

FF520

50/200kHz BLACK BOX FISH FINDER



Owner's Manual

Congratulations on your purchase of the FF520!

The STANDARD HORIZON organization is committed to ensuring your enjoyment of this unit. STANDARD HORIZON technical support personnel stand behind every product we sell, and our Product Support team invites you to contact us should you require technical advice or assistance, at 800/767-2450.



FCC Compliance Statement

This device complies with Part 15 of the FCC limits for Class A digital devices. This equipment generates, uses, and can radiate radio frequency energy and, if not installed or used in accordance with the instructions may cause harmful interference with radio communications.

There is no guarantee that interference will not occur in a particular instance. If this equipment does cause harmful interference to other equipment, try to correct the problem by relocating the equipment.

Consult an authorized STANDARD HORIZON dealer or other qualified service technician if the problem cannot be corrected. Operation is subject to the following conditions: (1) This device cannot cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

CAUTION

- The FF520 is designed for maritime use.
 - The FF520 contains dangerous high voltage circuits which only experienced technicians can handle.
 - STANDARD HORIZON will not be liable for errors contained herein, or for incidental or consequential damages in connection with the performance or use of this material.
-

WARNING

- When plugging in or unplugging a transducer to the FF520 make sure power is turned off.
-

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CODE: Issue F - 280906e

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1. INTRODUCTION

This chapter provides basic information in becoming familiar with the advanced functions of the FF520 before you start using it combined with the STANDARD HORIZON GPS Chart Plotters.

1.0 GENERAL INFORMATION

The STANDARD HORIZON GPS Chart Plotters combined with the sonar performance of the FF520 creates the most advanced marine navigation system available. This Owner's Manual covers the Fish Finder functions of the FF520 when used with the STANDARD HORIZON GPS Chart Plotters.

The FF520 advanced features include:

- A-Scope (displays Sonar Echo in real time)
- Preset modes (Fish, Cruise)
- 2x and 4x Zoom (capability to magnify any part of the Fish Finder image of a fixed rate)
- Bottom Lock (capability to magnify a user defined range around the bottom)
- White Line (help distinguish between fish and bottom, when fish are swimming close to the bottom)
- Sensitivity Time Control (STC) reduces surface clutter show on the display by reducing echoes from water disturbances
- Advanced Surface Declutter Function (suppresses the displaying of surface clutter)
- Interference rejection (allows reducing interference from other boats/Fish Finders)
- Noise Filter
- Fish Symbol feature
- Transducer ID (automatically selects power output and parameters for best performance).
- Dual Frequency: 50 and 200kHz with the capability to display the two frequencies at the same time.
- Dual Power output: 500/1000W (4000/8000Wpp) depending on the transducer connected. Refer to Sec. 6.1 "Optional Transducers".
- Max Depth*: 1KW - 1200Ft (365m) at 200kHz, 4000Ft (1219m) at 50kHz
500W - 700Ft (213m) at 200kHz, 1500Ft (457m) at 50kHz
- Min Depth: 2.5Ft (0.8m) at 200kHz, 5Ft (1.6m) at 50kHz
- Max Typical*: 1KW - 980Ft (299m) at 200kHz, 2700Ft (823m) at 50kHz
500W - 600 Ft (183m) at 200kHz, 1350Ft (411m) at 50kHz

NOTE*

This is not a guaranteed specification. The actual maximum depth capability of the system depends on the type of transducer fitted, the reflectivity of the bottom, water condition, etc.

- Speed Sensor (if available on transducer)
- Dual temperature inputs Sensor (One channel TEMP1, Optional second channel TEMP2) - if available on transducer
- Trip log
- External buzzer connections (buzzer not supplied)
- Alarms - Shallow, Depth, Temp Upper, Temp Lower

NOTE

Transducer ID is only available with STANDARD HORIZON DST520, DST521, DST523, DST525, DST526, DST527 and DST528 transducers.

Performance of the FF520 used in conjunction with optional transducers (sold separately) will vary based on water conditions, bottom composition, boat hull, vessel speed, installation, and specific transducer model. This includes but is not limited to both minimum and maximum depth performance.

1.1 PACKING LIST

When the package containing the FF520 is first opened, please check for the following contents.

1.1.0 FF520 Packing List

Replacement part	Item
S8101640	Tee cable FF520
S8101641	Power cable FF520
EY307X100	Owner's Manual

2. MOUNTING THE FF520

The FF520 must be properly installed according the following instructions to get the best possible performance.

NOTE

TRANSDUCER: refer to Chapter 6 and to the Installation Manual supplied with the transducer.

2.0 INSTALLATION

The FF520 must be mounted in a dry, cool and well ventilated location. The FF520 can be mounted horizontally or vertically. After the cables have been run, and connected as per Section 2.2, mount the FF520 in the desired location using the supplied hardware.

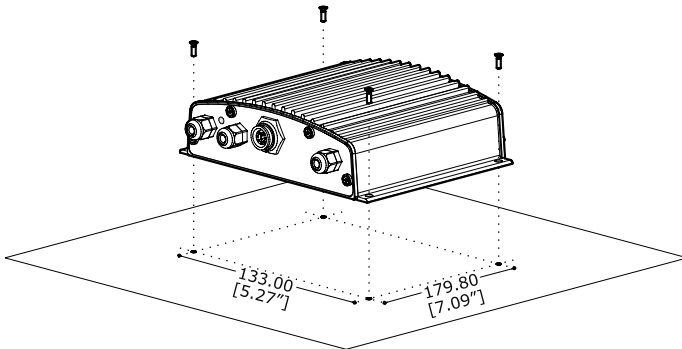


Figure 2.0 - The FF520 Installing

2.1 CONNECTIONS

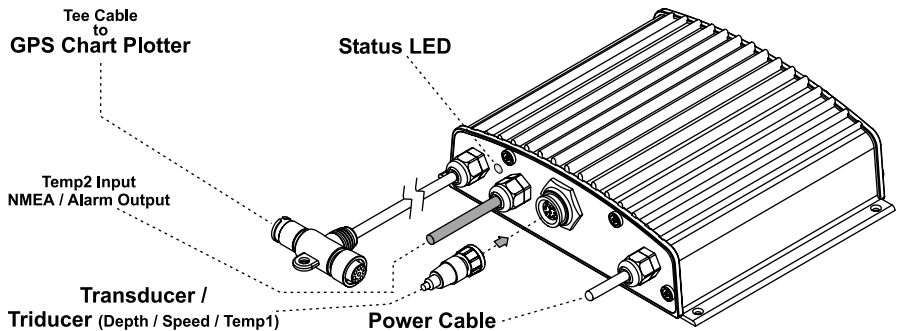


Figure 2.1 - The FF520

2.2 CONNECTING THE GPS CHART PLOTTERS TO THE FF520

CP155C/CP1000C/CP180/CP180i/CPV350 connections to FF520

1. If the power/data cable is plugged into the CP155C/CP1000C/CP180/CP180i/CPV350, remove it.
2. Route the cable from the FF520 to the GPS Chart Plotters location.

NOTE

You can disconnect the "Tee" cable from the FF520 to make installation easier. Refer to Section 7.

3. Plug in the "Tee" connector into the GPS Chart Plotter DC/Data connector.
4. Plug in the power data cable into the "Tee" connector.

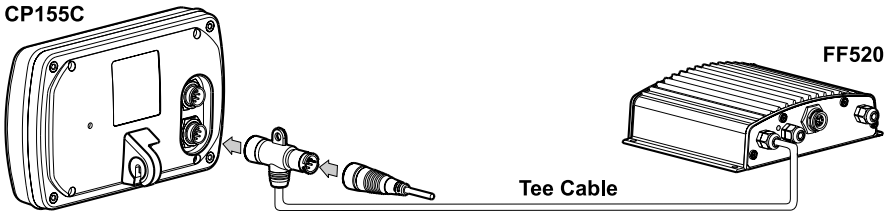


Figure 2.2 - CP155C Connection

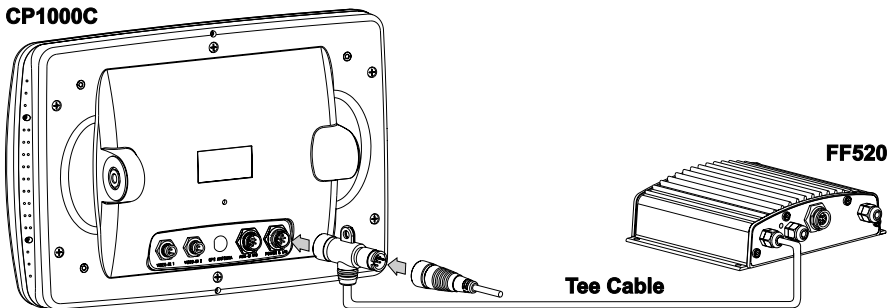


Figure 2.2a - CP1000C Connection

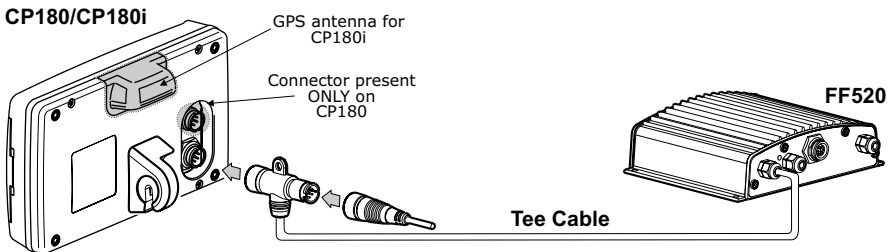


Figure 2.2b - CP180/CP180i Connection

CPV350

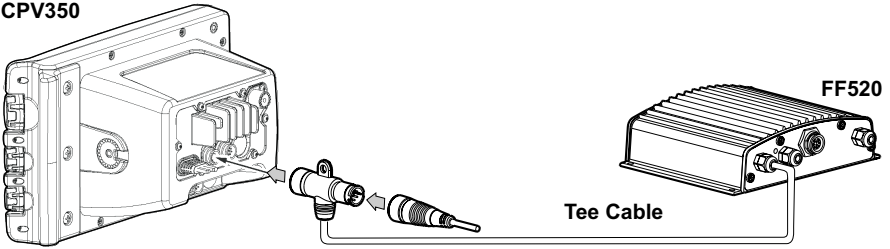


Figure 2.2c - CPV350 Connection

CP175C connections to FF520

1. Cut off the "Tee" connector on the FF520 as close to the "Tee connector as possible.
2. Route the cable from the FF520 to the CP175C location.
3. Strip back the black insulation on the "Tee" cable about three inches to expose the wires inside the cable. Connect the wires from the CP175C to the FF520 "Tee" cable referring to Figure 2.2d CP175C Connection.

CP175C

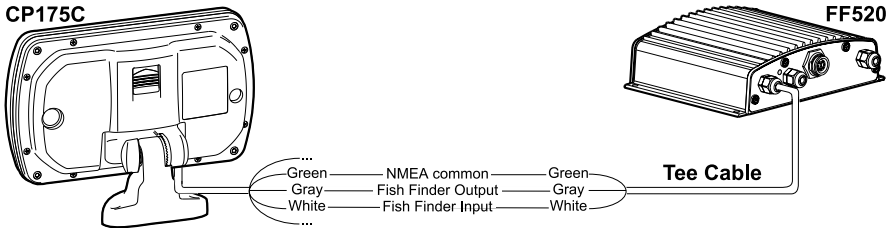
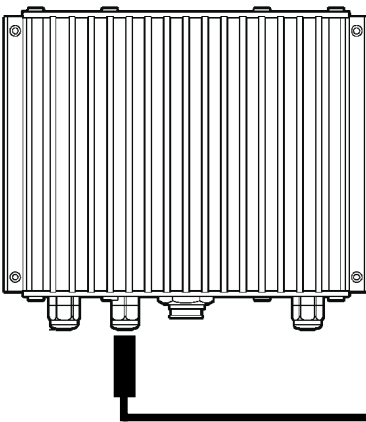


Figure 2.2d - CP175C Connection

2.3 OPTIONAL CONNECTIONS

The FF520 has one NMEA output, one alarm buzzer output and a second input for a temperature sensor.



WIRE COLOR	FUNCTION
BLACK	GND
RED	Not connected
WHITE	NMEA Output(+)
GREEN	NMEA GROUND
GRAY	Not connected
YELLOW	Temp 2 INPUT(+)
BROWN	Not connected
BLUE	Alarm OUTPUT(+)
ORANGE	Not connected
PINK	Not connected

Figure 2.3 - The FF520 Optional Connections (I)

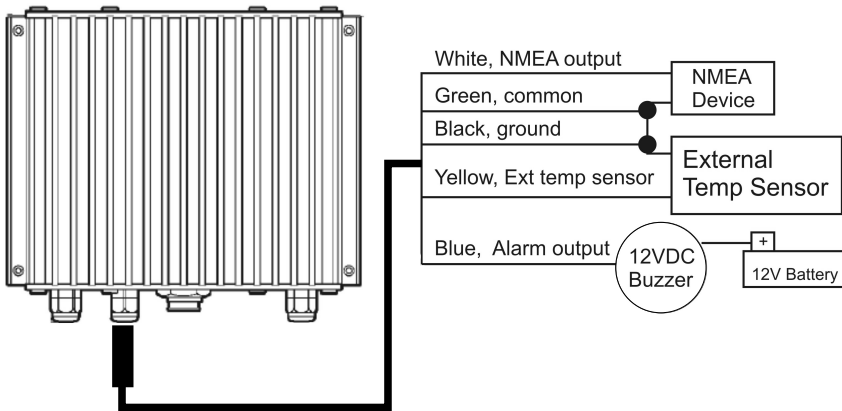


Figure 2.3a - The FF520 Optional Connections (II)

2.3.0 NMEA Output

The following sentences are outputted: DPT and DBT (Depth), VHW (Speed), VLW (Trip Log), MTW (Water Temperature), XDR (External Sensor Temperature).

2.3.1 Alarm Buzzer

This connection has the capability to drive a buzzer that draws 400mA. Any 12VDC buzzer within the current draw requirements can to be connected.

2.3.2 Second temp sensor

Any thermistor type temp sensor that produces 10K ohms at 77 degrees F can to be connected.

2.3.3 LED Status Indicator

There are seven different LED behaviors, representing seven different diagnostic conditions. These are described below.

- OFF
The FF520 is running in the boot loader, or DC power is not being supplied to the FF520.
- ON CONTINUOUSLY
The transducer is not connected to the GPS Chart Plotter or problem with cable of the transducer cable..
- 1 LONG FLASH EVERY 2 SECONDS
The FF520 is not connected with the GPS Chart Plotter.
- 1 SHORT FLASH EVERY 2 SECONDS
The FF520 is connected to the GPS Chart Plotter and is operating correctly.
- 2 SHORT FLASHES EVERY 2 SECONDS
The FF520 is connected to the GPS Chart Plotter and is operating correctly.

- 3 SHORT FLASHES EVERY 2 SECONDS
A non-Standard Horizon transducer (without transducer ID) has been connected
- 4 SHORT FLASHES EVERY 2 SECONDS
No transducer connected.

2.4 POWER CONNECTIONS

It is recommended the installation of a switch and a 5A fuse (not supplied) in the positive DC supply to the FF520. The FF520 is designed to remain in stand-by mode even when the power of the GPS Chart Plotter is turned off. The installation of the switch allows the FF520 to be turned off so the battery will not be drained.

In the example below you will notice the positive DC power connection is run through a switch and a fuse before connecting it to the FF520 and the GPS Chart Plotters.

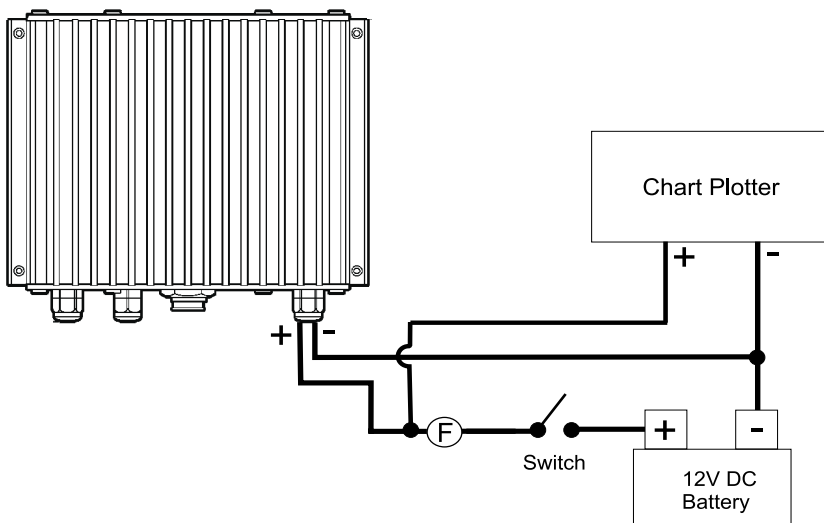


Figure 2.4 - The FF520 Power Connection

2.4.0 Selecting the FF520

With software version 11.06.00R or later, Port 2 of the GPS Chart Plotter has been set to FF520 to establish communications between the GPS Chart Plotter and Fish Finder.

CP180/CP180i/CPV350

1. Press **[MENU]** 2 times.
2. Select **ADVANCED SETUP** and press **[ENT]**.
3. Select **IN/OUT CONNECTIONS** and press **[ENT]**.
4. Select Port 2 and press **[ENT]**, select FF520 and press **[ENT]**.
5. Press **[CLR]** 3 times to exit.

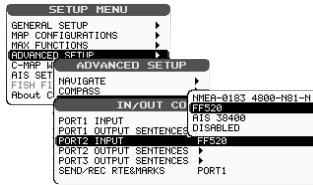


Figure 2.4.0 - Selecting the FF520 on CP180/CP180i/CPV350

CP155C/CP175C/CP1000C

1. Press **[MENU]**.
2. Select **SETUP** and press **[ENTER]**.
3. Select **ADVANCED SETUP** and press **[ENTER]**.
4. Select **IN/OUT CONNECTIONS** and press **[ENTER]**.
5. Select Port 2 and press **[ENTER]**, select FF520 and press **[ENTER]**.
5. Press **[CLEAR]** 3 times to exit.

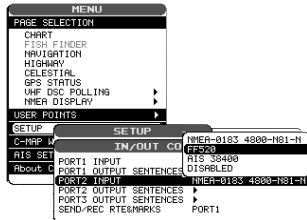


Figure 2.4.0a - Selecting the FF520 on CP155C/CP175C/CP1000C

3. FISH FINDER

This chapter is intended to help you understand how STANDARD HORIZON GPS Chart Plotters with the FF520 connected operate.

The FF520 consists of a high power transmitter, sensitive receiver and a transducer. The FF520 sends an electrical pulse to the transducer which contains a element that converts the pulse into acoustic (sound) wave which is sent through the water. As this wave travels from the transducer to the bottom, it may strike fish, structures, thermal clines (temperature changes in the water). When the wave strikes an object(s) a certain amount of the wave is reflected back to the transducer depending on the composition and shape of the object. When the reflected wave is returned to the transducer it is converted into a voltage and is amplified by the receiver, processed and sent to the display. The speed of sound in water is roughly 4800 ft./sec, so the time lapse between the transmitted signal and the received echo can be measured and the distance to the object determined.

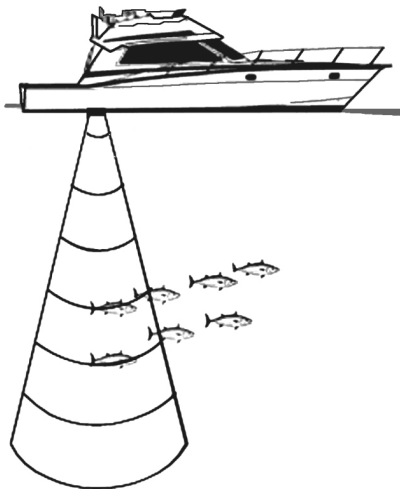


Figure 3 - Fish Finder working principle

3.0 UNDERSTANDING THE FISH FINDER PAGE

The display on STANDARD HORIZON GPS Chart Plotters shows a history of time of the echoes received by the transducer. The STANDARD HORIZON GPS Chart Plotters have a menu that allows adjustments to receiver sensitivity, depth range and scrolling speed of the Fish Finder display.

- ① Warning message
- ② Fish Finder window
- ③ Color Bar
- ④ Digital Depth
- ⑤ Water temperature
- ⑥ Alarm Bar
- ⑦ Depth ruler
- ⑧ Variable Depth Marker (VDM)
- ⑨ Zoom Bar
- ⑩ A-Scope
- ⑪ Operating Frequency

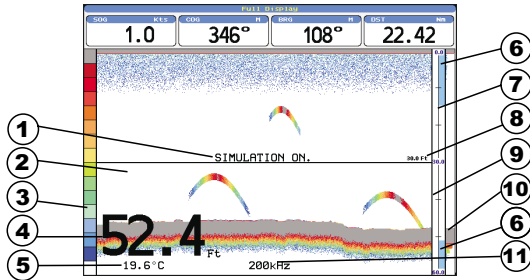


Figure 3.0 - The Fish Finder page

Following there is a brief description of terms listed in the previous Figure 3.0:

- ① **Warning Message**
This is a flashing label that is turned on when the echo sounder is in Simulation mode.
- ② **Fish Finder window**
It is the graphic presentation of sonar soundings recorded as a continuous profile scrolling across the screen from right to left. Such recordings represent the image of the water beneath your boat, items appear as they pass under your transducer; the items on the right side of the screen are closer to you than those on the left. The correct interpretation of the fish finder page allows retrieving useful information about what is under the boat. See the following Par. 3.0.0 for more information.
- ③ **Color Bar**
The colored scale located on the left side of the screen that shows the colors used in the Fish finder page to represent the echoes strength. The color on the top of the bar represents the maximum echo strength, while the color on the bottom of the bar represents the minimum echo strength.
- ④ **Digital Depth**
Readout of the current bottom depth.
- ⑤ **Water Temperature**
Readout of the current water temperature returned by the temperature sensor located in the depth transducer (TEMP1 sensor).
- ⑥ **Alarm Bar**
Range located on the right side of the depth ruler showing the range outside of which the depth measurement will trigger an alarm condition. Alarm can be set as to alert the user of shallow-water conditions, deep-water conditions or both.
- ⑦ **Depth ruler**
Vertical graduated bar that is located along the right side of the screen. It is a scale which reflects the depth of the area being displayed.

8 Variable Depth Marker (VDM)

Horizontal line on to the Fish finder page window with a depth label. Move the ShuttlePoint knob Up or Down to change the position of the VDM. The label displays the depth of the cursor position. The VDM can be moved to any location pinpointing the depth of a target.

9 Zoom Bar

Range bar that is located on the left side of the Depth Ruler representing the current zoom range. It is turned on in the un-zoomed window of the Standard/zoomed split view to indicate which portion of the Fish finder page is currently represented in the zoomed window.

10 A-Scope

Real time representation of fish and bottom features passing through the beam of the transducer. It is drawn as column of horizontal lines whose length and hue is proportional to the echo strength returned. The stronger the echo the larger shall be the line height. The hue depends on the currently selected palette. When the default palette is selected, on the color Chart Plotters the strongest sonar returns will be shown as red and weaker returns will be shown blue.

11 Operating Frequency

Readout of the selected operating frequency.

3.0.0 Understanding the Fish Finder display

- ① Fishes
- ② Thermoclines
- ③ White Line
- ④ Surface Clutter
- ⑤ Structures
- ⑥ Bottom Echo Profile

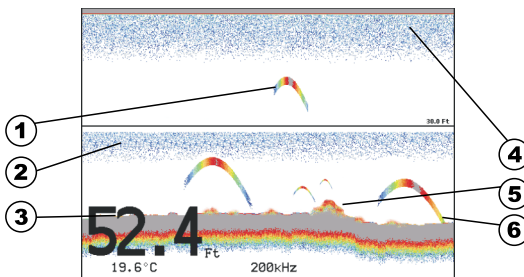


Figure 3.0.0 - The Fish Finder display

① Fishes

Fishes are represented as arcs because of the cone angle of the transducer. In fact as the boat passes over the fish the leading edge of the cone strikes the fish, causing a display pixel to be turned on. As the boat passes over the fish, the distance to the fish decreases turning each pixel on at a shallower depth on the display. When the boat is directly over the fish, the first half of the arch is formed and since the fish is closer to the boat, the signal is stronger and the arch is thicker. As the boat moves away from the fish, the distance increases and the pixels appear at progressively deeper depths forming the remaining half of the arch.

② Thermoclines

Are the zones where two layers of different water temperatures meet. The greater the temperature differential, the denser the thermocline shows on the screen. Thermoclines are represented as horizontal stripes of noise. They are very important for

fishing since often many species of game fish like to suspend in, just above, or just below the thermoclines.

3 White Line

The White Line shows the difference between hard, soft bottoms and even distinguish- es between fishes and structures located near the bottom. In this way it is easier to tell the difference between a hard and soft bottom and even to distinguish fishes and structures located nearby the bottom. For example, a soft, muddy or weedy bottom returns a weaker echo that is shown with a narrow white line while a hard bottom returns a strong echo that causes a wide white bottom line.

4 Surface Clutter

Appears like noise at the top of the screen extending many feet below the surface. It's caused by many things, including air bubbles, bait fish, plankton and algae.

5 Structures

Generally, the term "structure" is used to identify objects like wrecks and weeds rising from the bottom.

6 Bottom Echo Profile

Bottom profile recorded by the FF520. When the echo sounder is set in auto-range mode it is automatically kept in the lower half of the screen.

3.1 DISPLAYING THE FISH FINDER PAGE

This section explains how to show and customize the selection of the Fish Finder display pages. Legend:

[MENU] If you see brackets around a bold and capital letter word this refers to a key press.

[CHART] If you see brackets around a bold and small capital letter word this refers to a Soft Key press.

PAGE SELECTION An underlined word refers to a selection in the menu

NOTE FOR CP180/CP180i/CPV350

In the following the [ENTER] key is the same of the [ENT] key, [CLEAR] is the same of [CLR].

3.1.0 Menu selection for CP155C/CP175C/CP1000C

1. From all pages except the Fish Finder page, press **[MENU]**.
2. Move the ShuttlePoint knob to highlight **FISH FINDER** or move the ShuttlePoint knob to the right.

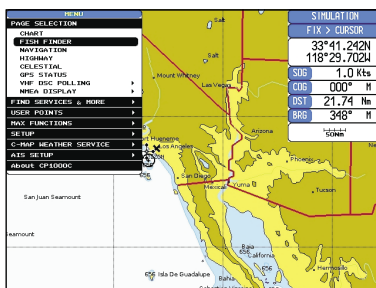


Figure 3.1.0 - Example of Fish Finder page selection by [MENU] on CP1000C

3. Press **[ENTER]** to select the Fish Finder Setup menu.

3.1.0a Menu selection for CP180/CP180i/CPV350

1. From all pages except the Fish Finder page, press **[MENU]**.
2. Move the ShuttlePoint knob to highlight **FISH FINDER**.



Figure 3.1.0a - Example of Fish Finder page selection by [MENU] on CP180/CP180i

3. Press **[ENT]** to select the Fish Finder Setup menu.

3.1.1 Customizing the Fish Finder menu selection

The default setting of the **FISH FINDER** selection in the Main Menu is 200kHz Full page, however this may be changed to show images as shown in the Figure 3.1.1.

From the Chart page:

1. Select the Fish Finder page (see previous Par. 3.1.0 or Par. 3.1.0a).
2. Press **[MENU]**, move the ShuttlePoint knob down to select **PAGE SELECTION** and press **[ENTER]** or move the ShuttlePoint knob to the right.
3. The PAGE SELECTION window will be shown. Move the ShuttlePoint knob up/down or left/right to select the desired display and press **[ENTER]**.

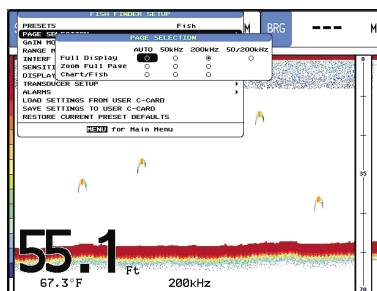


Figure 3.1.1 - Page Selection menu

3.1.2 Soft Keys for CP175C/CP1000C/CPV350

1. Press any of the soft keys to show the key discriptions, then press the 200kHz Full Soft Key.

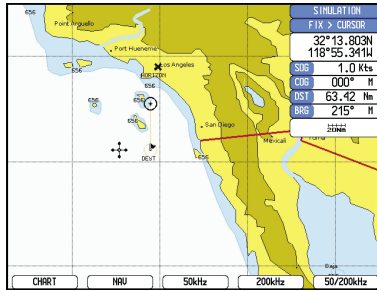


Figure 3.1.2 - Example of Fish Finder page selection by Soft Keys on CP1000C

3.1.3 Customizing the Soft Keys for CP175C/CP1000C/CPV350

All of the Soft Keys may be customized to select the three Fish Finder display to be able to quickly select each mode:

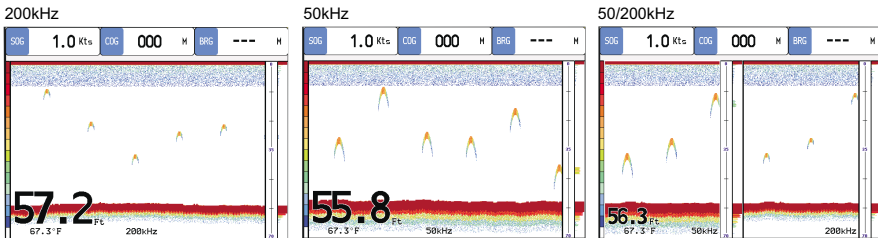


Figure 3.1.3 - Fish Finder FULL DISPLAY pages

To customize a Soft Key :

1. Press any of the Soft Keys.
2. Press and hold one of the Soft Keys until the menu is shown below.

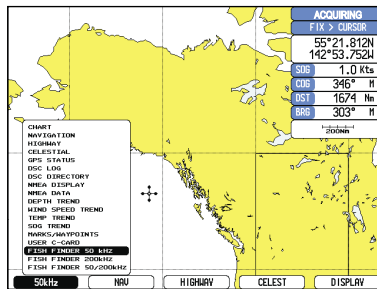


Figure 3.1.3 - 1 - Example of Fish Finder Soft Keys configuration on CP1000C

3. Move the ShuttlePoint to the desired Fish Finder page and press **[ENTER]**.

3.2 KEY OPERATION WHEN FISH FINDER PAGE IS SHOWN

When the Fish Finder pages are shown **[MENU]**, **[ENTER]**, **[CLEAR]**, **[MARK]**, **[ZOOM IN]** and **[ZOOM OUT]** are used to perform specific functions described below.

3.2.0 The MENU key

1. Pressing [MENU] when a Fish Finder page is displayed, will show the Fish Finder Setup:

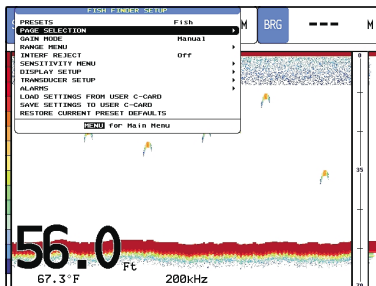


Figure 3.2.0 - The MENU key, Fish Finder Setup

2. If pressed again the GPS Chart Plotters Main Menu will be displayed.

NOTE

To change to the Chart page [MENU] must be pressed 2 times to show the Main Menu. Then move the ShuttlePoint Knob to select the Chart page and press [ENTER] or move the ShuttlePoint knob to select the Chart page.

3.2.1 The ENTER key

1. Pressing [ENTER] when a Fish Finder page is displayed, will show the Sensitivity Menu.

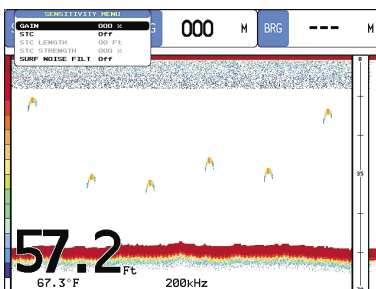


Figure 3.2.1 - The ENTER key, Sensitivity Menu

3.2.2 The CLEAR key

1. Pressing [CLEAR] hides the Variable Depth Marker (VDM).
2. Pressing [CLEAR] in ZOOM mode with AUTORANGE enabled, selects the BOTTOM FOLLOWING mode. In such mode the ZOOMED view automatically follows the bottom contour to keep it always displayed in the lower half of the screen.

3.2.3 The ZOOM IN and ZOOM OUT keys

Pressing [ZOOM IN] when any of the Fish Finder displays are shown, allows the page to be zoomed into 2X or 4X the normal display.

Move the ShuttlePoint knob up or down to move the VDM to the area you wish to zoom into. Press **[ZOOM IN]** once, and 2X will be shown in the bottom left corner of the display. Pressing **[ZOOM IN]** again switches to 4X and again to normal operation. Pressing **[ZOOM OUT]** switches from 4X to 2X and normal.

3.2.4 The MARK key

With the Fish Finder page is displayed, pressing **[MARK]** places a Mark on the chart page under the boat position.

3.2.5 The SHUTTLEPOINT knob

Moving up or down the ShuttlePoint knob when any of the Fish Finder displays are shown, will move the Variable Depth Marker (VDM) up and down.

3.2.6 Controls on Chart page or Fish page in Chart/Fish dual mode

When the GPS Chart Plotter is in the Chart/Fish display mode, it is possible to move the control between the Chart and the Fish:

1. To use the keys on the Chart Page, press **[MENU]** until the Main Menu is shown, then press **[CLEAR]**.
2. To use the keys to control Fish Finder operations, press **[MENU]** to until the display shows the Fish Finder Setup, then press **[CLEAR]**.

The Focus Soft Key for CP175C/CP1000C/CPV350

When the Fish Finder Chart/Fish is displayed, pressing one of the Soft Keys and then pressing **[Focus]** will allow you to move the control between the Chart and the Fish.

3.2.7 Sounder Adjustments with Soft Keys FOR CP175C/CP1000C/CPV350

When the Fish Finder full page is displayed, pressing one of the Soft Keys will allow control of Gain (receiver gain), Noise (Noise threshold), Range (manual depth range), Frequency (200kHz or 50kHz) and Sensitivity Time Control. If no key is pressed the Soft Keys will disappear in 5 seconds. To manually hide the Soft Keys, press **[CLEAR]** .

The GAIN Soft Key

By pressing **[GAIN]** the Gain changes between AUTO GAIN and MANUAL GAIN. If MANUAL GAIN, use the ShuttlePoint knob left/right to adjust it: a bar with the % symbol is displayed on the screen above the **[GAIN]** label. If AUTO GAIN, use the ShuttlePoint knob left/right to adjust the Gain Offset: a bar with the % symbol is displayed on the screen above the **[GAIN]** label.

The NOISE Soft Key

Pressing **[NOISE]** and moving the ShuttlePoint knob to the right or left will increase or decrease the Noise threshold level..

The RANGE Soft Key

By pressing [RANGE] the window switches to the next RANGE status: MANUAL, BOTTOM LOCK and AUTO.

If MANUAL is selected move the ShuttlePoint knob up or down will adjust the depth value in 10 Ft steps. To adjust the Shift move the ShuttlePoint knob to the Left or Right.

When BOTTOM LOCK is selected, move the ShuttlePoint knob up or down to adjust the Bottom range 10 Ft at a time.

If AUTO RANGE, the range value is set automatically by the FF520 and it cannot be changed by the user.

The FREQUENCY Soft Key

Pressing the [FREQUENCY] Soft Key toggles the FF520 output frequency between 50, 200kHz and Auto. The current value or Frequency is shown on a window right over the [FREQUENCY] label. [FREQUENCY] is not shown when the Fish Finder shows 50 and 200kHz Dual page.

The Sensitivity Time Control (STC) Soft Key

[STC] changes the STC value between OFF/SHORT/MID/LONG/CUSTOM. The current value of STC is shown on a window right over the [STC] label. Move the ShuttlePoint knob left or right will adjust the value.

3.3 SYSTEM INFORMATION PAGE FOR CP155C/CP175C/CP100C

For troubleshooting you maybe asked by a Standard Horizon Product Support Technician for the software version of Fish Finder.

The following procedure is how to access this information.

1. From the Chart Page, press [MENU] to open the Main Menu.
2. Move the ShuttlePoint knob to highlight **ABOUT...** and press [ENTER] or move the ShuttlePoint knob to the right.
3. A window will be shown with the system information on the Fish Finder Library version and on the Fish Finder module type and version.
4. Press [CLEAR] to exit.

3.3.0 The System Update menu

The System Update menu allows downloading the Fish Finder firmware into the Fish Finder device. To select this menu follow the procedure:

1. From the Chart Page, press [MENU] to open the Main Menu.
2. Move the ShuttlePoint knob to highlight **ABOUT...** and press [ENTER] or move the ShuttlePoint knob to the right.
3. A window will be shown with the system information.
4. Press [MENU].
5. Move the ShuttlePoint knob to highlight **BBFF FIRMWARE SOFTWARE** and press [ENTER] or move the ShuttlePoint knob to the right.
6. The current Fish Finder firmware version is shown in the System Update window that appears on the screen. Insert the C-CARD with the firmware in one of the GPS Chart Plotter available slots, and the press [ENTER] to update.

7. Move the ShuttlePoint knob to highlight **YES** and press **[ENTER]** to confirm.
8. Press **[CLEAR]** to exit.

WARNING

Turn Off and after few seconds turn On the Fish Finder in case of failed firmware upload.

3.4 SYSTEM INFORMATION PAGE FOR CP180/CP180i/CPV350

For troubleshooting you maybe asked by a Standard Horizon Product Support Technician for the software version of Fish Finder.

The following procedure is how to access this information.

1. From the Chart Page, press **[MENU]** for two times to open the Setup Menu.
2. Move the ShuttlePoint knob to highlight **ABOUT...** and press **[ENT]** or move the ShuttlePoint knob to the right.
3. A window will be shown with the system information on the Fish Finder Library version and on the Fish Finder module type and version.
4. Press **[CLR]** to exit.

3.4.0 The System Update menu

The System Update menu allows downloading the Fish Finder firmware into the Fish Finder device. To select this menu follow the procedure:

1. From the Chart Page, press **[MENU]** for two times to open the Setup Menu.
2. Move the ShuttlePoint knob to highlight **ABOUT...** and press **[ENT]** or move the ShuttlePoint knob to the right.
3. A window will be shown with the system information.
4. Press **[MENU]**.
5. Move the ShuttlePoint knob to highlight **BBFF FIRMWARE SOFTWARE** and press **[ENT]** or move the ShuttlePoint knob to the right.
6. The current Fish Finder firmware version is shown in the System Update window that appears on the screen. Insert the C-CARD with the firmware in one of the GPS Chart Plotter available slots, and the press **[ENT]** to update.
7. Move the ShuttlePoint knob to highlight **YES** and press **[ENT]** to confirm.
8. Press **[CLR]** to exit.

WARNING

Turn Off and after few seconds turn On the Fish Finder in case of failed firmware upload.

4. FISH FINDER SETUP MENU

- From the Full Fish Finder page, press **[MENU]** to show the Fish Finder Setup menu.

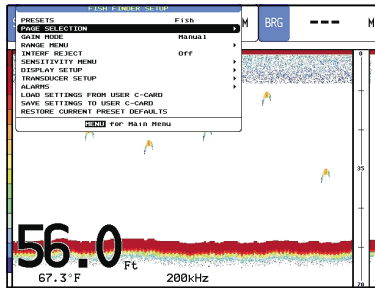


Figure 4 - Fish Finder Setup menu

- From the Chart page, to access this menu:
 - Press **[MENU]**, move the ShuttlePoint knob to **SETUP** and press **[ENTER]**.
 - Move the ShuttlePoint knob to **FISH FINDER SETUP** and press **[ENTER]**.

The following paragraphs describe the Fish Finder Setup menu sub-options.

4.0 PRESETS

Allows selection of the following preset modes: FISH, CRUISE. The default values are:

Fish	: Gain mode = Auto, Range mode = Auto Range, Gain Offset = 0%, Shift = 0, STC = Short, Noise Level = 2, Scrolling Speed = 10, Fish Symbols = Echo, A-Scope = On, Surface Declutter = 0.
Cruise	: Gain mode = Auto, Range mode = Auto Range, Gain Offset = 10%, Shift = 0, STC = Short, Noise Level = 4, Scrolling Speed = 10, Fish Symbols = Echo, A-Scope = On, Surface Declutter = 4.

NOTE

For Gain and Gain Offset settings please see the Sensitivity menu (Par. 4.5).
For Range and Shift settings see the Range menu (see Par. 4.3).

4.1 PAGE SELECTION

The Page Selection menu allows you to adjust the Fish Finder display page to your preference, sizing the Chart and Fish Finder page (see also Par. 3.1.0a).

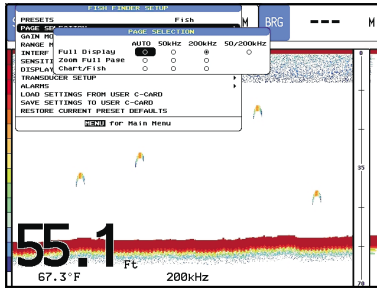


Figure 4.1 - Page Selection sub-menu

The Page Selection options are:

Auto	: Selects automatically the 50kHz if depth is greater than 400 ft and selects 200kHz if depth is less than 300 ft
Full Display	: Shows the full Fish Finder page allowing to select among the 200kHz Standard Fish Finder, 50 kHz Standard Fish Finder or 200/50 kHz Dual Fish Finder.
Chart/Fish	: Shows the Chart page on the left half of the screen and the Fish Finder on the right half of the screen. It is possible to select among the 200kHz Standard Fish Finder or 50 kHz Standard Fish Finder.
Zoom Full page	: Shows the zoomed Fish Finder on the left half of the screen and the unzoomed Fish Finder on the right half of the screen. It is possible to select between the 200kHz Split Fish Finder or the 50 kHz Split Fish Finder zoomed view.

4.2 GAIN MODE

Selects Auto or Manual.

4.3 RANGE MENU

The Range menu allows you to set the Fish Finder working range. The Depth and Shift functions allow the Fish Finder display to be changed from showing information between the bottom of the transducer and the bottom to a range you want to select.

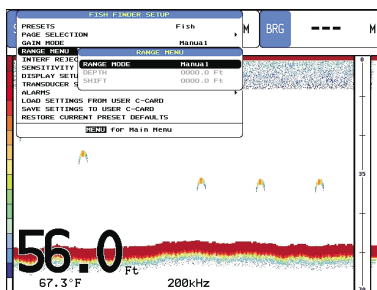


Figure 4.3 - Range sub-menu

The Range options are:

Range Mode	: Selects among Manual, Auto Range and Bottom Lock. In Manual Range Mode is possible to set Shift (the offset from the surface) and depth on which the Fish Finder shall operate. In Auto Range Mode the Fish Finder determines automatically the range as to keep the bottom visible in the lower bottom of the screen. In this mode, Shift is always set to 0. In Bottom Lock Mode the Fish Finder
-------------------	--

automatically tracks the range around the bottom specified by the Bottom Range value.

Depth : Moves the display from showing the bottom to the depth value entered.

Shift : Shifts the display from the bottom of the transducer to the depth value entered.

Example

Your vessel is in about 57FT of water, however there is fish suspended in 35FT of water. You want to display to 10FT area around the fish. Shift would be set to 25FT and Depth would be set to 35FT shown in example below.

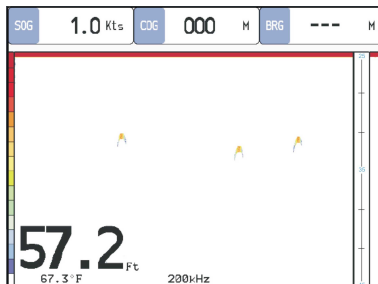


Figure 4.3a - Example of Depth and Shift

NOTE

The options under Range Mode change depending on the current Range Mode.

4.4 INTERFERENCE REJECTION

Selects a filter to remove noise from other sources to external noises.

4.5 SENSITIVITY MENU

The Sensitivity menu is accessible both from the Fish Finder Setup menu and by pressing [ENTER] when in Fish Finder pages. All settings in the Sensitivity menu are related to the Frequency.

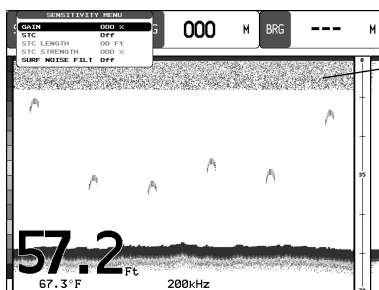


Figure 4.5 - Sensitivity sub-menu

Gain (%) : Allows you to control the sensitivity of the unit's receiver. To see more detail, increase the receiver sensitivity by selecting a higher gain percentage. If there is too much detail or if the screen is cluttered, lowering the sensitivity may increase the clarity of the display.

STC : Sensitivity Time Constant: it is a time varying gain curve which attenuates the sonar receiver gain in shallow water, increasing the gain gradually as the depth increases. This is for the purpose of filtering out surface clutter.

STC Length : If STC is Custom, it is possible to change the Length of the Sensitivity Time Constant.

STC Strength : If STC is Custom, it is possible to change the Strength of the Sensitivity Time Constant.

Surface Noise Filter ()** : This function implements an advanced time varying filter that allows suppressing the surface clutter efficiently while leaving fish targets visible..

NOTE (*)

If the Gain Mode option is set to Auto, the Gain Offset field is active. The default Gain Offset is zero. If the Gain Mode option is set to Manual, the Gain field is active. When switching from Automatic to Manual mode, the Gain + Offset value is copied into the Manual Gain setting of the receiver.

NOTE (**)

Thus imposing the capability of the Fish Finder to correctly detect the weakest echoes coming from a very deep bottom.

4.6 DISPLAY SETUP

The Display Setup menu allows you to change the Fish Finder display page appearance.

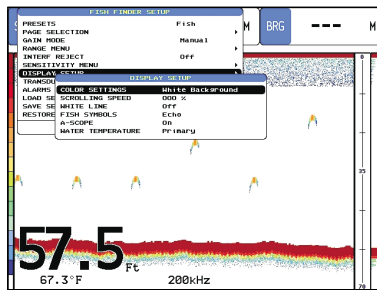


Figure 4.6 - Display Setup sub-menu

The Display Setup options are:

Color Settings : Allows you to change the color of the Fish Finder display.

Scrolling Speed(*) : Adjusts the chart scrolling rate.

White Line : Controls how the STANDARD HORIZON GPS Chart Plotters display information about the bottom type (hard or soft). When the White Line is Off the bottom return will display as red. When the White Line is On it can be used to determine bottom hardness.

Fish Symbols : Allows determining the graphical representation of underwater suspended targets. See below.

Echo: shown as arches (echoes)

Icon + Echo: shown as arches with the Fish icon

Icon + Echo + Depth: shown as arches with the Fish icon and relative depth values

Echo + Depth: shown depth values

Icon: shown as Fish icons without the arches

Icon + Depth: shown as Fish icons and their relative depth values (shown accordingly to currently selected depth unit)

A-Scope : displays Sonar Echo in real time

Water Temperature: Allows you to choose the Water Temperature label displayed over the echogram between Primary and Auxiliary.

NOTE (*)

Note that the max scrolling rate is limited by the sound speed and the depth according with the following relation: the deeper the setting, the slower the scrolling rate.

The following are examples of Color Settings:



Figure 4.6a - Color Settings item

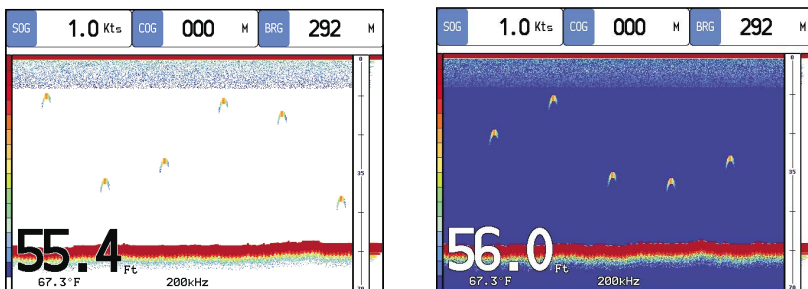


Figure 4.6b - Examples of Color Settings: white on the left and blue on the right

4.7 TRANSDUCER SETUP

This menu allows you to calibrate the speed through the water, water temperature and the keel/prop offset of the transducer.

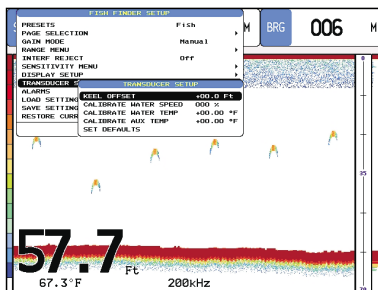


Figure 4.7 - Transducer Setup sub-menu

Keel Offset

: The keel offset can be set as to cause the Fish Finder to report either the depth below the keel or the actual water depth from the surface. If we want the Fish Finder to report the depth below the keel, we have to enter a negative value meaning the transducer is mounted above the keel. So if, the range scale is set to e.g. 20 feet, the actual depth below the transducer is 15 feet and a KEEL OFFSET of -3 feet is entered, then the digital depth shall report 12 feet because that is the depth below the keel and the scale on the graphic image shall change so that the range shown is not 0 to 20 feet but -3 to 17 feet. If we want the Fish Finder to report the actual water depth from the surface, we have to enter a positive value meaning the transducer is mounted below the surface. Assume that the transducer is mounted say 5 feet below the water line and we want the unit to report the water depth from the surface,

we would enter an offset of +5 feet. Then in this example, the digital depth would report a depth of 20 feet (from the surface) and the graphic image scale range would shift from 0 to 20' to 5 to 25'.

Calibrate Water Speed	: Allows calibrating the value of Water Speed coming from the transducer. The calibration value, in the range between -10% to +10%, will be applied to the water speed from the transducer.
Calibrate Water Temp	: Allows the calibration on the Water Temperature sensor. Using the readings from a precise temperature measuring device, insert a positive/negative offset to display the correct temperature.
Calibrate Aux Temp	: Allows the calibration of the Aux Temperature sensor. Using the readings from a precise temperature measuring device, insert here a positive/negative offset to display right value on FF screens.
Set Default	: Restores the factory settings.

4.8 ALARMS

The Alarms menu allows you to define alarm settings for Shallow Alarm, Depth Alarm and Temperature Upper/Lower/Rate. To set an Anchor Alarm, enter in a shallow water and depth value above and below your actual anchoring depth. The alarm will sound when the depth becomes shallower or deeper than the settings.

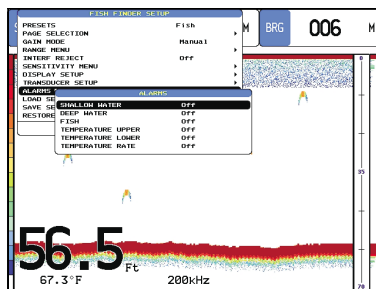


Figure 4.8 - Alarms sub-menu

Shallow Water	: Triggers an alarm when depth becomes shallower than the value set.
Depth Water	: Triggers an alarm when depth becomes deeper than the value set.
Fish	: The options for Fish Alarm set the size of the fishes that, if detected by the unit, switches an alarm to sound. These options are: Off, Small, Medium, Big and Huge. The alarm sounds if the set size (or bigger) is detected.
Temperature Upper	: Triggers an alarm when the transducer reports a temperature above the value set.
Temperature Lower	: Triggers an alarm when the transducer reports a temperature below the value set.
Temperature Rate	: Triggers an alarm when the transducer reports a temperature variation rate above the value set.

4.9 LOAD SETTINGS FROM USER C-CARD

This option loads the complete set of Fish Finder settings from the User C-CARD (Memory card that may be used to backup the User Points and Tracks too).

4.10 SAVE SETTINGS TO USER C-CARD

This option saves the complete set of Fish Finder settings to the User C-CARD. This is useful to avoid the user having to retune up Fish Finder after a Clear RAM operation or a software update.

4.11 RESTORE CURRENT PRESET DEFAULTS

This option restores the default values only for the current presets (see Par. 4.0, Preset) and does not affect the other presets.

5. SPECIFICATIONS

5.0 FF520 SPECIFICATIONS

Power supply	: 10 - 35 Volt dc
Max stand by current draw	: 1KW:142mA at 12 Volt dc : 500W:100mA at 12 Volt dc
Max current draw	: 1KW:1.42A at 12 Volt dc : 500W:1A at 12 Volt dc
Sounder Power	: 500/1000W (4000/8000Wpp)
Display Colors	: 16 colors
Display Vertical Resolution	: 400 pixels on CP1000C/CPV350 : 200 pixels on CP155C/CP175C/CP180/CP180i
Frequency	: Dual 50 and 200kHz
Max Depth*	: 1KW:1200Ft (365m) at 200kHz; 4000Ft (1219m) at 50kHz : 500W:700Ft (213m) at 200kHz; 1500Ft (457m) at 50kHz
Min Depth	: 2.5Ft (0.8m) at 200kHz; 5Ft (1.6m) at 50kHz
Max Typical*	: 1KW:980Ft (299m) at 200kHz; 2700Ft (823m) at 50kHz : 500W:600 Ft (183m) at 200kHz; 1350Ft (411m) at 50kHz

NOTE*

This is not a guaranteed specification. The actual maximum depth capability of the system depends on the type of transducer fitted, the reflectivity of the bottom, water condition, etc.

Data output	: proprietary format
NMEA output sentences	: \$SDDBT; \$SDDPT; \$VWVHW; \$VWVLW; \$YXMTW; \$YXXDR
Weight	: 1 kg (2,20 LBS)
Operating temperature range	: 32F to 122F (0C to +50C)
Storage temperature range	: -4F to 158F (-20C to +70C)
Dimensions - mm (inch)	:

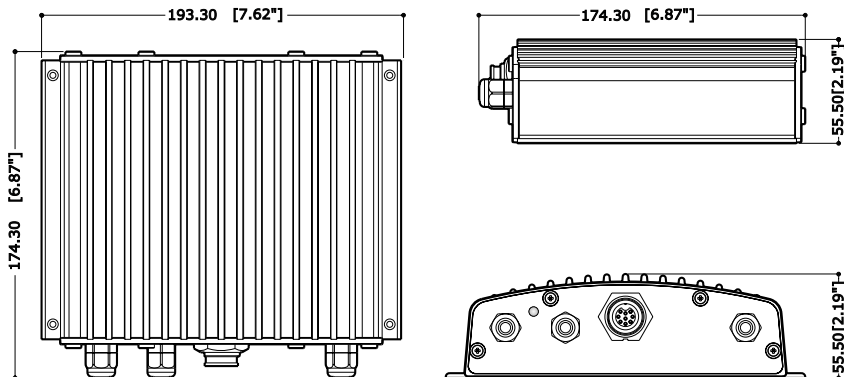


Figure 5.0 - FF520 Dimensions [mm/inch]

NOTE

Performance of the FF520 used in conjunction with optional transducers (sold separately) will vary

based on water conditions, bottom composition, boat hull, vessel speed, installation, and specific transducer model. This includes but is not limited to both minimum and maximum depth performance.

5.1 FF520 INTERNAL CONNECTIONS

NOTE

The image below is for your reference only. Since the FF520 is pre-wired it is recommended that the box not be disassembled.

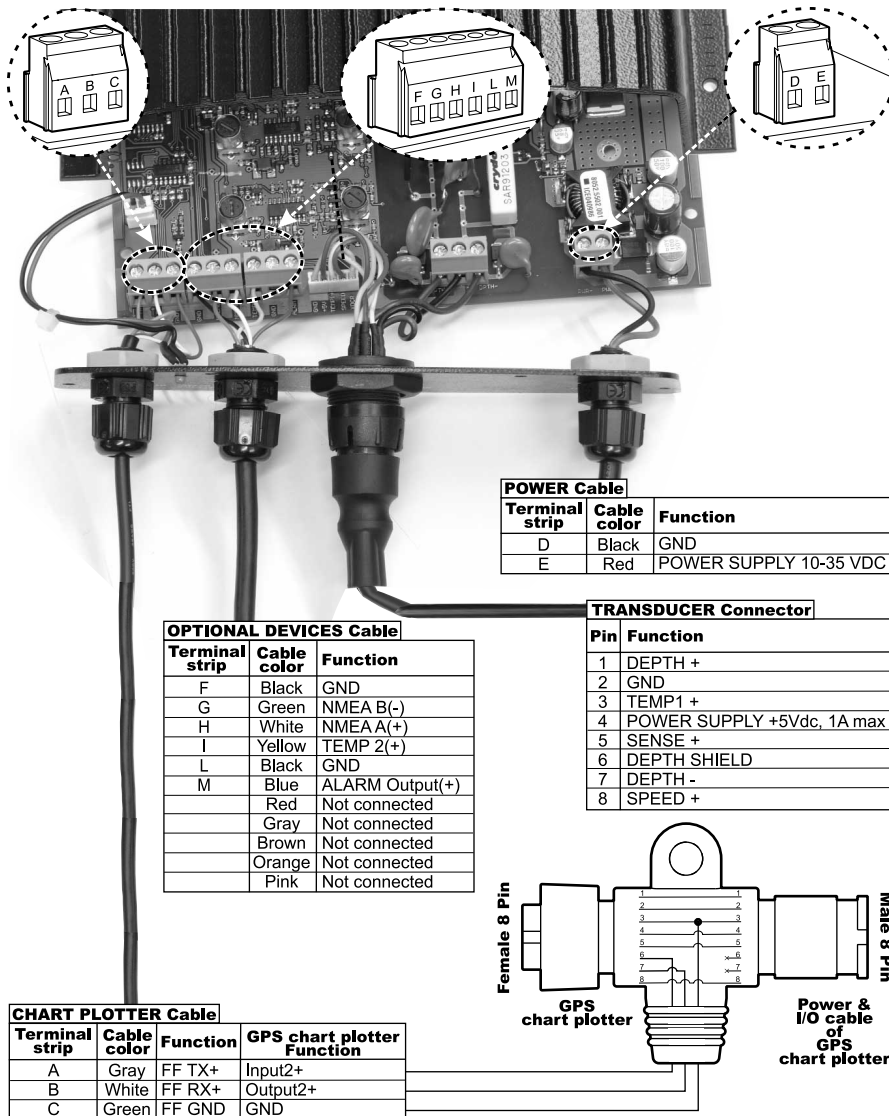


Figure 5.1 - FF520 Internal connections

6. TRANSDUCER

The transducer is a device that transmits and receives sound waves into the water. The active component inside the transducer is commonly referred to as an element but actually is a piezoelectric ceramic material.

6.0 TRANSDUCER MOUNTING

6.0.0 Power Boats

Basically there are 2 hull types of powerboats Planing and Displacement. In the pictures shown below the boxes with lines are where the transducer should be installed.

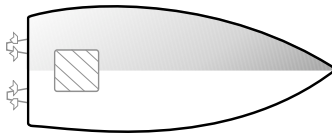


Figure 6.0.0 - Planing

The planing hull allows the boat to rise quickly out of the water, allowing the boat to travel at higher speeds.

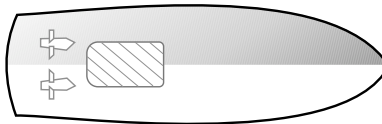


Figure 6.0.0a - Displacement

The displacement hull does not ride up on top of the water; rather it pushes through the water.

6.0.1 Sailboats

Most sailboats that use digital depth sounders/transducers are displacement hulls. There are two basic hull types of sailboats:

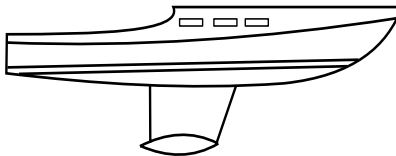


Figure 6.0.1 - Fin Keel

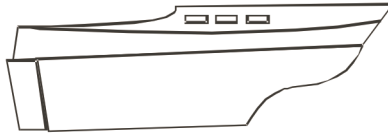


Figure 6.0.1a - Full Keel

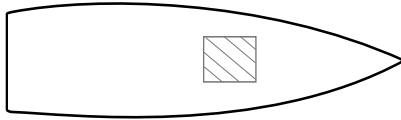


Figure 6.0.1b - Mounting Area

6.0.2 Transducer Types

Since there are many different shapes and sizes of hulls, STANDARD HORIZON offers a range of Depth transducers to fit the vessels requirements.

6.0.3 Low Profile Thru-Hull

If the user is planning to mount a thru-hull transducer first he has to know the dead rise angle where the transducer will be located on the boat. The dead rise is a nautical term that refers to the angle of the hull where the transducer will be mounted (see picture below). Specific transducers are designed to be installed on boats with different dead rises. See Par. 6.1.

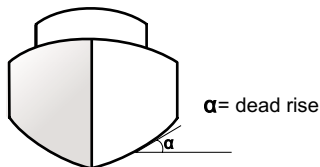


Figure 6.0.3 - Dead rise

6.0.4 Transom POWER BOATS ONLY

The back of a boat is called the transom this is where this transducer is mounted. This transducer has a bracket that is screwed down onto the hull.

6.0.5 Fairing Block

Used when a hull is over 10-15 degrees this type of transducer should be used.

- What makes this transducer different from a Low Profile transducer is that it is used with a fairing block.
- The Fairing block is used to compensate the dead rise of the hull. The fairing block STANDARD HORIZON offers is made from hard plastic which fits around the transducer.
- To install the transducer and fairing block, the user measures the dead rise of the hull and cuts the fairing block to that angle. One half of the fairing block mounts on the inside while the other part of the fairing block mounts on the outside of the hull.

6.0.6 In-hull

This transducer is epoxyed to the inside of the hull that is not more than 1/2 inch thick and is solid not cored.

6.1 OPTIONAL TRANSDUCER ID SENSORS



Figure 6.1 - Optional Transducers

7. TIPS OF OPERATIONS

7.0 HOW CAN I DISCONNECT THE CABLES FROM THE FF520 IN CASE I NEED TO DO SO FOR THE INSTALLATION?

- Open the FF520 box by unscrewing the four screws (see the following figure).

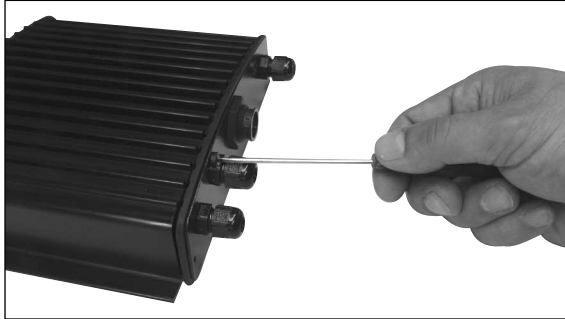


Figure 7.0 - The FF520 (I)

- Once the screws are removed, pull out the panel and the Printed Circuit Board (PCB). Unscrew the cables from the PCB.

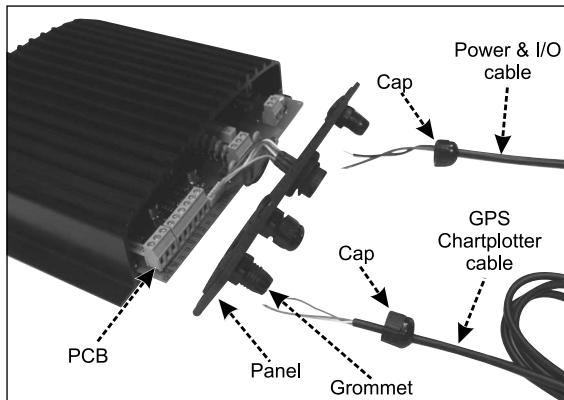


Figure 7.0a - The FF520 (II)

- Wire the cables as needed.
- Reconnect the cables to the PCB (see the Figure 5.1 for reference).
- Push the panel towards the case (be sure to have well positioned the rubber gasket). Close the FF520 box by screwing the four screws.

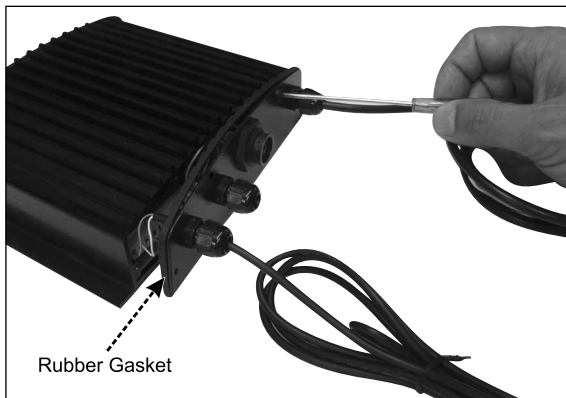


Figure 7.0b - The FF520 (III)

7.1 HOW CAN I SET OPTIMAL OPERATING PARAMETERS.

Optimal operating parameters can be set accordingly with the intended use of the Fish Finder, to quickly get optimal operational parameters for fishing it may be best to select the FISH preset from the Fish Finder Setup menu, while for cruising it may be best to select the CRUISE preset.

7.2 WHAT ARE PRESET MODES?

Preset modes are pre-defined settings of the Fish Finder operating parameters. You can use them to quickly set the Fish Finder in the most commonly used operating modes. These are:

- CRUISE: sets Fish Finder in full auto mode with the sensitivity settings (GAIN OFFSET, NOISE level and STC) optimized for displaying the bottom while underway.
- FISH : sets the Fish Finder in full auto mode with the sensitivity setting optimized for fish finding.

7.3 HOW CAN I RESTORE THE FISH FINDER DEFAULT OPERATING PARAMETERS?

While the Fish Finder page is shown, press **[MENU]** and move the ShuttlePoint knob to Transducer Setup and press **[ENTER]**. Move the ShuttlePoint knob to Set Defaults and press **[ENTER]**. Press **[CONFIRM]** on the C175C/CP1000C/CPV350, or on the CP155C/CP180/CP180i press **[ENTER]**. Note that this operation set all default settings, not only the working defaults.

7.4 CAN I ALWAYS LEAVE THE FISH FINDER IN FULL AUTO/ (AUTO GAIN AND AUTO RANGE) MODE?

Yes, but note that the full auto mode suits the 90% of the cases, however in extreme situations the auto modes may fail and thus it is necessary to switch to the Manual mode.

7.5 WHAT ARE EXTREME SITUATIONS IN WHICH AUTO MODES MAY FAIL?

When the bottom is very deep, at high boat speed, when the bottom is very shallow (< 5 feet),

when the water is full of materials in suspension, with bad sea conditions.

7.6 WHAT SHOULD I DO IF THE AUTO MODES FAIL?

Failure of auto modes can happen for various reasons. Hereafter you can find a range of possibilities.

7.7 AUTO-RANGE FAILS IN VERY SHALLOW WATERS DISPLAYING A DIGITAL DEPTH READOUT DEEPER THAN THE ACTUAL VALUE. WHAT SHOULD I DO?

This usually happens if the STC is set to LONG or MID and the bottom is shallow or SHORT if the bottom is very shallow causing the auto-range to hook to the second or third echo from the bottom (since in shallow waters the sound bounces more times back and forth the surface to the bottom). Try decreasing the STC value to SHORT in shallow waters or to switch it to VERY SHORT or OFF.

7.8 AUTO RANGE FAILS, AND THE DIGITAL DEPTH READOUT DISPLAYS A VERY SHALLOW READING. WHAT SHOULD I DO?

This usually happens if the STC is off or is set to a low value causing disturbance from surface clutter to be stronger than bottom echoes. Try increasing the STC value. As general rule STC has to be set as in shallow waters and LONG in depth waters.

7.9 AUTO-RANGE FAILS IN VERY DEEP WATERS DISPLAYING A DIGITAL VERY SHALLOW DEPTH READOUT. WHAT SHOULD I DO?

The Fish Finder capability to detect the bottom decreases as the bottom depth increase. If the bottom composition is soft as mud, if the sea conditions are bad, if there are thermoclines or the water is full of materials in suspension it can further decrease thus causing the digital depth readout to fail. When this happens the auto-range algorithm also fails. To recover from this situation it is necessary to switch to manual range mode and to set the manual depth mode. When manual depth mode is selected the algorithm that calculates the digital depth readout searches for the bottom within the range manually selected by the user. At this point it is necessary to increase manually the range until the bottom becomes graphically visible. If the echoes from the bottom are strong enough, the Fish Finder shall look to the bottom giving a correct depth reading and shall be possible to return in auto range mode. Please note that if one or more of the conditions that reduce the echoes from the bottom listed above is true the bottom may be not visible at all, in this situation a strong thermocline or surface clutter may be interpreted by the Fish Finder as the bottom.

7.10 AT A VERY SHALLOW RANGE UPPER HALF OF THE SCREEN APPEARS ALMOST COMPLETELY FILLED BY THE SURFACE CLUTTER. HOW CAN I ELIMINATE IT?

This is normal in shallow waters. To clean up the surface clutter without degrading the digital depth readout algorithm functionality there are two modes: 1) If Surface Declutter = OFF it is possible to set the STC value to custom setting the STC length to the same size of the

surface clutter, and increasing the STC strenght until the image on the screen cleans up. Please note that in very shallow waters it is usually better to switch to manual gain mode to reduce gain fluctuation due to rapidly changing bottom conditions. 2) Using Surface Declutter, increase the Surface Declutter value until the surface declutter disappears completely.

7.11 WHY DO I NEVER SEE FISHES IN THE RANGE BETWEEN 0 TO 2 FEET?

The minimum range of the Fish Finder is 2 Feet. In this interval the Fish Finder can detect neither the bottom nor any target.

7.12 HOW CAN I REDUCE THE SURFACE CLUTTER?

You can act by: properly setting the STC as described at 7.10 and also by increasing the NOISE LEVEL and reducing the GAIN or the GAIN OFFSET (if you are in auto gain mode). However please note that a strong attenuation of surface clutter may also reduce the capability to detect targets.

7.13 THE FISH FINDER IS IN AUTO GAIN MODE BUT THE PICTURE DISPLAY TOO MANY SMALL TARGETS, WHAT SHALL I DO TO REDUCE THE SCREEN CLUTTER?

Try increasing the NOISE LEVEL or decreasing the GAIN OFFSET.

7.14 IN VERY SHALLOW WATERS WHEN THE AUTO GAIN MODE IS SELECTED THERE ARE FLUCTUATIONS IN THE BOTTOM PROFILE WIDTH AND ITS COLOR REPRESENTATION. WHAT SHOULD I DO?

In very shallow waters the environment situation (bottom/water condition) change very quickly thus causing the auto gain algorithm to create oscillations while trying to set optimal GAIN value for each situation. To avoid this it is advisable to switch to MANUAL GAIN mode and fine tune the GAIN to a fixed setting.

7.15 IN VERY DEEP WATERS EVEN SETTING THE GAIN TO ITS MAXIMUM VALUE I CANNOT SEE THE BOTTOM WHAT SHALL I DO?

Try decreasing the NOISE LEVEL. If still the bottom is not visible there is nothing you can do, the bottom echo is simply too weak to be detected.

7.16 GPS CHART PLOTTER SHOWS NO DATA WHEN VIEWING THE FISH FINDER PAGE

This may be due to the FF520 having an issue. To confirm, listen to the depth transducer for the transmit pulse. If the pulse is not heard the FF520 is defective.

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