KODEN

FULL MENU REFERENCE

COLOR ECHO SOUNDER

Broadband DIGITAL

CVS-875D
CVS-877D

CVS-875D/877D.FM.E 0093107074-02

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CVS-875D/877D Full Menu Reference

Doc No. 0093107074

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Document No. Revised Version Norm

When part of the document needs to be revised, the document has advanced revision number. The document No. is indicated at the lower right side on the cover and at the left or right side of the footer region of each page.

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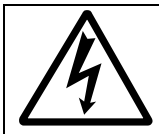
For Your Safe Operation

Symbol used in this Operation Manual

The following graphical symbols are used in this manual. The meaning of each symbols shall be well understood and apply at maintenance and inspection works.

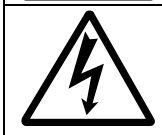
Symbol	Meaning
 Warning	**Mark for warning** This symbol denotes that there is a risk of death or serious injury when not dealing with it correctly.
	**Mark for danger high voltage** This symbol denotes that there is a risk of death or serious injury caused by electric shock when not dealing with it correctly.
 Caution	**Mark for caution** This symbol denotes that there is a risk of slight injury or damage of device when not dealing with it correctly.
	**Mark for prohibition** This symbol denotes prohibition of the specified conduct. Description of the prohibition is displayed near the mark.

Caution items on equipment

	**Be careful of a high voltage inside.** A high voltage, which may risk your life, is used. This high voltage remains in the circuit after you have powered off switch. To prevent touching the high voltage circuit inadvertently, the hard cover is provided to the high voltage circuit and the high voltage caution label is affixed. Ensure to power off switch for your safety and discharge the electricity remaining in the capacity before starting to check. An engineer authorized by our company should inspect and maintain
 Warning	**Be sure to power off in the boat.** If the power switch is inadvertently powered on during work, you will be electrified. To prevent such accident from occurring, ensure to power off in the boat and the power of equipment. Furthermore, it is safer to hang the caution tag described as [Under Work] near the power switch of equipment.
 Warning	**Be careful of dust** Inhaling dust may cause A respiratory disease. When cleaning the inside of equipment, be careful not to inhale dust. Wearing a safety mask is recommended.

 **Caution**	**Caution on location of equipment** Do not install the equipment where it is excessively damp and suffers from excessive water drops.
 **Caution**	**Measures against static electricity** The static electricity may be generated from the carpet on the floor in the cabin or clothes made of synthetic fiber. The static electricity may destroy the electronic parts on the circuit board. Handle the circuit board, taking the measure of static electricity free.
 **Caution**	**Caution at installation of a transducers** Install the transducer at the location where it is not affected by bubble and noise The bubble and noise seriously degrade the performance of this unit.

Cautions on handling

 **Warning**	Do not disassemble or modify. It may leads to trouble, fire, smoking or electric shock. In case of trouble, contact our dealer or our company.
 **Warning**	In case of smoke or fire, boat power off and the power of this unit. It may cause fire, electric shock or damage.
	**Be cautious of remaining high voltage.** A high voltage may remain in the capacitor for several minutes after you have powered off. Before inspecting inside, wait at least 5 minutes after powering off or discharge the remaining electricity in an appropriate manner. Then, start the work.
 **Caution**	The information displayed in this unit is not provided directly for your navigation. For your navigation, be sure to see the specified material.
 **Caution**	Use the specified fuse. If un-specified fuse is used, it may cause a fire, smoke or damage.
 **Caution**	Whenever transmitting, be sure to submerge the transducer in water first. If transmitted without submerging the transducer, it may be damaged.

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Introduction

CVS-875D is the 15inch LCD color echo sounder that can display images in 4 optional frequencies.

CVS-877D is the Black Box type without the display unit of CVS-875D, for which customer can select the display monitor of preference. The external monitor and connecting cable are user supply.

This unit equipped with the latest digital process can accurately display circumstances in the water under all conditions.

The main features of this unit are as follows:

- This unit is a multi-frequency echo sounder with broadband transducers.
- With a simple operation on a menu, frequencies up to 4 can be optionally set within a wide range.
- Various transducers can be set by the menu. In addition, the frequency and transmission power can be set automatically.
- With digital reception processing, the high resolution in shallow depth and the noise reduction capability in deep depth are both attainable.
- This unit has high waterproof level and can be installed in an open bridge. (Only CVS-875D)
- Up to 500 graphic images can be stored. Homing function is available by pushing event key while recalling the stored images, to provide navigation guidance to the designated position (optional GPS is required).
- Various alarm functions are available (Bottom, school of fish, water temperature*, vessel speed*, arrival*, XTE*, power source).

  (Note: The mark * denotes that the connection of optional sensors is required)
- The display and the operation units can be easily installed from the front side by flush mounting. (Flush mounting of monitor is only for CVS-875D).
- RGB analog output to an external monitor is provided as standard. The use of external monitor enables to observe the echo sounder images from the place distant from the main unit (External monitor is owner supply).
- The data for image, waypoint, and setting can be backed up in the USB memory and the SD card, to be recalled later.
- As the operation unit is separated, operation away from the processor and the display units is possible.

.

Menu List

The factory deafult setting is shown in bold and underlined.

1. [SHIFT/ⓂOFF] key
   - Shift OFF (OFF, **ON**)
   - Range Mode (Auto Range, **Manual**, Auto Shift)
2. [NORMAL/ZOOM] key
   - Normal/Zoom (**Normal Range Operation**, Zoom Range Operation)
3. [GAIN-R/SEL], [GAIN-L/SEL]
   - Individual gain (0.0 ~ 10.0: TVG type Manual 3.0, Based on Seabed TVG 5.0, High Sensitivity TVG **3.0**)
   - Interlocking gain (0.0 ~ 10.0: **0.0**)
4. [RANGE] key
   - Interlocking range (5.0, 10.0, 20.0, 50.0, 100, 150, 300, 500 m: **50.0 m**)
   - Individual range (5.0, 10.0, 20.0, 50.0, 100, 150, 300, 500 m: **50.0 m**)
   - Zoom range (1, 2.5, 5, 7.5, 10, 15, 20, 25, 30, 40, 50, 60, 70, 80, 90, 100, 120, 140, 160, 180, 200, 220, 240, 260 m: **10m**)
5. [SHIFT] key
   - Interlocking shift (0 ~ 3000 m: **0 m**)
   - Individual shift (0 ~ 3000 m: **0 m**)
6. [BRILL⏻] key
   - Screen brilliance (1 ~ 10: **10**)
   - Panel brightness (1 ~ 10: **10**)
7. [EVENT] key
   - (**Store Position**, Store Image, Homing)
8. [F1] key
   - (Shift Digit Input, IR, Color Erase, Noise Reduction, Background Color, TVG Adjust, White Line, A Scope, Image Swap, **Image Title**, VRM Interval, NAV Start, Image Recall, Frequency, Event Key Usage, Key Lock, Depth Unit, Color Tone, B.D. Mode)
9. [F2] key
   - (Shift Digit Input, **IR**, Color Erase, Noise Reduction, Background Color, TVG Adjust, White Line, A Scope, Image Swap, Image Title, VRM Interval, NAV Start, Image Recall, Frequency, Event Key Usage, Key Lock, Depth Unit, Color Tone, B.D. Mode)
10. [Image Speed/NAV] key
    - Image Speed (Speed -2, Speed -1, Speed 0, Speed 1, Stop, **Speed 2 (1/1)**, Speed 3, Speed 4, Speed 5, Speed 6, Speed 7, Speed 8, Speed 9)
    - NAV Display (**OFF**, NAV 1, NAV 2)

11. [MENU] key

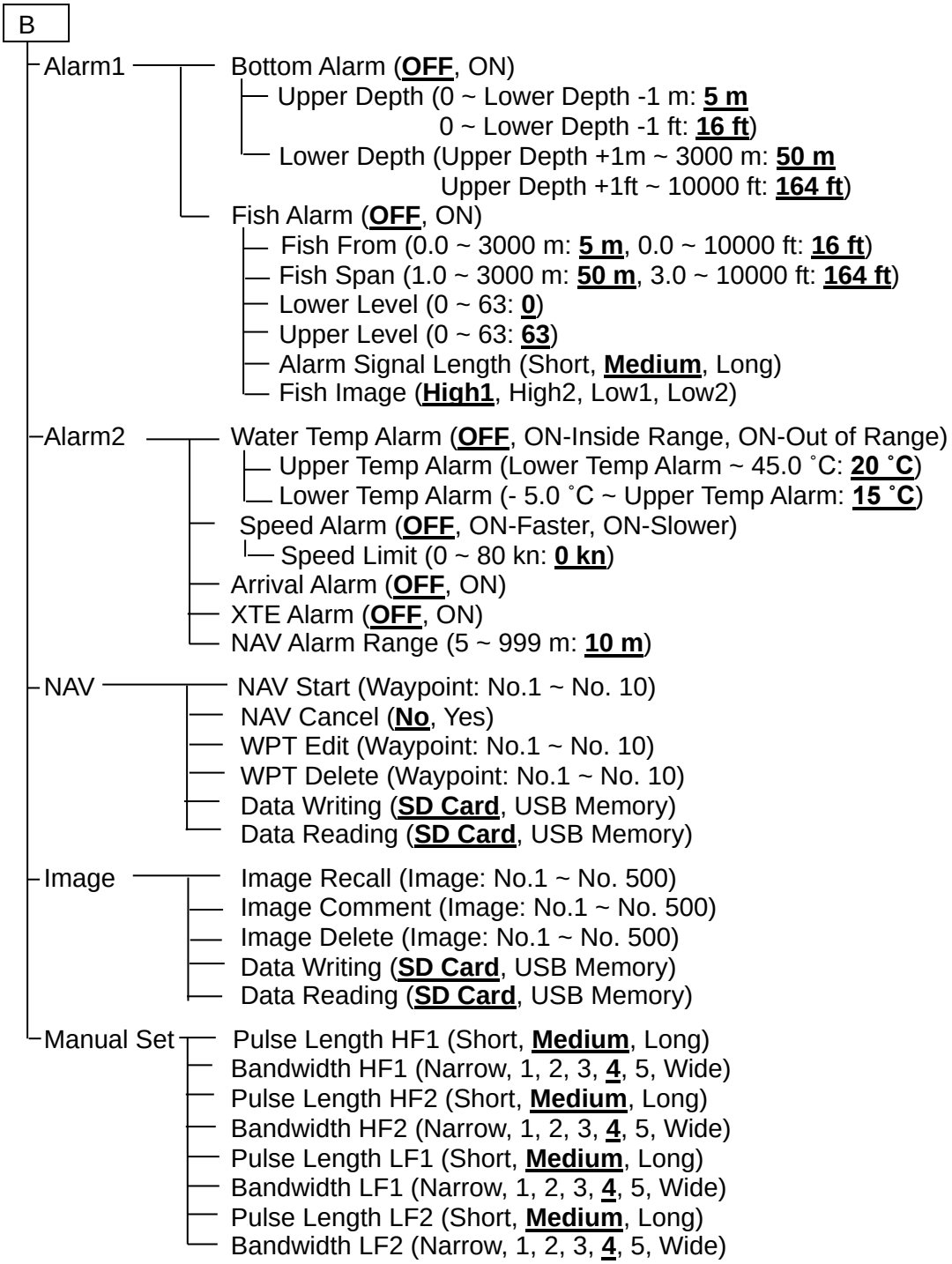
- Echo Adjust
  - IR (**OFF**, Low, High)
  - Random Transmission (**OFF**, 1, 2)
  - Color Erase (0 ~ 50 %, **0 %**)
  - Noise Reduction (0~10: **0**)
  - TX Power (HF) (20, 30, 40, 50, 60, 70, 80, 90, **100**, Auto)
  - TX Power (LF) (20, 30, 40, 50, 60, 70, 80, 90, **100**, Auto)
  - Dynamic Range HF1 (12 ~ 30 dB: **24 dB**)
  - Dynamic Range HF2 (12 ~ 30 dB: **24 dB**)
  - Dynamic Range LF1 (12 ~ 30 dB: **24 dB**)
  - Dynamic Range LF2 (12 ~ 30 dB: **24 dB**)
  - Background Color (Pale Blue, Marine Blue, Blue, **Dark Blue**, Black, Pale Green Blue, Green Blue, Dark Green Blue, White, Night Mode)
  - Color Tone (Monochrome, 8 color, 16 color, **64 color**)
  - Emphasis (OFF, **ON**)
- TVG
  - TVG Type (Manual, Based on Seabed, **High Sensitivity**)
  - TVG Strength HF1 (1 ~ 50: **20**)
  - TVG Depth HF1 (2 ~ 1000 m: **70 m**, 6 ~ 3300 ft, 1 ~ 550 fm, 1 ~ 610 l.fm, 1 ~ 660 J.fm)
  - TVG Adjust HF1 (2 ~ 30m: **2 m**, 6 ~ 100 ft, 1 ~ 16 fm, 1 ~ 18 l.fm, 1 ~ 20 J.fm)
  - TVG Strength HF2 (1 ~ 50: **20**)
  - TVG Depth HF2 (2 ~ 1000m: **97 m**, 6 ~ 3300 ft, 1 ~ 550 fm, 1 ~ 610 l.fm, 1 ~ 660 J.fm)
  - TVG Adjust HF2 (2 ~ 30 m: **2 m**, 6 ~ 100 ft, 1 ~ 16 fm, 1 ~ 18 l.fm, 1 ~ 20 J.fm)
  - TVG Strength LF1 (1 ~ 50: **20**)
  - TVG Depth LF1 (2 ~ 1000 m: **185 m**, 6 ~ 3300 ft, 1 ~ 550 fm, 1 ~ 610 l.fm, 1 ~ 660 J.fm)
  - TVG Adjust LF1 (2 ~ 30 m: **2 m**, 6 ~ 100 ft, 1 ~ 16 fm, 1 ~ 18 l.fm, 1 ~ 20 J.fm)
  - TVG Strength LF2 (1 ~ 50: **20**)
  - TVG Depth LF2 (2 ~ 1000 m,: **210 m**, 6 ~ 3300 ft, 1 ~ 550 fm, 1 ~ 610 l.fm, 1 ~ 660 J.fm)
  - TVG Adjust LF2 (2 ~ 30 m,: **2 m**, 6 ~ 100 ft, 1 ~ 16 fm, 1 ~ 18 l.fm, 1 ~ 20 J.fm)
- Disp. Setup1
  - A Scope (**OFF**, ON)
  - White Line (**OFF**, 1, 2, 3, 4, 5, Auto)
  - Mix (**A**, B, C, D, Fish School Size1, Fish School Size2, Fish School Size3)
  - Image Direction (**←|←**、 →|→、 ←|→)
  - Image Swap (**A|B**, B|A)
  - Image Split (**Vertical**, Horizontal)
  - Width of Zoom Image (Wide, Medium, **Narrow**)
  - Zoom Image Split (**Standard**, Vertical)
  - Sub Depth Value (**OFF**, m, fm, I.fm, ft, J.fm)
  - Bottom Hardness (**OFF**, ON)
  - BTM Bottom Position (**10%**, 20%, 30%, 40%, 50%)
  - B.D. Bottom Position (10%, 20%, **30%**, 40%, 50%)

A

A

- Disp. Setup2
  - Scale (OFF, **ON**)
  - Scale Position (**Side**, Center)
  - Scale Value (Small, Medium, **Large**)
  - Color Bar Scale (OFF, **ON**)
  - Image Title (**Frequency**, HF1 LF1)
  - Water Temp Window (**OFF**, 5 minutes, 10 minutes, 15 minutes, 30 minutes, 60 minutes)
  - W. Temp. Graph Range (2 ˚C, **5 ˚C**, 10 ˚C)
  - Depth Font Size (OFF, Small, **Medium**, Large)
  - Depth Position (**Bottom**, Top)
  - W. Temp. Font Size (OFF, **Small**, Medium, Large)
  - Speed Value (OFF, **ON**)
  - Detection Area (OFF, **ON**)
  - VRM Interval (0.0 ~ 100.0 m: **0.0 m**, 0.0 ~ 330.0 ft: **0.0 ft**)
  - VRM Image (**Active Screen**, All Screens)
- Range Setup
  - Range Operation (**All Screens Same**, Scr. Individual)
  - Range 1 (1.0 ~ 3000 m: **5 m**, 5.0 ~ 8000 ft: **15 ft**)
  - Range 2 (1.0 ~ 3000 m: **10 m**, 5.0 ~ 8000 ft: **30 ft**)
  - Range 3 (1.0 ~ 3000 m: **20 m**, 5.0 ~ 8000 ft: **50 ft**)
  - Range 4 (1.0 ~ 3000 m: **50 m**, 5.0 ~ 8000 ft: **140 ft**)
  - Range 5 (1.0 ~ 3000 m: **100 m**, 5.0 ~ 8000 ft: **340 ft**)
  - Range 6 (1.0 ~ 3000 m: **150 m**, 5.0 ~ 8000 ft: **440 ft**)
  - Range 7 (1.0 ~ 3000 m: **300 m**, 5.0 ~ 8000 ft: **920 ft**)
  - Range 8 (1.0 ~ 3000 m: **500 m**, 5.0 ~ 8000 ft: **1500 ft**)
- Shift Setup
  - Shift Operation (**All Screens Same**, Scr. Individual)
  - Shift Type (**Numerical Value**, Range Dependent, Preset Value, Range Ratio)
  - Shift Preset 1 (0 ~ 1000 m: **10 m**, 0 ~ 3300 ft: **10 ft**)
  - Shift Preset 2 (0 ~ 1000 m: **20 m**, 0 ~ 3300 ft: **20 ft**)
  - Shift Preset 3 (0 ~ 1000 m: **30 m**, 0 ~ 3300 ft: **30 ft**)
  - Shift Preset 4 (0 ~ 1000 m: **40 m**, 0 ~ 3300 ft: **40 ft**)
  - Shift Preset 5 (0 ~ 1000 m: **50 m**, 0 ~ 3300 ft: **50 ft**)
  - Shift Preset 6 (0 ~ 1000 m: **60 m**, 0 ~ 3300 ft: **60 ft**)
  - Shift Preset 7 (0 ~ 1000 m: **70 m**, 0 ~ 3300 ft: **70 ft**)
  - Shift Preset 8 (0 ~ 1000 m: **80 m**, 0 ~ 3300 ft: **80 ft**)
  - Zoom Shift Position (0 ~ 3000 m: **0 m**, 0 ~ 8000 ft: **0 ft**)
- BTM Search
  - Bottom Search Range (**Inside Range**, Outside Range)
  - Sounding Source (**Auto Select**, High1, High2, Low1, Low2)
  - Sounding Limit (100~ 4000: **4000 m**, 330 ~ 13000 ft: **13000 ft**)
  - Bottom Search Type (Edge, **Level**)

B


B
Alarm1
Bottom Alarm (**OFF**, ON)
Upper Depth (0 ~ Lower Depth -1 m: **5 m**
0 ~ Lower Depth -1 ft: **16 ft**)
Lower Depth (Upper Depth +1m ~ 3000 m: **50 m**
Upper Depth +1ft ~ 10000 ft: **164 ft**)
Fish Alarm (**OFF**, ON)
Fish From (0.0 ~ 3000 m: **5 m**, 0.0 ~ 10000 ft: **16 ft**)
Fish Span (1.0 ~ 3000 m: **50 m**, 3.0 ~ 10000 ft: **164 ft**)
Lower Level (0 ~ 63: **0**)
Upper Level (0 ~ 63: **63**)
Alarm Signal Length (Short, **Medium**, Long)
Fish Image (**High1**, High2, Low1, Low2)
Alarm2
Water Temp Alarm (**OFF**, ON-Inside Range, ON-Out of Range)
Upper Temp Alarm (Lower Temp Alarm ~ 45.0 ˚C: **20 ˚C**)
Lower Temp Alarm (- 5.0 ˚C ~ Upper Temp Alarm: **15 ˚C**)
Speed Alarm (**OFF**, ON-Faster, ON-Slower)
Speed Limit (0 ~ 80 kn: **0 kn**)
Arrival Alarm (**OFF**, ON)
XTE Alarm (**OFF**, ON)
NAV Alarm Range (5 ~ 999 m: **10 m**)
NAV
NAV Start (Waypoint: No.1 ~ No. 10)
NAV Cancel (**No**, Yes)
WPT Edit (Waypoint: No.1 ~ No. 10)
WPT Delete (Waypoint: No.1 ~ No. 10)
Data Writing (**SD Card**, USB Memory)
Data Reading (**SD Card**, USB Memory)
Image
Image Recall (Image: No.1 ~ No. 500)
Image Comment (Image: No.1 ~ No. 500)
Image Delete (Image: No.1 ~ No. 500)
Data Writing (**SD Card**, USB Memory)
Data Reading (**SD Card**, USB Memory)
Manual Set
Pulse Length HF1 (Short, **Medium**, Long)
Bandwidth HF1 (Narrow, 1, 2, 3, **4**, 5, Wide)
Pulse Length HF2 (Short, **Medium**, Long)
Bandwidth HF2 (Narrow, 1, 2, 3, **4**, 5, Wide)
Pulse Length LF1 (Short, **Medium**, Long)
Bandwidth LF1 (Narrow, 1, 2, 3, **4**, 5, Wide)
Pulse Length LF2 (Short, **Medium**, Long)
Bandwidth LF2 (Narrow, 1, 2, 3, **4**, 5, Wide)

12. [SUB MENU] key

- System
  - Event Key Usage (**Store Position**, Store Image, Homing)
  - FUNC1.Key Setting
  - FUNC2.Key Setting
    (Shift Digit Input, **IR (F2)**, Color Erase, Noise Reduction, Background Color, TVG Adjust, White Line, A Scope, Image Swap, **Image Title (F1),** VRM Interval, Nav Start, Image Recall, Frequency, Event Key Usage, Key Lock, Depth Unit, Color Tone, B.D. Mode)
  - Guide Window (OFF, **ON**)
  - Func. Guide Window (OFF, **ON**)
  - Header Display (OFF, **ON**)
  - Simple Menu (**OFF**, ON)
  - CM Key Usage (**CM**, Screen Mode)
  - Gain type (**Retroactive Gain**, Current Image)
  - Gain Range (**Standard**, Wide)
  - Bubble (**OFF**, Low, High)
  - Clock Display (**OFF**, ON)
- Source
  - Inter. Buzzer Volume (OFF, Small, Medium, **Large**)
  - Water Temp Source (**Internal Sensor**, NMEA)
  - Speed Source (Internal Sensor, **NMEA**)
  - Ext Trigger Type (**OFF**, _↑‾, ‾↓_, Net Finder)
  - RX TRG Delay (**OFF,** ON)
  - No Received Sync (**Stop**, Auto)
  - Ext Trigger Output (_↑‾, ‾↓_)
  - NMEA Monitor (**NMEA1**, NMEA2)
  - NMEA Output Interval (**1 sec**, 2 sec, 3 sec)
  - Plotter Connection (**OFF**, Olex, Nobeltec, Others)
- NMEA1 (NMEA2)
  - Baud Rate (**4800bps**, 9600bps, 19200bps, 38400bps)
  - DBT Output (**OFF**, ON)
  - DPT Output (OFF, **ON**)
  - GGA Output (**OFF**, ON)
  - MTW Output (OFF, **ON**)
  - TLL Output (**OFF**, ON)
  - VHW Output (**OFF**, ON)
  - VTG Output (**OFF**, ON)
  - ZDA Output (**OFF**, ON)
  - GLL Output (**OFF**, ON)
  - HDT Output (**OFF**, ON)
  - MWV Output (**OFF**, ON)
  - RMC Output (**OFF**, ON)

C

C

- Correct
  - Draft Set (- 10.0 ~ 10.0 m: **0.0 m**, - 30.0 ~ 30.0 ft: **0.0 ft**)
  - Sonic Speed (- 7 ~ 2 %: **0 %**)
  - Water Temp (- 10.0 ~ 10.0: **0.0**)
  - Boat Speed (- 10.0 ~ 10.0: **0.0**)
  - Gain (TD) (- 50 ~ 50, HF1: **0**, HF2: **0**, LF1: **0**, LF2: **0**)
  - Power Supply Freq (100.0 ~ 130.0: **107.0**)
- Heaving
  - Heaving (**OFF**, ON)
  - HF TD Back and Forth (- 100.0 ~ 100.0 m: **0.0 m**)
  - HF TD Right and Left (- 100.0 ~ 100.0 m: **0.0 m**)
  - HF TD Height (- 100.0 ~ 100.0 m: **0.0 m**)
  - LF TD Back and Forth (- 100.0 m ~ 100.0: **0.0 m**)
  - LF TD Right and Left (- 100.0 m ~ 100.0: **0.0 m**)
  - LF TD Height (- 100.0 ~ 100.0 m: **0.0 m**)
  - Heaving reversal (**OFF**, ON)
  - Pitching reversal (**OFF**, ON)
  - Rolling reversal (**OFF**, ON)
- TD Setting
  - HF TD Type (OFF,
    Broadband Type: **TDM-052A**, TDM-062A, TDM-083, R-209, R-309, TDM-091, TDM-091D, TDM-071, TD340-K, TD360-K/TD361-K, TD380-K
    Others: Others (1 Frequency), Others (2 Frequency), TD-282, TD-401D, TD501C, TD-501T-3, TD-501B, TD-751, TD-2001D, TD-284/284A, TD-404T, TD-504T, TD-504F, TD-754, TD-66, TD-031D, TDM-041, TDM-041D)
  - LF TD Type (same as above)
  - HF TD1 Setting (Frequency: 24.0 ~ 240.0 kHz: **200.0 kHz**, Beam Angle: 1 ~ 120 ˚: **7**˚)
  - HF TD2 Setting (Frequency: 24.0 ~ 240.0 kHz: **130.0 kHz**, Beam Angle: 1 ~ 120 ˚: **11**˚)
  - LF TD1 Setting (Frequency: 24.0 ~ 240.0 kHz: **50.0 kHz**, Beam Angle: 1 ~ 120 ˚: **10**˚)
  - LF TD2 Setting (Frequency: 24.0 ~ 240.0 kHz: **38.0 kHz**, Beam Angle: 1 ~ 120 ˚: **20**˚)
  - Bottom Limit HF (0.0 ~ 10.0 m: **2.0 m**)
  - Bottom Limit LF (0.0 ~ 10.0 m: **2.0 m**)
- Basics
  - Language (**English**, Japanese, Greek, Spanish, Italian, French, Korean, Thai, Chinese1, Chinese2, Danish)
  - Range&Speed Unit (**NM,kn**, km,km/h, sm,mph)
  - Depth Unit (**m**, fm, l.fm, ft, J.fm)
  - Temperature Unit (˚**C**, ˚F)
  - Localtime Offset (- 12.0 ~ 14.0: **0.0**)
    (Note: Default value is 9.0, when Japanese language is selected upon initial startup.)
  - GPS Select (**Others**, Koden GPS, V102, VectorG1, V104s, V200s)
  - GPS Initialize (**NO**, yes)

D

D

- Customize
  - Color Customize (**Depth Value Font**, Depth Value Edge, Fish Alarm bar, Bottom Alarm Bar, Zoom Range Bar, Scale Inside, Scale Edge, Scale Val Inside, Scale Value Edge, Graph Line, VRM Line, VRM Value Font, VRM Value Edge, VRM Inter. Line, VRM Int Val Font, VRM Int Val Edge, W. Temp Val Font, W. Temp Val Edge, Speed Value Font, Speed Value Edge, Header Display)
  - Color Divide (0 ~ 99, Red: **90**, Orange: **78**, Yellow: **66**, Green: **53**, Blue Green: **39**, Light Blue: **25**, Blue: **12**)
  - Fish Disp Col. Adj. (0 ~ 30: **0**)
  - B. D. Mode (**OFF**, 1, 2, 3)
  - Net Finder Color (**Red**, Brown, White)
  - Display Direction (**Standard**, Left Side Up, Bottom Side UP, Right Side Up)
- Maintain
  - Simulation (**OFF**, ON)
  - Simulation Select (**Shallow Depth**, Intermediate, Deep Depth)
  - Key Lock (**OFF**, ON)
  - Initialize (**CM1**, CM2, CM3, CM4, CM5, CM6, System All)
  - System Check (**Panel Test**, LCD Test, XID)
  - All WPTs:DLT (**No,** Yes)
  - All IMG DT:DLT (**No,** Yes)
  - Image Output (**OFF**, ON)
  - System Program Load (PC Connection, **SD Card**, USB Memory)
  - Save Setting Value (**SD Card**, USB Memory)
  - Apply Setting Value (**SD Card**, USB Memory)‘

Chapter 1 Echo Adjust/ Display Setup

1.1 Change of TX Power

The strength of TX Power (transmission output) can be changed.

When water depth is 50 m or less, the gain of images are sometimes too high. In such cases, the gain can be set appropriately by reducing the [TX Power]. When own equipment is affecting the echo sounders of other boats, the interference noise to the other boats can be reduced by weakening the TX Power.

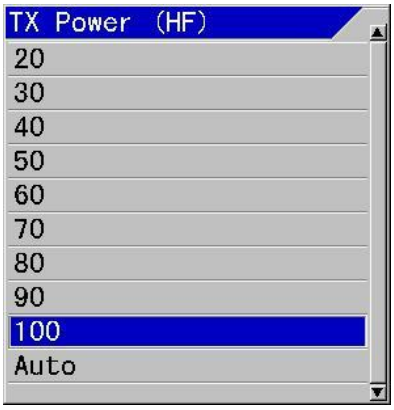
1.1.1 TX Power (HF)

Echo Adjust - TX Power (HF)

When TX Power (HF) has been changed, the TX Power of the transducer connected to the HF (high frequency) side can be adjusted.

1. Press MENU .
2. Select [Echo Adjust] - [TX Power (HF)].
3. Press [▶] of .

   The setup box of [TX Power (HF)] will be displayed.



4. Press [▲] and [▼] and select TX Power.

   The smaller the value is, the weaker the TX Power becomes.
5. Press MENU to close the menu.

> ⚠ **Caution:** At [Auto], transmission output will be adjusted depending of depth range. The output is reduced for shallow water, and is increased for deep water.

1.1.2 TX Power (LF)

Echo Adjust - TX Power (LF)

When TX Power (LF) is changed, the TX Power of transducer connected to the LF (low frequency) side can be adjusted.

1. Press MENU .
2. Select [Echo Adjust] - [TX Power (LF)].
3. Press [▶] of .

   The setup box of [TX Power (LF)] will be displayed.
4. Press [▲] and [▼], and select TX Power.

   The smaller the value is, the weaker the TX Power becomes.
5. Press MENU to close the menu.

> ⚠ **Caution:** At [Auto], transmission output will be adjusted depending of depth range. The output is reduced for shallow water, and is increased for deep water.

⚠ **Caution:** Never activate transmission while transducer is out of water. It will be damaged.

1.2 Change of dynamic range of Echo

Echo Adjust - Dynamic Range*1 HF1, HF2, LF1, LF2

The dynamic range of reflected signal (color gradation) can be adjusted.

1. Press MENU .
2. Select [Echo Adjust] - [Dynamic Range XXX].
3. Press [▶] of . The setup box of [Dynamic Range] will be displayed.



4. Press [▲] and [▼] and select a value.

   When the value is small, the expression range of strong and weak signal change is narrow, weaker signal will become undistinguished. When the value is larger, the expression range is wider and the weaker signals become distinct.

5. Press MENU to close the menu.

1.3 Making of reflection strength at shallow and deep depth equal

At [Based on Seabed] of TVG Type, it is set as the bottom signal can be seen at a constant level. At [Manual], the reflection strength of fish depending on the depth can be set to be seen uniformly.

Main changing items here are as follows:

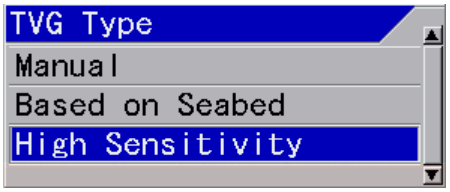
- To change TVG Type
- To change TVG Strength
- To change TVG Depth

1.3.1 Changing of TVG Type

TVG*2 - TVG Type

TVG is a function to display images, by correcting the attenuation of ultrasonic sound through propagation in water and by making reflection strength from deeper and shallower depth equal,

1. Press MENU .
2. Select [TVG] - [TVG Type]
3. Press [▶] of . The setup box of [TVG Type] will be displayed.



4. Press [▲] and [▼] to select a type.

   At [Based on Seabed] and [High Sensitivity], bottom signal will be corrected to be a constant level at all ranges. At the [TVG Adjust], it is possible to change the effect of correction on signal shallower than the start point.

   At [Manual], user is to set [TVG Strength], [TVG Depth] and [TVG Adjust] to produce desired performance. (See the Basic Operation Manual, “2.2.6 Adjustment of TVG”).

How to adjust TVG:

- Setup a gradient of gain variation at [TVG Strength].
- Setup a reference depth for correction at [TVG Depth].
- Setup a start depth for correction at [TVG Adjust].

5. Press MENU to close the menu.

*1 Dynamic Range: This is the function to expand and narrow down the signal range from blue to red in images.

*2 TVG (Time variable gain): The signal strength is different between deep and shallow water and this is the function to correct this.

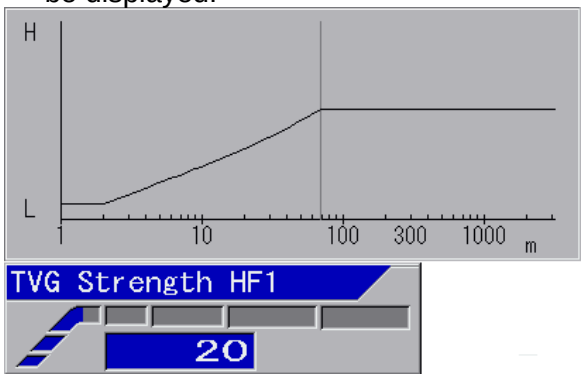
1.3.2 Changing of TVG Strength

TVG - TVG Strength HF1, HF2, LF1, LF2

The gradient of gain variation is adjusted to reduce gain for shallower depth.

1. Press MENU .
2. Select [TVG] - [TVG Strength XXX].
3. Press [▶] of .

   The setup box of [TVG Strength XXX] will be displayed.



4. Press [▲] and [▼] and set a value.

   When the value is larger, the gradient will be steeper (gain variation amount is large) and when the value is smaller, the gradient will be gentler (gain variation amount is small).

5. Press MENU to close the menu.

> ⚠ **Caution:** When [Manual] is selected for [TVG Type], setup shall be done to every frequency.

1.3.3 Changing of TVG Depth

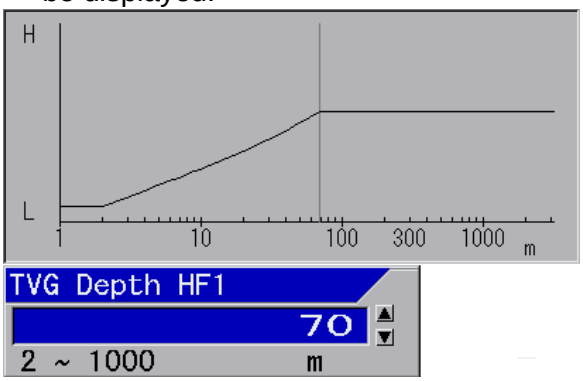
TVG - TVG Depth HF1, HF2, LF1, LF2

The reference depth for correction will be adjusted.

The reflected signal from depth shallower this reference depth will be corrected to be the same gain of the reference depth.

1. Press MENU .
2. Select [TVG] - [TVG Depth XXX].
3. Press [▶] of .

   The setup box of [TVG Depth XXX] will be displayed.



4. Press [▲] and [▼] to set a value for depth.

   When the value is larger, the correction reference depth becomes deeper and the gain at shallower depth will be reduced when smaller.

5. Press MENU to close the menu.

> ⚠ **Caution:** When [Manual] is selected for [TVG Type], setup shall be done at every frequency.

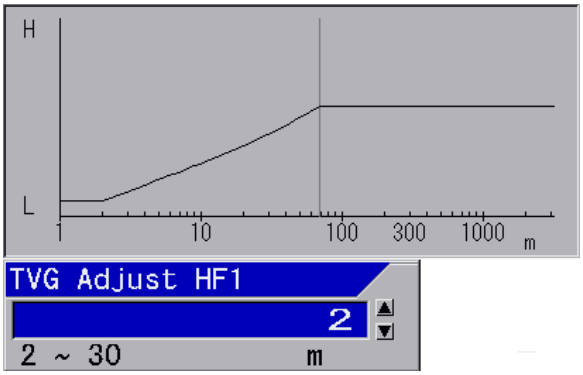
1.3.4 Changing of TVG Adjust

TVG - TVG Adjust HF1, HF2, LF1, LF2

When correction is too much effective at shallower depth, the correction start depth will be adjusted. The correction amount at depth shallower than the start depth will be the same as that of the start depth.

1. Press MENU .
2. Select [TVG] - [TVG Adjust XXX].
3. Press [▶] of .

The setup box of [TVG Adjust XXX] will be displayed.



4. Press [▲] and [▼] to set a value for depth.

   When the value is larger, the correction start depth will become deeper and the gain at shallower depth will increase.

   When the value is smaller, the correction reference depth becomes shallower and the gain at shallower depth will be reduced when smaller.

5. Press MENU to close the menu.

> ⚠ **Caution:** Please set the depth for each frequency.

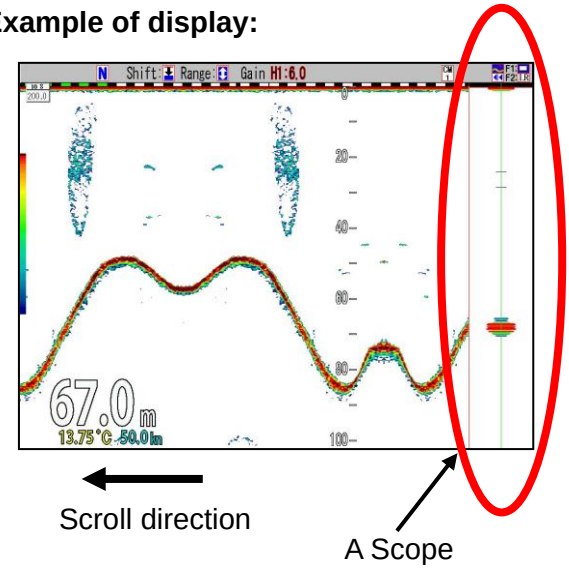
1.4 Displaying of A Scope

Disp. Setup1 - A Scope

A scope expresses the echo strength of fish image from one set of the latest transmitted/received signal as width, to provide better view by displaying stronger response wide and weaker response narrow.

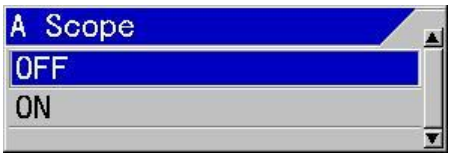
A Scope will be displayed next to the location of display of the latest image in the direction of scroll of echo sounder's images.

Example of display:



1. Press MENU .
2. Select [Disp. Setup1] - [A Scope]
3. Press [▶] of  .

   The setup box of [A Scope] will be displayed.

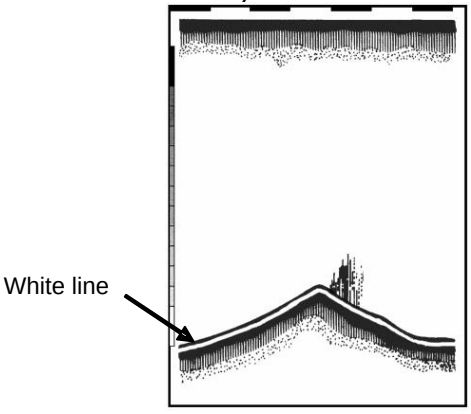


4. Press [▲] and [▼], and select [ON] to display and [OFF] to close.
5. Press MENU to close the menu.

1.5 Display in of white line

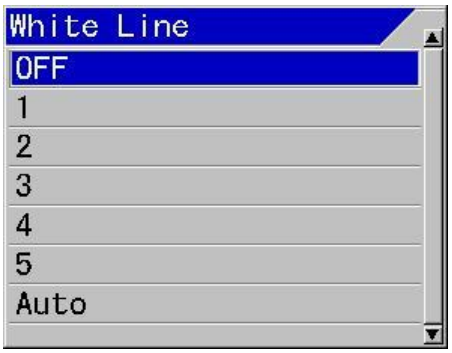
Disp. Setup1- White Line

The surface of sea bottom is marked with a white line of constant width to make the fish school at the bottom easily identified.



1. Press MENU .
2. Select [Disp. Setup1] - [White Line].
3. Press [▶] of .

   The setup box of [White Line] will be displayed.



4. Press [▲] and [▼] and select the line width of white line. At 1, the finest line will be displayed and at 5, the thickest line will be displayed. At [Auto], the width of white line will vary depending on the strength of reflection from sea bottom. To stop the display, select [OFF].
5. Press MENU to close the menu.

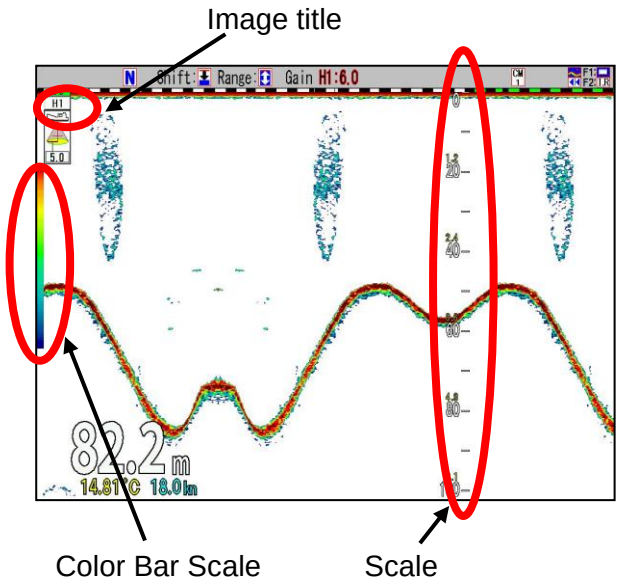
1.6 Changing of screen

The screen can be changed to be easily seen depending on environmental conditions of the usage.

The main items that can be changed here are as follows:

- Change of background color of images
- Change of display color of images
- Emphasis of big echo of images
- Display of scale/Not display
- Change of Scale Position
- Change of Scale Value
- Display of Color Bar Scale/Not display
- Set the Image Title as frequency/ HF1 or LF1
- Change of Image Direction
- Change of Image Swap
- Set the detail of image resolution or change by lapse time
- Change of Width of Zoom Image
- Zoom Image Split
- Set the BTM Bottom Position
- Set the B.D. Bottom Position
- Change the display direction

Layout of images



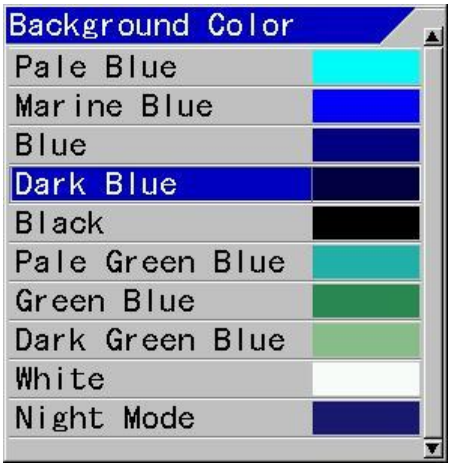
1.6.1 Changing of Background Color of images of echo sounders

Echo Adjust - Background Color

Responding to the ambient brightness, the background color of display can be changed.

1. Press MENU .
2. Select [Echo Adjust] - [Background Color].
3. Press [▶] of .

   The setup box of [Background Color] will be displayed.



4. Press [▲] and [▼] to select Background Color.

When night mode is selected, background color will be in darker color and display brightness is also turned down simultaneously.

> ⚠ **Caution:** The screen brightness in night mode can be set at different brightness from the other background color. As for the change of screen brightness, refer to the Basic Operation Manual, "1.7.1 Adjustment of LCD brilliance".

5. Press MENU to close the menu.

1.6.2 Changing of display color of echo sounder images

Echo Adjust - Color Tone

The color tone of images on echo sounders can be changed.

Either one of [Monochrome], [8 color], [16 color] and [64 color] can be selected.

1. Press MENU .
2. Select [Echo Adjust] - [Color Tone].
3. Press [▶] of  .

The setup box of [Color Tone] will be displayed.



4. Press [▲] and [▼] to set the color tone to which changed. In accordance with the setup, the Color Bar Scale will be also changed.
5. Press MENU to close the menu.

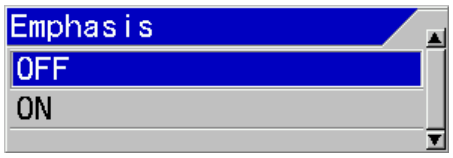
1.6.3 Emphasis of big echo of the sounder images

Echo Adjust - Emphasis

Big echo of the sounder image can be emphasized.

1. Press MENU .
2. Select [Echo Adjust] - [Emphasis].
3. Press [▶] of  .

The setup box of [Emphasis] will be displayed.



4. With [▲] and [▼] keys, select [ON] to emphasis and [OFF] not to emphasis.
5. Press MENU to close the menu.

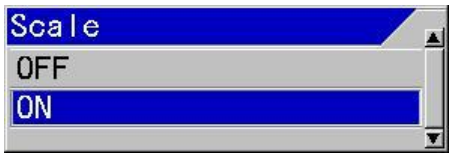
1.6.4 Display of Scale/Not display

Disp. Setup2 - Scale

It is selectable to display scale or not.

1. Press MENU .
2. Select [Disp. Setup2] - [Scale].
3. Press [▶] of  .

The setup box of [Scale] will be displayed.



4. With [▲] and [▼], select [ON] to display and [OFF] not to display.
5. Press MENU to close the menu.

1.6.5 Changing of Scale Position

Disp. Setup2 - Scale Position

The display of Scale Position can be selected.

1. Press MENU .
2. Select [Disp. Setup2] - [Scale Position].
3. Press [▶] of .

   The setup box of [Scale Position] will be displayed.



4. With [▲] and [▼] keys, select [Side] or [Center] of the position of display.
5. Press MENU to close the menu.

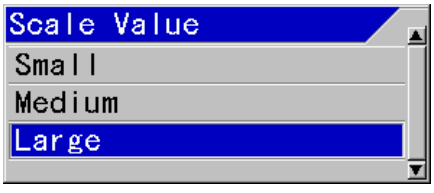
1.6.6 Changing of Scale Value

Disp. Setup2 - Scale Value

The display of Scale Value can be changed.

1. Press MENU .
2. Select [Disp. Setup2] - [Scale Value].
3. Press [▶] of .

   The setup box of [Scale Value] will be displayed.



4. Select [Small], [Medium] or [Large] of the size with [▲] and [▼].
5. Press MENU to close the menu.

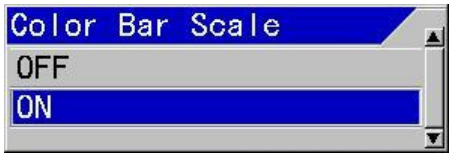
1.6.7 Displaying of Color Bar Scale

Disp. Setup2 - Color Bar Scale

It is selectable to display Color Bar Scale or not.

1. Press MENU .
2. Select [Disp. Setup 2] - [Color Bar Scale].
3. Press [▶] of .

   The setup box of [Color Bar Scale] will be displayed.



4. With [▲] and [▼], select [ON] to display and [OFF] not to display.
5. Press MENU to close the menu.

1.6.8 Setting the Image Title as frequency/ HF1 LF1

Disp. Setup2 - Image Title

The title of each image can be selected.

1. Press MENU .
2. Select [Disp. Setup2] - [Image Title].
3. Press [▶] of .

   The setup box of [Image Title] will be displayed.



4. With [▲] and [▼], select either one of [Frequency] or [HF1 LF1].
5. Press MENU to close the menu.

Example of display:



Simple indication of frequency.



Indication of the actual frequency in use.

1.6.9 Changing of Image Direction

Disp. Setup1 - Image Direction

The scroll direction of displayed images can be changed.

1. Press MENU .
2. Select [Disp. Setup1] - [Image Direction].
3. Press [▶] of .

   The setup box of [Image Direction] will be displayed.



4. With [▲] and [▼] keys, select one of the direction [←|←], [→|→] or [←|→].
5. Press MENU to close the menu.

> ⚠ **Caution:** [←|→] will be valid only with 2-screen, [←|←] for the others.

1.6.10 Changing of display alignment of images

Disp. Setup1 - Image Swap

The alignment of image display on echo sounder can be changed.

1. Press MENU .
2. Select [Disp. Setup1] - [Image Swap].
3. Press [▶] of .

   The setup box of [Image Swap] will be displayed.



4. With [▲] and [▼] keys, select swapping type [A|B] or [B|A].

   When [A|B] is selected, the alignment of images will be HF1, HF2, LF1 and LF2 from the right side. When [B|A] is selected, the alignment will be HF1, HF2, LF1, and LF2 from the left side.
5. Press MENU to close the menu.

1.6.11 Detailed display of image resolution and lapse time

Disp. Setup1 - Image Split

When more than one image is displayed on the screen, the arrangement of images can be selected.

1. Press MENU .
2. Select [Disp. Setup1] - [Image Split].
3. Press [▶] of .

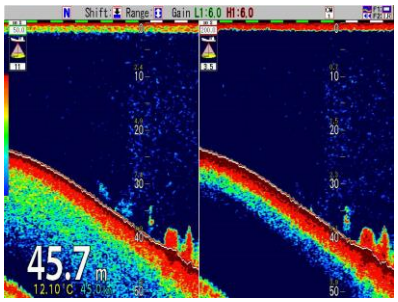
   The setup box of [Image Split] will be displayed.



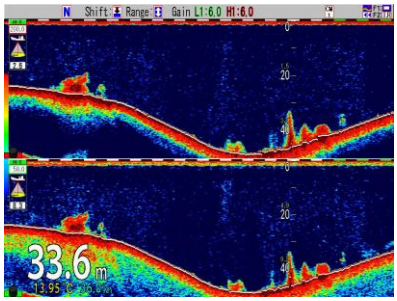
4. Pressing [▲] and [▼], select screen split [Vertical] or [Horizontal].

   [Vertical] arranges the screen on the left and right. Select when depth screen resolution is important. [Horizontal] arranges the screens at the upper and lower. Select when change by lapse time is important.
5. Press MENU to close the menu.

Example of display:



Display of vertical split of the screen



Display of horizontal split of the screen

1.6.12 Changing of Width of Zoom Image

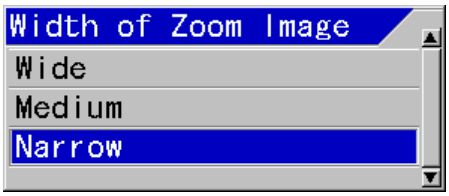
Disp. Setup1 - Width of Zoom Image

When zoomed images are displayed on the screen of echo sounders, the width of zoom image can be changed.

> **Caution:** To display zoomed images, refer to the Basic Operation Manual, “2.1.3 Displaying of zoom images”.

1. Press MENU .
2. Select [Disp. Setup1] - [Width of Zoom Image]
3. Press [▶] of .

   The setup box of [Width of Zoom Image] will be displayed.



4. With [▲] and [▼] keys, select one of the widths of zoomed display image, [Wide], [Medium] or [Narrow].
5. Press MENU to close the menu.

1.6.13 Zoom Image Split

Disp. Setup1 – Zoom Image Split

When one or two normal images are displayed on the screen, the zoom image can be displayed next to the normal image.

1. Press MENU .
2. Select [Disp. Setup1] - [Zoom Image Split]
3. Press [▶] of .

   The setup box of [Zoom Image Split] will be displayed.

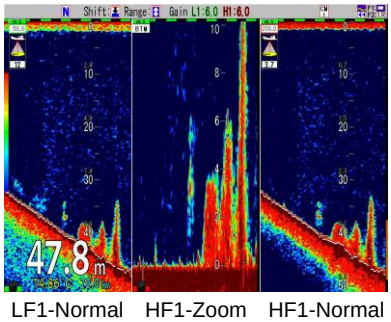


4. Pressing [▲] and [▼], select zoom screen split [Standard] or [Vertical].
5. At [Standard], the screen will be divided into upper and lower parts. This will be selected to put much emphasis on lapse time.

   At [Vertical], the screen will be divided into the right and left parts. This will be selected to put much emphasis in the depth direction.
6. Press MENU to close the menu.

Example of display:

In case of two normal images are selected

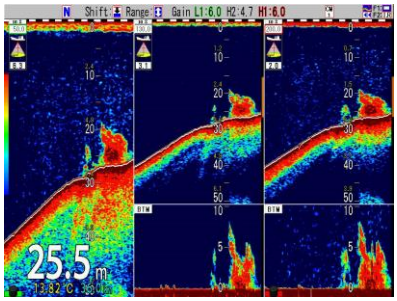


LF1-Normal HF1-Zoom HF1-Normal

When three or four normal images are displayed on the screen, the zoom image cannot be displayed next to the normal image.

In this case, the zoom image is displayed below the normal image.

In case of three normal images are selected



LF1-Normal | HF2-Normal / HF2-Zoom | HF1-Normal / HF1-Zoom

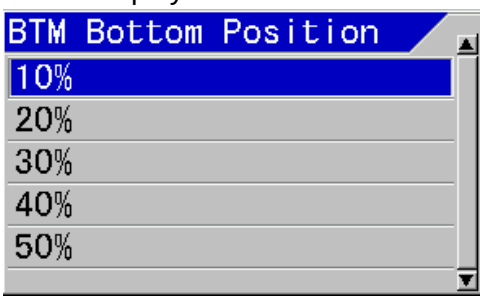
1.6.14 BTM Bottom Position

Disp. Setup1 – BTM Bottom Position

When BTM zoomed images are displayed on the screen of echo sounders, the position of Bottom line can be changed.

1. Press MENU .
2. Select [Disp. Setup1] - [BTM Bottom Position]
3. Press [▶] of  .

   The setup box of [BTM Bottom Position] will be displayed.



4. Pressing [▲] and [▼], select BTM Bottom Position [10%] to [50%].
5. Press MENU to close the menu.

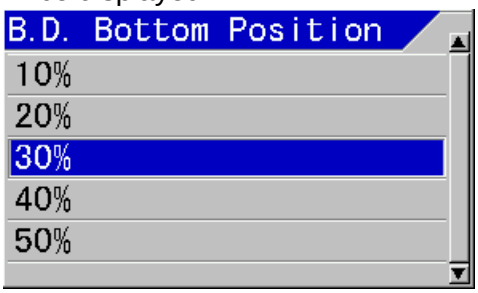
1.6.15 B.D. Bottom Position

Disp. Setup1 – B.D. Bottom Position

When B.D. zoomed images are displayed on the screen of echo sounders, the position of Bottom line can be changed.

1. Press MENU .
2. Select [Disp. Setup1] - [B.D. Bottom Position]
3. Press [▶] of  .

   The setup box of [B.D. Bottom Position] will be displayed.



4. Pressing [▲] and [▼], select B.D. Bottom position [10%] to [50%].
5. Press MENU to close the menu.

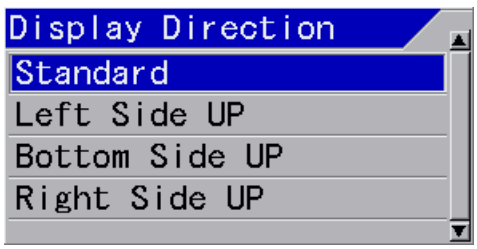
1.6.16 Change the display direction

Customize – Display Direction

Select the display direction from 4 types of images.

1. Press SUB MENU .
2. Select [Customize] - [Display Direction]
3. Press [▶] of  .

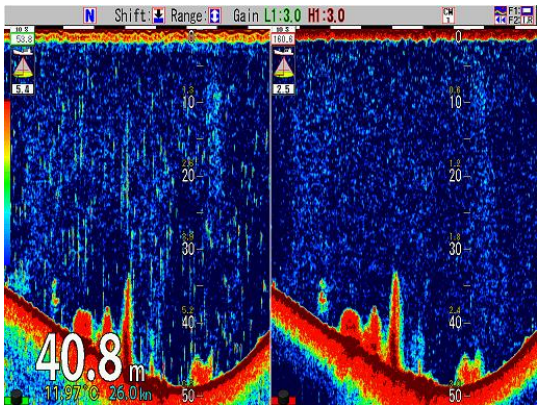
   The setup box of [Display Direction] will be displayed.



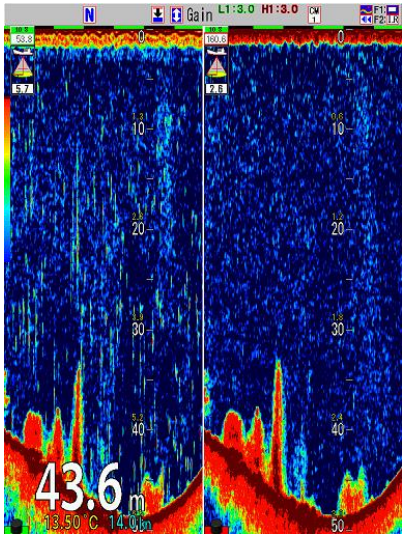
4. Pressing [▲] and [▼], select Display Direction [Standard] to [Right Side UP].

5. Press MENU to close the menu.

Example of display:



Standard and Bottom Side UP



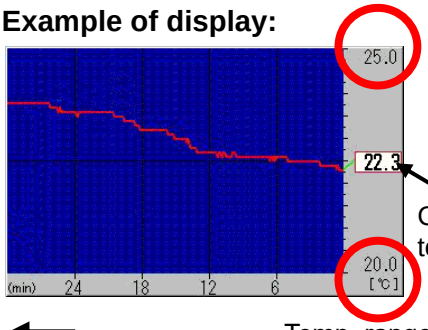
Left Side UP and Right Side UP

1.7 Displaying of Water Temp Window

The contents for displaying Water Temp Window are as follow:

- Display of Water Temp Window /Not to display
- Change of W. Temp. Graph Range

Example of display:



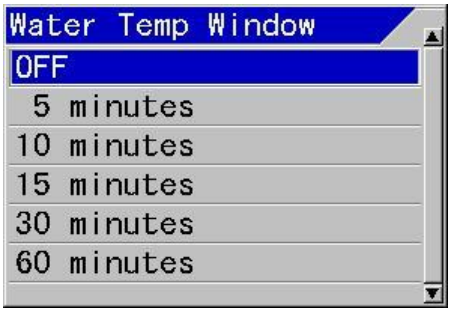
1.7.1 Display of Water Temp Window/Not to display

Disp. Setup2 - Water Temp Window

The latest water temperature and the transition of water temperature in the past can be displayed in a graph.

1. Press MENU .
2. Select [Disp. Setup2] - [Water Temp Window].
3. Press [▶] of .

   The setup box of [Water Temp Window] will be displayed.



4. With [▲] and [▼] keys, select display period of the graph from [5 minutes], [10 minutes], [15 minutes], [30 minutes] and [60 minutes]. To stop the display, select [OFF].
5. Press MENU to close the menu.

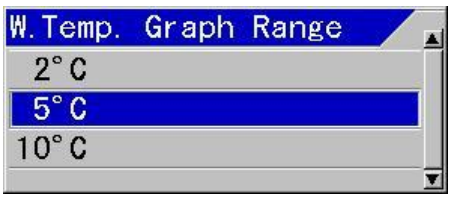
1.7.2 Changing of W. Temp. Graph Range

Disp. Setup2 - W. Temp. Graph Range

The display width of W. Temp. Graph Range can be selected.

1. Press MENU .
2. Select [Disp. Setup2] - [W. Temp. Graph Range]
3. Press [▶] of .

   The setup box of [W. Temp. Graph Range] will be displayed.



4. With [▲] and [▼] keys, select water temperature range, [2 ˚C], [5 ˚C] or [10 ˚C].
5. Press MENU to close the menu.

> **Caution:** When the unit of temperature is Fahrenheit, it is indicated as ˚F.

1.8 Changing of Depth Font Size and Depth Position/Display of Sub Depth Value

The contents for changes of display of water depth are as follows:

- Change of Depth Font Size
- Change of Depth Position
- Depth value can be displayed with the selected depth unit independently in addition to the Main depth value

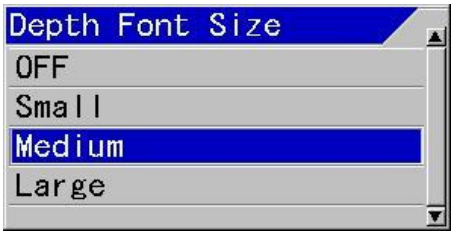
1.8.1 Changing of Depth Font Size

Disp. Setup 2 – Depth Font Size

The size of characters for water depth can be changed.

1. Press MENU .
2. Select [Disp. Setup2] - [Depth Font Size]
3. Press [▶] of .

   The setup box of [Depth Font Size] will be displayed.



4. With [▲] and [▼] keys, select one of Depth Font Size, [Small], [Medium] or [Large]. To stop the display, select [OFF].
5. Press MENU to close the menu.

1.8.2 Changing of display position of depth

Disp. Setup2 - Depth Position

The display position of water depth can be selected.

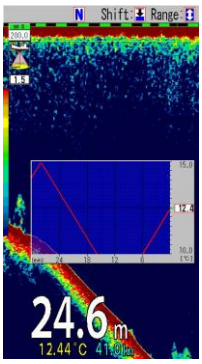
1. Press MENU .
2. Select [Disp. Setup2] - [Depth Position]
3. Press of [▶] of .

   The setup box of [Depth Position] will be displayed.

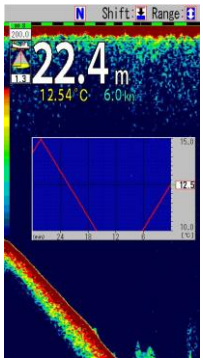


4. With [▲] and [▼] keys, select Depth Position, [Bottom] or [Top].
5. Press MENU to close the menu.

Example of display:



Bottom of display position



Top display position

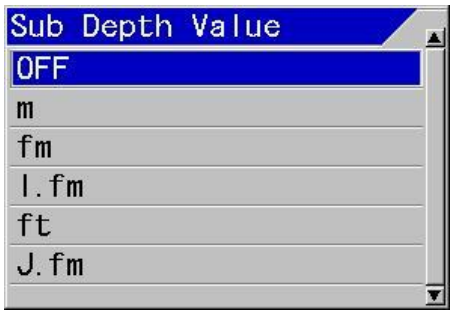
1.8.3 Display of Sub Depth Value

Disp. Setup1 – Sub Depth Value

Depth value can be displayed with the selected depth unit independently in addition to the Main depth value.

1. Press MENU .
2. Select [Disp. Setup1] - [Sub Depth Value]
3. Press of [▶] of .

   The setup box of [Sub Depth Value] will be displayed.



4. With [▲] and [▼] keys, select one of Sub Depth Value, [m], [fm], [I.fm], [ft] or [J.fm]. To stop the display, select [OFF].
5. Press MENU to close the menu.

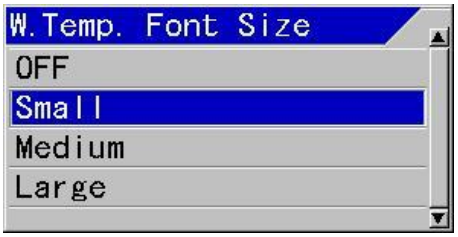
1.9 Changing of W. Temp./Speed Value/ Bottom Hardness Font size

Disp. Setup2 - W. Temp. Font size

Font size of the water temperature, Speed Value and Bottom Hardness display can be selected.

1. Press MENU .
2. Select [Disp. Setup2] - [W. Temp. Font Size].
3. Press [▶] of .

   The setup box of [W. Temp. Font Size] display will be displayed.

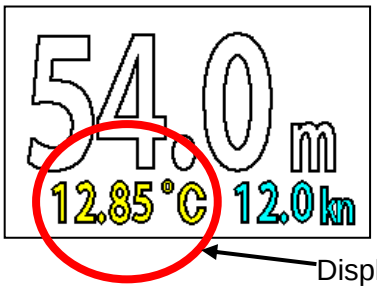


4. With [▲] and [▼] keys, select W. Temp. Font size, [Small], [Medium] or [Large]. To stop the display, select [OFF].

   The font size for [Speed Value] and [Bottom Hardness] is the same as the [W, Temp. Font Size] setting. If you set [W, Temp. Font Size] to off, those settings will be [small].

5. Press MENU to close the menu.

Example of display:



Display of Water Temperature

1.10 Displaying of Speed Value/Not to display

Disp. Setup2 - Speed Value

It is selectable to display the boat speed or not.

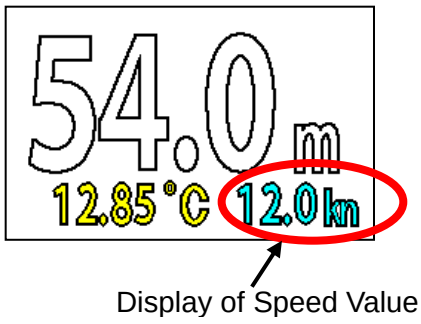
1. Press MENU .
2. Select [Disp. Setup2] - [Speed Value].
3. Press [▶] of .

The setup box of [Speed Value] will be displayed.



4. With [▲] and [▼] keys, select [ON] to display and [OFF] to stop.
5. Press MENU to close the menu.

Example of display:



Display of Speed Value

1.11 Display of Bottom Hardness value

Disp. Setup1 – Bottom Hardness

The Bottom Hardness value is displayed in % next to the Speed Value display.

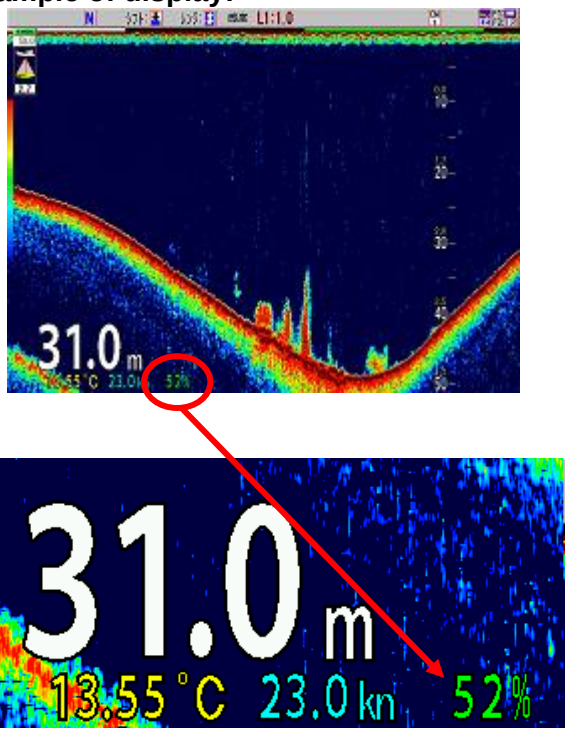
1. Press MENU .
2. Select [Disp. Setup1] - [Bottom Hardness].
3. Press [▶] of .

The setup box of [Bottom Hardness] will be displayed.



4. With [▲] and [▼] keys, select [ON] to display and [OFF] to not display.
5. Press MENU to close the menu.

Example of display:



1.12 Display of Detection Area/Not to display

Disp. Setup2 - Detection Area

Approximate detection area by the beam angle of the transducer in use will be displayed.

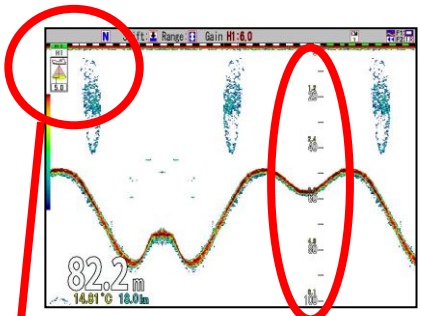
1. Press MENU .
2. Select [Disp. Setup2] - [Detection Area].
3. Press [▶] of .

The setup box of display of [Detection Area] will be displayed.

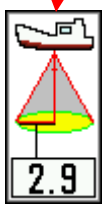


4. With [▲] and [▼] keys, select [ON] to display and [OFF] not to display.
5. Press MENU to close the menu.

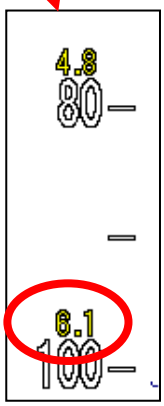
Caution: When a transducer other than broadband type*1 is used, the beam angle differs by transducer. Set the beam angle of the transducer to be used at [TD setting] → [HF TD setting] → [Beam Angle] and [LF TD setting] → [Beam Angle]



Display of detection area



Radius of detection area of sea bottom



Radius of detection area of scale (The value in yellow at upper part of scale values)

1.13 Widening of Bottom Search Range

BTM Search - Bottom Search Range

This is to select the bottom search range.

1. Press MENU .
2. Select [BTM Search] - [Bottom Search Range]
3. Press [▶] of  .

   The setup box of [Bottom Search Range] will be displayed.



4. With [▲] and [▼] keys, select [Bottom Search Range], [Inside Range] or [Outside Range].

   At [Inside Range], sea bottom is detected if sea bottom is displayed in the screen.

   At [Outside Range], sea bottom will be detected down to the depth twice as deep as display range.

5. Press MENU to close the menu.

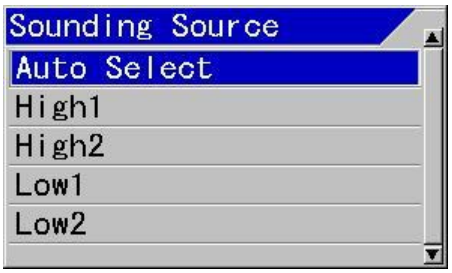
1.14 Selection of a Sounding Source (frequency)

BTM Search - Sounding Source

The bottom detection source is selected either in a specified image or auto select.

1. Press MENU .
2. Select [BTM Search] - [Sounding Source].
3. Press [▶] of  .

   The setup box of [Sounding Source] will be displayed.



*1Broaband Type Transducer: A transducer that can handle multiple frequencies (having wide range of frequency bandwidth). TDM-052A, TDM-062A and TDM-091 can be connected to CVS-875D/877D.

4. With [▲] and [▼] keys, select one of [High1], [High2]*1, [Low1] or [Low2]*2. For automatic selection, select [Auto select].

   At [Auto select], the image with the highest frequency of bottom detected will be selected.

5. Press MENU to close the menu.

> ⚠ **Caution:** When an image is specified and bottom cannot be detected in the image, water depth will not be displayed.

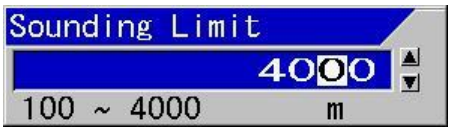
1.15 Setting depth to perform Bottom Limit searching at Auto-Range / Auto-Shift

BTM Search - Sounding Limit

When the sea bottom cannot be detected at Auto-Range*3/Auto-Shift*4, the maximum depth to detect the bottom shall be set.

1. Press MENU .
2. Select [BTM Search] - [Sounding Limit].
3. Press [▶] of .

   The setup box of [Sounding Limit] will be displayed.



4. Pressing [▲], [▼], [▶] or [◀], set a depth.

   Larger value makes the time longer for detecting the sea bottom again after lost due to bubble etc.

5. Press MENU to close the menu.

1.16 Selecting method for Bottom search

BTM Search – Bottom Search Type

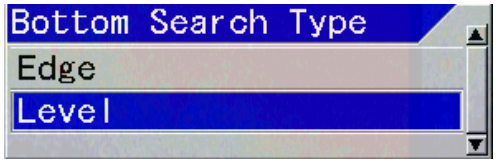
The bottom search type to detect the bottom shall be set.

Select the [Level] to confirm that the signal level of the seabed reflection is the signal level that can be judged as the seabed.
Select the [Edge] to confirm the rising edge of the waveform that is judged to be the signal of the seabed reflection.

.

1. Press MENU .
2. Select [BTM Search] - [Bottom Search Type].
3. Press [▶] of .

   The setup box of [Bottom Search Type] will be displayed.



4. Pressing [▲] and [▼] keys, select [Edge] or [Level].

   Select [Level] when setting BTM/B.D. with a range of 5m or less.

   [Edge] and [Level] each have their own characteristics.

   Please select your preferred method accordingly.

   [Edge] has a strong tendency to recognize the depth directly below the transducer (the center of the beam width) as the seabed on slopes and rocky areas, so there is a tendency for the seabed to be deeper than it appears in the image.

   It excels at distinguishing between schools of bottomed fish and the seabed. It also has excellent deep-sea sounding capabilities, with depths of more than 1000m.

*1High1/High2: Names of two images where the higher frequencies (H) in 4-frequency can be selected.
*2Low1/Low2 : Names of two images at those the lower frequencies (H) in 4-frequency can be selected.
*3Auto Range : The function to change the range automatically to keep the sea bottom always in the image.
*4Auto Shift : The function to change the shift automatically to keep the sea bottom always in the image.

[Level] has a strong tendency to recognize the shallowest depth as the seabed on slopes and rocky areas, so there is a tendency for the shallowest part of the seabed image to be the seabed.

5. Press MENU to close the menu.

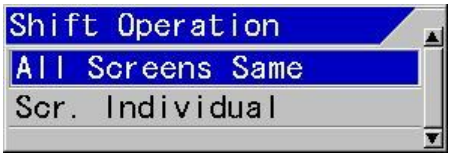
1.17 Selecting method for Shift Operation (per each image/for whole screen at the same time)

Shift Setup - Shift Operation

It can be selected whether the shift operation is changed for all images at once or for each image.

1. Press MENU .
2. Select [Shift Setup] - [Shift Operation].
3. Press [▶] of .

   The setup box of [Shift Operation] will be displayed.



4. When shift on all images will be changed at once with [▲] and [▼] keys, select [All Screens same]. When each image is changed, select [Scr. Individual].
5. Press MENU to close the menu.

> ⚠ **Caution:** When [Scr. Individual] is selected, the shift on the image, on which a red gain knob mark is blinking (active image), will be valid and changeable. To specify an image, push the gain knob and switch over to the active image.

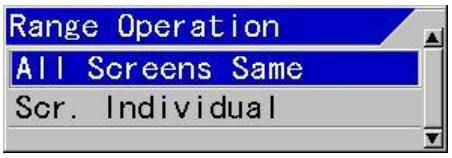
1.18 Selecting Range Operation (per image/Whole screen at same time)

Range Setup - Range Operation

It can be selected whether the range operation is changed for all images at once or for each image.

1. Press MENU .
2. Select [Range Setup] - [Range Operation].
3. Press [▶] of .

   The setup box of [Range Operation] will be displayed.



4. When range on all images will be changed at once with [▲] and [▼] keys, select [All Screens same]. When each image is changed, select [Scr. Individual].
5. Press MENU to close the menu.

> ⚠ **Caution:** When [Scr. Individual] is selected, the shift on the image, on which a red gain knob mark is blinking (active image), will be valid and changeable. To specify an image, push the gain knob and switch over to the active image.

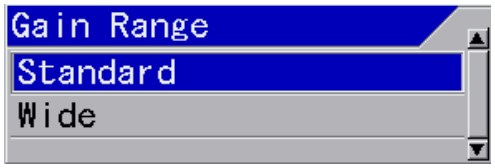
1.19 Selecting the effective range of Gain

System – Gain Range

If the dynamic range setting is set wider than 20 dB, the noise may not disappear even if the Gain is set to 0.0. In this case, if you set the Gain range to "Wide", you can further reduce the Gain and cancel noise.

1. Press SUB MENU .
2. Select [System] - [Gain Range]
3. Press [►] of .

The setup box of [Gain Range] will be displayed.



4. Press the [▲] and [▼] keys to select [Standard] when changing to the standard Gain range. When changing to change to a wider Gain range, select [Wide].
5. Press MENU to close the menu.

Chapter 2 Alarm

2.1 Use of Bottom Alarm

When the detected position of sea bottom is shallower than the upper limit or deeper than the lower limit, alarm sound and display will be provided.

It is convenient for maintaining a specific depth.

The content to use Bottom Alarm is as follows:

- Start/Stop the Bottom Alarm
- Set the Upper Depth for Bottom Alarm
- Set the Lower Depth for Bottom Alarm

2.1.1 Start/Stop of Bottom Alarm

Alarm1 - Bottom Alarm

Select [ON] for bottom alarm and [OFF] not for bottom alarm.

1. Press MENU .
2. Select [Alarm1] - [Bottom Alarm].
3. Press [▶] of .

   The setup box of [Bottom Alarm] will be displayed.



4. Press [▲] and [▼] keys, and select [ON] to activate the alarm, [OFF] to stop.
5. To set Bottom Alarm related items subsequently:

   (1) Go to item 2 of 2.1.2, when [Upper Depth] is to be set.
   (2) Go to item 2 of 2.1.3 when [Lower Depth] is to be set.
6. Press MENU to close the menu.

Caution: Press any key to stop the alarm sound and alarm display.

Caution: To activate the alarm sound and the alarm display again after once stopped, it is necessary for the boat to go outside of the alarm conditions.

Caution: When CCD camera image is displayed, the alarm display will be only by icon display. (See “2.7 Confirmation of alarm conditions”, p 2-8.)

2.1.2 Setup of Upper Depth

Alarm1 - Upper Depth

To set the depth to activate alarm when depth becomes shallower than the specified depth.

1. Press MENU .
2. Select [Alarm1] - [Upper Depth].
3. Press [▶] of

   The setup box of [Upper Depth] will be displayed



4. Pressing [▲] and [▼] keys, set Upper Depth.
5. To set [Lower Depth] subsequently, go to 2.1.3 of item 2.
6. Press MENU to close the menu.

Caution: The maximum value of Upper Depth is the Lower Depth – 1 m.

2.1.3 Setup of Lower Depth

Alarm1 - Lower Depth

To set the depth, where to activate alarm when the depth becomes deeper than a specified depth, will be set.

1. Press MENU .
2. Select [Alarm1] - [Lower Depth].
3. Press [▶] of .

   The setup box of [Lower Depth] will be displayed.



4. Pressing [▲] and [▼] keys, set Lower Depth.
5. Press MENU to close the menu.

> **Caution:** The minimum value of Upper Depth is the Upper Depth + 1 m.

2.2 Use of Fish Alarm

When there is response recognized as fish school within a set area, notice will be provided with sound and display.

It is convenient to judge if there is response of fish school.

The contents to use this Fish Alarm are as follows:

- Start/Stop the Fish Alarm
- Set the Fish From
- Set the Fish Span
- Set the Upper Level
- Set the Lower Level
- Set the Alarm Signal Length
- Set the Fish Image

2.2.1 Start/Stop Fish Alarm

Alarm1 - Fish Alarm

Select [ON] to enable the fish alarm and [OFF] to deactivate.

1. Press MENU .
2. Select [Alarm1] - [Fish Alarm]
3. Press [▶] of .

   The setup box of [Fish Alarm] will be displayed.



4. Press [▲] and [▼] keys, select [ON] to enable the alarm and [OFF] to delete it.
5. Consecutively, to set the Fish Alarm related items subsequently:
   (1) Go to item 2 of 2.2.2, when [Fish From] is set.
   (2) Go to item 2 of 2.2.3, when [Fish Span] is set.
   (3) Go to item 2 of 2.2.4, when [Upper Level] is set.
   (4) Go to item 2 of 2.2.5, when [Lower Level] is set.
   (5) Go to item 2 of 2.2.6, when [Alarm Signal Length] is set.
   (6) Go to item 2 of 2.2.7, when [Fish Image] is set.
6. Press MENU to close the menu.

> **Caution:** Press any key to stop the alarm sound and alarm display.

> **Caution:** To activate the alarm sound and the alarm display again after once stopped, it is necessary for the boat to go outside of the alarm conditions.

Caution: When CCD camera image is displayed, the alarm display will be only by icon display. (See “2.7 Confirmation of alarm conditions”, p 2-9.)

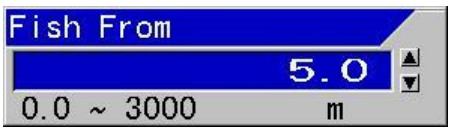
2.2.2 Setup of Fish From

Alarm1- Fish From

This is to set the start depth to sound alarm for fish schools.

1. Press MENU .
2. Select [Alarm1] - [Fish From].
3. Press [▶] of .

   The setup box of [Fish From] will be displayed.



4. Pressing [▲] and [▼] keys, set Fish From.
5. Consecutively, to set the Fish Alarm related items subsequently:
   (1) Go to item 2 of 2.2.3, when [Fish Span] is set.
   (2) Go to item 2 of 2.2.4, when [Upper Level] is set.
   (3) Go to item 2 of 2.2.5, when [Lower Level] is set.
   (4) Go to item 2 of 2.2.6, when [Alarm Signal Length] is set.
   (5) Go to item 2 of 2.2.7, when [Fish Image] is set.
6. Press MENU to close the menu.

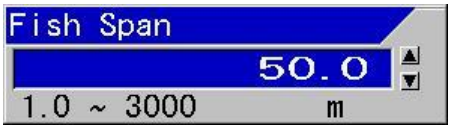
2.2.3 Setup of Fish Span

Alarm 1 - Fish Span

This is to set the range from the start point to sound alarm for fish schools.

1. Press MENU .
2. Select [Alarm1] - [Fish Span].
3. Press [▶] of .

The setup box of [Fish Span] will be displayed.



4. Pressing [▲] and [▼] keys, set Fish Span.
5. To set the Fish Alarm related items subsequently:
   (1) Go to item 2 of 2.2.4, when [Upper Level] is set.
   (2) Go to item 2 of 2.2.5, when [Lower Level] is set.
   (3) Go to item 2 of 2.2.6, when [Alarm Signal Length] is set.
   (4) Go to item 2 of 2.2.7, when [Fish Image] is set.
6. Press MENU to close the menu.

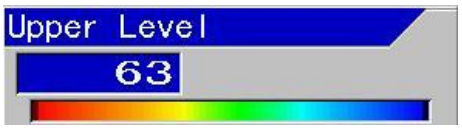
2.2.4 Setup of Upper Level

Alarm1 - Upper Level

This is to set the upper limit level of fish school response to sound the fish school alarm.

1. Press MENU .
2. Select [Alarm1] - [Upper Level]
3. Press [▶] of .

   The setup box of [Upper Level] will be displayed.



4. Pressing [▲] and [▼] keys, set Upper Level.

   The color level that is weaker than the preset color level is regarded as fish schools.

   This is to set the range of color level

where warning is activated together with the preset value of the [Lower Level].

5. To set the Fish Alarm related items subsequently:
   (1) Go to item 2 of 2.2.5, when [Lower Level] is set.
   (2) Go to item 2 of 2.2.6, when [Alarm Signal Length] is set.
   (3) Go to item 2 of 2.2.7, when [Fish Image] is set.
6. Press MENU to close the menu.

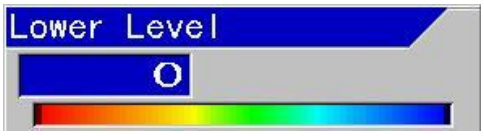
2.2.5 Setup of Lower Level

Alarm1 - Lower Level

This is to set the lower limit level of fish school response to sound the fish school alarm.

1. Press MENU.
2. Select [Alarm1] – [Lower Level]
3. Press [▶] of .

   The setup box of [Lower Level] will be displayed.



4. Pressing [▲] and [▼] keys, set Lower Level.

   The color level that is stronger than the preset color level is regarded as fish schools.

   This is to set the range of color level where warning is activated together with the preset value of the [Upper Level].

5. To set the Fish Alarm related items subsequently:
   (1) Go to item 2 of 2.2.6, when [Alarm Signal Length] is set.
   (2) Go to item 2 of 2.2.7, when [Fish Image] is set.
6. Press MENU to close the menu.

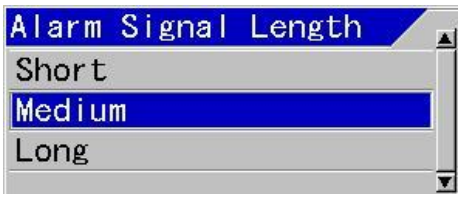
2.2.6 Setup of Alarm Signal Length

Alarm1 - Alarm Signal Length

This is to set the signal length of fish schools to sound the fish school alarm.

1. Press MENU.
2. Select [Alarm1] – [Alarm Signal Length]
3. Press [▶] of .

   The setup box of [Alarm Signal Length] will be displayed.



4. Pressing [▲] and [▼] keys, set Alarm Signal Length.

   At [Short], even a small response is judged as fish school.

   At [Long], continuous strong response is judged as fish school.

   At [Medium] the judgment is intermediate between Short and Long.

5. To set the Fish Alarm related items subsequently:
   (1) Go to item 2 of 2.2.7, when [Fish Image] is set.
6. Press MENU to close the menu.

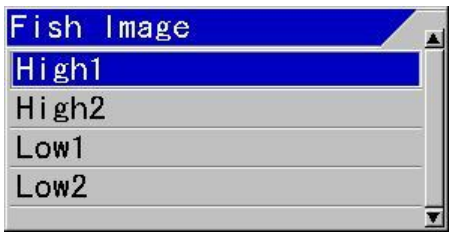
2.2.7 Setup of Fish Image

Alarm1 - Fish Image

To select a screen (Frequency) to sound fish school alarm.

1. Press MENU.
2. Select [Alarm1] - [Fish Image].
3. Press [▶] of .

The setup box of [Fish Image] will be displayed.



4. Pressing [▲] and [▼] keys, set Fish Image.
5. Press MENU to close the menu.

2.3 Use Water Temp Alarm

This is to deliver alarm sound and display when water temperature falls in the set range or it falls outside of the set range.

This is a convenient function to stay within a specific water temperature range.

The contents to use this Water Temp Alarm are as follows:
- Start/Stop the Water Temp Alarm
- Set the Upper Temp Alarm
- Set the Lower Temp Alarm

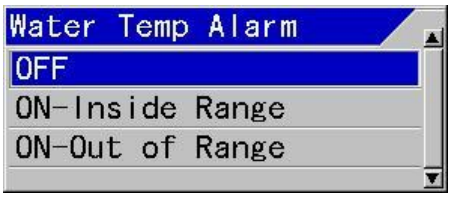
2.3.1 Start/Stop Water Temp Alarm

Alarm2 - Water Temp Alarm

This is to set “Water Temp Alarm” to be activated in the preset range, out of the preset range or to deactivate.

1. Press MENU .
2. Select [Alarm2] - [Water Temp Alarm].
3. Press [▶] of .

The setup box of [Water Temp Alarm] will be displayed.



4. Press [▲] and [▼] keys, to select [ON] to activate the alarm and [OFF] to deactivate.

   At [ON-Inside range], alarm is delivered when entering the preset range.

   At [ON-Out of range], alarm is delivered when going outside the preset range.

5. To set the Water Temp Alarm related items subsequently:

   (1) Go to item 2 of 2.3.2, when [Upper Temp Alarm] is set.
   (2) Go to item 2 of 2.3.3, when [Lower Temp Alarm] is set.

6. Press MENU to close the menu.

Caution: Press any key to stop any alarm sound and alarm display.

Caution: To activate the alarm sound and the alarm display again after once stopped, it is necessary for the boat to go outside of the alarm conditions.

Caution: When CCD camera image is displayed, the alarm display will be only by icon display. (See “2.7 Confirmation of alarm conditions”, p 2-9.)

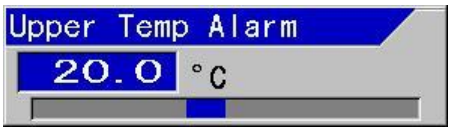
2.3.2 Setup of Upper Temp Alarm

Alarm2 - Upper Temp Alarm

This is to set the upper limit of alarm range for Water temperature.

1. Press MENU .
2. Select [Alarm2] - [Upper Temp Alarm].
3. Press [▶] of .

The setup box of [Upper Temp Alarm] will be displayed.



4. Pressing [▲] and [▼] keys, set Upper Temp Alarm.
5. To set the Water Temp Alarm related items subsequently:
   (1) Go to item 2 of 2.3.3, when [Lower Temp Alarm] is set.
6. Press MENU to close the menu.

> ⚠ **Caution:** The minimum water temperature at upper side of the alarm range cannot be set smaller than the temperature at lower side of the temperature alarm.

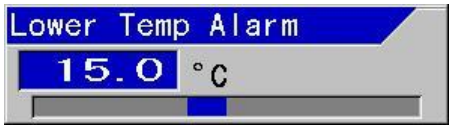
2.3.3 Setup of Lower Temp Alarm

Alarm2 - Lower Temp Alarm

This is to set the lower limit of alarm range for water temperature.

1. Press MENU .
2. Select [Alarm2] - [Lower Temp Alarm].
3. Press [▶] of .

The setup box of [Lower Temp Alarm] will be displayed.



4. Pressing [▲] and [▼] keys, set Lower Temp Alarm.
5. Press MENU to close the menu.

> ⚠ **Caution:** The maximum water temperature at lower side of the alarm range cannot be set larger than the temperature at upper side of the temperature alarm.

2.4 Use Speed Alarm

When boat speed exceeds or becomes below the set range, alarm sound and alarm indication are delivered for notification.

This is convenient where there is speed restriction.

The contents of the Speed Alarm are as follows:
- Start/Stop the Speed Alarm
- Set the Speed Limit

2.4.1 Start/Stop Speed Alarm

Alarm2 - Speed Alarm

This is to select speed alarm to be delivered when the boat speed exceeds the preset value, when the boat speed falls below the value, or deactivate the alarm.

1. Press MENU .
2. Select [Alarm2] - [Speed Alarm].
3. Press [▶] of .

The setup box of [Speed Alarm] will be displayed.



4. Pressing [▲] and [▼] keys, select [ON] to enable the alarm and [OFF] to delete it.

At [ON-Faster], alarm is delivered when the boat speed exceeds the specified speed.

At [ON-Slower], alarm is delivered when the speed falls less than the specified speed.

5. To set the [Speed Limit] related items subsequently: go to item 2 of 2.4.2.
6. Press MENU to close the menu.

Caution: Press any key to stop any alarm sound and alarm display.

Caution: To activate the alarm sound and the alarm display again after once stopped, it is necessary for the boat to go outside of the alarm conditions.

Caution: When CCD camera image is displayed, the alarm display will be only by icon display. (See "2.7 Confirmation of alarm conditions", p 2-9.)

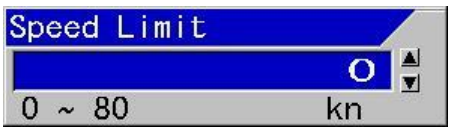
2.4.2 Setup of Speed Limit

Alarm2 - Speed Limit

This is to set the speed to deliver alarm.

1. Press MENU .
2. Select [Alarm2] - [Speed Limit].
3. Press [▶] of .

The setup box of [Speed Limit] will be displayed.



4. Pressing [▲] and [▼] keys, set Speed Limit.
5. Press MENU to close the menu.

2.5 Use the alarm at waypoint navigation

Alarm can be used while waypoints are set. (See the Basic Operation Manual, "4.4 To use event key" or the Full Menu Reference, "3.1 Starting waypoint NAV").

The contents for the alarm function during waypoint navigation are as follows:

- Sound alarm when arrived the waypoint
- Sound alarm when course deviation is found to a waypoint.
- Set the alarm range for arrival alarm and cross track error

2.5.1 Sound alarm at arrival at waypoints

Alarm2 - Arrival Alarm

This is used after waypoints have been set. When arrived at the specified range of the waypoints, alarm will be delivered. The range shall be set at [NAV Alarm Range].

1. Press MENU .
2. Select [Alarm2] - [Arrival Alarm]
3. Press [▶] of .

The setup box of [Arrival Alarm] will be displayed.



4. Press [▲] and [▼] keys, select [ON] to activate the alarm and [OFF] to stop it.
5. To set the items related to waypoint navigation subsequently:
   (1) Go to item 2 of 2.5.2, when [XTE Alarm] is set.
   (2) Go to item 2 of 2.5.3, when [NAV Alarm Range] is set.
6. Press MENU to close the menu.

Caution: Press any key to stop any alarm sound and alarm display.

Caution: To activate the alarm sound and the alarm display again after once stopped, it is necessary for the boat to go outside of the alarm conditions.

Caution: When CCD camera image is displayed, the alarm display will be only by icon display. (See “2.7 Confirmation of alarm conditions”, p 2-9.)

2.5.2 Sound alarm when XTE to waypoint has been found

Alarm2 - XTE Alarm

This is used after waypoints have been set. This will deliver alarm when the boat deviates by the specified distance from the preset course. The distance is to be set at [NAV Alarm Range].

1. Press MENU .
2. Select [Alarm2] - [XTE Alarm].
3. Press [▶] of .

   The setup box of [XTE Alarm] will be displayed.



4. Pressing [▲] and [▼] keys, select [ON] to enable the alarm and [OFF] to stop it.
5. To continue setup of waypoint navigation related alarm:
   (1) Go to item 2 of 2.5.1, when [Arrival Alarm] is set.
   (2) Go to item 2 of 2.5.3, when [NAV Alarm Range] is set.
6. Press MENU to close the menu.

Caution: Press any key to stop any alarm sound and alarm display.

Caution: To activate the alarm sound and the alarm display again after once stopped, it is necessary for the boat to go outside of the alarm conditions.

Caution: When CCD camera image is displayed, the alarm display will be only by icon display. (See “2.7 Confirmation of alarm conditions”, p 2-9.)

2.5.3 Setup of NAV Alarm Range

Alarm2 - NAV Alarm Range

This is to set the range in which alarm starts sounding for arrival and XTE alarms. For arrival alarm, the set range will be circles. For XTE alarm, the range will be the deviation from course to waypoints.

1. Press MENU .
2. Select [Alarm2] - [NAV Alarm Range].
3. Press [▶] of .

   The setup box of [NAV Alarm Range] will be displayed.



4. Pressing [▲] and [▼] keys, set NAV Alarm Range.
5. Press MENU to close the menu.

Caution: At [NAV Alarm Range], the ranges for [Arrival Alarm] and [XTE Alarm] is to be selected. (Setup range: 5 ~ 999 m)

Caution: The alarm setup range for [Arrival Alarm] and [XTE Alarm] cannot set individually.

2.6 Voltage Alarm

The input voltage to this equipment is continuously monitored, and alarm sound and display is delivered, when the voltage decreases or increases beyond a specified value.

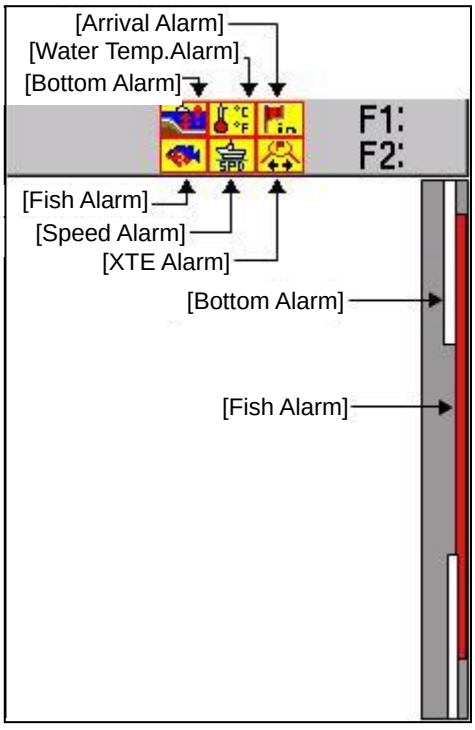
The set value of power supply voltage cannot be changed.

Caution: Reduction of power voltage may lead to drop out of main power to this equipment.

2.7 Confirmation of alarm conditions

The setup conditions of [Bottom Alarm] and [Fish Alarm] can be confirmed by the bar at the right side of the screen. However, if the alarm range is outside of the screen, it will not be displayed.

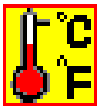
When [Bottom Alarm], [Fish Alarm], [Water Temp Alarm], [Speed Alarm], [Arrival Alarm] and [XTE Alarm] are ON, icons will be displayed in the header.



The icons for alarm represent as follow:


Bottom Alarm


Fish Alarm



Water Temp Alarm



Speed Alarm



Arrival Alarm


XTE Alarm


Voltage Alarm

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Chapter 3 NAV Operation

3.1 Starting waypoint NAV

NAV - NAV Start

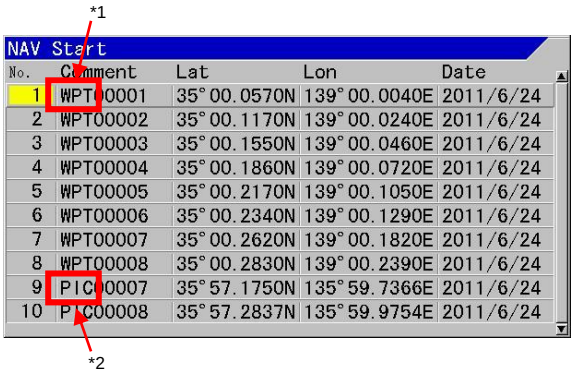
By selecting a waypoint from the waypoint list, waypoint NAV can be started.

To start waypoint NAV, registration of waypoints are necessary. (See the Basic Operation Manual, “4.4 [To use event key])

Caution: To use [Waypoint NAV], it is necessary to connect navigation equipment such as GPS.

1. Press MENU .
2. Select [NAV] - [NAV Start].
3. Press [▶] of .

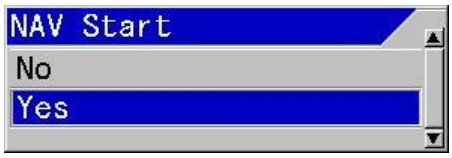
The [NAV Start] list box will be displayed.



Caution: The selected list No. will turn yellow.

4. Using [▲] and [▼] keys, select a No. in the list to start waypoint NAV.
5. Press MENU .

The setup box of [NAV Start] will be displayed.



6. Pressing [▲] and [▼] keys, select [Yes] to start and [No] not to start.
7. Press ENT .

When [Yes] is selected, the waypoint NAV will start taking the specified Lat/Lon as the waypoint. In addition, a plotter of NAV screen will be displayed. When the NAV screen is displayed and the plotter is not yet displayed, the display will automatically switch over to the plotter.

At the time when the waypoint NAV has started, the menu is closed. There is no need to proceed to the step 8.

When [No] is selected, the screen will return to the [NAV Start] list.

8. Press MENU to close the menu.

Caution: The starting operation of the waypoint NAV is once again performed during operation of the waypoint navigation, new navigation will start to the new waypoint selected.

3.2 Cancellation of waypoint NAV

NAV - NAV Cancel

The waypoint NAV already in progress can be cancelled on the way.

1. Press MENU .
2. Select [NAV] - [NAV Cancel].
3. Press [▶] of .

*1 WPT: The position (waypoint) that have been saved (Abbreviation of Waypoint)
*2 PIC : Showing that a position has been saved from images stored (Abbreviation of Picture)

The setup box of [NAV Cancel] will be displayed.



4. Using [▲] and [▼] keys, select [Yes] to cancel and [No] to resume navigation.
5. Press ENT .

   When [Yes] is selected, the present waypoint NAV under way will be cancelled.

   When [No] is selected, the present waypoint NAV will continue.
6. Press MENU to close the menu.
7. Keep pressed NAV to close NAV screen.

Refer to “3.6 Displaying of NAV Display” (p 3-3)

3.3 Editing of Waypoint

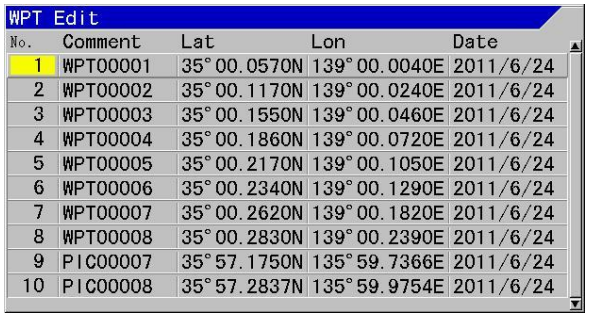
NAV - WPT Edit

Waypoint can be registered by input of its Lat/Lon.

The list of the registered waypoints can be edited.

1. Press MENU .
2. Select [NAV] - [WPT Edit].
3. Press [▶] of  .

   The [WPT Edit] list box will be displayed.



No.	Comment	Lat	Lon	Date
1	WPT00001	35° 00.0570N	139° 00.0040E	2011/6/24
2	WPT00002	35° 00.1170N	139° 00.0240E	2011/6/24
3	WPT00003	35° 00.1550N	139° 00.0460E	2011/6/24
4	WPT00004	35° 00.1860N	139° 00.0720E	2011/6/24
5	WPT00005	35° 00.2170N	139° 00.1050E	2011/6/24
6	WPT00006	35° 00.2340N	139° 00.1290E	2011/6/24
7	WPT00007	35° 00.2620N	139° 00.1820E	2011/6/24
8	WPT00008	35° 00.2830N	139° 00.2390E	2011/6/24
9	PIC00007	35° 57.1750N	135° 59.7366E	2011/6/24
10	PIC00008	35° 57.2837N	135° 59.9754E	2011/6/24

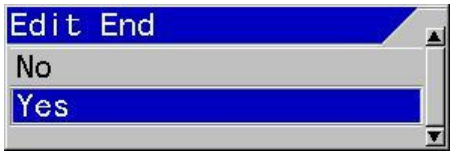
> **Caution:** The selected list No. will turn yellow.

4. Using of [▲] and [▼] keys, select No. of list to be edited.
5. Press ENT .
6. Select characters with [▲] and [▼] keys. (Selectable characters: Comment: A ~ Z, blank, 0 ~ 9, +, -, comma, dot, /, Lat/Lon: 0 ~ 9 N, S, E, W)
7. With [◀] and [▶], move the reversed positions of characters (Date can’t be changed)

> **Caution:** When Lat/Lon has not been input, the missing parts of Lat/Lon are registered as 0.

8. To stop editing, press SUB MENU .
9. When editing is completed, press ENT.

   The setup box of [Edit End] will be displayed.



10. With [▲] and [▼] keys, select [Yes] for saving edited data. Select [No] for not saving.
11. Press MENU to close the menu.

3.4 Deletion of waypoints

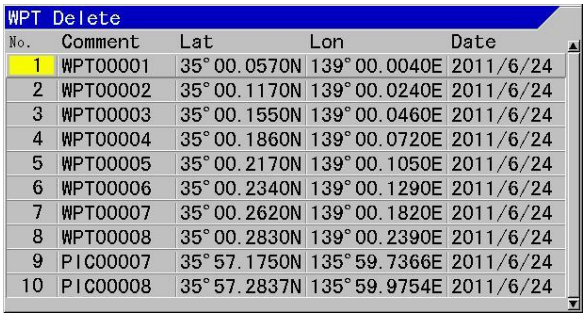
NAV - WPT Delete

The waypoints registered in the past can be deleted.

To complete of the deletion, it may take some time.

1. Press MENU .
2. Select [NAV] - [WPT Delete].
3. Press [▶] of  .

The [WPT Delete] list box will be displayed.



Caution: The list No. selected will turn yellow.

4. Using [▲] and [▼] keys, select list No. to be deleted.
5. Press ENT .

   The setup box of [WPT Delete] will be displayed.



6. Using [▲] and [▼] keys, select [Yes] to delete, and select [No] for not to delete.
7. Press ENT .

   When [Yes] is selected, a message of "Waponit data is deleted" will be displayed and returns to the [WPT Delete] list.

   When [No] is selected, returns to the [WPT Delete] list.
8. Press MENU to close the menu.

3.5 Deletion of all waypoints in the waypoints list

Maintain - All WPTs:DLT

This is the function to delete all the waypoint information registered in the waypoint list.

For this deletion, it may take some time.

1. Press SUB MENU .
2. Select [Maintain] - [All WPTs:DLT]
3. Press [▶] of  .

   The setup box of [All WPTs:DLT] will be displayed.



4. When all waypoints are to be deleted, select [Yes] with [▲] and [▼] keys. When deletion of all waypoints is to be cancelled, select [No].

   When [Yes] is selected, a message of "Waypoint data is deleted" will be displayed and the menu will be closed.

   When [No] is selected, it returns to the menu.
5. Press MENU to close the menu.

3.6 Displaying of NAV Display

There are two NAV screens, NAV1 and NAV2, and can be registered and displayed for each purpose.

The contents in display NAV screens are:
- Selection of NAV Display
- Selection of type of NAV Display

Example of display:



← Compass (For 2 display areas)

← RNG BRG (For 1 display area)

← Water temperature (For 1 display area)

← Water depth display

← HDG (For 1 display area)

← XTE (For 1 display area)

← Lat/Lon (For 1 display area)

← Wind (For 1 display area)

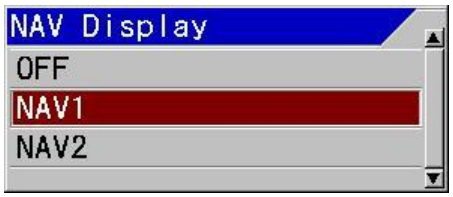
← Water depth display

3.6.1 Selection of NAV Display

This is the function to select and display the NAV screen suitable for purposes.

1. Press NAV for a while.

   The setup box of [NAV Display] will be displayed.



2. To display NAV1, select [NAV1] with [▲] and [▼] keys. To display NAV2, select [NAV2]. When the display of NAV Screen is to be cancelled, please select [OFF].

   When [NAV1] is selected, the NAV screen in the configuration registered by NAV1 will be displayed.

   When [NAV2] is selected, the NAV screen in the configuration registered by NAV2 will be displayed.

   When [OFF] is selected, the display of NAV screen will disappear.

3. Press MENU to close the menu.

> ⚠ **Caution:** When waypoint NAV has started and the simple plotter is not selected for the screen configuration, the screen of NAV1 will be changed to the simple plotter.

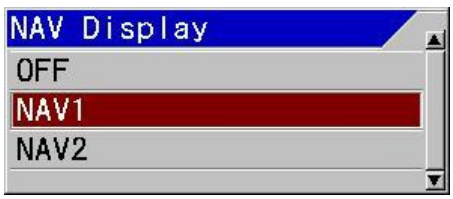
3.6.2 Selection of types of NAV Display

NAV1 or NAV2 can be selected for purposes and displayed.

The NAV screen can display simultaneously maximum 4 types of information.

1. Press NAV .

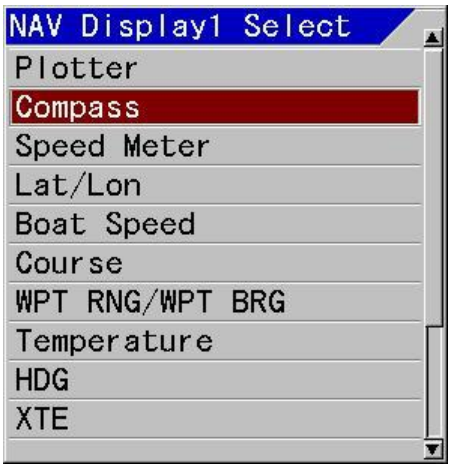
   The setup box of [NAV Display] will be displayed.



2. When navigation screen of NAV1 is to be changed, select [NAV1] with [▲] and [▼] keys. When NAV2 is to be changed, select [NAV2].

3. Press [▶] of .

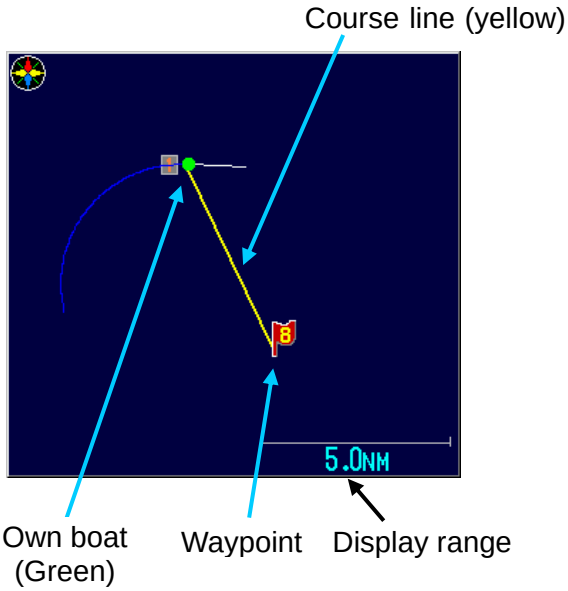
The setup box of [NAV Display1 Select] will be displayed.



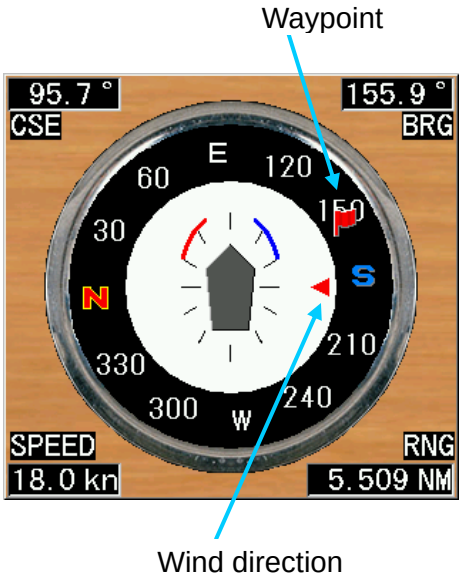
4. Using [▲] and [▼] keys, select a type suitable to the purpose.

Items to display in a display area for 2:

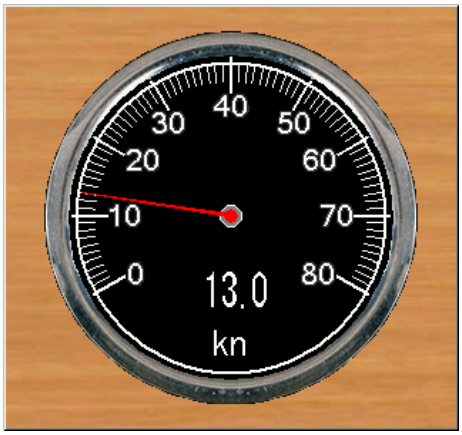
"**Plotter**" displays positional relation between own boat and a waypoint, and ship's trail. Depending on the distance from the waypoint, the display range will be automatically switched over.



"**Compass**" displays own boat course in upward direction and wind direction with an arrow. In addition, during waypoint navigation, a flag will be displayed at the waypoint direction.



"**Speed Meter**" display own boat's speed with an analogue meter.

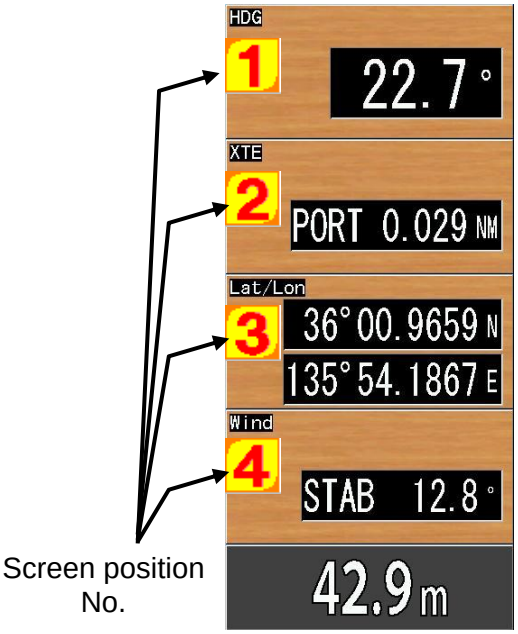


Items to display in a display area for 1:

"**Lat/Lon**" is display own position in numerical values of latitude and longitude.
"**Boat Speed**" displays own boat's speed in numerical value.
"**Course**" displays own course direction in numerical value.
"**WPT RNG/WPT BRG**" display distance and bearing of waypoints in numerical values at waypoint navigation.
"**Temperature**" displays the water temperature in numerical value.

"**HDG**" displays the ship's bearing in numerical value at input.
"**XTE**" displays the deviated distance from the course line to a waypoint in numerical value during waypoint navigation.
"**The time required**" displays the amount of time required to a waypoint during waypoint navigation.
"**Wind**" displays wind direction in numerical value.
"**Wind speed**" displays the wind velocity in numerical value.
"**CCD Image**" displays the center image from camera images when a CCD camera is connected.
"**OFF**" displays nothing in a display area.

5. Press ENT to confirm the type to be displayed.



Screen position No.

Each time ENT is pressed , the items indicated by the screen position No. (1 ~ 4) can be selected. However, the space for display is only for 4 images. Items that use display area for 1 can be displayed up to 4 kinds. When items that use display area for 2, the number of kinds displayed becomes less.

When items that use one display area are selected, setup box of [NAV Display2 (3 or 4) Select] will be displayed.

When items that use 2 display areas are selected, the setup box of [NAV Display3 or Display4 Select] will be displayed.

To select the display area again, press SUB MENU to return to the previous screen.

When all items to be displayed in NAV selection screen are decided, the setup box will disappear.

3.7 Storage of waypoint data

NAV – Data Writing

The waypoints registered in the past can be stored in the SD card or USB memory.

Please connect the SD card or the USB memory in the slot on the left side of the keyboard.

> ⚠ **Caution: Please connect or disconnect the SD card and the USB memory after turning off the power supply.**

1. Press MENU .
2. Select [NAV] - [Data Writing].
3. Press [▶] of  .

   The [Data Writing] selection list box will be displayed.



4. Using [▲] and [▼] keys, select [SD Card] or [USB Memory] to be stored.
5. Press [▶] of  .

   .

   The setup box of [Data Write] will be displayed.



(When SD card is selected)



(When USB memory is selected)

6. Using [▲] and [▼] keys, select [Yes] to store, and select [No] for not to store.
7. Press ENT .

   When [Yes] is selected, a message of "It is processing. Please wait for a while. Do not Power Off." will be displayed. When writing data ends, "Writing completed" will be displayed. And, after a while display returns to the [Data Writing] selection list menu.

   When [No] is selected, display returns to the [Data Writing] selection list menu.
8. Press MENU to close the menu.

3.8 Recall of waypoint data

NAV – Data Reading

The waypoints registered in the past can be recalled from the SD card or the USB memory.

Please connect the SD card or the USB memory in the slot on the left side of the keyboard.

> ⚠ **Caution: Please connect or disconnect the SD card and the USB memory after turning off the power supply.**

1. Press MENU .
2. Select [NAV] - [Data Reading].
3. Press [▶] of  .

   The [Data Reading] selection list box will be displayed.



4. Using [▲] and [▼] keys, select [SD Card] or [USB Memory] to be recalled.
5. Press [▶] of  .

   The setup box of [Data Read] will be displayed.
6. Using [▲] and [▼] keys, select [Yes] to recall, and select [No] for not to recall.
7. Press ENT .

   When [Yes] is selected, a message of "It is processing. Please wait for a while. Do not Power Off." will be displayed. When reading data ends, "Reading completed" will be displayed. And, after a while display returns to the [Data Reading] selection list menu.

   When [No] is selected, returns to the [Data Reading] selection list menu.
8. Press MENU to close the menu.

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Chapter 4 Image List

4.1 Recall of Image

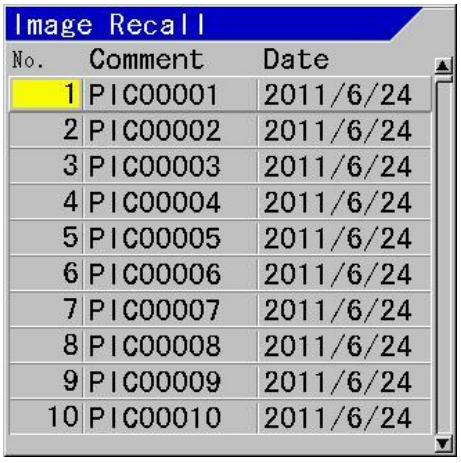
Image - Image Recall

It is possible to recall an image of fish schools stored and register waypoint. (See the Basic Operation Manual, “4.4 To use event key”)

During recalling of images, no images can be stored.

1. Press MENU .
2. Select [Image] - [Image Recall]
3. Press [▶] of .

   The [Image Recall] list box will be displayed.



⚠ **Caution:** The list No. selected will turn yellow.

4. A short list of images can be made after search.

   Further shorter list can be also made using the result.

   To search images, press EVENT .

   The setup box of [Image List Search] will be displayed.



5. To search by comments, use [▲] and [▼] keys and select [Comment Search].

   To search by dates, select [Date Search]. To search by the items without dates, select [No Date Search].

6. Press ENT .

   When [Comment Search] is selected, go to 7.

   When [Date Search] is selected, go to 8.

   When [No Date Search] is selected, the result of the search will be displayed in the [Image Recall] list and go to 9.

7. The setup box of [Comment Search] will be displayed.



   Select characters using [▲] and [▼]. (Selectable characters: for comment: A ~ Z, blank, 0 ~ 9, * , +, -, comma, dot, /)

   * will be used as a wildcard character for all characters.

   Using [◀] and [▶] keys, move the positions of characters highlighted in reverse.

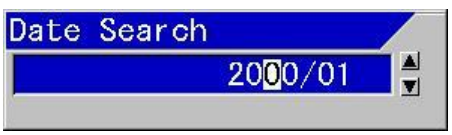
   To do comment search, press ENT .

   The result of the search will be displayed in the [Image Recall] list. Go to 9.

   When comment search is not performed, press SUB MENU.

   The display will return to the setup box of [Image List Search]. Go back to 5.

8. The setup box of [Date Search] will be displayed.



Select characters with [▲] and [▼]. (Characters: 0 ~ 9).

Using [◄] or [►] key, move the position of characters highlighted in reverse.

To do date search, press ENT .

The result of the search will be displayed in the [Image Recall] list. Go to 9.

When date search is not performed,

press SUB MENU .

The display will return to the setup box of [Image List Search]. Go back to 5.

9. Press [▲] and [▼] to select list No. of image to be displayed.

To search again,

press EVENT .

The display will return to the setup box of [Image List Search]. Go back to 5.

10. Press ENT .

The [Image Recall] list box will be displayed.

11. To see the conditions when the image was stored, press ENT .

Pressing the key again will turn off the display of conditions.

The window of setup status such as frequency at the time of storage of the image will be displayed.

12. Press [▲] and [▼] to recall the previous or next stored images. Recalled image will be displayed after the “It is processing” message.

13. To set a waypoint, move the event cursor with [◄] and [►].

When Lat/Lon information is stored at the cursor position on the screen, waypoint navigation can be started taking the position as a waypoint.

14. When waypoint navigation is started taking the event cursor position as the waypoint, press EVENT .

The recalling function of images will be ended.

The waypoint is set, and the waypoint navigation will start. Then, the plotter screen of NAV display will be displayed. (Same as 3.1 Starting of waypoint NAV)

15. Press MENU to end the image recall.

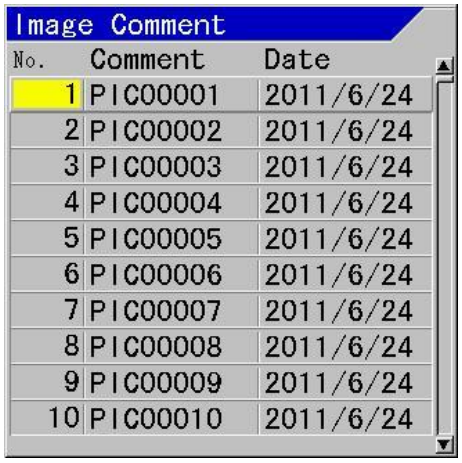
4.2 Editing of Image Comment

Image - Image Comment

It is possible to change the comments on images stored.

1. Press MENU .
2. Select [Image] - [Image Comment]
3. Press [►] of .

The [Image Comment] list box will be displayed.



⚠ **Caution:** The list No. selected will turn yellow.

4. A short list of images can be made after search.

Further shorter list can be also made using the result.

To search images, press EVENT .

The setup box of [Image List Search] will be displayed.



5. To search by comments, select [Comment Search] using [▲] and [▼] keys.

   To search by dates, select [Date Search]. To search by the items without dates, select [No Date Search].

6. Press ENT .

   When [Comment Search] is selected, go to 7.

   When [Date Search] is selected, go to 8.

   When [No Date Search] is selected, the result of the search will be displayed in the [Image Recall] list and go to 9.

7. The setup box of [Comment Search] will be displayed.



   Select characters using [▲] and [▼]. (Selectable characters: for comment: A ~ Z, blank, 0 ~ 9, * , +, -, comma, dot, /)

   * will be used as a wildcard character for all characters.

   Using [◄] and [►] keys, move the positions of characters highlighted in reverse.

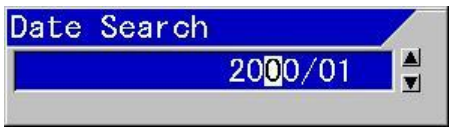
   To do comment search, press ENT .

   The result of the search will be displayed in the [Image Recall] list. Go to 9.

   When comment search is not performed, press SUB MENU.

   The display will return to the setup box of [Image List Search]. Go back to 5.

8. The setup box of [Date Search] will be displayed.



   Select characters with [▲] and [▼]. (Characters: 0 ~ 9).

   Using [◄] or [►] key, move the position of characters highlighted in reverse.

   To do date search, press ENT .

   The result of the search will be displayed in the [Image Recall] list. Go to 9.

   When date search is not performed, press SUB MENU .

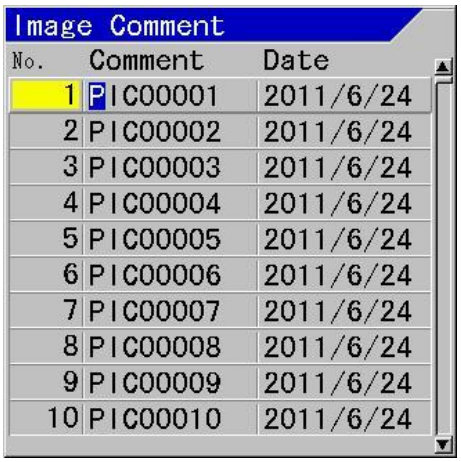
   The display will return to the setup box of [Image List Search]. Go back to 5.

9. Press [▲] and [▼] to select list No. of image comment to be edited.

   To search is to be performed again, press EVENT .

   The display will return to the setup box of [Image List Search]. Go back to 5.

10. Press ENT .



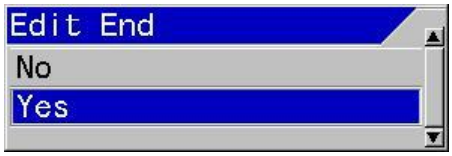
11. Select characters using [▲] and [▼]. (Selectable characters: for comment: A ~ Z, blank, 0 ~ 9, +, -, comma, dot, /)

12. Using [◄] and [►] keys, move the positions of highlighted characters in reverse. (Dates cannot be changed)

13. To end editing, press SUB MENU.
14. After completion of editing,

    press ENT .

    The setup box of [Edit End] will be displayed.



15. To save the edit, select [Yes] using [▲] and [▼] keys. Not to save the edit, select [No].
16. Press ENT .

    When [Yes] is selected, a message “It is processing” will be displayed and returns to the [Image Comment] list.

    When [No] is selected, the screen returns to the [Image Comment] list.

17. Press MENU to close the menu.

4.3 Deleting of Image

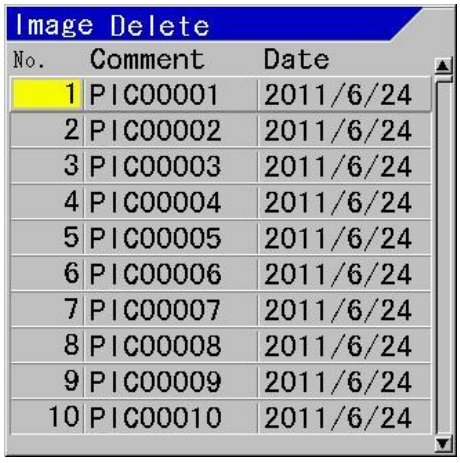
Image - Image Delete

Fish school images stored in the past can be deleted.

To complete the deletion, it will take some time.

1. Press MENU .
2. Select [Image] - [Image Delete]
3. Press [▶] of  .

The [Image Delete] list box will be displayed.



Caution: The list No. selected will turn yellow.

4. A short list of images can be made after search.

   Further shorter list can be also made using the result.

   Press EVENT .

   The setup box of [Image List Search] will be displayed.



   As for the searching method, see step 5 of 4.1 Recall of Image (page 4-1).

5. Select list No. of the image to delete with [▲] and [▼] keys.
6. Press ENT .

   The setup box of [Image Delete] will be displayed.



7. Select [Yes] with [▲] and [▼] keys, to delete, and [No] when not to delete.
8. Press ENT .

   When [Yes] is selected, a message “Image data is deleting” is displayed and the screen returns to the [Images Delete] list.

   When [No] is selected, the screen returns to the [Images Delete] list.

9. Press MENU to close the menu.

4.4 Deletion of all the images in the Image List

Maintain - All IMG DT:DLT

This is the function to delete all images registered in the Image List. For deletion of images, it will take some time.

1. Press SUB MENU .
2. Select [Maintain] - [All IMG DT:DLT]
3. Press [▶] of .

   The setup box of [All IMG DT:DLT] will be displayed.



4. To delete all the images, select [Yes] with [▲] and [▼] keys. When all images are not to be deleted, select [No].

   When [Yes] is selected, a message “Image data is deleted” will be displayed and the menu will be closed.

   When [No] is selected, the screen will return to the menu.
5. Press MENU to close the menu.

4.5 Storage of image files

Image – Data Writing

The image files saved in the past can be stored to the SD card or the USB memory.

Please connect the SD card or the USB memory in the slot on the left side of the keyboard.

⚠ Caution: Please connect or disconnect the SD card and the USB memory after turning off the power supply.

1. Press MENU .
2. Select [Image] - [Data Writing].
3. Press [▶] of .

   The [Data Writing] selection list box will be displayed.



4. Using [▲] and [▼] keys, select [SD Card] or [USB Memory] to be stored.
5. Press [▶] of .

   The setup box of [Data Write] will be displayed.
6. Using [▲] and [▼] keys, select [Yes] to store, and select [No] for not to store.
7. Press ENT .

   When [Yes] is selected, a message “It is processing. Please wait for a while. Do not Power Off.” will be displayed. When writing data ends, “Writing completed” will be displayed. And, after a while display returns to the [Data Writing] selection list menu.

   When [No] is selected, returns to the [Data Writing] selection list menu.
8. Press MENU to close the menu.

4.6 Recall of image files

Image – Data Reading

The image files registered in the past can be recalled from the SD card or the USB memory.

Please connect the SD card or the USB memory in the slot on the left side of the keyboard.

⚠ Caution: Please connect or disconnect the SD card and the USB memory after turning off the power supply.

1. Press MENU .
2. Select [Image] - [Data Reading].
3. Press [▶] of .

   The [Data Reading] selection list box will be displayed.



4. Using [▲] and [▼] keys, select [SD Card] or [USB Memory] to be recalled.
5. Press [▶] of .

   The setup box of [Data Read] will be displayed.

6. Using [▲] and [▼] keys, select [Yes] to recall, and select [No] for not to recall.
7. Press ENT .

   When [Yes] is selected, a message “It is processing. Please wait for a while. Do not Power Off.” will be displayed. When reading data ends, “Reading completed” will be displayed. And, after a while display returns to the [Data Reading] selection list menu.

   When [No] is selected, returns to the [Data Reading] selection list menu.

8. Press MENU to close the menu.

Chapter 5 System Setting

5.1 Allocation of function keys (F1/F2) to aimed operation

The operability can be improved, by allocating the frequently used functions to F1/F2 keys.

The allocated functions will be displayed in the header as icons.



The functional icons display the followings:

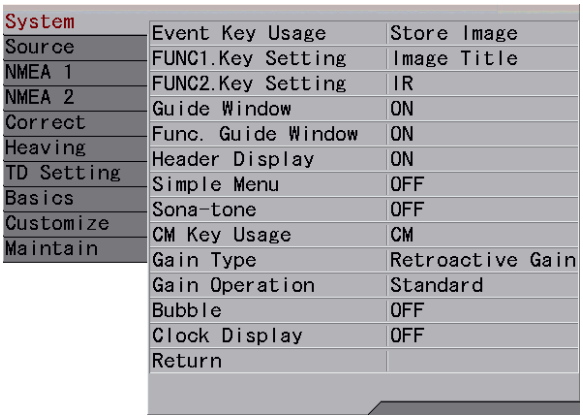
- Shift Digit Input
- IR (Interference rejection)
- Color Erase
- Noise Reduction
- Background Color
- TVG Adjust
- White Line
- A Scope
- Image Swap
- Image Title
- VRM Interval
- Nav Start
- Image Recall
- Frequency
- Event Key Usage
- Key Lock
- Depth Unit
- Color Tone
- B.D. Mode

5.1.1 Setup of [F1] key

System - FUNC1.Key Setting

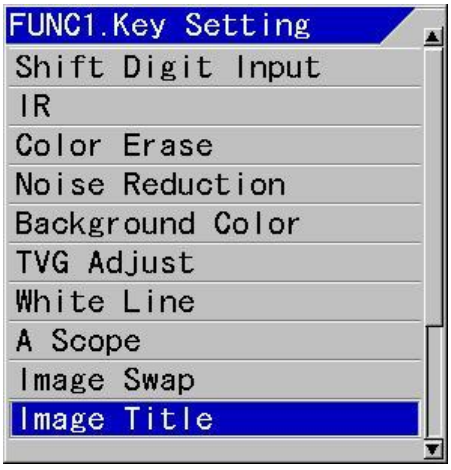
The functions to be allocated to [F1] key shall be selected.

1. Press SUB MENU .



2. Select [System] - [FUNC1. key Setting].
3. Press [▶] of .

   The setup box of [FUNC1. key Setting] will be displayed.



4. Using [▲] and [▼] keys, select functions used.
5. Press MENU to close the menu.

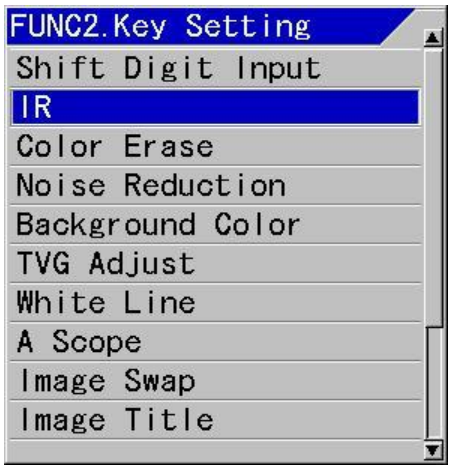
5.1.2 Setup of [F2] key

System - FUNC2.Key Setting

The functions to be allocated to [F2] key shall be selected.

1. Press SUB MENU .
2. Select [System] - [FUNC2. key Setting]
3. Press [►] of .

   The setup box of [FUNC2. key Setting] will be displayed.



4. Using [▲] and [▼] keys, select functions used.
5. Press MENU to close the menu.

5.2 Display/No display of Guide

This is to display guide to assist the menu operations. It is the function to display the guide for the next operation or the contents of functions without referring to the Operation manual.

5.2.1 Display/No display of Guide Window

System - Guide Window

Guide to describe the next operation clear will be displayed.

1. Press SUB MENU .
2. Select [System] - [Guide Window].
3. Press [►] of .

   The setup box of [Guide Window] will be displayed.

4. Select [ON] to display the Guide Window, and [No] not to display with [▲] and [▼].
5. Press MENU to close the menu.

5.2.2 Display/No display of Func. Guide Window

System - Func. Guide Window

The guide to show overview of the functions in the menu items will be displayed.

1. Press SUB MENU.
2. Select [System] - [Func. Guide Window].
3. Press [►] of .

   The setup box of [Func. Guide Window] will be displayed.

4. Select [ON] with [▲] and [▼] to display the Guide Window, and [No] not to display.
5. Press MENU to close the menu.

5.3 Display/No display of Header

System - Header Display

The header to indicate the present system status will be displayed.

1. Press SUB MENU .
2. Select [System] - [Header Display].
3. Press [►] of .

   The setup box of [Header Display] will be displayed.

4. Select [ON] to display the Header and [No] not to display with [▲] and [▼].
5. Press MENU to close the menu.

5.4 Limitation of Menu to be changed

System - Simple Menu

This is the function to prevent operation of the menu items which are not necessary to be changed after once set.

1. Press SUB MENU .
2. Select [System] - [Simple Menu].
3. Press [►] of  .

   The setup box of [Simple Menu] will be displayed.
4. Select [ON] to enable the function and [No] to disable with [▲] and [▼].
5. Press MENU to close the menu.

5.5 Use of Sona-tone™

The schools of fish and condition of bottom on the display of echo sounder can be confirmed by hearing the Sona-Tone™.

The Sona-Tone™ is always provided to the J2 connector.
To hear the Sona-Tone™, connect the external speaker with amplifier (owner supply).
Adjust the speaker volume with the volume provided on the speaker.

(As for the connection of External Speaker for Sona-Tone™, see the Installation Manual, “1.6.1 Connection of cables to Display and Processor unit”.)

5.6 To reduce frequency of Bubble

System - Bubble

This is the function to suppress the frequency of bubble.

1. Press SUB MENU.
2. Select [System] - [Bubble].
3. Press [►] of  .

   The setup box of [Bubble] will be displayed.
4. Select the degree of reduction in bubbling frequency, using [▲] and ▼] keys.

   At [Low], bubbling interpolation processing*1 will function for a short period at generation of bubble.

   At [High], when bubbles occur, stop the image and resume when bubbles disappear.
5. Press MENU to close the menu.

5.7 Display/No display of Clock

System - Clock Display

Use this function to display clock using data from external navigation equipment.

1. Press SUB MENU .
2. Select [System] - [Clock Display].
3. Press [►] of  .

   The setup box of [Clock Display] will be displayed.
4. Select [ON] to display the Clock, and [No] not to display with [▲] and [▼].

   The clock will be displayed on the left side of the screen.

   When the depth value position is changed, the clock display position also changed.
5. Press MENU to close the menu.

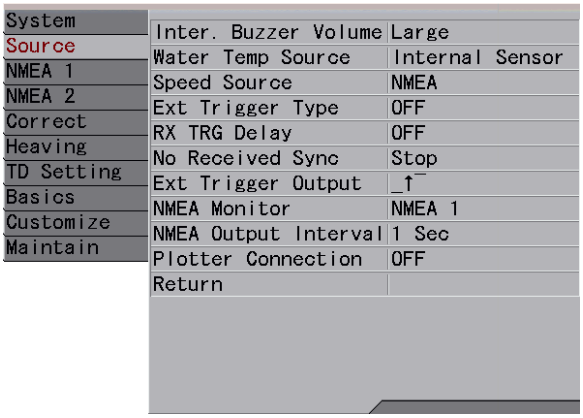
5.8 Changing of buzzer volume of operation

Source - Inter. Buzzer Volume

The buzzer volume of operation will be selected.

1. Press SUB MENU .

*1 Bubbling interpolation processing: Processing to make a part of the image vanished due to bubble, less noticeable.



2. Select [Source] - [Inter. Buzzer Volume].
3. Press [►] of  .

   The setup box of [Inter. Buzzer Volume] will be displayed.
4. Select the buzzer volume of operation with [▲] and [▼] keys.
5. Press MENU to close the menu.

> **Caution:** Alarming sound, which sounds at a constant sound level, cannot be lowered even operation buzzer volume is lowered.

5.9 Changing of Water Temp Source

Source - Water Temp Source

The input source of water temperature in the system such as for display can be selected.

1. Press SUB MENU .
2. Select [Source] - [Water Temp Source].
3. Press [►] of  .

   The setup box of [Water Temp Source] will be displayed.
4. Select an input source with [▲] and [▼] keys.

   [Internal Sensor] is for the water temperature sensor connected to J6 connector.

   [NMEA] uses input values from external sources connected to J3 and J8 connectors.

   (As for the connection to J6, J3 and J8 connectors, see the Installation Manual, “1.6.1 Connection of cables to Display and Processor unit”.)
5. Press MENU to close the menu.

5.10 Ext Trigger

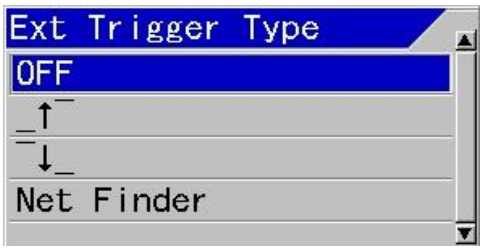
5.10.1 Use of Ext Trigger Type

Source - Ext Trigger Type

This is the function to prevent the display of interference wave by transmission synchronization[*1] with the other echo sounder.

1. Press SUB MENU .
2. Select [Source] - [Ext Trigger Type].
3. Press [►] of  .

   The setup box of [Ext Trigger Type] will be displayed.



4. Select input method with [▲] and [▼] keys:

   If [_↑¯] is selected, the rise signal of external synchronization will be detected and transmission will be done.

   If [¯↓_] is selected, the fall signal of external synchronization will be detected and transmission will be done.

   [Net Finder] is the same as [¯↓_] . If [Net Finder] is selected, when the net finder is connected, the depth is displayed in the image in the line.

[*1] Transmission synchronization: A function of echo sounder to transmit simultaneously (Connecting with cables, either one will be the master for synchronization)

5. Press MENU to close the menu.

> **Caution:** When synchronization signal from an external echo sounder is not yet received by this equipment, image scroll will be stopped at [_↑¯] or [¯↓_].

> **Caution:** At [OFF], this equipment will transmit synchronous signal.

5.10.2 RX TRG Delay

Source – RX TRG Delay

If the depth range of the external sounder connected by external synchronization is shallower than this unit, the false image caused by the oscillation line of the external sounder will be reduced. This feature is effective when used in combination with IR.

1. Press SUB MENU.
2. Select [Source] - [RX TRG Delay].
3. Press [►] of .

The setup box of [RX TRG Delay] will be displayed.



4. Select the operation with [▲] and [▼] keys.

   When set to [ON], this unit will after receiving the external sync signal, it is randomly delayed and transmitted. Then, the false image due to the oscillation line of the external sounder will be dispersed. This will prevent the false image from being mistaken for the seabed.

   If IR is set to [Low] or [High] at this time, the false image disappears.

   When set to [OFF], this unit transmits at the same time as the synchronization signal from the external sounder.

5. Press MENU to close the menu.

5.10.3 No Received Sync

Source – No Received Sync

The image scroll stops if synchronization signal from an external echo sounder is not received. The operation for the case is as follows.

1. Press SUB MENU.
2. Select [Source] - [No Received Sync].
3. Press [►] of .

   The setup box of [No Received Sync] will be displayed.



4. Select the operation with [▲] and [▼] keys.

   If [Stop] is selected, the image scroll stops when there is no synchronous signal from an external sounder.

   If [Auto] is selected, the image scroll starts by TX/RX this equipment when there is no synchronous signal from an external sounder.

5. Press MENU to close the menu.

5.10.4 Synchronous signal from this equipment

Source – Ext Trigger Output

The wave type of synchronous signal output from this equipment can be selected.

1. Press SUB MENU.
2. Select [Source] - [Ext Trigger Output].
3. Press [►] of .

   The setup box of [Ext Trigger Output] will be displayed.



4. Select output method with [▲] and [▼] keys:

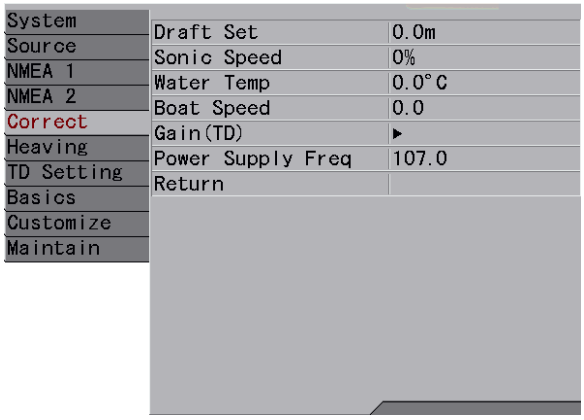
   If [_↑‾] is selected, when the transmission is done, the rise signal of synchronization is output.

   If [‾↓_] is selected, when the transmission is done, the fall signal of synchronization is output.

5. Press MENU to close the menu.

5.11 Correction

[Correct] is provided to correct errors in various data input to this equipment and to improve the application environment.



5.11.1 Setting of draft

Correct - Draft Set

This is to set the depth between the sea surface and the depth of transducer instated. Normally, it is the draft of the boat to be installed.

(Setting range: except for ft: - 10.0 to 10.0, in ft: - 30.0 to 30.0)

1. Press SUB MENU .
2. Select [Correct] - [Draft Set].
3. Press [►] of .

   The setup box of [Draft Set] will be displayed.

4. Setup the draft with [▲] and [▼] keys.
5. Press MENU to close the menu.

5.11.2 Correction of Sonic Speed

Correct- Sonic Speed

The error in sonic speed should be corrected in accordance with the environment of sea water or fresh water in which this equipment is used. (Setup range: - 7 ~ 2 %)

1. Press SUB MENU .
2. Select [Correct] - [Sonic Speed].
3. Press [►] of .

   The setup box of [Sonic Speed] will be displayed.

4. Set a correction value of sonic speed with [▲] and [▼].
5. Press MENU to close the menu.

5.11.3 Correction of Water Temperature

Correct - Water Temp

Error of water temperature can be corrected. (Setup range: - 10.0 ~ 10.0 ˚C (˚F))

1. Press SUB MENU.
2. Select [Correct] - [Water Temp].
3. Press [►] of .

   The setup box of [Water Temp] will be displayed.

4. Set a correction value of water temperature with [▲] and [▼] keys.
5. Press MENU to close the menu.

5.11.4 Correction of Boat Speed

Correct - Boat Speed

Error of boat's speed can be corrected.

(Setup range: - 10.0 ~ 10.0)

1. Press SUB MENU .
2. Select [Correct] - [Boat Speed].
3. Press [►] of .

The setup box of [Boat Speed] will be displayed.

4. Set a correction value for boat speed with [▲] and [▼] keys.
5. Press MENU to close the menu.

5.11.5 Adjustment of transducer's gain

Correct - Gain (TD)

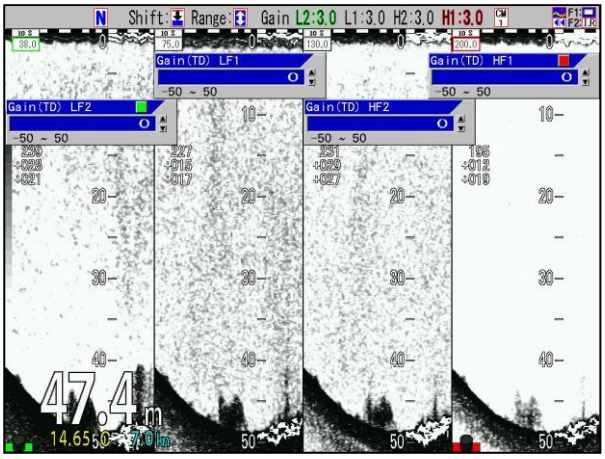
It corrects the attenuation due to the depth of ultrasonic waves and adjusts the accuracy of sea bottom detection.

This correction prevents to identify incorrectly of the seabed for large fish schools and to identify incorrectly of the seabed for position deeper than the actual.

This setting does not need to be changed if the TD installation is done properly.

1. Press SUB MENU .
2. Select [Correct] - [Gain (TD)].
3. Press [►] of .

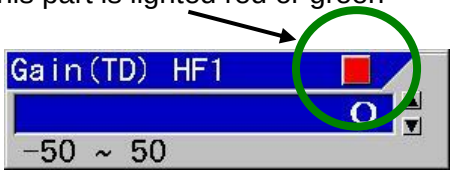
The screen will turn to the gain (TD) adjustment screen and displays the gain (TD) setup box at the upper side of the screen.



4. Setup the Gain (TD) by turning the gain knob, which are lighted red or green, at the side to be adjusted.

When a red square mark appears at right side upper corner of the Gain (TD) setup box, the red lighted gain knob shall be operated. When there is a green square mark, turn the green lighted gain knob.

This part is lighted red or green



The setup value shall be adjusted so that the white line to indicate sea bottom becomes the same thickness through the whole screen.

5. Pressing the gain knob at the side to be adjusted a few times, move to the position of the Gain (TD) box to be adjusted. (The red mark at right top side will move.)

When there are more than 2 screens, press the gain knob at the screen to be adjusted. The gain knob pressed will turn red. (The center screen of 3 screens will be the right side screen.)

6. Press MENU to close the menu.

5.11.6 Adjustment of Power Supply Frequency

Correct - Power Supply Freq

As echo sounders' images may have noise due to influence of frequency transmitted and received and frequency of power supply, the frequency of power supply can be adjusted to reduce the noise.

1. Press SUB MENU .
2. Select [Correct] - [Power Supply Freq].
3. Press [►] of .

The setup box of [Power Supply Freq] will be displayed.

4. Pressing [▲] and [▼] keys, setup power frequency.
5. Press MENU to close the menu.

5.12 Use of Heaving

This is the function to control the seesaw movement of images by detecting the seesaw movement caused by wave by sensors, when the images of sea bottom become undulated up and down due to the influence of heave and wave.

> ⚠ **Caution:** To use heaving*1, it is necessary to have a sensor that outputs heave sentence.



5.12.1 ON/OFF of Heaving

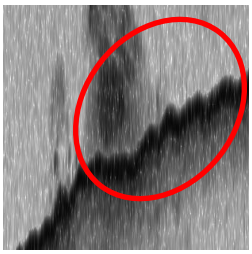
Heaving - Heaving

This is to enable the heaving function.

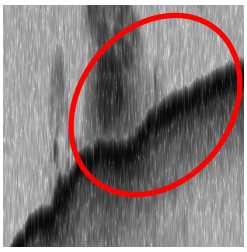
1. Press SUB MENU.
2. Select [Heaving] - [Heaving].
3. Press [►] of .

   The setup box of [Heaving] will be displayed.
4. To enable heaving function, select [ON] and when to cancel the function, select [OFF], with [▲] and [▼] keys.
5. Press MENU to close the menu.

Example of display:



Heaving OFF



Heaving ON

When this heaving function is set [ON], the images of sea bottom will be corrected.

5.12.2 Setup of sensor's positions for Heaving

By setting the relation between positions of heaving sensors and the transducer, more precise correction can be obtained.

Heaving - HF TD Back and Forth

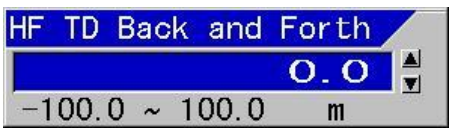
Heaving - LF TD Back and Forth

Set the front-back distance from the position of the ship's center of gravity to the transducer.

If the position of the transducer is on the bow side of the ship's center of gravity, set it with +, and if it is on the stern side, set it with -.

1. Press SUB MENU.
2. Select [Heaving] - [XX TD Back and Forth]
3. Press [►] of .

   The setup box of [XX TD Back and Forth] will be displayed.



4. Pressing [▲] and [▼] keys, set the distance in the direction to back and forth.
5. Press [◄].

*1Heaving: Seesaw movement of sea surface. In this context, this is the function to correct the seesaw movement of sea bottom images with GPS.

Heaving - HF TD Right and Left t

Heaving - LF TD Right and Left

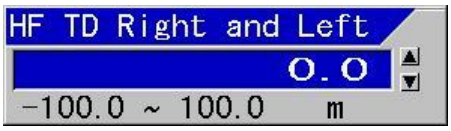
Set the left and right distance from the position of the keel to the transducer.

If the position of the transducer is on the starboard side of the keel, set it with +, and if it is on the port side, set it with -.

6. Select [Heaving] - [XX TD Right and Left].

7. Press [►].

The setup box of [XX TD Right and Left] will be displayed.



8. Pressing [▲] and [▼] keys, set the distance in right and left direction.

9. Press [◄].

Heaving - HF TD Height

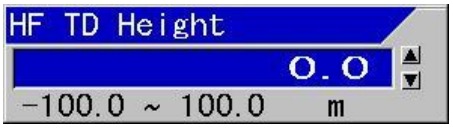
Heaving - LF TD Height

Set the height from the sea level to the GPS antenna (Display unit for KGC-222). Be sure to set the value with +.

10. Select [Heaving] - [XX TD Height].

11. Press [►].

The setup box of [XX TD Height] will be displayed.



12. Pressing [▲] and [▼] keys, set the distance in height direction.

13. Press MENU to close the menu.

5.12.3 Switch the ± sign of the sensor input signal

Heaving – Heaving reversal

The ± sign of the correction value of the heaving data of the GPS compass differs depending on the product.

If the correction is reversed when [Heaving] is set to [ON], you can correct it by switching ± with this setting.

1. Press SUB MENU.

2. Select [Heaving] - [Heaving reversal]

3. Press [►] of .

The setup box of [Heaving reversal] will be displayed.



4. Pressing [▲] and [▼] keys to set the ON/OFF.

5. Press [◄].

Heaving – Pitching reversal

The ± sign of the correction value of the pitching data of the GPS compass differs depending on the product.

If the correction is reversed when [Heaving] is set to [ON], you can correct it by switching ± with this setting.

1. Press SUB MENU.

2. Select [Heaving] - [Pitching reversal]

3. Press [►] of .

The setup box of [Pitching reversal] will be displayed.



4. Press [▲] and [▼] keys to set the ON/OFF.

5. Press [◄].

Heaving – Rolling reversal

The ± sign of the correction value of the rolling data of the GPS compass differs depending on the product.

If the correction is reversed when [Heaving] is set to [ON], you can correct it by switching ± with this setting.

1. Press SUB MENU.

2. Select [Heaving] - [Rolling reversal]

3. Press [►] of .

The setup box of [Rolling reversal] will be displayed.

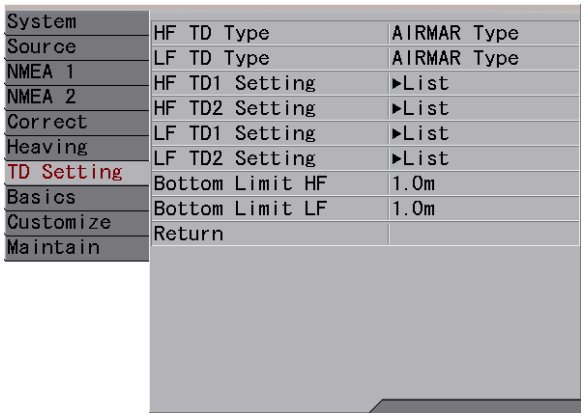


4. Press [▲] and [▼] keys to set the ON/OFF.

5. Press [◄].

5.13 Setup of transducer

The frequency and beam angle etc. per transducer will be conformed to those of the transducer to be used, then, the correct information can be provided.



5.13.1 Setup of type of transducer

TD Setting – HF TD Type

TD Setting – LF TD Type

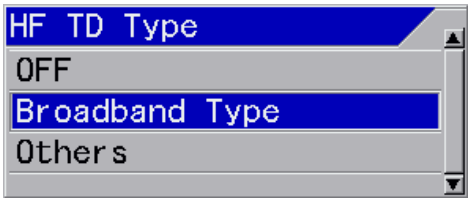
Select the type of transducer to be actually used. Be adjusted as it has influence on images.

1. Press SUB MENU.

2. Select [TD Setting] - [XF TD Type].

3. Press of [►] of .

The setup box of [XF TD Type] will be displayed.

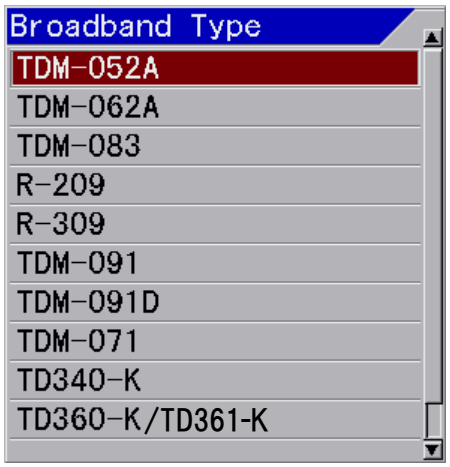


4. Press [▲] and [▼] to select TD type of XF.

When a Broadband transducer is used, select [Broadband Type]. When the other transducer is used, select [Others]. When transducer is not used, select [OFF].

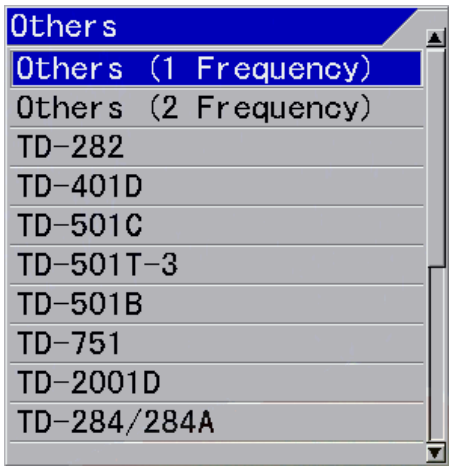
5. Press of [►] of .

When [Broadband Type] is selected, the setup box of [Broadband Type] will be displayed.



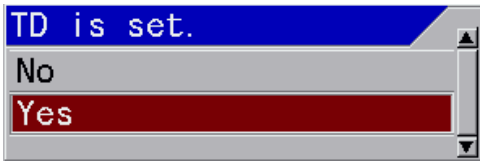
6. Press [▲] or [▼] to select the type of transducer to use.

When [Others] is selected, the setup box of [Others] will be displayed.



7. Press [▲] or [▼] to select the type of transducer to use.
8. Press ENT key.

   The setup box [TD selection] will be displayed.



9. Press [▲] or [▼] to select [Yes].
10. Press ENT key.

The message [It is processing. Please wait a while.] is displayed and the TD is set.

> It is processing.
> Please wait a while.

It will return to TD Setting – XF TD Type in a few seconds.

The TD selected in [Broadband Type] is also set in both [Broadband Type] high frequency and low frequency.

The [Frequency], [TX power], and [Beam Angle] of the selected TD are set automatically.

The [Frequency], [TX power], and [Beam Angle] of the TD selected in [TD-XXX] of [Others] are also set automatically.

When the name of TD to use is unknown, select [Others (1 Frequency)] or [Others (2 Frequency)].

Select [Others (1 Frequency)] when using a single frequency TD.
Select [Others (2 Frequency)] when using the 2-frequency alternating transmission TD.

> **Caution:**
> When [Others (1 Frequency)] or [Others (2 Frequency)] is selected, [Spc. Adj.] - [Output limit XF] is set to "70" (2kw equivalency).
> After this setting, set it according to the TX power of the TD to use. For details on the settings, refer to 2.6 Output Limit of the Installation Manual.

5.13.2 Setup of frequency and beam angle

TD Setting - HF TD1 Setting

TD Setting – HF TD2 setting

TD Setting – LF TD1 setting

TD Setting – LF TD2 setting

1. Press SUB MENU.
2. Select [TD Setting] - [XF TDX Setting].
3. Press [▶] of .

   The setup box of [XF TDX Setting] will be displayed.

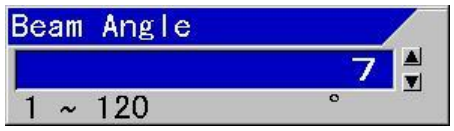


4. Select [Frequency] for changing of frequency, and [Beam angle] for changing of beam angle with [▲] and [▼] keys.
5. Press [▶].

   When [Frequency] is selected, the setup box of frequency will be displayed.



When [Beam Angle] is selected, the setup box of beam angle will be displayed.



6. Setup frequency or beam angle with [▲] and [▼] keys.

When [Broadband Type] is selected in 5.13.1, beam angle will be automatically set at setup of frequency.

7. Press MENU to close the menu.

Caution: The setup of beam angle is reflected on the display of detecting range and will not change the actual beam angle. (As for beam angle, refer to Installation Manual, [Type of transducer] in Configuration of Equipment)

5.13.3 Setup of Bottom Limit

TD Setting - Bottom Limit HF

TD Setting - Bottom Limit LF

To set Bottom Limit.

1. Press SUB MENU .
2. Select [TD Setting] - [Bottom Limit XF].
3. Press [▶] of .

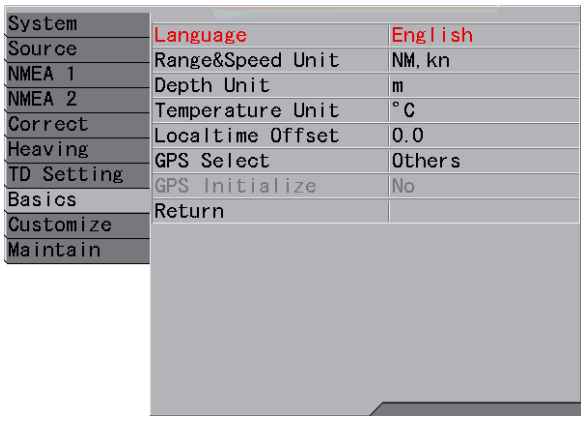
The setup box of [Bottom Limit XF] will be displayed.



4. Press [▲] and [▼] to set a depth.
5. Press MENU to close the menu.

5.14 Setup of Basics

This is to set environmental setup such as display language, present time, GPS used.



5.14.1 Selection of Language

Basics - Language

Displayed language can be changed.

Caution: [Language] will be displayed in red characters.

1. Press SUB MENU .
2. Select [Basics] - [Language].
3. Press [▶] of .

The setup box of [Language] will be displayed.

4. Pressing [▲] and [▼], select a language to be used.
5. Press MENU to close the menu.

5.14.2 Changing of Range & Speed Unit

Basics - Range & Speed Unit

The units in display can be changed to [NM, kn], [km, km/h] or [sm, mph].

1. Press SUB MENU .
2. Select [Basics] - [Range & Speed Unit].
3. Press [▶] of .

The setup box of [Range & Speed Unit] will be displayed.

4. Pressing [▲] and [▼] keys, set units for range and speed.
5. Press MENU to close the menu.

> **Caution:** With this change of units for range and speed, the set values in all related items will be converted to the values in the specified units.

5.14.3 Changing of Depth Unit

Basics - Depth Unit

The unit for depth can be changed to m, fm, I.fm, ft or J.fm.

1. Press SUB MENU .
2. Select [Basics] - [Depth Unit].
3. Press [▶] of .

The setup box of [Depth Unit] will be displayed.

4. Pressing [▲] and [▼] keys, select a unit for depth.
5. Press MENU to close the menu.

> **Caution:** With this change of unit for depth, the set values in all related items will be converted to the values in the specified unit.

5.14.4 Changing of Temperature Unit

Basics - Temperature Unit

The unit of water temperature can be changed between ˚C and ˚F.

1. Press SUB MENU .
2. Select [Basics] - [Temperature Unit].
3. Press [▶] of .

The setup box of [Temperature Unit] will be displayed.

4. Pressing [▲] and [▼] keys, select a unit for water temperature.
5. Press MENU to close the menu.

> **Caution:** With this change of unit for water temperature, the set values in all related items will be converted to the values in the specified unit.

5.14.5 Setup of Local time Offset

Basics – Local time Offset

When there is time difference between the time displayed on screen and the actual time, it is necessary to adjust it. The time difference can be set by 0.5 hour (30 minute) step. (Setup range: - 12.0 ~ 14.0 h) (World standard time 0.0 is set as reference)

1. Press SUB MENU .
2. Select [Basics] - [Localtime Offset].
3. Press [▶] of .

The setup box of [Localtime Offset] will be displayed.



4. Pressing [▲] and [▼] keys, set time difference to the world standard time.
5. Press MENU to close the menu.

> **Caution:** If the Language displayed at the initial power ON is set to Japanese, this time difference is automatically set at 9.0.

5.14.6 Selection of GPS

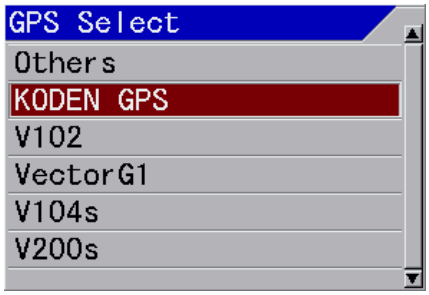
Basics - GPS Select

This is to select the GPS sensor in use.

> **Caution:** Only when KODEN GPS is directly connected, select [Koden GPS]. When there is no corresponding GPS sensor, please select [Others].

1. Press SUB MENU .
2. Select [Basics] - [GPS Select].
3. Press [▶] of .

   The setup box of [GPS Select] will be displayed.



4. Pressing [▲] and [▼] keys, select a type of GPS.
5. Press MENU to close the menu.

5.14.7 Initialization of GPS

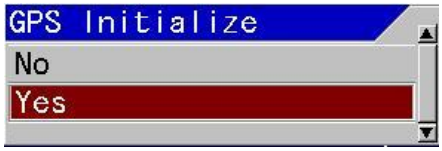
Basics- GPS Initialize

Initialization of GPS sensors is performed.

> **Caution:** When the setting of [GPS select] is [Others], GPS cannot be initialized.

1. Press SUB MENU .
2. Select [Basics] - [GPS Initialize].
3. Press [▶] of .

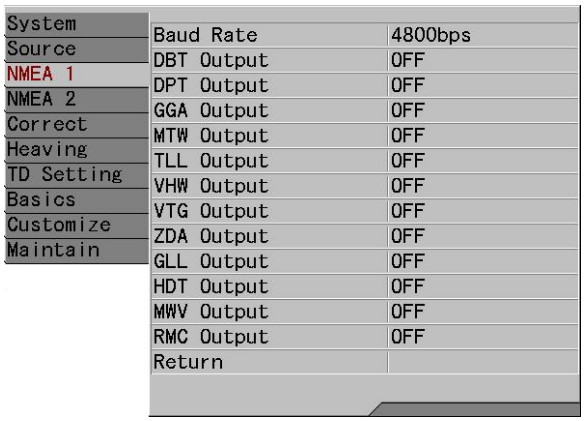
   The setup box of [GPS Initialize] will be displayed.



4. When initialization is performed, select [Yes] and initialization is not performed, select [No] with [▲] and [▼] keys.
5. Press ENT .
6. Press MENU to close the menu.

5.15 Setup of NMEA

This is to setup the NMEA1 (J8) and NMEA2 (J3) related ports to enable input and output. (As for the connection of J8 and J3 connectors, see the Installation Manual, 1.6.1 “Connection of cables to Display and Processor unit”)



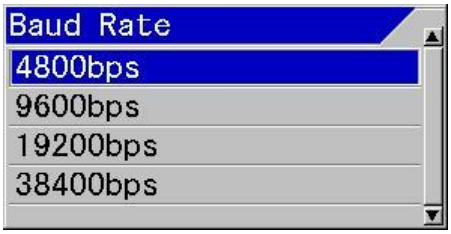
5.15.1 Setup of baud rate of NMEA1 (J8)

NMEA1 - Baud Rate

This is to set baud rate of J8.
Transmission rate should match the externally connected equipment.

1. Press SUB MENU .
2. Select [NMEA1] - [Baud Rate].
3. Press [▶] of .

   The setup box of [Baud Rate] will be displayed.



4. Select the baud rate at NMEA1 side with [▲] and [▼] keys.
5. Press MENU to close the menu.

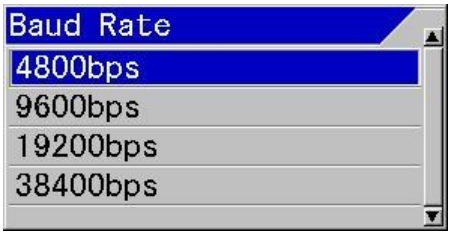
5.15.2 Setup of baud rate of NMEA2 (J3)

NMEA2- Baud Rate

This is to set baud rate of J3.
Transmission rate should match the externally connected equipment.

1. Press SUB MENU .
2. Select [NMEA2] - [Baud Rate].
3. Press [▶] of  .

   The setup box of [Baud Rate] will be displayed.



4. Select the baud rate at NMEA2 side with [▲] and [▼] keys.
5. Press MENU to close the menu.

5.15.3 Selection of NMEA Output

NMEA1 - DBT/DPT/GGA/MTW/TLL/VHW/ VTG/ZDA/GLL/HDT/MWV/RMC output

NMEA2 - DBT/DPT/GGA/MTW/TLL/VHW/ VTG/ZDA/GLL/HDT/MWV/RMC output

1. Press SUB MENU .
2. Select [NMEA1] - [Optional Output]. or [NMEA2] - [Optional Output].
3. Press [▶] of  .

   The setup box of [XXX Output] will be displayed.



4. To enable the output, select [ON] and to disable, select [OFF] with [▲] and [▼] keys.
5. Press MENU to close the menu.

5.15.4 Display of input sentence on NMEA Monitor

Source - NMEA Monitor

This is the function to confirm the data input from NMEA1 (J8) and NMEA2 (J3).

1. Press SUB MENU .
2. Select [Source] - [NMEA Monitor].
3. Press [▶] of  .

   The setup box of [NMEA Monitor] will be displayed.

4. For seeing the input data of NMEA1 (J8), select [NMEA1] and for seeing the input data from NMEA2 (J3), select [NMEA2] with [▲] and [▼] keys.
5. Press [▶].

   The monitor on the specified NMEA side will be displayed. The data input will be displayed white or yellow for the strings of characters.

6. For temporary stopping, press [▶].

   When stopped temporarily, the monitor image will stop and the data displayed can be confirmed.

7. For restarting, press [▶].
8. Press MENU to close the menu.

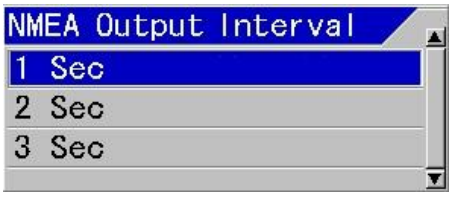
5.15.5 Interval selection of NMEA0183 output

Source – NMEA Output Interval

The interval of the NMEA0183 output can be selected.

1. Press SUB MENU.
2. Select [Source] - [NMEA Output Interval].
3. Press [►] of .

   The setup box of [NMEA Output Interval] will be displayed.



4. Select output interval with [▲] and [▼] keys.
5. Press MENU to close the menu.

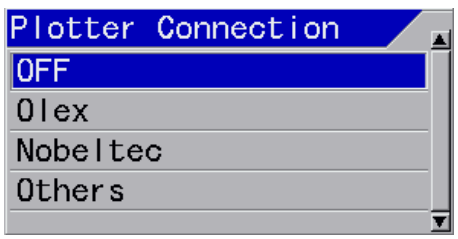
5.15.6 Plotter Connection

Source – Plotter Connection

This is to select connection with Plotter.

1. Press SUB MENU.
2. Select [Source] - [Plotter Connection].
3. Press [►] of .

   The setup box of [Plotter Connection] will be displayed.



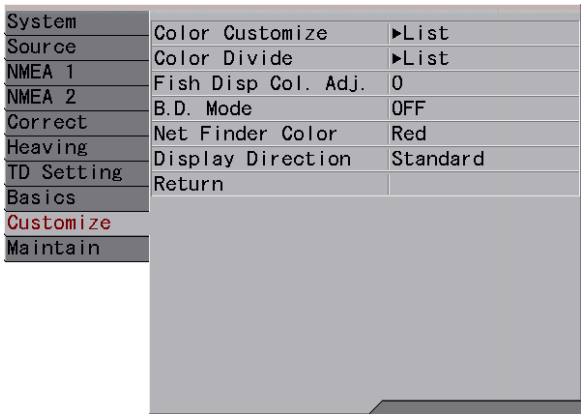
4. Select Plotter with [▲] and [▼] keys.

> **Caution:** When Plotter Connection is [Olex], [Nobeltec] or [Others], baud rates of J8 is set to 38400 bps, and output sentence of J8 is set to Plotter format.

5. Press MENU to close the menu.

5.16 Customization

When displayed targets (fish mark, sea bottom, etc.) on the screen are not easy to see or the image coloration of the echo sounder is required to be changed, it can be changed to desired color or coloration.



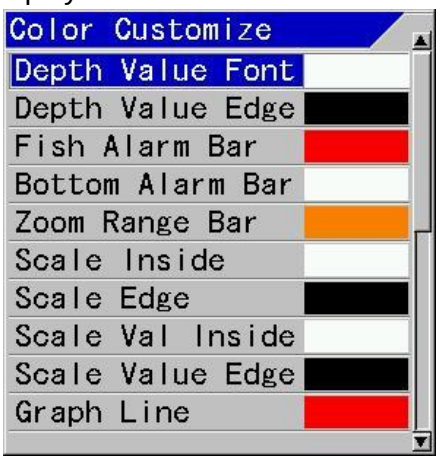
5.16.1 Changing of color of displayed items

Customize - Color Customize

The specific parts of displayed characters and scales can be changed.

1. Press SUB MENU.
2. Select [Customize] - [Color Customize].
3. Press [►] of .

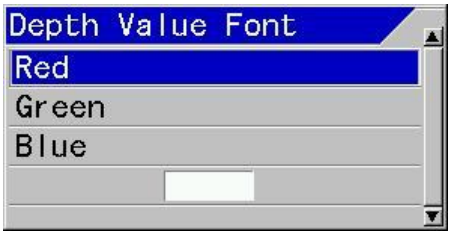
   The setup box of [Color Customize] will be displayed.



4. Select the item of which color to be changed with [▲] and [▼] keys.
   There are 21 items of which color can be changed.

5. Press [▶].

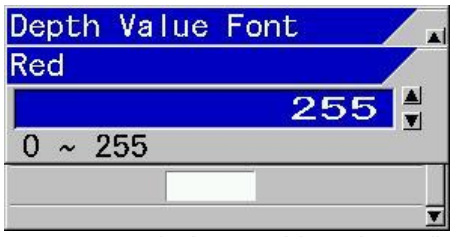
   The setup box of the color change RGB*1 for the specified item will be displayed.



6. Select color with [▲] and [▼] keys.

   By changing the component values of three primary colors, red, green and blue, desired colors can be set.
   The sample of presently set color will be displayed at lower part of the box.

7. Press [▶].
   The setup box of RGB will be displayed.



(When red is selected)

   When blue is selected, the setup box of blue component will be displayed. When green is selected, the setup box of green component will be displayed.

8. Adjust color brightness with [▲] and [▼] keys.

   If color brightness is adjusted, the actual color in display will be indicated at the lower part of the setup box.

9. Subsequently, other colors are to be changed, press [◀].

   The setup box of the color change RGB for the specified item will be displayed.

10. Repeat the steps 6 to 9.

11. Press MENU to close the menu.

5.16.2 Changing of coloration of image of Color Bar Scale

Customize- Color Divide

The coloration of image of Color Bar Scale will be set.

1. Press SUB MENU .
2. Select [Customize] - [Color Divide].
3. Press [▶] of  .

   The setup box of [Color Divide] will be displayed.

4. Select the color to be changed with [▲] and [▼] keys.
5. Press [▶].

   The setup box of the specified color will be displayed.

6. Set the [Color Divide] with [▲] and [▼] keys.

   When coloration is changed and the Color Bar Scale is displayed, the coloration of the Color Bar Scale will also change simultaneously.

> ⚠ **Caution:** If coloration under setting enters in the other coloration area at changing of coloration, the coloration will also change to the coloration under setting. Therefore, it is recommended to start from the color with small ratio (blue) and to move to other color with larger ratio.

7. When changing of coloration continues to other colors, press [◀].

   The setup box of [Color Divide] will be displayed.

8. Repeat the items 4 to 7.
9. Press MENU to close the menu.

*1 RGB setup: Setup of three primary colors of light: R (red), G (green) and B (blue)

5.16.3 Changing of red coloration of image of fish display

Customize- Fish Disp Col. Adj.

When mixed image is displayed, the red coloration of the fish image can be changed to have a better view.

1. Press SUB MENU .
2. Select [Customize] - [Fish Disp Col. Adj.].
3. Press [▶] of .

   The setup box of [Fish Disp Col. Adj.] will be displayed.



4. Pressing [▲] and [▼] keys, set the red coloration

   By changing the coloration value, desired red color can be set.
   When the value is increased, the red color is stronger.

5. Press MENU to close the menu.

5.16.4 Distinction of the sea bottom

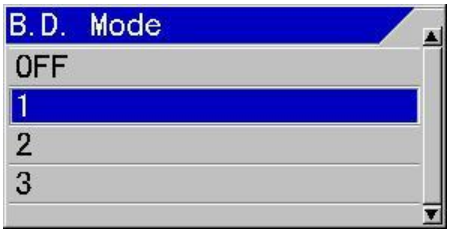
Customize- B.D. Mode

This is the function to make the distinction of the edge of the sea bottom by highlighting a lower image from the edge of the sea bottom.

The upper image from the edge of the bottom sea displays normally.

1. Press SUB MENU .
2. Select [Customize] - [B.D. Mode].
3. Press [▶] of .

   The setup box of [B.D. Mode] will be displayed.



4. Select [1], [2], or [3] with [▲] and [▼] keys, and [OFF] not to display.

   When the value is increased, the effect is increased.

5. Press MENU to close the menu.

5.17 Displaying of Simulation

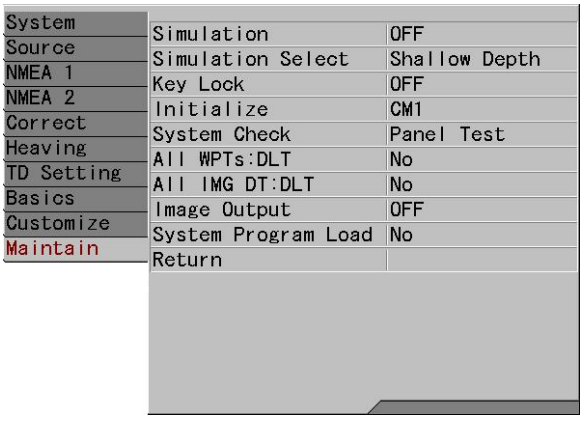
This is the function to confirm functions and operation of the echo sounders using Simulation.

5.17.1 Displaying of prepared Simulation

Maintain - Simulation

When Simulation is turns [ON], the simulated images will be displayed.

1. Press SUB MENU .



2. Select [Maintain] - [Simulation].
3. Press [▶] of .

   The setup box of [Simulation] will be displayed.

4. To display simulation, select [ON] with [▲] and [▼] keys, and [OFF] not to display.
5. Press MENU to close the menu.

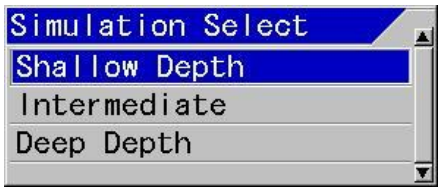
5.17.2 Selection of simulation

Maintain – Simulation Select

This is the function to select a type of simulation image to be displayed.

1. Press SUB MENU.
2. Select [Maintain] - [Simulation Select].
3. Press [▶] of .

   The setup box of [Simulation Select] will be displayed.



4. Pressing [▲] and [▼] keys, select a type of simulation image.
5. Press MENU to close the menu.

> **Caution:** When the built in data is old, only Shallow depth image is displayed.

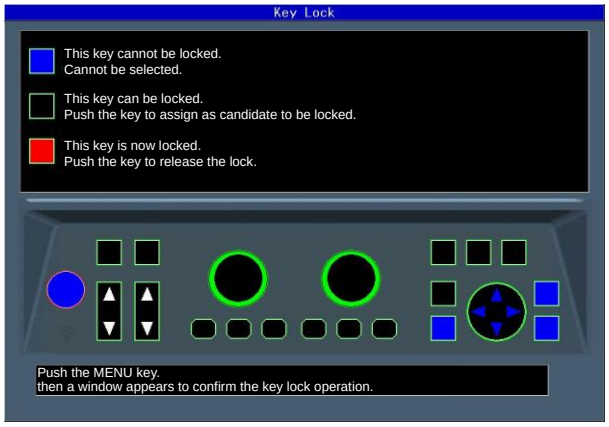
5.18 To lock the keys not to be operated

Maintain – Key Lock

This is to disable the functions of knobs and keys. This prevents the functions once setup from being changed by wrong operation.

1. Press SUB MENU.
2. Select [Maintain] - [Key Lock].
3. Press [▶] of .

   The setup screen of [Key Lock*1] will be displayed.

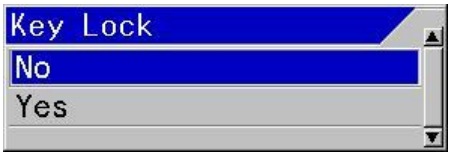


4. Press the keys to be locked in accordance with the instructions on the screen.

   The keys selected as candidates to be locked will turn red. When the keys are pressed once again, they will be released and turn black.

5. After all keys to be locked are selected, press MENU.

   The setup box of [Key Lock] will be displayed.



6. To lock keys, select [Yes] and not to lock keys, select [No] with [▲] and [▼] keys.
7. Press ENT.

   Locking status or lock release status will be confirmed.

> **Caution:** When key lock is turned to [No] having candidate keys selected, those keys are not locked.

*1 Keys not locked: BRILL, SUB MENU, ▲▼◀▶, ENT, MENU

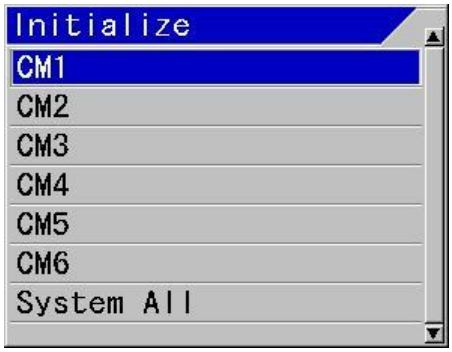
5.19 Returning to the Initialize

Maintain - Initialize

This is to return all setup of each CM or the whole system to the factory default settings. However, waypoint data and image stored data will remain as they are.

1. Press SUB MENU .
2. Select [Maintain] - [Initialize].
3. Press [▶] of .

   The setup box of [Initialize] will be displayed.



4. When an allocated CM is to be initialized, select [CM1] to [CM6] with [▲] and [▼] keys. To initialize the whole system, select [System ALL].

   When one of [CM1] to [CM6] is selected, the set values commonly used at each CM such as selected language and units will not be initialized.

   When [System ALL] is selected, all setup values including the values commonly used at each CM will be initialized.

5. Press [▶].

   The setup box of [CM Initialize] will be displayed.

6. When initialization is performed, select [Yes] for initialization by pressing [▲] and [▼] keys, and [No] for not to initialize.
7. Press ENT .

   At [Yes], initialization will be performed.
   At [No], the menu will be closed.

> ⚠ **Caution:** When [System ALL] is selected, the display will be in English after initialization.

5.20 Confirming of system conditions

Maintain - System Check

As self-diagnostics, panel test, LCD test and XID check can be performed.

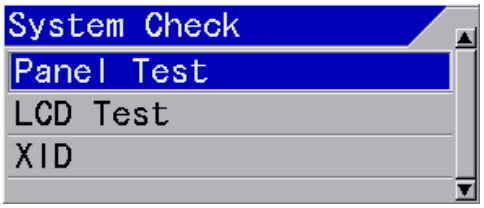
As [Panel Test], the present conditions of the system will be displayed at the upper side of the display screen in addition to confirmation of key inputs.

As [LCD Test], display will be switched over in the order of grid, white, black, red, green and blue each time the key is pressed.

[XID] can check the received data from the XID adaptive TD.

1. Press SUB MENU .
2. Select [Maintain] - [System Check].
3. Press [▶] of .

   The setup box of [System Check] will be displayed.

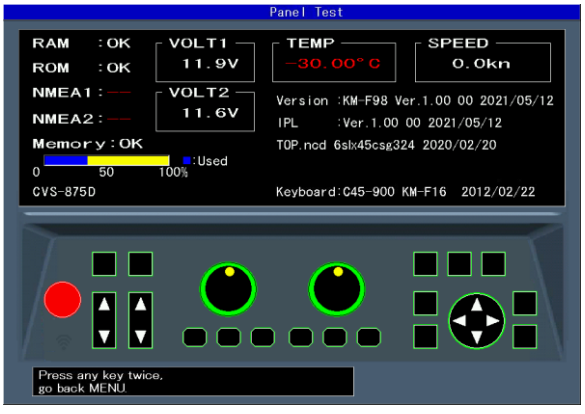


4. When panel test or confirmation of system conditions is performed, select [Panel Test] with [▲] and [▼] keys. For checking of LCD, select [LCD Test]. For checking of XID, select [XID].

5.20.1 Panel Test

The panel test confirms the key input and system status.

When [Panel Test] is selected and press [▶] key, the panel test screen will be displayed.



The system conditions will be displayed as shown in the above figure.

In case of CVS-877D, [CVS-877D Type] will be displayed at under [Memory].

When a key is pressed, the key will be identified and the key on the corresponding screen will change in color. The same key is pressed subsequently, the System Test screen will end and the setup box of [System Check] will be displayed.

> **Caution:** The LED on panel will turn the color from green to red if the gain knob is rotated to right or left, or one of CM1 ~ CM6 is pressed and one more pressing will turn the color to green. In addition, the internal buzzer will sound when the gain knob is rotated.

(1) [RAM] displays the result of RAM check. OK if normal, and NG if abnormal, will be displayed.

(2) [ROM] displays the result of ROM check. OK if normal, and NG if abnormal, will be displayed.

(3) [NMEA1] confirms J8 port. As the confirmation will be performed when the panel test screen is displayed, mount the jig before the display of the screen.

"– –" for not yet done, OK for normal case and NG for abnormal case will be displayed.

(4) [NMEA2] confirms J3 port. As the confirmation will be performed when the panel test screen is displayed, mount the jig before the display of the screen.

"– –" for not yet done, OK for normal case and NG for abnormal case will be displayed.

> **Caution:** For confirmation of [NMEA1] and [NMEA2] ports, the dedicated jig is necessary.

(5) [Memory] displays the conditions of internal memory.
Ok for normal case and NG for abnormal case will be displayed. The used ratio of memory is also displayed.

(6) [VOLT1] displays the voltage value of + 12 V line.
When the voltage falls in abnormal range, the indication will be in red.

(7) [VOLT2] displays voltage of power input line. When this voltage falls in abnormal range, alarm will sound and an alarm message will be displayed.

When the voltage falls in abnormal range, the indication will be in red.

(8) [TEMP] displays water temperature of the water temperature sensor.
In the case of non connection, - 30.0 in red will be displayed.

(9) [SPEED] is always displayed as 0.0kn.

(10) [Version] displays the version No. of the system software.

(11) [IPL] displays the version No. of IPL version.

(12) [Top.ncd] will display the version No. of FPGA data.

(13) [Keyboard] will display the software version No. of the Operation unit.

5.20.2 LCD Test

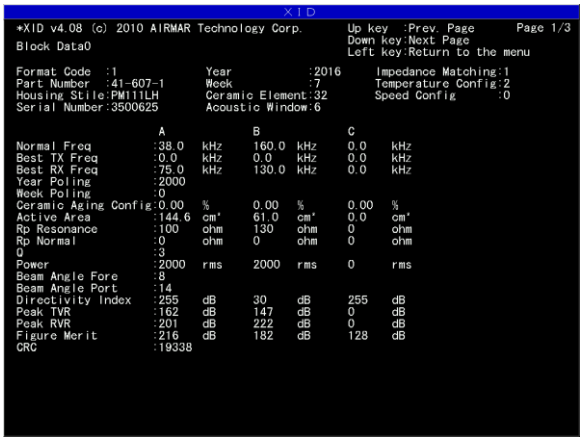
When [LCD Test] is selected, grid will be displayed. Each time [▶] key is pressed, the color of display will change, and the setup box of [System Check] will be finally displayed.

5.20.3 XID

All data received from the XID adaptive TD is displayed.

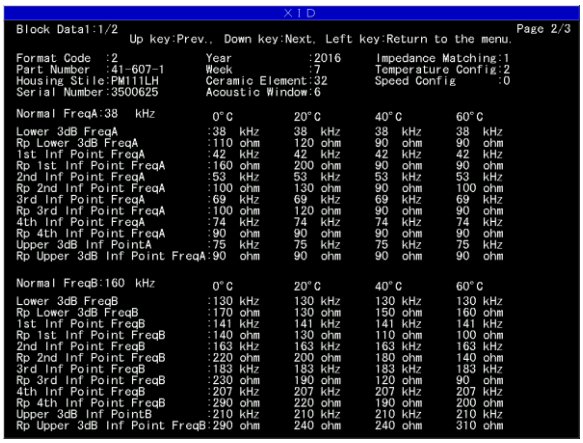
Select [XID] in the [System Check] settings box.

Press [▶] key to display the 1/3 page of the XID data.



You can see the TD model name, serial number, etc.

Press the [▼] key to display 2/3 page and then 3/3 page.



Press MENU to close the menu.

5.21 Updating of Program

Maintain – System Program Load

This is used for program update.
(Please consult your sales agent)

1. Press SUB MENU .
2. Select [Maintain] - [System Program Load].
3. Press [▶] of .

   The selection box of [System Program Load] will be displayed.



4. Using [▲] and [▼] keys, select [PC Connection], [SD Card] or [USB Memory] to be stored.

⚠ Caution: Please connect or disconnect the SD card and the USB memory after turning off the power supply.

5. Press [▶] of .

   The setup box of [System Program Load] will be displayed.

6. When program is to be updated, select [Yes] and is not to be updated, select [No] with [▲] and [▼] keys.
7. Press ENT .

   When [Yes] is selected, program will be in updating condition and a message "Updating
   Do not Power Off." will be displayed.

   When [No] is selected, returns to the [System Program Load] selection box menu.
8. The program will be downloaded from PC, SD Card or USB Memory.

   [In case of update of the program with the personal computer]

   When downloading has started, [CM] keys will blink red in the order from CM1 to CM6.
   At completion of downloading, the both gain knobs will light red.

   [In case of update of the program with the SD Card or the USB Memory]
   At completion of downloading, "Normally updated. Turn ON the power again." will be displayed.
9. Press BRILL for about 5 seconds to switch off the power.

> **Caution:** When program updating failed on the way, switch off the power once and switch on again. It will start up in the wait status of downloading. Try again the procedures from step 6 again.

5.22 Storage of settings in Flash memory device

Maintain – Save Setting Value

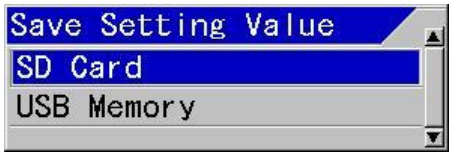
The system setting value can be stored in the SD card or the USB memory.

Please connect the SD card or the USB memory in the slot on the left side of the keyboard.

> **Caution: Please connect or disconnect the SD card and the USB memory after turning off the power supply.**

1. Press SUB MENU .
2. Select [Maintain] - [Save Setting Value].
3. Press [▶] of .

   The [Save Setting Value] selection list box will be displayed.



4. Using [▲] and [▼] keys, select [SD Card] or [USB Memory] to be stored.
5. Press [▶] of .

   The setup box of [Save Setting Value] will be displayed.
6. Using [▲] and [▼] keys, select [Yes] to store, and select [No] for not to store.
7. Press ENT .

   When [Yes] is selected, a message “It is processing” will be displayed. When storage is completed normally, “The setting value data saved.” will be displayed. And, after a while display returns to the [Save Setting Value] selection list menu.

   When [No] is selected, returns to the [Save Setting Value] selection list menu.
8. Press MENU to close the menu.

5.23 Recall settings by Flash memory device

Maintain – Apply Setting Value

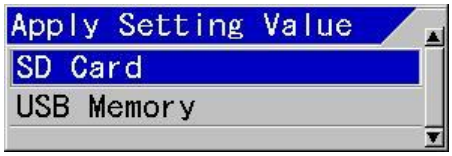
The system setting value can be recalled from the SD card or the USB memory.

Please connect the SD card or the USB memory in the slot on the left side of the keyboard.

> **Caution: Please connect or disconnect the SD card and the USB memory after turning off the power supply.**

1. Press SUB MENU .
2. Select [Maintain] - [Apply Setting Value].
3. Press [▶] of .

   The [Apply Setting Value] selection list box will be displayed.



4. Using [▲] and [▼] keys, select [SD Card] or [USB Memory] to be applied.
5. Press [▶] of .

   The setup box of [Apply Setting Value] will be displayed.
6. Using [▲] and [▼] keys, select [Yes] to apply, and select [No] for not to apply.

7. Press ENT .

   When [Yes] is selected, a message “It is processing” will be displayed. When the process ends, “Completed. The setting value data applied when restarted.” will be displayed.

   When [No] is selected, display returns to the [Apply Setting Value] selection list menu.

8. Press BRILL for about 5 seconds to switch off the power.

Chapter 6 CCD Camera

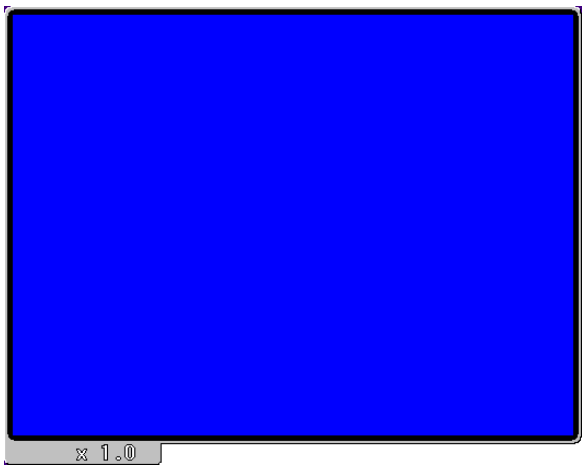
To display images of CCD camera, prepare a CCD camera separately and connect it with a video cable.

6.1 Display of CCD camera images

It is possible to display CCD camera images without any operation of menu, etc.

1. Press EVENT for a while.

   CCD camera images will be displayed.



2. Press MENU .

   CCD camera image screen will be closed.

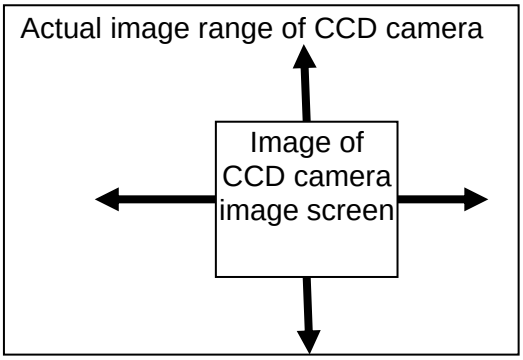
6.1.1 Scrolling of CCD camera images

This is the function to look into images of CCD camera with scrolling to the left, right, up and down of image ranges enlarged.

It is operative under the display of CCD camera images on screen.

1. Press keys of  and move to the part to display.

The image on CCD camera will scroll to the left, right, top and bottom.



Caution: There may be cases that no scrolling is available due to the enlargement factor of images displayed.

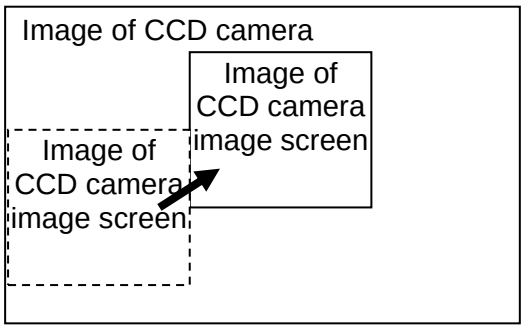
6.1.2 Return the images of CCD camera to the center

This is the function to return to the center of images after scrolling.

It is operative under display of CCD camera images on screen.

1. Press ENT .

   The image returns to the center of CCD camera image.



6.1.3 Zoom/Reduce of CCD camera images

This is the function to enlarge a part of CCD camera image for detailed display and to reduce for total view.

This is operative under display of CCD camera images on screen.

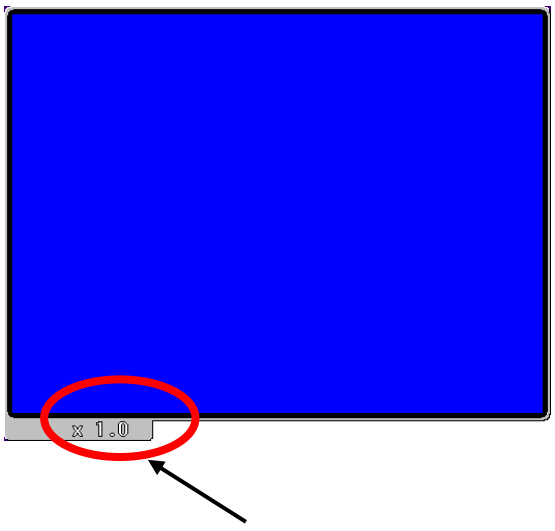
1. Press [▲] and [▼] of 

.

   With [▲] key, images will be zoomed.
   With [▼] key, images will be reduced.

   The enlargement factor of images will vary in a range of 0.8 to 4.0.

   The enlargement factor will be displayed at the left lower corner as shown in the below figure.



Enlargement factor of image

Chapter 7 Data of SD Card and USB Memory

⚠ Caution: Please use the SD card and the USB memory (with FAT16 or FAT32 format) KODEN recommends. When another type of device is used, KODEN doesn't assure operation.

The data in the SD card or the USB memory is saved as the following file name in the corresponding folder:

Data	Folder	File name
Image	PICTURE	PIC00001.zip
		PIC00001.inf
		|
		PIC00500.zip
		PIC00500.inf
Waypoint	WAYPOINT	WPT00001.wfx
		|
		WPT00010.wfx
Settings	FXBACKUP	FXBACKUP.fx2

An image file carries a pair of bit map file (zip.) and information file (inf.).

7.1 Storage

If the same file name exists, it is overwritten (after warning message is given). Please move the data to another folder in the personal computer beforehand to avoid the overwriting.

Storing/recalling files to/from the SD card or the USB memory can be only possible under the folder and file names described above.

If you desire to keep many kinds of files, please make sure to keep them in the specified folder on PC. Koden recommends the data to be managed by folders, making no changes in file names.

7.2 Recall

If you retrieve a file from the many saved, please rename the folder and the file name on PC as designated, before the recalling process.

7.3 SD Card recommendation

KODEN recommends the following type and manufacturer of the SD card to be used.

<Standard>
SD Memory Card Specification Part1 PHYSICAL LAYER SPECIFICATION Ver 2.0
<Speed Class>
Class 6
<Command Class>
Class 10 above

7.4 USB Memory recommendation

KODEN recommends the following type and manufacturer of the USB Memory to be used.

<Interface>
Hi-Speed USB2.0
<Capacity>
4GB or more

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Chapter 8 INDEX

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