

M A N U A L

Simrad EQ33

Echosounder

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1.1 Introduction and system familiarization

Congratulations on your purchase of **SIMRAD EQ33 Echosounder and Fishfinder** - a high performance echosounder in a unique slim-line design with a bright 6" TFT color or monochrome display.

The EQ33 is both an echosounder system with selectable frequency i.e. 50 and 200 kHz, providing an impression of what is to be found in the water under the vessel, and it is a repeater for navigational data from connected GPS receiver.

DS33 Dual Station for the EQ33 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 2.5 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 echosounder.

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.

0-9

Alpha-numeric keys for insertion of figures.

A-Z

Alpha-numeric keys for insertion of letters.



Emphasizes important points.

3,7

Indicates that you should press the keys [3] and [7] 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 careful not to get cut on the sharp edges of the glass pieces.

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 9.10 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 EQ33.

Quality service personnel: The EQ33 is sealed and does not contain any user serviceable parts. Opening of the unit will void its warranty. Touching electrical parts inside may cause bodily harm. If the unit is not working properly, check sections 9.7 Preventive maintenance, 9.8 Repair and service, and 9.9 Troubleshooting. If your EQ33 requires servicing or repair, call your authorized SIMRAD dealer.

Glossary of terms: If you have never used an echosounder before or if you are unsure of how a term is used in this manual, then turn to Appendix A - Glossary of terms.

Default settings: All user implemented data in the EQ33 can be erased by making a reset of the unit and thus return to factory default settings.

1.3 How to get started

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

ENT Press the [ENT] key when the legend 'System Ready' appears on the screen

1.3.1 Dedicated function keys

STND Press [STND] from any other display will call up the standard echo display.

Press [STND] again will toggle A-scope on/off.

Press [STND] for 2 seconds will toggle between 50 and 200 kHz echo displays.

B-LCK Press [B-LCK] from any other display will call up the bottom lock display.

Press [B-LCK] again will toggle A-scope on/off.

Press [B-LCK] for 2 seconds will toggle between 50 and 200 kHz echo displays with bottom expansion.

ZOOM Press [ZOOM] from any other display will call up the zoom display.

Press [ZOOM] again will toggle A-scope on/off.

Press [ZOOM] for 2 seconds will toggle between 50 and 200 kHz echo displays with zoom activated.

PAGE Press the [PAGE] key to toggle between four user-selectable pages. Press for 2 seconds to start automatic rotation of all four pages.

1.3.2 Echosounder features

A-scope - Activate A-scope by means of one of the dedicated function keys (see section 1.3.1), or with echo display in active screen the function can be turned on/off from the ECHO menu. Echoes are displayed in a 'bar-graph' format. The strength of the actual echo is indicated by both width and color intensity.

Change frequency - Press and hold one of the function keys: [STND], [B-LCK] or [ZOOM] for two seconds to toggle between 50 and 200 kHz, or select via the ECHO menu.

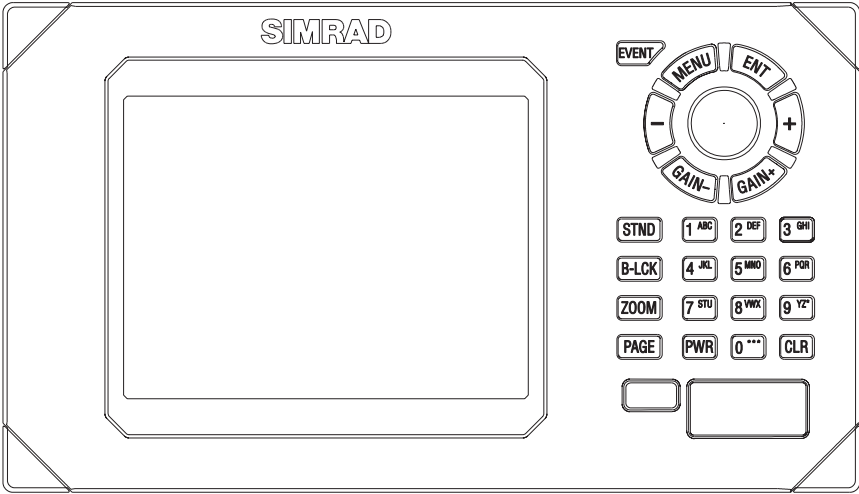
Gain - Adjust gain with the [GAIN-] and [GAIN+] keys to just below the point where you begin to see speckles of 'noise' on the screen.

Range - Select range by the numeric keys 1-9, or adjust with the +/- keys. Key 0 will select Auto Range.

Bottom expansion - Press [B-LCK] from any display (see section 1.3.1), or with echo display in active screen the function can be turned on/off from the ECHO menu. Activate bottom expansion to expand the view of the bottom in the echosounder display.

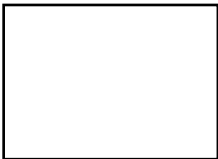
VRM expansion - Press [ZOOM] from any display (see section 1.3.1), or with echo display in active screen the function can be turned on/off from the ECHO menu. Activate VRM expansion to expand the view near the VRM - Variable Range Marker - in the echosounder display. Use the up/down cursor to activate and move the VRM line. Turn off the VRM line with [CLR].

Echo setup (presentation) - Press [ENT] from echo display 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].

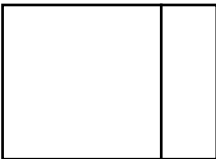


2.1 Fundamentals of the display and page system

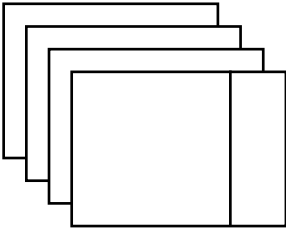
The EQ33 Echosounder has a multi-function screen and data presentation system with full screen or a split screen with echo display and data.



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: Echo 200kHz display, Depth & temperature diagram, Position display, and Highway display.

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 7.1. Press [PAGE] again to return to normal operation.

Example of how to change a pre-set page:

For instance, if you wish to have the Echo 50kHz display inserted in the PAGE sequence instead of the Highway display:

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

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

3,1 *then call up the Echo 50kHz display*



The same display can be selected for view in more than one page if it is selected via the menu. The hotkeys: [STND], [B-LCK] and [ZOOM] will jump to the page with the desired display - if it's there, and if it's not: it will replace 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.

MENU Turns the menu bar on/off. Exits any data display without taking any action.

EVENT Inserts a vertical mark at current ping and sends out WPL via NMEA to connected chartplotter.

+/- Changes echosounder range i.e. + (plus) selects a larger range) / - (minus) selects a smaller range). Toggles between available values.

GAIN +/- Adjusts echosounder gain. Optimum adjustment: Press [GAIN+] till noise appears in 'water', then press [GAIN-] till noise just disappears again.

STND Shortcut to standard echo display from any other display. Toggles A-scope on/off. Hold two seconds to toggle between 50 and 200 kHz frequency.

B-LCK Shortcut to Bottom lock display from any other display. Bottom lock is a combination of standard echo display and extended area around the bottom. When bottom lock is turned on, the [B-LCK] key will toggle A-scope on/off.

ZOOM Shortcut to VRM expansion from any other display. VRM expansion is a combination of standard echo display and extended area around the VRM - Variable Range Marker. When zoom is turned on, the [ZOOM] key will toggle A-scope on/off.

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.

ENT Opens for/confirms insertion and editing of data. Gives access to data and setup displays related to active display.



Moves cursor in data displays. Moves left/right/up/down in the menu system. Adjusts gain (left/right). Activates and moves the VRM line (up/down).

- 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 echosounder range. Key 0 will activate auto range.
- PWR

Calls up a window where you can adjust the brightness in the screen, background light in keypad, and select Daylight displays, Night display or custom made color palettes. Hold two seconds to turn the power off.
- CLR

Turns off VRM line in echo display. Deletes data in enter or edit mode.

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 e.g.:

ECHOSOUNDER				
1 POS	2 PILOT	3 ECHO	4 MISC	5 SETUP
		1 Echo 50kHz 2 Echo 200kHz, etc.		

Having selected e.g. 3:ECHO 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.

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 POS	2 PILOT	3 ECHO
1 Position	1 Highway	1 Echo 50kHz 2 Echo 200kHz 3 Turn bottom expansion ON 4 Turn VRM expansion ON 5 Turn A-scope ON 6 Depth & temperature diagram 7 Echosounder setup

4 MISC	5 SETUP
1 Wind 2 DSC alarm	1 Speed alarm, units & language 2 NMEA interface 3 Alarm output 4 Decca lanes 5 Loran C 6 Display color 7 Factory settings

Most functions in the menus are general, and can be called forward at any time, but a few are related to a certain menu(s) and can only be called forward or activated in the appropriate menu. Inactive functions in the menu will have a different color from the rest of the functions.

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 Initial start-up

PWR *To turn on the EQ33, press and hold the [PWR] key till a picture appears on the screen*

ENT *Press [ENT] when the legend 'System Ready' appears on the screen*

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

ENT *Confirm with [ENT]*

Customizing the EQ33 to suit individual needs can be done as you go along i.e. choose a different color for the display background, text, menu, etc. But to start out it will be wise to select the **display language** you prefer to use:

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

5,1 *press [5], [1] to call up the language display*



Press up on the cursor to jump to the bottom line in the display

+/-

Select language

ENT *Confirm entry*

The EQ33 has a demo program, which can be activated in the Echosounder setup display, refer to section 5.8.



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

2.6 Turn power off

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

PWR *Press and hold until screen turns black*

The EQ33 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. Position menu

1 POS
1 Position

3.1 Position display

 To present a position will require that the echosounder is connected to a navigator (GPS position sensor).

- MENU

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

load Position display

Water temp. 25.7°C	Log 1 0.0nm	Log 2 0.0nm	Trip log 1 and 2.
LAT 56°52.790 N LON 9°50.290 E			
Water speed 0.0kn	Course 0m	Depth K 6.9 m	Water speed/speed over ground.
Status OK	Local time 12:45:00	Local date 5-04-2002	Course, magnetic or true.

Editing of position display
Reset log or change the start figure, adjust local time and date, change position presentation i.e. SOG - speed over ground or STW - speed through water, and - course and bearing can be set to either magnetic or true.

- ENT


- Open for change

Move cursor to the value you want to change

CLR *Press [CLR] to reset log*

+/- *Toggle between available values, change time and date*

ENT *Confirm entry*

4. Pilot menu

2	PILOT
1	Highway

4.1 Highway display

To present any information in the EQ33 highway display will require that a navigator is connected via the NMEA input port (PWR) - refer to section 9.5 Electrical connections.

☞ The connected navigator must be in navigation mode, which could be Cursor, Waypoint, Route or Track navigation - see next page.

4.2 Navigation setup

MENU *Call up the menu bar, and...*
2,1 *load Highway display*

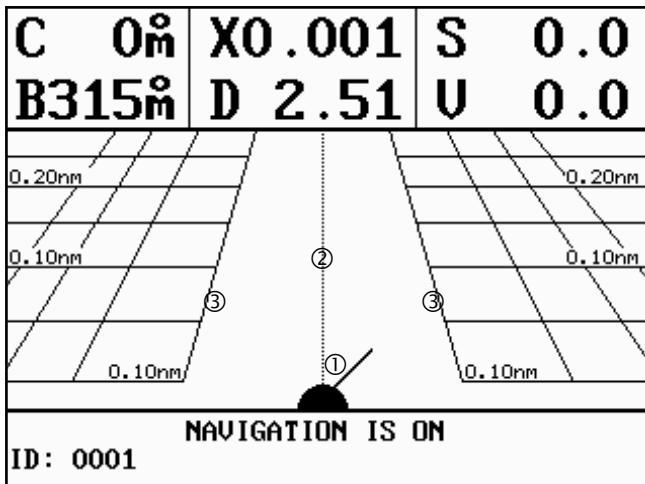
Since there is no navigation mode active, you will receive the legend: NAVIGATION IS OFF. To enter the basic Navigation setup:

ENT *Load Navigation setup*

Navigation setup:	
XTE distance:	00.10nm

Alarm distance can be changed in this display, but alarm can only be initiated from the connected navigator. Maximum setting in nautical miles is 9.99 nm.

ENT *Return to Highway display*

Highway display (with active navigation mode)

Nautical miles indication on horizontal lines indicates how many nautical miles there are from ship's position to the horizontal line.

- C: Course over ground
- X: Cross-track-error
- S: Speed over ground
- B: Bearing to approaching WP
- D: Distance to waypoint
- V: Speed towards WP (velocity)

Bottom line indicates name/number of approaching waypoint or routepoint.

- ① Ship's position and heading in relation to intended track.
- ② Ideal course line between two waypoints starting from ship's position when a navigation mode is activated on connected navigator.
- ③ XTE alarm lines - an alarm will sound if the ship touches the lines.

5. Echosounder operation

The echosounder function of the EQ33 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 1500 meters (4800 feet) 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 EQ33 provides various types of echosounder displays: standard echogram, A-scope, bottom expansion (zoom) and VRM expansion. 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.

5.1 Echosounder menu

3			ECHO
1	Echo 50kHz	-	see section 5.2
2	Echo 200kHz	-	see section 5.2
3	Turn bottom expansion ON	-	see section 5.3
4	Turn VRM expansion ON	-	see section 5.4
5	Turn A-scope ON	-	see section 5.5
6	Depth & temperature diagram	-	see section 5.7
7	Echosounder setup	-	see section 5.8

5.2 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

3,2

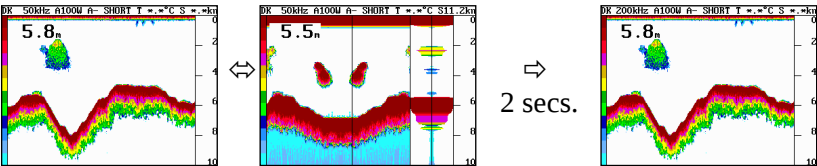
Call up the menu bar, and...

load the Echo display for 200kHz

- see display example on next page.

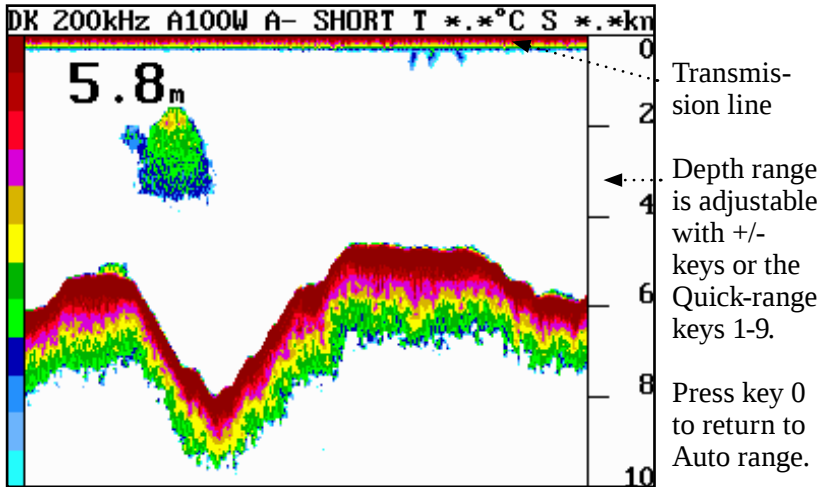
STND

Hotkey to Echo display i.e. jumps to page with Echo 50kHz or Echo 200kHz display; if none: inserts Echo display in active page.



From active echo display: hold either [STND], [B-LCK] or [ZOOM] depressed for two seconds to toggle between 50 and 200 kHz displays.

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.



Press cursor left/right to adjust gain

The data field is preset to show: Actual depth ***DK**, transmit power **A100W** (set to AUTO), transmission pulse length **A- SHORT** (set to AUTO), 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,5,1).

*) Actual depth i.e. Depth below **Keel/Surface/Transducer** - settings can be changed in Echosounder menu (MENU,3,7).



Refer to Appendix A for further description of the various functions.

ENT

Direct access to Setup display related to active echo display 50kHz or 200kHz - (see section 5.9)



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

+/-

Toggle between available values

ENT

Confirm changes

5.3 Bottom expansion

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 size of the expansion window can be adjusted in the Setup display for 50kHz/200kHz.

As an example, from active Echo 50kHz display:

MENU

Call up the menu bar, and...

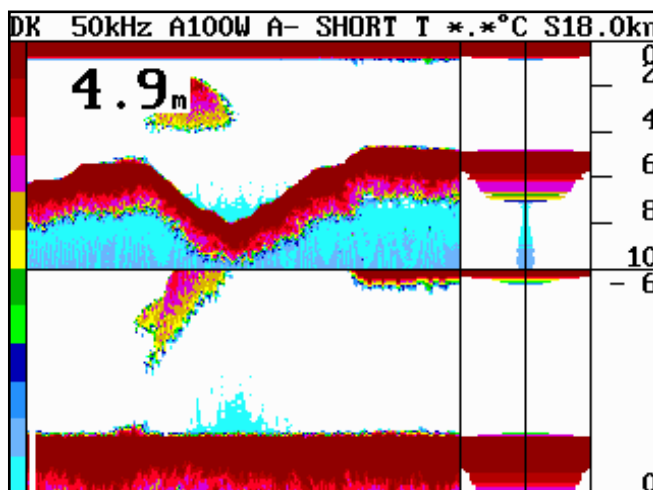
3,3

activate bottom expansion...

... or just press:

B-LCK

Call up the bottom lock display



+/-

Adjust range with the + and - keys

ENT

Open Setup display - if any changes are required (see section 5.9)

ENT

Confirm changes

5.4 VRM expansion

This feature will provide an expanded view of the area near the Variable Range Marker which will give a better separation of echoes. The actual size of the expansion window can be adjusted in the Setup display for 50kHz/200kHz.

As an example, from active Echo 50kHz display:

MENU

Call up the menu bar, and...

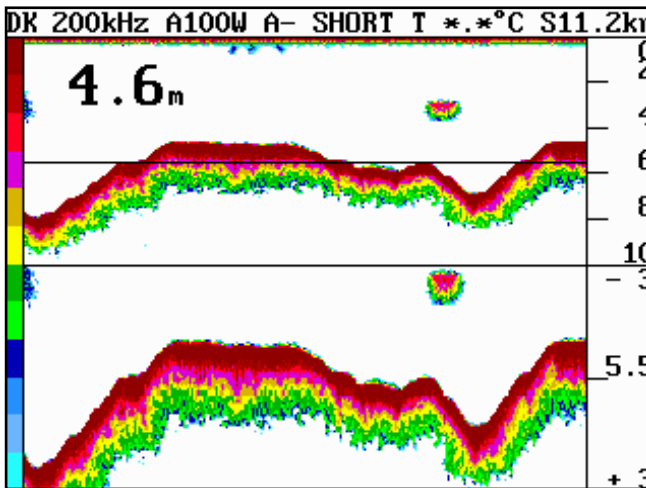
3,4

activate VRM expansion

... or just press:

ZOOM

Call up the zoom display



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 7.1). The VRM horizontal line can be moved up/down by means of the cursor.

+/-

Adjust range with the + and - keys

ENT

Open Setup display - if any changes are required (see section 5.9)

ENT

Confirm changes

5.5 A-scope

The amplitude scope, which appears in the right side of the echo display, can be turned on and off.

The readout 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 or the bottom.

As an example, from active Echo 50kHz display:

MENU

Call up the menu bar, and...

3,5

turn A-scope ON



or... toggle the A-scope function on/off from active echo display:

STND

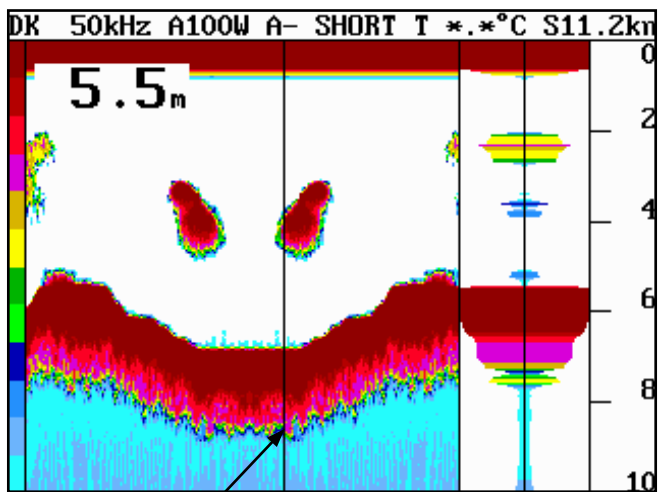
press either [STND] from standard echo display, or...

B-LCK

press [B-LCK] from echo display with bottom expansion, or...

ZOOM

press [ZOOM] from echo display with VRM expansion.



The vertical EVENT marker in this display is activated by the [EVENT] key - see Appendix A for further details.

+/-

Adjust range with the + and - keys

ENT

Open Setup display - if any changes are required (see section 5.9)

ENT

Confirm changes

5.6 Variable range marker

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

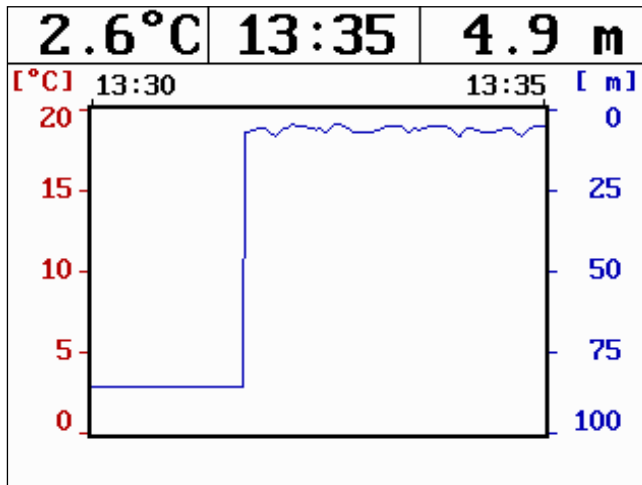
5.7 Depth & temperature diagram

MENU

Call up the menu bar, and...

3,6

activate Depth & temperature diagram



Present water temperature and depth.

Depth over time or distance.

Temperature over time or distance.

ENT

Call Setup for Depth
-see display example next page.

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.

5.8 Echosounder setup

The Echosounder setup display mainly consist of general settings, but also applies to a specific frequency where stated. The EQ33 features semi dual transceiver transmitting at 50 and 200 kHz.

MENU

Call up the menu bar, and...

3,7

activate 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: 30dB	OFF
Depth DS fish:	min:0010 m	max:0100 m
Depth DK alarm min.:	0005.0 m	OFF
Depth DK alarm max.:	0100.0 m	OFF
Water profile:	SALT	
Velocity of sound in water:	1470m/s	
Time/distance scale:	OFF	
Echo sampling:	BOTTOM	
Demo mode:	OFF	
MENU	Exit	Accept ENT



Use the cursor key to move cursor around in the display

+/-

Select new values by means of the +/- keys

ENT

Confirm changes, or...

MENU

Abandon changes and exit display

Transducer - select transmitter frequency 50kHz or 200kHz. 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. 00 (weak echo) to max. 99dB (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 5.9.

Echo sampling - is preset to BOTTOM, which enables auto range and a view all the way to the bottom. In RANGE the unit will not wait for a bottom echo, but transmit a new pulse as soon as the selected range has been reached. This mode will often improve bottom detection and digital depth readout for vessels moving at higher speeds. Also, it will enable a more detailed search for fish in mid water range. 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.

5.9 Presentation setup

The most common settings for adjusting the presentation of the high or low frequency echo picture are accessed by a single keystroke.

ENT *Press [ENT] from active echo display*

Setup 200kHz:	
Range start:	000 m
Range:	AUTO
Gain:	+30dB
White line:	OFF
Expansion window:	6 m
TVG:	Normal (20 log R)
Ping to ping filter:	ON
Signal threshold:	OFF
Color threshold:	 OFF
Depth grid:	OFF
Transmit pulse length:	AUTO
Transmit power:	AUTO
Scroll synchronization:	TIME
Scroll speed:	HIGH

 For details on the functions, refer to Appendix A.

 *Use the cursor key to move cursor around in the display*

0-9 *Key in new figures, or...*

+/- *Toggle between available values*

ENT *Confirm changes, or...*

MENU *Abandon changes and exit display*

6. Miscellaneous menu

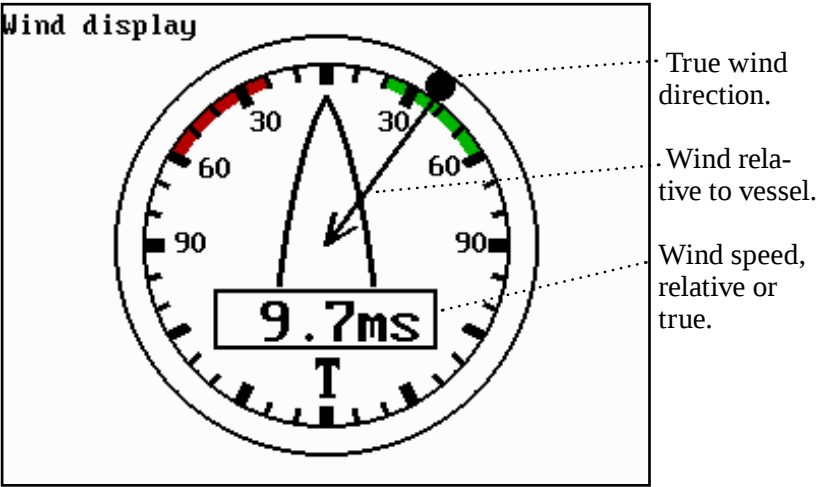
4	
MISC	
1	Wind - see section 6.1
2	DSC alarm - see section 6.2

6.1 Wind display

The EQ33 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
- 4.1
- Call up the menu bar, and...
load the ‘Wind instrument’ display



ENT

Load Setup for Wind display

Setup for Wind:

Damping level:

MEDIUM

Relative wind scale:

NORMAL

Wind angle offset:

000°

Show wind speed as:

RELATIVE

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.

Relative 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 RELATIVE.

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

6.2 DSC alarm (feature prepared for future DSC VHF)

To receive a DSC Alarm and Message from VHF will require that the EQ33 is connected to a compatible Simrad VHF radiotelephone.

The message from the VHF will appear in a pop-up window together with an acoustic alarm. Press [CLR] to reset the alarm.

To view the last received message:

MENU

Call up the menu bar, and...

4,2

load the DSC alarm display

7. Setup menu

5 SETUP	
1 Speed alarm, units & language	- see section 7.1
2 NMEA interface	- see section 7.2
3 Alarm output	- see section 7.3
4 Decca lanes	- see section 7.4
5 Loran C	- see section 7.5
6 Display color	- see section 7.6
7 Factory settings	- see section 7.7

7.1 Speed alarm, units & language

- MENU
- 5,1
- Call up the menu bar, and...
load Speed alarm, units & language display

Setup for speed:	
LOG speed sensor:	ON
LOG speed calibration:	019000 PULSES/nm
Speed alarm maximum (SOG):	000.0kn OFF
Speed alarm minimum (SOG):	000.0kn OFF
Setup for units:	
Depth/altitude in:	METERS
Distance in:	NAUTICAL MILES
Speed in:	KNOTS
Temperature in:	DEGREE CELSIUS
Software version:	EQ33 1.10
PAGE More (1/2)	Scroll ⬇️⬆️⬇️
MENU Exit	Accept ENT

To select new values for this setup display, see next page.

-
- 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*

Serial number:	0x00ffffff
Interface software version:	0x00000025
PAGE rotation interval:	05 sec.
Display text in:	English GB
PAGE More (2/2) Scroll ↓ ↑ MENU Exit Accept ENT	

Example of the Speed alarm, units & language display, page 2.

ENT *Confirm changes, or...*

MENU *exit function without making any changes*

Setup for speed:

LOG speed sensor - set to ON, the position display will show water speed from external log sensor (via ECHO port).
-with NMEA sentence VHW set to ON, the readout will show water speed from external water speed instrument (via NMEA port).

LOG speed calibration - calibrate log speed readout by increasing/decreasing the number of pulses per nautical mile - see also Appendix A.

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.



Press [CLR] to reset an alarm - this applies to all activated alarms in the system.

Setup for units

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).

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 EQ33 is supplied with the following national display languages: Danish (DK), English (GB), English (US), French (F), German (D), Italian (I), Netherlands (NL), Spanish (E), Swedish (S), and Portuguese (P).

7.2 Interface setup, NMEA

The next pages indicate the default settings for the interface setups. After the interface setups will follow a description of the input and output sentences available in the setups.

- MENU** Call up the menu bar, and...
- 5,2** load NMEA interface

Interf.setup: INPUT			
Port:		NMEA0183	
Sentence	String	Status	
Water data:			
Water temperature:	MTW	OFF	
Water speed:	VHW	OFF	
Heading data:			
Heading:	HDG	ON	
Position data:			
PAGE	More	(1/2)	Scroll
MENU	Exit	Accept	ENT

- PAGE** Toggle between the two pages of sentences
-refer to 7.2.1 default settings and 7.2.2 description of sentences
- +/-** Toggle between INPUT and OUTPUT
-  Go to any sentence you want to change
- +/-** Toggle between values, and between ON and OFF
- ENT** Confirm entry, and accept warning (press [ENT] again), or...
- MENU** exit function without making any changes

7.2.1 Default sentences

Interface setup - INPUT - Port NMEA0183:

<u>Sentence</u>	<u>String</u>	<u>Status</u>
Water data:		
Water temperature:	MTW	OFF
Water speed:	VHW	OFF
Heading data:		
Heading:	HDG	ON
Position data:		
Position:	GLL	ON
Course:	VTG	ON
Speed:	VTG	ON
Navigation data:		
Navigation (APB,RMB,XTE):		ON

Interface setup - OUTPUT - Port NMEA0183:

<u>Sentence</u>	<u>String</u>	<u>Status</u>
Water data:		
Depth below keel:	DBK	OFF
Depth below surface:	DBS	OFF
Depth below transducer:	DBT	OFF
Depth:	DPT	ON
Water temperature:	MTW	ON
Water speed and heading:	VHW	ON
Waypoint data:		
Waypoint location:	WPL	ON

7.2.2 Description of sentences

Description of NMEA0183 input sentences

MTW Water temperature.

VHW Water speed and heading.

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.

Description of NMEA0183 navigation input sentences

APB Autopilot sentence “B”.

RMB Recommended minimum navigation information.

XTE Cross-Track-Error, measured.

Description of NMEA0183 version 2.0 output sentences

DBS Depth below surface.

DBK Depth below keel.

DBT Depth below transducer.

DPT Depth, including offset.

MTW Water temperature

VHW Water speed and heading.

WPL Waypoint location

7.3 Interface setup, alarm output

MENU

Call up the menu bar, and...

5,3

load display for Alarm output

```
Interface setup, alarm:
Output (pin 1,2):      ON
Alarm stand-by level:  LOW
```

The stand-by level can either be: LOW = 0 volt or HIGH = 5 volt.



+/-

Toggle between available settings

ENT

Confirm entry, or...

MENU

exit function without making any changes

7.4 Decca lanes

☞ To present a position will require that the echosounder is connected to a navigator.

- MENU

5,4

+/-

ENT
- Call up the menu bar, and...

load decca chain display

Leaf through the available chains - see below.

Confirm entry

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			

7.5 Loran C

☞ To present a position will require that the echosounder is connected to a navigator.

- MENU

5,5

*Call up the menu bar, and...
load Loran C chain display*
- +/-

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

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		

7.6 Display color

MENU *Call up the menu bar, and...*
5,6 *load the Palette setup*

Palette 1 to 4 are preset to bright daylight (sunshine) in 1 and 2, normal daylight in 3, and night setting in 4. These four setups are not adjustable. Palette 5 to 9 can be customized to suit individual needs and wishes. If you wish to make your own special palette setup in e.g. palette 5, then:

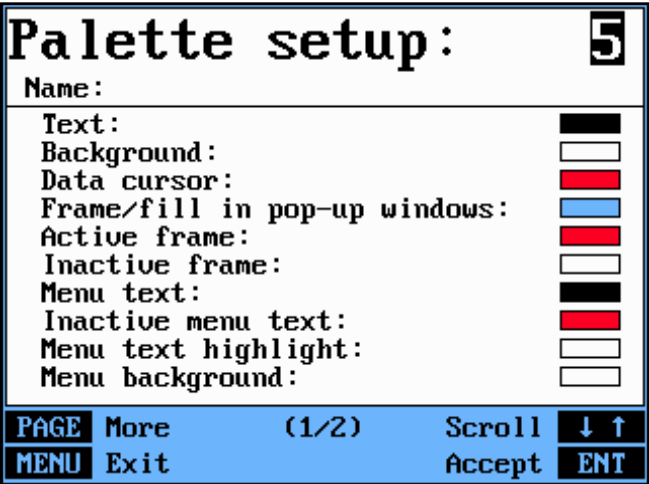
5 *Select Palette setup: 5*
 *Use cursor to scroll up/down in display*

A-Z *Key in a name for the new palette setup - max. 29 characters, -refer to “Alphanumeric names” next page.*

PAGE *Toggle between page 1 and 2*

+/- *Toggle between available color settings*

ENT *Confirm new setup*



Menu highlight:	
Menu frame:	
Menu example:	POS POS
Echogram background:	

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

Alphanumeric names:

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.

7.7 Factory settings

DELETE MEMORY: It will be possible to erase all sounder settings or NMEA settings entered into the unit by the user, and return to the default settings set up from the factory.

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 9.9. Activating 'Return to all factory presets' will erase all user-made settings and restore the basic default settings from the factory.

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

MENU*Call up the menu bar, and...***5,7***activate the display for Factory settings*

FACTORY PRESETS:	
1	Return to NMEA presets
2	Return to SOUNDER presets
CLR	Return to all factory presets
0	Show test display
MENU	Exit

To activate any of the above-mentioned 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*

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.

8.1 Parts of an echosounder

An echosounder is composed of a display screen, processor, and transmitter/receiver unit which in the case of the EQ33 are housed in one unit. Connected to this unit by a shielded cable is the transducer, which is mounted horizontally on the bottom of the hull or on the transom.

The display screen presents in graphic and numerical form the information the processor is receiving and accumulating from the transducer.

The processor is the “brain” of the echosounder. It is sealed inside the unit which protects it from harm. The processor is composed of highly sophisticated microprocessor, memory and logic circuitry.

The transmitter/receiver (often called the “transceiver”) section of your echosounder takes it’s commands from the processor. The processor tells the transceiver to activate the transmitter. The transmitter sends a high voltage transmit “ping” to the transducer mounted on the hull. At that point the transmitter’s job is done and the receiver takes over (see fig.1 in section 8.2).

The receiver is also connected to the transducer and amplifies the very small signals received as echoes from fish and the sea floor which arrive at the transducer (see fig.2 in section 8.2). The receiver is designed to reject other signals as much as possible and provide enough amplification to see even relatively small targets at long ranges.

The amplified receiver signals are then send to the processor to be shown on the display screen.

The transducer can be single or multiple ceramic elements in a rugged housing made from reinforced plastic, bronze or stainless steel. The transducer is attached horizontally to the bottom of the hull. It is essential that the transducer be mounted properly, as echo transmissions are radiated at aright angles from the transducer face. Shielded cables connect the transducer with the echosounder.

8.2 How the echosounder works

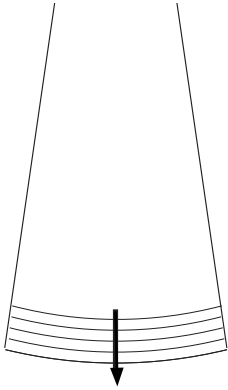
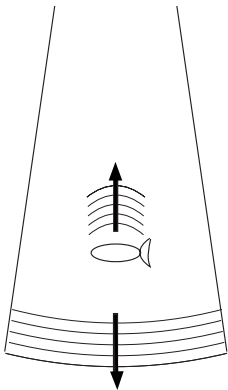


Fig. 1 Transmitted 'ping' from the transmitter/receiver.

When the EQ33 is turned on, the processor begins to send electrical pulses to the transducer. The ceramic resonator 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 which goes back up through the cable to the receiver.

The EQ33 processes the signals and presents them on the display screen.

See Fig. 2.

8.3 Transducer beam width

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 'beam width'.

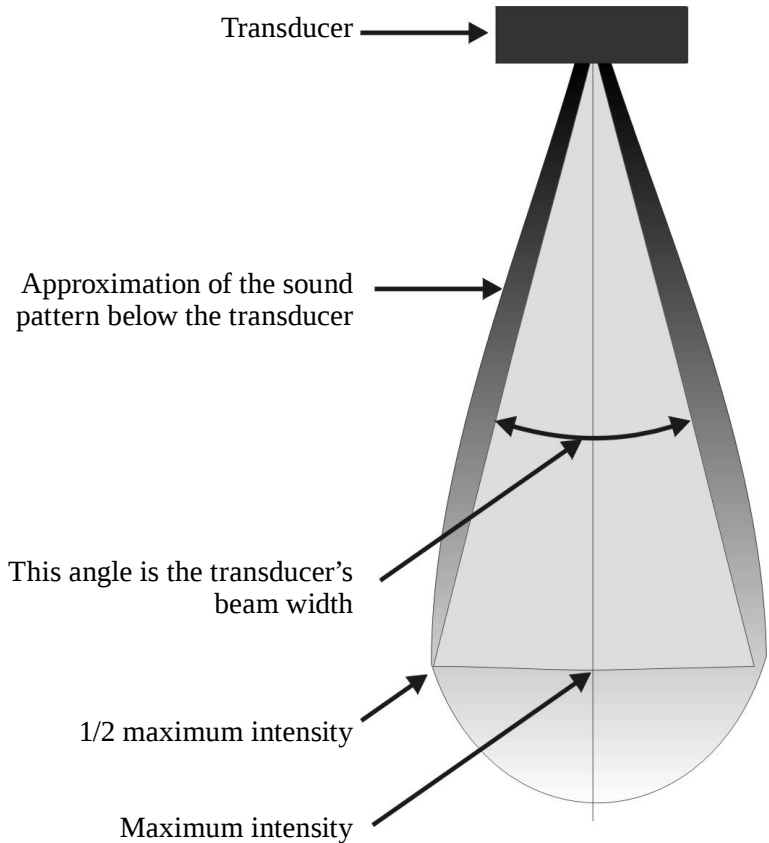


Fig. 3 A representation of a transducer beam width.

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 'beam width'. See Fig. 3.

8.4 Effects of the vessel's speed

The presentation of fish on the EQ33 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.

9. Installation and service

9.1 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:

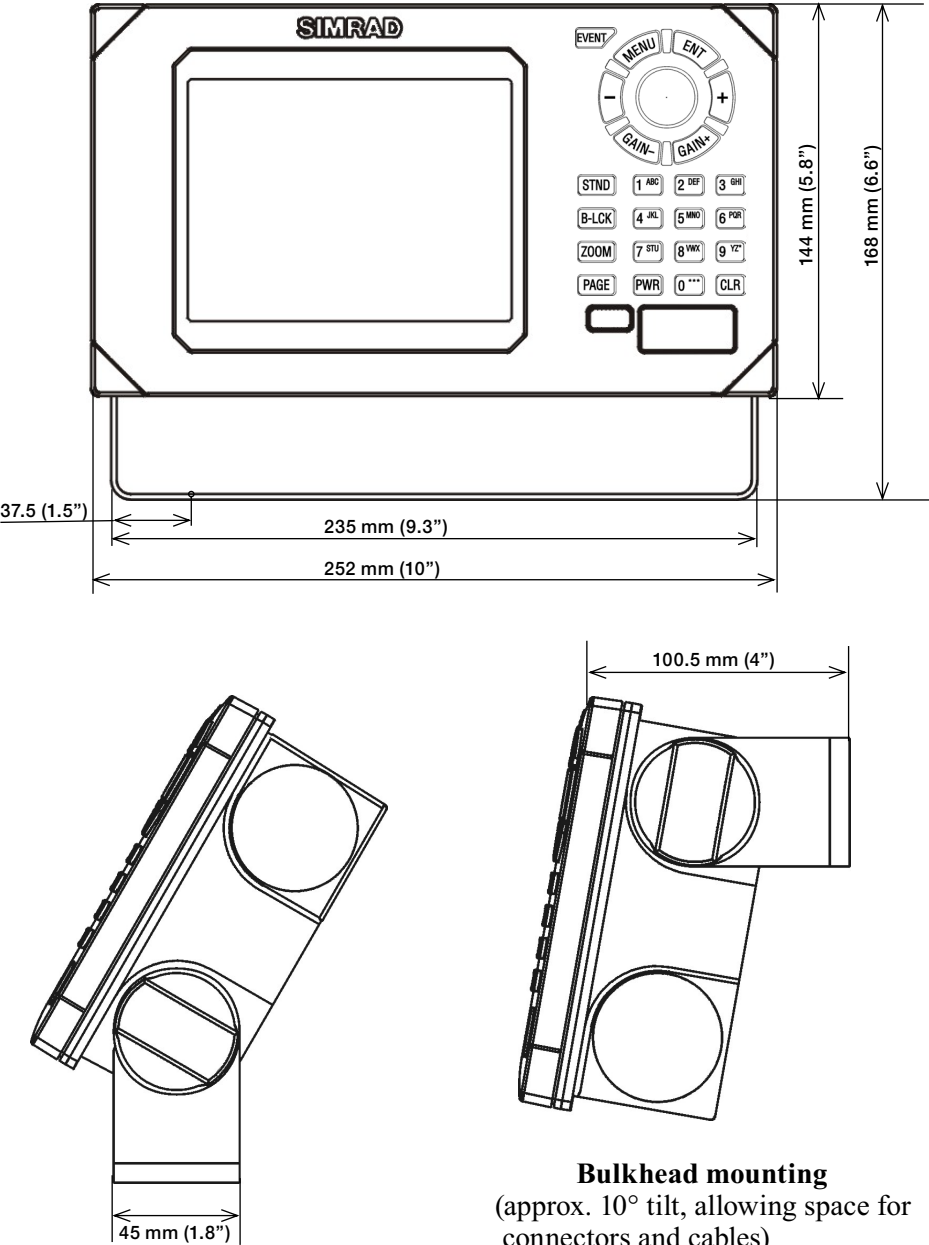
Echosounder setup:	
Transducer	
Depth	
Frequency	
Keel depth	

Other important settings:		

[illegible]

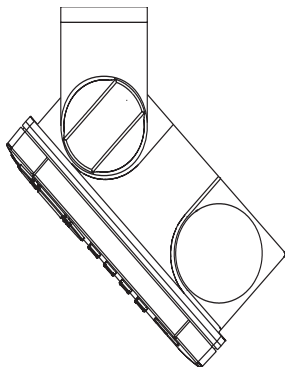
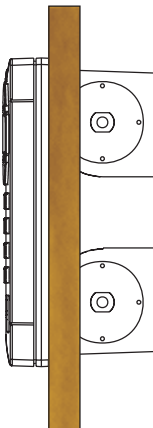
9.2 Installation of EQ33 Echosounder

The EQ33 can be flat or bracket mounted - overhead, bulkhead or console.

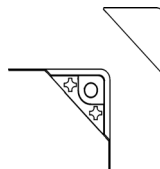


Console mounting
(max. tilt 45°)

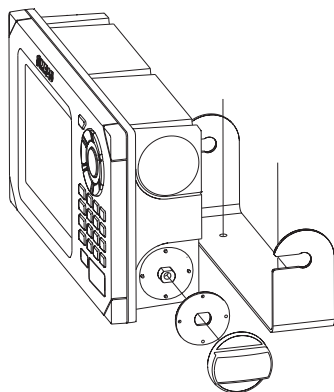
Bulkhead mounting
(approx. 10° tilt, allowing space for connectors and cables)

Overhead mounting**Flush mounting**

Removable corner
for flush mounting



Refer to included
template for instruc-
tions on flush
mounting.

**Bracket mounting**

Secure the bracket with two wood screws or bolts (incl.).

9.3 Location for display unit

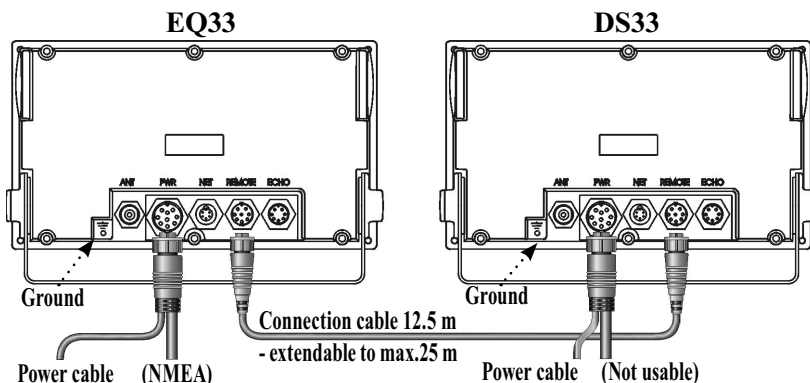
Determine which place is the most suitable and convenient for navigation and general operation after considering the following conditions:

- 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 9.10 Specifications.
- there is good ventilation and minimum vibration.
- the minimum distance to a magnetic compass is 500mm (20").
- provide sufficient space behind the unit to allow for proper cable connections to the rear panel connectors.

9.4 Installation of DS33 Dual Station

The DS33 is a remote control unit for the EQ33 echosounder. Both units are identical in size, so the same installation guides can be applied when performing the installation.

☞ Refer to section 9.5 for details on pin numbers.



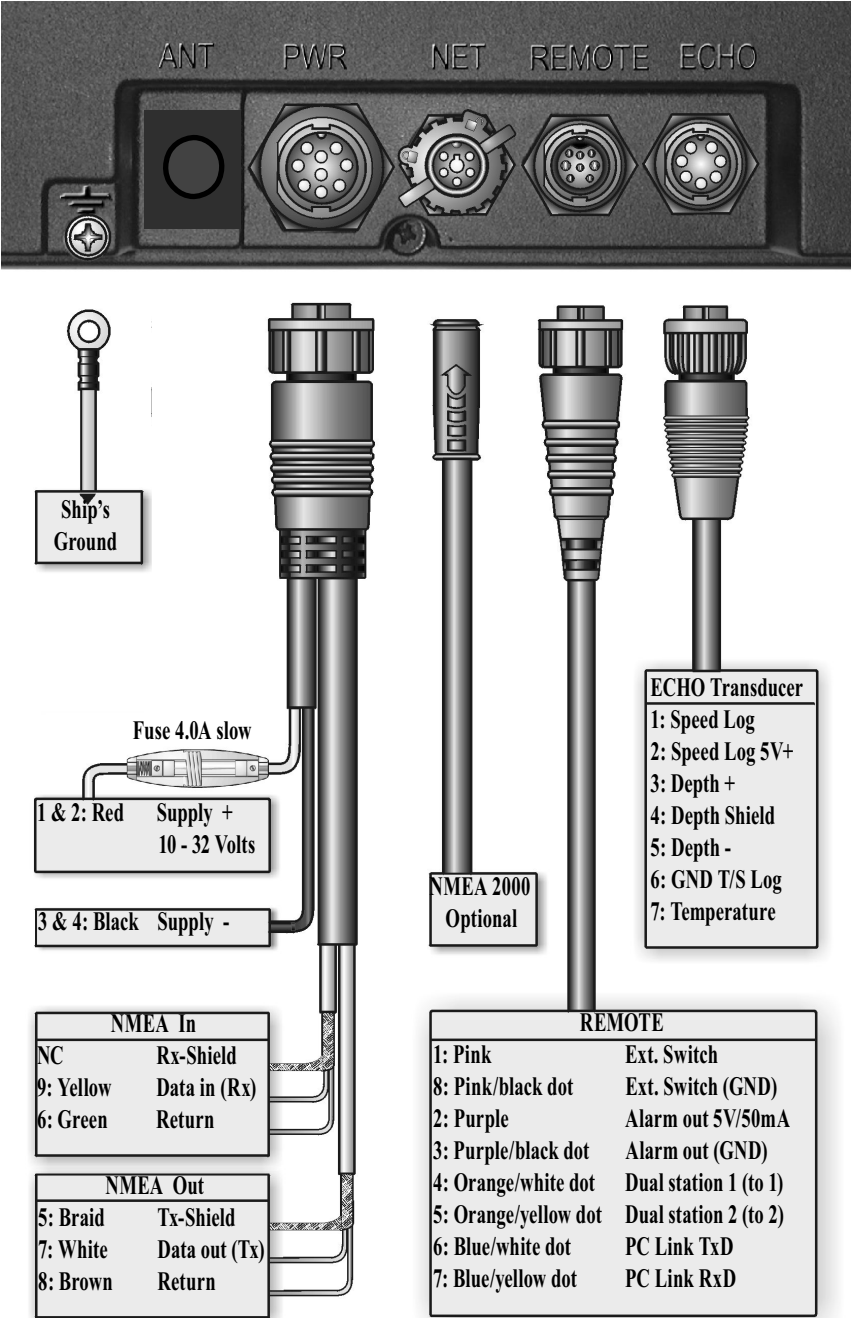
9.4.1 Operation of DS33 Dual Station

The main unit and the dual station operate in parallel.

All key commands are relayed to the main unit - EQ33 - 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.

9.5 Electrical connections



9.5.1 Power supply connections

The internal voltage regulator will allow the EQ33 to operate normally within the power supply voltage range from 10 to 32 V DC. The EQ33 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.

9.5.2 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 EQ33 is switched on or it will not protect the equipment as intended – see fuse rating in section 9.10 Specifications.

9.5.3 Transducer connection

Most transducers are supplied with a 10 meter cable for connection to the echosounder unit – EQ33. 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 EQ33 must be turned off while connecting/disconnecting the transducer cables.

Recommended transducers

Airmar single element two-frequency 50/200 kHz transducers i.e. B744, P319, B45, B256, P66 and P52.

9.5.4 NMEA0183 interface connection

NMEA0183 interface connection is made via the combined power and NMEA cable.

9.6 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 EQ33 must be turned off while connecting/disconnecting the transducer cable.

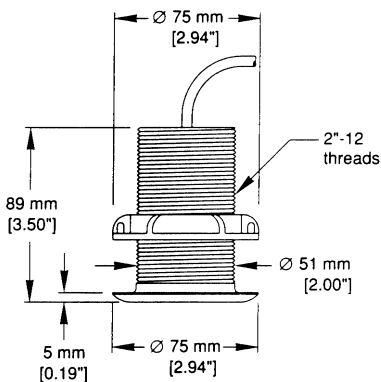
The use of longer cable runs, while possible, always increases the likelihood of increased interference and decreased performance. Care must be taken when increasing the cable lengths to ensure that proper, adequate and consistent

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.

9.6.1 Transducers (optional)

Airmar P319



Thru-hull mount

Frequency: 50/200 kHz

Beam width: 45° / 15°

Cable length: 10m (32')

Depth information.

Reference no. 179-0401-002 (P319)

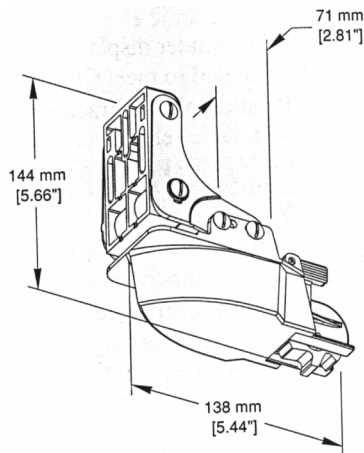
Housing: Reinforced plastic

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

Reference no. 179-0401-003 (B117)

Housing: Bronze

Recommended for fiberglass and wooden hulls.

Airmar P52**Transom mount**

Frequency: 50/200 kHz

Beam width: 45° / 15°

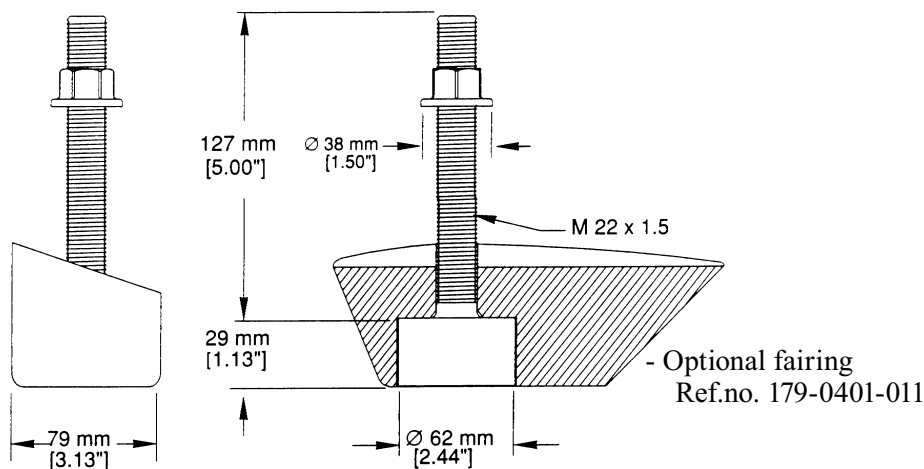
Cable length: 10m (32')

Speed, temperature + depth information

Reference no. 179-0401-001

Housing: Chemical resistant, high impact plastic alloy.

Recommended for all type hulls.

Airmar SS505**Thru-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

Beam width: 45° / 15°

Cable length: 10m (32')

Depth information.

Ref.no. 179.0401.004 (B45)

Housing: Bronze

Recommended for fiberglass or wooden hulls only.

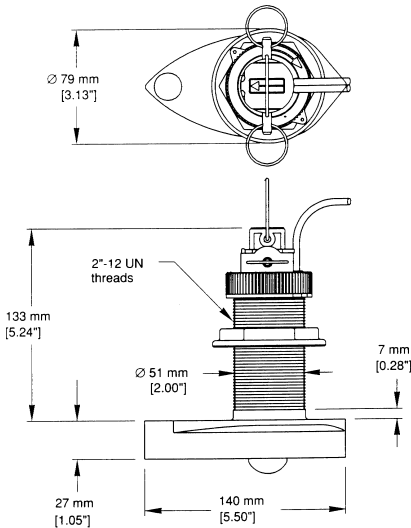
Ref.no. 179.0401.008 (SS505)

Housing: Stainless steel

Recommended for any hull material.

Airmar B744V

top and side view

**Thru-hull triducer**

Frequency: 50/200 kHz

Beam width: 45° / 15°

Cable length: 10m (32')

Speed, temperature + depth information.

Ref.no. 179-0401-009 (B744V)

Housing: Bronze

Recommended for fiberglass and wooden hulls.

9.6.2 Determining the position for the transducer

The EQ33 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 EQ33 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. Levelling 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.

9.7 Preventive maintenance

Surface cleaning – to keep the EQ33 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.

9.8 Repair and service

The EQ33 is sealed and does not contain any user serviceable parts. Opening of this unit will void its warranty. If the EQ33 requires servicing or repair, call your authorized SIMRAD dealer, but first check section 9.9 Troubleshooting.

Spare parts – fuses may be bought from a chandler or a marine supply store. Use only fuses specified for this unit – see 9.10 Specifications.

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

9.9 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 4.0A 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
		Return to factory presets, see section 7.7
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
	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 5.9 Presentation setup
	Check that the range is correct for the water depth	Adjust the range in 5.9 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

9.10 Specifications

General data

Power supply:	12 and 24 V DC (10-32 V DC max) 8-16 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 (3.0 lbs)
Environment:	-10 to +50°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" 320x340 pixels
Presentation:	4 pages. Manual, dedicated and remote switch, and automatic sequencing.
Interfacing:	1 port in/out NMEA 0183 1 port NMEA 2000 (optional) Alarm - signal output 5 V 50 mA
Fuse:	4.0A slow

Echosounder section

Frequencies:	50 or 200 kHz, selectable		
Transmit power:	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:	Max. 10 pings per second		
Alarms:	Fish, max. and min. depth		
Zoom mode:	Bottom and VRM expansion, 6 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 presentation:	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.

Options

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

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 EQ33 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 threshold – the color threshold function allows the “weaker” targets and noise which may be shown on the display screen to be eliminated from the display. These targets are usually shown in the weaker target colors such as blues and greens. The Color threshold allows you to choose not to display the blues, or the blues and greens, etc. Doing this will leave only the stronger targets on the display screen.

Configuration – the configuration functions of the EQ33 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.

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

Echogram background color – is the color shown on the EQ33 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.

Expansion (zoom) – 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). The amount of expansion can be adjusted in “Expansion window”, Presentation setup.

Gain – is another way of saying “sensitivity”, or possibly “volume”. Increas-

ing the gain setting of the EQ33 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.

LOG speed calibration – the unit is preset to receive 19000 pulses per nautical mile from the log transducer (paddle wheel). However the figure might have to be changed to compensate for various transducers and actual water flow passing the transducer. The correct pulse rate is calculated by:

$$\frac{19000 \times \text{indicated speed (e.g. 4kn)}}{\text{actual speed (GPS) (e.g. 5kn)}} = 15.200 \text{ pulses/nm}$$

Measurement units – the user may select the displayed units to be one of the following:

m	meters
ft	feet
fm	fathoms
nm	nautical mile, 1 nm is 1,852 meters
kn	knots, nautical mile per hour
km	kilometer, 1 km is 1,000 meters
kh	kilometer per hour
mi	statute mile, 1 mile is 1,609 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.

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.

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 and precise recording.

Pulse length – the transmitted pulse length can be set to OFF for observing 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 - see next page:

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>	

Range – refers to the distance shown from the top to the bottom of the display screen. Selecting **Auto range** will cause the EQ33 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.

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.

Scroll speed – is the rate of movement of the targets on the display screen, moving from right to left. It is adjustable, to allow the user to show a longer “history” on the display screen, if desired.

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

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.

TFT – Thin-Film Transistor (Active matrix) display.

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 EQ33 transmits a signal), and they also generate a voltage when they encounter sound waves (as when the EQ33 is receiving an echo).

Transmit power – should normally be left on AUTOMATIC.

The modes available are: AUTO, 600W, 100W and 10W.

TVG – Time Varying Gain – is a control that allows the EQ33 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.

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.

VRM – Variable Range Marker – this 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.

XTE – Cross-Track-Error (-Distance), measured magnitude of the position error perpendicular to the intended track line.

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Simrad Støvring AS

Declaration of Conformity

The EMC Directive, Article 10 (1)

Undersigned are herewith declaring, that

Product: SIMRAD EQ33
Echosounder

is in accordance with the protection requirements in
the EMC Directive 89/336/EØF of May 3rd, 1989

Employed harmonized standards:

EN 60945:1993 / Amd.1:1993

Støvring March 20, 2002

Simrad Støvring AS
Østre Allé 6
DK-9530 Støvring
Denmark



Odin Sletten
Product manager

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. These products are warranted for a period of 24 months on parts and 12 months on labor from date of purchase, except for category B items. Consumable parts such as lamps, fuses, batteries, bearings, etc. are not covered by this warranty.

CATEGORY “B”:

•Antennas •Transducers •Trawl sensors •Monitors (CRT/LCD) •Radar magnetrons •Disk drives.

These items are warranted for a period of 12 months on parts and labor from date of purchase.

WARRANTY SERVICE is available through authorized service dealers or national distributors worldwide. Products returned will, at the sole discretion of Simrad, either be repaired or replaced free of charge within normal working hours. Freight charges, insurance, duties or any other costs are the responsibility of the customer. Maximum liability shall not, in any case, exceed the contract price of the products claimed to be defective.

ON BOARD SERVICE can be arranged by authorized local service dealers or national distributors upon request. Labor costs for the repair/replacement of the defective modules/parts will be free of charge provided a valid warranty is confirmed. Overtime, travel, lodging, per diem, insurance, duties or any other costs are the responsibility of the customer. Additional expenses connected with replacement of transducers such as dry docking, diving and precautionary measures are not covered by this warranty.

VALIDITY: This warranty is effective only when warranty certificate or proof of purchase and equipment serial number is presented. Furthermore, the installation and operation has to be carried out in accordance with the product manual. Warranty liability does not apply to any equipment which has become inoperative due to misuse, accident, neglect, sea water damage or unauthorized repair. Simrad will not be liable for any loss, incidental or consequential damages whether based upon warranty, contract or negligence, or arising in connection with the sale, installation, use or repair of the product. Consequential damages include, but are not limited to, any loss of profit, property damage or personal injury. The terms of warranty as described does not affect your statutory rights.

TO BE RETAINED BY THE OWNER

SIMRAD
A KONGSBERG Company

ADDRESS

HOME PORT

SERIAL NO.

[illegible]

DATE OF INSTALLATION

YES: _____ NO: _____
INSTRUCTION FOR USE GIVEN

AUTHORIZED INSTALLER/DEALER STAMP

SIMRAD warrants that every product shall be free of defects in material and workmanship as specified overleaf:

SIMRAD

Simrad Støvring AS
Østre Allé 6
DK-9530 Støvring
Denmark

VESSEL

HOME PORT

TYPE

EQUIPMENT

DATE OF INSTALLATION

(DEALER'S SIGNATURE)

(DEALER'S SIGNATURE)

STAMP
HERE

NATIONAL SIMRAD DISTRIBUTOR:
