



M A N U A L

Simrad CE33

ChartSounder

183-2100-702 English 05082.20

Note!

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.


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

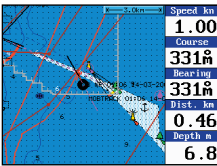
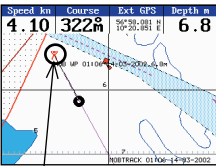
MOB Page 3: Data display will provide information of: Course, Bearing and Distance to MOB position, time elapsed since the incident occurred - first in seconds and then in minutes - if “*” is shown instead of numbers of minutes, means that the elapsed time has exceeded 9999 minutes. The two lines after 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	
C296M	B 296M
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 8.4.

MOB 'MAN OVERBOARD' function	back of front cover
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1.1 Introduction and system familiarization

Congratulations on your purchase of **SIMRAD CE33 ChartSounder** - a combination of the latest GPS and SDGPS receiver technology and optional built-in differential receiver for accurate positioning, plus: detailed cartography and high performance echosounder; all in a unique slim-line design with a bright 6" TFT color or monochrome display.

The **CE33 chart system** includes a built-in world chart for rough planning and overview. The choice of chart system best suitable for the CE33 was carefully singled out to be the C-MAP NT+ mini cards. The optional C-MAP charts are available world-wide at your local Simrad dealer.

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

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.






DS33 Dual Station for the CE33 is available with a 6" bright TFT color or monochrome display. The main unit and the dual station are identical in design and operation.

How to use this manual?

It is a good idea if you 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 features you have access to in


your new chart sounder. If your CE33 is the monochrome version, the color features described in this manual will appear in black, white, and grey scales. 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 get cut 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 10.12 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 CE33.

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.

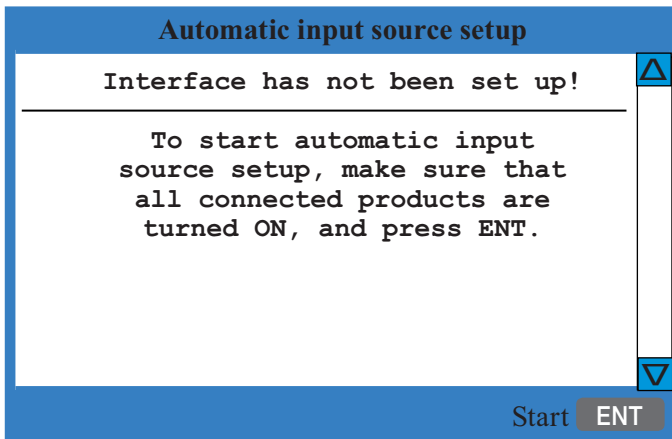
1.3 How to get started

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 9.5 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], [7], [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:

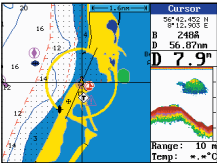
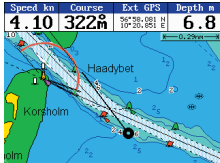
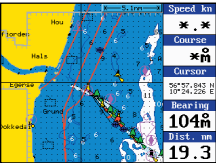


Chart + data field at the right side or top, or... sounder field.

CHART Long press will toggle between:

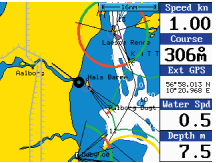


Chart 1

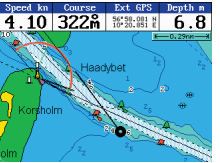
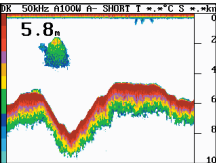
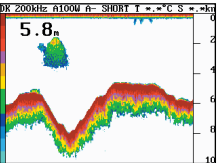


Chart 2

ECHO Short press will call up the ECHO display:

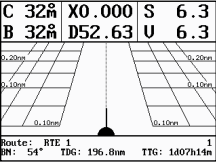


Echo 50 kHz

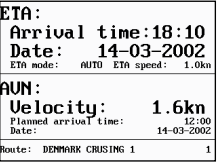


Echo 200 kHz

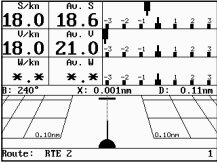
PILOT Short press will toggle between:



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], [7], [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 CE33.

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

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.

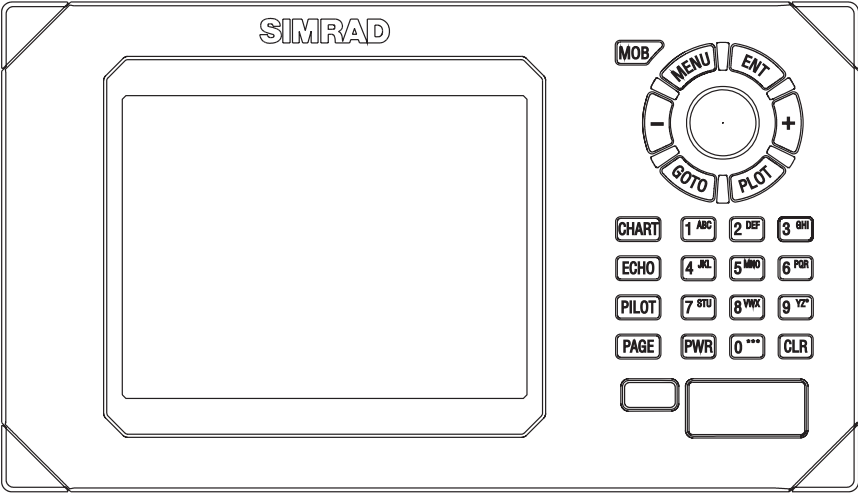
Shift display* - Press [ENT], [6] when operating in deep waters. Select the range for an expansion window. The expansion window can automatically follow a changing bottom or be set manually by the +/- keys.

*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.

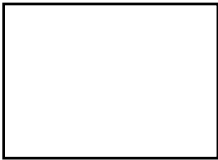
Echo setup (presentation) - Press [ENT], [9] to access the setup display for either 50 or 200 kHz. Press [ENT] to confirm changes, or leave the setup without having made any changes by pressing [MENU].

Echosounder setup - Press [MENU], [7], [ECHO] when you need to make any general settings, selecting a transducer or selecting demo mode etc.

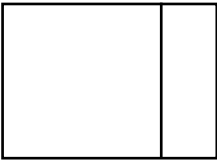


2.1 Fundamentals of the display and page system

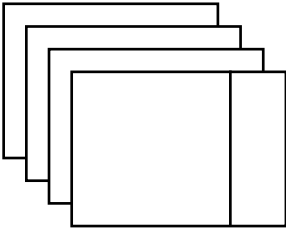
The CE33 ChartSounder has a multi-function screen and data presentation system with full screen or a split screen with chart and data.



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, Echo 200kHz displays.

The pre-set pages can also be toggled from an external switch - refer to section 10.7 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 9.4. 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 Echo 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. 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 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 range. Key 0 will center the cursor/ship on the chart or activate auto range in sounder mode.

- 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 (and contrast in monochrome version) 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						
<div>1</div> CHART	<div>2</div> POS	<div>3</div> WP/RTE	<div>4</div> PILOT	<div>5</div> ECHO	<div>6</div> MISC	<div>7</div> SETUP
			<div>1 Highway</div> <div>2 Waypoint navigation, etc.</div>			

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

1 CHART	2 POS	3 WP/RTE
1 Chart 1 1:26400000 2 Chart 2 1:6600000	1 Position 2 Dual speed 3 Speed, course & depth 4 Speed diagram 5 Satellites 6 DGPS 7 SDGPS	1 Waypoints 2 Routes 3 Route calculation 4 Lines 5 Tracks 6 Targets

4 PILOT	5 ECHO	6 MISC
1 Highway 2 Waypoint navigation 3 Route navigation 4 Track navigation 5 Anchor guard 6 Trim & Highway 7 Set & Drift	1 Echo 50kHz 2 Echo 200kHz 3 Depth & temperature diagram	1 Wind 2 Decca lanes 3 Loran C 4 MOB data 5 DSC info 6 Data transfer

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

4
PILOT
1 Highway
2 Stop navigation
3 WP advance
4 Restart to approaching point
5 ETA & AVN
6 Trim & Highway
7 Set & Drift

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

7
SETUP
CHART C-MAP cartridge
ECHO Echosounder setup
PILOT Pilot/Position setup
1 Speed alarm, units & language
2 Interface setup
3 Palette setup
4 Factory settings

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.

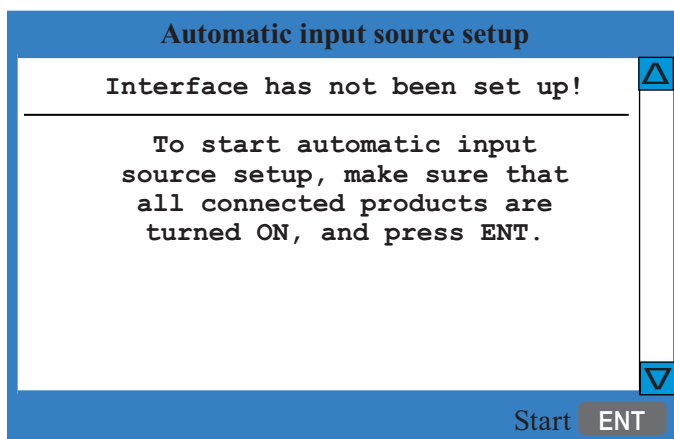
2.7 Initial start-up

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 9.5 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], [7], [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 (and contrast in mono-chrome version) 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 has a demo program, which can be activated in the Echosounder setup display, refer to section 9.2.



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...***7,1***press [7], [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:

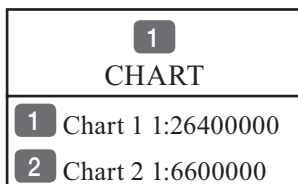
PWR*To turn on the CE33, press and hold the [PWR] key until you have a picture on the screen***ENT***Press [ENT] when the system is ready*

2.9 Turn power off

PWR*Call up INFO window, and...***PWR***Press and hold until the curtains begin go close*

The CE33 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.

3. Chart menu



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

3.1 Charts

MENU

1,1

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

MENU

1,2

Call up the menu bar, and...
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+ 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.
5. Hold [CHART] key for 2 seconds to toggle between Chart 1 and Chart 2.

CHART

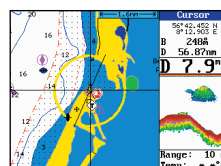
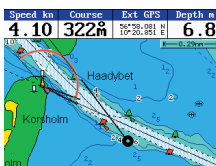
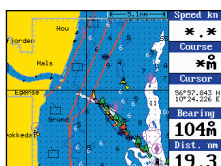


Chart + data field at right side or top.

Chart + sounder field.

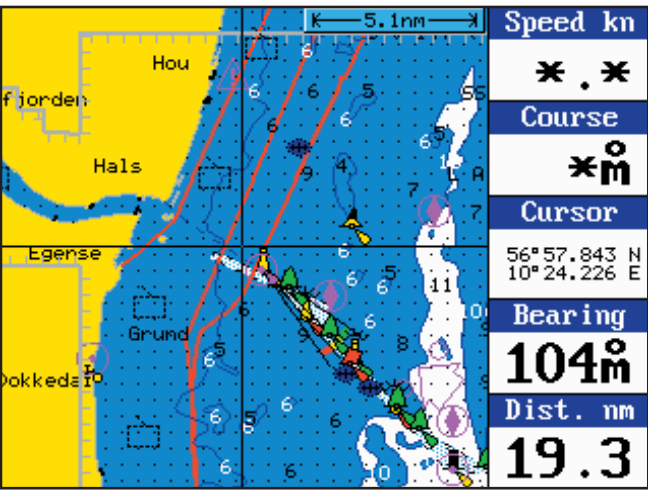


Chart range indicator (5.1nm) can be set ON/OFF in “Chart setup” under “General”, see section 3.3.

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	
1 Edit user data	Inactive function
2 Chart info	Refer to Appendix C
3 Find nearest port services	Refer to Appendix C
4 Bearing and dist from A to B	Inactive function
9 Chart setup	Refer to section 3.3
0 Ship to center	
PAGE More user data	
MENU 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	
1 Edit user data	Inactive function
2 Chart info	Refer to Appendix C
3 Find nearest port services	Refer to Appendix C
4 Bearing and dist from A to B	
9 Chart setup	Refer to section 3.3
0 Cursor to center	
PAGE More user data	Inactive function
MENU 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	
1	Edit user data
2	Chart info
3	Find nearest port services
4	Bearing and dist from A to B
9	Chart setup
0	Cursor to center
PAGE	More user data
MENU	Exit

Refer to Appendix C

Refer to Appendix C

Refer to section 3.2.2

Refer to section 3.3

Refer to section 3.2.2

Exit info window

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

Waypoint	
1	Edit
2	Move
CLR	Delete
MENU	Exit

Edit name, symbol, color etc.

Move waypoint with cursor

Delete waypoint

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
1	Edit user data	
2	Chart info	
3	Find nearest port services	
4	Bearing and dist from A to B	
9	Chart setup	
0	Cursor to center	
PAGE	More user data	
MENU	Exit	

Refer to Appendix C

Refer to Appendix C

Refer to section 3.2.2

Refer to section 3.3

Refer to section 3.2.2

Exit info window

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

Route leg	
1	Edit leg
2	Insert point
3	Edit
CLR	Delete
MENU	Exit

Open new info window to edit route leg

Move cursor to insert new point

Open new info window to edit route

Delete the whole route

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		
1	Edit user data	
2	Chart info	Refer to Appendix C
3	Find nearest port services	Refer to Appendix C
4	Bearing and dist from A to B	Refer to section 3.2.2
9	Chart setup	Refer to section 3.3
0	Cursor to center	Refer to section 3.2.2
PAGE	More user data	
MENU	Exit	Exit info window

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

Routepoint		
1	Edit point	Open new info window to edit routepoint
2	Move point	Move point with cursor
CLR	Delete point	Delete routepoint
3	Add point	Add point to route - in beginning or at end.
4	Edit	Open new info window to edit route
5	Delete	Delete the whole route
MENU	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		
1	Edit user data	
2	Chart info	Refer to Appendix C
3	Find nearest port services	Refer to Appendix C
4	Bearing and dist from A to B	Refer to section 3.2.2
9	Chart setup	Refer to section 3.3
0	Cursor to center	Refer to section 3.2.2
PAGE	More user data	
MENU	Exit	Exit info window

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

Trackpoint		
CLR	Delete point	Delete trackpoint
1	Delete points from A to B	See below
2	Edit	Open new info window
3	Delete	Delete the whole track
MENU	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	
1	Edit user data
2	Chart info
3	Find nearest port services
4	Bearing and dist from A to B
9	Chart setup
0	Cursor to center
PAGE	More user data
MENU	Exit

Refer to Appendix C

Refer to Appendix C

Refer to section 3.2.2

Refer to section 3.3

Refer to section 3.2.2

Exit info window

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

Target	
1	Edit
2	Move
CLR	Delete
MENU	Exit

Edit name, color, position etc.

Move point with cursor

Delete target

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	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).
1 Cursor	
2 Waypoint	
3 Route	
4 Track	
5 Anchor guard	
MENU Exit	

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	
1	Advance
2	Restart to approaching point
3	Turn NAV OFF
MENU	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 CE33 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	
PLOT	Plot mark - ship
1	Insert mark - ship
2	Plot waypoint - cursor
3	Insert waypoint
4	Make route
5	Draw line
6	Plot target
7	Start track
8	Stop track
9	Set vertical mark
MENU	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.

- 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.

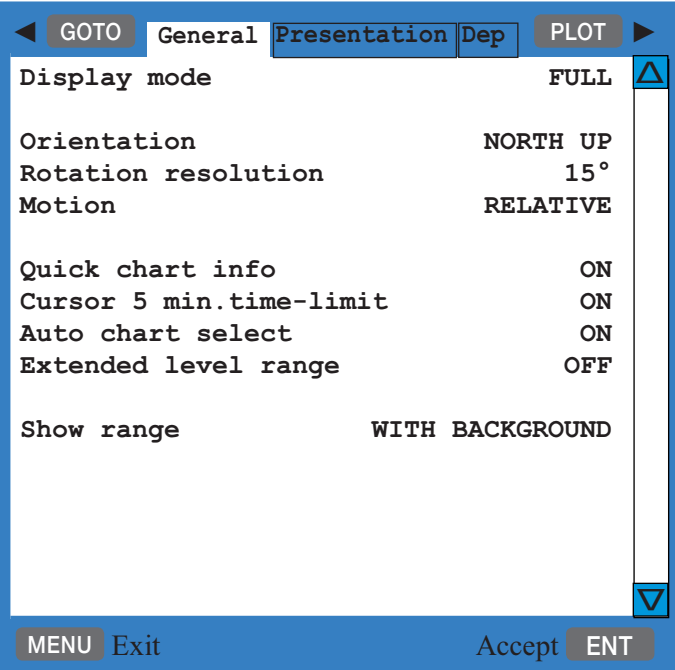
- 9 From active echo display: Plot vertical marker (line) at the current ping in the echo display.

3.3 Chart setup

The settings are dedicated to the chart in the active page and does not affect the second chart.

ENT
9

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



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 (default), CUSTOM, 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, land and chart 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.
C-MAP features are not available in GRID display mode.

C-MAP features	Full	*Custom	Simple	Fishing	Low
Marine:					
Names	ON	ON	ON	ON	OFF
Nav-Aids	INT	INT	INT	INT	INT
Light Sectors	ON	ON	OFF	OFF	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
Buoys	ON	ON	ON	ON	OFF
Signals	ON	ON	ON	ON	OFF




.....continued next page....

.....continued from previous page....

C-MAP features	Full	*Custom	Simple	Fishing	Low
Land:					
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
Chart:					
Grid	AUTO	AUTO	AUTO	AUTO	AUTO
Boundary lines	AUTO	AUTO	AUTO	OFF	OFF
Mixing levels	ON	OFF	OFF	ON	OFF
Declutter	ON	ON	ON	ON	ON

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
Depth Lines	ON	ON	ON	ON	OFF
Depth Lines>	0000m	0000m	0000m	0000m	0000m
Depth Lines<	9999m	9999m	5m	9999m	5m
Depth Areas	ON	ON	ON	ON	OFF
Depth					
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

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 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.

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.

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.

INTERNATIONAL - will present NavAids in 'real life' shapes and colors for quick visual recognition (as per official INT1 standard paper chart presentation).

INT. SIMPLIFIED - the NavAids will be shown in generic symbols for minimum visual clutter on-screen.

US - will present NavAids in simplified shapes and real colors (as generally found on NOAA paper charts).

US SIMPLIFIED - 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.

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.

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.

Underwater objects - can be set ON or OFF= Not shown on chart.

4. Position menu

2 POS	
1	Position - see section 4.1
2	Dual speed - see section 4.2
3	Speed, course & depth - see section 4.3
4	Speed diagram - see section 4.4
5	Satellites - see section 4.5
6	DGPS - see section 4.6
7	SDGPS - see section 4.7

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.
LAT 56°52.792 N LON 9°50.296 E			Trip log 1 and 2. Position with three decimals in minutes.
Speed 0.0kn	Course 359°	Compass *°	Speed over ground. Course, magnetic or true.
Internal POS GPS A	UTC time 9:20:50	UTC date 15-08-2004	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 built-in or 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, either via built-in differential receiver or 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 9.3).

ENT

From position display, press [ENT] to load Position 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 from built-in echosounder.
ANT. HEIGHT will indicate the actual antenna altitude (height above sea level).

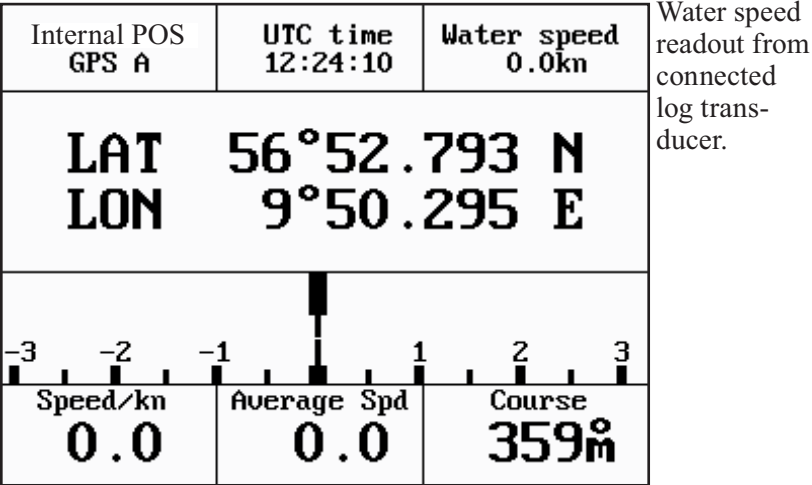
4.2 Dual speed display (trawling speed display)

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

2,2

Call up the menu bar, and...
load dual speed display



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 (°).

ENT

How to reset dual speed:
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
18.0kn
Course
71m
Depth below keel
12.4m

This display is preset to show:

Speed over ground in knots.

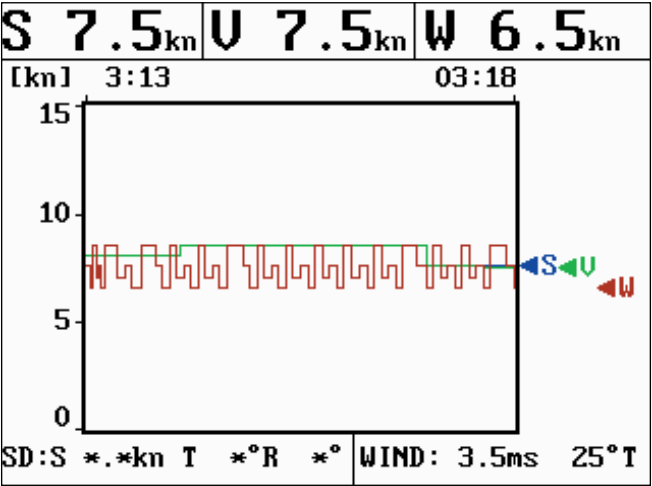
Magnetic course.

Depth below keel in meters.

- Speed over ground can be changed from the Position display settings to show Speed through water: Press [MENU], [7], [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], [7], [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°.
- Depth below keel can be changed from the Echosounder setup to show Depth below surface or Depth below transducer. Press [MENU], [7], [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:

005kn

Scale for speed, min:

+000kn

Speed over ground (SOG):

ON

Velocity made good (V):

ON

Water speed (W):

ON

Time interval:

5 MIN.

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

Time interval can be set in 8 intervals from 1 minute to 3 hours and freeze.



Go to the function you wish to change

+/-

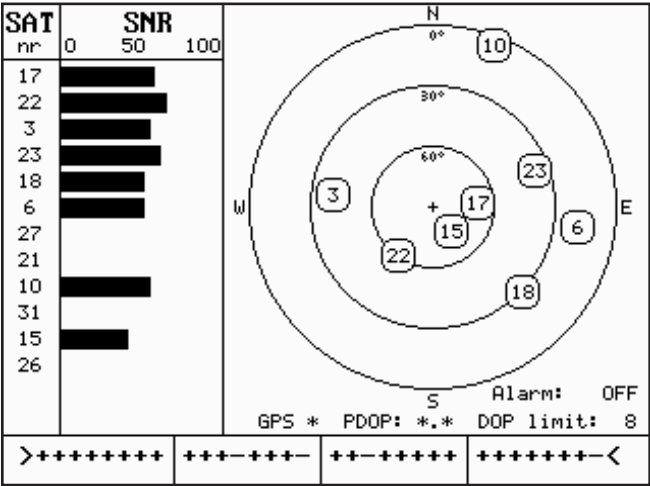
Key in new figure or change setting

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



Go to “Alarm”

+/-

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.



HDOP: Low



HDOP: High

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 DGPS information


The DGPS - differential position corrections - can be provided from a built-in module, which is preset to full automatic operation, or from connected DGPS receiver - see “Status indicator” in position display.



List of beacon stations is available in addendum, part no. 183.0122.501.

MENU
2,6

Call up the menu bar, and...
load DGPS setup display (with built-in module)

DGPS setup :		
Beacon:	UNKNOWN BEACON B***  D*****nm	
Status:		LOCKED
Beacon is monitored:		NO
Frequency:	291.5 kHz	AUTO
Bit rate:	200 bps	AUTO
Signal strength:		1
Signal to noise ratio (SNR):		0dB
Message :		

To receive valid differential data will require that the navigator is locked in on a beacon station.

ENT

Open for change, and...



Go to the function you wish to alter

+/-

Toggle the function, or...

0-9

insert new figures

ENT

Confirm entry

Beacon - informs the name of the beacon the navigator is locked on to (if any), together with indication of bearing and distance.

Status - can either be:

LOCKED = locked on a beacon and receiving differential data.

NOT LOCKED = not locked on a beacon and receiving no differential data.

NOT INSTALLED = there is no built-in DGPS module in unit.

NOT IN USE = external DGPS receiver applied.

Beacon is monitored - YES or NO.

If YES it should be safe to rely on the received differential data, because the beacon station's performance is under observation.

If NO, then you have to use the received differential data with caution, as there is no guarantee it is not faulty.

Frequency - the frequency of the beacon station can be set manually if known. However, when left in AUTO the navigator will always search for the nearest station with a good signal strength.

Bit rate - indicates *bits per second*, and can be set manually to 25, 50, 100 or 200 bps.

Signal strength - a good signal strength is 20 and up.

Signal to noise ratio (SNR) - should be 8dB and up.


Message - type 16 message will be displayed when received from the DGPS system. The contents of this message could be something to do with the performance of the system. Temporarily out of service etc.

4.7 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 (refer to section 4.6) or satellite differential GPS signals from WAAS, EGNOS or MSAS (refer to section 4.7.1).

- MENU
- 2,7
- Call up the menu bar, and...
load SDGPS setup display

SDGPS setup:		
SDGPS select mode:		AUTO
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
- 
- +/-
- ENT
- Open for change
Go to the function you wish to alter (see below)
Toggle the function
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”.

4.7.1 Satellites in SDGPS system

The SDGPS system consist of eight orbiting geostationary satel-
lites 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

3	
WP/RTE	
1	Waypoints - see section 5.1
2	Routes - see section 5.2
3	Route calculation - see section 5.3
4	Lines - see section 5.4
5	Tracks - see section 5.5 and 5.6
6	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
x	WP 2	57°20.289N	10°01.404E
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*
- PAGE** *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

3,2

*Call up the menu bar, and...
load route list display*

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

+/-

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)

Edit route:	
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 Modify	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 high-

CLR

light the routepoint you wish to remove, and press [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*
- PAGE** *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 ↓ WP 10 WP 2 WP 3 WP 4		1 +
PLOT Insert pos.		Delete RtePt CLR
MENU Abandon		Accept ENT

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: 15-08-2004

- +/- 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

3,4

*Call up the menu bar, and...
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:	LINE 1	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
MENU	Exit	Edit ENT

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.

5.5 Start / stop track

The track function will provide a track trailing the movement of your ship. As default from the factory, the first track is stored as TRACK 1, the next as TRACK 2 etc.

To start track function:

PLOT

Call up the PLOT menu, and....

7

Load Start track pop-up window

Start track:

Name: **TRACK 1**

Display track: **ON**

Update: **DISTANCE**

Interval: **0.100nm**

Trackpoints: **0**

Type:  

MENU Exit **Start** **ENT**

If you wish to change the default values:



Move cursor to where you wish to make a change

 $+/ -$

Toggle between available values, or...

0-9

key in new values

ENT

Start track

Name of track can be altered (max. 25 characters).

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

Update of the track can be performed by distance in nautical miles, or by time interval.


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: **TRACK 2**

Tracking: ON

Display track: ON

Update: DISTANCE

Interval: 0.500nm

Trackpoints: 10

Type:

MENU Exit

Edit ENT

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 CE33 can display the 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

3,6

*Call up the menu bar, and...
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

0-9

Key in new values, alphabetical or 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

4	
PILOT	
1	Highway
2	Waypoint navigation
3	Route navigation
4	Track navigation
5	Anchor guard
6	Trim & Highway
7	Set & Drift

- see section 6.1

- see section 6.5.2

- see section 6.5.3

- see section 6.5.4

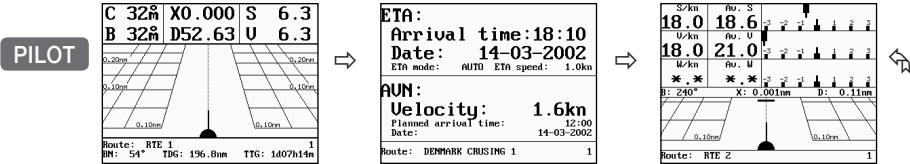
- see section 6.3

- see section 6.2.7

- 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.



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

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

This PILOT menu will appear when navigation mode is active.

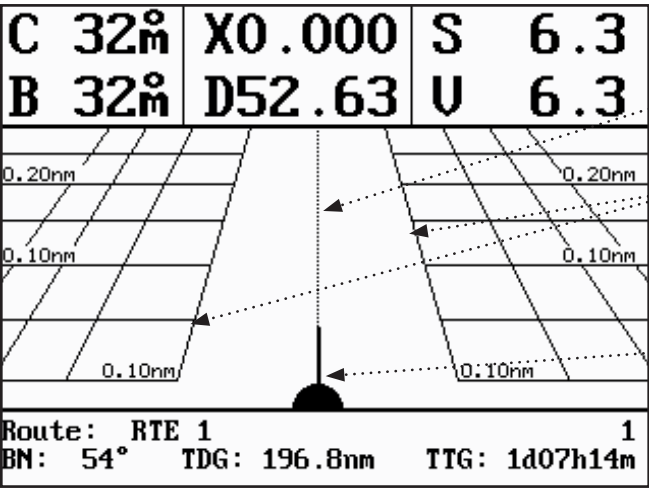
If the selected navigation mode is Waypoint navigation, then point 3: WP advance will not be available and therefore the color of the text will differ from the rest of the menu text.

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:



Intended track between two waypoints.

XTE alarm lines - refer to sec.6.1 for alarm setup.

Ship's position and heading in relation to intended track.

- 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...

4,2

turn off navigation mode

6.2.4 Pilot mode - Waypoint advance

MENU

Call up the menu bar, and...

4,3

activate shift to next waypoint

-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...

4,4

activate restart to approaching point

-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...

4,5

load the ETA & AVN display

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

ETA:

Arrival time:18:10

Date:14-03-2002

ETA mode: AUTO ETA speed: 1.0kn

AVN:

Velocity:1.6kn

Planned arrival time:12:00

Date:14-03-2002

Route: DENMARK


1

ETA - Estimated Time of Arrival - refers to the inserted local time, and can be calculated to any point used for navigation.


AVN - Approximate Velocity Necessary - is automatically calculated in knots after you key in the planned arrival time and date.

In route navigation the approaching point and present speed over ground (AUTO) is automatically used for the calculation. You can change to any waypoint in the route and also insert an alternative ETA speed (MANUAL).


- ENT

Open for change - in route navigation the approaching point is automatically suggested and present speed is used for calculation.
- 

If required - go to, and...
- 0-9

Insert alternative routepoint - only in Route navigation.
- 

Go to ETA mode, and...
- +/-

Select AUTO or MANUAL
- 

Go to AVN, and...
- 0-9

Insert time and date
- ENT

Confirm entry

6.2.7 Pilot mode - Trim & highway display

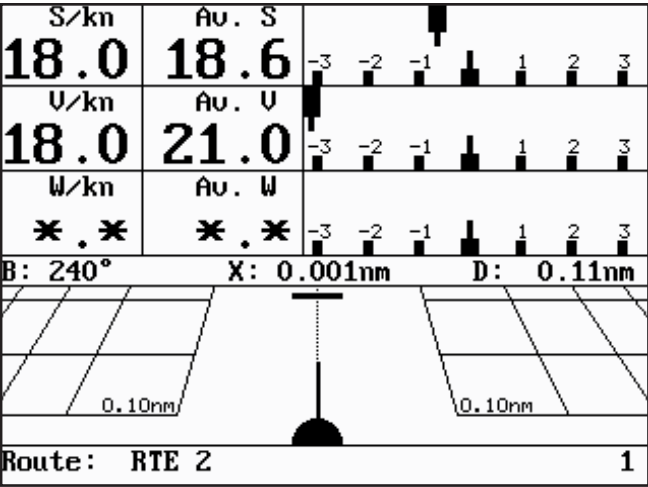
☞ Some of the readings rely on data from external log and compass.

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

4,6

Call up the menu bar, and...
load the Trim & highway display



B: Bearing.

X: XTE
Cross-track-error.

D: Distance
to point.

ENT

Open for change

ENT

Reset mean speed indication in display

6.2.8 Pilot mode - Set & drift



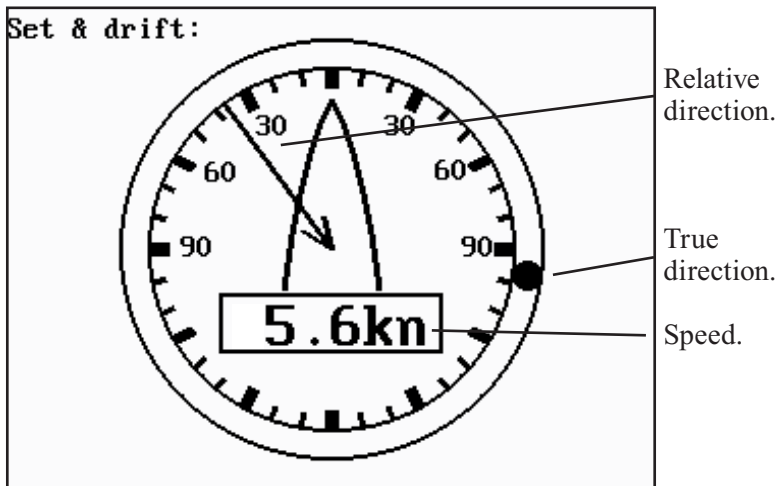
The readings rely on data from external log and compass.

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 CE33 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 the rear of the first page of the manual.

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...***6,4***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:

PILOT

C 32.8	X0.000	S 6.3
B 32.8	D52.63	U 6.3

Route: RTE 1
RN: 54° TDG: 196.8m TTG: 1407h14m

⇒

ETA:	
Arrival time:	18:10
Date:	14-03-2002
ETA mode: AUTO ETA speed: 1.0kn	
AUN:	
Velocity:	1.6kn
Planned arrival time:	12:00
Date:	14-03-2002
Route: DENMARK CRUISING 1	

⇒

S/kn	Rv. S
18.0	18.6
U/kn	Rv. U
18.0	21.0
W/kn	Rv. W
,	*,*
B: 240°	X: 0.001m D: 0.11m

Route: RTE 2

⇒

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

1

Call up “Select NAV mode” window, and...
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**2**

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

"Restart to approaching point"

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

To turn NAV mode off again:

GOTO**3**

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

"Turn NAV off" from active chart display

or...

MENU**4,2**

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

"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. Echosounder operation

The echosounder function of the CE33 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 CE33 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.

7.1 Echosounder menu

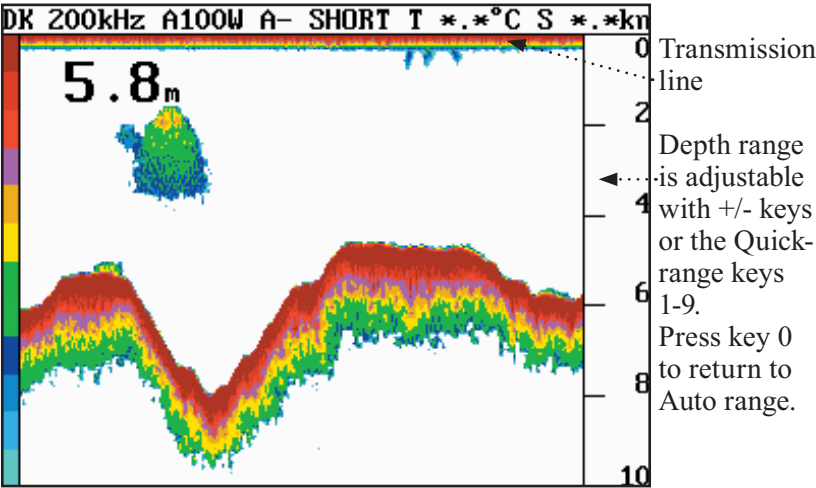
5	
ECHO	
1	Echo 50kHz - see section 7.2
2	Echo 200kHz - see section 7.2
3	Depth & temperature diagram - see section 7.7

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.



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,7,1).

*) Actual depth i.e. **Depth below Keel/Surface/Transducer** - settings can be changed in Echosounder menu (MENU,7,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:

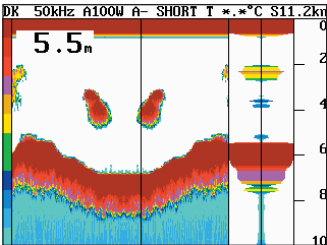
Echo quick menu	
1	Change frequency
2	Hide A-scope
3	Standard Echo display
4	Bottom lock display
5	Zoom display
6	Shift display
9	Presentation setup
ECHO	Transmit power off
MENU	Exit

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.

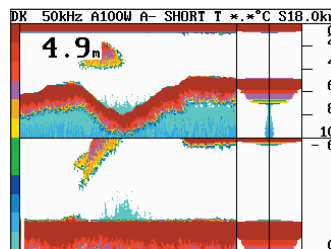


3

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.

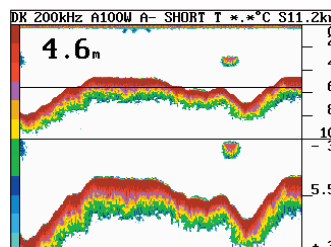
4

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

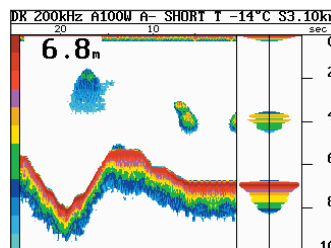
Zoom display This feature will provide an expanded view of the area near the Variable Range Marker (see section 7.3) which will give a better separation of echoes. The actual range of the expansion window can be adjusted in the Presentation Setup.



The zoom level can be selected in seven steps, ranging from 1 to 50 meters, or converting to feet or fathoms (refer to Setup for units, section 9.4).

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 9.2).


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
<hr/>		
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 CE33 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 CE33 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 9.4). 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 CE33 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. (monochrome version will show different scales of grey). 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
☞ <i>A long pulse will reach deeper but give less resolution.</i>	

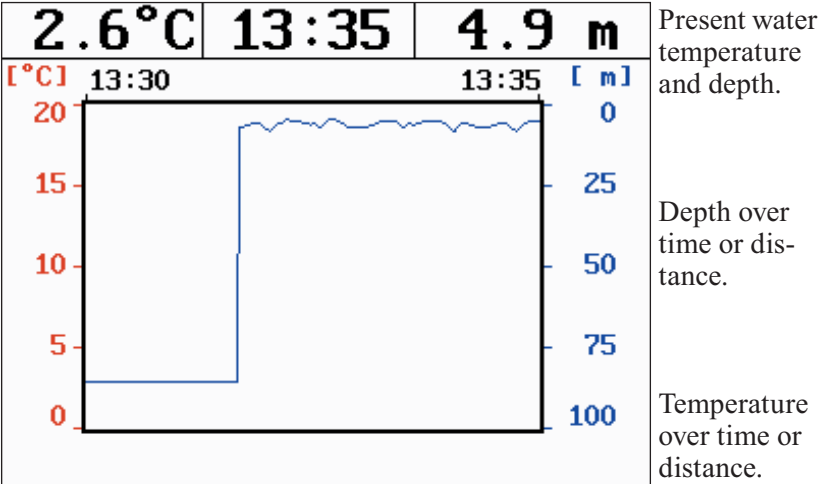
Transmit power – should normally be left on AUTOMATIC. The modes available are: AUTO, 600W, 100W, 10W and OFF.

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 Depth & temperature diagram

- MENU
- 5,3
- Call up the menu bar, and...
activate Depth & temperature diagram



- 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 0.05nm to 90nm in order to adjust to the speed of the ship, and you can freeze the reading.

7.8 How the echosounder works

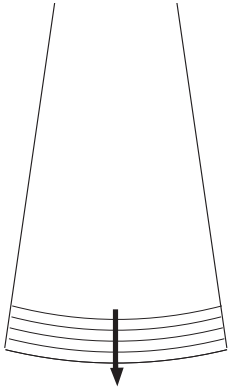
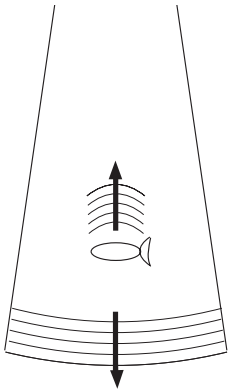


Fig. 1 Transmitted 'ping' from the transmitter/receiver.

When the CE33 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 CE33 processes the signals and presents them on the display screen.

See Fig. 2.

7.9 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'.

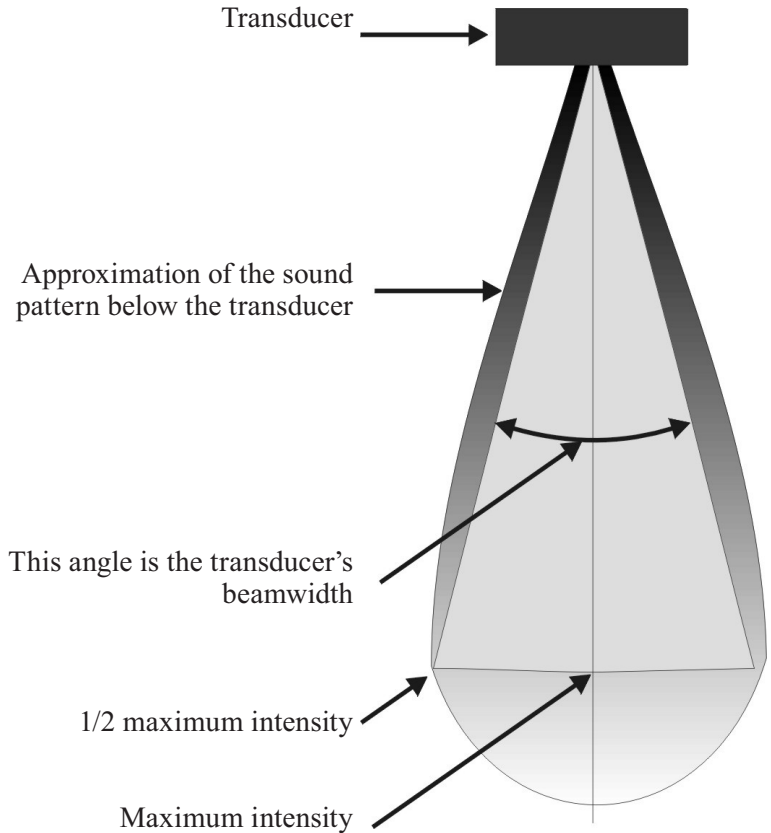


Fig. 3 A representation of a transducer beamwidth.

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.

7.10 Effects of the vessel's speed

The presentation of fish on the CE33 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.

8. Miscellaneous menu

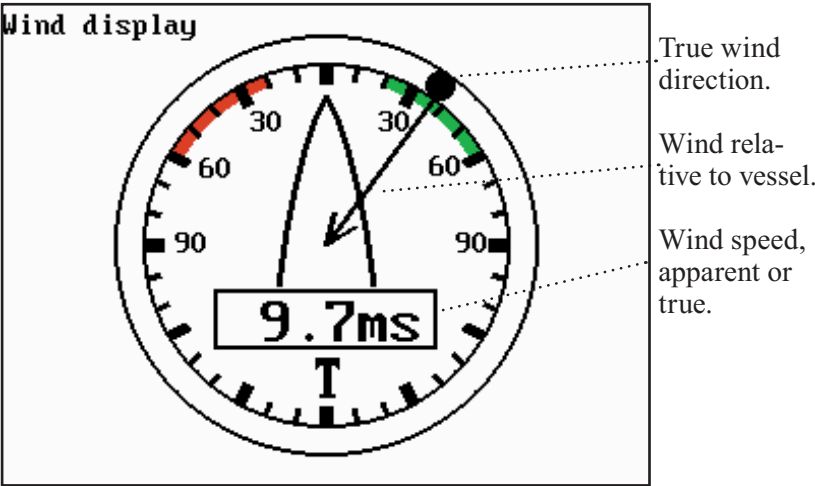
6		
MISC		
1	Wind	- see section 8.1
2	Decca lanes	- see section 8.2
3	Loran C	- see section 8.3
4	MOB data	- see section 8.4
5	DSC info	- see section 8.5
6	Data transfer	- see section 8.6

8.1 Wind display

The CE33 is ready to present wind data from connected instruments.

Wind data - the ‘wind instrument’ can provide both wind direction and wind speed, and the readings can be shown in relative or true (when the data is supplied from connected wind instrument).

- MENU
- 6,1
- Call up the menu bar, and...
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.

8.2 Decca lanes

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

6,2 *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 9.3 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		

8.3 Loran C

- MENU

6,3

Call up the menu bar, and...
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 9.3 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		

8.4 MOB data

MENU *Call up the menu bar, and...*
6,4 *load MOB data display*

MAN OVERBOARD	
DATE	12-08-2004
TIME	14:23:34
MOB	56°52.489N
POS	009°50.305E

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.

8.5 DSC VHF info

To receive an iDSC Alarm and Message from VHF will require that the CE33 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...*
6,5 *load the DSC info display*

8.6 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

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

Data transfer	
1	DataCard
7	NMEA connection - see section 8.7
MENU	Exit

- 1
- Select the DataCard function*

DataCard	
1	DataCard status
3	Save on DataCard
9	Load from DataCard
MENU	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 CE33 to Databank 1 or 2 on the DataCard, or from Databank 1 or 2 on DataCard to a CE33, the data package will replace the entire capacity in the receiving unit.

9

Load from DataCard

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 CE33	
Saved:		15-08-2004 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 CE33 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.

8.7 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 10.7) 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 10.6 for information on connection to PC.

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

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

Data transfer	
1	DataCard
7	NMEA connection
MENU	Exit

- see section 8.6

7 *Select the NMEA connection*

WARNING!	
Normal NMEA communication will be interrupted.	
MENU Exit	Accept ENT

ENT *Accept warning and continue*

NMEA connection	
1	Transmit WPs
3	Transmit routes
7	Receive WPs and routes
MENU	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 CE33 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 CE33 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].

Receive WPs and routes
Reception in progress
37 WPs received
5 routes received
Stop and save ENT

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

 Waypoints/routes transmitted to the CE33 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 CE33 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*

9. Setup menu

7 SETUP		
CHART	C-MAP cartridge	- see section 9.1
ECHO	Echosounder setup	- see section 9.2
PILOT	Pilot/Position setup	- see section 9.3
1	Speed alarm, units & language	- see section 9.4
2	Interface setup	- see section 9.5
3	Palette setup	- see section 9.6
4	Factory settings	- see section 9.7

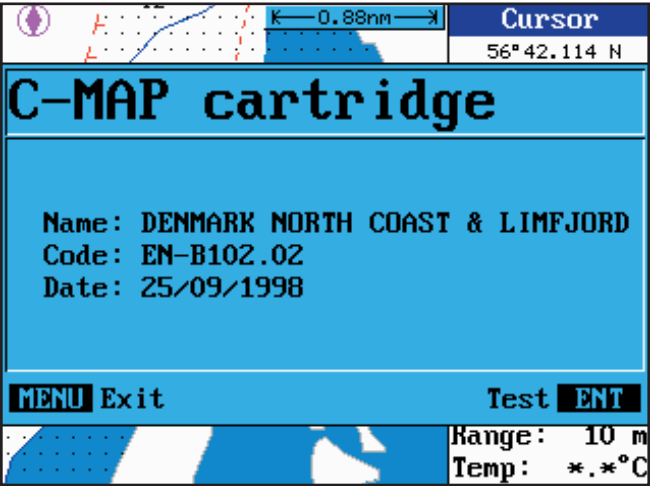
9.1 C-MAP cartridge

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
- 7
- 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)



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.

ENT

Press [ENT] to test the data on the C-MAP C-card

The unit will now test the data on the C-card to see if its valid and free from faults.



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.

9.2 Echosounder setup

The Echosounder setup display mainly consist of general settings, but also applies to a specific frequency where stated. The CE33 features semi dual transceiver transmitting at 50 and 200 kHz.

MENU

Call up the menu bar, and...

7

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.

9.3 Pilot / Position setup

- MENU
- 7
- PILOT
- Call up the menu bar, and...
- open the SETUP menu, and...
- load Pilot/Position setup display

Pilot/Pos setup:

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

PAGE More (1/2) Scroll

MENU Exit Accept ENT

Time: UTC

Time: 13:43:56 Date: 14-08-2004

PAGE More (2/2) Scroll

MENU Exit Accept 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.

Time - can be set to UTC or local. Toggle with +/-
Correct actual time and date by means of the numeric keys.

MENU	<i>Call up the menu bar, and...</i>
7.1	<i>load Speed alarm, units & language display</i>

```
GPS receiver type: N11999
PAGE rotation interval: 05 sec.
Display text in: English GB
```



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], [7], [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.

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 CE33 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.

9.5 Interface setup

CE33 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 NMEA 2000.

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 - Alarm - SimNet diagnostic - SimNet input - SimNet output - NMEA0183 input - NMEA0183 output - Identification.

MENU

Call up the menu bar, and...

7,2

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

GOTO

Nodes

Position

Navigation

PLOT

<div>+</div>	1: Simrad CE33-1	, Sn: 0173B2
<div>+</div>	2: Simrad GN33-2	, Sn: 0070B0
<div>+</div>	3: Airmar EQS	, Sn: 000000
<div>+</div>	4: Simrad RC35	, Sn: 000035
<div>-</div>	: NMEA-PORT	

MENU

Exit

Accept

ENT

Internal serial number

Product model numbers (top line is own unit); -1, -2, -3 etc. indicates multi sources. NMEA-PORT indicates incoming data via the NMEA port.



Move the cursor up/down to select one of the listed products



Press the [+]
key to access additional data

Example:

- CE33 CHART SOUNDER
- SimNet number=0173B2, Address: 254
- Device: class = 60, function = 170
- Instance: system = 0, device = 1
- SimNet:Compatible=YES,Ver= 1.000 E
- Ver.: NMEA2000 = 1.004, SW = 02.04
- Product code=0715,Unique no=11F3B2

The name **CHART SOUNDER** 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]

◀ GOTO Nodes Position Navigation PLOT ▶

Input:

Group selection: SIMRAD

Source (one available):
Simrad CE33-1 , Sn: 0173B2

Position mode: INTERNAL

External DGPS mode: OFF

Datum: 000-World Geodetic System 1984

Dead reckoning speed: 010.0kn

NMEA0183 output:

GPS fix data: GGA ON

GNSS fix data: GNS OFF

Geographic pos, Lat/Lon: GLL OFF

Recom. min. GPS data: RMC ON

Track made good & SOG: VTG ON

Time and date: ZDA OFF

MENU Exit Accept ENT

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’.

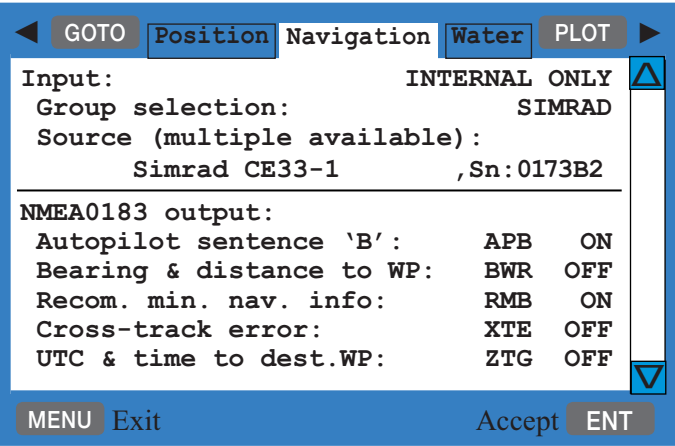
External DGPS mode - set to ON will enable reception of DGPS data from external receiver. The input port will switch from NMEA0183 to RTCM104 standard, but the output will continue transmitting NMEA0183 data.

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 9.5.1 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 9.5.1 Description of sentences.

PLOT*Go to Compass interface - step back with [GOTO]*

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]*

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]

Source - will indicate how many units are connected and available.

NMEA0183 output - see also section 9.5.1 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]

The screenshot shows a blue-themed diagnostic interface. At the top, there are navigation buttons: GOTO, Alarm, SimNet diagnostic (highlighted), and PLOT. Below these, a table displays the following data:

SimNet error frame counter:	0
Receive que full:	0
Transmit que full:	0
Atmel receive not ready:	0

At the bottom of the interface, there are two rows of buttons: MENU Exit and Accept ENT.

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]*

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*

9.5.1 Description of sentences

Description of NMEA0183 version 3.0 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.
DPT Depth, including offset.
DBK Depth below keel.
DBS Depth below surface.
DBT Depth below transducer.

WPL Waypoint location.
RNN Routes.
RTE Routes, ONC ON Complete route, or...
ONW ON Working route.

Description of NMEA0183 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.

Description of NMEA0183 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.

9.6 Palette setup

If your CE33 is the monochrome version, the colors in this display will appear in black, white, and grey scales.



Quick change of preset color palettes via the [PWR] key.

MENU

Call up the menu bar, and...

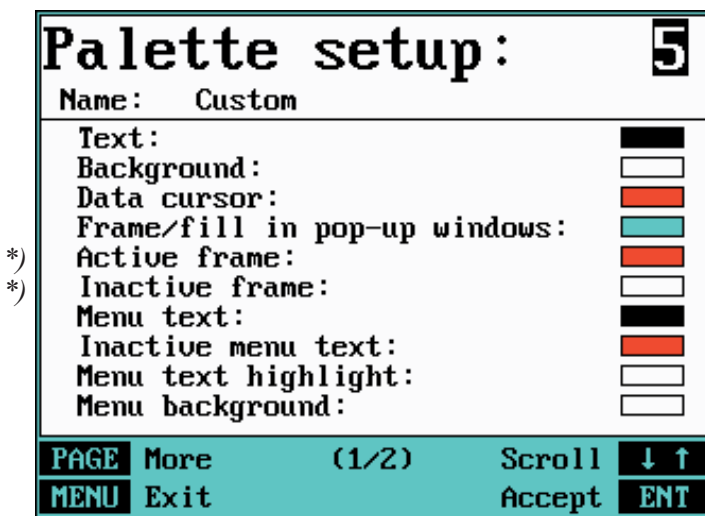
7,3

load the Palette setup

Monochrome: Palette 1:Day and 2:Night are preset. Color: 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



Page 1 of 2.

*) Not available in CE33!



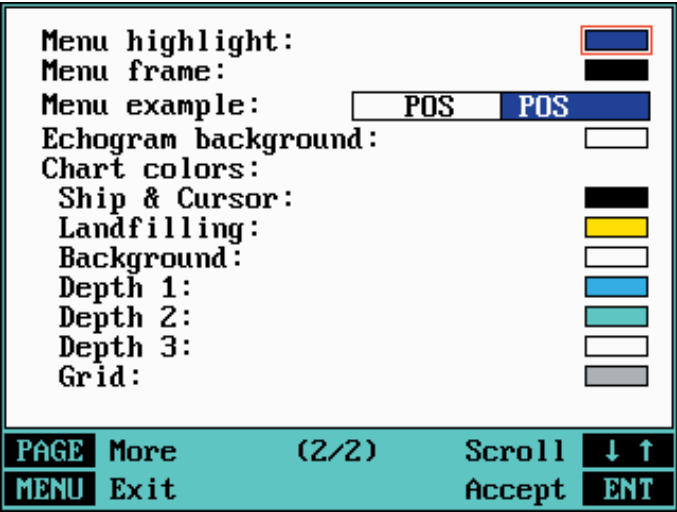
Use cursor to scroll up/down in display

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



Page 2 of 2.

- +/-

Toggle between available color settings
- ENT

Confirm new setup

9.7 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 8.6.

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 10.11.

Show test display
Information in this display is for technicians only.

- MENU

Call up the menu bar, and...
- 7,4

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
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.

10. Installation and service

10.1 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.

Transducer type:

Echosounder setup:	
Transducer	
Depth	
Frequency	
Keel depth	

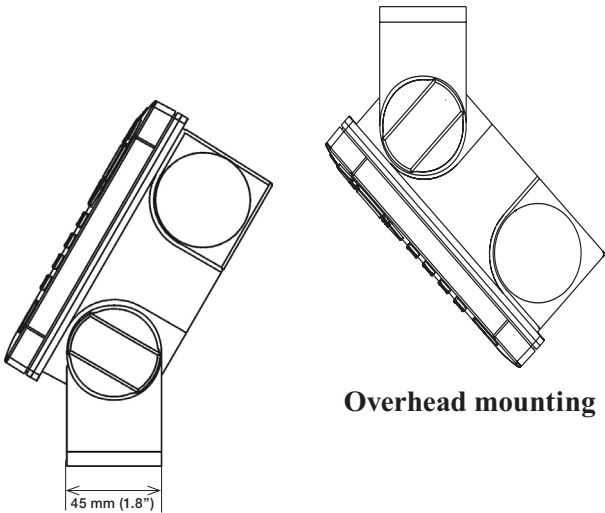
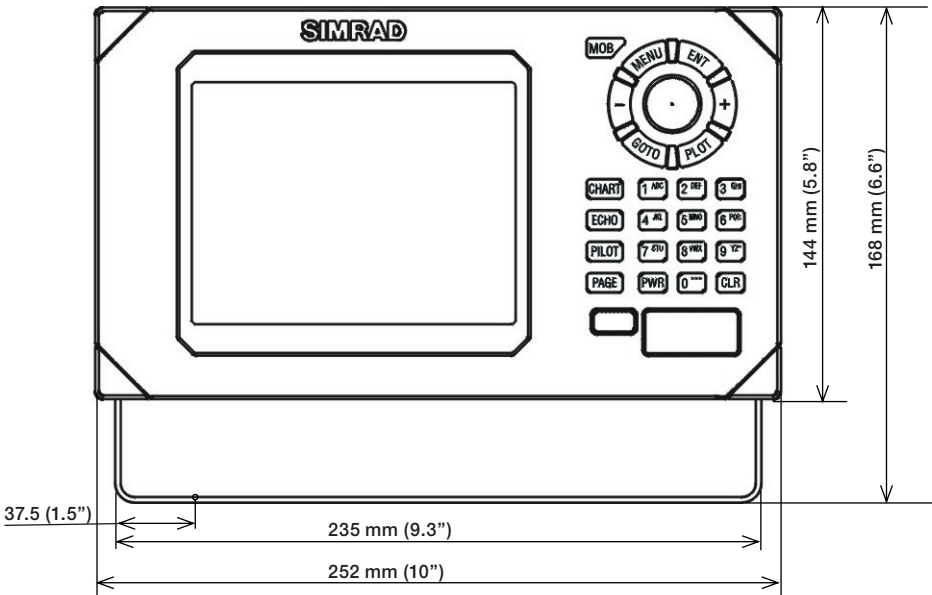
Other important settings:		

Other important settings (continued):

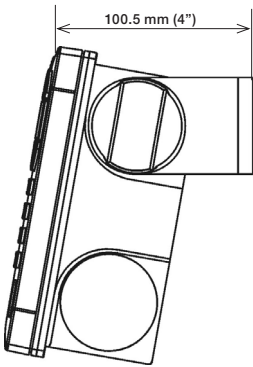
[illegible]

10.2 Installation of CE33 ChartSounder

The CE33 can be flat or bracket mounted - overhead, bulkhead or console.



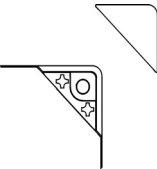
Overhead mounting



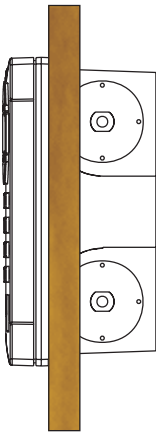
Console mounting
(max. tilt 45°)

Bulkhead mounting
(approx. 10° tilt, allowing
space for connectors and cables)

Flush mounting of CE33

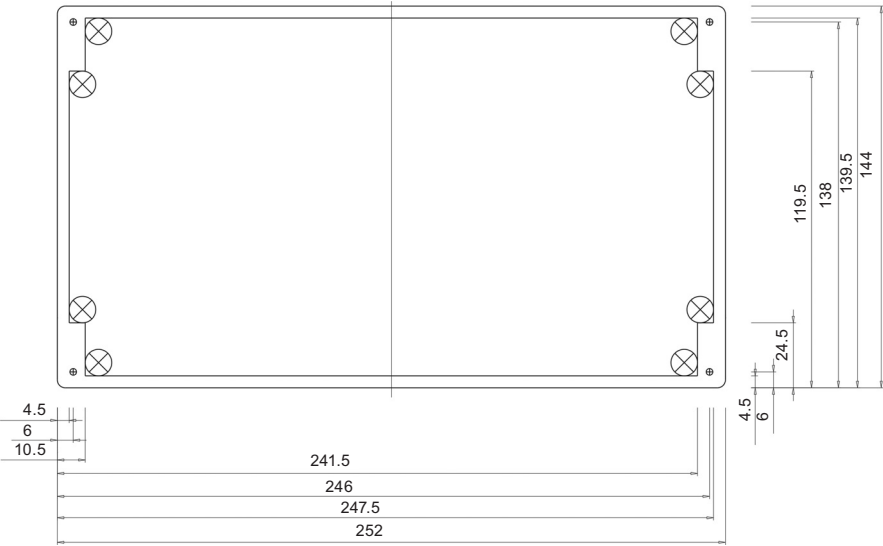


Removable corner
for flush mounting



Refer to included template for instructions on flush mounting.

(measurements in mm)



10.3 Location for display unit

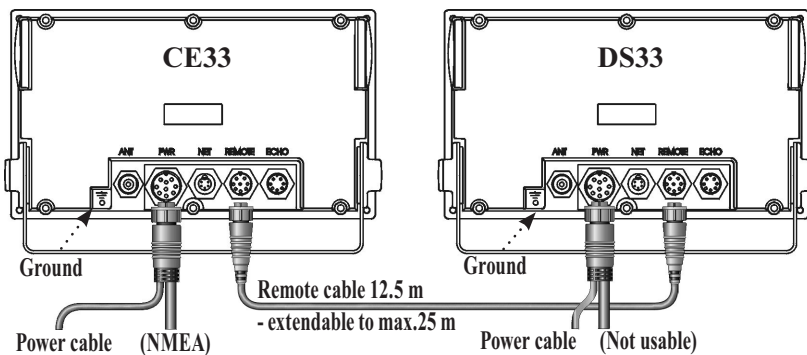
Determine which place is the most suitable and convenient for navigation and general operation after considering the following conditions:

- 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 10.12 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.

10.4 Connection between main unit and dual station

The DS33 is a remote control unit for the CE33 ChartSounder. Both units are identical in size, so the same installation guides can be applied when performing the installation.

Refer to section 10.6 for details on pin numbers



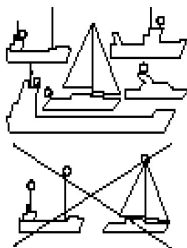
10.4.1 Operation of Dual Station

The main unit and the dual station operate in parallel.

All key commands are relayed to the main unit - CE33 - 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.

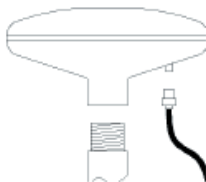
10.5 Installation of GPS / DGPS antenna



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, especially if DGPS is used. 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° below the horizon.

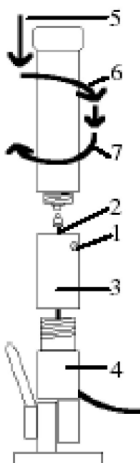


Avoid installing the GPS antenna inside the beam areas.



Mounting of DGPS antenna MGL-3

Mount the antenna on a standard US 1" 14 thread pipe, or optional standard antenna mount. Tighten firmly, but only by hand - no use of tools. Attach the antenna cable to the TNC socket.

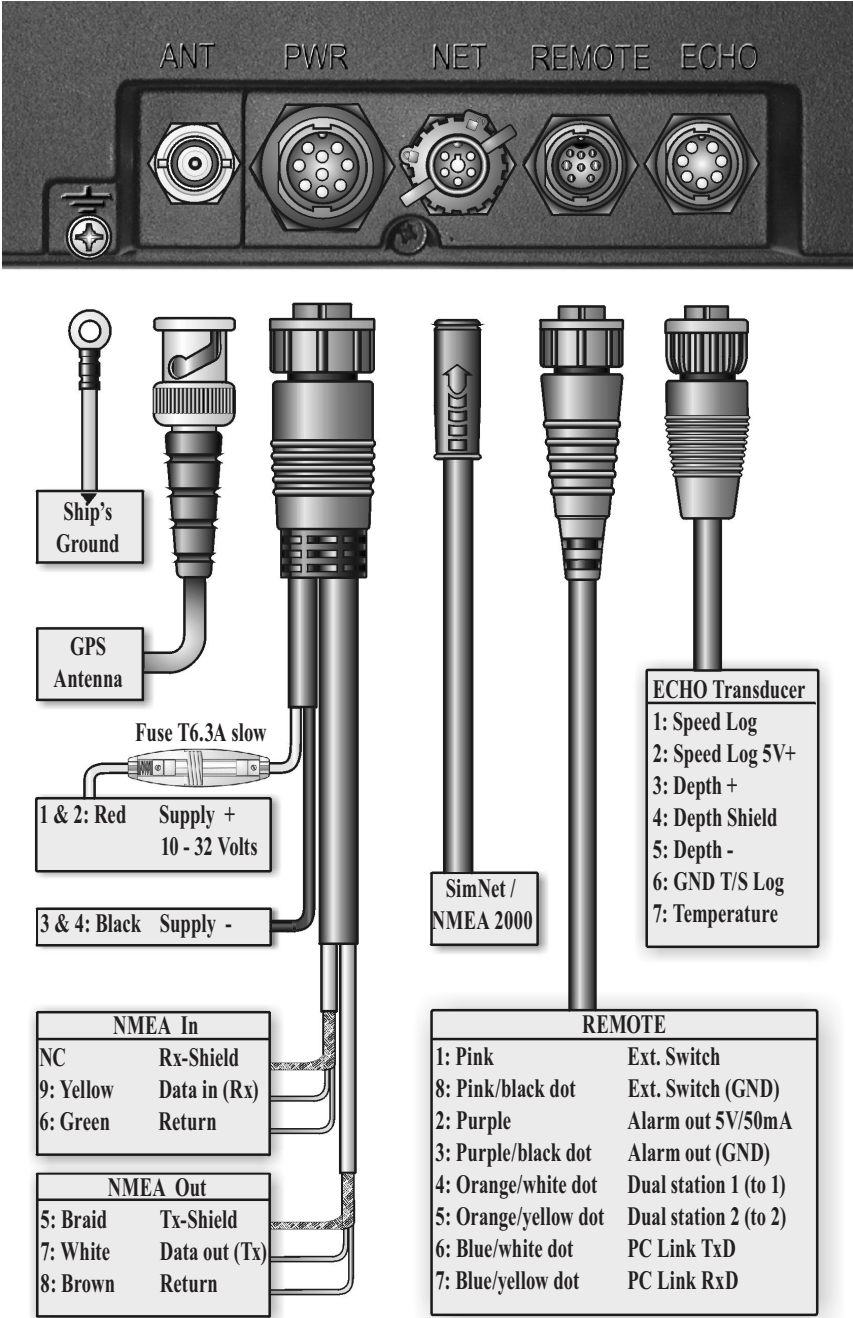


Mounting of GPS antenna RS5640

Loosen the screw (1) of the antenna adapter. Guide the antenna cable (2) through the adapter and connect it to the antenna. Screw the US 1" 14 mount adapter (3) firmly onto the optional antenna mount (4). Press (5) the antenna into the adapter and turn it (6) approx. 1/2 to 1 turn counter clockwise to "catch" the thread. Turn (7) clockwise 1 to 2 turns and firmly secure the antenna with the lock screw (1).

⚠ Do not close the small ventilation hole at the bottom, and do not attempt to open the antenna.

10.6 Electrical connections



10.6.1 Power supply connections

The internal voltage regulator will allow the CE33 to operate normally within the power supply voltage range from 10 to 32 V DC. The CE33 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.

10.6.2 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 CE33 is switched on or it will not protect the equipment as intended – see fuse rating in section 10.12 Specifications.

10.6.3 Transducer connection

Most transducers are supplied with a 10 meter cable for connection to the echosounder unit – CE33. 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 CE33 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.

10.6.4 PC up/download via NMEA connection

A PC can be connected to the CE33 via the REMOTE port to enable exchange of waypoint and route data. Use PC data cable, length 2 m.

10.6.5 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 XX33 marked “PWR” on the rear of the cabinet.

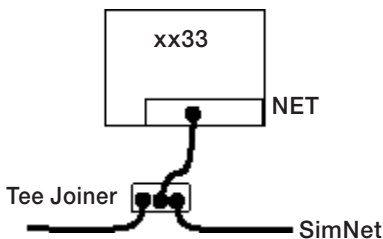


The unit must be turned off while connecting/disconnecting the interface cable.

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 10.12 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 XX33 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.

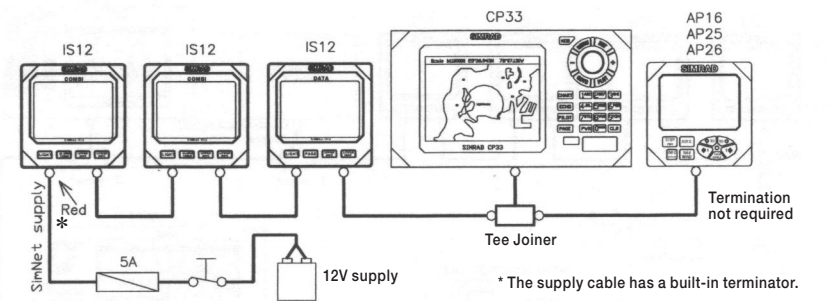


SimNet power and termination

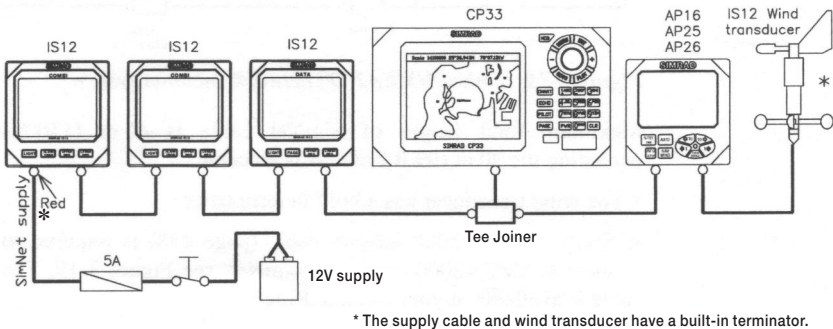
The following simple rules should be observed when installing SimNet:

- 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.

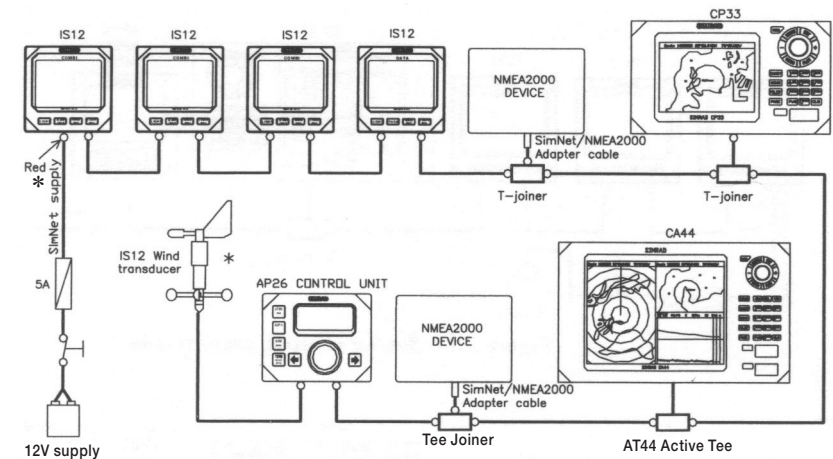
SimNet network, small system



SimNet network, small system with Wind transducer



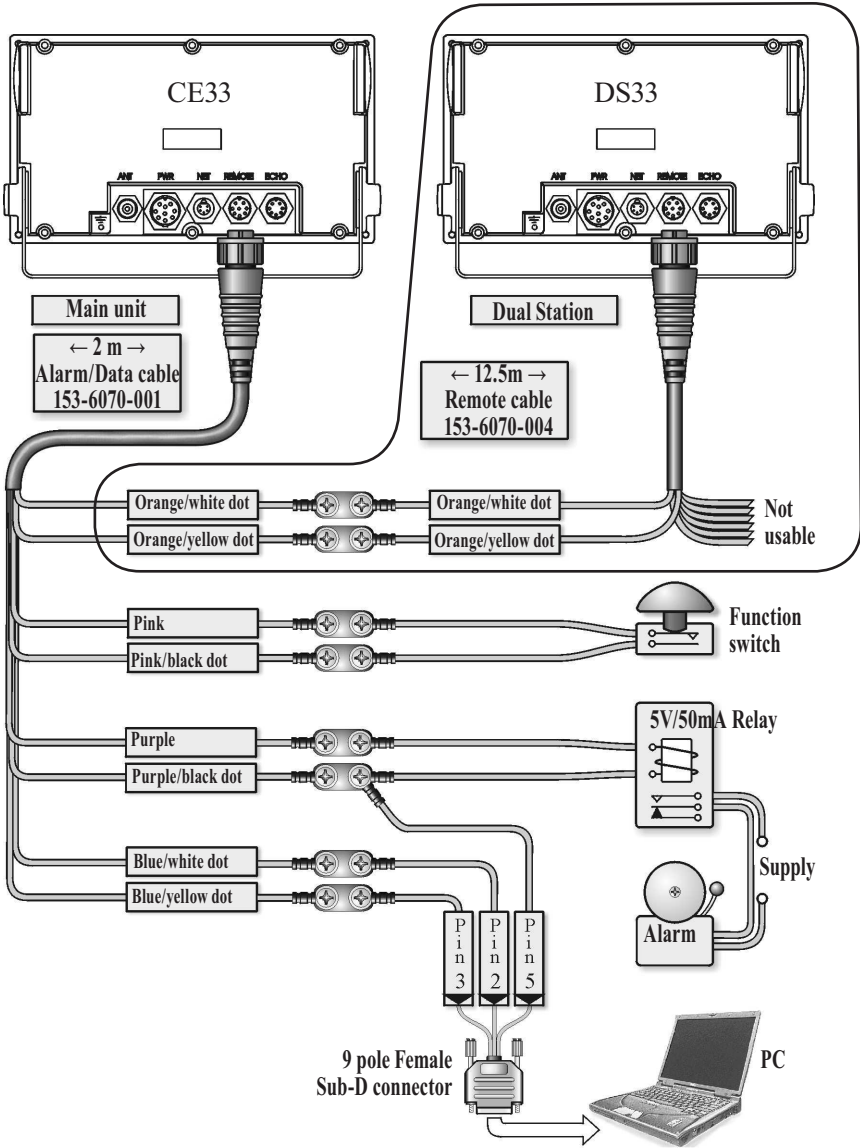
SimNet / NMEA2000 network, medium system



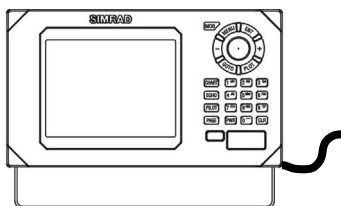
10.7 Optional connections

External alarm and function switch

Use the optional Alarm/Data cable (see also the Alarm interface setup in section 9.5). 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
- 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

10.8 Basic transducer and cable information

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.

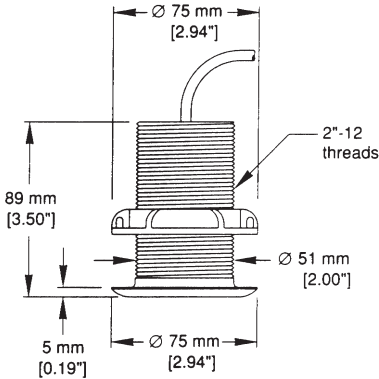
☞ The CE33 must be turned off while connecting/disconnecting the transducer cable.

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.

10.8.1 Transducers (optional)

Airmar P319



Thru-hull mount

Frequency: 50/200 kHz

Beamwidth: $45^\circ / 15^\circ$

Cable length: 10m (32')

Depth information.

Reference no. 179-0401-002 (P319)

Housing: Reinforced plastic

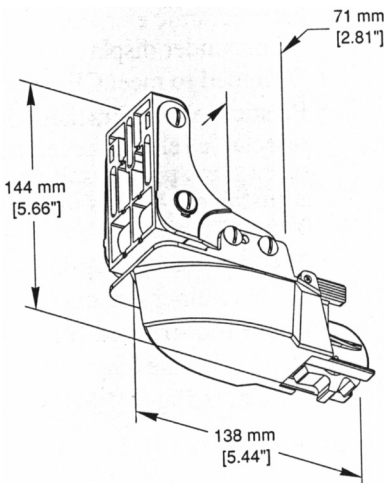
Recommended for fiberglass and metal hulls. Do not use in wooden hulls!

Reference no. 179-0401-003 (B117)

Housing: Bronze

Recommended for fiberglass and wooden hulls.

Airmar P66



Transom mount

Frequency: 50/200 kHz

Beamwidth: $45^\circ / 15^\circ$

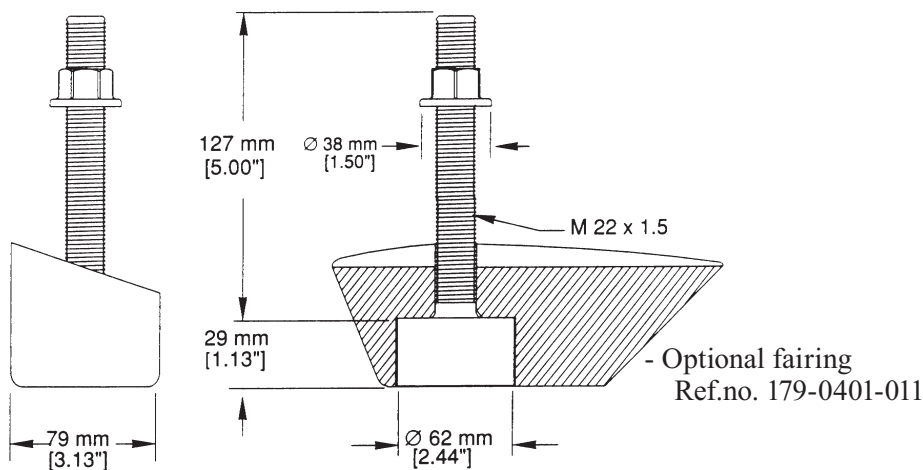
Cable length: 10m (32')

Speed, temperature + depth information

Reference no. 179-0401-001

Housing: Chemical resistant, high impact plastic alloy.

Recommended for all type hulls.

Airmar SS505**Thru-hul 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.

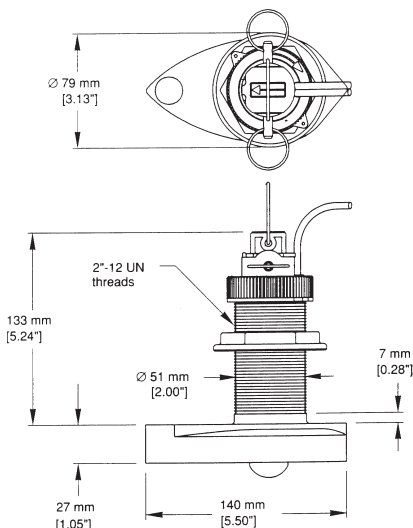
Ref.no. 179.0401.008 (SS505)

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.

10.8.2 Determining the position for the transducer

The CE33 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 CE33 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.

10.9 Preventive maintenance

Surface cleaning – to keep the CE33 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.

10.10 Repair and service

The CE33 is sealed and does not contain any user serviceable parts. Opening of this unit will void its warranty. If the CE33 requires servicing or repair, call your authorized SIMRAD dealer, but first check section 10.11 below.

Spare parts – fuses may be bought from a chandler or a marine supply store. Use only fuses specified for this unit – see 10.12 Specifications.

If you require a SIMRAD part, please contact your authorized dealer.

10.11 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], [7], [CHART] if C-MAP chart is defective	Remove C-MAP chart if defective
		Return to factory presets, see section 9.7
No GPS position update	Check that position mode is INTERNAL, refer to interface setup in [MENU],[7],[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
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 9.2
	Check that the transducer connectors are securely mated with the unit	Correctly mate the connectors to the unit
	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
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

10.12 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, or
STN transfective monochrome 6” 320x240 pixels
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 / s²

	GPS antenna RS5640	DGPS antenna MGL-3
Type:	Quadrifilar Helix	Patch and H-field
Dimensions:	L:230 mm	H:75 mm
	D:38 mm	D:127 mm
Weight:	150 g (0.33 lbs)	600 g (1.3 lbs)
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 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 in 21 steps, 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.

P52: 600W plastic transom mount triducer, depth, speed and temperature, 45° and 15° beam.

P319: 600W plastic thru-hull transducer, 45° and 15° beam.

ST650: Speed and temperature only.

Cables included

Power/NMEA cable, 2 m, incl. fuse T6.3A (153-6070-002)

Antenna cable, 10 m RG58

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 cable Tee Joiner (24005860)

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 adapter cable

Options

Simrad DataCards

C-MAP NT+ electronic charts

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 Dual Station, 5.7" TFT LCD color screen or 6" monochrome, incl.

12.5 m cable (153-6070-004) - max. length 25 m.

Sunhood (401-0024)

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. CE33 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.

Color - if your CE33 is the monochrome version, the color features described in this manual will appear in black, white, and grey scales.

Configuration – the configuration functions of the CE33 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 built-in DGPS module or an 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],[7],[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:

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 CE33 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.

Color - If your CE33 is the monochrome version, the color features described in this manual will appear in black, white, and grey scales.

Depths – DK = Depth below keel, DS = Depth below surface, DT = Depth below transducer.

Echogram background color – is the color shown on the CE33 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 CE33 transmits a signal), and they also generate a voltage when they encounter sound waves (as when the CE33 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].

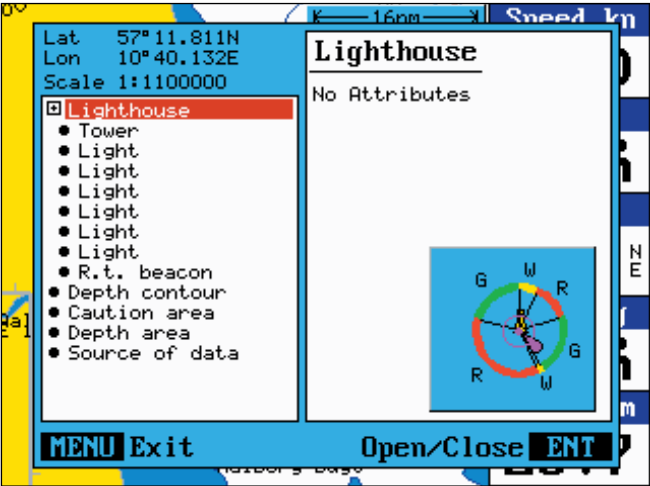
000 World Geodetic System 1984	037 Guam 1963
001 World Geodetic System 1984	038 GUX 1 Astro
002 European 1950	039 Hjorsey 1955
003 European 1979	040 Hong Kong 1963
004 North American 1927	041 Indian
005 North American 1983	042 Ireland 1965
006 Geodetic Datum 1983	043 ISTS 073 Astro 1969
007 Ordnance Survey of GB 1936	044 Johnston Island 1961
008 South American 1969	045 Kandawala
009 Adindan	046 Kerguelen Island
010 Afgooye	047 Kertau 1948
011 Ain el Abd 1970	048 L.C. 5 Astro
012 Anna 1 Astro 1965	049 Liberia 1964
013 Arc 1950	050 Luzon
014 Arc 1960	051 Mahe 1971
015 Ascension Island 1958	052 Marco Astro
016 Astro Beacon E	053 Massawa
017 Astro B4 Sorol Atoll	054 Merchic
018 Astro Dos 71/4	055 Mercury 1960
019 Astronomic Station 1952	056 Midway Astro 1961
020 Australian Geodetic 1966	057 Minna
021 Australian Geodetic 1984	058 Modified Mercury 1968
022 Bellevue (IGN)	059 Nahrwan
023 Bermuda 1957	060 Nanking 1960
024 Bogota Observatory	061 Naparima, BW1
025 Campo Inchauspe	062 Observatorio 1966
026 Canton Astro 1966	063 Old Egyptian
027 Cape	064 Old Hawaiian
028 Cape Canaveral	065 Oman
029 Carthage	066 Pico de las Nieves
030 Chatham 1971	067 Pitcairn Astro 1967
031 Chua Astro	068 Prov. South Chilean 1963
032 Corrego Allegre	069 Prov. South American 1956
033 Djakarta	070 Puerto Rico
034 DOS 1968	071 Qatar National
035 Easter Island 1967	072 Qornoq
036 Gandajika Base	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+ 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	
1 Edit user data	Inactive function
2 Chart info	See details below
3 Find nearest port services	See details below
4 Bearing and dist from A to B	See sec. 3.2
9 Chart setup	See sec. 3.3
0 Cursor to center	See sec. 3.2
PAGE More user data	Inactive function
MENU 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.



More details on next page.

Even though it says “No Attributes” for an object, you may try to press [ENT] to see if there is additional information available for the object.



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.

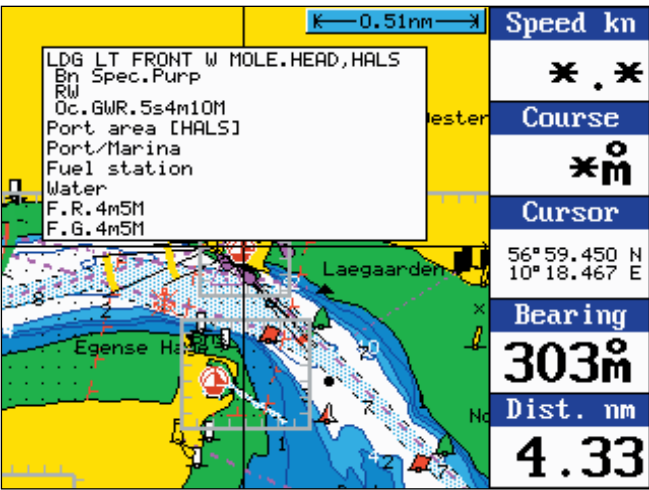


Use the cursor to go to the object in the left column you wish to have information on
- e.g. the “Port / Marina” symbol and then use the +/- keys to highlight the location you wish to locate on the chart by pressing [ENT].

The chart will now zoom in on the Port / Marina location you selected from the list - see example next page.



Use the same procedure to locate a Hospital, Coast Guard, Fuel Station, Public Telephone, Provisions, etc.



The facility information will stay on the screen for about 10 seconds.

Tide information



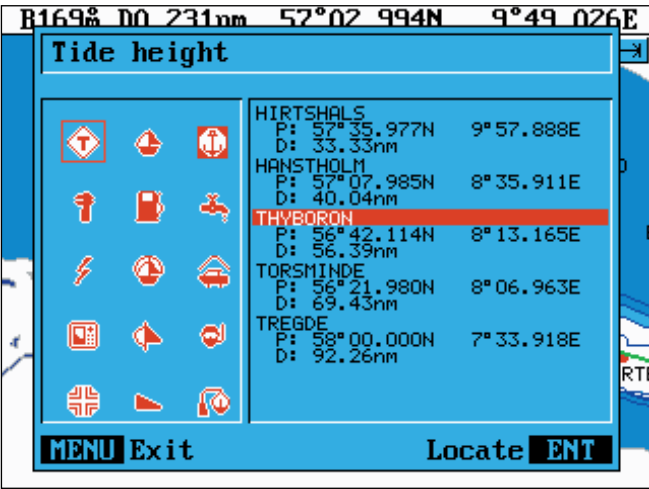
Press the cursor key to activate the chart cursor



Press [ENT] from the chart display to call up the Info window



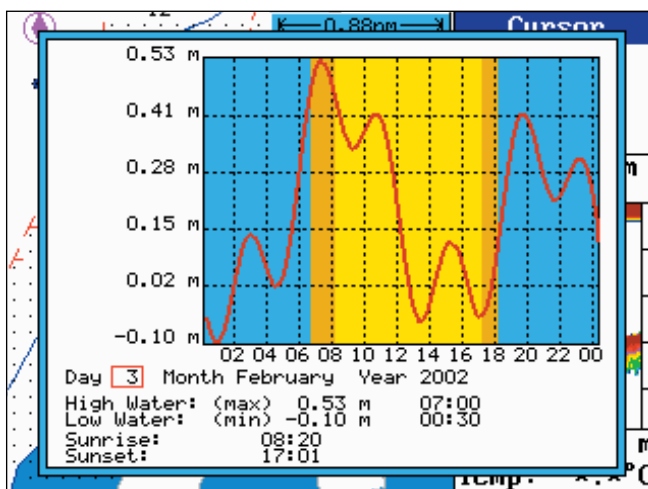
Press [3] to call up the C-MAP symbols with available facilities



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*
- MENU** *Exit function*

Example of Tide height information:



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.

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.

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:

LAND SETTINGS		
<u>Natural features:</u> Land area and coastline Hill, dune area Land contour lines Salt pan Slope topline Tree point Vegetation area <u>Natural features rivers:</u> Lake, Waterfall River, Canal	<u>Cultural features:</u> Airport area Built-up area Railway Road in general Overhead cable, w/pylons Overhead pipeline Fence line Telepheric Bridge Tunnel, tunnel entrance	<u>Landmarks:</u> Building, religious / single Cemetery Fortifid structure Siloway route part Tank, chimney Dish aerial Radar dome Flagstaff / Flagpole Flare stack Mast, Tower, Monument Windmill, windmotor

MARINE SETTINGS		
<u>Names:</u> Text <u>Nav-Aids/Light Sectors:</u> Lighthouse, Light float Lighted offshore platform Light in general <u>Attention Areas:</u> - see Caution Areas <u>Tides, currents:</u> Tide height (predictions) Current Water turbulence	<u>Nature of seabed:</u> Seabed area, rocky area, coral reef Weed / kelp Sand waves Spring in seabed <u>Buoys:</u> Cardinal Installation Isolated danger Lateral Safe water Special purpose Generic	<u>Signals:</u> 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

<u>Ports:</u> 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	<u>Tracks, routes:</u> 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
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<u>Attention Areas/</u> <u>Caution Areas:</u> 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
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DEPTH SETTINGS

<u>Soundings:</u> Spot sounding <u>Underwater objects:</u> Rocks Wreck area Obstruction Submarine cable Submarine pipeline Cable area, submarine pipeline area	<u>Depths:</u> 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 Article 3(1)(b) EN60945
Equipment category	Navigational equipment intended for world-wide use aboard non-SOLAS vessels
Model(s)	Simrad CP33 DGPS Chartplotter Simrad CE33 DGPS ChartSounder
Remarks	
Manufacturer	Simrad Støvring AS Østre Allé 6, DK-9530 Støvring Denmark Telephone +45 98373499 Telefax +45 98373807

Signed ... 
Odin Sletten, Product Manager

01 September 2004

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.

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