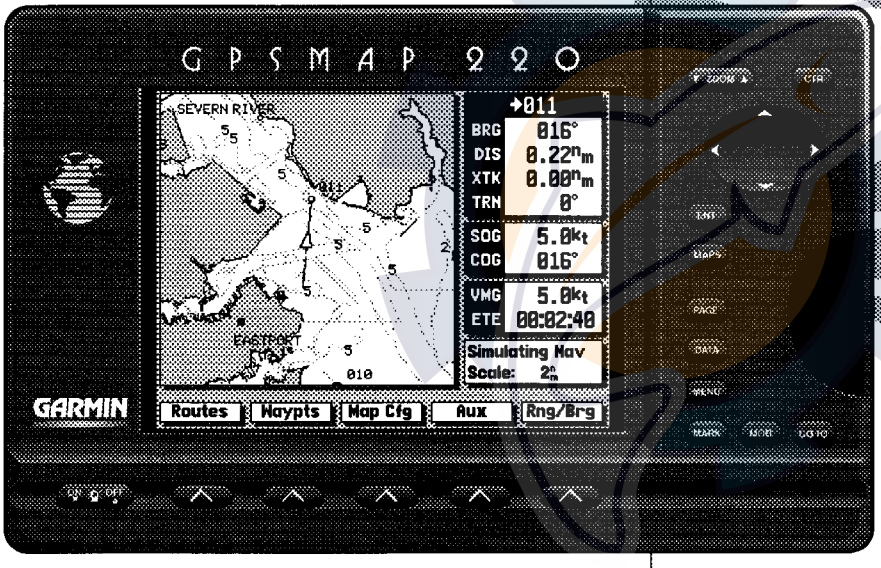
OWNER'S MANUAL
& REFERENCE



GPSMAP™ 205/210/220

GARMIN™

Software Version 2.00 or above

Internal Database Version 1.01 © Navionics Corporation

G-chart™ cartridge data is copyrighted by Navionics Corporation and may not be copied or used for any other purpose without permission.

9875 Widmer Road, Lenexa, KS 66215, USA

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June 1994 Part #190-00061-00 Rev. B Printed in Taiwan.

CAUTION!

The GARMIN GPSMAP system has no user-serviceable parts. Should you ever encounter a problem with your unit, please take it to an authorized dealer for repairs.

The GPSMAP display unit is sealed and filled with dry nitrogen. ***Any attempt to open the case to change or modify the unit in any way will void your warranty*** *and may result in permanent damage to the equipment.*

CAUTION

The GPS system is operated by the United States government, which is solely responsible for its accuracy and maintenance. The system is subject to changes which could affect the accuracy and performance of all GPS equipment. Although the GARMIN GPSMAP is a precision electronic NAVigation AID (NAVAID), any NAVAID can be misused or misinterpreted, and therefore become unsafe.

Use the GPSMAP at your own risk. To reduce the risk of unsafe operation, carefully review and understand all aspects of this Owner's Manual and thoroughly practice operation using the simulator mode prior to actual use. When in actual use, carefully compare indications from the GPSMAP to all available navigation sources including the information from other NAVAIDs, visual sightings, charts, etc. For safety, always resolve any discrepancies before continuing navigation.

WARNING! *The electronic chart is an aid to navigation designed to facilitate the use of authorized government charts, not to replace them. Only official government charts and notices to mariners contain all information needed for the safety of navigation, and as always, the user is responsible for their prudent use.*

NOTE: This device complies with Part 15 of the FCC limits for Class B digital devices. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try and correct the interference by relocating the equipment or connecting the equipment to a different circuit than the affected equipment. Consult an authorized dealer or technician for additional help if these remedies do not correct the problem.

Preface

Congratulations on choosing one of the most advanced marine navigation systems available! The GARMIN GPSMAP navigators combine the proven performance of GARMIN GPS with powerful G-Chart™ electronic charting for detailed cartography and plotting wherever you cruise.

To get the most out of your new navigation system, take the time to go through this operator's manual and learn the operating procedures for your unit. This manual covers the following GPSMAP units:

MAP 205 3-gray level LCD chart plotter

GPSMAP 210 3-gray level LCD chart plotter with built-in GPS

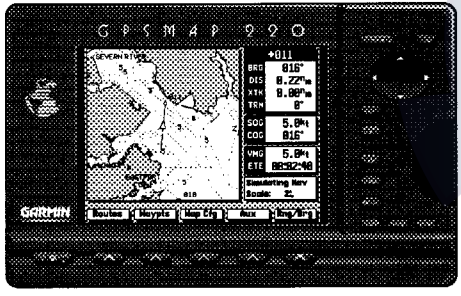
GPSMAP 220 Color LCD chart plotter with built-in GPS

ATTENTION MAP 205 USERS!

The Map 205 will perform to specifications when properly interfaced with a GPS receiver providing position, track, speed and time/date in NMEA 0183 (1.5 or 2.0) format. The Map 205 relies solely on an external device for all position, speed, track and time information. If you encounter problems in the information displayed by the unit, always check the interfaced NMEA source for errors.

INTRODUCTION

Packing List



Before installing and getting started with your unit, please check to see that your package includes the following items. If any parts are missing, please see your GARMIN dealer immediately.

Standard Package:

- GPSMAP Unit
- Remote GPS Antenna with 30' Antenna Cable
- Mounting Bracket and 2 Mounting Knobs
- Power/Data Cable
- Owner's Manual
- Warranty Registration Card
- G-chart™ Coverage Charts

Optional Accessories:

- G-chart Electronic Chart Cartridges
- 110/220 volt AC Adapter
- Flush Mounting Kit
- User Programmable Data Card

PART ONE: INTRODUCTION

PART TWO: REFERENCE

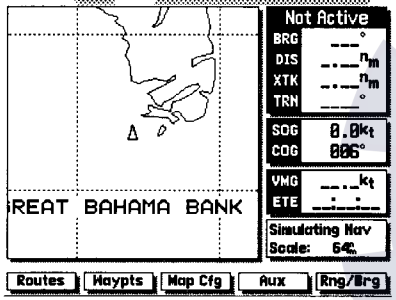
Designed for detailed electronic charting and simple operation, the GARMIN GPSMAP system is a powerful navigation device that can help guide you in waterways around the world:

Precision Performance

- 16-color active-matrix TFT screen (GPSMAP220)
- 3-Gray FTN LCD screen (205/210 models)
- MultiTrac8™ receiver tracks and uses up to 8 satellites simultaneously for fast, accurate positioning (210/220 models only)
- Differential-Ready— just add the optional GBR 21 beacon receiver for under 10 meter accuracy (210/220 models only)
- Waterproof, dry nitrogen-filled case for use in exposed locations

Advanced Navigating and Plotting

- 500 alphanumeric waypoints with selectable icons and comments
- Built-in worldwide database usable from 4096 to 64 n.m. scales
- 20 reversible routes with up to 50 waypoints each
- Graphic softkeys for easy operation right from the map display
- G-chart™ electronic charting for seamless, worldwide coverage
- On-screen point-to-point distance and bearing calculations
- 2,000 track log points with time, distance or resolution settings
- Built-in simulator mode for full route and trip planning



The GPSMAP system uses a set of on-screen 'softkeys' to perform route, waypoint and setup functions. These softkeys allow you to perform many navigation functions and custom setups right from the map display.

ZOOM — The ZOOM key changes the map scale displayed to one of 16 available ranges.

CTR — The CTR key eliminates the cursor and centers your vessel on the screen.

The ARROW KEYPAD controls the movement of the cursor and is used to select screen options and positions.

ENT — The ENTER key is used to confirm data entry and execute various on-screen function prompts.

MAPS — The MAPS key returns the display to the map page and/or displays the outlines of chart coverage in use.

PAGE — The PAGE key scrolls through the main screen pages in sequence.

DATA — The DATA key turns the data window on or off in map mode and toggles the displayed data on other pages.

MENU — The MENU key turns the softkey menu on or off in map mode.

MARK — The MARK key captures present position for storage as a waypoint.

MOB — The MOB key marks your present GPS position and instantly provides a return course with steering guidance.

GOTO — The GOTO key lets you select a waypoint or target cursor position as a destination and sets a course from your present position.

OFF ON — The POWER key turns the GPSMAP on and off and adjusts the screen backlight level.

GPSMAP TOUR

Power On

The GARMIN GPSMAP is a powerful electronic charting/navigating system that provides detailed chart coverage and convenient control of many advanced features right from the graphic charting page. This tour is designed to take you through the basic pages and functions of the GPSMAP system. Once you're familiar with the main pages and functions of the unit, refer to the reference section for instructions on performing specific tasks and functions.

Before beginning the GPSMAP tour, make sure the main unit and antenna have been properly installed (see Appendices A & B). Note that our tour will use the GPSMAP's built-in worldwide database and the simulator mode, so you won't have to install a chart cartridge or acquire satellites for this exercise. The tour assumes you have not changed any of the default settings for the unit. If you have changed any settings (position formats, units of measure, etc.), the descriptions and pictures in the tour may not match your configuration.

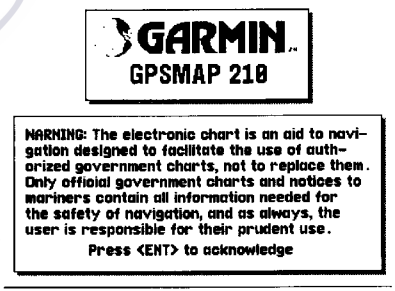
Powering Up and Starting the GPSMAP Tour

The GPSMAP's power and screen backlighting are controlled by the OFF ON rocker key at the bottom left of the unit. To turn the GPSMAP on:

1. Press and hold the right side of the OFF ON key until the power tone sounds.
2. Once the welcome page appears, press the ENT key to acknowledge the mariner's warning notice and begin operation.

To adjust the screen backlighting level:

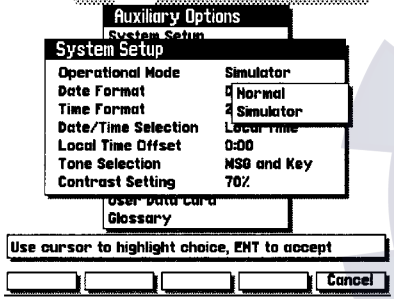
1. To increase the brightness level, press and release the right side of the OFF ON key.
2. To decrease the brightness level, press and release the left side of the OFF ON key.



The GPSMAP system is designed as an aid to navigation, and is not intended to replace the use of government-approved charts and traditional navigation practices. Make sure you read and understand the mariner's acknowledgement before using the unit.

GPSMAP TOUR

Simulator Setup



The GPSMAP system does not actively track satellites in the simulator mode. Never use the simulator mode for actual navigation. Any waypoints, routes and track logs you create while simulating navigation will be saved in memory, and are available for use when using the unit in normal operating mode.

Once you've acknowledged the mariner's warning, the Satellite Status Page will appear. The Status Page provides a visual reference of satellite acquisition and status, with a signal strength bar graph and satellite sky view in the center of the screen. The Status field at the top left of the screen indicates the unit's operating mode, with current GPS accuracy displayed below.

Across the bottom of the screen, you'll find five on-screen menu buttons called 'softkeys'. Each softkey corresponds to the key directly below it, and provides access to various route, waypoint and auxiliary functions. To see how softkeys work, let's put the GPSMAP in simulator mode:

1. Press the AUX softkey to display the Auxiliary Options menu.

The Auxiliary Options menu will appear, with the System Setup option highlighted. At the bottom of the screen, you'll notice a prompt field that provides you with instructions to help you through operating procedures.

1. With the System Setup option highlighted, press the ENT key.
2. The System Setup Menu will appear. Highlight the Operational Mode field and press ENT to see the available options.
3. Use the keypad to highlight 'Simulator' and press ENT to accept.
4. Press ENT to acknowledge the simulator warning notice.
5. Press the EXIT softkey to return to the Auxiliary Options menu.
6. Press the EXIT softkey again to return to the Status Page.

Your GPSMAP is now in simulator mode.

GPSMAP TOUR

Entering a Position

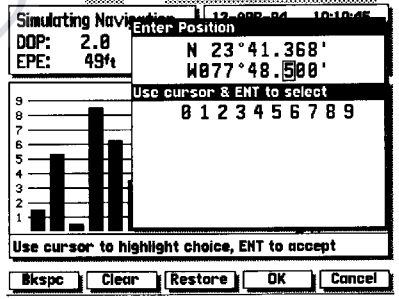
Now that you are back at the Status Page, let's enter a starting position for our tour. Entering names and numbers in the GPSMAP system is done through data entry windows. Once a data entry window is open, the arrow keypad and ENTER key are used to choose and accept a value for each character position:

1. Press the ● key to highlight the position field.
2. Press the ENT key to begin entry of the following position:
   N 23° 41.368', W 077° 48.533'
3. Use the ● keypad to highlight the appropriate character choice for each field.
4. Press the ENT key to accept each choice and move to the next character position. When you accept a value for the last character position, you will automatically return to the Status Page.

If you need to correct a mistake or change values in a character field, use the appropriate softkeys at the bottom of the screen. Use BKSPC to move back one character position; CLEAR to erase all entered data; and RESTORE to restore the previous field value. The OK softkey accepts data entry and returns the display to the previous page, and the CANCEL softkey stops the current data entry mode.

The Status Page will now indicate the position you entered and give you a simulated display of signal strength and satellite position. To continue the tour, let's move on to the Map Page.

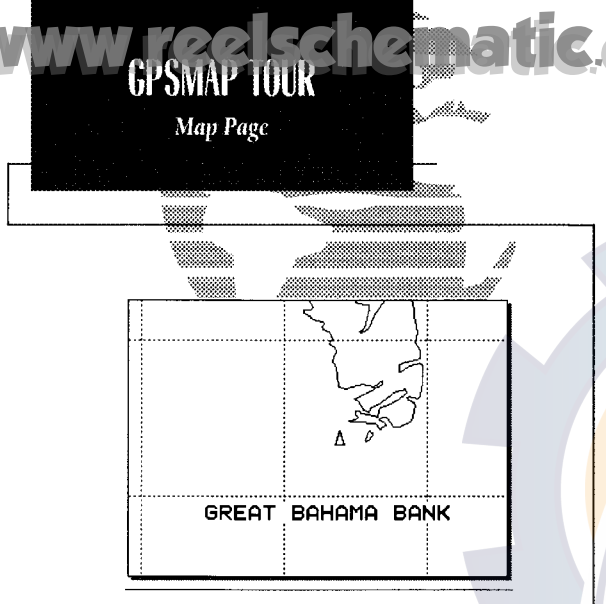
1. Press the MAPS key to display the Map Page.



Use the ARROW KEYPAD to choose letters, numbers, spaces and symbols in a data field. Only the appropriate characters will be available for a particular data entry window.

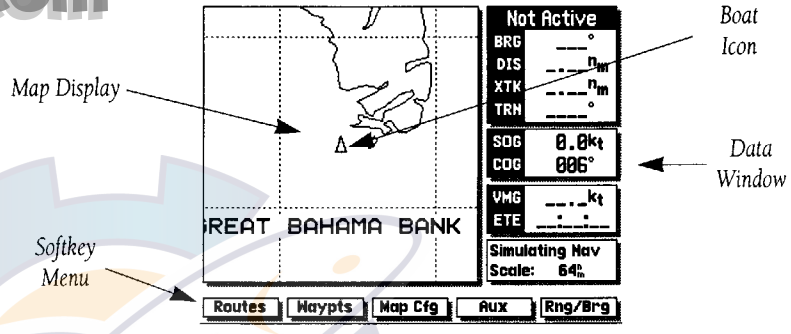
GPSMAP TOUR

Map Page



The Data Window (at the right side of the screen) and the Softkey Menu Display (at the bottom of the screen) may be turned off for a full page display of cartography:

- *To turn the Data Window off, press* DATA.
- *To turn the Softkey Menu off, press* MENU.



The GPSMAP system is built around a powerful graphical Map Page. The Map Page combines digital electronic charting with a complete display of important navigational data and easy access to advanced features. After completing the tour, you'll be able to perform most navigation, waypoint and route functions directly from the Map Page. Before we start creating waypoints and routes, let's take a brief look at its various features and displays.

The Map Page can be broken down into three main sections: map display, data window and softkey menu.

The **map display** shows your boat as a wedge icon on an electronically generated chart, complete with geographic names, markers, buoys and depth contours. It also displays your track, routes and nearby waypoints. An on-screen target cursor lets you pan to other map areas, determine the range and bearing to a position and perform various route and waypoint functions.

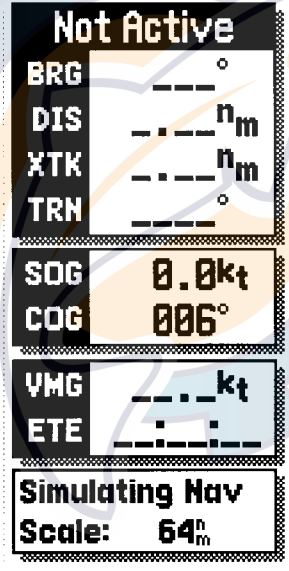
The **data window** provides a digital display of navigation data, in relation to your present position, the target cursor position or a particular waypoint.

The destination field, located at the top of the data window, shows your bearing and distance to a destination waypoint or to the cursor. It also displays your crosstrack error (XTK) and turn (TRN) heading to an active destination. The XTK value is the distance you are off a desired course, while TRN represents the direction (left or right) in degrees between the bearing to your destination and your course over ground (COG).

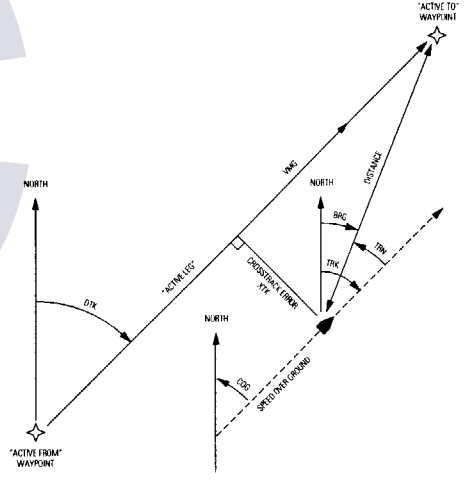
The speed and course field, located below the destination field, displays your present speed and course over ground (SOG and COG).

Below the speed and course field are the arrival and status fields. The arrival field displays your velocity made good (VMG) and estimated time enroute (ETE). Your velocity made good is the speed you are closing in on a destination along your desired track, while the ETE represents the total time left to your destination based on your current VMG.

The status field indicates the operating mode and map scale currently in use. The map scale represents the approximate distance from the top of the map display to the bottom.



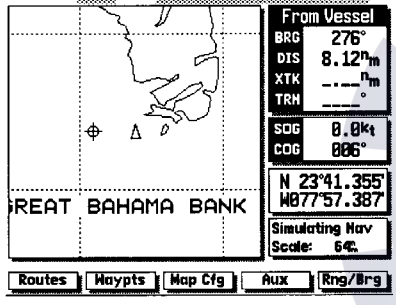
The **softkey menu** provides you with direct access to the GPSMAP's route, waypoint, auxiliary and range/bearing calculation functions.



For a glossary of navigation terms, select the 'Glossary' option from the Auxiliary Options Menu or see pages 75-76.

GPSMAP TOUR

Using the Target Cursor



As you move the cursor, the distance and bearing from your present position to the cursor will be displayed in the destination field (at the top right of the screen).

The cursor's position coordinates will be displayed in the position field (below the speed and course field).

While in cursor mode, the boat icon will continue to move, and may go off screen to accommodate the scrolling cursor.

Using the Map Page is a simple process that centers around the use of the cursor. Controlled by the arrow keypad, the cursor is an important tool that can be used as a distance and bearing marker, to create new waypoints and routes, and to review position data of on-screen waypoints, buoys and markers. Try moving the cursor using the following exercise:

1. Use the ZOOM key to set the map scale to 64 n.m.
2. Your boat should be in the center of the map display, near the Great Bahama Bank (the position you entered earlier).
3. Press the bottom arrow of the keypad to move the cursor down to the first lat/lon grid South of your boat's position.
4. Using the keypad to move the target crosshair in each direction, try following the outline of the lat/lon grid closest to your boat. Notice how the destination field of the data window displays the distance and bearing from your position to the target cursor, with the cursor's coordinate position indicated in the position field.
5. Press the CTR key to eliminate the cursor and recenter your position on the map display.

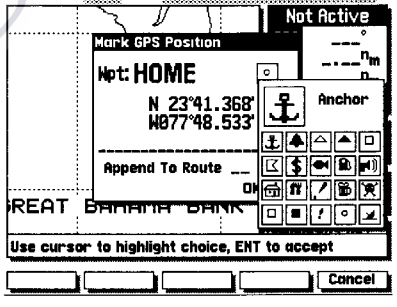
As you become more familiar with using the cursor, you'll see that the map display actively scrolls forward with your panning, letting you explore areas around the world (even outside of your current G-chart™ coverage) and create waypoints and routes. Wherever you move the cursor, you'll always be one CTR keystroke away from returning to your present position.

To continue the tour, let's mark our simulated present position for reference:

1. Press the MARK key to capture your present position as a waypoint.

The Mark GPS Position window will appear, with a default three-digit waypoint name and symbol. By pressing the ENT key, you can confirm the waypoint with the default name and symbol, but let's change the name and symbol to something a little more meaningful:

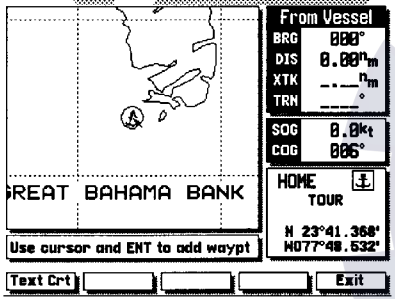
1. Use the keypad to move the field highlight to the 'Wpt' field and press ENT.
2. Enter the name 'HOME' with the keypad, pressing ENT after each character.
3. After you've entered the last letter, press the OK softkey to confirm the name.
4. The field highlight will move to the waypoint symbol field. Press ENT to begin selection of a new waypoint symbol.
5. Use the keypad to highlight the anchor symbol (at the top left corner of the window) and press the ENT key.
6. The field highlight will move to the comment field, where you may enter a 20-character comment (the default comment is the date and time of creation).
7. Press ENT to begin entry of a comment.
8. Use the keypad to enter 'TOUR' in the comment field, pressing the ENT key after each character.
9. Press the OK softkey to accept your comment.
10. Use the keypad to highlight the OK field.
11. Press the ENT key to save your new waypoint.



The GPSMAP system stores up to 500 alphanumeric waypoints, with selectable graphic icons and a user-defined comment field. If you mark a navaid position that appears on a G-chart electronic cartridge, the default comment will automatically select the navaid text associated with the marker.

GPSMAP TOUR

Creating a Route



Whenever the cursor comes in close proximity to an on-screen waypoint or navaid, it will 'snap' to and highlight its on-screen icon.

Once an on-screen marker has been highlighted, destination and position information will be displayed in the data window.

This feature makes it easy to review waypoint positions right from the map display.

Now that you've marked a waypoint for your starting position, let's make a route to navigate using the ROUTES softkey (for the purposes of this tour, make sure that the current map scale is still at 64 n.m.).

1. Press the ROUTES softkey to begin creating a route.
2. Use the keypad to highlight the Route 1 field and press ENT.

The GPSMAP system can store 20 reversible routes of up to 50 waypoints each. Routes 1-19 are used as storage routes, with Route 0 always serving as the active route. Although you may create a route in the Route 0 position, be aware that it will automatically become the active route upon completion. If you want to save a route created in the Route 0 position, be sure to copy it to another storage route, as it will be overwritten by the next route activation (see Section 7 for more details on routes).

As the GPSMAP returns to the Map Page, you'll notice several changes. The map display will now show the cursor as an arrow at your present position, with the prompt field indicating instructions for adding waypoints to your route. To select the HOME waypoint as your first route waypoint:

1. Press the ENT key to add the waypoint to the route.

Now add the next waypoint to the route:

1. Use the keypad to move the arrow cursor as close as possible to the following coordinates: N 23° 45.425', W 077° 51.327'.
2. Press ENT to save the waypoint position.
3. Press ENT to confirm the default waypoint name, symbol and comment.

Now add the final waypoint to the route:

1. Use the keypad to move the arrow cursor as close as possible to the following coordinates: N23°51.798', W077°49.665.
2. Press the ENT key to save the waypoint position.
3. Press ENT to confirm the default waypoint name, symbol and comment.

We now have a three waypoint route from our present position to waypoint 002. To activate the route and begin navigation:

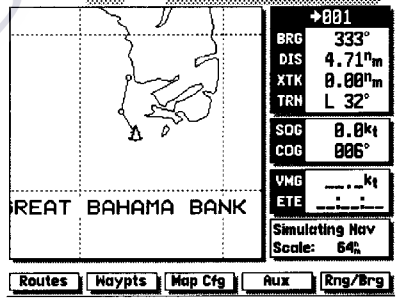
1. Press the EXIT softkey to quit the route creation mode.
2. Press the ACTIVTE softkey.

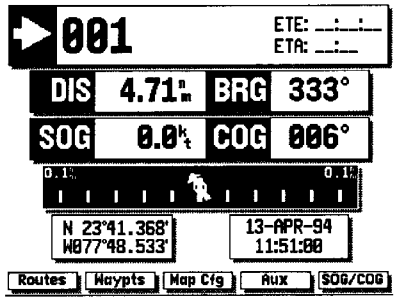
The GPSMAP will return to the map page, with your active route (Route 0) shown on the map display and the 'active to' waypoint (001) displayed in the destination field. The speed and course field tells us we're getting nowhere fast, so let's go to the Navigation Page and enter a speed for our simulated trip:

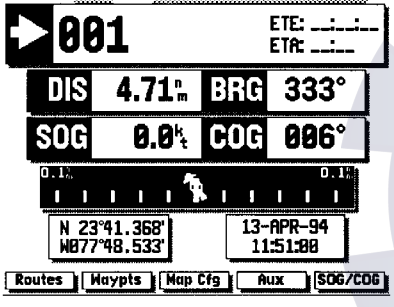
1. Press the PAGE key to display the Navigation Page.

The Navigation Page provides you with a large, digital display of nav data and graphic steering guidance to an active destination. The active destination waypoint is displayed at the top of the screen, with the ETE (estimated time enroute) and ETA (estimated time of arrival) based on your present speed and course at the right side of the field.

The distance and bearing to the first route waypoint, along with your current speed and course over ground (SOG and COG) are indicated below the distance and bearing fields.







The Simulator SOG/COG window lets you specify the speed and course for the simulator mode. By leaving the COG field value at the default setting, the GPSMAP system will automatically set a course directly to your destination.

If you choose to enter your own course over ground, highlight the COG field and enter the desired course. To reset the simulator to steer a direct course for you, highlight the 'Reset COG to Nav Course' prompt and press the ENTER key.

Now enter a speed of 50 knots for our simulated trip:

1. Press the SOG/COG softkey to display the Simulator SOG/COG window.
2. Press the ENT key to begin data entry.
3. Use the keypad to enter a speed of 50 knots, pressing the ENT key after each character entry.
4. Once you've entered your speed, press the EXIT softkey.

By leaving the COG field value at the default setting, the GPSMAP system will automatically set a direct course to each route waypoint. If you choose to enter your own course, highlight the COG field and enter the desired course. To reset the simulator to automatically steer a direct course for you, highlight the 'Reset COG to Nav Course' prompt and press the ENT key.

The distance and bearing to the 'active to' waypoint are displayed below the destination field, with your present speed (SOG) and course over ground (COG) also indicated. The SOG and COG fields can be changed to display velocity made good (VMG) and turn (TRN). To toggle the speed and course displays, press the DATA key.

Just below the speed and course fields is the CDI (course deviation indicator) scale. The CDI scale features a large arrow in the center, which always points to your destination waypoint relative to the direction you're moving in. The moving vertical bar will move from side to side, indicating how far you are off course from your desired track. Your present position and the date and time are displayed below the CDI scale.

You are now underway toward the first waypoint in your route. Whenever there is an active route under navigation, the GPSMAP will display route waypoint and leg information on the Active Route Page. To view the Active Route Page from the Navigation Page:

1. Press the PAGE key.

The Active Route Page shows each waypoint of the active route in sequence, with the name, desired track, distance and ETE or ETA to each waypoint from your present position displayed. As you navigate a route, the waypoint list will automatically update to list the next 'active to' waypoint first, followed by the remaining route waypoints in sequence. From the Active Route Page, you can:

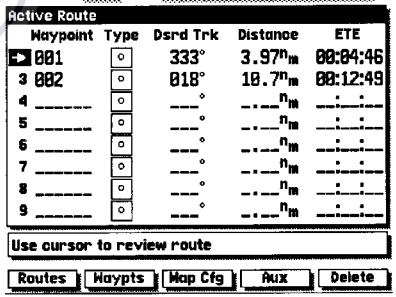
1. Scroll through the entire list of route waypoints using the key.
2. Review a highlighted waypoint by pressing the ENT key.
3. Change the ETE field to display ETA by pressing the DATA key.

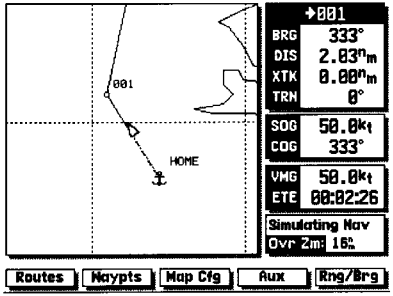
Let's go back to the Map Page to look at our progress:

1. Press the MAPS key.

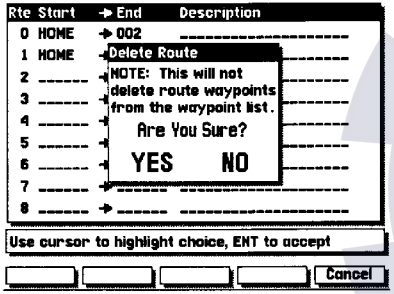
As you travel along your route, your boat will move across the map display, leaving a track plot of your course. You may have some difficulty differentiating track plots and route legs at the 64 n.m. scale, so try zooming down past the built-in database with the ZOOM to get a good view of the track plot.

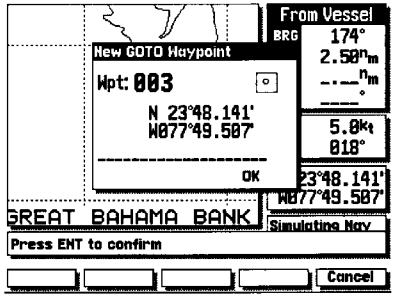
Whenever you zoom past the usable range of the current electronic chart, the range field will display 'Ovr Zm' or 'No Map'. These warnings indicate that although you may still have cartography, you should exercise extreme caution using the data. For a more detailed explanation of Overzoom and No Map modes, see page 20.





Map Display in Overzoom Mode





As you approach a destination waypoint, an audible alert and on-screen message will indicate when you are one minute from your destination. To acknowledge the message:

1. Press the ENT key.

Whenever you're finished navigating a route with the GPSMAP system, you'll need to clear the Active Route to stop navigation guidance to the last route waypoint. To stop navigation of the Active Route:

1. Press the ROUTES softkey.
2. Press the DELETE softkey.

Although creating and navigating routes in the GPSMAP system is a simple process, there may be times when you want to head right to a specific destination without creating a route. Imagine that as you were navigating our current route, you see a spot of interest off the starboard bow. By marking a new position with the cursor and using the GOTO function, we can set a new course right from the map display:

1. Use the keypad to move the cursor as close to the following position as possible: N 23° 48.230, W 077° 49.111.
2. Press the GOTO key.

Notice that the cursor has become an arrow pointer, and the prompt field displays instructions for going to the cursor position.

1. Press the ENT key.
2. The New GOTO Waypoint window will appear, asking you to confirm the waypoint name, position and details. Press the ENT key to confirm the information.

The GPSMAP will now provide you with steering guidance to your new waypoint. To stop navigation to a GOTO destination, clear the active GOTO:

1. Press the GOTO key.
2. Press the CLR GOTO softkey. (Note that in simulator mode, navigation will continue along the previously defined course over ground)

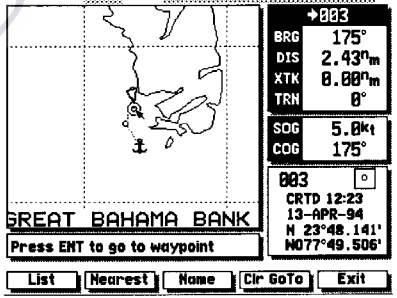
Congratulations! You've now gone through the basic operation of the GARMIN GPSMAP system. Your new unit is a powerful navigation device with many advanced features not covered in the tour.

Now that you have a working knowledge of the unit, use the reference manual to help you with advanced navigation and setup functions. The reference section is organized by topic, so you can quickly find instructions for performing specific functions, including installation and the use of G-chart™ electronic navigation charts.

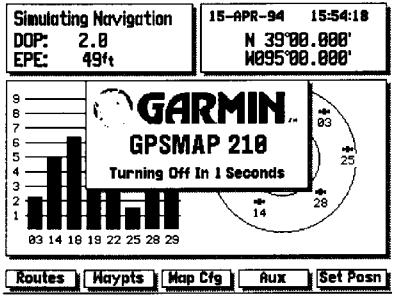
To turn your GPSMAP off:

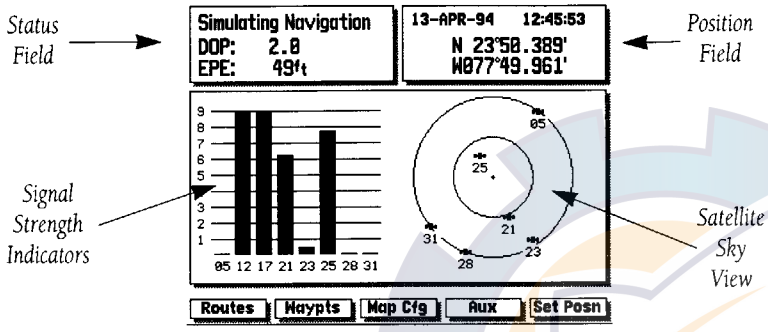
1. Press and hold the left side of the PWR key for three seconds.

Thank you for choosing the GARMIN GPSMAP Navigation System. We hope it will be a useful navigation tool for you wherever you may travel. If you have any questions or comments about its use, please call our Product Support staff at 1-800-800-1020 or 913-599-1515. You may also FAX our Product Support staff at 913-599-2103.



Press CLR GOTO to stop navigation.

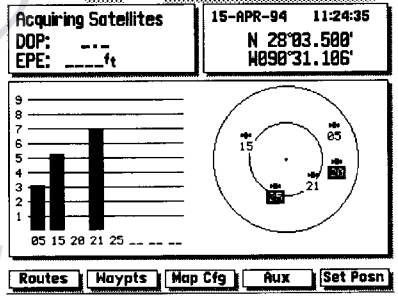




The GPSMAP 210/220 Status Page provides a visual reference of various receiver functions, including current satellite coverage, receiver operating mode and present position or DGPS status. The status information will give you an idea of what the receiver is doing at any given moment.

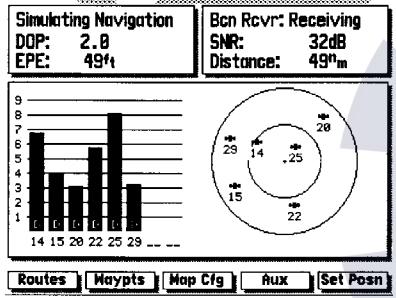
The sky view and signal strength bars give you an indication of what satellites are visible to the receiver and whether or not they are being tracked. The signal strength is shown on a bar graph for each satellite, with the satellite number below. When a satellite is visible but not being tracked, the strength bar will remain blank and the sky view indicator will remain highlighted.

The sky view shows a bird's eye view of the position of each satellite relative to the receiver's last known position. The outer circle represents the horizon (north up); the inner circle 45° above the horizon; and the center point a position directly overhead. Use the sky view to determine if there are obstructions shading your reception of GPS signals.



In this example, satellites 5, 15 and 21 are currently being tracked, with the corresponding signal strength bars indicating the relative strength of the signals. Satellites 20 and 25 (shown in reverse video) are visible, but are not currently being tracked.

NOTE: *For first time operation, GPSMAP 210 and 220 units may require 7.5 to 15 minutes to collect initial satellite almanac data and establish a present position. You may speed up the initial acquisition process by entering an initial position (see page 16).*



Whenever your GPSMAP is operating with a DGPS beacon receiver, the position window will be replaced by a beacon receiver status window. This window will display the beacon receiver status, the signal-to-noise ratio (SNR), and the distance from your beacon receiver to the DGPS transmitter.

The GARMIN GBR 21 is the recommended beacon receiver for all GARMIN GPSMAP systems.

The Status Page also shows receiver status and the current horizontal accuracy at the top left of the screen. The operating mode field will indicate whether the receiver is acquiring satellites, or is in simulator, 2-D, 2-D differential, 3-D or 3-D differential mode; with the current dilution of precision (DOP) and estimated position error (EPE) displayed below.

DOP is a measurement of satellite geometry quality, measured on a scale of one to ten (lower numbers being the best, higher numbers the poorest). The EPE uses the DOP and other factors such as signal quality to calculate a horizontal position error in feet or meters.

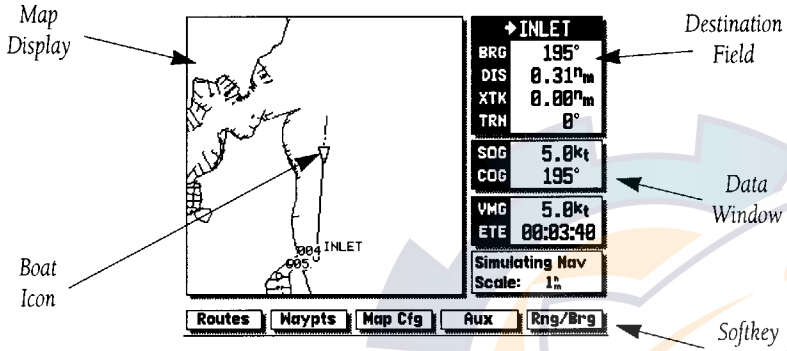
At the top right of the screen, your present position and the current date and time are displayed in the position window. The position shown will be the receiver's last calculated position. If you have moved more than 300 miles from your last position, you may want to enter a more accurate position to speed up satellite acquisition. You may enter your own position coordinates (by data entry or graphically) whenever the GPSMAP is acquiring satellites or is in simulator mode.

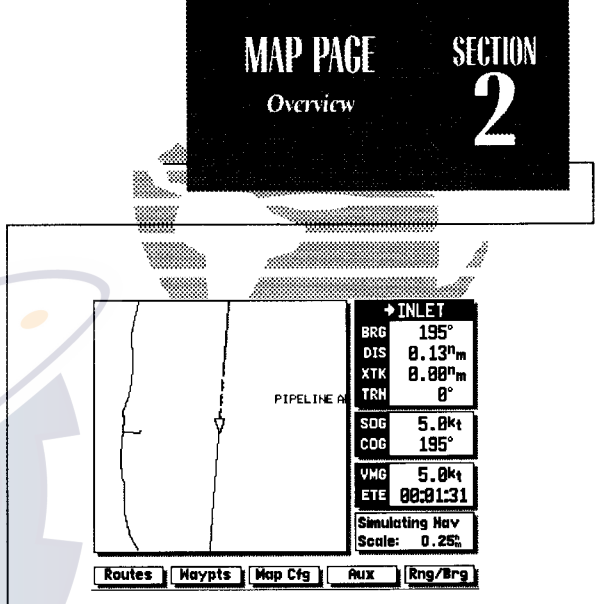
To enter new position coordinates by data entry:

1. Highlight the position field and press the ENT key to begin data entry.
2. Use the keypad to enter the new position, pressing the ENT key after each character is selected.

To enter new position coordinates graphically:

1. Press the SET POSN softkey.
2. Use the keypad to move the cursor to the desired position on the map display and press the ENT key.
3. Press the EXIT softkey to return to the Status Page.



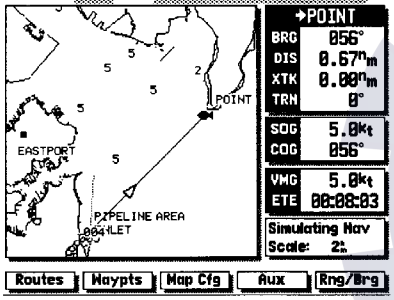


The GPSMAP Map Page provides a comprehensive display of electronic cartography, plotting and navigational data. It is the primary page used for navigating with the GPSMAP system. The Map Page can be broken down into three main sections: map display, data window and softkey menu.

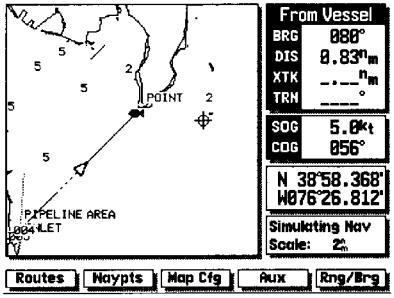
The map display shows your boat on an electronically generated chart, complete with geographic names, navaids, depth contours and a host of other chart features. It also plots your track and displays any routes and waypoints you create. An on-screen cursor lets you pan and scroll to other map areas, determine the distance and bearing to a position, and perform various route and waypoint functions. The GPSMAP system has a built-in world wide data-base to 64 n.m.(see Appendix F for built-in coverage map), with more detailed coverage available through the use of G-chart™ data cartridges (see Section 11 for installing and using G-chart™ cartridges).

Your boat's position is represented by a wedge icon, with your track plot shown as a dotted line (MAP 205/GPSMAP210) or a solid yellow line (GPSMAP220).

To select what chart features are displayed on a particular chart scale, refer to the Map Configuration section on pages 44-45.



Boat Mode



Cursor Mode

The map display uses the cursor keypad and a set of hard keys to control most map display functions. The ZOOM, CTR, ENT and MARK keys, combined with the keypad lets you select zoom ranges, move the cursor and display chart outlines. Two basic map operating modes determine what cartography is shown on the map display: boat mode and cursor mode. Boat mode pans the cartography to keep the present position marker within the display area, while cursor mode pans the cartography to keep the cursor within the display area.

The GPSMAP system will always power up in the boat mode, with your vessel centered on the map display. In boat navigation mode:

- Your movement is shown by the map scrolling past the centered boat.
- Whenever sufficient map coverage is not available to keep the boat centered, the boat icon will move toward the edge of the display.
- If the boat icon attempts to go off the display, the zoom level may need to be adjusted to keep cartography on screen.

Whenever the keypad is pressed, the GPSMAP will enter cursor mode. In cursor mode:

- The cursor can be moved over the map display using the keypad.
- Whenever the cursor reaches the edge of the display, the map will scroll forward under the cursor. Keep in mind that the boat icon will move with the map scrolling, and may go off the display screen (you may not be able to see your present position).
- When the cursor is stationary, a fixed coordinate position will appear in the position field. Note that the distance and bearing, displayed in the destination field, will change as your boat's position changes.
- Whenever you zoom in cursor mode, the cursor will be centered on screen.

The cursor allows you to pan away from your present position and scroll to other map areas around the world (even outside of your current G-chart™ coverage). As you pan past the edge of the current map display, the screen will actively scroll forward to provide continuous map coverage wherever you move the cursor.

To move the cursor:

1. Press the appropriate arrow icon on the ● keypad to move the cursor in the desired direction.

As you move the cursor, the distance and bearing from your present position to the cursor, will be displayed in the data window, with the cursor's position coordinates shown in the position field. Keep in mind that when the cursor is stationary, the distance and bearing from your present position will change as your boat moves.

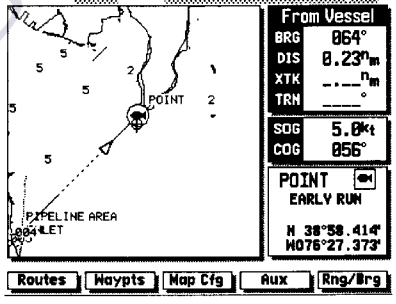
The cursor may also be used to 'snap' to on-screen waypoints and navaids, allowing you to review the selected position directly from the map display

To select an on-screen waypoint or navaid with the cursor:

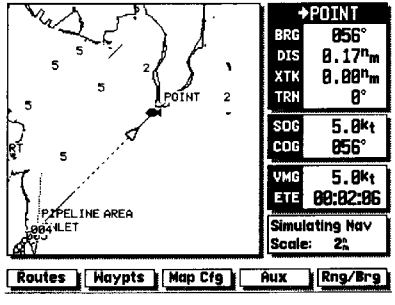
1. Use the ● keypad to move the cursor to the desired waypoint or navaid (if there are several waypoints grouped closely together, zoom in closer for a better view of the area).
2. When a waypoint or navaid is selected, it will become highlighted on screen, with the name, position, comment and icon displayed in the data window.

To eliminate the cursor, recenter your position on-screen and return to the boat navigation mode:

1. Press the CTR key.

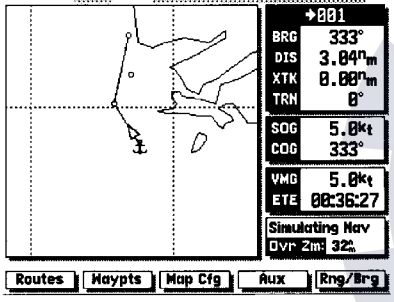


Snapping to an on-screen waypoint

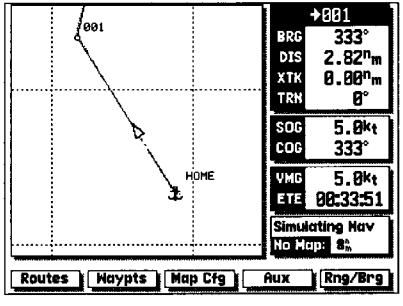


Remove the cursor by pressing the CTR key

Selecting Zoom Scales



Overzoom Mode



Track Plot Mode

The map display has 16 available range scales from 1/8th to 4096 n.m. (0.230 to 7500km). The map scale is controlled by the ZOOM key, with the current scale displayed at the bottom of the data window.

To select a map scale:

1. Press the arrow icon on the right or left side of the ▼ZOOM▲ key to zoom in or out.

The GPSMAP will display cartography as long as there is chart information available for the range you've selected. Zooming operation will conform to the following default settings:

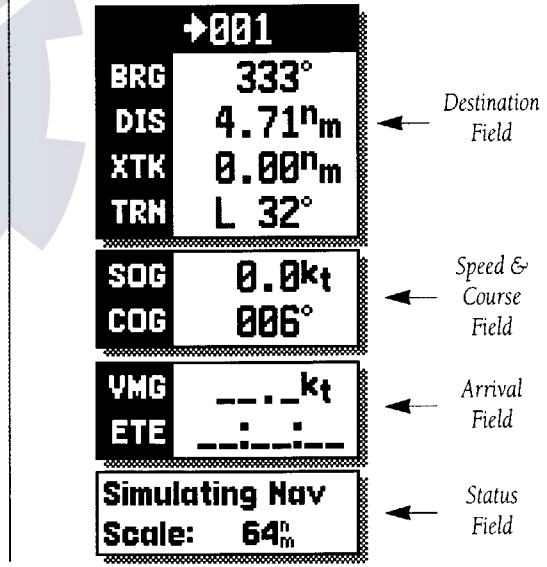
- When the selected zoom range is covered by either the internal database or a G-chart™ data cartridge, cartography will be displayed.
- When the selected zoom range is covered by both the internal database and a G-chart™ cartridge, cartography will be displayed using the data with the best resolution.
- When the selected zoom range exceeds the resolution of the chart in use by up to two settings, OVERZOOM cartography will be displayed. The display will not show any filled landmass areas, and an 'Ovr Zm' warning will appear in the scale field and the lat/lon grid will be turned on regardless of the map configuration setting. Although Overzoom mode provides some level of cartography, additional caution should be used while navigating.
- When the selected zoom range exceeds the resolution of the chart in use by more than two settings, all cartography will be replaced by a TRACK PLOT display. The lat/lon grid will be displayed regardless of the map configuration setting. Additional caution should be used while navigating in track plot mode.

The second section of the Map Page is the data window, located at the right side of the screen display. The data window provides a digital display of navigation data in relation to your present position, the cursor position or a particular waypoint.

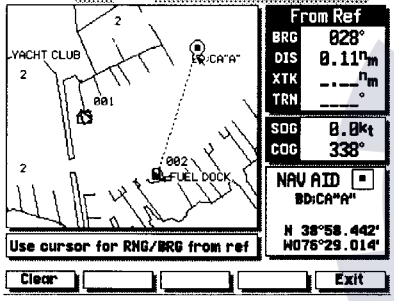
The top field of the data window is the destination field, which displays the bearing and distance to the destination waypoint indicated, with crosstrack error (XTK) and turn value (TRN) shown at the bottom of the field. If there is not an active destination waypoint, 'Not Active' will be indicated in the destination field. The XTK value is the distance you are off a desired course, while TRN represents the direction in degrees between the bearing to your destination and your course over ground (COG). Whenever the cursor is in use, the destination field will display the distance and bearing from your present position to the cursor.

The speed and course field, located below the destination field, displays your present speed and course over ground (SOG and COG). Directly below this field are the arrival and status fields. The arrival field displays your velocity made good (VMG) and estimated time enroute (ETE). VMG is the speed you are closing in on a destination along the desired track, with the ETE representing the total time left to your destination based on your current VMG. Whenever the cursor is in use, the arrival field will be replaced by a position field, which displays the coordinates of the cursor.

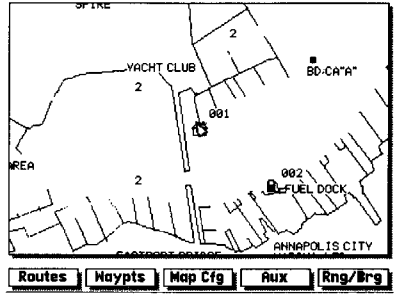
The status field, located directly below the arrival field, indicates the operating mode and map scale currently in use. When the cursor is used to 'snap' to an on-screen waypoint or navaid, the arrival and status fields will be replaced with a waypoint review field, showing the name, position, icon and comment for the selected on-screen position.



Range & Bearing Softkey Menu



Calculating Range/Bearing



Expanded Map Display

The last section of the Map Page is the softkey menu, which is displayed across the bottom of the screen. The first four softkeys provide quick access to route, waypoint and other functions from any GPSMAP page. For instructions on using these softkeys, refer to the section dedicated to each key. The RNG/BRG softkey appears only on the Map Page, and lets you use the cursor to calculate the range and bearing between any two on-screen positions.

To calculate the distance and bearing between two points:

1. Press the RNG/BRG softkey.
2. Use the keypad to move the arrow cursor to the desired reference position and press the ENT key. To clear a reference point, press the CLEAR softkey.
3. Use the keypad to move the arrow cursor to the desired finish position. The bearing and distance from the reference point will be displayed in the destination window.
4. Press the EXIT softkey to quit the RNG/BRG mode.

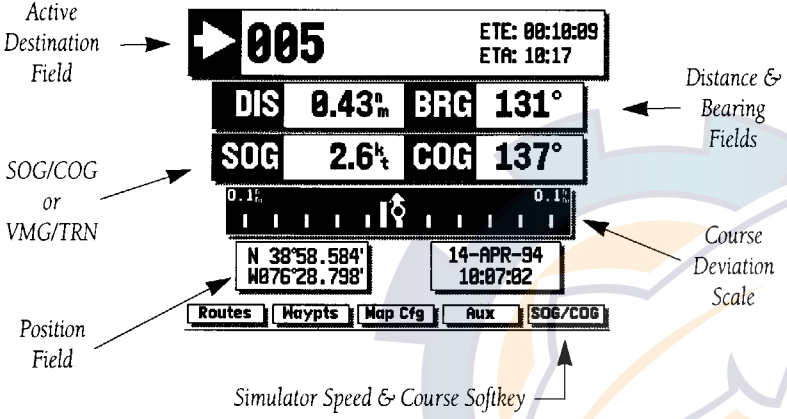
Although the Map Page's data window/softkeys provide you with important data and system functions, you may prefer to have a full-screen map display. To display cartography on the entire page, simply 'turn off' the other displays.

To turn the data window display on or off:

1. Press the DATA key.

To turn the softkey menu display on or off:

1. Press the MENU key.

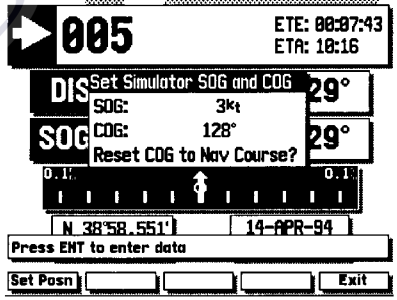


The GPSMAP Navigation Page provides a large, digital display of navigation data and graphic steering guidance to an active waypoint. The active destination waypoint is displayed at the top of the screen, with the ETE (estimated time enroute) and ETA (estimated time of arrival) based on your present speed and course at the right side of the field.

The distance and bearing to the destination waypoint, along with your present speed and course over ground (SOG and COG) are shown below the destination field. The SOG and COG fields may also be changed to display your velocity made good and turn value (VMG and TRN).

To display VMG and TRN:

1. Press the DATA key. To return to the display to SOG and COG, press DATA again.

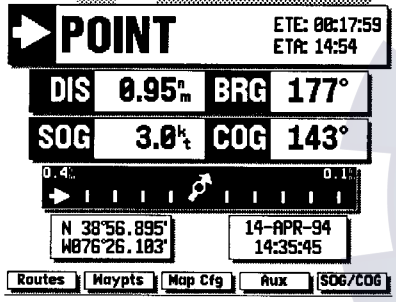


Whenever your GPSMAP is in simulator mode, a SOG/COG softkey will appear in the softkey menu. Use the SOG/COG softkey to set the speed and course for your simulated trip (see pg. 9-10)

Once you are in the SOG/COG window, you can also set a simulator position graphically by pressing the SET POSN softkey and following the steps outlined on page 16.

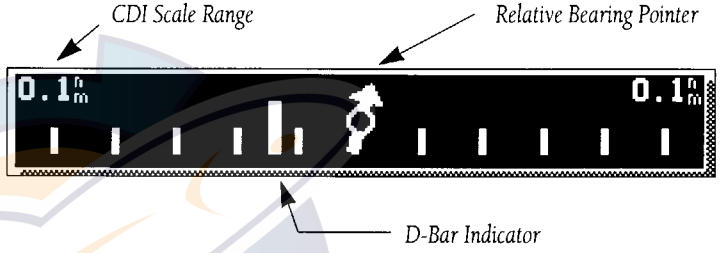
SECTION 3 NAVIGATION PAGE

CDI Scale
Navigation Data



Whenever you are off course by more than the selected CDI scale, your distance off course will be displayed in place of the CDI scale setting. An arrow icon will also appear, indicating which direction to steer to get back on course.

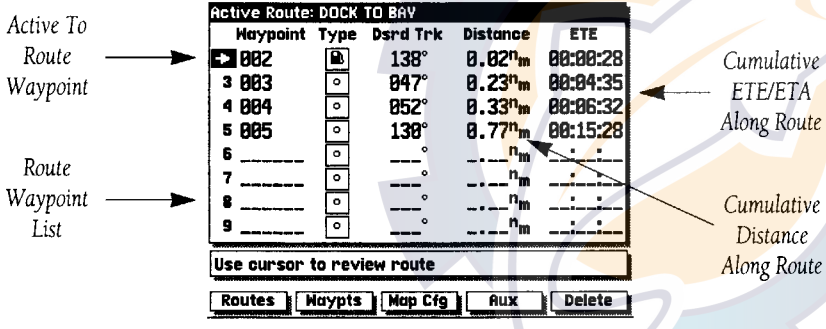
The GPSMAP Navigation Page's graphic course deviation indicator (CDI) is located directly below the speed and course fields.



The CDI scale features a large arrow in the center, which always points to your destination waypoint relative to the direction you're moving in. The vertical bar on the scale moves from side to side, indicating how far off course you are from your desired track, relative to the scale value shown at the top left and right of the scale. As you navigate to a destination, you want to try to keep the vertical bar as close to the center of the scale. If you exceed the scale setting of the CDI, the scale value numbers will change to indicate the distance and direction you are off course. To change the CDI scale and steering guidance preferences, refer to Section 10.

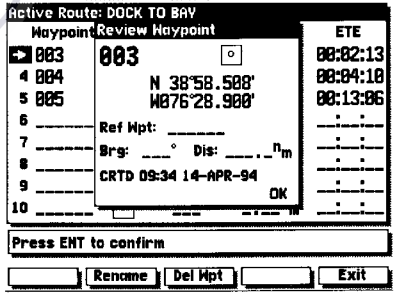
The last two fields on the Navigation Page are the position and date/time fields. The position field displays your present GPS position or a simulator mode position you have entered manually. The date/time field displays the current date and time as calculated from GPS satellites. The date and time formats may be changed through the system setup softkey (see Section 10), and the time may be set to display either UTC (Greenwich Mean Time) time or the local time, based on a local offset entered in the system setup menu.

The last page in the GPSMAP system is the Active Route Page. The Active Route Page shows each waypoint of the active route in sequence,with the waypoint name, desired track, cumulative distance and ETE or ETA for each waypoint from the present position. Your current destination waypoint, the 'active to' waypoint, is marked with an arrow icon, and will be the first waypoint listed. As you navigate a route, the waypoint list will automatically update to display the next 'active to' waypoint first, followed by the remaining route waypoints in order.

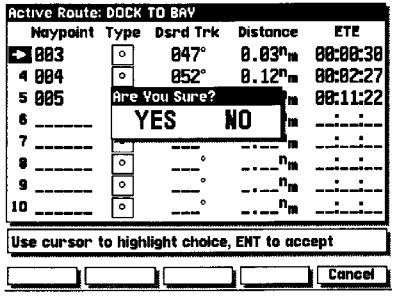


From the Active Route Page, you can:

1. Scroll through the entire list of route waypoints using the keypad.
2. Review the waypoint data for a highlighted waypoint by pressing the ENT key.
3. GOTO a highlighted waypoint by pressing the GOTO key.
4. Stop navigation of the Active Route by pressing the DELETE softkey.
5. Change the ETE field to display ETA by pressing the DATA key.



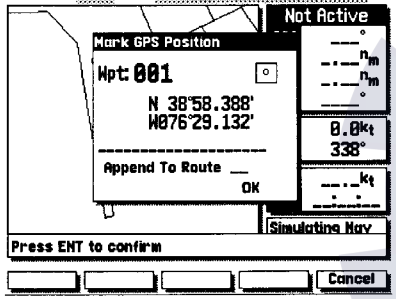
Reviewing a Route Waypoint

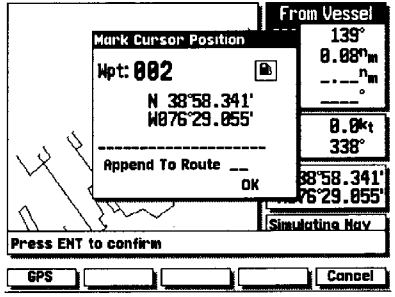


Deleting the Active Route

SECTION 5 MARK KEY

Marking GPS & Cursor Positions





The GARMIN GPSMAP system features a MARK position key that lets you quickly capture your present position or a target cursor position and create a new waypoint right from the map display. The MARK key will capture your present position when the cursor is not in use, or will give you the option of marking your present position or the cursor position when the cursor is in use.

To mark your present position:

1. Press the MARK key to capture your present position.
2. If you want to accept the waypoint with the default name, symbol and comment, press ENT to confirm the 'OK' prompt.
3. To enter your own name, symbol or comment, highlight the appropriate field and press ENT.
4. After entering your changes, move the field highlight back to the 'OK' prompt and press ENT.

To mark the cursor position:

1. Use the keypad to move the cursor to the desired position.
2. Press the MARK key to mark the position.
3. Press the CURSOR softkey to select Mark Cursor Position.
4. If you want to accept the waypoint with the default name, symbol and comment, press ENT to confirm the 'OK' prompt.
5. After entering your changes, move the field highlight back to the 'OK' prompt and press ENT.

The cursor may also be used to mark a navaid position as a waypoint by snapping to the desired navaid with the cursor and following the steps above. The default comment will be the navaid text shown on the cartography.

The GPSMAP's GOTO command lets you select any stored waypoint or target cursor position as a destination and quickly set a course from your present position. Once a GOTO has been activated, the Navigation Page will provide CDI steering guidance to your destination. A GOTO may be activated on the map display using the cursor, or from any waypoint list.

To activate a GOTO from the map display:

1. Press the GOTO key.

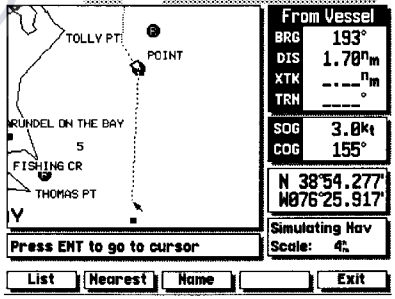
The cursor will appear as an arrow pointer, which lets you point to a position as your destination using the ARROW KEYPAD. If you want to GOTO an existing on-screen waypoint, 'snap to' the waypoint with the arrow cursor and press the ENT key. If your destination is not an existing waypoint or is an on-screen navaid, you'll need to mark the position as a waypoint:

2. Press the ENT key to confirm the arrow cursor position as your destination.
3. If you want to accept the new GOTO waypoint with the default name, symbol and comment, press ENT to confirm the 'OK' prompt.
4. To enter your own name, symbol or comment, highlight the appropriate field and press ENT. After entering your changes, move the field highlight back to the 'OK' prompt and press ENT.

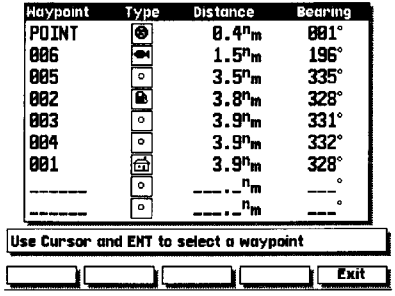
You can also quickly activate a GOTO to any stored waypoint from any waypoint list (e.g. the waypoint or nearest waypoints list).

To activate a GOTO from a waypoint list:

1. Highlight the desired waypoint with the keypad.
2. Press GOTO key to activate the GOTO mode.
3. Press ENT to confirm the new GOTO waypoint.

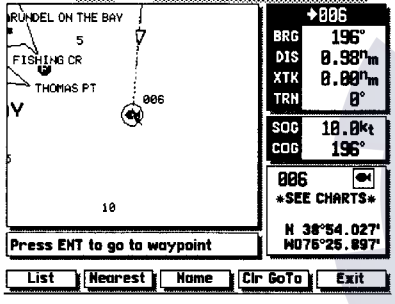


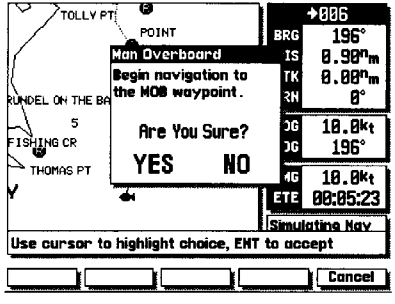
Cursor GOTO



List GOTO

Stopping Active GOTOs
MOB Function





Once a GOTO has been activated, the GPSMAP will keep the waypoint as your active destination and provide CDI steering guidance until you stop the active GOTO.

To stop navigation to an active GOTO position:

1. Press the GOTO key.
2. Press the CLR GOTO softkey.

The GPSMAP's man overboard function (MOB) lets you mark and set an immediate course to a position for quick response to emergency situations.

To activate the MOB function:

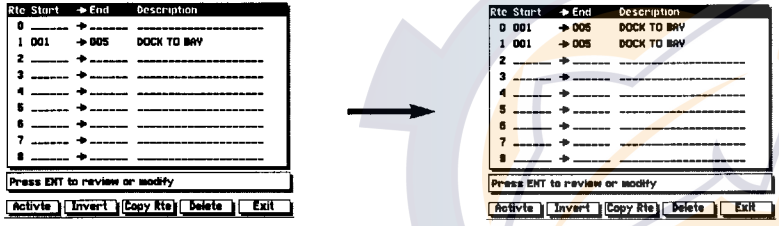
1. Press the MOB key.
2. Press the ENT key to confirm that you want to stop any current route or GOTO navigation and begin navigating to the MOB position.
3. If you only want to mark the MOB position, and do not want to make the MOB position the active destination waypoint, use the keypad to highlight the 'NO' prompt and press the ENT key.

Once a MOB has been activated, an MOB icon will appear on the map display, and the destination field on the Map Page will display the bearing, distance, XTK and ETE to the MOB position based on your present speed and course. To view CDI steering guidance to the MOB position, press the PAGE key to display the Navigation Page.

To stop navigation to the MOB position:

1. Press the GOTO key.
2. Press the CLR GOTO softkey.

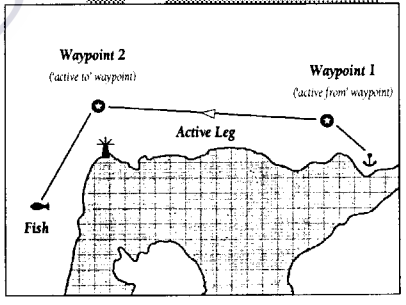
The GARMIN GPSMAP system lets you create and store up to 20 reversible routes with up to 50 waypoints each. Routes can be created and modified right from the Map Page, allowing you to see each route graphically on-screen as you create, review, modify or navigate the route. The GARMIN route system is a powerful and extremely flexible system that you'll want to master to get the most out of your GPSMAP system. It's really quite simple.



When a route is activated or inverted, it is copied into Route 0. The original route remains intact in its original storage route.

Each route in the GPSMAP system has its own route number. Routes 1 through 19 are used as storage routes, with Route 0 always serving as the active route you are navigating. When you activate a route, the storage route you are activating is simply copied into Route 0, the active route.

This feature lets you modify your active route while you navigate, without changing the storage route you activated. When you are finished navigating the active route, simply delete Route 0 by pressing the DELETE softkey (you still have the original route in storage) to stop navigating the active route. To store a modified Active Route, copy Route 0 to an empty storage route.

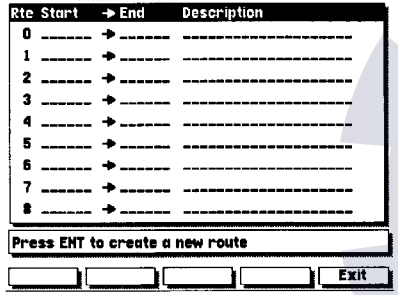


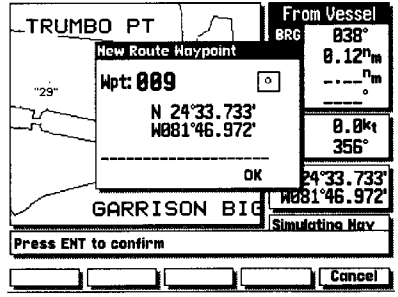
Routes are broken down and navigated in smaller segments called 'legs'. The waypoint you are going to in a leg is called the 'active to' waypoint, and the waypoint immediately behind you is called the 'active from' waypoint. The line connecting the 'active to' and 'active from' waypoint is referred to as the 'active leg'.

When a route is activated in the GPSMAP system, the route leg closest to your position is automatically selected as the 'active leg'.

SECTION 7 ROUTES

Creating Routes Graphically





All of the GPSMAP route functions are accessed through the ROUTES softkey, located at the far left of the softkey menu.

To create a route from the map display:

1. Press the ROUTES softkey to display the route list window.
2. Use the keypad to select an empty storage route (routes 1-19) and press the ENT key. You can create a route in the active route (Route 0) position, but you'll need to copy it to an empty storage route to save it, as it will be overwritten by the next route activation.
3. The route list window will be replaced by the Map Page, with the target cursor appearing as an arrow pointer. To add waypoints to the route, use the keypad to move the arrow cursor to the desired position and press the ENT key.

   HINT: Once the map display is in route creation mode, you can use the arrow cursor to 'snap to' existing on-screen waypoints or navaids, or create new waypoint positions. Existing waypoint positions will be added to the route without confirmation. Whenever you are adding a new route waypoint not currently stored in memory, you'll be asked to save the new waypoint.
4. Press ENT to confirm the 'OK' prompt.
5. Once you've entered all the desired route waypoints, press the EXIT softkey.

The map display will now return to the map review mode, where you can review, activate, invert or modify the current on-screen route. The review mode will always appear when you have finished creating a new route on the map display or when you have selected a route for review from the route list window.

When the review mode is in use, the cursor may be used to highlight individual route legs. When a route leg is highlighted, the 'active from' and active to' waypoints will be displayed at the bottom of the data window, with the desired track (DTK) and distance (DIS) for the leg indicated below. The rest of the map review functions are performed through the map review softkeys at the bottom of the screen.

To activate or invert the on-screen route:

1. Press the ACTIVTE softkey.

2. To invert (activate in reverse order) the route, press the INVERT softkey.

Once a route has been activated or inverted, the destination field in the data window will display navigation information to the next 'active to waypoint'. As you complete navigation of each route leg, this information will be updated to reflect the next 'active to' waypoint in the route. When you reach the final destination waypoint in the active route, you'll need to cancel the active route to stop navigation to the last route waypoint. Also note that the Active Route, if not cancelled, will be automatically reactivated when the unit is powered up.

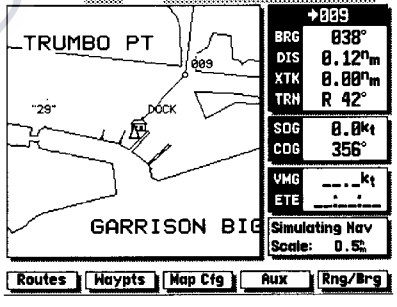
To stop navigation of the active route:

1. Press the ROUTES softkey.

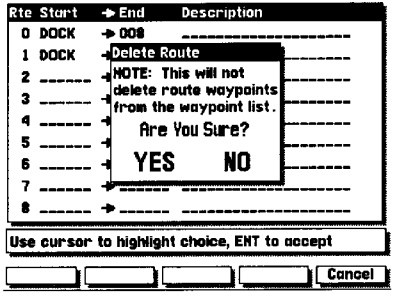
2. Press the DELETE softkey.

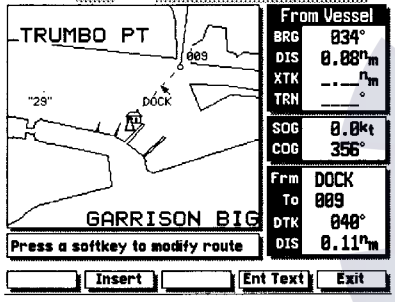
3. Press the ENT key to confirm the delete route warning.

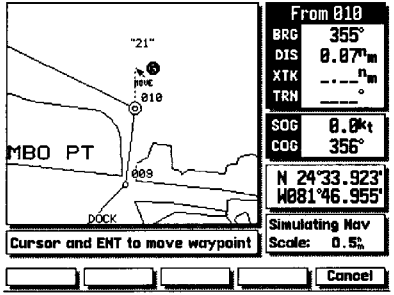
To save a newly created or modified Active Route, copy Route 0 to an open storage route (Routes 1-19), as the Active Route will be overwritten by a new route activation.



Activated Routes appear as solid lines.







The next softkey in the route review mode allows you to modify a route by moving, inserting or removing route waypoints on screen or editing a route through a text review window.

To modify the on-screen route:

1. Press the MODIFY softkey.

Once you have pressed the MODIFY softkey, you'll notice that you have a new set of softkeys below the map display:

- The MOVE softkey allows you to move the position of any route waypoint on screen.
- The INSERT softkey will let you add a new route waypoint before the first route waypoint, add a new route waypoint after the last route waypoint or add a new waypoint in any route leg.
- The REMOVE softkey will let you delete any waypoint from the route and adjusts the route legs accordingly.
- The ENT TEXT softkey provides an editing window to add a comment; review, insert or remove waypoints; or activate/invert the route.
- The EXIT softkey returns you to the route review mode.

To move an on-screen waypoint:

1. Use the ● keypad to snap to the waypoint you want to move.
2. Press the MOVE softkey.
3. Use the ● keypad to move the arrow cursor to the new waypoint position.
4. Press the ENT key to complete the move.

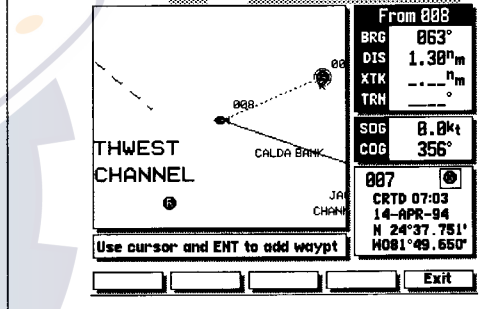
The INSERT softkey allows you to add a waypoint before the first route waypoint or after the last route waypoint; or add a new route waypoint to an existing route leg.

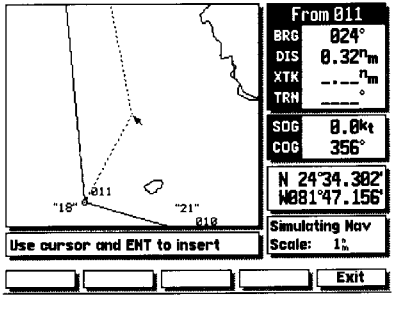
To insert a new starting or ending route waypoint:

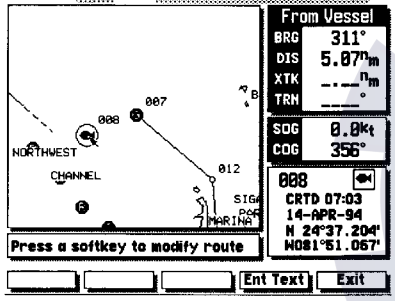
1. Use the ● keypad to snap to and highlight the first or last route waypoint.
2. Press the INSERT softkey.
3. Use the ● keypad to move the arrow cursor to the new waypoint position.
4. If the new waypoint position is not an existing waypoint, confirm the New Route Waypoint by highlighting the 'OK' prompt and pressing the ENT key.
5. Press the ENT key to complete the insertion.
6. Press the EXIT softkey to return to the route modification mode.

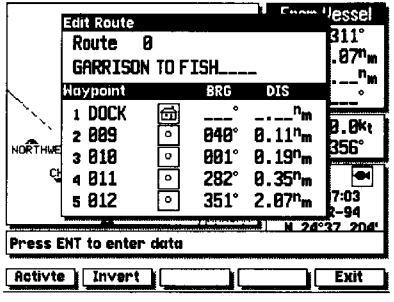
To insert a new waypoint in an existing route leg:

1. Use the ● keypad to snap to and highlight a route leg.
2. Press the INSERT softkey.
3. Use the ● keypad to move the arrow cursor to the new waypoint position.
4. If the new waypoint position is not an existing waypoint, confirm the New Route Waypoint by highlighting the 'OK' prompt and pressing the ENT key.
5. Press the ENT key to complete the waypoint insertion.









To remove a route waypoint:

1. Use the keypad to snap to and highlight the waypoint you want to remove.
2. Press the REMOVE softkey.

The ENT TEXT softkey will display an editing window where you may add a route comment, insert or delete waypoints or review any waypoint of the on-screen route. You can also activate or invert the route using the ACTIVTE or INVERT softkeys available from the Edit Route window.

To display the Edit Route window:

1. Press the ENT TEXT softkey.

The Edit Route window will appear with the route comment field highlighted. The waypoint list shows the route waypoints in sequence, with the waypoint name, symbol, and bearing and distance between waypoints indicated.

To enter a route comment:

1. Highlight the comment field and press the ENT key.
2. Use the keypad to enter your comment.
3. Press the OK softkey to accept the comment.
4. Press the EXIT softkey to return to the modify mode.
5. Press the EXIT softkey again to return to the route review mode.

You can also quickly access the Edit Route window and add a route comment after a route has been created by pressing the TXT RVW softkey from the route review mode.

The Edit Route window will also let you scroll through the list of route waypoints and review each waypoint and change waypoint information.

To review a route waypoint:

1. Use the ● keypad to scroll through and select the waypoint to be reviewed.
2. Press the ENT key to display the Select Route Waypoint window.
3. Press the OK softkey to return to the Edit Route window. The field highlight will automatically scroll to the next route waypoint on the list.

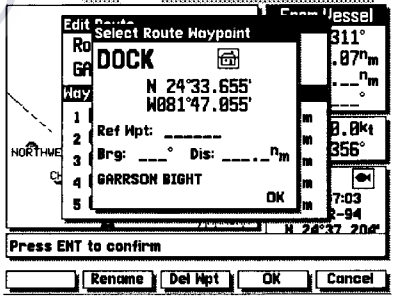
From the Select Route Waypoint window, you may change the name, symbol, position or comment by highlighting the appropriate field and entering new information. You can also replace any route waypoint with an existing or entirely new waypoint.

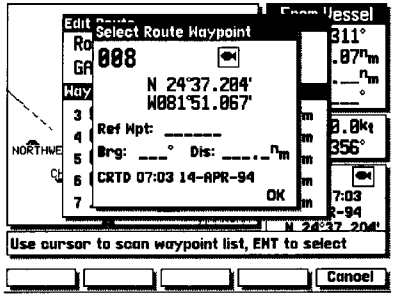
To replace a route waypoint with another stored waypoint:

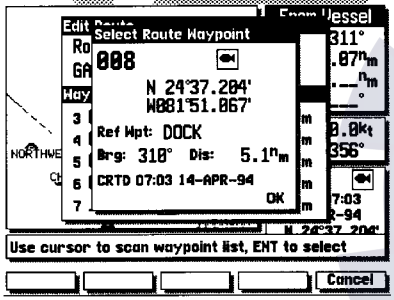
1. Use the ● keypad to highlight the waypoint name field.
2. Press the SCAN softkey.
3. Use the ● keypad to scan the waypoint list and select a new waypoint.
4. Press ENT to return the cursor to the OK prompt.
5. Press ENT to confirm the replacement waypoint.

To replace a route waypoint with a new waypoint:

1. Use the ● keypad to highlight the waypoint name field.
2. Press the ENT key and use the ● keypad to enter the new waypoint name.
3. Enter the waypoint position and data and press the OK softkey.







From the Select Route Waypoint window, you can also determine the distance and bearing between the route waypoint shown and any other waypoint in memory.

To use the reference waypoint function:

- *Highlight the "Ref Wpt' field*
- *Press the SCAN softkey*
- *Use the ARROW KEYPAD to scroll through and find the desired waypoint*

The distance and bearing will now be displayed below the reference waypoint field.

The Select Route Waypoint window also lets you rename a route waypoint, or delete a waypoint from system memory ('active to' waypoints can't be deleted).

To rename a route waypoint:

1. Press the RENAME softkey.
2. Use the keypad to enter the new name.
3. Press the OK softkey to accept the new waypoint name.

To delete a route waypoint from system memory:

1. Press the DELETE softkey.
2. Press the ENT key to confirm the delete waypoint warning.

The last two functions of the text review mode are removing and inserting route waypoints from the route waypoint list.

To remove a route waypoint from the list:

1. Press the REMOVE softkey.

To insert a route waypoint in the list:

1. Use the keypad to highlight the existing route waypoint position where you want the new waypoint to appear.
2. Press the INSERT softkey.
3. To insert a waypoint from the main waypoint list, press the SCAN softkey, use the keypad to select a waypoint and press the ENT key twice.
4. To enter a new waypoint, press the ENT key and use the keypad to enter the new waypoint name and press the OK softkey.
5. Enter the waypoint position and data and press the OK softkey.

In addition to the graphic on-screen creation of routes, the GPSMAP system also provides a data entry window for creating new routes.

To create a route through data entry:

1. Press the ROUTES softkey to display the route list window.
2. Use the keypad to select an empty route and press the ENT key.
3. Press the TEXT CRT softkey to display the Edit Route window.

The Edit Route window will appear, with the comment field highlighted.

To enter a route comment:

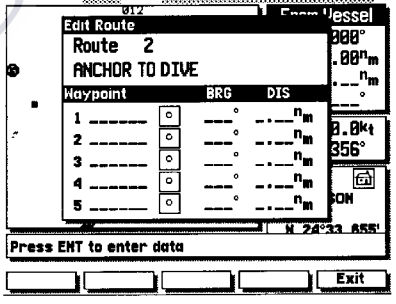
1. Press the ENT key with the comment field highlighted.
2. Use the key to enter your comment and press the OK softkey.

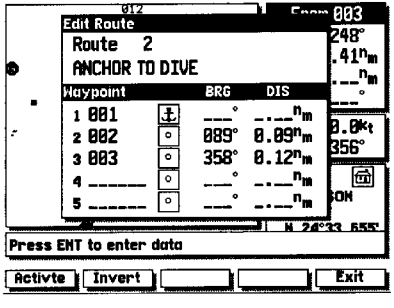
The field highlight will move to the first route waypoint field, where you may select each waypoint of the new route by scanning your existing waypoint list or entering new waypoints.

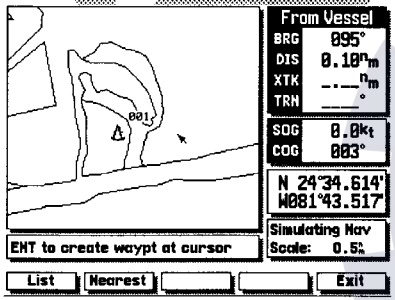
To add an existing waypoint to a route:

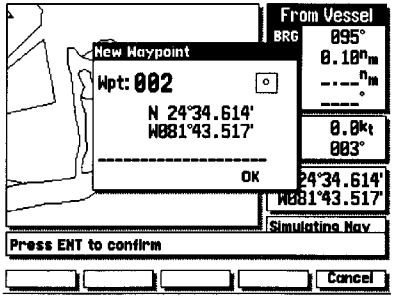
1. Highlight the route waypoint field (waypoints must be added in route sequence).
2. Press the ENT key to begin entry.
3. Press the SCAN softkey.
4. Use the keypad to scan the waypoint list and select the route waypoint.
5. Press the ENT key twice to confirm the selection.

To add a new waypoint to a route, follow steps 1 and 2 above, then press the ENT key to begin entry of waypoint data. After you've entered the name, position and other information, confirm the OK prompt by pressing ENT.









The GARMIN GPSMAP system stores up to 500 alphanumeric waypoints with a user-defined icon and comment available for each waypoint. Waypoints can be created, reviewed, moved or deleted right from the Map Page, using the target cursor to select positions and waypoints, and are managed through the WAYPOINTS softkey. Once you are in the waypoint mode, you can also create, edit and review waypoints through the waypoints list and the nearest waypoints windows. Let's cover the graphic waypoint functions first.

To create a waypoint from the map display:

1. Press the WAYPTS softkey.The target cursor will appear as an arrow pointer.
2. Use the ● keypad to move the arrow cursor to the desired waypoint position.
3. Press the ENT key to capture the position.

The New Waypoint window will appear, with a default three-digit name and graphic icon. The position coordinates are displayed in the center of the window, with a user-defined comment field below.

4. To accept the default waypoint name, icon and comment (the date and time of creation), press the ENT key to confirm the 'OK' prompt.

The GPSMAP system lets you enter a six character waypoint name and a 20 character user comment and a graphic icon for each waypoint.

To enter a user-defined name, icon or comment:

1. Highlight the name, icon or comment field and press ENT.
2. Use the ● keypad to enter your name, icon or comment and press the OK softkey (for name and comment entry) or the ENT key (for icon selection).
3. After you've made your changes, highlight the OK prompt and press ENT.

The next graphic waypoint functions are reviewing and modifying on-screen waypoints. By moving the cursor close to an on-screen waypoint, you can 'snap to' a specific waypoint. Once the target cursor snaps to a waypoint, the waypoint will be highlighted with a white circle, and the GPSMAP will display waypoint information at the bottom of the data window. When an on-screen waypoint is highlighted, you'll be able to review, edit, move or delete the waypoint.

To select and review an on-screen waypoint:

1. Use the ● keypad to 'snap to' the on-screen waypoint.
2. Press ENT to display the Review Waypoint window for the highlighted waypoint.

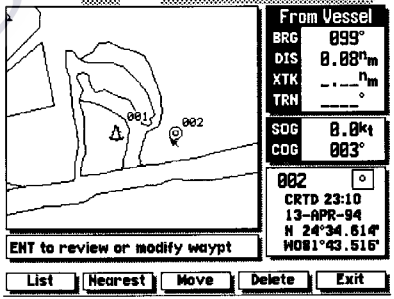
From the Waypoint Review window, you can change the waypoint name, icon or comment; edit the position coordinates, or delete the waypoint. You can also determine the distance and bearing from the displayed waypoint to any other waypoint stored in your GPSMAP system.

To change the waypoint icon, comment or position:

1. Highlight the, icon or comment or position field and press ENT.
2. Use the ● keypad to enter the new, icon, comment or position and press the OK softkey (for name and comment entry) or the ENT key (for icon selection).
3. After you've made your changes, highlight the OK prompt and press ENT.

To change the waypoint name or delete the waypoint from memory:

1. To rename the waypoint, press the RENAME softkey, use the ● keypad to enter the new waypoint name, and press the OK softkey when finished.
2. To delete the waypoint, press the DEL WPT softkey and ENT to confirm.



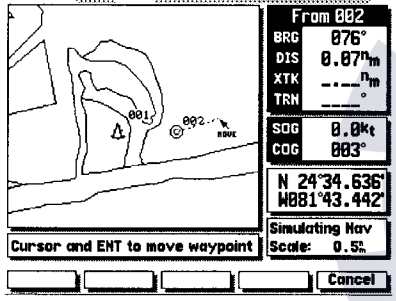
Selected waypoint or navaid is displayed at the bottom of the data window.

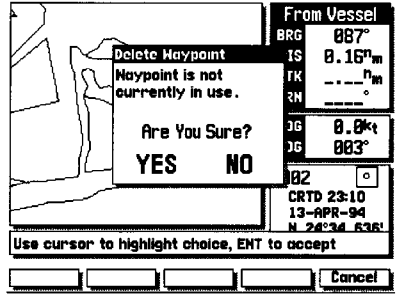
Note:

'Active to' navigation waypoints cannot be deleted from system memory until the active GOTO or route has been cancelled.

To cancel an active GOTO, press the GOTO key, then press the CLR GOTO softkey.

To cancel an active route, press the ROUTES softkey, highlight route 0, then press the DELETE softkey.





The last two graphic waypoint functions allow you to move a highlighted on-screen waypoint or delete it from system memory from the map display.

To move an on-screen waypoint:

1. Use the keypad to 'snap to' the on-screen waypoint.
2. Press the MOVE softkey.
3. Use the keypad to move the arrow cursor to the new waypoint position. As you move the arrow cursor, the bearing and distance from the original waypoint position will be displayed at the top of the data window, with the position coordinates of the new position displayed in the position field.
4. Press the ENT key to confirm the move.

To delete an on-screen waypoint:

1. Use the keypad to 'snap to' the on-screen waypoint.
2. Press the DELETE softkey.
3. Press the ENT key to confirm the deletion warning.

The WAYPOINTS softkey also provides access to the GPSMAP system's waypoint management features, the waypoints lists and nearest waypoints list. To get to the waypoint and nearest lists, press the WAYPOINTS softkey from any GPSMAP page.

The waypoints list functions allow you to scroll through a master list of all stored waypoints for review or editing; delete individual waypoints, delete all stored waypoints; and create new waypoints through a text window. The waypoint list will list all 500 stored waypoints in numerical to alphabetical order, with the waypoint icon and comment shown for each listing.

To scroll through and review the waypoint list:

1. Press the WAYPTS softkey (if you are not currently in the waypoints submenu).
2. Press the LIST softkey.
3. Use the ● keypad to scroll through the list in either direction.
4. Press the ENT key to review the highlighted waypoint.
5. Highlight the OK prompt and press ENT to return to the waypoint list.
6. The field highlight will automatically scroll to the next waypoint. If you want to see the review waypoint window for each listing, you can also scroll through any waypoint list by pressing the ENT key repeatedly.

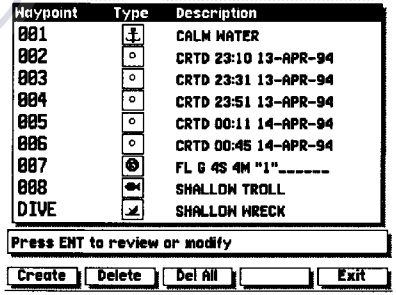
Once the waypoint review window is displayed you may change any data field, rename or delete the waypoint by following the steps outlined on page 39. You can also delete an individual waypoint or the entire list of waypoints right from the waypoint list.

To delete an individual waypoint from the list:

1. Use the ● keypad to highlight the waypoint to be deleted.
2. Press the DELETE softkey.
3. Press the ENT key to confirm the deletion warning.

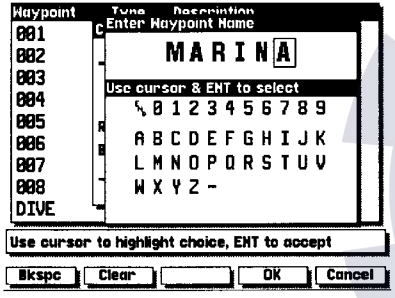
To delete the entire waypoint list:

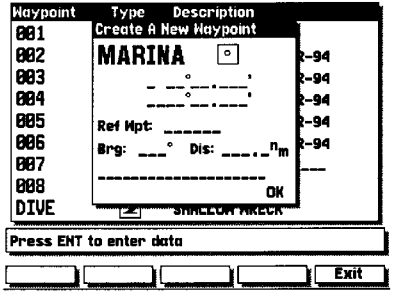
1. Press the DEL ALL softkey.
2. Press the ● keypad to highlight the 'YES' prompt.
3. Press the ENT key to confirm the deletion.



Once a waypoint on the waypoint list is highlighted, you can select it as a GOTO destination right from the list by pressing the GOTO key.

8 Creating Waypoints by Text





The CREATE softkey lets you create new waypoints by entering a name and position, or by entering the distance and bearing from an existing (a reference) waypoint.

To create a new waypoint from the list submenu:

1. Press the CREATE softkey.
2. Use the keypad to enter the new waypoint name.
3. Press the OK softkey to confirm the name.
4. The Create a New Waypoint window will appear, with the icon field highlighted. To select an icon for your waypoint, press ENT and use the keypad to choose the icon. Press the ENT key to confirm the selection.
5. To enter the position coordinates of the new waypoint, highlight the position field and press ENT. Use the keypad to enter the position, and press ENT to confirm the entry.
6. To accept the new waypoint with the default comment (the date and time of creation), press ENT. To enter your own comment, highlight the comment field and press the ENT key. Use the keypad to enter the comment and press the OK softkey to confirm your entry.
7. When you have finished entering all your waypoint data, use the keypad to highlight the OK prompt and press the ENT key.

If you don't know the position coordinates for your new waypoint, you can enter the distance and bearing from a reference waypoint (any waypoint stored in your system), and the GPSMAP will calculate the coordinates for you.

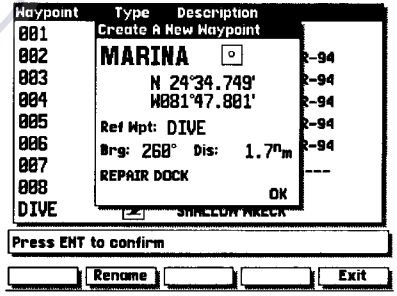
To create a new waypoint using a reference waypoint:

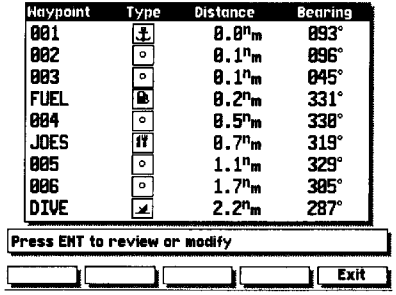
1. Follow steps 1-4 for creating a new waypoint on page 42.
2. Highlight the reference waypoint field and press the SCAN softkey.
3. Use the keypad to scan the waypoint list and find the desired reference waypoint. Press ENT to confirm the reference waypoint.
4. Press ENT to begin entry of the bearing from your reference waypoint to the new waypoint position. Enter the bearing and press ENT.
5. Press ENT to begin entry of the distance from your reference waypoint to the new waypoint position. Enter the distance and press ENT. The position for the new waypoint will automatically be calculated for you.
6. Press the ENT key to confirm the OK prompt.

The last softkey function under the waypoints softkey is the nearest waypoints function. The NEAREST softkey will display a list of the nine nearest waypoints within 100 nautical miles to your present position, with the waypoint name, icon, distance and bearing displayed.

To scroll through and review the nearest waypoint list:

1. Press the WAYPTS softkey (if you are not currently in the waypoints submenu).
2. Press the NEAREST softkey.
3. Use the keypad to scroll through the list in either direction.
4. Press the ENT key to review the highlighted waypoint.
5. Highlight the OK prompt and press ENT to return to the waypoint list.
6. If you want to see the review waypoint window for each listing, you can also scroll through the entire list by pressing the ENT key repeatedly.

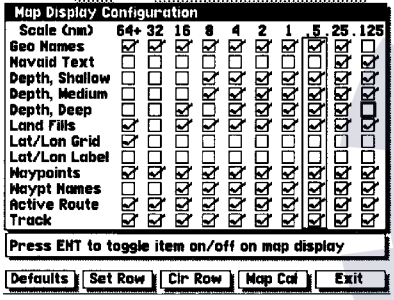


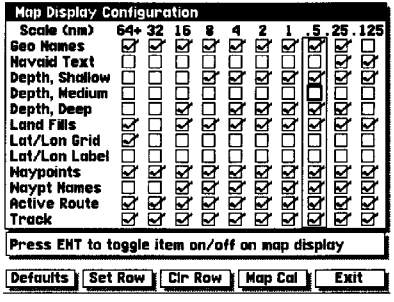


SECTION 9

MAP CONFIGURATION

Selecting On-Screen Display Features





The GARMIN GPSMAP system features a graphic map display with 16 zoom scales from 1/8th to 4096 n.m. (0.250 to 7500km). By using G-chart™ electronic chart cartridges, the map display can show a wide variety of chart details such as depth contours, routes and track plots, and waypoints.

The MAP CFG softkey allows you to determine what chart features are displayed on a particular range scale. By selecting individual features on the map configuration window, you can choose what specific information to display.

To access the map display configuration window:

1. Press the MAP CFG softkey.

The configuration window features an on/off grid with a list of chart features down the left side of the grid. The zoom scales are displayed across the top of the grid, with the chart scale currently in use indicated by a box outline around the selection grid (the far left column denotes range scales 64 n.m. (120 km) and greater). A check mark in a grid box indicates that the chart feature listed will be displayed at the scale marked at the top of the grid.

Individual grid boxes are turned on and off with the ENTER key, while entire rows may be controlled by the using the configuration softkeys.

To use the map configuration grid:

1. Use the ● key to toggle an individual grid box on or off.
2. Press the DEFAULTS softkey to return the entire grid to the factory settings.
3. Use the SET ROW softkey to turn an entire horizontal row on.
4. Use the CLR ROW softkey to turn an entire horizontal row off.

Note that geographic names and navaid text can't be displayed simultaneously at range scales greater than 2 n.m. (4 km) and that navaid text is always

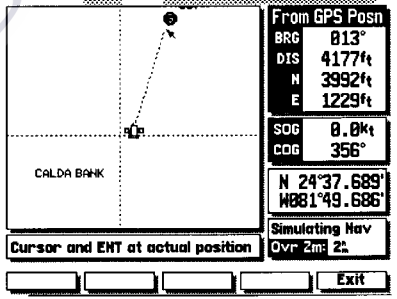
available in the review window by highlighting the navaid with the cursor. Waypoint names and lat/lon labels cannot be displayed unless the waypoints or lat/lon grid options have been selected. The lat/lon grid will always appear in Overzoom and No Map modes, regardless of the configuration selection.

The map display configuration window also features a map calibration softkey to provide access to a user-defined map correction function. This function allows you to calibrate the map display to match your exact physical position (see the Selective Availability warning below) or correct data from older charts.

If your GPSMAP is not providing an accurate display of your position (*within the estimated position error noted on the status page*), check to see that your GPSMAP datum matches the datum on the government charts you are using (see Section 10 for selecting a map datum). To calibrate the map display, you must know exactly where you are, and understand that the correction is generally valid only in a limited range from the point of correction. You should also only perform a map calibration when your boat is not moving. The maximum correction is 16,400 feet (5000m). *Note that all map calibration offsets will stay in effect until they are cancelled!*

To perform a map calibration from the map configuration window:

1. Press the MAP CAL softkey.
2. Use the ● key to move the arrow cursor from the satellite position (indicated by the satellite icon) to your exact position. The bearing, distance, and horizontal and vertical offset will be indicated at the top of the data window, with the position coordinates indicated in the position field.
3. Press ENT to confirm the offset, EXIT to return to the configuration window.
4. To cancel a map calibration offset, press the MAP CAL softkey. When the map display appears, press the CANCEL softkey, followed by the EXIT softkey.



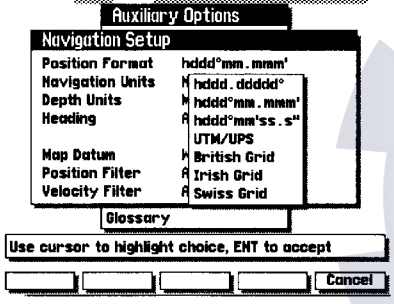
WARNING!

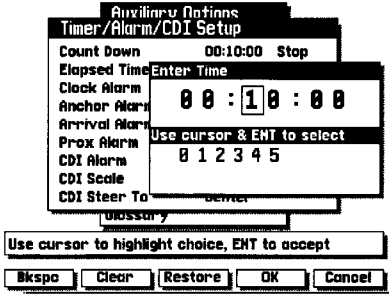
The map calibration function is valid only in a limited range. The further you are away from the point of correction, the larger the position error will be. Keep in mind that Selective Availability can cause position errors up to 330 feet (100 m).

The map calibration function should NEVER be used to attempt SA corrections. Any incorrect use of the calibration function can seriously affect the accuracy of your unit.

SECTION 10 AUXILIARY MENU

Using Setup Menus





The GPSMAP's AUX softkey provides access to the various system, navigation and interface setup menus used to customize your unit's operation. Once you have pressed the AUX softkey, you'll see a complete list of available options listed by category. Each category on the list has its own submenu of setup options and functions which can be accessed by selecting an auxiliary option with the keypad and pressing ENT.

When a submenu window is displayed, you'll see a complete listing of available functions, with the current setting for each option indicated. Once you've entered an auxiliary submenu, you'll use two data entry formats to enter most of your setup preferences:

The option window provides you with a list of menu choices from which you select your preferences.

To select a menu choice from the options window:

1. Use the key to highlight an option from the list.
2. Press the ENT key to see a list of menu options.
3. Use the keypad to highlight your choice and press ENT.

The data entry window is used for settings that require entry of numerical or alphabetical values, and provides a table of values to enter characters.

To enter a value in a data entry window:

1. Use the keypad to select a character value for each position. Press the ENT key to accept the value and move to the next character position.
2. Press the OK softkey to accept the data entry (pressing the key after the final character will also accept the data entry).

The system setup submenu is used to select the operating mode, date and time formats, tone preferences and display contrast (205/210 models only).

Operational Mode lets you select between normal operation and simulator mode. The GPSMAP system does not track satellites in simulator mode, and should not be used for actual navigation. Waypoints and routes created in simulator mode are saved in memory and are available for use in normal mode.

Date Format selects format between date/month/year and month/date/year.

Time Format allows selection of 12- or 24-hour time display.

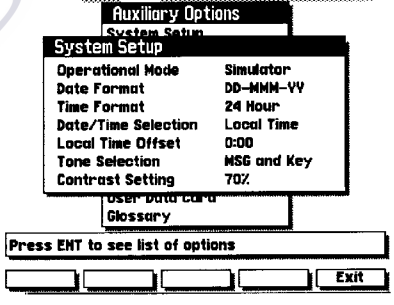
Date/Time Selection lets you choose to display the date and time in UTC (Greenwich Mean Time) time or local time offset from UTC time.

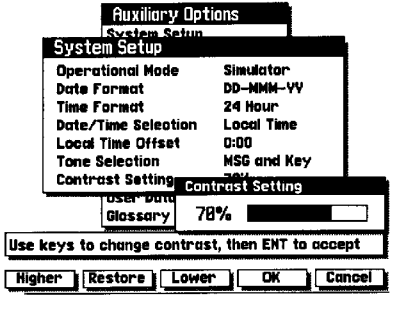
Local Time Offset provides a data entry field to enter the time difference between UTC time and the local time. See Appendix E for a list of time offsets. Note that entering an offset will not automatically display local time. The *local* setting from the Date/Time Selection submenu must be selected.

Tone Selection lets you select an audible tone to sound for messages and keystroke confirmation, messages only, or not to sound at all (the tone selection does not affect the external alarm operation).

Contrast Setting (205/210 models only) provides a slide bar to adjust the LCD screen contrast to compensate for changes in temperature or lighting conditions. Keeping the contrast at the lowest acceptable setting will prolong the life of the display. To adjust the contrast:

1. Use the HIGHER or LOWER softkeys or the ● keypad to adjust the contrast.
2. Press the ENT key to confirm the new setting. Pressing the RESTORE softkey before confirmation will restore the previous contrast value.

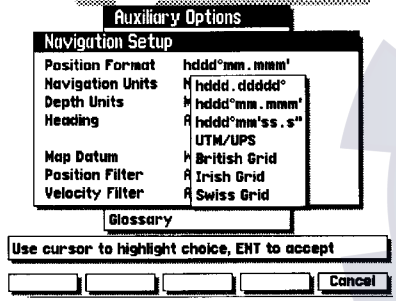


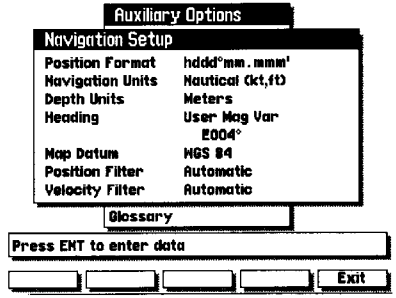


SECTION 10

AUXILIARY MENU

Navigation Setup Options





The navigation setup submenu is used to select a variety of navigation information, including position format, units of measure, and heading preferences. This submenu is also used to select map datums and adjust the built-in position and velocity filters.

Position Format lets you select the coordinate system used to display position. You can select latitude/longitude in three display formats: degrees only (N37.25818°), degrees and minutes (N37°15.490) or degrees, minutes and seconds (N37°15'29.4"). Options are also available for UTM/UPS coordinates and British, Irish or Swiss grids.

Navigation Units selects the format for speed and distance measurements. You may select from nautical, statute or metric formats.

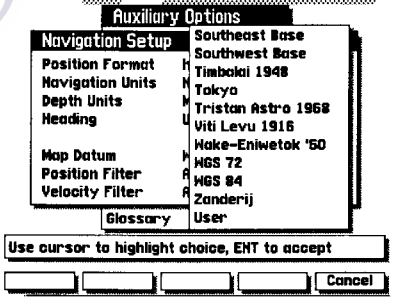
Depth Units selects the format for depth contour display on G-chart™ electronic chart cartridges. Depth contours can be displayed in feet, meters or fathoms. *The default setting is meters.*

Heading lets you select what reference is used in calculating heading information. You can select to reference automatic magnetic variation, true north, grid heading or user magnetic variation. To enter a user magnetic variation:

1. Select the 'User Mag Var' option and press the ENT key.
2. Use the keypad to highlight the variation field and press ENT.
3. Enter the desired variation and press the OK softkey. Pressing the ENT key after entering the final character value will also confirm the entry.

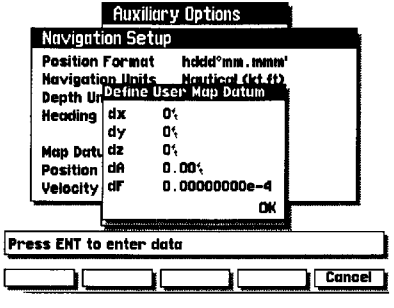
The navigation setup submenu is also used to select map datums and adjust the built-in position and velocity filters. The GPSMAP system's default map datum is WGS 84, a worldwide map datum that's suitable for use with most government charts. You should only change the map datum if the charts you are currently using specify a different map datum in the legend.

Using an incorrect map datum can seriously effect the accuracy of your GPSMAP navigator. The map datum used on the GPSMAP should always match the datum of the chart you are using. If no datum information is indicated on the charts you are using, contact the chart manufacturer. Selecting and defining a user datum is recommended only for navigators with experience in global models and datums.



Map Datum (GPSMAP 210 and 220 only) provides a list of the available map datums for use with the GPSMAP system. For a list of the available GPSMAP datums, see Appendix F. A 'user' datum option is also available to allow entry of your own datum corrections. To define a user map datum:

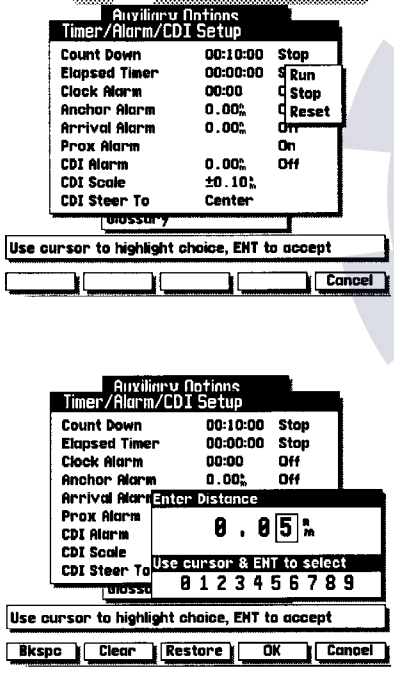
1. Select the 'User' option from the datum list.
2. Enter the datum values in each field. The values you enter will be based on their difference from the WGS 84 datum.
3. Highlight the OK prompt and press ENT to confirm the user datum.



Position Filter and Velocity Filter let you select the GPSMAP's response time to changes in track or ground speed. Four settings are available: automatic, fast (3 seconds), medium (20 seconds), and slow (120 seconds). Selecting a slower filter may be desirable in slow speed applications with frequent ground track changes (sailing vessels, etc.). The automatic setting is highly recommended for most applications.

SECTION 10 AUXILIARY MENU

Timer & Alarm Setup



The timer/alarm/CDI setup submenu is used to control the GPSMAP's various alarm and timer settings and select course deviation scale (CDI) preferences.

Count Down timer controls an alarm to sound when an entered interval (up to 99:59:59) has expired. Enter a time interval in the time field and use the control field to the immediate right to run, stop or reset the timer.

Elapsed Timer provides a running clock to 99:59:59. To run, stop or reset the elapsed time clock, highlight the control field to the right of the timer display, select the appropriate option.

Clock Alarm provides an alarm for the system clock. Enter a time in the time field and turn the alarm on and off from the control field menu. Remember to enter alarm times in the same time format (UTC or local) you're using for your system.

Anchor Alarm lets you specify an alarm to sound when you've exceeded a specified drift distance. Enter a distance up to 9.9 miles or kilometers in the distance field and use the control field to turn the alarm on and off.

Arrival Alarm lets you specify an alarm to sound when you're a specified distance away from a destination waypoint. Enter a distance radius for sounding the alarm and use the control field to turn the alarm on and off. If the arrival alarm is turned off, the alarm will still sound one minute before reaching the destination waypoint at your current speed and course.

Prox Alarm lets you select an alarm to sound when you're a specified distance from a proximity waypoint. Use the control field to turn the alarm on and off. Proximity waypoints and radius values are entered from the proximity waypoint list submenu (see page 54).

The GPSMAP's course deviation indicator (CDI) settings are also controlled through the timer/alarm/CDI setup submenu. Through the CDI submenu, you can control an off-course alarm, set the CDI scale and select a graphic steer-to preference.

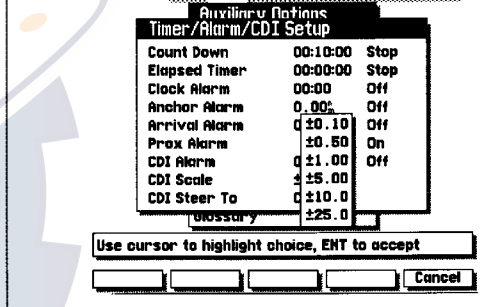
CDI Alarm lets you select an alarm to sound when you're off a desired course by a specified distance. Enter a distance in the distance field and use the control field to turn the CDI alarm on and off.

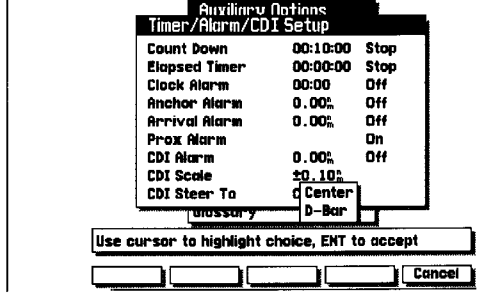
CDI Scale provides a list of five CDI scale settings: +/-0.10, 0.50, 1.0. 5.0, 10.0 and 25.0 miles or kilometers. The scale represents the distance from the center of the scale to either end of the scale. Select the scale from the menu listing. Whenever you go off course by more than the selected CDI scale distance, the distance you're off course will be displayed in place of the CDI scale display, with an arrow indicating the direction to steer.

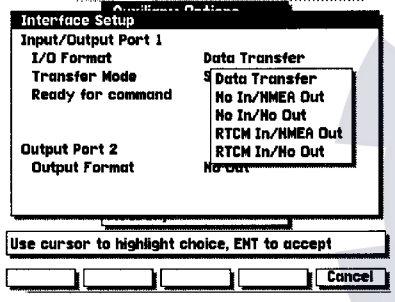
CDI Steer To lets you select a steer-to-center or steer-to-D-Bar orientation for graphic steering guidance.

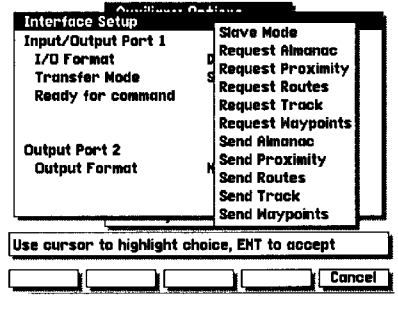
The steer-to-center selection displays your position as the vertical line on the scale, and your desired track as the center of the scale. When you are off course in steer-to-center mode, steer toward the center of the scale.

The steer to D-Bar option displays your position as the center of the scale, with the desired track as the vertical line. When you are off course in steer-to-D-Bar mode, steer toward the D-Bar.









The GPSMAP interface setup submenu lets you control two ports for connecting external NMEA electronic devices and a PC/printer (MAP 205 units provide only data transfer and NMEA 0183 interfaces). The first port, listed at the top of the interface setup window, is an Input/Output port that lets you specify one of five interface formats:

Data Transfer is a proprietary interface that allows you to exchange data such as waypoints, routes and track logs between GPSMAP units.

No In/NMEA Out provides navigation information to a compatible NMEA device such as an autopilot or radar. The GPSMAP provides NMEA 0180, 0182, 0183 v.1.5 and 0183 v.2.0 output options. See Appendix B for additional NMEA sentence information.

No In/No Out turns off both interface ports.

RTCM In/NMEA Out provides an input interface for connection of a DGPS beacon receiver and a selectable NMEA output.

RTCM In/No Out provides an input interface for connection of a DGPS beacon receiver, but provides no output capabilities.

To specify an I/O format, highlight the I/O format field, press ENT and select an option from the submenu listing. Once you've selected an I/O format, you may need to specify other preferences in various fields below the format field for transfer modes, NMEA formats, receiver frequency, etc.

When Data Transfer is selected, you'll need to specify what information to request or send to the remote unit through the Transfer Mode field. The 'slave' setting lets you control all data transfer from the connected GPSMAP, while the other settings request or send specific data from the main GPSMAP unit.

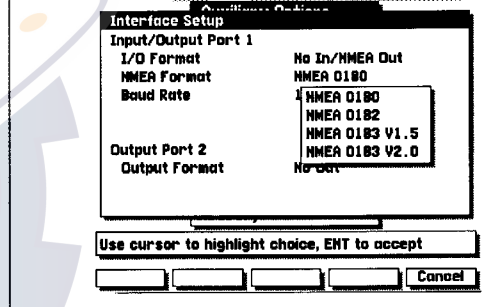
Whenever an NMEA output is selected for the GPSMAP system, you'll need to select an option from the NMEA Format field. To choose an NMEA format, highlight the NMEA Format field and press ENT. Once you've selected a format, the GPSMAP will automatically set the proper baud rate for the NMEA format you've selected.

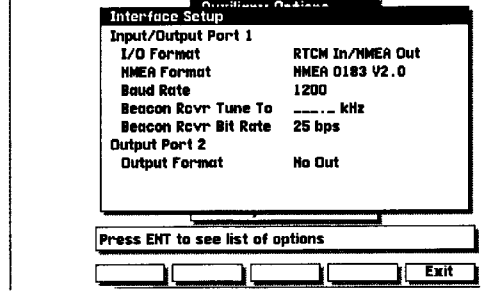
If the I/O Format is set to accept RTCM input for connecting a differential-ready GPS receiver beacon, you will need to specify a frequency in the Beacon Receiver Tuning field and select a bit rate from the Beacon Receiver Bit Rate options. The default frequency will be 304.0kHz or the last DGPS frequency tuned. The DGPS status will be displayed on the status page, with the frequency, signal-to-noise ratio, distance to transmitter and status shown.

The GPSMAP's second port is an output only port for connecting an RS-232 serial printer. Once as printer has been connected, you can print speed and course over ground data. This information can then be used to review your speed and course over extended cruises or for dead reckoning navigation. To connect to a PC printer, you'll need to attach a 9-pin 'D' connector to the ground and RS-232 leads of the GPSMAP wiring harness (see Appendix B).

To output to a PC printer:

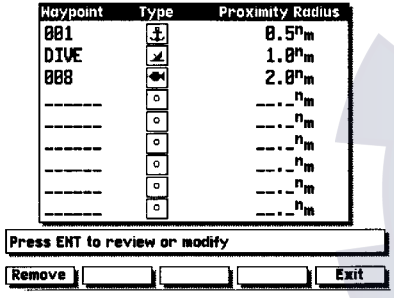
1. Highlight the Output Format field and press the ENT key.
2. Use the key to select the 'printer out' option and press ENT.
3. Highlight the Baud Rate field and press the ENT key.
4. Use the keypad to select a baud rate and press the ENT key.
5. If you prefer to enter a different output interval for printing, highlight the Output Interval field and press the ENT key.
6. Enter the desired time interval and press the ENT key.





SECTION 10 AUXILIARY MENU

Proximity Waypoints List



If a proximity alarm circle overlaps with an existing alarm circle, a 'proximity overlap' warning will be displayed. As long as the overlap exists, the overlap warning will be displayed each time the GPSMAP is turned on.

If you enter an alarm circle overlap, the GPSMAP will only inform you of the closest proximity waypoint.

The next submenu listing on the GPSMAP's AUX menu is the proximity waypoints list. The proximity waypoints list lets you define an alarm circle around a stored waypoint position, and can be used to help you avoid reefs, rocks or restricted waters. Up to nine waypoints may be listed on the list, with a maximum alarm radius of 99.9 nautical or statute miles or kilometers. The alarm is turned on and off through the Alarm/Timer/CDI setup submenu.

To enter a proximity waypoint:

1. Highlight the Proximity Waypoint List field and press the ENT key.
2. Press the ENT key to begin waypoint entry.
3. Press the SCAN softkey.
4. Use the keypad to select the desired waypoint and press ENT.
5. Press ENT to confirm the OK prompt. The radius field will now be highlighted.
6. Press ENT to begin entry of the proximity radius.
7. Use the keypad to enter a distance value and press ENT.

To review a proximity waypoint from the list:

1. Use the key to highlight the waypoint to be reviewed.
2. Press the ENT softkey.
3. Press the ENT key to return to the proximity list.

To remove a proximity waypoint from the list:

1. Use the key to highlight the waypoint to be removed.
2. Press the REMOVE softkey.

The GPSMAP system features a route planning window that will calculate and display the desired track and distance to route waypoints, along with the total fuel required and estimated time enroute (ETE).

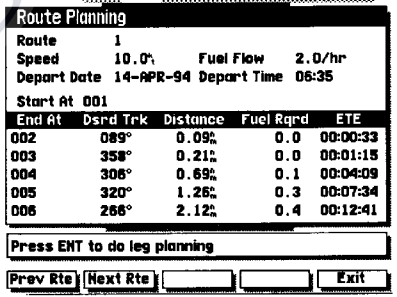
To use the route planning mode:

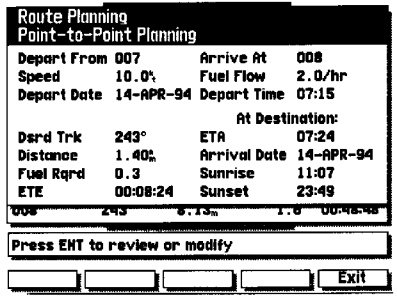
1. Highlight the Route Trip Planning option from the Auxiliary Options window and press the ENT key.
2. Use the PREV RTE and NEXT RTE softkeys to select a route.
3. Highlight the speed field and enter a speed for your trip.
4. Highlight the fuel flow field and enter a units per hour flow.
5. Highlight the depart date field and enter a date.
6. Highlight the depart time field and enter a departure time.

The starting route waypoint is indicated under the departure date field, with a list of the route waypoints in sequence below. The distance, fuel required and ETE displayed are the total values from the starting waypoint to each listed waypoint, with the desired track representing the course between any two route waypoints.

From the route waypoint list, you can use the keypad to scroll through the entire list and review individual route legs by highlighting the desired destination waypoint and pressing the ENT key.

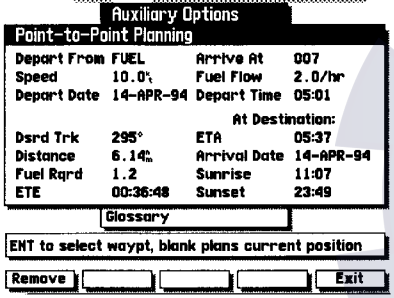
The Point-To-Point route planning window lets you review leg totals for distance, fuel required and ETE. The estimated time of arrival (ETA), along with the sunrise and sunset at your destination are also displayed. You can also use the leg planning window to perform additional speed, fuel and time calculations. To return to the main route planning page, press the EXIT softkey.

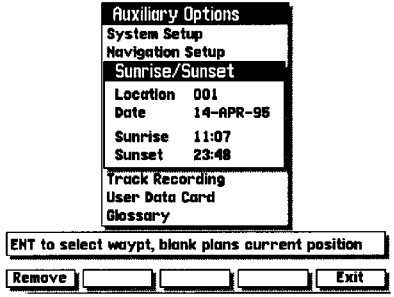




SECTION 10

Point-to-Point Planning Mode





The GPSMAP's Point-to-Point planning feature lets you calculate the trip distance, fuel usage, ETE and ETA between any two waypoints or your present position and a stored waypoint. The planning mode will also provide sunrise and sunset data at your destination on the specified arrival date.

To use the point-to-point planning mode:

1. Highlight the Point-to-Point Planning option and press the ENT key.
2. Enter a departure and arrival waypoint in the appropriate fields. Once the Select a Waypoint window appears, use the SCAN softkey to quickly select the desired waypoint from the list (if you leave the departure or arrival waypoint field blank, your present GPS position will be used for planning calculations).
3. Enter a speed and hourly fuel flow in the appropriate fields.
4. Enter the departure date and time for your trip.

Once you've entered your speed, fuel and date/time values, the trip information will be calculated and displayed at the bottom of the window.

The GPSMAP's planning features also include a separate Sunrise/Sunset Planning window to provide sunrise and sunset times at any waypoint.

To use the sunrise/sunset function:

1. Highlight the Sunrise/Sunset Planning option and press the ENT key.
2. Enter a waypoint in the location field and use the SCAN softkey to quickly select the desired waypoint from the list (if you leave the waypoint field blank, your present GPS position will be used).
3. Enter the date you want sunrise and sunset information for in the date field. The default date is always the current date.

The GPSMAP's track recording submenu lets you specify whether or not to record a track plot (an electronic recording of your path) and define how it is recorded. It also provides an indicator of the track memory used and a function to clear the track memory.

Recording Status lets you select one of three track recording options:

Off: no track plot will be recorded.

Fill: a track plot will be recorded until track memory is full.

Wrap: a track plot will be continuously recorded, wrapping through the available memory (replacing the oldest data with new data).

Recording Interval defines the frequency that the track plot is recorded.

Time: records track plot based upon a user-defined time interval.

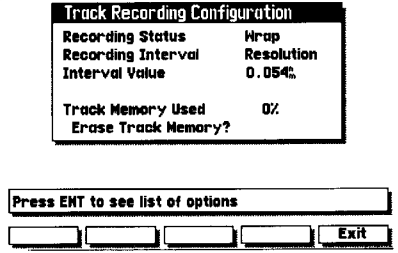
Distance: records track plot based upon a user-defined distance.

Resolution: records track plot based upon the variance from your course over the ground. This setting is highly recommended for the most efficient use of track memory. The distance value entered is the maximum error allowed from the true course before recording a track point.

Interval Value lets you set the distance or time value for recording the track.

Erase Track Memory lets you clear all track plot positions from system memory and start a new track plot. To erase the track memory:

1. Highlight the Erase Track Memory field and press ENT.
2. Move the field highlight to the 'Yes' prompt and press the ENT key.

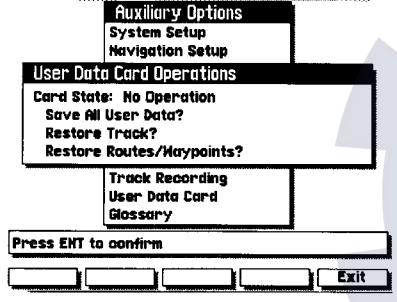


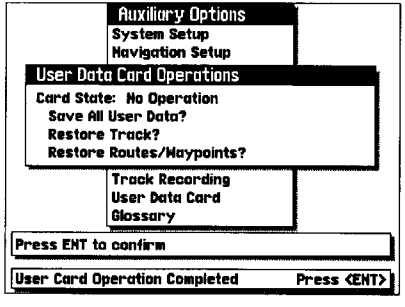
The 'Track Memory Used' field displays the percentage of available memory currently being used. If you are nearing 100% capacity, you can save all existing track plots to an optional user-programmable data card for storage and uploading at a later date. See page 58 for more information on user data cards.

SECTION 10

AUXILIARY MENU

User-Programmable Data Card





The GARMIN user-programmable data card lets you save and restore all the track plots, waypoints and routes used in your GPSMAP system to a programmable cartridge. The GPSMAP system stores all waypoints, track logs and routes in internal memory, so the data cards are a convenient way to back up and transfer your navigation data or to make room for additional information on your system. The data card is used for three functions:

- Saving all user data (waypoints, routes and track logs). Whenever you save to a user data card, all existing information on the card is erased.
- Restoring all track logs stored on a user data card to the GPSMAP system. Whenever you restore data from a card to the GPSMAP, all existing track log data will be deleted and overwritten. Your track recording preference will also be set to the 'off' position.
- Restoring all routes and waypoints stored on a user data card to the GPSMAP system. Whenever you restore route and waypoint data from a card to the GPSMAP, all existing waypoints and routes will be deleted and overwritten.

To save or restore information:

1. Insert a user data card in the card slot. The card state field will change from 'no data card inserted' to 'no operation' when the card is inserted properly.
2. Highlight the user card function you want to perform and press the ENT key.
3. Use the ENT key to highlight the 'YES' prompt on the warning window.
4. Press the ENT key to acknowledge the warning and begin data transfer.

The current status of the data transfer will be shown in the card state field, and a message will indicate when the transfer has been completed.

The last listing on the auxiliary options menu is the glossary function. The GPSMAP's on-screen glossary contains basic information on general navigation terms and abbreviations, as well as helpful hints on using your unit.

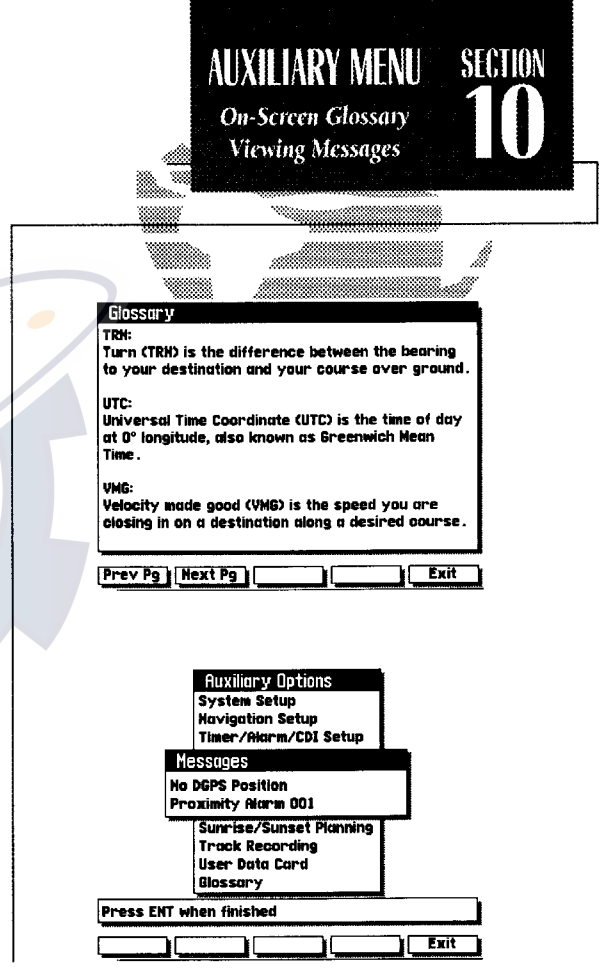
To use the on-screen glossary:

1. Highlight the Glossary option and press the ENT key.
2. Use the PREV PG and NEXT PG softkeys to scroll through the glossary listings.

The Auxiliary Options window is also used to access any current messages in your unit. There are two types of messages used in the GPSMAP system: temporary messages (eg. approaching a waypoint) and condition messages (eg. no DGPS position). All message are initially indicated by a flashing on-screen alert (and a tone if specified). After a temporary message has been acknowledged, it is cleared from the screen. Condition messages will remain displayed in the messages window until the condition has been resolved.

To view messages:

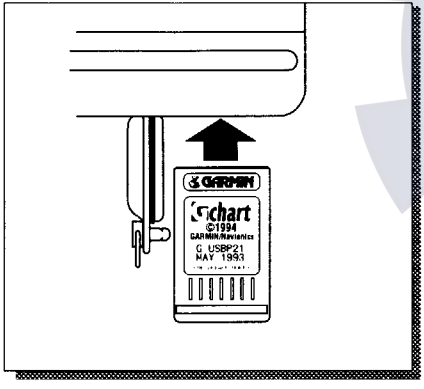
1. From the Auxiliary Options window, press the MESSAGE softkey.
2. To return to the Auxiliary Options window, press the ENT key.



SECTION 11

G-CHART CARTRIDGES

Inserting & Removing Cartridges



The GARMIN GPSMAP system uses G-chart™ digital cartography to display nautical charts on-screen. G-chart™ cartridges are installed in the card slot located at the bottom right of the GPSMAP unit. G-chart™ cartridges may be installed or removed at any time, whether the unit is on or off.

To install a G-chart™ cartridge:

1. Turn the latch ring 1/4 turn counterclockwise and open the cartridge door.
2. Insert the card (label facing front and G-chart™ logo at top) into the slot.
3. Use your thumb to firmly push the cartridge into place, until the cartridge will not go any further into the unit. If your GPSMAP is on, a confirmation tone will sound when the cartridge has been properly installed and accepted.
4. Close the cover and turn the latch ring 1/4 turn clockwise to secure. The cartridge cover features a sealing gasket to keep the G-chart™ area waterproof.

If you insert a G-chart™ cartridge and get a 'card format not recognized' message, try removing the card and reinserting it. If the card is still not recognized, contact the dealer you purchased it from for assistance. G-chart™ cartridges are not waterproof, and should not be exposed to moisture or excessive static charges.

To remove a G-chart™ cartridge:

1. Turn the latch ring 1/4 turn counterclockwise and open the cartridge door.
2. Grasp the card at the bottom groove and pull firmly to remove.
3. If your GPSMAP is on, a confirmation tone will sound when the G-chart™ cartridge has been removed.

Once a G-chart cartridge has been inserted, the map coverage outlines for the cartridge will automatically appear on screen. Keep in mind that the display will not automatically scroll to the map area or zoom to a level where you can see the coverage outlines. If you do not immediately see the outlines, scroll the cursor to the broad geographic area covered by the chart and zoom out to another map scale. You may have to press the MAPS key to display the outlines.

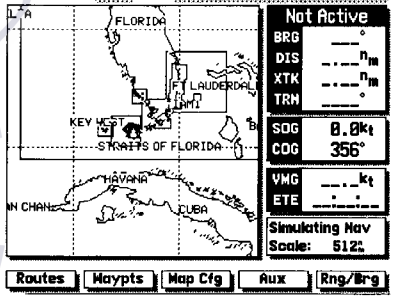
The large outline box shown is the main chart, which serves as the boundary area for the entire cartridge. The smaller box outlines inside the main box are subcharts, which provide more detailed coverage of the area indicated. To view the detailed cartography of any subchart, scroll the cursor to the subchart outline and use the CTR key to zoom in to smaller range scales.

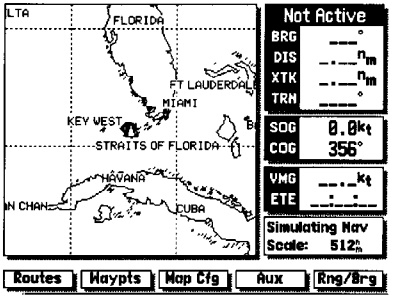
Whenever you zoom past the usable range of the current electronic chart, the range field will display 'Ovr Zm' or 'No Map'. These warnings indicate that although you may still have cartography, you should exercise extreme caution using the data. See page 20 for more information on Overzoom and No Map modes.

When a G-chart cartridge is installed, the GPSMAP system will automatically use the best available chart for display. As you enter and exit various subcharts, the system will automatically display the appropriate chart for the area you are in. When you leave the area covered by the main map of a cartridge, the GPSMAP will default back to using the built-in 64 n.m. database if it is available at the current scale. Once you've inserted a cartridge, the coverage outlines can be turned off to keep the display as uncluttered as possible.

To turn the map outlines on or off:

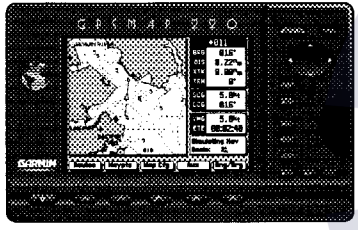
1. Press the MAPS key.





SECTION A APPENDIX

Installation



WARNING!

The GPSMAP system has no user-serviceable parts, and you should never attempt any repairs yourself. The unit has been filled with dry nitrogen to prevent moisture penetration. Opening the case or loosening any fittings may expose internal components to moisture and ***will void the manufacturer's warranty!***

Should your unit ever need repair, take it to an authorized GARMIN service center.

Your GPSMAP system includes the following hardware components:

GPSMAP Unit

Gimbal Mount Bracket

GPS Antenna with 30' cable (210/220 models only)

Power/Data Cable

If you are missing any of these pieces, see your dealer. To complete the standard installation, you'll also need the following:

2-amp in-line fuse (may be included with Power/Data cable)

Four 1/4" (6 mm) diameter mounting screws

1" x 14 thread antenna mount and screws

Several optional accessories are also available to provide flexible installation on any vessel. See your Garmin dealer for more information on these items:

Flush Mount Kit

Antenna Cable Extension

110/220 volt AC adapter

Reading through the entire installation section before starting your installation will help you get the most out of your GARMIN navigation system. An improper or poorly planned installation can affect the GPS receiver's accuracy and the overall performance of the GPSMAP system.

To begin installation, you'll need to select a suitable mounting position for the antenna and the GPSMAP unit. Once you've identified the best mounting locations for your application, install the antenna and cable first, then the unit and wiring harness.

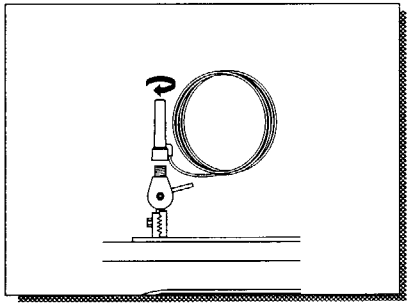
Mounting the GPS antenna

The antenna should be mounted in a location that has a clear, unobstructed view of the sky in all directions to ensure the best reception in all conditions. Avoid mounting the antenna where it will be shaded by the boat's superstructure, a radome antenna, or mast. Most marine VHF and loran antennas will not seriously degrade the GPS antenna's reception. Never paint the antenna or clean it with harsh solvents.

The GARMIN antenna screws directly onto any standard 1" x 14 thread antenna mount. If you need to raise the antenna to avoid shading, try using a 1" x 14 thread extension mast available at most marine dealers.

To install the GPS antenna:

1. Screw the antenna directly onto the 1" x 14 thread mount.
2. Route the cable to the mounting location of the display unit, using the appropriate tie-wraps, escutcheon plates and sealant to secure the cable along the route and through any bulkhead or deck.
3. Once the GPSMAP unit has been installed, connect the cable to the antenna connector on the back of the display unit. Make sure that you turn the antenna 1/4 turn clockwise to lock the cable into place.

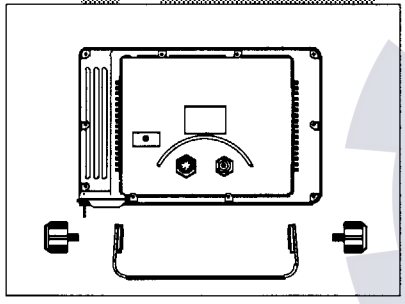


CAUTION!

Never cut or modify the antenna cable. If the standard cable is not long enough for your application, see your dealer for the proper GARMIN cable extension.

SECTION A APPENDIX

Installation



WARNING!

The temperature range for GPSMAP units is from -4 to +158°F (-20- 70°C). Extended exposure to temperatures exceeding this range (in storage or operating conditions) may cause failure of the LCD screen. This type of failure and related consequences ARE NOT covered by the manufacturer's warranty.

Mounting the GPSMAP unit

The GARMIN GPSMAP's compact, waterproof case is suitable for mounting in exposed locations or at the nav station. The unit comes with a gimbal bracket that can be used for surface or overhead mounting. When choosing a location for the display unit, make sure you consider the following conditions:

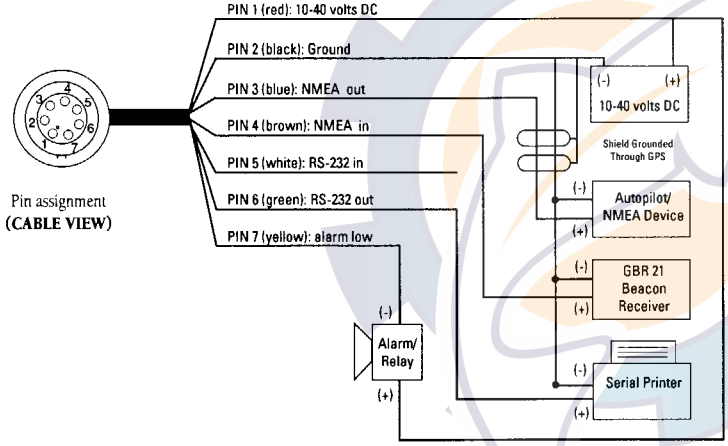
- There should be at least 3.25" (8.25 cm) clearance behind the case to allow connection of the antenna and power/data cables.
- Provide adequate clearance for the G-chart cartridge cover to swing open freely. You may swivel the unit to get a firm grip on the cartridge.
- The mounting surface should be heavy enough to support the unit and protect it from excessive vibration and shock.
- MAP 205 and GPSMAP 210 screens will provide crisp contrast in most lighting conditions, even in full sunlight. Because of the technology used in TFT screens, the GPSMAP 220 performs best in shaded conditions, protected from direct sunlight.

To install the GPSMAP unit:

1. Place the mounting bracket in the desired location.
2. Mark and drill the four mounting holes for the fasteners you are using.
3. Fasten the bracket to the surface using the appropriate fasteners.
4. Insert the GPSMAP into the mounting bracket. The bracket is designed for a tight fit to provide additional support when swiveling the unit.
5. Screw the two mounting knobs through the bracket and into the display case.
6. Connect the power/data and antenna cables to the back of the unit, making sure the locking rings are fully tightened on both connectors.

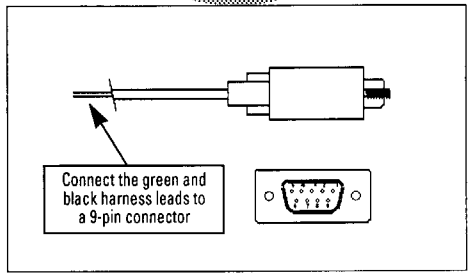
Connecting the power/data cable

The power/data cable connects the GPSMAP system to a 10-40 volt DC power source and provides interface capabilities for connecting NMEA devices, a serial printer, and an external alarm (see section 10 for interface operation details). The color code in the diagram below indicates the appropriate harness connections.



To connect the GPSMAP to a power source:

1. Connect the RED harness lead to the positive side of a 10-40volt DC power source. Make sure the power lead has an in-line 2-amp fuse installed.
2. Connect the BLACK harness lead to a ground strip or the negative side of a 10-40 volt DC power source.



The GPSMAP system will also interface to a RS-232 serial printer to print speed and course information and to an external alarm device..

To connect to a serial printer, connect the GREEN and BLACK (ground) harness leads to a standard 9-pin 'D' connector. See section 10 for selecting printing intervals and baud rates.

To connect an external alarm, connect the ground side of the alarm device or relay to the YELLOW harness lead.

SECTION B APPENDIX

NMEA Formats

Complete information concerning NMEA formats and sentences is available from the NMEA at:

NMEA
P. O. Box 50040
Mobile, AL 36605
205-473-1793
205-473-1669 FAX.

Cost of the NMEA materials is $35 U. S. dollars, plus shipping and handling.

The following interface formats are supported by the GPSMAP system for connection to up to three NMEA devices (MAP 205 units only support NMEA 0183 formats, and do not accept RTCM DGPS corrections):

NMEA 0180

NMEA 0182

NMEA 0183 version 1.5
- Approved sentences—
  GPBWC, GPGLL, GPRMB,
  GPRMC, GPXTE, GPVTG, GPWPL
- Proprietary sentences—
  PGRMM (map datum, 210/220 units only),
  PGRMZ (alt.), PSLIB (beacon receiver control input)

NMEA 0183 version 2.0
- Approved sentences—
  210/220 models: GPGGA, GPGSA, GPGSV,
  All models: GPRMB, GPRMC, GPRTE, GPWPL
- Proprietary sentences—
  210/220 models: PGRME (estimated error),
  PGRMM (map datum)
  All models: PGRMZ (altitude),
  PSLIB (beacon rec. control input)

DGPS corrections are accepted in RTCM-104 v. 2.0 format through the NMEA in (BROWN) harness lead. The GARMIN GBR 21 is the recommended beacon receiver for use with the GPSMAP system.Other receivers with the correct RTCM format may be used, but may not correctly display status or allow tuning control from the GPSMAP unit.

GPSMAP Specifications

PHYSICAL

Case:	Waterproof, dry nitrogen-filled
Size:	5.8"H x 9"W x 3"D (14.7 x 22.9 x 7.6 cm)
Weight:	Less than 3 lbs. (1.4 kg)
Temperature Range:	-4° to 158°F (-20° to 70°C)

PERFORMANCE (GPSMAP 210 and 220 Models)

Receiver:	Differential-ready MultiTrac8™
Acquisition Time:	Approx. 15 seconds (warm) Approx. 2 minutes (cold) Approx. 7.5 minutes (AutoLocate™)
Update Rate:	1/second, continuous
Position Accuracy:	5-10 meters (16-33 ft.) with DGPS corrections* 15 meters (49 ft.) RMS**
Velocity Accuracy:	0.1 knot RMS steady state
Dynamics:	Performs to specification to 3g's

POWER

Input:	10-40vDC
Usage:	15 watts max. (205/210) 25 watts max. (220)

Specifications subject to change without notice.

** With optional GARMIN GBR 21 Beacon Receiver Input.*

*** Subject to accuracy degradation to 100m 2DRMS under the United States Department of Defense-imposed Selective Availability Program.*

SECTION APPENDIX

D Messages

The GPSMAP system uses an on-screen message field to alert you to important information. Whenever a message appears, press the ENTER key to confirm the message.

There are two types of messages: temporary messages and condition messages. Temporary messages are cleared from the message page after viewing, while condition messages remain in the message window until the condition has been resolved.

To view the message window, press the MESSAGES softkey from the Auxiliary Options Window. Pay careful attention to all messages for your own safety.

Alarm Clock—The alarm clock has sounded.

Anchor Drag Alarm—You have drifted out of the specified distance range.

Approaching—You are less than one minute away from reaching a destination waypoint at your present speed over ground.

Arrival At—You have arrived at the destination waypoint.

Can't Change Active Waypoint—You have attempted to change the 'active to' or 'active from' waypoint. Clear the active route or GOTO before making your changes.

Card Format Not Recognized—The cartridge you have inserted is not readable by the GPSMAP system and may be damaged. Reinsert the cartridge and make sure it is properly installed. If the cartridge is a user-programmable data card, you can try reformatting the card through the User Data Card operations window and selecting the 'Save All?' option (see page 58).

CDI Alarm—You have exceeded the off-course distance specified in the CDI setup.

Database Memory Failed—The built-in 64 n.m. database has failed or the user card has failed during a save operation. See an authorized service center for repair.

Data Card Checksum Failure—The information on the data card you have inserted is corrupted and/or damaged. Try reformatting the card using the Data Card Operations window and selecting the 'save all' option (see page 58).

Degraded Accuracy—The accuracy of the GPSMAP has been degraded beyond 500 meters due to poor satellite geometry or data quality. You should check other navigational sources to verify the position indicated.

Display ROM Failed—The graphics read-only memory has failed and the unit is no longer operable. Take your unit to an authorized GARMIN service center for repairs.

Max Calibration Is 5000mt (16,400 ft)—You have exceeded the maximum possible map calibration.

Memory Battery Low—The internal battery that stores waypoints, routes and track plots needs to be replaced. Take your unit to an authorized GARMIN service center for installation of a new battery.

No DGPS Position—Not enough data is being received to compute a DGPS position.

No RTCM Input—The beacon receiver is not properly connected or baud rates do not match. See section 10 for selecting DGPS baud rates.

Oscillator Needs Adjustment—The GPSMAP has detected excessive drift in its internal oscillator which may result in longer acquisition times. Take your unit to an authorized GARMIN service center for adjustment.

Poor GPS Coverage—The GPSMAP cannot acquire the necessary number of satellites to compute a position.

Power Down and Re-init—The GPSMAP cannot calculate a position due to abnormal satellite conditions. Power down and verify the last position shown by other means.

Proximity Alarm—You have entered the alarm radius specified for the proximity waypoint indicated.

Proximity Overlap—The alarm radius specified overlaps the area specified for another proximity waypoint. See section 10 for more information on proximity overlaps.

RAM Failed—The random access memory has failed and the unit is not operable. Take your unit to an authorized GARMIN service center for repairs.

ROM Failed—The permanent memory has failed and the unit is not operable. Take your unit to an authorized GARMIN service center for repairs.

MAP 205 Messages

The MAP 205 chart plotter features two additional messages to alert the user of data input status:

No NMEA Data Received—
The MAP 205 is not receiving NMEA 0183 input and cannot display your position. Check the NMEA source and the MAP 205 interface setup page to correct the problem.

No NMEA Position Received—
The MAP 205 is not receiving position data in the correct NMEA 0183 sentence format. Check the interface setup and sentence format of the NMEA source (the interfaced GPS unit) to verify it's compatibility with the MAP 205.

Received Invalid Waypoint—A waypoint was received during upload transfer that has an invalid identifier.

Receiver Failed—A failure in receiver hardware has been detected. If this message persists, do not use the unit and take it to an authorized dealer for repair.

Route is Full—You have attempted to add more than 50 waypoints to a route.

Route Waypoint Deleted—A route waypoint entered does not exist in the database and has been deleted from the route.

RTCM Input Failed—DGPS data being received has been lost. You are no longer receiving the beacon signal.

Searching the Sky—The GPSMAP is in searching the sky for almanac data or the unit is in AutoLocate™ mode.

Stored Data Lost—All waypoints, routes and almanac data has been lost due to internal battery failure.

Timer Expired—The countdown timer has expired.

Track Memory Full—The track memory is full and no additional track plot will be recorded until the track memory has been cleared or set to wrap mode (see page 57).

Transfer Completed—The receiver is finished uploading or downloading information to the connected device.

User Card Operation Complete—The user card data transfer has been completed.

Waypoint Exists—The waypoint name you're entering already exists in memory.

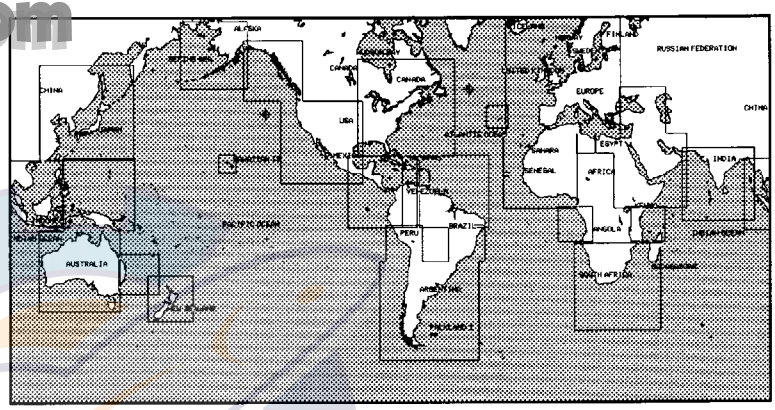
Waypoint Memory Full—You have used all 500 waypoints in the GPSMAP system.

The chart below gives an approximate UTC time offset for the various longitudinal zones. Check with local charts for more detailed information. If you are in daylight savings time, add one hour to the offset.

Longitudinal Zone	Offset
W180.0° to W172.5°	-12
W172.5° to W157.5°	-11
W157.5° to W142.5°	-10
W142.5° to W127.5°	-9
W127.5° to W112.5°	-8
W112.5° to W097.5°	-7
W097.5° to W082.5°	-6
W082.5° to W067.5°	-5
W067.5° to W052.5°	-4
W052.5° to W037.5°	-3
W037.5° to W022.5°	-2
W022.5° to W007.5°	-1
W007.5° to E007.5°	0
E007.5° to E022.5°	1
E022.5° to E037.5°	2
E037.5° to E052.5°	3
E052.5° to E067.5°	4
E067.5° to E082.5°	5
E082.5° to E097.5°	6
E097.5° to E112.5°	7
E112.5° to E127.5°	8
E127.5° to E142.5°	9
E142.5° to E157.5°	10
E157.5° to E172.5°	11
E172.5° to E180.0°	12

SECTION F APPENDIX

Map Datums



The GPSMAP's built-in world-wide database includes chart coverage down to 64 n.m. (120 km) for the areas outlined above. Note that the GPSMAP database is only valid to 68°15' of latitude. The maximum cursor latitude is 85°05', and the maximum waypoint latitude is 89°24.543 north or south.

Adindan	Adindan- Ethiopia, Mali, Senegal, Sudan
Afgooye	Afgooye- Somalia
AIN EL ABD '70	AIN EL ANBD 1970- Bahrain Island, Saudi Arabia
Anna 1 Ast '65	Anna 1 Astro '65- Cocos I.
ARC 1950	ARC 1950- Botswana, Lesotho, Malawi, Swaziland, Zaire, Zambia, Zimbabwe
ARC 1960	Kenya, Tanzania
Ascnsn Isld '58	Ascension Island '58- Ascension Island
Astro B4 Sorol	Sorol Atoll- Tern Island
Astro Bcn "E"	Astro Beacon "E"- Iwo Jima
Astro Dos 71/4	Astro Dos 71/4- St. Helena
Astr Stn '52	Astronomic Stn '52- Marcus Island
Astrln Geod '66	Australian Geod '66- Australia, Tasmania Island
Astrln Geod '84	Australian Geod '84- Australia, Tasmania Island
Bellevue (IGN)	Efate and Erromango Islands
Bermuda 1957	Bermuda 1957- Bermuda Islands
Bogata Observ	Bogata Obsrvatry- Colombia
Campo Inchspe	Campo Inchauspe- Argentina
Canton Ast '66	Canton Astro 1966- Phoenix Islands
Cape	Cape- South Africa

Cape Canavrl	Cape Canaveral- Florida, Bahama Islands
Carthage	Carthage- Tunisia
CH-1903	CH 1903- Switzerland
Chatham 1971	Chatham 1971- Chatham Island (New Zealand)
Chua Astro	Chua Astro- Paraguay
Corrego Alegr	Corrego Alegre- Brazil
Djakarta	Djakarta (Batavia)- Sumatra Island (Indonesia)
Dos 1968	Dos 1968- Gizo Island (New Georgia Islands)
Easter Isld 67	Easter Island 1967
European 1950	European 1950- Austria, Belgium, Denmark, Finland, France, Germany, Gibraltar, Greece, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland
European 1979	European 1979- Austria, Finland, Netherlands, Norway, Spain, Sweden, Switzerland
Finland Hayfrd	Finland Hayford- Finland
Gandajika Base	Gandajika Base- Republic of Maldives
Geod Datm '49	Geodetic Datum '49- New Zealand
Guam 1963	Guam 1963- Guam Island
Gux 1 Astro	Guadalcanal Island
Hjorsey 1955	Hjorsey 1955- Iceland
Hong Kong '63	Hong Kong
Indian Bngldsh	Indian- Bangladesh, India, Nepal
Indian Thailand	Indian- Thailand, Vietnam
Ireland 1965	Ireland 1965- Ireland
ISTS 073 Astro	ISTS 073 ASTRO '69- Diego Garcia
Johnston Island	Johnston Island Kandawala Kandawala- Sri Lanka
Kerguelen Islnd	Kerguelen Island
Kertau 1948	West Malaysia, Singapore
L. C. 5 Astro	Cayman Brac Island
Liberia 1964	Liberia 1964- Liberia
Luzon Mindanao	Luzon- Mindanao Island
Luzon Philippine	Luzon- Philippines (excluding Mindanao Isl.)
Mahe 1971	Mahe 1971- Mahe Island
Marco Astro	Marco Astro- Salvage Isl.
Massawa	Massawa- Eritrea (Ethiopia)
Merchich	Merchich- Morocco
Midway Ast '61	Midway Astro '61- Midway
Minna	Minna- Nigeria
NAD27 Alaska	North American 1927- Alaska
NAD27 Bahamas	North American 1927- Bahamas (excluding San Salvador Island)
NAD27 Canada	North American 1927- Canada and Newfoundland
NAD27 Canal Zone	North Am. 1927- Canal Zone
NAD27 Caribbn	North American 1927- Caribbean (Barbados, Caicos Islands, Cuba, Dom. Rep., Grd. Cayman, Jamaica, Leeward and Turks Islands)
NAD27 Central	North American 1927- Central America (Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua)

SECTION F APPENDIX

Map Datums

NAD27 CONUS	North Am. 1927- Mean Value (CONUS)
NAD27 Cuba	North American 1927- Cuba
NAD27 Grnland	North American 1927- Greenland (Hayes Peninsula)
NAD27 Mexico	N. American 1927- Mexico
NAD27 San Sal	North American 1927- San Salvador Island
NAD83	North American 1983- Alaska, Canada, Central America, CONUS, Mexico
Nhrwn Masirah	Nahrwn- Masirah Island (Oman)
Nhrwn Saudi A	Nahrwn- Saudi Arabia
Nhrwn United A	Nahrwn- United Arab Emirates
Naparima BWI	Naparima BWI- Trinidad and Tobago
Obsrvtorio '66	Observatorio 1966- Corvo and Flores Islands (Azores)
Old Egyptian	Old Egyptian- Egypt
Old Hawaiian	Old Hawaiian- Mean Value
Oman	Oman- Oman
Ord Srvy GB	Old Survey Grt Britn- England, Isle of Man, Scotland, Shetland Isl., Wales
Pico De Las Nv	Canary Islands
Ptcairn Ast '67	Pitcairn Astro '67- Pitcairn
Prov S Am '56	Prov So Amricn '56- Bolivia, Chile,Colombia, Ecuador, Guyana, Peru, Venezuela
Prov S Chln '63	So Chilean '63- S. Chile
Puerto Rico	Puerto Rico & Virgin Isl.
Qatar National	Qatar National- Qatar
Qornoq	Qornoq- South Greenland
Reunion	Reunion- Mascarene Island
Rome 1940	Rome 1940- Sardinia Isl.
RT 90	Sweden
Santo (Dos)	Santo (Dos)- Espirito Santo
Sao Braz	Sao Braz- Sao Miguel, Santa Maria Islands
Sapper Hill '43	Sapper Hill 1943- East Falkland Island
Schwarzeck	Schwarzeck- Namibia
Sth Amrcn '69	S. American '69- Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Guyana, Paraguay, Peru, Venezuela, Trin/Tobago
South Asia	South Asia- Singapore
SE Base	Southeast Base- Porto Santo and Madiera Islands
SW Base	Southwest Base- Faial, Graciosa, Pico, Sao Jorge and Terceira Islands
Timbalai 1948	Timbalai 1948- Brunei and E. Malaysia (Sarawak and Sabah)
Tokyo	Tokyo- Japan, Korea, Okinawa
Tristan Ast '68	Tristan Astro 1968- Tristan da Cunha
Viti Levu 1916	Viti Levu 1916- Viti Levu/ Fiji Islands
Wake-Eniwetok	Wake-Eniwetok- Marshall
WGS 72	World Geodetic System 72
WGS 84	World Geodetic System 84
Zanderij	Zanderij- Surinam

Almanac Data—Satellite constellation information (including location and health of satellites) that is transmitted to your receiver from every GPS satellite. Almanac data must be acquired before GPS navigation can begin.

Bearing—The compass direction from your position to a destination.

Course Over Ground (COG)—Direction of movement relative to a ground position.

Crosstrack Error (XTK)—The distance you are off a desired course in either direction.

Desired Track (DTK)—The compass course between the 'from' and 'to' waypoints.

Differential GPS (DGPS)—An extension of the GPS system that uses land-based radio beacons to transmit position corrections to GPS receivers.

Estimated Time of Arrival (ETA)—The time of day of your arrival at a destination.

Estimated Time Enroute (ETE)—The time left to your destination at your present speed.

Grid—A coordinate system that projects the earth on a flat surface, using square zones for position measurements.

Ground Speed—The velocity you are travelling relative to a ground position.

Latitude—A north/south measurement of position perpendicular to the earth's polar axis.

Longitude—An east/west measurement of position in relation to the Prime Meridian, an imaginary circle that passes through the north and south poles.

Position—An exact, unique location based on a geographic coordinate system.

SECTION G APPENDIX

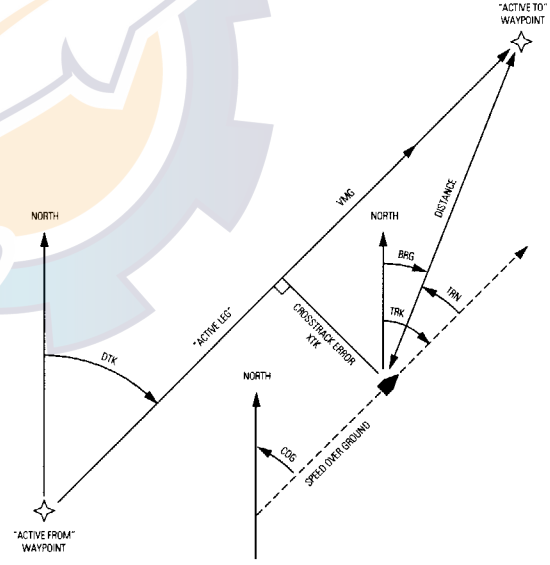
Glossary

Turn (TRN)— The difference and direction in degrees between the bearing to your destination and your course over ground. The TRN value is used to indicate what direction and how many degrees to turn to get back on course.

Universal Time Coordinated (UTC)— The time of day at the prime meridian (0° longitude) in Greenwich, England.

Universal Transverse Mercator- (UTM)— A grid coordinate system that projects global sections onto a flat surface to measure position in specific zones.

Velocity Made Good (VMG)—The speed you are closing in on a destination along a desired course.



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