

Matrix™ 87c Operations Manual



531352-1_A



Matrix™
FISHING SYSTEM

Thank You!

Thank you for choosing Humminbird®, America's #1 name in fishfinders. Humminbird® has built its reputation by designing and manufacturing top-quality, thoroughly reliable marine equipment. Your Humminbird® is designed for trouble-free use in even the harshest marine environment. In the unlikely event that your Humminbird® does require repairs, we offer an exclusive Service Policy - free of charge during the first year after purchase, and available at a reasonable rate after the one-year period. For complete details, see the separate warranty card included with your unit. We encourage you to read this operations manual carefully in order to get full benefit from all the features and applications of your Humminbird® product.

Contact our Customer Resource Center at either 1-800-633-1468 or visit our website at www.humminbird.com.

WARNING! This device should not be used as a navigational aid to prevent collision, grounding, boat damage, or personal injury. When the boat is moving, water depth may change too quickly to allow time for you to react. Always operate the boat at very slow speeds if you suspect shallow water or submerged objects.

WARNING! Disassembly and repair of this electronic unit should only be performed by authorized service personnel. Any modification of the serial number or attempt to repair the original equipment or accessories by unauthorized individuals will void the warranty. Handling and/or opening this unit may result in exposure to lead, in the form of solder.

WARNING! This product contains lead, a chemical known to the state of California to cause cancer, birth defects and other reproductive harm.

DualBeam PLUS™, Fish ID™, Humminbird®, HumminbirdPC™, Matrix™, QuadraBeam™, RTS® Window, SmartCast®, WhiteLine®, X-Press™ Menu, Structure ID®, WideSide® and WeatherSense® are trademarks or registered trademarks of Humminbird®.

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Table of Contents

How Sonar Works	1
DualBeam PLUS™ Sonar	1
QuadraBeam™ Sonar (with optional-purchase QuadraBeam™ Transducer)	1
Wideside® Sonar (with optional purchase WideSide® Transducer)	2
How GPS and Cartography Work	2
Multi-Media Card (MMC)	3
What's On the Sonar Display	4
Views	6
Sonar View	7
Understanding Sonar History	8
Real Time Sonar (RTS®) Window	8
Bottom Presentation	9
Sonar Zoom View	10
200/83 kHz Split Sonar View	11
Big Digits View	12
Side Beam View	13
WideSide® View	14
Bird's Eye View	15
Chart View	16
Combo View	17
View Orientation	17
Viewing Cartography	18
Introduction to Navigation	19
Waypoints, Routes and Tracks	19
Save, Edit or Delete a Waypoint	20
Navigate to a Waypoint or Position	21
Add a Waypoint Target or Trolling Grid	22
Save, Edit or Delete a Route	24
Save or Clear a Current Track	24
Edit, Delete or Hide Saved Tracks	25
Key Functions	26
POWER/LIGHT Key	26
VIEW Key	26
INFO Key	26
MENU Key	27
4-WAY Cursor Control Key	27
MARK Key	27
GOTO Key	28
ZOOM (+/-) Key	28
EXIT Key	28

Table of Contents

Accessory Bus	29
Powering Up the Unit	29
The Menu System	30
Start-Up Options Menu	32
Normal Operation	32
Simulator	33
System Status	34
PC Connect (with PC Connect Cable Only)	35
Sonar X-Press™ Menu (Sonar Views Only)	36
Side View (WideSide® Transducer: WideSide® View Only)	37
Sensitivity	37
Upper Range (Advanced: Sonar, Split Sonar and Big Digits Views Only)	38
Lower Range	38
Side Beam Range (WideSide® Transducer: WideSide® View Only)	39
Chart Speed	39
Bottom View	40
Navigation X-Press™ Menu (Navigation Views Only)	41
Save Current Track	42
Clear Current Track	42
Save Current Route (Only When Navigating)	42
Skip Next Waypoint (Only When Navigating)	43
Cancel Navigation (Only When Navigating)	43
Remove Target (Only If a Target is Active)	43
Remove Grid (Only If a Grid is Active)	44
Sonar Window (Combo View Only)	44
Sonar Menu Tab	45
Beam Select	46
Fish ID+™	47
Fish Sensitivity	48
Real Time Sonar (RTS®) Window	48
83 kHz Sensitivity (Advanced)	48
455 kHz Balance (Advanced: with QuadraBeam™ Transducer)	49
WideSide® Sensitivity (Advanced: With WideSide® Transducer)	49
Depth Lines (Advanced)	50
Surface Clutter (Advanced)	51
Noise Filter (Advanced)	51
Max Depth (Advanced)	52
Water Type (Advanced)	52
Transducer Select	52

Table of Contents

Navigation Menu Tab	53
Tracks	54
Waypoints	54
Routes	55
View Orientation	55
Chart Detail Level	56
Map Borders	56
Lat/Lon Grid	57
Spot Soundings	57
Shaded Depth	57
North Reference	57
Grid Rotation	58
Trackpoint Interval	58
Track Min Distance (Advanced)	58
Map Datum (Advanced)	59
Set Simulation Position (Advanced)	59
Set Map Offset (Advanced)	59
Clear Map Offset (Advanced)	60
Delete All Nav Data (Advanced)	60
Alarms Menu Tab	61
Depth Alarm	62
Fish ID Alarm	62
Low Battery Alarm	62
Temp Alarm	63
Off Course Alarm	63
Arrival Alarm	64
Drift Alarm	64
Alarm Tone	65
Setup Menu Tab	66
Units - Depth	67
Units - Temp (International Only)	67
Units - Distance	67
Units - Speed	68
User Mode	68
Language (International Only)	68
Triplog Reset	69
Restore Defaults	69
Select Readouts (Advanced, Sonar View Only)	70
Depth Offset (Advanced)	71
Temp Offset (Advanced)	71
Speed Calibration (Advanced, with Temp/Speed Only)	71
Local Time Zone (Advanced)	72

Table of Contents

Daylight Savings Time (<i>Advanced</i>)	72
Position Format (<i>Advanced</i>)	72
Time Format (<i>Advanced, International Only</i>)	73
Date Format (<i>Advanced, International Only</i>)	73
NMEA Output (<i>Advanced</i>)	74
Sonar	74
Views Menu Tab	75
Accessories Menu Tab	76
Troubleshooting	77
Matrix™ Doesn't Power Up	77
Matrix™ Defaults to Simulator with a Transducer Attached	77
Display Problems	78
Finding the Cause of Noise	79
Matrix™ Accessories	80
Specifications	81
Contact Humminbird®	82

NOTE: Entries in this Table of Contents which list (*International Only*) are only available on products sold outside of the US and Canada by our authorized International Distributors. To obtain a list of authorized International Distributors, please visit our website at www.humminbird.com or contact our Customer Resource Center at 1-800-633-1468 to locate the distributor nearest you.

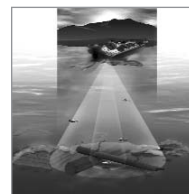
NOTE: Entries in this Table of Contents which list (*with PC Connect Cable Only*) or (*with Optional-Purchase QuadraBeam™/WideSide® Transducer*) or (*with Temp/Speed Only*) require the purchase of separate accessories. You can visit our website at www.humminbird.com to order these accessories online or contact our Customer Resource Center at 1-800-633-1468.

How Sonar Works

Sonar technology is based on sound waves. The Matrix™ Fishing System uses sonar to locate and define structure, bottom contour and composition, as well as depth directly below the transducer.

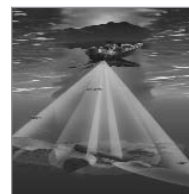
Your Matrix™ Fishing System sends a sound wave signal and determines distance by measuring the time between the transmission of the sound wave and when the sound wave is reflected off of an object; it then uses the reflected signal to interpret location, size, and composition of an object.

Sonar is very fast. A sound wave can travel from the surface to a depth of 240 ft (70 m) and back again in less than ¼ of a second. It is unlikely that your boat can "outrun" this sonar signal.



DualBeam PLUS™ Sonar

Your Matrix™ 87c is shipped with a 200/83 kHz DualBeam PLUS™ sonar system with a wide (60°) area of coverage. DualBeam PLUS™ sonar returns can be blended together, viewed separately or compared side-by-side. DualBeam PLUS™ is ideal for a wide range of conditions - from shallow to very deep water in both fresh and salt water. Depth capability is affected by such factors as boat speed, wave action, bottom hardness, water conditions and transducer installation.



QuadraBeam™ Sonar (with Optional-Purchase QuadraBeam™ Transducer)

Your Matrix™ 87c also supports QuadraBeam™ sonar with the purchase of an additional QuadraBeam™ transducer. QuadraBeam™ sonar provides an extremely wide 90° area of coverage. QuadraBeam™ starts with two 45° 455 kHz beams for a continuous 90° of uninterrupted side to side coverage to 160 feet. These Side Structure locating beams reveal fish and structure to the left and right of your boat near the bottom. For structure directly below your boat, QuadraBeam™ uses DualBeam PLUS™ technology.

WideSide® Sonar (with Optional-Purchase WideSide® Transducer)

Your Matrix 87c Fishing System also supports WideSide® sonar with the purchase of an additional WideSide® transducer. The WideSide® transducer is a specialized "side-looking" transducer that is extremely useful for bank fishing or looking for bait fish in open water. The WideSide® transducer uses three different sonar elements that transmit signals to the left, right and straight down from your boat. The downward beam is 200 kHz with a 24° area of coverage. This beam maintains a continuous digital depth readout from the bottom directly beneath your boat. The side beams are 455 kHz with a 16° area of coverage. The side-looking elements can be used independently, or together to locate targets near the surface of the water on either side of your boat.

How GPS and Cartography Work

Your Matrix™ uses GPS and sonar to determine your position, display it on a grid, and provide detailed underwater information. The Global Positioning System (GPS) is a satellite navigation system designed and maintained by the U.S. Department of Defense. GPS was originally intended for military use; however, civilians may also take advantage of its highly accurate position capabilities, typically within +/- 10 meters, depending on conditions. This means that 95% of the time, the GPS receiver will read a location within 10 meters of your actual position. Your GPS Receiver also uses information from WAAS (the Wide Area Augmentation System), EGNOS (the European Geostationary Navigation Overlay Service), and MSAS (the MTSAT Satellite Augmentation System) satellites if they are available in your area.

GPS uses a constellation of satellites that continually send radio signals to the earth. Your present position is determined by receiving signals from up to 12 satellites and measuring the distance from the satellites.

The GPS Receiver included with your Matrix™ allows you to combine easy-to-use FishingGPS™ chartplotter and navigation capabilities with advanced fishfinding. The following GPS functionality is currently supported by the Matrix™ when it is connected to the included GPS receiver:

- View current position
- View current track (breadcrumb trail)
- View precision speed and heading from your GPS receiver
- Save tracks, waypoints and routes
- Travel a route and navigate from one waypoint to the next.

Your Matrix™ supports Navionics® Gold Chart marine cartography and Navionics® HotMaps™ 2004 Gold for inland fishing.

NOTE: Your Matrix™ does not support Navionics® Classic Charts, only Navionics® Gold Charts and Navionics® HotMaps™ 2004 Gold Charts.

Your unit also comes with a built-in World map with a more detailed map of North America (Domestic models) or a more detailed map of Europe and Southeast Asia, including Australia and New Zealand (International models).

Your Matrix™ uses the GPS Receiver to determine the position of the boat automatically, and uses the zoom level settings on a particular view to select the best chart to display. See Viewing Cartography for more information.



Multi-Media Card (MMC) Slot

Multi-Media Card (MMC)

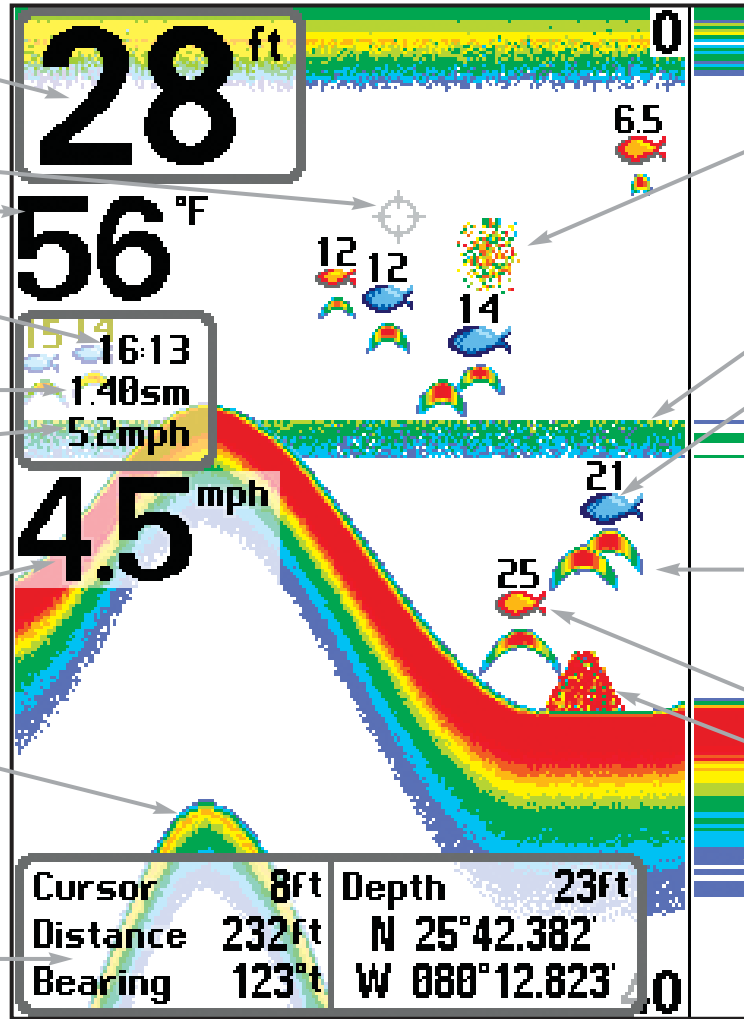
Your Matrix™ also has a multi-media card (MMC) slot that is used to insert optional-purchase cards containing additional detailed maps. If you insert an MMC that contains a more detailed chart for a particular location, your Matrix™ will retrieve that chart and display it automatically. Use the illustration to locate the position of the MMC slot cover, remove the MMC slot cover, and then insert the MMC into the slot. The label on the MMC should face away from you so that you're looking at the back of the card. Press down on the card until it clicks into place, then replace the slot cover, making certain that the gasket is present and positioned correctly before re-installing the cover, then replace and tighten the screw snugly - do NOT overtighten, as this will not improve water resistance, and may damage the cover.

What's On the Sonar Display

The Matrix™ can display a variety of useful information about the area under and adjacent to

your boat, including the following items:

- Depth** - water depth; can be set to alarm when the water becomes too shallow.
- Cursor** - available in Freeze Frame and can be positioned in the Sonar View to provide depth of a sonar return and bottom depth below the cursor.
- Temperature** - water surface temperature.
- Timer** - Elapsed time with Temp/Speed Accessory or GPS Receiver.
- Distance** - Distance traveled with Temp/Speed Accessory or GPS Receiver.
- Average Speed** - Average speed reading with Temp/Speed Accessory or GPS Receiver.
- Speed** - if a Temp/Speed accessory or GPS Receiver is attached, the Matrix™ can display the speed of the boat, and can keep a Triplog of nautical or statute miles traveled.
- Second Sonar Return** - when the sonar signal bounces between the bottom and the surface of the water and back again. Use the appearance of the second return to determine bottom hardness. Hard bottoms will show a strong second return, while soft bottoms will show a very weak one or none at all.
- Cursor Dialog Box** - indicates cursor depth on the display and the depth of the bottom directly below the cursor. In addition, the Latitude and Longitude of the cursor position is shown, the distance to travel to the cursor position and the bearing to the cursor position. A waypoint can be marked at the cursor position for later retrieval and use.



- High Sonar Intensity Return**
- Bait Ball**
- Thermoclines** - layers of water with different temperatures that appear at different depths and different times of the year. A thermocline typically appears as a continuous band of many colors moving across the display at the same depth.
- 83 kHz Blue Fish Symbol**
- Fish** - are displayed as arches and/or fish icons, and can be set to alarm when a fish of a certain size is detected. When a target is detected, a Fish ID+™ symbol appears on the display with the depth displayed above it. The size of the symbol indicates the intensity of the sonar return. The unit will clearly show schools of Bait Fish as "clouds" of different shapes and sizes, depending on the number of fish and boat speed.
- 200 kHz Orange Fish Symbol**
- Structure** - where fish may be hiding.
- RTS® (Real Time Sonar) Window**
- Low Sonar Intensity Return**

NOTE: Entries in this view that list (with Temp/Speed or GPS Receiver) are available if either device is connected to the Matrix™ Fishing System. If both devices are connected, then only the information from the GPS receiver will be displayed on the view.

connected to the Matrix™ Fishing System. If both devices are connected, then only the information



Views

The views available on your Matrix™ are:

Sonar views:

- Sonar View
- Zoom View
- 200/83 kHz Split Sonar View
- Big Digits View
- Side Beam View
- WideSide® View

Navigation views:

- Bird's Eye View
- Chart View
- Combo View

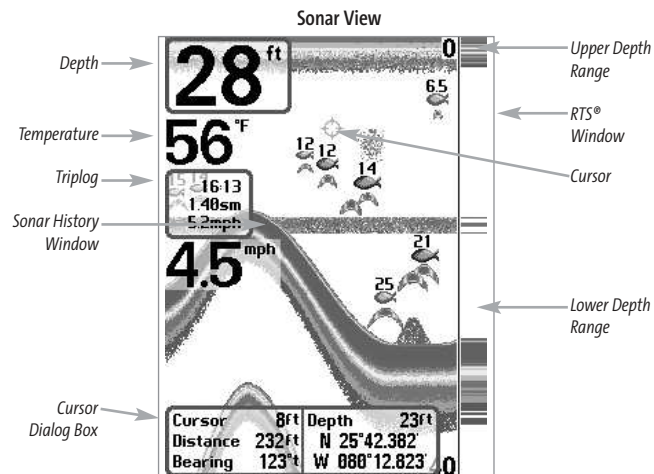
NOTE: Side Beam View and WideSide® View requires the purchase of the QuadraBeam™ transducer for the Side Beam View and the WideSide® transducer for the WideSide® View. You can visit our website at www.humminbird.com to order these accessories online or contact our Customer Resource Center at 1-800-633-1468.

Sonar View is the default view. When the VIEW key is pressed, the display cycles through the available views. When the EXIT key is pressed, the display cycles through the available views in reverse order. Any view can be hidden or displayed as part of the view rotation using the Views Menu tab.

NOTE: When you change any menu settings that affect the sonar, the view will update immediately (i.e. you don't have to exit the menu to apply the change to the screen).

Sonar View

Sonar View presents a historical log of sonar returns. Depth is always displayed. Readouts for temperature and speed are automatically displayed if the appropriate accessory is connected. The most recent sonar returns are charted on the right side of the window; as new information is received, the older information is moved across the display to the left. A Digital Depth Readout is displayed in the upper left corner. A scale with Upper and Lower Depth Range readouts appears along the right edge of the Sonar View. The scale indicates the distance from the surface of the water to a depth range sufficient to show the bottom. Depth Range is automatically selected to keep the bottom visible on the display, although you can adjust it manually as well (see **Sonar X-Press™ Menu**). Five additional Digital Readouts display information from optional-purchase accessories. These information boxes can be customized to show only the information desired (see **Setup Menu Tab, Select Readouts**).



NOTE: If the Depth number is flashing, it means that the unit is having trouble locating the bottom. This usually happens if the water is too deep, the transducer is out of the water, the boat is moving too fast, or for any other reason that the unit can't accurately receive continuous data.

Freeze Frame - Pressing any arrow on the 4-WAY Cursor Control key will freeze the screen in the Sonar View and a cursor and cursor dialog box will be displayed on the screen. The cursor can be positioned on the display using the 4-WAY Cursor Control key to determine the depth of any sonar return. The RTS® Window continues to update in Freeze Frame. In addition, see the effects of menu setting changes with Instant Image Update. Pressing EXIT will exit Freeze Frame and the display will start to scroll. Freeze Frame is only available in the Sonar View.

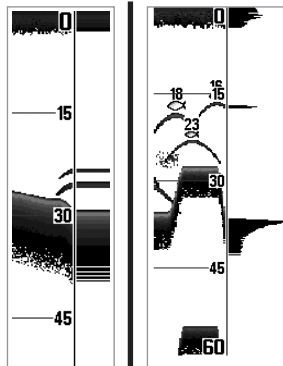
Understanding Sonar History

It is important to understand the significance of the Matrix™ display. The display does NOT show a literal 3-dimensional representation of what is under the water. Each vertical band of data received by the control head and plotted on the display represents something that was detected by a sonar return at a particular time. As both the boat and the targets (fish) may be moving, the returns are only showing a particular segment of time when objects were detected, not exactly where those objects are in relation to other objects shown on the display.

Real Time Sonar (RTS®) Window

A Real Time Sonar (RTS®) Window appears on the right side of the display in the Sonar View only. The RTS® Window always updates at the fastest rate possible for depth conditions and shows only the returns from the bottom, structure and fish that are within the transducer beam. The RTS® Window plots the depth and intensity of a sonar return. (See *Sonar Menu: RTS® Window*).

The **Narrow RTS® Window** indicates the sonar intensity through the use of colors. Red indicates a strong return and blue indicates a weak return. The depth of the sonar return is indicated by the vertical placement of the return on the display depth scale.



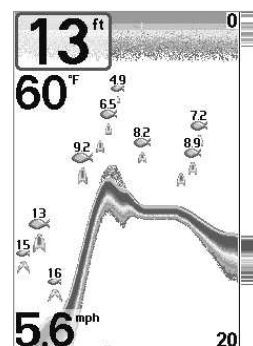
The **Wide RTS® Window** indicates the sonar intensity through the use of a bar graph. The length of the plotted return provides an indication of whether the return is weak or strong. The depth of the sonar return is indicated by the vertical placement of the return on the display depth scale.

Bottom Presentation

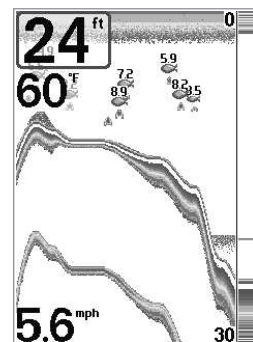
As the boat moves, the unit charts the changes in depth on the display to create a profile of the **Bottom Contour**. The type of bottom can be determined from the return charted on the display. A **Hard Bottom** such as compacted sediment or flat rock appears as a thinner line across the display. A **Soft Bottom** such as mud or sand appears as a thicker line across the display. **Rocky Bottoms** have a broken, random appearance.

NOTE: A sloping bottom will be represented as a thicker line across the display. Also, harder bottoms will be typically displayed with red and softer bottoms will be typically displayed with blue.

The sonar returns from the bottom, structure and fish can be represented as either **Structure ID®** or **WhiteLine®**. See *Sonar X-Press™ Menu: Bottom View* for details on how to set the bottom view.



Structure ID® represents weak returns in blue and strong returns in red.



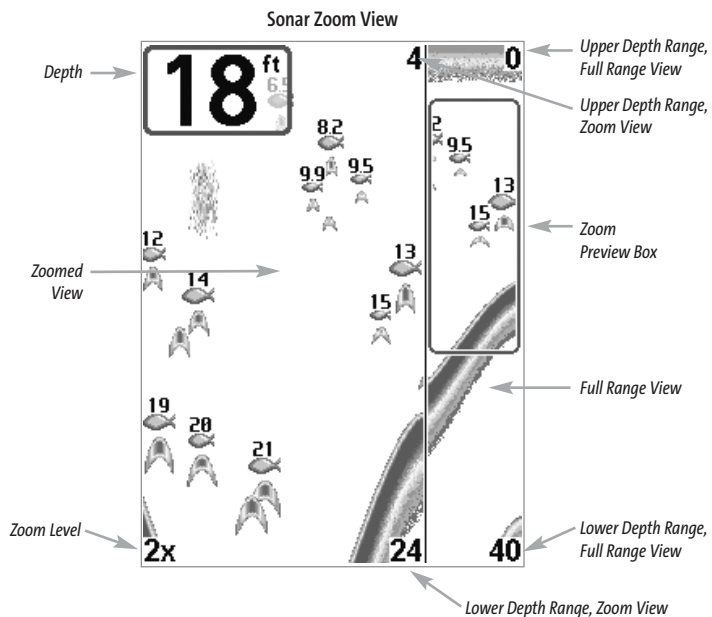
WhiteLine® highlights the strongest sonar returns in white, resulting in a distinctive outline. This has the benefit of clearly defining the bottom on the display.

Sonar Zoom View

Sonar Zoom View increases the displayed resolution to separate sonar returns that are very close together, such as those caused by fish suspended close to the bottom or within structure. In Zoom View, the display is split to show a narrow slice of the full range view on the right and the zoomed view on the left. The full range view on the right also contains the Zoom Preview Box that shows what part of the full range view is shown in zoom view on the left; the Zoom Preview Box tracks the bottom in the full range view.

As the depth changes, the zoomed view updates automatically to display a magnified image of the bottom. The Zoom Preview Box shows where the zoomed view is in relation to the full range view. The Zoom Level, or magnification, is displayed in the lower left corner and can be changed to suit conditions (see *Sonar X-Press™ Menu: Zoom Level*). Upper and Lower Zoom Depth Range numbers indicate the depth of the water which is being viewed.

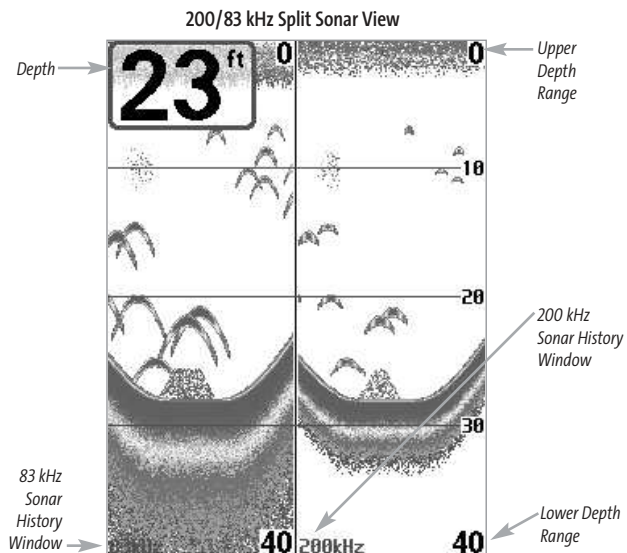
Digital depth is displayed in the upper left hand corner. The digital readouts in the Sonar Zoom View cannot be customized; therefore, information such as water temperature and voltage are unavailable in the Sonar Zoom View.



200/83 kHz Split Sonar View

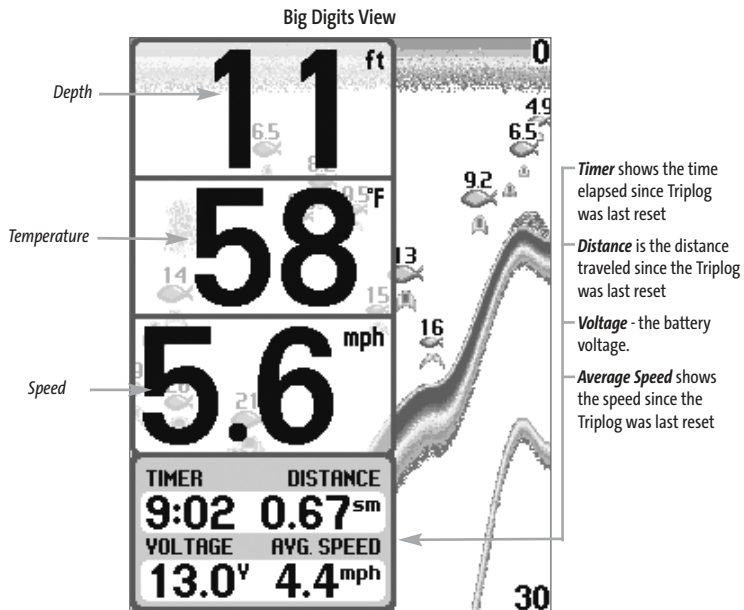
Split Sonar View displays sonar returns from the 83 kHz wide beam on the left side of the screen and displays sonar returns from the 200 kHz narrow beam on the right side of the screen. Depth is always displayed in the upper left hand corner. You can use the Split Sonar View to make side by side comparisons between the sonar returns from the 83 kHz wide beam and the 200 kHz narrow beam.

The digital readouts in the Split Sonar View cannot be customized; therefore, information such as water temperature and voltage are unavailable in the Split Sonar View.



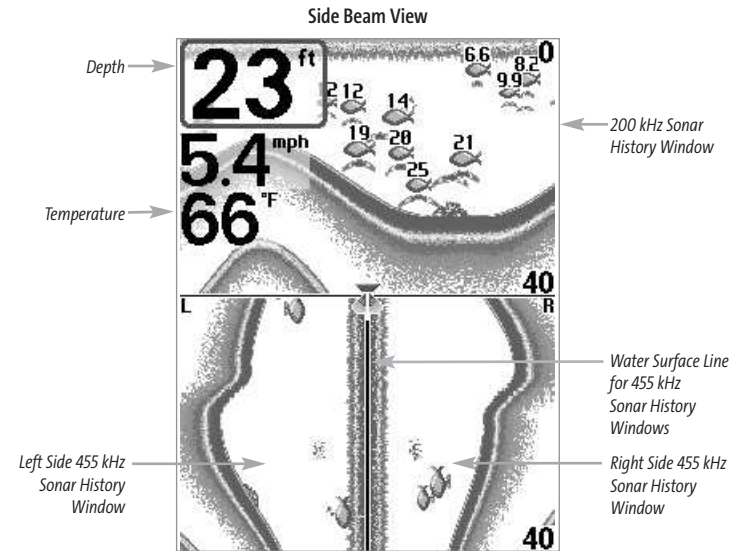
Big Digits View

Big Digits View provides digital data in a large, easy-to-see format. Depth is always displayed. Readouts for temperature, speed and Triplog information are displayed automatically if the appropriate accessory is connected to the Matrix™. The Triplog shows distance traveled, average speed, and time elapsed since the Triplog was last reset. The digital readouts in the Big Digits View cannot be customized.



Side Beam View

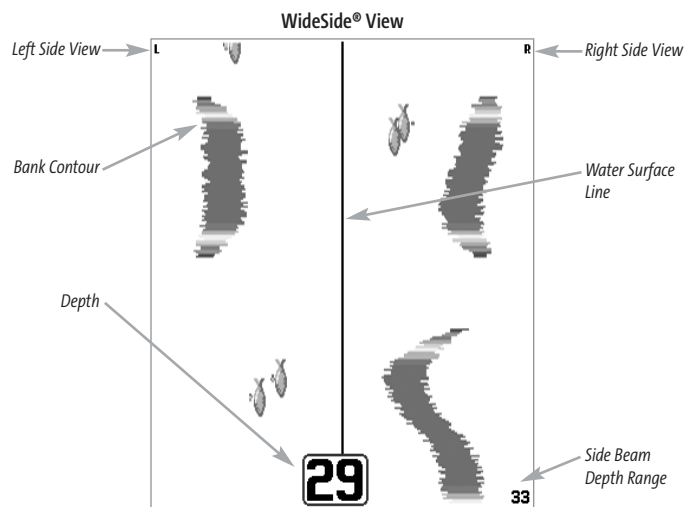
Side Beam View is only available if you have connected a QuadraBeam™ transducer accessory and when Transducer Select is set to QuadraBeam™ (see *Sonar Menu Tab: Transducer Select*). The QuadraBeam™ transducer requires a separate purchase. This view shows sonar information from both the left and right 90° 455 kHz beams and the 200 kHz down-looking beam in one view. The top portion of the display presents a historical log of sonar returns from the 200 kHz down-looking sonar. The bottom portion of the display presents a historical log of sonar returns from the 455 kHz right- and left-looking sonar. New information appears at the top, and scrolls down the display.



The sonar information from the side-looking beams reveals bottom contour, structure and fish similar to the down-looking beam, but the area covered is to the left and right of the area shown in the down-looking portion, so you actually see more of the bottom. The distance covered by the right and left 90° beams is based on the depth setting for the down-looking beam, up to a maximum of 160 feet.

WideSide® View

WideSide® View is only available if you have connected a WideSide® transducer accessory and when Transducer Select is set to WideSide® (see *Sonar Menu Tab: Transducer Select*). The WideSide® transducer requires a separate purchase. The WideSide® View displays information from the 455 kHz SideView transducer. Three views are available: Left, Right and Both. The default view is Both. Information from both the left and right beams are displayed simultaneously. The depth of the water beneath the boat is always displayed. A bottom contour may be present while bank fishing or fishing river channels. When fishing in the open water, a bottom contour will not be present, and only sonar returns from either debris or fish will be displayed.



Bird's Eye View

Bird's Eye View shows a 3D perspective view of the track and the chart land contour from a point above and behind the boat (the eye point). As the boat turns, the eye point moves to follow the boat.

When you press the 4-WAY Cursor key in the Bird's Eye View, the position of the eye point will shift. This allows you to move and turn the eye point so that you can look off to the sides, or even behind the boat. Pressing the RIGHT or LEFT arrow keys on the 4-WAY Cursor key turns the eye point right or left, while pressing the UP arrow key moves the eye point forward, and pressing the DOWN arrow key moves the eye point backward.

Pressing the EXIT key moves the eye point back to its original position behind and above the boat.

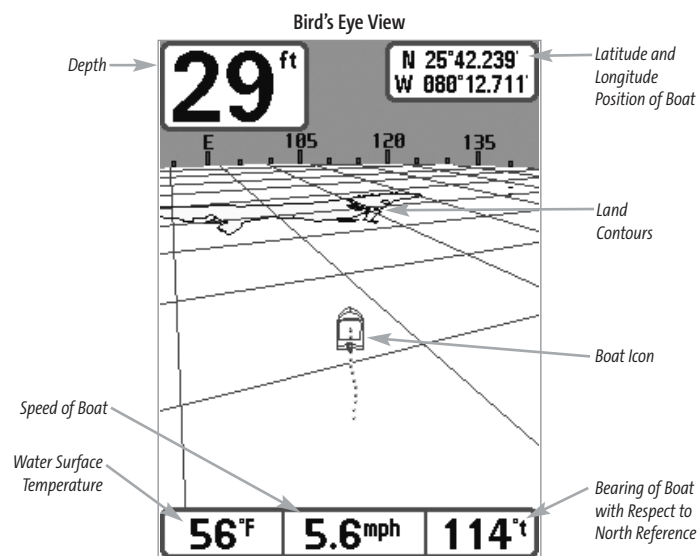
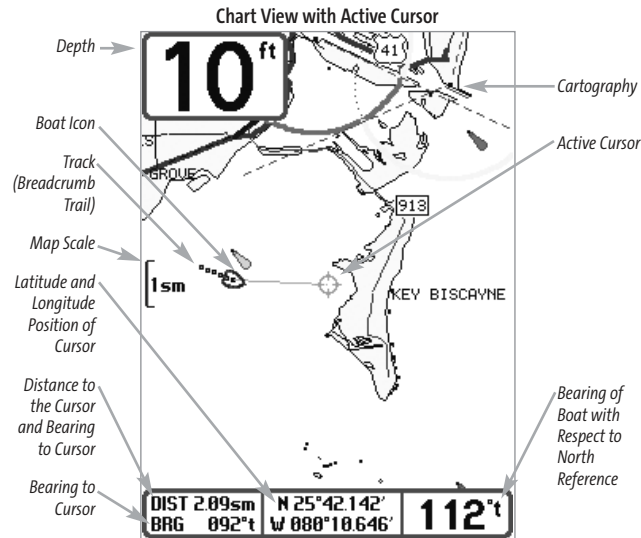


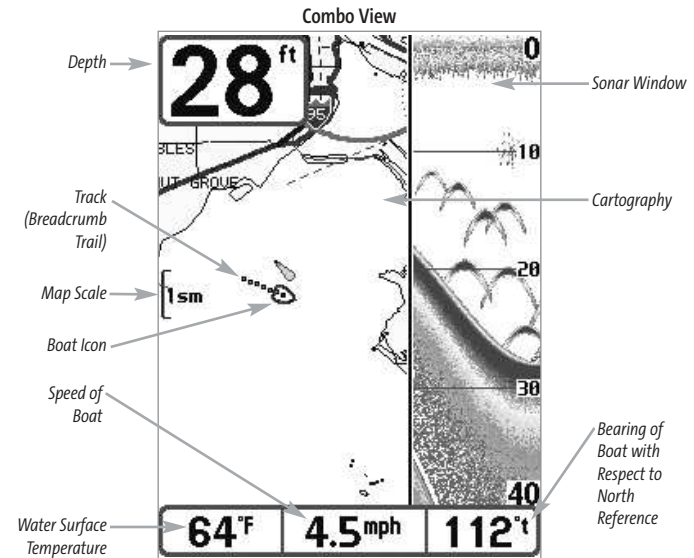
Chart View

Chart View shows cartography from the built-in UniMap™ or an optional MMC map for the area surrounding your current position. The current track (also known as the position history or breadcrumb trail) showing where the boat has been, along with saved tracks, waypoints, and the current route (when navigating), are overlaid on the chart. You can use the 4-WAY Cursor Control key to shift/pan the chart to another area. You can use the ZOOM (+/-) keys to zoom in and out. You can use the INFO key to get information on the chart objects near the cursor.



Combo View

Combo View is displayed as a split screen, with Chart View on the left and Sonar View on the right side of the screen. The width of the sonar window can be changed.



View Orientation

Both **Chart** and **Combo** views allow you to choose the orientation of the view. When North-Up orientation is selected, True North is shown at the top of the display. In other words, objects located to the north of the boat are drawn above the boat. When Course-Up orientation is selected, the direction of motion of the boat is shown at the top of the display. In other words, objects ahead of the boat are drawn above the boat. In both orientations, the view pans automatically, so that the boat is always centered on the display. When the boat is stationary, it is drawn as a circle. When the boat is in motion, it takes on a boat shape, pointed in the direction of motion (always Up in the Course-Up orientation).

Viewing Cartography

In the **Chart** or **Combo** Views, there are several cartography-related functions that you can access using various keys.

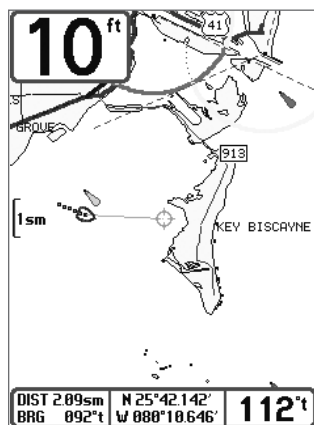


Chart View with Cursor Present

Panning: Use the 4-WAY Cursor keys to move the chart around on the display in the direction of the key being pressed. When you do this, a Bullseye Cursor is drawn at the center of the screen and is linked to the boat by a yellow line, even if the boat is off the screen. At the same time, the temperature and speed boxes in the lower left corner are replaced with the distance and bearing from the boat to the cursor position and the latitude/longitude coordinates of the cursor.

Zooming: Use the Plus (+) key to Zoom In and the Minus (-) key to Zoom Out showing the cartography at different scales. The scale is indicated on the left side of the display. If you zoom in beyond the available chart data, the display will go into Overzoom mode whereby the last available chart data is amplified to reflect the scale selected. If you zoom in so far that no cartography is available, a lat/long grid will be drawn instead.

Chart Info: Use the INFO key to get detailed information about the chart. If the cursor is active, you will see information about the chart objects located near the cursor. If the cursor is not active, the Chart Info menu will appear. You can select the nearest port, the nearest tide station, or the nearest current station to see information about any of these objects.

NOTE: The built-in UniMap™ does not contain any Port, Tide or Current information. This information is only available from optional-purchase MMC cards.

Nearest Port: The position and services information for the nearest port to your present position will be displayed. Press the EXIT key to remove the information box and the Bullseye Cursor will be centered over the port position. The Cursor Information Boxes at the bottom of the display will indicate the distance and bearing to the port from your present position.

Nearest Tide Station: Tide information for the nearest tide station to your present position will be displayed. This includes the position of the station and the times of the high and low tides for today's date. A tide graph is also displayed showing the rise and fall of the tides for the 24 hour time period encompassing the date. You can change the date to look at tide information before or after the date displayed by pressing the LEFT or RIGHT Cursor key respectively. Press the EXIT key to remove the information box and the Bullseye Cursor will be centered over the tide station position. The cursor information boxes at the bottom of the display will indicate the distance and bearing to the tide station from your present position.

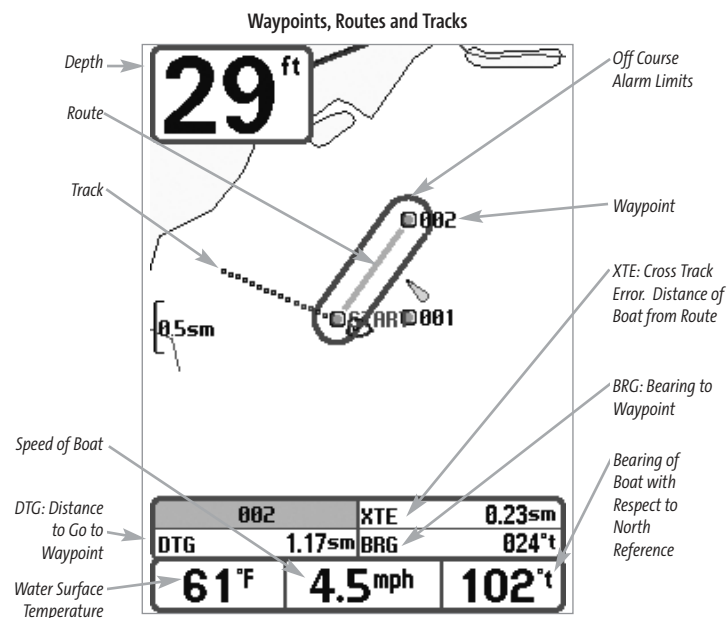
Nearest Current Station: Current information for the nearest current station to your present position will be displayed. This includes the position of the station and the current changes for today. Two graphs are also presented that show the time, direction and flow speed of the current changes for the 24 hour time period of today's date. You can change the date to look at current information before or after the date displayed by pressing the LEFT or RIGHT Cursor key respectively. Press the EXIT key to remove the information box and the Bullseye Cursor will be centered over the current station position. The Cursor Information Boxes at the bottom of the display will indicate the distance and bearing to the current station from your present position.

Introduction to Navigation

Use the Matrix™ to establish waypoints at areas of interest and to navigate to those waypoints via a saveable route (representing the shortest intended distance between waypoints). You can also view and save tracks, which represent the actual path of the boat.

Waypoints, Routes and Tracks

Waypoints are stored positions that allow you to mark areas of interest or navigation points. Your Matrix™ can store up to 750 waypoints.



Routes link two or more waypoints together to create a path for navigation, and are used in trip planning. You can link individual waypoints together by using the GOTO key. A route represents your intended navigation and shows the shortest path from each waypoint to the next. As you travel a route, staying on the route line is the most efficient way to get to your destination, although you should always look out for obstacles not shown on the chart. Your Matrix™ can store up to 10 routes that can each contain up to 20 waypoints.

Tracks consist of detailed position history, and are displayed as a breadcrumb trail of trackpoints. The Current Track shows the position history since the unit was powered up (maximum of 2000 trackpoints displayed). You can clear the Current Track or save it at any time. Your Matrix™ can store up to 10 saved tracks, each containing 2000 trackpoints. The current track represents your actual path so far.

Save, Edit, or Delete a Waypoint

Save your current position as a waypoint: On any view, press the MARK key to save the current position of the boat as a waypoint.

Save the cursor position as a waypoint: On the Chart or Combo view, use the Cursor key to designate the position you want to save as a waypoint. Then press the MARK key to save the marked position as a waypoint.

Save a position from the sonar history: On the Sonar view, use the Cursor key to point to a feature in the sonar history (also called the Sonar Saver feature). Press the MARK key to create a waypoint at the location where that sonar reading was taken. The new waypoint will also record the depth at that location.

***NOTE:** When you save a waypoint by any of these methods, a numerical waypoint name is automatically assigned. You can edit the waypoint information later to give it a different name and select an icon to represent it (see Waypoint submenu on the Navigation Main Menu Tab).*

Display the Waypoints Submenu: From any view, press the MENU key twice to display the Main Menu System, then use the RIGHT Cursor key to select the Navigation tab. Select Waypoints and press the RIGHT Cursor key to display the Waypoints submenu.

Program a specific position as a waypoint: To create a waypoint that is NOT your current position, from the Waypoints submenu, select the Create option and press the RIGHT Cursor key. Use the Cursor keys to program a waypoint name, latitude, longitude, and icon before selecting Save.

Edit a waypoint: From the Waypoints submenu, select Edit and press the RIGHT Cursor key to display a list of saved waypoints. Select the waypoint you want to edit and press the RIGHT Cursor key. Use the 4-WAY Cursor Control key to move from field to field, and the UP and DOWN Cursor keys to change values once you are in a field. In the Waypoint Name, Latitude and Longitude

fields, use the UP and DOWN Cursor keys to change the letter or number. All upper and lower case letters are available, as well as digits 0-9 and some punctuation characters. In the Waypoint Icon field, use the UP and DOWN Cursor keys to change the icon used to represent the waypoint on the Combo and Chart Views. You can exit these fields with the LEFT and RIGHT Cursor keys or by pressing the EXIT key. Select Save and press the RIGHT Cursor key to save your changes.

To make it easier to select a waypoint, select Sort By and press the RIGHT or LEFT Cursor keys to select a sort order:

- **Name** shows the waypoints alphabetically
- **Time** shows the most recently-created waypoint first
- **Distance** shows the closest waypoint first.

Delete a waypoint: From the Waypoints submenu, select Delete and press the RIGHT Cursor key to display a list of waypoints. Select the waypoint you want to delete, then press the RIGHT Cursor key. You will be asked to confirm deletion before the waypoint is actually deleted.

Navigate to a Waypoint or Position

Navigate to the cursor position: From the Chart or Combo view, use the Cursor key to select a position or waypoint to which you want to navigate. Press the GOTO key. Navigation will begin immediately.

Navigate to a specified waypoint: Press the GOTO key, then choose the waypoint to which you would like to navigate from the waypoint list and press the RIGHT Cursor key to select it.

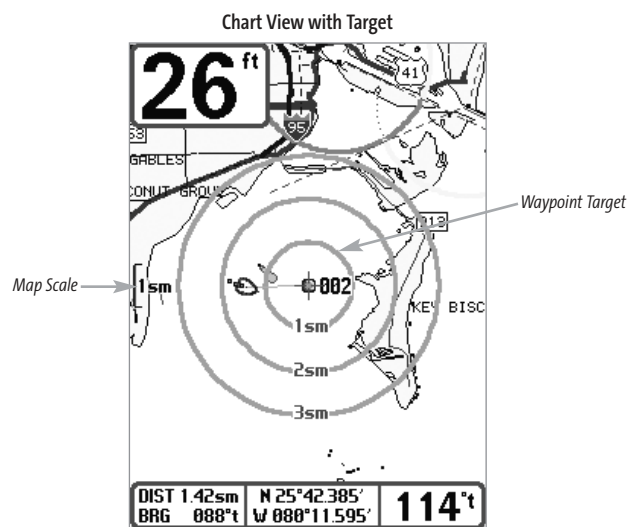
***NOTE:** By repeating the previous instructions, you can add more waypoints to create a longer multi-segment route.*

Skipping a waypoint: From the Navigation X-Press™ Menu, select Skip Next Waypoint and press the RIGHT Cursor key. If there is not another waypoint to skip to, navigation will be cancelled.

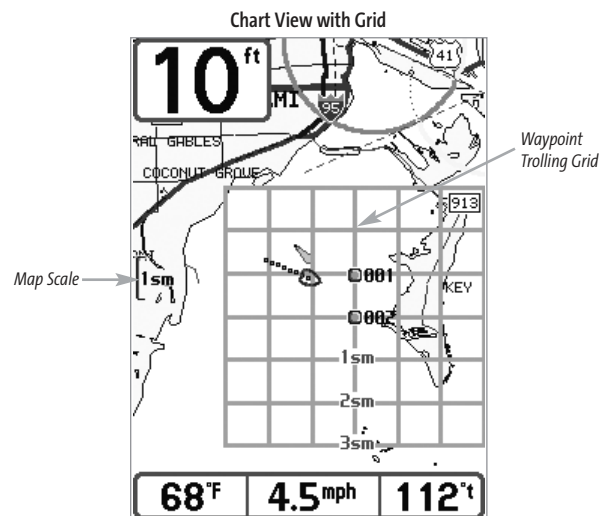
Cancel navigation: From the Navigation X-Press™ Menu, select Cancel Navigation and press the RIGHT Cursor key. Canceling navigation removes the route and any waypoints created using the GOTO key, but does not remove any saved routes from memory. You will be prompted to save the current route when you cancel navigation.

Add a Waypoint Target or Trolling Grid

Add or Remove a Waypoint Target: From the Waypoints submenu, select Target and press the RIGHT Cursor key to display a list of waypoints. Select the waypoint you want to target. A target consisting of concentric circles centered on the selected waypoint will appear on all of the navigation views; the target shows various distance ranges from the targeted waypoint. To remove the target, choose Remove Target from the Navigation X-Press™ Menu.



Add or Remove a Trolling Grid: From the Waypoints submenu, select Grid and press the RIGHT Cursor key to display a list of waypoints. Select the waypoint to which you want to add the grid. The trolling grid will appear on all of the navigation views, and can be used as a guide when trolling around a waypoint. The grid can be rotated to any desired heading using Grid Rotation from the Navigation Main menu. To remove the trolling grid, choose Remove Grid from the Navigation X-Press™ Menu.



NOTE: Only one waypoint can have either a target or a grid at one time. If you apply a target or a grid to a new waypoint, the original waypoint will lose its target or grid.

NOTE: The spacing of the rings on the waypoint target and the spacing of the grid lines on the trolling grid is the same as the length of the scale bar on the left edge of the display. Zooming in or out will decrease or increase the spacing, respectively.

Save, Edit or Delete a Route

Save the current route: While you are navigating, the current route can be saved. From the Navigation X-Press™ Menu, select Save Current Route and press the RIGHT Cursor key. Navigation will continue.

Display the Routes submenu: From any view, press the MENU key twice to display the Main Menu System, then use the RIGHT Cursor key to select the Navigation tab. Select Routes and press the RIGHT Cursor key to display the Routes submenu.

Create a route: From the Routes submenu, select Create and press the RIGHT Cursor key. A Route Edit screen will be displayed with an empty route. You can name the route, add waypoints to the route from the list of all waypoints, and order the waypoints in the route using the Cursor keys.

Edit a saved route: From the Routes submenu, select Edit and press the RIGHT Cursor key. A Route Edit screen will be displayed. Select the route you wish to edit and press the RIGHT Cursor key. Re-name the route or change, delete or re-order the waypoints used in the route.

Delete a saved route: From the Routes submenu, select Delete and press the RIGHT Cursor key. Select the route you wish to delete and press the RIGHT Cursor key. You will be asked to confirm your choice by pressing the RIGHT Cursor key again before the route is deleted.

Travel a saved route: From the Routes submenu, select Travel and press the RIGHT Cursor key. A list of saved routes will appear. Select the route you wish to travel and press the RIGHT Cursor key to make this route the current route and begin navigation. You may also travel the route in either forward or reverse order.

Route Info: From the Routes submenu, select Info and press the RIGHT Cursor key. A list of saved routes will appear. Select the route for which you want information, and press the RIGHT Cursor key. The list of waypoints in the route will be shown, with the distance and bearing from each waypoint to the next, as well as the distance and bearing from the current position to the first waypoint in the route.

Save or Clear a Current Track

Save the current track: From the Navigation X-Press™ Menu, select Save Current Track and press the RIGHT Cursor key. The track will remain on the display, but will change from black to gray. To remove the track completely from the display, see Edit, Delete or Hide Saved Tracks.

NOTE: When you save a track, a name is automatically assigned. The track name consists of a date/time stamp, but can be re-named later (see Edit a Saved Track).

Clear the current track: From the Navigation X-Press™ Menu, select Clear Current Track and press the RIGHT Cursor key. The track will be removed from the display and discarded.

Edit, Delete or Hide Saved Tracks

Display the Tracks Submenu: From any view, press the MENU key twice to display the Main Menu System, then use the RIGHT Cursor key to select the Navigation tab. Select Tracks and press the RIGHT Cursor key to display the Tracks submenu.

Edit a saved track: From the Tracks submenu, select Edit and press the RIGHT Cursor key to display the list of saved tracks. Select the track you want to edit and press the RIGHT Cursor key. When the Edit Track dialog box appears, use the Cursor keys to move between fields. In the Track Name field, the UP and DOWN Cursor keys change the letter or number. All upper and lower case letters are available, as well as digits 0-9 and some punctuation characters. You can exit the Track Name field with the LEFT and RIGHT Cursor keys or by pressing the EXIT key. Select Save and press the RIGHT Cursor key to save your changes.

Delete a saved track: From the Tracks submenu, select Delete and press the RIGHT Cursor key to display the list of saved tracks. Select the track you want to delete and press the RIGHT Cursor key. You will be asked to confirm deletion before the track is actually deleted.

Hide or display a saved track: From the Tracks submenu, select Visibility and press the RIGHT Cursor key to display the list of saved tracks. Select the track you want to hide or display and use the Cursor keys to select Hidden or Visible. Press the EXIT key to return to the Tracks submenu.

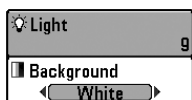
Key Functions

Your Matrix™ user interface consists of a set of easy-to-use keys that work with various on-screen views and menus to give you flexibility and control over your fishing experience.



POWER/LIGHT Key

The POWER/LIGHT key is used to turn the Matrix™ on and off, and also to adjust the backlight and background color of the display. Press the POWER/LIGHT key to turn the unit on. The Title screen is then displayed until the Matrix™ begins sonar operation.



To adjust the backlight or to adjust the display background color, press the POWER/LIGHT key to access the Light and Background menu. Use the 4-WAY Cursor key to select Light or Background and then use the LEFT or RIGHT Cursor key to change the settings. Press EXIT to exit the Light and Background menu.

Press and hold the POWER/LIGHT key for 3 seconds to turn the unit off. A message will appear telling you how many seconds there are until shutdown occurs. Your Matrix™ should always be turned off using the POWER/LIGHT key. This will ensure that shutdown occurs properly and any menu settings will be saved.



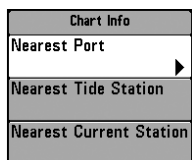
VIEW Key

The VIEW key is used to cycle through all available views. Press the VIEW key to advance to the next view. Repeatedly pressing VIEW cycles through all views available. Views can be hidden to optimize the system to your fishing requirements (see *View Menu Tab*).



INFO Key

Press the INFO key while in Bird's Eye, Chart or Combo View to display information about objects that are nearest to an active cursor.



If the cursor is not active, the following menu will be displayed. Use the 4-WAY Cursor key to select Nearest Port, Nearest Tide Station or Nearest Current Station, then use the RIGHT Cursor key to display the requested information.

NOTE: The built-in Uni-Map™ does not contain Port, Tide or Current information. This information is only available from optional purchase MMC cards.



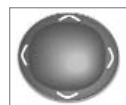
MENU Key

The MENU key is used to access the menu system.

Start-Up Options Menu - Press the MENU key during the power up sequence to view the Start-Up Options menu.

X-Press™ Menu - Press the MENU key once for the X-Press™ Menu. The X-Press™ Menu allows you to access frequently-used settings without having to navigate through the whole menu system. When the X-Press™ Menu is displayed, you can use the UP or DOWN Cursor keys to move to a particular menu choice. As soon as you alter a parameter (using the RIGHT or LEFT Cursor keys) the X-Press™ Menu will collapse temporarily, and the screen will update if it is affected by your menu setting change, allowing you to see the effects of your action immediately. Reactivate the X-Press™ Menu by using the UP or DOWN Cursor keys.

Main Menu - Press the MENU key twice for the tabbed Main Menu System. The Main Menu System is organized under tabbed headings to help you find a specific menu item quickly: Alarms, Sonar, Navigation, Setup, Views, and Accessories tabs are part of your tabbed Main Menu System. Use the LEFT or RIGHT 4-WAY Cursor Control key to select a tab; then use the DOWN or UP key to select the menu item, and the LEFT or RIGHT key to alter a menu setting.



4-WAY Cursor Control Key

The 4-WAY Cursor Control Key has multiple functions, depending on the situation:

Freeze Frame - Pressing any arrow on the 4-WAY Cursor Control key will freeze the display in the Sonar View and a cursor and cursor dialog box will be displayed. The cursor can be positioned on the Sonar View using the 4-WAY Cursor Control key.

Active Cursor - In the Bird's Eye View, the 4-WAY Cursor Control key controls the motion of the eyepoint. In the Chart and Combo Views, the 4-WAY Cursor Control key pans the charts.

Menu Selection - Use the DOWN or UP arrow keys to select a menu choice from the menu list, then use the LEFT or RIGHT arrow keys to change a menu setting.

NOTE: Menu choices are implemented and saved immediately - no further action is required.



MARK Key

Press the MARK key while in any view to mark the position of a waypoint, either at the current boat location, or, if the Cursor is active, at the current Cursor location.



GOTO Key

If the Cursor is active, pressing the GOTO key while in any view creates a waypoint and starts navigation towards that waypoint. If the Cursor is not active, pressing the GOTO key displays the list of waypoints, so that you can select the waypoint towards which you want to navigate.



ZOOM (+/-) Key

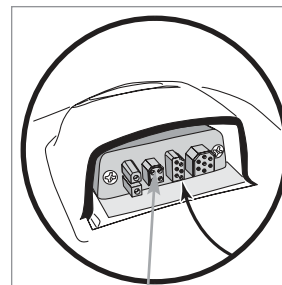
Press the - or + ZOOM keys while in any of the Navigation Views or the Sonar Zoom View to change the scale of the view to appear closer or farther away.



EXIT Key

The EXIT key has multiple functions, depending on the situation:

- If an alarm is sounding, pressing EXIT will cancel the alarm.
- If a menu tab is selected, pressing EXIT will exit the menu mode and return to the view.
- If a menu is active, pressing EXIT will return to the previous level in the menu system.
- Pressing EXIT will cycle through the available views in reverse order.
- If Freeze Frame is active, pressing EXIT will return to a scrolling display.
- If the Cursor is active, pressing EXIT will remove the cursor from the display.

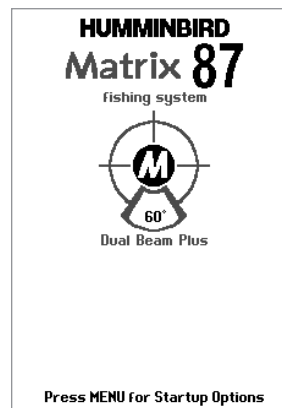


Accessory Bus

Accessory Bus

Use the Accessory Bus to expand the functionality of your Matrix™. Accessories plug directly into the Matrix™, enabling Advanced features such as WeatherSense® and the SmartCast® Wireless Sonar Link. Additional tabs and menu choices will be added to the menu system automatically when an accessory is plugged into the unit. In addition, multiple accessories can be attached simultaneously. See Accessories Menu Tab and Matrix™ Accessories in this manual, as well as your accessory's Operations Manual for additional details.

NOTE: Accessories to enable WeatherSense® and the SmartCast® Wireless Sonar Link require separate purchases. You can visit our website at www.humminbird.com or contact our Customer Resource Center at 1-800-633-1468 for additional details.



Matrix™ 87c Title Screen

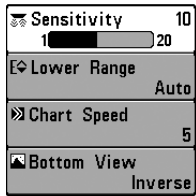
Powering Up the Unit

Turn on your Matrix™ by pressing the POWER key. The Title screen is displayed until the Matrix™ begins operation. Your Matrix™ will begin Normal or Simulator operation, depending on the presence or absence of a transducer.

The Menu System

The menu system is divided into easy-to-use menu modules. The main components of the menu system are:

Start-Up Options Menu - Press the MENU key during the power up sequence to view the Start-Up Options menu.

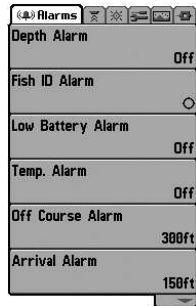


X-Press™ Menu

X-Press™ Menu - The X-Press™ Menu allows you to access the settings that are changed frequently without having to navigate through the whole menu system. Press the MENU key once to display the X-Press™ Menu. When you select a menu item from the X-Press™ Menu, the menu will collapse, leaving only the menu choice on the screen. Use the Up or Down Cursor keys to reactivate the X-Press™ Menu.

NOTE: The X-Press™ Menu choices will vary depending on which view is active when you press the MENU key, as well as whether you are in Normal or Advanced User Mode. Either the Sonar or Navigation X-Press™ Menu will appear, depending on the view you are in.

Main Menu Tabs - Less frequently-adjusted menus are grouped into the Main Menu System. The Main Menu system is organized under the following tab headings to help you find a specific menu item quickly: Alarms, Sonar, Navigation (if the GPS Receiver is attached), Setup, Views, and Accessories.

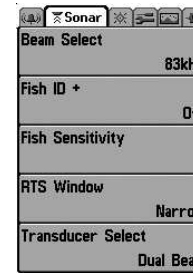


Main Menu System
Normal User Mode

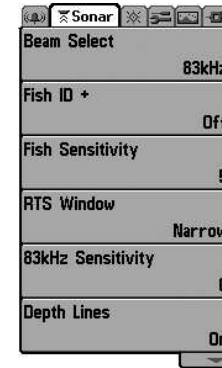
Press the MENU key twice for the Main Menu, then use the 4-WAY Cursor LEFT or RIGHT key to select a tab, and use the DOWN or UP key to select a specific menu item under that tab, then use the LEFT or RIGHT keys again to change a menu setting. Press the EXIT key to move quickly to the top of the tab. A down arrow at the bottom of a menu means that you can scroll to additional menu choices using the DOWN Cursor key. A right or left arrow on a menu choice means that you can use the RIGHT or LEFT Cursor keys to make changes or to see more information.

NOTE: The Main Menu choices will vary depending on whether you are in Normal or Advanced User Mode.

User Mode (Normal or Advanced) - An Advanced Mode is provided for users who desire the highest level of control over the Matrix™ and Normal Mode for users who desire greater simplicity and fewer menu choices. Additional Advanced menu choices will be displayed throughout the menu system when you navigate to specific menus while in Advanced Mode. Any changes made while in Advanced Mode will remain in effect after you switch back to Normal Mode. See Setup Menu Tab: User Mode for specific instructions on changing to Advanced User Mode.

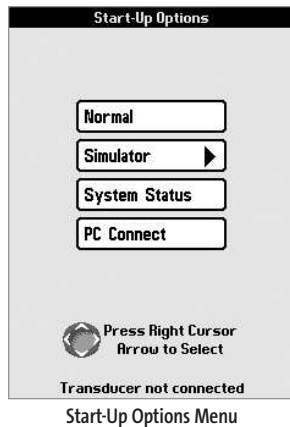


Sonar Tab, Normal Mode



Sonar Tab, Advanced Mode

Total Screen Update - when you change any menu settings that affect the Sonar View, the view will update immediately (i.e. you don't have to exit the menu to apply the change to the screen).



Start-Up Options Menu

Press the MENU key when the Title screen is displayed to access the Start-Up Options menu.

Use the UP or DOWN 4-WAY Cursor keys to position the cursor, then the RIGHT Cursor key to select one of the following choices. If you wait too long, the system will default to whichever menu mode happens to be highlighted:

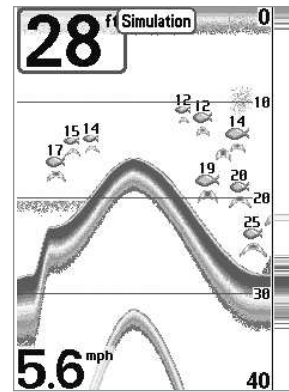
- Normal
- Simulator
- System Status
- PC Connect (use with PC Connect Cable).

See the following paragraphs for more information about each of these choices.

Normal Operation

Use Normal operation for on the water operation with a transducer connected. In addition, your Matrix™ uses advanced transducer detection methods to determine if a transducer is connected. If a functioning transducer is connected, Normal operation will be selected automatically at power up and your Matrix™ can be used on the water.

Exit Normal operation by powering your Matrix™ off.



Simulator

Simulator

Use the **Simulator** to learn how to use your Matrix™ before taking your boat on the water. The Simulator is a very powerful tool that simulates on the water operation, providing a randomly-updated display. We recommend going through this manual while using the Simulator, since all of the menus function and affect the display the way they actually do when in Normal operation.

NOTE: To get the full benefit of the Simulator, it is important to select Simulator manually from the Start-Up Options menu as opposed to letting the Matrix™ enter Simulator automatically (as it will if a transducer is not connected and you do nothing during power up). Manually selecting Simulator from the Start-Up Options menu allows you to pre-configure your Matrix™ for on the water operation. Any menu changes you make will be saved for later use.

A message will appear on the display periodically to remind you that you are using the Simulator.

Exit the Simulator by powering your Matrix™ off.

System Status

Use **System Status** to view system connections and to conduct a unit self-test. Exit System Status by powering your Matrix™ off.

The following screens are displayed in turn when you press the VIEW button when using System Status:

- Self Test
- Accessory Test
- GPS Diagnostic View.

SYSTEM STATUS	
Self Test	
PASSED	
S/N	
41028998001	
SOFTWARE VERSION	
2.552	
VOLTAGE	TOTAL TIME
13.4 ^v	0 ^{hrs}
PCB S/N	
00 410281652	
Press VIEW for Next Screen	

System Status Self Test Screen

Self Test displays results from the internal diagnostic self test, including unit serial number, Printed Circuit Board (PCB) serial number, software revision, total hours of operation and the input voltage.

SYSTEM STATUS	
ACCESSORY TEST	
GPS	CONNECTED
SmartCast WSL	CONNECTED
Speed	CONNECTED
Temperature	CONNECTED
WeatherSense	CONNECTED

Accessory Test Screen

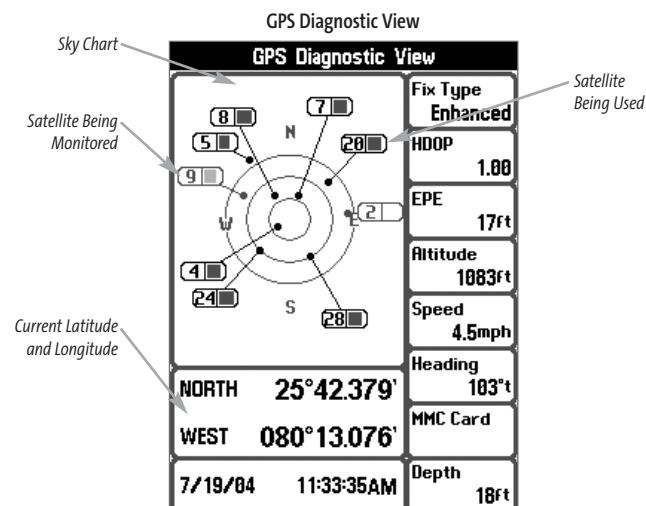
Accessory Test lists the accessories connected to the system.

NOTE: The speed accessory will be detected only if the paddlewheel has moved since your Matrix™ was powered up.

GPS Diagnostic View shows a sky chart and numerical data from the GPS receiver. The sky chart shows the location of each visible GPS satellite with its satellite number and a signal strength bar. A dark grey bar indicates that the satellite is being used to determine your current position. A light gray bar indicates that the satellite is being monitored, but is not yet being used.

NOTE: The GPS Diagnostic View only appears if the GPS Receiver is connected.

This view also reports the current position, local time and date, and other numeric information. The current GPS Fix Type is reported as No Fix, 2D Fix, 3D Fix, or Enhanced. An Enhanced fix has been augmented using information from WAAS, EGNOS, or MSAS. A 3D or Enhanced Fix is required for navigation. HDOP (the Horizontal Dilution of Precision) is a GPS system parameter which depends on the current satellite configuration. HDOP is used to calculate the Estimated Position Error.



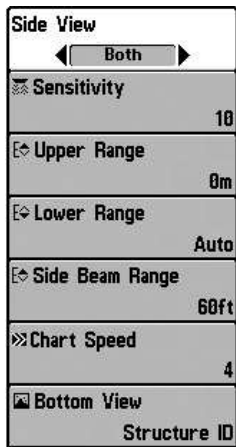
PC Connect

(With PC Connect Cable Only)

Use PC Connect to update the software of the Matrix™ control head. This feature requires the use of the PC Connect Cable. Complete instructions are included with the PC Connect Cable accessory.

NOTE: The PC Connect Cable requires a separate purchase. For more information visit our website at www.humminbird.com or contact our Customer Resource Center at 1-800-633-1468.

Exit PC Connect mode by powering the Matrix™ off.



Sonar X-Press™ Menu

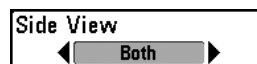
Sonar X-Press™ Menu (Sonar Views Only)

The **Sonar X-Press™ Menu** provides access to the settings most frequently-used. Press the MENU key once while in any of the Sonar Views to access the Sonar X-Press™ Menu.

NOTE: Menu choices will vary depending on system settings such as whether the unit is set for Advanced User mode or what transducer is currently selected.

Side View

(WideSide® Transducer: WideSide® View Only)

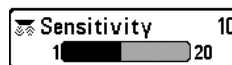


Side View sets which transducer beam from the WideSide® Transducer is shown in the WideSide® View. A WideSide® transducer must be connected to the Matrix™ Fishing System. The Side View menu choice is available when Transducer Select is set to WideSide® (see *Sonar Menu Tab: Transducer Select*) and can only be accessed from the Sonar X-Press™ menu when you are in WideSide® view.

NOTE: The WideSide® View requires the purchase of the WideSide® transducer. You can visit our website at www.humminbird.com to order this accessory online or contact our Customer Resource Center at 1-800-633-1468.

To adjust the Side View:

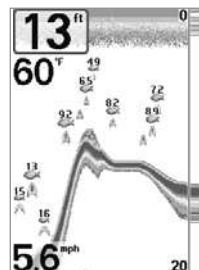
1. Make sure you are in WideSide® Transducer Mode and that a WideSide® transducer is connected, then highlight Side View on the Sonar X-Press™ menu.
2. Use the LEFT or RIGHT 4-WAY Cursor Control keys to change the Side View setting. (L [Left], Both, R [Right], Default = Both)



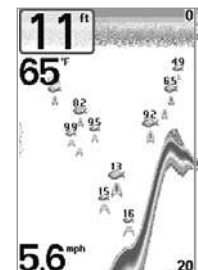
Sensitivity

Sensitivity controls how much detail is shown on the display.

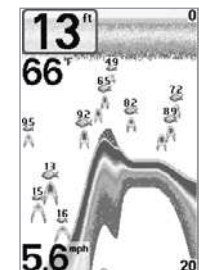
Increasing the sensitivity shows more sonar returns from small baitfish and suspended debris in the water; however, the display may become too cluttered. When operating in very clear water or greater depths, increased sensitivity shows weaker returns that may be of interest. Decreasing the sensitivity eliminates the clutter from the display that is sometimes present in murky or muddy water. If Sensitivity is adjusted too low, the display may not show many sonar returns that could be fish.



Sensitivity at Low



Sensitivity at Medium



Sensitivity at High

To adjust the Sensitivity:

1. Highlight Sensitivity on the Sonar X-Press™ menu.
2. Use the LEFT or RIGHT 4-WAY Cursor Control keys to increase or decrease the Sensitivity setting. (Low = 1, High = 20, Default = 10)



Upper Range

(Advanced: Sonar, Split Sonar and Big Digits Views Only)

Upper Range sets the shallowest depth range that will be displayed on the Sonar, Split Sonar and Big Digits Views. The Upper Range menu choice is available when User Mode is set to Advanced (see *Setup Menu Tab: User Mode*) and can only be accessed from the Sonar, Split Sonar and Big Digits Views. Upper Range is often used with Lower Range.

For example, if you are only interested in the area between 20 and 50 feet deep, you should set the Upper Depth Range to 20 and the Lower Depth Range to 50. The Sonar View will then show the 30 foot area between 20 and 50, and will not show the surface or the bottom (assuming the bottom is deeper than 50 feet), and will show greater detail for that area between 20 and 50 feet.

NOTE: A minimum distance of 10 feet will be maintained between the Upper and Lower Range regardless of the manual settings entered.

To adjust the Upper Range:

1. Make sure you are in Advanced Mode, then highlight Upper Range on the Sonar X-Press™ Menu.
2. Use the LEFT or RIGHT 4-WAY Cursor Control keys to increase or decrease the Upper Range setting. (0 to 1490 feet or 0 to 497 meters [International Models Only], Default = 0)



Lower Range

Lower Range sets the deepest depth range that will be displayed.

Automatic is the default setting. When in automatic mode, the lower range will be adjusted by the unit to follow the bottom. Selecting a specific setting locks the depth range into Manual mode. Use both Upper and Lower Range together to view a specific depth range manually when looking for fish or bottom structure. **M** will be displayed in the lower right corner of the screen when you start manually adjusting the Lower Range to indicate that you are in Manual mode.

For example, if you are fishing in 60 feet of water but are only interested in the first 30 feet (surface to a depth of 30 feet) you should set the Lower Depth Range limit to 30. The display will show the 0 to 30 foot range, allowing you to see a more detailed view than you would see if the display went all the way to the bottom.

NOTE: A minimum distance of 10 feet will be maintained between the Upper and Lower Range regardless of the manual settings entered.

To adjust the Lower Range:

1. Highlight Lower Range on the Sonar X-Press™ Menu.
2. Use the LEFT or RIGHT 4-WAY Cursor Control keys to increase or decrease the Lower Range setting. (AUTO, 10 to 1500 feet, 3 to 500 meters [International Models Only], Default = AUTO)



Side Beam Range

(WideSide® Transducer: WideSide® View Only)

Side Beam Range sets the deepest range that will be displayed in the WideSide® View. The range must be set manually to keep the bottom visible on the display. If the Side Beam Range is set too deep for current depth conditions the sonar information will become compressed on the display and valuable detail will be lost. A WideSide® transducer must be connected to the Matrix™ Fishing System. Side Beam Range menu choice is available when Transducer Select is set to WideSide® (see *Sonar Menu Tab: Transducer Select*) and can only be accessed from the WideSide® view.

NOTE: The Side Beam Range requires the purchase of the WideSide® transducer. You can visit our website at www.humminbird.com to order this accessory online or contact our Customer Resource Center at 1-800-633-1468.

To adjust the Side Beam Range:

1. Make sure you are in WideSide® Transducer Mode and that a WideSide® transducer is connected, then highlight Side Beam Range on the Sonar X-Press™ menu.
2. Use the LEFT or RIGHT 4-WAY Cursor Control keys to increase or decrease the Side Beam Range setting. (6 - 240 feet or 2 - 80 meters [International Models Only], Default = 33 feet [10 meters])

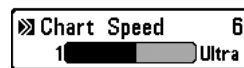


Chart Speed

Chart Speed determines the speed at which the sonar information moves across the display, and consequently the amount of detail shown.

A faster speed shows more information in the Sonar Views and is preferred by most anglers; however, the sonar information moves across the display quickly. A slower speed keeps the information on the display longer, but the bottom and fish details become compressed and may be difficult to interpret. Regardless of the Chart Speed setting, the RTS® Window will update at the maximum rate possible for the depth conditions. Adjust Chart Speed to your personal preference.

To adjust the Chart Speed:

1. Highlight Chart Speed on the Sonar X-Press™ Menu.
2. Use the LEFT or RIGHT 4-WAY Cursor Control keys to increase or decrease the Chart Speed setting. (1-9, Ultra, where 1 = Slow, 9 = Fast, Ultra = Fastest, Default = 4)

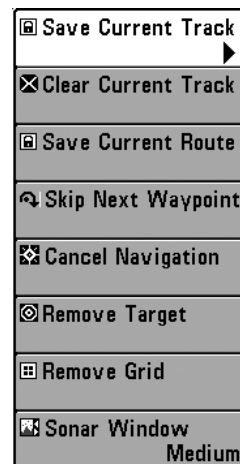


Bottom View

Bottom View selects the method used to represent bottom and structure on the display. Structure ID® represents weak returns in blue and strong returns in red. WhiteLine® highlights the strongest sonar returns in white resulting in a distinctive outline. This has the benefit of clearly defining the bottom on the display. See *Bottom Presentation* for more information.

To adjust the Bottom View:

1. Highlight Bottom View on the Sonar X-Press™ Menu.
2. Use the LEFT or RIGHT 4-WAY Cursor Control keys to change the Bottom View setting. (Structure ID, WhiteLine, Default = Structure ID)



Navigation X-Press™ Menu

Navigation X-Press™ Menu (Navigation Views Only)

The **Navigation X-Press™ Menu** provides access to the settings most frequently used. Press the MENU key once while in the Bird's Eye View, the Chart or the Combo View to access the Navigation X-Press™ Menu.

NOTE: Menu choices will vary depending on system settings, such as whether you are currently navigating.

Save Current Track

Save Current Track allows you to save the current track being displayed. After the current track is saved, a new current track is started.

To Save Current Track:

1. Highlight Save Current Track on the Navigation X-Press™ Menu.
2. Use the RIGHT 4-WAY Cursor Control key to initiate saving the current track.
3. The Confirm dialog box will appear. To save the current track, press the RIGHT Cursor key once more. To cancel saving the current track, press the LEFT Cursor key.

Clear Current Track

Clear Current Track allows you to clear the current track being displayed and start a new track at the present position.

To Clear Current Track:

1. Highlight Clear Current Track on the Navigation X-Press™ Menu.
2. Use the RIGHT 4-WAY Cursor Control key to initiate clearing the current track.
3. The Confirm dialog box will appear. To clear the current track, press the RIGHT Cursor key once more. To cancel clearing the current track, press the LEFT Cursor key.

Save Current Route (Only When Navigating)

Save Current Route allows you to save the current route being displayed. This menu choice will only appear when you are currently navigating a route.

To Save Current Route:

1. Highlight Save Current Route on the Navigation X-Press™ Menu.
2. Use the RIGHT 4-WAY Cursor Control key to initiate saving the current route.
3. The Confirm dialog box will appear. To save the current route, press the RIGHT Cursor key once more. To cancel saving the current route, press the LEFT Cursor key.

Skip Next Waypoint (Only When Navigating)

Skip Next Waypoint removes the next waypoint from the current route. This menu choice will only appear when you are currently navigating a route.

To Skip Next Waypoint:

1. Highlight Skip Next Waypoint on the Navigation X-Press™ Menu.
2. Use the RIGHT 4-WAY Cursor Control key to initiate skipping the next waypoint.
3. The Confirm dialog box will appear. To skip the next waypoint, press the RIGHT Cursor key once more. To cancel skipping the next waypoint, press the LEFT Cursor key.

Cancel Navigation (Only When Navigating)

Cancel Navigation discards the current route and exits Navigation Mode. This menu choice will only appear when you are currently navigating a route. This will not delete a previously-saved route.

To Cancel Navigation:


1. Highlight Cancel Navigation on the Navigation X-Press™ Menu.
2. Use the RIGHT 4-WAY Cursor Control key to initiate canceling navigation.
3. The Confirm dialog box will appear. To cancel navigation, press the RIGHT Cursor key once more. To avoid canceling navigation, press the LEFT Cursor key.

Remove Target (Only if a Target is Active)

Remove Target removes the waypoint target from the display. This menu choice will only appear when a target has already been applied to a waypoint.

To Remove a Target:

1. Highlight Remove Target on the Navigation X-Press™ Menu.
2. Use the RIGHT 4-WAY Cursor Control key to remove the target.


 Remove Grid

Remove Grid (Only if a Grid is Active)

Remove Grid removes the waypoint grid from the display. This menu choice will only appear when a grid has already been applied to a waypoint.

To Remove a Grid:

1. Highlight Remove Grid on the Navigation X-Press™ Menu.
2. Use the RIGHT 4-WAY Cursor Control key to remove the grid.


 Sonar Window
Medium

Sonar Window (Combo View Only)

Sonar Window sets the size of the Sonar Window in the Combo View. Sonar Window can only be accessed from the Combo View.

To Set the Size of the Sonar Window in the Combo View:

1. Highlight Sonar Window on the Navigation X-Press™ Menu.
2. Use the LEFT or RIGHT 4-WAY Cursor Control keys to adjust the size of the sonar window. (Wide, Medium, Narrow, Default = Medium)

Sonar	
Beam Select	83kHz
Fish ID +	Off
Fish Sensitivity	5
RTS Window	Narrow
83kHz Sensitivity	0
455kHz Balance	0
WideSide Sensitivity	0
Depth Lines	On
Surface Clutter	5
Noise Filter	Off
Max Depth	Auto
Water Type	Fresh
Transducer Select	Dual Beam

Sonar Menu

Sonar Menu Tab

Press the MENU key twice to access the Main Menu System and then press the RIGHT Cursor key to select the Sonar tab.

NOTE: Menu choices will vary depending on system settings such as whether the unit is set for Advanced User mode or what transducer is currently selected.

Beam Select

◀ 200/83kHz ▶

Beam Select

Beam Select sets which sonar returns from the transducer will be displayed on the screen.

When set to **200/83 kHz**, the returns from both beams are blended. The Split Sonar View continues to display the sonar returns from each beam in their respective windows. The blended information is shown in the Sonar View, Sonar Zoom View and the Big Digits View. The RTS® Window in the Sonar View will only show the returns from the 200 kHz narrow beam.

When set to **200 kHz**, only the returns from the 200 kHz narrow beam will be displayed in the Sonar View, the Sonar Zoom View and the Big Digits View. The Split Sonar View will continue to display returns from both beams in their respective windows. The RTS® Window in the Sonar View will display the returns from the 200 kHz narrow beam.

When set to **83 kHz**, the returns from the 83 kHz wide beam will be displayed in the Sonar View, the Sonar Zoom View and the Big Digits View. The Split Sonar View will continue to display returns from both beams in their respective windows. The RTS® Window will display the returns from the 83 kHz wide beam.

To use Beam Select:

1. Highlight Beam Select on the Sonar main menu.
2. Use the LEFT or RIGHT 4-WAY Cursor Control keys to select either the 200 kHz beam, the 83 kHz beam or the 200/83 kHz beam. (200/83 kHz, 200 kHz, 83 kHz, Default = 83 kHz)

Fish ID+

◀ On ▶

Fish ID+™

Fish ID+™ uses advanced signal processing to interpret sonar returns, and will display a Fish Symbol when very selective requirements are met. When a fish is detected, a fish icon and its depth are displayed above the return that has been classified as being a fish. Three different fish size icons represent the intensity of the sonar return, and provide an indicator of relative fish size.

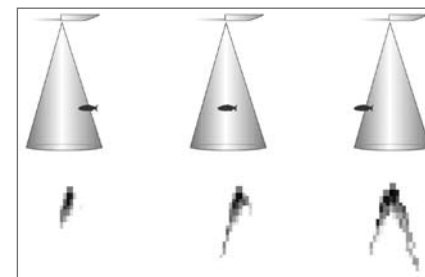
DualBeam PLUS™ Sonar models represent targets detected in the 200 kHz narrow beam as Orange Fish Symbols, and represent targets detected in the 83 kHz wide beam as Blue Shaded Fish Symbols.



200 kHz, Narrow Beam
Orange Fish Symbols

83 kHz, Wide Beam Blue Fish Symbols
(DualBeam PLUS™ Only)

When Fish ID+™ is turned off, the Matrix™ shows only the raw sonar returns on the display. These returns will often result in "arches" forming on the display, indicating potential targets. Due to the transducer beam angle, the distance to a fish decreases as the fish moves into the beam, and then increases as it moves out again, creating a Fish Arch when this distance change is shown on the display. Boat speed, chart speed, and the position of the fish within the sonar beam greatly affect the shape of the arch.



Transducer Cone and Fish Arches

To turn Fish ID+™ on or off:

1. Highlight Fish ID+ on the Sonar main menu.
2. Use the LEFT or RIGHT 4-WAY Cursor Control keys to turn the Fish ID+™ setting On or Off. (Off, On, Default = Off)



Fish Sensitivity

Fish Sensitivity adjusts the threshold of the Fish ID+™ detection algorithms. Selecting a higher setting allows weaker returns to be displayed as fish. This is useful for identifying smaller fish species or baitfish. Selecting a lower setting displays fewer fish from weak sonar returns. This is helpful when seeking larger species of fish. Fish Sensitivity is used in conjunction with Fish ID+™. Fish ID+™ must be On for Fish Sensitivity to affect the ability of the Matrix™ to identify sonar returns as fish.

To change the Fish Sensitivity setting:

1. Highlight Fish Sensitivity on the Sonar main menu.
2. Use the LEFT or RIGHT 4-WAY Cursor Control keys to change the Fish Sensitivity setting. (Low = 1, High = 10, Default = 5)

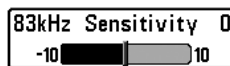


Real Time Sonar (RTS®) Window

RTS® Window sets the RTS® Window to either Wide or Narrow, or turns it off in the Sonar View. The RTS® Window always updates at the fastest rate possible and only displays returns that are within the transducer beam. (See *Real Time Sonar [RTS®] Window* for more information.)

To change the RTS® Window setting:

1. Highlight RTS Window on the Sonar main menu.
2. Use the LEFT or RIGHT 4-WAY Cursor Control keys to change the RTS® Window setting. (Wide, Narrow, Off, Default = Wide)



83 kHz Sensitivity (Advanced)

83 kHz Sensitivity changes the sensitivity of the 83 kHz beam. Increasing the 83 kHz Sensitivity will display additional weak returns and decreasing the 83 kHz Sensitivity will display fewer weak returns. The 83 kHz Sensitivity menu choice is only available when User Mode is set to Advanced (see *Setup Menu Tab: User Mode*).

To set the 83 kHz Sensitivity:

1. Make sure you are in Advanced User Mode, then highlight 83 kHz Sensitivity on the Sonar main menu.
2. Use the LEFT or RIGHT 4-WAY Cursor Control keys to set the 83 kHz Sensitivity. (-10 to +10, Default = 0)



455 kHz Balance (Advanced: with QuadraBeam™ Transducer)

455 kHz Balance adjusts the sensitivity of the 455 kHz beam. Increasing the sensitivity will display additional weak returns and decreasing the sensitivity will display fewer weak returns. A QuadraBeam™ transducer must be attached to the Matrix™. The 455 kHz Balance menu choice is available when Transducer Select is set to QuadraBeam™ (see *Sonar Menu Tab: Transducer Select*) and User Mode is set to Advanced (see *Setup Menu Tab: User Mode*).

NOTE: The 455 kHz Balance requires the purchase of the QuadraBeam™ transducer. You can visit our website at www.humminbird.com to order this accessory online or contact our Customer Resource Center at 1-800-633-1468.

To change the 455 kHz Balance setting:

1. Make sure you have selected QuadraBeam™ Transducer and Advanced Mode and that the QuadraBeam™ transducer is connected, then highlight 455 kHz Balance on the Sonar Main Menu.
2. Use the LEFT or RIGHT 4-WAY Cursor Control keys to change the 455 kHz Balance. (-10 to +10, Default = 0)



WideSide® Sensitivity (Advanced: With WideSide® Transducer)

WideSide® Sensitivity adjusts the sensitivity of the WideSide® beam. Increasing the sensitivity will display additional weak returns and decreasing the sensitivity will display fewer weak returns. A WideSide® transducer must be attached to the Matrix™ Fishing System. The WideSide® Sensitivity menu choice is available when Transducer Select is set to WideSide® (see *Sonar Menu Tab: Transducer Select*) and User Mode is set to Advanced (see *Setup Menu Tab: User Mode*).

NOTE: The WideSide® Sensitivity requires the purchase of the WideSide® transducer. You can visit our website at www.humminbird.com to order this accessory online or contact our Customer Resource Center at 1-800-633-1468.

To change the WideSide® Sensitivity setting:

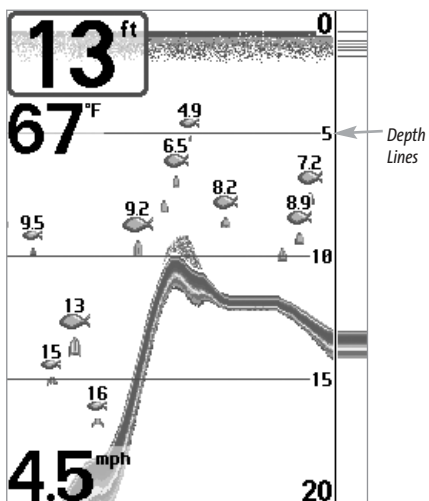
1. Make sure you have selected WideSide® Transducer and Advanced Mode and that the WideSide® transducer is connected, then highlight WideSide Sensitivity on the Sonar Main Menu.
2. Use the LEFT or RIGHT 4-WAY Cursor Control keys to change the WideSide® Sensitivity. (-10 to +10, Default = 0)

Depth Lines

On

**Depth Lines
(Advanced)**

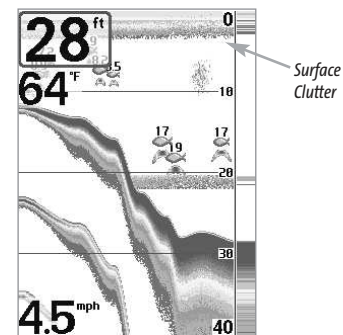
Depth Lines divide the display into four equal sections that are separated by three horizontal depth lines. The depth of each line is displayed along the depth scale. You can either turn Depth Lines On or Off. The Depth Lines menu choice is available when User Mode is set to Advanced (see *Setup Menu Tab: User Mode*).

**To change the Depth Lines setting:**

1. Make sure you are in Advanced User Mode, then highlight Depth Lines on the Sonar main menu.
2. Use the LEFT or RIGHT 4-WAY Cursor Control keys to turn the Depth Lines setting On or Off. (Off, On, Default = On)

Surface Clutter
1 10**Surface Clutter
(Advanced)**

Surface Clutter adjusts the filter that removes surface clutter noise caused by algae and aeration. The lower the setting, the less surface clutter will be displayed. The Surface Clutter menu choice is available when User Mode is set to Advanced (see *Setup Menu Tab: User Mode*).

**To change the Surface Clutter setting:**

1. Make sure you are in Advanced User Mode, then highlight Surface Clutter on the Sonar main menu.
2. Use the LEFT or RIGHT 4-WAY Cursor Control keys to change the Surface Clutter setting. (Low = 1 to High = 10, Default = 5)

Noise Filter

Medium

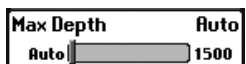
**Noise Filter
(Advanced)**

Noise Filter adjusts the sonar Noise Filter to limit interference on the display from sources such as your boat engine, turbulence, or other sonar devices. The Noise Filter menu choice is available when User Mode is set to Advanced (see *Setup Menu Tab: User Mode*).

NOTE: The Off setting removes all filtering; Low, Medium and High settings add progressive filtering of the sonar returns. In some deep water situations, the High setting may actually hinder your unit's ability to find the bottom.

To change the Noise Filter setting:

1. Make sure you are in Advanced User Mode, then highlight Noise Filter on the Sonar main menu.
2. Use the LEFT or RIGHT 4-WAY Cursor Control keys to change the Noise Filter setting. (Off, Low, Medium, High, Default = Off)

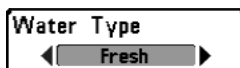


Max Depth (Advanced)

Max Depth adjusts the maximum depth of operation. The performance of your Matrix™ can be tuned to the maximum depth you will be fishing in by setting the Max Depth. When a maximum depth is set, your Matrix™ will not attempt to acquire sonar data below that depth, thus increasing overall performance. When Max Depth is set to Auto, the Matrix™ will acquire bottom readings as needed (within the capacity of the unit). If the bottom is deeper than the Max Depth setting, the digital depth readout will flash, indicating that the Matrix™ cannot locate the bottom. The Max Depth menu choice is available when User Mode is set to Advanced (see *Setup Menu Tab: User Mode*).

To change the Max Depth setting:

1. Make sure you are in Advanced User Mode, then highlight Max Depth on the Sonar main menu.
2. Use the LEFT or RIGHT 4-WAY Cursor Control keys to change the Max Depth setting. (AUTO, 10 to 1500 feet, 3 to 500 meters [*International Models Only*], Default = AUTO)



Water Type (Advanced)

Water Type configures your unit for operation in fresh or salt water. The Water Type menu choice is available when User Mode is set to Advanced (see *Setup Menu Tab: User Mode*).

NOTE: In salt water, what would be considered a large fish might be 2 to 10 times bigger than a large fish in fresh water (depending on the type of fish you are seeking). The salt water setting allows for a greater range in fish size adjustment to account for this. Also, make sure that the Water Type is set accurately, especially in salt water, as this affects the accuracy of deep water depth readings.

To change the Water Type setting:

1. Make sure you are in Advanced User Mode, then highlight Water Type on the Sonar main menu.
2. Use the LEFT or RIGHT 4-WAY Cursor Control keys to change the Water Type setting. (Fresh, Salt, Default = Fresh)

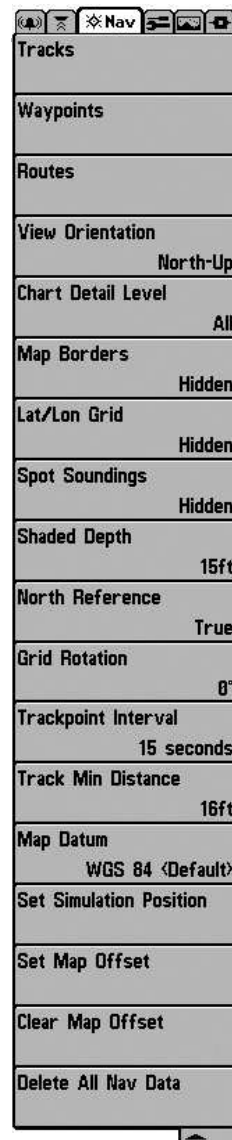


Transducer Select

Transducer Select allows you to select which transducer you want to use (the Matrix™ comes with a DualBeam PLUS™ transducer, and also supports the optional-purchase QuadraBeam™ and WideSide® transducers.)

To change the selected Transducer:

1. Highlight Transducer Select on the Sonar Main menu.
2. Use the LEFT or RIGHT 4-WAY Cursor Control keys to change the transducer selected. (DualBeam, QuadraBeam, WideSide, Default = DualBeam)



Navigation Menu

Navigation Menu Tab

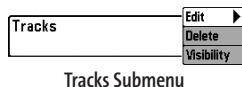
Press the MENU key twice to access the Main Menu System, then press the RIGHT cursor key to select the Navigation tab.

NOTE: Menu choices will vary depending on system settings.

Tracks

Tracks

Tracks allows you to view the Tracks submenu.



To view the Tracks Submenu:

1. Highlight Tracks on the Navigation main menu.
2. Use the RIGHT 4-WAY Cursor Control keys to view the Tracks submenu.

The Tracks Submenu contains the following menu choices:

Edit allows you to select a previously-saved track and edit its name.

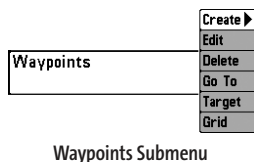
Delete allows you to delete a track from a list of previously-saved tracks.

Visibility allows you to display or hide each saved track.

Waypoints

Waypoints

Waypoints allows you to view the Waypoints submenu.



To view the Waypoints Submenu:

1. Highlight Waypoints on the Navigation main menu.
2. Use the RIGHT 4-WAY Cursor Control keys to view the Waypoints submenu.

The Waypoints Submenu contains the following menu choices:

Create allows you to create a new waypoint and edit it immediately. The current boat position will be used as the default, but you can set the coordinates to any valid position. The icon used to represent the waypoint in the Chart and Combo Views can also be changed.

Edit allows you to choose from a list of previously-saved waypoints, then edit the Name, Position (Latitude and Longitude) and select the Icon that will be used to represent the waypoint in the Chart and Combo Views.

Delete allows you to delete a waypoint from the list of saved waypoints.

Go To allows you to select a waypoint and start navigation toward that waypoint, or add that waypoint to the end of the current route.

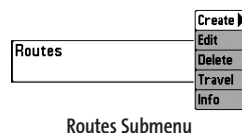
Target allows you to apply a target to a waypoint selected from the list of waypoints.

Grid allows you to apply a trolling grid to a waypoint selected from the list of waypoints.

Routes

Routes

Routes allows you to view the Routes submenu.



To view the Routes Submenu:

1. Highlight Routes on the Navigation main menu.
2. Use the RIGHT 4-WAY Cursor Control keys to view the Routes submenu.

The Routes Submenu contains the following menu choices:

Create allows you to create a new, empty route and add waypoints to it immediately.

Edit allows you to select a previously-saved route and edit its name and the waypoints on it.

Delete allows you to delete a route from a list of previously-saved routes.

Travel allows you to select a previously-saved route to use as the current route; this menu setting also begins navigation on this route. Routes can be traveled in either the forward or reverse direction.

Info displays information about the route, including the distance and bearing from each waypoint to the next.

View Orientation

View Orientation

View Orientation allows you to select whether the Chart and Combo Views should be drawn North-Up or Course-Up.

To change the View Orientation setting:

1. Highlight View Orientation on the Navigation main menu.
2. Use the LEFT or RIGHT 4-WAY Cursor Control keys to change the View Orientation setting. (North-Up, Course-Up, Default = North-Up)

NOTE: The View Orientation setting does not apply to the Bird's Eye View.

Chart Detail Level

All

Chart Detail Level

Chart Detail Level allows you to select how much chart detail you want displayed on the Navigation Views. Basic shows land areas, ports, obstructions and restricted areas. Navigation shows nav aids, landmarks, ferryways and navigation routes in addition to the Basic information. Underwater shows depth contours, fishing areas, underwater wrecks, tides and currents in addition to the Basic and Navigation information. All shows roads, buildings, railways, and other notations in addition to the Basic, Navigation and Underwater information.

To change the Chart Detail Level setting:

1. Highlight Chart Detail Level on the Navigation main menu.
2. Use the LEFT or RIGHT 4-WAY Cursor Control keys to change the Chart Detail Level setting. (Basic, Navigation, Underwater, All, Default = All)

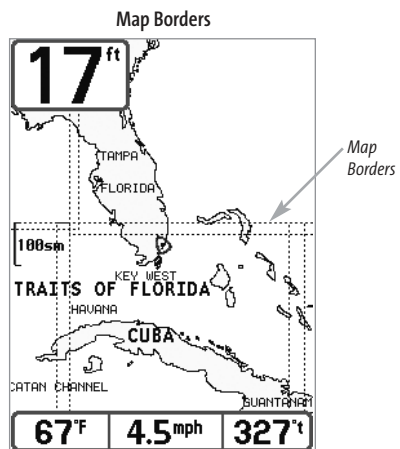
NOTE: Some chart details are only available on optional-purchase MMC charts.

Map Borders

Hidden

Map Borders

Map Borders allows you to display or hide map borders. A Map Border indicates an area which contains a different map.

**To change the Map Borders setting:**

1. Highlight Map Borders on the Navigation main menu.
2. Use the LEFT or RIGHT 4-WAY Cursor Control keys to change the Map Borders setting. (Hidden, Visible, Default = Hidden)

Lat/Lon Grid

Hidden

Lat/Lon Grid

Lat/Lon Grid allows you to display or hide a grid showing latitude and longitude lines.

To change the Lat/Lon Grid setting:

1. Highlight Lat/Lon Grid on the Navigation main menu.
2. Use the LEFT or RIGHT 4-WAY Cursor Control keys to change the Lat/Lon Grid setting. (Hidden, Visible, Default = Hidden)

Spot Soundings

Hidden

Spot Soundings

Spot Soundings allows you to display or hide spot soundings, which are depth measurements shown on the chart.

NOTE: Spot Soundings are only available on optional-purchase MMC charts.

To change the Spot Soundings setting:

1. Highlight Spot Soundings on the Navigation main menu.
2. Use the LEFT or RIGHT 4-WAY Cursor Control keys to change the Spot Soundings setting. (Hidden, Visible, Default = Hidden)

Shaded Depth

15 ft

0 60

Shaded Depth

Shaded Depth allows you to change the depth used for shading on the chart views.

To change the Shaded Depth setting:

1. Highlight Shaded Depth on the Navigation main menu.
2. Use the LEFT or RIGHT 4-WAY Cursor Control keys to change the Shaded Depth setting. (Off, 1 to 60 Feet or 1 to 20 Meters [*International Units Only*], Default = 16 ft, 5 m)

North Reference

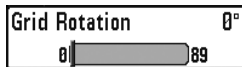
True

North Reference

North Reference allows you to have bearings displayed with one of two orientations: True North or Magnetic North.

To change the North Reference setting:

1. Highlight North Reference on the Navigation main menu.
2. Use the LEFT or RIGHT 4-WAY Cursor Control keys to change the North Reference setting. (True, Magnetic, Default = True)



Grid Rotation

Grid Rotation allows you to set the orientation of the trolling grid in degrees, where a setting of 0° displays a standard North, South, East, West alignment. See Waypoints for information on how to set a Grid.

To change the Grid Rotation setting:

1. Highlight Grid Rotation on the Navigation main menu.
2. Use the LEFT or RIGHT 4-WAY Cursor Control keys to change the Grid Rotation setting. (0° to 89°, Default = 0°)



Trackpoint Interval

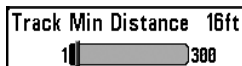
Trackpoint Interval allows you to select the time period between trackpoints. The current track can only contain up to 2000 trackpoints, so longer time periods cause the track to extend back further in time, but will be less detailed.

NOTE: Trackpoint Interval works in conjunction with Track Min Distance. Both conditions must be met before a trackpoint is added to the current track.

To change the Trackpoint Interval setting:

1. Highlight Trackpoint Interval on the Navigation main menu.
2. Use the LEFT or RIGHT 4-WAY Cursor Control keys to change the Trackpoint Interval setting. (1 second, 5 seconds, 10 seconds, 15 seconds, 30 seconds or 60 seconds, Default = 15 seconds)

NOTE: During slow travel or drift, setting both Trackpoint Interval and Track Min Distance to small values will allow you to increase the track resolution.



Track Min Distance (Advanced)

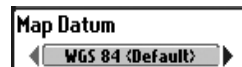
Track Min Distance allows you to set a minimum distance of travel before a trackpoint is added to the track.

NOTE: Track Min Distance works in conjunction with Trackpoint Interval. Both conditions must be met before a trackpoint is added to the current track.

To change the Track Minimum Distance setting:

1. Make sure you are in Advanced User Mode, then highlight Track Min Distance on the Navigation main menu.
2. Use the LEFT or RIGHT 4-WAY Cursor Control keys to change the Track Min Distance setting. (1 to 300 feet or 1 to 100 meters [International Units Only], Default = 16 ft, 5 m)

NOTE: During slow travel or drift, setting both Trackpoint Interval and Track Min Distance to small values will allow you to increase the track resolution.



Map Datum (Advanced)

Map Datum allows you to change the map coordinate system used by the Matrix™ to match those of a paper map.

To change the Map Datum setting:

1. Make sure you are in Advanced User Mode, then highlight Map Datum on the Navigation main menu.
2. Use the LEFT or RIGHT 4-WAY Cursor Control keys to change the Map Datum setting. (Default = WGS 84)



Set Simulation Position (Advanced)

Set Simulation Position allows you to set the position of the boat used in the Simulator.

To set the Simulation Position:

1. Activate the cursor and move it to the new coordinates.
2. Make sure you are in Advanced User Mode, then highlight Set Simulation Position on the Navigation main menu.
3. Use the RIGHT 4-WAY Cursor Control key to change the Simulation Position setting.



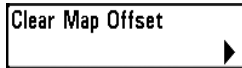
Set Map Offset (Advanced)

Set Map Offset allows you to change the map offset used by the Matrix™.

NOTE: The Map Offset will be applied to all maps and not just the map that requires the correction. The Map Offset should be cleared if a different map is to be used.

To change the Map Offset setting:

1. Activate the cursor and move it location where the Map Offset will be applied.
2. Make sure you are in Advanced User Mode, then highlight Set Map Offset on the Navigation main menu.
3. Use the RIGHT 4-WAY Cursor Control key to set the Map Offset.

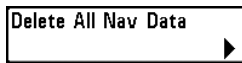


Clear Map Offset (Advanced)

Clear Map Offset allows you to clear the Map Offset. Clear Map Offset is only accessible if a Map Offset is currently active.

To Clear Map Offset:

1. Make sure you are in Advanced User Mode, then highlight Clear Map Offset on the Navigation main menu.
2. Use the RIGHT 4-WAY Cursor Control key to clear the Map Offset.

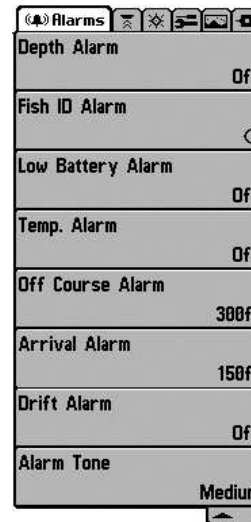


Delete All Nav Data (Advanced)

Delete All Nav Data allows you to delete all saved Tracks, Waypoints and Routes. This menu choice should be used with caution.

To Delete All Navigation Data:

1. Make sure you are in Advanced User Mode, then highlight Delete All Nav Data on the Navigation main menu.
2. Use the RIGHT 4-WAY Cursor Control key to delete all navigation data.

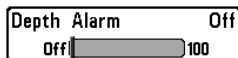


Alarms Menu

Alarms Menu Tab

From any view, press the MENU key twice to access the Main Menu System. The Alarms tab will be the default selection.

NOTE: When an alarm is triggered, you can silence it by pressing any key. The alarm will be silenced, and will not be triggered again until a new instance of the alarm condition is detected.



Depth Alarm

Depth Alarm sounds when the depth becomes equal to or less than the menu setting.

To change the Depth Alarm setting:

1. Highlight Depth Alarm on the Alarms main menu.
2. Use the LEFT or RIGHT 4-WAY Cursor Control keys to change the Depth Alarm setting. (Off, 1 to 100 feet, or 0.5 to 30 meters [*International Models Only*], Default = Off)



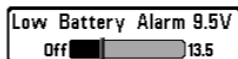
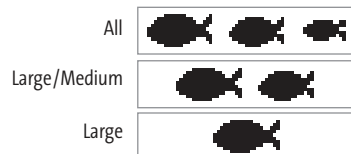
Fish ID Alarm

Fish ID Alarm sounds when the Matrix™ detects fish that correspond to the alarm setting. Fish ID Alarm will only sound if Fish ID+™ is on.

For example, if you've set the Fish ID Alarm to sound for Large fish only, the Fish ID alarm will sound when a large-sized fish is detected.

To change the Fish ID Alarm setting:

1. Highlight Fish ID Alarm on the Alarms main menu.
2. Use the LEFT or RIGHT 4-WAY Cursor Control keys to change the Fish ID Alarm setting. (Off, All, Large/Medium, Large, Default = Off)

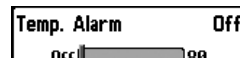


Low Battery Alarm

Low Battery Alarm sounds when the input battery voltage is equal to or less than the menu setting. The battery alarm will only sound for the battery that is connected to the Matrix™. The Low Battery Alarm should be set to warn you when the battery voltage drops below the safety margin that you have determined. For instance, if you are running a trolling motor (battery operated), you would want to set the Low Battery Alarm to sound before the battery voltage drops too low for it to be used to start your main, gasoline-powered engine.

To change the Low Battery Alarm setting:

1. Highlight Low Battery Alarm on the Alarms main menu.
2. Use the LEFT or RIGHT 4-WAY Cursor Control keys to change the Low Battery Alarm setting. (Off, 9.0V - 13.5V, Default = Off)

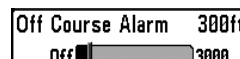


Temp Alarm

Temp Alarm sounds when the water temperature detected by the Matrix™ 87c reaches the Temp Alarm setting, which is either set in degrees Fahrenheit or Celsius [*International Models Only*]. For example, if the Temp Alarm is set to 58 degrees Fahrenheit, and the water temperature falls from 60 degrees to 58 degrees, the Temp Alarm will sound. Similarly, if the water temperature rises from 56 degrees to 58 degrees, the Temp Alarm will also sound.

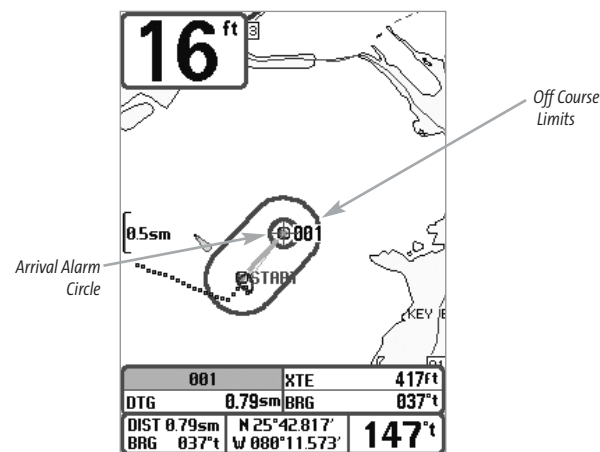
To change the Temp Alarm setting:

1. Highlight Temp Alarm on the Alarms main menu.
2. Use the LEFT or RIGHT 4-Way Cursor Control keys to change the Temp Alarm setting. (Off, 32-120 [Fahrenheit], 0-50 [Celsius [*International Models Only*]], Default = Off)



Off Course Alarm

Off Course Alarm sounds when the boat has moved too far off course based on the menu setting when navigating. Off Course Alarm allows you to set how far the boat is allowed to move off course before the Off Course Alarm will sound.



To change the Off Course Alarm setting:

1. Highlight Off Course Alarm on the Alarms main menu.
2. Use the LEFT or RIGHT 4-WAY Cursor Control keys to change the Off Course Alarm setting. (Off, 30 to 3000 feet, 10 to 1000 meters [*International Models Only*], Default = 300 ft, 100 m)

Arrival Alarm	150ft
Off	3000

Arrival Alarm

Arrival Alarm sounds when the boat has either exceeded the distance to the destination waypoint, or has entered the Arrival Alarm Circle, based on the menu setting when navigating. Arrival Alarm allows you to set how close the boat must be to the destination waypoint before the Arrival Alarm will sound.

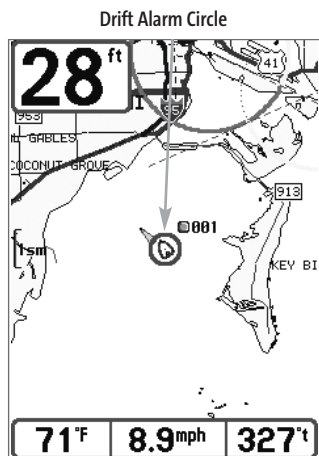
To change the Arrival Alarm setting:

1. Highlight Arrival Alarm on the Alarms main menu.
2. Use the LEFT or RIGHT 4-WAY Cursor Control keys to change the Arrival Alarm setting. (Off, 30 to 3000 feet, 10 to 1000 meters *[International Models Only]*, Default = 150 ft, 50 m)

Drift Alarm	Off
Off	3000

Drift Alarm

Drift Alarm sounds when the boat has exceeded the distance from the boat's anchored position, based on the menu setting. Drift Alarm allows you to set the size of a perimeter around the boat's anchored position; if the anchored boat drifts outside of that perimeter, the Drift Alarm will sound.



To change the Drift Alarm setting:

1. Highlight Drift Alarm on the Alarms main menu.
2. Use the LEFT or RIGHT 4-WAY Cursor Control keys to change the Drift Alarm setting. (Off, 30 to 3000 feet, 10 to 1000 meters *[International Models Only]*, Default = Off)

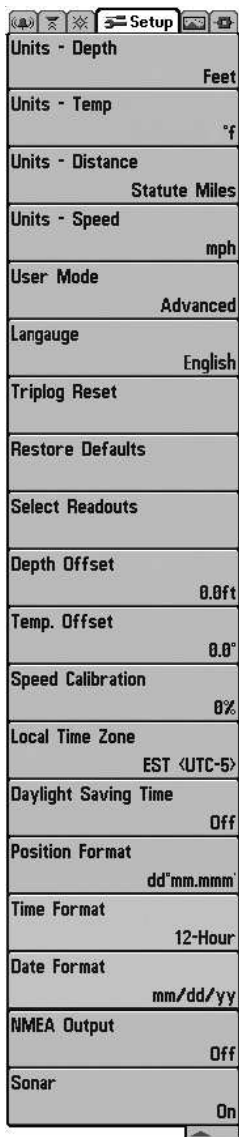
Alarm Tone
Medium

Alarm Tone

Alarm Tone selects the pitch of the alarm sound. A brief tone will be produced as you adjust the Alarm Tone so that you can select the tone that you can hear best.

To change the Alarm Tone setting:

1. Highlight Alarm Tone on the Alarms main menu.
2. Use the LEFT or RIGHT 4-WAY Cursor Control keys to change the Alarm Tone setting. (High, Medium, Low, Default = Medium)

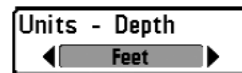


Setup Menu

Setup Menu Tab

From any view, press the MENU key twice to access the tabbed Main Menu System, then press the RIGHT cursor key until the Setup tab is selected.

NOTE: Menu choices will vary depending on system settings such as whether the unit is set for Advanced User mode and what accessories are attached to the unit.

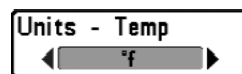


Units - Depth

Units - Depth selects the units of measure for all depth-related readouts.

To change the Units - Depth setting:

1. Highlight Units - Depth on the Setup menu.
2. Use the LEFT or RIGHT 4-WAY Cursor Control keys to change the Units - Depth setting. (Meters [*International Models Only*], Feet, Fathoms; Default is Meters for International models, and Feet for Domestic models)

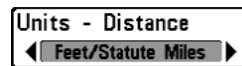


Units - Temp (International Only)

Units - Temp selects the units of measure for all temperature-related readouts. International Models Only.

To change the Units - Temp setting:

1. Highlight Units - Temp on the Setup menu.
2. Use the LEFT or RIGHT 4-WAY Cursor Control keys to change the Units - Temp setting. (Celsius, Fahrenheit; Default = Celsius)



Units - Distance

Units - Distance selects the units of measure for all distance-related readouts.

To change the Units - Distance setting:

1. Highlight Units - Distance on the Setup menu.
2. Use the LEFT or RIGHT 4-WAY Cursor Control keys to change the Units - Distance setting. (Domestic Models: Statute Miles, Nautical Miles; Default = Statute Miles; International Models: Meters/Kilometers, Meters/Nautical Miles, Feet/Statute Miles, Feet/Nautical Miles; Default = Meters/Kilometers)

Units - Speed

mph

Units - Speed

Units - Speed selects the units of measure for speed-related readouts.

To change the Units - Speed setting:

1. Highlight Units - Speed on the Setup menu.
2. Use the LEFT or RIGHT 4-WAY Cursor Control keys to change the Units - Speed setting. (kph [International Models Only], mph, kts, Default = kph for International models and mph for Domestic models)

User Mode

Advanced

User Mode

User Mode sets the menu system to either Normal or Advanced.

When set to Normal (default setting), only the basic menu options are shown. When set to Advanced, additional menu choices are available.

To change the User Mode setting:

1. Highlight User Mode on the Setup menu.
2. Use the LEFT or RIGHT 4-WAY Cursor Control keys to change the User Mode setting. (Normal, Advanced, Default = Normal)

Language

English

Language**(International Only)**

Language selects the display language for menus. International Models Only.

To change the Language setting:

1. Highlight Language on the Setup menu.
2. Use the LEFT or RIGHT 4-WAY Cursor Control keys to change the Language setting. (Default = English)

Triplog Reset

 Confirm:
 Triplog Reset
 No Yes
Triplog Reset

Triplog Reset resets the Triplog to zero. The Triplog provides the following information: timer for elapsed time, distance traveled since last reset, and average speed.

NOTE: See Setup Menu Tab: Select Readouts (Advanced) to find out how to display Triplog information on the screen.

To Reset Triplog:

1. Highlight Reset Triplog on the Setup menu.
2. Use the RIGHT 4-WAY Cursor Control key to initiate Triplog Reset.
3. The Confirm dialog box will appear. To reset the Triplog, press the RIGHT Cursor key once more. To cancel Reset Triplog, press the LEFT Cursor key.

Restore Defaults

 Confirm:
 Restore Defaults
 No Yes
Restore Defaults

Restore Defaults resets ALL menu settings to their factory defaults. Use this menu choice with caution!

To Restore Defaults:

1. Highlight Restore Defaults on the Setup menu.
2. Use the RIGHT 4-WAY Cursor Control key to initiate restoring defaults.
3. The Confirm dialog box will appear. To reset the defaults, press the RIGHT Cursor key once more. To cancel Restore Defaults, press the LEFT Cursor key.

Select Readouts
Readout 1 Temperature
Readout 2 Off
Readout 3 Off
Readout 4 Temperature
Readout 5 Off



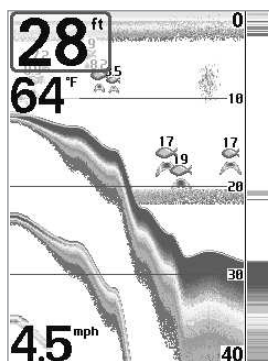
Select Readouts

Select Readouts (Advanced, Sonar View Only)

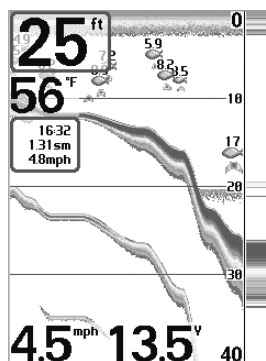
Select Readouts sets individual digital readouts on the Sonar View. This Advanced feature allows you to select what data will be displayed in each of 5 fixed-position data windows arranged around the left and bottom edges of the Sonar View screen, or whether a particular window will be turned off, displaying nothing in that area; you can access this menu choice only when in Advanced User Mode (see *Setup Menu Tab: User Mode.*)

Data windows can display readouts from supported accessories such as Temp/Speed. Each data window can either be empty or contain one of the following:

- Heading
- Navigation
- Position
- Speed
- Temperature
- Time + Date
- Triplog
- Voltage.



Default Sonar View



Customized Sonar View

To Select Readouts:

1. Make sure you are in Advanced User Mode, then highlight Select Readouts on the Setup main menu.
2. Use the RIGHT 4-WAY Cursor Control key to initiate this procedure.
3. The Select Readouts submenu will appear, showing a list of all Readouts. Use the UP or DOWN Cursor keys to select a particular Readout position, then use the RIGHT or LEFT Cursor keys to change what will be displayed at that position. (Heading, Navigation, Position, Off, Speed, Temperature, Time+Date, Triplog, Voltage)

Depth Offset	0.0ft
-10.0	10.0

Depth Offset (Advanced)

Depth Offset will adjust the digital depth readout to indicate depth from the waterline or boats keel. Enter a positive vertical measurement from the transducer to the waterline to read the depth from the waterline. Enter a negative vertical measurement from the transducer to keel to read the depth from the keel. This menu choice is available only when in Advanced User Mode (see *Setup Menu Tab: User Mode.*)

To change the Depth Offset setting:

1. Make sure you are in Advanced User Mode, then highlight Depth Offset on the Setup menu.
2. Use the LEFT or RIGHT 4-WAY Cursor Control keys to change the Depth Offset setting. (-10.0 to +10.0 feet or -3 to 3 meters [*International Models Only*], Default = 0)

Temp. Offset	0.0°
-10.0	10.0

Temp Offset (Advanced)

Temp Offset will adjust the temperature readout by the amount entered. This menu choice is available only when in Advanced User Mode (see *Setup Menu Tab: User Mode.*)

To change the Temp Offset setting:

1. Make sure you are in Advanced User Mode, then highlight Temp Offset on the Setup menu.
2. Use the LEFT or RIGHT 4-WAY Cursor Control keys to change the Temp Offset setting. (-10.0 to +10.0 degrees, Default = 0)

Speed Calibration	5%
-20	20

Speed Calibration (Advanced, with Temp/Speed Only)

Speed Calibration will adjust the speed readout by the percentage entered, and will appear in the menu if a Temp/Speed Accessory is connected and the paddlewheel has moved at least once, when the unit is in Advanced User Mode (see *Setup Menu Tab: User Mode.*)

To change the Speed Calibration setting:

1. Make sure you are in Advanced User Mode, then highlight Speed Calibration on the Setup menu.
2. Use the LEFT or RIGHT 4-WAY Cursor Control keys to change the Speed Calibration setting. (-20% to +20%, Default = 0%)

Local Time Zone

◀ EST (UTC-5) ▶

**Local Time Zone
(Advanced)**

Local Time Zone selects your time zone in reference to the time reported by the GPS receiver when Time+Date is selected as a Digital Readout on the Sonar View (see *Select Readouts*). This menu choice is available only when in Advanced User Mode (see *Setup Menu Tab: User Mode*).

To change the Local Time Zone:

1. Make sure you are in Advanced User Mode, then highlight Local Time Zone on the Setup menu.
2. Use the LEFT or RIGHT 4-WAY Cursor Control keys to change the Local Time Zone (Default = EST [UTC-5] - Eastern Standard Time).

Daylight Saving Time

◀ Off ▶

**Daylight Savings Time
(Advanced)**

Daylight Savings Time adjusts the time display to account for local Daylight Savings Time. Selecting On adds one hour to the time display adjusted for your local time zone. Selecting Off leaves the time display as adjusted for your local time zone. This menu choice is available only when in Advanced User Mode (see *Setup Menu Tab: User Mode*).

To change the Daylight Savings Time setting:

1. Make sure you are in Advanced User Mode, then highlight Daylight Savings Time on the Setup menu.
2. Use the LEFT or RIGHT 4-WAY Cursor Control keys to turn Daylight Savings Time On or Off. (Off, On, Default = Off)

Position Format

◀ dd°mm.mmm ▶

**Position Format
(Advanced)**

Position Format selects the format of the latitude and longitude position display. This menu choice is available only when in Advanced User Mode (see *Setup Menu Tab: User Mode*).

To change the Position Format setting:

1. Make sure you are in Advanced User Mode, then highlight Position Format on the Setup menu.
2. Use the LEFT or RIGHT 4-WAY Cursor Control keys to change the Position Format. (dd.ddddd°, dd°mm.mmm', or dd°mm'ss", Default = dd°mm.mmm')

Time Format

◀ 12-Hour ▶

**Time Format
(Advanced, International Only)**

Time Format changes the time format used by the unit. This menu choice is available only when in Advanced User Mode (see *Setup Menu Tab: User Mode*.) International Models Only. Time Format selects a 12 hour or 24 hour format for the time of day displayed when Time + Date is selected as a Digital Readout on the Sonar View (see *Select Readouts*).

To change the Time Format:

1. Make sure you are in Advanced User Mode, then highlight Time Format on the Setup menu.
2. Use the LEFT or RIGHT 4-WAY Cursor Control keys to change the Time Format. (12 hour, 24 hour, Default = 12 hour)

Date Format

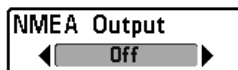
◀ mm/dd/yy ▶

**Date Format
(Advanced, International Only)**

Date Format changes the date format used by the unit. This menu choice is available only when in Advanced User Mode (see *Setup Menu Tab: User Mode*.) International Models Only. Date Format selects the format for the date display when Time + Date is selected as a Digital Readout on the Sonar View. (see *Select Readouts*).

To change the Date Format:

1. Make sure you are in Advanced User Mode, then highlight Date Format on the Setup menu.
2. Use the LEFT or RIGHT 4-WAY Cursor Control keys to change the Date Format. (mm/dd/yy, dd.mm.yy or yy.mm.dd, Default = mm/dd/yy)



NMEA Output (Advanced)

NMEA Output turns the NMEA output on or off. This menu choice is available only when in Advanced User Mode (see *Setup Menu Tab: User Mode*.)

The following NMEA sentences are output:

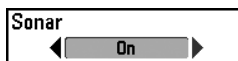
DPT- Depth
 MTW - Water Temperature
 GLL - Lat/Lon Position
 GGA - GPS Fix Data
 RMC - Recommended Minimum Specific GNSS Data
 VTG - Course Over Ground and Ground Speed
 ZDA - Time and Date

When navigating, the following NMEA sentences are also output:

APB - Autopilot Sentence B
 BWR - Bearing and Distance to Waypoint
 RMB - Recommended Minimum Navigation Info

To turn NMEA Output on or off:

1. Make sure you are in Advanced User Mode, then highlight NMEA Output on the Setup menu.
2. Use the LEFT or RIGHT 4-WAY Cursor Control keys to change the NMEA Output to On or Off (Off, On, Default = Off).

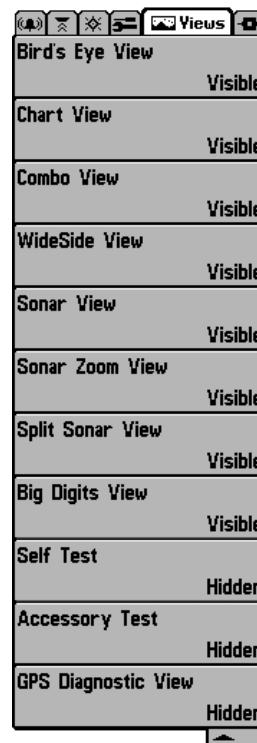


Sonar

Sonar deactivates Sonar and removes the Sonar Views from the view rotation. (Off, On, Default = On)

To turn Sonar on or off:

1. Highlight Sonar on the Setup menu.
2. Use the LEFT or RIGHT 4-WAY Cursor Control keys to change the Sonar to On or Off (Off, On, Default = On).



Views Menu

Views Menu Tab

From any view, press the MENU key twice to access the tabbed Main Menu System, then press the RIGHT 4-WAY Cursor Control key until the Views tab is selected. This menu tab allows you to set the available views to either hidden or visible in the view rotation. The view will be removed from the view rotation if it is set to Hidden and will be displayed in the view rotation if it is set to Visible. The following views are available:

- Bird's Eye View
- Chart View
- Combo View
- WideSide® View
- Sonar View
- Sonar Zoom View
- Split Sonar View
- Big Digits View
- Self Test
- Accessory Test
- GPS Diagnostic View.

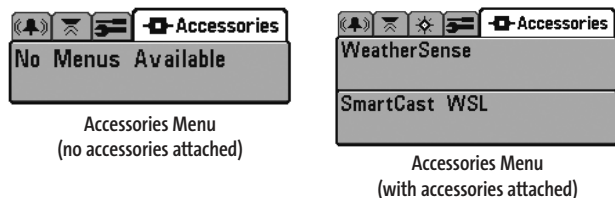
To Change the View Status of Any View:

1. Highlight the View main menu tab.
2. Use the UP or DOWN 4-WAY Cursor Control keys to select a View.
3. Use the LEFT or RIGHT 4-WAY Cursor Control keys to change the status of the view from Hidden to Visible.

Accessories Menu Tab

From any view, press the MENU key twice to access the tabbed Main Menu System, then press the RIGHT cursor key until the Accessories tab is selected.

If no accessories are attached to the Accessory Bus, no menu choices will appear under the Accessories tab. If an accessory is attached, however, additional menu choices that support the accessory will be added automatically. See the Operations Manual that comes with your accessory for detailed information.



Accessories Menu
(no accessories attached)

Accessories Menu
(with accessories attached)

NOTE: Accessories to enable WeatherSense® and the SmartCast® Wireless Sonar Link (WSL) require separate purchases. You can visit our website at www.humminbird.com or contact our Customer Resource Center at 1-800-633-1468 for additional details.

Troubleshooting

Before contacting the Humminbird® Customer Resource Center, please read the following section. Taking the time to review these troubleshooting guidelines may allow you to solve a performance problem yourself, and therefore avoid sending your unit back for repair.

Matrix™ Doesn't Power Up

If your Matrix™ doesn't power up, use the Installation Guide that also comes with it for specific confirmation details, making sure that:

- the power cable is properly connected to the Matrix™ control head,
- the power cable is wired correctly, with red to positive battery terminal and black to negative terminal or ground
- the fuse is operational
- the battery voltage of the power connector is at least 10 Volts.

Correct any known problems, including removing corrosion from the battery terminals or wiring, or actually replacing the battery if necessary.

Matrix™ Defaults to Simulator with a Transducer Attached

A connected and functioning transducer will cause the newly-started Matrix™ to go into Normal operating mode automatically. If, when you power up the Matrix™, it goes into Simulator mode automatically, even though a transducer is already connected, this means that the control head is not detecting the transducer. Perform the following troubleshooting tasks:

- Using the Installation Guide that also comes with your Matrix™, check to make sure that the transducer cable is securely connected to the Matrix™. Reconnect if necessary, and power up the Matrix™ again to see if this fixes the problem.
- Replace the non-functioning transducer with a known good transducer if available and power up the control head again.
- Check the transducer cable. Replace the transducer if the cable is damaged or corroded.

Display Problems

There are several main conditions or sources of possible interference that may cause problems with the quality of the information displayed on the control head. Look in the following table for some symptoms of display problems and possible solutions:

Problem	Possible Cause
The control head loses power at high speeds.	If the power output of your boat's engine is unregulated, the control head may be protecting itself using its over-voltage protection feature. Make sure the input voltage does not exceed 20 Volts.
When the boat moves at higher speeds, the bottom disappears or suddenly weakens, or the display contains gaps.	The transducer position may need to be adjusted. A mix of air and water flowing around the transducer (cavitation) may be interfering with the interpretation of sonar data. See your Installation Guide for suggestions on adjusting the transducer position. Electrical noise from the boat's engine may be interfering with sonar reception. See Finding the Cause of Noise for more information.
There are no fish detected, even when you know they are in the water under the boat, or sonar readings seem weak or faulty.	Sonar readings may be affected if the transducer is not positioned correctly (i.e. mounted at an angle, not straight down), or there is some kind of mechanical interference, either because it is mounted inside a hull that is too thick for proper sonar transmission, the bond between the transducer and the hull is not airtight, or because the transducer is dirty. Check with your Installation Guide for guidance on re-positioning the transducer, and make sure the transducer is clean. Low battery voltage may be affecting the power of signal transmission. Electrical noise from the boat's engine may be interfering with sonar reception. See <i>Finding the Cause of Noise</i> for more information.

Finding the Cause of Noise

Electrical noise usually affects the display with many black dots at high speeds, and high sensitivity readings. One or more of the following sources can cause noise or interference:

Possible Source of Noise	Isolation
Other electronic devices	Turn off any nearby electronic devices to see if the problem goes away, then turn them on one at a time to see if the noise re-appears.
The boat's engine	To determine whether the boat's engine is the source of the noise, increase the RPMs while the boat is in neutral and stationary to see if the noise increases proportionately; if noise appears when you rev the engine, the problem could be the spark plugs, alternator, or tachometer wiring. Replace the spark plugs with resistor plugs, install an alternator filter, or route the control head power and transducer cables away from the engine wiring.
Cavitation from the boat's propeller	Turbulence created by the propeller can cause noise; make sure the transducer is mounted at least 15" (38 cm) from the propeller, and that the water flows smoothly over the face of the transducer at all times.

Matrix™ Accessories

Accessories customize the Matrix™ to your needs and enable you to stay on the edge of new technology. When an accessory is connected to the Matrix™, additional menus and readouts are added automatically to the Main Menu System. Accessories available today that are supported by your Matrix™ include:

WeatherSense® Fishing Condition Monitor: purchase and plug in the WeatherSense® accessory to your Matrix™ to obtain barometric pressure readouts and trend data in real time.

GPS Connection Cable: purchase the GPS Connection Cable in order to connect a handheld or other NMEA* GPS-compatible device that you may already own to your Matrix™.

**NMEA 0183 is a National Marine Electronics Association standard for data communication.*

Wireless Sonar Link (WSL): purchase the Wireless Sonar Link (WSL) accessory to receive remote sonar signals from a SmartCast® Remote Sonar Sensor (RSS). Radio signals from the RSS are received by the WSL and are transmitted over the Accessory Bus to the Matrix™.

PC Connect Cable: Purchase the PC Connect Cable to connect the Matrix™ to a PC in order to upload product software updates and new features obtained from www.humminbird.com. This accessory requires the MSWindows-compatible HumminbirdPC™ software downloaded from our website to your PC in order to communicate with the Matrix™.

Be sure to check out our website www.humminbird.com for additional new and exciting accessories to grow your Matrix™!

NOTE: Each accessory requires a separate purchase. You can visit our website at www.humminbird.com or contact our Customer Resource Center at 1-800-633-1468 for additional details.

Specifications

Depth Capability.....	1500 ft (500 m)
Power Output	500 Watts (RMS), 4000 Watts (Peak to Peak)
Operating Frequency.....	200 kHz and 83 kHz DualBeam PLUS™
Area of Coverage	60° @ -10 dB in 83 kHz 20° @ -10 dB in 200 kHz
Target Separation	2½ Inches (63.5 mm)
Power Requirement	10-20 VDC
LCD	240V x 320H
Transducer.....	XHS-9-20-T
Transducer Cable Length	20 ft (6 m)

NOTE: Product specifications and features are subject to change without notice.

Contact Humminbird®

Contact the Humminbird® Customer Resource Center
in any of the following ways:

By Telephone

(Monday - Friday 8:00 a.m. to 4:30 p.m. Central Standard Time):

1-800-633-1468

By e-mail

(typically we respond to your e-mail within three business days):

custserv@johnsonoutdoors.com

For direct shipping, our address is:

Humminbird®

Service Department
678 Humminbird Lane
Eufaula, AL 36027 USA

