GPSMAP® 500/700 Series and echoMAP™ 50/70 Series

Owner's Manual

DRAFT

January 2013 190-01556-00_01 Printed in Taiwan

All rights reserved. Under the copyright laws, this manual may not be copied, in whole or in part, without the written consent of Garmin. Garmin reserves the right to change or improve its products and to make changes in the content of this manual without obligation to notify any person or organization of such changes or improvements. Go to www.garmin.com for current updates and supplemental information concerning the use of this product.

Garmin®, the Garmin logo, BlueChart®, g2 Vision®, GPSMAP®, and MapSource® are trademarks of Garmin Ltd. or its subsidiaries, registered in the USA and other countries. echoMAP™, GXM™, and HomePort™ are trademarks of Garmin Ltd. or its subsidiaries. These trademarks may not be used without the express permission of Garmin.

The Bluetooth® word mark and logos are owned by the Bluetooth SIG, Inc. and any use of such marks by Garmin is under license. iOS® is a registered trademark of Cisco Systems, Inc. used under license by Apple Inc. microSD™ is a trademark of SD-3C, LLC. NMEA®, NMEA 2000®, and the NMEA 2000 logo are registered trademarks of the National Marine Electronics Association. SiriusXM™ is a registered trademark of SiriusXM Radio Inc. All other trademarks and copyrights are the property of their respective owners. Other trademarks and trade names are those of their respective owners.

DRAFT

Table of Contents

Introduction 1
Device Views 1
echoMAP 70 Series and GPSMAP 700 Series 1
Using the Touchscreen 1
echoMAP 50 Series and GPSMAP 500 Series 1
Device Keys 1
Tips and Shortcuts 1
GPS Satellite Signals 1
Adjusting the Backlight 1
Adjusting the Color Mode 1
Customizing the Home Screen 1
Inserting Memory Cards 2

Charts and 3D Chart Views 2
Navigation Chart and Offshore Fishing Chart 2
Zooming In and Out of the Chart 2
Panning the Chart 2
Selecting an Item on the Map Using the Device Keys 2
Chart Symbols 2
Navigating to a Point on the Chart 3
Viewing Location and Object Information on a Chart 3
Viewing Details about Navaids 3
Premium Charts 3
Viewing Tide Station Information 3
Showing Satellite Imagery on the Navigation Chart 4
Viewing Aerial Photos of Landmarks 4
Automatic Identification System 4
AIS Targeting Symbols 4
Heading and Projected Course of Activated AIS Targets 5
Showing AIS Vessels on a Chart or 3D Chart View 5
Activating a Target for an AIS Vessel 5
Viewing Information about a Targeted AIS Vessel 5
Deactivating a Target for an AIS Vessel 5
Viewing a List of AIS Threats 5
Setting a Safe-Zone Collision Alarm 5
AIS Search and Rescue Transmitters 5
Navigating to a SART Transmission 6
AIS-SART Targeting Symbols 6
Enabling AIS Transmission Test Alerts 6
Turning Off AIS Reception 6
Chart and 3D Chart View Settings 6
Navigation and Fishing Chart Setup 6
Waypoints and Tracks Settings on the Charts and Chart Views 6
Overlay Numbers Settings 6
Editing the Data Fields 6
Showing a Navigation Inset 7
Chart Appearance Settings 7
Other Vessels Settings on the Charts and Chart Views 7
AIS Display Settings 7
Fish Eye 3D Settings 7

Navigation with a Chartplotter 7
Basic Navigation Questions 8
Destinations 8
Searching for a Destination by Name 8
Selecting a Destination Using the Navigation Chart 8
Searching for a Destination Using Nav Info 8
Searching for a Marine Services Destination 8
Courses 8
Setting and Following a Direct Course Using Go To 8
Setting and Following a Course Using Auto Guidance 9
Autopilot Navigation 9
Stopping Navigation 9
Waypoints 9
Marking Your Present Location as a Waypoint 9
Creating a Waypoint at a Different Location 9
Marking and Navigating to an MOB Location 9
Viewing a List of all Waypoints 9
Editing a Saved Waypoint 9
Moving a Saved Waypoint 9
Browsing for and Navigating to a Saved Waypoint 9
Deleting a Waypoint or an MOB 10
Deleting All Waypoints 10
Routes 10
Creating and Navigating a Route From Your Present Location 10
Creating and Saving a Route 10
Viewing a List of Routes 10
Editing a Saved Route 10
Browsing for and Navigating a Saved Route 10
Browsing for and Navigating Parallel to a Saved Route 10
Deleting a Saved Route 11
Deleting All Saved Routes 11
Tracks 11
Showing Tracks 11
Setting the Color of the Active Track 11
Saving the Active Track 11
Viewing a List of Saved Tracks 11
Editing a Saved Track 11
Saving a Track as a Route 11
Browsing for and Navigating a Recorded Track 11
Deleting a Saved Track 11
Deleting All Saved Tracks 11
Retracing the Active Track 11
Clearing the Active Track 11
Managing the Track Log Memory During Recording 11
Configuring the Recording Interval of the Track Log 11
Deleting All Saved Waypoints, Routes, and Tracks 12

Combinations 12
Selecting a Combination 12
Customizing the Combinations Screen 12

Gauges and Almanac Information 12
Viewing the Compass 12
Viewing Trip Gauges 12
Resetting Trip Gauges 12
Viewing Engine and Fuel Gauges 12
Customizing Engine Gauge and Fuel Gauge Limits 12
Enabling Status Alarms for Engine Gauges 12
Enabling Some Engine Gauge Status Alarms 12
Selecting the Number of Engines Shown in Gauges 12
Customizing the Engines Shown in Gauges 13
Configuring the Fuel Gauges Display 13
Setting the Fuel Capacity of the Vessel 13
Synchronizing the Fuel Data with the Actual Vessel Fuel 13
Setting the Fuel Alarm 13
Viewing the Wind Gauges 13
Configuring the Speed Source 13
Configuring the Heading Source of the Wind Gauge 13
Selecting the Range of the Close-Hauled Wind Gauge . 13

DRAFT

Viewing the Environment Gauges 13
Configuring the Alignment of the Wind Gauge 13
Selecting the Range of the Close-Hauled Environment Gauge 13
Setting the Barometer Reference Time 13
Tide, Current, and Celestial Information 14
Tide Station Information 14
Current Station Information 14
Celestial Information 14
Viewing Tide Station, Current Station, or Celestial Information for a Different Date 14
Viewing Information for a Different Tide or Current Station 14
Viewing Almanac Information from the Navigation Chart 14
Sonar 14
Full-Screen Sonar View 14
Split-Zoom Sonar View 14
Split-Frequency Sonar View 14
Pausing the Sonar Display 14
Creating a Waypoint on the Sonar Screen 14
Adjusting the Gain on the Sonar Screen 14
Adjusting the Range of the Depth Scale 14
Setting the Zoom Level on the Sonar Screen 15
Selecting Frequencies 15
Turning On the A-Scope 15
Sonar Setup 15
Sonar Settings 15
Sonar Appearance Settings 15
Advanced Sonar Settings 15
Sonar Alarm Settings 15
Setting the Keel Offset 15
Recording the Sonar Display 16
Stopping the Sonar Recording 16
Depth and Water Temperature Graphs 16
Setting the Depth and Water Temperature Graph Range and Time Scales 16
Radar 16
Radar Display Modes 16
Transmitting Radar Signals 16
Adjusting the Zoom Scale on the Radar Screen 17
Tips for Selecting a Radar Zoom Scale 17
Sentry Mode 17
Enabling Timed Transmit 17
Setting the Standby and Transmit Times 17
Enabling a Guard Zone 17
Defining a Circular Guard Zone 17
Defining a Partial Guard Zone 17
Marking a Waypoint on the Radar Screen 17
Viewing a List of AIS Threats 17
Showing AIS Vessels on the Radar Screen 17
VRM and EBL 18
Showing the VRM and the EBL 18
Adjusting the VRM and the EBL 18
Measuring the Range and Bearing to a Target Object 18
Radar Overlay 18
Radar Overlay and Chart Data Alignment 18
Showing the Radar Overlay 18
Stopping the Transmission of Radar Signals 18
Optimizing the Radar Display 18
Range of Radar Signals 18
Radar Gain and Clutter 18
Automatically Adjusting Gain on the Radar Screen 18
Manually Adjusting Gain on the Radar Screen 19
Minimizing Nearby Large-Object Interference 19
Minimizing Side-Lobe Interference on the Radar Screen 19
Adjusting Sea Clutter on the Radar Screen 19
Adjusting Rain Clutter on the Radar Screen 19
Adjusting Cross Talk Clutter on the Radar Screen 19
Radar Display Settings 19
Radar Appearance Settings 19
Front-of-Boat Offset 20
Measuring the Potential Front-of-Boat Offset 20
Setting the Front-of-Boat Offset 20
Digital Selective Calling 20
Networked Chartplotter and VHF Radio Functionality 20
Turning On DSC 20
DSC List 20
Viewing the DSC List 20
Adding a DSC Contact 20
Incoming Distress Calls 20
Navigating to a Vessel in Distress 20
Man-Overboard Distress Calls Initiated from a VHF Radio 20
Man-Overboard Distress Calls Initiated from the Chartplotter 20
Position Tracking 21
Viewing a Position Report 21
Navigating to a Tracked Vessel 21
Creating a Waypoint at the Position of a Tracked Vessel 21
Editing Information in a Position Report 21
Deleting a Position-Report Call 21
Viewing Vessel Trails on the Chart 21
Individual Routine Calls 21
Selecting a DSC Channel 21
Making an Individual Routine Call 21
Making an Individual Routine Call to an AIS Target 21
Viewing Video 21
Selecting a Video Source 21
Configuring the Video Appearance 22
Configuring the VGA Display 22
Exiting VGA Display Mode 22
SiriusXM™ 22
SiriusXM Equipment and Subscription Requirements 22
Weather Data Broadcasts 22
Viewing Precipitation Information 22
Precipitation Views 22
Switching Weather Charts 23
Storm Cell and Lightning Information 23
Hurricane Information 23
Weather Warnings and Weather Bulletins 23
Forecast Information 23
Viewing Forecast Information for Another Time Period 23
Viewing a Marine Forecast or an Offshore Forecast 23
Weather Fronts and Pressure Centers 23
City Forecasts 24
Viewing Sea Conditions 24
Surface Winds 24
Wave Height, Wave Period, and Wave Direction 24

DRAFT

Viewing Forecast Sea Conditions Information for Another Time Period 24
Viewing Fishing Information 24
Surface Pressure and Water Temperature Data 24
Forecasting Fish Locations 24
Visibility Information 25
Viewing Forecast Visibility Information for Another Time Period 25
Viewing Buoy Reports 25
Viewing Local Weather Information near a Buoy 25
Creating a Waypoint on a Weather Chart 25
Weather Overlay 25
Turning On the Weather Overlay on a Chart 25
Weather Overlay Settings on the Navigation Chart 25
Weather Overlay Settings on the Fishing Chart 25
Showing Fish Forecasting Data on the Fishing Chart ... 25
Viewing Weather Subscription Information 25
SiriusXM Radio 26
Customizing the Channel Guide 26
SiriusXM Presets 26
Saving a SiriusXM Channel to the Presets List 26
Adjusting SiriusXM Satellite Radio Volume 26
Changing the SiriusXM Settings from a Chart 26
Device Configuration 26
Turning On the Chartplotter Automatically 26
System Settings 26
GPS Settings 26
Viewing the Event Log 26
Viewing System Software Information 26
My Vessel Information 26
Setting the Keel Offset 27
Calibrating a Water Speed Device 27
Setting the Water Temperature Offset 27
Communications Settings 27
NMEA 2000 and NMEA 0183 27
NMEA 0183 27
NMEA 2000 28
Communication with Wireless Devices 28
Connecting a Bluetooth Wireless Device 28
Disconnecting a Bluetooth Wireless Device 28
Setting Up the Wireless Network 28
Connecting a Wireless Device to the Chartplotter ... 28
Setting Alarms 28
Navigation Alarms 28
System Alarms 28
Setting the Fuel Alarm 28
Setting Weather Alarms 28
Setting the Safe-Zone Collision Alarm 28
Units Settings 29
Navigation Settings 29
Auto Guidance Line Configurations 29
Adjusting the Distance from Shore 29
Other Vessel Settings 30
Viewing System Software Information 30
Restoring the Original Chartplotter Factory Settings 30
Chartplotter Data Management 30
Copying Waypoints, Routes, and Tracks to a Chartplotter .. 30
Copying Data from a Memory Card 30
Copying Waypoints, Routes, and Tracks to a Memory Card 30
Copying Waypoints, Routes, and Tracks to or from all Chartplotters on a NMEA 2000 Network 30
Copying Built-In Maps to a Memory Card 31
Backing Up Data to a Computer 31
Restoring Backup Data to a Chartplotter 31
Saving System Information to a Memory Card 31
Appendix 31
Registering Your Device 31
Calibrating the Touchscreen 31
Updating the Device Software 31
Screenshots 31
Capturing Screenshots 31
Copying Screenshots to a Computer 31
NMEA 0183 Information 32
NMEA 2000 PGN Information 32
Index 33

DRAFT

DRAFT

Introduction

⚠ WARNING

See the *Important Safety and Product Information* guide in the product box for product warnings and other important information.

Device Views

echoMAP 70 Series and GPSMAP 700 Series

①	Power key
②	Automatic backlight sensor
③	Touchscreen
④	microSD™ memory card slot

Using the Touchscreen

- Tap the screen to select an item.
- Drag or swipe your finger across the screen to pan or scroll.
- Pinch two fingers together to zoom out.
- Spread two fingers apart to zoom in.

Locking the Touchscreen

You can lock the touchscreen to prevent inadvertent screen touches.

1. Select ⏻.
2. Select **Lock Touchscreen**.

echoMAP 50 Series and GPSMAP 500 Series

①	Automatic backlight sensor
②	Power key
③	Device keys
④	microSD memory card slot

Device Keys

⏻	Turns on and off the device when held.
	Adjusts the backlight and color mode.
−	Zooms out of a chart or view.
+	Zooms in to a chart or view.
◀ ▶ ▼ ▲	Scrolls, highlights options, and moves the cursor.
Select	Acknowledges messages and selects options.
Back	Returns to the previous screen.
Mark	Saves the present location as a waypoint.
Home	Returns to the Home screen.
Menu	Opens a menu of options for the page, when applicable.
	Closes a menu, when applicable.

Tips and Shortcuts

- Select **Home** from any screen to return to the Home screen.
- Select **Menu** from any main screen to access additional settings anout that screen.
- Press ⏻ to adjust the backlight and lock the touchscreen.
- Hold ⏻ to turn the chartplotter on or off.

GPS Satellite Signals

When you turn on the chartplotter, the GPS receiver must collect satellite data and establish the current location. When the chartplotter acquires satellite signals, appears at the top of the Home screen. When the chartplotter loses satellite signals, disappears and a flashing question mark appears over on the chart.

For more information about GPS, go to www.garmin.com/aboutGPS.

Adjusting the Backlight

1. Select **Settings** > **System** > **Display** > **Backlight**.

   TIP: Press ⏻ from any screen to access the backlight settings.
2. Select an option:
   - Adjust the backlight level.
   - Select **Enable Auto Backlight** or **Auto**.

Adjusting the Color Mode

1. Select **Settings** > **System** > **Display** > **Color Mode**.
2. Select an option.

Customizing the Home Screen

You can add items to and rearrange the Home screen icons.

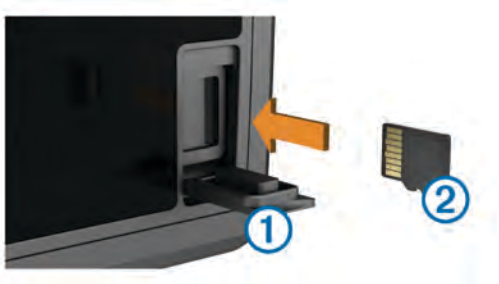
1. From the Home screen, select **Menu**.
2. Select an option:
   - To rearrange an item, select **Rearrange**, select the item to move, and select the new location for it.
   - To add an item to the Home screen, select **Add**, and select the new item to add.
   - To remove a item you have added to the Home screen, select **Remove**, and select the item to remove.

DRAFT

Inserting Memory Cards

You can use optional memory cards in the chartplotter. Map cards allow you to view high-resolution satellite imagery and aerial reference photos of ports, harbors, marinas, and other points of interest. You can use blank memory cards to transfer data such as waypoints, routes, and tracks to another compatible Garmin chartplotter or a computer.

1 Open the access door ① on the front of the chartplotter.



2 Insert the memory card ② with the label facing to the right.

3 Press the card in until it clicks.

4 Close the door.

Charts and 3D Chart Views

The chartplotters have a basic imagery map. The charts and 3D chart views listed below are available on the chartplotter. The charts and views that are available depend on the map data and accessories used.

You can access the charts and chart views by selecting **Charts**.

Navigation Chart: Shows navigation data available on your pre-loaded maps and from supplemental maps, if available. The data includes buoys, lights, cables, depth soundings, marinas, and tide stations in an overhead view.

Perspective 3D: Provides a view from above and behind the boat (according to your course) and provides a visual navigation aid. This view is helpful when navigating tricky shoals, reefs, bridges, or channels, and is beneficial when trying to identify entry and exit routes in unfamiliar harbors or anchorages.

Mariner's Eye 3D: Shows a detailed, three-dimensional view from above and behind the boat (according to your course) and provides a visual navigation aid. This view is helpful when navigating tricky shoals, reefs, bridges, or channels, and when trying to identify entry and exit routes in unfamiliar harbors or anchorages.

NOTE: Mariner's Eye 3D and Fish Eye 3D chart views are available with premium charts, in some areas.

Fish Eye 3D: Provides an underwater view that visually represents the sea floor according to the chart information. When a sonar transducer is connected, suspended targets (such as fish) are indicated by red, green, and yellow spheres. Red indicates the largest targets and green indicates the smallest.

NOTE: Mariner's Eye 3D and Fish Eye 3D chart views are available with premium charts, in some areas.

Fishing Chart: Provides a detailed view of the bottom contours and depth soundings on the chart. This chart removes navigational data from the chart, provides detailed bathymetric data, and enhances bottom contours for depth recognition. This chart is best for offshore deep-sea fishing.

NOTE: The offshore Fishing chart is available with premium charts, in some areas.

Radar Overlay: Superimposes radar information on the Navigation chart or the Fishing chart, when the chartplotter is connected to a radar. This feature is not available with all models.

Navigation Chart and Offshore Fishing Chart

NOTE: The offshore Fishing chart is available with premium charts, in some areas.

The Navigation and Fishing charts allows you to plan your course, view map information, and follow a route. The Fishing chart is for offshore fishing.

To open the Navigation chart, select **Charts** > **Navigation Chart**.

To open the Fishing chart, select **Charts** > **Fishing Chart**.

Zooming In and Out of the Chart

The zoom level is indicated by the scale number at the bottom of the chart. The bar under the scale number represents that distance on the chart.

- Select ▬ to zoom out.
- Select ✚ to zoom in.

Panning the Chart

You can move the chart to view an area other than your present location.

1 From the chart, drag the navigation screen or use the arrow keys.

2 Select **Stop Panning** or **Back** to stop panning and return the screen to your present location.

Selecting an Item on the Map Using the Device Keys

1 From a chart or 3D chart view, select ◀, ▶, ▼, or ▲ to move the cursor.

2 Select **Select**.

Chart Symbols

This table contains some of the common symbols you might see on the detailed charts.

Icon	Description
	Buoy
	Information
	Marine services
	Tide station
	Current station
	Overhead photo available
	Perspective photo available

Other features common to most charts include depth contour lines (with deep water represented in white), intertidal zones,

DRAFT

spot soundings (as depicted on the original paper chart), navigational aids and symbols, obstructions, and cable areas.

Navigating to a Point on the Chart

⚠ CAUTION

The Auto Guidance feature is based on electronic chart information. That data does not ensure obstacle and bottom clearance. Carefully compare the course to all visual sightings, and avoid any land, shallow water, or other obstacles that may be in your path.

When using Go To, a direct course and a corrected course may pass over land or shallow water. Use visual sightings, and steer to avoid land, shallow water, and other dangerous objects.

NOTE: The offshore Fishing chart is available with premium charts, in some areas.

NOTE: Auto Guidance is available with premium charts, in some areas.

1. From the Navigation chart or Fishing chart, select a location.
2. If necessary, select **Select**.
3. Select **Navigate To**.
4. Select an option:
   - To navigate directly to the location, select **Go To**.
   - To create a route to the location, including turns, select **Route To**.
   - To use Auto Guidance, select **Guide To**.
5. Review the course indicated by the magenta line.

   NOTE: When using Auto Guidance, a gray segment within any part of the magenta line indicates that Auto Guidance cannot calculate part of the Auto Guidance line. This is due to the settings for minimum safe water depth and minimum safe obstacle height.
6. Follow the magenta line, steering to avoid land, shallow water, and other obstacles.

Viewing Location and Object Information on a Chart

You can view information about a location or an object on the Navigation chart or the Fishing chart.

NOTE: The offshore Fishing chart is available with premium charts, in some areas.

1. From the Navigation chart or Fishing chart, select a location or object.

   A list of options appears along the right side of the chart. The options that appear vary based on the location or object you selected.
2. Select an option:
   - To view details of objects in the vicinity of the cursor, select **Review**.

     NOTE: Review does not appear if the cursor is not near an object. If the cursor is near only one object, the name of the object appears.
   - To navigate to the selected location, select **Navigate To**.
   - To mark a waypoint at the cursor location, select **Create Waypoint**.
   - To view the distance and bearing of the object from your current location, select **Measure Distance**.

     The distance and bearing appear on the screen. Select **Set Reference** to measure from a location other than your current location.
   - To view tide, current, celestial, chart notes, or local services information near the cursor, select **Information**.

Viewing Details about Navaids

From the Navigation chart, Fishing chart, Perspective 3D chart view, or Mariner's Eye 3D chart view, you can view details about various types of navigation aids, including beacons, lights, and obstructions.

NOTE: The offshore Fishing chart is available with premium charts, in some areas.

NOTE: Mariner's Eye 3D and Fish Eye 3D chart views are available with premium charts, in some areas.

1. From a chart or 3D chart view, select a navaid.
2. If necessary, select **Review**.
3. Select the name of the navaid.

Premium Charts

⚠ CAUTION

The Auto Guidance feature is based on electronic chart information. That data does not ensure obstacle and bottom clearance. Carefully compare the course to all visual sightings, and avoid any land, shallow water, or other obstacles that may be in your path.

Optional premium charts, such as BlueChart® g2 Vision®, allow you to get the most out of your chartplotter. In addition to detailed marine charting, premium charts may contain these features, which are available in some areas.

Mariner's Eye 3D: Provides a view from above and behind the boat for a three-dimensional navigation aid.

Fish Eye 3D: Provides an underwater, three-dimensional view that visually represents the sea floor according to the information on the chart.

Fishing Charts: Shows the chart with enhanced bottom contours and without navigational data. This chart works well for offshore deep-sea fishing.

High Resolution Satellite Imagery: Provides high-resolution satellite images for a realistic view of the land and water on the Navigation chart (page 4).

Aerial Photos: Shows marinas and other navigationally significant aerial photos to help you visualize your surroundings (page 4).

Detailed Roads and POI data: Shows detailed road and point of interest (POI) data, which includes highly detailed coastal roads and POIs such as restaurants, lodging, local attractions.

Auto Guidance: Uses specified safe depth, safe height, and chart data to determine the best course to your destination. Auto Guidance is available when you navigate to a destination using Guide To.

Viewing Tide Station Information

NOTE: Tide station icons are available with premium charts, in some areas.

◈ on the chart indicates a tide station. You can view a detailed graph for a tide station to help predict the tide level at different times or on different days.

DRAFT

NOTE: This feature is available with premium charts, in some areas.

1. From the Navigation chart or Fishing chart, select a tide station.

   Tide direction ① and tide level information ② appear near ◈.

2. Select an option to view additional station information:
   - Select the button with the station name ③.
   - If more than one item is in the vicinity, select **Review**, and select the button with the station name.

Animated Tide and Current Indicators

NOTE: This feature is available with premium charts, in some areas.

You can view indicators for animated tide station and current direction on the Navigation chart or the Fishing chart. You must also enable animated icons in the chart settings (page 4).

An indicator for a tide station appears on the chart as a vertical bar graph with an arrow. A red arrow pointing downward indicates a falling tide, and a blue arrow pointing upward indicates a rising tide. When you move the cursor over the tide station indicator, the height of the tide at the station appears above the station indicator.

Current direction indicators appear as arrows on the chart. The direction of each arrow indicates the direction of the current at a specific location on the chart. The color of the current arrow indicates the range of speed for the current at that location. When you move the cursor over the current direction indicator, the specific current speed at the location appears above the direction indicator.

Color	Current Speed Range
Yellow	0 to 1 knot
Orange	1 to 2 knots
Red	2 or more knots

Showing and Configuring Tides and Currents

NOTE: This feature is available with premium charts, in some areas.

You can show static or animated tide and current station indicators on the Navigation chart or Fishing chart.

1. From the Navigation or Fishing chart, select **Menu** > **Chart Setup** > **Tides & Currents**.
2. Select an option:
   - To show current station indicators and tide station indicators on the chart, select **On**.
   - To show animated tide station indicators and animated current direction indicators on the chart, select **Animated**.

Showing Satellite Imagery on the Navigation Chart

NOTE: This feature is available with premium charts, in some areas.

You can overlay high-resolution satellite images on the land or on both land and sea portions of the Navigation chart.

NOTE: When enabled, high-resolution satellite images are present only at lower zoom levels. If you cannot see high-resolution images in your optional chart region, you can select ✚ to zoom in. You also can set the detail level higher by changing the map zoom detail.

1. Select **Charts** > **Navigation Chart** > **Menu** > **Navigation Chart Setup** > **Photos**.
2. Select an option:
   - Select **Land Only** to show standard chart information on the water, with photos overlaying the land.
   - Select **Photo Map Blend** to show photos on both the water and the land at a specified opacity. Use the slider bar to adjust the photo opacity. The higher you set the percentage, the more the satellite photos cover both land and water.

Viewing Aerial Photos of Landmarks

Before you can view aerial photos on the Navigation chart, you must turn on the Photo setting in the chart setup.

NOTE: This feature is available with premium charts, in some areas.

You can use aerial photographs of landmarks, marinas, and harbors to help orient yourself to your surroundings or to acquaint yourself with a marina or a harbor prior to arrival.

1. From the Navigation chart, select a camera icon:
   - To view an overhead photo, select .
   - To view a perspective photo, select . The photo was taken from the location of the camera, pointed in the direction of the cone.
2. Select **Review** > **Aerial Photo**.

Automatic Identification System

The Automatic Identification System (AIS) enables you to identify and track other vessels, and alerts you to area traffic. When connected to an external AIS device, the chartplotter can show some AIS information about other vessels that are within range, that are equipped with a transponder, and that are actively transmitting AIS information. The information reported for each vessel includes the Maritime Mobile Service Identity (MMSI), location, GPS speed, GPS heading, time that has elapsed since the last position of the vessel was reported, nearest approach, and time to the nearest approach.

AIS Targeting Symbols

Symbol	Description
	AIS vessel. The vessel is reporting AIS information. The direction in which the triangle is pointing indicates the direction in which the AIS vessel is moving.
	Target is selected.
	Target is activated. The target appears larger on the chart. A green line attached to the target indicates the heading of the target. The MMSI, speed, and direction of the vessel appear beneath the target, if the details setting has been set to Show. If the AIS transmission from the vessel is lost, a message banner appears.
	Target is lost. A green X indicates that the AIS transmission from the vessel is lost, and the chartplotter displays a message banner asking whether the vessel should continue to be tracked. If you discontinue vessel tracking, the lost target symbol disappears from the chart or the 3D chart view.

DRAFT

Symbol	Description
	Dangerous target in range. The target flashes while an alarm sounds and a message banner appears. After the alarm has been acknowledged, a solid red triangle with a red line attached to it indicates the location and the heading of the target. If the safe-zone collision alarm has been set to Off, the target flashes, but the audible alarm does not sound and the alarm banner does not appear. If the AIS transmission from the vessel is lost, a message banner appears.
	Dangerous target is lost. A red X indicates that the AIS transmission from the vessel is lost, and the chartplotter displays a message banner asking whether the vessel should continue to be tracked. If you discontinue vessel tracking, the lost dangerous target symbol disappears from the chart or the 3D chart view.
	The location of this symbol indicates the closest point of approach to a dangerous target, and the numbers near the symbol indicate the time to the closest point of approach to that target.

Heading and Projected Course of Activated AIS Targets

When heading and course over ground information are provided by an activated AIS target, the heading of the target appears on a chart as a solid line attached to the AIS target symbol. A heading line does not appear on a 3D chart view.

The projected course of an activated AIS target appears as a dashed line on a chart or a 3D chart view. The length of the projected course line is based on the value of the projected heading setting. If an activated AIS target is not transmitting speed information, or if the vessel is not moving, a projected course line does not appear. Changes in the speed, course over ground, or rate of turn information transmitted by the vessel can impact the calculation of the projected course line.

When course over ground, heading, and rate of turn information are provided by an activated AIS target, the projected course of the target is calculated based on the course over ground and the rate of turn information. The direction in which the target is turning, which is also based on the rate of turn information, is indicated by the direction of the barb at the end of the heading line. The length of the barb does not change.

When course over ground and heading information are provided by an activated AIS target, but rate of turn information is not provided, the projected course of the target is calculated based on the course over ground information.

Showing AIS Vessels on a Chart or 3D Chart View

Before you can use AIS, you must connect the chartplotter to an external AIS device and receive active transponder signals from other vessels.

You can configure how other vessels appear on a chart or on a 3D chart view. The display range configured for one chart or one 3D chart view are applied only to that chart or to that 3D chart view. The details, projected heading, and trails settings configured for one chart or one 3D chart view are applied to all charts and to all 3D chart views.

1. From a chart or 3D chart view, select **Menu** > **Other Vessels** > **AIS Display Setup**.
2. Select an option:
   - To indicate the distance from your location in which AIS vessels appear, select **Display Range**, and select a distance.
   - To show details about AIS-activated vessels, select **Details** > **Show**.
   - To set the projected heading time for AIS-activated vessels, select **Projected Heading**, and enter the time.
   - To show the tracks of AIS vessels, select **Trails**, and select the length of the track that appears using a trail.

Activating a Target for an AIS Vessel

1. From a chart or a 3D chart view, select an AIS vessel.
2. Select **AIS Vessel** > **Activate Target**.

Viewing Information about a Targeted AIS Vessel

You can view the AIS signal status, MMSI, GPS speed, GPS heading, and other information that is reported about a targeted AIS vessel.

1. From a chart or a 3D chart view, select an AIS vessel.
2. Select **AIS Vessel**.

Deactivating a Target for an AIS Vessel

1. From a chart or a 3D chart view, select an AIS vessel.
2. Select **AIS Vessel** > **Deactivate**.

Viewing a List of AIS Threats

From a chart or 3D chart view, select **Menu** > **Other Vessels** > **AIS List**.

Setting a Safe-Zone Collision Alarm

Before you can set a collision alarm, you must have a compatible chartplotter connected to an AIS device or radar.

The safe-zone collision alarm is used only with AIS. The safe zone is used for collision avoidance and can be customized.

1. Select **Alarms** > **AIS** > **AIS Alarm** > **On**.

   A message banner appears and an alarm sounds when an AIS-activated vessel enters the safe-zone area around your boat. The object is also labeled as dangerous on the screen. When the alarm is off, the message banner and audible alarm are disabled, but the object is still labeled as dangerous on the screen.
2. Select **Range**.
3. Select a distance for the safe-zone radius around your vessel.
4. Select **Time To**.
5. Select a time at which the alarm will sound if a target is determined to intersect the safe zone.

   For example, to be notified of a pending intersection 10 minutes before it will likely occur, set **Time To** to 10, and the alarm will sound 10 minutes before the vessel intersects the safe zone.

AIS Search and Rescue Transmitters

AIS Search and Rescue Transmitters (AIS-SART, or SART) are self-contained devices that transmit emergency position reports when activated. SART transmissions are different than standard AIS transmissions, so they appear differently on the chartplotter. Instead of tracking a SART transmission for collision avoidance, you track a SART transmission to locate and assist a vessel.

DRAFT

Navigating to a SART Transmission

When you receive a SART transmission, a distress signal alarm appears.

Select **Review** > **Go To** to begin navigation to the SART transmision.

AIS-SART Targeting Symbols

Symbol	Description
	AIS-SART transmission. Select to see more information about the SART transmission and begin navigation.
	AIS-SART transmission lost.
	AIS-SART transmission test. Appears when a vessel initiates a test of their SART device, and does not represent a true emergency.
	AIS-SART transmission test lost.

Enabling AIS Transmission Test Alerts

To avoid a large number of test alerts and symbols in crowded areas such as marinas, you can select to receive or ignore AIS test messages. To test an AIS emergency device, you must enable the chartplotter to receive test alerts.

1. Select **Settings** > **Alarms** > **AIS**.
2. Select an option:
   - To receive or ignore Emergency Position Indicating Radio Beacon (EPRIB) test signals, select **AIS-EPIRB Test**.
   - To receive or ignore Man Overboard (MOB) test signals, select **AIS-MOB Test**.
   - To receive or ignore Search and Rescue Transponder (SART) test signals, select **AIS-SART Test**.

Turning Off AIS Reception

AIS signal reception is turned on by default.

Select **Settings** > **Other Vessels** > **AIS** > **Off**.

All AIS functionality on all charts and 3D chart views is disabled. This includes AIS vessel targeting and tracking, collision alarms that result from AIS vessel targeting and tracking, and the display of information about AIS vessels.

Chart and 3D Chart View Settings

NOTE: Not all settings apply to all charts and 3D chart views. Some options require premium maps or connected accessories, such as radar.

These settings apply to the charts and 3D chart views, except the Radar overlay and Fish Eye 3D (page 7).

From a chart or 3D chart view, select **Menu**.

Waypoints & Tracks: See page 6.

Other Vessels: See page 7.

Surface Radar: Shows surface radar details on the Perspective 3D or Mariner's Eye 3D chart views.

Weather Radar: Shows weather radar imaging on the Perspective 3D or Mariner's Eye 3D chart views.

Navaids: Shows navigational aids on the Fishing chart.

Chart Setup: See page 6.

Overlay Numbers: See page 6. This might appear in the Chart Setup menu.

Chart Appearance: See page 7. This might appear in the Chart Setup menu.

Navigation and Fishing Chart Setup

NOTE: Not all settings apply to all charts and 3D chart views. Some settings require external accessories or applicable premium charts.

From the Navigation chart or Fishing chart, select **Menu** > **Chart Setup**.

Photos: Shows camera icons in some areas when using some premium charts. This enables you to view aerial photos of landmarks (page 4).

Tides & Currents: Shows current station indicators and tide station indicators on the chart (page 4).

Service Points: Shows locations where marine maintenance and repair services may be obtained.

Roses: Shows a compass rose around your boat, indicating compass direction oriented to the heading of the boat. A true wind direction or apparent wind direction indicator appears if the chartplotter is connected to a compatible marine wind sensor.

Weather: Sets which weather items are shown on the chart, if the chartplotter is connected to a compatible weather receiver with an active subscription.

Lake Level: Allows you to enter the present level of the lake.

Overlay Numbers: See page 6.

Chart Appearance: See page 7.

Waypoints and Tracks Settings on the Charts and Chart Views

From a chart, select **Menu** > **Waypoints & Tracks**.

Tracks: Shows tracks on the chart or 3D chart view.

Waypoints: Shows the Waypoints list (page 9).

New Waypoint: Creates a new waypoint.

Waypoint Display: Sets how to display waypoints on the chart or 3D chart view.

Active Tracks: Shows the active track options menu.

Saved Tracks: Shows the list of saved tracks (page 11).

Tracks Display: Sets which tracks to display on the chart or 3D chart view based on track color.

Overlay Numbers Settings

From a chart, 3D chart view, the Radar screen, or a Combinations screen, select **Menu** > **Overlay Numbers**.

Edit Layout: Sets the layout of the data overlay, or data fields. You can select the data to be shown within each data field.

Navigation Inset: Shows the navigation inset when the vessel is navigating to a destination.

Navigation Inset Setup: Allows you to configure the navigation inset to show **Route Leg Details**, and to control when the inset appears before a turn or destination.

Compass Tape: Shows the compass tape data bar when the vessel is navigating to a destination.

Editing the Data Fields

You can change the data shown in the overlay numbers displayed on the charts, 3D chart views, Combination screens, Sonar screens, and Radar screens.

1. From a screen that supports overlay numbers, select **Menu** > **Overlay Numbers** > **Edit Layout**.
2. If necessary, select **Chart Setup**.

DRAFT

3. Select **Overlay Numbers** > **Edit Layout**.
4. Select a layout.
5. Select a data field.
6. Select the type of data shown in the field.

   Available data options vary based on the chartplotter and network configuration.

Showing a Navigation Inset

You can control whether a navigation inset appears on some chart views. The navigation inset is shown only when the boat is navigating to a destination.

1. From a chart or 3D chart view, select **Menu** .
2. If necessary, select **Chart Setup**.
3. Select **Overlay Numbers** > **Navigation Inset** > **Auto**.
4. Select **Navigation Inset Setup**.
5. Complete an action:
   - To show waypoint velocity made good (VMG) when navigating a route with more than one leg, select **Route Leg Details** > **On**.
   - To show next-turn data based on distance, select **Next Turn** > **Distance**.
   - To show next-turn data based on time, select **Next Turn** > **Time**.
   - To indicate how the destination data appears, select **Destination**, and select an option.

Chart Appearance Settings

You can adjust the appearance of the different chart views. Each setting is specific for the type of chart view that you are in.

NOTE: Not all settings apply to all charts and 3D chart views and chartplotter models. Some options require premium maps or connected accessories, such as radar.

From a chart or 3D chart view, select **Menu** > **Chart Setup** > **Chart Appearance**.

Orientation: Sets the perspective of the map.

Detail: Adjusts the amount of detail shown on the map, at different zoom levels, for the chart.

Heading Line: Shows and adjusts the heading line, which is a line drawn on the map from the bow of the boat in the direction of travel, and the data source for the heading line.

World Map: Uses either a basic world map or a shaded relief map on the chart. These differences are visible only when zoomed out too far to see the detailed charts.

Spot Depths: Turns on spot soundings and sets a dangerous depth. Spot depths that are equal to or more shallow than the dangerous depth will be indicated by red text.

Safety Shading: Sets the appearance of depth shading.

Depth Range Shading: Sets the appearance of depth range shading.

Symbols: Shows and configures the appearance of various symbols on the chart, such as the vessel icon, navaid symbols, land POIs, and light sectors.

Style: Sets how the chart appears over 3D terrain.

Hazard Colors: Shows shallow water and land with a color scale. Blue indicates deep water, yellow is shallow water, and red is very shallow water.

Safe Depth: Sets the appearance of a safe depth for Mariner's Eye 3D.

NOTE: This setting affects only the appearance of hazard colors in Mariner's Eye 3D. It does not affect the safe water depth Auto Guidance setting or the sonar shallow water alarm setting.

Range Rings: Shows and configures the appearance of range rings, which help you to visualize distances in some chart views.

Lane Width: Specifies the width of the navigation lane, which is the magenta line in some chart views that indicates the course to your destination.

Other Vessels Settings on the Charts and Chart Views

NOTE: These options require connected accessories, such as an AIS receiver or VHF radio.

From a chart or 3D chart view, select **Menu** > **Other Vessels**.

AIS List: Shows the AIS list (page 5).

DSC List: Shows the DSC list (page 20).

AIS Display Setup: See page 7.

DSC Trails: Shows the tracks of DSC vessels, and selects the length of the track that appears using a trail.

AIS Alarm: Sets the safe-zone collision alarm (page 5).

AIS Display Settings

NOTE: AIS requires the use of an external AIS device and active transponder signals from other vessels.

From a chart or 3D chart view, select **Menu** > **Other Vessels** > **AIS Display Setup**.

AIS Display Range: Indicates the distance from your location within which AIS vessels appear.

Details: Shows details about AIS-activated vessels.

Projected Heading: Sets the projected heading time for AIS-activated vessels.

Trails: Shows the tracks of AIS vessels, and select the length of the track that appears using a trail.

Fish Eye 3D Settings

NOTE: This feature is available with premium charts, in some areas.

From the Fish Eye 3D chart view, select **Menu**.

View: Sets the perspective of the 3D chart view.

Tracks: Shows tracks.

Sonar Cone: Shows a cone that indicates the area covered by the transducer.

Fish Symbols: Shows suspended targets.

Navigation with a Chartplotter

⚠ CAUTION

The Auto Guidance feature is based on electronic chart information. That data does not ensure obstacle and bottom clearance. Carefully compare the course to all visual sightings, and avoid any land, shallow water, or other obstacles that may be in your path.

To navigate, you must choose a destination, set a course or create a route, and follow the course or route. You can follow

DRAFT

the course or the route on the Navigation chart, Fishing chart, Perspective 3D chart view, or Mariner's Eye 3D chart view.

NOTE: Auto Guidance is available with premium charts, in some areas.

NOTE: Mariner's Eye 3D and Fish Eye 3D chart views are available with premium charts, in some areas.

NOTE: The offshore Fishing chart is available with premium charts, in some areas.

Basic Navigation Questions

Question	Answer
How do I make the chartplotter point me in the direction in which I want to go (bearing)?	Navigate using Go To. See page 8.
How do I make the device guide me along a straight line (minimizing cross track) to a location using the shortest distance from the present location?	Build a single-leg route and navigate it using Route To. See page 10.
How do I make the device guide me to a location while avoiding obstacles?	Build a multi-leg route and navigate it using Route To. See page 10.
How do I make the device steer my automatic pilot?	Navigate using Route To. See page 10.
Can the device create a path for me?	If you have premium maps that support Auto Guidance and are in an area covered by Auto Guidance, navigate using Auto Guidance. See page 9.
How do I change the Auto Guidance settings for my boat?	See page 29.

Destinations

You can select destinations using various charts and 3D chart views or using the lists.

Searching for a Destination by Name

You can search for saved waypoints, saved routes, saved tracks, and marine services destinations by name.

1. Select **Nav Info** > **Search by Name**.
2. Enter at least a portion of the name of your destination.
3. If necessary, select **Done**.

   The 50 nearest destinations that contain your search criteria appear.
4. Select the location.

Selecting a Destination Using the Navigation Chart

1. Select **Charts** > **Navigation Chart**.
2. Select a destination.

Searching for a Destination Using Nav Info

1. Select **Nav Info**.
   - To view a list of preloaded locations and previously marked locations, select **Waypoints**.
   - To view a list of previously saved routes, select **Routes**.
   - To view a list of recorded tracks, select **Tracks**.
   - To view a list of marinas and other offshore points of interest, select **Offshore Services**.
   - To view a list of marinas and other inland points of interest, select **Inland Services**.
   - To search for a destination by name, select **Search by Name**.
2. Select a destination.

Searching for a Marine Services Destination

NOTE: This feature is available with premium charts, in some areas.

The chartplotter contains information for thousands of destinations offering marine services.

1. Select **Nav Info**.
2. Select **Offshore Services** or **Inland Services**.
3. If necessary, select the marine service category.

   The chartplotter shows a list of the nearest locations and the distance and bearing to each.
4. Select a destination.

   You can select ❮ or ❯ to view additional information or to show the location on a chart.

Courses

⚠ CAUTION

The Auto Guidance feature is based on electronic chart information. That data does not ensure obstacle and bottom clearance. Carefully compare the course to all visual sightings, and avoid any land, shallow water, or other obstacles that may be in your path.

When using Go To, a direct course and a corrected course may pass over land or shallow water. Use visual sightings, and steer to avoid land, shallow water, and other dangerous objects.

NOTE: Auto Guidance is available with premium charts, in some areas.

You can set and follow a course to a destination using one of three methods: Go To, Route To, or Guide To.

Go To: Takes you directly to the destination.

Route To: Creates a route from your location to a destination, allowing you to add turns along the way.

Guide To: Create a path to a destination using Auto Guidance.

Setting and Following a Direct Course Using Go To

⚠ CAUTION

When using Go To, a direct course and a corrected course may pass over land or shallow water. Use visual sightings, and steer to avoid land, shallow water, and other dangerous objects.

You can set and follow a direct course from your current location to a selected destination.

1. Select a destination (page 8).
2. Select **Navigate To** > **Go To**.

   A magenta line appears. In the center of the magenta line is a thinner purple line that represents the corrected course from your current location to the destination. The corrected course is dynamic, and it moves with your boat when you are off course.
3. Follow the magenta line, steering to avoid land, shallow water, and other obstacles.

DRAFT

4 If you are off course, follow the purple line (corrected course) to go to your destination, or steer back to the magenta line (direct course).

Setting and Following a Course Using Auto Guidance

⚠ CAUTION

The Auto Guidance feature is based on electronic chart information. That data does not ensure obstacle and bottom clearance. Carefully compare the course to all visual sightings, and avoid any land, shallow water, or other obstacles that may be in your path.

NOTE: Auto Guidance is available with premium charts, in some areas.

1 Select a destination (page 8).
2 Select **Navigate To** > **Guide To**.
3 Review the course indicated by the magenta Auto Guidance line.
4 Follow the magenta line, steering to avoid land, shallow water, and other obstacles.

NOTE: When using Auto Guidance, a gray segment within any part of the magenta line indicates that Auto Guidance cannot calculate part of the Auto Guidance line. This is due to the settings for minimum safe water depth and minimum safe obstacle height.

Autopilot Navigation

When you start navigation (Go To, Route To, or Guide To), if you are connected through a NMEA 2000® network to a compatible Garmin® autopilot, you are prompted to engage the autopilot.

Stopping Navigation

From the Navigation chart or Fishing chart, select **Menu** > **Stop Navigation**.

Waypoints

Waypoints are locations you record and store in the device.

Marking Your Present Location as a Waypoint

From any screen, select **Mark**.

Creating a Waypoint at a Different Location

1 Select **Nav Info** > **Waypoints** > **Create Waypoint**.
2 Select an option:
- To create the waypoint by entering position coordinates, select **Enter Coordinates**, and enter the coordinates.
- To create the waypoint using a chart, select **Use Chart**, select the location, and select **Move Waypoint**.

Marking and Navigating to an MOB Location

When you mark a waypoint, you can designate it as a man overboard (MOB) location.

Select an option:
- From any screen, select **Mark** > **Man Overboard** > **Yes**.
- From the Home screen, select **Man Overboard** > **Yes**.

An international MOB symbol marks the active MOB point and the chartplotter sets a direct course back to the marked location.

Viewing a List of all Waypoints

Select **Nav Info** > **Waypoints**.

Editing a Saved Waypoint

1 Select **Nav Info** > **Waypoints**.
2 Select a waypoint.
3 Select **Edit Waypoint**.
4 Select an option:
- To add a name, select **Name**, and enter a name.
- To change the symbol, select **Symbol**.
- To change the depth, select **Depth**.
- To change the water temperature, select **Water Temp.**.
- To change the comment, select **Comment**.
- To move the position of the waypoint, select **Position**.

Moving a Saved Waypoint

1 Select **Nav Info** > **Waypoints**.
2 Select a waypoint.
3 Select **Edit Waypoint** > **Position**.
4 Indicate a new location for the waypoint:
- To move the waypoint while viewing a chart, select **Use Chart**, select a new location on the chart, and select **Move Waypoint**.
- To move the waypoint using coordinates, select **Enter Coordinates**, and enter the new coordinates.

Browsing for and Navigating to a Saved Waypoint

⚠ CAUTION

The Auto Guidance feature is based on electronic chart information. That data does not ensure obstacle and bottom clearance. Carefully compare the course to all visual sightings, and avoid any land, shallow water, or other obstacles that may be in your path.

When using Go To, a direct course and a corrected course may pass over land or shallow water. Use visual sightings, and steer to avoid land, shallow water, and other dangerous objects.

NOTE: Auto Guidance is available with premium charts, in some areas.

You must create a waypoint before you can navigate to a waypoint.

1 Select **Nav Info** > **Waypoints**.
2 Select a waypoint.
3 Select **Navigate To**.
4 Select an option:
- To navigate directly to the location, select **Go To**.
- To create a route to the location, including turns, select **Route To**.
- To use Auto Guidance, select **Guide To**.
5 Review the course indicated by the magenta line.

NOTE: When using Auto Guidance, a gray segment within any part of the magenta line indicates that Auto Guidance cannot calculate part of the Auto Guidance line.

DRAFT

This is due to the settings for minimum safe water depth and minimum safe obstacle height.

6 Follow the magenta line, steering to avoid land, shallow water, and other obstacles.

Deleting a Waypoint or an MOB

1 Select **Nav Info** > **Waypoints**.
2 Select a waypoint or an MOB.
3 Select **Delete**.

Deleting All Waypoints

Select **Nav Info** > **Manage Data** > **Clear User Data** > **Waypoints** > **All**.

Routes

Creating and Navigating a Route From Your Present Location

You can create and immediately navigate a route on the Navigation chart or the Fishing chart. This procedure does not save the route or the waypoint data.

NOTE: The offshore Fishing chart is available with premium charts, in some areas.

1 From the Navigation chart or Fishing chart, select a destination.
2 Select **Navigate To** > **Route To**.
3 Select the location of the last turn before the destination.
4 Select **Add Turn**.
5 If necessary, repeat step 3 and 4 to add additional turns, working backward from the destination to the present location of your vessel.

The last turn you add should be the first turn you make, starting from your present location. It should be the turn closest to your vessel.

6 If necessary, select **Menu**.
7 Select **Navigate Route**.
8 Review the course indicated by the magenta line.
9 Follow the magenta line, steering to avoid land, shallow water, and other obstacles.

Creating and Saving a Route

This procedure saves the route and all the waypoints in it. The starting point can be your present location or another location.

1 Select **Nav Info** > **Routes** > **New Route** > **Use Chart**.
2 Select the starting location of the route.
3 Select **Add Turn**.
4 Select the location of the next turn on the chart.
5 Select **Add Turn**.

The chartplotter marks the location of the turn with a waypoint.

6 If necessary, repeat steps 4 and 5 to add more turns.
7 Select the final destination.

Viewing a List of Routes

Select **Nav Info** > **Routes**.

Editing a Saved Route

You can change the name of a route, or change the turns the route contains.

1 Select **Nav Info** > **Routes**.
2 Select a route.
3 Select **Edit Route**.
4 Select an option:
   - To change the name, select **Name**, and enter the name.
   - To select a waypoint from the turn list, select **Edit Turns** > **Use Turn List**, and select a waypoint from the list.

Browsing for and Navigating a Saved Route

Before you can browse a list of routes and navigate to one of them, you must create and save at least one route.

1 Select **Nav Info** > **Routes**.
2 Select a route.
3 Select **Navigate To**.
4 Select an option:
   - To navigate the route from the starting point used when the route was created, select **Forward**
   - To navigate the route from the destination point used when the route was created, select **Backward**.

   A magenta line appears. In the center of the magenta line is a thinner purple line that represents the corrected course from your present location to the destination. The corrected course is dynamic, and it moves with your boat when you are off course.
5 Review the course indicated by the magenta line.
6 Follow the magenta line along each leg in the route, steering to avoid land, shallow water, and other obstacles.
7 If you are off course, follow the purple line (corrected course) to go to your destination, or steer back to the magenta line (direct course).

Browsing for and Navigating Parallel to a Saved Route

Before you can browse a list of routes and navigate to one of them, you must create and save at least one route.

1 Select **Nav Info** > **Routes**.
2 Select a route.
3 Select **Navigate To**.
4 Select **Offset** to navigate parallel to the route, offset from it by a specific distance.
5 Indicate how to navigate the route:
   - To navigate the route from the starting point used when the route was created, to the left of the original route, select **Forward – Port**.
   - To navigate the route from the starting point used when the route was created, to the right of the original route, select **Forward – Starboard**.
   - To navigate the route from the destination point used when the route was created, to the left of the original route, select **Backward – Port**.
   - To navigate the route from the destination point used when the route was created, to the right of the original route, select **Backward – Starboard**.
6 If necessary, select **Done**.

   A magenta line appears. In the center of the magenta line is a thinner purple line that represents the corrected

DRAFT

course from your present location to the destination. The corrected course is dynamic, and it moves with your boat when you are off course.

7. Review the course indicated by the magenta line.
8. Follow the magenta line along each leg in the route, steering to avoid land, shallow water, and other obstacles.
9. If you are off course, follow the purple line (corrected course) to go to your destination, or steer back to the magenta line (direct course).

Deleting a Saved Route

1. Select **Nav Info** > **Routes**.
2. Select a route.
3. Select **Delete**.

Deleting All Saved Routes

Select **Nav Info** > **Clear User Data** > **Routes**.

Tracks

A track is a recording of the path of your boat. The track currently being recorded is called the active track, and it can be saved. You can show tracks in each chart or 3D chart view.

Showing Tracks

From any chart or a 3D chart view, select **Menu** > **Waypoints & Tracks** > **Tracks** > **On**.

A trailing line on the chart indicates your track.

Setting the Color of the Active Track

1. Select **Nav Info** > **Tracks** > **Active Track Options** > **Track Color**.
2. Select a track color.

Saving the Active Track

The track currently being recorded is called the active track.

1. Select **Nav Info** > **Tracks** > **Save Active Track**.
2. Select an option:
   - Select the time the active track began.
   - Select **Entire Log**.
3. Select **Save**.

Viewing a List of Saved Tracks

Select **Nav Info** > **Tracks** > **Saved Tracks**.

Editing a Saved Track

1. Select **Nav Info** > **Tracks** > **Saved Tracks**.
2. Select a track.
3. Select **Edit Track**.
4. Select an option:
   - Select **Name**, and enter the new name.
   - Select **Track Color**, and select a color.

Saving a Track as a Route

1. Select **Nav Info** > **Tracks** > **Saved Tracks**.
2. Select a track.
3. Select **Edit Track** > **Save Route**.

Browsing for and Navigating a Recorded Track

Before you can browse a list of tracks and navigate to them, you must record and save at least one track (page 11).

1. Select **Nav Info** > **Tracks**.
2. Select a track.
3. Select **Follow Track**.
4. Select an option:
   - To navigate the track from the starting point used when the track was created, select **Forward**.
   - To navigate the track from the destination point used when the track was created, select **Backward**.
5. Review the course indicated by the colored line.
6. Follow the line along each leg in the route, steering to avoid land, shallow water, and other obstacles.

Deleting a Saved Track

1. Select **Nav Info** > **Tracks** > **Saved Tracks**.
2. Select a track.
3. Select **Delete**.

Deleting All Saved Tracks

Select **Nav Info** > **Manage Data** > **Clear User Data** > **Saved Tracks**.

Retracing the Active Track

The track currently being recorded is called the active track.

1. Select **Nav Info** > **Tracks** > **Follow Active Track**.
2. Select an option:
   - Select the time the active track began.
   - Select **Entire Log**.
3. Review the course indicated by the colored line.
4. Follow the colored line, steering to avoid land, shallow water, and other obstacles.

Clearing the Active Track

Select **Nav Info** > **Tracks** > **Clear Active Track**.

The track memory is cleared, and the active track continues to be recorded.

Managing the Track Log Memory During Recording

1. Select **Nav Info** > **Tracks** > **Active Track Options**.
2. Select **Record Mode**.
3. Select an option:
   - To record a track log until the track memory is full, select **Fill**.
   - To continuously record a track log, replacing the oldest track data with new data, select **Wrap**.

Configuring the Recording Interval of the Track Log

You can indicate the frequency at which the track plot is recorded. Recording more frequent plots is more accurate but fills the track log faster. The resolution interval is recommended for the most efficient use of memory.

1. Select **Nav Info** > **Tracks** > **Active Track Options** > **Record Interval** > **Interval**.
2. Select an option:
   - To record the track based on a distance between points, select **Distance** > **Change**, and enter the distance.
   - To record the track based on a time interval, select **Time** > **Change**, and enter the time interval.

DRAFT

- To record the track plot based on a variance from your course, select **Resolution** > **Change**, and enter the maximum error allowed from the true course before recording a track point.

Deleting All Saved Waypoints, Routes, and Tracks

Select **Nav Info** > **Manage Data** > **Clear User Data** > **All** > **OK**.

Combinations

The Combination screen shows a combination of different screens at the same time. The number of options available on the Combination screen depends on the optional devices you have connected to your chartplotter and whether you are using premium maps.

Selecting a Combination

1. Select **Combinations**.
2. Select a combination.

Customizing the Combinations Screen

1. Select **Combinations**.
2. Select a combination.
3. Select **Menu**.
4. Select an option:
   - To change the name, select **Name**, and enter a new name.
   - To customize the data shown on the screen, select **Overlay Numbers** (page 6).

Gauges and Almanac Information

Gauges provide various information about the trip, engine, environment, and wind, and are available on all chartplotter models. Numbers, Compass, and Trip gauges are available on all chartplotters. Wind and Environment gauges require valid wind data from the NMEA® 0183 or NMEA 2000 network. Engine gauges require a connection to the NMEA 2000 network, so they are not available on all chartplotter models.

The chartplotters also provide almanac information about tides, currents, and the sun and moon, such as rise and set times.

Viewing the Compass

You can view information about your bearing, heading, and route using the compass.

Select **Gauges** > **Compass**.

Viewing Trip Gauges

Trip gauges show information for odometer, speed, time, and fuel for your present trip.

Select **Gauges** > **Trip**.

Resetting Trip Gauges

1. Select **Gauges** > **Trip** > **Menu**.
2. Select an option:
   - To set all the readings for the present trip to zero, select **Reset Trip**.
   - To set the maximum speed reading to zero, select **Reset Maximum Speed**.
   - To set the odometer reading to zero, select **Reset Odometer**.
   - To set all the readings to zero, select **Reset All**.

Viewing Engine and Fuel Gauges

Before you can view engine and fuel gauges, you must be connected to a NMEA 2000 network capable of sensing engine and fuel data. See the installation instructions for details.

Select **Gauges** > **Engine**.

Customizing Engine Gauge and Fuel Gauge Limits

You can configure the upper and lower limits and the range of desired standard operation of a gauge. When a value exceeds the range of standard operation, the gauge becomes red.

NOTE: Not all options are available for all gauges.

1. Select **Gauges** > **Engine** > **Menu** > **Gauge Setup** > **Set Gauge Limits**.
2. Select a gauge.
3. Select **Gauge Limits** > **Custom** > **Edit Limits**.
4. Select an option:
   - To set the minimum value of the standard operating range, select **Rated Min.**.
   - To set the maximum value of the standard operating range, select **Rated Max.**.
   - To set the lower limit of the gauge lower than the rated minimum, select **Scale Min.**.
   - To set the upper limit of the gauge higher than the rated maximum, select **Scale Max.**.
5. Select the limit value.
6. Repeat steps 4 and 5 to set additional gauge limits.

Enabling Status Alarms for Engine Gauges

You can enable the chartplotter to display engine status alarms.

Select **Gauges** > **Engine** > **Menu** > **Gauge Setup** > **Status Alarms** > **On**.

When an engine alarms occurs, a gauge status alarm message appears and the gauge may become red depending on the type of alarm.

Enabling Some Engine Gauge Status Alarms

1. Select **Gauges** > **Engine** > **Menu** > **Gauge Setup** > **Status Alarms** > **Custom**.
2. Select one or more engine gauge alarms to turn on or off.

Selecting the Number of Engines Shown in Gauges

You can show information for up to four engines.

1. Select **Gauges** > **Engine** > **Menu** > **Gauge Setup** > **Engine Selection** > **Number of Engines**.
2. Select an option:
   - Select the number of engines.
   - Select **Auto Configure** to automatically detect the number of engines.

DRAFT

Customizing the Engines Shown in Gauges

Before you can customize how the engines are shown in the gauges, you must manually select the number of engines (page 12).

1. Select **Gauges** > **Engine** > **Menu** > **Gauge Setup** > **Engine Selection** > **Edit Engines**.
2. Select **First Engine**.
3. Select the engine to display in the first gauge.
4. Repeat steps 2 and 3 for the remaining engine bars.

Configuring the Fuel Gauges Display

Before you can configure and display the fuel levels, a compatible fuel flow sensor or tank level sensors must be connected to the NMEA 2000 network.

You can display the total amount of fuel on-board either as a numeric display that shows the total fuel or as a graphic display that shows the level in each fuel tank.

1. Select **Gauges** > **Engine** > **Menu** > **Gauge Setup** > **Fuel Display**.
2. Select an option:
   - To display a numeric value for the total fuel level in all tanks, select **Use Total Fuel Onboard**.
   - To display a graphical representation of the amount of fuel in each tank, select **Use Fuel Tank Levels**.

Setting the Fuel Capacity of the Vessel

1. Select **Settings** > **My Vessel** > **Fuel Capacity**.
2. Enter the combined total capacity of the fuel tanks.

Synchronizing the Fuel Data with the Actual Vessel Fuel

You can synchronize the fuel levels in the chartplotter with the actual fuel in the vessel when you add fuel to your vessel.

1. **Gauges**Select **Engine** > **Menu**.
2. Select an option:
   - After you have filled up all the fuel tanks on the vessel, select **Fill Up All Tanks**. The fuel level is reset to maximum capacity.
   - After you have added less than a full fuel tank, select **Add Fuel to Boat**, enter the amount added, and select **Done**.
   - To specify the total fuel in the vessel tanks, select **Set Total Fuel Onboard**, enter the total amount of fuel in the tanks.

Setting the Fuel Alarm

Before you can set a fuel level alarm, a compatible fuel flow sensor must be connected to the NMEA 2000network.

You can set an alarm to sound when the total amount of remaining onboard fuel reaches the level you specify.

1. Select **Settings** > **Alarms** > **Fuel** > **Fuel Alarm** > **On**.
2. Enter the remaining amount of fuel that triggers the alarm.

Viewing the Wind Gauges

Before you can view wind information, you must have a wind sensor connected to the chartplotter.

Select **Gauges** > **Wind**.

Configuring the Speed Source

You can specify whether the vessel sped data displayed on the gauge and used for wind calculations is based on water speed or GPS speed.

1. Select **Gauges** > **Wind** > **Menu** > **Speed Display**.
2. Select an option:
   - To calculate the vessel speed based on data from the water-speed sensor, select **Water Speed**.
   - To calculate the vessel speed based on GPS data, select **GPS Speed**.

Configuring the Heading Source of the Wind Gauge

You can specify the source of the heading displayed on the wind gauge. Magnetic heading is the heading data received from a heading sensor, and GPS heading is calculated by your chartplotter GPS (course over ground).

1. Select **Gauges** > **Wind** > **Menu** > **Heading Source**.
2. Select **GPS Hdg** or **Magnetic**.

Selecting the Range of the Close-Hauled Wind Gauge

You can specify the range of the close-hauled wind gauge for both the upwind scale and the downwind scale.

1. Select **Gauges** > **Wind** > **Menu**.
2. Select an option:
   - To set the maximum and minimum values that appear when the upwind close-hauled wind gauge appears, select **Change Upwind Scale**, and set the angles.
   - To set the maximum and minimum values that appear when the downwind close-hauled wind gauge appears, select **Change Downwind Scale**, and set the angles.

Viewing the Environment Gauges

Select **Gauges** > **Environment**.

Configuring the Alignment of the Wind Gauge

You can specify the alignment of the wind gauge on the environment gauges.

1. Select **Gauges** > **Environment** > **Menu** > **Alignment**.
2. Select an option:
   - To set the top of the wind gauge to a North heading, select **North Up**.
   - To rotate the gauge so the direction in which you are moving is at the top, select **Head Up**.

Selecting the Range of the Close-Hauled Environment Gauge

You can specify the source of the heading displayed on the environment gauge. Magnetic heading is the heading data received from a heading sensor, and GPS heading is calculated by your chartplotter GPS (course over ground).

1. Select **Gauges** > **Environment** > **Menu** > **Heading Source**.
2. Select **GPS Hdg** or **Magnetic**.

Setting the Barometer Reference Time

You can specify the reference time used to calculate the barometer trend. The trend is indicated in the barometer field.

1. Select **Gauges** > **Environment** > **Menu** > **Pressure Reference Time**.

DRAFT

2 Select an option.

Tide, Current, and Celestial Information

Tide Station Information

You can view information about a tide station for a specific date and time, including the tide height, and when the next high and low tides will occur. By default, the chartplotter shows tide information for the most recently viewed tide station and for the present date and time.

Select **Nav Info** > **Tides & Currents** > **Tides**.

Current Station Information

NOTE: Current station information is available with certain detailed maps.

You can view information about a current station for a specific date and time, including the current speed and level of the current. By default, the chartplotter shows current information for the most recently viewed current station and for the present date and time.

Select **Nav Info** > **Tides & Currents** > **Tides**.

Celestial Information

You can view information about sunrise, sunset, moonrise, moonset, moon phase, and the approximate sky view location of the sun and moon . The center of the screen represents the sky overhead, and the outermost rings represent the horizon. By default, the chartplotter shows celestial information for the present date and time.

Select **Nav Info** > **Tides & Currents** > **Celestial**.

Viewing Tide Station, Current Station, or Celestial Information for a Different Date

1 Select **Nav Info** > **Tides & Currents**.
2 Select **Tides**, **Currents**, or **Celestial**.
3 Select an option.
- To view information for a different date, select **Change Date** > **Manual**, and enter a date.
- To view information for today, select **Change Date** > **Current**.
- If available, to view information for the day after the date shown, select **Next Day**.
- If available, to view information for the day before the date shown, select **Previous Day**.

Viewing Information for a Different Tide or Current Station

1 Select **Tides** or **Currents**.
2 Select **Nearby Stations**.
3 Select a station.

Viewing Almanac Information from the Navigation Chart

1 Select **Charts** > **Navigation Chart**.
2 Select an area on the map.
3 Select **Information**.
4 Select **Tides**, **Currents**, or **Celestial**.

Sonar

When properly connected to an optional Garmin sounder module and a transducer, your compatible chartplotter can be used as a fishfinder. There are three different sonar views to help you view the fish in the area: a full-screen view, a split-zoom view, and a split frequency view.

Full-Screen Sonar View

The full-screen sonar view shows a large image of the sonar readings from a transducer. The range scale along the right side of the screen shows the depth of detected objects as the screen scrolls from the right to the left.

Select **Sonar** > **Full Screen**.

①	Range adjustment controls
②	Position information
③	Suspended targets or fish
④	Bottom of the body of water
⑤	Range or depth of the water
⑥	Transducer frequency

Split-Zoom Sonar View

The split-zoom sonar view shows a full-view graph of sonar readings, and a magnified portion of that graph, on the same screen.

Select **Sonar** > **Split Zoom**.

Split-Frequency Sonar View

In the split-frequency sonar view, one side of the screen shows a full-view graph of high frequency sonar data, and the other side of the screen shows a full-view graph of lower frequency sonar data.

NOTE: The split-frequency sonar view requires the use of a dual-frequency transducer.

Select **Sonar** > **Split Frequency**.

Pausing the Sonar Display

From a sonar view, select **Menu** > **Pause Sonar**.

Creating a Waypoint on the Sonar Screen

1 From a sonar view, select **Menu** > **Pause Sonar**.
2 Select the location of the waypoint.
3 Select **Mark** or **New Waypoint**.

Adjusting the Gain on the Sonar Screen

You can control the sensitivity of the sonar receiver. To see more detail, increase the gain. If the screen is cluttered, decrease the gain.

1 From a sonar view, select **Menu** > **Gain**.
2 Complete an action:
- To increase or decrease the gain manually, select **Up** or **Down**.
- To allow the chartplotter to adjust the gain automatically, select an automatic option.

Adjusting the Range of the Depth Scale

You can adjust the range of the depth scale that appears on the right side of the screen.

1 From a sonar view, select **Menu** > **Range**.

DRAFT

2 Select an option:

- To allow the chartplotter to adjust the depth scale automatically, select **Auto**.
- To increase or decrease the range of the depth scale manually, select **Up** or **Down**.

  TIP: From the sonar screen, you can select ✚ or ━ to manually adjust the range of the depth scale.

Setting the Zoom Level on the Sonar Screen

1 From a sonar view, select **Menu** > **Zoom**.

2 Select an option:

- To zoom in on the sonar data from the bottom depth, select **Bottom Lock**.
- To set the depth range of the magnified area manually, select **Set Zoom**, select **View Up** or **View Down** to set the depth range of the magnified area, and select **Zoom In** or **Zoom Out** to increase or decrease the magnification of the magnified area.
- To set the depth and zoom automatically, select **Set Zoom** > **Auto**.

Selecting Frequencies

You can indicate which frequencies appear on the sonar screen when using a dual frequency transducer.

1 From a sonar view, select **Menu** > **Frequency**.

2 Select an option:

- To sweep each pulse through a range of frequencies to deliver shallow-water-like target separation at extremely deep depths and at low frequencies, select **Chirp**. This is useful mainly for very deep, offshore waters and when targeting some species of fish.
- To show data from a 200 kHz sonar signal, select **200 kHz**. This is useful mainly for more-shallow, inland waters.
- To show data from an 77 kHz sonar signal, select **77 kHz**. This is useful mainly for deeper waters.
- To select a specific frequency, select **Add**, and enter the frequency.

Turning On the A-Scope

The a-scope is a vertical flasher along the right side of the full-screen sonar view. This feature expands the most recently received sonar data so that it is easier to see. It can also be helpful for detecting fish that are close to the bottom.

From a sonar view, select **Menu** > **Set Up Sonar** > **Appearance** > **A-Scope**.

Sonar Setup

Sonar Settings

From a sonar view, select **Menu** > **Set Up Sonar**.

Depth Line: Shows a quick-reference depth line.

Scroll Speed: Sets the rate at which the sonar scrolls from right to left.

On-screen Control: Sets the control on the sonar screen to control the gain or range. This is available for touchscreen devices.

Appearance: See page 15.

Overlay Numbers: See page 6.

Advanced: See page 15.

Sonar Appearance Settings

From a sonar view, select **Menu** > **Set Up Sonar** > **Appearance**.

Color Scheme: Sets the color scheme.

Whiteline: Highlights the strongest signal from the bottom to help define the hardness or softness of the signal.

A-Scope: Displays a vertical flasher along the right side of the screen that shows instantaneously the range to targets along a scale.

Pic. Advance: Allows the sonar picture to advance faster by drawing more than one column of data on the screen for each column of sounder data received. This is especially helpful when you are using the sounder in deep water, because the sonar signal takes longer to travel to the water bottom and back to the transducer.

The 1/1 setting draws one column of information on the screen per sounder return. The 2/1 setting draws two columns of information on the screen per sounder return, and so on for the 4/1 and 8/1 settings.

Fish Symbols: Sets how the sonar interprets suspended targets.

Advanced Sonar Settings

From a sonar view, select **Menu** > **Set Up Sonar** > **Advanced**.

Interference: Adjusts the sensitivity to reduce the effects of interference from nearby sources of noise.

Surface Noise: Hides surface noise to help reduce clutter.

Color Gain: Adjusts the color of sonar returns.

Sonar Alarm Settings

NOTE: Some settings require external accessories.

Select **Settings** > **Alarms** > **Sonar**.

Shallow Water: Sets an alarm to sound when the depth is less than the specified value.

Deep Water: Sets an alarm to sound when the depth is greater than the specified value.

Water Temp.: Sets an alarm to sound when the transducer reports a temperature that is 2°F (1.1°C) above or below the specified temperature.

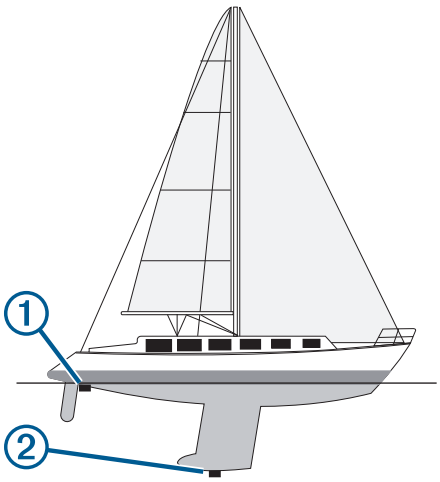
Setting the Keel Offset

You can enter a keel offset to compensate the surface reading for the depth of a keel, making it possible to measure depth from the bottom of the keel instead of from the transducer location. Enter a positive number to offset for a keel. You can enter a negative number to compensate for a large vessel that may draw several feet of water.

1 Complete an action, based on the location of the transducer:

- If the transducer is installed at the water line ①, measure the distance from the transducer location to the keel of the boat. Enter this value in step 3 and 4 as a positive number.
- If the transducer is installed at the bottom of the keel ②, measure the distance from the transducer to the water line. Enter this value in step 3 and 4 as a negative number.

DRAFT



2 Select **Settings** > **My Vessel** > **Keel Offset**.

3 Select ✚ or ━ based on the location of the transducer.

4 Enter the distance measured in step 1.

Recording the Sonar Display

From a sonar view, select **Menu** > **Record Sonar**.

Stopping the Sonar Recording

Before you can stop recording the sonar, you must begin recording it (page 16).

From a sonar view, select **Menu** > **Stop Recording**.

Depth and Water Temperature Graphs

If you are using a depth-capable transducer, or are receiving water depth information over NMEA 0183 or NMEA 2000, you can view a graphic log of depth readings over time. If you are using a temperature-capable transducer, or are receiving water temperature information over NMEA 0183 or NMEA 2000, you can view a graph of temperature readings over time.

The graphs scroll to the left as information is received.

Select **Sonar** > **Data Graphs**.

Setting the Depth and Water Temperature Graph Range and Time Scales

You can indicate the amount of time and the range of depth that appear in the depth and water temperature graphs.

1 Select **Sonar** > **Data Graphs** > **Menu**.

2 Select **Depth Graph Settings** or **Temperature Graph Settings**.

3 Complete an action:

- To set a time-elapsed scale, select **Duration**. The default setting is 10 minutes. Increasing the time-elapsed scale allows you to view variations over a longer period of time. Decreasing the time-elapsed scale allows you to view more detail over a shorter period of time.
- To set the depth-range or temperature-range scale, select **Scale**. Increasing the depth-range scale allows you to view more variation in readings. Decreasing the scale allows you to view more detail in the variation.

Radar

⚠ WARNING

The marine radar transmits microwave energy that has the potential to be harmful to humans and animals. Before beginning radar transmission, verify that the area around the radar is clear. The radar transmits a beam approximately 12° above and below a line extending horizontally from the center of the radar. Avoid looking directly at the radar, because the eyes are the most susceptible parts of the body.

When you connect your chartplotter to an optional Garmin marine radar, such as a GMR 1206 xHD or a GMR 24 HD, you can view more information about your surroundings.

The GMR transmits a narrow beam of microwave energy as it rotates to a 360° pattern. When the transmitted energy contacts a target, some of that energy is reflected back to the radar.

Radar Display Modes

NOTE: Not all modes are available with all radar devices and all chartplotters.

Select **Radar**, and select a mode.

Cruising Mode: Shows a full-screen image of the gathered radar information.

Harbor Mode: Intended for use in inland waters, this mode works best with short-range signals (2 nm or less).

Offshore Mode: Intended for use in open waters, this mode works best with long-range signals.

Sentry Mode: Allows you to put the radar into timed-transmit mode, in which you can configure a radar transmit and standby cycle to conserve power. You can also enable a guard zone in Sentry mode, which identifies a safe zone around your boat. If you switch from Sentry mode to another mode, the radar switches to full-time transmission and disables all guard zones.

Radar Overlay Mode: Shows a full-screen image of the gathered radar information on top of the Navigation chart. The Radar overlay displays data based on the most-recently used radar mode.

Transmitting Radar Signals

NOTE: As a safety feature, the radar enters standby mode after it warms up. This gives you an opportunity to verify the area around the radar is clear before beginning radar transmission.

1 With the chartplotter off, connect your radar as described in the radar installation instructions.

2 Turn on the chartplotter.

The radar warms up and a countdown alerts you when the radar is ready.

3 Select **Radar**.

4 Select a radar mode.

A countdown message appears while the radar is starting up.

5 Select **Menu** > **Transmit Radar**.

DRAFT

Adjusting the Zoom Scale on the Radar Screen

The radar zoom scale, also called the radar signal range, represents the distance from your position (the center) to the outermost ring.

From a Radar screen, select + or −.

Each ring represents an even division of the zoom scale.

For example, if the zoom scale is set at 3 miles, each ring represents 1 mile from the center out.

Tips for Selecting a Radar Zoom Scale

The radar zoom scale, or radar signal range, indicates the length of the pulsed signal transmitted and received by the radar. As the range increases, the radar transmits longer pulses in order to reach distant targets. Closer targets, especially rain and waves, also reflect the longer pulses, which can add noise to the Radar screen. Viewing information about longer-range targets can also decrease the amount of space available on the Radar screen for viewing information about shorter-range targets.

- Determine what information you need to see on the Radar screen.

  For example, do you need information about nearby weather conditions or targets and traffic, or are you more concerned about distant weather conditions?
- Assess the environmental conditions where the radar is being used.

  Especially in inclement weather, longer-range radar signals can increase the clutter on the Radar screen and make it more difficult to view information about shorter-range targets. In rain, shorter-range radar signals can enable you to view information about nearby objects more effectively, if the rain clutter setting is configured optimally.
- Select the shortest effective range, given your reason for using radar and the present environmental conditions.

Sentry Mode

Sentry mode allows you to put the radar into timed-transmit mode, in which you can configure a radar transmit and standby cycle to conserve power. You can also enable a guard zone in this mode, which identifies a safe zone around your boat and sounds an alarm when a radar object enters the zone. Sentry mode works with all Garmin GMR model radars.

Enabling Timed Transmit

Select **Radar** > **Sentry** > **Menu** > **Set Up Sentry** > **Timed Xmit** > **On**.

Setting the Standby and Transmit Times

Before you can set the standby and transmit times, you must enable timed transmit (page 17).

To help conserve power, you can indicate the radar standby time and the transmit time to implement periodic radar signal transmissions at set intervals.

1. Select **Radar** > **Sentry** > **Menu** > **Set Up Sentry**.
2. Select **Stdby Time**.
3. Enter the time interval between radar signal transmissions.
4. Select **Xmit Time**.
5. Enter the duration of each radar signal transmission.

Enabling a Guard Zone

Select **Radar** > **Sentry** > **Menu** > **Set Up Sentry** > **Enable Guard Zone**.

Defining a Circular Guard Zone

Before you can define the boundaries of the guard zone, you must enable a guard zone (page 17).

You can define a circular guard zone that completely encompasses your boat.

1. Select **Radar** > **Sentry** > **Menu** > **Set Up Sentry** > **Adjust Guard Zone** > **Move Radar Guard Zone** > **Circle**.
2. Select the location of the outer guard zone circle.
3. Select the location of the inner guard zone circle to define the width of the guard zone.

Defining a Partial Guard Zone

You can define the boundaries of a guard zone that does not completely encompass your boat.

1. Select **Radar** > **Sentry** > **Menu** > **Set Up Sentry** > **Adjust Guard Zone** > **Move Radar Guard Zone** > **Corner 1**.
2. Touch and drag the location of the outer guard-zone corner ①.

3. Select **Corner 2**.
4. Touch the location of the inner guard-zone corner ② to define the width of the guard zone.

Marking a Waypoint on the Radar Screen

1. From a Radar screen or the Radar overlay, select a location.
2. Select **Create Waypoint**.

Viewing a List of AIS Threats

From any Radar screen or the Radar overlay, you can view and customize the appearance of a list of AIS threats.

From a Radar screen or the Radar overlay, select **Menu** > **Other Vessels** > **AIS List**.

Showing AIS Vessels on the Radar Screen

AIS requires the use of an external AIS device and active transponder signals from other vessels.

You can configure how other vessels appear on the Radar screen. If any setting (except the AIS display range) is configured for one radar mode, the setting is applied to every other radar mode. The details and projected heading settings configured for one radar mode are applied to every other radar mode and to the Radar overlay.

1. From a Radar screen or the Radar overlay, select **Menu** > **Other Vessels** > **AIS Display Setup**.
2. Select an option:
   - To indicate the distance from your location within which AIS vessels appear, select **AIS Display Range**, and select a distance.
   - To show details about AIS-activated vessels, select **Details** > **Show**.
   - To set the projected heading time for AIS-activated vessels, select **Projected Heading**, and enter the time.

DRAFT

- To show the tracks of AIS vessels, select **Trails**, and select the length of the track that appears.

VRM and EBL

The variable range marker (VRM) and the electronic bearing line (EBL) measure the distance and bearing from your boat to a target object. On the Radar screen, the VRM appears as a circle that is centered on the present location of your boat, and the EBL appears as a line that begins at the present location of your boat and intersects the VRM. The point of intersection is the target of the VRM and the EBL.

Showing the VRM and the EBL

The VRM and the EBL configured for one mode are applied to all other radar modes.

From a Radar screen, select **Menu** > **Show VRM/EBL**.

Adjusting the VRM and the EBL

Before you can adjust the VRM and the EBL, you must show them on the Radar screen (page 18).

You can adjust the diameter of the VRM and the angle of the EBL, which moves the intersection point of the VRM and the EBL. The VRM and the EBL configured for one mode are applied to all other radar modes.

1. From a Radar screen, select a new location for the intersection point of the VRM and the EBL.
2. Select **Drop VRM/BLE**.
3. Select **Stop Pointing**.

Measuring the Range and Bearing to a Target Object

Before you can adjust the VRM and the EBL, you must show them on the Radar screen (page 18).

1. From a Radar screen, select the target location.
2. Select **Measure Distance**

   The range and the bearing to the target location appear in the upper-left corner of the screen.

Radar Overlay

When you connect your chartplotter to an optional Garmin marine radar, you can use the Radar overlay to overlay radar information on the Navigation chart or on the Fishing chart.

The Radar overlay superimposes radar information on the Navigation chart or the Fishing chart. Data appears on the Radar overlay based on the most recently used radar mode (Cruising, Harbor, Offshore, or Sentry), and all settings configurations applied to the Radar overlay are also applied to the last-used radar mode. For example, if you use Harbor mode and then you switch to the Radar overlay, the Radar overlay would show Harbor mode radar data. If you changed the gain setting using the Radar overlay menu, the gain setting for Harbor mode would change automatically.

Radar Overlay and Chart Data Alignment

When using the Radar overlay, the chartplotter aligns radar data with chart data based on the boat heading, which is based by default on data from a magnetic heading sensor connected using a NMEA 0183 or NMEA 2000 network. If a heading sensor is not available, the boat heading is based on GPS tracking data.

GPS tracking data indicates the direction in which the boat is moving, not the direction in which the boat is pointing. If the boat is drifting backward or sideways due to a current or wind, the Radar overlay may not perfectly align with the chart data. This situation should be avoided by using boat-heading data from an electronic compass.

If the boat heading is based on data from a magnetic heading sensor or an automatic pilot, the heading data could be compromised due to incorrect setup, mechanical malfunction, magnetic interference, or other factors. If the heading data is compromised, the Radar overlay may not align perfectly with the chart data.

Showing the Radar Overlay

The Radar overlay displays data based on the most recently used radar mode.

Select **Radar** > **Radar Overlay**.

The radar picture appears in orange and overlays the Navigation chart.

Stopping the Transmission of Radar Signals

From the Radar screen, select **Menu** > **Radar to Standby**.

Optimizing the Radar Display

You can adjust the radar display settings for reduced clutter and increased accuracy.

NOTE: You can optimize the radar display for each radar mode.

1. Select a radar range (page 18).
2. Restore the default value of the gain setting (page 18).
3. Adjust the gain setting manually (page 19).

Range of Radar Signals

The range of the radar signal indicates the length of the pulsed signal transmitted and received by the radar. As the range increases, the radar transmits longer pulses in order to reach distant targets. Closer targets, especially rain and waves, also reflect the longer pulses, which can add noise to the Radar screen. Viewing information about longer-range targets can also decrease the amount of space available on the Radar screen for viewing information about shorter-range targets.

Radar Gain and Clutter

Automatically Adjusting Gain on the Radar Screen

Auto is the default value for the gain setting. The automatic gain setting for each Radar mode is optimized for that mode, and may differ from the automatic gain setting used for another mode.

NOTE: Depending upon the radar in use, the gain setting configured for use in one radar mode may or may not be applied to other Radar modes or to the Radar overlay.

From a Radar screen or the Radar overlay, select **Menu** > **Gain** > **Auto**.

The chartplotter sets the gain automatically once, based on average conditions, the range of the radar signal, and the selected radar mode. The chartplotter does not readjust the gain automatically in response to changing conditions.

DRAFT

Manually Adjusting Gain on the Radar Screen

For optimal radar performance that accounts for actual conditions, you can manually adjust the gain.

NOTE: Depending upon the radar in use, the gain setting configured for use in one radar mode may or may not be applied to other Radar modes or to the Radar overlay.

1. From a Radar screen or the Radar overlay, select **Menu** > **Gain**.
2. Select **Up** to raise the gain, until light speckles appear across the Radar screen.

   Data on the Radar screen is refreshed every few seconds. As a result, the effects of manually adjusting the gain may not appear instantly. Adjust the gain slowly.
3. Select **Down** to lower the gain until the speckles disappear.
4. If boats, land, or other targets are within range, select **Down** to lower the gain until the targets begin to blink.
5. Select **Up** to raise the gain until the boats, land, or other targets appear steadily lit on the Radar screen.
6. Minimize the appearance of nearby large objects, if necessary.
7. Minimize the appearance of side-lobe echoes, if necessary.

Minimizing Nearby Large-Object Interference

Nearby targets of significant size, such as jetty walls, can cause a very bright image of the target to appear on the Radar screen. This image can obscure smaller targets located near it.

NOTE: Depending upon the radar in use, the gain setting configured for use in one radar mode may or may not be applied to other radar modes or to the Radar overlay.

1. From a Radar screen or the Radar overlay, select **Menu** > **Gain**.
2. Select **Down** to lower the gain until the smaller targets are clearly visible on the Radar screen.

   Reducing the gain to eliminate nearby large-object interference may cause smaller or distant targets to blink or disappear from the Radar screen.

Minimizing Side-Lobe Interference on the Radar Screen

Side-lobe interference may appear to streak outward from a target in a semi-circular pattern. Side-lobe effects can be avoided by reducing the gain or reducing the radar range.

NOTE: Depending upon the radar in use, the gain setting configured for use in one radar mode may or may not be applied to other radar modes or to the Radar overlay.

1. From a Radar screen or the Radar overlay, select **Menu** > **Gain**.
2. Select **Down** to lower the gain until the semi-circular, streaked pattern disappears from the Radar screen.

   Reducing the gain to eliminate side-lobe interference may cause smaller or distant targets to blink or disappear from the Radar screen.

Adjusting Sea Clutter on the Radar Screen

You can adjust the appearance of clutter caused by choppy sea conditions. The sea clutter setting affects the appearance of nearby clutter and targets more than it affects the appearance of distant clutter and targets. A higher sea clutter setting reduces the appearance of clutter caused by nearby waves, but it can also reduce or eliminate the appearance of nearby targets.

NOTE: Depending upon the radar in use, the sea clutter setting configured for use in one radar mode may or may not be applied to other radar modes or to the Radar overlay.

1. From a Radar screen or the Radar overlay, select **Menu** > **Noise Rejection** > **Sea Clutter** > **Presets**.
2. Select a setting that reflects the present sea conditions.
3. Select **Menu** > **Noise Rejection** > **Sea Clutter**.
4. Select **Up** or **Down** to adjust the appearance of sea clutter until other targets are clearly visible on the Radar screen.

   Clutter caused by sea conditions may still be visible.

Adjusting Rain Clutter on the Radar Screen

You can adjust the appearance of clutter caused by rain. Reducing the radar range also can minimize rain clutter (page 17).

The rain clutter setting effects the appearance of nearby rain clutter and targets more than it effects the appearance of distant rain clutter and targets. A higher rain clutter setting reduces the appearance of clutter caused by nearby rain, but it can also reduce or eliminate the appearance of nearby targets.

NOTE: Depending upon the radar in use, the rain clutter settings configured for use in one radar mode may or may not be applied to other radar modes or to the Radar overlay.

1. From a Radar screen or the Radar overlay, select **Menu** > **Noise Rejection** > **Rain Clutter**.
2. Select **Up** or **Down** to decrease or increase the appearance of nearby rain clutter until other targets are clearly visible on the Radar screen.

   Clutter caused by rain may still be visible.

Adjusting Cross Talk Clutter on the Radar Screen

You can reduce the appearance of clutter caused by interference from another nearby radar source. On is the default value for the crosstalk setting.

NOTE: Depending upon the radar in use, the crosstalk setting configured for use in one radar mode may or may not be applied to other radar modes or to the Radar overlay.

From a Radar screen or the Radar overlay, select **Menu** > **Noise Rejection** > **Cross Talk Reject** > **On**.

Radar Display Settings

From any Radar screen or the Radar overlay, select **Menu** > **Set Up Radar**.

Orientation: Sets the perspective of the radar display. The orientation setting applies to every radar mode. This setting does not apply to the Radar overlay.

Appearance: Sets the color scheme, look-ahead speed, and navigation appearance.

Front of Boat: Compensates for the physical location of the radar scanner on a boat, if the radar scanner does not align with the bow-stern axis.

Radar Appearance Settings

From a Radar screen, select **Menu** > **Set Up Radar** > **Appearance**.

NOTE: These settings do not apply to the Radar overlay.

Color Scheme: Sets the color scheme.

Look-Ahead Speed: Shifts your present location toward the bottom of the screen automatically as your speed increases. Enter your top speed for the best results.

DRAFT

Heading Line: Shows an extension from the bow of the boat in the direction of travel on the radar screen.

Rings: Shows the range rings that help you to visualize distances on the radar screen.

Nav. Lines: Shows the navigation lines that indicate the course you have set using Route To, Guide To, or Go To.

Waypoints: Shows waypoints on the radar screen.

Front-of-Boat Offset

The front-of-boat offset compensates for the physical location of the radar scanner on a boat, if the radar scanner does not align with the bow-stern axis.

Measuring the Potential Front-of-Boat Offset

The front-of-boat offset compensates for the physical location of the radar scanner on a boat, if the radar scanner does not align with the bow-stern axis.

1. Using a magnetic compass, take an optical bearing of a stationary target located within viewable range.
2. Measure the target bearing on the radar.
3. If the bearing deviation is more than +/- 1°, set the front-of-boat offset.

Setting the Front-of-Boat Offset

Before you can set the front-of-boat offset, you must measure the potential front-of-boat offset.

The front-of-boat offset setting configured for use in one radar mode is applied to every other radar mode and to the Radar overlay.

1. From a Radar screen or the Radar overlay, select **Menu** > **Set Up Radar** > **Front of Boat**.
2. Select **Up** or **Down** to adjust the offset.

Digital Selective Calling

Networked Chartplotter and VHF Radio Functionality

If you have a NMEA 0183 VHF radio or a NMEA 2000 VHF radio connected to your chartplotter, these features are enabled.

- The chartplotter can transfer your GPS position to your radio. If your radio is capable, GPS position information is transmitted with DSC calls.
- The chartplotter can receive digital selective calling (DSC) distress and position information from the radio.
- The chartplotter can track the positions of vessels sending position reports.

If you have a Garmin NMEA 2000 VHF radio connected to your chartplotter, these features are also enabled.

- The chartplotter allows you to quickly set up and send individual routine call details to your Garmin VHF radio.
- When you initiate a man-overboard distress call from your radio, the chartplotter shows the man-overboard screen and prompts you to navigate to the man-overboard point.
- When you initiate a man-overboard distress call from your chartplotter, the radio shows the Distress Call page to initiate a man-overboard distress call.

Turning On DSC

Select **Settings** > **Other Vessels** > **DSC**.

DSC List

The DSC list is a log of the most recent DSC calls and other DSC contacts you have entered. The DSC list can contain up to 100 entries. The DSC list shows the most recent call from a boat. If a second call is received from the same boat, it replaces the first call in the call list.

Viewing the DSC List

Before you can view the DSC list, the chartplotter must be connected to a VHF radio that supports DSC.

Select **Nav Info** > **Other Vessels** > **DSC List**.

Adding a DSC Contact

You can add a vessel to your DSC list. You can make calls to a DSC contact from the chartplotter.

1. Select **Nav Info** > **Other Vessels** > **DSC List** > **Add Contact**.
2. Enter the Maritime Mobile Service Identity (MMSI) of the vessel.
3. Enter the name of the vessel.

Incoming Distress Calls

If your Garmin chartplotter and VHF radio are connected using NMEA 0183 or NMEA 2000, your chartplotter alerts you when your VHF radio receives a DSC distress call. If position information was sent with the distress call, that information is also available and recorded with the call.

▧ designates a distress call in the DSC list and marks the position of the vessel on the Navigation chart at the time of the DSC distress call.

Navigating to a Vessel in Distress

▧ designates a distress call in the DSC list and marks the position of a vessel on the Navigation chart at the time of the DSC distress call.

1. Select **Nav Info** > **Other Vessels** > **DSC List**.
2. Select a position-report call.
3. Select **Navigate To**.
4. Select **Go To** or **Route To**.

Man-Overboard Distress Calls Initiated from a VHF Radio

When your chartplotter is connected to a Garmin NMEA 2000 compatible radio, and you initiate a man-overboard DSC distress call from your radio, your Garmin chartplotter shows the man-overboard screen and prompts you to navigate to the man-overboard point. If you have a Garmin autopilot system connected to the network, your chartplotter prompts you to start a Williamson's turn to the man-overboard point.

If you cancel the man-overboard distress call on the radio, the chartplotter screen prompts you to activate navigation to the man-overboard location disappears.

Man-Overboard Distress Calls Initiated from the Chartplotter

When your chartplotter is connected to a Garmin NMEA 2000 compatible radio and you activate navigation to a man-overboard location, the radio shows the Distress Call page so you can quickly initiate a man-overboard distress call.

For information on placing distress calls from your radio, see the VHF radio owner's manual. For information about marking an MOB, see page 9.

DRAFT

Position Tracking

When you connect your Garmin chartplotter to a VHF radio using NMEA 0183, you can track vessels that send position reports. This feature is also available with NMEA 2000, when the vessel sends the correct PGN data (PGN 129808; DSC Call Information).

Every position report call received is logged in the DSC list (page 20).

Viewing a Position Report

1. Select **Nav Info** > **Other Vessels** > **DSC List**.
2. Select a position-report call.
3. Select **Review**.
4. Select an option:
   - To switch to position report details, select **Next Page**.
   - To switch to a Navigation chart marking the location, select **Previous Page**.

Navigating to a Tracked Vessel

1. Select **Nav Info** > **Other Vessels** > **DSC List**.
2. Select a position-report call.
3. Select **Review** > **Navigate To**.
4. Select **Go To** or **Route To**.

Creating a Waypoint at the Position of a Tracked Vessel

1. Select **Nav Info** > **Other Vessels** > **DSC List**.
2. Select a position-report call.
3. Select **Create Waypoint**.

Editing Information in a Position Report

1. Select **Nav Info** > **Other Vessels** > **DSC List**.
2. Select a position-report call.
3. Select **Review** > **Edit**.
   - To enter the name of the vessel, select **Name**.
   - To select a new symbol, select **Symbol**.
   - To enter a comment, select **Comment**.
   - To show a trail line for the vessel if your radio is tracking the position of the vessel, select **Trail** > **Show**.
   - To select a color for the trail line, select **Trail Line**.

Deleting a Position-Report Call

1. Select **Nav Info** > **Other Vessels** > **DSC List**.
2. Select a position-report call.
3. Select **Review** > **Clear Report**.

Viewing Vessel Trails on the Chart

You can view trails for all tracked vessels on some chart views. By default, a black line indicates the path of the vessel, a black dot indicates each previously reported position of a tracked vessel, and a blue flag indicates the last reported position of the vessel.

1. From a chart or 3D chart view, select **Menu** > **Other Vessels** > **DSC Trails**.
2. Select the number of hours to show tracked vessels on the chart.

   For example, if you select **4 Hours**, all trail points that are less than four hours old appear for all tracked vessels.

Individual Routine Calls

When you connect your Garmin chartplotter to a Garmin VHF radio over the NMEA 2000 or the NMEA 0183 network, you can use the chartplotter interface to set up an individual routine call.

When setting up an individual routine call from your chartplotter, you can select the DSC channel on which you want to communicate. The radio transmits this request with your call.

Selecting a DSC Channel

NOTE: The selection of a DSC channel is limited to those channels that are available in all frequency bands. The default channel is 72. If you select a different channel, the chartplotter uses that channel for subsequent calls until you call using another channel.

1. Select **Nav Info** > **Other Vessels** > **DSC List**.
2. Select a vessel or a station to call.
3. Select **Review** > **Call with Radio** > **Channel**.

Making an Individual Routine Call

NOTE: When initiating a call from the chartplotter, if the radio does not have an MMSI number programmed, the radio will not receive call information.

1. Select **Nav Info** > **Other Vessels** > **DSC List**.
2. Select a vessel or a station to call.
3. Select **Review** > **Call with Radio**.
4. If necessary, select **Channel**, and select a new channel.
5. Select **Send**.

   The chartplotter sends information about the call to the radio.
6. On your Garmin VHF radio, select **Call**.

Making an Individual Routine Call to an AIS Target

1. From a chart or 3D chart view, select an AIS target.
2. Select **AIS Vessel** > **Call with Radio**.
3. If necessary, select **Channel**, and select a new channel.
4. Select **Send**.

   The chartplotter sends information about the call to the radio.
5. On your Garmin VHF radio, select **Call**.

Viewing Video

Before you can view video, you must connect the chartplotter to a video source.

The chartplotter can show video if you are connected to one or more video sources using the supplied video cable.

Select **Video**.

Selecting a Video Source

1. Select **Video** > **Menu**.
2. Select **Source**.
3. Indicate the sources of the video feed.
   - To display video for input, select **Video 1**.
   - To view video while using an S-Video connector, select **S-Video**.

DRAFT

- To display real-time data from a computer, select **VGA Input**.
- To simultaneously display four RCA video inputs, select **Quad Video**.

Configuring the Video Appearance

Before you can configure the video appearance, you must set the video source (page 21).

1. Select **Nav Info** > **Video** > **Menu**.
2. Select an option:
   - To show the video using a stretched aspect ration, select **Aspect** > **Stretch**. The video cannot be stretched beyond the dimensions provided by the connected video device, and it may not fill the entire screen.
   - To show the video using a standard aspect ration, select **Aspect** > **Standard**.
   - To adjust the brightness, select **Brightness**, and select **Up**, **Down**, or **Auto**.
   - To adjust the color saturation, select **Saturation**, and select **Up**, **Down**, or **Auto**.
   - To adjust the color saturation, select **Contrast**, and select **Up**, **Down**, or **Auto**.
   - To allow the chartplotter to automatically select the source format, select **Standard** > **Auto**.

Configuring the VGA Display

Before you can configure the VGA display mode, you must set the video source to VGA Input.

1. Select **Information** > **Video**.
2. Select anywhere on the screen.

   An on-screen display appears.
3. Select an option:
   - To adjust the screen brightness, select the brightness arrows.
   - To adjust the screen contrast, select the contrast arrows.

Exiting VGA Display Mode

1. Select **Information** > **Video**.
2. Select anywhere on the screen.

   An on-screen display appears.
3. Select the display mode icon in the upper-left corner.

   The video menu appears.
4. Select **Source**.
5. Select a video source.

SiriusXM™

⚠ WARNING

The weather information provided through this product is subject to service interruptions and may contain errors, inaccuracies, or outdated information, and consequently should not be relied upon exclusively. Always use common sense while driving or navigating, and check alternate weather information sources prior to making safety-related decisions. You acknowledge and agree that you shall be solely responsible for use of the weather information and all decisions taken with respect to driving or navigating in weather. Garmin will not be responsible for any consequences of using the weather data.

A Garmin SiriusXM satellite weather receiver and antenna receives XM WX Satellite Weather data and shows it on various Garmin devices, including the Navigation chart on a compatible chartplotter. The weather data for each feature comes from reputable weather data centers such as the National Weather Service and the Hydrometeorological Prediction Center. For more information, go to www.xmwxweather.com.

To view XM WX Satellite Weather information, you must have a subscription to XM WX Satellite Weather, and you must have a Garmin SiriusXM satellite weather receiver connected to a compatible chartplotter.

SiriusXM Equipment and Subscription Requirements

To use XM WX satellite weather, you must have a compatible satellite weather receiver. To use SiriusXM satellite radio, you must have a compatible satellite radio receiver. Go to www.garmin.com for more information. You must also have a valid subscription to receive satellite weather and radio. To connect the antenna and receiver and for subscription instructions, refer to the instructions for your satellite weather and radio equipment.

Weather Data Broadcasts

XM WX Satellite Weather data is broadcast at five-minute intervals. When the Garmin receiver is turned on, or when a different weather feature is selected, the receiver has to receive new data before it can be shown. You might experience a delay before weather data or a different feature appears on the chart.

NOTE: Any weather feature can change in appearance if the source that provides the information changes.

Viewing Precipitation Information

Precipitation ranging from very light rain and snow, up to strong thunderstorms, is indicated in varying shades and colors. Precipitation is shown either independently or with other weather information.

Select **Weather** > **Precipitation**.

The time stamp in the upper-left corner of the screen indicates the elapsed time since the weather data provider last updated the information.

Precipitation Views

Select **Weather** > **Precipitation** > **Menu**.

Radar Loop: You can view precipitation information as an image of the latest update or as an animated loop of the latest updates. The time stamp indicates the elapsed time since the service provider generated the weather radar frame currently displayed on the screen.

Cloud Cover: Cloud cover can be shown or hidden.

Satellite IR: Infrared satellite data displays clouds based on cloud-top temperatures. Deeper shades of gray represent colder clouds often found with cirrus or thunderstorm clouds. Lighter shades or a lack of shading indicate warmer clouds usually associated with stratus or fog.

DRAFT

Switching Weather Charts

You can change from one type of weather chart to a different chart.

1. From a weather chart, select **Weather** > **Change Weather**.
2. Select a different weather chart.

Storm Cell and Lightning Information

Storm cell icons on the weather Precipitation chart indicate both the present position of a storm and the projected path of that storm in the immediate future.

Red cones appear with a storm cell icon, and the widest part of each cone points in the direction of the projected path of the storm cell. The red lines in each cone indicate where the storm will most likely be in the near future. Each line represents 15 minutes.

Lightning strikes are represented by . Lightning appears on the weather Precipitation chart if strikes were detected within the last seven minutes. The ground-based lightning detection network detects cloud-to-ground lightning only.

Hurricane Information

The weather Precipitation chart can show the present position of a hurricane , a tropical storm, or a tropical depression. A red line stemming from a hurricane icon indicates the projected path of the hurricane. Darkened dots on the red line indicate the projected locations through which the hurricane will pass, as received from the weather data provider.

Weather Warnings and Weather Bulletins

When a marine weather warning, weather watch, weather advisory, weather bulletin, or other weather statement is issued, shading indicates the area to which the information applies. The aqua lines on the chart indicate the boundaries of marine forecasts, coastal forecasts, and offshore forecasts. Weather bulletins may consist of either weather watches or weather advisories.

To view information about the warning or bulletin, select the shaded area.

Color	Marine Weather Group	Weather Subcategories
Light Blue	Flash Flood	
Dark Blue	Flood	Areal Flood, Coastal Flood, Debris Flow, Flood, High Water Level, Hydrological, Lakeshore Flood, Storm Surge
Yellow	Marine/Wind	Brisk Wind, Extreme Wind, Freezing Spray, Gale, Hazardous Seas, High Surf, High Wind, Hurricane Force Wind, Lake Wind, Les Suêtes Wind, Low Water, Marine Weather, Rip Tide, Small Craft, Small Craft Hazardous Seas, Small Craft Rough Bar, Small Craft Winds, Special Marine, Squall, Storm, Strong Wind, Tsunami, Waterspout, Wind, Wreckhouse Winds
Pink	Miscellaneous	Air Quality, Air Stagnation, Ashfall, Blowing Dust, Excessive Heat, Fire Weather, Heat, High Heat and Humidity, Humidex, Humidex and Health, Rainfall, Special Weather, Weather
Orange	Severe Storm	
Red	Tornado	
Purple	Tropical	Hurricane, Inland Hurricane, Inland Tropical Storm, Tropical Storm, Typhoon
Dark Gray	Visibility	Dense Fog, Dense Smoke, Dust Storm, Smog
White	Winter	Arctic Outflow, Avalanche, Blizzard, Blowing Snow, Cold Wave, Extreme Cold, Flash Freeze, Freeze, Freezing Drizzle, Freezing Fog, Freezing Rain, Frost, Hard Freeze, Heavy Freezing Spray, Heavy Snow, Ice Storm, Lake Effect Blowing Snow, Lake Effect Snow, Sleet, Snow, Snow and Blowing Snow, Snow Squall, Snowfall, Wind Chill, Winter Storm, Winter Weather

Forecast Information

The Forecast chart shows city forecasts, marine forecasts, warnings, hurricane warnings, METARS, county warnings, weather fronts and pressure centers, surface pressure, and WX buoys.

Viewing Forecast Information for Another Time Period

1. Select **Weather** > **Forecast**.
2. Select an option:
   - To view the weather forecast for the next 12 hours, select **Next Forecast**, and to view forecasts for up to 48 hours, in 12-hour increments, select **Next Forecast** again.
   - To view the weather forecast for the previous 12 hours, select **Previous Forecast**, and to view previous forecasts, up to 48 hours ago, in 12-hour increments, select **Previous Forecast** again.

Viewing a Marine Forecast or an Offshore Forecast

1. Select **Weather** > **Forecast**.
2. Pan the chart to an offshore location.

   The Marine Forecast or Offshore Forecast options appear when forecast information is available.
3. Select **Marine Forecast** or **Offshore Forecast**.

Weather Fronts and Pressure Centers

Weather fronts appear as lines that indicate the leading edge of an air mass.

Front Symbol	Description
	Cold front
	Warm front
	Stationary front

DRAFT

Front Symbol	Description
	Occluded front
	Trough

Pressure-center symbols often appear near weather fronts.

Pressure-Center Symbol	Description
L	Indicates a low-pressure center, which is a region of relatively lower pressure. Moving away from a low-pressure center results in increased pressure. Winds flow counterclockwise around low-pressure centers in the northern hemisphere.
H	Indicates a high-pressure center, which is a region of relatively higher pressure. Moving away from a high-pressure center results in decreased pressure. Winds flow clockwise around high-pressure centers in the northern hemisphere.

City Forecasts

City forecasts appear as weather symbols. The forecast is viewed in 12-hour increments.

Symbol	Weather	Symbol	Weather	Symbol	Weather
	Partly cloudy		Rain (drizzle, sleet, showers)		Windy
	Thunderstorms		Fair (sunny, hot, clear)		Foggy
	Smoke (dusty, hazy)		Snow (snow showers, flurries, blizzard, blowing snow, sleet, freezing rain, freezing drizzle)		Cloudy

Viewing Sea Conditions

The Sea Conditions chart shows information about surface conditions, including winds, wave height, wave period, and wave direction.

Select **Weather** > **Sea Conditions**.

Surface Winds

Surface wind vectors appear on the Sea Conditions chart using wind barbs that indicate the direction from which the wind is blowing. A wind barb is a circle with a tail. The line or flag attached to the tail of the wind barb indicates the wind speed. A short line represents 5 knots, a long line represents 10 knots, and triangle represents 50 knots.

Wind Barb	Wind Speed	Wind Barb	Wind Speed
	Calm		20 knots
	5 knots		50 knots
	10 knots		65 knots
	15 knots		

Wave Height, Wave Period, and Wave Direction

Wave heights for an area appear as variations in color. Different colors indicate different wave heights ①, as shown in the legend on the left of the screen ②.

The wave period indicates the time (in seconds) between successive waves. Wave period lines ③ indicate areas that have the same wave period.

Wave directions appear on the chart using red arrows ④. The direction of each arrow pointer indicates the direction in which a wave is moving.

Viewing Forecast Sea Conditions Information for Another Time Period

1. Select **Weather** > **Sea Conditions**.
2. Select an option:
   - To view forecasted sea conditions for the next 12 hours, select **Next Forecast**, and to view forecasts up to 48 hours, in 12-hour increments, select **Next Forecast** again.
   - To view the forecasted sea conditions for the previous 12 hours, select **Previous Forecast**, and to view previous forecasts, up to 48 hours ago, in 12-hour increments, select **Previous Forecast** again.

Viewing Fishing Information

The weather Fishing chart shows present water temperature, present surface pressure conditions, and fishing forecasts.

Select **Weather** > **Fishing**.

Surface Pressure and Water Temperature Data

Surface-pressure information appears as pressure isobars and pressure centers. Isobars connect points of equal pressure. Pressure readings can help to determine weather and wind conditions. High-pressure areas are generally associated with fair weather. Low-pressure areas are generally associated with clouds and the chance of precipitation. Isobars packed closely together show a strong pressure gradient. Strong pressure gradients are associated with areas of stronger winds.

Pressure units are shown in millibars (mb), inches of Mercury (inHg), or hectopascals (hPa).

Colored shading indicates the surface temperature of the water, as shown in the legend in the corner of the display.

Forecasting Fish Locations

You can show areas that contain optimal weather conditions for specific species of fish.

1. Select **Weather** > **Fishing** > **Menu** > **Fish Species**.
2. Select a species of fish.
3. Select **On**.
4. Repeat steps 2 and 3 to show areas with optimal weather conditions for additional species of fish.

   Shaded areas indicate optimal fishing areas. If you have selected more than one species of fish, you can select a shaded area to view the fish species that are included in the shaded area.

DRAFT

Visibility Information

Visibility is the forecast maximum horizontal distance that can be seen at the surface, as shown in the legend on the left of the screen. Variations in the visibility shading show the forecast change in surface visibility.

Select **Weather** > **Visibility**.

Viewing Forecast Visibility Information for Another Time Period

1. Select **Weather** > **Visibility**.
2. Select an option:
   - To view the visibility forecast for the next 12 hours, select **Next Forecast**, and to view forecasts up to 48 hours, in 12-hour increments, select **Next Forecast** again.
   - To view the visibility forecast for the previous 12 hours, select **Previous Forecast**, and to view previous forecasts, up to 48 hours ago, in 12-hour increments, select **Previous Forecast** again.

Viewing Buoy Reports

Report readings are taken from buoys and coastal observation stations. These readings are used to determine air temperature, dew point, water temperature, tide, wave height and period, wind direction and speed, visibility, and barometric pressure.

1. From a weather chart, select .
2. Select **Review** > **Buoy**.

   Review does not appear if the cursor is not near an object. If the cursor is near only one object, the name of the buoy appears.

Viewing Local Weather Information near a Buoy

You can select an area near a buoy to view forecast information.

1. From a weather chart, select a location on the chart.
2. Select **Local Weather**.
3. Select an option:
   - To view present weather conditions from a local weather service, select **Current Cond.**.
   - To view a local weather forecast, select **Forecast**.
   - To view surface wind and barometric pressure information, select **Sea Surface**.
   - To view wind and wave information, select **Marine Bulletin**.

Creating a Waypoint on a Weather Chart

1. From a weather chart, select a location.
2. Select **Create Waypoint**.
3. Select the waypoint on the right side of the screen, and select **Edit**.
4. Select one or more options:
   - Select **Name**, and enter a name.
   - Select **Symbol**, and enter a symbol.
   - Select **Depth**, and enter the depth.
   - Select **Water Temp.**, and enter the water temperature.
   - Select **Comment**, and enter a comment.

Weather Overlay

The weather overlay superimposes weather and weather-related information on the Navigation chart, the Fishing chart, and the Perspective 3D chart view. The Navigation chart and the Fishing chart can show WX radar, height of cloud tops, lightning, WX buoys, county warnings, and hurricane warnings. The Perspective 3D chart view can show WX radar.

Weather overlay settings configured for use on one chart are not applied to another chart. The weather overlay settings for each chart must be configured separately.

NOTE: The offshore Fishing chart is available with premium charts, in some areas.

Turning On the Weather Overlay on a Chart

From the Navigation chart or Fishing chart, select **Menu** > **Chart Setup** > **Weather** > **Weather** > **On**.

Weather Overlay Settings on the Navigation Chart

You must turn on the weather overlay page 25) before you can change the settings of the weather overlay on the Navigation chart.

From the Navigation chart, select **Menu** > **Weather**.

WX RADAR: Shows WX radar.

Cloud Cover: Shows cloud cover data.

Satellite IR: Shows infrared satellite data.

Visibility: Shows visibility data.

WX Bouys: Shows buoys.

Legend: Shows the weather legend.

Weather Overlay Settings on the Fishing Chart

You must turn on the weather overlay (page 25) before you can change the settings of the weather overlay on the Fishing chart.

From the Fishing chart, select **Menu** > **Weather**.

WX RADAR: Shows WX radar.

Sea Temperature: Shows sea temperature data.

WX Bouys: Shows buoys.

Legend: Shows the weather legend.

Showing Fish Forecasting Data on the Fishing Chart

Before you can show fish forecasting data on the Fishing chart, you must turn on the weather overlay (page 25).

You can show areas that contain optimal weather conditions for specific species of fish.

1. From the Fishing chart, select **Menu** > **Chart Setup** > **Weather** > **Fish Species** > **On**.
2. Select all of species of fish you want to show on the Fishing chart, and select **Back**.

Viewing Weather Subscription Information

You can view information about the weather services you have subscribed to and how many minutes have passed since the data for each service was updated.

Select **Weather** > **Weather Subscription**.

DRAFT

SiriusXM Radio

Customizing the Channel Guide

SiriusXM radio channels are grouped in categories. You can select the category of channels that appear in the channel guide.

1. Select **Media** > **Menu** > **Category**.
2. Select a category.

SiriusXM Presets

The SiriusXM presets list is a customizable channel category. You can save your favorite channels to the presets list.

Saving a SiriusXM Channel to the Presets List

1. Select **Media** > **Menu** > **Source**.
2. Complete an action:
   - To select a specific channel, select a SiriusXMchannel, and select **Back**.
   - To enter an channel manually, select **Channel Entry**, enter a channel number, and select **Select**.
3. Select **Save Preset**.

Adjusting SiriusXM Satellite Radio Volume

1. Select **Media** > **Menu**.
2. Select an option:
   - To turn the SiriusXM satellite radio volume off or on, select **Volume**.
   - To adjust the volume level, use the slider bar.

Changing the SiriusXM Settings from a Chart

You can quickly change the SiriusXM channel or adjust the volume while viewing a chart or while viewing gauges.

1. From any chart or from the gauges screen, select **SiriusXM**.
2. Adjust the SiriusXM channel or adjust the volume.
3. Select **Back** to return to the chart or gauges.

Device Configuration

Turning On the Chartplotter Automatically

You can set the chartplotter to turn on automatically when the power is applied. Otherwise, you must turn on the chartplotter by pressing ⏻.

Select **Settings** > **System** > **Auto Power**.

NOTE: When **Auto Power** is **On**, and the chartplotter is turned off using ⏻, and power is removed and reapplied within less than two minutes, you may need to press ⏻ to restart the chartplotter.

System Settings

Select **Settings** > **System**.

Display: Adjusts the backlight brightness and color scheme.

Beeper: Turns on and off the tone that sounds for alarms and selections.

Auto Power: Turns the device on automatically when power is applied (page 26).

Keyboard Layout: Sets the arrangement of the keyboard to an alphabetical or computer keyboard layout.

Language: Sets the on-screen text language.

Speed Sources: Selects the source of the speed data used to calculate true wind speed or fuel economy. Water speed is the speed reading from a water-speed sensor, and GPS speed is calculated from your GPS position.

System Information: Provides information about the devices on the network and the software version.

Simulator: Turns the simulator on or off and allows you to set the time, date, speed, and simulated location.

GPS: Provides information about the GPS satellite settings and fix (page 26).

GPS Settings

Select **Settings** > **System** > **GPS**.

Skyview: Shows the relative position of GPS satellites in the sky.

GLONASS: Turns on or off GLONASS usage (Russia satellite system). When the system is used in situations with poor sky visibility, this configuration can be used in combination with GPS to provide more accurate position information.

WAAS/EGNOS: Turns on or off WAAS (in North America) or EGNOS (in Europe), which can provide more-accurate GPS position information. When using WAAS or EGNOS, the device may take longer to acquire satellites.

Speed Filter: Averages the speed of your vessel over a short period of time for smoother speed values.

Initialize Position: Initializes the GPS receiver and begins collecting new almanac data from the satellites.

Viewing the Event Log

The event log shows a list of system events.

Select **Settings** > **System** > **System Information** > **Event Log**.

Viewing System Software Information

You can view the software version, the basemap version, any supplemental map information (if applicable), the software version for an optional Garmin radar (if applicable), and the unit ID number. You may need this information to update the system software or to purchase additional map data information.

Select **Settings** > **System** > **System Information** > **Software Information**.

My Vessel Information

NOTE: Some settings and options require additional charts or hardware.

Select **Settings** > **My Vessel**.

Keel Offset: Offsets the surface reading for the depth of a keel, making it possible to measure depth from the bottom of the keel instead of from the transducer location (page 15).

Temperature Offset: Compensates for the water temperature reading from a NMEA 0183 water-temperature sensor or a temperature-capable transducer (page 27).

Calibrate Water Speed: Calibrates the speed-sensing transducer or sensor (page 27).

Fuel Capacity: Sets the combined fuel capacity of all the fuel tanks on your boat (page 13).

Fill Up All Tanks: Sets the tank levels to full (page 13).

DRAFT

Add Fuel to Boat: Allows you to enter the quantity of fuel you added to your tank, when you did not entirely fill up the tank (page 13).

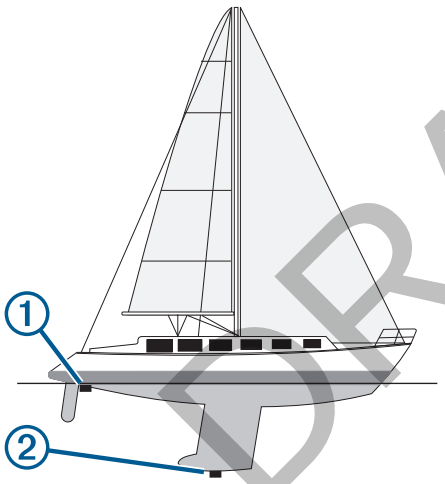
Set Total Fuel Onboard: Sets the total fuel in your tanks (page 13).

Set Gauge Limits: Sets the upper and lower limits of various gauges (page 12).

Setting the Keel Offset

You can enter a keel offset to compensate the surface reading for the depth of a keel, making it possible to measure depth from the bottom of the keel instead of from the transducer location. Enter a positive number to offset for a keel. You can enter a negative number to compensate for a large vessel that may draw several feet of water.

1. Complete an action, based on the location of the transducer:
   - If the transducer is installed at the water line ①, measure the distance from the transducer location to the keel of the boat. Enter this value in step 3 and 4 as a positive number.
   - If the transducer is installed at the bottom of the keel ②, measure the distance from the transducer to the water line. Enter this value in step 3 and 4 as a negative number.



2. Select **Settings** > **My Vessel** > **Keel Offset**.
3. Select ➕ or ➖ based on the location of the transducer.
4. Enter the distance measured in step 1.

Calibrating a Water Speed Device

If you have a speed-sensing transducer connected to the chartplotter, you can calibrate that speed-sensing device to improve the accuracy of water-speed data displayed by the chartplotter.

1. Select **Settings** > **My Vessel** > **Calibrate Water Speed**.
2. Follow the on-screen instructions.

   If the boat is not moving fast enough or the speed sensor is not registering a speed, a message appears.
3. Select **OK**, and safely increase the boat speed.
4. If the message appears again, stop the boat, and ensure the speed-sensor wheel is not stuck.
5. If the wheel turns freely, check the cable connections.
6. If you continue to get the message, contact Garmin product support.

Setting the Water Temperature Offset

Before you can set the water temperature offset, you must have a NMEA 0183 water-temperature sensor or a temperature-capable transducer to measure water temperature.

The temperature offset compensates for the temperature reading from a temperature sensor.

1. Measure the water temperature using the temperature sensor or temperature-capable transducer that is connected to the chartplotter.
2. Measure the water temperature using a different temperature sensor or a thermometer that is known to be accurate.
3. Subtract the water temperature measured in step 1 from the water temperature measured in step 2.

   This is the temperature offset. Enter this value in step 5 as a positive number if the sensor connected to the chartplotter measures the water temperature as being colder than it actually is. Enter this value in step 5 as a negative number if the sensor connected to the chartplotter measures the water temperature as being warmer than it actually is.
4. Select **Settings** > **My Vessel** > **Temperature Offset**.
5. Enter the temperature offset calculated in step 3.

Communications Settings

NOTE: Some settings and options require additional charts or hardware.

Select **Settings** > **Communications**.

Serial Port 1: Sets the input/output format for port 1 to use when connecting the chartplotter to external NMEA devices, computers, or other Garmin devices.

Serial Port 2: Sets the input/output format for port 2 to use when connecting the chartplotter to external NMEA devices, computers, or other Garmin devices.

Set Up NMEA 0183: Sets how the chartplotter sees NMEA 0183 output sentences, how many digits to the right of the decimal point are transmitted in a NMEA output, and how waypoints are identified (page 28).

Set Up NMEA 2000: Allows you to view and name the devices on the NMEA 2000 network ().

Wireless Devices: Allows you set up wireless devices (page 28).

NMEA 2000 and NMEA 0183

GPSMAP 500 series and GPSMAP 700 series chartplotters can accept data from both NMEA 0183 devices and certain NMEA 2000 devices connected to an existing NMEA 2000 network on your boat.

echoMAP 50 series and echoMAP 70 series chartplotters can accept data from NMEA 0183 compliant devices.

NMEA 0183

The chartplotters support the NMEA 0183 standard, which is used to connect various NMEA 0183 devices, such as VHF radios, NMEA instruments, autopilots, wind sensors, and heading sensors.

To connect the chartplotter to optional NMEA 0183 devices, see the chartplotter installation instructions.

DRAFT

The approved NMEA 0183 sentences for the chartplotter are GPAPB, GPBOD, GPBWC, GPGGA, GPGLL, GPGSA, GPGSV, GPRMB, GPRMC, GPRTE, GPVTG, GPWPL, GPXTE, and Garmin proprietary sentences PGRME, PGRMM, and PGRMZ.

This chartplotter also includes support for the WPL sentence, DSC, and sonar NMEA 0183 input with support for the DPT (depth) or DBT, MTW (water temperature), and VHW (water temperature, speed, and heading) sentences.

NMEA 0183 Settings

Select **Settings** > **Communications** > **Set Up NMEA 0183**.

Route: Enables NMEA 0183 output sentences for routes.

System: Enables NMEA 0183 output sentences for system information.

Garmin: Enables NMEA 0183 output sentences for Garmin proprietary sentences.

Sounder: Enables NMEA 0183 output sentences for the sounder (if applicable).

Posn Precision: Adjusts the number of digits to the right of the decimal point for transmission of NMEA output.

Waypoint IDs: Sets the device to transmit waypoint names or numbers via NMEA 0183 while navigating. Using numbers may resolve compatibility issues with older NMEA 0183 autopilots.

Defaults: Restores the NMEA 0183 settings to the original factory defaults.

NMEA 2000

GPSMAP 500 and 700 series chartplotters are NMEA 2000 certified and can receive data from a NMEA 2000 network installed on the boat to show specific information, such as depth, speed, water temperature, wind speed and direction, and engine data.

You can also name your engines and tanks so that you can better identify their location on the boat.

To connect a GPSMAP chartplotter to an existing NMEA 2000 network and to see a list of supported NMEA 2000 PGN numbers, see the chartplotter installation instructions.

Viewing a List of NMEA 2000 Network Devices

You can view the devices connected to the NMEA 2000 network.

From the Home screen, select **Configure** > **Communications** > **NMEA 2000 Setup** > **Device List**.

Communication with Wireless Devices

The chartplotters can connect to Bluetooth® wireless devices. Some models can connect to wireless networks.

Connecting a Bluetooth Wireless Device

You can wirelessly connect the chartplotter to a Bluetooth device.

1. Place the Bluetooth device within 33 ft. (10 m) of the chartplotter.
2. Select **Settings** > **Communications** > **Wireless Devices** > **Bluetooth Devices** > **Bluetooth** > **Device List** > **Add Device**.
3. Follow the on-screen directions.

Disconnecting a Bluetooth Wireless Device

1. Select **Settings** > **Communications** > **Wireless Devices** > **Bluetooth Devices** > **Bluetooth** > **Device List**.
2. Select a device.
3. Select **Forget Device**.

Setting Up the Wireless Network

The first time you access the Wireless Devices settings, you are prompted to set up the network.

1. Select **Settings** > **Communications** > **Wireless Devices** > **Wireless Devices** > **On**.
2. Enter a name for this wireless network.
3. Enter a password.

   You will need this password to access the wireless network from a wireless device.

Connecting a Wireless Device to the Chartplotter

Before you can connect a wireless device to the chartplotter wireless network, you must configure the chartplotter wireless network (page 28).

You can connect a wireless device to the chartplotter to share data. For example, you can connect an iOS® device to the chartplotter to share BlueChart Mobile data.

1. From the iOS device, select **Settings** > **Wi-Fi**.
2. Select the chartplotter.
3. Enter the password you entered when you set up the chartplotter as a wireless network.

Setting Alarms

Navigation Alarms

Select **Settings** > **Alarms** > **Navigation**.

Arrival: Sets an alarm to sound when you are within a specified distance or time from a turn or a destination.

Anchor Drag: Sets an alarm to sound when you exceed a specified drift distance while anchored.

Off Course: Sets an alarm to sound when you are off course by a specified distance.

System Alarms

Alarm Clock: Sets an alarm clock.

Device Voltage: Sets an alarm to sound when the battery reaches a specified low voltage.

GPS Accuracy: Sets an alarm to sound when the GPS location accuracy falls outside the user-defined value.

Setting the Fuel Alarm

Before you can set a fuel level alarm, a compatible fuel flow sensor must be connected to the NMEA 2000network.

You can set an alarm to sound when the total amount of remaining onboard fuel reaches the level you specify.

1. Select **Settings** > **Alarms** > **Fuel** > **Fuel Alarm** > **On**.
2. Enter the remaining amount of fuel that triggers the alarm.

Setting Weather Alarms

Before you can set weather alarms, you must have a compatible chartplotter connected to a weather device, such as a GXM™ device, and have a valid weather subscription.

1. Select **Settings** > **Alarms** > **Weather**.
2. Turn on alarms for specific weather events.

Setting the Safe-Zone Collision Alarm

Before you can set a safe-zone collision alarm, you must have a compatible chartplotter connected to an AIS device.

The safe-zone collision alarm is used only with AIS. The safe zone is used for collision avoidance, and can be customized.

1. Select **Settings** > **Alarms** > **AIS** > **AIS Alarm** > **On**.

DRAFT

A message banner appears and an alarm sounds when an AIS-activated vessel enters the safe-zone area around your boat. The object is also labeled as dangerous on the screen. When the alarm is off, the message banner and audible alarm are disabled, but the object is still labeled as dangerous on the screen.

2. Select **Range**.
3. Select a distance for the safe-zone radius around your vessel.
4. Select **Time To**.
5. Select a time at which the alarm will sound if a target is determined to intersect the safe zone.

Units Settings

Select **Settings** > **Units**.

System Units: Sets the unit format for the device.

Heading: Sets the direction references used in calculating heading information. Auto Mag Var (automatic magnetic variation) sets the magnetic declination for your location automatically. True sets true north as the heading reference. Grid sets grid north as the heading reference (000°). User Mag Var allows you to enter the magnetic variation value manually.

Position Format: Sets the position format in which a given location reading appears. Do not change this setting unless you are using a map or chart that specifies a different position format.

Map Datum: Sets the coordinate system on which the map is structured. Do not change this setting unless you are using a map or chart that specifies a different map datum.

Pressure Reference Time: Sets the reference time used to calculate the barometer trend. The trend is indicated in the barometer field.

Time Format: Sets a 12-hour, 24-hour, or UTC time format.

Time Zone: Sets the time zone, or allows automatic selection based on GPS location.

Navigation Settings

NOTE: Some settings and options require additional charts or hardware.

Select **Settings** > **Navigation**.

Route Labels: Sets the type of labels shown with route turns on the map.

Auto Guidance: Sets the measurements for the **Safe Depth**, **Safe Height**, and **Shoreline Distance**, when you are using some premium maps.

Turn Transition Activation: Sets the turn transition to be calculated based on time or distance.

Turn Transition Time: Sets how many minutes before the turn that you transition to it as the next leg, when **Time** is selected for the **Turn Transition Activation**. You can raise this value to help improve the accuracy of the autopilot when navigating a route or an Auto Guidance line with many frequent turns or at higher speeds. For straighter routes or slower speeds, lowering this value can improve autopilot accuracy.

Turn Transition Distance: Sets how far before the turn that you transition to it as the next leg, when **Distance** is selected for the **Turn Transition Activation**. You can raise this value to help improve the accuracy of the autopilot when navigating a route or an Auto Guidance line with many frequent turns or at higher speeds. For straighter routes or slower speeds, lowering this value can improve autopilot accuracy.

Route Start: Selects a starting point for route navigation.

Auto Guidance Line Configurations

⚠ CAUTION

The Safe Depth and Safe Height settings influence how the chartplotter calculates an Auto Guidance line. If an area has an unknown water depth or an unknown obstacle height, the Auto Guidance line is not calculated in that area. If an area at the beginning or the end of an Auto Guidance line is shallower than the safe water depth or lower than the safe obstacle height, the Auto Guidance line is not calculated in that area. On the chart, the course through those areas appears as a gray line. When your boat enters one of those areas, a warning message appears.

NOTE: Auto Guidance is available with premium charts, in some areas.

You can set the parameters the chartplotter uses when calculating an Auto Guidance line.

Safe Depth: Sets the minimum depth (chart depth datum) the chartplotter uses when calculating an Auto Guidance line.

Safe Height: Sets the minimum height (chart height datum) of a bridge that your boat can safely travel under.

Shoreline Distance: Sets how close to the shore you want the Auto Guidance line to be placed. The Auto Guidance line may move if you change this setting while navigating. The available values for this setting are relative, not absolute. To ensure that the Auto Guidance line is placed the appropriate distance from shore, you can assess the placement of the Auto Guidance line using one or more familiar destinations that require navigation through a narrow waterway (page 29).

Adjusting the Distance from Shore

⚠ CAUTION

The Auto Guidance feature is based on electronic chart information. That data does not ensure obstacle and bottom clearance. Carefully compare the course to all visual sightings, and avoid any land, shallow water, or other obstacles that may be in your path.

NOTE: Auto Guidance is available with premium charts, in some areas.

The Shoreline Distance setting indicates how close to the shore you want the Auto Guidance line to be placed. The Auto Guidance line may move if you change this setting while navigating. The available values for the Shoreline Distance setting are relative, not absolute. To ensure the Auto Guidance line is placed the appropriate distance from shore, you can assess the placement of the Auto Guidance line using one or more familiar destinations that require navigation through a narrow waterway.

1. Dock your vessel or drop the anchor.
2. Select **Settings** > **Navigation** > **Auto Guidance** > **Shoreline Distance** > **Normal**.
3. Select a destination that you have navigated to previously.
4. Select **Navigate To** > **Guide To**.

DRAFT

5 Review the placement of the Auto Guidance line, and determine whether the line safely avoids known obstacles and the turns enable efficient travel.

6 Select an option:

- If the placement of the Auto Guidance line is satisfactory, select **Menu** > **Stop Navigation**, and proceed to step 10.
- If the Auto Guidance line is too close to known obstacles, select **Settings** > **Navigation** > **Auto Guidance** > **Shoreline Distance** > **Far**.
- If the turns in the Auto Guidance line are too wide, select **Settings** > **Navigation** > **Auto Guidance** > **Shoreline Distance** > **Near**.

7 If you selected **Near** or **Far** in step 6, review the placement of the Auto Guidance line, and determine whether the line safely avoids known obstacles and the turns enable efficient travel.

Auto Guidance maintains a wide clearance from obstacles in open water, even if you set the Shoreline Distance setting to Near or Nearest. As a result, the chartplotter may not reposition the Auto Guidance line, unless the destination selected requires navigation through a narrow waterway.

8 Select an option:

- If the placement of the Auto Guidance line is satisfactory, select **Menu** > **Stop Navigation**, and proceed to step 10.
- If the Auto Guidance line is too close to known obstacles, select **Settings** > **Navigation** > **Auto Guidance** > **Shoreline Distance** > **Farthest**.
- If the turns in the Auto Guidance line are too wide, select **Settings** > **Navigation** > **Auto Guidance** > **Shoreline Distance** > **Nearest**.

9 If you selected **Nearest** or **Farthest** in step 8, review the placement of the Auto Guidance line, and determine whether the line safely avoids known obstacles and the turns enable efficient travel.

Auto Guidance maintains a wide clearance from obstacles in open water, even if you set the Shoreline Distance setting to Near or Nearest. As a result, the chartplotter may not reposition the Auto Guidance line, unless the destination selected requires navigation through a narrow waterway.

10 Repeat steps 3 through 9 at least once more, using a different destination each time, until you are familiar with the functionality of the Shoreline Distance setting.

Other Vessel Settings

When your compatible chartplotter is connected to an AIS device or VHF radio, you can set up how other vessels are displayed on the chartplotter.

Select **Settings** > **Other Vessels**.

AIS: Enables and disables AIS signal reception.

DSC: Enables and disables digital selective calling (DSC).

AIS Alarm: Sets the collision alarm (page 28 and page 6).

Viewing System Software Information

You can view the software version, the basemap version, any supplemental map information (if applicable), the software version for an optional Garmin radar (if applicable), and the unit ID number. You may need this information to update the system software or to purchase additional map data information.

Select **Settings** > **System** > **System Information** > **Software Information**.

Restoring the Original Chartplotter Factory Settings

NOTE: This will delete all settings information you have entered.

Select **Settings** > **System** > **System Information** > **Factory Settings**.

Chartplotter Data Management

Copying Waypoints, Routes, and Tracks to a Chartplotter

Before you can copy data to the chartplotter, you must have the latest version of MapSource® or HomePort™ software programs loaded on your computer and a memory card installed in the chartplotter.

Select an option:

- Copy the data from HomePort to the prepared memory card.

  For more information, see the HomePort help file.
- Copy the data from MapSource to the prepared memory card.

  For more information, see the MapSource help file.

Copying Data from a Memory Card

1 Insert a memory card into the card slot.

2 Select **Nav Info** > **Manage Data** > **Data Transfer** > **Card**.

3 Select an option:

- To transfer data from the memory card to the chartplotter and combine it with existing user data, select **Merge From Card**.
- To transfer data from the memory card to the chartplotter and overwrite existing user data, select **Replace From Card** to .

4 Select the file name.

Copying Waypoints, Routes, and Tracks to a Memory Card

1 Insert a memory card into the card slot.

2 Select **Nav Info** > **Manage Data** > **Data Transfer** > **Card** > **Save to Card**.

3 Select an option:

- To create a new file, select **Add New File**, and enter a name.
- To add the information to an existing file, select the file from the list.

The file name is saved with a .adm extension.

Copying Waypoints, Routes, and Tracks to or from all Chartplotters on a NMEA 2000 Network

You can transfer information for waypoints, routes, and tracks from one chartplotter connected to a NMEA 2000 network to

DRAFT

every other chartplotter connected to the network. The transfer may take a long time, depending on the number of waypoints being transferred.

1. Select **Nav Info** > **Manage Data** > **Data Transfer** > **NMEA 2000**.
2. Select an option:
   - To transfer data from the chartplotter to the other chartplotters connected to the network, select **Clone User Data**. Existing data is overwritten on those chartplotters.
   - To transfer data between all the chartplotters connected to the network, select **Merge User Data**. Unique data is combined with existing data on every chartplotter.

Copying Built-In Maps to a Memory Card

You can copy maps from the chartplotter to a memory card for use with HomePort.

1. Insert a memory card into the card slot.
2. Select **Nav Info** > **Manage Data** > **Data Transfer** > **Card**.
3. To copy the maps loaded onto your chartplotter to the memory card, select **Copy Built-In Map**.

Backing Up Data to a Computer

1. Insert a memory card into the card slot.
2. Select **Nav Info** > **Manage Data** > **Data Transfer** > **Card** > **Save to Card**.
3. Select a file name from the list, or select **Add New File**.
4. Select **Save to Card**.

   The file name saves with an .adm extension.
5. Remove the memory card and insert it into a card reader attached to a computer.
6. Open the Garmin\UserData folder on the memory card.
7. Copy the backup file on the card and paste it to any location on the computer.

Restoring Backup Data to a Chartplotter

1. Insert a memory card into a card reader that is attached to the computer.
2. Copy a backup file from the computer to the memory card, into a folder named Garmin\UserData.
3. Insert a memory card into the card slot.
4. Select **Nav Info** > **Manage Data** > **Data Transfer** > **Card** > **Replace From Card**.

Saving System Information to a Memory Card

You can save system information to a memory card as a troubleshooting tool. A product support representative may ask you to use this information to retrieve data about the network.

1. Insert a memory card into the card slot.
2. Select **Settings** > **System** > **System Information** > **Garmin Devices** > **Save to Card**.
3. Remove the memory card.

Appendix

Registering Your Device

Help us better support you by completing our online registration today.

- Go to http://my.garmin.com.
- Keep the original sales receipt, or a photocopy, in a safe place.

Calibrating the Touchscreen

The chartplotter touchscreen does not normally require calibration. If the buttons do not seem to be responding properly, use the following process to calibrate the screen.

1. While the chartplotter is turned off, select ⏻.

   A warning screen appears.
2. Touch anywhere on the black portion of the screen for approximately 15 seconds until the calibration screen appears.
3. Follow the on-screen instructions.

Updating the Device Software

The device may contain a software-update memory card. If so, follow the instructions provided with the card.

If a software update memory card is not included, go to www.garmin.com to make sure your device software is up-to-date.

1. If necessary, load the software update onto the memory card from your computer by following the instructions on www.garmin.com.
2. Turn on the chartplotter.
3. Insert the memory card into the card slot.
4. Follow the on-screen instructions.

Screenshots

You can capture a screenshot of any screen shown on your chartplotter as a bitmap (.bmp) file. You can transfer the screenshot to your computer.

Capturing Screenshots

1. Insert a memory card into the card slot.
2. Select **Settings** > **System** > **Beeper** > **Screenshot Capture** > **On**.
3. Go to a screen you want to capture.
4. Hold **Home** for at least six seconds.

Copying Screenshots to a Computer

1. Remove the memory card from the chartplotter, and insert it into a card reader that is attached to a computer.
2. From Windows® Explorer, open the Garmin\scrn folder on the memory card.
3. Copy a .bmp file from the card and paste it to any location on the computer.

DRAFT

NMEA 0183 Information

Type	Sentence	Description
Transmit	GPAPB	APB: Heading or track controller (autopilot) sentence "B"
	GPBOD	BOD: Bearing (origin to destination)
	GPBWC	BWC: Bearing and distance to waypoint
	GPGGA	GGA: Global positioning system fix data
	GPGLL	GLL: Geographic position (latitude and longitude)
	GPGSA	GSA: GNSS DOP and active satellites
	GPGSV	GSV: GNSS satellites in view
	GPRMB	RMB: Recommended minimum navigation information
	GPRMC	RMC: Recommended minimum specific GNSS data
	GPRTE	RTE: Routes
	GPVTG	VTG: Course over ground and ground speed
	GPWPL	WPL: Waypoint location
	GPXTE	XTE: Cross track error
	PGRME	E: Estimated error
	PGRMM	M: Map datum
	PGRMZ	Z: Altitude
	SDDBT	DBT: Depth below transducer
	SDDPT	DPT: Depth
	SDMTW	MTW: Water temperature
	SDVHW	VHW: Water speed and heading
Receive	DPT	Depth
	DBT	Depth below transducer
	MTW	Water temperature
	VHW	Water speed and heading
	WPL	Waypoint location
	DSC	Digital selective calling information
	DSE	Expanded digital selective calling
	HDG	Heading, deviation, and variation
	HDM	Heading, magnetic
	MWD	Wind direction and speed
	MDA	Meteorological composite
	MWV	Wind speed and angle
	VDM	AIS VHF data-link message
You can purchase complete information about National Marine Electronics Association (NMEA) format and sentences from: NMEA, Seven Riggs Avenue, Severna Park, MD 21146 USA (www.nmea.org)		

NMEA 2000 PGN Information

Type	PGN	Description
Transmit and receive	059392	ISO acknowledgment
	059904	ISO request
	060928	ISO address claim
	126208	NMEA: Command, request, and acknowledge group function
	126464	Transmit and receive PGN list group function
	126996	Product information
	127250	Vessel heading
	128259	Speed: Water referenced
	128267	Water depth
	130306	Wind data
	130312	Temperature
Transmit	127258	Magnetic Variance
	129025	Position: Rapid update
	129026	COG and SOG: Rapid update
	129029	GNSS position data
	129283	Cross track error
	129284	Navigation data
	129285	Navigation route and waypoint info
	129539	GNSS DOPs
	129540	GNSS satellites in view
Receive	127245	Rudder
	127250	Vessel heading
	127488	Engine parameters: Rapid update
	127489	Engine parameters: Dynamic
	127493	Transmission parameters: Dynamic
	127498	Engine parameters: Static
	127505	Fluid level
	129038	AIS class A position report
	129039	AIS class B position report
	129040	AIS class B extended position report
	129794	AIS class A static and voyage related data
	129798	AIS SAR aircraft position report
	129799	Radio frequency, mode, and power
	129802	AIS safety-related broadcast message
	129808	DSC call information
	130310	Environmental parameters
	130311	Environmental parameters (obsolete)
	130313	Humidity
	130314	Actual pressure
	130576	Small craft status
This data applies only to NMEA 2000-compatible products.		

DRAFT

Index

A

aerial photos **4**
AIS **4–7**
  alarm **28**
  radar **17**
  SART **5, 6**
  targeting **4–6**
  threats **5, 17**
  turning on **30**
  vessels **5**
alarms **28**
  anchor drag **28**
  arrival **28**
  collision **5, 28**
  deep water **15**
  engine **12**
  gauges **12**
  navigation **28**
  off course **28**
  shallow water **15**
  sonar **15**
  water temperature **15**
  weather **28**
anchor drag alarm **28**
animated currents, tides **4**
arrival alarm **28**
Auto Guidance **9, 29**
  line **29**
  shoreline distance **29**
autopilot **9**

B

backlight **1**
buoy reports **25**

C

celestial information **14**
charts **2, 4, 6, 25**
  appearance **7**
  details **3**
  heading line **7**
  navigation **3, 4**
  orientation **7**
  panning **2**
  symbols **2**
clock **28**
  alarm **28**
collision alarm **5, 28**
color mode **1**
combinations **12**
  selecting **12**
compass **12**
compass roses **6**
compass tape data bar **6**
courses **8**
current stations **14**
  indicators **4**

D

data
  backup **31**
  copying **30**
data fields **6**
data management **30**
deleting, all user data **12**
depth log **16**
destinations
  navigation chart **8**
  selecting **8**
device
  keys **1, 2**
  registration **31**
digital selective calling **20, 21**
  channels **21**
  contacts **20**
  individual routine calls **21**
  turning on **20, 30**
distress call **20**
distress calls **20**
DSC **20, 21**. *See* digital selective calling
  trails **7**

E

EBL **18**
  adjusting **18**
  measuring **18**
  showing **18**
EGNOS **26**
engine gauges **12**
  configuring **12, 13**
  status alarms **12**
environment gauges **13**
environmental gauges **13**
event log **26**

F

factory settings **30**
Fish Eye 3D
  sonar cone **7**
  suspended targets **7**
  tracks **7**
fishing chart **2, 25**
  panning **2**
  setup **6**
fuel alarm **13, 28**
fuel capacity **13, 26**
fuel gauges **12, 13**
  configuring **13**
  status alarm **13, 28**
  synchronizing with actual fuel **13**
  synchronizing with fuel **26**
fuel onboard **26**

G

gauges **26**
  engine **12, 13**
  engines **12**
  environment **13**
  environmental data **13**
  fuel **12, 13**
  limits **12**
  status alarms **12**
  trip **12**
  wind **13**
GLONASS **26**
Go To **8**
GPS
  EGNOS **26**
  GLONASS **26**
  signals **1**
  WAAS **26**
GPS accuracy **28**

H

hazard colors **7**
home screen, customizing **1**

I

inset map **7**

K

keel offset **15, 26, 27**
keys **1**
  power **1**

L

lane width **7**
language **26**
locking, screen **1**

M

man overboard **9**
marine services **8**
mark location **9**
memory card **30, 31**
  detailed maps **31**
  installing **2**
  slot **1**
music player **22, 26**

N

navaids **3**
navigation alarms **28**
navigation chart **2, 4, 8, 25**
  aerial photos **6**
  marine service points **8**
  panning **2**
  radar overlay **18**
  setup **6**
  vessel trails **21**
navigation inset **6, 7**
NMEA **27**
NMEA 0183 **20, 27, 28**
NMEA 2000 **20, 27, 28**

O

off course alarm **28**
offset, front of boat **20**
other vessels, AIS **7**
overlay numbers **6**

P

Perspective 3D **25**
photos, aerial **4**
position report **21**
position tracking **21**
power key **1, 26**
premium charts **3, 4**
  aerial photos **4**
  Fish Eye 3D **7**
  tide and current indicators **4**
product registration **31**

R

radar **16**
  AIS **17**
  clutter **19**
  color scheme **19**
  field of view **19**
  front-of-boat offset **20**
  gain **18, 19**
  optimizing display **18, 19**
  overlay screen **18**
  range **18**
  range rings **19**
  sentry mode **17**
  timed transmit **17**
  transmitting **16**
  waypoints **17, 19**
  zoom scale **17**
radar overlay **18**
radio, SiriusXM **26**
range rings **7**
registering the device **31**
routes
  copying **30**
  creating **10**
  deleting **11**
  editing **10**
  navigating **10**
  navigating parallel to **10**
  viewing list of **10**
  waypoints **30**

DRAFT

S

safe depth **29**
safe height **29**
safe zone collision alarm **5, 28**
SART **5, 6**
satellite imagery **4**
satellite signals, acquiring **1**
screen
  brightness **1**
  locking **1**
screenshots **31**
  capturing **31**
sentry mode **17**
  guard zone **17**
  timed transmit **17**
settings **26, 27, 29**
  radar display **19**
  system information **26, 30**
shoreline distance **29**
SiriusXM **22**
SiriusXM Satellite Radio **26**
sonar **14**
  a-scope **15**
  alarms **15**
  appearance **15**
  bottom lock **15**
  cone **7**
  depth **15**
  depth line **15**
  depth scale **14**
  frequencies **15**
  gain **14**
  interference **15**
  noise **15**
  overlay numbers **15**
  recording **16**
  scroll speed **15**
  suspended targets **15**
  views **14**
  waypoint **14**
  whiteline **15**
  zoom **15**
SOS **9**
suspended targets **7**
symbols **4**
system information **26, 30, 31**

T

tide stations **3, 14**
  indicators **4**
touchscreen **1**
  calibrating **31**
tracks **11**
  clearing **11**
  copying **30**
  deleting **11**
  editing **11**
  list **11**
  navigating **11**
  recording **11**
  saving **11**
  saving as route **11**
  showing **6, 11**
transducer **14**
trip gauges **12**

U

unit ID **26, 30**
units of measure **29**
user data, deleting **12**

V

vessel trails **21**
VGA connector **22**
VHF radio **20**
  calling an AIS target **21**
  distress calls **20**
  DSC channel **21**
  individual routine calling **21**
  individual routine calls **21**
video **21**
  configuring **22**
  source **21**
voltage **28**
volume, adjusting **26**
VRM **18**
  adjusting **18**
  measuring **18**
  showing **18**

W

WAAS **26**
water
  speed **27**
  temperature offset **27**
water temperature log **16**
waypoint, tracked vessel **21**
waypoints **9, 25**
  copying **30**
  creating **9, 25**
  deleting **10**
  editing **9**
  man overboard **9**
  navigating to **9**
  radar **17**
  showing **6**
  sonar **14**
  tracked vessel **21**
  viewing list of **9**
weather **6, 22, 23, 25, 26**
  alarms **28**
  broadcasts **22**
    charts
      fishing **25**
      navigation **25**
  fishing **24**
  fishing chart **25**
  forecast **23–25**
  overlay **25**
  precipitation **22, 23**
  sea conditions **24**
  subscription **22, 25**
  surface pressure **24**
  visibility **25**
  water temperature **24**
  wave information **24**
  winds **24**
wind gauges **13**
wireless **28**
wireless devices
  Bluetooth devices **28**
  connecting a wireless device **28**
  network configuration **28**

Z

zoom
  chart **2**
  radar **17**
  sonar **15**

DRAFT

DRAFT

DRAFT

DRAFT

www.garmin.com/support

913-397-8200 1-800-800-1020	0808 2380000 +44 870 850 1242	1-866-429-9296	43 (0) 3133 3181 0
00 32 2 672 52 54	00 45 4810 5050	00 358 9 6937 9758	00 331 55 69 33 99
0180 5 / 42 76 46 - 880	00 39 02 3669 9699	0800-0233937	815 69 555
00800 4412 454 +44 2380 662 915	00 35 1214 447 460	00 34 902 007 097	00 46 7744 52020

Garmin International, Inc.
1200 East 151st Street
Olathe, Kansas 66062, USA

Garmin (Europe) Ltd.
Liberty House, Hounsdown Business Park
Southampton, Hampshire, SO40 9LR UK

Garmin Corporation
No. 68, Zhangshu 2nd Road, Xizhi Dist.
New Taipei City, 221, Taiwan (R.O.C.)

DRAFT

МП02

© 2013 Garmin Ltd. or its subsidiaries