval for updating of screen can be related to TIME or DISTANCE.

TIME interval can be set in 6 intervals from 5 minutes to 3 hours (+ freeze) for refreshing of the screen.

DISTANCE can be set in 7 intervals, ranging from 0.5nm to 90nm in order to adjust to the speed of the ship, and you can freeze the reading.

## 8. Engine menu

<div style="border: 1px solid black; display: inline-block; padding: 2px 5px; margin-bottom: 5px;">6</div> ENG	
<div style="border: 1px solid black; display: inline-block; padding: 2px 5px; margin-bottom: 5px;">1</div> Engine status	- see section 8.1
<div style="border: 1px solid black; display: inline-block; padding: 2px 5px; margin-bottom: 5px;">2</div> Fuel and transmission	- see section 8.2
<div style="border: 1px solid black; display: inline-block; padding: 2px 5px; margin-bottom: 5px;">3</div> Battery status	- see section 8.3
<div style="border: 1px solid black; display: inline-block; padding: 2px 5px; margin-bottom: 5px;">4</div> 2nd Engine status	- see section 8.4
<div style="border: 1px solid black; display: inline-block; padding: 2px 5px; margin-bottom: 5px;">5</div> 2nd Fuel and transmission	- see section 8.4
<div style="border: 1px solid black; display: inline-block; padding: 2px 5px; margin-bottom: 5px;">6</div> 2nd Battery status	- see section 8.4



This graphical engine monitoring system is available for engines outputting data via NMEA2000® or an appropriate interface device supporting NMEA2000®. Depending on the engine system and interface, some data may not be transmitted on the databus. If not readily available, please contact the engine manufacturer or your local Simrad dealer.

The CP31/CX33 is capable of receiving and presenting various engine data. The menu points 4, 5 and 6 are a second set of displays, which only will be visible if the system detected more than two engines on board.

For dual engines, the system provides ‘dual bar analog instruments’ to give a precise overview of the rpm synchronization and to make direct comparison of data between the two engines.

The engine monitoring system provides analog graphical gauges and digital (numerical readings) data for up to four engines - see display examples further on in this chapter.

### General settings


SimNet will auto detect the engines at start-up and will automatically set up the parameters in default mode. Before using the engine monitor system, you need to edit the setup and prepare for the read-out. The top line identifies the engine/battery, the default is ENGINE 1 to 4 or BATTERY 1 to 4. Insert the correct name for the engine/battery in the Interface setup:

**MENU**


*Call up the menu bar, and...*

8,2 *load the Interface setup*

PLOT *Use the [PLOT] key to go to the Engine tab*

 *Go to the name you wish to change,  
- refer to section 2.6 Naming of routes, points etc.*

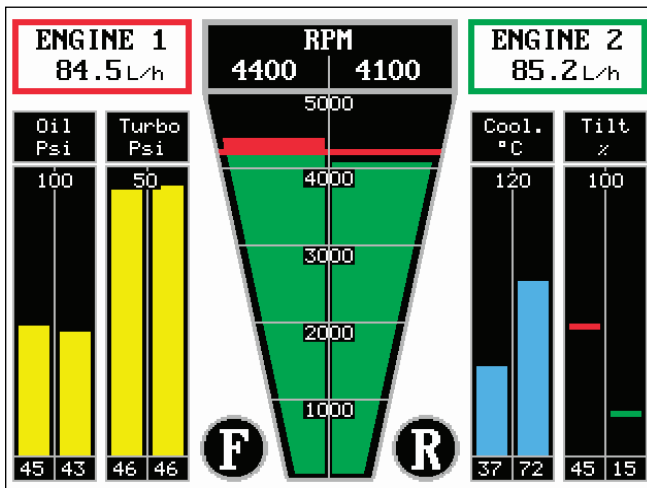
ENT *Confirm entry and exit*

 *To change the measuring units, refer to 'Setup for units' in section 10.4.*

## 8.1 Engine status

MENU *Call up the menu bar, and...*

6,1 *load the Engine status display*



Forward Reverse (N = Neutral)

The numbers at the bottom represents Engine 1 to the left and Engine 2 to the right in each column.

The Engine status display will provide data from 1 or 2 engines. If there are more than 2 engines on board (and connected to the system), a second Engine status display is available by pressing: [MENU], [6], [4].

The default ranges in the Engine status display can be viewed and changed as described below, except for **Tilt**, which is read-only



## 8.2 Fuel and transmission

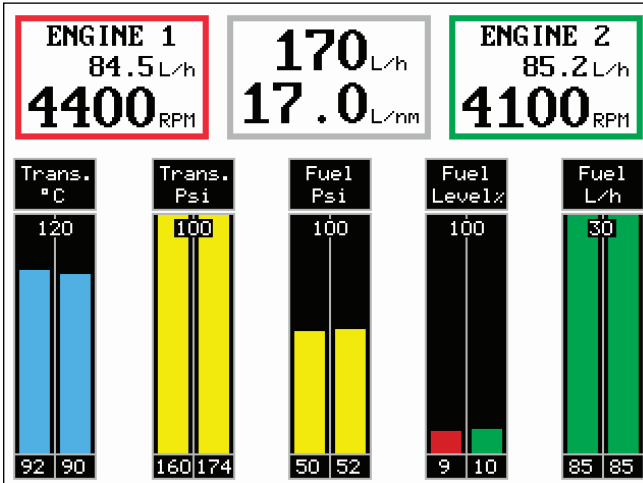
The level of fuel is indicated in a percentage of the maximum value, depending on the shape of the fuel tank and the level sensor. This level can either be 'level above tank bottom' or 'remaining volume in tank'. The fill color will be red when reaching < 10 %.

MENU

*Call up the menu bar, and...*

6,2

*load the Fuel and transmission display*



In the top part of this display you have read-outs for Engine 1 to the left and Engine 2 to the right and a total for both in the middle. The second line in the middle i.e. '17.0 L/nm' - liter per nautical mile, is calculated by the Chartplotter. The read-out can be presented in L/nm, L/km, L/mi, G/nm, G/km, G/mi. The unit can be selected in [MENU], [8], [1], see section 10.4. The numbers at the bottom represents Engine 1 to the left and Engine 2 to the right in each column.

To change the default ranges:

ENT

*Load Fuel and transmission setup*

**Left engine source** - use +/- to toggle between connected engines.

**Right engine source** - use +/- to toggle between connected engines.

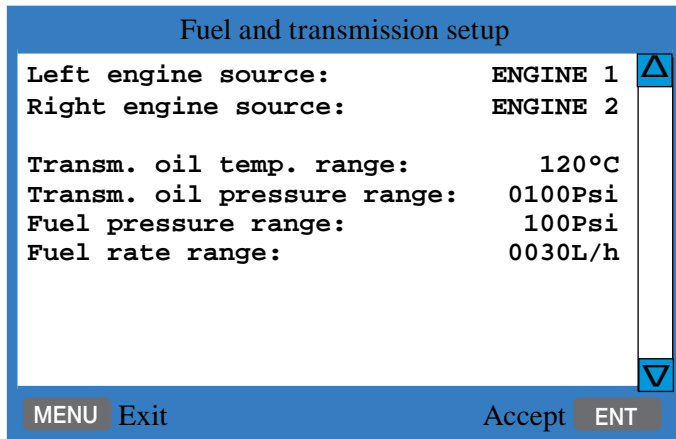
**Transmission oil temperature range**, default is 120 degrees Celcius. Use numerical keys to enter new range. Can be shown in

Celcius (50°C to 300°C) or Fahrenheit (122°F to 572°F).

**Transmission oil pressure range**, default is 100 Psi. Use numerical keys to enter new range. Can be shown in Psi (10-500 Psi) or Pascal (69-3447 kPa).

**Fuel pressure range**, default is 100 Psi. Use numerical keys to enter new range. Can be shown in Psi (10-125 Psi) or Pascal (69-862 kPa).

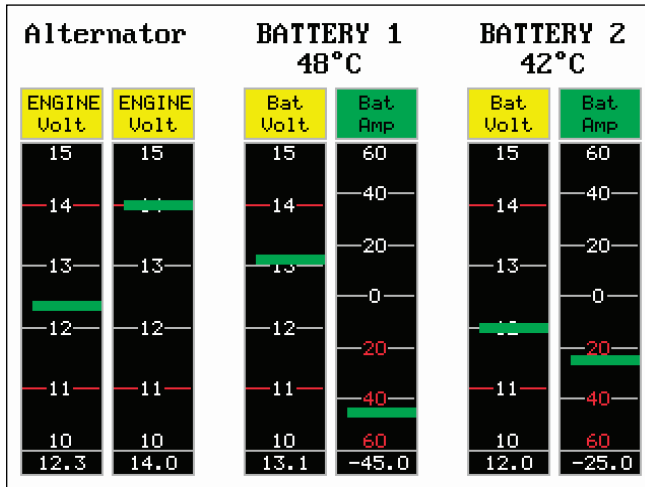
**Fuel rate range**, default is 0030 liter per hour. Use numerical keys to enter new range. Can be shown in liter per hour (1-1000 L/h) or gallon per hour (1-264 G/h).



**ENT** Confirm entry or exit with [MENU] without making any changes

### 8.3 Battery status

**MENU** Call up the menu bar, and...  
**6,3** load the Battery status display  
 - see display example next page.



To change the default ranges:

ENT

*Load Battery status setup*

**Battery status setup**

Left engine source: ENGINE 1 ▲

Right engine source: ENGINE 2

Left battery source: BATTERY 1

Right battery source: BATTERY 2

Left alternator volt.range:10-15 Volt

Right alternat. volt.range:10-15 Volt

Left battery voltage range:10-15 Volt

Left battery current range: 60 Amp

Right battery volt.range: 10-15 Volt

Right batt. current range: 60 Amp ▼

MENU Exit
Accept ENT

**Left engine source** - use +/- to toggle between connected engines.

**Right engine source** - use +/- to toggle between connected engines.

**Left battery source** - use +/- to toggle between connected batteries.

**Right battery source** - use +/- to toggle between connected batteries.



**Left alternator voltage range**, default is 10-15 Volt. Selectable in steps i.e. 10-15, 20-30 or 26-41 Volt (use +/- keys).

**Right alternator voltage range**, default is 10-15 Volt. Selectable in steps i.e. 10-15, 20-30 or 26-41 Volt (use +/- keys).

**Left battery voltage range**, default is 10-15 Volt. Selectable in steps i.e. 10-15, 20-30 or 26-41 Volt (use +/- keys).

**Left battery current range**, default is 60 Amp. Selectable in steps from 10 to 1000 Amp (use +/- keys).

**Right battery voltage range**, default is 10-15 Volt. Selectable in steps i.e. 10-15, 20-30 or 26-41 Volt (use +/- keys).

**Right battery current range**, default is 60 Amp. Selectable in steps from 10 to 1000 Amp (use +/- keys).

**ENT**

*Confirm entry or exit with [MENU] without making any changes*

## 8.4 Second set of engine monitoring displays

The menu points 4, 5 and 6 are a second set of displays, which only will be visible if the system detected more than two engines on board.

**MENU**

*Call up the menu bar, and...*

**6,4**

*load the 2nd Engine status display*

*- refer to section 8.1.*

**MENU**

*Call up the menu bar, and...*

**6,5**

*load the 2nd Fuel & transmission display*

*- refer to section 8.2.*

**MENU**

*Call up the menu bar, and...*

**6,6**

*load the 2nd Battery status display*

*- refer to section 8.3.*

## 8.5 Demo mode

For the purpose of demonstration, the engine function has a demo mode, which can present simulated read-outs. To run a demo of the engine monitoring system:

**MENU**

*Call up the menu bar, and...*

**8,2**

*load the Interface setup*

**PLOT**

*Use the [PLOT] key to go to the Engine tab*



*Go to the bottom line and toggle the demo mode on and off with +/-*

**ENT**

*Confirm entry and exit*



Remember to turn off the demo mode again! The monitoring system will not present any actual readings when the demo mode is running.

## 9. Miscellaneous menu

<b>7</b>	
MISC	
<b>1</b> Wind	- see section 9.1
<b>2</b> Decca lanes	- see section 9.2
<b>3</b> Loran C	- see section 9.3
<b>4</b> MOB data	- see section 9.4
<b>5</b> DSC info	- see section 9.5
<b>6</b> Data transfer	- see section 9.6

### 9.1 Wind display

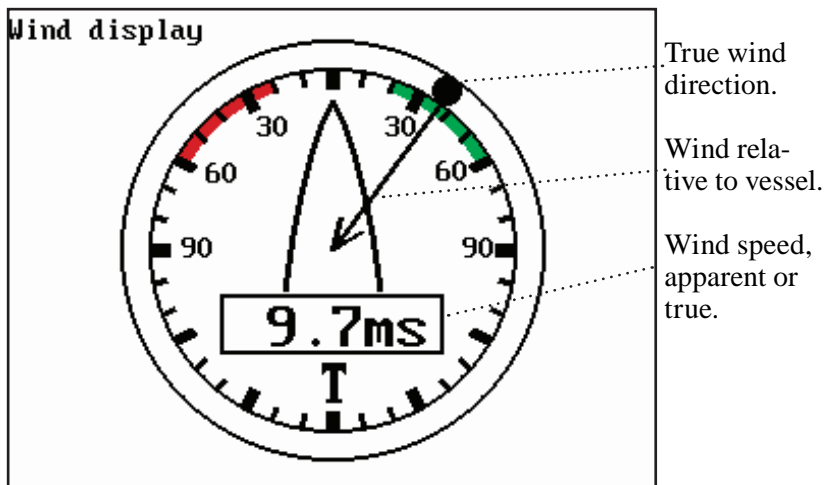
The CP31/CX33/CX33-E is prepared to show wind data from instruments connected via NMEA0183 or SimNet.

**MENU**

*Call up the menu bar, and...*

**7,1**

*load the 'Wind instrument' display*



ENT

*Load Setup for Wind display***Setup for Wind:**

Damping level:	MEDIUM
Apparent wind scale:	NORMAL
Wind angle offset:	000°
Show wind speed as:	APPARENT
Wind speed unit:	METERS/SECOND

*Go to the function you wish to change*

+/-

*Toggle between settings, or...*

0-9

*Key in new figure*

ENT

*Confirm entry and return to Wind display*

**Damping level** - can be set to LOW, MEDIUM or HIGH. The higher level the more steady and slow reacting reading.

**Apparent wind scale** - can either be set to NORMAL (0-180°) or MAGNIFIED (0-60°).

**Wind angle offset** - can be from 0 to 360°.

**Show wind speed as** - TRUE or APPARENT.

**Wind speed unit** - can be either METER/SECOND, KNOTS, KILOMETERS/HOUR or MILES/HOUR.

## 9.2 Decca lanes

**MENU** *Call up the menu bar, and...*

**7,2** *load decca chain display*

**ENT** *Open for change*

**+/-** *Leaf through the available chains - see listing below.*

**ENT** *Confirm entry*

To change the position readouts to decca mode, see section 10.3 under Position setup, where 'Display position as' can be toggled to 'Decca'.

### List of decca chains:

00 S Baltic	0A	24 Skagerak	10B
01 Vestlandet	0E	25 N Persian	5C
02 SW British	1B	26 S Persian	1C
03 North Humber	2A	27 Bombay	7B
04 Holland	2E	28 Calcutta	8B
05 British	3B	29 Bangladesh	6C
06 Lofoten, Norway	3E	30 Hokkaido	9C
07 German	3F	31 Tohoku	6C
08 N Baltic	4B	32 Kyusyu	7C
09 NW Spanish	4C	33 Namaqua	4A
10 Trondelag (N)	4E	34 Cape chain	6A
11 English	5B	35 E Province	8A
12 N Bothnian	5F	36 Dampier	8E
13 S Spanish	6A	37 Port Hedld	4A
14 N Scottish	6C	38 Hokuriku	2C
15 Finland	6E	39 Newfoundld.	2C
16 Danish	7B	40 Cabot strt	6B
17 Irish	7D	41 Nova Scotia	7C
18 Finnmarken	7E	42 Salaya	2F
19 French	8B	43 Kanto	8C
20 S Bothnian	8C	44 SW Africa	9C
21 Hebridean	8E	45 Natal	10C
22 Frisian	9B	46 Shikoku	4C
23 Helgeland	9E		

### 9.3 Loran C

**MENU** *Call up the menu bar, and...*

**7,3** *load Loran C chain display*

**ENT** *Open for change*

**+/-** *Leaf through the available chains - see listing below.*



*If required, go to the slaves, and...*

**+/-** *Toggle between available slaves (not all chains have more than one slave)*

**0-9** *...and it is possible to alter the figures in the time delay*



*If required, go to Offset, and key in a positive or negative offset*

**0-9** *Key in a positive or negative offset to the time delay (toggle positive/negative with +/-)*

**ENT** *Confirm entry*

To change the position readouts to Loran C mode, see section 10.3 under Position setup, where 'Display position as' can be toggled to 'Loran C'.

#### List of Loran C chains:

Central Pacific	4990	Commando Lion	5970
Gulf of Alaska	7960	North West Pacific	9970
Southeast U.S.	7980	Norwegian Sea	7970
Great Lakes	8970	Mediterranean Sea	7990
Northeast U.S.	9960	Icelandic	9980
Canadian West Coast	5990	Saudi Arabia South	7170
Canadian East Coast	5930	Saudi Arabia North	8990
Labrador Sea	7930	Eastern U.S.S.R.	7950
West Coast U.S.	9940	Western U.S.S.R.	8000
North Pacific	9990		

## 9.4 MOB data

**MENU***Call up the menu bar, and...***7,4***load MOB data display*

<b>MAN OVERBOARD</b>	
<b>DATE</b>	<b>15-01-2006</b>
<b>TIME</b>	<b>14:23:34</b>
<b>MOB</b>	<b>56°52.489N</b>
<b>POS</b>	<b>009°50.305E</b>

The MOB display will provide information of the last activated MOB position. To delete a MOB track from the memory, see section 3.2.6.

## 9.5 DSC VHF info

To receive an iDSC Alarm and Message from VHF will require that the CP31/CX33/CX33-E is connected to a compatible Simrad VHF radiotelephone. The data is transmitted via SimNet or NMEA.

The message from the VHF will appear in a pop-up window together with an acoustic alarm. Press [CLR] to reset the alarm, or press [ENT] to stop alarm and select the suggested channel for communication - refer to the VHF manual for further details.

To view the last received message:

**MENU***Call up the menu bar, and...***7,5***load the DSC info display*

## 9.6 Data transfer via DataCard

Data transfer to and from external memory can be performed via Simrad DataCard.

Use the Simrad DataCard to make backup files of all the user data you have created plus the current setups in the internal memory of the unit. Do it whenever you have added important data, or when you wish to transfer routes and waypoints, etc. to another compatible unit. The storage capacity of the DataCard is divided into two databanks of each 450 Kb, meaning that the entire internal memory can be stored in one databank.

External memory with data transfer via DataCard:

**MENU**

*Call up the menu bar, and...*

7,6

*load the Data transfer window*

Data transfer	
<b>1</b>	DataCard
<b>5</b>	PC-Planner
<b>7</b>	NMEA connection
<b>MENU</b>	Exit

- see section 9.7

- see section 9.8

**1**

*Select the DataCard function*

DataCard	
<b>1</b>	DataCard status
<b>3</b>	Save on DataCard
<b>9</b>	Load from DataCard
<b>MENU</b>	Exit

### DataCard status

**1**

*Press [1] to find out what data (if any) is stored on the DataCard*  
The capacity is divided into two databanks: DATABANK 1 and 2 which can hold approx. 2 x 450 Kb data. Toggle between the two databanks with the +/- keys.



3

**Save on DataCard**

Press [3] to call up a new INFO window where you can see which data will be transferred i.e. routes, waypoints, etc. and how much space it will take up in bytes + percentage of max. storage capacity. Choose which databank you wish to transfer the data to (use the +/- keys). The actual date and time will be saved with the data transfer. A name can be added for easy identification later on.

ENT

Press [ENT] to activate 'Save on DataCard'

You will now receive a warning that existing data on the DataCard, in the selected databank, will be overwritten. You can not 'add more information' to data already transferred. Whenever transferring data from a CP31/CX33/CX33-E to Databank 1 or 2 on the DataCard, or from Databank 1 or 2 on DataCard to a CP31/CX33/CX33-E, the data package will replace the entire capacity in the receiving unit.

**Load from DataCard**

9

Press [9] to call up a new INFO window where you can see which data is stored in Databank 1 or 2 on the DataCard.

+/-

Use the +/- keys to toggle between DATABANK 1 and 2

Load:		DATABANK-1	
Data generated by:	Simrad CX33		
Saved:	15-08-2006	19:43:00	
Name:			
Data type	Amount	Size	Select
Marks/WP:	11	256	ON
Lines:	1	80	ON
Routes:	1	96	ON
Targets:	3	72	ON
Tracks:	0	0	ON
Setup:	1	1745	OFF
Destination memory:	504 bytes = 0%		
MENU Exit		Load	ENT

ENT

Press [ENT], [ENT] to transfer a copy of the data in DATABANK 1 to the internal memory in the CP31/CX33/CX33-E unit.

Any existing data in the internal memory will be overwritten.

**MENU** Press [MENU] to exit and \*reboot (only if loading “Setup”)

\*) When the system makes a ‘reboot’ the screen will turn black for a brief moment, then the system will re-start and automatically return to the active display which was on the screen before you made the transfer.

## 9.7 Data transfer via DataCard to/from PC-Planner

Data transfer to and from a PC-Planner can be performed via Simrad DataCard. Transfer routes, waypoints and tracks stored in the internal memory of the CP31/CX33/CX33-E to the PC-Planner or routes and waypoints from the PC-Planner to the CP31/CX33/CX33-E unit.

**MENU** Call up the menu bar, and...  
7,6 load the Data transfer window

Data transfer	
<b>1</b>	DataCard - see section 9.6
<b>5</b>	PC-Planner
<b>7</b>	NMEA connection - see section 9.8
<b>MENU</b>	Exit

**5** Select the PC-Planner function - to transfer data, a DataCard must be placed in the drawer below the keypad. Example:

PC-Planner	
<b>1</b>	Import
<b>2</b>	Export
Status: DataCard empty	
<b>MENU</b>	Exit

Choose [1] to transfer data (routes and waypoints) from PC-Planner, or choose:

**2** Export - to transfer data (routes, waypoints and tracks) to DataCard.

**ENT***Press [ENT] to accept 'DataCard will be erased ?'*

Status will indicate: 'Saving data', and close with 'Transfer completed'. The data on the DataCard is now ready to be loaded into the PC-Planner.

## 9.8 Data transfer via PC interface

Data transfer to and from a route planning program on a Personal Computer can be made via NMEA connection (see section 11.7) by means of the standard NMEA0183 sentences WPL and RTE.



The data transfer on these two sentences does not include WP symbol, color, XTE limit, etc. Refer to section 11.6 for information on connection to PC.

NB! PC-based planning systems differ in operation and performance beyond the control of Simrad.

**MENU**

7,6

*Call up the menu bar, and...  
load the Data transfer window*

Data transfer	
<b>1</b>	DataCard
<b>5</b>	PC-Planner
<b>7</b>	NMEA connection
<b>MENU</b>	Exit

- see section 9.6

- see section 9.7

**7***Select the NMEA connection*

<b>WARNING!</b>	
Normal NMEA communication will be interrupted.	
<b>MENU</b>	Exit      Accept <b>ENT</b>

**ENT** *Accept warning and continue*

NMEA connection	
<b>1</b>	Transmit WPs
<b>3</b>	Transmit routes
<b>7</b>	Receive WPs and routes
<b>MENU</b>	Exit

The normal communication via the NMEA port is temporarily abrupted during the time of data transfer.

### Transmit WPs

**1** *Press [1] to start transmission of all waypoints stored in the CP31/CX33/CX33-E WP list to PC*

When the transmission is completed you will receive a new info window informing of how many waypoints were transferred.

**MENU** *Exit function and return to normal NMEA communication*

### Transmit routes

**3** *Press [3] to start transmission of all routes stored in the CP31/CX33/CX33-E Route list to PC*

When the transmission is completed you will receive a new info window informing of how many routes were transferred.

**MENU** *Exit function and return to normal NMEA communication*

### Receive WPs and routes

**7** *Press [7] to enable reception of waypoints and routes from the planning program*

The transmission of waypoints and routes can now be activated from the PC program.

The info window below will inform you of the progress of the recep-

tion of data by keeping an eye on the counter. When the counter stops, means that all the data from the PC planner has been collected. However, some PC programs may continue to transmit the same data over and over again and will have to be stopped by pressing [ENT].

<b>Receive WPs and routes</b>
<b>Reception in progress</b>  <b>37 WPs received</b> <b>5 routes received</b>
<b>Stop and save</b> <b>ENT</b>

**ENT***Stop and save*

- will stop collecting data (if not already finished) and start saving the collected data.



Waypoints/routes transmitted to the CP31/CX33/CX33-E are added to the WP/route list. However, if two waypoint/route names are identical, the latest transferred one will not be saved, even though position(s) may be different. Routepoints will not be included in the WP list.

Saving the collected data can take anywhere from less than a second and up to a few minutes, depending on the amount of data. If it takes too long and you need the CP31/CX33/CX33-E in a hurry, then press the [MENU] key to *Stop saving* any more data - what has been saved until this point will stay in the memory, the rest will be lost.

**MENU***Stop saving*

Under normal circumstances we assume the saving procedure is allowed to finish and will indicate "Saving completed" in the info window. You are now ready to:

**MENU***Exit function and return to normal NMEA communication*



## 10. Setup menu

8 SETUP		
<b>CHART</b>	C-MAP cartridge	- see section 10.1
<b>ECHO</b>	Echosounder setup (CX33-E)	- see section 10.2
<b>PILOT</b>	Pilot/Position setup	- see section 10.3
<b>1</b>	Speed alarm, units & language	- see section 10.4
<b>2</b>	Interface setup	- see section 10.5
<b>3</b>	Palette setup	- see section 10.6
<b>4</b>	Factory settings	- see section 10.7

### 10.1 C-MAP cartridge

On the unit's front below the keypad is a watertight drawer wherein you place the C-MAP cartridge/C-card you wish to load.



Do not attempt to insert or remove a cartridge unless the unit is turned off, or chart reading is in stand-by - see below.

**MENU**  
**8**  
**CHART**

*Call up the menu bar, and...  
open the SETUP menu, and...*

*load the pop-up window for C-MAP cartridge (which also brings the chart system in stand-by)*

<b>C-MAP cartridges</b>
Code: EN-C161.4 [14/09/2002] EAST DENMARK AND WEST SWEDEN
<b>MENU</b> Exit

To open the drawer below the keypad, press the eject key next to the drawer. Place the cartridge in the tray with the terminals pointing towards the unit, and push the drawer back in place - make sure it is closed tight, so it remains watertight.



If a C-card is defect, it must be removed before you can exit the display.

**MENU***Exit the window*

In addition to the larger boundaries of the world chart there will be separate boundary lines for the individual charts stored on the same cartridge. However, the boundary lines for the C-MAP chart areas can be turned off, so they will not be visible on the chart - refer to section 3.3 Chart setup.

Other chart areas can quickly be reached by means of the zoom keys:

**+**

Zoom out until desired area becomes visible



Move cursor to approximate area, and...

**-**

Zoom in

The chart will automatically start to move when cursor reaches the edge of the screen. When cursor is switched off [CLR], the chart will return to ship's position.

## 10.2 Echosounder setup (CX33-E)

The Echosounder setup display mainly consist of general settings, but also applies to a specific frequency where stated. The CX33-E features semi dual transceiver transmitting at 50 and 200 kHz.

**MENU***Call up the menu bar, and...***8***open the SETUP menu, and...***ECHO***load Echosounder setup display*



## Echosounder setup:

```

Transducer:          SINGLE 200kHz  00.0 m
Keel depth below surface:  00.0 m
Display:              DEPTH BELOW KEEL
Data on NMEA-out from:    200kHz
Alarm for fish:        Strength: 065% OFF
Depth DS fish:         min:0005 m  max:0030 m
Depth DK alarm min.:    0005.0 m  OFF
Depth DK alarm max.:    0030.0 m  OFF
Water profile:         SALT
Velocity of sound in water: 1470m/s
Time/distance scale:    ON
  
```

```

PAGE More (1/2) Scroll ↓↑
MENU Exit Accept ENT
  
```

```

Restart of AUTO pulse/power: 20 sec.
Echo sampling:                BOTTOM
Demo mode:                    OFF
  
```

```

PAGE More (2/2) Scroll ↓↑
MENU Exit Accept ENT
  
```



Use the cursor key to move cursor around in the display

PAGE

Toggle between page 1 and 2

+/-

Select new values by means of the +/- keys

ENT

Confirm changes, or...

MENU

Abandon changes and exit display

**Transducer** - select transducer type. Insert the depth (position) of the transducer below surface.

**Display** can show: DEPTH BELOW KEEL / SURFACE / TRANSDUCER

**Data on NMEA-out from** - select the frequency you wish to use for transfer of data to connected navigator, plotter, etc.

**Alarm for fish** - set the strength from min. 000 (weak echo) to max. 099% (strong echo), and you can set it ON or OFF.

**Depth DS fish** - define a specific area below the water surface of minimum and maximum depth for the fish alarm.

**Depth DK alarm min. and max.** - set up a depth limit alarm for depth below keel.

**Water profile** - choose between SALT and FRESH water. The setting will reflect on the:

**Velocity of sound in water:** SALT = 1470 meters per second and FRESH = 1430 meters per second as standard. The standard settings can be even more accurate by slightly increasing the number of meters in warm waters and decreasing in cold waters.

**Time/distance scale** - will indicate the elapsed time or distance for the echo picture. The readout will appear in the upper part of the echo display. Toggle between time and distance in “Scroll synchronisation”, section 7.6.

**Restart of AUTO pulse/power** - will automatically restart the echosounder if bottom detection has been lost for the chosen time interval i.e. 10, 20 or 40 seconds. The AUTO pulse and power will restart from 10W and SHORT pulse.

**Echo sampling** - is preset to BOTTOM, which enables auto range and a view all the way to the bottom. For vessels moving at high speed with the risk of losing bottom detection, RANGE or a max. depth setting (50 to 2000m) is recommended. The unit will not wait for a bottom echo, but transmit a new pulse as soon as the selected range has been reached. Auto range is automatically switched off. The depth alarm setting will have a higher priority than the selected depth range.

**Demo mode** - the echosounder will function as though a transducer was connected, but all data presented in the display will be simulated.

### 10.3 Pilot / Position setup

- MENU** Call up the menu bar, and...
- 8** open the *SETUP* menu, and...
- PILOT** load *Pilot/Position setup display*

<b>Pilot/Pos setup:</b>	
Display position as:	LAT/LON
Start position:	56°57.000N 010°25.000E
Speed and course filter level:	3
Display speed as:	SOG
Course and bearing as:	MAGNETIC
COG vector length:	06 min
Grounding alarm, depth:	03m OFF
Grounding alarm, objects:	ON
<b>PAGE</b> More (1/2)	Scroll <input type="button" value="↓↑"/>
<b>MENU</b> Exit	Accept <input type="button" value="ENT"/>

Time:	UTC
Time: 13:43:56	Date: 15-01-2006
<b>PAGE</b> More (2/2)	Scroll <input type="button" value="↓↑"/>
<b>MENU</b> Exit	Accept <input type="button" value="ENT"/>



*Go to the function you wish to change*

**PAGE** Toggle between page 1 and 2

**0-9** Key in new values, or...

**+/-** Toggle between available values

**ENT** Confirm editing

**Display position as** - the position can be shown in latitude/longitude, Loran C or decca coordinates (after selecting chain from the Miscellaneous menu). Toggle with +/-.

**Start position** - can be inserted if the exact start position is known.

**Speed and course filter level** - there is a filter of 10 steps available (0= fast response, 9= stable readout).

**Display speed as** - SOG Speed Over Ground or STW Speed Through Water. Toggle with +/-.



To receive STW information will require connection of external instrument via the SimNet system or the NMEA port.

**Course and bearing as** - readings of course and bearing can be made in either MAGNETIC or TRUE. Toggle with +/-.

**COG vector length** - (default to 6 minutes) - indicates own course and speed. The length of the COG vector reflects a distance run during the specified number of minutes at the immediate speed.

**Grounding alarm** - the function will require a valid position, COG, SOG and a C-MAP C-card inserted in the drawer below the keypad. When an alarm is activated, an info-window will state the cause of the alarm. Reset with [CLR].

**Depth alarm** - will be activated if the depth at the COG vector end point is less than the value in the Pilot/Position setup and the alarm is set to ON.

**Object alarm** - will be activated if set to ON and an object is detected beneath the ship i.e. rocks, wrecks, etc.

**Time** - can be set to UTC or local. Toggle with +/-  
Correct actual time and date by means of the numeric keys.


## 10.4 Speed alarm, units & language


**MENU**

*Call up the menu bar, and...*

**8,1**

*load Speed alarm, units & language display*

<b>Setup for speed:</b>	
Speed alarm maximum (SOG):000.0kn	OFF
Speed alarm minimum (SOG):000.0kn	OFF
<b>Setup for units:</b>	
Depth/altitude in:	METERS
Distance in:	NAUTICAL MILES
Speed in:	KNOTS
Temperature in:	DEGREE CELCIUS
Pressure in:	PSI
Volume in:	LITER
Software version:	CX33 4.00
<b>PAGE</b> More (1/2)	Scroll 
<b>MENU</b> Exit	Accept <b>ENT</b>

Serial number:	0x0000b43e
Interface software version:	1.19
GPS receiver type:	N11999
PAGE rotation interval:	05 sec.
Display text in:	English GB
<b>PAGE</b> More (2/2)	Scroll 
<b>MENU</b> Exit	Accept <b>ENT</b>



*Scroll up/down to go to the function you wish to change*

**PAGE**

*Toggle between page 1 and 2*

**0-9**

*Key in new values, or...*

**+/-**

*Toggle between available values*

**ENT**

*Confirm changes, or...*

**MENU**

*exit function without making any changes*

**Speed alarm** - can be set to maximum and/or minimum cruising speed. This may be handy for trawl fishing, entering harbors with speed limits, etc.

Speed stability and time of response can be adjusted in Pilot/Position setup display, press [MENU], [8], [PILOT], [ENT], and use the

cursor key to go to “Speed and course filter level” to adjust the setting, confirm with [ENT].



Press [CLR] to reset an alarm - this applies to all activated alarms in the system.

**Depth / altitude in** - can be set to meters (m), feet (ft) or fathoms (fm).

**Distance in** - can be calculated in nautical miles (nm), kilometers (km) or statute miles (mi).

**Speed in** - can be shown in knots (kn), kilometers/hour (kh) or miles/hour (mh).

**Temperature in** - can be shown in Celcius or Fahrenheit.

**Pressure in** - can be shown in Psi or Pascal (kPa).

**Volume in** - can be shown in liter or gallon.

**Software version** - indicates which software version is installed in the unit.

**Serial number** - indicates the unit’s serial number.

**Interface software version** - indicates which version is installed in the unit (for technicians only).

**GPS receiver type** - indicates which type is installed in the unit (for technicians only).

**PAGE rotation interval** - can be set to anywhere between 03 to 99 seconds. Refer to “Fundamentals of the display and page system” in section 2.1 for more details on how the function works.

**Display text in** - as standard the CP31/CX33/CX33-E is supplied with the following national display languages: Danish (DK), English\* (GB) and (US), French (F), German (D), Italian (I), Nederlands (NL), Spanish (E), Swedish (S), and Portuguese (P).

\*) The difference from GB English to US English is: Celcius is changed to Fahrenheit, meters is changed to feet, and the date presentation is changed from dd.mm.yy to mm.dd.yy.

## 10.5 Interface setup

**CP31/CX33/CX33-E** has a connector for SimNet control or NMEA2000 plus one NMEA in/out port.

**Plug-and-play:** SimNet offers easy and uncomplicated interfacing with a unique cable and plug solution and automatic system setup. SimNet is the optimum solution for integrating SimNet products and other products with NMEA2000.

**Group selection or stand-alone:** Main products, e.g. MultiRadar, Chartplotter and Autopilot will automatically select the optimum sources for position, heading, depth, speed etc. for all other SimNet products connected. This means that if two Chartplotters are connected, they will both use position data from the same GPS and heading from the same compass. If you wish to use the built-in GPS, also on the Chartplotter, which automatically was set to operate with an external position, you can change the Group selection from SIMRAD to STAND-ALONE.

**Multi source:** If a main product recognizes e.g. two heading devices it will automatically select a gyro compass before a fluxgate compass, and DGPS before GPS.

**NMEA 0183 input:** If there is no data available from the SimNet bus for e.g. heading, position or depth, the system will automatically look for data via the NMEA 0183 port.

The next pages show examples of interface settings, which are divided into the following groups:

Nodes - Position - Navigation - Water - Compass - Wind - Waypoint - Engine - Alarm - SimNet diagnostic - SimNet input - SimNet output - NMEA0183 input - NMEA0183 output - Identification.

**MENU**

**8,2**

*Call up the menu bar, and...  
load interface setup - see display example next page.*

Searching interface channels for valid sources and data. Please wait till the first page appears on the screen which will show the nodes

(products) operating on the SimNet bus. See below example:

Additional data

No additional data

Automatically assigned network address

Product model numbers (top line is own unit); -1, -2, -3 etc. indicates multi sources. NMEA-PORT indicates incoming data via the NMEA port.

Internal serial number

+	1:	Simrad CX33-1	,Sn:00B43E
+	2:	Simrad GN33-2	,Sn:0070B0
+	3:	Airmar EQS	,Sn:000000
+	4:	Simrad RC35	,Sn:000035
-	:	NMEA-PORT	

MENU Exit Accept ENT



*Move the cursor up/down to select one of the listed products*



*Press the [+] key to access additional data*

Example:

- CX33 CHART PLOTTER
- SimNet number=00B43E, Address: 254
- Device: class = 60, function = 170
- Instance: system = 0, device = 1
- SimNet:Compatible=YES,Ver= 1.000 E
- Ver.: NMEA2000 = 1.004, SW = 03.00
- Product code=0715,Unique no=11F43E

The name CHART PLOTTER can be user defined - see the Identification interface (last tab).



*Press the [-] key to hide additional data*

**General information:** Go to the next interface by pressing [PLOT] and step back to the previous interface by pressing [GOTO].

Use the cursor key to move around in the display and toggle between available settings and sentences with the +/- keys.

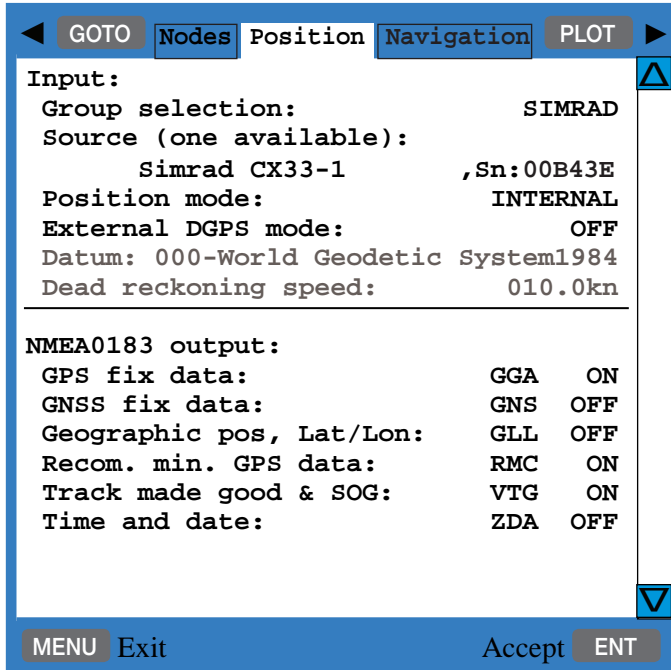


*Confirm editing, or...*



*exit function without making any changes*



**Group selection can be set to:****SIMRAD** - auto-selected SimNet units from the Simrad group.**STAND-ALONE** - manually selected data source and third party units.**Source:** - depending on which products (sources) are connected, the legend will indicate: 'none available', 'one available', 'multiple available' or 'owned, data type locked'.**PLOT***Go to Position interface - step back with [GOTO]***Position mode:****INTERNAL** - the applied position is compiled by the in-built GPS receiver.**EXTERNAL** - the applied position is compiled by an external unit.**DEAD RECKONING** - will allow the system to function as a Navigation simulator, which can be used for demonstration purpose or for practicing 'live' navigation in 'off season'. If you wish to change the preset speed (10 kn), refer to description next page. Navigation to cursor or waypoint, in route or in track is started as described in

chapter 6. The ship symbol will now 'sail' to the point of destination directly or via the route you have selected and you can see how the alarms and automatic waypoint shift all work, as if you were sailing yourself. You can also simulate making a track trailing the ship or plotting eventmarks, etc. as the ship is 'sailing'.

**External DGPS mode** - set to ON will enable reception of DGPS data from external receiver. The input port will switch from NMEA0183 to RTCM104 standard, but the output will continue transmitting NMEA0183 data.

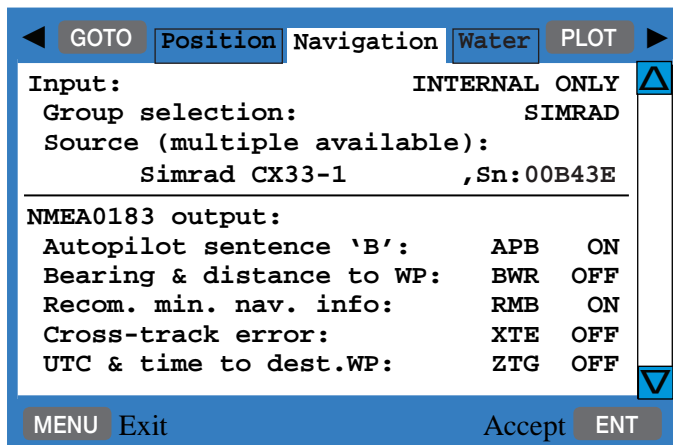
**Datum:000-World Geodetic System 1984** - the internal datum is applied if the datum line is light grey. If you wish to apply the datum received from external unit and as such need to change the type, the position mode must be EXTERNAL. Enter a new datum by means of the numeric keys or the +/- keys. Refer to list of datums in Appendix B.

**Dead reckoning speed** - is preset to 010.0 knots, but can be increased or decreased when DEAD RECKONING is selected as position mode. Enter a new speed by means of the numeric keys or the +/- keys.

**NMEA0183 output** - see also section 10.5.1 Description of sentences.

PLOT

*Go to Navigation interface - step back with [GOTO]*



**Input: INTERNAL ONLY** - indicates that no external source can be selected for navigation.

**NMEA0183 output** - see also section 10.5.1 Description of sentences.

PLOT

Go to Water interface - step back with [GOTO]

Example: CX33-E

```

◀ GOTO  Navigation  Water  Compass  PLOT ▶
Water depth input:          INTERNAL ONLY
Group selection:           SIMRAD
Source (multiple available):
    Simrad CX33-1          ,Sn:00D43E
Water temperature input:
Group selection:           SIMRAD
Source (one available):
    Simrad CX33-1          ,Sn:00D43E
Water temperature offset:  +0.0°C

Water speed input:
Group selection:           SIMRAD
Source (one available):
    Airmar EQS             ,Sn:000000
LOG speed cal.:           019000 PULSES/nm
-----
NMEA0183 output:
Water temperature:        MTW   ON
Water speed and heading:  VHW   ON
Depth:                    DPT   ON
Depth below keel:        DBK   OFF
Depth below surface:     DBS   OFF
Depth below transducer:  DBT   OFF
MENU Exit                Accept ENT
  
```

Example for CP31 and CX33, see next page.

**Input: INTERNAL ONLY** - indicates that no external source can be selected for depth.

**Water temperature offset** - a figure can be keyed in to compensate for differences in temperature sensor.

**LOG speed calibration** - the unit is preset to receive 19000 pulses per nautical mile from the log transducer (paddle wheel). However the figure might have to be changed to compensate for various transducers and actual water flow passing the transducer. The correct

pulse rate is calculated by:

$$\frac{19000 \times \text{indicated speed (e.g. 4kn)}}{\text{actual speed (GPS) (e.g. 5kn)}} = 15.200 \text{ pulses/nm}$$

Example: CP31 or CX33:

◀ GOTO Navigation **Water** Compass PLOT ▶

Water depth input: ▲

Group selection: SIMRAD

Source (one available):  
Airmar EQS ,Sn:000000

Water temperature input:

Group selection: SIMRAD

Source (one available):  
Airmar EQS ,Sn:000000

Water temperature offset: +0.0°C

Water speed input:

Group selection: SIMRAD

Source (one available):  
Airmar EQS ,Sn:000000

LOG speed cal.: 019000 PULSES/nm

---

NMEA0183 output:

Water temperature: MTW OFF

Water speed and heading: VHW OFF

▼

MENU Exit Accept ENT

**NMEA0183 output** - see also section 10.5.1 Description of sentences.

PLOT

*Go to Compass interface - step back with [GOTO]*

```

◀ GOTO  Navigation  Water  COMPASS  PLOT ▶
Input:
  Group selection:          SIMRAD
  Source (one available):
    Simrad RC35           ,Sn:000035
  Use COG as internal heading:  NO
MENU Exit                    Accept ENT

```

**Source** - indicates that there is one source available: Simrad RC35.

**Use COG as internal heading** - if no compass is connected, you can use the course (COG) from the built-in GPS module by changing NO to YES.



When using the GPS course as replacement for heading input, the accuracy will be reduced in relation to speed, wind and current.

PLOT

*Go to Wind interface - step back with [GOTO]*

```

◀ GOTO  Water  COMPASS  WIND  Waypoi  PLOT ▶
Apparent wind input:
  Group selection:          SIMRAD
  Source (none available):
                                NONE
Calculated true wind input:
  Group selection:          SIMRAD
  Source (none available):
                                NONE
MENU Exit                    Accept ENT

```

**Source** - will indicate how many units are connected and available.

PLOT

*Go to Waypoint interface - step back with [GOTO]*

```

◀ GOTO Compass Wind Waypoint Ala PLOT ▶
Waypoint location input:
  Source (none available):          NONE

Target Lat/Lon input:
  Source (none available):          NONE

-----
NMEA0183 output:
Waypoint location:                 WPL  OFF
Routes:                            RNN  OFF
Routes:                            RTE  OFF

MENU Exit                          Accept ENT

```

**Source** - will indicate how many units are connected and available.

**NMEA0183 output** - see also section 10.5.1 Description of sentences.

PLOT

*Go to Engine interface - step back with [GOTO]*

```

◀ GOTO Wind Waypoint Engine Ala PLOT ▶
Engine 1:                          PORT
  Teleflex PIN ,Sn:06952E-0
Engine 2:                          STARBOARD
  Teleflex PIN-1 ,Sn:060000-1
Battery 1:                          Battery 1
  Teleflex PIN ,Sn:06952E-0
Battery 2:                          Battery 2
  Teleflex PIN-1 ,Sn:060000-1

-----
Engine/battery demo mode:           OFF

MENU Exit                          Accept ENT

```

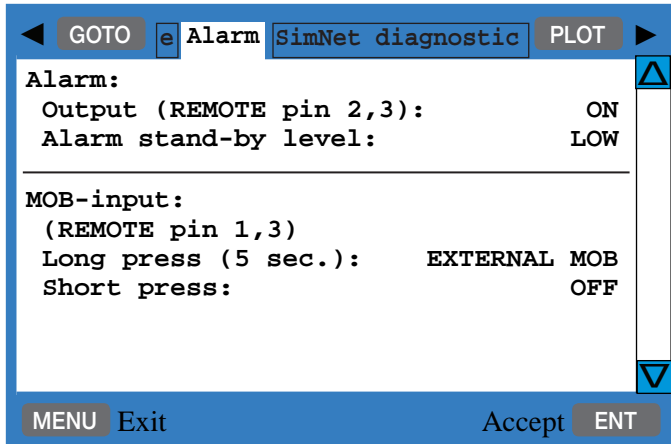
**PIN** - Propulsion system (Engine interface).

To run a demo of the engine/battery monitoring system, use the cursor to go to OFF and use the +/- key to toggle to ON. When ready to connect the **real** system, be sure to turn off the demo mode again.

**NMEA2000 output**<sup>®</sup> - see section 10.5.2 Description of sentences.

PLOT

Go to Alarm interface - step back with [GOTO]



**Stand-by level** can either be: LOW = 0 volt or HIGH = 5 volt.

### MOB-input

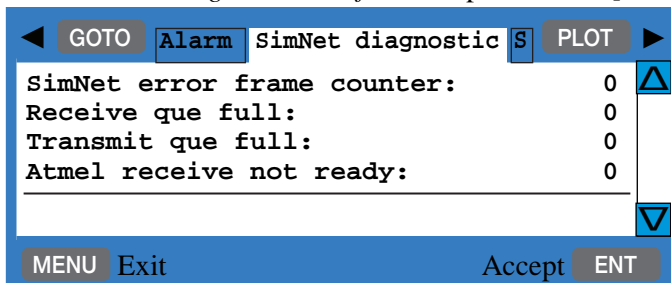
- Press the external switch for more than 5 seconds to activate the MOB function (fixed setting), and press the [ENT] key to start MOB navigation.
- Short press on the external switch (less than 5 seconds) will shift page or plot ship's position. Use the +/- keys to toggle between OFF, SHIFT PAGE and PLOT SHIP's POS:

SHIFT PAGE - short press on the external switch will shift to next page stored under the PAGE key.

PLOT SHIP's POS - short press on the external switch will plot and save the actual position, which will be registered in the WP list.

PLOT

Go to SimNet diagnostic interface - step back with [GOTO]



**SimNet error frame counter** - if the figure is not 0 it could be due to a number of things and not necessarily that there is a system error. However, if the counter is active and the number is rapidly increasing, then the system has detected a fault.

For instance, if the SimNet cable is pulled, the counter will be activated and once the cable is back in place, the counter will stop, but will stay at the figure it has reached. So therefore, a figure other than 0 does not necessarily mean that something is wrong, only if the figure continues to increase.

Prior to call for technical assistance:

1. Check connected cabling.
2. Check supply voltage to be between 10.8-15 VDC to the SimNet system.
3. Systematically disconnect one unit at a time to see which one is causing the problem. Start at the opposite end of the 12V power supply.

The three last lines in the SimNet diagnostic interface are for technicians only.

**PLOT**

*Go to the next interface - step back with [GOTO]*

The interfaces: SimNet input, SimNet output, NMEA0183 input and NMEA0183 output are for technicians only.

**PLOT**

*Go to the next and last interface: Identification - step back with [GOTO]*

The screenshot shows a blue-themed menu interface. At the top, there are navigation buttons: a left arrow, 'GOTO', '83 output' (highlighted), 'Identification', 'PLOT', and a right arrow. Below this is a table with the following content:

<b>Unit description:</b>	CHART PLOTTER	
<b>Device instance</b>	001	
<b>System instance</b>	000	

At the bottom of the screen, there are two buttons: 'MENU Exit' on the left and 'Accept ENT' on the right.

**Unit description** - can be customized to read e.g. MAIN UNIT or BACK-UP UNIT. Maximum number of characters is 16.

The identification name can be seen in the Nodes interface - refer to the beginning of this section.

**ENT**

*Confirm editing, or...*



**MENU** *exit function without making any changes*

## 10.5.1 Description of NMEA0183 version 3.0 sentences

### Description of output sentences

GGA Global Positioning System fix data.  
 GNS GNSS fix data  
 GLL Geographic position, latitude/longitude.  
     GL2 Geographic position, with 2 decimals.  
 RMC Recommended minimum specific GPS data.  
 VTG Course over ground and ground speed.  
 ZDA Time and date.  
 APB Autopilot sentence 'B'.  
 BWR Bearing and distance to waypoint (Rhumbline) /  
 BWC Bearing and distance to waypoint (Great circle).  
 RMB Recommended minimum navigation information.  
 XTE Cross-Track-Error, measured.  
 ZTG UTC & time to destination waypoint.  
 MTW Water temperature  
 VHW Water speed and heading.  
 WPL Waypoint location.  
 RNN Routes.  
 RTE Routes, ONC ON Complete route, or...  
     ONW ON Working route.

Additional sentences for CX33-E:

DPT Depth, including offset.  
 DBK Depth below keel.  
 DBS Depth below surface.  
 DBT Depth below transducer.

### Description of instrument input

WPL Waypoint data (will only be updated every 5 seconds).  
 TLL Target data (will only be updated every 5 seconds).  
 MTW Water temperature.  
 VHW Water speed and heading.  
 HDT Heading, True.  
 HDG Heading, Deviation and Variation.  
 HDM Heading, Magnetic.  
 VWT True wind speed and angle.  
 VWR Relative wind speed and angle.  
 MWV Wind speed and angle.  
 RTE Routes

Additional sentences for CP31/CX33:

DPT Depth, including offset.

DBK Depth below keel.

DBS Depth below surface.

DBT Depth below transducer.

### Description of external position, heading and speed input

GLL Geographic position, latitude/longitude.

RMA Recommended minimum specific Loran C data.

RMC Recommended minimum specific GPS data.

GGA Global Positioning System fix data.


VTG Track made good (course) and ground speed.

## 10.5.2 Description of NMEA2000® sentences

PGN name	PGN	Data content	Indication on display
Battery status	127508	Battery instance,  Battery potential, Battery current, Battery case temperature	Free name tag related to instance no. Default is: Battery 1, 2, 3, 4 Bat Volt Bat Amp *.*°C or °F
Engine parameters, Rapid update	127488	Engine instance,  Engine speed, Engine boost pressure (Turbo)	Free name tag related to instance no. Default is: Engine 1, 2, 3, 4 RPM Turbo Psi or kPa
Engine parameters, Dynamic	127489	Engine instance, Engine oil pressure, Engine coolant temp. Alternator potential Fuel rate Fuel pressure Engine tilt/trim	See above. Oil Psi or kPa Coolnt °C or °F Engine name tag Volt Fuel G/h or L/h and per nm* Fuel Psi or kPa Tilt %
Transmission Parameters, Dynamic	127493	Transmission instance  Transmission gear (F,N,R) Transmission oil pressure Transmission oil temp.	Follows name tag and instance of engine. <b>F</b> orward, <b>R</b> everse or <b>N</b> eutral Transm Psi or kPa Transm °C or °F
Fluid Level	127505	Fluid instance  Fluid type (Fuel) Fluid level (0-100%)	Follows name tag and instance of engine. Fuel Level %

\*) Calculated on the basis of GPS SOG and 'gallons per hour' input.

## 10.6 Palette setup

 Quick change of preset color palettes via the [PWR] key.

**MENU**

*Call up the menu bar, and...*


**8,3**

*load the Palette setup*

Palette 1:Bright (sunshine), 2:Day (normal daylight), 3:Dusk and 4:Night are preset. Preset palettes are not adjustable. Non-preset palettes can be customized to suit individual needs and wishes. To make your own special palette setup in e.g. palette 5, then:

**5**


*Select Palette setup: 5*





**Palette setup:** **5**


Name: Custom


---


Text: 


Background: 


Data cursor: 


Frame/roll in pop-up windows: 


\*) Active frame: 

\*) Inactive frame: 


Menu text: 

Inactive menu text: 

Menu text highlight: 

Menu background: 

---

**PAGE** More (1/2) **Scroll** 

**MENU** Exit **Accept** **ENT**

Page 1 of 2.

\*) Not available in this model.



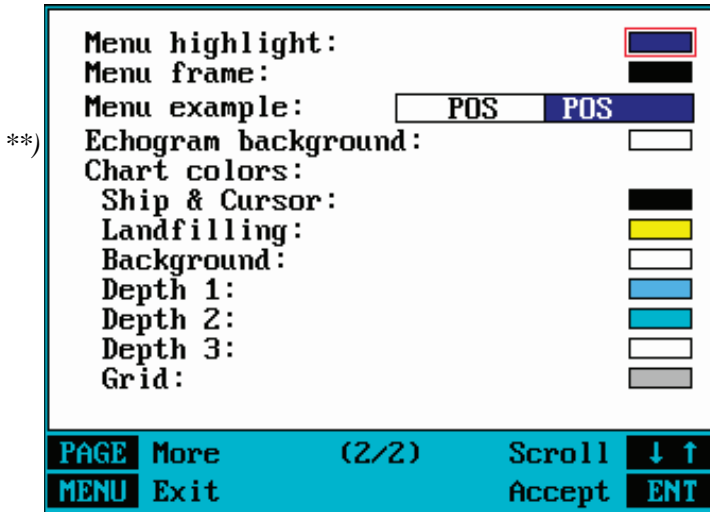
*Use cursor to scroll up/down in display*

**A-Z**

*Key in a name for the new palette setup - max. 29 characters, -refer to "Naming of routes, points, etc." in section 2.6.*

**PAGE**

*Toggle between page 1 and 2*



\*\*) Only available in the CX33-E model.

+/-

*Toggle between available color settings*

ENT

*Confirm new setup*

## 10.7 Factory settings

**DELETE MEMORY:** It will be possible to erase a single category of objects entered into the unit by the user - for example, if moving to a different place in the world you may no longer need the routes etc. you have in the memory. However, an alternative is to store the data on a DataCard - refer to section 9.6.

**FACTORY PRESETS:** If the unit is still 'alive' but has ceased to respond to normal operation, it could become necessary to return to the factory presets - but first check 'Troubleshooting' in section 11.11.

### Show test display

Information in this display is for technicians only.

MENU

*Call up the menu bar, and...*

8,4

*activate the display for Factory settings*

DELETE MEMORY:	
1	Delete all WAYPOINTS
2	Delete all ROUTES
3	Delete all LINES
4	Delete all TRACKS
5	Delete all TARGETS
Used memory: 0%	
FACTORY PRESETS:	
6	Return to SimNet/NMEA presets
7	Return to CHART presets
8	Return to SOUNDER presets (CX33-E)
CLR	Return to all factory presets
0	Show test display
MENU	Exit

To activate any of the functions, please follow the instructions in the display. However, any attempt to make any type of change, will first of all generate a WARNING display to inform you that you are about to erase some or all data/settings.

**ENT** If you are absolutely sure, *press [ENT] to complete the job*

**MENU** If not absolutely sure, *press [MENU] to exit function without having made any changes*

☞ Activating ‘Return to all factory presets’ will erase all user-made settings including waypoints, routes, tracks etc. and restore the basic settings from the factory. The unit will restart with ‘Automatic input source setup’ as described in section 2.7 Initial start-up.

☞ Activating ‘Return to SimNet/NMEA presets’ will give two choices:

Press [1]      Product SimNet reset  
                   Reset this unit only

Will bring this unit only back to factory defaults of the Interface setup. The unit will restart with ‘Automatic input source setup’ as described in section 2.7 Initial start-up.

Press [2]      Global SimNet reset  
Reset entire Simrad group  
on the network

Will bring this unit together with all connected units (which are not turned off at the moment) back to factory defaults of the Interface setup. The units will restart with 'Automatic input source setup' as described in section 2.7 Initial start-up.

### **POWER OFF - RESET**

In case, for some reason, the unit is totally locked i.e. no immediate response from the keypad, then first try to reset the unit by disconnecting the power supply. Reconnect the power cable and then start up the unit again by pressing and holding the [PWR] key until a picture appears on the screen.

**MASTER RESET** (will return all settings to factory presets)

If the Power off - reset does not solve the problem, you may have to perform a **master reset** by disconnecting the power supply, and then while reconnecting the power cable you will have to press the [PWR] and [CLR] keys at the same time, and hold both keys depressed until a picture appears on the screen. All user-made data will be erased, and all settings are returned to factory presets.

## II. Installation and service

### II.1 Installation notes

For a number of reasons, all user-related decisions, setups, etc. should be noted in these two pages as they occur. This information may be helpful if your unit has been updated with new software, reset or in for service.

<b>Transducer type:</b>
-------------------------

<b>Echosounder setup:</b>	
<b>Transducer</b>	
<b>Depth</b>	
<b>Frequency</b>	
<b>Keel depth</b>	

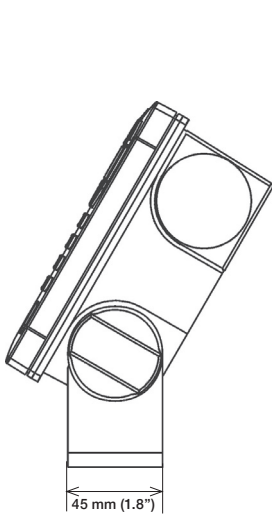
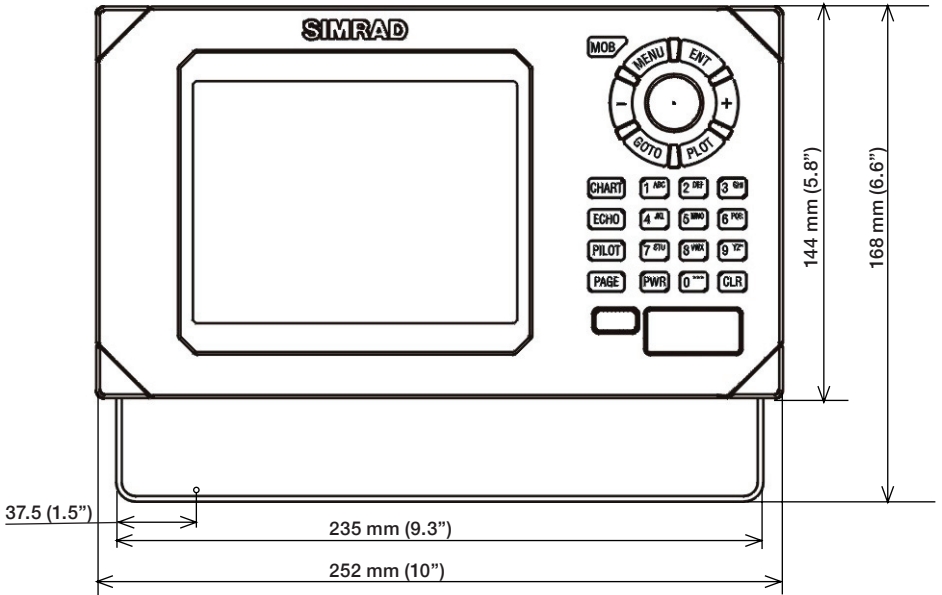
<b>Other important settings:</b>		



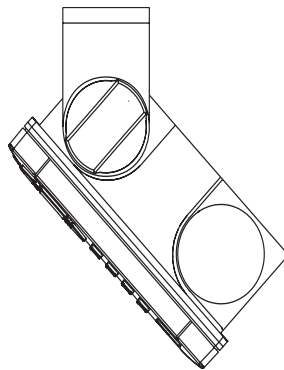


### II.2 Installation of CP31/CX33/CX33-E

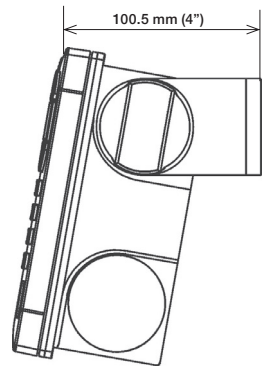
The unit can be flat or bracket mounted - overhead, bulkhead or console.



**Console mounting**  
(max. tilt 45°)

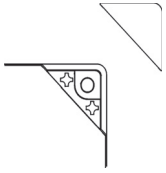


**Overhead mounting**

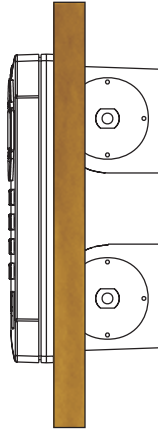


**Bulkhead mounting**  
(approx. 10° tilt, allowing space for connectors and cables)

### Flush mounting of CP31/CX33/CX33-E

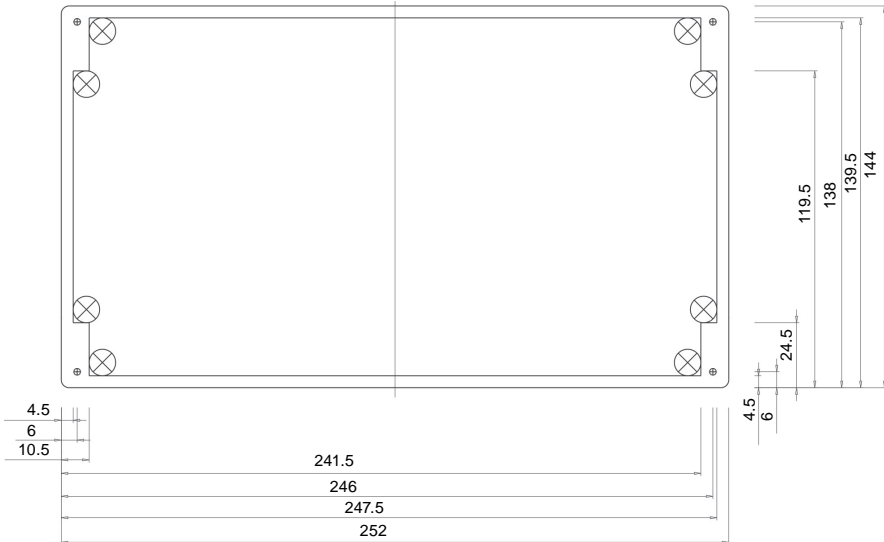


Removable corner  
for flush mounting



Refer to included template for instructions on flush mounting.

(measurements in mm)



### 11.3 Location for display unit

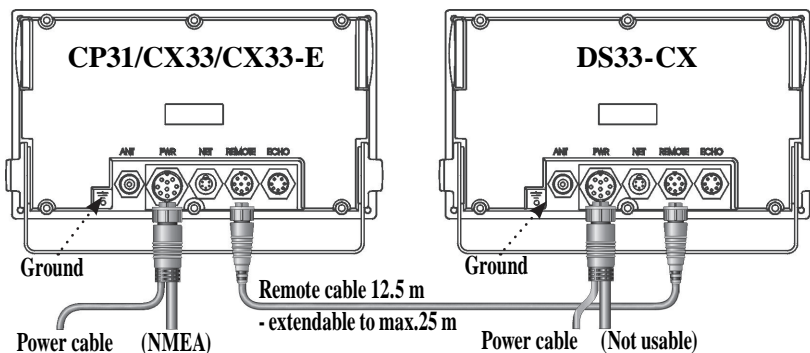
Determine which place is the most suitable and convenient for navigation and general operation after considering the following conditions:

- you can see the ship's bow when you raise or lower your eyes from the display.
- there is limited exposure to direct sunlight to avoid overheating - see environment temperature limits in 11.12 Specifications.
- there is good ventilation and minimum vibration.
- the minimum distance to a magnetic compass is 650mm (25.6").
- provide sufficient space behind the unit to allow for proper cable connections to the rear panel connectors.

### 11.4 Connection between main unit and dual station

The DS33-CX is a remote control unit for the CP31/CX33/CX33-E. These units are identical in size, so the same installation guides can be applied when performing the installation.

Refer to section 11.6 for details on pin numbers



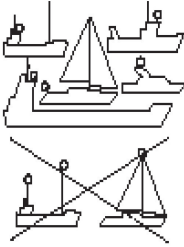
#### 11.4.1 Operation of Dual Station

The main unit and the dual station operate in parallel.

All key commands are relayed to the main unit - CP31/CX33/CX33-E - and the display picture is instantly transferred back via a high speed data bus (HSDb).

Adjust light/contrast in screen and background light in keypad via the [PWR] key. The eject key and cartridge drawer are blinded and can not be opened on the dual station.

## II.5 Installation of GPS antenna



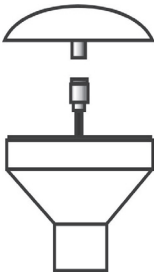
The antenna must be placed in a position where tall constructions, steel wires, masts, etc. do not obstruct the view to the satellites. Do not, however, mount the antenna in the top of a mast or tower, as this may degrade the COG and SOG readings. Do not place the antenna close to sources of electrical interference, such as radar, satcom, etc. If installing the GPS antenna close to other antennas it must be placed either above or below the radiation beams. There is full coverage down to  $20^\circ$  below the horizon.



Avoid installing the GPS antenna inside the beam areas.

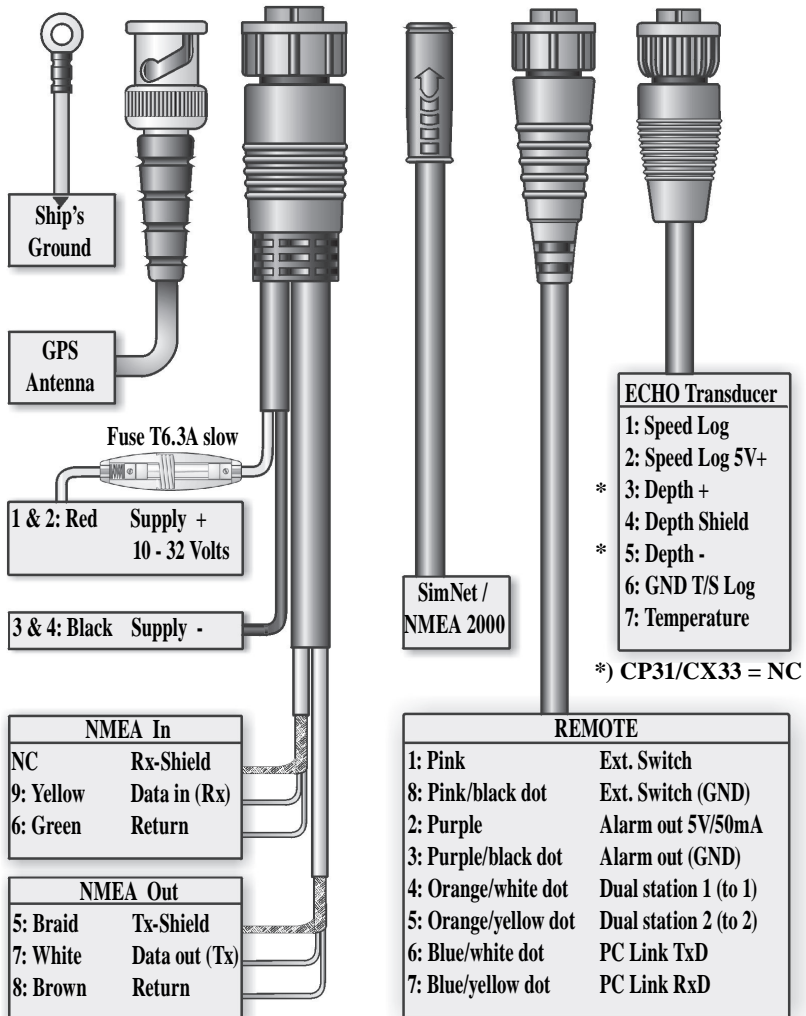
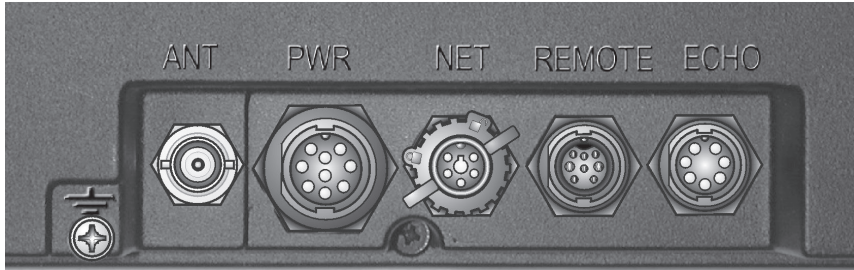
### Mounting of GPS antenna GPS 5

Pull the cable through the mounting base and fix the mounting base onto a mount with standard US 1" 14 thread. Tighten firmly, but only by hand. Attach the antenna cable to the TNC socket. Firmly press the antenna onto the mounting base till it snaps into a locked position.



The antenna can also be deck mounted or fixed on a flat surface. Drill a 15 mm hole for the cable and three 5 mm holes for the fixing screws. Pull the cable through and connect to the TNC socket. Apply silicone adhesive along the outer circle of the antenna and press it into place. Use the included screws to secure the antenna.

## 11.6 Electrical connections



### 11.6.1 Power supply connections

The internal voltage regulator will allow the CP31/CX33/CX33-E to operate normally within the power supply voltage range from 10 to 32 V DC. The CP31/CX33/CX33-E is connected to external power (battery) by means of the supplied power/NMEA cable. Cable length is approximately 2 meters. After connecting the cable to the power source, push the plug as far as it will go into the nine pin receptacle marked “PWR” on the rear of the cabinet and turn the plug’s coupling ring clockwise until it makes a click.

### 11.6.2 Fuse

**Warning!** A fuse should always be installed to protect the unit.

Using a fuse which is not specified for your equipment can cause it to blow the instant the CP31/CX33/CX33-E is switched on or it will not protect the equipment as intended – see fuse rating in section 11.12 Specifications.

### 11.6.3 Transducer connection (CX33-E)

Most transducers are supplied with a 10 meter cable for connection to the echosounder unit – CX33-E. Push the female plug, as far as it goes, into the receptacle marked “ECHO” on the rear of the cabinet and turn the plug’s coupling ring clockwise until it clicks into locked position

☞ The unit must be turned off while connecting/disconnecting the transducer cables.

### Recommended transducers

Airmar single element two-frequency 50/200 kHz transducers i.e. B744V, P319, B45, B256, P66 and P52.

### 11.6.4 PC up/download via NMEA connection

A PC can be connected to the CP31/CX33/CX33-E via the REMOTE port to enable exchange of waypoint and route data. Use PC data cable, length 2 m.

### 11.6.5 Interface connection

The 33 series feature three possibilities for interconnection and data sharing:

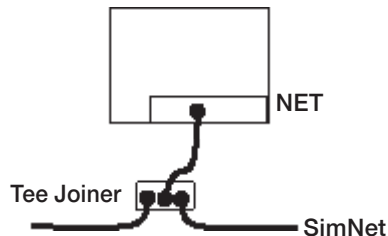
1. SimNet, which is recommended for control and data sharing between Simrad SimNet products.
2. NMEA2000, SimNet products will interface and share data with NMEA2000 based products.

3. NMEA0183, which has been the common standard for marine electronics. Interface connections are made via the combined power and NMEA cable to the receptacle on CP31/CX33/CX33-E marked “PWR” on the rear of the cabinet.
  - ☞ The unit must be turned off while connecting/disconnecting the interface cable.

**SimNet** is a high-speed control and data network designed to integrate SimNet products into a complete system. Ready-made cables with small plugs makes it easy to run cables. Only 10 mm (3/8”) holes are required through panels and bulkheads. The SimNet accessory program contains the necessary items to make a successful installation, see section 11.12 Specifications.

**Plug and Play** - once all products are connected and power is switched on, the entire network system will be set up automatically and will ensure optimum performance.

**SimNet interface connection for CP31/CX33/CX33-E** is made directly to the receptacle marked NET on the rear of the cabinet. Use a Tee Joiner to make a drop connection from the SimNet system to the NET receptacle.

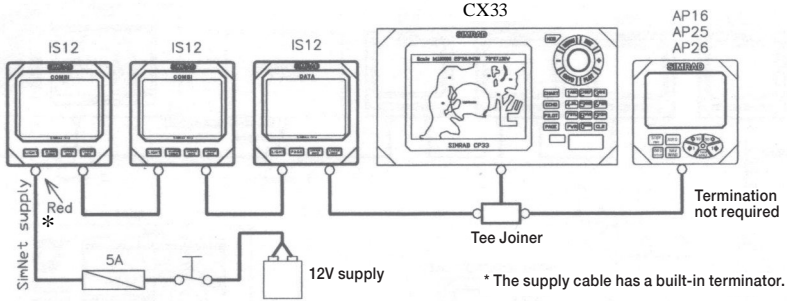


### SimNet power and termination

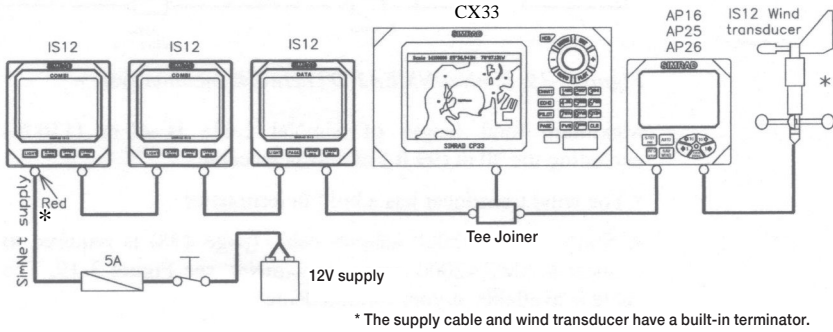
The following simple rules should be observed when installing SimNet:

- SimNet must be powered with 12 VDC and connected to the battery via circuit breaker and 5 amp fuse.
- Do not connect the SimNet power cable to the same terminals as the Autopilot Computer, Radar, thruster or other high current products.
- SimNet should normally be terminated in each end, starting with the power cable with termination in one end and termination plug or wind transducer (with termination) in the other end.

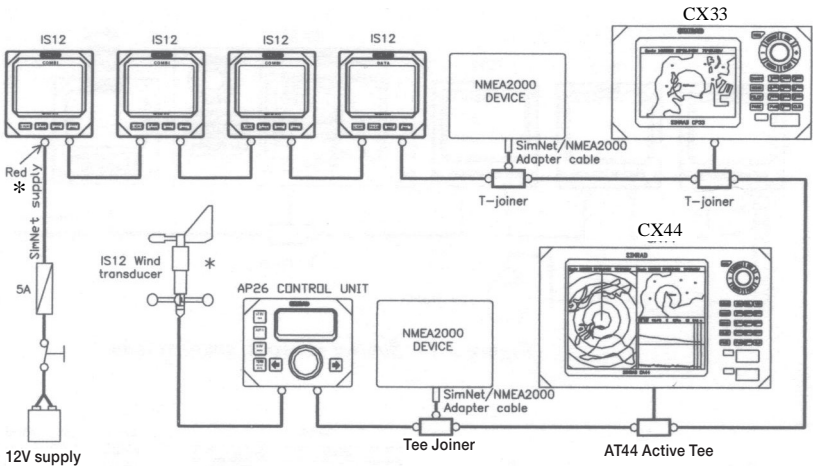
SimNet network, small system



SimNet network, small system with Wind transducer



SimNet / NMEA2000 network, medium system

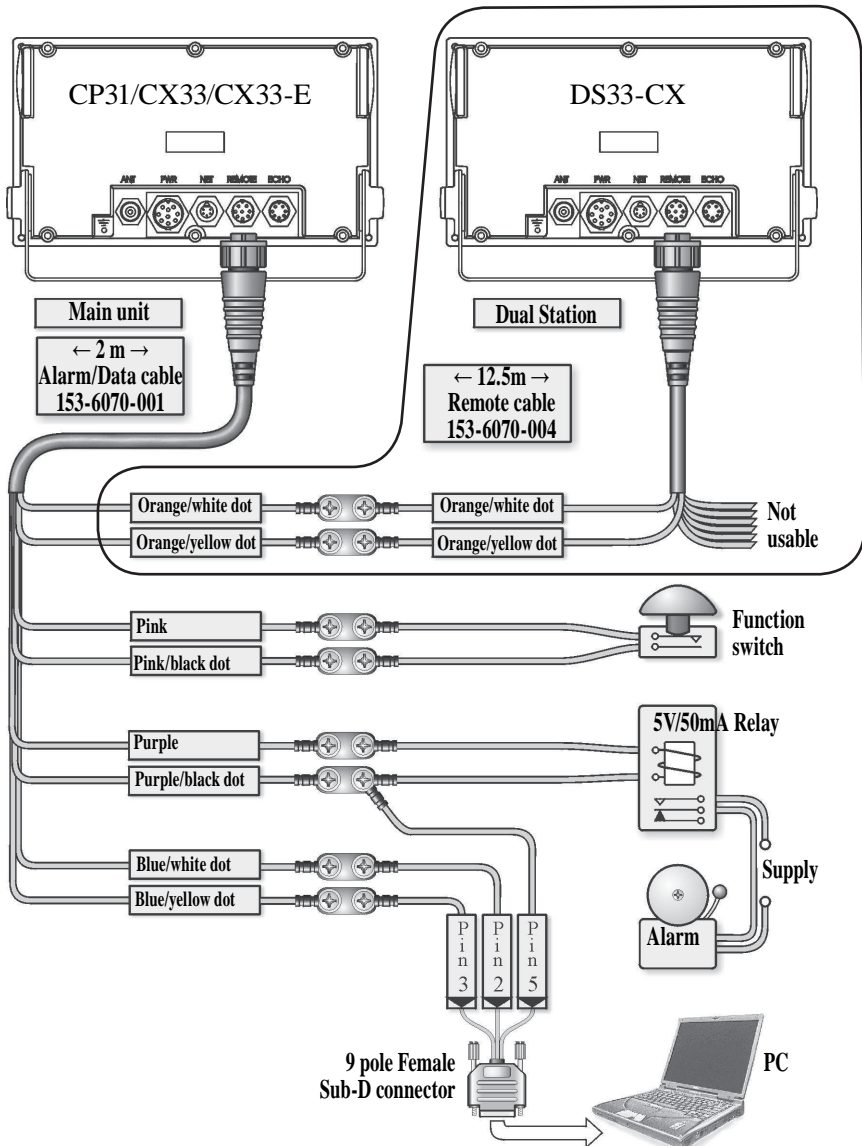




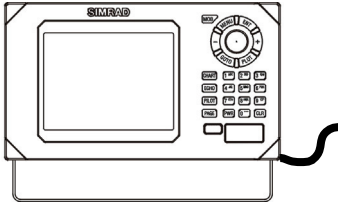
## 11.7 Optional connections

### External alarm and function switch

Use the optional Alarm/Data cable (see also the Alarm interface setup in section 10.5). If main unit is connected to Dual Station, the remote cable must be cut and rejoined as illustrated below:



### Overview of various optional connections:



- Dual Station DS33-CX
- WR20 RemoteCommander
- Performance Instruments
- Color Trackplotter
- Differential Beacon Receiver
- Water speed and temperature sensor
- Autopilot
- Radar
- Yeoman digitizer
- NMEA Buffer RS5345
- PC - WPs & routes up/download
- Other equipment via SimNet or NMEA0183

### 11.8 Basic transducer and cable information (CX33-E)

The installation should be carefully planned in advance, keeping in mind the standard cable length of 10 meters (32 feet) which is connected to the transducer. In the event where the standard cable is not long enough, up to an additional 10 meters (32 feet) may be connected without a noticeable reduction of the performance. The cable must be of the same type as the standard cable.

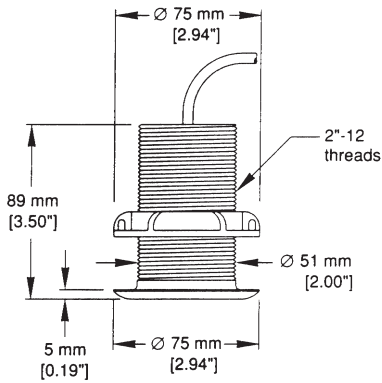
☞ The CX33-E must be turned off while connecting/disconnecting the transducer cable.

The use of longer cable runs, while possible, always increases the likelihood of increased interference and decreased performance. Care must be taken when increasing the cable lengths to ensure that proper, adequate and consistent shielding is maintained, that cable of adequate cross section is used, and that all connections are properly made and protected from the effects of the marine environment.

If possible, running the transducer cable through a grounded conduit will greatly decrease the likelihood of interference. Likewise, the transducer cable should be run as far as possible from other electrical cabling. If it is absolutely necessary to pass close to other cabling, it is best to keep as much distance as possible, and to make all crossings as close to a right angle as possible.

### II.8.1 Transducers (optional for CX33-E)

#### Airmar P319



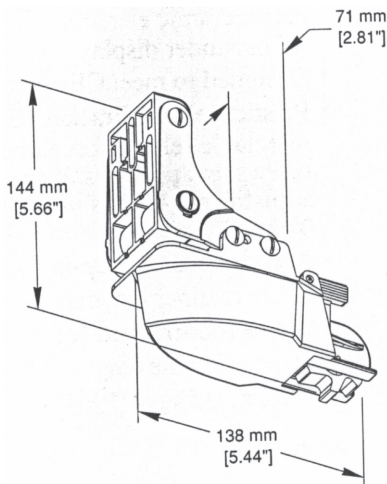
#### Thru-hull mount

Frequency: 50/200 kHz  
 Beamwidth: 45° / 15°  
 Cable length: 10m (32')  
 Depth information.

Reference no. 179-0401-002 (P319)  
 Housing: Reinforced plastic  
 Recommended for fiberglass and metal hulls. Do not use in wooden hulls!

Reference no. 179-0401-003 (B117)  
 Housing: Bronze  
 Recommended for fiberglass and wooden hulls.

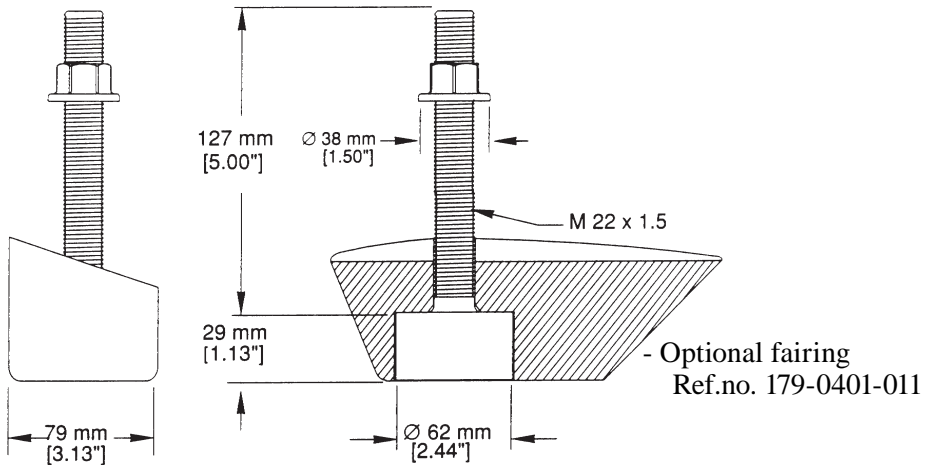
#### Airmar P66



#### Transom mount

Frequency: 50/200 kHz  
 Beamwidth: 45° / 15°  
 Cable length: 10m (32')  
 Speed, temperature + depth information

Reference no. 179-0401-001  
 Housing: Chemical resistant, high impact plastic alloy.  
 Recommended for all type hulls.

**Airmar SS505****Thru-hull stem mount**

Accommodates hull thickness:

Min. no fairing 6 mm (1/4"), Max. with fairing 83 mm (3 1/4")

Frequency: 50/200 kHz

Beamwidth: 45° / 15°

Cable length: 10m (32')

Depth information.

Ref.no. 179.0401.004 (B45)

Housing: Bronze

Recommended for fiberglass or wooden hulls only.

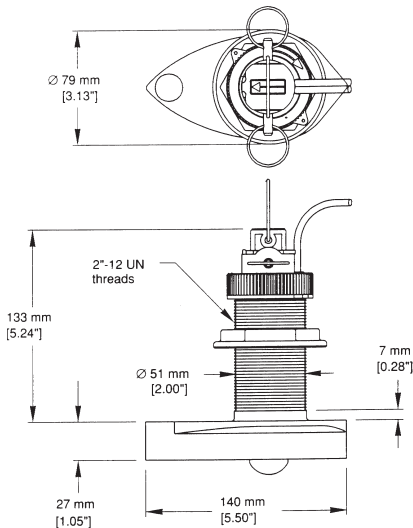
Ref.no. 179.0401.008 (SS505)

Housing: Stainless steel

Recommended for any hull material.

**Airmar B744V**

top and side view

**Thru-hull triducer**

Frequency: 50/200 kHz

Beamwidth: 45° / 15°

Cable length: 10m (32')

Speed, temperature + depth information.

Ref.no. 179-0401-009 (B744V)

Housing: Bronze

Recommended for fiberglass and wooden hulls.

**11.8.2 Determining the position for the transducer (CX33-E)**

The CX33-E is a sophisticated piece of electronic equipment, but how well it will perform under actual operating conditions will be largely dependent upon the location of the transducer and how it has been installed.

Careful consideration, therefore, must be given to selecting the mounting location and on deciding the method of installation that best suits the vessel.

Air bubbles and turbulence caused by the vessel's movement through the water will seriously degrade the transducer's performance. Therefore the transducer should be located well clear of any water intake or discharge line and also clear of any projection along the hull line which might disturb the smooth flow of water. It is of profound importance for good performance of the CX33-E that the water flowing over the transducer be free of bubbles and aeration. If the transducer face is clean but the performance degrades with increasing vessel speed, then aeration of the water flowing under the transducer may be the cause of the poor performance.

Due to the varying design of ship's hulls and different operating speeds, there can be great variation in the amount of air bubbles which are carried beneath the hull. These bubbles tend to be carried close to the hull as they pass aft. For

this reason, it is desirable for the transducer to be mounted on a fairing block which holds the transducer away from the hull and which directs the flow of aerated water around the sides of the transducer rather than over the face of the transducer.

On deep keeled vessels, care must be taken to ensure that the transducer beam will not be blocked by any part of the keel. Although the appropriate mounting location that meets all requirements depends on the type of vessel and its normal operating speeds, a practical choice is usually somewhere between one third and one half of the vessel's water line length from the bow. Leveling blocks may be designed accordingly to meet this requirement.

☞ The more the transducer protrudes from the hull, the better the results will be.

Particularly at lower frequency operation (50kHz), interference from propeller noise can be a significant problem. This can be seen as an increase in the "noise" on the echosounder display when the propeller speed is increased. To help reduce this, the transducer's mounting face may be angled slightly forward on the order of 3-5°. The goal is to incline the transducer so that a line of sight along the transducer's radiating surface passes below the propeller.

☞ Keeping the propeller clean and free of any nicks or roughness will assist in minimizing interference from propeller noise due to cavitation.

### Sources of noise to consider:

Water/air noise	Acoustic noise	Electrical noise
Air bubbles Turbulence Propeller	Main engine Reduction gear propeller shaft Generators auxiliary engines Power plant for freezers Hydraulic pumps Rudder engine Bow thruster Stern thruster	Noise from electrical cables Noise from generators Poor grounding of instrument Radiated noise from other instruments Dc – Dc converters Electrical winches Neon lights etc.

## 11.9 Preventive maintenance

**Surface cleaning** – to keep the CP31/CX33/CX33-E cabinet and display screen clean, wipe the surfaces with a clean damp cloth. For heavier cleaning, use a clean, damp cloth which has been dipped in a solution of a mild dish detergent and water. Wring out firmly before wiping the unit.

☞ Never use cleaning solutions containing spirit or alcohol.

**Electrical connections** – periodically check the electrical connections. Make sure that connections are tight and that no cables are frayed or worn.

**Transducer** - periodically clean the face of the transducer with a plastic utensil using a scrubbing action.

☞ Do not use a harsh abrasive or a solvent to clean the transducer.

## 11.10 Repair and service

The CP31/CX33/CX33-E is sealed and does not contain any user serviceable parts. Opening of this unit will void its warranty. If the CP31/CX33/CX33-E requires servicing or repair, call your authorized SIMRAD dealer, but first check section 11.11 below.

**Spare parts** – fuses may be bought from a chandler or a marine supply store. Use only fuses specified for this unit – see 11.12 Specifications.

If you require a SIMRAD part, please contact your authorized dealer.

## 11.11 Troubleshooting

For all fault finding, first check that the supply voltage is between 10-32 VDC		
Symptom	Check	Remedy
No picture on display screen	Check that the unit is turned on	Press the [PWR] key on keypad
	Check fuse in power cable fuse holder	Replace fuse. Use only type T6.3A slow
Picture appears on the display screen, but image is too dark or too bright		Press [PWR], adjust light/contrast, press [ENT]
No normal picture or key operation		Turn unit off and on again
		Disconnect power and connect power again

Symptom	Check	Remedy
	Check via [MENU], [8], [CHART] if C-MAP chart is defective	Remove C-MAP chart if defective
		Return to factory presets, see section 10.7
No GPS position update	Check that position mode is INTERNAL, refer to interface setup in [MENU],[8],[2], Position	
	Check antenna and cable	Replace antenna or cable
Screen update is extremely slow	Check that the stored Tracks and Routes (not currently in use) are not all drawn up on the chart	Turn off 'Course line' for each stored route in sec.5.2, and turn off 'Display track' in sec.5.6
Some values are missing in the engine displays.	Check what type of data output is transmitted from the engine(s) via the databus.	The engine source controls the value of the read-outs.
Unstable or no data from SimNet.	Check connection of SimNet cables. Check for stable 12 Volt supply. Check termination is correct.	Use minimum one termination e.g. the power cable with red disc. Perform SimNet system reset, see section 10.7.
No data from replaced SimNet sensor.	Check connection of SimNet cables.	Perform SimNet system reset, see section 10.7.
All data is deleted after turning off the unit and turning it back on	Check battery lifetime. Expected lifetime is min. 5 years	Internal battery must be replaced by authorized dealer
Additional data for the CX33-E Chartplotter with Echosounder:		
Symptom	Check	Remedy
Echo picture appears normal, but no target are shown or only random "noise" is seen	Check that the correct transducer frequency is selected	Go to Echosounder setup and select transducer frequency in section 10.2
	Check that the transducer connectors are securely mated with the unit	Correctly mate the connectors to the unit



Symptom	Check	Remedy
	Check that the receiver gain is set high enough	Increase the receiver gain in 7.6 Presentation setup
	Check that the range is correct for the water depth	Adjust the range in 7.6 Presentation setup
Excessive noise in echo picture	Check for correct grounding	Connected equipment must be properly grounded to the main unit

## 11.12 Specifications

### General data

- Power supply: 12 and 24 V DC (10-32 V DC max) 8-17 watt
- Power cable: Power/NMEA cable, 2 m (153-6070-002)
- Dimensions: H:144 mm (5.8") W:252 mm (10") D:70 mm (2.8")
- Weight: 1.5 kg (3.3 lbs)
- Environment: -10 to +55°C, IEC 60945, waterproof USC 46 CFR and IP55
- Housing: Casted aluminum back, polycarbonate front
- Display: TFT color, power backlight: 5.7" 320x240 pixels  
 CP31: Acrylic front lens.  
 CX33: Glass front with bonded display.
- Presentation: 4 pages. Manual, dedicated and remote switch, and automatic sequencing.
- Interfacing: 1 port in/out NMEA0183  
 1 port SimNet/NMEA2000  
 PC up/download WPL and RTE  
 Alarm - signal output 5 V 50 mA
- Fuse: T6.3A slow (5 x 20 mm)

### SimNet control

- Maximum number of products connected in a network:.....50 units
- Maximum cable length (excl. 30 m wind transducer cable): ..... 120 m (400')
- Bit rate of the bus: ..... 250 kbit/second
- Maximum DC current through a single SimNet plug: .....5A
- SimNet power supply:..... 10.8 - 15 VDC
- Maximum drop cable length:.....6 m (20')
- Maximum total length of all drop cables: .....60 m (200')
- Environmental protection: Cable and plug/connector system: .....IP66
- Temperature: ..... max. 70°C (158°F)

**GPS section**

Receiver type:	14 channel parallel, C/A code, 8 state Kalman filter		
Accuracy:	Position (DGPS):	2-5 m RMS	
	Position (SDGPS):	3-7 m RMS	
	Position (GPS):	8 m RMS	
	Speed:	0.1 kn	
	Course:	1°	
Speed filter:	10 settings		
Update rate:	1 second interval, typical		
Dynamics:	Velocity:	600 km/h	
	Acceleration:	10 m / s <sup>2</sup>	

**GPS antenna GPS 5**

Type:	Patch		
Dimensions:	Height:	100 mm (top=30 mm, bottom=70 mm)	
	Diameter:	86 mm	
Weight:	122 g (top=83 g, bottom=39 g)		
Environment:	-35°C to +75°C, 95% rel.		
Mounting:	1" 14 thread (standard US)		
Cable:	10 m RG58 (standard), 15 m RG223 (option), max. 30 m RG213		

**Chartplotter section**

Chart system:	C-MAP MAX or NT+		
Presentation:	Semi dual chart - two charts in individual scales and detail levels		

**Internal**

memory:	Dynamic storage with combinations of/or totals up to:		
	35,000 marks/waypoints		
	10,000 waypoints with name (25 characters)		
	50,000 trackpoints		
	50,000 line sections		
	1,000 routes		

**Echosounder section**

Frequencies:	50 or 200 kHz, selectable		
Output power:	Variable up to 600 watt RMS (4,800 W PP)		
Impedance:	175 / 425 ohms		
Display ranges:	5 to 1000 m (50kHz) or 5 to 400 m (200kHz), manual and auto mode		

**Detection**

ranges:	Frequency	Beam	Bottom
	50 kHz	45°	800 m / 2,400 ft
	200 kHz	15°	350 m / 1,050 ft

Pulse length:	Short, medium, long and auto
Transmission rate:	10 pings per second
Alarms:	Fish, max. and min. depth
Zoom mode:	Shift, bottom and VRM expansion, 1 to 50 meters, feet or fathoms
Event marker:	At current ping and depth memory
Picture speed:	True distance or time, high, medium, low, and freeze
Noise filter:	User selectable on/off
Echo pre-sentation:	A-scope and white line discrimination
Temperature:	Sensor or NMEA
Speed:	Sensor or NMEA

### **Alternative 50/200 kHz medium-rang transducers (Airmar Des.A)**

B256: 1kW medium range transducer, 16x28° and 4x6° beams.

B45: 600W bronze stem mount transducer, 45° and 15° beam.

B744V: 600W bronze thru hull triducer, depth, speed and temperature, 45° and 15° beam.

P66: 600W plastic transom mount triducer, depth, speed and temperature, 45° and 15° beam.

P319: 600W plastic thru-hull transducer, 45° and 15° beam.

ST850: Speed and temperature only.

### **Cables included**

Power/NMEA cable, 2 m, incl. fuse T6.3A (153-6070-002)

Antenna cable, 10 m RG58 (153-2025-004)

### **SimNet cables and accessories (not included)**

SimNet cable 0.3 m (1'), (24005829)

SimNet cable 2 m (6.6'), (24005837)

SimNet cable 5 m (16.6'), (24005845)

SimNet cable 10 m (33'), (24005852)

SimNet Tee Joiner, 3 sockets (24005860)

SimNet Multi Joiner, 7 sockets (24006298)

SimNet cable gland (24005878)

SimNet protection plug (24005886)

SimNet termination plug (24005894)

2 m (6.6') SimNet power incl. termination (24005902)

2 m (6.6') SimNet power excl. termination (24005910)

AT10 Universal NMEA0183 converter (24005936)

SimNet cable protection cap (24005928)

SimNet/NMEA2000 drop cable (24005729)

**Options**

Simrad DataCards

C-MAP electronic charts MAX or NT+

WR20 RemoteCommander

6-channel NMEA Buffer RS5345

Alarm/Data cable, 2 m (153-6070-001)

PC data cable, 2 m (153-6070-006)

Antenna cable 15 m RG223 (101-5615)

DS33-CX Dual Station, 5.7" TFT LCD color screen,  
incl. 12.5 m cable (153-6070-004) - max. length 25 m.

Sunhood (401-0024)

Scanstrut mounting solutions.

## General

**Almanac** – a satellite's almanac data, is data which determines an approximate lane for satellites in orbit. The almanac data is used by the GPS receiver to find and lock onto the satellite signal. CP31/CX33/CX33-E has a built-in basic almanac.

**AVN** – Approximate Velocity Necessary – to arrive at a specific waypoint at a specific time.

**Bearing** – is the direction of where to go e.g. towards a specific waypoint.

**Course** – Course Over Ground, magnetic or true. The direction of which the vessel is moving.

**Configuration** – the configuration functions of the CP31/CX33/CX33-E allow you to adapt the system more specifically to your needs. You may set Units of measure (feet, fathoms, meters, etc.), Menu languages, Scroll speed, etc.

**dGPS** – differential data is received from external DGPS Receiver.

**ETA** - Estimated Time of Arrival - at a specific waypoint if keeping a steady speed.

**Great circle** – the shortest distance between two points on the globe.

**Heading** – the direction of which the vessel is pointing (from ext.compass).

**Measurement units** – the user may select the displayed units to be one of the following:

m	meters
ft	feet, 1 foot is 0.3048 meter
fm	fathoms, 1 fathom is 1.83 meters
nm	nautical mile, 1 nm is 1852 meters
kn	knots, nautical mile per hour
km	kilometer, 1 km is 1000 meters
kh	kilometer per hour
mi	statute mile, 1 mile is 1609 meters
mh	mile per hour

**MENU** – the selection of main menus will be shown in the upper part of the screen. Leaf through the menus by means of the cursor key and the [ENT] key, or use the numerical keys to activate one of the menus.

**Navigation simulator** - the chartplotter function features a built-in navigation simulator which can be used for demonstration purpose or for practicing 'live' navigation in 'off season'.

Navigation to cursor or waypoint, in route or in track is started as described in chapter 6. The navigation simulator is started via the interface setup: Press [MENU],[8],[2],[PLOT]; under index tab 'Position' use the cursor to go to 'Position mode' and use the +/- keys to toggle to 'Dead Reckoning'; then go to 'Dead reckoning speed' if you wish to change the current speed by entering a new figure; press [ENT] to confirm.

The ship symbol will now 'sail' to the point of destination directly or via the route you have selected and you can see how the alarms and automatic waypoint shift all work, as if you were sailing yourself. You can also simulate making a track trailing the ship or plotting eventmarks, etc. as the ship is 'sailing'.

**NMEA** – National Marine Electronics Association. The NMEA is an organization of manufacturers of marine electronics equipment. They have adopted the NMEA0183 as a standard for communications between various types of marine electronic equipment.

**Port** side – left (red) / **Starboard** side – right (green).

**Position update** - if, for some reason, there is no position update from GPS or external sensor, the displayed position will start to flash and an alarm will be activated to alert the operator. Reset the 'Position missing' alarm by [CLR]. The alarm can be set ON/OFF - see section 4.5. The displayed position will stop flashing once normal position update is resumed.

**Restart to approaching point** – will automatic recalculate the navigation data from current position to approaching point.

**Rhumbline** – is the straight line to a waypoint on a chart.

**Route name** – each route can be given a name for easy identification.

**SDGPS** - Satellite Differential Global Positioning System - will provide position corrections from received satellite signals (WAAS, EGNOS and MSAS).

**Speed** – Speed Over Ground, measured in knots, kilometers, and miles.

**TFT** – Thin-Film Transistor (Active matrix) display.

**UTC** – Universal Time Coordinates, which is equal to standard time in London (GMT). UTC is not affected by the local summertime adjustments.

**Velocity** – speed towards approaching waypoint.

**Waypoint name** – a name can be added to each waypoint for easy identification.

**XTE** – Cross-Track-Error (-Distance), measured magnitude of the position error perpendicular to the intended track line.

### **Echosounder section (CX33-E):**

**Alarms** – can be set to sound a “beep” if the echosounder detects a target above (shallower than) a minimum alarm depth or below (deeper than) a maximum alarm depth. The CX33-E allows you to set the alarm depths and to enable or disable both the minimum and maximum depth alarms.

**A-scope** – a method of displaying the echosounder information. In A-Scope mode, the echoes are displayed in a “bar-graph” format, with stronger echoes displayed not only in the color representing their target strength, but also in a width representing their target strength.

**Depths** – DK = Depth below keel, DS = Depth below surface, DT = Depth below transducer.

**Echogram background color** – is the color shown on the CX33-E in the event no target is present. There are three colors to choose from, white, blue or black, where black is especially useful during nighttime operation when the white background could appear too bright.

**Echosounder frequency** 50 kHz or 200 kHz can be selected to suit the task. 200 kHz is for general purpose and offers optimum discrimination and a narrow transmitter beam. 50 kHz is for searching in a wider area, determining bottom conditions and going the deepest.

**Event marker** – allows the user to set a vertical marker on the screen at the current ping to indicate a school of fish, etc.

**Transducer** – the transducer serves as the acoustic “loudspeaker” and “microphone” to send and receive the signals through the water. They are most often made from ceramic elements carefully built into a robust housing. The ceramic elements change shape when a voltage is applied across them (when the CX33-E transmits a signal), and they also generate a voltage when they encounter sound waves (as when the CX33-E is receiving an echo).





Select the appropriate datum by inserting the number prefix: Press [MENU], [2], [1], [ENT], and key in the desired number by means of the numerical keys or the +/- keys, confirm entry by [ENT].

000 World Geodetic System 1984  
001 World Geodetic System 1984  
002 European 1950  
003 European 1979  
004 North American 1927  
005 North American 1983  
006 Geodetic Datum 1983  
007 Ordnance Survey of GB 1936  
008 South American 1969  
009 Adindan  
010 Afgooye  
011 Ain el Abd 1970  
012 Anna 1 Astro 1965  
013 Arc 1950  
014 Arc 1960  
015 Ascension Island 1958  
016 Astro Beacon E  
017 Astro B4 Sorol Atoll  
018 Astro Dos 71/4  
019 Astronomic Station 1952  
020 Australian Geodetic 1966  
021 Australian Geodetic 1984  
022 Bellevue (IGN)  
023 Bermuda 1957  
024 Bogota Observatory  
025 Campo Inchauspe  
026 Canton Astro 1966  
027 Cape  
028 Cape Canaveral  
029 Carthage  
030 Chatham 1971  
031 Chua Astro  
032 Corrego Allegre  
033 Djakarta  
034 DOS 1968  
035 Easter Island 1967  
036 Gandajika Base

037 Guam 1963  
038 GUX 1 Astro  
039 Hjorsey 1955  
040 Hong Kong 1963  
041 Indian  
042 Ireland 1965  
043 ISTS 073 Astro 1969  
044 Johnston Island 1961  
045 Kandawala  
046 Kerguelen Island  
047 Kertau 1948  
048 L.C. 5 Astro  
049 Liberia 1964  
050 Luzon  
051 Mahe 1971  
052 Marco Astro  
053 Massawa  
054 Merchic  
055 Mercury 1960  
056 Midway Astro 1961  
057 Minna  
058 Modified Mercury 1968  
059 Nahrwan  
060 Nanking 1960  
061 Naparima, BW1  
062 Observatorio 1966  
063 Old Egyptian  
064 Old Hawaiian  
065 Oman  
066 Pico de las Nieves  
067 Pitcairn Astro 1967  
068 Prov. South Chilean 1963  
069 Prov. South American 1956  
070 Puerto Rico  
071 Qatar National  
072 Qornoq  
073 Reunion  
074 Rome 1940  
075 Santo (DOS)  
076 Sao Bras  
077 Sapper Hill 1943  
078 Schwarzeck  
079 South Asia  
080 Southeast Base

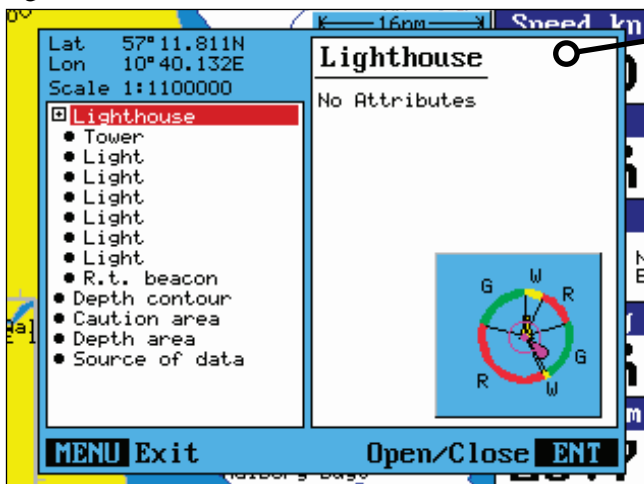
- 081 Southwest Base
- 082 Timbalai 1948
- 083 Tokyo
- 084 Tristan Astro 1968
- 085 Viti Levu 1916
- 086 Wake-Eniwetok 1960
- 087 Wake Island Astro 1952
- 088 Zanderij
- 089 Finnish Datum
- 090 Swedish Datum
- 091 World Geodetic System 1984
- 092 World Geodetic System 1984
- 093 World Geodetic System 1984
- 094 World Geodetic System 1984
- 095 World Geodetic System 1972
- 096 World Geodetic System 1984
- 097 World Geodetic System 1984
- 098 World Geodetic System 1984
- 099 Lisboa Datum
- 100 Pulkovo 1942
- 101 North Am. 1927 Alaska, Can.
- 102 South American - Yacare
- 103 Old Hawaiian Maui
- 104 Old Hawaiian Oahu
- 105 Old Hawaiian Kauai
- 106 Bukit Rimpah
- 107 Camp Area Astro
- 108 Guam 1963
- 109 G. Segara
- 110 Herat North
- 111 HU-TZU-SHAN
- 112 Indian (old)
- 113 Qornoq Datum 1927
- 114 Scoresbysund Datum 1952
- 115 Angmassalik Datum 1958
- 116 Tanarieve Observatory 1925
- 117 Timbalai
- 118 Special Indian (MGRS rel.)

The optional detailed C-MAP NT+ or MAX cards can provide numerous of functions which are accessible via symbols presented on the electronic chart. Place the cursor on a C-MAP object e.g. a buoy or light to call up a small data window with details on the object. The data window will stay on screen for about 10 seconds or till cursor is moved. For expanded information, place the cursor on a C-MAP object and press [ENT] to call up an info window:


Scale: 1:20000	Actual chart scale
No user data at cursor position	
<b>1</b> Edit user data	Inactive function
<b>2</b> Chart info	See details in this appendix
<b>3</b> Find nearest port services	See details in this appendix
<b>4</b> Bearing and dist from A to B	See sec. 3.2
<b>8</b> Tidal current predictions	See details in this appendix
<b>9</b> Chart setup	See sec. 3.3
<b>0</b> Cursor to center	See sec. 3.2
<b>PAGE</b> More user data	Inactive function
<b>MENU</b> Exit	Exit info window

2

*Chart info* will provide information on the C-MAP objects e.g. Lighthouse, Depth area, Fishery zone, Navigation mark, Buoy, Fog signal, etc.



When there is an image of a camera in the right top corner, press [PLOT] to see the picture, and [MENU] to remove it.

**ENT** Press [ENT] to Open/Close for additional information available for the object next to  symbols.

Use the cursor to move up/down in the list of objects in the left column

- details on the object will appear in the right column. In case the details overflows the window, use the +/- keys to move up/down in the text lines. Press [MENU] to exit the function.

### Service information

**ENT** Press [ENT] from the chart display to call up the Info window

**3** Find nearest port services will call up a list of symbols with relevant information on each symbol.



Use the cursor to go to the object in the left column you wish to have information on


- e.g. the “Port / Marina” symbol and then use the +/- keys to highlight the location you wish to locate on the chart by pressing [ENT].

The chart will now zoom in on the Port / Marina location you selected from the list.

**ENT** Press [ENT], [2] to ...

**2** ...call up a list of attributes on the location

**ENT**

Press [ENT] to Open/Close for additional information available for the port/marina next to  symbols.



*Use the cursor to move up/down in the list of facilities in the left column*

- details on the facilities will appear in the right column. In case some of the details are blocked or overflows the window, use the +/- keys to move up/down in the text lines. Press [MENU] to exit the function.



Use the same procedure to locate a Hospital, Coast Guard, Fuel Station, Public Telephone, Provisions, etc.

### Pictures and diagrams

The enhanced MAX cartography can show aerial images, landmarks, Nav-Aids, etc and e.g. bridge diagrams. The C-card has a collection of pictures and diagrams from key market areas. To recognise when there is a picture or diagram available on the location, see example below:



*Press the cursor key to activate the chart cursor, and place the cursor on e.g. a Port/Marina symbol*

- a pop-up window will show the name of the location and list some of the facilities. The information will stay on the screen for approx. 10 seconds. Before it disappears:

**ENT**

*Press [ENT] to call up the info-window on the location*



*Use the cursor to move up/down in the list of facilities in the left column*

- details on the facilities will appear in the right column. In case some of the details are blocked or overflows the window, use the +/- keys to move up/down in the text lines. When there is a picture or diagram available on the location, there will be a small image of a camera at the top right corner. To view the picture/diagram:

**PLOT**

*Press [PLOT] to open the picture/diagram*

**MENU**

*Press [MENU] to remove it from the screen again*

## Tide information



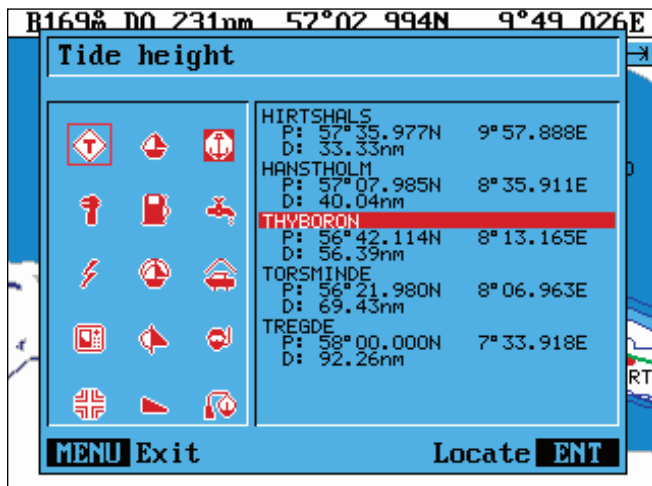
Press the cursor key to activate the chart cursor

ENT

Press [ENT] from the chart display to call up the Info window

3

Press [3] to call up the C-MAP symbols with available facilities



+/-

Use the +/- keys to select the location where you want to know the tide height

ENT

Press [ENT] to go to the tide symbol on the location

ENT

With the cursor placed on the tide symbol, press [ENT] to call up the INFO window

2

Press [2] to access chart info

ENT

Press [ENT] to expand the information, - see example next page.

If you wish to see the low and high tides for a different date - in the past or in the future - it is possible to change the date:

### Day

In the display there will be a red box cursor on the number of the day in the month. Toggle to a different number (date) with the +/- keys.

### Month

Use the cursor to go to the present month. Toggle to a different month with the +/- keys.

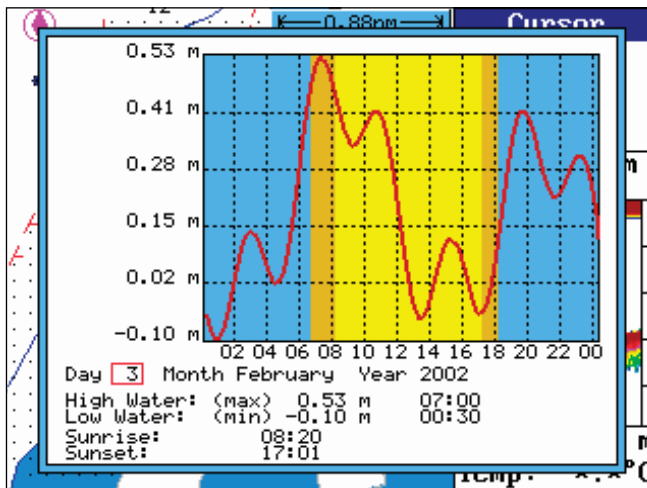
**Year** Use the cursor to go to the year. Toggle to a different year with the +/- keys.

The last two lines in the tide display will inform of **Sunrise** and **Sunset** for the present day.

**MENU**

*Exit function*

Example of Tide height information:



**Caution** - the tide information system is quite accurate. However, the predictions are subject to variables, which, like the weather, are beyond the control of man. The tide predictions are based on normal weather conditions. Hurricanes and strong winds will often have a strong influence on the water level, which can vary several meters. Changes in a coast line, either due to natural erosion, major storms or larger man-made constructions, like breakwaters or dredged canals, can also have influence on the local tide situation.

## Tidal current prediction



*Press the cursor key to activate the chart cursor and then place the cursor in the area on the chart where you wish to obtain information on the current at a given date*

If the area is far from your actual position, you can easily ‘travel’ anywhere you wish by following the procedure described on page C-2 for information on Port/Marina.

**ENT**

*Press [ENT] to call up the Info window*

**8**

*Press [8] to call up the Tidal current prediction display*

The red frame around the chart indicates the active field in the display, so at this point the visible chart area can be altered by:






**+/-**

*Zoom out with [+], zoom in with [-] (more details)*



*Use the cursor to move the chart in steps*

The arrows on the chart will indicate direction and strength of the current by means of color and size:

0 to 0.1 kn	- 	Green
0.2 to 1.0 kn	- 	Green
1.1 to 2.0 kn	- 	Yellow
2.1 to 3.0 kn	- 	Yellow
3.1 to 9.9 kn	- 	Red



If no arrows appear on the chart, press the [-] key to zoom in for details. If there is still no arrows, then there are no current prediction available in the selected area.

To check for current predictions at a different date or time, in the past or in the future:

**PAGE**

*Press [PAGE] to move the red frame in the display*

**+/-**

*Increase / decrease the value  
- and wait for the chart to update the information.*

**MENU**

*Exit with [MENU]*



**Objects organized in categories** The purpose of the C-MAP functions is to select objects, which are to be displayed on the screen (chart). The objects are organized in categories and each category can be selected as one, without having to decide upon almost 300 objects separately. Refer to section 3.3 Chart setup. The following functions are used to enable/disable visualization of the categories listed below:

<b>LAND SETTINGS</b>		
<p><u>Natural features:</u>                      Land area and coastline                      Hill, dune area                      Land contour lines                      Salt pan                      Slope topline                      Tree point                      Vegetation area</p> <p><u>Natural features rivers:</u>                      Lake, Waterfall                      River, Canal</p>	<p>Cultural features:                      Airport area                      Built-up area                      Railway                      Road in general                      Overhead cable, w/pylons                      Overhead pipeline                      Fence line                      Telepheric                      Bridge                      Tunnel, tunnel entrance</p> <p>Points of interest:                      Attractions,                      Historic buildings, etc.</p>	<p>Landmarks:                      Building, religious / single                      Cemetery                      Fortifid structure                      Siloway route part                      Tank, chimney                      Dish aerial                      Radar dome                      Flagstaff / Flagpole                      Flare stack                      Mast, Tower, Monument                      Windmill, windmotor</p> <p>Traffic:                      Roads, railroads, etc.</p>
<b>MARINE SETTINGS</b>		
<p>Names:                      Text</p> <p>Nav-Aids/Lights/Light                      Sectors:                      Lighthouse, Light float                      Lighted offshore platform                      Light in general</p> <p>Signals:                      Anchor point, Cairn                      Chain / Wire, Fog signal                      Radar reflector, Top mark                      Navigational aid, generic                      Extended nav.aid, generic                      Radar station                      Radar transponder beacon                      Radio station</p>	<p>Buoys:                      Cardinal                      Installation                      Isolated danger                      Lateral                      Safe water                      Special purpose                      Generic</p> <p>Attention Areas:                      - see Caution Areas</p> <p>Tides, currents:                      Tide height (predictions)                      Current                      Water turbulence</p>	<p>Nature of seabed:                      Seabed area, rocky area,                      coral reef                      Weed / kelp                      Sand waves                      Spring in seabed</p>

Ports: Berthing facility-up area Causeway Checkpoint Crane Dam Distance mark Dock area Dry dock Dyke area Dyke crown Floating dock Gate Harbor facility Landing place Lock basin Oil barrier Ramp area Shoreline construction Slipway Weir line Small craft facility Coastguard station Pilot boarding place Rescue station Signal station, warning Port area Harbor master Coast guard Police Customs Health emergency Post office Yacht club Boat yard Marine electronics Electric/electronic repairs Engine repairs Sailmaker Fishing/diving gear Scuba recharge Hotel/Inn	Restaurant Bank/Exchange office Pharmacy Port/Marina Boat hoist Fuel station Water Electricity Showers Laundrette Public toilets Post box Public telephone Refuse bin Visitor's berth Chaneler Provisions Bottle gas Car parking Parking for boat+trailer Caravan site Camping site Sewerage pump station Public telegraph Public radio Public radiotelegraph	Tracks, routes: Deep water route part Deep water route centrel. Fairway Ferry route Navigation line Precautionary area Radar line Radar range Radio calling Recomm. route centreline Recommended track Recomm. traffic lane part Traffic separation line Traffic sep. boundary Traffic sep. crossing Traffic sep. land part Traffic sep. roundabout Traffic separation zone Two-way route part
--	--	---

Attention Areas/ Caution Areas: Fishing facility Marine farm/culture Cable, submarine Cable area Offshore production area Pipeline area Anchor berth Anchorage area Cargo transshipment area	Contiguous zone Continental shelf area Custom zone Dumping ground Exclusive economic zone Fishery zone Fishing ground Free port area Harbor area (administr.) Incineration area Log pond	Military practice area National territorial area Restricted area Sea-plane landing area Spoil ground Straight territorial sea baseline Submarine transit lane Territorial sea area
--	--	--

**DEPTH SETTINGS**

Soundings: Spot sounding  Underwater objects: Rocks Wreck area Obstruction Submarine cable Submarine pipeline Cable area, submarine pipeline area	Depths: Depth contour Shallow water blue Zero meter contour
---	--



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# EU Declaration of Conformity



I, the undersigned, hereby declare that the following equipment complies with the relevant essential requirements in the Directive 1999/5/EC of the European Parliament and the Council of 9 March 1999 on radio equipment and telecommunication terminal equipment and the mutual recognition of their conformity.

Conformity assessment	Annex II of 1999/5/EC (internal production control)
Employed standards	Article 3(1)(a) EN60945.2002 Article 3(1)(b) EN60945.2002
Equipment category	Navigational equipment intended for world-wide use aboard non-SOLAS vessels
Model(s)	Simrad CP31 SDGPS Chartplotter Simrad CX33 SDGPS Chartplotter Simrad CX33-E SDGPS Chartplotter with Echosounder
Remarks	
Manufacturer	Simrad Støvring AS Østre Allé 6, DK-9530 Støvring Denmark Telephone +45 98373499 Telefax +45 98373807

Signed ...  .....

Odin Sletten, Customer Support Manager

14 April 2005

SIMRAD warrants that every product shall be free of defects in material and workmanship as specified below:

**CATEGORY “A”:**

•Autopilots •Radars •Instruments •Navigators •Radiotelephones •Plotters •Gyro compasses incl. sensitive elements •Sonars •Echosounders •Trawl Instrumentation •SatCom •SatTV.

These products are warranted for a period of 24 months on parts and 12 months on labor from date of purchase, except for category B items. Consumable parts such as lamps, fuses, batteries, bearings, etc. are not covered by this warranty.

**CATEGORY “B”:**

•Antennas •Transducers •Trawl sensors •Monitors (CRT/LCD) •Radar magnetrons •Disk drives.

These items are warranted for a period of 12 months on parts and labor from date of purchase.

**WARRANTY SERVICE** is available through authorized service dealers or national distributors worldwide. Products returned will, at the sole discretion of Simrad, either be repaired or replaced free of charge within normal working hours. Freight charges, insurance, duties or any other costs are the responsibility of the customer.

Maximum liability shall not, in any case, exceed the contract price of the products claimed to be defective.

**ON BOARD SERVICE** can be arranged by authorized local service dealers or national distributors upon request. Labor costs for the repair/replacement of the defective modules/parts will be free of charge provided a valid warranty is confirmed. Overtime, travel, lodging, per diem, insurance, duties or any other costs are the responsibility of the customer. Additional expenses connected with replacement of transducers such as dry docking, diving and precautionary measures are not covered by this warranty.

**VALIDITY:** This warranty is effective only when warranty certificate or proof of purchase and equipment serial number is presented. Furthermore, the installation and operation has to be carried out in accordance with the product manual. Warranty liability does not apply to any equipment which has become inoperative due to misuse, accident, neglect, sea water damage or unauthorized repair. Simrad will not be liable for any loss, incidental or consequential damages whether based upon warranty, contract or negligence, or arising in connection with the sale, installation, use or repair of the product. Consequential damages include, but are not limited to, any loss of profit, property damage or personal injury.

The terms of warranty as described does not affect your statutory rights.

# WARRANTY CARD

TO BE RETAINED BY THE OWNER

Simrad Støvring AS  
Østre Allé 6  
DK-9530 Støvring  
Denmark



OWNER \_\_\_\_\_

VESSEL \_\_\_\_\_

ADDRESS \_\_\_\_\_

HOME PORT \_\_\_\_\_

EQUIPMENT \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

TYPE \_\_\_\_\_

SERIAL NO.									

DATE OF PURCHASE \_\_\_\_\_ DATE OF INSTALLATION \_\_\_\_\_

YES: \_\_\_\_\_ NO: \_\_\_\_\_  
INSTRUCTION FOR USE GIVEN

AUTHORIZED INSTALLER/DEALER STAMP \_\_\_\_\_

SIMRAD warrants that every product shall be free of defects in material and workmanship as specified overleaf:



STAMP  
HERE

NATIONAL SIMRAD DISTRIBUTOR:

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