FURUNO

OPERATOR'S MANUAL

COLOR VIDEO SOUNDER

MODEL FCV-1500

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·Your Local Agent/Dealer

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SAFETY INSTRUCTIONS

⚠ WARNING

ELECTRICAL SHOCK HAZARD
Do not open the equipment.

Only qualified personnel should work inside the equipment.

Immediately turn off the power at the switchboard if water leaks into the equipment or something is dropped in the equipment.

Continued use of the equipment can cause fire or electrical shock. Contact a FURUNO agent for service.

Do not disassemble or modify the equipment.

Fire, electrical shock or serious injury can result.

Do not place liquid-filled containers on the top of the equipment.

Fire or electrical shock can result if a liquid spills into the equipment.

Immediately turn off the power at the switchboard if the equipment is emitting smoke or fire.

Continued use of the equipment can cause fire or electrical shock. Contact a FURUNO agent for service.

Make sure no rain or water splash leaks into the equipment.

Fire or electrical shock can result if water leaks in the equipment.

⚠ WARNING

Keep heater away from equipment.

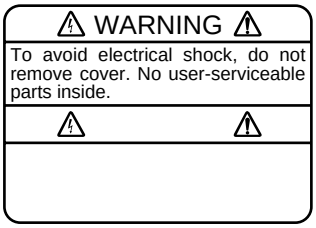
A heater can melt the equipment's power cord, which can cause fire or electrical shock.

Use the proper fuse.

Fuse rating is shown on the equipment. Use of a wrong fuse can result in equipment damage.

⚠ CAUTION

A warning label is attached to the equipment. Do not remove the label. If the label is missing or illegible, contact a FURUNO agent or dealer.



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

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A Word to FCV-1500/1500M Owners

Congratulations on your choice of the FURUNO FCV-1500/FCV-1500M COLOR VIDEO SOUNDER. FCV-1500 is a dual-frequency color video sounder, and FCV-1500M is a monitor which displays the external video sounder signal. We are confident you will see why the FURUNO name has become synonymous with quality and reliability.

For over 50 years FURUNO Electric Company has enjoyed an enviable reputation for innovative and dependable marine electronics equipment. This dedication to excellence is furthered by our extensive global network of agents and dealers.

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

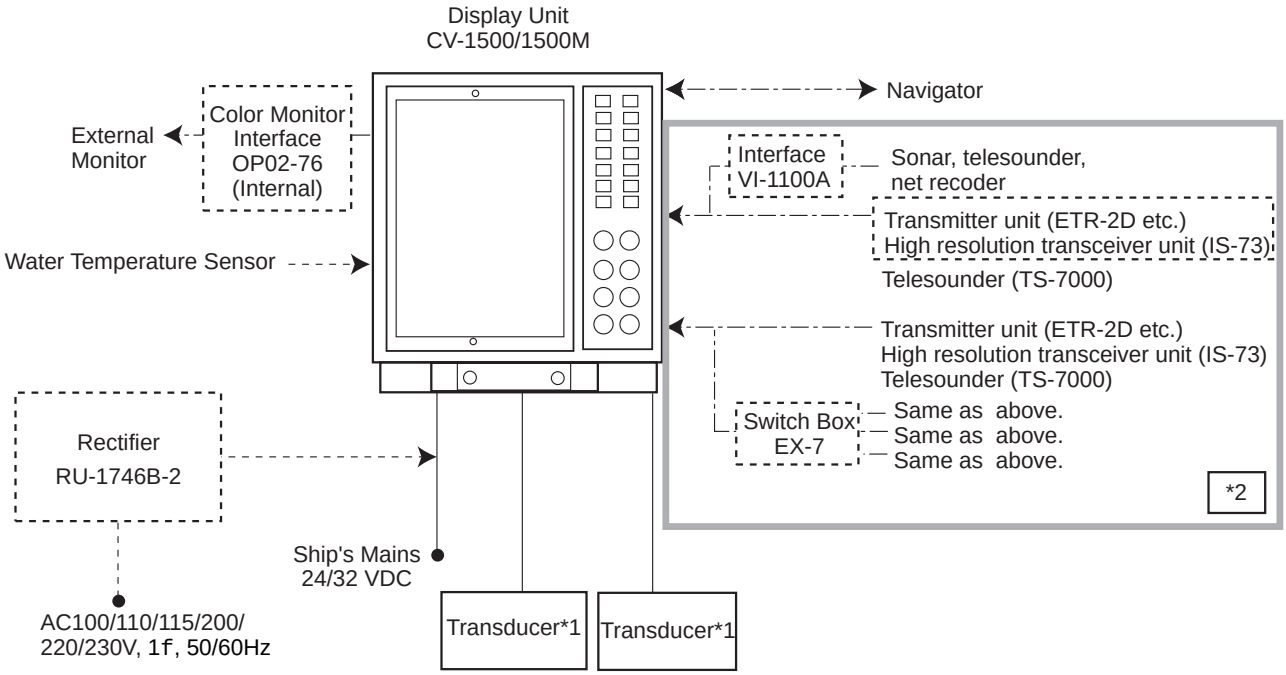
We would appreciate hearing from you, the end-user, about whether we are achieving our purposes.

Thank you for considering and purchasing FURUNO equipment.

Features

- 8 or 16 color presentation (including background) provides detailed information on fish density and bottom composition, on a 15-inch color CRT.
- Automatic bottom tracking features permits unattended operation.
- Alarms: Fish, Bottom, Fish-Bottom, Water Temperature (temperature data required).
- Two types of noise limiters effectively suppress interference from other sonars and video sounders.
- Independent adjustment of gain, TVG and clutter for both low and high frequencies.
- A-scope presentation displays echoes at each transmission with amplitudes and colors according to intensities.
- Picture storage and retrieval.
- Frequency mixing picture helps discriminate fish species.
- Eight basic ranges are operator-programmable to suit individual fishing ground, fishing method.

SYSTEM CONFIGURATION



*1 : FCV-1500 only
*2 : FCV-1500M only
- - - - - - - - : Option
—·—·—·— : Connectable External Equipment

1.1 Controls

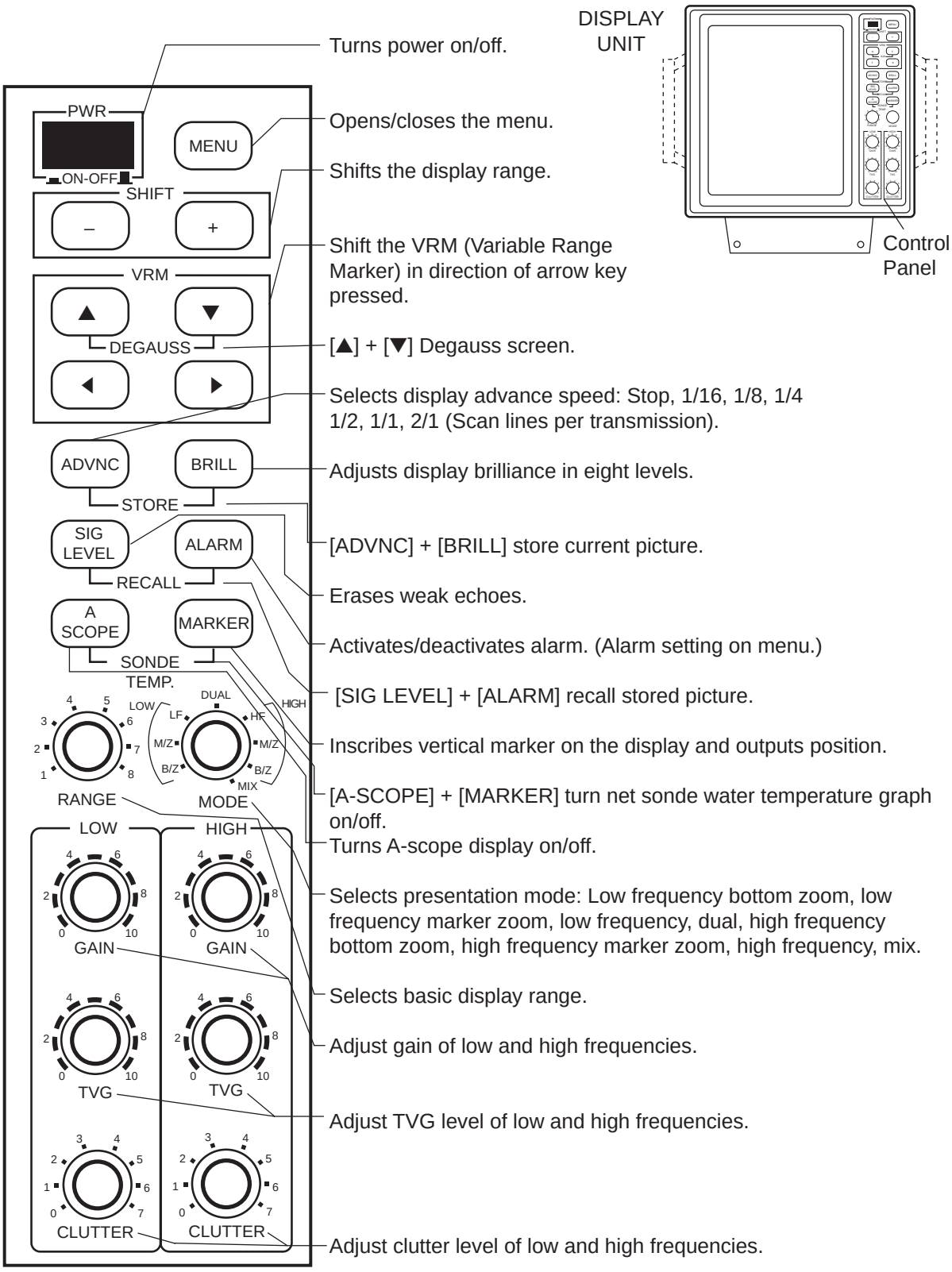


Figure 1-1 Control panel

1.2 Indications

Figure 1-2 shows the various indications which appears on the display.

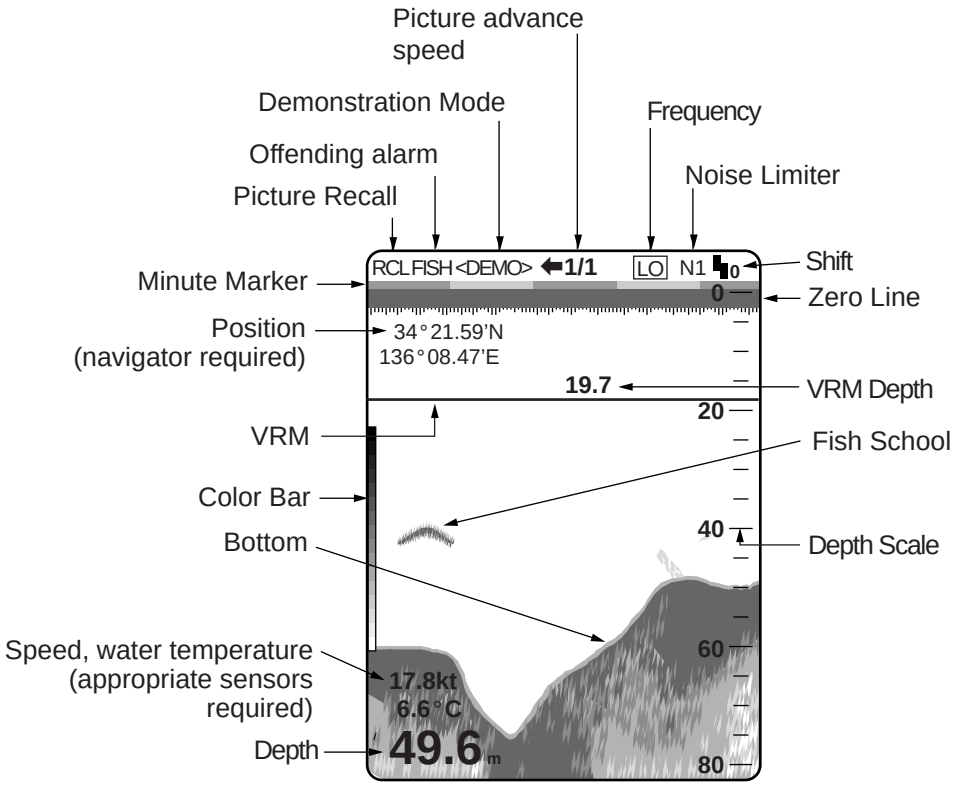


Figure 1-2 Indications on the normal display

1.3 Turning the Power On/Off

Press the [PWR] key to turn the power on or off. Each time the power is turned on the equipment beeps and starts up with last-used settings. After the turning the power off, wait a few seconds before turning the power on again.

Note: With the demonstration mode, you can practice this equipment while the ship is anchored. Refer to Chapter 3.

1.4 Screen Brilliance

Press the [BRILL] key, and the display below appears. Press the [BRILL] key again within five seconds to select brilliance level desired. (The window disappears if more than five seconds elapses between pressings of the [BRILL] key.)

Figure 1-3 Brilliance window

1.5 Presentation Mode

Eight presentation modes are available with the [MODE] switch.

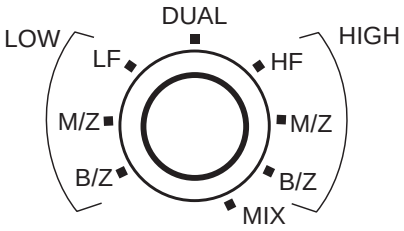


Figure 1-4 MODE switch

Single picture (low frequency or high frequency)

- Low frequency

  The lower the frequency of the ultrasonic pulse the wider the detection area. Thus, the low frequency is suitable for general search and judging bottom condition.

- High frequency

  The higher the frequency of the ultrasonic pulse the better the resolution. Therefore, the high frequency pulse is useful for detailed observation of fish echoes.

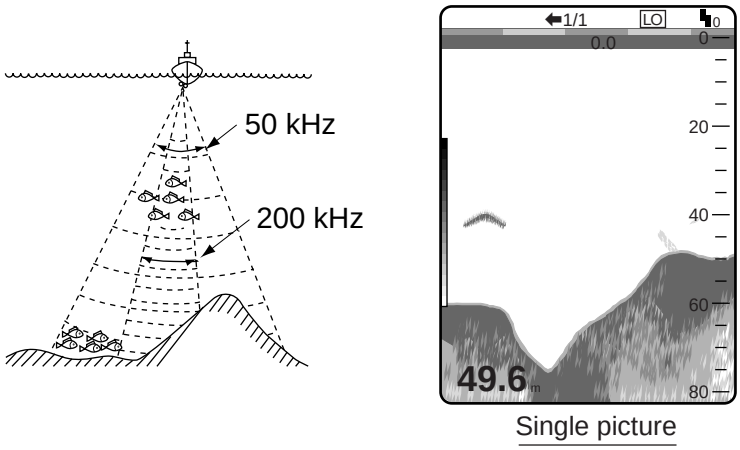


Figure 1-5 Comparison of detection ranges, sample single picture

Dual

Provides the low frequency picture on the left 1/2 of the screen; the high frequency on the right 1/2.

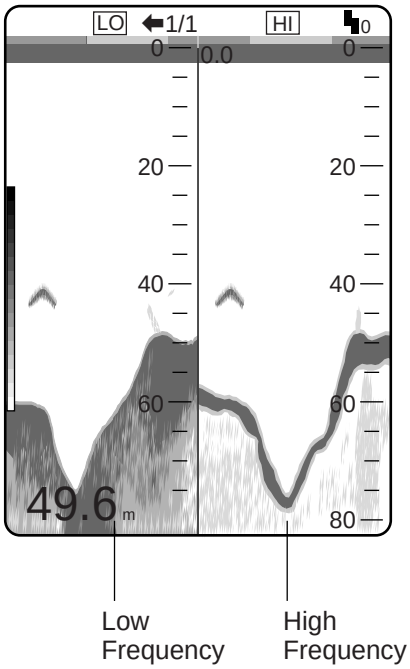


Figure 1-6 Dual frequency display (normal high and low frequency displays)

The default dual display shows the low and high frequency normal displays. Alternately, you may show high and low frequency bottom-lock displays. This can be done on the DISP/FUNC menu. For further details see DUAL MODE on page 2-2.

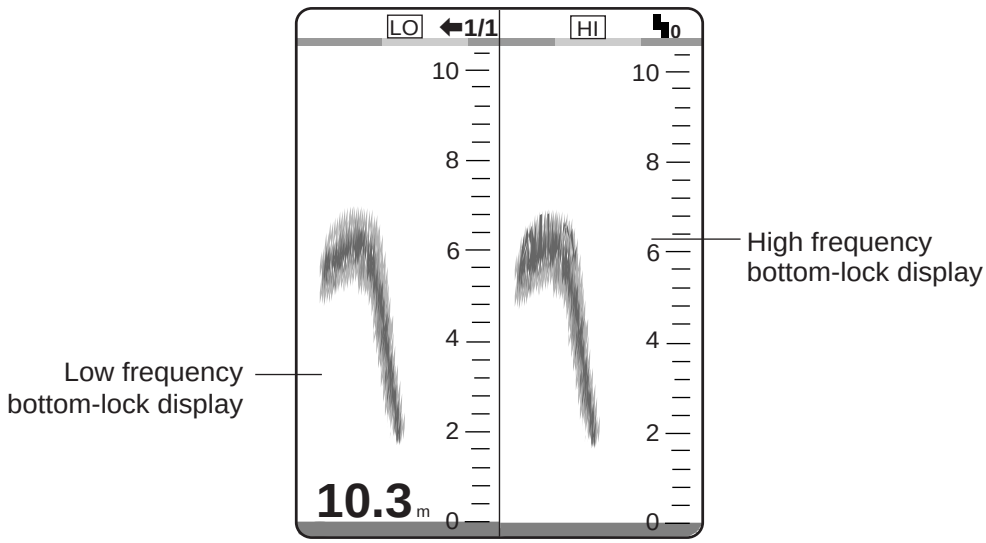


Figure 1-7 Dual frequency display, showing high and low frequency bottom-lock displays

Bottom zoom (high frequency or low frequency)

The normal high or low frequency picture appears on the right 1/2 of the screen and the bottom zoom picture (either bottom-lock display, the default display, or bottom-discrimination display) on the left 1/2. The bottom-lock display shows the bottom as a straight line at the bottom of the screen to distinguish it from fish near the bottom, and thus it is useful for discriminating fish near the bottom.

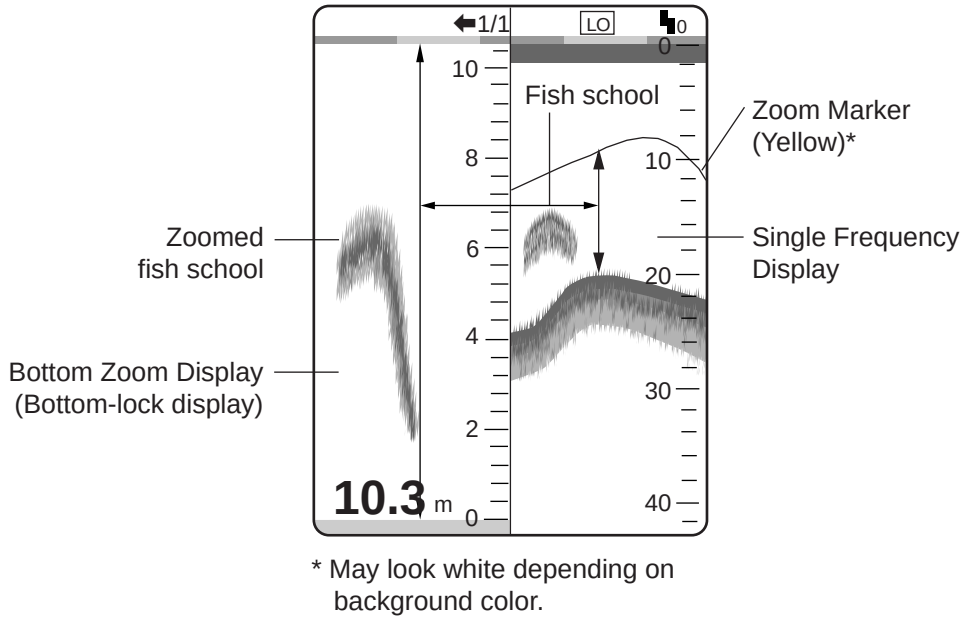


Figure 1-8 Bottom zoom display, bottom-lock display

The bottom discrimination display shows the bottom as a straight line on the left 1/2 of the screen and the normal picture on the right 1/2. It is useful for determining bottom hardness. You can choose which bottom zoom display to use on the DISP/FUNC menu. For details, see B/Z on page 2-2. B/D appears at the top of the screen when the bottom discrimination display is selected.

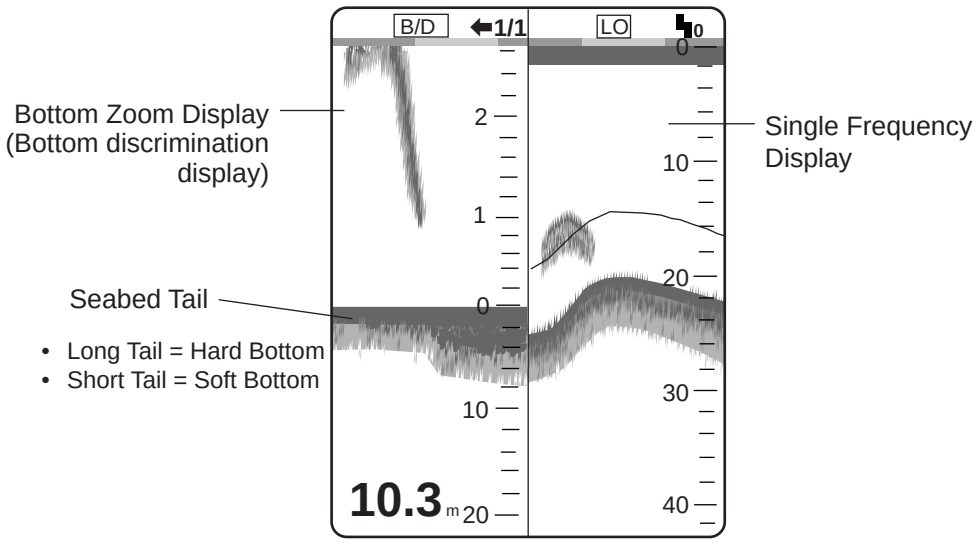


Figure 1-9 Bottom zoom display, bottom discrimination display

Marker zoom (high frequency or low frequency)

The normal high or low frequency picture appears on the right 1/2 of the screen and the marker zoom (M/Z) picture on the left 1/2. The marker zoom display expands the area selected with the VRM on the normal picture to full vertical size of the screen on the left-half window. This mode is useful for observing specific fish schools.

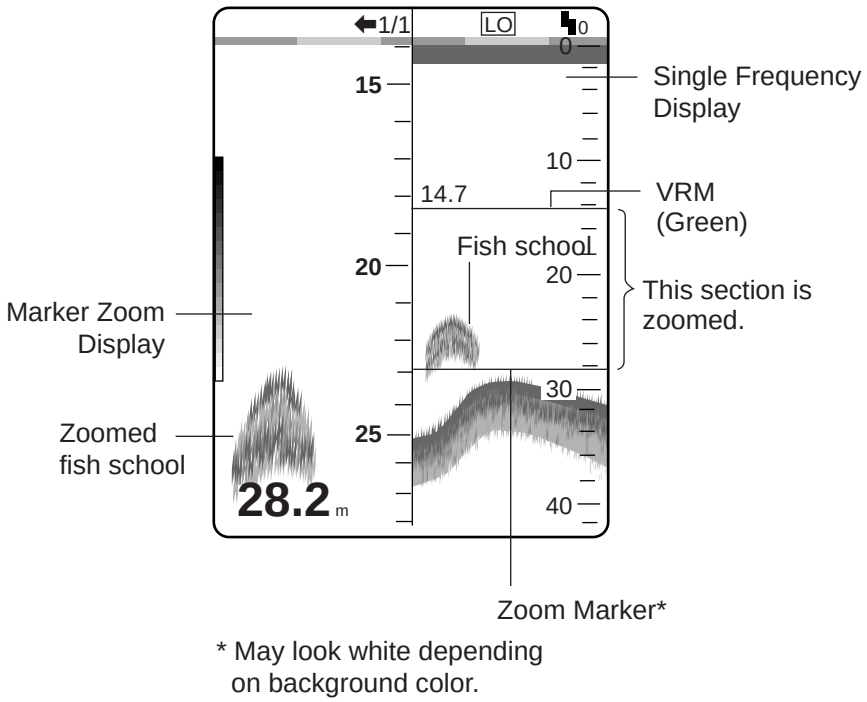


Figure 1-10 Marker zoom display

Mix

This mode compares echo intensity between low and high frequencies, and displays echoes from tiny fish in discriminative colors. This is done by utilizing the fact that tiny fish return a stronger echo against a high frequency rather than a low frequency. This is done as below.

1) If a high frequency echo is stronger than the corresponding echo on the low frequency, the high frequency echo is displayed.
2) If the low frequency echo is stronger than or equal to the high frequency echo, it is less likely to be a tiny fish and therefore is displayed in blue.
3) If the echoes on both frequencies have the intensity corresponding to reddish brown or red, they are displayed in reddish brown or red: this is necessary to display the zero line and bottom in reddish brown or red.

In other words, the echoes displayed in orange thru light-blue may be considered to be tiny fish such as whitebait.

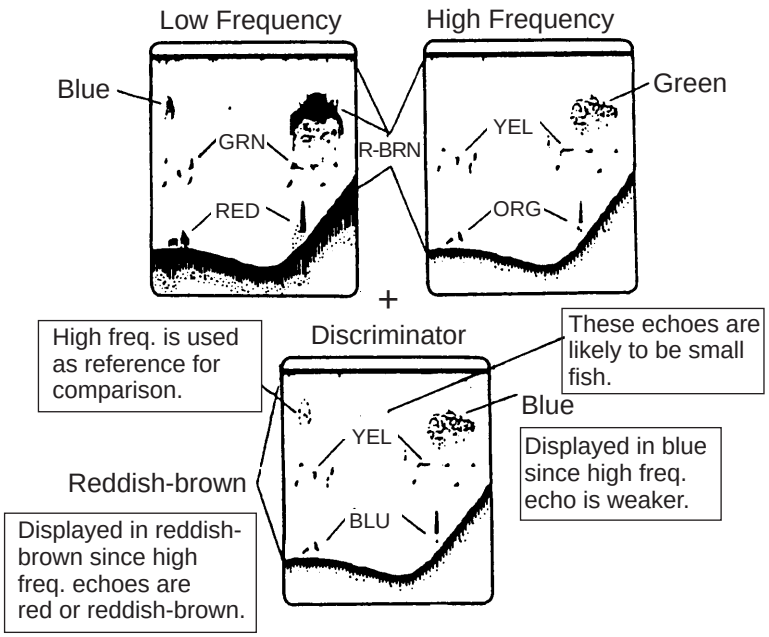


Figure 1-11 How the mix display works

The default mix display only shows the mix display. Alternately you may display the high or low frequency on the left-half of the screen and the mix display on the right-half. This can be done on the DISP/FUNC menu. For further details see MIX MODE DISP on page 2-2.

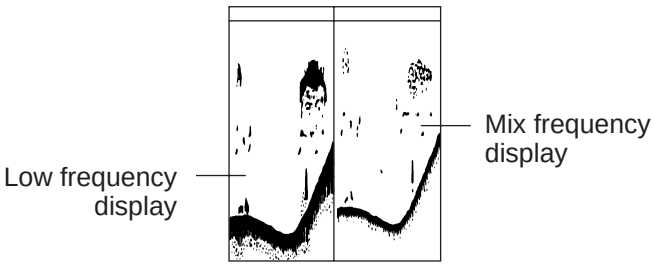


Figure 1-12 Low frequency display and mix display

1.6 Selecting Basic Range

The basic range may be selected with the [RANGE] switch from the eight ranges listed below. (The default unit of depth measurement is feet.) These eight ranges may be programmed as desired, on the ALARM/RNG menu. For further details, see the ALARM/RNG menu description on page 2-5.

Basic ranges (default settings)

Range Unit	Range Switch Position							
	1	2	3	4	5	6	7	8
Feet	30	60	120	250	500	1000	1600	3000
Meters	10	20	40	80	150	300	500	1000
Fathoms	5	10	20	40	80	160	250	500
Passi/Braza	6	12	25	50	100	200	300	600

1.7 Shifting the Basic Range

The [SHIFT-] and [SHIFT+] keys determine the start depth of the picture. Holding down the keys accelerates the speed of shift progressively in steps of 1 m, 10 m, 100 m and 1000 m. Shift value is shown at the top of the screen.

The FCV-1500 can automatically shift the display range to provide virtually hands-free automatic operation. This can be done with SHIFT on the DISP/FUNC menu. For further details see “SHIFT” on page 2-4. When the AUTO SHIFT feature is enabled the SHIFT keys [+]/[-] are inoperative. Operating them with the AUTO SHIFT feature turned on displays the message “Doesn’t activate during AUTO SHIFT!”

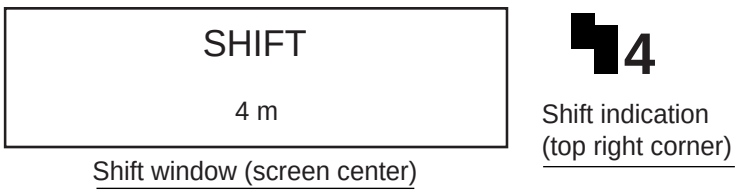
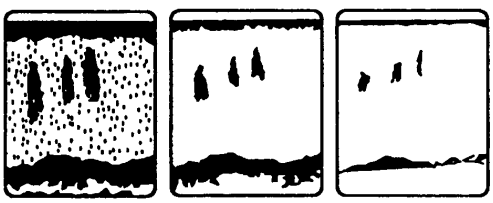


Figure 1-13 Shift window, shift indication

1.8 Adjusting Gain

The [GAIN] control adjusts the sensitivity of the receiver. Adjust it so excessive noise just disappears from the screen.



Gain too high Gain proper Gain too low

Figure 1-14 Examples of proper and improper gain levels

1.9 Adjusting TVG

The TVG compensates for propagation loss of sound, so that the echoes from the same size fish schools are displayed in the same color. Normally, set it between “0” and “5”. Avoid excessive TVG; weak echoes may not be displayed. The TVG is also useful for reducing surface noise.

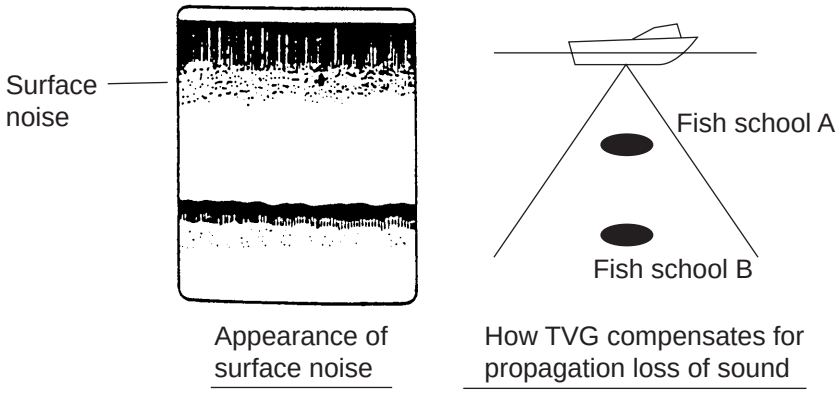


Figure 1-15 How TVG works

Note: Surface noise appearing in the range of 0 to 40 m can be reduced by the STC function. For details, see STC on page 2-8.

1.10 Adjusting Clutter

When blue dots appear over the entire screen (mainly caused by dirty water), use the [CLUTTER] control to eliminate them. The higher the setting the more clutter is suppressed. Avoid overadjusting the clutter–weak echoes may be eliminated. A setting between “1” and “4” is suitable in most cases.

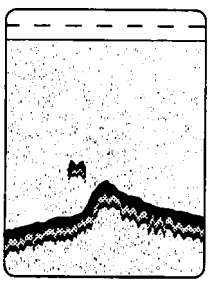


Figure 1-16 Appearance of clutter

1.11 Picture Advance Speed

The [ADVNC] key selects picture advance speed. Press the key to show the “ADVANCE” window.

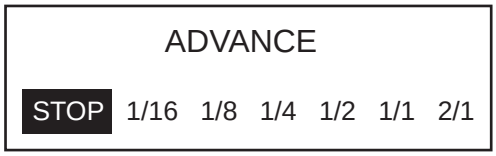


Figure 1-17 Advance window

Press the key again to select desired speed. The fractions in the window mean the number of vertical scan lines produced per transmission. For example, “1/2” means a vertical scan line is produced every two transmissions. These fractions also appear at the top of the screen for your reference.

When selecting an advance speed, keep in mind that a fast advance speed will expand the size of a fish school horizontally and a slow speed will contract it.

With speed data provided by a speed log, current indicator or navigation equipment, the display advance speed may be set according to ship’s speed, the ship’s speed dependent mode. As shown in the figure below the horizontal scale of the display is not influenced by the change of ship’s speed, thus the speed-dependent picture advance permits judgement of fish school size and abundance at any speed. The picture advance speed indication is suffixed with an “S” when the ship’s speed dependent mode is active. For example, “1/1S.” For how to enable the ship’s speed dependent mode see PRR LEVEL on page 2-9.

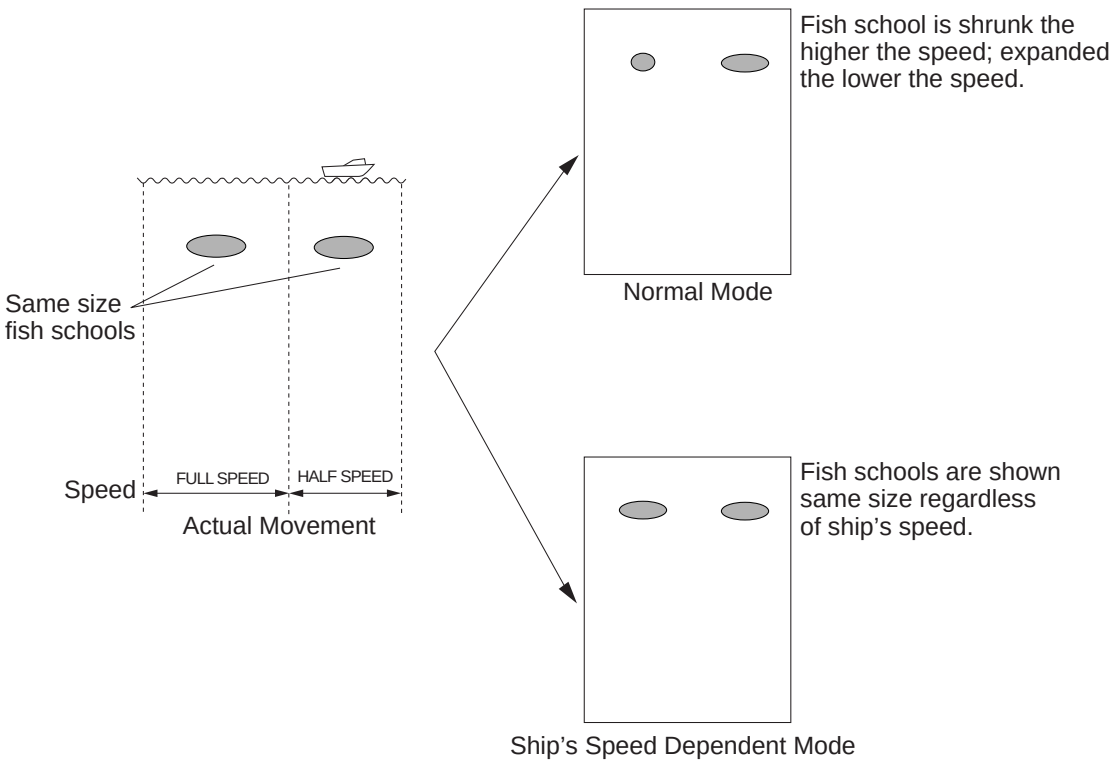


Figure 1-18 How the ship’s speed dependent mode works

1.12 Eliminating Weak Echoes

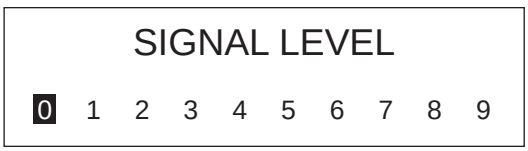
Dirty water or reflections from plankton may be painted on the display in green or light-blue. These weak echoes may be erased with the [SIG LEVEL] key. Every pressing eliminates the weakest echoes on the screen, up to yellow echoes. The echoes eliminated can be identified with the color bar where a color is eliminated with each pressing of the [SIG LEVEL] key.

FURUNO Std. Color	8 color display	16 color display
Reddish-brown	7	15
		14
Red	6	13
		12
Orange	5	11
		10
Yellow	4	9
		8
Green	3	7
		6
Light-blue	2	5
		4
Blue	1	3
		2
Background	0	1
		0

Range of colors which can be erased.

Note: Above colors are applicable to default colors.
Accordingly, the result will vary with color arrangement used.

1. Press the [SIG LEVEL] key to display the SIGNAL LEVEL window.



16 color display

8 color display

Figure 1-19 Signal level windows

2. Press the key again to select level desired. Note you may also select the echo to erase with the [◀] or [▶] key.

1.13 Measuring Depth, Time

Measuring depth

Use the VRM keys [▲]/[▼] to place the VRM on the object to measure depth. Depth is digitally displayed above the VRM. VRM depth may be displayed at the top of the screen instead of above the VRM. This can be done with VRM READOUT on the DISP/FUNC menu. For further details see VRM READOUT on page 2-4.

Measuring elapsed time

Use the [◀]/[▶] key to measure time (default setting). Elapsed time is shown at the bottom of the screen. With connection of speed sensor (or navigator), the [◀]/[▶] key may measure range instead of time. This can be done on the FUNCTION SETTING menu. For further details see VERT VRM UNIT at Chapter 3.

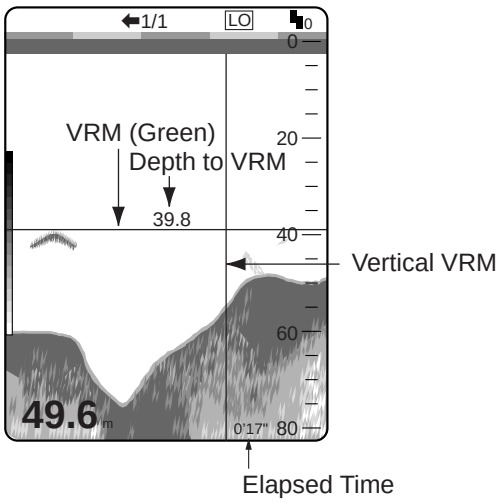


Figure 1-20 How to use the VRM

1.14 Alarms

The FCV-1500 has four types of alarms which trigger visual and aural alarms: Fish, Bottom, Bottom-fish, and Water Temperature (sensor required). When an alarm setting is violated the FCV-1500 releases visual and aural alarms. You can temporarily silence the aural alarm with the [ALARM] key. The aural alarm will sound again whenever the alarm is violated. The visual alarm remains on the screen until the offending alarm is disabled.

Fish alarm: Fish of yellow or stronger echo color entering the alarm zone will trigger the alarms.

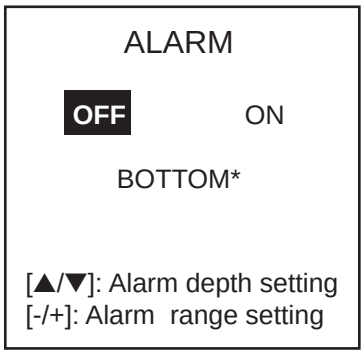
Bottom alarm: Bottom echo of red or stronger color coming into the alarm zone will trip the alarms.

Bottom-fish alarm: This alarm will be triggered when fish echoes of yellow or stronger color are within a preset distance from the bottom. Effective only in the bottom zoom mode.

Water temperature alarm: This alarm is triggered when the water temperature is above (below) the preset range.

1. Select the alarm type desired from the ALARM/RNG menu. The default setting is the bottom alarm. See page 2-5 for how to select alarm.

2. Press the [ALARM] key.



* Alarm selected on the ALARM/RNG menu.

Figure 1-21 Alarm window

3. Within five seconds of completing step 2, press the [ALARM] key to enable/disable the alarm selected.

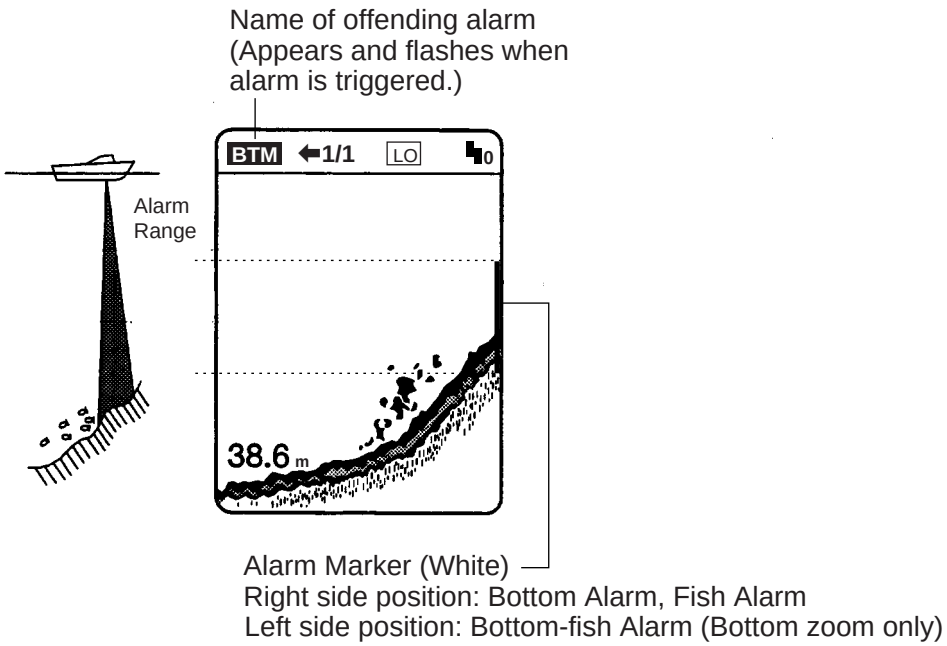


Figure 1-22 Alarm setting

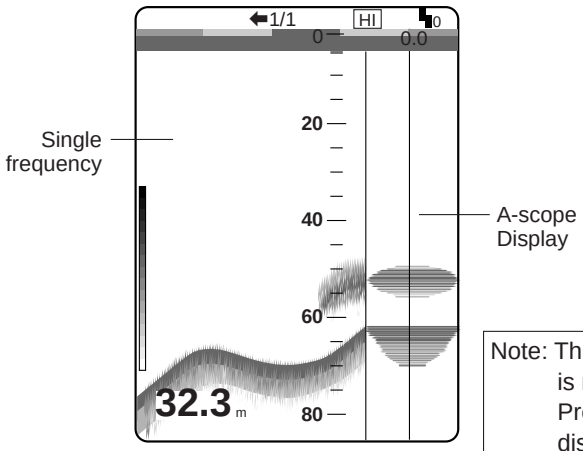
4. Use the VRM keys [▲], [▼] to locate the alarm range marker.

5. Use the [+] and [-] keys to set alarm range. (Note that the alarm zone marker can only be moved when the ALARM window is displayed.)

To disable the alarm select OFF at step 2 in this procedure.

1.15 A-Scope Display

The A-scope picture displays echoes at each transmission with amplitudes and colors proportional to their intensities on the right 1/3 of the screen. This feature is useful for close observation of small fish and fish near the bottom, vital for bottom trawlers and lobster/crab potters. Use the [A-SCOPE] key to turn the A-scope display on/off.



Note: The recalling picture function (Refer to section 1.17 below.) is not available on the A-scope display.
Press the [A-SCOPE] key again to appear the A-scope displasy.

Figure 1-23 A-scope display

1.16 Marker Line, Position Output

The [MARKER] key inscribes a vertical line in the strongest color. It may be used to denote a fish school or other important echo. At the same moment the key is pressed latitude and longitude position are output to connected navigation plotter and marked on its screen. (This feature requires a navigation plotter.)

Elapsed time from the moment that the [MARKER] key is pressed may be displayed at the upper-left corner of the screen, by selection on the SYSTEM MENU (See page 3-3).

1.17 Storing, Recalling Picture

The picture currently displayed on the screen can be stored in the memory and recalled whenever desired. Only one picture can be stored; the previous picture is erased each time a picture is stored.

Storing

Press the [ADVNC] and [BRILL] keys together. The picture is saved to the memory. The message “Complete picture storing” appears and a beep sounds when the picture has been stored.

Recalling

Press the [SIG LEVEL] and [ALARM] keys together. The stored picture appears and the indication “RCL” appears at the top left-hand corner. To return to normal operation, press the [SIG LEVEL] and [ALARM] keys together again.

1.18 Net Sonde Water Temperature Display

A display showing net sonde water temperature at the position of the net sonde transmitters may be shown by pressing the [A-SCOPE] and [MARKER] keys together. This feature requires a net sonde.

1. Press [A-SCOPE] and [MARKER] together.

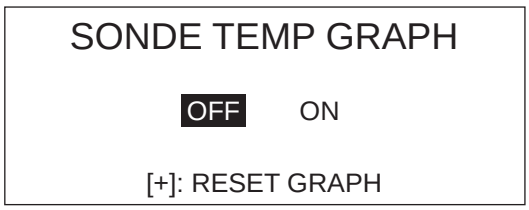


Figure 1-24 Net sonde temperature graph window

2. Within five seconds of completing step 1, press [A-SCOPE] and [MARKER] together again to turn the net sonde temperature graph display on or off.
3. To reset the graph press the [+] key while the screen shown in Figure 1-21 is displayed. When this is done the graph is erased and redrawn with the latest water temperature data.

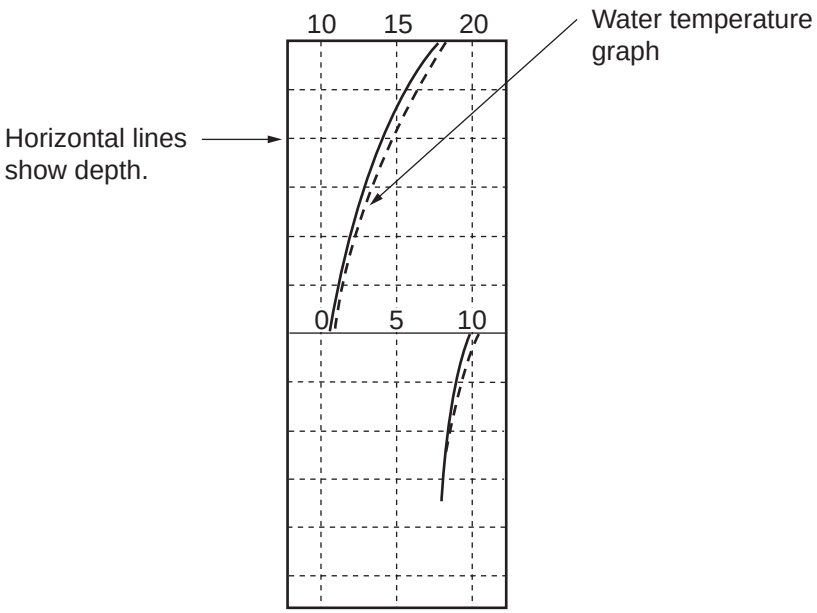


Figure 1-25 Water temperature graph

Note: The default water temperature graph displays net sonde transmitter position temperature based on surface temperature. Alternately, net sonde transmitter position temperature based on bottom temperature can be shown. This can be done on the DISP/FUNC menu. For further details see SONDE GRAPH on page 2-3.

1.19 Degaussing the Screen

The screen is degaussed automatically at certain time intervals, which may be selected on the DISP/FUNC menu. (See AUTO DEGAUSS on page 2-4.) While being degaussed, the screen may be disturbed momentarily with vertical lines. If you wish to degauss by manual operation, press [▲] and [▼] together.

2.1 Basic Menu Operation

The main menu, consisting of the DISP/FUNC, ALARM/RNG and TX/RX menus, contains various items which once preset do not require frequent adjustment.

1. Press the [MENU] key to open the menu. The last-used menu among DISP/FUNC, ALARM/RNG and TX/RX appears.
2. Select menu with [+] or [-] key. The menu selected is highlighted at the top of the screen.
3. Select item with the [▲] or [▼] key. The selected item is highlighted in light-blue.
4. Select option with the [◀] or [▶] key. The selection option is highlighted in light-blue.
5. Press the [MENU] key to close the menu.

2.2 DISP/FUNC Menu

<DISP/FUNC> <ALARM/RNG> <TX/RX>

(Use [-], [+] to select MENU.)

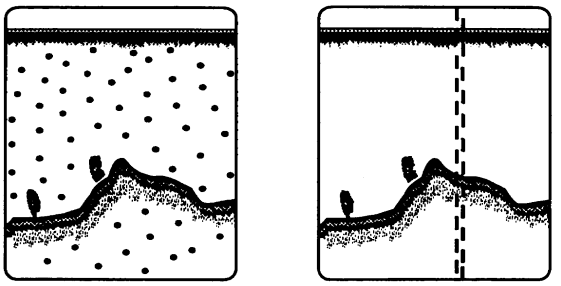
NOISE LIMIT	: OFF	N1	N2	N3
BACKGND COLOR	: BLACK	DARKBLUE	[BLUE]	
HUE	: USER SET	[STANDARD]	HUE-1...	
NO. OF COLORS	: 8	[16]		
MIX MODE DISP	: [MIX]	LO/MIX	HI/MIX	
DUAL MODE	: [NORMAL]	B/L		
B/Z	: [B/L]	B/D		
COLOR (SONDE)	: [COLOR-1]	COLOR-2	COLOR-3	
SONDE MARK	: [OFF]	LOW-FREQ	HI-FREQ	
SONDE GRAPH	: [SURFACE]	BOTTOM		
NAV DATA DISP	: OFF	[STANDARD]	DEPTH	
BOTTOM SEARCH	: [AUTO]	LOW-FREQ	HI-FREQ	
TEMP GRAPH	: [OFF]	ON		
SHIFT	: [MANUAL]	AUTO		
SHIFT LIMIT	: 2500	[3000]	3500...	
VRM READOUT	: [STANDARD]	TOP		
SMOOTHING	: [3]	(◀: OFF, 1~8: ▶)		
AUTO DEGAUSS	: [30] seconds	(◀: 4~60sec, OFF: ▶)		

[▲] [▼] : Select item.
[◀] [▶] : Change setting.
[MENU] : Exit.

(Default settings are circumscribed.)

Figure 2-1 DISP/FUNC menu

NOISE LIMIT: Suppresses interference from other echo sounders or electrical interference. Four levels are available including off: N1, N2, N3 and OFF. N3 offers the highest level of interference rejection. Turn off the noise limiter when no interference exists; weak echoes may be eliminated.



Interference from other sounder

Electrical inteference

Figure 2-2 Interference

BACKGND COLOR: Selects background color to black, dark blue or blue. Note that the background color is fixed when the user color (in HUE below) is selected.

HUE: Selects desired picture color. USER displays the colors programmed by the user. (See 3.4 USER COLOR menu on page 3-5.) STD is the standard colors used on most FURUNO video sounders. COLOR 1-7 provide other picture color arrangements.

NO. OF COLORS: Selects eight color or sixteen color presentation.

MIX MODE DISP: Selects mix mode picture arrangement. LO/MIX, low frequency and mix pictures; HI/MIX, High frequency and mix pictures, MIX, Mix picture only.

DUAL MODE: Determines what pictures are displayed on the screen when DUAL is selected with the [MODE] control. NORMAL, High and low frequencies, B/L, Low and high frequency bottom-lock pictures.

B/Z: Determines what pictures are displayed on the screen when B/Z is selected with the [MODE] control. B/L displays bottom as a straight line at screen bottom (useful for observing fish near the bottom) and B/D displays bottom as a straight line at screen center (useful for observing bottom tail).

COLOR (SONDE): Selects number of colors to display in net sonde display.

COLOR-1: Color of level 14 (Reddish-brown in standard color)
COLOR-2: Color of level 12 (Red in standard color)
COLOR-3: Color of level 10 (Orange in standard color).

COLOR-1, -2, -3 are not fixed; they change according to the setting of HUE.

SONDE MARK: Selects where to display the sonde mark; HIGH frequency picture, LOW frequency picture or OFF.

SONDE GRAPH: Selects the display starting position of the net sonde water temperature graph. SURFACE is the first-written water temperature (surface condition); BOTTOM the last-written water temperature (net sonde position). The display range is 12 C and the scale interval is 5 C. The display range shifts with temperature. For example, if the surface water temperature is 18 C, the first temperature scale would be 10 C-20 C and the display range is 9 C-21 C. If the water temperature drops by 9 C, for example, the next temperature scale would be 0 C to 10 C and the display range -1 C to 11 C.

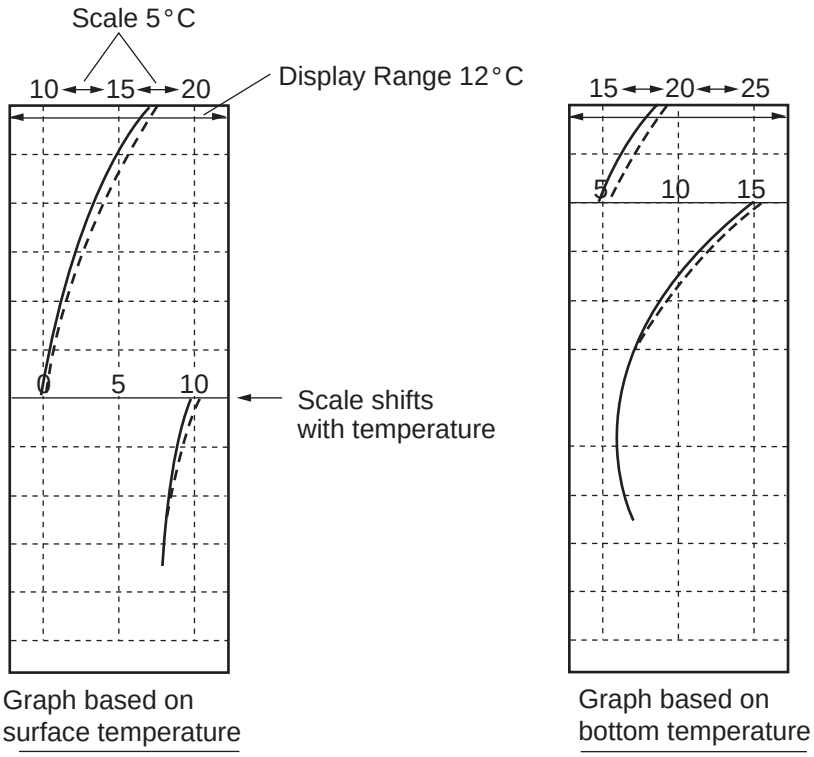


Figure 2-3 Net sonde water temperature graph

NAV DATA DISP: Turns on/off nav data (position, speed, temperature, depth). DEPTH displays only depth data.

BOTTOM SEARCH: Selects transducer which is to measure depth, AUTO, automatic; LOW, low frequency, HIGH, high frequency.

TEMP GRAPH: Turns water temperature graph and scale on/off.

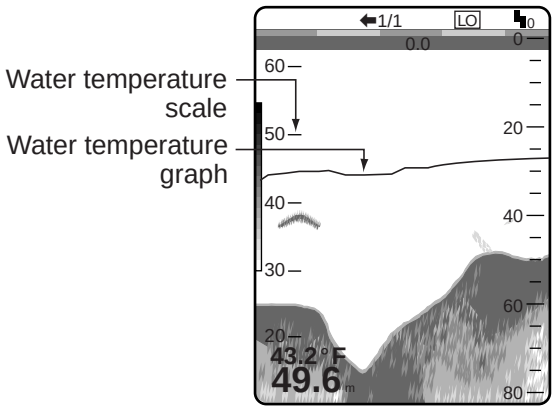
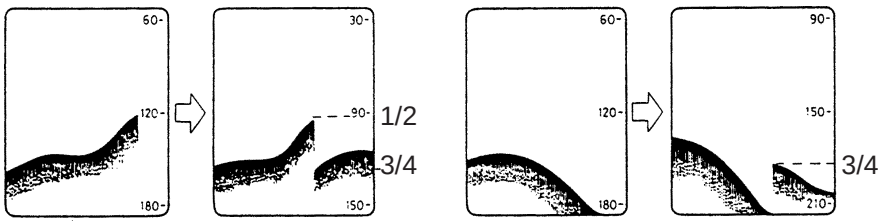


Figure 2-4 Location of water temperature scale and graph

SHIFT: Selects manual or automatic depth shift. The automatic shift function automatically locates the bottom trace on the lower half of the screen; the range window jumps up when the bottom trace rises over the center of the screen and jumps down when it reaches the bottom of the screen. AUTO appears at the top right corner of the screen when the auto shift function is on. Note that the SHIFT keys ([+], [–]) are inoperative when the automatic shift function is turned on.



Range changes automatically to locate the bottom on the lower half of screen.

The equipment shifts to a deeper range when the bottom comes to the lower edge of the depth scale.

Figure 2-5 Automatic shift concept

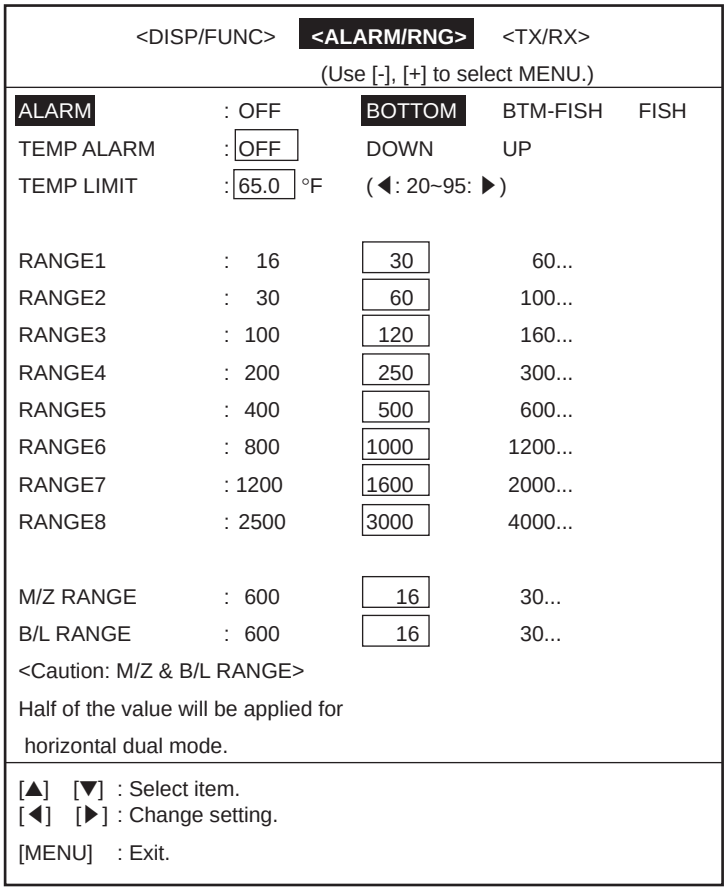
SHIFT LIMIT: Sets the depth limit for automatic bottom tracking.

VRM READOUT: Selects location of VRM depth data. STANDARD, near the VRM, TOP, at top of screen. When TOP is selected the VRM indication is shown as VRM xx.x (x=depth).

SMOOTHING: Smooths echo presentation. The higher the number, the greater the smoothing.

AUTO DEGAUSS: Selects screen degaussing interval in one second increments, from 4-60 seconds and OFF.

2.3 ALARM/RNG menu



(Default settings are circumscribed.)

Figure 2-6 ALARM/RNG menu

ALARM: Selects alarm function to use.

- BOTTOM: Red color or stronger bottom echoes trigger the alarm.
- BTM-FISH: Yellow or stronger fish echoes near the bottom trigger the alarm.
- FISH: Fish echoes of yellow or stronger colors trigger the alarm.

TEMP ALARM: Selects temperature range which triggers temperature alarm. Alarm is activated when water temperature is above (UP) or below (DOWN) preset value.

TEMP LIMIT: Sets temperature alarm value (20 F to 95 F in 0.1 F steps).

RANGE1-RANGE8: Presets basic ranges for the [RANGE] switch.

Basic ranges

No.	M	*FT	FA	P/B	No.	M	*FT	FA	P/B
1	5	16	2.5	3	12	200	600	100	120
*2	10	30	5	6	13	250	800	120	160
*3	20	60	10	12	*14	300	1000	160	200
4	30	100	16	20	15	400	1200	200	250
*5	40	120	20	25	*16	500	1600	250	300
6	50	160	25	30	17	600	2000	300	400
7	60	200	30	40	18	800	2500	400	500
*8	80	250	40	50	*19	1000	3000	500	600
9	100	300	50	60	20	1200	4000	600	800
10	120	400	60	80	21	1500	5000	800	1000
*11	150	500	80	100	22	2000	6000	1000	1200

* Default setting

M/Z RANGE: Sets display range of marker zoom picture. See the table below for possible settings.

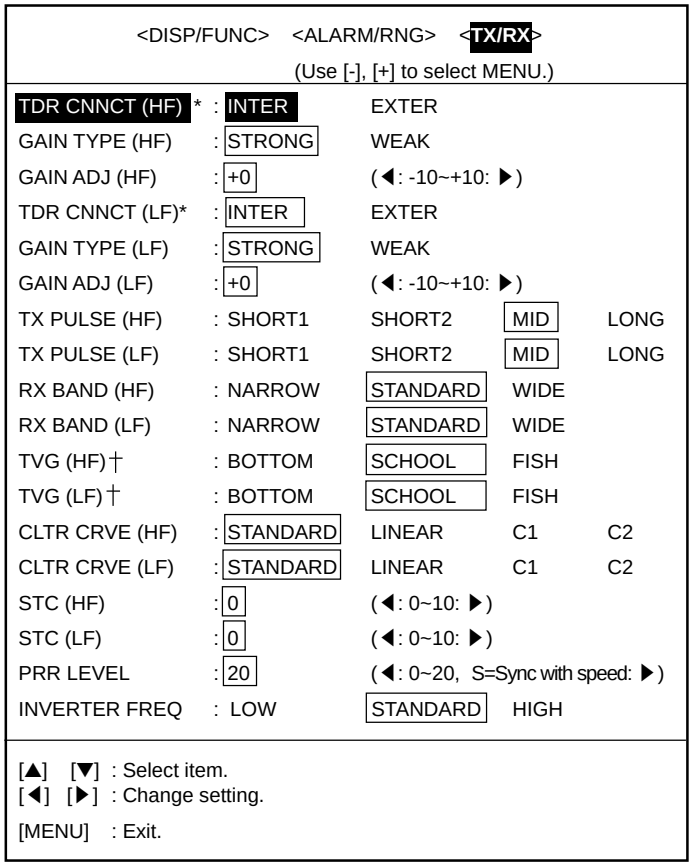
B/L RANGE: Sets bottom-lock expansion range. See the table below for possible settings.

Marker zoom, bottom-lock ranges

No.	M	*FT	FA	P/B
*1	5	16	2.5	3
2	10	30	5	6
3	20	60	10	12
4	30	100	16	20
5	40	120	20	25
6	50	160	25	30
7	60	200	30	40
8	80	250	40	50
9	100	300	50	60
10	120	400	60	80
11	150	500	80	100
12	200	600	100	120

*Default setting

2.4 TX/RX Menu



(Default settings are circumscribed.)

*: Set at installation. Do not change the setting.

†: Not available on FCV-1500M.

Figure 2-7 TX/RX menu

TDR CNNCT (HF): Sets he transceiver unit to use for the high frequency automatically. FCV-1500; INTER, FCV-1500M; EXTER.

GAIN TYPE (HF): Sets gain adjustment range for the high frequency. STRONG is effective in the strong gain settings (4-10) of previous FURUNO sounders. WEAK is effective in the low gain settings (0-6) of previous FURUNO sounders.

GAIN ADJ. (HF): Adjusts gain of transceiver unit selected at TDR CNNCT (HF).

TDR CNNCT (LF): Sets he transceiver unit to use for the low frequency automatically. FCV-1500; INTER, FCV-1500M; EXTER.

GAIN TYPE (LF): Sets gain adjustment range for the low frequency. STRONG is effective in the strong gain settings (4-10) of previous FURUNO sounders. WEAK is effective in the low gain settings (0-6) of previous FURUNO sounders.

GAIN ADJ. (LF): Adjusts gain of transceiver unit selected at TDR CNNCT (LF). This setting is restored to its default setting whenever default settings are restored. Therefore, if necessary, note the setting before restoring default settings.

TX PULSE (HF): Sets TX pulselength for high frequency: SHORT1, SHORT2, MID, and LONG. Pulselength automatically changes with range and shift.

TX PULSE (LF): Sets TX pulselength for low frequency.

RX BAND (HF): Sets amplifier bandwidth of high frequency Rx amplifier. Internal transceiver only. NARROW, STANDARD, and WIDE choices are available. Select NARROW to suppress cruising noise and sea noise when searching fish schools. If line is drawn across the bottom on the NARROW setting switch to WIDE.

RX BAND (LF): Sets amplifier bandwidth of low frequency Rx amplifier.

TVG (HF): Sets TVG curve for high frequency. BOTTOM, 20log; SCHOOL, 30log, FISH, 40log.

TVG (LF): Sets TVG curve for low frequency. Internal transceiver only.

CLTR CRVE (HF): Sets clutter curve for high frequency. STANDARD, Standard curve; LINEAR, Linear curve, C1, C2, Same as STANDARD.

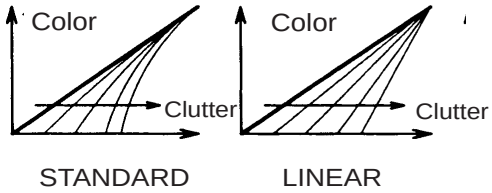


Figure 2-8 Clutter curve

CLTR CRVE (LF): Sets clutter curve for low frequency.

STC (HF): Adjusts STC level for high frequency, and is useful for supressing surface noise. The setting range is 0-10; the higher the setting the greater the extent of suppression. Setting 10 suppresses noise up to about 40 m. Turn off the STC when there is no noise on the screen, otherwise weak echoes may be missed.

STC (LF): Adjusts STC level for low frequency.

PRR LEVEL: Changes pulse repetition rate. Normally, the highest rate (20) is used. When in shallow waters second reflection echoes of the bottom may be seen between the surface and bottom. In this case lower the PRR level.

The choice “S” means the ship’s speed dependent mode, where the PRR changes automatically with ship’s speed. (Requires ship’s speed input.) An echo is plotted wider horizontally when the ship’s speed is low and narrower when it is high. This is because of the time required to pass over an echo is different. Thus, when judging the size of a fish school, you must always keep in mind the ship’s speed. To overcome this inconvenience, the ship’s speed dependent mode is provided. It allows you to directly compare the sizes of fish schools with the echoes on the screen since the horizontal scale of the picture is not influenced by ship’s speed.

INVERTER FREQ: Reduces noise which appears over the entire screen, by changing transmitting frequency.

3.1 SYSTEM Menu Operation

The SYSTEM menu provides for initial setup of the equipment according to expected usage.

1. Press the [PWR] key while pressing and holding down any key. Release the keys when the SYSTEM menu appears.

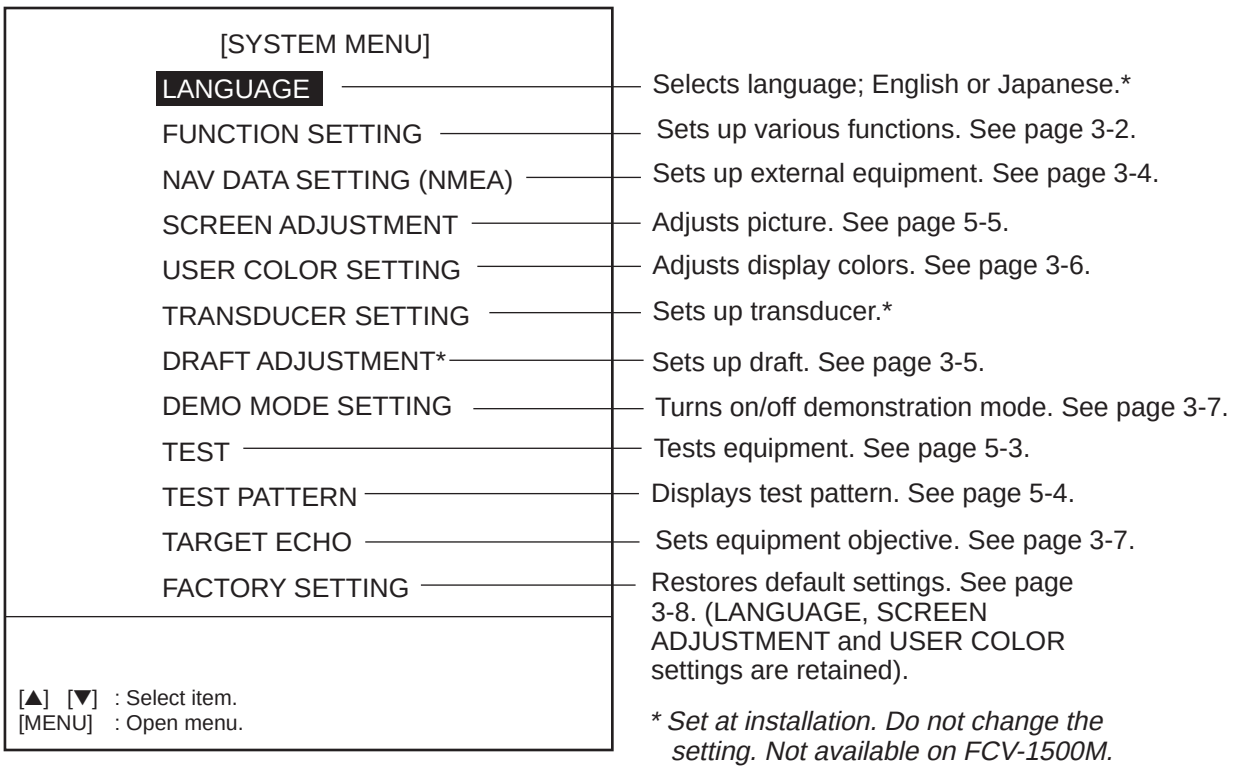


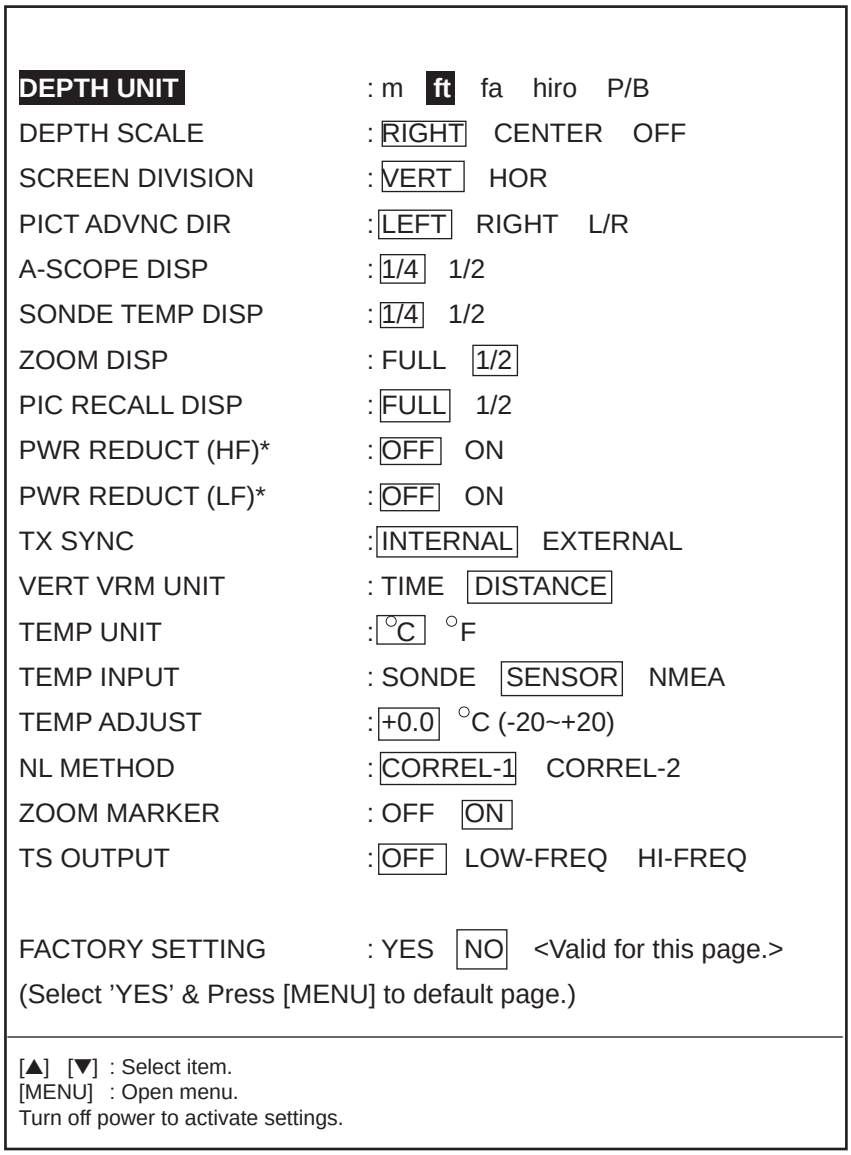
Figure 3-1 System menu

2. Select item with the [▲] or [▼] key. The selected item is highlighted in light-blue.
3. Press the [MENU] key to open menu selected.
4. Select item with the [▲] or [▼] key. The selected item is highlighted in light-blue.
5. Select option with the [◀] or [▶] key. The selection option is highlighted in light-blue.
6. Press the [MENU] key to close the menu and return to the SYSTEM menu.

To escape from the system menu turn off the power, and wait a few seconds and then turn the power on again.

3.2 FUNCTION SETTING Menu

This menu mainly sets picture layout parameters.



(Default settings are circumscribed.)

*Not available on FCV-1500M.

(Default settings are circumscribed.)

Figure 3-2 Function setting menu

DEPTH UNIT: Selects unit of depth measurement; meters, feet, fathoms, hiro, passi/braza.

DEPTH SCALE: Selects where to position the depth scale; right, center or off.

SCREEN DIVISION: Sets screen division for the dual picture. VERT vertically divides the screen; HOR horizontally divides the screen.

PICT ADVNC DIR: Selects picture advance direction to right, left, or left/right which advances the picture in both right and left directions from the screen center.

A-SCOPE DISP: Sets width of A-scope display; 1/2 or 1/4 of the screen.

SONDE TEMP DISP: Sets width of sonde temperature display; 1/2 or 1/4 of the screen.

ZOOM DISP: Sets size of zoom display; full screen or 1/2 screen.

PIC RECALL DISP: Sets size of recalled picture: full screen or 1/2 screen.

PWR REDUCT (HF): Reduces power output on high frequency. LOW TX appears when turned on. (FCV-1500 only)

PWR REDUCT (LF): Reduces power output on low frequency. LOW TX appears when turned on. (FCV-1500 only)

TX SYNC: Synchronizes transmission with other echo sounders. Select EXTERNAL to synchronize transmission.

VERT VRM UNIT: Selects unit of measurement for the vertical VRM; elapsed time or distance. For distance, optional water temperature sensor or navigator is required. If no sensor or navigator is connected the unit is time, regardless of setting.

TEMP UNIT: Sets unit of water temperature measurement; Celsius or Fahrenheit.

TEMP INPUT: Selects source of water temperature data; net sonde, sensor, or NMEA.

TEMP ADJUST: Offsets water temperature indication. Effective only for net sonde and water temperature sensor.

NL METHOD: Selects type of noise limiter to use.

CORREL-1: Echoes in the same position are correlated each transmission.

CORREL-2: In addition to CORREL-1, echoes in neighboring positions are correlated for several transmission cycles. Sharpens echo outline and echo size not interfered by correlation.

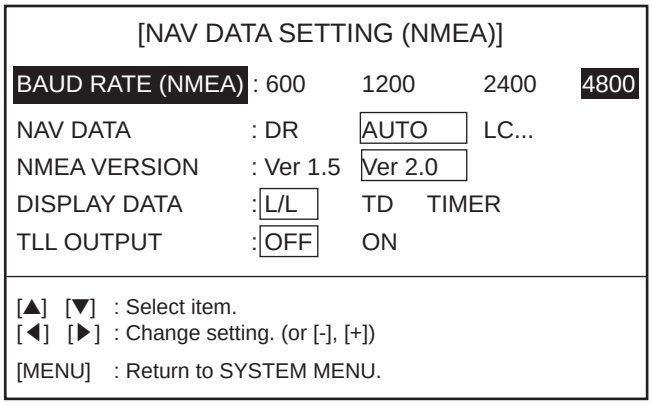
ZOOM MARKER: Turns zoom marker on/off.

TS OUTPUT: Selects OFF (Default Setting)

FACTORY SETTING: Restores default settings of this menu.

3.3 NAV DATA SETTING (NMEA) Menu

This menu sets up external equipment.



(Default settings are circumscribed.)

Figure 3-3 Nav data setting menu

BAUD RATE: Sets communication speed (bit per second) to external equipment.

NAV DATA: Selects source of navigation data (NMEA talker); GPS, Loran C, Loran A, Decca, DR or AUTO. Select AUTO when more than one navigator is connected, and the priority is GPS, Loran C, Loran A, Decca, DR.

NMEA VERSION: Selects NMEA version of external equipment.

DISPLAY DATA: Selects how to display position; L/L or line of position TD. (Navigator which outputs position data in TDs required to display position in TDs.) Selects TIMER to display the elapsed time after the moment MARKER key is pressed at the upper-left corner of the screen (Max. 99H 59M).

TLL OUTPUT: Enables/disables output of L/L position to a navigation plotter when the [MARKER] key is pressed.

3.4 DRAFT ADJUSTMENT Menu

This menu sets up the ship's draft. If the ship's draft level is set, the picture shows the depth between the sea surface and the seabed. It can be set from -5m to 60.0m in 0.1m steps.

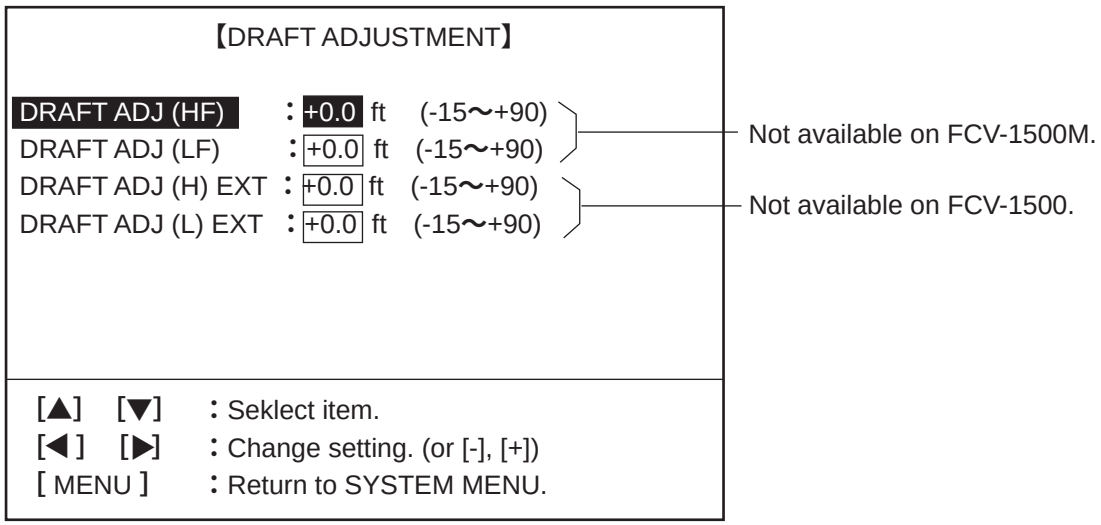


Figure 3-4 Draft adjustment menu

DRAFT ADJ (HF, LF): **FCV-1500;** Sets up the internal adjustment. (HIGH and LOW frequency)

FCV-1500M; Sets up the external adjustment. (HIGH and LOW frequency)

Note: When the picture recorder MT-12 is used to replay the recording data, set the draft to -0.6m.

3.5 USER COLOR Menu

In addition to the standard and factory programmed color sets (provided on the DISP/ FUNC menu), the user may set display colors as desired and store them as user color setting.

1. Press any key while turning on the power.
2. Select USER COLOR SETTING and press the [MENU] key to display the USER COLOR SETTING menu.

[USER COLOR SETTING]

		R	G	B
ES 15	:	4	0	0
*14	:	9	0	0
13	:	12	0	0
*12	:	14	5	0
11	:	14	7	0
*10	:	13	9	0
9	:	13	12	0
*8	:	11	13	0
7	:	8	14	0
*6	:	3	12	0
5	:	0	10	0
*4	:	0	12	13
3	:	0	10	13
*2	:	0	8	12
1	:	0	7	10
*0	:	0	2	9

(*: for 8-level display)

MENU CHAR : 15 15 15

MENU BKGD : 0 0 6

FACTORY SETTING : YES [NO] (Valid for this page)

(Select 'YES' & Press [MENU] to default setting.)

[▲▼◀▶] : Select item.
[—] [+] : Change setting.
[MENU] : Return to SYSTEM MENU.

Figure 3-5 User color menu

3. With the [▲] or [▼] key select the color to change.
4. Change the setting with the [+] or [-] key.

3.6 DEMO MODE SETTING Menu

The demonstration mode provides simulated operation without connection of the transducer, using sounder picture data stored in the unit's memory. All controls except TVG are operative.

1. Press any key while turning on the power.
2. Select DEMO MODE SETTING and press the [MENU] key to display the DEMO MODE SETTING menu.

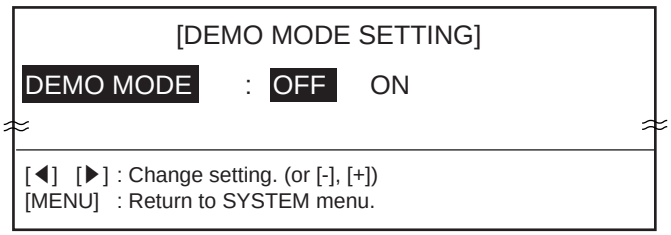


Figure 3-6 Demo mode setting window

3. Select ON and reset the power to start the demonstration mode. The indication <DEMO> appears at the top of the screen when the demonstration mode is active.
4. To return to normal operation, select OFF at the DEMO MODE SETTING menu and reset the power.

3.7 TARGET ECHO Menu

The TARGET ECHO menu sets equipment objective. Two choices are available: NORMAL and SURFACE. NORMAL provides all-purpose functions where STC is normal and the pulse/minute rate is 1,000. SURFACE is mainly for use in detecting small targets. Its STC is effective to 10 meters; the pulse/minute rate is 3,000.

1. Press any key while turning on the power.
2. Select TARGET ECHO and press the [MENU] key to display the TARGET ECHO menu.

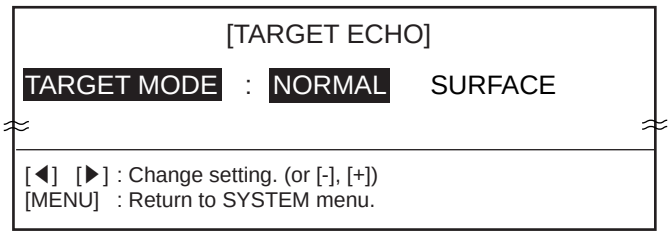


Figure 3-7 TARGET ECHO menu

3.8 Restoring Default Settings

All default settings can be restored to start afresh. Note that language, screen adjustment, user color settings and gain adjustment settings are not disturbed.

1. Press any key while turning on the power.
2. Select FACTORY SETTING and press the [MENU] key to display the FACTORY SETTING menu.

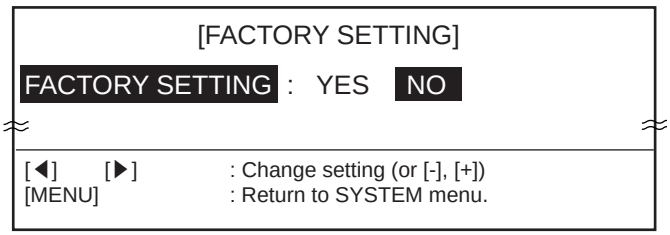


Figure 3-8 Factory setting window

3. Select YES and press the [MENU] key. The buzzer sounds three times and the message “Default setting completed” appears when the restoration of default settings is completed.

This section provides, using typical examples, information necessary for interpreting the display.

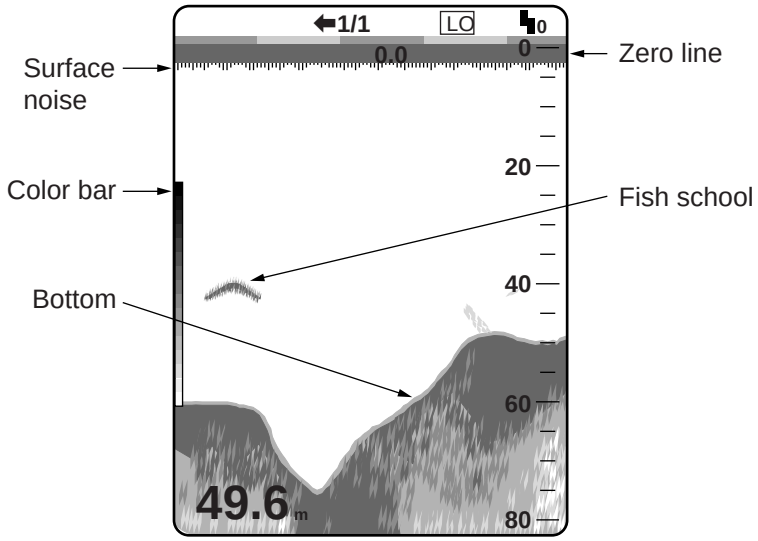


Figure 4-1 Typical display

4.1 Color Bar

The color bar shows the relation between echo intensity and echo color on the screen. The top color (reddish brown) is the strongest color and the lower colors the weakest. The bar can be used as a reference to estimate density of a fish school, fish species and hardness of the bottom. The background color can be selected on the menu screen.

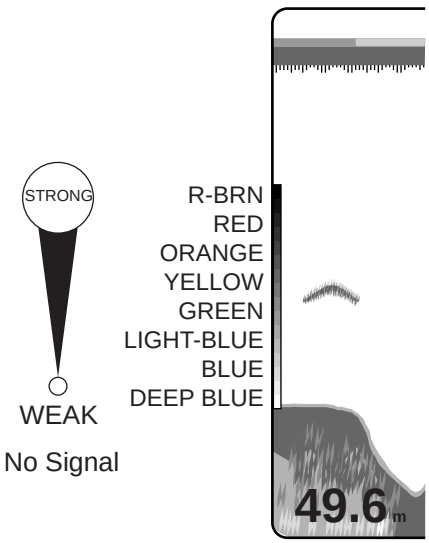


Figure 4-2 Color bar

4.2 Zero Line

The zero line represents the transducer's position. It moves off the screen when a shifted range is used, or is shown at draft depth when ship's draft is entered.

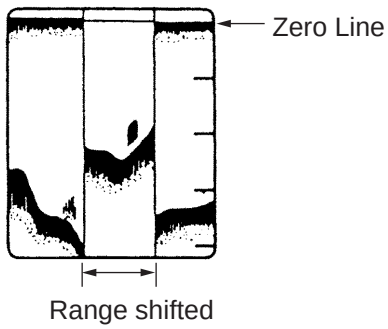


Figure 4-3 Zero line

4.3 Bottom Echoes

Bottom echoes are normally strongest and displayed in reddish brown or red, but colors and width will vary with bottom material, depth, sea condition, installation, frequency, pulselength and sensitivity.

Bottom profile

A hard and rough bottom appears with a longer tail because it reflects more of the ultrasonic pulse. Because of their stronger return, shallow echoes appear wider than deep ones even when all bottom conditions are equal. Also, a longer bottom tail appears on slopes because of the difference in traveling time at both edges of the beam angle. In the rugged bottom, echoes are reflected on many different planes, overlapping to present a 3D effect.

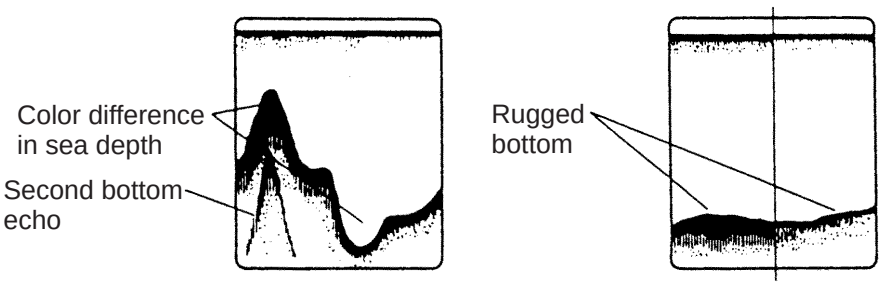


Figure 4-4 Bottom material and bottom profile

Bottom nature

The nature of the bottom is known from the intensity and length of the bottom tail. Generally, when observing the bottom nature, the lower sounding frequency is used, the pulselength is set to long, and the gain setting is not disturbed. In the hard and craggy bottom, the bottom appears in reddish brown with a long tail. In the muddy or sandy bottom, the bottom appears less reddish and with a short tail. However, the bottom with sediment may give a long tail if a low frequency sounding is used.

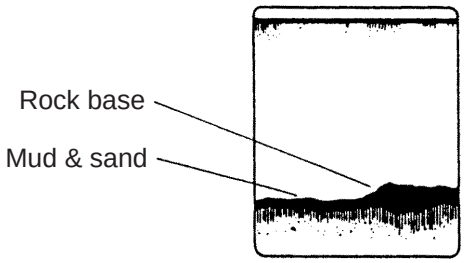


Figure 4-5 Bottom nature

4.4 Fish Schools

Fish quantity

Fish quantity can be estimated to a certain extent from fish echoes on the screen if fish school size and fish school density are kept in mind.

Fish school size

Usually the size of fish echoes on the screen is proportional to the actual size of the fish school. However, if two fish echoes appear at different depths with the same size, the fish school at shallower depth is smaller because the ultrasonic beam widens as it propagates and a fish school in deep water is displayed larger.

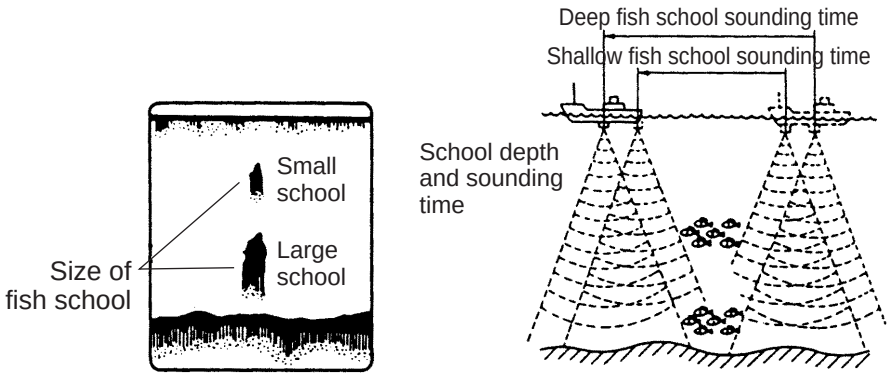


Figure 4-6 Fish school size

Fish school density

If two fish schools appear with the same color at different depths, the one in deeper water is denser because the ultrasonic wave attenuates as it propagates and the fish school in deep water tends to be displayed in a weaker color.

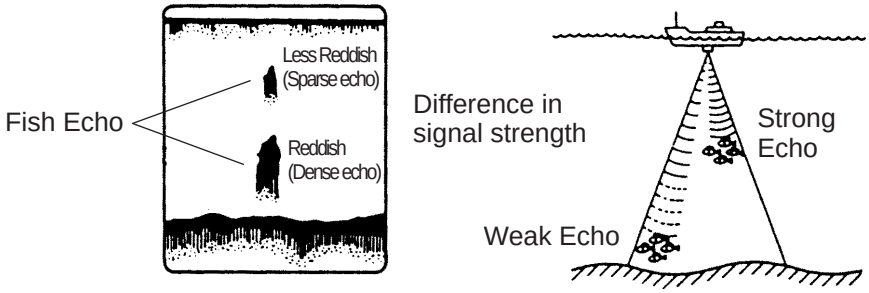


Figure 4-7 Fish school density

4.5 Other Echoes

Plankton

A plankton layer, a likely place to find fish, is displayed in green or blue dots. It usually descends in the day and rises at night.

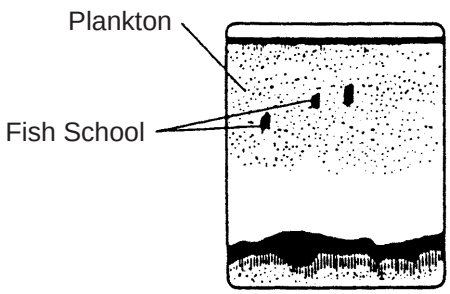


Figure 4-8 Plankton

Current rip

When two ocean currents meet with different speeds, directions and water temperatures, a current rip develops. A current rip's on-screen appearance is as shown below.

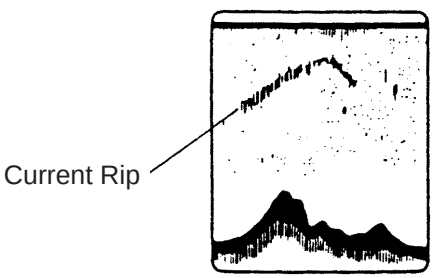


Figure 4-9 Current rip

Surface noise

When the sea is rough or the ship passes over a wake, surface noise may appear at the top of the screen. It can be suppressed with the [TVG] control, STC (on TX/RX menu) or [CLUTTER] control.

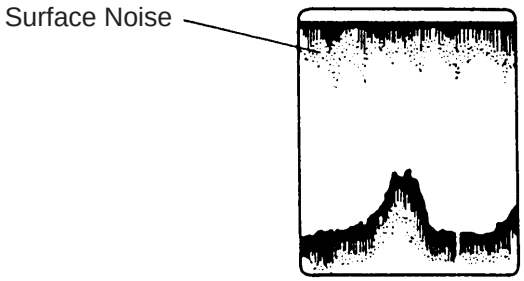


Figure 4-10 Surface noise

Aerated water

When the sea is rough or the ship makes a quick turn, gaps in the bottom echo on the screen may appear. This is caused by air bubbles which block propagation of the sound wave. Generally low frequency ultrasonic waves are interrupted more easily than high ones.

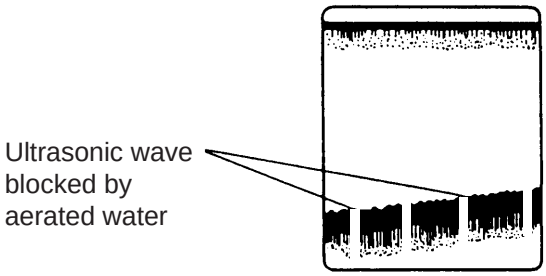


Figure 4-11 Aerated water

False image

Every time the ultrasonic pulse is transmitted, some radiation escapes on each side of the beam, called “side lobes.” Echoes from side lobes show on the display as false images as below.

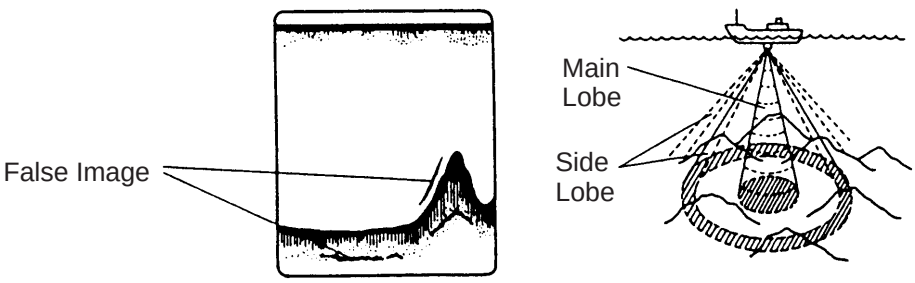


Figure 4-12 False images

MAINTENANCE & TROUBLESHOOTING

⚠ WARNING

ELECTRICAL SHOCK HAZARD
Do not open the equipment.

Only qualified personnel should work inside the equipment.

5.1 Maintenance

Regular maintenance is important for continued performance. Important points to be checked from time to time are shown below.

Maintenance check points

Check point	Action
Transducer cable	If conductors are exposed, replace cable.
Power cable plug, transducer cable plug	If loosened, secure tightly.
Display unit ground	If corroded, clean.
Ship's mains voltage	If out of ratings, correct problem.
Transducer cleanliness	Marine life on the transducer will result in a gradual decrease in sensitivity. Check the transducer face each time the boat is dry-docked. Carefully remove any marine life with a piece of wood or sandpaper.
Display unit cleanliness	Dust or dirt may be removed with a soft cloth. Water-diluted mild detergent may be used if desired. DO NOT use chemical cleaners to clean the display unit; they may remove paint and markings.

5.2 Fuse Replacement

A 15A fuse on the rear panel of the display unit protects the equipment against overvoltage and reverse polarity of the ship's mains or internal fault. If the fuse blows find the cause before replacing it.

> **⚠ CAUTION**
>
> **Use the proper fuse.**
>
> Use of a wrong fuse can cause fire or equipment damage.

5.3 Troubleshooting

This section provides simple troubleshooting procedures which the user may follow to restore normal operation.

Troubleshooting table

If...	Then
there are no echoes but the scale appears	• check if the transducer is properly connected.
there is no zero line or zero line is not in correct position	• check if the range is shifted. (Zero line does not appear when the range is shifted.) • check if ship's draft has been entered on the FUNCTION SETTING menu in the SYSTEM menu. (Zero line appears at the draft depth when draft value is entered.)
you suspect low sensitivity	• check that gain control is properly set. • check power reduction setting on the FUNCTION SETTING menu in the SYSTEM menu.
the bottom is traced in zigzag pattern or you experience occasional loss of echo	• the sea may be rough. Bottom is traced zigzag when the sea is rough. • own boat may have passed over other boat's wake, which blocks propagation of sound wave.
there is no depth readout	• check to see if seabed is present on the normal picture range. • check if seabed echo is strong enough (red, reddish brown in color).
automatic shift is inoperative	• check if seabed echo is strong enough (red, reddish brown in color).
picture is distorted	• check if magnetic field generating equipment (transformer, rectifier) are nearby.
color is strange in a given area	• check if a magnet is near the equipment.
occasional noise is seen	• check if the cables of pulse generating equipment are near the equipment.
there is noise and interference	• check that GAIN and CLUTTER are properly adjusted. • check the setting of the noise limiter on the DISP/FUNC menu. • check the equipment's ground.

5.4 Diagnostic Test

The diagnostic test checks the equipment for proper operation.

1. Turn on the power while pressing and holding down any key to display SYSTEM menu.
2. Select TEST with the [▲] or [▼] key.
3. Press the [MENU] key. The test results appear on the display.
   - ROM, SRAM, DRAM test results are shown as OK or NG (No Good).
   - ES, EXIF (requires optional equipment) test results are shown as OK or OPEN (no connection).
   - NMEA*, SONDE (CIF)* test results are shown as OK. Nothing appears in case of error. * requires special test connector.

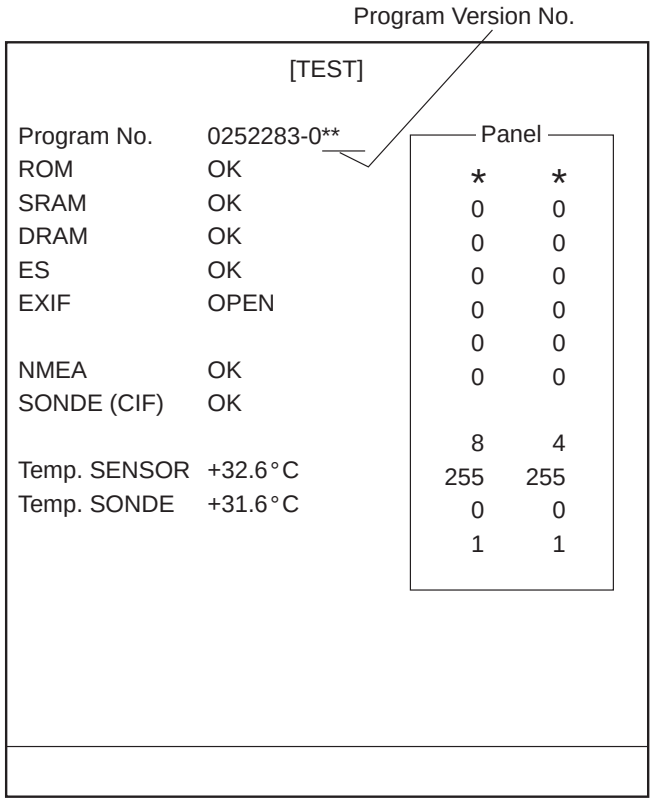


Figure 5-1 Test display

4. Press the [MENU] key to return to the SYSTEM menu.

Panel test

The “Panel” column on the self test display is used to check keys and controls.

1. Press any key except the [POWER] key and the [MENU] key. The pressed key’s on-screen location changes from 0 to 1 when the key is pressed.
2. Operate the controls. For GAIN and TVG controls the figure on the screen changes from 0 to 255. Other controls change from 1 to 8.

5.5 Test Pattern

The test pattern tests for proper display of colors.

1. Turn on the power while pressing and holding down any key to display the SYSTEM menu.
2. Select TEST PATTERN with the [▲] or [▼] key.
3. Press the [MENU] key.
4. Use the [+] or [-] key to change the display color. The display changes in the sequence shown below when the [+] key is used.

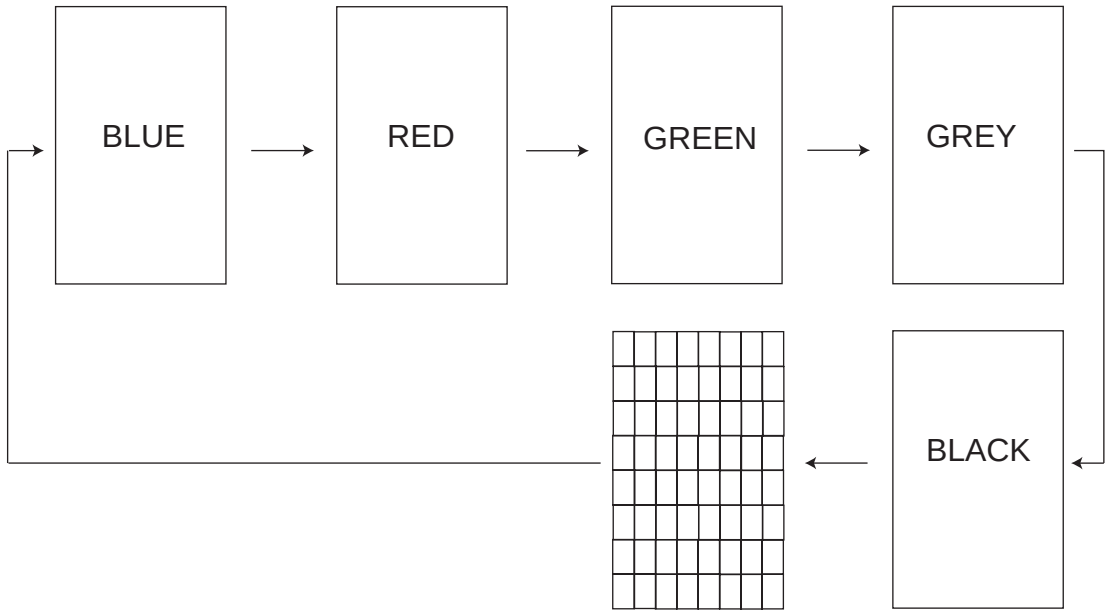


Figure 5-2 Test pattern

5. Press the [MENU] key to return to the SYSTEM menu.

5.6 Adjustment of Picture

1. Turn on the power while pressing and holding down any key to display the SYSTEM menu.
2. Select SCREEN ADJUSTMENT and press the [MENU] key to display the SCREEN ADJUSTMENT menu.

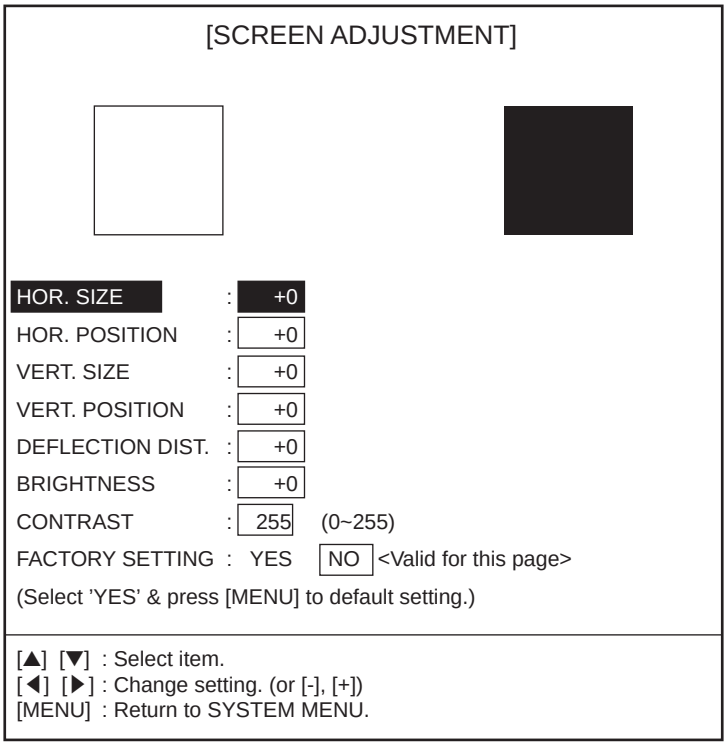


Figure 5-3 Screen adjustment menu

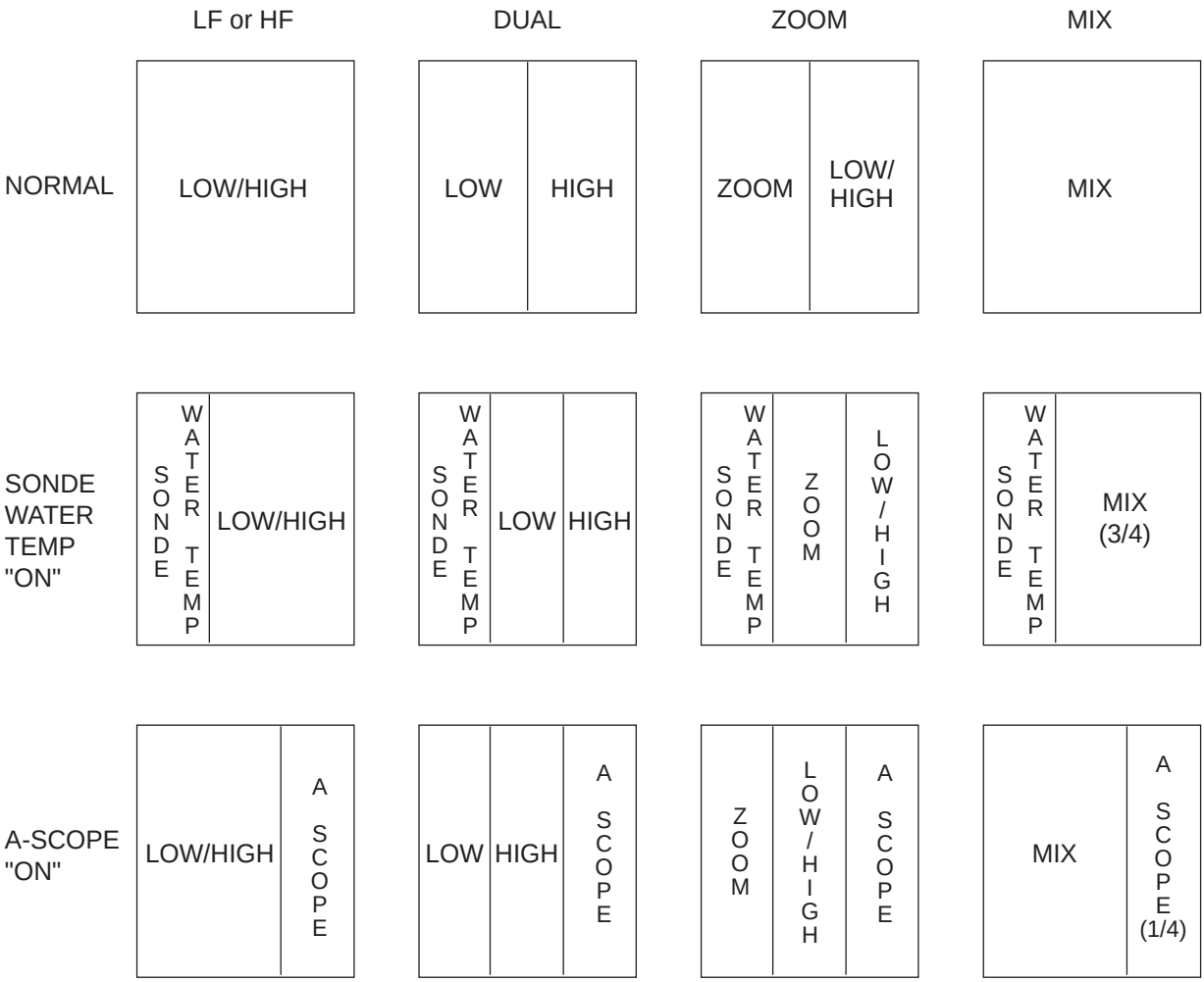
3. Adjust the picture as required referring to the following:

HOR. SIZE:	Adjusts picture size in horizontal direction.
HOR. POSITION:	Adjusts picture in horizontal direction.
VER. SIZE:	Adjusts picture size in vertical direction.
VER. POSITION:	Adjusts picture in vertical direction.
DEFLECTION DIST.:	Corrects concave distortion.
BRIGHTNESS:	Adjusts picture brightness.
CONTRAST:	Adjusts picture contrast.
FACTORY SETTING:	Restores the factory settings of this menu.

4. Reset the power to restore normal operation.

Screen Division

Vertical division

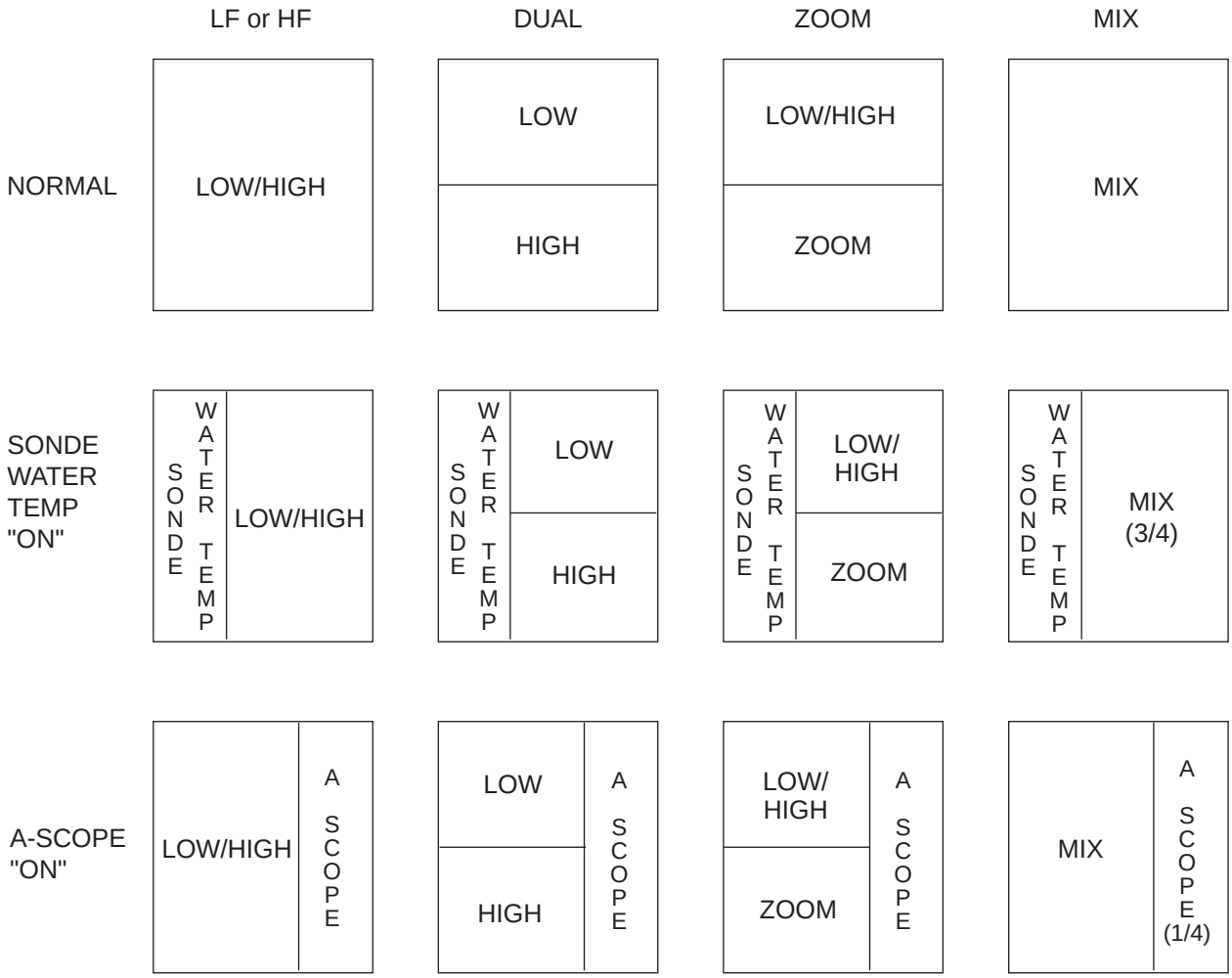


1) The width of the A-scope and Sonde temperature displays may be set to 1/4 or 1/2 the full screen size. Selection is made on the FUNCTION SETTING menu in the SYSTEM menu. (With both A-scope, Sonde temperature and Dual displays set to 1/4, four displays may be shown on the Dual display. When A-scope or Sonde temperature display is set to 1/2, and other displays are set to 1/4, the Dual display is only shown at the right 1/4 of the screen. If both A-scope and Sonde temperature displays are set to 1/2, only A-scope and Sonde temperature displays are shown.)

2) The zoom display can be shown over 1/4 or 1/2 of the screen. Selection is made on the FUNCTION SETTING menu in the SYSTEM menu.

3) The Mix display can be composed of Low frequency/mix, High frequency/mix or Mix display alone. Selection is made on the DISP/FUNC menu.

Horizontal division



Menu Tree

Default settings are circumscribed, or indicated where data entry is required.

[MENU] key — [+] or [-]

<DISP/FUNC> <ALARM/RNG> <TX/RX>

(Use [-], [+] to select MENU.)

NOISE LIMIT	: [OFF]	N1	N2	N3
BACKGND COLOR	: BLACK	DARKBLUE	[BLUE]	
HUE	: USER SET	[STANDARD]	HUE-1...	
NO. OF COLORS	: 8	[16]		
MIX MODE DISP	: [MIX]	LO/MIX	HI/MIX	
DUAL MODE	: [NORMAL]	B/L		
B/Z	: [B/L]	B/D		
COLOR (SONDE)	: [COLOR-1]	COLOR-2	COLOR-3	
SONDE MARK	: [OFF]	LOW-FREQ	HI-FREQ	
SONDE GRAPH	: [SURFACE]	BOTTOM		
NAV DATA DISP	: OFF	[STANDARD]	DEPTH	
BOTTOM SEARCH	: [AUTO]	LOW-FREQ	HI-FREQ	
TEMP GRAPH	: [OFF]	ON		
SHIFT	: [MANUAL]	AUTO		
SHIFT LIMIT	: 2500	[3000]	3500...	
VRM READOUT	: [STANDARD]	TOP		
SMOOTHING	: [3]	(◀: OFF, 1~8: ▶)		
AUTO DEGAUSS	: [30] seconds	(◀: 4~60sec, OFF: ▶)		

[+] or [-]

<DISP/FUNC> **<ALARM/RNG>** <TX/RX>

(Use [-], [+] to select MENU.)

ALARM	: OFF	[BOTTOM]	BTM-FISH	FISH
TEMP ALARM	: [OFF]	DOWN	UP	
TEMP LIMIT	: [65.0] °F	(◀: 20~95: ▶)		
RANGE1	: 16	[30]	60...	
RANGE2	: 30	[60]	100...	
RANGE3	: 100	[120]	160...	
RANGE4	: 200	[250]	300...	
RANGE5	: 400	[500]	600...	
RANGE6	: 800	[1000]	1200...	
RANGE7	: 1200	[1600]	2000...	
RANGE8	: 2500	[3000]	4000...	
M/Z RANGE	: 600	[16]	30...	
B/L RANGE	: 600	[16]	30...	

See next page for TX/RX menu.

[MENU] key + [+] or [-]

<DISP/FUNC> <ALARM/RNG> <**TX/RX**>

(Use [-], [+] to select MENU.)

TDR CNNCT (HF)*	: [INTER]	EXTER			
GAIN TYPE (HF)	: [STRONG]	WEAK			
GAIN ADJ (HF)	: [+0]	(◀: -10~+10: ▶)			
TDR CNNCT (LF)*	: [INTER]	EXTER			
GAIN TYPE (LF)	: [STRONG]	WEAK			
GAIN ADJ (LF)	: [+0]	(◀: -10~+10: ▶)			
TX PULSE (HF)	: SHORT1	SHORT2	[MID]	LONG	
TX PULSE (LF)	: SHORT1	SHORT2	[MID]	LONG	
RX BAND (HF)†	: NARROW	[STANDARD]	WIDE		
RX BAND (LF)†	: NARROW	[STANDARD]	WIDE		
TVG (HF)†	: BOTTOM	[SCHOOL]	FISH		
TVG (LF)†	: BOTTOM	[SCHOOL]	FISH		
CLTR CRVE (HF)	: [STANDARD]	LINEAR	C1	C2	
CLTR CRVE (LF)	: [STANDARD]	LINEAR	C1	C2	
STC (HF)	: [0]	(◀: 0~10: ▶)			
STC (LF)	: [0]	(◀: 0~10: ▶)			
PRR LEVEL	: [20]	(◀: 0~20, S=Sync with speed: ▶)			
INVERTER FREQ	: LOW	[STANDARD]	HIGH		

[POWER] key + any key
(Select menu with [▲], [▼], and press [MENU] key to open menu.)

[SYSTEM MENU]

- LANGUAGE
- FUNCTION SETTING
- NAV DATA SETTING (NMEA)
- SCREEN ADJUSTMENT ①
- USER COLOR SETTING ②
- TRANSDUCER SETTING* ③
- DRAFT ADJUSTMENT
- DEMO MODE SETTING ④
- TEST ⑤
- TEST PATTERN ⑥
- TARGET ECHO ⑦
- FACTORY SETTING ⑧

See page A-6.

See page A-7.

[LANGUAGE]

LANGUAGE : [ENGLISH] JAPANESE

Turn off the power after selection of LANGUAGE.

*Not available on FCV-1500M.

DEPTH UNIT	: m	[ft]	fa	hiro	P/B
DEPTH SCALE	: [RIGHT]	CENTER	OFF		
SCREEN DIVISION	: [VERT]	HOR			
PICT ADVNC DIR	: [LEFT]	RIGHT	L/R		
A-SCOPE DISP	: [1/4]	1/2			
SONDE TEMP DISP	: [1/4]	1/2			
ZOOM DISP	: FULL	[1/2]			
PIC RECALL DISP	: [FULL]	1/2			
PWR REDUCT (HF)*	: [OFF]	ON			
PWR REDUCT (LF)*	: [OFF]	ON			
TX SYNC	: [INTERNAL]	EXTERNAL			
VERT VRM UNIT	: TIME	[DISTANCE]			
TEMP UNIT	: °C	[°F]			
TEMP INPUT	: SONDE	[SENSOR]	NMEA		
TEMP ADJUST	: [+0.0]	°F (-20~+20)			
NL METHOD	: [CORREL-1]	CORREL-2			
ZOOM MARKER	: OFF	[ON]			
TS OUTPUT	: [OFF]	LOW-FREQ	HI-FREQ		
FACTORY SETTING	: YES	[NO]	<Valid for this page>		

*Not available on FCV-1500M.

[NAV DATA SETTING (NMEA)]

BAUD RATE (NMEA)	: 600	1200	2400	[4800]
NAV DATA	: DR	[AUTO]	LC...	
NMEA VERSION	: Ver 1.5	[Ver 2.0]		
DISPLAY DATA	: [L/L]	TD	TIMER	
TLL OUTPUT	: [OFF]	ON		

[DRAFT ADJUSTMENT]

DRAFT ADJ (HF) : +0.0 ft (-15〜+90)
DRAFT ADJ (LF) : +0.0 ft (-15〜+90)

Not available on FCV-1500M.

DRAFT ADJ (H) EXT : +0.0 ft (-15〜+90)
DRAFT ADJ (L) EXT : +0.0 ft (-15〜+90)

Not available on FCV-1500.

①

[SCREEN ADJUSTMENT]

HOR. SIZE	:	+0
HOR. POSITION	:	+0
VERT. SIZE	:	+0
VERT. POSITION	:	+0
DEFLECTION DIST.	:	+0
BRIGHTNESS	:	+0
CONTRAST	:	255 (0~255)
FACTORY SETTING	:	YES NO <Valid for this page>

②

[USER COLOR SETTING]

		R	G	B
ES 15	:	4	0	0
*14	:	9	0	0
13	:	12	0	0
*12	:	14	5	0
11	:	14	7	0
*10	:	13	9	0
9	:	13	12	0
*8	:	11	13	0
7	:	8	14	0
*6	:	3	12	0
5	:	0	10	0
*4	:	0	12	13
3	:	0	10	13
*2	:	0	8	12
1	:	0	7	10
*0	:	0	2	9

(*: for 8-level display)

MENU CHAR	:	15	15	15
MENU BKDG	:	0	0	6

FACTORY SETTING : YES NO (Valid for this page)

③

[TRANSDUCER SETTING]

XDR SELECT	:	TYPE	MANUAL
		LO-FREQ	HI-FREQ
FREQUENCY	:	50 kHz	200 kHz
TRANSDUCER	:	50B-6/6B	200B -5S
OUTPUT POWER	:	1 kW	1 kW
SUPPLY VOLTAGE	:	46 V	60 V
IMPEDANCE	:	333	575

(Sample setting; nothing is set in default setting.)

④

[DEMO MODE SETTING]

DEMO MODE : OFF ON

⑤

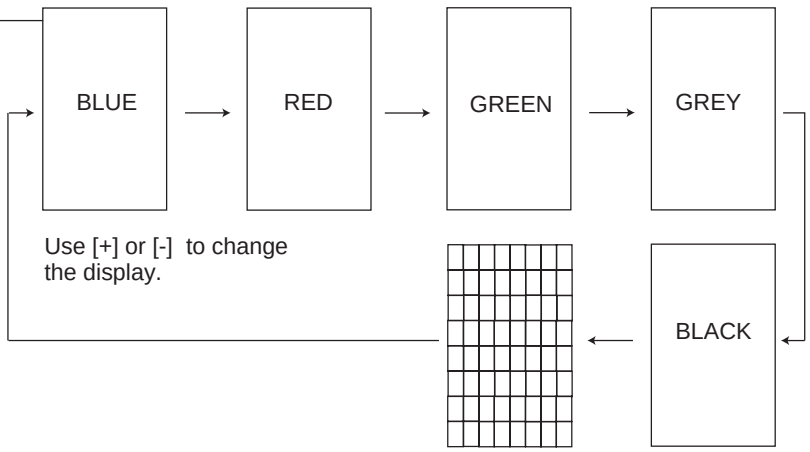
[TEST]

Program No.	0252283-0XX
ROM	OK
SRAM	OK
DRAM	OK
ES	OK
EXIF	OPEN
NMEA	OK
SONDE (CIF)	OK
Temp. SENSOR	+86.2°F
Temp. SONDE	+77.4°F

Panel

*	*
0	0
0	0
0	0
0	0
0	0
0	0
8	4
255	255
0	0
1	1

⑥



⑦

[TARGET ECHO]

TARGET ECHO : [NORMAL] SURFACE

⑧

[FACTORY SETTING]

FACTORY SETTING : YES [NO]

SPECIFICATIONS OF COLOR VIDEO SOUNDER
FCV-1500/1500M

This equipment is a dual-frequency color video sounder which has a large variety of functions.

1. ECHO SOUNDER (FCV-1500 ONLY)

(1)	TX Frequency	15/28/38/45/50/68/88/107/150/200/400 kHz, select 2 channels
(2)	Output Power	1/2/3 kWrms
(3)	TX Rate	20 to 1000 pulse/min (20 to 1000 m range, normal mode) Max. 3000 pulse/min (5 m range, surface mode)
(4)	Pulselength	0.2 to 10.0 msec
(5)	Sensitivity	187 dBµPa or less (15 kHz)

2. DISPLAY UNIT

(1)	Display Mode	15 inch color CRT
(2)	Echo Color	16 colors (including background color) according to echo intensity. Marks are indicated in 4 colors.
(3)	Display Mode	Normal mode (high frequency / low frequency), Dual-frequency, Zoom, A-scope
(4)	Zoom Display	Marker zoom, Bottom zoom, Bottom-lock expansion
(5)	Range Shift	Range: 5-2000 m, Shift: 0-2000 m, Expansion range: 5-200 m
(6)	Display Advance Speed	7 steps (Lines/TX: Freeze, 1/16, 1/8, 1/4, 1/2, 1/1, 2/1)
(7)	Alarm	Fish alarm, Water temperature alarm, Bottom alarm

3. I/O DATA

(1)	Data Format	IEC61162-1, NMEA0183 Ver.1.5/2.0
(2)	Input Data	Sonde depth, Water temperature
(3)	Output Data	Water temperature and Depth (optional external sensor required) VRM depth
(4)	Output for Monitor	RGB: VGA signal

4. POWER SUPPLY

(1)	Voltage and Current	24-32 VDC: 10-4 A
(2)	Power Consumption	260 VA or less

5. DIMENSION AND MASS

See Outline Drawings.

6. ENVIRONMENTAL CONDITION

(1)	Temperature	-15 °C to +55 °C
(2)	Relative Humidity	Less than 95% (at 40°C)
(3)	Water Resistance	Display Unit: IEC IPX2

7. COATING COLOR

(1)	Display Unit	Panel: N3.0 Newtone No.5
		Chassis: 2.5GY5/1.5

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