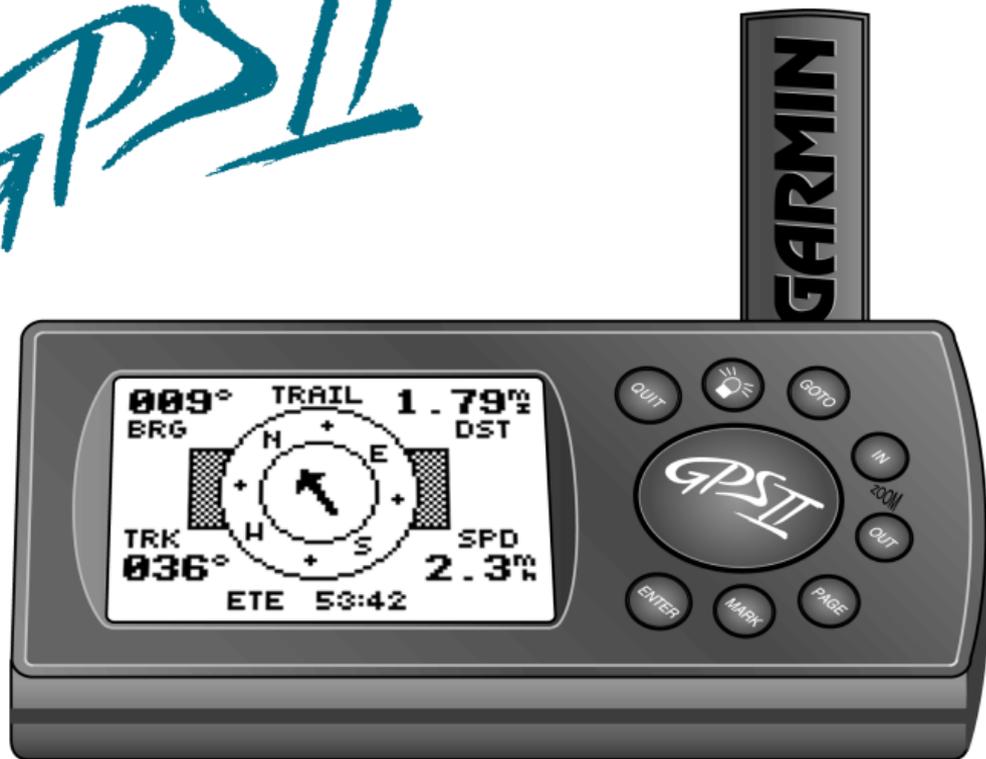


GPST II



Owner's Manual & Reference



Software Version 2.0 or above

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Thank You!

Thanks for choosing the GARMIN GPS II—the smallest, easiest-to-use GPS navigator for outdoor use! The GPS II represents GARMIN's continuing commitment to provide quality navigation information in a versatile and user-friendly flexible design you'll enjoy for years. To get the most from your new GPS, take the time to read through the owner's manual in order to understand the operating features of the GPS II. This manual is organized into three sections for your convenience:

Section One (Read Me First!) takes you through step-by-step instructions to initialize the receiver for first-time use.

Section Two (Getting-Started Tour) introduces you to the basic features of the unit and provides a quick-start orientation to the GPS II.

Section Three (Reference) provides details about the advanced features and operations of the GPS II by topic.

Before getting started with your GPS, check to see that your GARMIN GPS II package includes the following items. If you are missing any parts, please contact your dealer immediately.

Standard Package:

- GPS II Unit
- Wrist Strap
- GPS II Owner's Manual
- Velcro Mount

CAUTION!



The Global Positioning System (GPS) is operated by the government of the United States, 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 GPS II is a precision electronic NAVigation AID (NAVAID), any NAVAID can be misused or misinterpreted and, therefore, become unsafe.

WARNING



For vehicular applications, it is the sole responsibility of the owner/operator of the GPS II to secure the GPS unit so that it will not cause damage or personal injury in the event of an accident. Do not mount the GPS II over airbag panels or in a place where the driver or passengers are likely to have an impact with it in an accident or collision. The mounting hardware provided by GARMIN is not warranted against collision damage or the consequences thereof.

WARNING



For vehicular operations, it is the sole responsibility of the operator of the vehicle to operate his or her vehicle in a safe manner, maintain full surveillance of all driving conditions at all times, and never become distracted by the GPS II to the exclusion of safe operating practices. It is unsafe to operate the GPS II while you are driving. Failure by the operator of a vehicle equipped with a GPS II to pay full attention to operating the vehicle and road conditions while the vehicle is in motion could result in an accident or collision with property damage and personal injury.

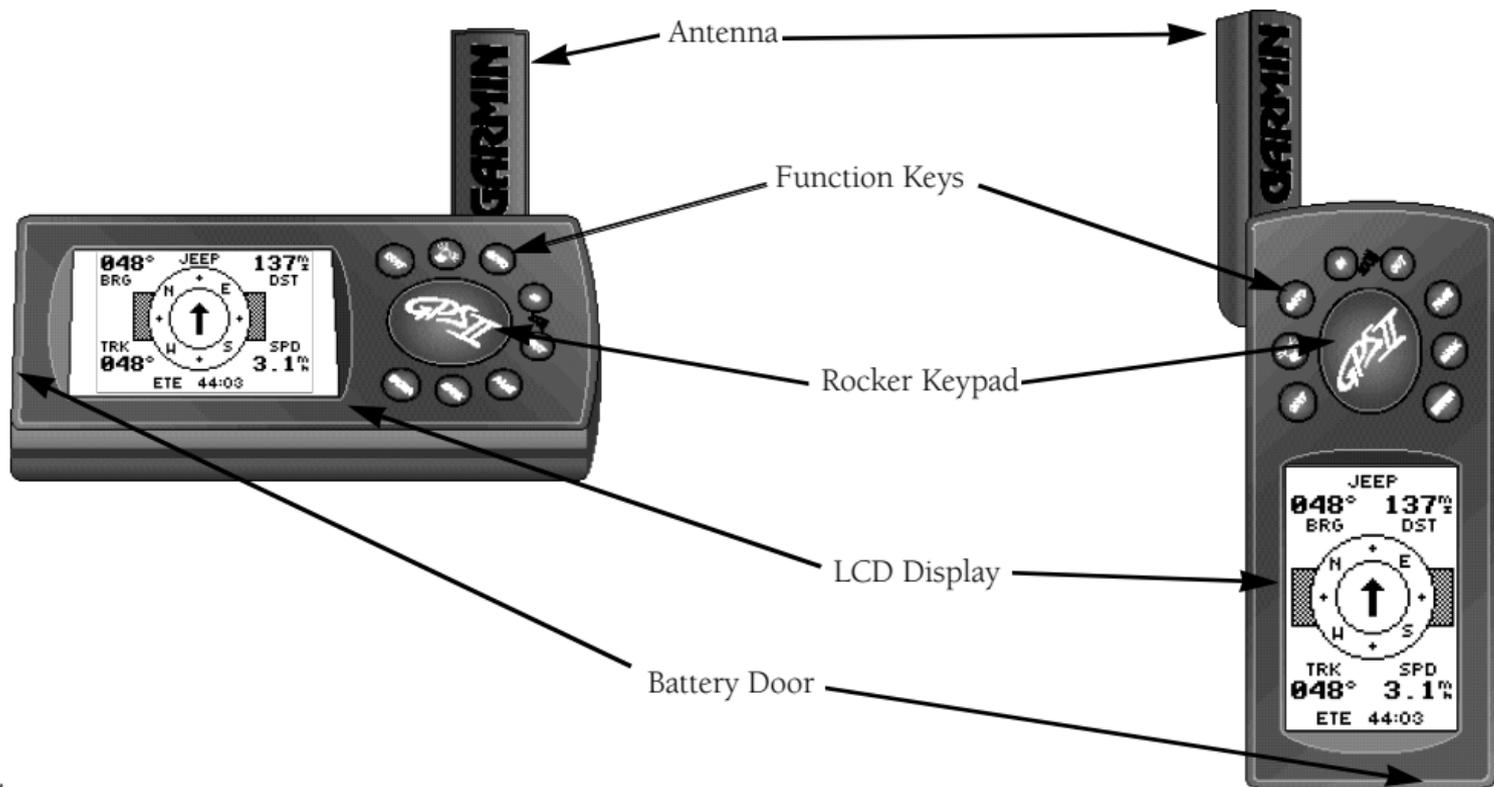
This device complies with Part 15 of the FCC limits for Class B digital devices. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

There is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to other equipment, which can be determined by turning the affected 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 other qualified service technician for additional help if these remedies do not correct the problem. Operation is subject to the following conditions: (1) This device cannot cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

The GPS II does not contain any user-serviceable parts. Repairs should only be made by an authorized GARMINservice center. Unauthorized repairs or modifications could void your warranty and your authority to operate this device under Part 15 regulations.

UNIT FEATURES



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KEYPAD USAGE/OPERATING TERMS

(POWER)— Turns the unit on and off, and controls three-levels of screen backlighting intensity.

(PAGE)— Scrolls the main pages in sequence and returns the display from a submenu page to a main page.

(MARK)— Captures your present position and displays the mark position window.

(GOTO)— Displays the GOTO waypoint window, allowing you to select the destination waypoint.

(ENTER)— Activates highlighted fields and confirms menu options and data entry.

(QUIT)— Returns the display to a previous page or restores a data field's previous value.

(ZOOM)— Provides 12 adjustable fields by selecting either the in or out keys from the map page.

(KEYPAD)— Controls the movement of the cursor and is used to select options and positions, and to enter data.

SYSTEM SETUP	
MODE:	Simulator?
DATE	02 AUG 96
TIME	02:45:24pm
OFFSET:	+00:00
HOURS:	12
CONTRAST:	█
LIGHT TIMEOUT:	15 SEC

← *'Mode'
Field*

CURSOR— Solid black bar which can be moved up, down, left, and right with the keypad to select individual fields.

DEFAULT— A system-selected format, built into a software program or the unit's memory, that will be followed unless the user chooses a different setting.

FIELD— The location on a page where a group of characters or option is entered and displayed.

HIGHLIGHT— The act of using the cursor to select a field for the purpose of entering data.

SCROLL— Moving through characters or options from a selected field.

What is GPS?

GPS is a system of 24 satellites which circle the earth twice a day in a very precise orbit and transmit information to earth. The GPS II must continuously “see” at least three of these satellites to calculate your position and track your movement.

By using an almanac (a timetable of satellite numbers and their orbits) stored in the receiver’s memory, the GPS II can determine the distance and position of any GPS satellite and use this information to compute your position.

Your GPS receiver can only see satellites above the horizon, so it needs to know what satellites to look for at any given time. To use this almanac data, your GPS needs to either be told its general location or given the opportunity to find itself, or “initialize.” Once you initialize the unit to a position, it will usually compute a fix within a few minutes.

Initialization is only necessary under the following conditions:

- The first time you use your GPS II (from the factory).
- After the GPS II has been moved over 500 miles from the last time you used it (with the power off).
- If the GPS II’s memory has been cleared and all stored data has been lost.





To prevent accidental battery power loss, the GPS II will automatically shut off 10 minutes after the last keystroke if the unit is not tracking at least one satellite and has never acquired a position fix.

Satellite Signals

Because the GPS II relies on satellite signals to provide you with navigation guidance, the receiver needs to have an unobstructed, clear view of the sky for best performance. In a nutshell, the GPS receiver's view of the sky will generally determine how fast you get a position fix—or if you get a fix at all. GPS signals are relatively weak and do not travel through rocks, buildings, people, metal, or heavy tree cover, so remember to keep a clear view of the sky at all times for best performance.

Once the GPS II has calculated a position fix, you'll usually have anywhere from four to eight satellites in view. The GPS II will then continuously select the best satellites in view to update your position. If some of the satellites in view get blocked or "shaded," the receiver can simply use an alternate satellite to maintain the position fix. Although a GPS receiver needs four satellites to provide a three-dimensional (3D) fix, the GPS II can maintain a two-dimensional (2D) fix with only three satellites. A three-dimensional fix means the unit knows its latitude, longitude, and altitude, while a two-dimensional fix means the unit knows only its latitude and longitude.

Battery Installation

The GPS II operates on 4 AA batteries, which are installed at the base of the unit. Normal battery life is approximately 15 hours, and up to 20 hours when the unit is in battery saver mode.

To install the batteries:

1. Flip up the metal ring at the base of the unit, and turn the ring 90 degrees count clockwise.
2. Install the batteries (Fig. 5), and close the battery compartment door.
3. Lock the door in the closed position by rotating the metal ring 90 degrees clockwise.

Battery life varies due to a variety of factors, including temperature, backlighting, and whether the unit is in battery saver mode. You may find that you get more or less battery life in different conditions.

When replacing the GPS II's batteries, observe the polarity markings engraved in the plastic case.

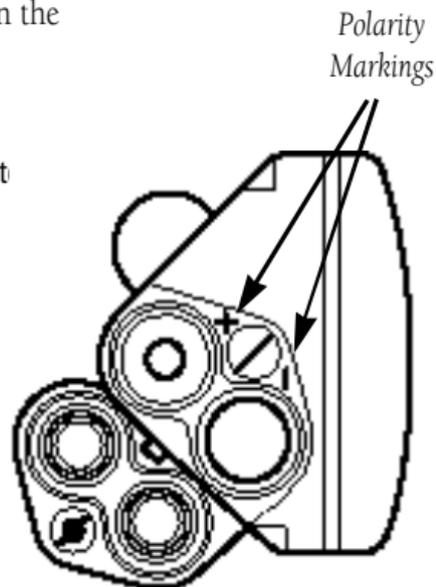


Fig. 5

Screen Orientation



Fig. 6a



Fig. 6b

The GPS II has a unique screen orientation feature for switching from a horizontal mounting position in a vehicle or on a bike to a vertical orientation for handheld outdoor use, such as hunting or hiking. The GPS II's rocker keypad and single-use keys are designed to function in the same manner, no matter if you're using the unit vertically (Fig. 6a) or horizontally (Fig. 6b).

To change the screen orientation:

1. Press and hold PAGE.

Initializing Your GPS II

To initialize the GPS II, take the receiver outside and find an open area where the antenna has a clear view of the sky. You may either hold the receiver at a comfortable height with the external antenna pointing up (Fig. 7a), or mount the receiver on the dash of a vehicle (Appendix B) or on a bike. (Likewise, when you use your GPS II in a vehicle, make sure the antenna is pointing up.)

To turn the GPS II on, press and hold the power key.

The welcome page will be displayed while the unit conducts a self test. Once testing is complete, the welcome page will be replaced by the satellite status page. You'll see the EZinit prompt, which asks you to choose an initialization method. Note: If the EZinit prompt has not automatically appeared, press ENTER.

To initialize your unit:

1. Press ENTER (Fig. 7b). (The word 'COUNTRY' in the first prompt will already be highlighted.)
2. Use the rocker keypad to scroll up or down through the list of countries to select your country/state/region. If the country you're in isn't listed, select another country within 500 miles of your present position, and press ENTER.



Fig. 7a

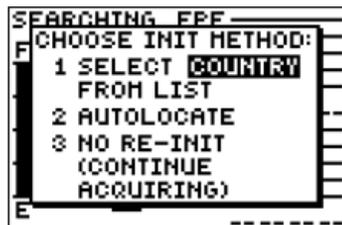
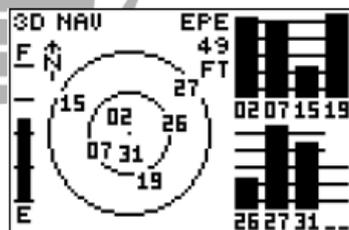


Fig. 7b



Check the satellite status page for 2D or 3D navigation to verify a position fix.



Fig. 8a

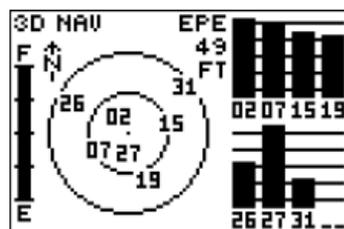


Fig. 8b

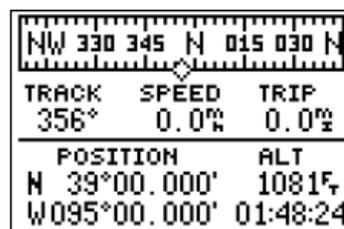


Fig. 8c

This usually provides a position fix in 3-5 minutes*. You'll know you have a fix when the unit automatically transitions from the satellite status page to the position page (Figs. 8b-8c). Your receiver is now ready for everyday use!

To turn the unit off:

1. Press and hold the red power key for three seconds (Fig. 8a).

*(The almanac data stored in your GPS' memory is typically valid for 3-6 months. If your unit has older data, the time required for initialization may take 15 to 30 minutes.)



If you have trouble initializing or getting a position fix, check the following:

- **Does the receiver have a clear view of the sky?**

If there are large buildings or mountains, or if there is heavy tree cover, the receiver may not be receiving enough satellite signals to calculate a fix. Also, if you're using the GPS II on a car dash, make sure the unit is placed so that it has the clearest possible view of the sky. Your GPS will only be able to detect satellites that it can "see" through your vehicle's windshield. Depending on the slope of your dash or the overall surface area of the window, it may be necessary to mount an external antenna on your vehicle's roof or trunk in order to give the unit a better view of the sky. (Contact your local GARMIN dealer and inquire about the GA26 low-profile remote antenna, part number 010-10052-02)

- **Have you selected the right country/state/region from the EZinit list?**

Check for the correct approximate lat/lon on the position page, or reselect the appropriate country from the list to restart the initialization.

- **Have you moved more than 500 miles from the last calculated position with the receiver off?**

Reinitialize the receiver by selecting the country/state/region of your new location from the EZinit list.

Scrolling Through the Main Pages

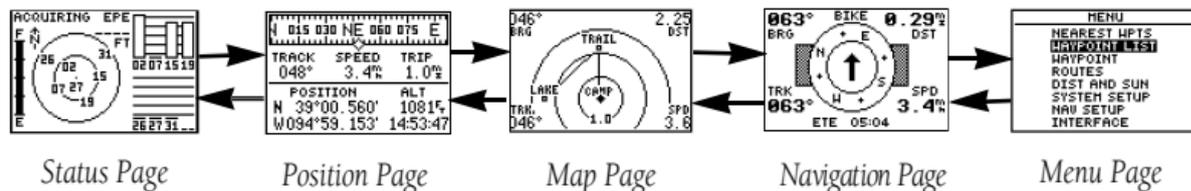


Fig. 10

The GPS II features five main pages which are linked together in a chain (Fig. 10). You can quickly scroll through the pages in either direction using PAGE or QUIT. Let's briefly tour each of these pages in order to give you some insight into how they help you navigate. We'll go over all of them in much more detail in the reference section of this manual.

This tour assumes that you have only initialized the receiver and have not changed any of the factory settings (units of measure, selectable fields, etc.). If you have changed any of the default settings, the pictures and descriptions in the tour may not match your unit. Also, make sure your unit's screen is orientated horizontally.

Satellite Status Page

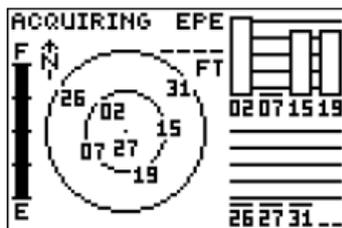
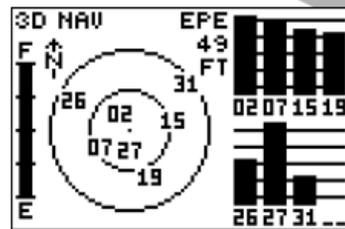


Fig. 11

Let's start with the satellite status page, which is the page you'll view while your unit is getting a position fix. If you're not already on this page, press PAGE or QUIT until it appears. The satellite status page shows you status information that helps you understand what the receiver is doing at any given time, and it's a page that you'll want to occasionally refer back to as you use your unit. It features a sky view of available satellites, signal strength bars, the status of your current position fix (acquiring, 2D, 3D, etc.), and your estimated position error (EPE). You can also tell how much battery power is remaining (Fig. 11). Once your GPS II has acquired sufficient satellites, the satellite status page will automatically be replaced by the position page (as long as you haven't pressed any other buttons).



The signal strength bars give you an indication of what satellites are visible to the receiver, whether or not they're being used to calculate a position fix, and the signal quality.

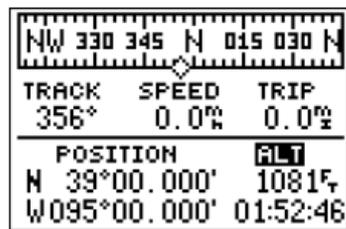


Fig. 12

Position Page

The position page (Fig. 12) shows you where you are, what direction you're heading, and how fast you're going—and it's the page you'll want to use when you don't have an active destination selected.

A graphic compass display at the top of the page shows your direction of travel, while five data fields below display your track and speed, a trip odometer, and your position and altitude. The 'trip' and 'altitude' fields are user-selectable, which means you can change them to display other navigation information. We'll cover more about those fields in the reference section of this manual.

Marking a Position

GPS is really about marking and going to places called waypoints. Before we can use our GPS II to guide us somewhere, we have to mark a position as a waypoint.

To mark a position:

1. Press MARK.

The mark position page will appear, showing the captured position and a default 3-digit waypoint name. Let's change the default name to something a little more meaningful, like 'HOME' (Fig. 13).

To name a waypoint:

1. Use the keypad to highlight the name field, and press ENTER.
2. Enter the waypoint name 'HOME', and press ENTER.
3. Highlight 'SAVE?', and press ENTER.

The mark position page will be replaced by the position page (the page displayed before pressing MARK). The 'HOME' waypoint is now stored in the GPS II's memory, which is maintained by an internal lithium battery.



Fig. 13



If you try to mark a position without a position fix, you will be alerted with a 'No Position' message.

NW 330 345 N 015 030 N		
TRACK	SPEED	TRIP
356°	3.1%	0.0%
POSITION		ALT
N 39°00.003'	10814'	
W095°00.000'	01:55:33	

You can even time yourself with the GPS II's on-screen clock.

Using the Position Page

Now that you've marked a position, it's time to take a brisk walk using the position and moving map pages to watch your every move. You should still be on the position page.

To get the most from this tutorial, walk in a straight line for 3-4 minutes at a fast pace and watch the position page. (Because the GPS system typically has a margin of error of approximately 15 meters, you'll need to walk this long to ensure that you travel far enough to register useful information. You'll also get a much better indication of how the GPS II's steering guidance and mapping features work to guide you.)

You'll see that the direction you are moving (track), your speed, and how far you've gone displayed in the middle of the screen, just below the graphic compass display. The latitude, longitude and approximate altitude of your position are displayed at the bottom of the page, with the time of day displayed below.

To continue the tour, let's move on to the next page:

1. Press PAGE.

Moving Map Page

The GPS II's next page, the moving map page, shows your movement as a real-time track log (electronic breadcrumb trail), and your present position as a diamond icon in the center of the map. You'll notice the black square below the diamond, which represents the position you just created ('HOME'), and the line between the two, which shows your track (Fig. 15a).

Nearby waypoints are represented as squares, with the waypoint name listed above the square. When you want to change the map scale, simply use the zoom keys ("in" and "out") to select the desired scale. We'll cover more about other information you can obtain from this field in the reference section.

1. Now turn 90° to your right and continue walking at a fast pace for another 2-3 minutes. Notice how the display changes, always keeping the direction you are moving at the top of the map. (Fig. 15b)

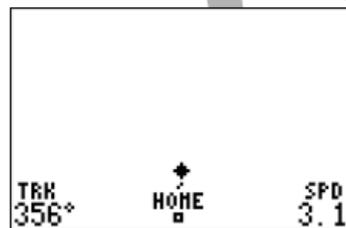


Fig. 15a

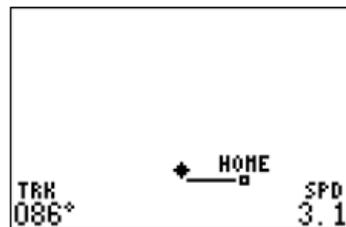


Fig. 15b



Fig. 16a

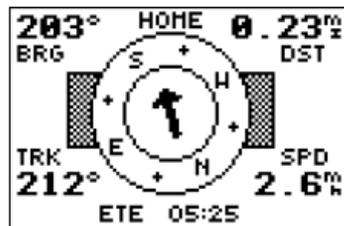


Fig. 16b

Going To a Waypoint

Once you've stored a waypoint in memory, you can use the GPS II to guide you to it by performing a simple GOTO. A GOTO is really nothing more than the receiver drawing a straight-line course from your present position to the destination you've selected. To see how it works, let's try navigating back to our starting position, the HOME waypoint.

To select a GOTO destination:

1. Press GOTO.
2. Highlight the 'HOME' waypoint, (Fig. 16a) and press ENTER.

You'll notice that you'll automatically be on the default navigation page, the compass page (Fig. 16b). Let's navigate back to 'HOME' using this page.

Compass Page

The compass page is the default navigation page for the GPS II, and provides a rotating compass in the middle of the page. The compass ring shows your actual direction of travel while you're moving, and the pointer arrow in the middle points to your destination (selected waypoint). As you move toward 'HOME', notice how the compass rose and the pointer arrow provide a clear picture of the direction you're moving and the direction of 'HOME'. Note: The pointer arrow may not give accurate direction guidance unless you are moving at a fast pace.

The bearing and distance to a waypoint are displayed at the top of the screen, and your current track and speed are shown below. The default 'ETE' field, at the bottom of the screen between the 'track' and 'speed' fields (Fig. 17a), is a user-selectable field that can provide a variety of navigation information. We'll cover more about that field in the reference section of this manual.

As you get close to 'HOME', you'll be alerted to press PAGE. The GPS II will give you the message "Approaching HOME" (Fig. 17b). Once you've arrived, you'll notice the distance field will read 0.00.

To continue the tour, let's move on to the next page:

1. Press PAGE.

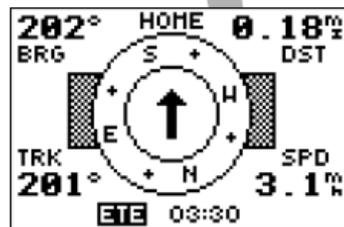


Fig. 17a



Fig. 17b



Fig. 18a



Fig. 18b

Menu Page

You've already seen the first four pages in action by acquiring satellites, marking a position, and navigating to a destination. The last page available from the main page sequence is the menu page (Fig. 18a), which provides access to the GPS II's waypoint management, route, and setup features.

Clearing the Track Log

After you've practiced and used the GPSII for a few trips, you may find that your map display has become cluttered with track plots of your every move. To get a feel for how the map and track features work, let's clear the track log (the plot points left on the map page) we've just created during the Getting Started tour.

To clear the track log:

1. Scroll to the map page, and press ENTER.
2. Highlight the 'track setup' field, and press ENTER.
3. Highlight the 'clear log?' field (Fig. 18b), and press ENTER.
4. Highlight 'Yes?', and press ENTER.



Congratulations! You've just completed the Getting-Started Tour! You now know enough about the GPS II to go out and have some fun with it.

We strongly recommend that you read on and explore the Reference section, which contains a closer look at all of the exciting features of the GPS II. The first two sections of this manual have only explored a small part of what this unit can do for you. The next section will describe GARMIN's state-of-the-art operating system, which is second to none in the world of GPS receivers. In fact, because there are so many things this unit can do for you, you won't be using it to its full capacity unless you read on. As you delve further into the GPS II and become more familiar with its many features, you'll find that it's one navigation tool that you'll grow into— for years to come.

To turn your GPS II off:

1. Press and hold the red power key (Fig. 19).



Fig. 19

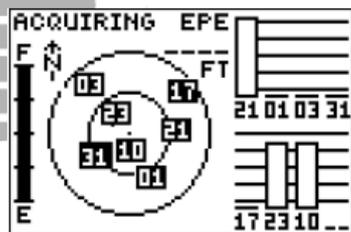


Fig. 20a

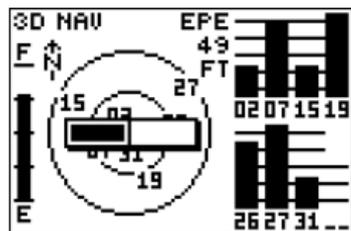


Fig. 20b

Satellite Status Page

The GPS II's satellite status page provides a visual reference of satellite acquisition and position. As the receiver locks onto satellites, a signal strength bar will appear for each satellite in view, with the appropriate satellite number (1-32) underneath each bar. The progress of satellite acquisition is shown in three stages:

- No signal strength bars— the GPS II is looking for the satellites indicated.
- Hollow signal strength bars— the GPS II has found the satellite(s) and is collecting data (Fig. 20a).
- Solid signal strength bars— the GPS II has collected the necessary data and the satellite(s) is ready for use (Fig. 21b).

Each satellite has a 30-second data transmission that must be collected (hollow bar status) before that satellite may be used for navigation (solid bar status). Once a fix has been calculated, the GPS II will then update your position, track, and speed by selecting and using the best satellites in view. You can also access the GPS II's contrast feature from this page (see pg 73).

To adjust the screen contrast:

1. Press the rocker keypad, adjust the level of contrast (Fig. 20b), and press ENTER.

Sky View and Signal Strength Bars

The sky view and signal strength bars give you an indication of what satellites are visible to the receiver, whether or not they are being used to calculate a position fix, and the signal quality. The satellite sky view shows a bird's-eye view of the position of each available satellite relative to the unit's last known position. The outer circle represents the horizon (north up); the inner circle 45° above the horizon; and the center point directly overhead. You can use the sky view to help determine if any satellites are being blocked, and whether you have a current position fix (indicated by a '2D NAV' or '3D NAV' (Fig. 21b) in the status field.

When the receiver is looking for a particular satellite, the corresponding signal strength bar will be blank and the sky view indicator will be highlighted. Once the receiver has found the satellite, a hollow signal strength bar will appear, indicating that the satellite has been found and the receiver is collecting data from it (Fig. 21a). The satellite number in the sky view will no longer appear highlighted. As soon as the GPS II has collected the necessary data to use the satellite for positioning, the hollow bar will become solid.

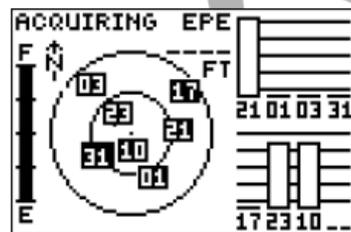


Fig. 21a

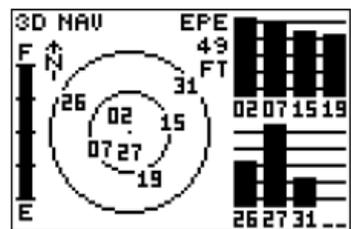


Fig. 21b

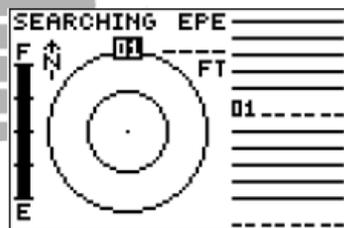


Fig. 22a

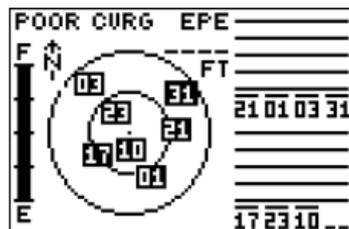


Fig. 22b

Receiver Status and EPE

Receiver status is indicated at the top left of the page, with the current horizontal accuracy (estimated position error, in feet or meters) at the top right. The status will be shown as one of the following conditions:

Searching— the GPS II is looking for any available satellites in view (Fig. 22a).

AutoLocate— the GPS II is initializing and collecting new almanac data. This process can take 7.5 to 30 minutes, depending on satellites currently in view.

Acquiring— the receiver is collecting data from available satellites, but has not collected enough data to calculate a 2D fix.

2D Navigation— at least three satellites with good geometry have been locked onto and a 2-dimensional position fix (latitude and longitude) is being calculated. '2D Diff' will appear when you are receiving DGPS corrections in 2D mode.

3D Navigation— at least four satellites with good geometry have been locked onto, and your position is now being calculated in latitude, longitude and altitude. '3D Diff' will appear when you are receiving DGPS corrections in 3D mode.

Poor GPS Coverage— the receiver isn't tracking enough satellites for a 2D or 3D fix due to bad satellite geometry (Fig. 22b).

Not Usable— the receiver is unusable, possibly due to incorrect initialization or abnormal satellite conditions. Turn the unit off and back on to reset, and reinitialize the receiver if necessary.

Simulator— the receiver is in simulator mode (Fig. 23a).

EZinit Option Prompt

The satellite status page also provides access to the EZinit prompt whenever a position fix has not been calculated (Fig. 23b). The unit must be in searching, AutoLocate, acquiring, simulator, or poor coverage mode. This allows you to reinitialize the unit (see page 7), and is useful if you have traveled over 500 miles with the receiver off and must initialize your new position. (The EZinit prompt will automatically appear if the receiver needs to be initialized. The prompt may also appear during normal use if the antenna is shaded or the unit is indoors.)

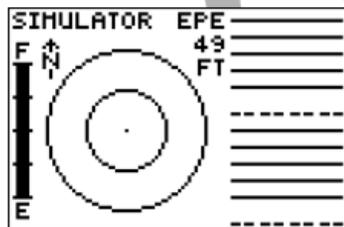


Fig. 23a

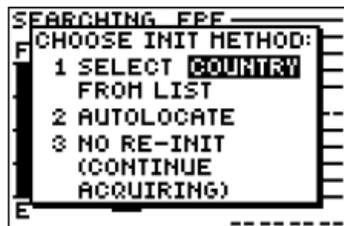


Fig. 23b

Battery Level Indicator

The satellite status page also features a battery level indicator, located to the left of the sky view, which displays the strength of the unit's batteries (Fig. 24).

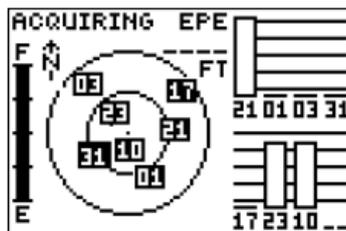


Fig. 24



The battery level indicator is calibrated for alkaline batteries. Ni-Cad and lithium batteries will inaccurately display the battery level at one-half its proper level due to voltage differences. No other receiver functions are affected by using Ni-Cad or lithium batteries.

The GPS II features an internal lithium battery that will maintain the unit's memory for up to 10 years, regardless of whether the four AA batteries are installed.

Screen Backlighting

The GPS II's backlight feature illuminates the screen display for a user-defined interval (the default is 15 seconds) after every keystroke. There are three stages of backlighting. When backlighting is on, a bulb icon will appear at the bottom left of the sky view (Fig. 25). To adjust the duration of the screen backlighting, refer to the operation setup section (see page 71).

To turn the screen backlighting on:

1. Press the red power key.
2. Cycle through the three levels of backlight by pressing the red power key.

To turn the screen backlighting off:

1. Press the red power key.

Whenever the GPS II's backlighting is off, the bulb icon disappears from the satellite status page.

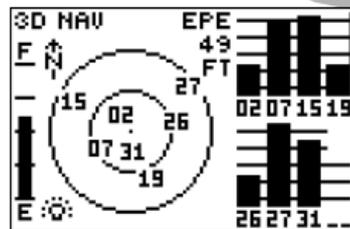
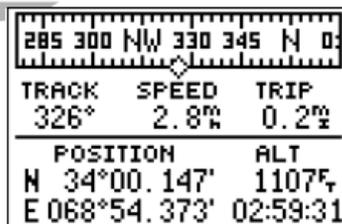


Fig. 25

Note: Using the screen backlighting can greatly reduce battery life. If you're using your GPS primarily in daylight hours, you should keep the backlight timeout at the default 15-second setting.



285 300 NW 330 345 N 0		
TRACK	SPEED	TRIP
326°	2.8%	0.2%
POSITION		ALT
N 34°00.147'	1107'	
E 068°54.373'	02:59:31	

The graphic compass display is designed to show your current track and doesn't serve as a true magnetic compass while you're standing still.

Position Page

The second page in the GPS II's main page sequence is the position page. This page shows you where you are, what direction you're heading, and how fast you're going (up to 103 mph), and is most useful when you are traveling without an active destination waypoint. The graphic heading display at the top of the page indicates the direction you're heading (only while you're moving).

Directly below this display are the track, speed, and trip odometer fields (default). Track is the compass direction representing your actual course over the ground, and speed is how fast you're moving. The lower left-hand corner of the page shows your current latitude and longitude in degrees and minutes. The GPS II uses this basic information to mark exact positions as waypoints, which help guide you from one place to another. The lower right-hand corner of the page contains the altitude field (default).

Both the trip odometer and the altitude fields are user selectable, and both offer a trip odometer, trip timer, and elapsed time so that you can always be sure of viewing this information regardless of the option you've selected to view in the other user-selectable field.



Available user-selectable options on the position page are:

Trip Odometer (TRIP)— shows the total distance traveled since last reset.

Trip Timer (TTIME)— total (cumulative) time in which a ground speed has been maintained since last reset.

Elapsed Time (ELPSD)— shows the overall hours and minutes since last reset.

Average Speed (AVSPD)— calculates the average speed traveled.

Maximum Speed (MXSPD)— shows the maximum speed traveled since last reset.

Altitude (ALT)— measurement of a vertical distance above sea level.

To reset a timer, speed measurement, or odometer:

1. Highlight the user-selectable field, and press ENTER.
2. Press ENTER to confirm the 'RESET?' prompt, or QUIT to exit.

The trip odometer, trip timer, and average speed fields are linked, so resetting one of these options in one user-selectable field will automatically reset the corresponding data in the other. That way, the information provided in these fields is relative to your current trip.

NAV SETUP	
POSN:	hddd°mm. mmm'
DATUM:	WGS 84
CDI SCALE:	±0.25
UNITS:	Statute
HEADING:	Auto Mag E003

The position format and units of measure for speed, distance, position, and altitude are all user-selectable through the navigation setup page (see pages 74). The 12/24 hour clock and time offset options are available from the system setup page (see page 72).

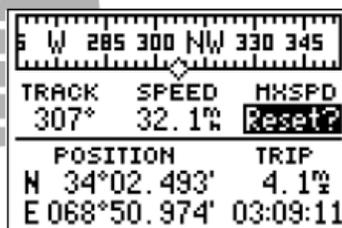


Fig. 28a

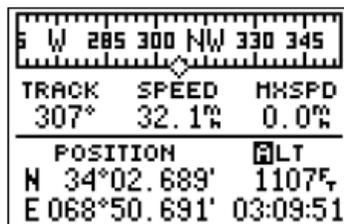


Fig. 28b

Maximum Speed Field

To obtain the most accurate reading of average speed, keep in mind that due to the sensitivity of the GPS II's antenna, your maximum speed value may include the effects of rapid movement, such as swinging your arm while holding the unit.

To reset the maximum speed field:

1. Highlight the 'maximum speed' field, and press ENTER.
2. Press ENTER to confirm the 'RESET?' prompt (Fig. 28a).

Altitude Field

When the GPS II is acquiring satellites or navigating in the 2D mode, the last known altitude will be used to compute your position. If the altitude shown is off by several hundred feet, you can manually enter your altitude for greater accuracy. In cases where the GPS II has only 2D coverage, entering your approximate altitude will enable the receiver to determine a 3D fix.

To enter an altitude:

1. Highlight the 'alt' field, and press ENTER (Fig. 28b).
2. Enter a value, and press ENTER.

Marking and Saving Waypoints

The GPS II allows you to mark, store, and use up to 250 positions as waypoints. Waypoints serve as electronic markers that let you keep track of starting points, destinations, nav aids, etc. A waypoint position can be entered by taking an instant electronic fix, by manually entering a coordinate, or by referencing a bearing and distance to an existing waypoint.

To mark your present position:

1. Press MARK. The mark position page will appear, showing the captured position and a default three-digit waypoint name (Fig. 29).
2. Press ENTER.

MARK POSITION	
Waypoint:	Add to route number:
001	---
N 39°00.000'	
W 095°00.000'	SAVE?

Fig. 29

MESSAGES
No Position
Searching the Sky
PRESS PAGE

If you try to mark a waypoint without having a position fix, you'll be notified with a 'No Position' message.

MARK POSITION	
Waypoint:	Add to route number:
TRAIL <input type="checkbox"/>	--
N 34°00.000'	SAVE?
E 068°54.375'	

Fig 30a

MARK POSITION	
Waypoint:	Add to route number:
TRAIL	<input checked="" type="checkbox"/>
N 34°00.000'	SAVE?
E 068°54.375'	

Fig. 30b

Marking a Position

When marking a position, you may also choose to change the default name or add the waypoint to a route.

To change the default position name:

1. Highlight the 'name' field, and press ENTER.
2. Enter a value in the appropriate 'character' field (Fig. 30a), highlight 'SAVE?', and press ENTER.

If you'd like to add this waypoint to a route:

1. Highlight the 'add to route number' field, press ENTER, and enter a route number (Fig. 30b).
2. Press ENTER to confirm the route number, and ENTER again to save the waypoint.

To save the marked waypoint:

1. Highlight 'SAVE?', and press ENTER.

Waypoint Pages

MENU
NEAREST WPTS
WAYPOINT LIST
WAYPOINT
ROUTES
DIST AND SUM
SYSTEM SETUP
NAV SETUP
INTERFACE

Fig 31

The GPS II has three waypoint pages that let you manage a large number of waypoints quickly. These pages—nearest waypoints, waypoint list, and waypoint definition—can be accessed through the menu page.

To select a waypoint page:

1. Access the menu page, and highlight a waypoints page (Fig. 31).
2. Press ENTER.

WAYPOINT	HOME
N 34°00.000'	RENAME?
E 068°54.375'	NEW?
02-AUG-96 14:33	DELETE?
REF: -----	DONE?
BRG DST	
000° 0.00%	

Use the function prompts on the left side of the waypoint definition page to review, rename, or delete stored waypoints, and to create new waypoints manually.

NEAREST WPTS			
NO	WAYPOINT	BRG	DST
1	HOME	177'	0.00
2	TRAIL	177'	0.00
3	ROAD	357'	2.18
4	RIDGE	302'	6.06
5	LAKE	073'	6.93
6	CAMP	276'	7.27

Fig. 32a

WAYPOINT TRAIL	
N 34°00.000'	RENAME?
E 068°54.375'	NEW?
02-AUG-96 15:48	DELETE?
REF: -----	DONE?
BRG DST	
000° 0.00%	

Fig. 32b

Nearest Waypoints Page

The nearest waypoints page shows the nine nearest waypoints that are within 100 miles of your present position, with the bearing and distance noted for each waypoint (Fig. 32a). This page will also let you retrieve a waypoint definition page or GOTO a selected waypoint right from the list.

To review the waypoint definition page of a highlighted waypoint from the list:

1. Highlight a waypoint.
2. Press ENTER.

To return to the nearest waypoint page:

1. Highlight 'DONE?' (Fig. 32b).
2. Press ENTER.

To GOTO a highlighted list waypoint:

1. Highlight a waypoint, and press GOTO.
2. Press ENTER.

Waypoint List Page

The waypoint list page provides a complete list of all waypoints currently stored in the GPS II. If a waypoint is currently used in a route, the lowest route number will be indicated to the left of the waypoint name. The total number of empty and used waypoints is indicated above the waypoint list. From the waypoint list page, you can retrieve a waypoint definition page, delete all user-defined waypoints, or GOTO a selected waypoint.

To review the waypoint definition page of a highlighted list waypoint:

1. Follow the steps outlined on the previous page.

To delete all user-defined waypoints:

1. Highlight 'DEL ALL WPTS?' (Fig. 33a), and press ENTER.

A warning page will appear, asking if you are sure you want to delete all user-defined waypoints and routes.

If you want to continue and delete:

1. Highlight 'Yes?' (Fig. 33b), and press ENTER.



Fig. 33a



Fig. 33b

WAYPOINT		TRAIL
N	39°01.287'	RENAME?
W	094°58.043'	NEW?
07-AUG-96 08:15		DELETE?
REF:	-----	DONE?
BRG	DST	
046°	2.30%	

Fig. 34a

WAYPOINT		PATH
N	39°00.000'	RENAME?
W	095°00.000'	NEW?
09-AUG-96 11:06		DELETE?
REF:	-----	DONE?
BRG	DST	
000°	0.00%	

Fig. 34b

Waypoint Definition Page

The waypoint definition page lets you create new waypoints manually, or review and edit existing waypoints. To create a new waypoint manually, you'll need to know its position coordinates or its approximate distance and bearing from an existing waypoint.

To create a waypoint by entering coordinates:

1. From the waypoint definition page, highlight 'NEW?' (Fig. 34a), and press ENTER.
2. Enter a waypoint name, and press ENTER
3. Enter your position (Fig. 34b), and press ENTER.
4. Highlight 'DONE?', and press ENTER.

Reference Waypoints

To create a new waypoint manually without knowing its position coordinates, you'll need to enter its bearing and distance from an existing waypoint or your present position.

To create a new waypoint by referencing a stored waypoint:

1. From the waypoint definition page, highlight 'NEW?', and press ENTER.
2. Enter a waypoint name, and press ENTER.
3. Highlight the 'reference field' (Fig. 35a), and press ENTER.
4. Enter a reference waypoint name (Fig. 35b) (or leave the field blank to use your present position), and press ENTER.
5. Enter the bearing and distance of your new waypoint from the reference waypoint.
6. Press ENTER to confirm the 'DONE?' prompt.

WAYPOINT		BIKE
N	39°00.000'	RENAME?
W	095°00.000'	NEW?
09-AUG-96 11:06		DELETE?
REF:	████████	DONE?
BRG	DST	
000°	0.00%	

Fig. 35a

WAYPOINT		BIKE
N	39°03.132'	RENAME?
W	094°55.368'	NEW?
09-AUG-96 11:06		DELETE?
REF:	RAIL	DONE?
BRG	DST	
044°	3.20%	

Fig. 35b

WAYPOINT		BIKE
N	34°00.000'	RENAME?
E	068°54.375'	NEW?
REF: [REDACTED]		DELETE?
BRG	DST	DONE?
000°	0.00%	

Fig. 36a

Editing Existing Waypoints

The waypoint definition page also allows you to change the name, coordinates, comment, or reference waypoint field for a stored waypoint (Figs. 36a-36c).

To edit the coordinates, comment, or reference waypoint field:

1. Highlight the field you want to edit, and press ENTER.
2. Enter new data, and press ENTER.

WAYPOINT		BIKE
N	39°03.132'	RENAME?
W	094°55.368'	NEW?
09-AUG-96 11:06		DELETE?
REF: [REDACTED]		DONE?
BRG	DST	
045°	5.50%	

Fig. 36b

WAYPOINT		BIKE
N	34°00.000'	RENAME?
E	068°54.375'	NEW?
REF: [REDACTED]		DELETE?
BRG	DST	DONE?
048°	0.00%	

Fig. 36c

Waypoint Comments

Each waypoint stored in the GPS II has a user-defined 16-character comment field. The default comment is the UTC (or Greenwich mean time) date and time of the waypoint's creation.

To change or add a comment:

1. Highlight the 'comment' field.
2. Press ENTER (Fig. 37a).
3. Make changes or enter a comment (Fig. 37b).
4. Press ENTER.

WAYPOINT		BIKE
N	39°03.132'	RENAME?
W	094°55.368'	NEW?
█	-----	DELETE?
REF:	-----	DONE?
BRG	DST	
045°	5.50%	

Fig. 37a

WAYPOINT		BIKE
N	39°03.132'	RENAME?
W	094°55.368'	NEW?
ROUGH_TRAI	█-----	DELETE?
REF:	-----	DONE?
BRG	DST	
045°	5.50%	

Fig. 37b

WAYPOINT		BIKE
N 39°03.132'		RENAME?
W094°55.368'		NEW?
ROUGH TRAIL		
REF: -----		DELETE?
BRG	DST	
045°	5.50%	DONE?

Fig. 38a

```

Rename
BIKE
To:
TRAIL
ARE YOU SURE
Yes? OR No?
    
```

Fig. 38b

Renaming and Deleting Waypoints

The rename and delete function fields are located along the right side of the waypoint definition page.

To rename a stored waypoint:

1. Highlight 'RENAME?' (Fig. 38a), and press ENTER.
2. Enter the new waypoint name (Fig. 38b), and press ENTER.
3. Press ENTER to confirm the 'Yes?' prompt.

To delete a stored waypoint:

1. Highlight 'DELETE?', and press ENTER.
2. Select 'Yes?', and press ENTER.

Scanning Waypoints

As you manually enter a waypoint's name, the GPSII's waypoint scanning feature will automatically display the first numerical or alphabetical match of the character you have entered to that point. This helps eliminate the need to always enter a waypoint's complete name.

To scan waypoints from a waypoint field:

1. Highlight the 'waypoint name' field, and press ENTER.
2. Press the left side of the keypad to clear the name field.
3. Scroll through the waypoints.
4. When you find the desired waypoint, press ENTER.

WAYPOINT RIDGE		
N 38°57.461'		RENAME?
W094°52.660'		NEW?
09-AUG-96 13:04		DELETE?
REF: -----		DONE?
BRG	DST	
110°	7.20%	

The waypoint scanning feature will offer the first waypoint that matches the character or characters you have entered to that point. If you have more than one waypoint that begins with the same letter or number, move to the next character position as needed.



Fig. 40a



Fig. 40b

Selecting a GOTO Destination

The GPS II provides four ways to navigate to a destination: GOTO, MOB, TracBack, and route navigation. The most basic method of selecting a destination is the GOTO function, which lets you choose any stored waypoint as the destination and quickly sets a direct course from your present position.

To activate the GOTO function:

1. Press GOTO.
2. Select the waypoint you want to navigate to (Fig. 40a), and press ENTER.

Once a GOTO waypoint has been activated, the compass page or highway page will provide steering guidance to the destination until either the GOTO is cancelled or the unit has resumed navigating the active route (see page 53).

To cancel an active GOTO:

1. Press the GOTO key.
2. Highlight 'CANCELGOTO?' (Fig. 40b), and press ENTER.

Man Overboard Function

The GPS II's man overboard function (MOB) lets you simultaneously mark and set a course to a position for quick response to passing positions.

To activate the MOB mode:

1. Press GOTO twice. The GOTO waypoint page will appear with 'MOB' selected (Fig. 41a).
- 2 Press ENTER to begin MOB navigation (Fig. 41b).

The GPS II will now guide you to the MOB waypoint until the MOB GOTO is cancelled. If you want to save the MOB waypoint, be sure to rename it (Fig. 41c) because it will be overwritten the next time a MOB is activated.



Fig. 41a



Fig. 41c

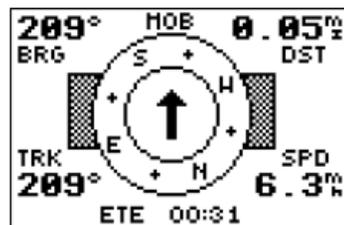


Fig. 41b

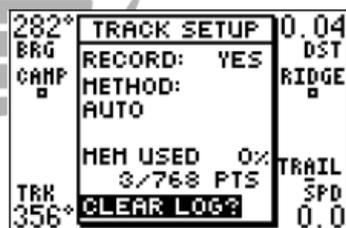


Fig. 42a



Fig. 42b

TracBack Navigation

The TracBack function allows you to quickly and easily retrace your path using the track log automatically stored in the receiver's memory. The advantage of the TracBack feature is that it eliminates the need to mark waypoints along the way and manually create and activate a route back to where you began your trip.

Once a TracBack route is activated, it will lead you back to the oldest track log point stored in memory, so it's usually a good idea to clear the existing track log at the start of each trip.

To clear the track log and define a starting point for a TracBack route:

1. From the map page, press ENTER.
2. Highlight the 'track setup' option, and press ENTER.
2. Highlight 'CLEARLOG?' (Fig. 42a), and press ENTER.
3. Highlight 'Yes?' (Fig. 42b), and press ENTER.

To activate a TracBack route:

1. Press GOTO, and highlight 'TRACBACK?' (Fig. 43a).
2. Press ENTER.

Once the TracBack function has been activated, the GPS II will take the track log currently stored in memory and divide it into segments called legs (Fig. 43b). Up to 30 temporary waypoints (e.g., 'T001') will be created to mark the most significant features of the track log in order to duplicate your exact path as closely as possible.

The active route page will appear, showing a route from your present position to the oldest track log point in memory. Steering guidance to each waypoint will be provided back to the starting point of your track log (Fig. 43c).

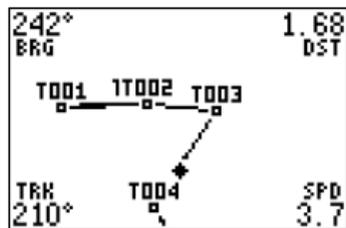


Fig. 43c



Fig. 43a

ACTIVE		TRACBACK		
WAYPNT	ETE	DST		
T006	---	---		
T005	23:28	1.49		
T004	01:08	4.28		CLR?
T003	01:50	6.98		INV?
T002	02:17	8.65		ACT?
T001	02:48	10.7		

Fig. 43b

Tips on Creating and Using the TracBack Feature

To get the most out of the TracBack feature, remember the following tips:

- Always clear your track log at the exact point that you want to go back to (trail head, truck, dock, etc.).
- The 'record' option on the track log setup page must be set to the 'YES' position.
- There must be at least two track log points stored in memory to create a TracBack route.
- If there are not enough available waypoints in memory to create a TracBack route, you will be alerted with a 'waypoint memory full' message, and the receiver will use any available waypoints to create a TracBack route with an emphasis on the track log closest to the destination (the oldest track log point in memory).
- If the 'method' option on the track log setup page is set to a time interval, the TracBack route may not follow your exact path. (Keeping the criteria set to automatic will always provide the most detailed TracBack route.)



- If the receiver is turned off or you lose satellite coverage during your trip, the TracBack route will simply draw a straight line between any point where coverage was lost and where it resumed.
- If the changes in direction and distance of your track log are very complex, 30 waypoints may not be enough to accurately mark your exact path. The receiver will then assign the 30 waypoints to the most significant points of your track, and simplify segments with fewer changes in direction.
- If you want to save a TracBack route, copy route 0 to an open storage route before activating another TracBack. Activating another TracBack or storage route will overwrite the existing TracBack route. (We'll cover more on route management in the following pages.)
- Whenever a TracBack route is activated, the receiver will automatically erase any temporary waypoints (e.g., 'T001') that are not contained in routes 1-19. If there are temporary waypoints stored in routes 1-19, the receiver will create any new temporary waypoints using the first three-digit number available.

Route Definition Page

The last form of navigating to a destination with the GPS II is by creating a user-defined route. The GPS II lets you create and store up to 20 routes of 30 waypoints each.

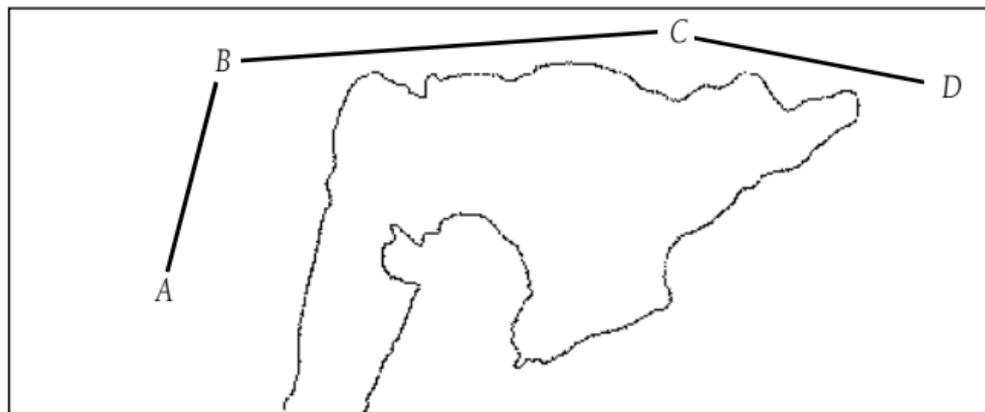


Fig. 46

The route navigation feature lets you plan and navigate a course from one place to another using a set of pre-defined waypoints. Routes are often used when it's not practical, safe, or possible to navigate a direct course to a particular destination (e.g., through a body of water or impassable terrain) (Fig. 46).

Route Definition Page (cont.)

The right side of the route definition page features several 'function' fields which let you copy, clear, invert, or activate the displayed route. Routes 1-19 are used as storage routes, with route 0 always serving as the active route you are navigating. If you want to save a route that's currently in route 0, be sure to copy it to another open route, as it will be overwritten by the next route activation.

Routes can be copied, cleared, inverted, and activated (Fig. 47a) through the route definition page.

To select the route definition page:

1. Highlight 'ROUTES' from the menu page, and press ENTER.

The 'route number' field is displayed at the top of the page (Fig. 47b), with a 16-character 'user comment' field to the right. If no user comment is entered, the field will display the first and last waypoint in the route. The waypoint list on the left side of the page accepts up to 30 waypoints for each route, with fields for desired track and distance between legs. The total distance of the route is indicated below the waypoint list.

ROUTE: 1 HOME TO PATH				
NO	WAYPNT	DKR	DST	
1	HOME	297'	2.0	COPY
2	TRAIL	307'	1.7	TO:--
3	ROAD	063'	2.6	CLR?
4	BIRE	009'	2.8	INU?
5	CAMP			ACT?
TOTAL DST			10.8	

Fig. 47a

ROUTE: 1 HOME TO PATH				
NO	WAYPNT	DKR	DST	
1	HOME	297'	2.0	COPY
2	TRAIL	307'	1.7	TO:--
3	ROAD	063'	2.6	CLR?
4	BIRE	009'	2.8	INU?
5	CAMP			ACT?
TOTAL DST			10.8	

Fig. 47b

ROUTE: 4 CAMP_TO_TRAIL				
NO	WAYPNT	DTK	DST	
1	-----	---	---	COPY
2	-----	---	---	TO:--
3	-----	---	---	CLR?
4	-----	---	---	INV?
5	-----	---	---	ACT?
TOTAL DST			0.00	

Fig. 48a

ROUTE: 4 CAMP TO TRAIL				
NO	WAYPNT	DTK	DST	
1	CAMP	215'	4.8	COPY
2	ROAD	063'	2.6	TO:--
3	BIKE	---	---	CLR?
4	TRAIL	---	---	INV?
5	---	---	---	ACT?
TOTAL DST			7.46	

Fig. 48b

Creating and Navigating Routes

To create a route from the route definition page:

1. Highlight the 'route number' field, and press ENTER.
2. Enter a route number, and press ENTER. (Only open routes will be available.)
3. Press ENTER to begin entry of a route comment, if desired (Fig. 48a).
4. Enter your comment, and press the ENTER key.
5. Enter the first waypoint of your route, and press ENTER. As you continue entering the rest of your waypoints, the list will automatically scroll down as needed (Fig. 48b).

Just like the Tracback feature, routes are broken down and navigated in smaller segments called 'legs'. The waypoint you're 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 between the active to and the active from waypoint is called the 'active leg'.

Whenever you activate a route, it will automatically select the route leg closest to your position as the active leg. As you pass each waypoint in the route, the receiver will automatically sequence and select the next waypoint as the active to waypoint.

Activating and Inverting Routes

After a route has been entered, it can be either activated in sequence or inverted from the route definition page. The process of activating or inverting a stored route takes a storage route (routes 1-19) and copies it into the active route (route 0) for navigation. The storage route is now no longer needed and will be retained in its original format under its existing route number.

This system allows you to have an active route that you may edit during navigation and save as an entirely new route from the original. You will have to copy the active route to an unused storage route to save it, since new route or TracBack activation overwrites route 0.

To activate a route:

1. From the route definition page, highlight the 'route number' field.
2. Enter the route number to be activated, and press ENTER.
3. Highlight 'ACT?' (Fig. 49a), and press ENTER.

To activate a route in inverted order:

1. Follow the steps above, but select 'INV?' (Fig. 49b), and press ENTER.

ROUTE: 4 CAMP TO TRAIL				
NO	WAYPNT	DTK	DST	
1	CAMP	215'	4.8	COPY
2	ROAD	063'	2.6	TO:--
3	BIKE	205'	2.4	CLR?
4	TRAIL	---	---	INV?
5	-----	---	---	ACT?
TOTAL DST			9.87	

Fig. 49a

ROUTE: 4 CAMP TO TRAIL				
NO	WAYPNT	DTK	DST	
1	CAMP	215'	4.8	COPY
2	ROAD	063'	2.6	TO:--
3	BIKE	205'	2.4	CLR?
4	TRAIL	---	---	INV?
5	-----	---	---	ACT?
TOTAL DST			9.87	

Fig. 49b

ACTIVE WAYPNT	CAMP	TO TRAIL	
	ETE	DST	
TRAIL	--:--	----	
BIKE	55:44	3.15	
ROAD	01:42	5.77	CLR?
CAMP	03:08	10.6	INV?
-----	--:--	----	ACT?
-----	--:--	----	

Fig. 50a

ACTIVE WAYPNT	CAMP	TO LAKE	
	ETE	DST	
CAMP	--:--	----	
TRAIL	38:02	2.28	
LAKE	01:33	5.59	CLR?
-----	--:--	----	INV?
-----	--:--	----	ACT?
-----	--:--	----	

Fig. 50b

Active Route Page

Once a route has been activated, the active route page will display the waypoint sequence of your route with the estimated time enroute (ETE) at your present speed and the distance to each waypoint (Fig. 50a). As long as you are navigating an active route, the active route page will become part of the main page sequence. The active route page will also allow you to change the 'ETE' field to display desired track (DTK) or estimated time of arrival (ETA) for each leg. You can also clear or invert the active route.

To display DTK or ETA for each leg:

1. Highlight 'ETE', and press ENTER (Fig. 50b).
2. Select 'DTK' or 'ETA', and press ENTER.

The active route page also allows you to clear (stop navigating) or invert the active route without using the route definition page.

To invert a route from the active route page:

1. Highlight 'INV?', and press ENTER.

To clear the active route and stop route navigation:

1. Select 'CLR?', and press ENTER.

Copying and Clearing Routes

The route definition page is also used to copy a route to another route number. This feature is useful when you make changes to the active (or TracBack) route and want to save the route in its modified form for future use.

To copy a route:

1. Highlight the 'route number' field, and press ENTER (Fig. 51a).
2. Enter the route number to be copied, and press ENTER.
3. Highlight the 'copyto' field, and press ENTER.
4. Scroll through the available routes and select a destination route number. (Only open routes will be available.) Press ENTER to copy the route.

To clear a route from memory:

1. Highlight the 'route number' field, and press ENTER.
2. Enter the route number, and press ENTER.
3. Select 'CLR?' (Fig. 51b), and press ENTER.
4. Highlight 'Yes?', and press ENTER.

ROUTE: 1 HOME TO PATH				
NO	WAYPNT	DTK	DST	
1	HOME	297'	2.0	COPY TO: <input checked="" type="checkbox"/>
2	TRAIL	307'	1.7	CLR?
4	BIKE	063'	2.6	INV?
5	CAMP	009'	2.8	ACT?
TOTAL DST			10.8	

Fig. 51a

ROUTE: 1 HOME TO PATH				
NO	WAYPNT	DTK	DST	
1	HOME	297'	2.0	COPY TO: <input type="checkbox"/>
2	TRAIL	307'	1.7	<input checked="" type="checkbox"/> CLR?
4	BIKE	063'	2.6	INV?
5	CAMP	009'	2.8	ACT?
TOTAL DST			10.8	

Fig. 51b

ROUTE: 1 HOME TO PATH				
NO	WAYPNT	DTK	DST	
1	HOME	.	.	COPY
2	TRAIL	---	---	TO:---
3	ROAD	---	---	CLR?
4	BIKE	063'	2.6	INV?
5	CAMP	009'	2.8	ACT?
TOTAL DST			10.7	

Fig. 52a

ROUTE: 1 HOME TO PATH				
NO	WAYPNT	DTK	DST	
1	H	REVIEW?		COPY
2	T	INSERT?	0	TO:---
3	R	REMOVE?	7	CLR?
4	B	CHANGE?	6	INV?
5	CAMP	009'	2.8	ACT?
TOTAL DST			10.8	

Fig. 52b

Editing Routes

Once a route has been created and stored, it can be edited at any time.

To edit a route from the active route page or the route definition page:

1. Select the waypoint you want to edit, and press ENTER (Fig. 52a).

An on-screen menu of editing choices will appear, with options for reviewing, inserting, deleting, or changing the waypoint field highlighted (Fig. 52b). This field contains the following options:

- **Review?**— reviews the waypoint's definition page
- **Insert?**— adds a new waypoint that precedes the selected waypoint
- **Remove?**— deletes a selected waypoint
- **Change?**— replaces the selected waypoint with a new waypoint

If you add, delete, or change the first or last waypoint of a route, the default comment (first and last waypoint) will automatically be updated after your changes. Note: Editing the original storage route will not affect route 0. If you want to save an edited version of route 0, save it to an open storage route.

On-Route GOTOs

At the beginning of this section, we mentioned that the GPS II will automatically select the route leg closest to your position as the active leg. This will give you steering guidance to the desired track of the active leg. Note that the first waypoint selected as the destination waypoint will be of the route leg closest to your present position. This may mean you're not navigating to the first waypoint in the active route—you may be navigating to the last. If you prefer to navigate a route out of sequence, you can perform an 'on-route GOTO' from the active route page.

1. Highlight the desired route waypoint, and press GOTO.
2. Once the GOTO waypoint page appears with the waypoint highlighted (Fig. 53a), press ENTER.

Note that after you reach the on-route GOTO waypoint, the GPS II will automatically resume navigating the rest of the route in sequence (Fig. 53b).



Fig. 53a

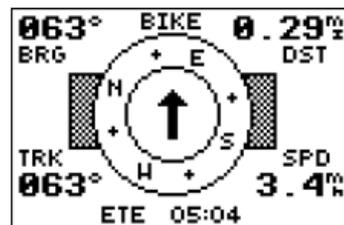


Fig. 53b

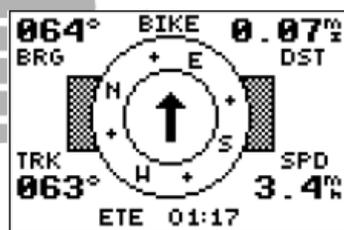


Fig. 54a

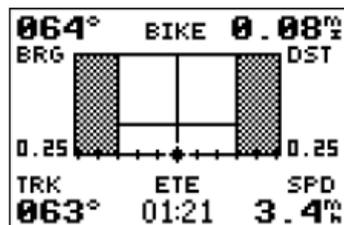


Fig. 54b

Selecting a User-Defined Navigation Page

Once you've selected a GOTO destination or activated a TracBack, MOB, or route, the GPS II will provide graphic steering guidance to the destination with one of two navigation pages:

- The **compass page** (default) provides a directional pointer to the destination, with a rotating compass display to show your direction of travel (Fig. 54a). The compass page provides better steering guidance for car travel, hiking, or biking, where straight-line navigation usually is not possible.
- The **highway page** provides a graphic highway that shows your movement relative to the desired course, with an emphasis on your crosstrack error (the distance and direction you are off course) (Fig. 54b). The highway page is well suited for water or off-road recreation where straight-line navigation is possible.

Both pages provide a digital display of the bearing and distance to the destination, your current speed and track over the ground, and a course deviation indicator (CDI). You can switch to either navigation page at any time.

To select either navigation page:

1. Press ENTER from the existing navigation page, and ENTER again to change the page.



The 'ETE' field, located in the middle of the bottom of both pages, is a user-selectable field that allows you to display a variety of navigation values for your trip.

To access the user-selectable field:

1. Highlight 'ETE', and press ENTER.
2. Use the keypad to scroll through the possible options.

The following data options are available from the navigation pages (see Appendix H):

Estimated Time Enroute (ETE)— the time left to your destination based on your present speed and track.

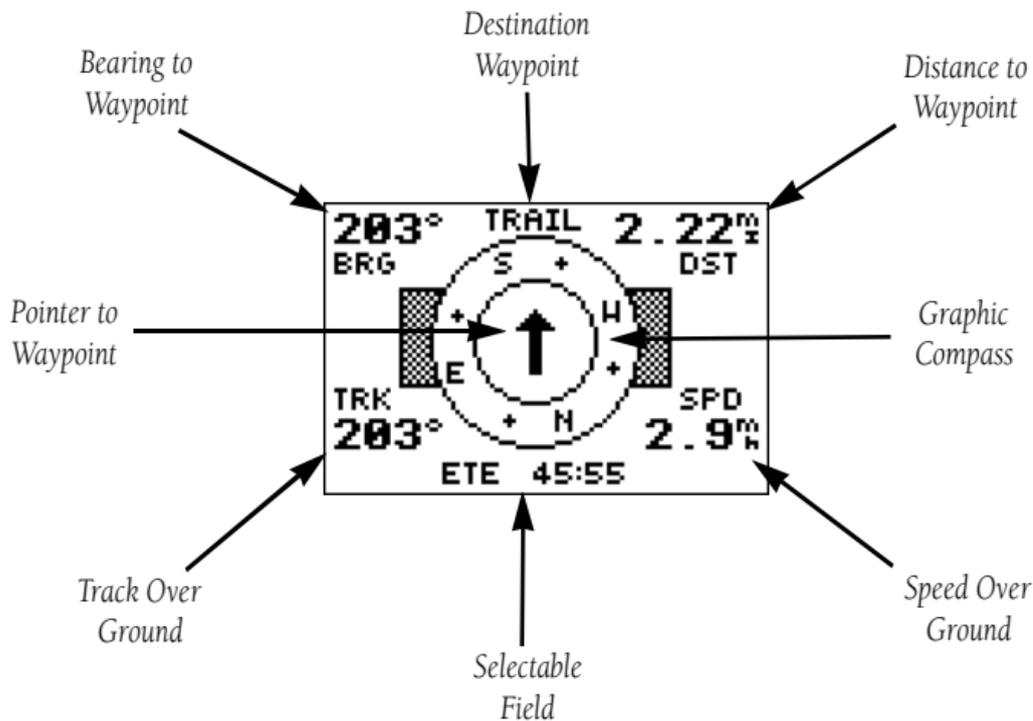
Estimated Time of Arrival (ETA)— the time of day of your arrival at a destination, based on current ground speed and track.

Course to Steer (CTS)— the bearing which will give you the most efficient way to stay on course to your destination.

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

Velocity Made Good (VMG)— the speed you are traveling toward the destination.

Turn (TRN)— the amount of correction in degrees needed to travel directly to your destination.



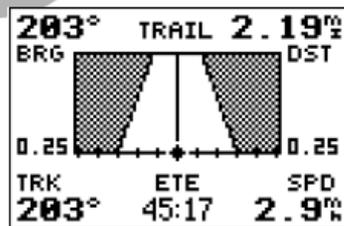


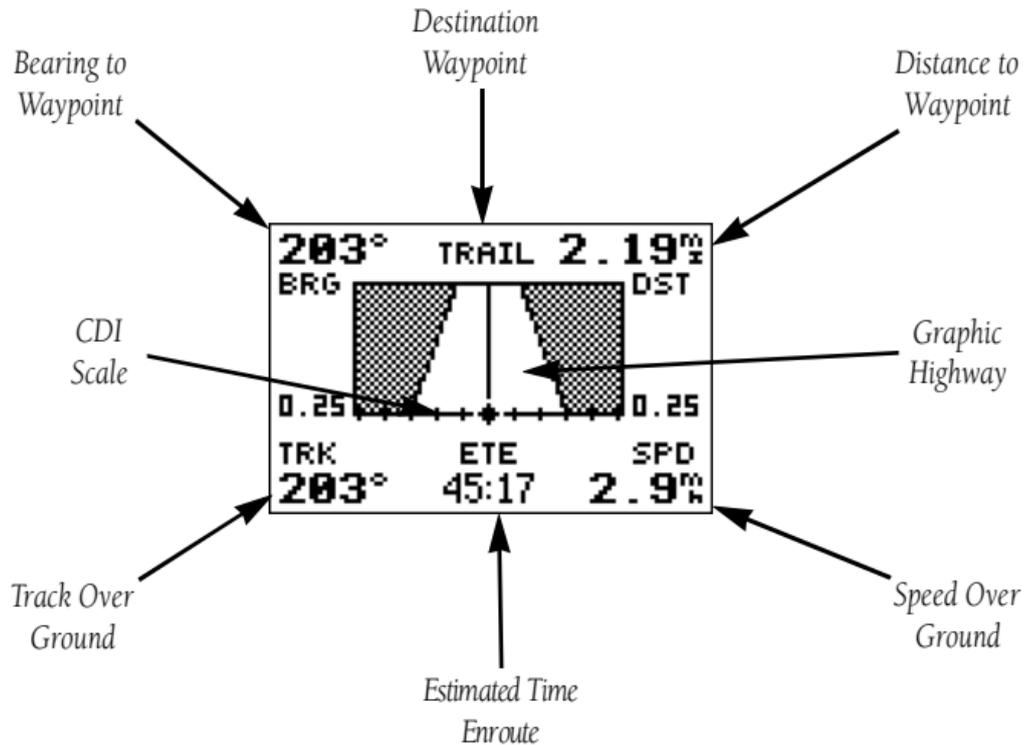
Fig. 58

Using the Highway Page

The GPS II's highway page (Fig. 58) also provides graphic steering guidance to a destination, with a greater emphasis on the straight-line desired course and the distance and direction you are off course. As you head toward your destination, the middle of the screen provides visual guidance to your waypoint on a moving graphic 'highway'.

Your present position is represented by the diamond in the center of the course deviation scale. The line down the middle of the highway represents your desired track. As you navigate toward a waypoint, the highway will actually move, indicating the direction you're off course, relative to the position diamond on the CDI scale. To stay on course, simply move toward the center of the highway.

If you do get off the desired course by more than 1/5th of the selected CDI range, the exact distance you are off course will be displayed where the CDI scale setting normally appears. If you get too far off course (the highway has disappeared), a message box will appear to indicate what course to steer to get back on course. For information on how to set this scale, see page 76.



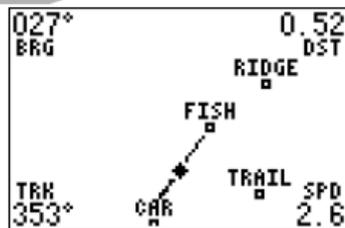


Fig. 60

Moving Map Page

The GPS II features a powerful real-time moving map (Fig. 60) that can do much more than just plot your course and route. The map page also provides you with a target cursor that will let you pan ahead to nearby waypoints, determine the distance and bearing to any map position, and mark new waypoints while you navigate. The GPS II also features dedicated zoom keys for instant zooming. The map portion of the page displays your present position as a diamond icon, with your track and/or route displayed as small points. Nearby waypoints are represented as squares, with the waypoint name listed. You may select which features are shown through the map setup submenu page (see pages 65-66).

The four corners of the map page are used to display various navigation data, including the bearing and distance to a destination waypoint and your current track and speed over the ground. The two fields at the top corners of the map show your bearing and distance to one of three selectable destinations: an active destination waypoint; a highlighted on-screen waypoint; or the panning target crosshair. If you are not navigating to a waypoint or using the panning function, the top data fields will not be displayed. Your current track and speed are shown at the bottom corners of the display.

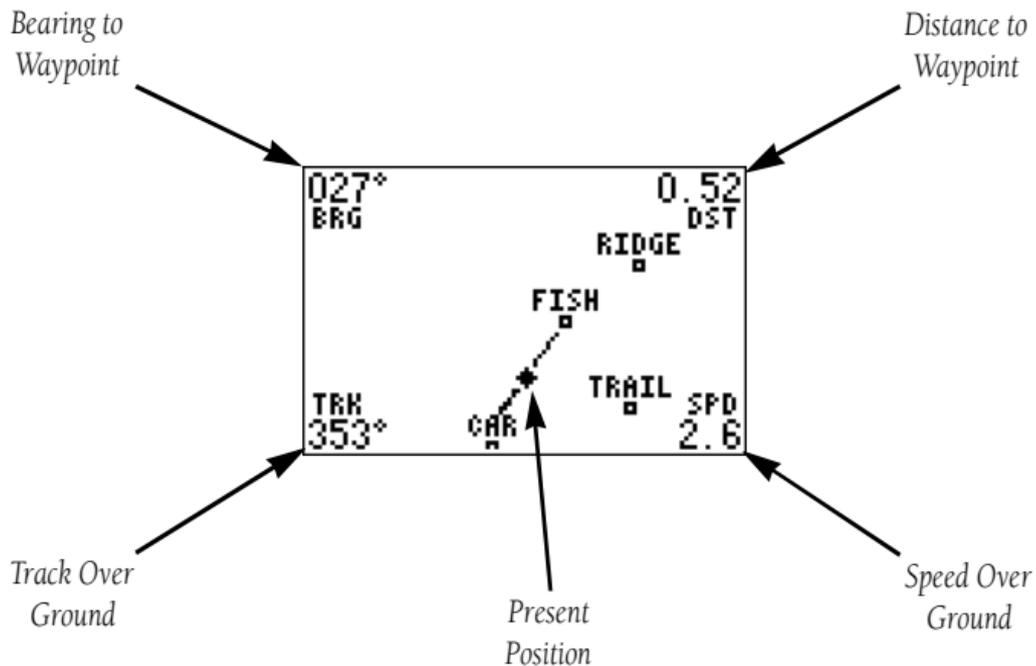




Fig. 62a



Fig. 62b

Zooming and Panning

There are three main functions you can perform from the map page— zooming, panning, and pointing. The moving map has 12 map scales (from 0.2 to 320 miles, or 0.5 to 600 km.) which are selected by selecting the IN and OUT zoom keys. These ranges are measured vertically.

To use the zoom keys:

1. From the map page, press either IN or OUT (Fig. 62a).
2. To see the current map scale, press and hold either button down. A pop-up window will display the current scale (Fig. 62b).

The second function on the map page is the pan function, which allows you to move the map with the keypad in order to view areas outside the current map.

To activate the pan function:

1. Use the keypad to move the map in any direction, including diagonally.

As you begin to move the map, a crosshair will appear. This crosshair will now serve as a target marker for the moving map. The distance and bearing to a destination will now be replaced by the distance and bearing from your present position to the target crosshair.

As you pan around the map, you'll notice that the target crosshair will “snap” to on-screen waypoints and highlight the waypoint name (Fig. 63a). Once a waypoint name is highlighted, you can review its waypoint definition page or execute a GOTO function right from the map page (Fig. 64b).

To review the definition page for a waypoint highlighted on the map page:

1. Press ENTER.

To GOTO a waypoint highlighted on the map page:

1. Press GOTO.
2. Press ENTER to confirm the GOTO waypoint page.

To stop the panning function:

1. Press QUIT.

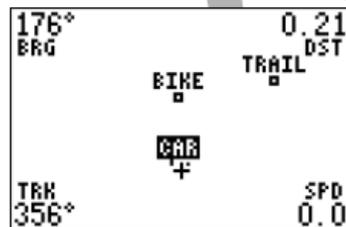


Fig. 63a



Fig. 63b

MARK POSITION	
Waypoint:	Add to
001	route
N 39°00.036'	number:
W094°59.992'	3
	SAVE

Fig. 64a

GOTO WAYPOINT
FISH
GARIN
MAP
RIDGE
TRAIL
CANCEL GOTO? TRACBACK?

Fig. 64b

Using the Cursor to Mark and GOTO Waypoints

During panning, the crosshair represents a target position right on the moving map, with the range and bearing to the target displayed at the top corners of the screen. You can also use the target crosshair to mark a new waypoint position or as a GOTO destination right from the map field.

To mark the target crosshair position as a new waypoint:

1. Press MARK (Fig. 64a).
2. Enter a name and/or route number, and press ENTER.

You can also use the target crosshair as an instant GOTO destination. Similar to the MOB mode, this function will mark and instantly set a course for a new waypoint called 'MAP'.

To GOTO the target crosshair:

1. Press GOTO, and press ENTER (Fig. 64b).

If you want to save the MAP waypoint, be sure to rename it because it will be overwritten the next time a map GOTO is executed.

Accessing the Map Setup and Track Setup Windows

You can access two additional pages—the map setup page and the track setup page—by pressing ENTER while on the map page (Fig. 65a). The map setup and track setup window will appear, ready for you to select one.

To select map setup or track setup:

1. Highlight either field, and press ENTER.

Map Setup Page and Orientation

The map setup page lets you select map orientation and specify what items are displayed. The map may be oriented to 'NORTH UP,' 'TRACK UP' (the direction of current travel), or 'DTK UP' (desired track up, or the direction of travel to stay on course). The default setting is track up.

To change the map orientation:

1. Highlight the 'map' field, and press ENTER (Fig. 65b).
2. Select the desired orientation, and press ENTER.

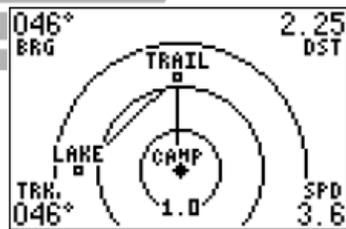
The rest of the map setup page lets you specify what items are displayed or plotted on the map page by selecting 'YES' or 'NO' in the appropriate field.



Fig. 65a



Fig. 65b



On-screen range rings help you estimate distances relative to your present position. The value of each ring is determined by the current zoom scale. The distance value of each ring is equal to 1/5 of the current zoom range, with the interval of each ring noted below the first range ring.

- 'Rings'— displays the three present position range rings on the map.
- 'Route'— plots the straight leg lines between waypoints of an active route and displays all route waypoint names.
- 'Nearest'— shows the nine nearest waypoints to your present position (not to the target cursor) on the map.
- 'Names'— displays the waypoint name for the nine nearest waypoints.

To turn a map item on or off:

1. Highlight the 'confirmation' ('YES' or 'NO') field for the map item, and press ENTER.
2. Select 'YES' or 'NO', and press ENTER.

Track Setup Page

The track setup page lets you manage the GPS II's track log data. From this page, you can select whether to record a track log and define how it is recorded.

To turn the track log on or off:

1. Highlight the 'TRACK LOG' field, and press ENTER.
2. Select 'YES' or 'NO', and press ENTER. (Note: Turning the track recording off will disable the trackback feature.)

Track Method

The stored track method determines how often positions are stored in the track log. The default setting is automatic, which will store a track based on resolution. This setting gives you the most efficient use of track memory and provides the most accurate TracBack route.

To change the method to record points based on a specific time interval:

1. Highlight the 'method' field, and press ENTER.
2. Select 'TIME INTERVAL' (Fig. 67a), and press ENTER twice (Fig. 67b).
3. Enter a value in hours, minutes, and seconds, and press ENTER.

Track Log Display

The track log option sets the number of points the unit will attempt to display on the map page. The default setting of 250 points provides good resolution with minimal screen clutter. The maximum setting is 768 points. Once you've reached the maximum number of track points, the older points will be lost as new points are added. Note that adjusting the track points displayed will not affect whether the receiver records a track log or the ability to create a TracBack route.



Fig. 67a



Fig. 67b

Managing and Clearing the Track Log

WARNING!

all track log
points will be
deleted

ARE YOU SURE
Yes? OR No?

It's a good idea to clear the track log at the end of the trail head, etc., in order to make the best use of the traceback feature.

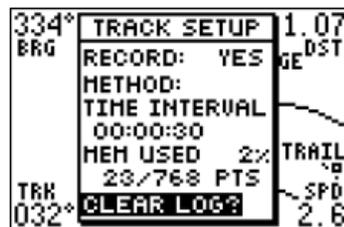


Fig. 68

The rest of the track setup window displays the percentage of available memory currently used to store track log data and function fields to clear the track log memory and activate the backtrack feature.

To clear the track log:

1. Highlight 'CLEAR LOG?' (Fig. 68), and press ENTER.
2. Highlight 'Yes', and press ENTER.

Menu Page

The GPS II's menu page provides access to additional pages (submenus) that are used to select and customize operation and navigation setup. These eight pages are divided into categories by function. The waypoint and route management pages are discussed in their own respective sections. We'll now address the rest of these pages in the order they appear on the menu page.

To select a submenu page from the menu page:

1. Highlight the page (Fig. 69a), and press ENTER (Fig. 69b).
2. To return to the menu page, press QUIT.

MENU	
NEAREST WPTS	
WAYPOINT LIST	
WAYPOINT	
ROUTES	
DIST AND SUM	
SYSTEM SETUP	
NAV SETUP	
INTERFACE	

Fig. 69a

NEAREST WPTS			
NO	WAYPOINT	BRG	DST
1	HONE	177'	0.00
2	TRAIL	177'	0.00
3	ROAD	357'	2.18
4	RIDGE	302'	6.06
5	LAKE	073'	6.93
6	CAMP	276'	7.27

Fig. 69b

DIST AND SUN	
FROM: BIKE__	BRG 000°
TO: _____	DST 0.00%
DATE: 05 AUG 96	
SUNRISE 11:23:51	
SUNSET 01:28:10	
AT DESTINATION	

Fig. 70a

DIST AND SUN	
FROM: BIKE	BRG 146°
TO: TRAIL	DST 2.17%
DATE: 05 AUG 96	
SUNRISE 11:23:46	
SUNSET 01:28:06	
AT DESTINATION	

Fig. 70b

Distance and Sun Calculation

The distance and sun calculation submenu page will give you the distance and bearing between any two waypoints or between your present position and a waypoint. It will also calculate the sunrise and sunset (in local time) for a particular date at either your present position or any stored waypoint.

To perform a distance and sun calculation:

1. Highlight the 'from' field, enter the desired waypoint (Fig. 70a), and press ENTER.
2. Highlight the 'to' field, enter the destination waypoint, and press ENTER.
3. The 'date' field will become highlighted (Fig. 70b). Enter the date you'll arrive at your destination, and press ENTER.

If you haven't marked your present position as a waypoint or you leave the 'to' field blank (Fig. 70b), the sunrise and sunset at your present position will be provided.

System Setup

The system setup submenu page (Fig. 71a) is used to select the operating mode, time offset, and screen preferences. The GPS II has three operating modes:

- **Normal Mode** operates the unit at maximum performance, and provides a battery of life up to 12 hours on alkaline batteries.
- **Battery Saver Mode** (Fig. 71b) is suitable for most applications, and extends battery life to up to 20 hours on alkaline batteries by reducing the receiver's update rate when navigational conditions permit (e.g., you're traveling a steady course without significant variations in speed or heading). Since battery saver mode changes the update rate based solely on navigational conditions, the battery life will vary accordingly.
- **Simulator Mode** allows you to operate the unit without acquiring satellites, and is ideal for practicing or entering waypoints and routes while at home.

To select an operating mode:

1. Highlight the 'mode' field, and press ENTER.
2. Select a mode, and press ENTER.



Fig. 71a

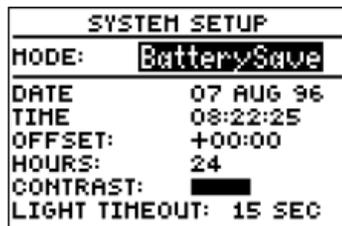


Fig. 71b

SYSTEM SETUP	
MODE:	Simulator
DATE	05 AUG 96
TIME	14:05:28
OFFSET:	+00:00
HOURS:	24
CONTRAST:	█
LIGHT TIMEOUT:	15 SEC

Fig. 72a

SYSTEM SETUP	
MODE:	Simulator
DATE	05 AUG 96
TIME	14:05:44
OFFSET:	+00:00
HOURS:	24
CONTRAST:	█
LIGHT TIMEOUT:	15 SEC

Fig. 72b

Date and Time Setup

The date and time is located directly below the mode field. Note: Date and time information is derived from the GPS satellites and cannot be changed by the user. Because the time shown is UTC (Greenwich mean time) time, you will need to enter a time offset to display the correct local time for your area. To determine the time offset for your area, note your position and refer to the chart in Appendix F

To enter the time offset:

1. Highlight the 'offset' field (Fig. 72a), and press ENTER.
2. Enter the time offset, and press ENTER.

Time Format

The time display shown on the system setup and position pages may be set to display the time in a 12- or 24-hour format.

To select the time format:

1. Highlight the 'hours' field (Fig. 72b), and press ENTER.
2. Select 12- or 24-hour display, and press ENTER.

Screen Contrast

The GPS II has adjustable screen contrast controlled by an on-screen bar scale.

To set the screen contrast:

1. Highlight the 'contrast' field, and press ENTER.
2. Adjust the bar scale to the desired contrast, and press ENTER.

Note: The screen contrast can also be adjusted by pressing the rocker keypad while on the satellite status page (see pg 20).

Screen Backlighting

The screen backlight timer is adjustable for 0, 15, 30, 60, 120, and 240 seconds. The '0' setting will keep backlighting on continuously. Whenever backlighting is on, a bulb icon will appear on the status page.

To set the backlight timer:

1. Highlight the 'light timeout' field, and press ENTER (Fig. 73b).
2. Select the desired setting, and press ENTER.
3. To turn lighting on and off, press the red power key briefly.

SYSTEM SETUP	
MODE:	Simulator
DATE	05 AUG 96
TIME	14:06:10
OFFSET:	+00:00
HOURS:	24
CONTRAST:	
LIGHT TIMEOUT:	15 SEC

Fig. 73b

Battery life will be significantly affected by the amount of time you have the backlight on. To ensure the longest battery life, keep the screen backlighting at the default 15-second option.



Fig. 74a

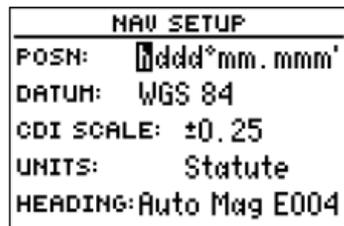


Fig. 74b

Navigation Setup

The navigation setup submenu page (Fig. 74a) is used to select units of measurement for position formats, map datums, CDI scale, units, and heading information.

Position Formats

The default position format for the GPS II is latitude and longitude in degrees and minutes (hddd°mm.mmm'). You may also select degrees, minutes and seconds (hddd°mm'ss.s"); degrees only (hddd.ddddd°); UTM/UPS coordinates; or British, German, Irish, Maidenhead, Swedish, Swiss, or Taiwan, or User grid formats.

To select a position format:

1. Highlight the 'posn' field, and press ENTER (Fig. 74b). Select the desired setting, and press ENTER.

User Grid Option

The user grid option lets you create a user-defined position format by establishing factors such as longitude of origin, scale, and false Easting or Northing.

To define a user grid:

1. Select 'User Grid', and press ENTER. Enter values for longitude origin, scale, and false Easting and Northing, and press ENTER. Highlight 'SAVE?', and press ENTER.

Map Datums

The 'map datum' field is located just below the 'position format' field, and comes with a WGS 84 default setting. Although 106 total map datums are available for use (see Appendix F for map datums), you should only change the datum if you are using maps or charts that specify a different datum than WGS 84.

To select a map datum:

1. Highlight the 'datum' field, and press ENTER.
2. Select the desired setting, and press ENTER.

To define a user datum:

1. Highlight the 'datum' field, and press ENTER.
2. Scroll through the map datum options until 'USER' appears, and press ENTER.
3. Enter values for 'DX', 'DY', 'DZ', 'DA', and 'DF' using the rocker keypad, and press ENTER.
4. Highlight 'SAVE?', and press ENTER. The setup menu will reappear.

NAV SETUP	
POSM:	hddd°mm.mmm'
DATUM:	User
CDI SCALE:	±0.25
UNITS:	Statute
HEADING:	Auto Mag E004

The user datum function is recommended only for individuals trained in creating map/chart datums. Incorrect entries may result in substantial position errors.

NAV SETUP	
POSM:	hddd°mm. mmm'
DATUM:	WGS 84
CDI SCALE:	±0.25
UNITS:	Statute
HEADING:	Auto Mag E004

Fig. 76a

NAV SETUP	
POSM:	hddd°mm. mmm'
DATUM:	WGS 84
CDI SCALE:	±0.25
UNITS:	Statute
HEADING:	Auto Mag E004

Fig 76b

CDIScale Settings

The course deviation indicator (CDI) scale definition field lets you select the +/- range of the CDI bar scale. Three scales are available: +/- 0.25 (default), 1.25, and 5.0 miles or kilometers.

To enter a CDI scale setting:

1. Highlight the 'cdiscale' field (Fig. 76a), and press ENTER.
2. Select the desired setting, and press ENTER.

Units of Measure

The GPS II lets you select nautical (default), statute, or metric units of measure for all 'speed' and 'distance' fields.

To change the unit of measure:

1. Highlight the 'units' field (Fig. 76b), and press ENTER.
2. Select the desired unit of measure, and press ENTER.

Magnetic Heading Reference

The GPS II's heading information can be displayed referencing magnetic north (auto or user-defined), true north, or calculated grid headings. The default setting is automatic magnetic north, which is suitable for most applications.

To select a heading reference:

1. Highlight the 'heading' field (Fig. 77a), and press ENTER.
2. Select the desired heading preference, and press ENTER.

To enter a user-defined magnetic heading:

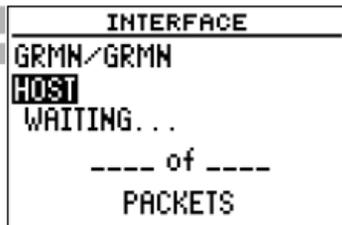
1. Select 'User Mag' and press ENTER (Fig. 77b).
2. Enter the degrees and direction of magnetic variation, and press ENTER.

NAU SETUP	
POSM:	hddd°mm.mmm'
DATUM:	WGS 84
CDI SCALE:	±0.25
UNITS:	Statute
HEADING:	Auto Mag E004

Fig. 77a

NAU SETUP	
POSM:	hddd°mm.mmm'
DATUM:	WGS 84
CDI SCALE:	±0.25
UNITS:	Statute
HEADING:	User Mag: 000

Fig 77b



During data transfer, the number of packets being exchanged will be displayed on screen.

Interface Setup

The GPS II's interface page lets you specify the formats for connecting external devices. There are six options: GRMN/GRMN, None/None, RTCM/None, RTCM/NMEA, NMEA/NMEA, and None/NMEA. Each option lists the input format first, followed by the output format.

To select I/O format:

1. Highlight the I/O field, and press ENTER.
2. Select the desired setting, and press ENTER.

The GRMN/GRMN setting is a proprietary format that lets you exchange information such as waypoints, routes, and track logs between two GARMIN GPS devices or a GARMIN GPS and a PC. There are eight data transfer options: send alm, send wpt, send trk, send rte, request alm, request wpt, request trk, request rte.

To select a transfer option:

1. Highlight 'HOST', and press ENTER.
2. Select a desired setting, and press ENTER.

To disable all interfacing capabilities, select the None/None setting. If you want to output NMEA 0183 data without any differential input capability, select 'None/NMEA.'

DGPS Interface

The last two format settings allow the differential-ready GPS II to accept RTCM DGPS corrections in RTCM 104 version 2.0 format. Using DGPS corrections will improve receiver accuracy to 5-10 meters, regardless of errors induced by the government's Selective Availability (SA) program. The RTCM/NONE format will allow connection to any manually-tuned beacon receiver by using the proper output interface. The baud rate is selectable from the GPS II.

The RTCM/NMEA selection controls the GARMIN GBR-21 differential beacon receiver. Once a RTCM setting has been selected, the GPS II will either automatically try to tune the last frequency and bit rate you selected or will switch to the default frequency of 304.0 kHz with a bit rate of 100 bps if no previous beacon has been tuned. You may also enter your own frequency and bit rate if desired.

To enter a DGPS beacon frequency:

1. Highlight the 'freq' field (Fig. 79a), and press ENTER.
2. Enter the desired frequency, and press ENTER.
3. Highlight the 'rate' field (Fig. 79b), and press ENTER.
4. Select the desired transmission rate, and press ENTER.

INTERFACE	
RTCM/NMEA	4800 baud
NMEA	0183 2.0
BEACON RCVR: NO STATUS	
FREQ	_____ KHz DIST __. __°
RATE	25bps SNR __dB

Fig. 79a

INTERFACE	
RTCM/NMEA	4800 baud
NMEA	0183 2.0
BEACON RCVR: NO STATUS	
FREQ	_____ KHz DIST __. __°
RATE	25bps SNR __dB

Fig. 79b



The message page will alert you to any problems relating to DGPS operation. You may also monitor the DGPS status from the status field on the interface setup page.

When the GPS II is receiving DGPS corrections from the GBR-21, the 'beacon receiver' section of the I/O setup page will display the beacon frequency and signal strength, as well as the distance from the transmitter to the beacon receiver. At the bottom of the beacon receiver field, a status message will keep you informed of DGPS activity:

- A 'tuning' message will be displayed while a beacon signal is being tuned.
- Once the beacon signal has been tuned, a 'receiving' message will be displayed.
- If a beacon signal is tuned and no corrections are being received, a 'no data' message will be displayed.
- If a beacon signal cannot be tuned, a 'no status' message will be displayed.

The GPS II will also display one of three alert messages concerning DGPS operation through the message page:

No DGPS Position— not enough data is available to compute a DGPS position.

No RTCM Input— the beacon receiver is not properly connected or the baud rates do not match.

RTCM Input Failed— DGPS data was being received but has been lost.

Navigation Simulator

The GPS II's simulator mode lets you practice all aspects of its operation without active satellite acquisition. You can plan and practice trips, enter new waypoints and routes, and save them for use during normal operation. The simulator is activated from the system setup page, with speed and heading controlled from the position, compass or highway pages.

To activate the simulator:

1. From the menu page, highlight 'SYSTEMSETUP', and press ENTER.
2. Highlight the 'mode' field, and press ENTER.
3. Select 'Simulator?' (Fig. 81a), and press ENTER.

Once the simulator mode has been activated, use the position, compass, or highway page to set your speed and track. You may also enter a new position if you desire (only from the position page).

To enter a track, speed, and position:

1. Highlight the 'track' field, and press ENTER.
2. Enter a track heading (Fig. 81b), and press ENTER.

SYSTEM SETUP	
MODE:	Simulator
DATE	12 AUG 96
TIME	13:33:25
OFFSET:	+00:00
HOURS:	24
CONTRAST:	█
LIGHT TIMEOUT:	15 SEC

Fig. 81a

NW 330 345 N 015 030 N		
TRACK	SPEED	TRIP
350°	0.0%	0.0%
POSITION		ALT
N 39°00.000'	1081F	
W095°00.000'	13:34:07	

Fig. 81b

NW 330 345 N 015 030 N		
TRACK	SPEED	TRIP
356°	0.0%	0.0%
POSITION		ALT
N 39°00.000'		1081F
W095°00.000'		13:56:01

Fig. 82a

NW 330 345 N 015 030 N		
TRACK	SPEED	TRIP
356°	0.0%	0.0%
POSITION		ALT
N 39°00.000'	1081F	
W095°00.000'		13:56:46

Fig 82b

3. Highlight the 'speed' field, and press ENTER.
4. Enter a speed, and press ENTER.
5. Highlight the 'position' field, and press ENTER (Fig. 82a).
6. Enter a position, and press ENTER.



The GPS II does not track satellites in simulator mode. Although you can create and save waypoints and routes while using the simulator mode, never attempt to use the simulator mode for actual navigation.

To reset the altitude:

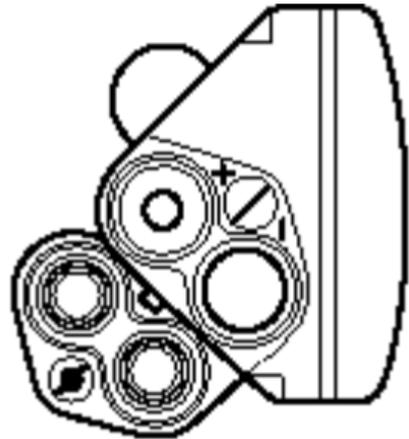
1. Highlight the 'altitude' field, and press ENTER (Fig. 82b).
2. Press the left side of the rocker keypad.

Battery Replacement

The GPS II requires 4 AA alkaline batteries. These batteries will need to be replaced after up to 15 hours of operation in normal mode or 20 hours of operation in battery-saver mode. Rechargeable Ni-cad or lithium batteries may also be used. Note: The battery level indicator is calibrated for alkaline batteries, and will be inaccurate if Ni-Cad or lithium batteries are used.

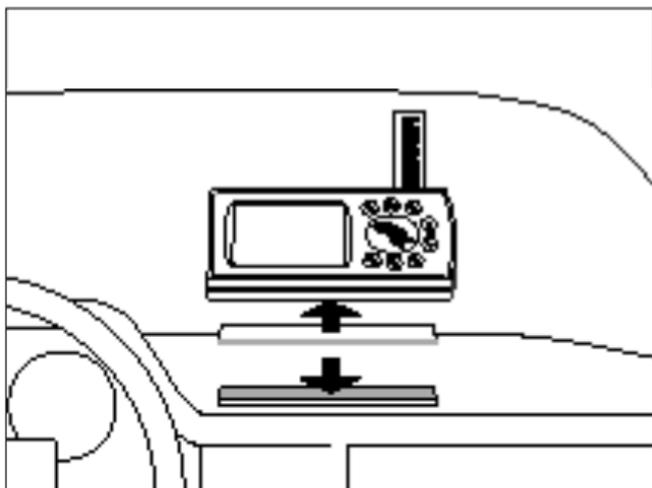
To replace batteries:

1. Remove the battery cover by turning the thumb loop at the side of the unit 1/4 turn counter-clockwise.
2. Remove used batteries and insert new batteries into position. The battery pole you can still see should match the symbol marked on the case.
3. Close and secure the battery cover by turning the thumb loop 1/4 turn clockwise.



Dashboard Mounting

The GPS II can be mounted on the dashboard of an automobile or to another convenient surface using the two Velcro™ strips provided with the unit.



To mount the GPS II using the Velcro strips:

1. Select a location for the unit that provides a clear and unobstructed view of the sky.
2. Remove the paper strip liners from both pieces of Velcro.
3. Make sure the surface to which you're adhering the Velcro is clean and dry. Place the adhesive side of the rough piece of Velcro on the desired mounting surface, and press into place.
4. Place the adhesive side of the smooth piece of Velcro on the bottom of the unit (between the rubber anti-skid bumps), and press into place.
5. Mount the unit, placing one piece of Velcro on top of the other.

Specifications

The GPS II is constructed of high quality materials and should not require user maintenance. If your unit ever needs repair, please take it to an authorized GARMIN service center. The GPSII has no user-serviceable parts. Never attempt any repairs yourself. To protect your GPS II, keep it in its carrying case (optional accessory) when not in use, and never allow gasoline or other solvents to come into contact with the case. To clean the case and lens, use a soft cloth and a household window cleaner.

PHYSICAL

Case: Ruggedized, gasket sealed

Size: 6.15"H x 2"W x 1.23"D (15.6 x 5.1 x 1.23 cm)

Weight: Approx 9 ounces (255g) w/ batteries

Temperature Range: 5 to 158°F (-15° to 70°C)

Memory Back Up: Internal Lithium Battery

PERFORMANCE

Receiver: Differential-ready MultiTrac8™

Acquisition Time: Approx. 20 seconds (warm start)

Approx. 2 minutes (cold start)

Approx. 15 minutes (AutoLocate)

Update Rate: 1/second, continuous

Specifications (cont.)

Position Accuracy:	5-10 meters (16-33 ft.) with DGPS corrections* 15 meters (49 ft.) RMS**
Velocity Accuracy: ***	0.1 knot RMSsteady state (90 knots/103 mph max.)
Dynamics:	Performs to specification to 3g's
Interfaces:	NMEA 183, and RS-232 DGPS correction
Antenna:	Detachable with standard BNC connector

POWER

Input:	Four 1.5 volt AA batteries or 10-36VDC
Current Consumption:	0.16 amps max.
Battery Life:	Up to 15 hours (normal mode/with alkaline batteries, up to 20 hours in battery saver mode)

Specifications subject to change without notice.

* With optional GARMINGBR 21 Beacon Receiver Input.

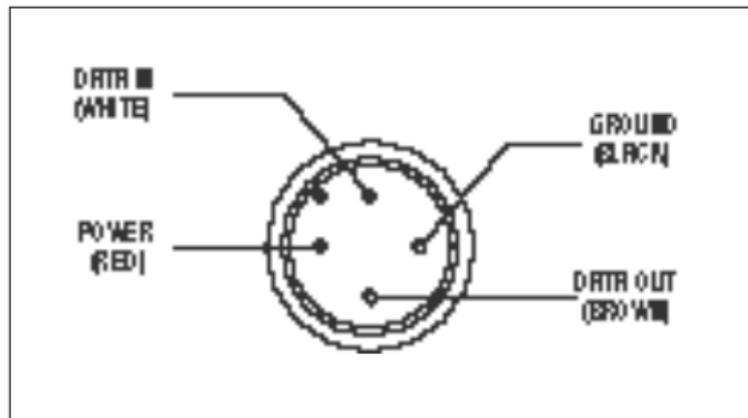
** Subject to accuracy degradation to 100m 2DRMS under the US DOD-imposed Selective Availability Program.

*** Speed Limitation-GARMIN products designed for non-aviation use will display a maximum speed of approximately 90 knots or 103 MPH. This until will not display speed or position information if this limit is exceeded.

Specifications and Wiring (cont.)

Three optional cables are available to connect the GPS II to an external power source or interface with another unit or PC:

- Cigarette Lighter Adapter—
Allows connection to a 12- volt DC cigarette lighter plug.
- Data Cross-Load Cable—
Allows data transfer between other GARMIN GPS units.
- PC Kit Data Cable—
PC interface cable with 9-pin 'D' serial data connector.



Specifications and Wiring (cont.)

The NMEA 0183 version 2.0 interface format is supported by the GPS II, and enables the unit to drive three NMEA devices:

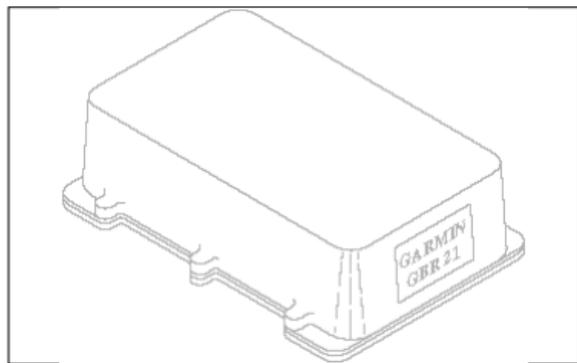
NMEA 0183 version 2.0

Approved sentences:

GPGGA, GPGLL, GPGSA, GPGSV, GPRMB,
GPRMC, GPRTE, GPWPL, GPBOD

Proprietary sentences:

PGRME(estimated error), PGRMM (map datum),
PGRMZ (altitude), PSLIB (beacon receiver control)



DGPS corrections are accepted on RTCM-104 v. 2.0 format. The GARMIN GBR 21 is the recommended beacon receiver for use with the GPS II. Other receivers with the correct RTCM format may be used, but may not correctly display status or allow tuning control.

External Antenna

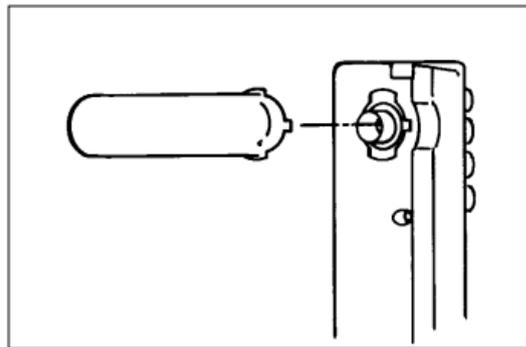
The GPS II's antenna may be removed to allow attachment of an optional remote-mount GPS antenna, such as the GARMIN GA 26.

To remove the attached antenna:

1. Rotate the antenna toward the rear of the unit as shown.

Note: The antenna can only be removed or installed in this position.

2. Pull the antenna gently away from the unit.
3. To install the optional external antenna, mate the BNC connector notches with the mounting posts and turn the knurled knob one-quarter turn clockwise.



Messages

The GPS II uses a flashing on-screen message indicator to alert you to important information. Whenever the message indicator appears, press PAGE to view the message page. There are two types of messages: temporary alerts and condition alerts. Temporary alerts are cleared from the message page after viewing, while condition alerts remain until the condition has been resolved. Pay careful attention to all messages for your own safety.

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

Accuracy has been Degraded—The accuracy of the GPS II 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.

Already Exists—The name you are entering already exists in the GPS II's memory.

Approaching—You are one minute away from reaching a destination waypoint.

Battery Power is Low—The batteries are low and should be replaced.

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

Power Down and Re-init—The GPSII cannot calculate a position due to abnormal satellite conditions. Turn the unit off, and use other means to verify the last position shown. Try the unit again later, possibly in a different location.

Real Time Clock has Failed—The GPS II's internal clock has failed. Take your unit to an authorized GARMIN dealer for repairs.

Read Only Mem has Failed—The permanent memory has failed and the unit is not operable. Take your unit to an authorized GARMIN dealer for repairs.

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

Messages (cont.)

Receiver has 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 30 waypoints to a route.

Route is not Empty—You have attempted to copy into a route already in use.

Route Waypoint Can't be Deleted—The waypoint you are trying to delete is part of a route. Delete the waypoint from the route before removing it from memory.

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

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

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

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

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

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

Stored Data was Lost—All waypoints, routes, time, and almanac data have been lost due to battery failure, or the receiver's memory has been cleared.

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

WPT Memory is Full—You have used all 250 waypoints in the GPS II. Delete unwanted waypoints to make room for new entries.

Map Datums

The following list shows the map datums available for the GPS II. Menu page abbreviations are listed first, followed by the corresponding map datum name and area. The default map datum for the GPS II is WGS 84.

Adindan	Adindan- Ethiopia, Mali, Senegal, Sudan		Tasmania Island
Afgooye	Afgooye- Somalia	Astrln Geod '84	Australian Geod '84- Australia, Tasmania Island
AINELABD '70	AIN ELANBD 1970- Bahrain Island, Saudi Arabia	Bellevue (IGN)	Efate and Erromango Islands
Anna 1 Ast '65	Anna 1 Astro '65- Cocos Isl.	Bermuda 1957	Bermuda 1957- Bermuda Islands
ARC 1950	ARC 1950- Botswana, Lesotho, Malawi, Swaziland, Zaire, Zambia, Zimbabwe	Bogata Observ	Bogata Observatry- Colombia
ARC 1960	ARC 1960- Kenya, Tanzania	Campo Inchspe	Campo Inchauspe- Argentina
Ascnsn Isl'd '58	Ascension Island '58- Ascension Island	Canton Ast '66	Canton Astro 1966- Phoenix Islands
Astro B4 Sorol	Astro B4 Sorol Atoll- Tern Island	Cape	Cape- South Africa
Astro Bcn "E"	Astro Beacon "E"- Iwo Jima	Cape Canavrl	Cape Canaveral- Florida, Bahama Islands
Astro Dos 71/4	Astro Dos 71/4- St. Helena	Carthage	Carthage- Tunisia
Astr Stn '52	Astronomic Stn '52- Marcus Island	CH-1903	CH 1903- Switzerland
Astrln Geod '66	Australian Geod '66- Australia,	Chatham 1971	Chatham 1971- Chatham Island (New Zealand)
		Chua Astro	Chua Astro- Paraguay

Map Datums (cont.)

Corrego Alegre	Corrego Algre-Brazil	Guam 1963	Guam 1963- Guam Island
Djakarta	Djakarta (Batavia)- Sumatra Island (Indonesia)	Gux 1 Astro	Gux 1 Astro- Guadalcanal Island
Dos 1968	Dos 1968- Gizo Island (New Georgia Islands)	Hjorsey 1955	Hjorsey 1955- Iceland
Easter Isld 67	Easter Island 1967	Hong Kong '63	Hong Kong '63- Hong Kong
European 1950	European 1950- Austria, Belgium, Denmark, Finland, France, Germany, Gibraltar, Greece, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland	Hu-Tzu-Shan	Hu-Tzu-Shan- Taiwan
European 1979	European 1979- Austria, Finland, Netherlands, Norway, Spain, Sweden, Switzerland	Indian Bngldsh	Indian- Bangladesh, India, Nepal
Finland Hayfrd	Finland Hayford- Finland	Indian Thailand	Indian- Thailand, Vietnam
Gandajika Base	Gandajika Base- Republic of Maldives	Indonesia '74	Indonesia 1974- Indonesia
Geod Datm '49	Geodetic Datum '49- New Zealand	Ireland 1965	Ireland 1965- Ireland
		ISTS 073 Astro	ISTS 073 ASTRO '69- Diego Garcia
		Johnston Island	Johnston Island Kandawala- Sri Lanka
		Kerguelen Islnd	Kerguelen Island
		Kertau 1948	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 Island)

Map Datums (cont.)

Mahe 1971	Mahe 1971- Mahe Island	NAD27 Central	North American 1927- Central America (Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua)
Marco Astro	Marco Astro- Salvage Island	NAD27 CONUS	North Am. 1927- Mean Value
Massawa	Massawa- Eritrea (Ethiopia)	NAD27 Cuba	North American 1927- Cuba
Merchich	Merchich- Morocco	NAD27 Grnland	North American 1927- Greenland (Hayes Peninsula)
Midway Ast '61	Midway Astro '61- Midway	NAD27 Mexico	N. American 1927- Mexico
Minna	Minna- Nigeria	NAD27 San Sal	North American 1927- San Salvador Island
NAD27 Alaska	North American 1927- Alaska	NAD83	North American 1983- Alaska, Canada, Central America, CONUS, Mexico
NAD27 Bahamas	North American 1927- Bahamas (excluding San Salvador Island)	Nhrwn Masirah	Nahrwn- Masirah Island (Oman)
NAD27 Canada	North American 1927- Canada and Newfoundland	Nhrwn Saudi A	Nahrwn- Saudi Arabia
NAD27 Canal Zone	North Am. 1927- Canal Zone	Nhrwn United A	Nahrwn- United Arab Emirates
NAD27 Caribbn	North American 1927- Caribbean (Barbados, Caicos Islands, Cuba, Dom. Rep., Grand Cayman, Jamaica, Leeward and Turks Islands)	Naparima BWI	Naparima BWI- Trinidad and Tobago
		Obsrvtorio '66	Observatorio 1966- Corvo and Flores Islands (Azores)

Map Datums (cont.)

Old Egyptian	Old Egyptian- Egypt		
Old Hawaiian	Old Hawaiian- Mean Value	Sapper Hill '43	Sapper Hill 1943- East Falkland Island
Oman	Oman- Oman	Schwarzeck	Schwarzeck- Namibia
Ord Srvy GB	Old Survey Grt Britn- England, Isle of Man, Scotland, Shetland Isl., Wales	Sth Amrcn '69	South American '69- Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Guyana, Paraguay, Peru, Venezuela, Trinidad and Tobago
Pico De Las Nv	Canary Islands	South Asia	South Asia- Singapore
Ptcairn Ast '67	Pitcairn Astro '67- Pitcairn Isl.	SE Base	Southeast Base- Porto Santo and Madiera Islands
Prov S Am '56	Prov So Amrcn '56- Bolivia, Chile, Colombia, Ecuador, Guyana, Peru, Venezuela	SW Base	Southwest Base- Faial, Graciosa, Pico, Sao Jorge and Terceira Islands (Azores)
Prov S Chln '63	Prov So Chilean '63- S. Chile	Timbalai 1948	Timbalai 1948- Brunei and E. Malaysia (Sarawak and Sabah)
Puerto Rico	Puerto Rico & Virgin Islands	Tokyo	Tokyo- Japan, Korea, Okinawa
Qatar National	Qatar National- Qatar	Tristan Ast '68	Tristan Astro 1968- Tristan da Cunha
Qornoq	Qornoq- South Greenland	Viti Levu 1916	Viti Levu 1916- Viti Levu/ Fiji Islands
Reunion	Reunion- Mascarene Island	Wake-Eniwetok	Wake-Eniwetok- Marshall Isl.
Rome 1940	Rome 1940- Sardinia Island	WGS 72	World Geodetic System 1972
RT 90	Sweden	WGS 84	World Geodetic System 1984
Santo (Dos)	Santo (Dos)- Espirito Santo Island	Zanderij	Zanderij-Surinam
Sao Braz	Sao Braz- Sao Miguel, Santa		

Time Offset Chart

The table below gives approximate UTC time offsets for various longitudinal zones. If you are in daylight savings time, add one hour to the offset.

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

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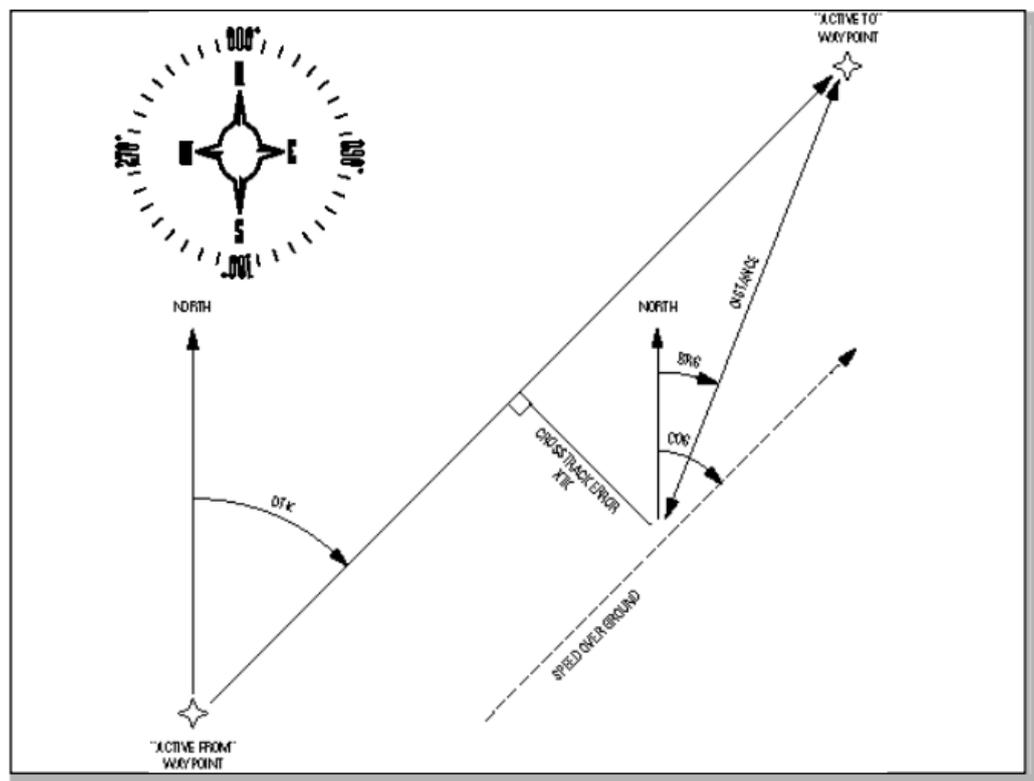
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LIMITED WARRANTY

GARMIN Corporation warrants this product to be free from defects in materials and workmanship for one year from the date of purchase. GARMIN will, at its sole option, repair or replace any components which 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. GARMIN assumes no responsibility for special, incidental, punitive or consequential damages, or loss of use.

The warranties and remedies contained herein are exclusive and in lieu of all other warranties expressed or implied, including any liability arising under 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.

To obtain warranty service, call the GARMIN Customer Service department 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 at its sole discretion.



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