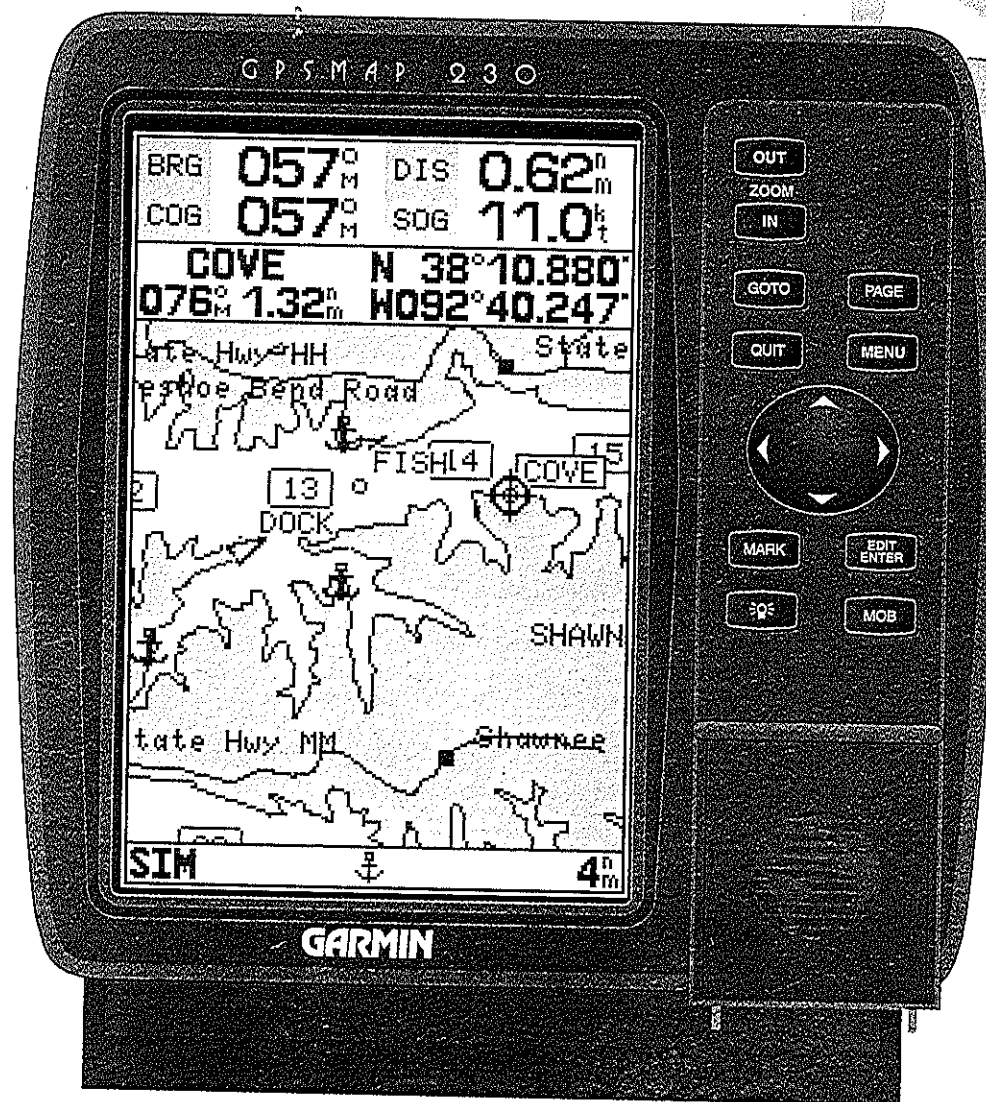


OWNER'S MANUAL
AND REFERENCE



GPSMAP
230

 **GARMIN®**



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Help us better support you by completing our on-line registration today! Have the serial number of your GPSMAP 230 handy and connect to our website (www.garmin.com). Look for the Product registration link on the Home page.

Why should you register your GPSMAP 230?

- Notification of Product Updates
- Notification of New Products
- Lost or Stolen unit tracking

NOTE: If you have previously registered your GARMIN product purchase using a mail-in registration card, we invite you to re-register using our NEW on-line system. Many services provided by our new product registration system are now being automated and re-registering your purchase ensures you the best possible support from GARMIN.

INTRODUCTION

Foreword

Software Version .4.03 or above

Internal Database Version 2.01

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

GARMIN™, G-chart™, AutoLocate™, TracBack™ and PhaseTrac12™ are trademarks of GARMIN Corporation and may only be used with permission. All rights are reserved.

INTRODUCTION

Cautions

CAUTION!

The GARMIN GPSMAP 230 has no user-serviceable parts. Should you ever encounter a problem with your unit, please take it to an authorized GARMIN dealer for repairs.

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 230 is a precision electronic NAVigation AID (NAVAID), any NAVAID can be misused or misinterpreted and, therefore, become unsafe.

Use the GPSMAP 230 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 230 to all available navigation sources, including the information from other NAVAIDs, visual sightings, charts, etc. For safety, always resolve any discrepancies before continuing navigation.

NOTE: 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, the user is encouraged to try to correct the interference by relocating the equipment or connecting the equipment to a different circuit. Consult an authorized dealer or other qualified technician for additional help if these remedies do not correct the problem.

This device complies with Part 15 of the FCC limits for class B digital devices for home or office use. Operation is subject to the following conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

The GPSMAP 230 contains no user-serviceable parts. Repairs should only be made by an authorized service center. Unauthorized repairs or modifications could void your warranty and your authority to operate this device under Part 15 regulations.

INTRODUCTION

Capabilities

Designed for detailed electronic charting and simple operation, the GARMIN GPSMAP 230 is a powerful navigation device that can help guide you in waterways around the world:

Precision Performance

- 7" High-contrast 4-level gray LCD screen
- PhaseTrac12™ receiver tracks and uses up to 12 satellites simultaneously for fast, accurate positioning
- Differential-Ready— just add the optional GBR 21 beacon receiver for better than 10-meter accuracy
- Gasketed case for use in exposed locations

Advanced Navigating and Plotting

- 250 alphanumeric waypoints with selectable icons and comments
- Built-in worldwide database usable from 4096 to 64 nm scales
- 20 reversible routes with up to 30 waypoints each
- G-chart™ electronic charting with inland and offshore coverage
- On-screen point-to-point distance and bearing calculations
- TracBack™ route feature which allows you to quickly retrace your track log to a starting position
- Built-in simulator mode

INTRODUCTION

Warranty

LIMITED WARRANTY

GARMIN Corporation warrants this product to be free from defects in materials and manufacture for one year from the date of purchase. GARMIN will, at its sole option, repair or replace any components that fail in normal use. Such repairs or replacement will be made at no charge to the customer for parts or labor. The customer is, however, responsible for any transportation costs. This warranty does not cover failures due to abuse, misuse, accident or unauthorized alteration or repairs.

THE WARRANTIES AND REMEDIES CONTAINED HEREIN ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES EXPRESS OR IMPLIED OR STATUTORY, INCLUDING ANY LIABILITY ARISING UNDER ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, STATUTORY OR OTHERWISE. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, WHICH MAY VARY FROM STATE TO STATE.

IN NO EVENT SHALL GARMIN BE LIABLE FOR ANY INCIDENTAL, SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES, WHETHER RESULTING FROM THE USE, MISUSE, OR INABILITY TO USE THIS PRODUCT OR FROM DEFECTS IN THE PRODUCT. SOME STATES DO NOT ALLOW THE EXCLUSION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATIONS MAY NOT APPLY TO YOU.

To obtain warranty service, call the GARMIN Customer Service department (913-397-8200) for a returned merchandise tracking number. The unit should be securely packaged with the tracking number clearly marked on the outside of the package and sent freight prepaid and insured to a GARMIN warranty service station. A copy of the original sales receipt is required as the proof of purchase for warranty repairs. GARMIN retains the exclusive right to repair or replace the unit or software or offer a full refund of the purchase price at its sole discretion. SUCH REMEDY SHALL BE YOUR SOLE AND EXCLUSIVE REMEDY FOR ANY BREACH OF WARRANTY.

PREFACE

Congratulations on choosing one of the most advanced marine navigation systems available! The GARMIN GPSMAP 230 combines 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 is broken down into two sections for your convenience.

Getting Started introduces you to the GPSMAP 230 and provides a tutorial that will help you become more familiar with the unit. This part will provide you with a basic working knowledge necessary to use the unit to its fullest potential.

The **Reference** portion is divided into sections that provide detailed instructions on the advanced features and operations of the GPSMAP 230. This allows you to concentrate on a specific topic quickly, without reading through entire portions of text that you may not need.

An **Appendix** section concludes the manual with specific information needed for custom setup, trouble shooting, and indexing.

INTRODUCTION

Preface

WARNING!

The electronic chart is an aid to navigation and is designed to facilitate the use of authorized government charts, not 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.

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 230 Unit
- External Antenna and 30' cable
- Power/Data Cable
- Mounting Bracket and Knobs
- Owner's Manual
- Quick Reference Card

Optional Accessories:

- G-chart Electronic Chart Cartridges
- PC Kit

GETTING STARTED

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INTRODUCTION

Keypad Usage

The GPSMAP 230's advanced keypad system is designed to allow for fast, convenient selection of navigation options and data entry.

The Getting-Started Tour will introduce you to most of the keypad and provide a "hands-on" lesson in using the GPSMAP 230. We strongly encourage you to take the Getting-Started tour before using your unit for actual navigation.

The GPSMAP 230 Quick Reference Card contains helpful tips on using the unit and performing various navigation tasks. It's a good idea to keep the Quick Reference Card nearby whenever you're navigating with your new GPS chartplotter.


	Turns the unit on and off and controls 3-level screen backlighting.
	Scrolls the main pages in sequence and returns display from a submenu page to a main page.
	Captures your present position and displays the mark position window.
	Displays the GOTO waypoint window, allowing you to select the destination waypoint. Press GOTO twice to select a destination waypoint from the map.
	Displays context-sensitive options window. Press MENU twice to display main menu page.
	Activates highlighted fields and confirms menu options and data entry.
	Returns display to a previous page or restores a data field's previous value.
	Decreases the scale of the moving map and highway pages.
	Increases the scale of the moving map and highway pages.
	Controls the movement of the cursor and is used to select options and positions, and to enter data.
	Marks your present GPS position and instantly sets a return course while providing steering guidance.

Initializing the Receiver

The first time you power up your new GPSMAP 230 is an important step in getting the best possible GPS performance. The receiver must be given an opportunity to collect satellite data and establish its present position. To ensure proper initialization, the GPSMAP 230 is shipped from the factory in AutoLocate™ mode, which will allow the receiver to “find itself” anywhere in the world. To speed up the initialization process, we recommend using the graphic initialization process described below, which will usually provide a position fix in about a minute.

Before you initialize, make sure the GPSMAP unit and antenna have been correctly installed on your vessel according to the instructions in Appendix A.

To turn the GPSMAP 230 on:

1. Press and hold the  key until the power tone sounds.



The welcome page will appear while the unit conducts a self test. Once the internal test is complete, the mariner's warning will appear, asking you to read and acknowledge important information regarding the proper use of electronic charts.

To acknowledge the mariner's warning:

1. Press the  key.

A message alert and prompt will also appear to ask you to select an initialization method.

To view a message:

1. Press the  key.
2. Press the  key again to return to the previous page.

GETTING STARTED

Initialization



Welcome To The
GARMIN
GPSMAP230

Software Version 4.03
Internal Database 2.00
Copyright 1996-1999
GARMIN Corporation

Internal Database 2.01
Copyright Navionics Corp

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.

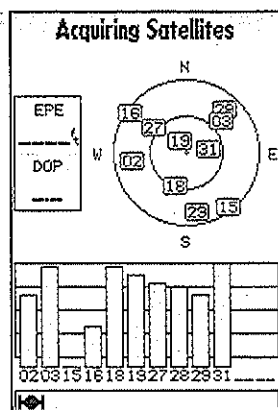
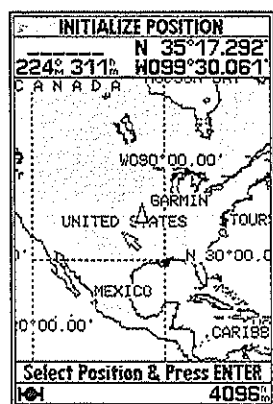
Press ENTER to acknowledge



- A. The welcome page will be displayed while the unit performs a self-test.
- B. Confirm the mariner's warning before starting navigation. Remember that the electronic chart is designed as a supplement to local government charts, not as a replacement.

GETTING STARTED

Initialization



- A. Use the arrow keypad to move the cursor to a location close to your present position.
- B. Hollow signal strength bars will appear on the Satellite Page while the receiver collects satellite data.

The select initialization window will appear, with the 'select from map' option highlighted.

1. Press **EDIT/ENTER** to initialize the receiver from the built-in worldwide map.

The Map Page will appear, prompting you to select your approximate present position with the map cursor.

1. Use the **⬅** keypad to move the map cursor to a location close to your present position. If you have difficulty identifying your exact position, press the **IN** key to zoom in to a lower map scale.
2. Press **EDIT/ENTER** to confirm your selection.

The GPSMAP 230 will now begin searching for the appropriate satellites for your present position and should acquire a fix within a minute or so. While the receiver searches for satellites, a flashing satellite icon will appear at the left-hand side of the status bar. A signal strength bar will also appear for each satellite in view, with the appropriate satellite number under each bar. The progress of satellite acquisition is shown in three stages:

- **No signal strength bars**— the receiver is looking for the satellites indicated.
- **Hollow signal strength bars**— the receiver has found the indicated satellite(s) and is collecting data.
- **Solid signal strength bars**— the receiver has collected the necessary data and the satellite(s) is ready for use.

Once the receiver has collected information from at least three satellites, the flashing satellite icon on the status bar will quit flashing and remain solid, and the GPSMAP 230 is ready for use.

Now that the unit is initialized, let's turn the unit off and then begin the Getting-Started Tour.

To turn the GPSMAP 230 off:



1. Press and hold the **⏻** key for about 3 seconds, until the screen is blank.

GPSMAP 230 Getting-Started Tour

The GARMIN GPSMAP 230 is a powerful electronic charting/navigating system that provides detailed chart coverage and convenient control of many advanced features right from the map display. This tour is designed to take you through the basic pages and functions of the system using the simulator mode. 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.




The Getting-Started Tour assumes that the receiver has been properly installed and initialized, and you have not changed any of the default unit settings. If you have changed any settings (position formats, units of measure, etc.), the descriptions and pictures in the tour may not match your configuration.


To turn the GPSMAP 230 on:

1. Press and hold the  key until the power tone sounds. The welcome page will appear while the unit conducts a self test.
2. Once the self test is complete, press the  key to acknowledge the mariner's warning.

The Satellite Page will appear, and the receiver will begin to acquire satellites. From the Satellite Page, you may also quickly adjust the screen contrast and backlighting.

To adjust the screen contrast:

1. To increase the screen contrast, press the right arrow of the  keypad.
2. To decrease the screen contrast, press the left arrow of the  keypad.
3. Press the  key to finish.

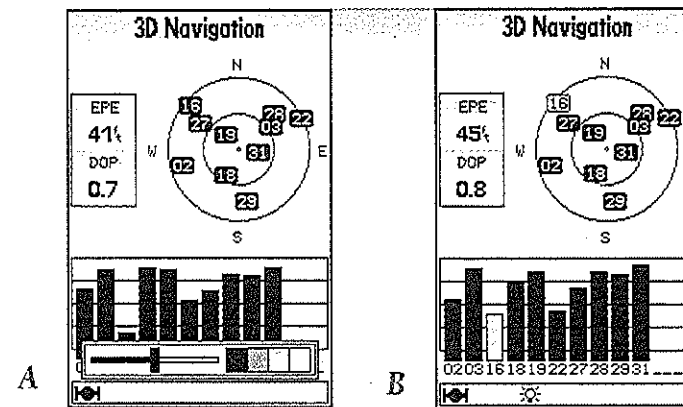
The GPSMAP 230's three-level screen backlighting is controlled with  key, and may be adjusted at any time from any page.

To turn on and adjust the backlighting:

1. Press the  repeatedly until the backlighting is at the desired level (off, 1, 2, or 3).

GETTING STARTED

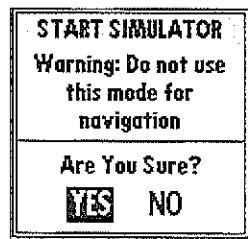
Power On & Screen Contrast



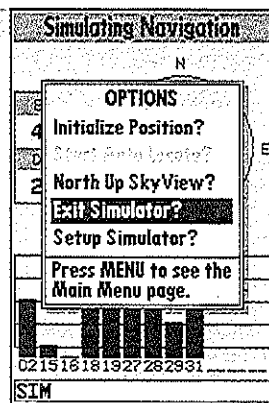
- A. The screen contrast may be adjusted from the Satellite Page by pressing the ARROW KEYPAD. Press EDIT/ENTER to confirm changes.
- B. Whenever the screen backlighting is on, a bulb icon will appear in the status bar at the bottom of every GPSMAP 230 page.

GETTING STARTED

Satellite Page & Simulator Mode

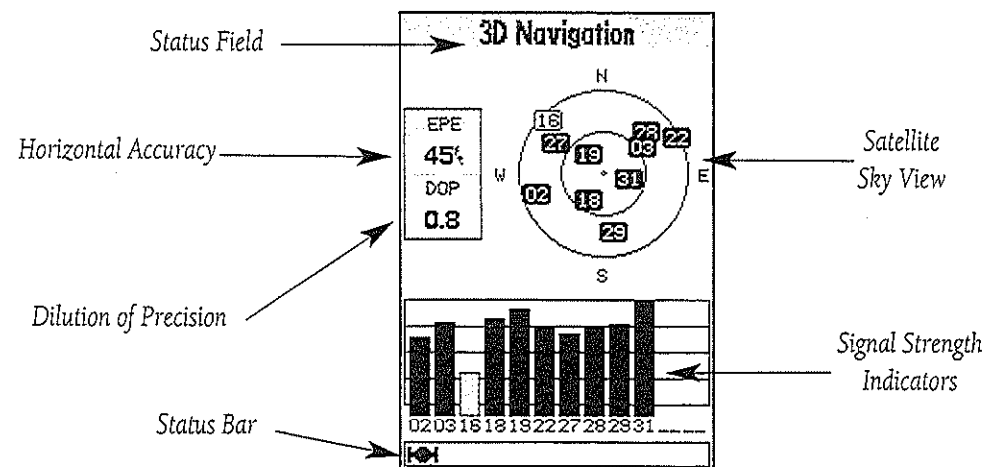


A



B

- A. To start the simulator, confirm the simulator warning. Simulator mode should never be used for actual navigation.
- B. Whenever the GPSMAP 230 is in simulator mode, a 'Setup Simulator?' and an 'Exit Simulator?' option will appear on the options page.

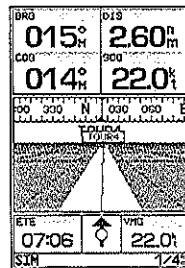
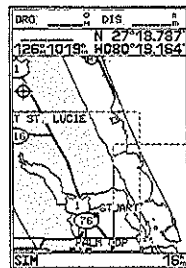
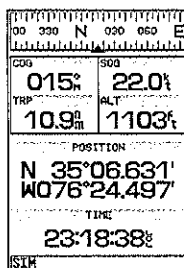
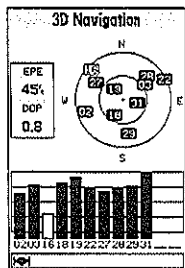


The GPSMAP 230's **Satellite Page** provides a visual reference of satellite acquisition and receiver status, with a signal strength bar graph and a satellite sky view in the center of the page. Each page of the GPSMAP 230's system also features an options page, which gives you access to other functions and features that relate to the specific page you are viewing. To get a feel for how the options pages work, let's put the GPSMAP 230 into simulator mode.

To place the GPSMAP 230 in simulator mode:

1. From the Satellite Page, press the **MENU** key. The options page will appear, displaying a menu of options and functions for the Satellite Page.
2. Use the UP or DOWN arrow of the **ROV** keypad to highlight the 'Start Simulator?' option and press **EDIT/ENTER**.
3. Press the **ROV/ENTER** key to confirm the simulator warning.

Once the simulator has been started, the status field at the top of the page will display a 'Simulating Navigation' status, and you're ready to continue the rest of the tour. Keep in mind that the GPSMAP 230 does not track satellites in simulator mode, and should never be used for actual navigation. All the waypoint and route planning done in simulator mode will still be retained in memory for future use.



GETTING STARTED

Page Sequence & Position Page

The Satellite Page is one of four main pages used in the GPSMAP 230's system. All four pages are linked together in a simple chain, which allows you to scroll through the pages in either direction using the **PAGE** and **QUIT** keys. To continue the tour, let's move on to the next page, the Position Page.

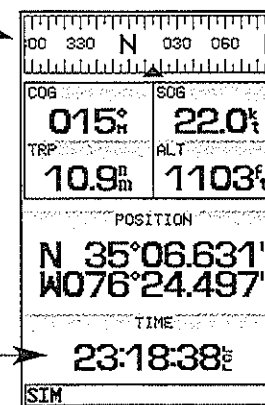
To scroll to the next page in sequence:

1. Press the **PAGE** key.

The GPSMAP 230's **Position Page** shows where you are, what direction you're heading and how fast you're going. The compass tape at the top of the page indicates the direction you're moving. The four user-selectable data fields below the compass tape show your current course and speed over ground, along with a resettable trip odometer and altitude display. Your current latitude and longitude, along with a 12/24-hour clock, appear at the bottom of the page.

Now that you've seen how the Satellite and Position Pages can be used to monitor satellite acquisition and your present position, let's take a minute to learn how to mark and store our present position as a waypoint. (Since we're in simulator mode, the present position displayed will be the last position calculated by the receiver, which should be the spot where you've initialized the unit.) This will also give you an opportunity to see how the GPSMAP 230's keypad and **EDIT/ENTER** key are used for data entry.

Graphic
Compass Tape



Data
Fields

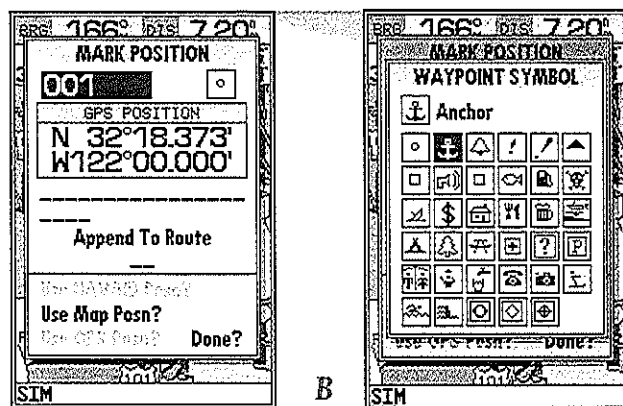
Position
Coordinates

Time
of Day

Status Bar

GETTING STARTED

Marking A Position



A. The mark position page will automatically assign a default three-digit name for each waypoint, which can be changed at any time to an alphanumeric name containing up to six-characters.

B. A complete set of waypoint symbols allows you to mark inland and offshore waypoints with a custom icon for fast waypoint recognition.

To mark your present position:

1. Press the **MARK** key. The mark position page will appear, with a default three-digit waypoint name and symbol.
2. Use the **ENTER** keypad to highlight the waypoint name field (001) and press **EDIT ENTER**.
3. Press the LEFT ARROW of the **ENTER** keypad to clear the name field.

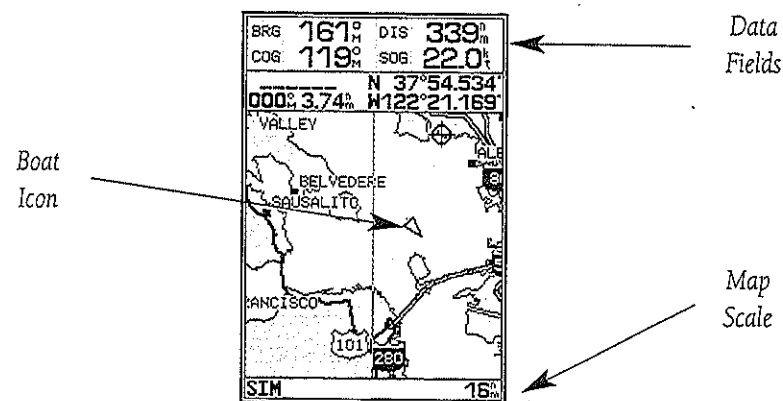


4. Use the **ENTER** keypad to enter the name 'DOCK', using the UP and DOWN arrows to select each letter, and the RIGHT arrow key to advance to the next character position. If you make a mistake and select an incorrect character, simply use the LEFT arrow key of the **ENTER** keypad to backspace the cursor and correct the entry.
5. Press **EDIT ENTER** to confirm the name.
6. The field highlight will advance to the symbol field. Press **EDIT ENTER** to access the waypoint symbol page.
7. Use the **ENTER** keypad to highlight the ANCHOR symbol.
8. Press **EDIT ENTER** to confirm the symbol.
9. Press **EDIT ENTER** again to confirm the 'DONE?' prompt and save the waypoint.

The waypoint is now stored in memory. Note that waypoints may also be created directly from the map display or by manually entering position coordinates. Both of these techniques are described in the reference section of the manual and/or on your GPSMAP 230 quick reference guide. To continue our tour, let's move on to the Map Page.

1. Press the **PAGE** key.

The GPSMAP 230's **Map Page** combines digital chartplotting with a user-selectable display of navigation data and a built-in worldwide database to 64 nm. It will also be the page you use most to create and edit waypoints and routes. Before we take off on our practice route, let's take a brief look at its various features and displays.

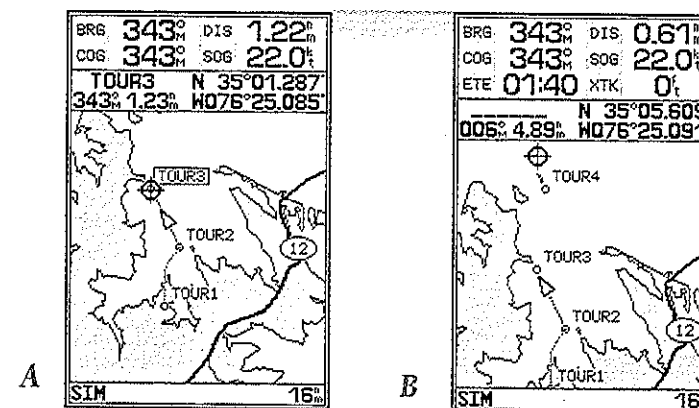


The **map display**, located in the middle of the page, shows your boat as a triangle marker on an electronically generated chart, along with geographic names, markers and buoys that are provided by the G-chart cartridge you're currently using. It also displays your track, routes and nearby waypoints. An on-screen **cursor** lets you pan to other map areas, determine the range and bearing to a position, and perform various waypoint and route functions.

The **data window**, located at the top of the page, provides a user-selectable display of various navigation data, including course, speed over ground, and the bearing and distance to the cursor or a particular waypoint. The status bar, located at the bottom of the page, displays the current map scale setting, as well as the status information described on page 17.

GETTING STARTED

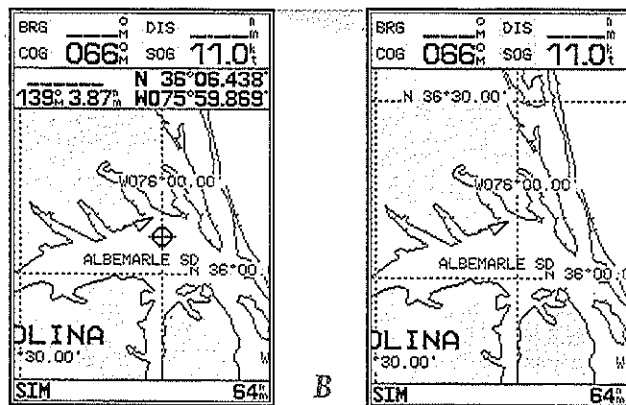
Map Page



- To select an on-screen waypoint, simply move the cursor over the desired waypoint. The waypoint/navaid name and position, along with the bearing and distance from your present position, will be displayed.
- The map page can also be configured to display additional data fields and a graphic course deviation scale or compass. See page 26 for more on map options.


GETTING STARTED

Using the Map Cursor








- A. Whenever the cursor is active, the bearing and distance of the cursor from your present position will appear in a pop-up data window.
- B. To remove the cursor and recenter your vessel on the map, press the QUIT key.

Using the Map Cursor

Working from the Map Page is a simple process that centers around the use of the cursor. Controlled by the  keypad, the cursor is an important tool that can be used to pan to other map locations, mark and edit waypoints and routes, and review position data of on-screen nav aids and waypoints.

To get a feel for using the Map Page and using the cursor, try the following exercise:

1. Use the  key to set the map scale to the 64 nm setting. Your boat should be near the center of the map, at the receiver's last known position (if your boat isn't where it should be, make sure that you have initialized the receiver and acquired a position as described on pages 1-2).
2. Use the DOWN arrow of the  keypad to move the cursor down to the first lat/lon grid south of your boat's position.
3. Using the  keypad to move the cursor, try following the outline of the lat/lon grid closest to your boat. Notice how another data field appears at the top of the page, showing the bearing and distance from your boat to the cursor, along with the lat/lon of the cursor.
4. Press the  key to remove the cursor and recenter your boat on the map display.

As you become more familiar with the cursor, you'll see that the map display actively scrolls or "pans", 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, pressing  once will return the map to your present position.

Now that you have a feel for how the cursor works, let's move on and see how the GPSMAP 230 works on the water. To help you practice using the Map Page and other features, we've stored a practice route in the receiver's permanent memory, so you can see exactly what you'll experience when you're navigating with your new GPS chartplotter.

Going to a Destination

GPS is all about marking positions as waypoints and navigating to them using the receiver's steering guidance and map displays. We've already seen how to use the **MARK** key to store our present position, so it's time to move on to the fun part—going to a destination. The **GOTO** key, located on the left side of the keypad above the **QUIT** key, is the primary tool used to select a destination waypoint or a route to navigate. The **GOTO** key can be used in three primary ways:

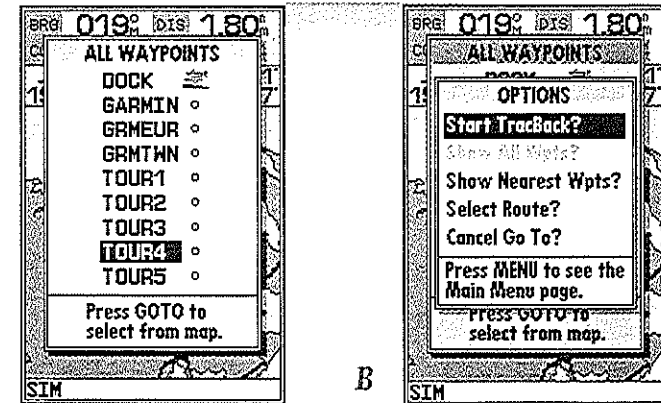
- Pressing **GOTO** once displays a list of all waypoints in memory, from which you can select a single destination waypoint.
- Pressing **GOTO** followed by the **MENU** key provides a list of GOTO options that lets you start a TracBack™ route, select a destination waypoint from the nearest waypoints list, select a stored route to navigate, or cancel the current GOTO destination.
- Pressing **GOTO** twice allows you to select an on-screen waypoint, navaid or cursor position as a destination directly from the map display.

For our simulated trip, we're going to select the preprogrammed tour route (the second method), which will automatically place our vessel at the first route waypoint. This will also give us an idea of how the **MENU** key is used throughout the GPSMAP 230 system to provide context-sensitive options and functions. Let's give it a try by activating the practice route stored in memory for navigation:

1. Press **GOTO**. The waypoint list page will appear (if we were selecting a single waypoint to navigate to rather than a route, we would highlight the waypoint and press **EDIT/ENTER**).
2. Press **MENU** to display the context-sensitive options available for the GOTO function.
3. Use the **⬇** keypad to highlight the 'Select Route?' option. Press **EDIT/ENTER** to confirm.
4. The select route page will appear, with the 'GPSMAP TOUR' route highlighted.
5. Press **EDIT/ENTER**. The Map Page will reappear and display five waypoints chained together in a simple route, with your boat at the first route waypoint.

GETTING STARTED

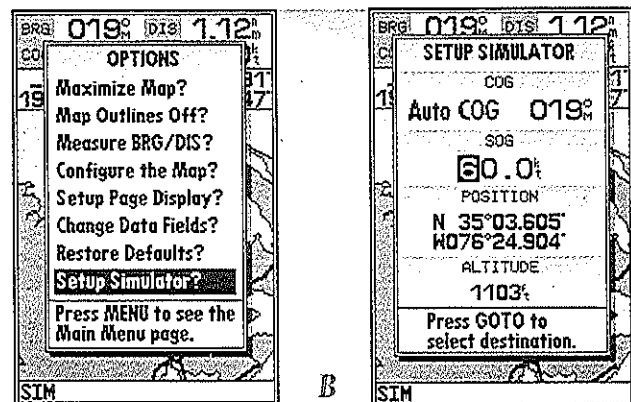
Using the GOTO key



- A. Pressing GOTO once displays a list of all waypoints stored in memory. To pick a destination, select the desired waypoint and press EDIT/ENTER.
- B. The GOTO options page allows you to either start a TracBack route back home, select a destination from the nearest waypoints list, or select a route to navigate.

GETTING STARTED

Simulator Setup & Map Scales



- A. To enter a boat speed or define the simulated course, highlight the 'Setup Simulator?' option and press EDIT/ENTER.
- B. Enter a boat speed of 60 knots to begin the tour. This will allow you to complete the Getting-Started Tour in 10-15 minutes.

A **data field** at the top of the page will now display the bearing and distance to the second route waypoint. To get started, let's enter a speed for our vessel, which we can do from the 'Setup Simulator?' listing on the options page. The **setup simulator page** is also available from any other page in the main page sequence.

To enter a boat speed:

1. Press the **MENU** key to display the map options page.
2. Use the **⬅** keypad to select the 'Setup Simulator?' option and press **EDIT/ENTER**.
3. Once the setup simulator page appears, press **EDIT/ENTER** to access the SOG field.
4. Use the **⬅** keypad to enter a speed of 60 knots.
5. Press **EDIT/ENTER** to finish, and **PAGE** to return to the map display.

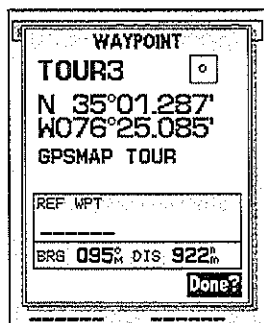
Once a speed has been entered, you'll notice that the map will begin to move slowly, keeping your boat centered on the display. To get a better view of what's going on, zoom in to a closer map scale.

1. Press the **IN** key to select the 16 nm scale.

You'll now have a clearer picture of the route we are navigating, along with an outline-only presentation of the surrounding shoreline. Because the usable range of the built-in database is only valid to 64 nm scale, we no longer have full cartography available. Keep in mind that whenever you do exceed the usable range of the built-in database or the G-chart cartridge in use, the range field will display 'OVR ZM' or 'NO MAP' to indicate that you should exercise extreme caution using the cartography data. See page 25 and 66 for more information on map scales and using G-chart detailed cartography.

Now that we're zoomed in a little closer to our route, we can pan ahead of our vessel with the cursor to review and create on-screen waypoints and nav aids. Try moving the cursor to select the 'TOUR3' waypoint— just use the **⬅** keypad to move the cursor as close as possible to the waypoint (to move the cursor in small increments, try a series of short key presses).

Once the cursor is over the TOUR3 waypoint, you'll notice that the waypoint symbol and name will become highlighted, and the data field at the top of the page will display the waypoint name, the range and bearing from your present position, and the coordinates for the waypoint.



To review the waypoint page for a selected waypoint:

1. Press the **EDIT/ENTER** key.
2. To return to the Map Page, press **EDIT/ENTER** again.

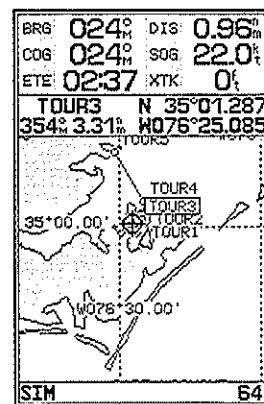
The cursor can also be used to create new waypoints right from the map display.

To create a new waypoint using the cursor:

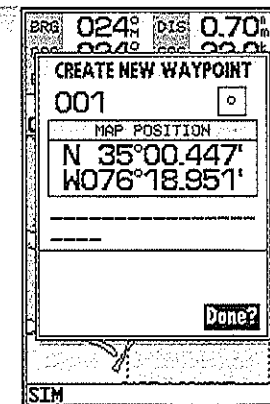
1. Use the **⬇** keypad to move the cursor as close as possible to the following position: N 35° 02.129'; W 076° 26.106' (use the data window to verify the cursor position).
2. Press the **EDIT/ENTER** key to capture the cursor position.
3. Use the **⬇** key to highlight the waypoint symbol field.
4. Press **EDIT/ENTER** to access the symbol page.
5. Press the DOWN arrow of the **⬇** keypad twice to select the wreck symbol.
6. Press **EDIT/ENTER** to confirm, and **EDIT/ENTER** again to finish.

GETTING STARTED

Reviewing & Creating Waypoints on the Map



A

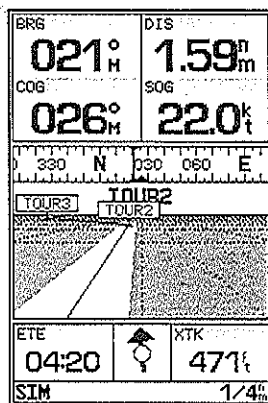
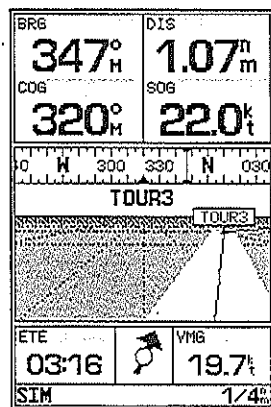


B

- A. Waypoints can be created from the map display by moving the cursor to the desired position and pressing the **EDIT/ENTER** key.
- B. The create new waypoint page will automatically assign the next available three-digit number as the default waypoint name. If you are creating a waypoint at an on-screen navaid, the navaid icon and name will be used as the default symbol and comment.

GETTING STARTED

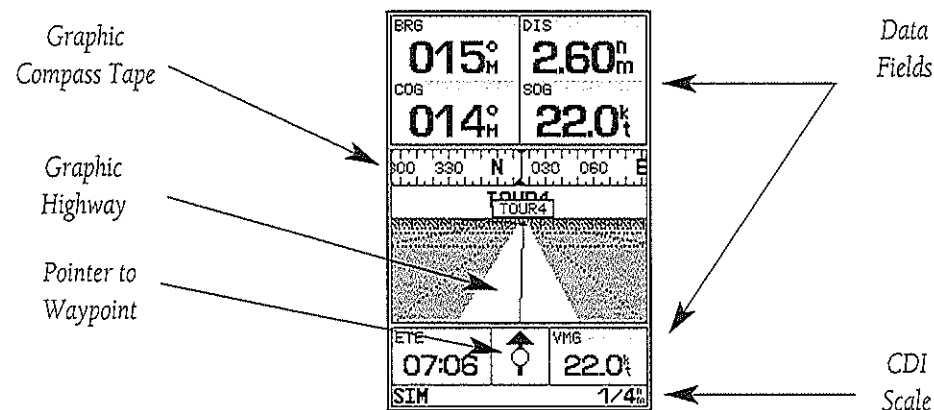
Navigation Page



- A. In this example, our boat is off course to the left by about 1/16th of a mile (the base of the highway map is equal to the scale selected at the bottom right of the page). To get back on course, steer right.
- B. In this example, our boat is off course to the right. To get back on course, steer left. A digital readout of your exact crosstrack error can be displayed in any of the six data fields (see page 29).


Now that we're navigating to an actual destination, let's move on to the next page of the GPSMAP 230 system, the **Navigation Page**:

1. Press the **PAGE** key.




The Navigation Page provides graphic steering guidance to your destination. The **bearing (BRG)** and **distance (DIS)** to the destination, with your current **course (COG)** and **speed over ground (SOG)**, are displayed at the top of the page, along with a graphic compass to indicate your cardinal heading. The **estimated time enroute (ETE)** and **velocity made good (VMG)**, or the rate you are closing in on your destination) are displayed at the bottom of the page.

As you head toward the destination, the middle section of the page gives you visual guidance to your waypoint on a **graphic highway**, which displays the route and nearby waypoints on screen. The moving arrow below the highway always points to the destination waypoint relative to the direction you're moving. The line down the center of the highway represents your desired track, while the bottom of the page provides a graphic indication of your **crosstrack error** (the distance and direction you are off course) according to the scale at the bottom right of the page.

Whenever the GPSMAP 230 is in simulator mode, you can adjust your speed and course from the Navigation Page using the  keypad. As you head toward each waypoint in the tour route, try adjusting your boat speed and course to get a feel for how the highway works.

To adjust the simulated boat speed:



1. Press the UP arrow of the  keypad to increase the speed in 5 knot/kph/mph increments. Press the DOWN arrow to decrease the speed in the same increments.

To steer the boat:

1. Press the LEFT and RIGHT arrows of the  keypad.







Notice that as you get off course, the highway and waypoint pointer move to give you graphic guidance to get back on course. The base of the highway display also serves as a graphic course deviation indicator (CDI), relative to the scale setting shown at the bottom right of the page. The scale setting represents the total distance (or the width) of the base of the highway display. The default graphic highway setting is 1/4 nm, but can be set for a 1/2-, 1-, 2- or 4-nm range.

To change the highway scale display:

1. Press the  or  key (OUT to increase, IN to decrease the scale).

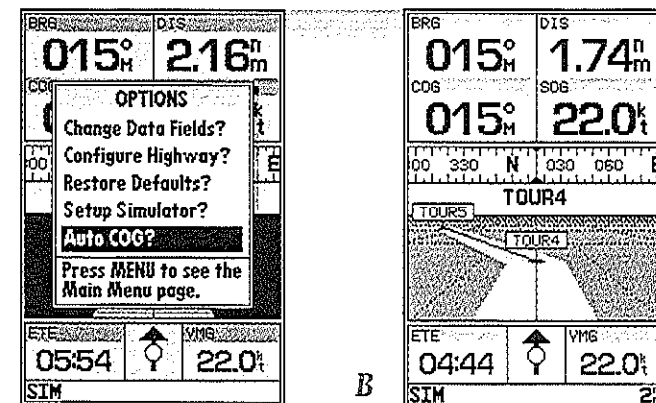
The Navigation Page data fields may also be configured to display any of ten different navigation values. Let's change the VMG field to crosstrack error to provide a digital readout of the distance we're off course.

To change a data field:

1. Press the  key to display the Navigation Page options.
2. Highlight the 'Change Data Fields?' option and press . The field highlight will now appear in the top-left data field (the BRG field).
3. Use the  keypad to move the field highlight to the VMG field and press .
4. Highlight the 'XTE' option and press , and press  to finish.

GETTING STARTED

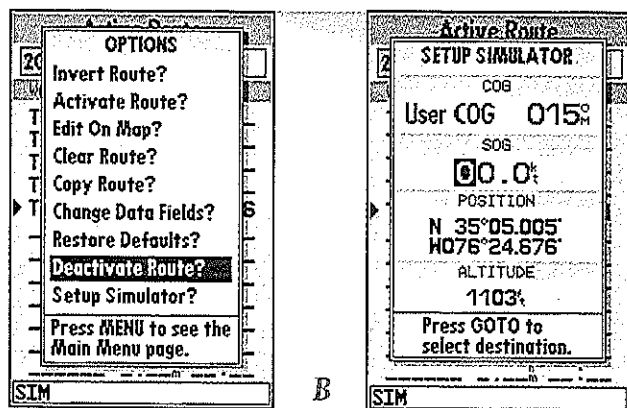
Using the Navigation Page



- A. To reset the simulator to steer the desired course automatically, select the 'Auto COG' setting from the options page.
- B. The highway scale can be set to a 1/4-, 1/2-, 1-, 2-, or 4-nm/mi/km range with the ZOOM keys.

GETTING STARTED

Active Route & Main Menu Page



- To stop navigating the active route, select the 'Deactivate Route?' option and press EDIT/ENTER.
- Use the left arrow key to clear the SOG field and press EDIT/ENTER to confirm.

Now that you've seen the four main pages, let's review the **active route page**, which appears in the main page sequence whenever you are navigating a route:

- Press the **PAGE** key.

The active route page shows each waypoint of the active route in sequence, with the waypoint name, distance and estimated time enroute to each waypoint displayed. As you navigate the route, the active route list will be automatically updated, indicating the next destination waypoint.

The active route page also provides quick access to many route activation, editing and copying functions you'll use most often, like inverting and deactivating the active route. Let's go ahead and deactivate the active route.

To deactivate the active route and stop navigation:

- Press the **MENU** key.
- Highlight the 'Deactivate Route?' option.
- Press **EDIT/ENTER** to confirm.

To reset the boat speed to zero:

- Press the **MENU** key.
- Highlight the 'Setup Simulator?' option.
- Press **EDIT/ENTER**.
- Press **EDIT/ENTER** to access the SOG field.
- Press the LEFT arrow of the **0** keypad to clear the speed entry.
- Press **EDIT/ENTER**.

As you've seen, the GPSMAP 230's main pages provide vital status, position, navigation and map information. The last page we'll cover in the tour is the **main menu** page, which provides access to the GPSMAP 230's waypoint, route and planning functions, as well as various operational and navigation setup features. The Main Menu is available from any page, and is accessed through the **MENU** key.

To access the Main Menu Page:

1. Press the **MENU** key twice.

The Main Menu Page's 11 submenus are divided into categories by function. You can select a particular submenu by simply highlighting the desired option and pressing **EDIT/ENTER**. To get a feel for how the Main Menu Page works, let's clear out the track log we've created during our simulated tour. This will ensure that you have a clean slate once you start navigating in your home waters.

To select the track submenu:

1. Highlight the 'Track' menu option and press **EDIT/ENTER**.

The track log page allows you to specify whether to record a track plot and define how it is recorded. It also provides both an indicator of the total memory used and the individual functions to clear the track log and start a TracBack route.

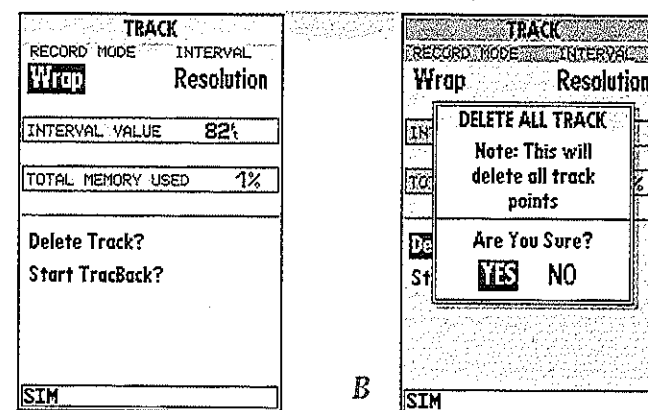
To delete the track log:

1. Highlight the 'Delete Track' option and press **EDIT/ENTER**. A confirmation page will appear.
2. Highlight the 'Yes' prompt and press **EDIT/ENTER** to confirm.
3. Press **PAGE** to return to the main page sequence.

Congratulations! You've now gone through the basic operation of the GARMIN GPSMAP 230. Your new digital chartplotter is a powerful tool with many advanced features not covered in the Getting-Started Tour. For detailed instructions on using these features or performing a specific task, please refer to the quick reference guide or the appropriate reference section of this manual.

GETTING STARTED

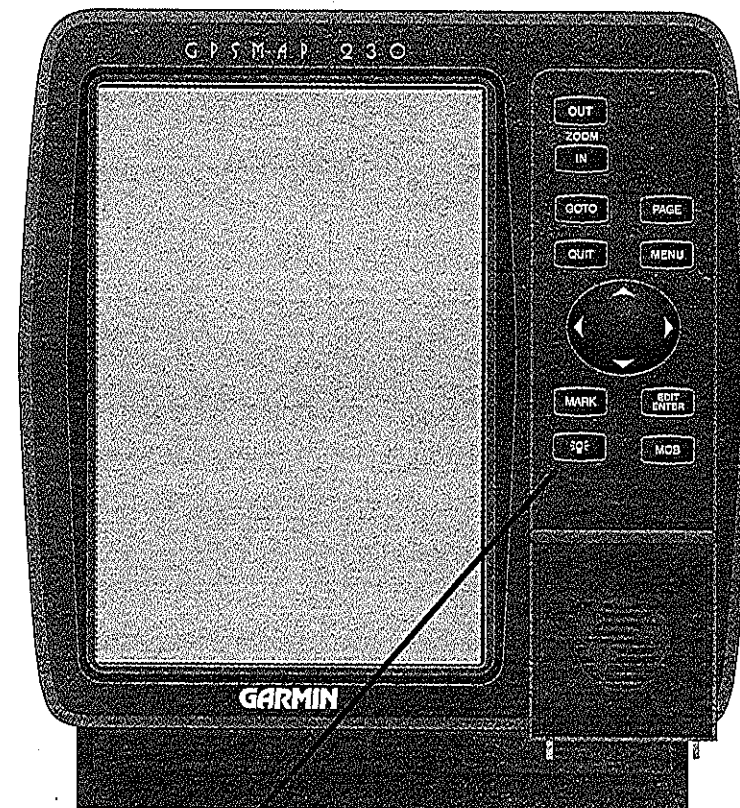
Track Submenu & Clearing the Track Log




- A. The GPSMAP 230's track page lets you clear the track log and start a TracBack route.
- B. To delete the track log, confirm the warning page by highlighting the 'YES' prompt and pressing **EDIT/ENTER**.

GETTING STARTED

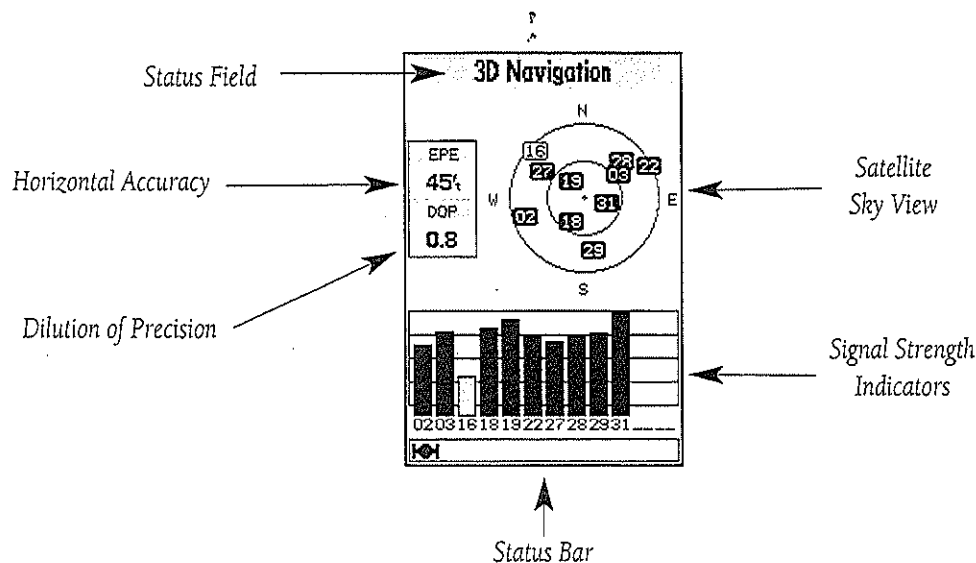
Power Off



To turn the GPSMAP 230 off:

1. Press and hold the  key for about 3 seconds, until the screen is blank.

Thank you for choosing the GARMIN GPSMAP 230 navigation system. We hope that it will be a useful tool for you wherever you travel.



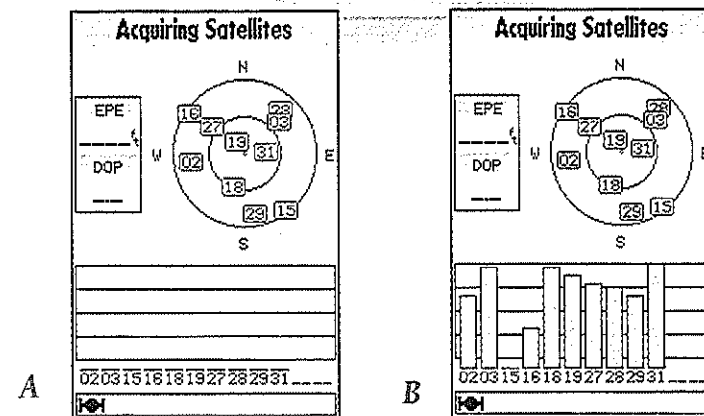
The GPSMAP 230 **Satellite Page** provides a visual reference of various receiver functions, including current satellite coverage, receiver operating mode and current receiver accuracy. The status information will give you an idea of what the receiver is doing at any given moment.

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 not be shown and the sky view indicator will not be 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 (track up), the inner circle is 45° above the horizon, and the center point is a position directly overhead. Use the sky view to determine if there are obstructions shading your reception of GPS signals.

SATELLITE PAGE Overview

SECTION 1



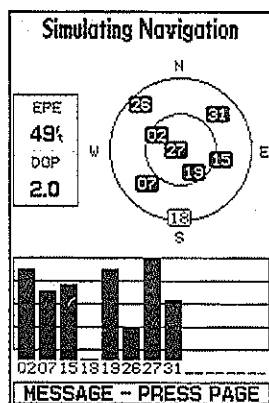
- Whenever the GPSMAP 230 is searching for satellites, no signal strength bars will appear.
- Once the receiver has found the satellite(s) indicated, a hollow signal strength bar will appear. After satellite data has been collected, the signal strength bars will become solid.

SECTION

1

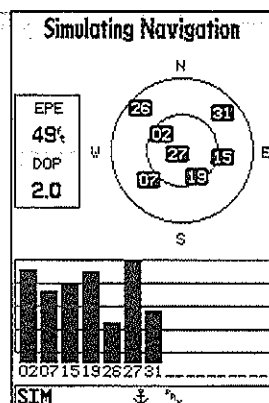
SATELLITE PAGE

Receiver Status



A

A. The status bar at the bottom of the page displays important status, alarm, and map scale information. It also provides on-screen user and message prompts.



B

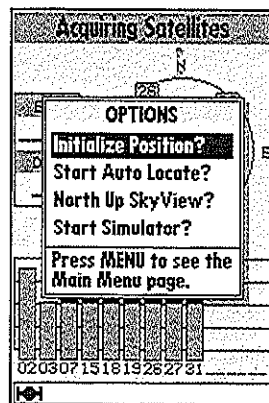
B. The status bar will display an anchor symbol or 'PRX' icon whenever the anchor drag alarm or proximity alarm has been triggered.

Receiver Status, EPE & DOP

Receiver status is indicated at the top of the page, with the current **estimated position error** (EPE) and **dilution of precision** (DOP) to the left of the sky view. DOP is an indication of satellite geometry quality measured on a scale of one to ten (lowest numbers the best, highest numbers the poorest). EPE uses DOP and other factors to calculate a horizontal position error in feet or meters. The status field will show one of the following conditions:

- **Searching the Sky**— the receiver is looking for any satellites.
- **AutoLocate**— the receiver is looking for any satellite whose almanac has been collected. This process can take up to five minutes.
- **Acquiring Satellites**— the receiver is looking for and collecting data from satellites visible at its last known or initialized position, but has not collected enough data to calculate fix.
- **2D Navigation**— at least three satellites with good geometry have been acquired and a 2 dimensional position fix (latitude and longitude) is being calculated. '2D Differential Navigation' will appear when you are receiving DGPS corrections in 2D mode.
- **3D Navigation**— at least four satellites with good geometry have been acquired and your position is now being calculated in latitude, longitude and altitude. '3D Differential Navigation' will appear when you are receiving DGPS corrections in 3D mode.
- **Poor GPS Coverage**— the receiver is no longer tracking enough satellites for a 2D or 3D fix.
- **Receiver Not Usable**— the receiver is unusable, possibly due to incorrect initialization or abnormal satellite conditions. Turn the unit off and back on to reset.
- **Simulating Navigation**— the receiver is in simulator mode.

Satellite Page Options



The GPSMAP 230's Satellite Page features a context-sensitive options page that provides access to functions and features relating to the Satellite Page.

To display the Satellite Page options:

1. Press **MENU**.

To select a menu option:

1. Highlight the desired option and press **EDIT/ENTER**.

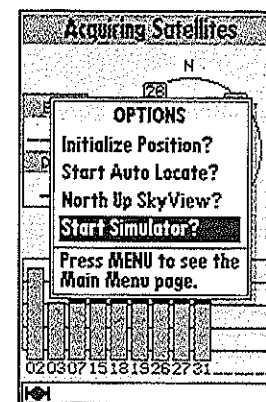
The following options are available:

- **Initialize Position?**— allows you to initialize the receiver on map or by text. See pages 1-2 for instructions on initialization.
- **Start AutoLocate?**— allows the receiver to locate your position automatically.
- **Track Up/North Up SkyView?**— allows you to select between a north up or track up sky view display.
- **Setup Simulator?**— allows you to define speed, course, and position values while in simulator mode. See the Getting-Started Tour for more on using simulator mode.

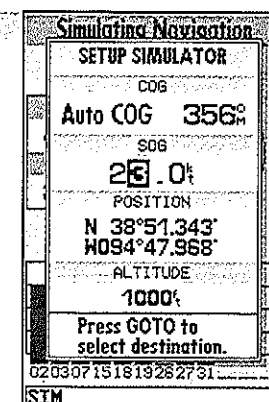
SATELLITE PAGE

Satellite Page Options

SECTION 1



A



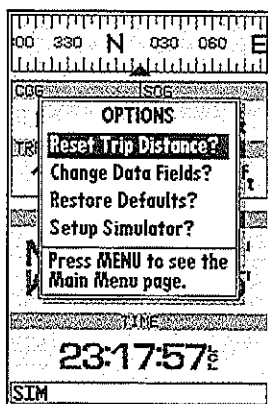
B

- Whenever the GPSMAP 230 is in simulator mode, the 'Setup Simulator?' option will appear on all the main pages.
- The setup simulator page allows you to define your speed and course over ground, as well as your position and altitude. The 'Auto COG' option will automatically steer the desired course to your destination. Your speed and course can also be selected from the Navigation Page using the rocker keypad (see page 13).

SECTION 2

POSITION PAGE

Overview

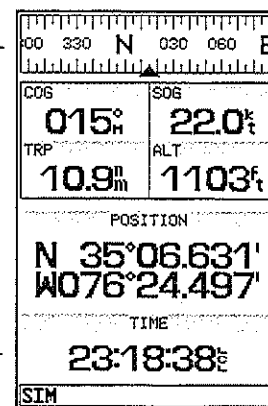


The trip odometer can be reset from the Position Page options window. To reset the odometer, select the 'Reset Trip Distance?' option and press EDIT/ENTER.

Position Page

Graphic
Compass Tape

Time
of Day



Data
Fields

Position
Coordinates

Status Bar

The GPSMAP 230 Position Page shows you where you are, what direction you are heading and how fast you are going. The top of the page features a graphic compass tape to indicate the direction you're heading (while you're moving), and four user selectable data fields: course over ground (COG), speed over ground (SOG), distance traveled (TRP) and altitude (ALT). The bottom half of the page displays your present position's coordinates, along with the time of day as calculated using GPS satellites. The status bar at the bottom of the page indicates position fix status, and is described in detail on page 18.

The units of measure for speed, distance, position, and altitude are all user-selectable through the navigation setup option on the Main Menu Page. The time of day, shown in UTC (Universal Time Coordinated, or Greenwich Mean Time) may be set to display in a 12- or 24-hour time format (with a local offset) through the system setup option on the Main Menu Page.

Position Page Options

The GPSMAP 230's Position Page features a context-sensitive options page that provides access to functions and features relating to the Position Page.

To display the Position Page options:

1. Press **MENU**.

To select a menu option:

1. Highlight the desired option and press **EDIT/ENTER**.

The following options are available:

- **Reset Trip Distance?**— resets the trip odometer (TRP) field to zero.
- **Change Data Fields?**— allows you to choose the data displayed in the four user-selectable data fields. Five data types are available:
 - SOG— speed over ground
 - COG— course over ground
 - TRP— distance traveled
 - ALT— altitude
 - VDC— DC voltage

To change a data field:

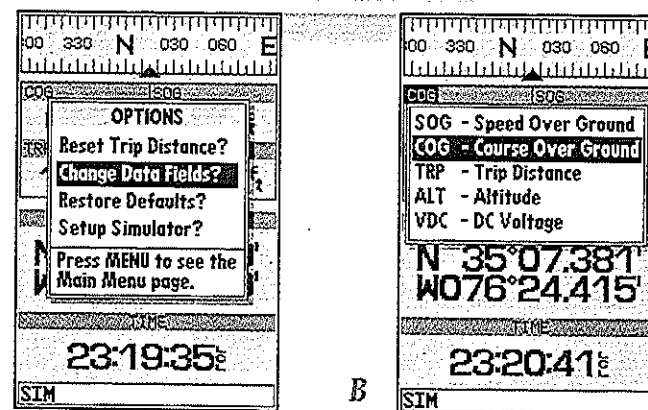
1. Highlight the 'Change Data Fields?' option and press **EDIT/ENTER**.
2. Move the field highlight to the field you want to change and press **EDIT/ENTER**.
3. Select the desired data field option and press **EDIT/ENTER**.

- **Restore Defaults?**— resets all data fields to the factory settings.
- **Setup Simulator?**— allows you to define speed, course and position values while in simulator mode. See the Getting-Started Tour for more on using simulator mode.

POSITION PAGE

Position Page Options

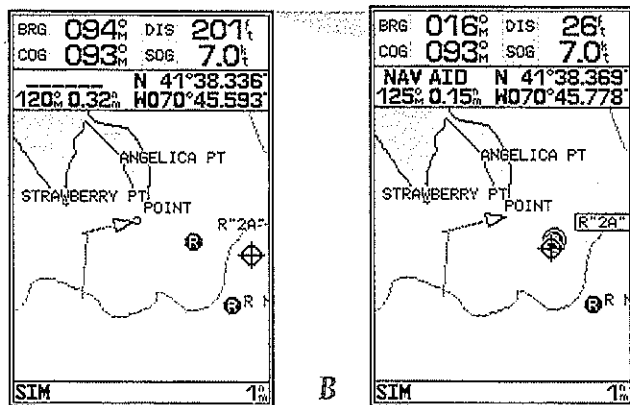
SECTION 2



- A. The four data fields at the top of the position page can be changed by selecting the 'Change Data Fields?' option.
- B. Each data field can be set to display speed over ground, course over ground, distance traveled, altitude, or DC voltage.

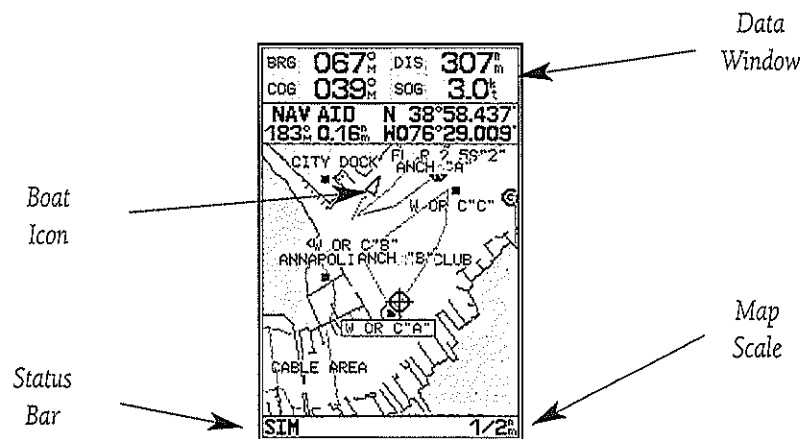
SECTION 3

MAP PAGE Overview



- Use the cursor to pan ahead to other map areas. The map display will automatically scroll forward when you reach the edge of the map.
- To select or "highlight" an on-screen navaid or waypoint, simply move the cursor over the waypoint symbol. The cursor will "snap" to the waypoint, and display its name and position in the data field.

GPSMAP 230 Map Page



The GPSMAP 230's Map Page provides a comprehensive display of electronic cartography, plotting and navigational data. The **map display** shows your boat on a digital 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 **data window**, located at the top of the page, provides a user-selectable display of your current course and speed over ground, along with the bearing and distance to a destination waypoint. Whenever the cursor is active, an additional data window will appear below to indicate the position, range and bearing to the cursor or a selected waypoint or navaid. Each data field may be configured to display any one of ten data options. The data window may also be changed to display additional data fields, a graphic compass tape, or a CDI scale. The **status bar** at the bottom of the page displays the map scale currently in use.

Map Modes

The map display uses the cursor keypad and a set of hard keys to control most map display functions. The **IN** and **OUT** keys, combined with the **ENTER** keypad, let you select zoom ranges and move the cursor. Two basic map operating modes, position mode and cursor mode, determine what cartography is shown on the map display. Position 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 position mode, with your vessel centered on the map display.

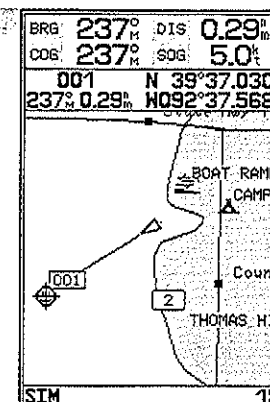
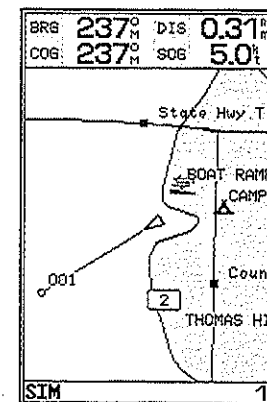
- Whenever sufficient map coverage is not available to keep the boat centered, the boat icon will move toward the edge of the display.
- If the boat icon attempts to go off the display, the zoom level may need to be adjusted to keep cartography on screen.

Whenever the **ENTER** keypad is pressed, the GPSMAP 230 will enter cursor mode. In cursor mode:

- The cursor can be moved over the map display using the **ENTER** 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 will change as the boat's position changes.
- Whenever you zoom in cursor mode, the cursor will be centered on screen.
- To return to position mode, press the **QUIT** key.

MAP PAGE
Map Modes

SECTION
3



A. Position mode on inland water cartography.

B. Cursor mode on inland water cartography.

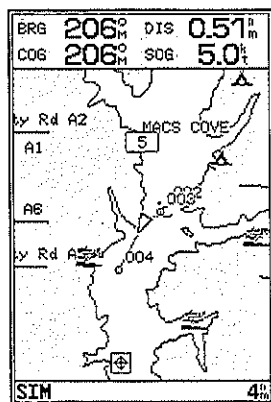
SECTION

3

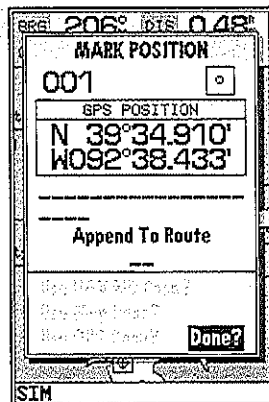
MAP PAGE

Using the Cursor

A



B



- A. To create a new waypoint at the cursor, move the cursor to the desired position and press EDIT/ENTER.
- B. The create new waypoint page will appear, where you may change the waypoint name, symbol, and comment before saving the waypoint.

Using the Cursor

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.

To move the cursor:

1. Press the keypad to move the cursor in an up, down, left, or right direction.

As you move the cursor, the distance and bearing from your present position to the cursor will be displayed in the data window, along with the cursor's position coordinates. 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 nav aids, allowing you to review a selected position directly from the map display.

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

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

To eliminate the cursor and re-center your position on-screen:

1. Press the key.

The cursor may also be used to create new waypoints directly from the map.

To create a waypoint with the cursor:

1. Use the keypad to move the cursor to the desired map position.
2. Press .
3. Press to confirm the new waypoint.

Selecting Map Scales

The map display has 16 available range scales from 1/8th to 4096 n.m. (1/4 to 7500km). The map scale is controlled by the **IN** and **OUT** keys, with the current scale displayed at the bottom of the data window.

To select a map scale:

1. Press the up **OUT** key to zoom out and the down **IN** key to zoom in.

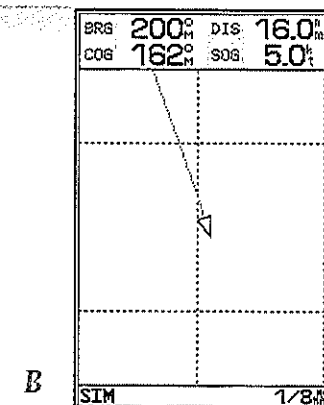
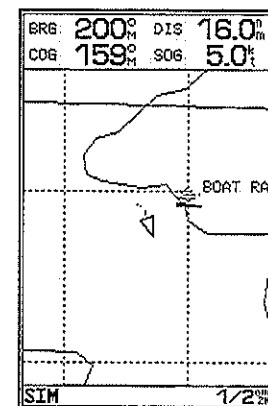
The GPSMAP 230's system has a built-in worldwide database to 64 n.m. (see Appendix D for a built-in coverage map), with more detailed coverage available through the use of G-chart™ data cartridges (see Section 10 for installing and using G-chart™ cartridges). The GPSMAP 230 will display cartography as long as there is chart information available for the range you've selected. Map coverage will conform to the following conditions:

- 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. The lat/lon grid will also be turned on regardless of the map configuration setting.
- 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, and a 'No Map' warning will appear in the scale field. The lat/lon grid will be displayed regardless of the map configuration setting. Additional caution should be used while navigating in track plot mode.

MAP PAGE

Selecting Map Scales

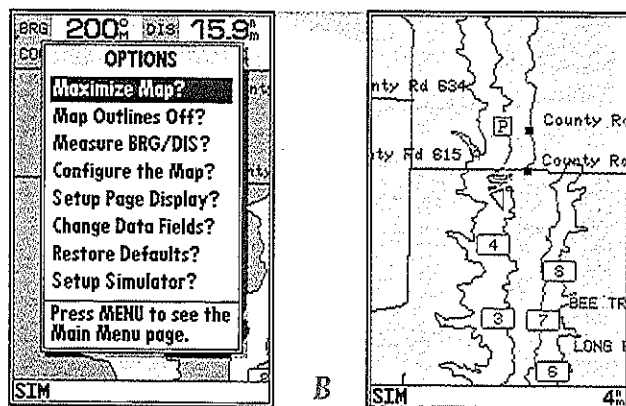
SECTION 3



- A. Whenever the selected map scale exceeds the resolution of the chart by up to two settings, an 'Ovr Zm' warning will appear in the scale field.
- B. Whenever the selected map scale exceeds the resolution of the chart by more than two settings, a 'No Map' warning will appear in the scale field.

SECTION 3

MAP PAGE Map Page Options



- A. The map options page provides access to all map configuration, page display, and data field options.
- B. The 'Maximize Map?' option will eliminate the data fields and show full-screen cartography.

Map Page Options

The GPSMAP 230 Map Page is designed to be a flexible tool that can be custom-tailored to your exact navigation needs. The map options page provides access to many of the features and functions that will help you configure the Map Page to your own preferences.

To display the Map Page options:

1. Press **MENU**.

To select a menu option:

1. Highlight the desired option and press **EDIT/ENTER**.

The following options are available:

- **Maximize/Normal Map?**— allows you to select between a full-screen map display or the default map display with data window.
- **Map Outlines Off/On?**— allows you to specify whether coverage outlines for G-chart cartography are displayed or not. The default setting is on.
- **Measure BRG/DIS?**— allows you to measure the bearing and distance between any two points on the map display.






To measure the BRG/DIS between two points:

1. Highlight the 'Measure BRG/DIS?' option and press **EDIT/ENTER**. An on-screen pointer will appear on the map display at your present position.
2. Move the cursor to the desired reference point (the point that you want to measure from) and press **EDIT/ENTER**.
3. Move the cursor to the point that you want to measure to. The bearing and distance from the reference point will be displayed at the bottom left of the data window.
4. Press the **QUIT** key to finish.




- **Configure the Map?**— allows you to determine what chart features are displayed on a particular map scale to prevent excessive clutter. The map configuration page features an on/off grid with a list of chart features down the left side. The zoom scales are displayed across the top of the grid with the chart scale currently in use also indicated. The far-left scale setting represents all map scales 64 nm and above. A check mark in a grid box indicates that the chart feature listed will be displayed at the corresponding scale.

Individual grid boxes may be turned on and off through a popup scale window, while entire rows may be controlled by using the map configuration options page (accessible through the **MENU** key).

To use the map configuration grid:




1. Use the  keypad to select the desired map item and press . A popup window will appear with the current settings displayed.
2. Use the  keypad to highlight the scale you want to change.
3. Press  to change the on/off setting.
4. Press  to finish.

To turn an entire row on or off:

1. Use the  keypad to select the desired map item.
2. Press the  key.
3. Select the 'Enable Row?' or 'Disable Row?' option and press .

The map configuration page also allows you to set the moving map display to a North Up, Track Up, or Desired Track Up orientation.

To change the map orientation:

1. Use the  keypad to highlight the 'Orientation' field and press .
2. Select the desired setting and press .

MAP PAGE

Map Configuration

SECTION 3

Map Item	64 Scale 1/2
Geo Names	#####
Navaid Text	#####
Depth, Shallow	#####
Depth, Deep	#####
Lat/Lon Grid	#####
Waypoints	#####
Waypt Names	#####
Active Rte/Trk	#####
National Hwy	#####
Local Hwy	#####
Local Road	#####
Road Labels	#####
Orientation	North Up
SIM	

A

Map Item 64 Scale

Geo Names

Map Item Test

De...

De...

La...

Ca...

Ya...

Ac...

Lo...

Lo...

Options

Enable Row?

Disable Row?

Calibrate the Map?

Set Map Colors?

Restore Defaults?

Press MENU to see the Main Menu page.

Road Labels

Orientation North Up

Index

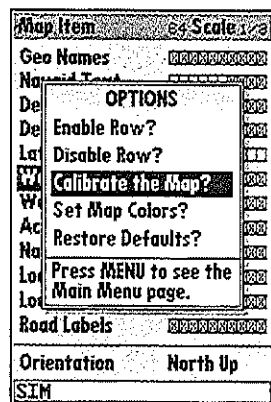
- A. The map configuration grid allows you to define what items appear on the display at each map scale.
- B. To turn an entire row on for the selected map item, highlight the 'Enable Row?' option and press EDIT/ENTER.

SECTION

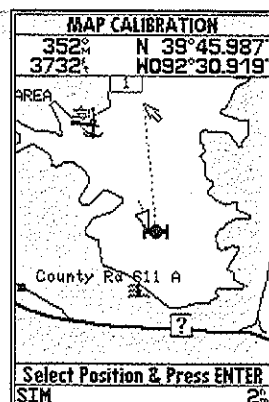
3

MAP PAGE

Map Configuration & Map Colors



B



A. To calibrate the map, highlight the 'Calibrate the Map?' option and press EDIT/ENTER.

B. A satellite icon will remain on the map to indicate the GPS position, while the boat marker will move to reflect the calibration changes.

CAUTION!

The map calibration function should never be used to attempt corrections to Selective Availability errors.

The map configuration options page also features a map calibration function that allows you to calibrate the map display your exact physical surroundings or to correct data from older charts. Before using the map calibration function, check to make sure that your map datum selected on the GPS matches the datum on the chart you are using (see page 61). 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.

Map calibration should only be performed while the vessel is not moving, and should never be used to attempt SA corrections, which can degrade accuracy up to 330' (100 meters). The maximum correction is 16,400 feet (5000m).

To calibrate the map:

1. Select the 'Calibrate the Map?' option and press **EDIT/ENTER**.
2. Use the **⬇** keypad to move the arrow cursor from the satellite position (indicated by the satellite icon) to your exact position. The bearing, distance, and position will be indicated in the data window.
3. Press **EDIT/ENTER** to confirm the calibration offset.

The next option available from the map configuration page is the set map colors option, which allows you to define the fill color (grayscale) of the land and water used on the map display. Three options are available: no color (no fills for land or water), gray land/white water (the default setting), and white land/gray water.

To select a map colors option:

1. Select the 'Set Map Colors?' option and press **EDIT/ENTER**.
2. Highlight the desired map color option and press **EDIT/ENTER**.

The map configuration options page also features a 'restore defaults' function that can be used to quickly restore all map configuration options to the factory settings.

To restore the map configuration options to the factory defaults:

1. Highlight the 'Restore Defaults?' settings and press **EDIT/ENTER**.

- **Setup Page Display?**— allows you to specify the number of fields displayed in the data window section of the map page. A graphic compass tape or CDI scale may also be displayed. The following options are available:

- | | |
|----------------------|----------------------|
| • 2 Fields | • 2 Fields & Compass |
| • 2 Fields & CDI | • 4 Fields |
| • 4 Fields & Compass | • 4 Fields & CDI |
| • 6 Fields | • 6 Fields & Compass |
| • 6 Fields & CDI | • 8 Fields |

To select a page display option:

1. Highlight the 'Setup Page Display?' option and press **EDIT/ENTER**.
2. Select the desired option and press **EDIT/ENTER**.

- **Change Data Fields?**— allows you to specify the data displayed in each data field used on the map display. The following options are available:

- | | |
|-------------------------------|----------------------------------|
| • BRG- bearing to active wpt | • DIS- distance to active wpt |
| • SOG- speed over ground | • COG- course over ground |
| • ETE- estimated time enroute | • ETA- estimated time of arrival |
| • XTK- crosstrack error | • VMG- velocity made good |
| • TRN- turn angle to wpt | • WPT- active wpt name |

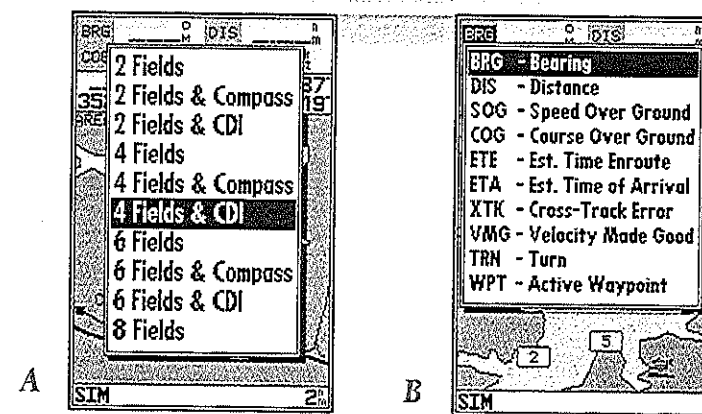
To change a data field:

1. Highlight the 'Change Data Fields?' option and press **EDIT/ENTER**.
2. Move the field highlight to the desired field and press **EDIT/ENTER**.
3. Select a data field option and press **EDIT/ENTER**.

- **Restore Defaults?**— resets all map page options (except map configuration options, see pages 27-28) to the factory settings.
- **Setup Simulator?**— allows you to define speed, course, and position values while in simulator mode. See the Getting-Started Tour for more on using simulator mode.

MAP PAGE SECTION 3

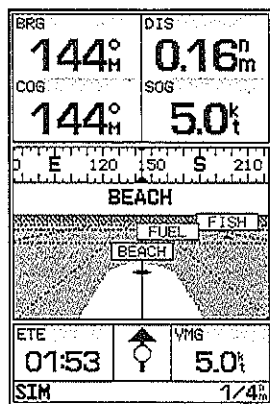
Page Display & Data Fields



- A. The map page can be configured to display a variety of navigation data.
- B. Each data field can be set to display one of ten data options.

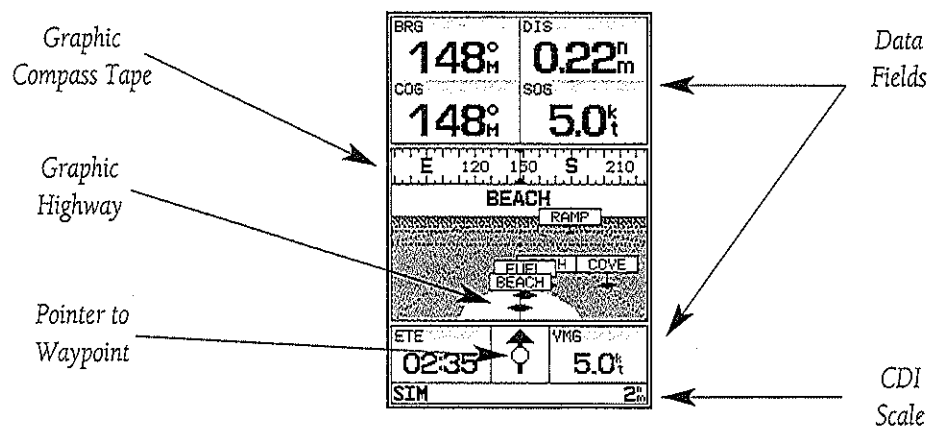
SECTION 4 NAVIGATION PAGE

Overview



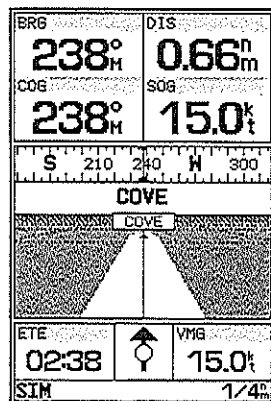
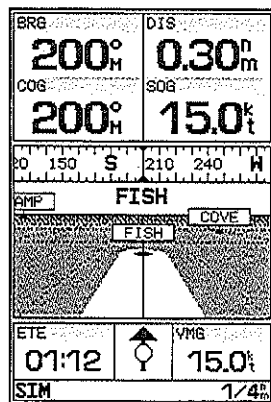
The Navigation Page can be configured to show the active waypoint, all route waypoints and/or nearby waypoints on the graphic highway.

GPSMAP 230 Navigation Page



Whenever a GOTO, MOB, TracBack or route has been activated, the GPSMAP 230 will provide digital and graphic steering guidance to the destination with the Navigation Page. The top half of the nav page features four user-selectable **data fields** that display the bearing (BRG) and distance (DIS) to waypoint, along with your current course (COG) and speed over ground (SOG). In addition, there's a moving compass tape to indicate the direction you're heading. Two additional data fields at the bottom of the page show the estimated time enroute (ETE) and velocity made good (VMG) to your destination.

The middle section of the screen provides visual guidance to the waypoint on a **graphic highway** display. The line down the center of the highway represents your desired track, while a graphic indication of the distance and direction you are off course is shown on a scale at the bottom right of the page (the selected scale represents the distance from side to side). The **arrow pointer** below the highway always points to the destination waypoint relative to the direction you are moving.



As you head toward your destination, the highway will move to indicate your progress to the waypoint and which direction you should steer to stay on course. If you are navigating a route, the Navigation Page will show each route waypoint in sequence, with the active leg indicated by the white portion of the highway. Nearby waypoints not in the active route will also be displayed. The highway scale may also be zoomed in or out to display a larger or smaller view of the highway. Five scales are available from 1/4 to 4 nm, with a default setting of 1/4 nm.

To change the highway scale:

1. Press the **IN** or **OUT** key to select the desired setting.

Navigation Page Options

The GPSMAP 230's navigation options page allows you to define the nav data fields and select what waypoints are displayed on screen.

To display the Navigation Page options:

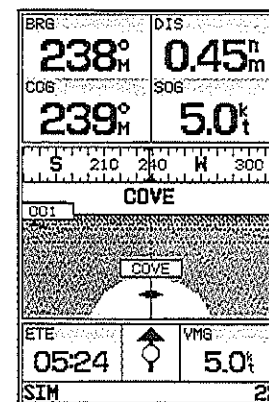
1. Press **MENU**.

To select a menu option:

1. Highlight the desired option and press **EDIT/ENTER**.

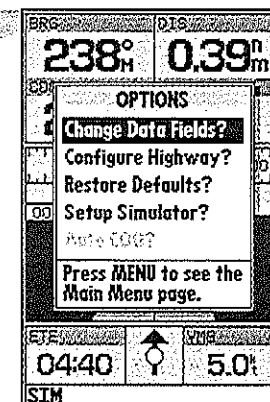
NAVIGATION PAGE SECTION 4

Highway Scale & Nav Page Options



A

A. To change the highway scale, press the IN and OUT keys.

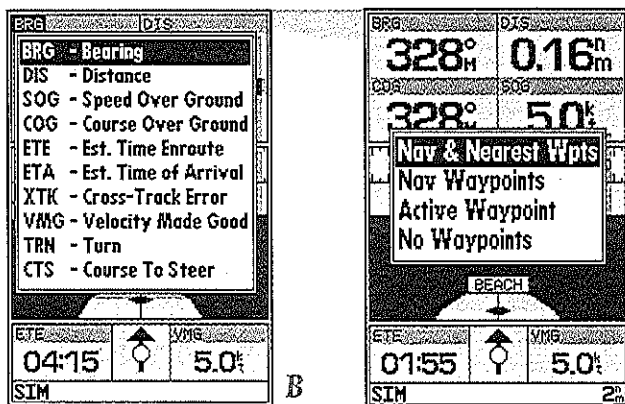


B

B. The navigation options page lets you set up the Navigation Page to your own preferences.

SECTION 4 NAVIGATION PAGE

Nav Page Options



- A. Ten data options are available for each data field on the Navigation Page. The digital crosstrack error option is especially useful to display the exact distance you are off course in feet/miles or meters.
- B. To select what waypoints appear on the graphic highway, highlight the desired setting and press EDIT/ENTER.

The following options are available for the Navigation Page:

- **Change Data Fields?**— allows you to define the data displayed in any of the six user-selectable data fields. Ten data options are available:
 - BRG— bearing to active wpt
 - SOG— speed over ground
 - ETE— estimated time enroute
 - XTK— crosstrack error
 - TRN— turn angle to wpt
 - DIS— distance to active wpt
 - COG— course over ground
 - ETA— estimated time of arrival
 - VMG— velocity made good
 - CTS— course to steer

To change a data field:

1. Highlight the 'Change Data Fields?' option and press **EDIT/ENTER**.
2. Highlight the field you want to change and press **EDIT/ENTER**.
3. Select the desired data field option and press **EDIT/ENTER**.

- **Configure Highway?**— allows you to select what waypoints are shown on the highway display. Four options are available:

- Nav & Nearest Waypoints— all route and nearest waypoints displayed
- Nav Waypoints— only waypoints in the active route will be displayed
- Active Waypoint— only the active waypoint will be displayed
- No Waypoints— no waypoints will be displayed

To configure the highway display:

1. Highlight the 'Configure Highway?' option and press **EDIT/ENTER**.
2. Select the desired option and press **EDIT/ENTER**.

- **Restore Defaults?**— resets all navigation page options to the factory settings.
- **Setup Simulator?**— allows you to define speed, course, and position values while in simulator mode. See pages 4-16 for more details on using simulator mode.
- **Auto COG?**— allows you to reset automatic steering while simulating navigation and cancel any course adjustments made with the **⬇** keypad.

Main Menu Page

The GPSMAP 230's Main Menu Page provides access to various waypoint, system, navigation, and interface management and setup menus. The Main Menu Page is available from any page in the GPSMAP 230's system, and is accessed through the **MENU** key.

MAIN MENU	
Nearest Waypoints	
Proximity Waypoints	
Create Waypoint	
Waypoints	
Routes	
Track	
Trip & Fuel Planning	
System Setup	
Navigation Setup	
Timers & Alarms	
Input/Output	
SIM	

To access the Main Menu Page:

1. Press **MENU** twice.

The 11 submenus are divided into categories by function.

To select a submenu from the Main Menu Page:

1. Highlight the submenu you want to view and press **EDIT/ENTER**.

For specific instructions on using a submenu, see the waypoints, route, or setup sections of this manual.

MAIN MENU PAGE

Overview

SECTION 5

A

MAIN MENU	
Nearest Waypoints	
Proximity Waypoints	
Create Waypoint	
Waypoints	
Routes	
Track	
Trip & Fuel Planning	
System Setup	
Navigation Setup	
Timers & Alarms	
Input/Output	
SIM	

B

MAIN MENU	
Nearest Waypoints	
Proximity Waypoints	
Create Waypoint	
Waypoints	
Routes	
Track	
Trip & Fuel Planning	
System Setup	
Navigation Setup	
Timers & Alarms	
Input/Output	
SIM	

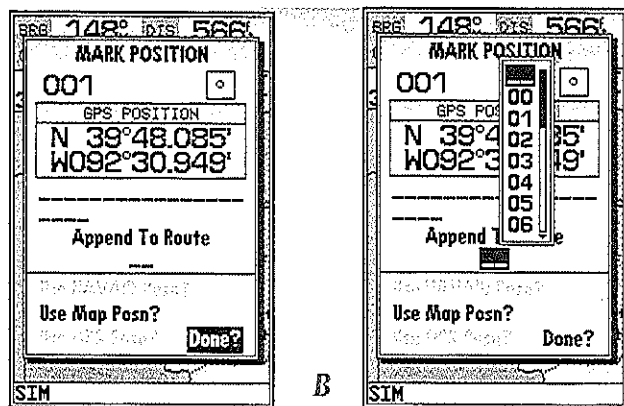
- A. The waypoint category options on the Menu Page are described in the 'Waypoints' section on pages 34-42.
- B. The routes category options are described on pages 47-54.

SECTION

6

WAYPOINTS

Creating Waypoints & MARK Key



- A. The MARK key is used primarily to mark your present position, but it can also be used to mark the cursor or a navaid position from the map page.
- B. The mark position page also allows you to add the new waypoint to the end of any route. If you're heading out without a planned route, you can create a series of waypoints along the way with the mark key and save them to an open storage route. When you're ready to head back, simply invert the route to get back (see page 51).

Creating and Using Waypoints

The GARMIN GPSMAP 230 stores up to 250 alphanumeric waypoints with a user-defined icon and comment available for each waypoint. Waypoints can be created using three basic methods:

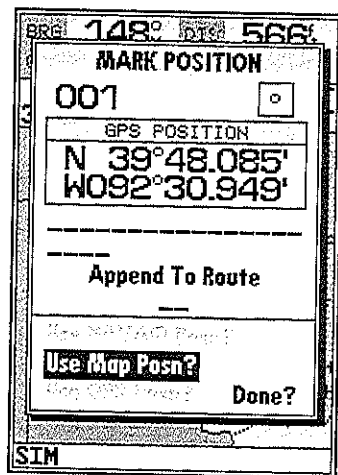
- **MARK key**— used primarily for marking your present position, the **MARK** key also provides options that allow you to select a map or navaid position from the map display.
- **On Map**— allows you to define a new waypoint position from the map display using the cursor.
- **Text Entry**— allows you to enter a new waypoint's position coordinates manually (from a chart, etc.) or by referencing it's bearing and distance from a stored waypoint or your present position.

Mark Key

The GARMIN GPSMAP 230's **MARK** key lets you quickly capture your present position— or cursor or navaid position— in order to create a new waypoint. You must have a valid position fix to mark your present position.

To mark your present position:

1. Press the **MARK** key. The mark position page will appear, with a default three-digit name for the new waypoint.
2. To accept the waypoint with the default name, symbol and comment (the date and time of creation), press **EDIT/ENTER** to confirm the 'Done?' prompt.
3. To enter a different name, symbol or comment, highlight the appropriate field and press the **EDIT/ENTER** key.
4. After entering and confirming your changes, move the field highlight back to the 'Done?' prompt and press **EDIT/ENTER**.



The MARK key may also be used on the Map Page to mark the cursor position or an on-screen navaid. To mark a navaid, select the desired navaid with the cursor. The GPSMAP 230 will use the navaid text shown on the cartography as the default comment.

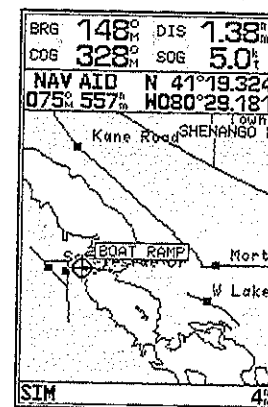
To mark the cursor or navaid position with the **MARK** key:

1. Use the **⬅** keypad to move the cursor to the desired position or navaid.
2. Press the **MARK** key.
3. Highlight the 'Use Map Posn?' or the 'Use NAVAID Posn?' option and press **EDIT/ENTER**.
4. To accept the waypoint with the default name, symbol, and comment (the date and time of creation), press **EDIT/ENTER** to confirm the 'Done?' prompt.
5. To enter a different name, symbol or comment, highlight the appropriate field and press the **EDIT/ENTER** key.
6. After entering and confirming your changes, move the field highlight back to the 'Done?' prompt and press **EDIT/ENTER**.

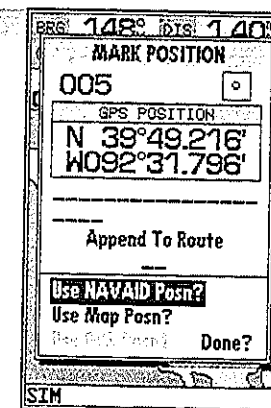
WAYPOINTS

Using the MARK Key

SECTION 6



A



B

- A. To create a waypoint at an on-screen navaid, move the cursor over the desired navaid.
- B. Press the MARK key and select the 'Use Navaid Posn?' option. Press EDIT/ENTER to finish.