FURUNO

OPERATOR'S MANUAL

COLOR VIDEO SOUNDER

MODEL FCV-582

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⚠ SAFETY INSTRUCTIONS

"**DANGER**", "**WARNING**" and "**CAUTION**" notices appear throughout this manual. It is the responsibility of the operator and installer of the equipment to read, understand and follow these notices. If you have any questions regarding these safety instructions, please contact a FURUNO agent or dealer.

⚠ **DANGER**	This notice indicates a potentially hazardous situation which, if not avoided, will result in death or serious injury.
⚠ **WARNING**	This notice indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
⚠ **CAUTION**	This notice indicates apotentially hazardous situation which, if not avoided, could result in minor or moderate injury, or property damage.

SAFETY INFORMATION FOR THE OPERATOR

WARNING

Do not open the cover of the equipment.

This equipment uses high voltage electricity which can shock, burn, or cause death. Only qualified personnel should work inside the equipment.

Do not dissasemble or modify the equipment.

Fire, electrical shock or serious injury can result.

Immediately turn off the power at the ship's mains switchboard if water or foreign object falls into the equipment or the equipment is emitting smoke or fire.

Continued use of the equipment can cause fire, electrical shock or serious injury.

CAUTION

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

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

Do not place heater near the equipment.

Heat can melt the power cord, which can result in fire or electrical shock.

Do not operate the unit with wet hands.

Electrical shock can result.

Use the correct fuse.

Use of the wrong fuse can cause fire or equipment damage.

(Continued on next page)

NOTICE

Do not use the equipment for other than its intended purpose.

Use of the equipment as a chair or a shelf, for example, can cause equipment damage.

Immediately turn off the power whenever you feel the equipment is abnormal.

Continued use can cause equipment damage.

The useable temperature range is 0°C to 50°C.

Use out of the range can cause equipment damage.

Keep magnets and magnetic fields (speaker, transformer, etc.) away from the equipment.

Magnets and magnetic fields can cause equipment malfunction.

Do not place objects near the equipment.

Objects near the equipment can cause overheating.

Handle the equipment carefully.

Rough handling can cause corrosion.

Do not use chemical cleaners to clean the equipment.

Chemical cleaners can remove paint and markings.

SAFETY INFORMATION FOR THE INSTALLER

WARNING

Only qualified personnel should work inside the equipment.

This equipment uses high voltage electricity which can shock, burn, or cause death.

Turn off the power at the ship's mains switchboard before beginning the installation. Post a warning sign near the switchboard to ensure that the power will not be applied while the equipment is being installed.

Serious injury or death can result if the power is not turned off, or is applied while the equipment is being installed.

CAUTION

Ground the equipment to prevent electrical shock and mutual interference.

Ungrounded equipment can give off or receive electro-magnetic interference or cause electrical shock.

Confirm that the power supply voltage is compatible with the voltage rating of the equipment.

Connection to the wrong power supply can cause fire or equipment damage. The voltage rating appears on the label at the rear of the equipment.

NOTICE

The mounting location must satisfy the following conditions:

- Away from rain and water splash
- Out of direct sunlight
- Away from air conditioner vents
- Away from magnets and magnetic fields
- Moderate and stable in temperature and humidity

A Word To Furuno FCV-582 Owners:

Congratulations on your choice of the FURUNO FCV-582 Color Video Sounder! We are confident that you will enjoy many years of operation with this fine piece of equipment.

For over 40 years Furuno Electric Company has enjoyed an enviable reputation for quality and reliability throughout the world. This dedication to excellence is furthered by our extensive global network of agents and dealers.

The FCV-582 Color Video Sounder is just one of the many Furuno developments in the field of echo sounding. The compact, lightweight but rugged unit is easy to install and operate and is suitable for both fresh and salt water applications.

This unit is designed and constructed to give the user many years of trouble-free operation. However, to obtain optimum performance from this unit, you should carefully read and follow the recommended procedures for installation, operation and maintenance. No machine can perform to the utmost of its ability unless it is installed and maintained properly.

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

Thank you for considering and purchasing Furuno equipment.

FEATURES

The FCV-582 is a dual-frequency (50kHz and 200kHz) color video sounder which has a large variety of functions, all contained in a splash-proof rugged plastic case that is compact to fit small size boats.

- Thought of user-friendly design have brought a simple operation.
- A wide variety of presentation modes (incl. bottom-lock expansion, marker zoom and unique bottom zoom display), using potent 500W transceiver, and NAV data display are available.
- 8 or 16-color presentation (including background), on an 8" diagonal CRT, gives you detailed information on fish density and the nature of the bottom.
- AUTO function permits unattended range and gain setting operations. The range scale and gain change automatically so that the bottom is displayed in reddish brown on the lower half of the screen.

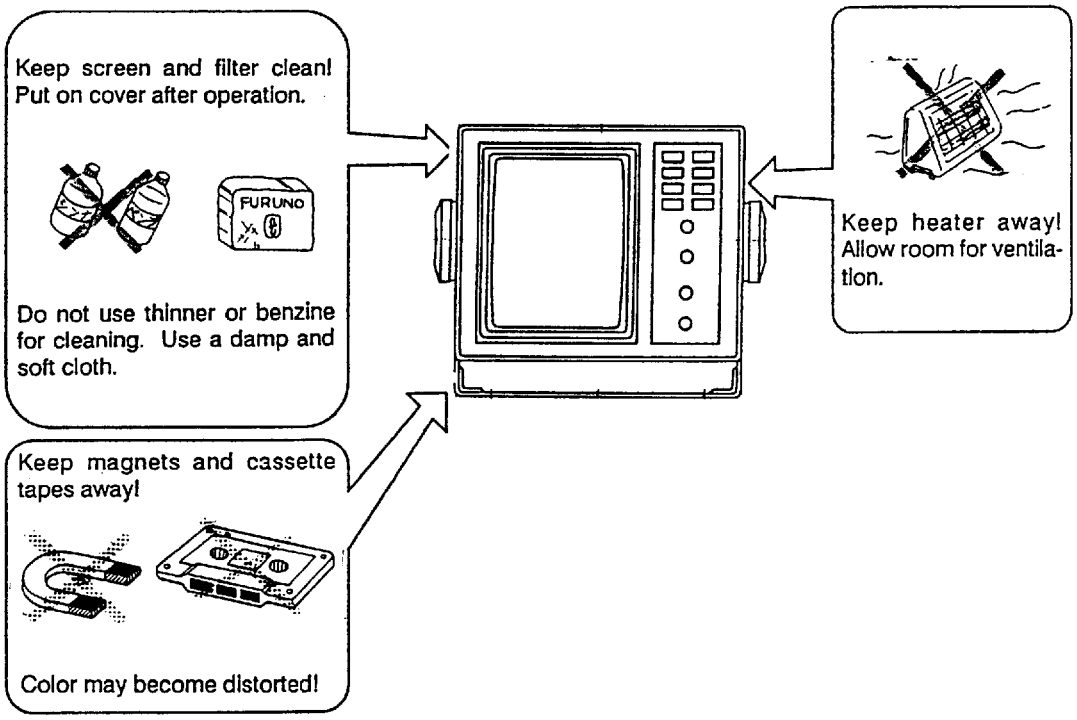
- A-scope presentation especially useful for bottom trawler and lobster/crab potter is incorporated.
- Digital display of navigational data and water temperatures in addition to water depth ensures finding of best fishing ground and safe navigation.
- Alarm may be activated. The operator is alerted when bottom or fish echoes enter into the preset alarm zone.
- Six pulselengths from 0.2 to 3.6 msec. for excellent performance on both shallow and deep ranges.
- Universal 10.5-30.0VDC power supply drawing less than 20W of power.

Table of Contents

1. HANDLING PRECAUTION

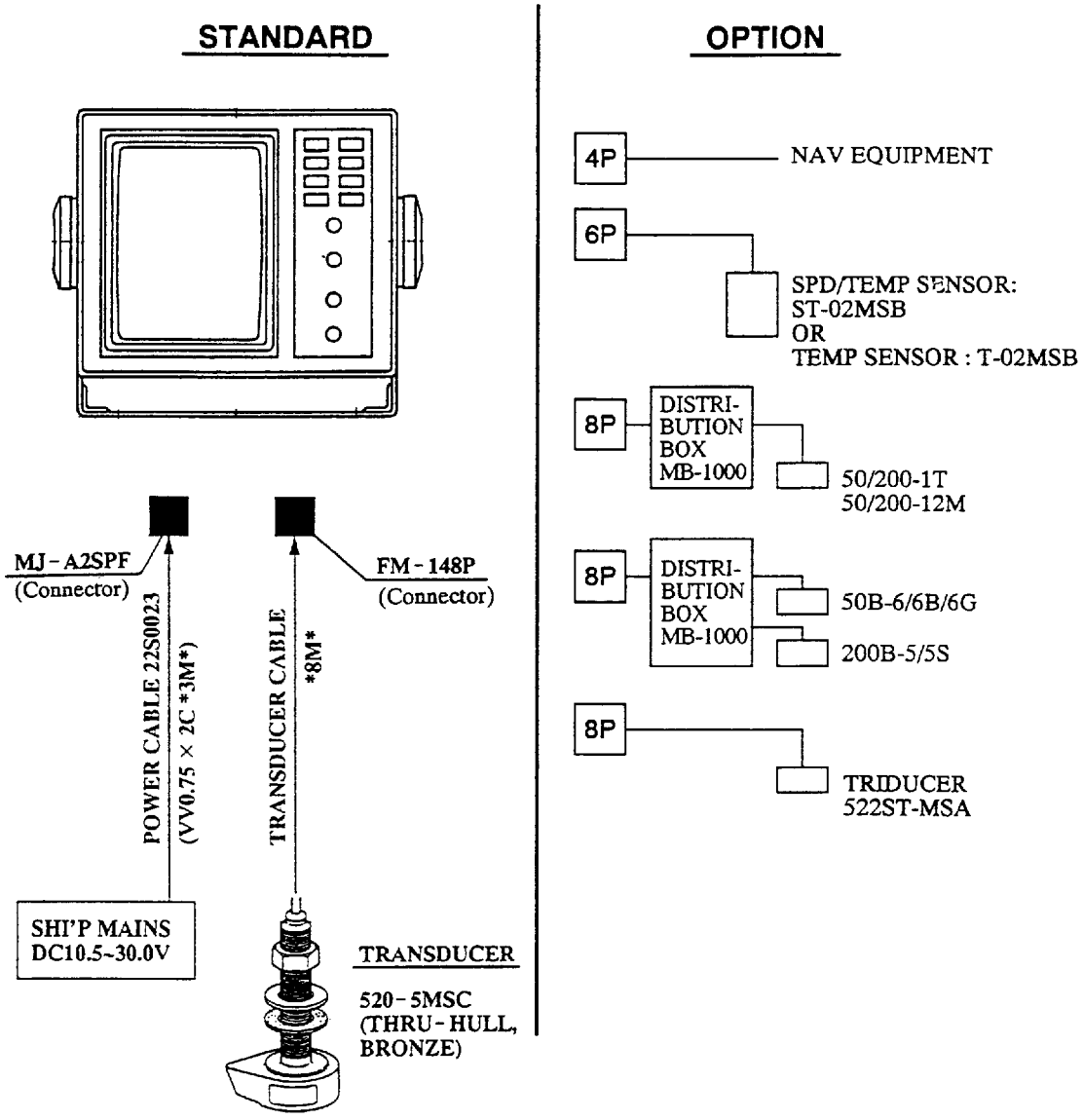
1. Moderate screen brightness to extend life of CRT.
2. Do not remove display unit cover. High voltage exists inside.

* Observe the following points to keep your FCV-582 in top condition for many years.



2. SYSTEM CONFIGURATION

The FCV-582 consists of the following units.

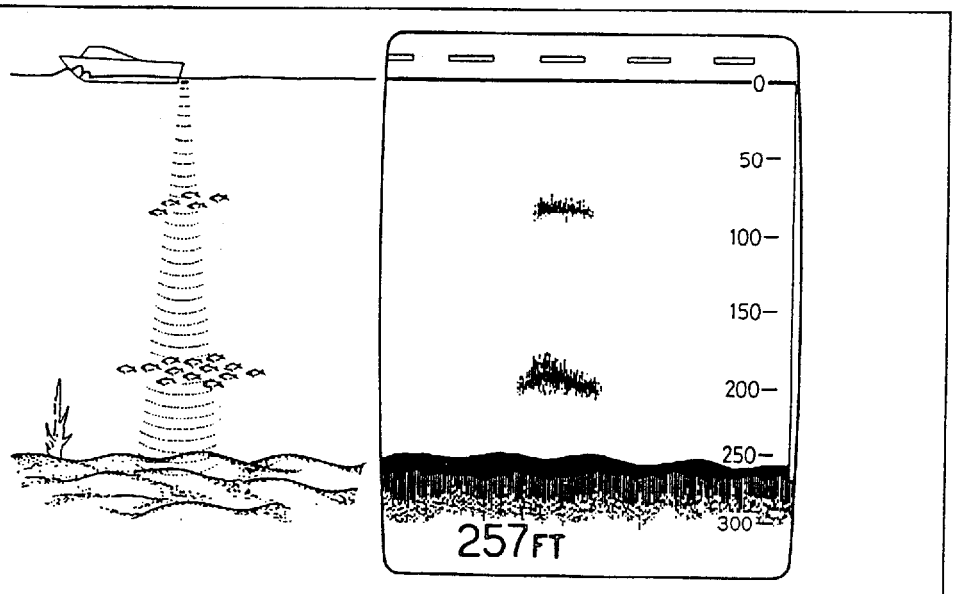


3. PRINCIPLE OF OPERATION

The FCV-582 Color Video Sounder determines the distance between its transducer and underwater objects such as fish, lake bottom or seabed and displays the results on an 8" color screen. It does this by utilizing the fact that an ultrasonic wave transmitted through water travels at a nearly constant speed of 4800 feet (1500m) per second. When a sound wave strikes an underwater object such as fish or sea bottom, part of the sound wave is reflected back toward the source. Thus by calculating the time difference between the transmission of a sound wave and the reception of the reflected sound wave, the depth to the object can be determined. In a sense an echo sounder can be thought of as being an extremely sophisticated and quick timer, since it is capable of resolving time differences shorter than one thousandth of a second.

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

The picture displayed by the FCV-582 is made up of a series of vertical scan lines, one for each transmission. Each line represents a "snapshot" of what has occurred beneath the boat. The series of snapshots are accumulated side by side across the screen, and the resulting contours of the bottom and fish between the bottom and surface are displayed. The amount of history of objects that have passed beneath the boat over a series of transmission varies from less than a minute to a few minutes, depending on how you adjust the unit.



Typical Display

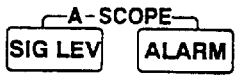
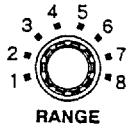
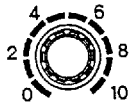
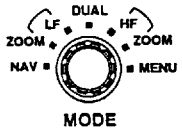
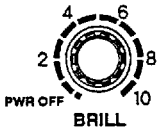
4. OPERATING CONTROLS

Introduction

The equipment is so designed that even a first time user can quickly become acquainted with the operating procedure. Pressing of each touchpad key is acknowledged by a beep sound, and keying sequence is smartly organized and acknowledged by alphanumeric/symbolic indicators on the screen.

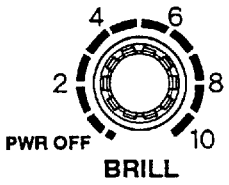
F Photo No.2074

KEY/CONTROL	FUNCTION
SHIFT (−) (+)	Changes start depth of the picture. Selects desired parameters on the menu page.
ZOOM	With the **MODE** switch set to ZOOM position, pressing this key selects one of three expansion pictures; marker zoom, bottom-lock expansion and bottom zoom.
AUTO	Turns on/off the AUTO function in which appropriate gain setting and range scale are automatically selected by the computer according to intensity of received echoes and depth of seabed. Two types of AUTO functions are available; AUTO 1 suitable for searching fish school and AUTO 2 suitable for tracking seabed.
ADVANCE ZOOM AUTO	**ZOOM** and **AUTO** keys pressed simultaneously select picture advance speed.
SIG LEV	Eliminates low intensity echoes in two (five) steps up to light blue color echoes.
ALARM	Selects the alarm function (Fish or Bottom alarm).

	**SIG LEV** and **ALARM** keys pressed simultaneously display A-scope picture on the right 1/4 of the screen. To turn it off, press the two keys again.
	Moves the variable range marker. These are also used to set the alarm zone or to change the MENU items.
	Sets the basic range of the picture.
	Adjusts picture sensitivity.
	Selects presentation mode.
	Turns on/off the unit and adjusts screen brilliance.

5. BASIC OPERATION

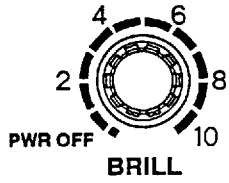
Power ON/OFF



"ON" ..... Turn the **BRILL** control clockwise until a click sound is heard. The unit starts with the settings used before it was turned off. Note that there is a few second delay prior to display of the picture until the CRT warms up.

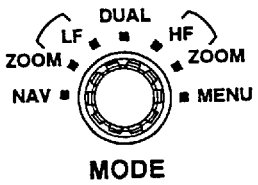
"OFF" .... Turn the **BRILL** control fully counterclockwise.

Brilliance Control



The picture brilliance is adjusted with the **BRILL** knob. Keep the moderate brilliance to extend the life of the CRT.

Presentation Mode Selection

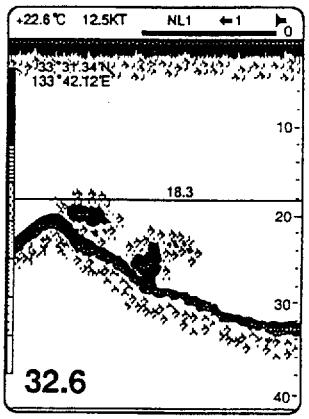


Seven presentation modes are available and you may select one of them with the **MODE** switch.

MODE	FUNCTION
NAV	displays navigation data such as ship's position (L/L), ship's speed, water temperature on full screen.
(LF) ZOOM	displays normal picture for low frequency (50kHz) on right half and its zoom picture on left haft of screen.
LF	displays normal picture for low frequency (50kHz) on full screen.
DUAL	displays normal picture for high frequency (200kHz) on right half and that for low frequency (50kHz) on left half of screen.
HF	Same as LF except that frequency is 200kHz.
(HF) ZOOM	Same as (LF) ZOOM except that frequecy is 200kHz.
MENU	displays menu on which unfrequently altered parameters are preset.

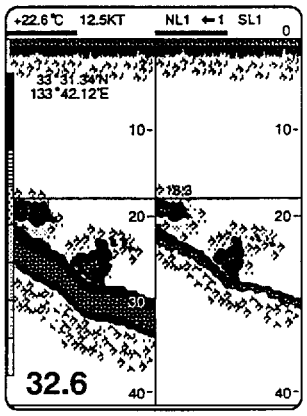
LF or HF

This is a basic presentation mode for observing fish schools and seabed.



DUAL

This mode is useful for detecting fish school which has different reflection characteristics with frequency. For example, school of tiny fish like minnow returns stronger echoes on a high frequency compared to a low frequency.

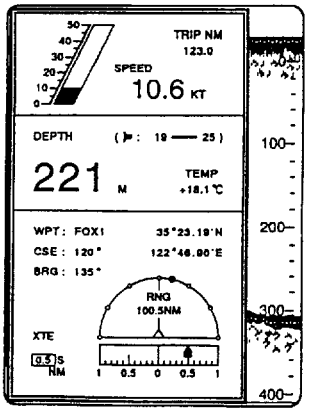


ZOOM

Refer to the next paragraph "Zoom Picuture Selection".

NAV

On this NAV mode, the navigation data are digitally displayed on the entire screen as shown below.



See page 23 for further information.

Zoom Picture Selection

ZOOM

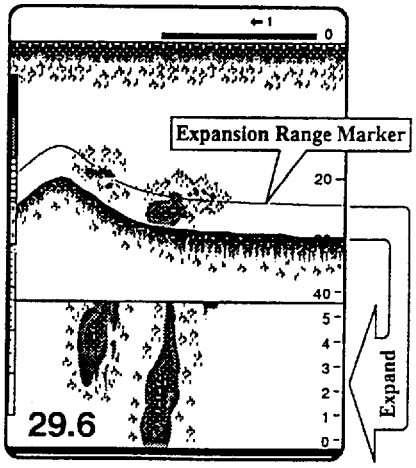
Three types of the zoom pictures are available: bottom-lock expansion, bottom zoom and marker zoom. To select one of them, press the **ZOOM** key with the **MODE** switch set to the ZOOM position.

Bottom-Lock Expansion

The bottom-lock expansion provides a compressed normal picture on the upper 2/3 of the screen and a 5m or 10m wide layer in contact with the seabed is expanded onto the rest of the screen with the seabed contour displayed by a straight line at the screen bottom. The range of expansion can be easily recognized on the normal picture because it is marked with a yellow color as illustrated below. This mode of presentation offers an excellent bottom fish discrimination which is indispensable for bottom trawling.

■ **NOTE :**

1. *For the bottom-lock expansion presentation, the seabed contour must be steadily and distinctly plotted in RED or REDDISH BROWN color. Adjust the Gain if necessary.*
2. *The bottom-lock expansion range can be selected on the system menu [3]. See page 48.*

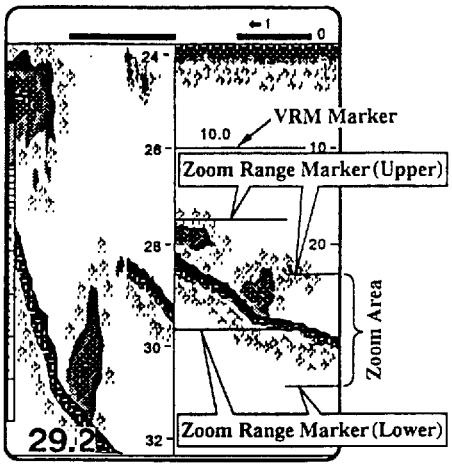


Bottom Zoom

The bottom zoom expands bottom and bottom fish echoes 2 to 5 times to full vertical size of the screen. The zone expanded is indicated by a zoom range markers on the normal picture display.

The zone automatically moves so that the bottom echoes are located on the lower half screen.

This mode may be advantageous for observing hardness of the bottom closely together with bottom fish. Many fishermen find the place where bottom fish are likely to be, from the shape of bottom profile and length of tail of bottom echoes. Some fish may live on soft sandy bottom which is displayed with short tails and some fish on hard bottom displayed with long echo tails. In addition, as you become acquainted with this mode, you may find a small school of

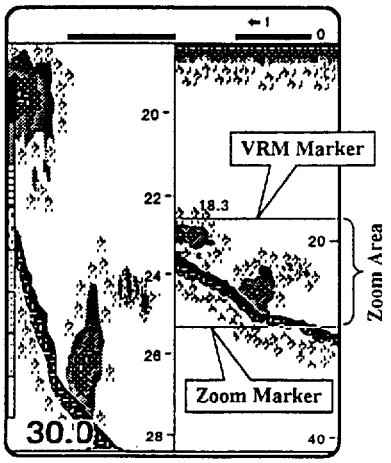


bottom fish which may be overlooked even on the bottom-lock expansion picture

■ **NOTE**
The zoom range can be selected on the system menu. See page 48.

Marker Zoom

This mode expands anywhere of the normal picture to full vertical size of the screen on the left half window of the screen. You may specify the portion to be expanded with **MARKER** [▲] or [▼] key. The segment between the VRM and zoom range markers are expanded. The length of the segment is equal to one division of the depth scale.

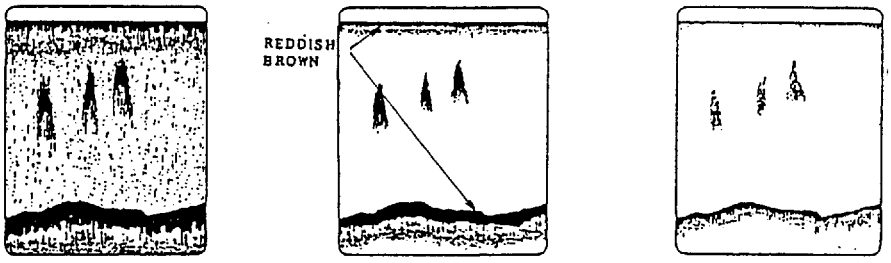


Gain Control Setting

The GAIN control adjusts the sensitivity of the receiver manually or automatically. For **MANUAL** setting, set it to the point where excessive noise does not appears on the screen. As a general rule of thumb, use a higher gain setting for greater depths and a lower setting for shallower waters.

■ NOTE

The GAIN control adjusts the sensitivity for both low (50kHz) and high (200kHz) frequency pictures. If you wish to chage it only for either of the frequencies, open the menu. See page 20.



Too High Proper Too Low

Gain Control Adjustment

Using AUTO Setting

AUTO

Press the **AUTO** key, and the gain and the range scale are automatically selected. You may use this function virtually all the time. How it actually works is as follows;

1) Range changes automatically to locate the bottom on the lower half of the screen. It jumps to one step shallower range when bottom echoes reach a half way point of the full scale from the top and to one step deeper range when they come to the lower edge of the scale.

2) The gain is auomatically adjusted to display the bottom echo in reddish brown.

There are two types of AUTO function: AUTO 1 and AUTO 2. The AUTO 1 is fish mode suitable for searching fish schools and AUTO 2 cruising mode for tracking a seabed. Since AUTO 2 uses a higher clutter setting than AUTO 1, small and weak fish echoes may be eliminated.

■ NOTE

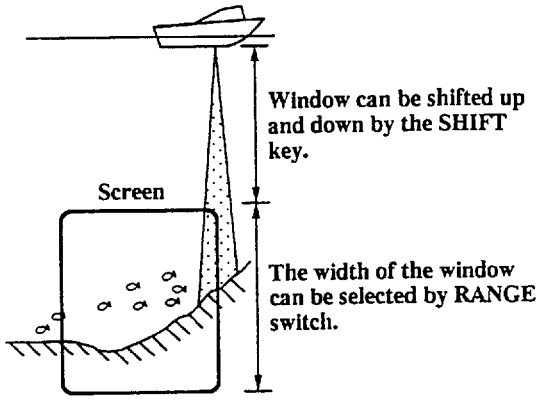
1. The AUTO function stops working when bottom echoes go deeper than 500m (250fa, 1500ft); the range is fixed at 500m (250fa, 1500ft).

2. In the AUTO function, the CLUTTER and GAIN ADJUST on the menu are automatically set to AUTO (A).

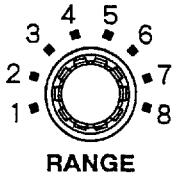
Normal Picture Range Selection

Introduction

The Basic Range and Range Shifting functions used together give you the means to select the depth you can observe directly under the boat. The Basic Range can be thought of as providing a "window" into the water column.



Basic Range Selection



The Basic Range is selected with **RANGE** switch from 8 ranges shown in the table.

Range No.	1	2	3	4	5	6	7	8
Meters (M)	5	10	20	40	80	150	300	500
Feet (FT)	15	30	60	120	200	400	1000	1500
Fathoms (FA)	3	5	10	20	40	80	150	250
Passi/Braza(P/B)	3	5	10	30	50	100	200	300

■ **NOTE:**

1. The ranges are user-reprogramable on the system menu [3]. See page 48.

2. The depth unit can be selected on the system menu [1]. See page 46.

Range Shifting

The basic range (window) selected may be shifted up and down by pressing **SHIFT** [-] or [+] key. The amount of range shifting, i.e., the depth at the upper limit of the window, is digitally indicated at the top right corner of the screen. Step of range shifting with the [-] or [+] key differs with respect to the key touch, i.e., one press for 1m step and keep pressing for accelated steps.

■ **NOTE**

When the AUTO function is turned on by pressing the AUTO key, the manual range setting mentioned above is not operative.

Picture Advance Speed Selection:

ADVANCE
ZOOM AUTO

Press **ZOOM** and **AUTO** keys simultaneously to set the picture advance speed. Every pressing changes the on-screen indication as well as the advance speed.

The fractions in the table below correspond to how many transmissions are necessary to construct one scan line.

If the advance rate is set to "0", the display will remain frozen indefinitely.

Item Indicator	0	1	2	3	4	5
Scan Line/ Transmissions	Freeze	1/8	1/4	1/2	1/1	Max (2/1)

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

Eliminating Low Intensity Echoes

SIG LEV

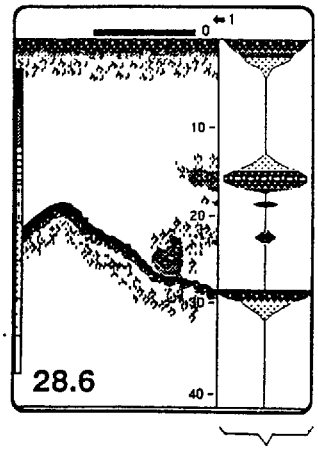
When you wish to display fish schools above certain level or wish to eliminate a small noise over the entire screen, press **SIG LEV** key. Every pressing eliminates the weakest color echoes on the screen, up to light blue echoes with two (8 color presentation) or five (16 color presentation) key strokes. The echoes eliminated can be identified with the color bar whose color is eliminated in the same order.

Eliminated Color: No → BLU → L-Blue →

Turning on A-Scope Presentation

A-SCOPE
SIG LEV ALARM

To display the A-SCOPE picture, press **A-SCOPE** key. Echoes at each transmission are displayed with amplitudes and colors proportional to their intensities on the right 1/4 of the screen. This will enable close observation of small fish and fish near the bottom.



A-Scope Presentation

Measuring Depth to a Fish School

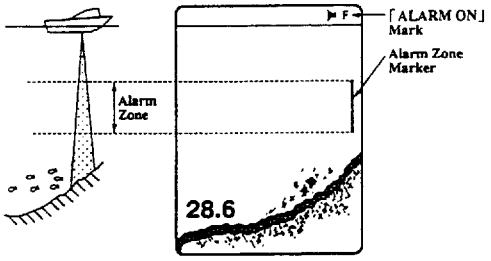
Move the VRM marker onto a fish school with **MARKER** [▲][▼] keys, and the depth to the fish school is digitally read out at the right-hand side on the marker.

6. ADVANCED OPERATION

Using Fish or Bottom Alarm

Introduction

The alarm function alerts you to the seabed or fish entered into the specified alarm zone. The alarm sounds and the ▶F or ▶B on the upper right of the screen is highlighted while releasing the alarm.



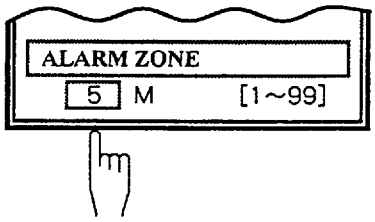
■ NOTE:

1. To activate the bottom alarm, the seabed depth should be digitally displayed on the left bottom of the screen.

2. Weak fish echo cannot trigger the alarm. Select proper fish echo level (F/A LEVEL) referring to page 46.

Procedure

1. Set **MODE** switch to "MENU".
2. Select the "ALARM ZONE" item with **MARKER** [▲][▼] keys and set alarm zone width with **SHIFT** [-] [+] keys.



Set width of alarm zone.

3. Set **MODE** switch to the desired mode.
4. Each press of **ALARM** key selects the bottom alarm/fish alarm on or off.
   The alarm ON mark and message appear on the screen.
5. While the alarm message is being displayed, move the alarm zone marker to the desired depth with **MARKER** [▲][▼] keys.

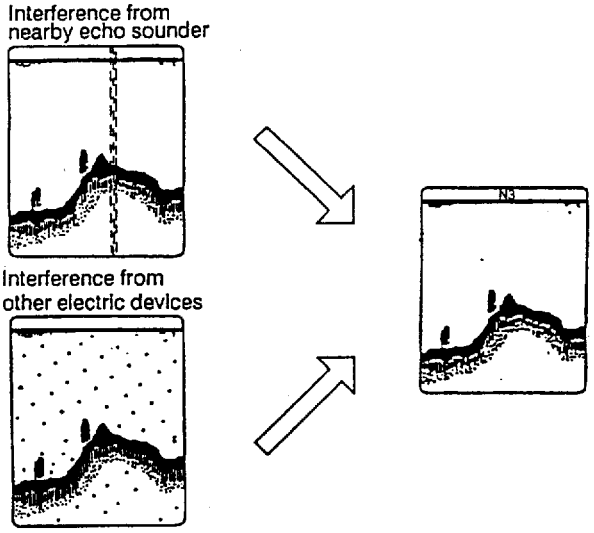
■ NOTE:

The alarm message is displayed for five seconds.

6. To turn off the alarm, press the **ALARM** key to select "ALARM OFF".

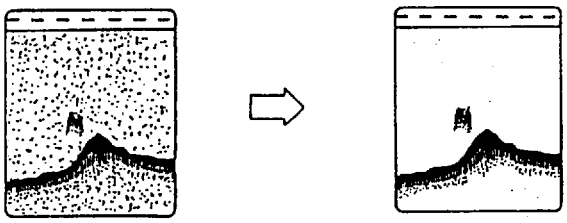
Eliminating Interference

When interference from other acoustic equipment operating nearby or other electric equipment is seen on the screen, use the **NOISE LIMITER** function which can be set on the menu screen. See page 19.



Eliminating Low Level Noise

When blue dots appear on the whole screen mainly due to contaminated water, use **CLUTTER LEVEL** function to eliminate them. The **CLUTTER LEVEL** function can be turned on on the menu. See page 20.



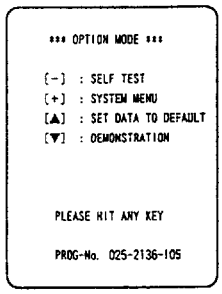
Compensating Water Temperature Indication

Overview

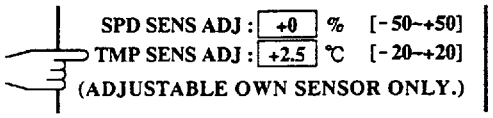
An error in the water temperature indication can be compensated on the system menu up to ±20°C (°F) in 1° steps.

Procedure

1. Turn the unit on while pressing one of the keys. The following message will be displayed.



2. Press **SHIFT** [+] key to display the system menu.
3. Select SYSTEM MENU [2] with **SHIFT** [-] [+] keys.
4. Select the "TMP SENS ADJ" item with **MARKER** [▲][▼] keys and sets the compenssion value with **SHIFT** [-] [+] keys.



5. Turn the unit off and on to return to the normal display.

■ **NOTE:**
The water temperature measured with the temperatur sensor (option) can be corrected but that fed from the navigation equipment can not.

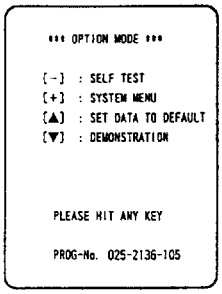
Compensating Ship's Speed Indication

Overview

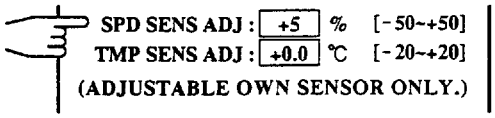
An error in the ship's speed indication can be compensated on the system menu up to ±50% in 1% steps.

Procedure

1. Turn the unit on while pressing one of the keys. The following messages will be displayed.



2. Press **SHIFT** [+] key to display the system menu.
3. Select SYSTEM MENU [2] with **SHIFT** [-] [+] keys.
4. Select the "SPD SENS ADJ" item with **MARKER** [▲][▼] keys and set the compensation value with **SHIFT** [-] [+] keys.



5. Turn the unit off/on to return to the normal display.

■ **NOTE:**
The ship's speed measured with the speed sensor (option) can be corrected but that fed from the navigation equipment can not.

Selecting Background Color and Echo Color

Depending on your preferences, you may select the echo color gradations and the background color as shown below on the menu.
See page 19.

On-screen Indication	Background Color	Echo Color
HUE 1	Blue	15 gradations
HUE 2	Blue	7 gradations
HUE 3	Black	15 gradations
HUE 4	Black	7 gradations
HUE 5	Light Blue	15 gradations
HUE 6	Light Blue	7 gradations
HUE 7	Black	Monochrome

In the monochrome presentation, echoes are displayed in amber with 7 intensity gradations.

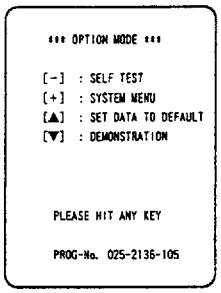
Displaying Demonstration Picture

Overview

In this equipment, a convenient demonstration picture is incorporated for a self-study of the operation without connecting the transducer.

Procedure

1. Turn the unit on while pressing one of the keys. The following message will be displayed.

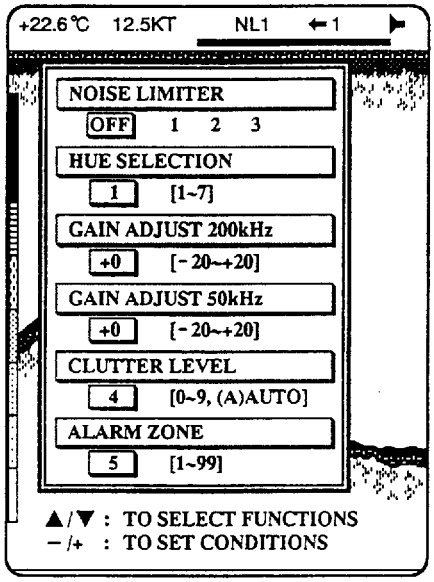


2. Press **MARKER** [▼] key, and the demonstration picture will be displayed.
3. Turn the unit off/on to return to the normal display.

7. MENU SETTING

Introduction

The menu screen as shown below is displayed when the **MODE** switch is set to the "MENU" position. You may set or select those functions that are not frequently altered in daily use if they have been once preset according to your fishing conditions and preferences.



Operating Procedure

1. Set **MODE** switch to the "MENU" position.
2. Select the desired item with MARKER [▲] [▼] keys. The selected item is highlighted in yellow.
3. Set the desired parameter with **SHIFT** [-] [+] keys.
4. Turn **MODE** switch to other position to restore the normal picture.

Description of Menu Item

Noise Limiter

When the interference from other echo sounders operating nearby or other types of electrical interference exist, you may use the noise limiter to eliminate or reduce the interference. Position "3" offers

the highest degree of noise rejection. The status of the noise limiter, NL1, NL2 or NL3, is indicated on top of the echo sounder picture.

■ **NOTE :**
If the noise limiter is left in "3" when no interference exists, weak echoes may be missed or eliminated.

Hue Selection

This item allows you to select the echo color gradations and the background color as shown below.

On-screen Indication	Background Color	Echo Color
HUE 1	Blue	15 gradations
HUE 2	Blue	7 gradations
HUE 3	Black	15 gradations
HUE 4	Black	7 gradations
HUE 5	Light Blue	15 gradations
HUE 6	Light Blue	7 gradations
HUE 7	Black	Monochrome

In the monochrome presentation, echoes are displayed in amber with 7 intensity gradations.

Gain Adjust 200kHz/Gain Adjust 50kHz

You may adjust the gain for individual frequencies when you wish to have a higher or lower gain on either of the two frequencies. Changing the setting on this item by 10 corresponds to changing setting of the **GAIN** control by 1.

Clutter Level

When blue dots appear on the whole screen mainly due to contaminated water, they may be eliminated with this clutter level setting.

Normally use the "AUTO" setting where rejection level is automatically adjusted considering existing clutter level. The manual settings "1" to "9" may be used when the clutter can not be eliminated satisfactorily with the "AUTO".

■ **NOTE :**
Do not use too high a setting, otherwise weak echoes may also be eliminated.

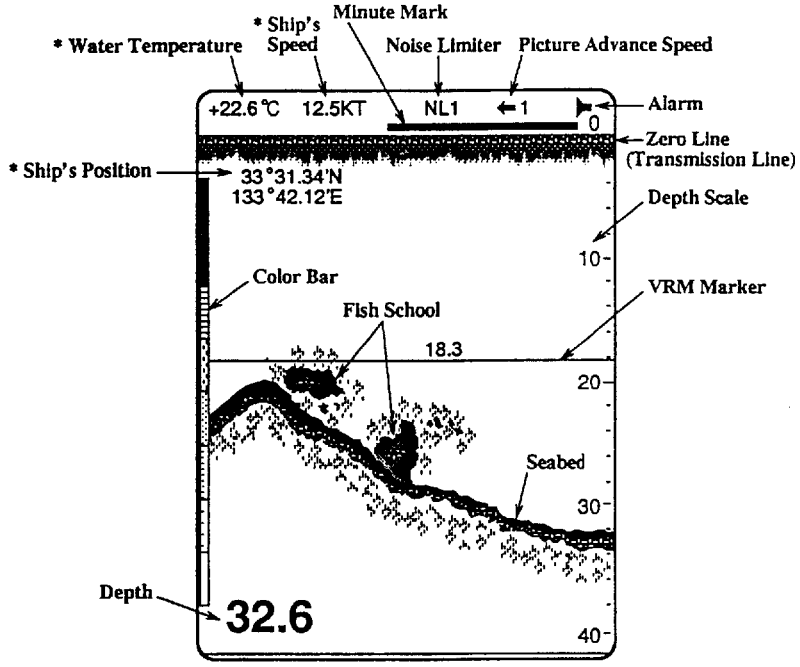
Alarm Zone

In this item, you may set the width of the alarm zone.

8. DISPLAYS

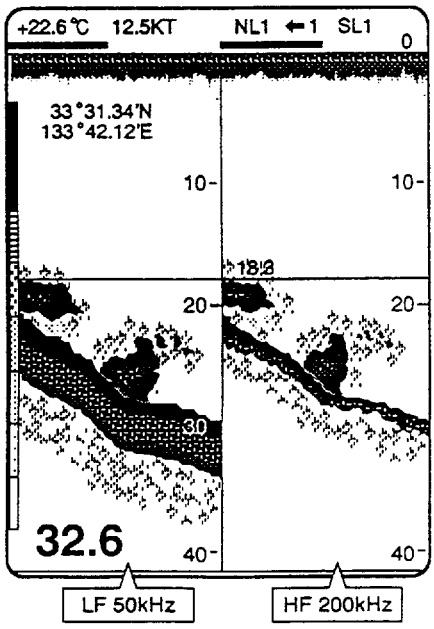
Echo Sounder Picture

HF or LF

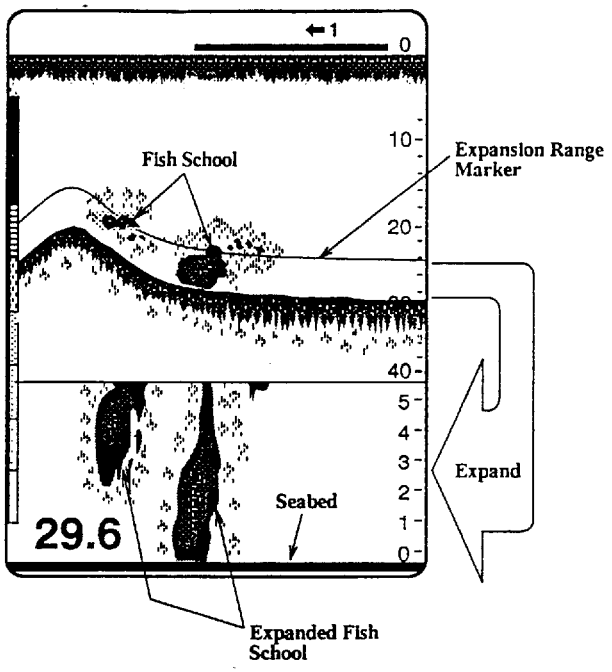


* : Position fixing equipment and/or temperature speed sensor is required.

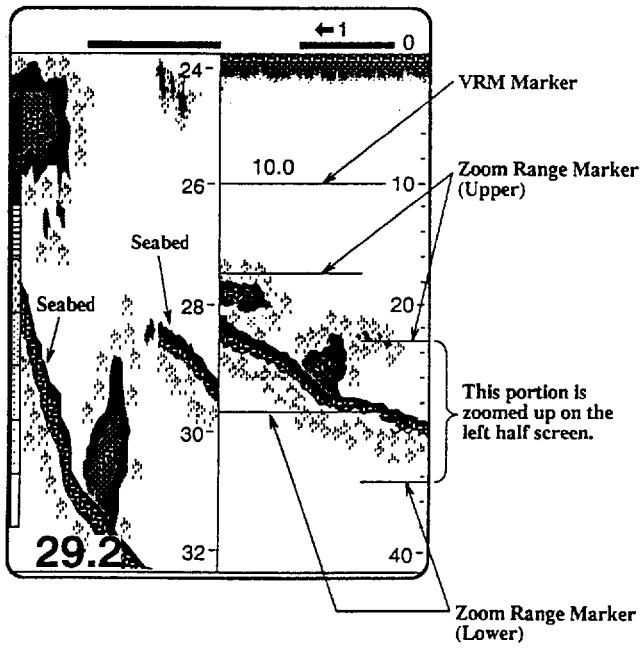
DUAL



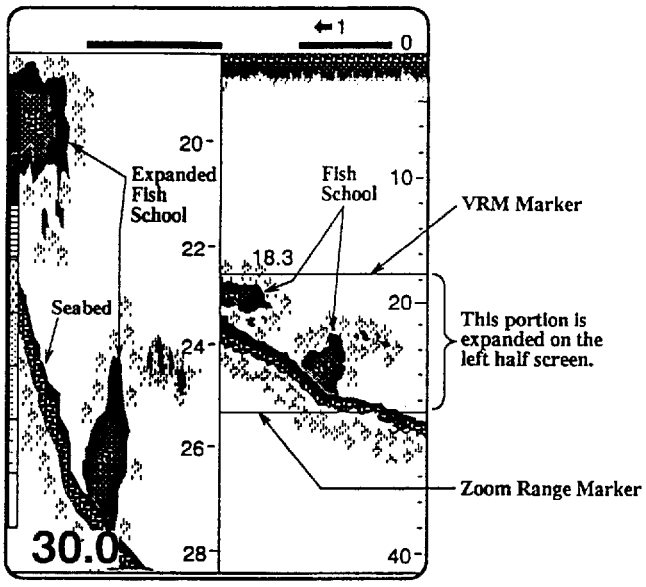
HF (or LF) + Bottom-Lock Expansion



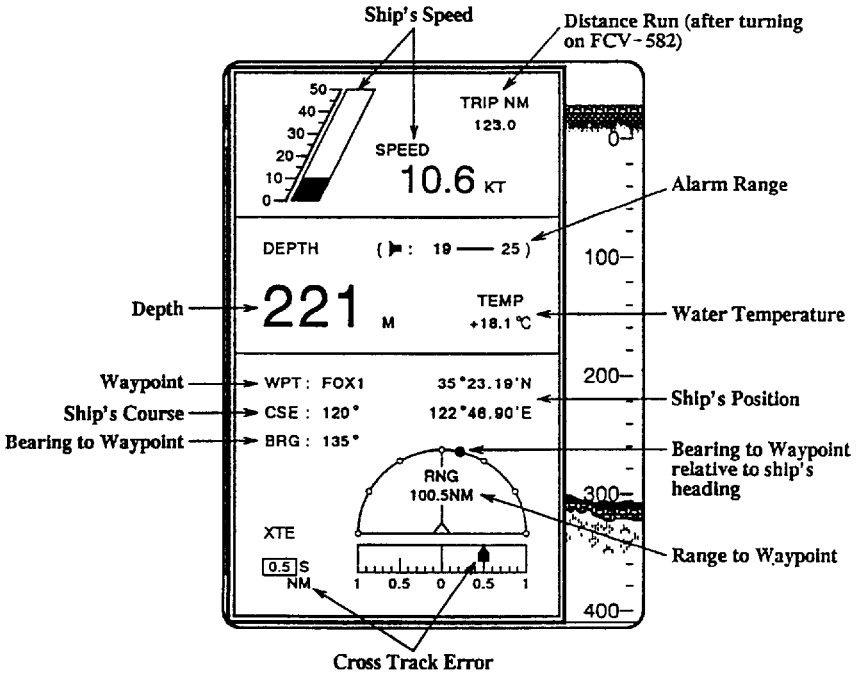
HF (or LF) + Bottom Zoom



HF (or LF) +
Marker Zoom



Navigation Data



■ **NOTE:**
To display data except for depth and alarm zone, the temperature/speed sensor and position fixing equipment should be connected.

9. INTERPRETING THE DISPLAY

As mentioned before both fish echoes and bottom contour echoes are composed of a series of vertical scan lines moving right to left across the screen. It is possible for the same object to be recorded on the display with a variety of shapes depending on the distance to the object, the angle at which the object is struck by the transmitted pulse, echo strength, etc.

Frequency

With the FCV-582, you have 50kHz and 200kHz. There are advantages and disadvantages to both frequencies and you should use the frequency best suited to your needs.

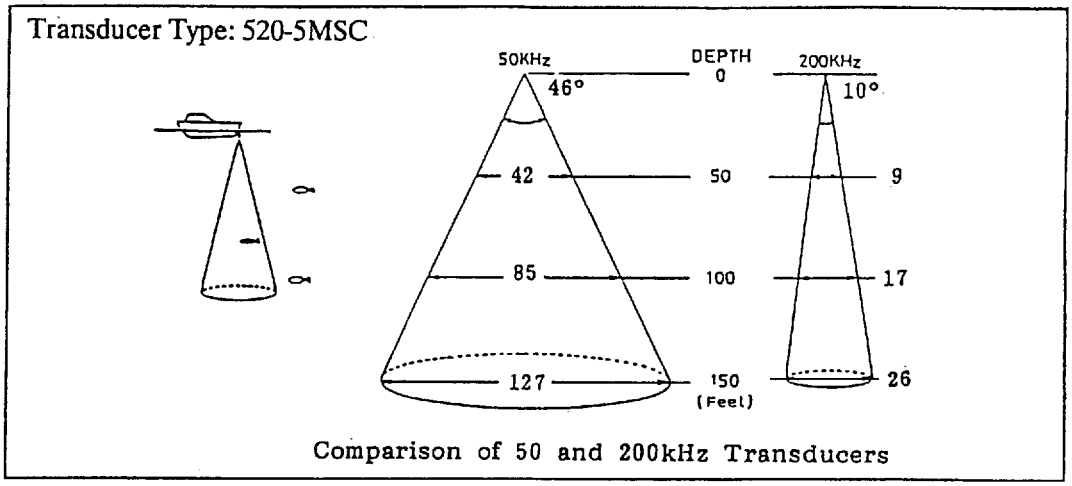
- High frequency is useful to detect species which do not have air bladders or which are very small and do not readily reflect the echo.
- When the sea is rough, noise (reddish color) heavily covers the surface layer, and sounding is easily interrupted by aerated water which passes below the transducer. It should be noted that a high frequency is less influenced by rough sea when compared with a low frequency. However, in the application where observation of DSL (plankton layer) is first essential, use low frequency since such scattering objects are clearly plotted.
- To watch the seabed condition in the bottom trawling, a low frequency is preferable because the seabed is plotted thickly and changes of the width can be easily noticed. A wide seabed trace indicates a hard seabed and a narrow trace a soft seabed.
- Though a high frequency offers a sharp, clear-cut picture, its use should be limited to shallow water fishing because it is easily attenuated in the water.

Detecting Area

The detecting area varies depending on the main beamwidth of the transducer, as shown on the next page. Objects out of the main beam but close to the beam will be presented less densely, smaller in size, and at a lower intensity.

Generally, beamwidth depends on transmission frequency; a narrower beamwidth is usually obtained at the higher frequency. For example, the 200 kHz transducer has a "-3 dB" beamwidth of

approximately 10 degrees, whereas the 50 kHz transducer has a beamwidth of approximately 46 degrees.

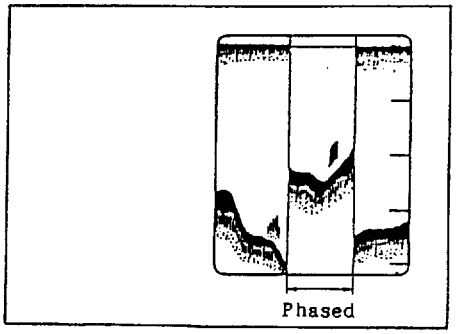


Because the beam width of the 200kHz transducer is narrow, the operator has the advantage of higher resolution. In addition, the effects of cruising noise and air bubbles are greatly reduced, since air bubbles resonate at a frequency between 15 and 100kHz. On the minus side, a narrow beamwidth transducer will display even the smoothest bottom contour in a sawtooth pattern if the boat is moving up and down due to pitching and rolling of the boat.

Because of the limited coverage area, a narrow beamwidth tends to overlook catchable fish at the sides of the boat. (The maximum percent of depth covered on the bottom for the 200kHz transducer is 17% of the depth. For example, if the bottom depth is 300 meters, the diameter of the coverage circle on the bottom would be only 52 meters.)

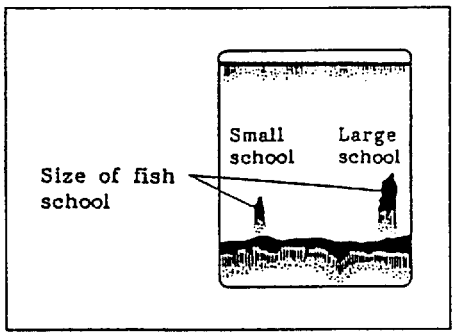
Zero Line

The zero line (sometimes referred to as the transmission line) represents the transducer's position, and moves off the screen when a deep phased range is used.



Fish School Echoes

Fish school echoes will generally be plotted between the zero line and the bottom. Usually the fish school/fish echo is weaker than bottom echo because the reflection property is much smaller than compared to the bottom. The size of the fish school can be ascertained from the density of the display.

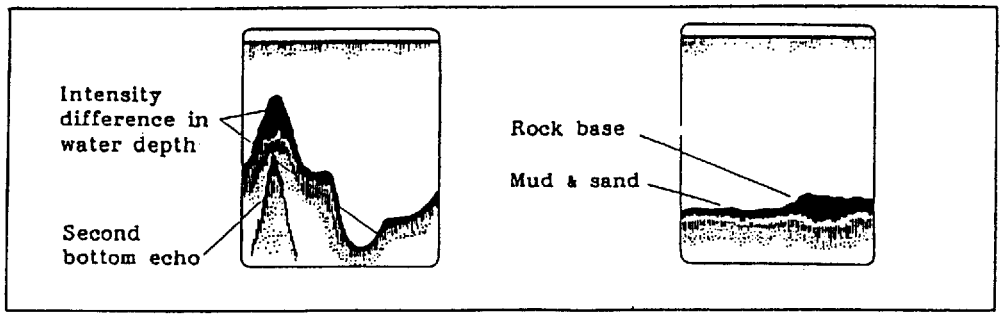


Bottom Echo

Echoes from the bottom are normally the strongest and are displayed in the reddish brown color but the color and width will vary with bottom composition, water depth, frequency, sensitivity, etc.

In a comparatively shallow depth, a high gain setting and strong bottom echo will cause a second or sometimes a third or a fourth echo to be displayed at the same interval between them below the first echo trace. This is because the echo travels between the bottom and the surface twice or more in shallow depths.

The color of the bottom echo can be used to help determine the density of the bottom materials (soft or hard). The harder the bottom, the wider the trace. If the gain is set to show only a single bottom echo on mud, rocky bottom will show a second or third bottom return. The Basic Range chosen should be set to show the first and second bottom echoes when bottom hardness is being determined.

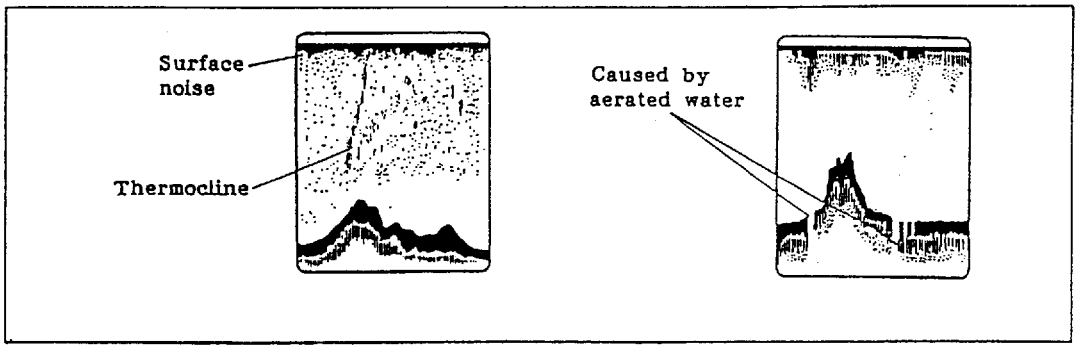


In rough waters, the bottom is recorded in a zig-zag pattern, similar to the teeth of a saw. This is caused by the heavy pitching and rolling of the boat causing the sounding direction to fluctuate and the distance to the bottom to vary.

Surface Noise/Aeration

When the waters are rough or the boat passes over a wake, surface noise may appear near the zero line. As surface turbulence is acoustically equivalent to running into a brick wall, the bottom echo will be displayed intermitently. Similar noise sometimes appears when a water temperature difference (thermocline) exists. Different species of fish tend to prefer different temperature zone, so thermocline information may be useful to help identify target fish. 200kHz tends to show shallow thermoclines better than 50kHz.

In rough waters the display is occasionally interrupted due to below-the-ship air bubbles obstructing the sound path. This also occurs when the boat makes a quick turn or reverses movement. However, reconsideration of the transducer installation may be necessary if the interruption occurs frequently in good weather conditions.



10. MAINTENANCE

General

The equipment will maintain optimum performance for a long period . However, continued performance cannot be expected without periodic inspection and maintenance. Important hints to be checked from time to time are tabulated below.

⚠WARNING

Do not open the cover of the equipment.

This equipment uses high voltage electricity which can shock, burn, or cause death. Only qualified personnel should work inside the equipment.

Check Item	Action
Cable run	If conductors are exposed, replace cable.
Power cable plug/transducer cable plug	If loosened, secure it firmly.
Display unit grounding	If corroded, clean it.
Ship's mains voltage (10.5 to 30.0VDC)	If out of ratings, correct problem.

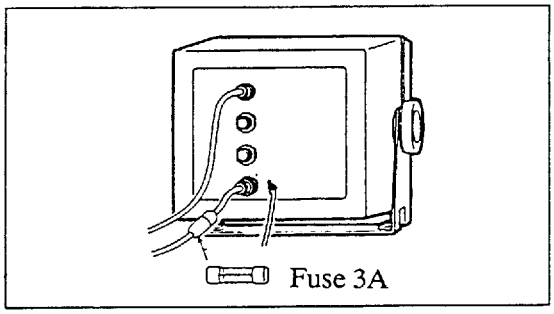
Fuse Replacement

To protect the equipment from serious damage, a fuse is provided on the power cable, as illustrated. The fuse protects against over-voltage/reverse polarity of the ship's mains or internal fault of the equipment. If the fuse has blown, first find the cause of the problem before replacing it with a new one. A fuse rated for more than 3A should not be used, since it may cause serious damage to the equipment.

⚠CAUTION

Use the correct fuse.

Use of the wrong fuse can cause fire or equipment damage.



Cleaning

Keep the equipment clean and dry at all times. Dust or dirt should be wiped off with a soft, dry cloth. To remove heavy dirt, use mild detergent and water on a cotton tipped swab or soft cloth.

■ CAUTION

Never apply plastic solvent, such as thinner or acetone, for cleaning and lubrication . It may dissolve paint coating/markings on the front panel.

Maintenance of the Transducer

Underwater growth on the transducer face will result in a gradual decrease in the sensitivity. Check the transducer face each time the boat is dry-docked. If any barnacles or seaweed growth is found, remove them very carefully with a piece of wood or sandpaper, taking care not to damage the transducer face.

11. TROUBLESHOOTING

If something appears wrong with your unit, check the equipment referring to the "basic troubleshooting and diagnostic self-check. In case the trouble isn't found after performing these checks, and the unit still appears faulty, call your electronics technician for service.

Basic Troubleshooting

Note that the number listed on each possible cause corresponds to that of the illustration on the next page.

Neither echo nor fixed range scale

* Is the battery dead? 1
* Is the fuse blown? 2
  Supply voltage is normal?
  Corrosion on battery terminal? 1
* Poor contact of power cable? 1

No echo but fixed range scale shows

* Is the picture advance rate set to "0"? 3
* Transducer plug is loose? 4

Echo appears but no zero line

* Is the range shifting operative? 5

Low sensitivity

* Is the gain setting too low? 6
* Air bubbles or underwater growth (barnacle, seaweed, etc.) attached to the transducer face? 7
* Highly sedimented water? 8
* Soft bottom? 9

No water depth readout

* Bottom echo is not painted in red or reddish brown? 6
* Bottom is not displayed on the screen? 10

Heavy noise or interference

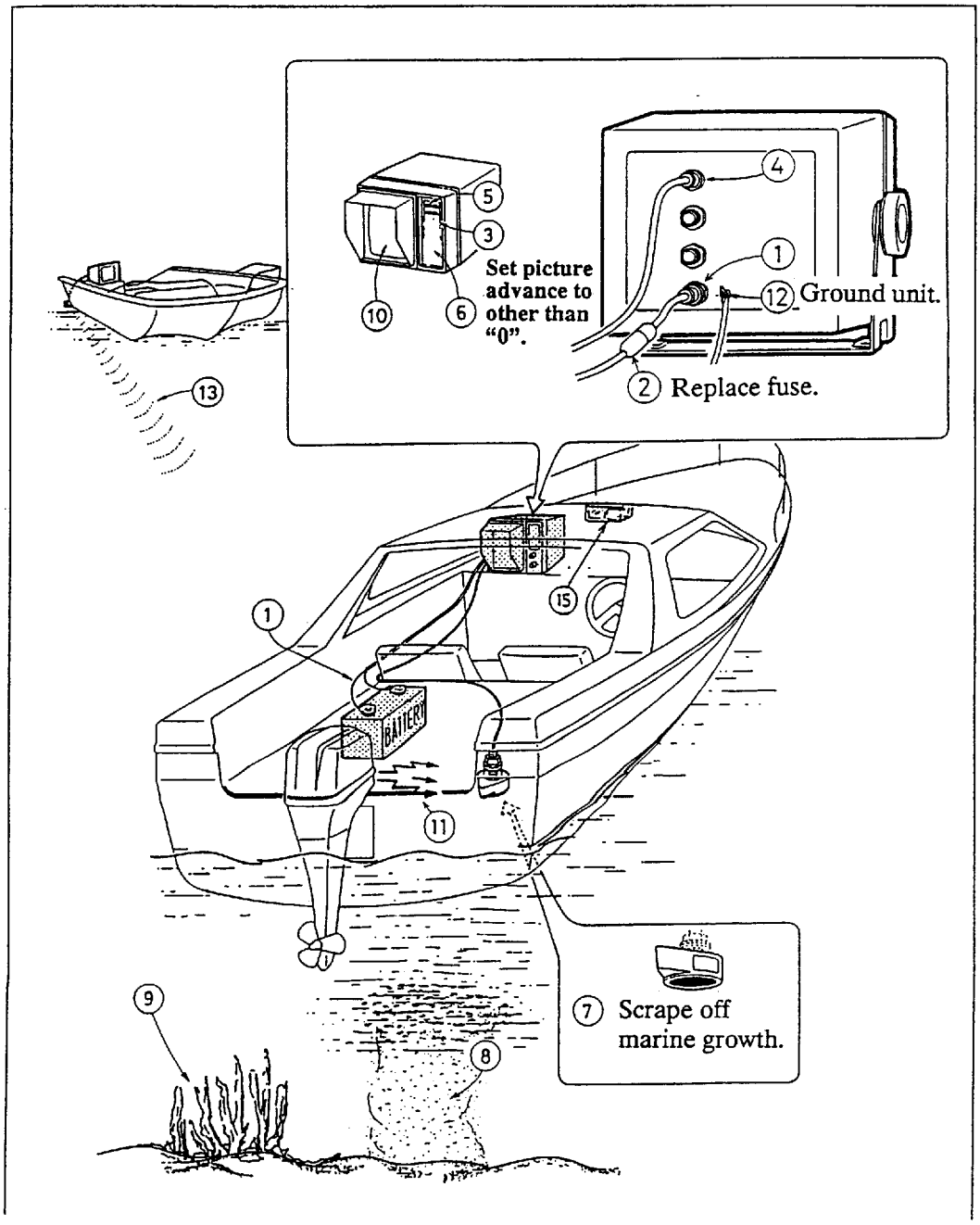
* Is the transducer/cable located too near the engine? 11
* Is the unit grounded? 12
* Are other echosounders of the same frequency operating nearby? 13

No or unrealistic speed/temperature indication

* Sensor plug is loose? 14

No or unrealistic ship's position indication

* Plug for the position fixing equipment is loose? 15
* The position fixing equipment itself is operating normally? 16



⑪ Try to mount a large electrolytic capacitor right at the output terminals of the alternator as close as possible. The capacitor must be rated for the nominal output voltage of the alternator, plus a 50% safety factor and capacity should be about 10,000 microfarads or so. The positive lead of the capacitor is connected to the output terminal of the alternator in parallel with the heavy lead going to the battery bank. The negative terminal of the capacitor should go to a mounting bolt used to secure the alternator to its mounting frame. Be careful to observe polarity of the capacitor. Reverse polarity will destroy the capacitor, and could damage the charging system as well.

■ **NOTE**
Do not connect the capacitor to the field terminal of the alternator, as it may damage the alternator itself.

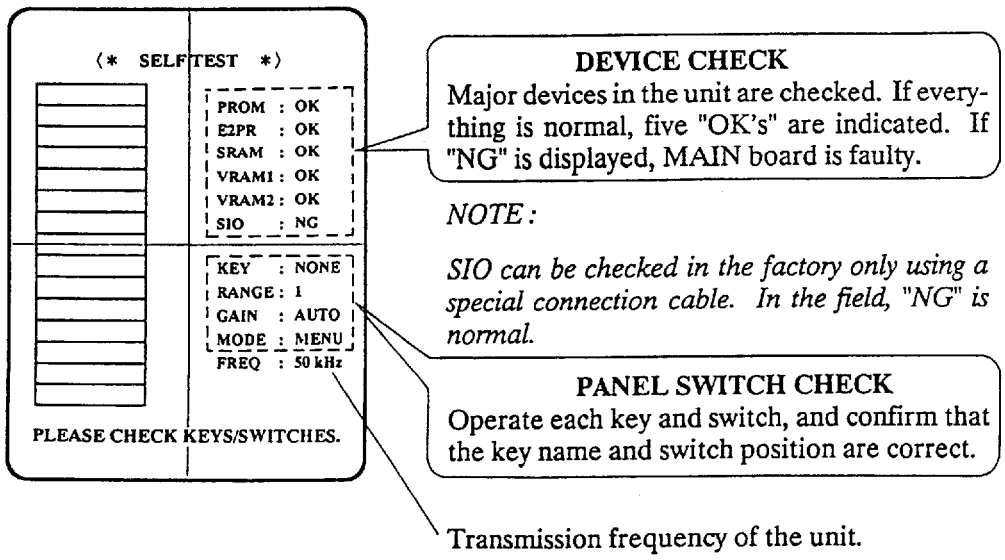
Diagnostic Self-Check

Introduction

The FCV-582 incorporates diagnostic self-check facilities, enabling to find a faulty pc board. If no trouble is found through the basic troubleshooting, perform the following self-checks.

Procedure

1. Turn the unit on while pressing one of the keys.
2. Press **SHIFT** [-] key.
   The self-check screen is displayed and the check results will appear in a few seconds.



3. To terminate the self-check, turn the unit off.

Transducer Check

A simple and reliable check of the transducer is to temporarily substitute a new transducer instead of the existing one to the display unit. If the picture sensitivity is considerably improved through this change, the transducer is considered to be faulty. This method is especially useful for inside-hull or through-hull installation.

The following quick check also helps to judge the performance of the transducer to some extent.

Haul the transducer from the water and turn on the POWER. Put your ear near the transducer face and carefully listen to the transmission sound. If you can hear a clicking sound , the transducer is probably OK. Next, rub the transducer face with your hand and observe whether any noise appears on the screen. The appearance of noise indicates that the transducer is normal. In case of neither sound nor noise, the transducer is likely to be faulty.

Speed/temperature Sensor (Option) Check

The idea of transducer check can apply to this case, too; temporarily substitute a new sensor instead of the existing one to the display unit. If the speed/temperature indications become normal through this exchange, the sensor is considered to be faulty.

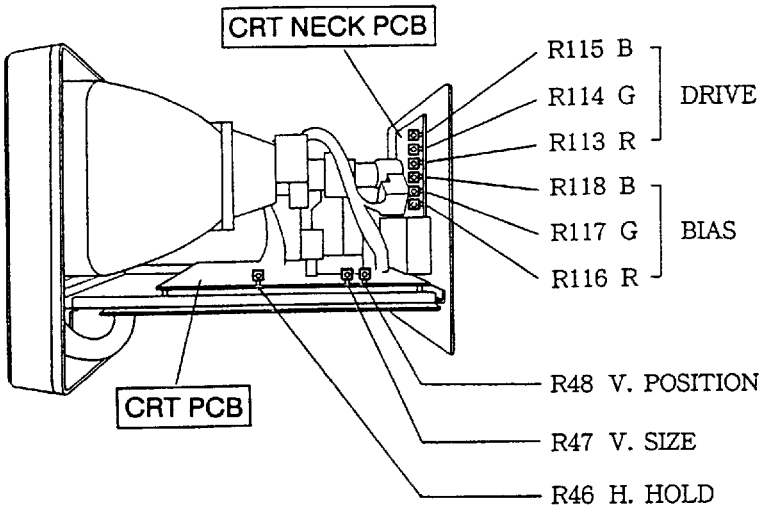
Unless a new sensor is available, try the following checks.

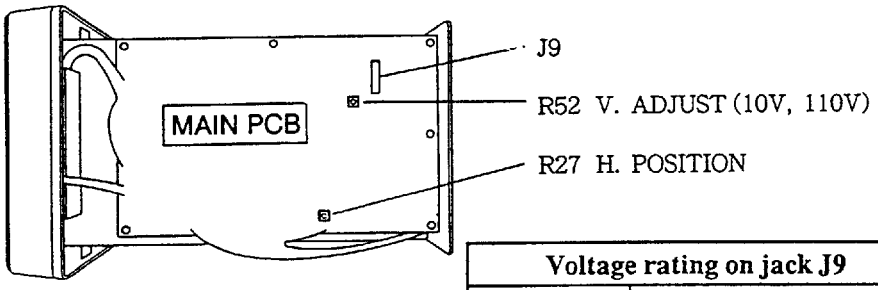
First, unplug the sensor connector from the display rear panel. If the speed is indicated "00" and the temperature indicate "*20" or around, the display unit will be all right.

Next, turn the water wheel with a finger. If the sensor is normal, the speed indication will be 2 to 3 knots when the wheel is turned at a normal speed and will be 7 to 8 knots when turned more quickly. As for the temperature, the reading should change when you touch the thermosensor.

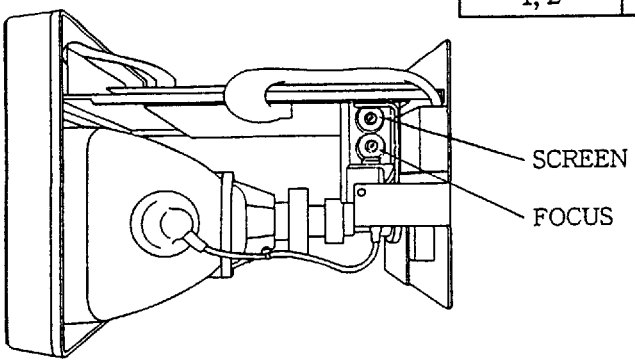
Voltage and CRT Adjustment (for Serviceman)

To adjust +10V, +110V lines and CRT, refer to the drawing below. +5V line requires no adjustment.





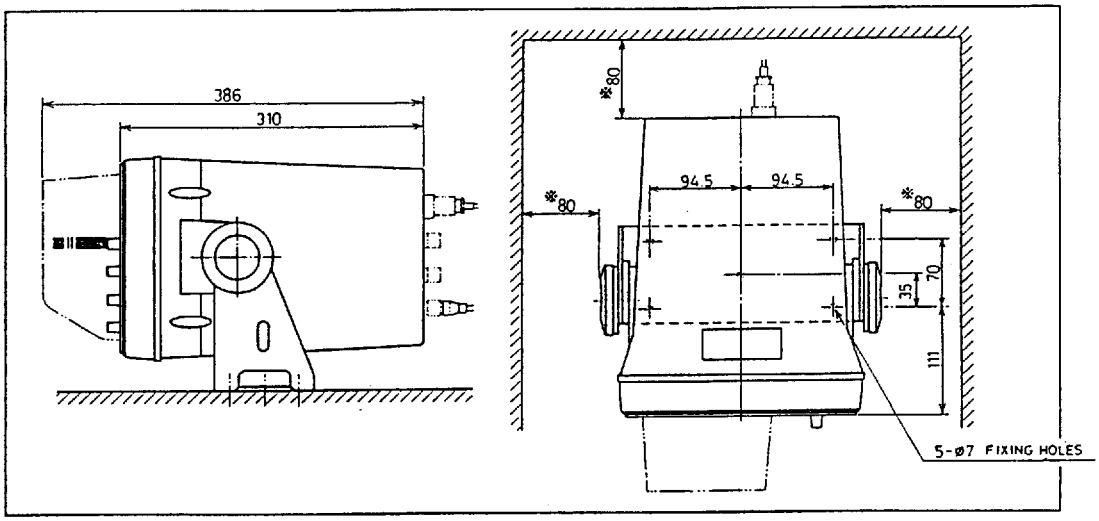
Voltage rating on jack J9	
Pin No.	Rating
5, 6	+5V (4.3 to 5.7V)
9, 10	+10V (9.5 to 10.5V)
1, 2	+110V (105 to 115V)



12. INSTALLATION

DISPLAY UNIT INSTALLATION

Allow service/ventilation space indicated below.

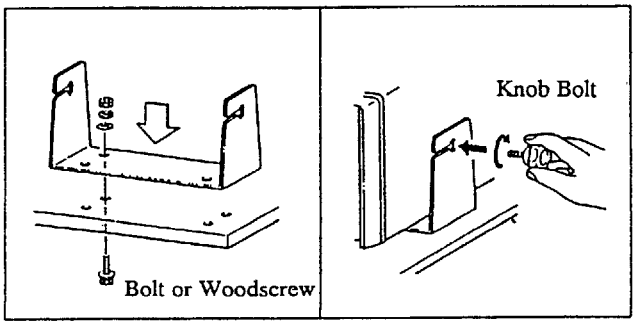


Mounting Procedure

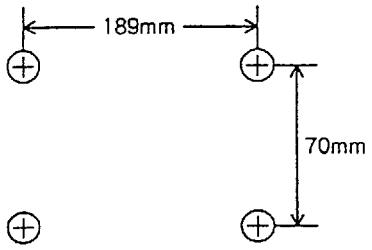
1.Drill four 7mm dia. holes for the bracket.

2.Fix the bracket with M5 bolts or woodscrews.

3.Install the display unit on the bracket.



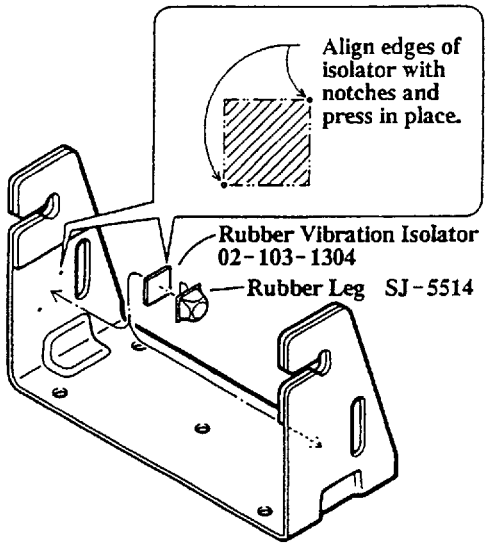
Mounting Hole Dimension



OVERHEAD MOUNTING ALLOWED, BUT NO BULKHEAD MOUNTING.

Installation of Rubber Vibration Isolator

The rubber vibration isolators stablize the display unit against ship's vibration. When a strong vibration is expected, attach them to the bracket as follows.



TRANSDUCER INSTALLATION

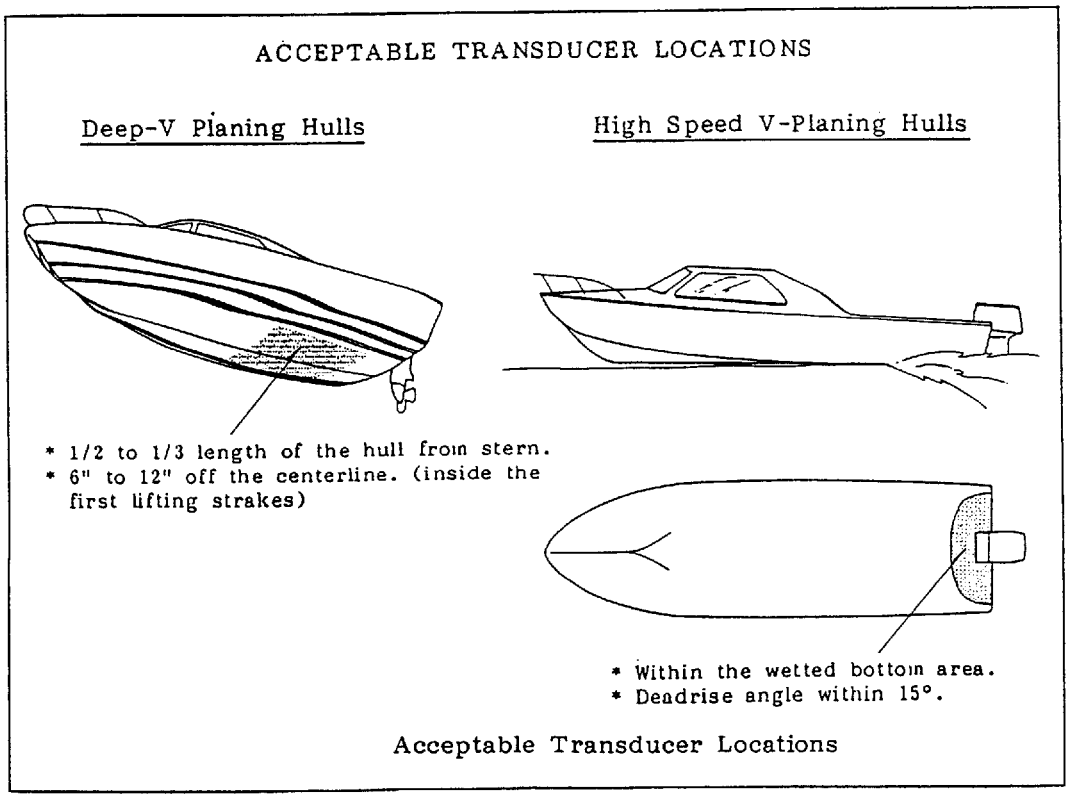
Overview

This section shows installation procedure for the through-hull and inside-hull mounts which can be performed with the standard supply transducer 520-5MSC.

Location

The performance of the video sounder is directly related to the mounting location of the transducer, especially for high-speed cruising. The installation should be planned in advance, keeping the standard cable length (8m) and the following factors in mind.

- Air bubbles and turbulence caused by movement of the boat seriously degrade the sounding capability of the transducer. The transducer should, therefore, be located in a position where water flow is the smoothest. Noise from the propellers also adversely affects performance and the transducer should not be mounted nearby. The rifting strakes are notorious for creating accoustic noise, and these must be avoided by keeping the transducer inboard of them.



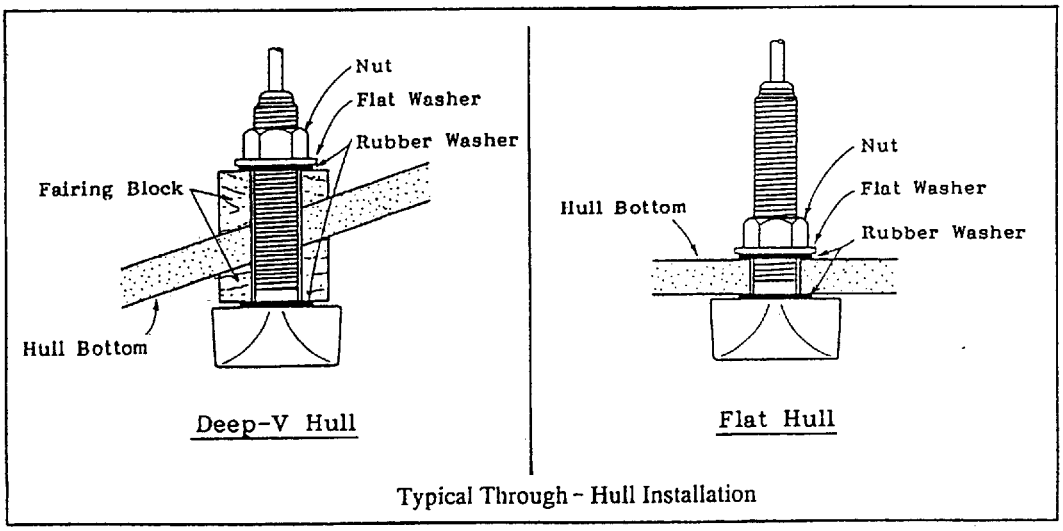
Acceptable Transducer Locations

- The transducer must always remain submerged, even when the boat is rolling, pitching or up on a plane at high speed.
- For displacement hulls, using inside-hull and through-hull installations, a practical choice would be somewhere between 1/3 and 1/2 of the boat's length from the stern. For planing hulls, a practical location is generally rather far astern, so that the transducer is always in the water regardless of the planing attitude.

Through-Hull Mount

Overview

This type of mounting provides the best performance of all, since the transducer protrudes from the hull and the effect of air bubbles and turbulence near the hull skin is reduced. To determine the transducer location, keep in mind the general considerations described on pages 37. Also when the boat has a keel, the transducer should be at least 30cm (1 foot) away from it. Typical through-hull mountings are illustrated below.



Typical Through - Hull Installation

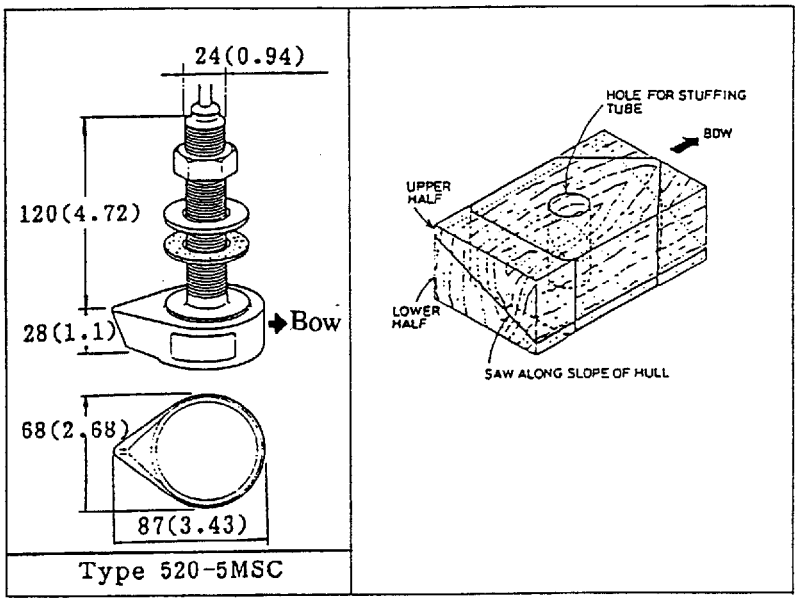
Mounting Procedure

1. With the boat hauled out of the water, mark the location selected for mounting the transducer on the bottom of the hull.
2. If the hull is not level within 15 degrees in any direction, Faring blocks made out of teak should be used between the transducer and hull, both inside and outside, to keep the transducer face parallel with the water line. Fabricate the fairing block as shown on the next page and make the entire surface as smooth as possible to provide an undisturbed flow of water around the transducer. The fairing block should be smaller than the transducer itself to provide a channel to divert turbulent water around the sides of the transducer rather than over its face.

3. Drill a hole just large enough to pass the threaded stuffing tube of the transducer through the hull, making sure it is drilled vertically.

4. Apply a sufficient amount of high quality caulking compound to the top surface of the transducer, around the threads of the stuffing tube and inside the mounting hole (and fairing blocks if used) to ensure watertight mounting.

5. Mount the transducer and fairing blocks and tighten the locking nuts. Be sure that the transducer is properly oriented and its working face is parallel to the waterline. Do not over-stress the stuffing tube and locking nuts through excessive tightening, since the wood block will swell when the boat is placed in the water. It is suggested that the nut be tightened lightly at installation and retightened several days after the boat has been launched.



Through-Hull Transducer Outline Drawing &
Fairing Block Cutting Instruction.

Inside-Hull Mount

Introduction

While this is by no means an optimum mounting scheme for deep-water sounding, this type of mounting can sometimes be used on fiberglass boats. A transducer can be likened to an antenna used with a TV set. Mounting an antenna inside your attic is like mounting an echo sounder transducer inside the hull. Both will work well enough, but are hardly optimum for either TV or echo sounder operation.

Mounting Location

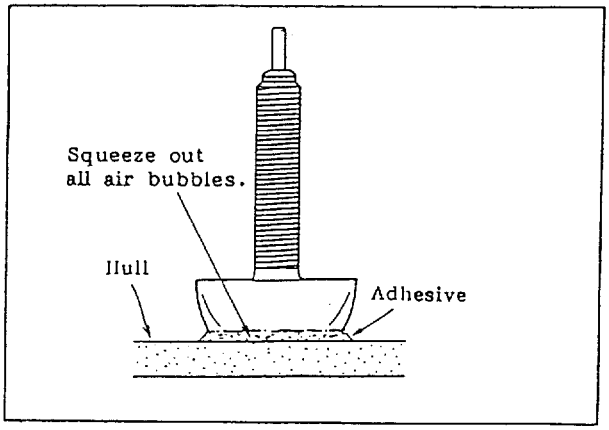
In addition to the general considerations described on page 37, it is important to ensure that the transducer be placed in an area that has a single-hull thickness and is void of air or flotation materials other than solid fiberglass between the transducer face and the water. Also, the transducer face should not be placed over hull struts or ribs which generally run under the hull. Further, a location where the rising angle of the hull exceeds 15° should be avoided to minimize the effect of the boat' s rolling.

It is advisable that the mounting location be finalized through a little trial and error after all other installation works have been completed. Temporarily put some silicone grease (not the type that sets up after drying!) inside the hull. Push the transducer down to squeeze out any air bubbles. Turn on your unit. Run the boat at various speeds and move the transducer to different locations to select the position where the best picture is obtained. Once a good location is found, you may permanently mount the transducer.

The inside-hull mounting is accomplished as follows. See figure on page 39 for outline drawing.

Mounting Procedure

1. Lightly roughen the transducer face with fine #10 sandpaper and degrease it with a solvent (thinner or alcohol). Also, roughen and degrease the inside of the hull where the transducer is to be mounted.



2. Allow both to dry completely, then coat the transducer face and hull with the adhesive supplied. In a cold environment, you should warm the adhesive to approximately 40°C before usage to soften it.

3. Press the transducer firmly down on the hull and gently twist it back and forth to remove any air which may be trapped in the adhesive. Allow sufficient time for the adhesive to dry.

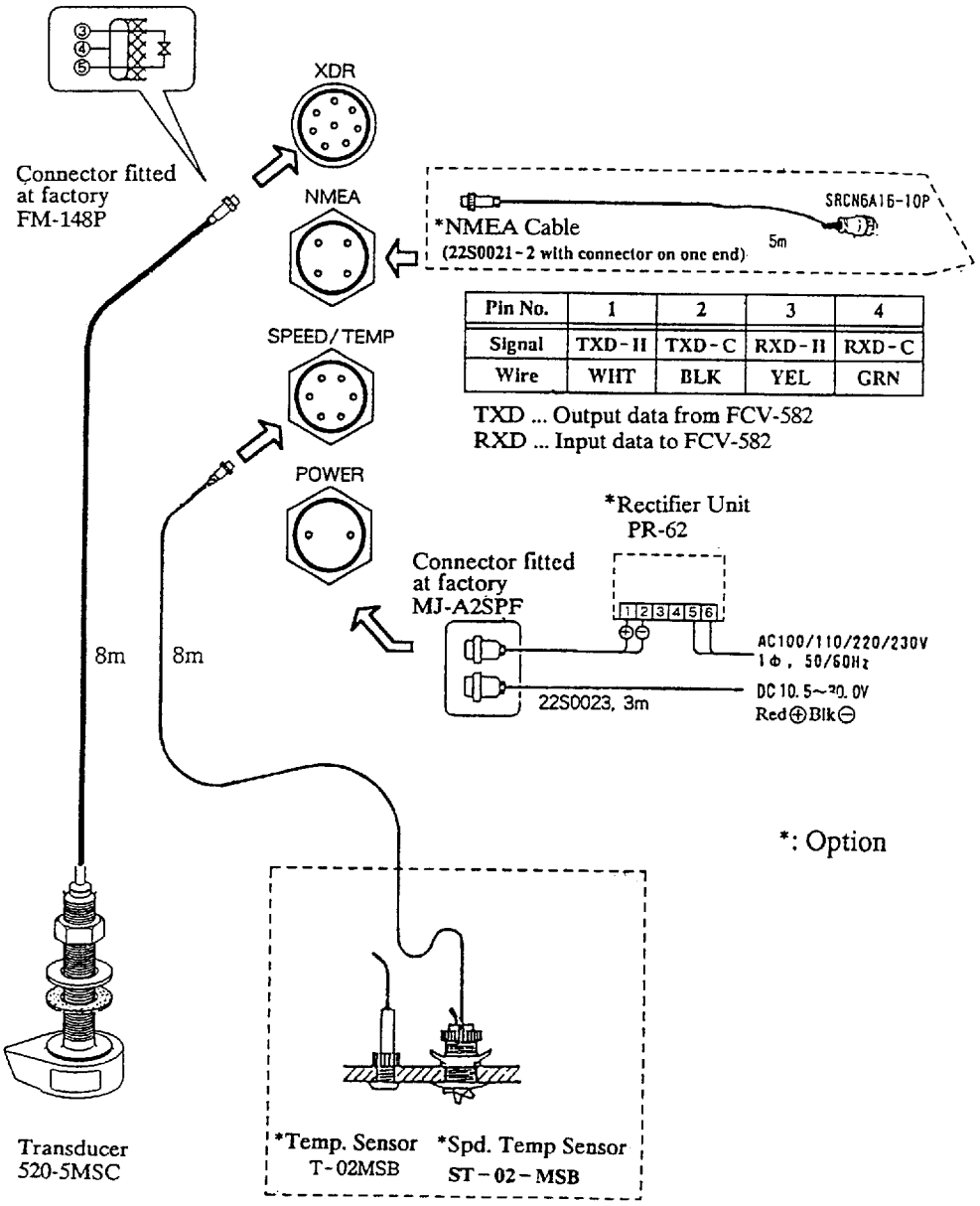
Transducer Preparation and Painting

Just prior to putting your boat into the water, the face of the transducer should be thoroughly wiped with a detergent liquid soap. This will lessen the time necessary for the transducer to establish good contact with the water. Eliminating this will lengthen the time required for complete "saturation" and will reduce the performance of the unit.

To maintain the sensitivity of the transducer, do not coat the face with heavy pigmented antifouling paints, i.e., cuprous oxide types. Use only a light, thin coat of a vinyl based antifouling paint, like International Paint's TRI-LUX No.67 or No.68.

CABLE CONNECTIONS

Cable connections to the FCV-582 display unit are made at the connectors located at the rear of the unit. The figure below shows the wiring instructions.



Transducer Cable Connection

In order to minimize the chance of picking up electrical interference, avoid where possible routing the transducer cable near other on-board electrical equipment. Also avoid running the cable in parallel with power cables.

Power Cable Connection

The FCV-582 is designed to operate normally at a voltage between 10.5 and 30Vdc. The power should be directly taken from the distribution board or breaker panel.

Connect the red lead of the cable to the positive (+) terminal of the battery and the black lead to the negative (-) terminal.

■ CAUTION

Reversing the polarity will result in blowing the fuse and may very well damage internal components

Connection to Position Fixing Equipment

To connect the FCV-582 with the position fixing equipment, the NMEA cable assembly (type CP02-02320, code no. 001-358-810) is optionally required. The contents of the assembly are as follows.

No.	Name	Type	Qty
1	NMEA Cable	22S0021	5m
2	Connector	SRCN16-10P	1
3	Rubber Bush	02-073-2001-0	1

The FCV-582 can accept Furuno CIF or NMEA #0183 format data. Refer to page 51 for the NMEA sentences which are accepted by the FCV-582.

Connect the yellow and green leads of the cable to the signal and return lines of the position fixing equipment respectively.

Grounding

The FCV-582 is designed to operate normally without grounding the display unit, provided that the cable routing precautions stated before are taken. However in some cases, interference may show up at high gain settings, and it may become necessary to ground the unit to the boat's grounding bus to eliminate the problem. In such cases, run a heavy duty ground wire from the grounding terminal on the rear bottom of the display unit to the nearest grounding point on the boat.

On a fiberglass boat, it is best to install a ground plate that measures about 20 cm by 30 cm (0.8 feet by 1.0 feet) on the outside of the hull bottom to provide a ground point. If this is not practical, the engine block can be used.

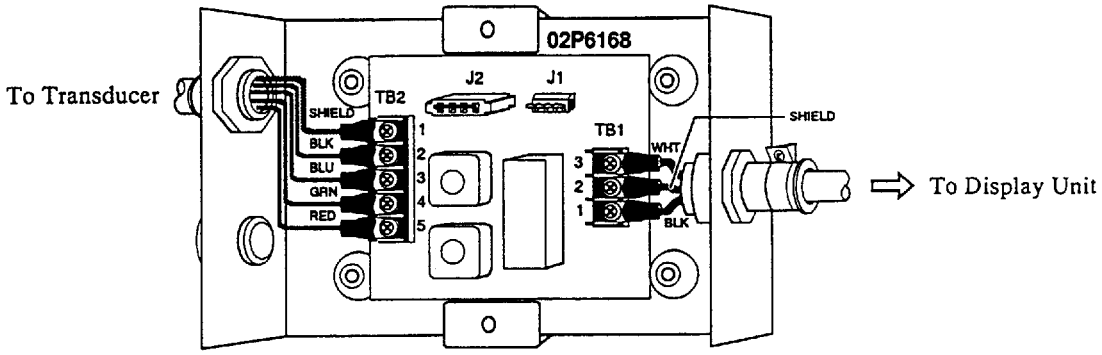
Using Optional Transducer

To use the optional transducers, Distribution Box MB-1000 (code no. 000-040-809) is required. Necessary installatiion materials are supplied together with the MB-1000.

Name	Type	Code No.	Qty	Remarks
Distribution Box	MB-1000	000-040-805	1	Cable with 8P plug fitted.
Crimp-on Lug	FV1.25-3 Red	000-538-113	6	
Cord Lock	NC-1	000-516-650	1	

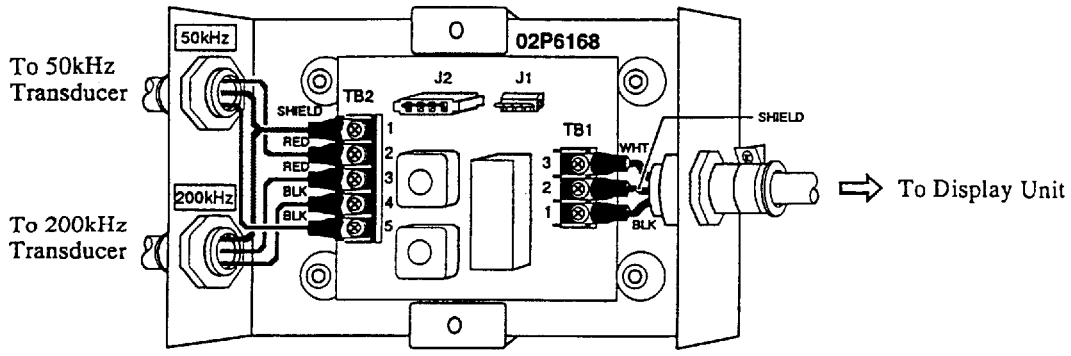
Using Transducer 50/200-1T or 50/200-12M

Make wiring, referring to the drawing below.



Using Transducers 50B-6 (6B/6G) and 200B-5 (5S)

Make wiring referring to the drawing below.



Note: J1 and J2 are for output power control. Put the jumper plug on J2 for full power and on J1 for reduced power.

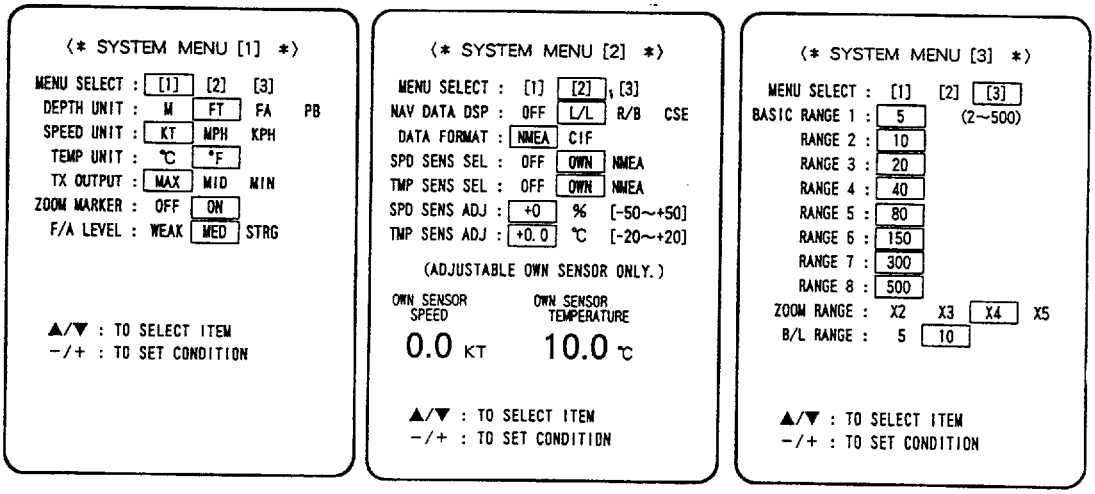
13. SYSTEM MENU SETTING

Overview

Three system menu are provided to allow custom tailoring of the unit to specific uses, such as user's preference, combined navigation equipment, etc.

Operation Procedure

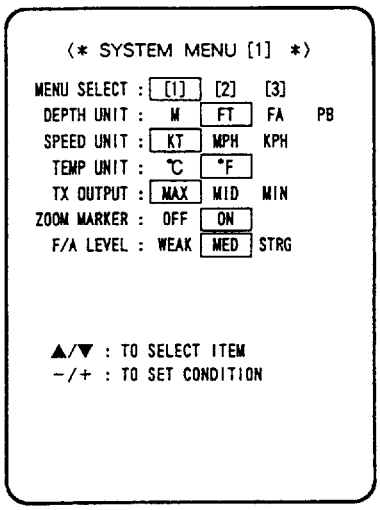
1. Turn on the unit while pressing one of the key switches.
2. Press **SHIFT** [+] key to dislay a system menu.
3. To display another system menu, change selection on MENU SELECT item with **SHIFT** [-] [+] keys.



4. To change settings, select the desired item with **MARKER** [▲] [▼] keys and set the desired paremeter with **SHIFT** [-] [+] keys.
5. To return to the normal display, turn the unit off and on.

Description of System Menu Item

System Menu [1]



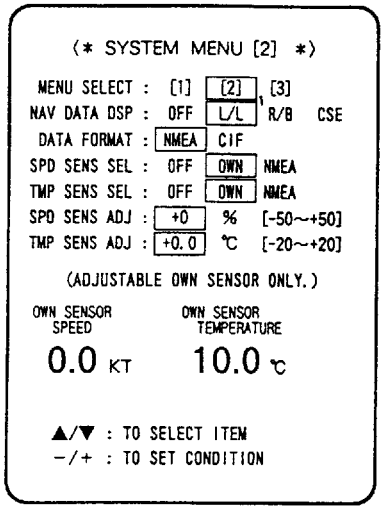
*: Factory setting

ITEM	PARAMETER	FUNCTION
DEPTH UNIT	*M FT FA PB	Select unit of depth readout.
SPEED UNIT	*KT MPH KPH	Select unit of speed readout. KT : Knot MPH : Mile per hour KPH : Kilo-meter per hour
TEMP UNIT	*°C °F	Select unit of temperature readout.
TX OUTPUT	*MAX MID MIN	Select transmission output power.
ZOOM MARKER	OFF *ON	Turn on/off zoom range and expansion range markers.
F/A LEVEL	WEAK *MED STRG	Select level of fish echo.

■ **NOTE**

If DEPTH UNIT is changed, all range settings on system menu [3] are reset to default settings (factory settings).

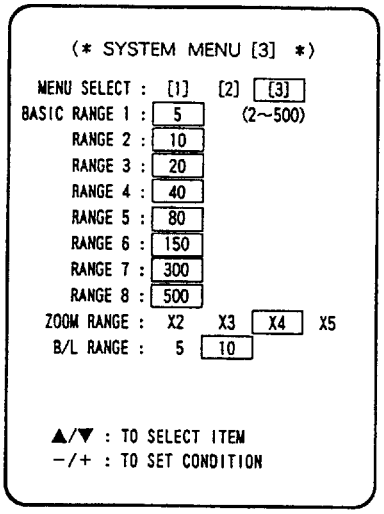
System Menu [2]



*: Factory setting

ITEM	PARAMETER	FUNCTION
NAV DATA DSP	OFF *L/L R/B CSE	Select digital data to be displayed on top left of the screen. L/L: Ship's position in latitude/longitude R/B: Range and bearing to waypoint CSE Ship's course
DATA FORMAT	*NMEA CIF	Select format of data fed from nav sensor. CIF is the standard data format of Furuno equipment.
SPD SENS SEL	OFF *OWN NMEA (CIF)	Select speed sensor. Select "OWN" when the speed data is fed from the optional speed sensor and "NMEA" (CIF) when it is fed from a position fixing equipment.
TMP SENS SEL	OFF *OWN NMEA (CIF)	Select water temperature sensor. Select "OWN" when the water temperature data is fed from the optional temperature sensor and "NMEA" (CIF) when it is fed from a position fixing equipment.
SPD SENS ADJ	*0% (-50 to +50)	Speed sensor adjustment. When the ship's speed data fed from the speed sensor has an error, correct it. Note that the data fed from the position fixing equipment can not be corrected.
TMP SENS ADJ	*0° (-20 to +20)	Temperature sensor adjustment. When the water temperature data fed from the temperature sensor has an error, correct it. Note that the data fed from the position fixing equipment can not be corrected.

System Menu [3]



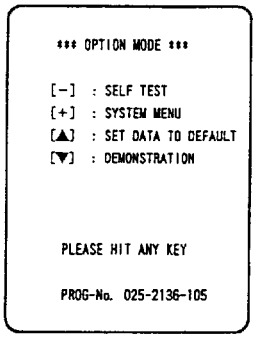
*: Factory setting

ITEM	PARAMETER	FUNCTION
BASIC RANGE	2 to 500M 5 to 1500FT 10 to 250FA 10 to 300P/B	Set basic ranges when factory-set ranges shown on page 10 are undesirable. *NOTE: Ranges should be set in order from shallow to deep ranges: range 1 shallowest and range 8 deepest.*
ZOOM RANGE	x2 x3 *x4 x5	Select range scale for bottom zoom and marker zoom pictures. "x2", for example, expands echoes to double size relative to those on normal picture.
B/L RANGE	5M (10FT, 2FA, 2P/B) *10M (20FT, 5FA, 5P/B)	Select range for bottom lock expansion picture.

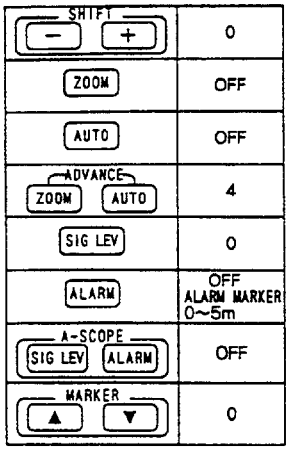
14. UNIT INITIALIZATION

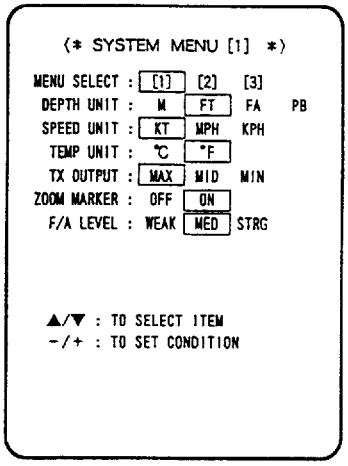
When you wish to reset all settings on the fron panel keys and the menus:

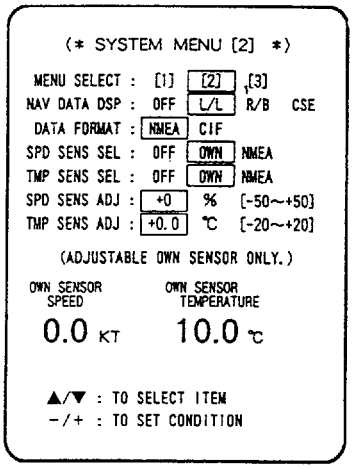
1. Turn on the unit while pressing one of the keys. The following message will be displayed.

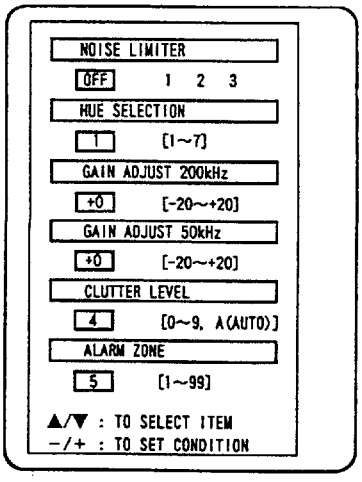


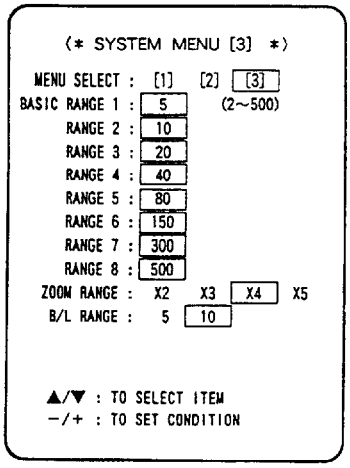
2. Press MARKER [▲] key, and the settings on the keys and the menus are reset to factory settings as shown below.











14. SPECIFICATIONS

1. Display

8" diagonal CRT

2. Echo Color

8 or 16 colors depending on echo intensity. Monochrome presentation is also available. The background color is selectable from blue, light blue and black.

3. Basic Range

Range No.	1	2	3	4	5	6	7	8
Meters	5	10	20	40	80	150	300	500
Feet	15	30	60	120	200	400	1000	1500
Fathoms	3	5	10	20	40	80	150	250
Passi/Braza	3	5	10	30	50	100	200	300

The basic ranges are user-reprogrammable.

4. Range Shift

Display start depth can be shifted in 1, 10 or 100M (FT, FA, P/B) steps up to 500M (1500FT, 250FA, 300P/B).

5. Zoom Range

Times 2, 3, 4 and 5 ranges

6. Bottom Lock Expansion Range

Meters	Feet	Fathoms	Passi/Braza
5	10	2	2
10	20	5	5

7. Auto Mode

Automatically changes depth range and sensitivity depending on the depth of the water and echo intensity.

8. Presentation Mode

HF	High Frequency
LF	Low Frequency
DUAL	High Frequency + Low Frequency (1/2 + 1/2)
ZOOM	High or Low Frequency + Zoom (1/2 + 1/2)
NAV	Graphical and digital displays of water depth, water temperature, ship's speed, L/L data, etc.

* A-scope presentation is also available.

9. Zoom Display

Marker Zoom
Bottom Zoom
Bottom-lock Expansion

10. Picture Advance Speed

Setting	0	1	2	3	4	5
Lines/TX	Freeze	1/8	1/4	1/2	1/1	2/1

11. TX Frequency/ Output Power

50 and 200kHz (alternately transmitted), 500Wrms

12. Pulselength/TX Rate

Display End Depth	Pulselength (ms)	TX Rate (Pulse/Min)
5m	0.2	600
10m	0.2	600
20m	0.2	600
40m	0.4	375
80m	0.8	187
150m	1.5	100
300m	3.0	50
500m	3.6	42
1000m	3.6	42

13. Interference Rejector

Rejects unwanted signals by comparing last and present echoes in strength

14. Alarm

Alarm sounds when bottom or fish echo comes into the alarm zone.

15. Input/Output Data (NMEA #0183 or CIF Format)

NMEA #0183 Format Input/Output Sentence

Input	RMB, BWC, RMC, RMA, GLL, VTG, VHW, MTW
Output	SDDBT (depth), YCMTW* (water temperature) VWVHW* (ship's speed)

CIF Format Input Output Data

Input	L/L, Ship's Speed, Course, Waypoint ID, Range to Waypoint, Waypoint Bearing, Water Temperature, Cross-track Error
Output	Depth, Water Temperature*, Ship's Speed

* When speed/temperature sensor is connected.

16. Environmental Condition

Temperature: 0 - 50°C
Relative Humidity: Less than 85% (Splash proof structure)

17. Power Supply

10.5Vdc to 30Vdc, approx. 20W.

COMPLETE SET

No.	Name	Type	Code No.	Qty
1	Display Unit	CV-582	000-014-963	1
2	Transducer	520-5MSC-A (Thru-hull, Bronze)	000-015-230	1
3	Installation Materials	CP02-05000	000-014-886	1 set
4	Accessories	FP02-06000	000-014-887	1 set
5	Spare Parts	SP02-03300	000-014-885	1 set
6	Documents	Operator's Manual		1

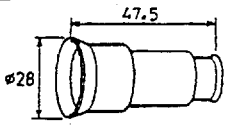
INSTALLATION MATERIALS

No.	Name	Type	Code No.	Qty	Fig.
1	Power Cable Assembly	22S0023	000-109-516	1	1
2	Vinyl Wire	KIV 2.0sq, 2m	000-554-516	1	2
3	Connector Cap	02-103-1211	100-152-071	1	3

1

2

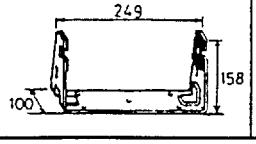
3



ACCESSORIES

No.	Name	Type	Code No.	Qty	Fig.
1	Bracket	FP02-03610	001-380-010	1	1
2	Viewing Hood	02-103-1111-0	100-156-010	1	2
3	Rubber Cushion	02-103-1304-0	000-802-827	2	3
4	Knob Bolt Assy	FP02-03621	001-380-300	1 set	4
5	Rubber Foot	SJ-5514	000-802-827	2	5
6	Tapping Screw	6x20, SUS302	000-800-414	5	6

1



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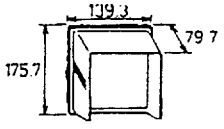

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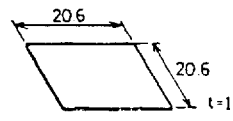

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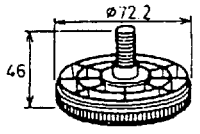
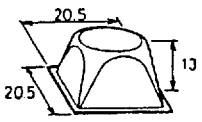
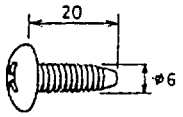
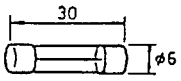


5 	6 	7	

SPARE PARTS

No.	Name	Type	Code No.	Qty	Fig.
1	Fuse	FGBO-A 3A AC125V	000-549-063	2	1

1


OPTION

No.	Name	Type	Code No.	Remarks
1	Transducer	50B-6	000-115-042	To use these transducers, distribution box MB-1000 is required.
		50B-6G	000-115-016	
		200B-5	000-015-027	
		200B-5S	000-115-029	
		50/200-1T	000-015-170	
		50/200-12M	000-015-171	
2	Speed/Temperature Sensor	ST-02MSB	000-137-986	Bronze
3	Temperature Sensor	T-02MSB	000-040-040	Bronze
4	Triducer	524ST-MSA	000-015-223	
5	Rectifier	PR-62, 100VAC	000-013-484	
		PR-62, 110VAC	000-013-485	
		PR-62, 220VAC	000-013-486	
		PR-62, 230VAC	000-013-487	
6	Distribution Box	MB-1000	000-040-809	
7	Hood with magnifying lens	OP03-90	008-455-050	
8	EMI Filter	FP02-03700	001-380-400	
9	Inner Hull Set "S"	22S0191	000-802-598	

No.	Name	Type	Code No.	Remarks
10	Cable	02S4078	001-390-580	
		MJ-A6SPF0010-100	001-390-590	
11	Loran Kit	CP02-02320	001-358-810	

Transducer & Hull Bottom/Sideboard Installation Materials

Frequency	Transducer (Code No.)	Hull Bottom Installation			Sideboard Installation	
		Ship's Hull	Tank (Code No.)	Thru-hull Pipe (Code No.)	Type	Pipe Length (Code No.)
50kHz	50B-6 (000-015-042) 50B-6B (000-015-017)	Steel	T-605 (000-015-515)	TFB-5000 (000-015-206)	T-27	2.3m (000-015-313) 2.7m (000-015-557)
		FRP	T-605-F (000-015-516)	TRB-1000 (000-015-215)		
		Wood	T-605-W (000-015-517)	TFB-1000 (000-015-201)		
	50B-6G (000-015-016)				T-27A	2.3m (000-015-558)
200kHz	200B-5S (000-015-029)	Steel	T-605 (000-015-515)	TFB-5000 (000-015-206)	T-27	2.3m (000-015-313) 2.7m (000-015-557)
		FRP	T-605-F (000-015-516)	TRB-1000 (000-015-215)		
		Wood	T-605-W (000-015-517)	TFB-1000 (000-015-201)		
	200B-5 (000-015-027)				T-31A	2.3m (000-281-260)
50/200kHz	50/200-1T (000-015-170)	Steel	T-603 (000-015-509)	TFB-5000 (000-015-206)	T-63	2.3m (000-015-326) 2.7m (000-015-562)
		FRP	T-603-F (000-015-510)	TRB-1000 (000-015-215)		
		Wood	T-603-W (000-015-511)	TFB-1000 (000-015-201)		
	50/200-12M (000-015-171)	Through-hull Installation				

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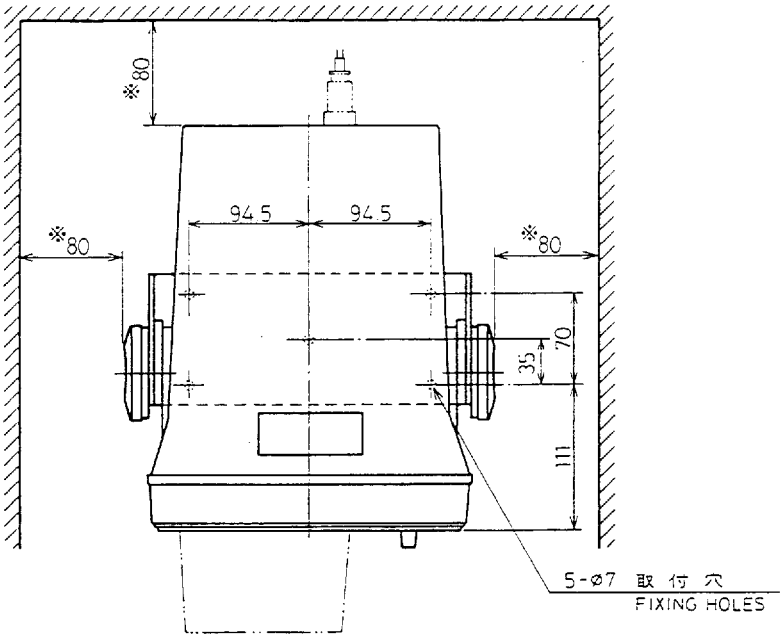

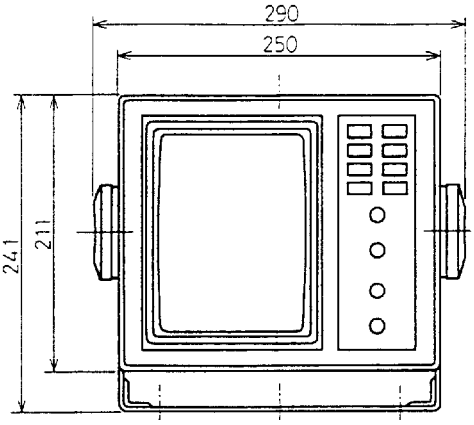

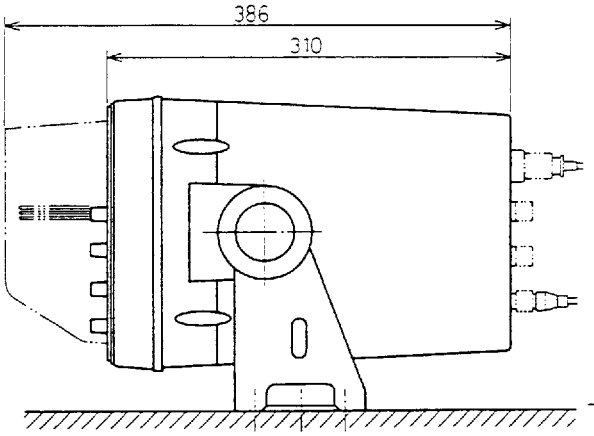

※：推奨サービス空間
RECOMMENDED SERVICE SPACE

品番 ITEM	品名 NAME	材質 MATERIAL	数量 Q'TY	図番 DWG.NO.	摘要 REMARKS

承認 APPROVED	SEP. 9. '91 T. NAKAJO	三角法 THIRD ANGLE PROJECTION		名称 TITLE	FCV-581/582 指示器 DISPLAY UNIT
検図 CHECKED	AUG. 28. '91 M. USUDA	尺度 SCALE	1/5		
製図 DRAWN	JUL. 30. '91 TOMITA	重量 WEIGHT	8 kg	図番 DWG.NO.	C2334-G01-B

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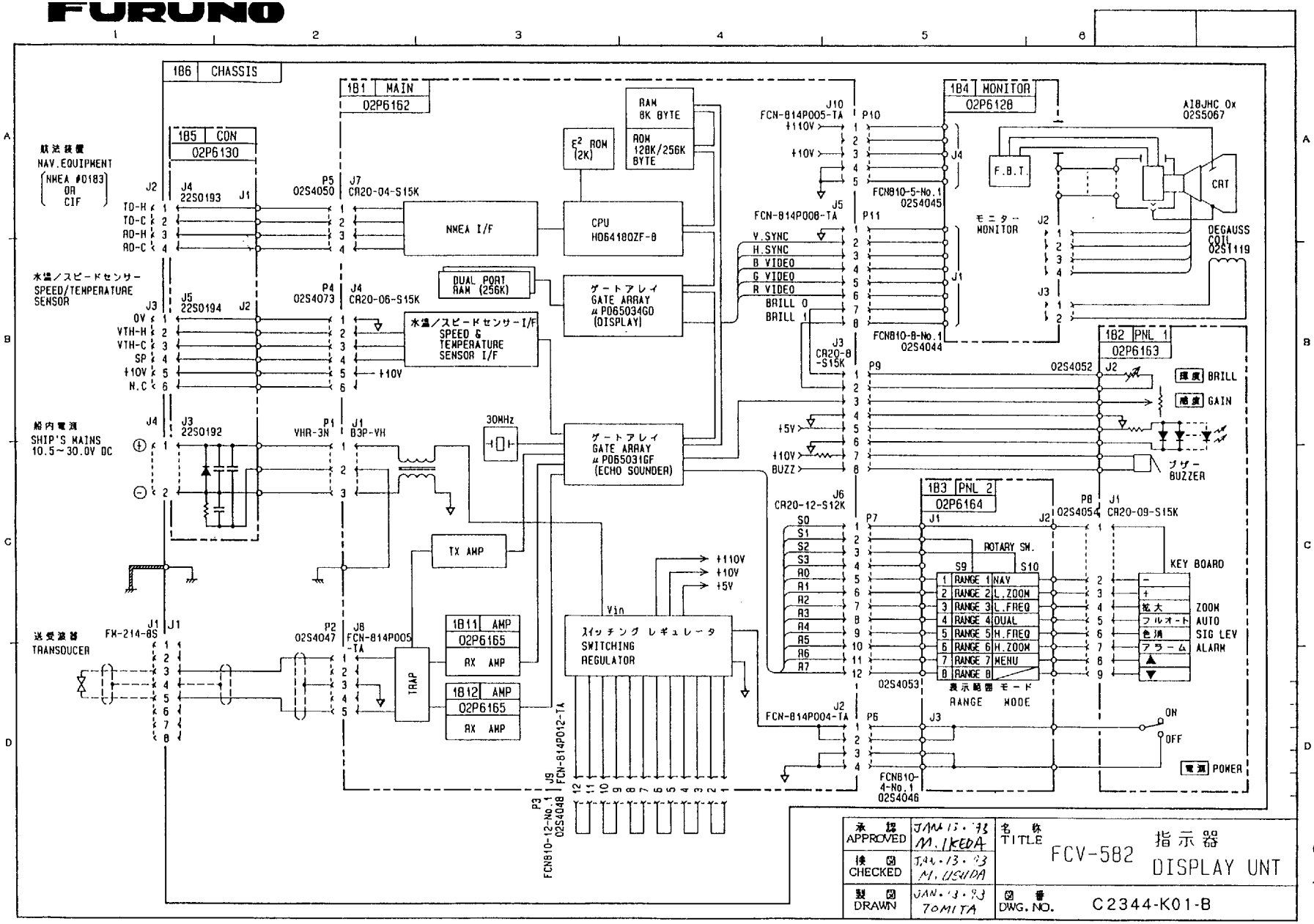

承認 APPROVED	JAN.13.'93 M.IKEDA	名称 TITLE	FCV-582 指示器 DISPLAY UNT
検図 CHECKED	JAN.13.'93 M.USHIDA		
製図 DRAWN	JAN.13.'93 TOMITA	図番 DWG.NO.	C2344-K01-B

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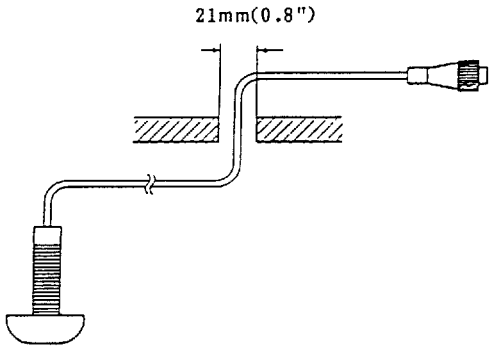
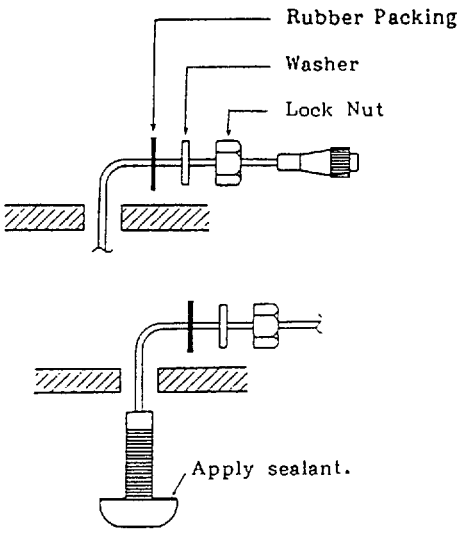
APPENDIX 1. MOUNTING TEMPERATURE SENSOR (OPTION)

Mounting Location

- Select a mid-boat, flat position. The sensor does not have to be installed perfectly perpendicular. The sensor must not be damaged in dry-docking operation.
- Select a place apart from the equipment generating heat.
- Select a place in forward direction viewing from the drain hole for cooling water.
- Select a place free from vibration.

Mounting Procedure

T-02MSB	
1)	Dry-dock the boat.
2)	Make a hole of approx. 21mm (0.8") dia. on the hull bottom.
3)	Run the cable through the hole.
	
4)	Pass the cable through the rubber packing, washer and the lock nut as shown below.
5)	Apply high-grade sealant to the sensor flange as shown below.
6)	Fix the sensor by turning the lock nut. Do not tighten the nut excessively. (600kg-cm max.)



7	After the launching, check for water leakage around the sensor.

APPENDIX 2 NAVIGATION DATA

Data Displayed On FCV-582 When Connected With Furuno Position Fixing Equipment

NMEA #183 Data Format

	L/L	Ship's Speed	Course	Waypoint ID	Range to Waypoint	Waypoint Bearing	Water Temp.	XTE
LC-90MK2	O	O	O	O	O	O		O
LP-1000	O	O		O	O	O		
LP-1300	O	O		O	O	O	O*	
FSN-50	O	O						
GP-70/500	O	O	O	O	O	O		O
GP-1500	O	O	O	O	O	O		O
GP-50	O	O	O	O	O	O		O

* When LP-1000 is connected to temeperature indicator.

Furuno CIF Data Format

	L/L	Ship's Speed	Course	Waypoint ID	Range to Waypoint	Waypoint Bearing	Water Temp.
LC-90MK2	O	O	O	O	O	O	
LP-1000	O	O	O	O	O	O	
LP-1300	O	O	O	O	O	O	O*
FSN-50	O	O	O	O	O	O	
GP-70/500	O	O	O	O	O	O	
GP-1500	O	O	O	O	O	O	
GP-50	O	O	O	O	O	O	

* When LP-1000 is connected to temperature indicator.

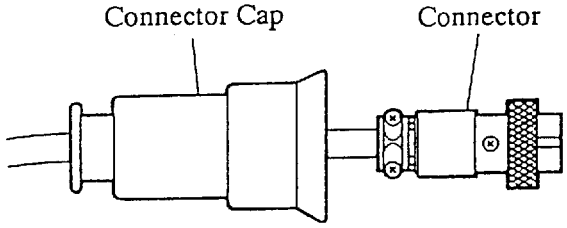
APENDIX 3. WATERPROOFING TRANSDUCER CABLE CONNECTOR

Overview

An ordinary connector has been fitted to the transducer cable. To make it waterproof, attach the connector cap supplied as an installation material.

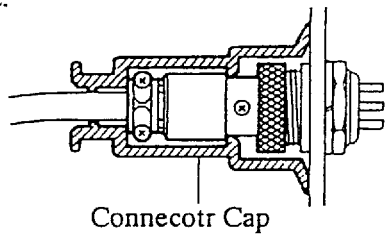
Procedure

1. Unsolder the connector FM-148P from the transducer cable.



2. Pass the cable through the connector cap and refit the connector.

3. Plug the connector into the receptacle on the FCV-582. Slide the connector cap over the connector and press it onto the chassis of the FCV-582.



■ NOTE:
The power, NMEA and temperature/speed sensor cables have been fitted with waterproof connectors. The display unit is splashproof.

APPENDIX 4. HANDLING PRECAUTION OF DISPLAY UNIT CASE

The display unit is made splashproof by gaskets on the unit case. When putting back the case after maintenance and service, make sure that the two gaskets are in position.