

Pictorials

This manual uses the following symbols for easy understanding safety instructions. Always follow these instructions carefully.

	WARNING	Always follow this safety instruction to prevent death or injury.
	CAUTION	Follow this safety instruction to avoid possible injury or damage to your property. Symbol “△” is a CAUTION or WARNING label indicating the safety instruction.
	WARNING	This symbol is an Electrical Shock WARNING label.
		Symbol “ ” is an instruction that you must not violate. (This symbol instructs NOT to disassemble the system components)
		Symbol “ ” is an operation instruction that you must follow. (This symbol shows the main power OFF instruction.)



WARNING <For System Operators>

Always follow this instruction to prevent death or personal injury.

	Turn power off During abnormality.	If smoke or a small of burning occurs, a fire or an electrical short circuit may result. Turn the power switch OFF and shut down the power supply immediately. Never try to repair the system yourself. Call for service.
 	Do not open Cabinet.	High voltage exists in the instrument. Contact with voltage may cause possible injury or death.
	Do not touch back side of the equipment.	Harmful line voltage is present on back side of the equipment. Never try to touch back side while power is turned on.
	Avoid excessive shock to display unit.	The LCD display module contains a liquid. Do not apply any mechanical shock to the display. If the display broken, liquid may leak and injure your skin and eyes.
	Do not use with poor ventilation.	If you cover this unit or use in an enclosed place, it may malfunction or become damaged as a result of overheating. Use only where there is sufficient ventilation.



Installation Cautions <For service Personnel>

Follow installation instructions to avoid personal injury and system malfunction.

Installation in rigid location.	Mount your HD-70F on a rigid frame or base to prevent your unit from working loose.
Use correct Installation materials.	Use the installation materials provided in the standard accessory pack only. If you use hardware of insufficient strength, your system may loosen causing damaged.
Keep away from direct sunlight.	Keep your system out of direct sunlight as it may become damaged by overheating.
Keep away from water.	Take care not to get water on or in your unit as it may be damaged and/or cause an electrical shock.
Keep away from heat source.	Keep your system away from other heat source as it may malfunction, be damaged, or burn.
Use correct power source.	Operate your system within the specified power voltage. An incorrect power supply may cause



Maintenance Cautions<For Maintenance Personnel>

Use the following safety precaution internal inspection.

Discharge capacitors.	High voltage may be retained in the capacitors if the high-tension circuit several minutes after you have turned the power switch off.
Check that power is OFF	To prevent an electrical injury due to erroneous power switching, make sure that the main power supply and the system power switch are both in the off position. Additionally, attach a safety label showing that service is in progress.
Avoid EMI.	Take care not to damage the ESDs (Electrostatic Sensitive Devices) by static electricity from carpet and cloths.
Avoid dust.	Wear a safety mask so as not to breath in dust during inspection or cleaning inside your system instruments.

Operation Notes <For operators>

Observe the following operation notes, otherwise the system failure or deterioration can result. And periodical inspection and maintenance are required for keeping the system in an optimum condition.

Backup important data.	The waypoint and other registered data may become unreadable by unexpected failure. We recommend recording this data separately.
Use correct transducer only.	If you use incorrect transducer, the transmitter circuit may be damaged due to a matching error. Consult us for system information.
Check transducer Connection before power on	Do not turn the power switch ON if the transducer is disconnected or if it is not inserted into the water. If done, the transducer or transmitter circuit may be damaged.
Always clean the transducer	Since transducer performance can drop due to accumulated bottom growth, keep the transducer clean. Never paint transducer surface.
Transducer must be installed by authorized personnel.	Consult us for transducer installation by authorized personnel.

	WARNING This product is designed to assist a navigation. When you are sailing, use the certified chart from the Government or IMO.
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|| Fishfinder System

Welcome

HD-70F opens a new chapter of performance and integration in vessel navigation system display and management. Whether you are a Cruiser or Sport fisherman or both, HD-70F gives you the information you need.



CAUTION

HD-70F is Color LCD Charting Systems employs the latest in proven technology to provide accurate navigation information. The Plotter functions of HD-70F are totally dependent upon the capability of the navigation source to provide accurate position information. This device is only an aid to navigation. It should be used in conjunction with all other navigation accuracy. For safety, always resolve any uncertainty before continuing navigation.



CAUTION

The performance of LCD displays are degraded by continuous direct exposure to ultraviolet rays. Locate your HD-70F Display away from direct sunlight. When not in use. Keep the display covered.



DISPLAY BREAKAGE WARNING

The LCD display module contains a liquid. If the display is broken and the liquid contacts your skin, wash it off immediately in running water for 15 minutes. If the liquid contacts your eyes, immediately flush your eyes with running water for 15 minutes. Contact a physician if any abnormal symptom is experienced.

Fishfinder System

The Color LCD Fishfinder System opens a new chapter of performance and integration in vessel navigation system display and management. Whether you are a Cruiser or Sport fisherman or both, 650 gives you the information you need.



CAUTION

The Color LCD Fishfinder Systems employs the latest in proven technology to provide accurate navigation information. The Plotter functions of HD-70F are totally dependent upon the capability of the navigation source to provide accurate position information. This device is only an aid to navigation. It should be used in conjunction with all other navigation accuracy. For safety, always resolve any uncertainty before continuing navigation.

There is no direct relationship between the color of water areas and their depth. The navigator shall always query the area for depth information and use the official paper chart.



CAUTION

The performance of LCD displays are degraded by continuous direct exposure to ultraviolet rays. Locate your HD-70F Display away from direct sunlight. When not in use. Keep the display covered.



DISPLAY BREAKAGE WARNING

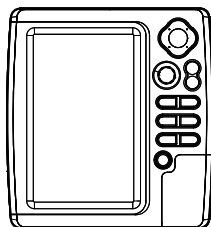
The LCD display module contains a liquid. If the display is broken and the liquid contacts your skin, wash it off immediately in running water for 15 minutes. If the liquid contacts your eyes, immediately flush your eyes with running water for 15 minutes. Contact a physician if any abnormal symptom is experienced.

Fishfinder System

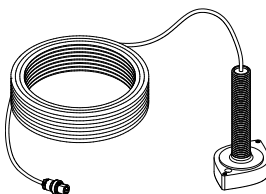
Introduction

The HD-70F is a premium multifunction command and control center. HD-70F front panel keyboard and its wide screen with wide viewing area make placement easy. Although HD-70F offers many advanced features, operation is simplified through the use of popup menus similar to those found on personal computers.

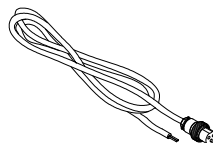
Standard Equipment Configuration List (Metal)



Display unit



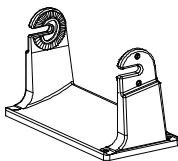
Transducer



Power cable



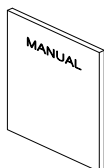
Protector



Mounting Bracket



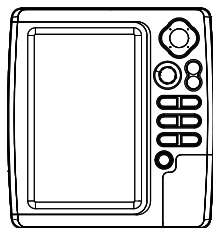
Knobs



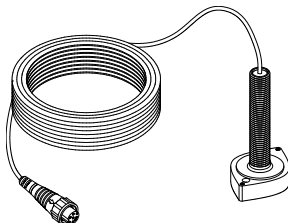
Manual

Fishfinder System

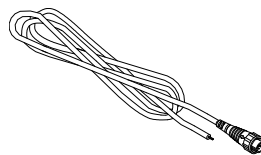
Standard Equipment Configuration List (Plastic)



Display unit



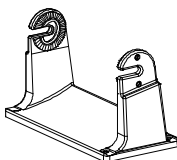
Transducer



Power cable



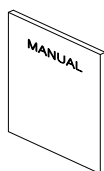
Protector



Mounting Bracket



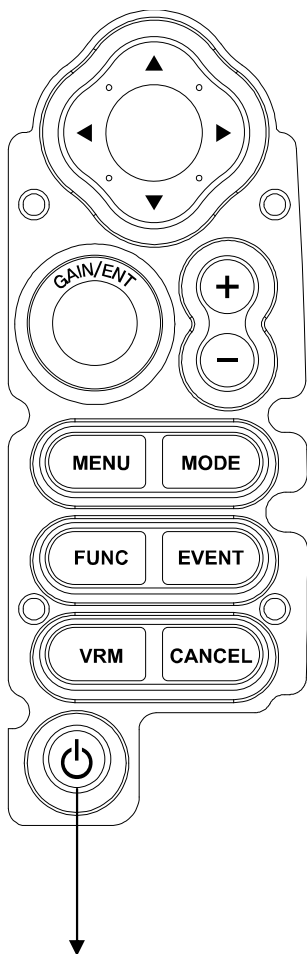
Knobs



Manual

II Fishfinder System

Keypad



[PWR/BRT]

KEY	Description
[Cursor Key]	With MENU: Choosing the menu Without MENU: Choosing the frequency (50/200KHz)
[GAIN] & [ENTER]	Button: Enter when menu table on the screen Rotary: Adjustment of gain level with turning.
[+] & [-]	Setting up the depth range, when depth range sets "manual range".
[MENU]	One step: Quick menu is displayed. Two step: Main menu is displayed.
[MODE]	Setting up Fishfinder mode
[FUNC]	Setting up Using Frequently key function
[EVENT]	Choose the Active,Waypoint, setup Nav or capture functions for using one function.
[VRM]	Press the VRM key, and show the bar for the depth range.
[CANCEL]	Return to the previous display, or canceled the set-up.

Fishfinder System

How to use [Power/Brightness]

► Press [PWR/BRT]

1. Use PWR:

To turn off the power, keep pressing the [BRT/PWR] until the end of counting.

2. Use BRT:

Press [BRT/PWR] shortly and the brightness can be controlled. Use the arrow keys of the cursor to control the brightness and the contrast.

Choosing the frequency on the dual

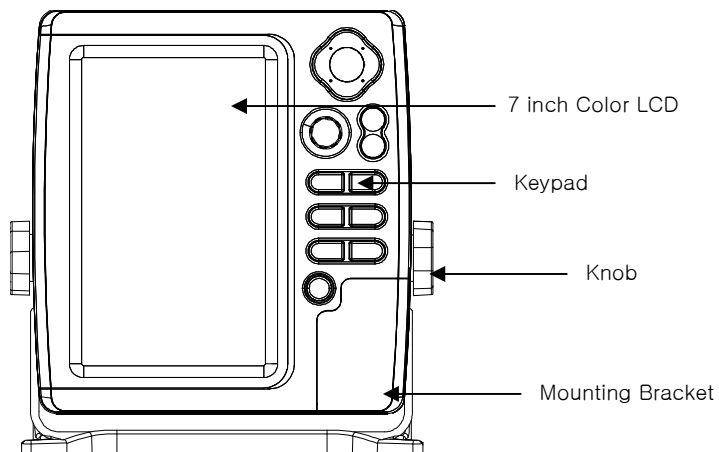
► Press [↑][↓]

You can see the red box is moving with the right and the left. In the active frequency in the red, it's on operation

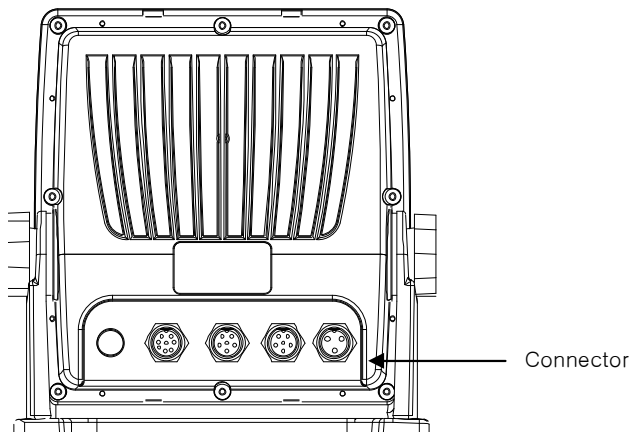
Fishfinder System

Display Unit - Metal

<Front>



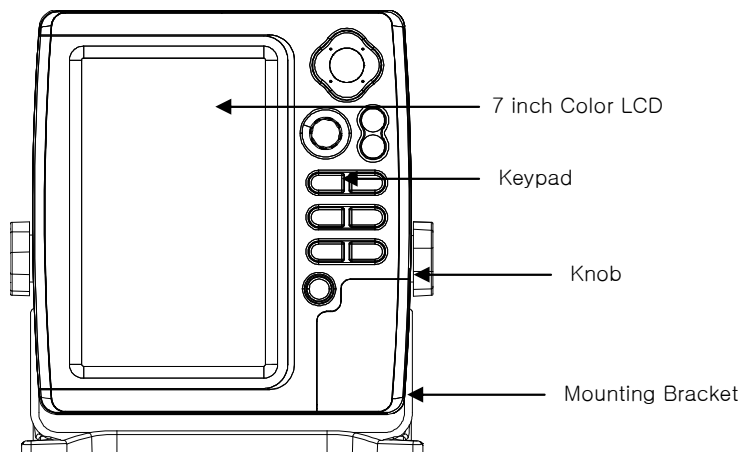
<Rear>



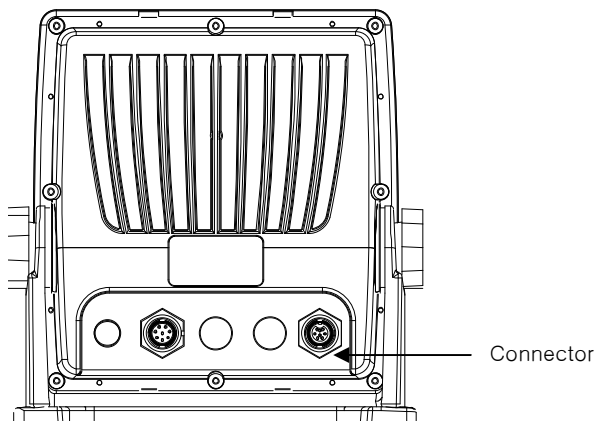
Fishfinder System

Display Unit - Plastic

<Front>



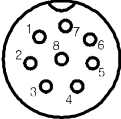
<Rear>



Fishfinder System

SPEC of the connectors (Metal)

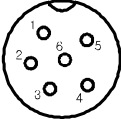
J4



TRANSDUCER

NO	NAME
1	SPD_PULSE
2	SPD_VCC
3	TD1
4	TD_GND
5	TD2
6	TEMP_VCC
7	TEMP_SIG
8	SPD_GND

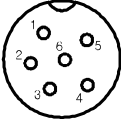
J3



AIS

NO	NAME
1	GND
2	TX +
3	TX -
4	RX +
5	RX -
6	NC

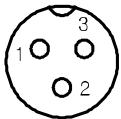
J2



TX/RX

NO	NAME
1	GND
2	TX +
3	TX -
4	RX +
5	RX -
6	NC

J1

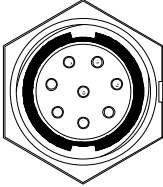


DC POWER

NO	NAME
1	DC +(10V~40V)
2	DC -
3	NC

SPEC of the connectors (Plastic)

J4

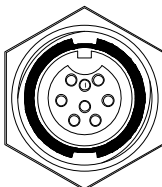


TRANSDUCER

NO	COLOR	NAME
1	Black	SPD_PULSE
2	Red	SPD_VCC
3	White	TD1
4	Green	TD_GND
5	Gray	TD2
6	Yellow	TEMP_VCC
7	Brown	TEMP_SIG
8	Blue	SPD_GND




J1

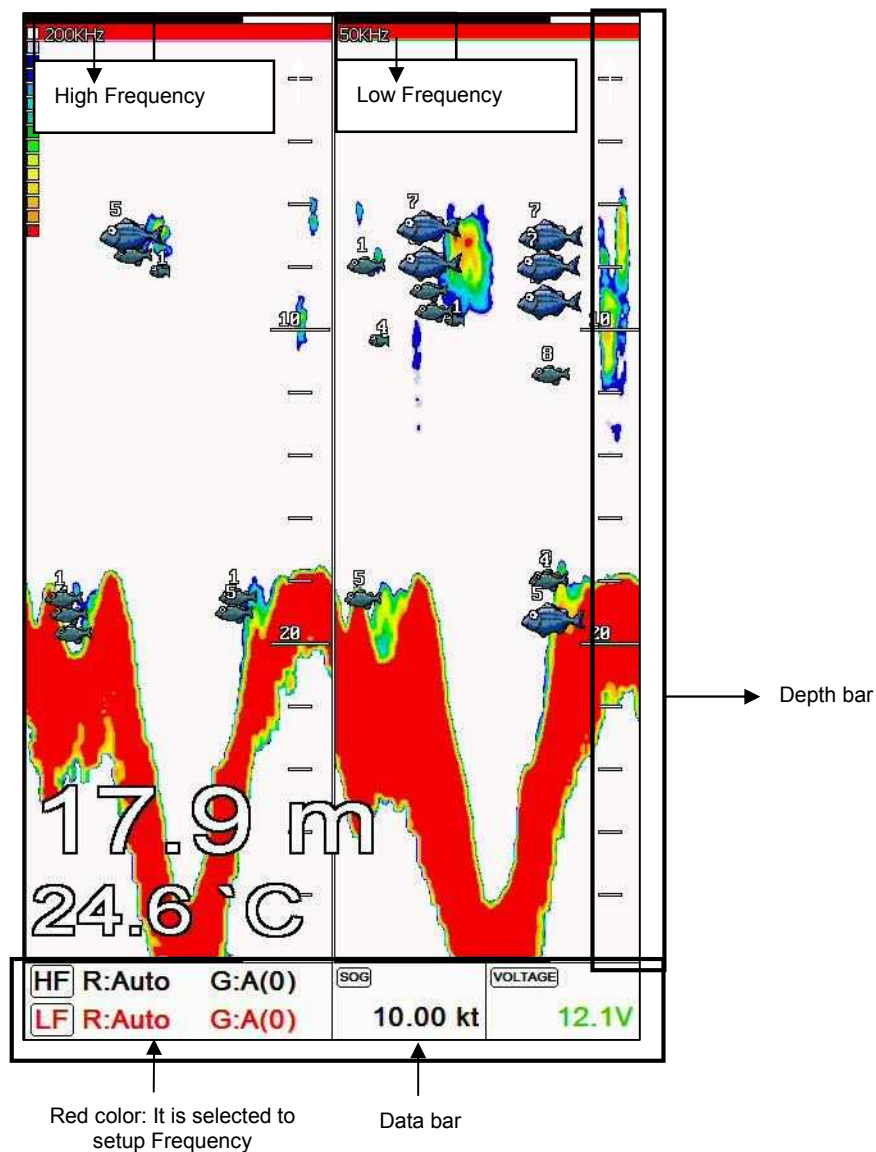


PWR/IO

NO	COLOR	NAME
1	Black	GND/COMMON
2	Red	PWR(10~40V)
3	White	INPUT1
4	Green	NC
5	Gray	OUTPUT2(AIS)
6	Yellow	OUTPUT1
7	Brown	INPUT2(AIS)
8	Blue	GND

Fishfinder System

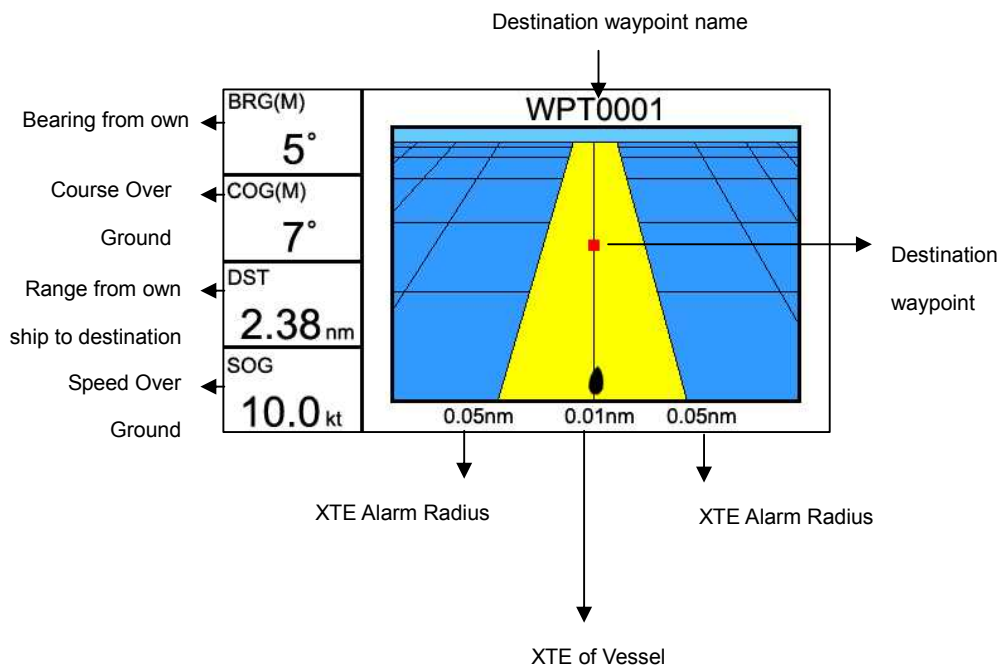
Screen



Operation

FF + Highway

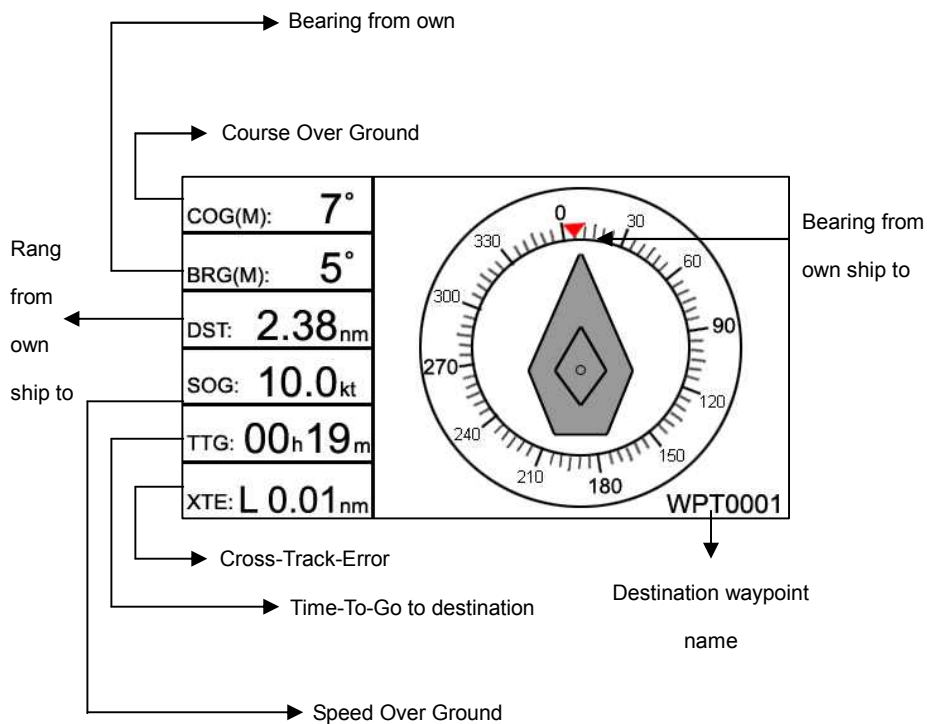
The highway display provides a 3D view of own ship's progress toward destination (waypoint).



Operation

FF + Steering

The steering display provides steering information such as ship's speed, course, range, bearing, TTG.



Operation

Fishfinder modes are selectable for single frequency or dual and some functions, for example bottom zoom or lock.

► Press [MODE]

1. Normal (200KHz or 50KHz)

Normal mode (with Auto Range active) displays the sounder image with the surface at the top of the screen and the sea bottom in the lower part of the screen. The depth scale indicates the depth range appearing in the display. Bottom contours and fish echoes are displayed at the depths where they are detected. If the depth Range is set manually to a value less than actual water depth, sea bottom echoes are not displayed, but all other echoes within the Range setting are displayed.

2. Bottom Zoom (200KHz or 50KHz)

Bottom Zoom magnifies the sounder display from the sea bottom toward the surface for a short distance. The sea bottom contour is displayed and additional contour lines are added at intervals above the sea bottom to aid in determining distances of echoes near the bottom. Use the Sounder Menu to set the magnified Bottom Range from 2.5 to 20m (10 to 60ft.). Default setting is 10m (40ft.). If the depth Range is set manually, the setting must place the sea bottom echo in the lower portion of the screen for Bottom Zoom to be effective.

3. Bottom Lock (200KHz or 50KHz)

Bottom Lock divides the Fishfinder main screen image for the selected Fishfinder into two sections. The left hand section displays a Normal Mode image. The right hand section of the screen displays the Fishfinder image relative to the sea bottom. The sea bottom appears as a straight line with the Fishfinder image magnified for a short distance toward the surface. A scale appears on the right for estimating distances of echoes near the bottom. Use the Fishfinder Menu to set the magnified Bottom range from 2.5 to 20m (10 to 60ft.). Default setting is 10m (40ft.). If the depth Range is set manually, the setting must place the sea bottom echo in the lower portion of the screen for Bottom Lock to be effective.

Fishfinder modes are selectable for single frequency or dual and some functions, for example bottom zoom or lock.

4. Normal (200KHz and 50KHz)

The high frequency (200KHz) displays on the left and the low frequency (50KHz) Normal displays on the right, which increase the accuracy of a fish school and your decision to catch fishes.

5. Bottom Zoom (200KHz and 50KHz)

The high frequency (200KHz) displays on the left and the low frequency (50KHz) Bottom Zoom displays on the right, which increase the accuracy of a fish school and your decision to catch fishes.

Operation

Gain

Setting up the gain.

1. Auto/Manual Gain

► Press [MENU]

Press the key changes Auto Gain / Manual Gain.

(* Setting is available individually)

2.Set Gain

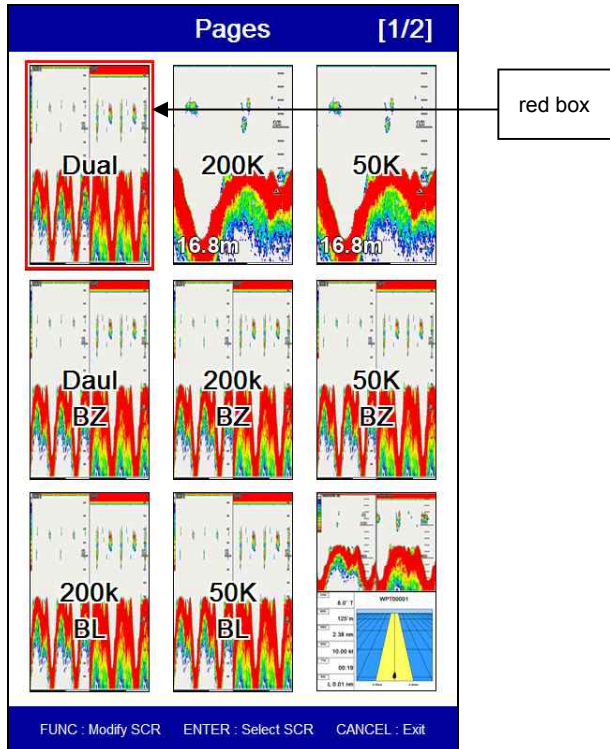
► Tune [GAIN]

Turn to the left, the gain level will be decreasing. Turn to the right, the gain level will be increasing.
(It is applied Auto Gain Adjustment, when the mode sets "Auto gain mode")

Operation

Select Page

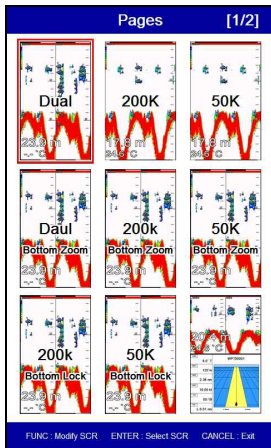
Select [Page] menu and then go to "Pages" screen
Selectable Pages by red box and then press [ENTER] key.



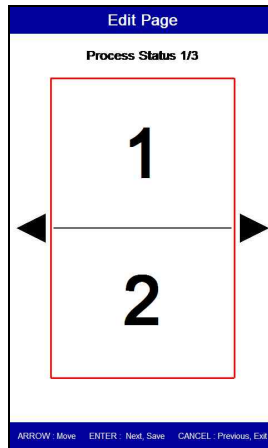
Operation

Customize of screen

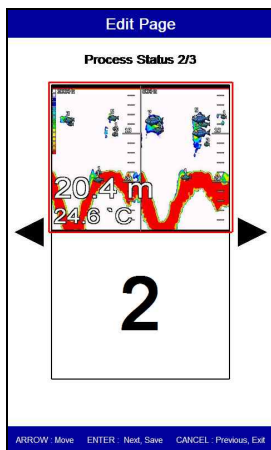
Press [FUNC] key on the Pages which selected red box.(*Refer Fig. 1.1.1 as below)
 Select the layout of the formation of screen.(*Refer Fig. 1.1.2 as below)
 Select displays .(*Refer Fig. 1.1.3 & 1.1.4 as below)



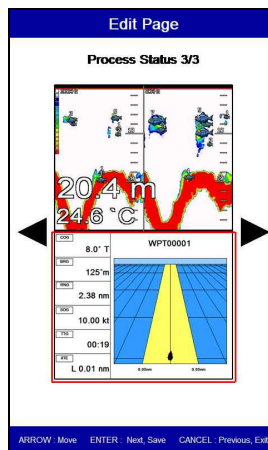
<Fig. 1.1.1>



<Fig. 1.1.2>



<Fig. 1.1.3>



<Fig. 1.1.4>

I Operation

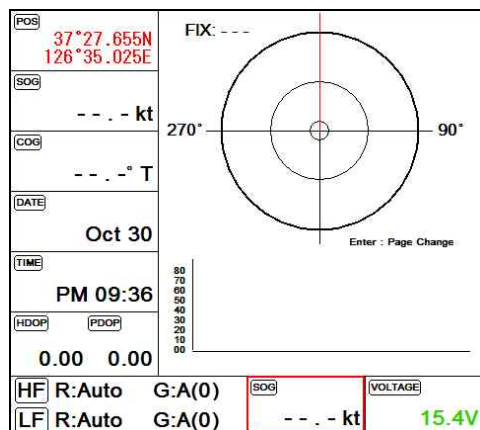
Customize of data bar

► [MENU]->Databar edit

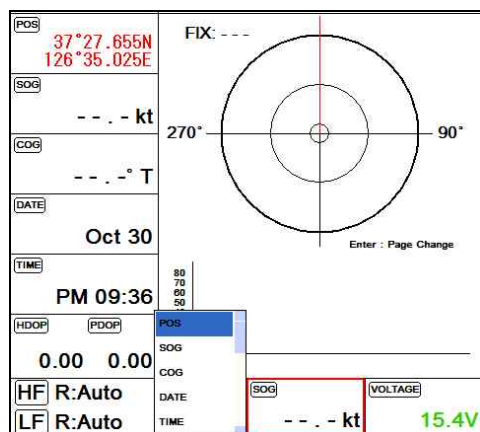
Select the section to edit by red box. (*Refer Fig. 1.2.1 as below)

Press [ENTER] key and select the data as a user want. (*Refer Fig. 1.2.2 as below)

Finish the formation of data bar, press [CANCEL] key to complete.



<Fig. 1.2.1>



<Fig. 1.2.2>

Operation

Navigation data edit

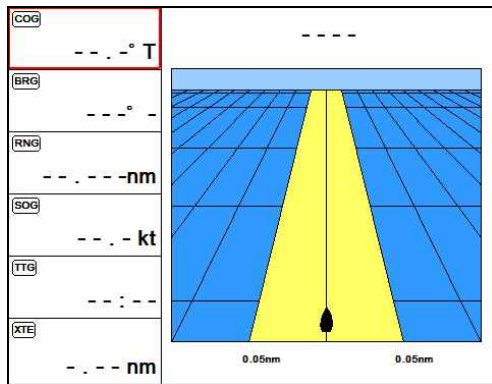
► [MENU]->Navigation data edit

Select the section to edit. (*Refer Fig. 1.3.1 as below)

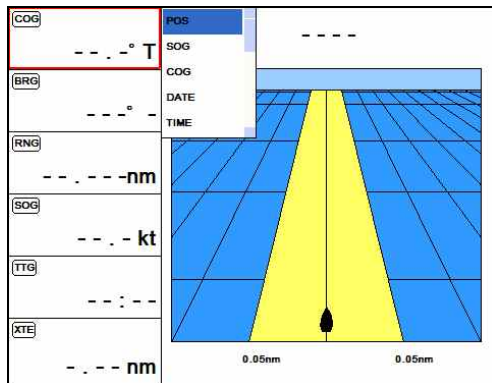
Press [ENTER] key and select the data as a user want. (*Refer Fig. 1.3.2 as below)

Finish the formation of data bar, press [CANCEL] key to complete

(* If no navigation data on present activated display, it is not available to edit)



<Fig. 1.3.1>



<Fig. 1.3.2>

Operation

Quickmenu

The menu and explanation of operation are displayed.

► [MENU]

1. Navigation data edit

It customizes the Navigation data section except activated the fishfinder section.

2. Databar edit

It customizes the data bar information.

3. Auto Gain

HD-70F selects the best condition of gain for measuring automatically in the environment of the sea.

4. Fish symbol

Fish symbol with sizes and levels show for targets.

(*Fish symbol is only for reference. This could be different from the real.)

5. Recording

This is the function of recording current screen.

Marked [● REC] in red color on the upper right on the data bar during recording.

Note: The recording file is stored in external memory cards, SD memory. Check SD memory in the HD-70F.

(* Recording time is different by the size of the memory card)

6. Screen Capture

This is the function of Screen Capture.

Note: The recording file is stored in external memory cards, SD memory. Check SD memory in the HD-70F.

Operation

Main menu

The menu and explanation of operation are displayed.

► [MENU] -> [MENU]

1. Range

HD-70F selects the best condition for measuring the depth automatically in the environment of the sea.

(☞ The default setting is Auto.)

2. Shift

A user selects this function to see more detailed bottom of the sea. When you turn up the shift, the range of Sounder shall go up from the shift range. For example, if you raise 5m of shift at 20m range, the surface shall start 5m and the bottom range shall be 25m.

(☞ The default setting is 0m.)

3. Display

3-1. A-Scope:

A-scope shows the research under the water by a scope to see the environment under the water.

(☞ The default setting is Off.)

3-2. Image Speed:

Select the speed of Sounder image from 4X until stop.

(☞ The default setting is 1X.)

3-3. White Line

It is necessary to research a detailed fish on the bottom or a seaweed under the sea. The color of the bottom changes into white or black to see the bottom easier than red.

(☞ The default setting is OFF.)

3-4. Bottom Zoom Range

Select the range of the bottom zoom or lock. It is necessary to modify the bottom.

(☞ The default setting is 10m.)

3.5.Depth

3.5.1. Display

On/Off the depth range on the screen.

(☞ The default setting is ON.)

3.5.2. Depth Font

Select the depth range font size on the screen.

(☞ The default setting is Normal.)

3.6. TEMP

3.6.1. Display

On/Off the temperature on the screen.

(☞ The default setting is Off.)

3.6.2. TEMP Font

Select the temperature font size on the screen.

(☞ The default setting is small.)

3.7. Speed

3.7.1. Display

On/Off the speed on the screen.

(☞ The default setting is Off.)

Operation

3.7.2. .Speed Font

Select the temperature font size on the screen.

( The default setting is normal.)

3.8. Fish

3.8.1. Symbol

Fish symbol with sizes and levels show for targets.

(*Fish symbol is only for reference. This could be different from the real.)

( The default setting is Off.)

3.8.2. Size

Display the size of fish on the window

(*Fish size is only for reference. This could be different from the real..)

( The default setting is Off.)

3.8.3. Size unit

Set up the unit(cm, inch) of displayed size of fish on the screen

( The default setting is centimeter.)

4. Rejection

4-1. Interference Rejection (from engine)

When there are another boats around you on sailing, your sounder could be disturbed to work.

The step of the function is from off to level 2. The bigger number, the more rejection.

( The default setting is OFF.)

4-2. Noise Rejection

Your Fishfinder could be disturbed by the engine noise. This function can reject the noise from the engine or other machinery instruments.

( The default setting is OFF.)

5. Color

5-1. Bottom color level

This function adjusts the colors. Make it upper level, the color becomes darker.

( The default setting is 0.)

5-2. Color Rejection

There are 16 color levels for fishfinder. The color bar is on the left of the Fishfinder. If the level is higher, the color of the bar is deleted one by one.

5-3. Screen Color

Select the back ground color of the Fishfinder for your convenience.

II Operation

6. Alarm

6-1. Depth

6-1-1. Deep Alarm

It alarms when the set deep depth is out of the range.

(☞ The default setting is OFF.)

6-1-2. Deep range

Setup the range of deep depth alarm

(☞ The default setting is 0M.)

6-1-3. Shallow alarm

It alarms when the set shallow depth is out of the range.

(☞ The default setting is OFF.)

6-1-4. Shallow range

Setup the range of shallow depth alarm

(☞ The default setting is 0M.)

6-2. TEMP(Temperature)

6-2-1. High alarm

It alarms when the set high temperature is out of the range.

(☞ The default setting is OFF.)

6-2-2. High Range

It alarms when the set high temperature is out of the range.

(☞ The default setting is 0.)

6-2-3. Low alarm

It alarms when the set low temperature is out of the range.

(☞ The default setting is OFF.)

6-2-4. Low range

It alarms when the set low temperature is out of the range.

(☞ The default setting is 0.)

6-3. Fish-School

6-3-1. Alarm

It alarms when it detects school of fish.

It will detect school of fish depend on set depth, range and level of the fishfinder.

(☞ The default setting is OFF.)

6-3-2. Fish-school Depth

If the alarm is on, It is available to setup the depth of the Fish-school

(☞ The default setting is 10m.)

6-3-3. Alarm range

If the the alarm is on, It is available to setup the Range(hight) of the Fish-school.(The bar, next of display is shown)

(☞ The default setting is 50m.)

6-3-4. Alarm Interval

If the the alarm is on, It is available to setup the alarm interval.

(☞ The default setting is middle)

6-3-5. Color Level

If the the alarm is on, It is available to setup the color level.

It is available to setup the color level

Operation

7. Output Power

Select the output of the transducer.

(☞ The default setting is 600W.)

8. Page

Selects the display mode

9. Setup

9-1. System

It contains ID and the program version, and it has important information for maintenance and upgrade.

9-2. Unit

9-2-1. Distance/Speed Unit:

Select desired unit of measure for distance and speed. Choose from: nautical mile/knots (nm/kt), kilometer/kilometers per hour(km/kmh), yard/knot(yd/kt).

cf) 1nm = 1.852km, 1kt /h= 1.852km/h, less than 1nm display in yard and over 1nm display in mile

(☞ The default setting is Nm/Kt.)

9-2-2. Depth unit

Select desired unit of measure for depth of water. Choose from: meter(M), foot(ft), fathom(fm), Italian Fathom(lfm), Japanese fathom(Jfm).

cf) 1m = 3.281ft = 0.549fm = 0.609lfm = 0.660jfm

(☞ The default setting is Meter.)

9-2-3. Temperature unit

Select desired unit of measure for temperature of water. Choose from: Celsius(°C), or Fahrenheit(°F).

cf) 1°C = +32°F

9-3. Time/Date

9-3-1. Reference

Available to adjust the collect local time by the UTC time from the GPS.

(☞ The default setting is incorrect every the country.)

Time format

Sets you preferred time between 12 hour and 24 hour.

(☞ The default setting is 12 hour.)

9-3-2. Date Format

Sets you preferred date among YY-MM-DD, MM-DD-YY or DD-MM-YY.

(☞ The default setting is YY-MM-DD.)

9-3-3. Month format

Setup the character of month(Ex: 1, 2, 3...or JAN, FEB, MAR...)

II Operation

9-4. Input/Output

9-4-1. Output Sentences

The HD-70F allows customizing the NMEA-0183 sentence.

NMEA	Description	Default
\$GPDBT	Depth below transducer	On
\$GPDPT	Depth	On
\$GPMTW	Water temperature	Off
\$GPTLL	Target latitude and longitude	On
\$GPVHW	Water speed and heading	Off
\$GPGGA	Global positioning system fix data	Off
\$GPVTG	Course over ground and ground speed	Off
\$GPRMC	Recommended minimum specific GNSS data	Off

9-4-2. Transmit

Available to adjust transmit speed of input/output in each ports.

9-5. Speed source

Switch the Sensor/NMEA.

- InsideSensor: Use the built-in speed meter for sensor.

- NMEA: Use the external input value for NMEA.

(☞ The default setting is InsideSensor.)

9-6. Buzzer

It is can be sound on/off.

(☞ The default setting is on.)

9-7. Simulator:

It is necessary for an indoor demonstration. The simulations of Fish finder in the memory..

9-8. Databar position

Set up the place of the data bar.

9-9. Language:

Select the language.

9-0. Initialization

All systems returns to the initial system.

9-0-1.Setup Initialization: reset without deleting user data.

9-0-2.Factory Initialization]: returning to the initial system from the releasing of factory.

(All user data will be deleted)

Operation

0. Others

0-1. Key Setup

It is available to set up [FUNK] key and [EVENT] key on the HD-70F.

0-1-1. [FUNK] key:

Set the function frequently used for your convenience.

(☞ The default setting is Page.)

[FUNK]KEY SETUP
1. Page
2. Image Speed
3. Color Rejection
4. Noise Rejection
5. Shift
6. Bottom Zoom Range
7. White Line
8. Pulse
9. Output Power
0. Reset

0-1-2. [EVENT] key:

Change the key of the Waypoint input, Setup Nav or capture.

(☞ The default setting is Active.)

- Active: Select the activated section.
- WPT: Input the mark on the current position.
- GOTO: Start navigating toward the mark.
- Capture: Store the current screen.

0-2. WPT

Setting up the WPT List, Edit, and Alarm.

0-2-1. List

Shown the WPT list and it is available to set up or edit the WPT on the list.

0-2-2. Alarm

0-2-2-1. Arrival Alarm:

When you approach into the waypoint range, it gives you a notice with alarm.

(☞ The default setting is OFF.)

0-2-2-2. Arrival Radius:

It is to adjust the range of arrival from your waypoint. If you have a route, it changes to the next waypoint automatically.

(☞ The default setting is 0.05nm.)

0-2-2-3. XTE Alarm:

If you are out of the course, it gives you a notice with alarm.

(☞ The default setting is OFF.)

0-2-2-4. XTE Radius:

It is to adjust the range of the off course.

(☞ The default setting is 0.05nm.)

0-2-3. Navigating Stop

Stops the present navigation.

0-2-4. Save WPT

0-2-5. Load WPT

0-3. Recording List

Available to display and delete the recording file

0-4. Capture List

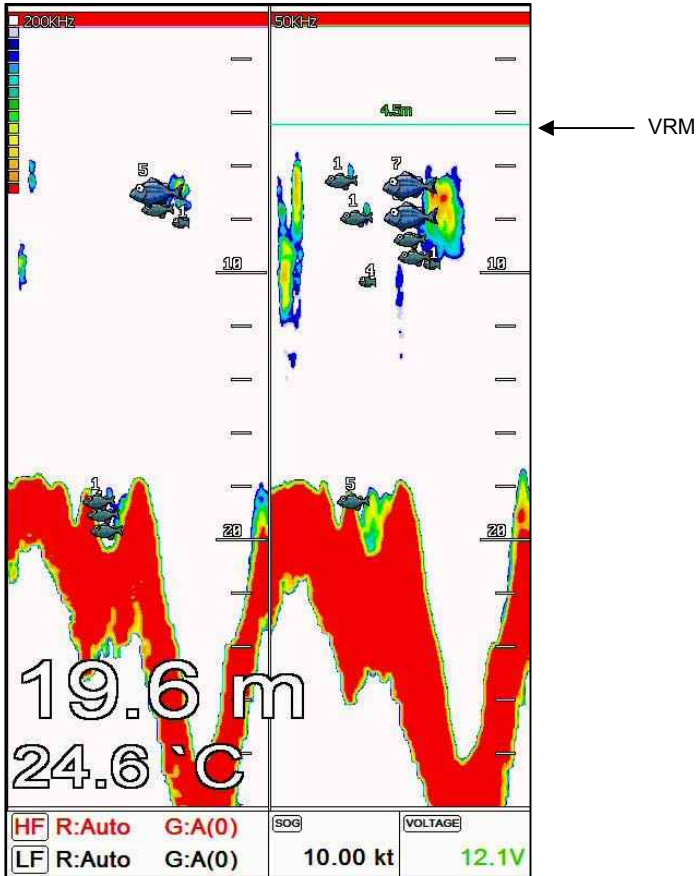
Available to display and delete the capture file

Operation

VRM

► Press [VRM]

The VRM (movable marker) shown by the green line can be moved up and down. It is convenient to measure the depth by aligning with the target such as school of fish.



* Caution: When several seconds pass after finishing the VRM operation, the numerical of marker depth becomes normal display.

Installation

Display unit brings expandable display technology to your bridge or navigation station. A careful installation will assure maximum benefit from Display unit integrated features.

Display Unit Location

Select a location for your Display unit that provides easy viewing from all likely operator's positions. The display unit is designed to be mounted on either a console or from an overhead surface. The Display unit is also designed for flush mounting using six threaded holes on the rear panel. Locate the display in an area with protection from the elements and avoid direct sunlight on the viewing window. Also, consider access to the rear panel of the unit for connecting power and cables to the various remote sensors. The mounting surface must be flat and solid to support the unit and prevent vibration. There should be access to the inside of the surface to permit through bolt fastening for the mounting bracket.

Display Unit Installation

Temporarily install the mounting bracket on the Genesis display unit and place the unit at the selected location.



CAUTION

The Display unit is unstable when the mounting bracket is not secured. Hold the unit in place at all times.

Check the suitability of the location and make any adjustments. When all is satisfactory, use the holes in the mounting bracket as a guide and mark the holes locations on the mounting surface.

Installation

Drill a 1/4 in. diameter hole at each marked location. Mount the Display unit bracket using bolts through the mounting surface. Place large flat washers on the opposite side of the mounting surface from the bracket and then install lock washers and nuts. Tighten securely.

Install the display unit into the mounting bracket. Check alignment and operation of the pivots and security of the mounting. Make any adjustments necessary to prevent binding and assure even meshing of the pivot locking washers. It is advised to remove the display unit and store it in a safe place to prevent damage during the rest of the installation process.

Power Connection

Power is supplied to the Fishfinder Unit through a connector on the rear panel of the display unit. Route the power cable from the Fishfinder Unit location to the ship's power distribution panel. Connect the black wire to a battery negative (-) terminal of the power panel. Connect the white wire to a fused battery positive (+) terminal of the power panel (12 to 24 Vdc nominal). If a fused terminal is not available, install an in-line fuse holder.

Sensor Connection

There are many sensors and transducers available which may be used to expand the capabilities of the Fishfinder Unit. Connectors for these accessories are provided on the rear panel of the Fishfinder Unit. For most sensors, only data and control connections are routed to the Fishfinder Unit.

Installation

An input designation means, in put to Fishfinder unit and an output designation means, output from HD-70F. Sensors will have similar designations, but from the sensors point of view. Therefore, a sensor output will connect to an HD-70F input and a sensor input will connect to an Fishfinder unit output.

Transducer Installation

If you have chosen a Sonar option for your Fishfinder a transducer must be installed on your vessel unless an exiting compatible transducer is installed. The installation of sonar transducers require some planning and skill to achieve the best result. It is strongly advised hat you read the installation instructions completely before starting. The two basic types of transducers are transom mount and through-hull mount. There are variations within each type to provide for options such as temperature sensors, speed sensors and for different beam angels and sonar frequencies. Several different transducers may be used with the HD-70F. Refer to the optional Equipment list for the variations available.



Mounting a sonar transducer for your HD-70F Sonar requires drilling holes into the hull of your boat which could affect its water integrity. Therefore, installation should be attempted only by qualified individuals. If you have any doubt about your ability to complete the process successfully, we recommend you obtain the services of a HAIYANG dealer or marine service center with knowledge and experience in transducer installation .

Since your HD-70F Sonar performance depends upon how well the transducer is installed, please carefully observe the following mounting procedures.

For proper performance, the transducer's mounting location must be chosen carefully. The transducer must be mounted in a location that is free from turbulence and air bubbles created by movement of the boat through water. Air bubbles greatly reduce the efficiency of the transducer. It is also strongly Installation

recommended, for transom mounted transducers, the transducer be mounted in an area with the least amount of disturbed water passing under the transom. To determine the best mounting location, operate the boat at several different speeds and observe the water as it passes under the transom. Turbulence caused by the trim tabs, motor mounting, the keel, and lifting strakes.

Installation

Transom Mounting

Transducers designed for transom mounting give good performance when installed on most boat types, however, the transom transducer style should not be used on boats with inboard engines.

For boats with poor water flow under the transom or on in-boards, consider selecting a through-hull transducer. HAIYANG offers many styles of transducers.

Determine the transducer mounting place by referring to the steps mentioned above. For best result, the transducer face should be level. Also, the transducer face should be mounted from flush to 1/4 inch below the under surface of the hull. The trailing edge of the housing should be about 1/8 inch below the leading edge. The adjustable stainless steel bracket is designed to allow fine tuning of the transducer position once the installation is completed.

Route the transducer cable as far as possible away from the boat's power cables, engine controls and other electrical cables. Do not route transducer cables near your VHF radio power or antenna cables. Assemble the transducer using the brackets and hardware supplied. Actual fastening to the hull of your boat depends upon the hull construction and hull material. If additional items must be used, be sure to obtain marine stainless steel hardware. Also, be sure to use marine waterproof sealant on all through hull fastenings. Do not use silicone RTV, since it does not have long life underwater.

Transom Transducer Maintenance

If your boat is kept in the water, sea growth can quickly accumulate on the face of the transducer. In just two weeks in some locations, your Sonar performance could be affected. It is recommended that at least the face of the transducer be coated with special transducer antifouling paint. Alternatively, the entire transducer can be painted and is easier to keep clean. **Do not use regular antifouling paint.**

All copper base antifouling paints are unsatisfactory and will prevent normal operation. If fouling does occur, use a stiff brush or putty knife to remove growth. Be careful not to gouge the face of the Transducer. Occasional wet sanding of the transducer face is permissible with #220 grit or finer wet or dry paper.

Do not use solvents to clean your transducer. The high impact polycarbonate housing is very durable but solvents will destroy it. Keep acetone, MEK, lacquer thinner and most other thinner/solvents away from your transducer.

Through-hull Transducers

Through-hull transducers are recommended for in-boards and other vessels with disturbed water flow under the transom. HAIYANG offers several models of bronze through-hull transducers. To enjoy the full capability of your Sonar, select a dual frequency model with temperature sensor. Sturdy bronze construction assures a secure installation and provides a strong base for fairing blocks, if needed, to compensate for hull shape.

The transducer should be installed in a location free of bubbles and away from disturbed water flow. Smooth water flow around the transducer and along its surface is very important for consistent operation.

Areas in the center third of water line length at cruising speed are usually satisfactory.

Locations forward of the engine and in a flat area near the center line of the boat are preferred. Do not install the transducer behind water intakes, other through-hull fittings or irregularities in the hull.

Installation

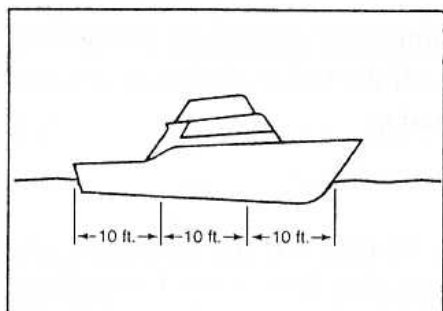
Dead-rise

On hulls with dead-rise of 5 or less, the transducer may be mounted directly through the hull. Where dead-rise is greater than 5, fairing blocks must be used to orient the face of the transducer parallel with the water surface.

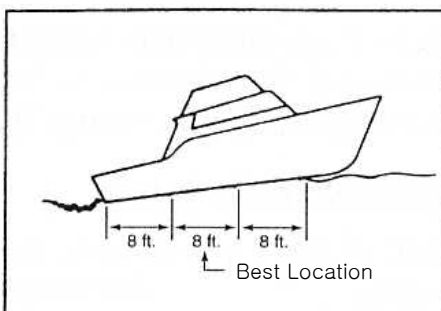
In this case, no fairing block is necessary. To prevent leakage, any gaps between the stem threads and holes drilled in the hull should be completely filled with waterproof marine sealant. Tighten the

stem nuts securely but do not over tighten. In this situation, install fairing blocks both inside and outside the hull. Install the transducer with the face aiming straight down. To prevent leakage, any gaps between the stem threads and holes drilled in the hull should be completely filled with waterproof marine sealant.

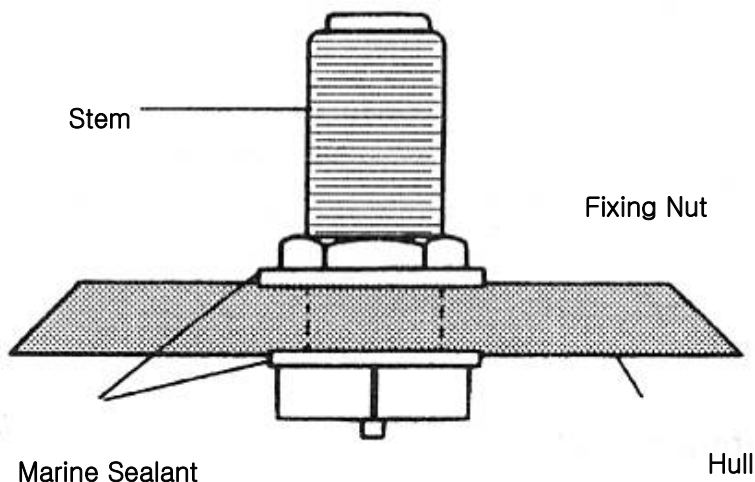
sealant. Tighten the stem nuts securely but do not over tighten.



Water Line Drifting



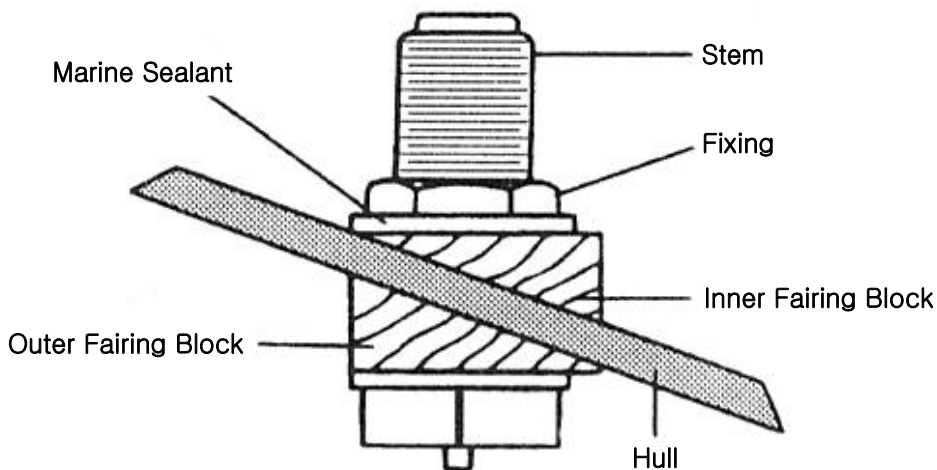
Water Line Cruising

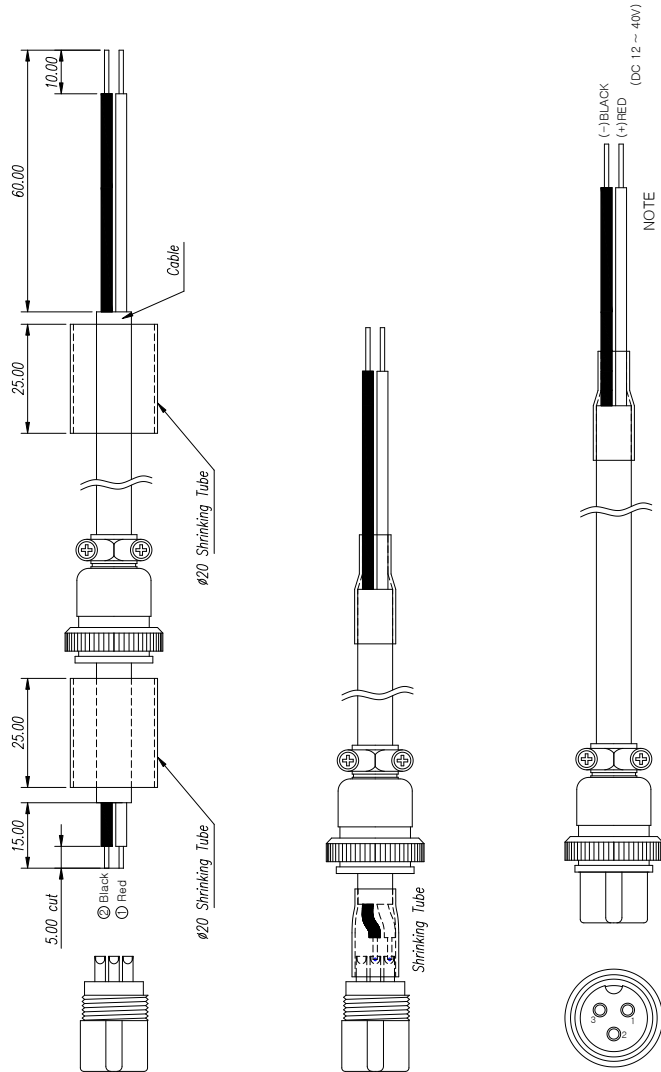


Installation

Through-hull Transducer Maintenance

If your boat is kept in the water, performance of your HD-70F Sonar will be adversely affected by accumulations of sea growth on the face of the transducer. To prevent sea growth effects, the face of the transducer may be coated with antifouling paint specially formulated for transducers. Do not use regular antifouling paint on the face of the transducer. The bronze housing may be coated with any antifouling paint. If fairing blocks are used, especially if made of wood, complete sealing prior to painting is important.

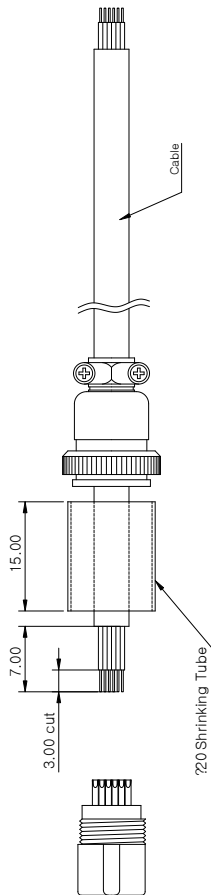




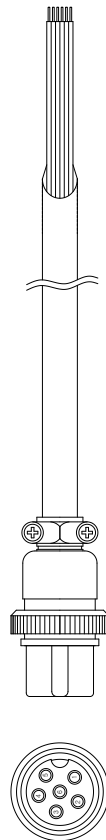
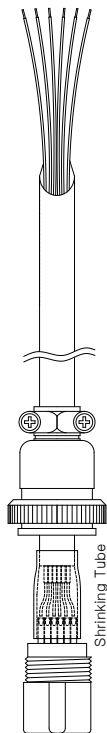
16-03P
To HD-70 series (J1)

MATERIAL		DESCRIPTION	
SCALE	MODEL	Power Cable	
NONE	HD-70 Series		
CHK. BY	DES. BY	DWG. NO.	
Y.S.KIM	Y.S.KIM	S7-DC10303M	
PERN	DATE		
Y.S.KIM	05.07.2012		

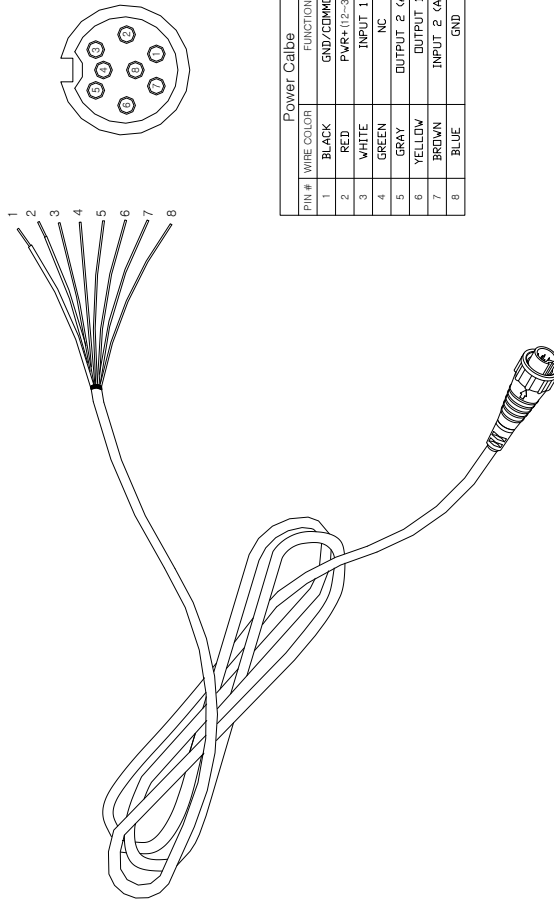
HAIYANO OLUX CO., LTD



Data Cable	
Pin #	FUNCTION
1	GND
2	TX+
3	TX-
4	RX+
5	RX-
6	NC

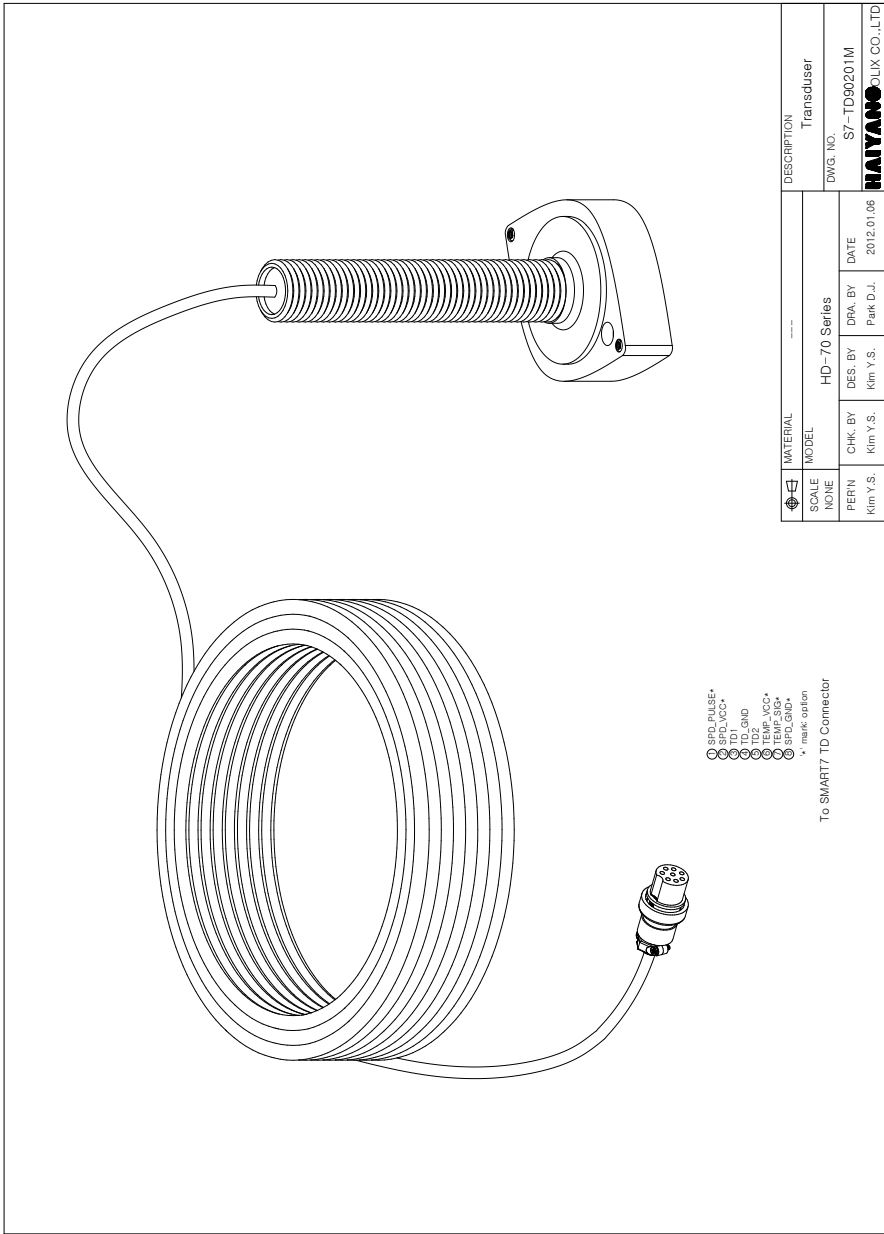


SCALE	MATERIAL	DESCRIPTION	
		MODEL	Data Cable
NONE	HD-70 Series	---	
PERN	CHK. BY	DRA. BY	DATE
Y.S.KIM	Y.S.KIM	Y.S.KIM	05.07.2012
DWG. NO. S7-DC10103M			
HAIVANO OLIX CO., LTD			



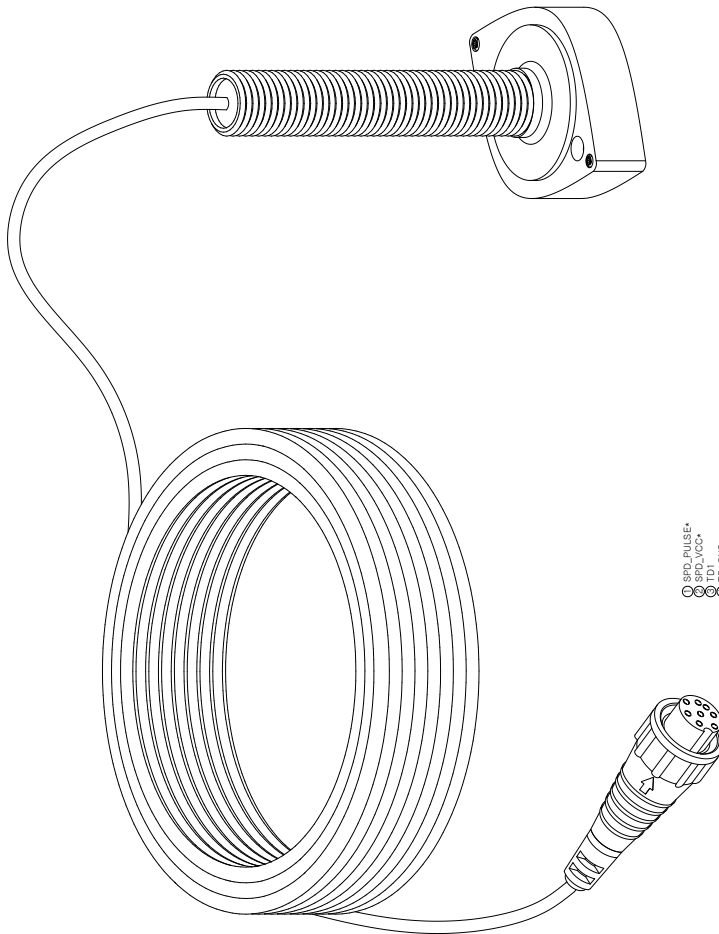
Power Calbe		
PIN #	WIRE COLOR	FUNCTION
1	BLACK	GND/COMMON
2	RED	PWR+ (12-36)
3	WHITE	INPUT 1
4	GREEN	NC
5	GRAY	OUTPUT 2 (A1S)
6	YELLOW	OUTPUT 1
7	BROWN	INPUT 2 (A1S)
8	BLUE	GND

	MATERIAL	— — — —		DESCRIPTION
	SCALE 1/2	MODEL HD-70 Series		
PERN Kim Y.S.	CHK. BY Kim Y.S.	DES. BY Kim Y.S.	DRA. BY Park D.J.	DATE 2012.05.07
				DWG. NO. S7-DC10301P HAIVANO OLUX CO.,LTD



DESCRIPTION	
Transducer	
DWG. NO.	S7-TD90201M
DATE	2012.01.06
DRW. BY	Park D.J.
DES. BY	Kim Y.S.
CHK. BY	Kim Y.S.
SCALE	NONE
MODEL	HD-70 Series
PERN	Kim Y.S.

HAIYANG OILUX CO.,LTD



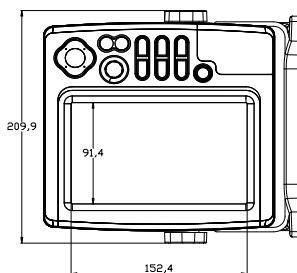
- ① SPD_PULSE*
- ② SPD_VCC*
- ③ GND
- ④ TD_V
- ⑤ TD_GND
- ⑥ TD2
- ⑦ TEMP_VCC*
- ⑧ TEMP_GND*
- ⑨ SPD_GND*

* mark option

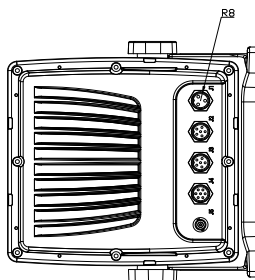
To SMART7 TD Connector

MATERIAL		DESCRIPTION	
SCALE	MODEL	Transducer	
NONE	HD-70 Series	DWG. NO.	S7-TD90201P
PER N	CHK. BY	DRA. BY	DATE
Kim Y.S.	Kim Y.S.	Kim Y.S.	2012.05.07

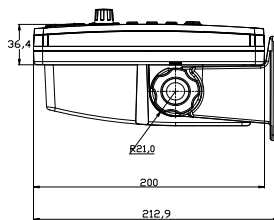
HAIRYANG POLIX CO.,LTD



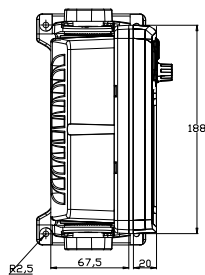
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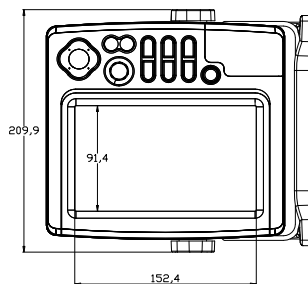


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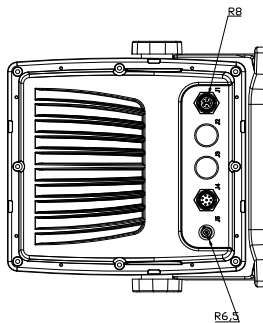


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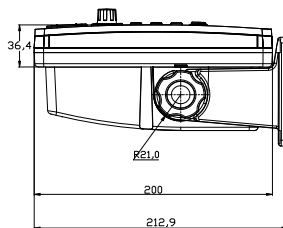
DESCRIPTION		PLAN & DIMENSIONS			
 MATERIAL	MODEL		HD-70F Series		
	SCALE	INS	CHK. BY	DES. BY	DATE
	PERN				2012.02.16
		DWG. NO.		S7-FL00DM.dwg	
		HAIYANG OLIX CO.,LTD			



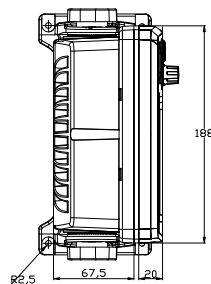
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<LEFT>



<TOP>

DESCRIPTION		PLAN & DIMENSIONS	
MATERIAL	MODEL	HD-70 Series	DWG. NO.
SCALE	INS	CHK. BY	DES. BY
PER N	DATE	2012.02.16	S7-PL00DP_dle
HAIYANO OLIX CO.,LTD			

Declaration of Warranty

Declares of under his sole responsibility that the produced Plotter with Fish Finder manufactured by

HAIYANG OLIX Co., LTD.

103-903 BucheonTechnopark 364 Samcheongdong

Ojeonggu Bucheon Gyeonggi, Korea

TEL +82 2 3240381 FAX +82 32 327 4713

Web-site: <http://www.haiyang.co.kr>

Guarantee for One Year

Haiyang Electronic Equipment Co., LTD warrants the produced equipment, Equipment for One (1) year for guarantee as bellows.

1. Main Unit: One (1) year guarantee after a user purchases the product within one (1) year
2. Accessories: One (1) year for consumed accessories (including TD) after a user purchases them.

Service in Charge

1. Over the term from the guarantee
2. Damage from user's carelessness (inundation, impact)
3. Intentional dismantle, modification or remodeling of the unit.
4. Unauthorized parts, components or accessories are used in the unit.
5. Installed or maintained by unauthorized person
6. Consumed parts and components (batteries, LCD, etc) run out.
7. Faults or damages from other reasons.

Model	HD -70	Serial No.	
Date of Purchase		CustomerName	
Name of Dealer		Price	

※ Caution – Keep this warranty card with the receipt for fast and good service