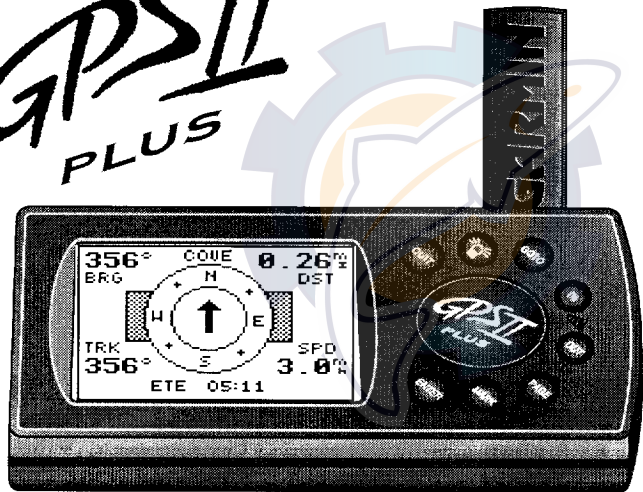# GPS II PLUS

Owner's Manual & Reference

GARMIN.

Software Version 3.0 or above

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February 1998   Part # 190-00130-10 Rev. A   Printed in Taiwan.

Thank You!

Thank you 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 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

⚠ 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.

⚠ For vehicular applications, it's 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.

⚠ 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 GARMIN service center. Unauthorized repairs or modifications could void your warranty and your authority to operate this device under Part 15 regulations.
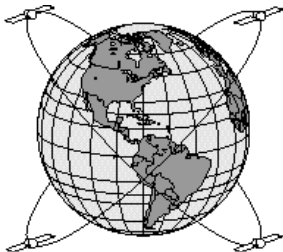
iv

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. We'll show you how to initialize your new GPS on .

Initialization is only necessary under the following conditions:

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

Satellite Acquisition

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 twelve satellites in view. The receiver 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, it 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.

WELCOME TO THE
GARMIN
GPS II
PLUS
SOFTWARE 3.00
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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 not acquired a position fix.
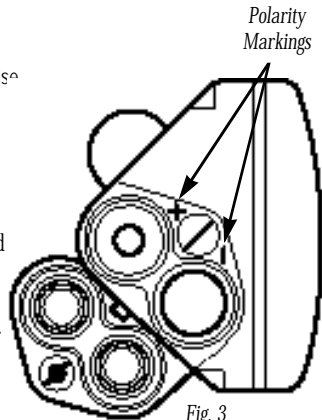
2

Battery Installation

The GPS II+ operates on 4 AA batteries (not included), which are installed at the base of the unit. These batteries provide up to 24 hours of use.
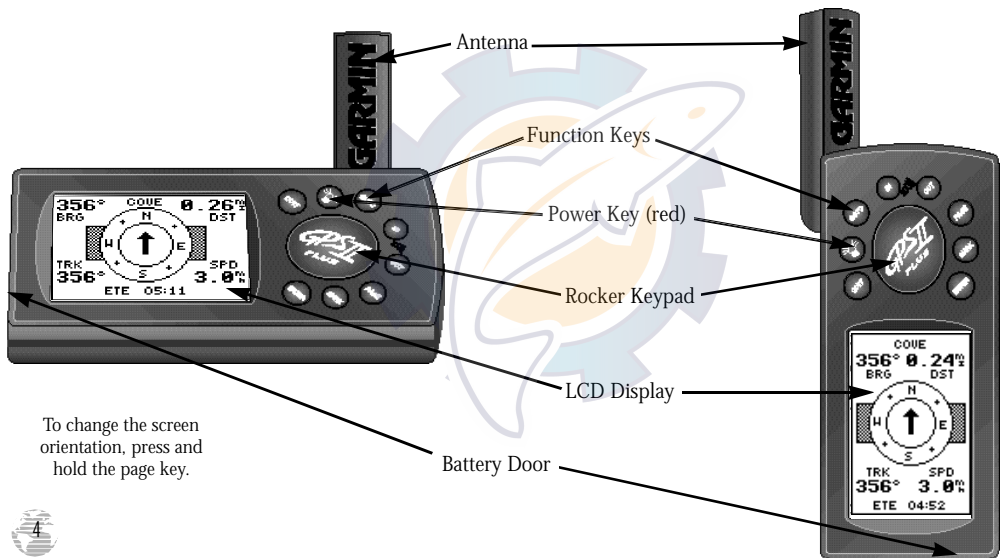
To install the batteries:

1. Flip up the metal ring at the base of the unit, and turn the ring 90° counter clockwise.

2. Install the batteries (Fig. 3), and close the battery compartment door.

3. Lock the door in the closed position by rotating the metal ring 90° clockwise.

Battery life varies due to a variety of factors, including temperature and backlighting. You may find that the battery life varies in different conditions and that lithium batteries provide longer life in colder conditions.

When replacing the GPS II+'s batteries, observe the polarity markings engraved in the plastic case. An internal 10-year lithium battery will retain your data while you're changing batteries.

Polarity Markings

Fig. 3

Antenna

Function Keys

Power Key (red)

Rocker Keypad

LCD Display

To change the screen orientation, press and hold the page key.

Battery Door

4

(POWER)— Red key turns the unit on and off, and controls three levels of screen backlighting intensity.

(PAGE)— Scrolls main pages in sequence and returns display from a submenu page to a main page. Press and hold this key to change screen orientation.

(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.

(IN and OUT)— Provides 18 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.
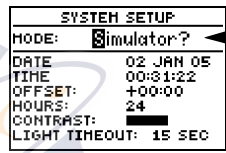
```
SYSTEM SETUP
MODE:    Simulator?
DATE     02 JAN 05
TIME     00:31:22
OFFSET:  +00:00
HOURS:   24
CONTRAST:
LIGHT TIMEOUT: 15 SEC
```
'Mode' Field

Fig. 5

CURSOR— A 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 (Fig. 5).

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

SCROLL— The act of moving through characters or options from a selected field.

Fig. 6a

Fig. 6b

Screen Orientation

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 identically, 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.

Data Entry

The arrow keypad is used for all data entry. Use the UP and DOWN keys to select letters, numbers, and menu options; use the LEFT and RIGHT keys to move the cursor forward or backward along the line (Fig. 6c). Press ENTER to confirm your entry.
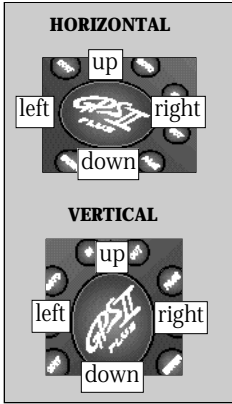

Fig. 6c

6

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 A) 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 red power key.

The Welcome and Database Info pages will be displayed while the unit conducts a self test. Once testing is complete, the Welcome Page will be replaced by the Satellite Page. You'll see the EZ*init* prompt, which asks you to choose an initialization method. Note: If the EZ*init* 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 the closest country to your present position, and press ENTER.
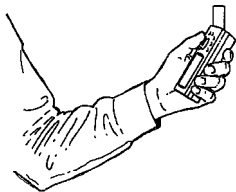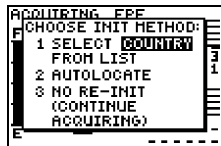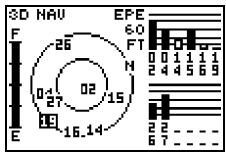
Fig. 7a

Fig. 7b

Check the Satellite Page for '2D nav' or '3D nav' to verify a position fix.
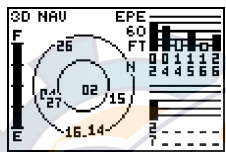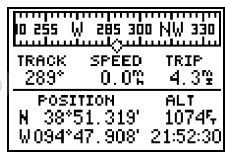

Fig. 8a

Fig. 8b

Fig. 8c

This usually provides a position fix in 1 minute. You'll know you have a fix when the unit automatically transitions from the Satellite Page to the Position Page (Figs. 8a-8b). Your receiver is now ready to use!

To turn the unit off:

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

8

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 GA 26 low-profile remote antenna, part number 010-10052-02.)

• **Have you selected the right country/state/region from the EZ*init* 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 EZ*init* list.
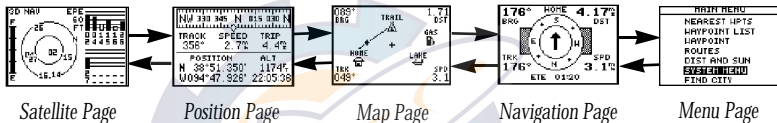
Scrolling Through the Main Pages

Satellite Page *Position Page* *Map Page* *Navigation Page* *Menu Page*

Fig. 10

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

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 the PAGE or QUIT keys. 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 more detail in the reference section.

This tour assumes that you have only initialized the receiver and have not changed any of the factory settings (units of measure, user-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 by pressing and holding down the PAGE key.
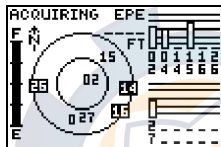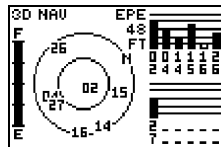
Satellite Page

Fig. 11

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.

Let's start with the Satellite 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 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, corresponding 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), and you can adjust the screen contrast by pressing the rocker keypad.

Fig. 12a

Fig. 12b

Position Page

The Position Page (Fig. 12a) 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 you're moving, 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 those fields more in the reference section.

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. (Your GPS II⁺ can hold up to 500 waypoints.)

To mark your present position:

1. Press the MARK key. The mark position page will appear, with a default three-digit name for the new waypoint in the upper-left portion of the page (Fig. 12b).

To rename the waypoint:

1. Use the keypad to highlight the name field, and press ENTER.

2. Enter the waypoint name 'HOME' (Fig. 13a), and press ENTER. (See p. 6 for data entry.) The 'waypoint symbol' field will become highlighted.

Each waypoint may also be assigned a custom waypoint symbol for easy waypoint recognition on the map page.

To change the waypoint symbol:

1. Highlight the waypoint symbol field (Fig. 13b), and press ENTER.

2. Select the house symbol, and press ENTER.

3. Move the cursor to the 'DONE?' prompt, and press ENTER.
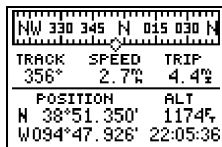
4. Press ENTER to confirm the 'SAVE?' prompt.

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.

Fig. 13a

Fig. 13b

13

```
NW 330 345 N 015 030 N
TRACK    SPEED    TRIP
 356°     2.7%    4.4%
    POSITION      ALT
N 38°51.350'     1174%
W094°47.926'  22:05:36
```

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 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 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.

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Map Page

The GPS II⁺'s next page, the Map Page, shows your movement as a real-time track log (an electronic breadcrumb trail that "flashes" at a map scale of less than 5 miles), and your present position as a diamond icon in the center of the map. Use the zoom keys (IN and OUT) to change the map scale until you see the waypoint you just created ('HOME'). We'll cover more about this page in the reference section.

1. Now turn approximately 90º 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).
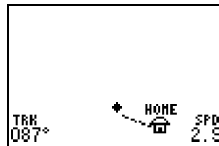
Fig. 15a
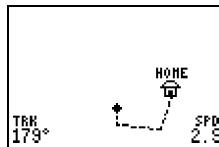
Fig. 15b

Fig. 16a
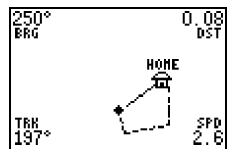
Fig. 16b

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 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 return to the Map Page, and a straight line will connect your current position to the position of the GOTO waypoint (16b).

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

1. Press PAGE.

Compass Page

Whenever you select a destination waypoint, the GPS II+ provides graphic steering guidance with the Compass Page (the default navigation page). The 'compass ring' in the middle of the page shows your direction of travel while you're moving (indicated by the top of the ring), and the pointer arrow points to your destination (selected waypoint). As you move toward 'HOME', notice how the compass ring and the pointer arrow provide a clear picture of the direction you're moving and the direction of 'HOME.'

Fig. 17a

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 (see page 55).

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.
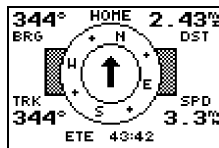
Fig. 17b

17

MAIN MENU

NEAREST WPTS
WAYPOINT LIST
WAYPOINT
ROUTES
DIST AND SUN
SYSTEM MENU
FIND CITY

Fig. 18a

NEAREST WPTS			
NO	WAYPOINT	BRG	DST
1	HOME	050°	0.20
2	GARMIN	044°	0.37
3	------	---°	-.--
4	------	---°	-.--
5	------	---°	-.--
6	------	---°	-.--

Fig. 18b

18

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, setup, and city locator features.

To view the Menu Page:

1. Press PAGE.

To select a menu option:

1. Highlight the desired field, and press ENTER (18b).

To return to the Menu Page:

1. Press QUIT.

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. 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. 19a), and press ENTER.

4. Highlight 'Yes?', and press ENTER.

Fig. 19a

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+.

To turn your GPS II+ off:

1. Press and hold the red power key (Fig. 19b). The unit will count down for three seconds and then turn off.
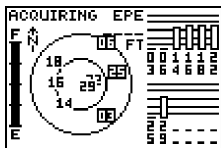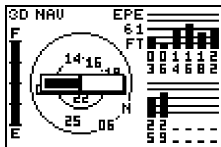
Fig. 19b

19

Fig. 20a

Fig. 20b

20

Satellite Page

The GPS II+'s Satellite 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 receiver is looking for the satellites indicated.
- Hollow signal strength bars— the receiver has found the satellite(s) and is collecting data (Fig. 20a).
- Solid signal strength bars— the receiver has collected the necessary data and the satellite(s) is ready for use.

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 p. 75).

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 45º 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' in the status field) (Fig. 21b). You can also set the sky view to a track up configuration by changing the "orientation" option on the Map Page. (See p. 67 for setup instructions.)

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 calculate a fix, the status field will indicate a 2D or 3D status.
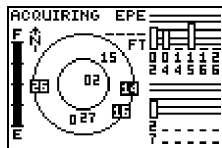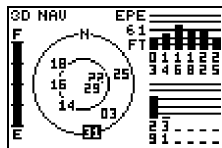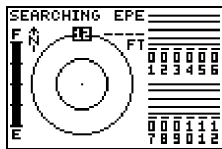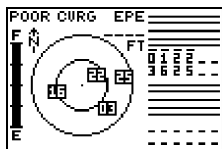

Fig. 21a

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 5 minutes, depending on the 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).

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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).

Fig. 23a

EZ*init* Option Prompt

The Satellite Page also provides access to the EZ*init* 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 p. 7), and is useful if you have traveled over 500 miles with the receiver off and must initialize your new position. (The EZ*init* 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. 23b

23
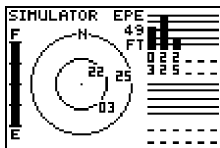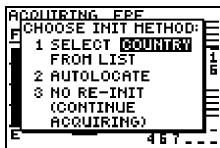
Battery Level Indicator

The Satellite 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). The battery indicator will not appear if the receiver is operating off external power.
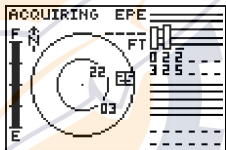
Fig. 24

⚠️ *The battery level indicator is calibrated for alkaline batteries. Ni-Cad and lithium batteries will display the battery level differently due to voltage differences. No other receiver functions are affected.*

The GPS II+ features an internal 10-year lithium battery that will maintain the unit's memory when the receiver is not running off batteries or external power.

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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 p. 75).

Fig. 25

To turn the screen backlighting on:

1. 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 Page.

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.

Position Page

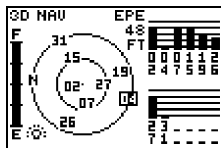The second page in the GPS II+'s main page sequence is the Position Page. This page shows you where you are, what direction you're heading, and how fast you're going, and it's most useful when you are traveling without an active destination waypoint. The graphic heading display at the top of the page 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 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). Below that field is a 12- or 24-hour clock.

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.

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

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The following user-selectable options are available on the Position Page:

> **Trip Odometer (TRIP)—** 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)—** hours and minutes since last reset.
>
> **Average Speed (AVSPD)—** average speed traveled.
>
> **Maximum Speed (MXSPD)—** maximum speed traveled since last reset.
>
> **Altitude (ALT)—** 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. This allows the information provided in these fields to always be relative to your current trip.

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

The position format and units of measure for speed, distance, position, and altitude are all user-selectable through the navigation setup page (see p. 76). The 12/24 hour clock and time offset options are available from the system setup page (see p. 73).

Fig. 28a

Fig. 28b

28

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 a Position

The GPS II+ allows you to mark, store, and use up to 500 positions as waypoints. Waypoints serve as electronic markers that let you keep track of starting points, destinations, navaids, etc. A waypoint position can be entered by taking an instant electronic fix, by manually entering coordinates (see p. 34), or by referencing a bearing and distance to a known position (see p. 35).

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. To save a default name and symbol, press ENTER to confirm the 'SAVE?' prompt.

Position Averaging Function

Position Averaging provides more accurate saved positions by reducing position error when marking waypoints.

1. After pressing MARK, highlight the 'AVERAGE?' field, and press ENTER. The Figure of Merit (FOM) field will display a value reflecting estimated accuracy of the averaged position.

```
      MARK POSITION
   Waypoint:    | Add to
    001      □  | route
                | number:
   N 38°51.350' |  --
   W094°47.936' | SAVE?
   FOM ___.__ₓ AVERAGE?
```

Fig. 29

Note: As the II+ calculates the FOM, it will rapidly change and then begin to stabilize over time.

Fig. 30a

Fig. 30b

2. The unit will continue averaging until you have highlighted 'SAVE?' and pressed ENTER.

To enter a different waypoint name:

1. Highlight the waypoint name field, and press ENTER (Fig. 30a).

2. Make the appropriate changes, and press ENTER.

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

Note: To enter a different waypoint symbol or comment, see pp. 36-37.

To add this waypoint to a route:

1. Highlight the 'add to route number' field (Fig. 30b), and press ENTER.

2. Enter a route number, press ENTER to confirm the route number, and ENTER again to save the waypoint.

Waypoint Pages

MAIN MENU
NEAREST WPTS
WAYPOINT LIST
WAYPOINT
ROUTES
DIST AND SUN
SYSTEM MENU
FIND CITY

Fig 31a

WAYPOINT **HOME**

N 38°51.323'
W094°47.924'   RENAME?

                     NEW?
REF: _____
                     DELETE?
  BRG   DST
  000°   0.00%   **DONE?**

Fig. 31b

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.

The GPS II+ has three waypoint pages that let you quickly manage up to 500 waypoints. These pages—nearest waypoints, waypoint list, and waypoint definition—can be accessed through the Menu Page (Fi. 31a).

To select a waypoint page:

1. Access the Menu Page, and highlight a waypoint page option (Fig. 31b).
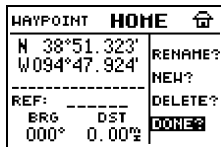
2. Press ENTER.

Fig. 32a

Fig. 32b

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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 selected waypoint:

1. Highlight the desired 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 the desired 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+ and their respective waypoint symbols. The total number of empty and used waypoints is also indicated. From the waypoint list page, you can retrieve a waypoint definition page, delete all user-defined waypoints, delete waypoints by symbol, or review and perform a GOTO to a selected waypoint (see p. 32).

To delete all user-defined waypoints:

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

An options page will appear, asking if you want to delete all user-defined waypoints or if you want to delete waypoints by symbol type.

1. Highlight either 'ALL' or 'SYMBOL' (Fig. 33b), and press ENTER.

If you highlight 'SYMBOL,' you'll be asked to select a symbol.

1. Select the symbol to be deleted, and press ENTER.

2. Press ENTER to confirm the 'DONE' prompt, highlight the 'YES?' prompt, and press ENTER.

Note: This feature is handy for deleting temporary waypoints created by the TrackBack function.

```
 HAYPOINT LIST    5 USED
      ▶ GAS
      ⌂ HOME
      ⇌ LAKE
      ▫ RIDGE
 DELETE WPTS?   495 EMPTY
```

Fig. 33a

```
 HAYPOINT LIST    1 USED
      ┌─ OPTIONS ─┐
      1 DELETE ALL
      2 DELETE BY
        SYMBOL
      ───────────
 DELETE WPTS?   499 EMPTY
```

Fig. 33b

33

Fig. 34a

Fig. 34b

Waypoint Definition Page

The waypoint definition page lets you create new waypoints manually or review and edit an existing waypoint's coordinates, symbols, and comments. It is also used to delete an individual waypoint from memory (see p. 38). 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. Press ENTER to select a waypoint symbol, make your selection, and press ENTER.

4. Highlight the 'DONE?' prompt, and press ENTER to return to the waypoint page.

5. Highlight the 'position' field, enter your position (Fig. 34b), and press ENTER.

6. Press ENTER to confirm the 'DONE' prompt.

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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.

Fig. 35a

Fig. 35b

35

Fig. 36a

Fig. 36b

Waypoint Symbols

The GPS II+ allows you to select one of 16 symbols for each waypoint for easy recognition on the map display. From the symbol page, you may also select how the waypoint appears on the map.

To select a waypoint symbol:

1. Highlight the symbol field (Fig. 36a), and press ENTER.

2. Use the arrow keypad to select the desired symbol, and press ENTER.

3. The cursor will move to the display field, where you can select which waypoint information is displayed on the map.

4. Press ENTER, and select one of the following display options: 'name with symbol,' 'symbol only,' or 'comment with symbol' (Fig. 36b).

5. Press ENTER to confirm your selection, and ENTER again to confirm the 'done' prompt.

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).

Note: You can clear the 'comment' field by pressing the left side of the rocker keypad.

3. Enter the desired comment (Fig. 37b).

4. Press ENTER.


```
HAYPOINT  HOME    ⌂
N 38°51.333'
W094°47.941'      RENAME?
◻1-JAN-05_00:01_  NEW?
REF: _____       DELETE?
 BRG     DST      DONE?
 000°   0.00%
```

Fig. 37a


```
HAYPOINT  LAKE    ⬌
N 38°51.339'
W094°43.364'      RENAME?
COVE_HEST_OF_BE◻  NEW?
REF: _____       DELETE?
 BRG     DST      DONE?
 086°   4.09%
```

Fig. 37b

WWW.reelschematic.com

Fig. 38a

Fig. 38b

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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. Highlight the 'Yes' prompt, and press ENTER.

Note: To delete a waypoint that's part of a route, first remove the waypoint from the route (see p. 52), and then delete it. If you attempt to delete a waypoint that's part of a route, you'll be given a "Route Waypoint Can't be Deleted" message.

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.

Note: The GPS II+'s waypoint scanning feature will offer the first waypoint that matches the character or characters you have entered up 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.

4. When you find the desired waypoint, press ENTER.

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.

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Fig. 40a

Fig. 40b

Selecting a GOTO Destination

The GPS II+ provides five ways to navigate to a destination: GOTO, MOB, TracBack, route, and find city navigation (see pp. 71-72). 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 GOTOwaypoint 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 p 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 MOBGOTOis 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

41
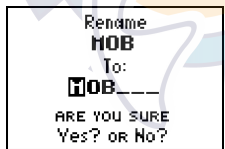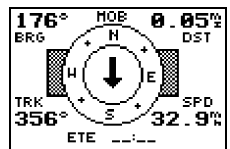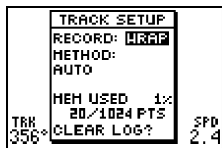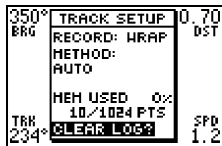
Fig. 42a

Fig. 42b

TrackBack Navigation

GARMIN's patented TrackBack feature allows you to quickly retrace your path using the track log automatically stored in the receiver. This feature eliminates the need to mark waypoints along the way and manually create and activate a route back to where you began your trip. You may select one of three track recording options:

Off—no plot will be recorded.

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

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

To select a track log option:

1. Highlight the 'record' field (Fig. 42a), press ENTER, select an option, and press ENTER.

Once a TrackBack 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 TrackBack route:

1. From the Map Page, press ENTER, highlight the 'track setup' option, and press ENTER.

2. Highlight 'CLEARLOG?' (Fig. 42b), press ENTER, highlight 'Yes?', and press ENTER.

To activate a TracBack route:

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


```
GOTO WAYPOINT
  ↩ LAKE
  □ MOB
  ⊗ RIDGE
  △ TRAIL
CANCEL GOTO? TRACBACK?
FIND CITY?
```

Fig. 43a


```
ACTIVE  TRACBACK
WAYPNT  ETE   DST
T017    --:--  -.--
T016    16:56  0.70
T015    23:03  0.96      CLR?
T014    31:20  1.30      INV?
T013    48:30  2.02      ACT?
T012    59:45  2.49
```

Fig. 43b

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 will be created to mark the most significant features of the track log in order to duplicate your exact path as closely as possible. These points will be indicated by a 'T001' number on the waypoint list, and by a "T" symbol on the Map Page (Fig. 43c).


```
109°                    0.20
BRG                      DST



TRK                      SPD
034°                     23.0
```

Fig. 43c

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. Note: You may delete a TrackBack waypoint from a route, but only if the route is not active.

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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 can be set to either the 'wrap' or 'fill' positions (see p. 42).

- 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.)

TracBack Tips (cont.)

- 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.

- Whenever a TracBack route is activated, the receiver will automatically erase any temporary waypoints 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. (You can also quickly delete all temporary TracBack waypoints in memory by using the 'delete by symbol' method described on p. 33.)

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.
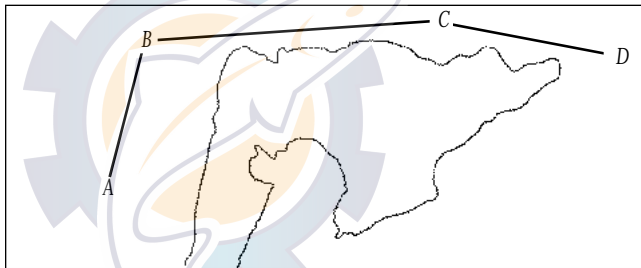

Fig. 46

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 displays 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 route distance is indicated below the waypoint list.

Fig. 47a

ROUTE: 1 DOCK TO FISH			
NO HAYPNT	DTK	DST	COPY
2 SUPPLY	232°	0.9	TO:__
3 BAIT			
4 COVE	320°	1.3	CLR?
5 FISH	054°	1.4	INV?
6 _____	---	-.-	**ACT?**
TOTAL DST		4.47	

Fig. 47b

ROUTE: **2** HOME TO SUPPLY			
NO HAYPNT	DTK	DST	COPY
1 HOME	356°	4.2	TO:__
2 RIDGE			
3 LAKE	132°	5.9	CLR?
4 SUPPLY	356°	-.-	INV?
5 _____	---	-.-	ACT?
TOTAL DST		3473	

47

```
ROUTE: 2 HOME_TO_SUPPL▓__
NO WAYPNT DTK DST
 1 HOME   356° 4.2   COPY
 2 RIDGE  132° 5.9   TO:__
 3 LAKE   356° -.-   CLR?
 4 SUPPLY 356° -.-   INV?
 5 _____ --- -.-    ACT?
TOTAL DST     3473
```

Fig. 48a

```
ROUTE: 3 HOME TO RIDGE
NO WAYPNT DTK DST
 2 GAS    356° -.-   COPY
 3 BAIT   320° 1.3   TO:__
 4 COVE   303° -.-   CLR?
 5 RIDGE  --- -.-    INV?
 6 HOME__ --- -.-    ACT?
TOTAL DST     6925
```

Fig. 48b

48

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 these two 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.

Fig. 49a

Fig. 49b

49

Fig. 50a

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 of the unit. 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.

Fig. 51a

Fig. 51b

51

Fig. 52a

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

You may delete a waypoint from a route, but only if the route is not active. 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.

To 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 using the page you were on before performing a GOTO (Fig. 53b).

Fig. 53a

Fig. 53b

53
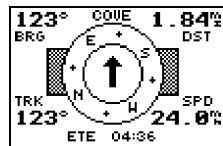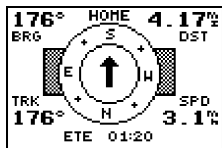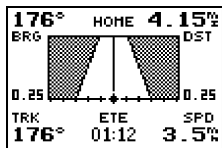
Fig. 54a

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). This page also features a course deviation indicator (CDI) (see p. 78). 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, and your current speed and track over the ground. 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.

Selecting a User-Defined Navigation Page (cont.)

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. This field will give you a digital representation of the CDI scale.

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 the destination.

Using the Compass Page

The GPS II+'s Compass Page (Fig. 56 and p. 57) provides graphic steering guidance to a destination waypoint. The middle of the page features a rotating 'compass ring' that shows your course over ground while you're moving (track up), and a pointer arrow that indicates the direction of the destination relative to the direction you're moving. The compass ring and pointer arrow work independently to show—at a glance—the direction of your movement and the direction to your destination. For instance, if the arrow points up, you are going directly to the waypoint. If the arrow points any direction other than up, turn toward the arrow until it points up—then continue in that direction. The bearing and distance to a waypoint are displayed at the top of the screen, and your current track and speed are shown below.
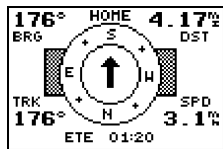
This page provides better steering guidance than the Highway Page for travel at slower speeds and for travel with many directional changes. When you are one minute away from the destination (based on your current speed and track over the ground), the GPS II+ will alert you with a flashing on-screen message box.

Fig. 56

56

Bearing to Waypoint

Destination Waypoint

Distance to Waypoint

Pointer to Waypoint

Graphic Compass Ring

Track Over Ground

Estimated Time Enroute (User-Selectable Field)

Speed Over Ground

176°
BRG
HOME
4.17%
DST

TRK
176°
SPD
3.1%

ETE 01:20
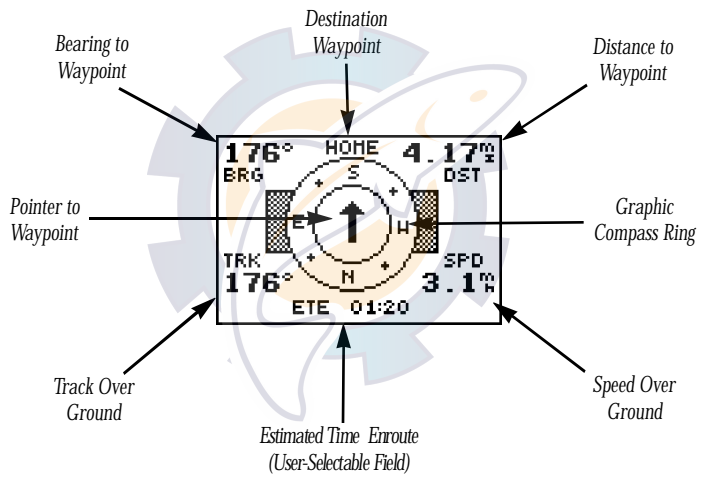
Using the Highway Page

The GPS II+'s Highway Page (Fig. 58 and p. 59) also provides graphic steering guidance to a destination waypoint, 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."
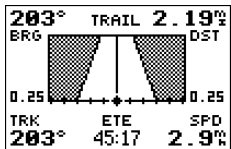
Your present position is represented by the diamond in the center of the course deviation scale. The line down the middle of the highway represents your desired track. As you navigate toward a waypoint, the highway will actually move—indicating the direction you're off course—relative to the position 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 CDIscale 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 p. 78.) As you approach a waypoint, a horizontal "finish line" will move toward the bottom of the highway. When the finish line reaches the CDI scale, you've arrived at your destination.

Fig. 58

Bearing to Waypoint

Destination Waypoint

Distance to Waypoint

CDI Scale

Graphic Highway

Track Over Ground

Speed Over Ground

Estimated Time Enroute (User-Selectable Field)

59
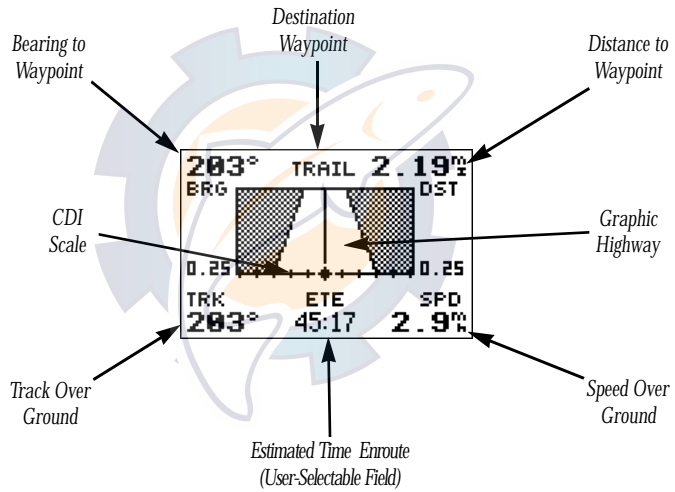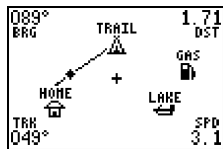
Map Page

The GPS II+ features a powerful real-time map (Fig. 60 and p. 61) 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 (see p. 62). The map portion of the page displays your present position as a diamond icon, with your track and/or route displayed as small points (electronic breadcrumb trail that "flashes" at a map scale of less than 5 miles.). Nearby waypoints are represented with names, symbols, or comments. You may select which features are shown through the waypoint definition page (see pp. 64-65).

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. 60

60

Bearing to Waypoint

Route Line

Distance to Waypoint

Track Log

089° BRG

TRAIL

1.71 DST

GAS

HOME

LAKE

TRK 049°

SPD 3.1

Track Over Ground

Present Position

Panning Cursor

Speed Over Ground

61
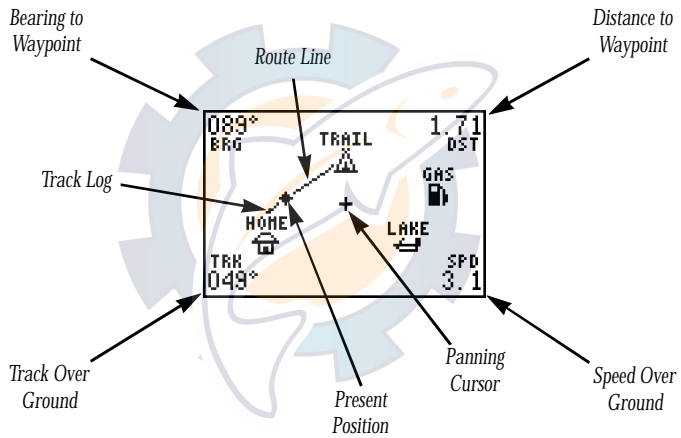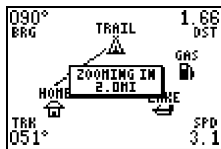
Fig. 62a

Fig. 62b

Zooming and Panning

There are three main functions you can perform from the Map Page: zooming, panning, and pointing. The map has 18 map scales (from 0.2 to 00 miles, or 0.3 to 800 km) which are selected by pressing the IN and OUT zoom keys. These ranges are measured vertically, from the bottom of the screen to the top.

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.

Zooming and Panning (cont.)

As you begin to move the map, a crosshair appears (Fig. 63a). This crosshair will serve as a target marker for the map. The distance and bearing to a destination will be replaced by the distance and bearing from your present position to the target crosshair.
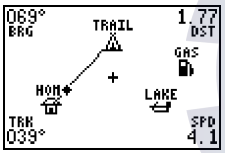
Fig. 63a
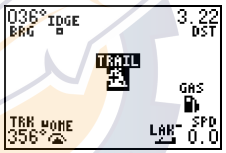
Fig. 63b

Fig. 63c

Fig. 63d

When you pan around the map, you'll notice the target crosshair will "snap to' on-screen waypoints and highlight the waypoint name (Fig. 63b). Once a waypoint name is highlighted, you can either review its waypoint definition page (Fig. 63c) or way-point display options, or execute a GOTO function right from the Map Page (Fig. 63d).

63
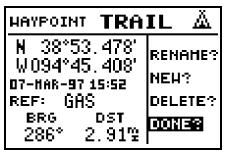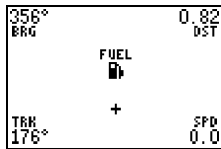
To review the waypoint definition page for a highlighted waypoint:

1. Press ENTER while the waypoint is highlighted.

Fig. 64a

Fig. 64c

Fig. 64b

From the waypoint definition page, you can also define how each individual waypoint is displayed on the map. The GPS II⁺ displays waypoints as a name with a corresponding symbol (e.g., "fuel" and a gas pump symbol) (Fig. 64a), a symbol only (e.g., a fish symbol) (Fig. 64b), or a 16-character comment and corresponding symbol (e.g., "great view" and the camp site symbol) (Fig. 64c). The waypoint name has a six character limit while the 'comment' field has a 16-character limit, and there are 16 individual waypoint symbols available.

To select a waypoint display option:

1. Highlight the symbol field (to the right of the name field), and press ENTER.

2. Move the cursor to the 'display' field (Fig. 65a), and press ENTER.

3. Select a display option, and press ENTER to select one of the following display options: 'name with symbol,' 'symbol only,' (Fig. 65b) or 'comment with symbol.'

4. Press ENTER to confirm the 'DONE?' prompt.

5. Press ENTER again (on the waypoint definition page) to return to the Map Page.

Fig. 65a

The last function you can perform with a waypoint highlighted on the Map Page is to perform a GOTO directly to the waypoint.

To GOTO a waypoint highlighted on the Map Page:

1. Press GOTO.

2. Press ENTER to confirm the GOTOwaypoint page.
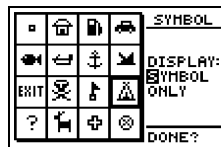
Fig. 65b

MARK POSITION

Waypoint:	Add to
003 □	route number:
N 38°51.350'	--
W094°47.936'	**SAVE?**
FOM ___.⊦ᵣ AVERAGE?	

Fig. 66a

WAYPOINT LIST 12 USED

- □ **MAP**
- □ **MOB**
- ⊗ **RIDGE**
- △ **TRAIL**

DELETE WPTS? 490 EMPTY

Fig. 66b

Using the Cursor to Mark and GOTO Waypoints

During panning, the crosshair represents a target position right on the Map Page, 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. 66a).

2. Enter a name and/or route number, and press ENTER.

You can also use the target crosshair as an instant GOTO destination. This feature is similar to the MOB mode, and will allow you to mark and instantly set a course for a new waypoint called 'MAP'.

To GOTO the target crosshair:

1. Press GOTO, and press ENTER (Fig. 66b).

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

To stop the panning function:

1. Press QUIT.

Accessing the Map Pages

You can access four additional pages—the map setup page, the track setup page, the find city page, and the city setup page—by pressing ENTER while on the Map Page (Fig. 67a).

To select one of these options:

1. Highlight the desired field, and press ENTER.

Fig. 67a

Map Setup Page and Orientation

The map setup page lets you select Map Page *and* satellite sky view (see p. 21) orientation, as well as specify what items are displayed. The Map and Satellite Pages 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. 67b).

2. Select the desired orientation, and press ENTER.

Note: Selecting the 'DTK UP' option will set the satellite sky view to track up.
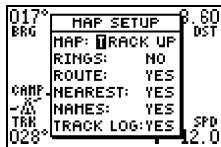
Fig. 67b
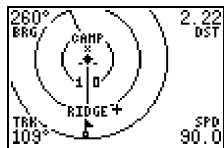
Fig. 68

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.

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.

- 'Rings'— displays the three present position range rings on the map (Fig 68).

- '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.

- 'Track Log'— displays and plots track points on the map.

To turn a map item on or off:

1. Highlight 'YES' or 'NO' for the specific map item, 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 'record' field, and press ENTER.

2. Select 'YES' or 'NO', and press ENTER. (Note: Turning the track recording off will disable the TracBack 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. 69a), and press ENTER twice (Fig. 69b).

3. Enter a value in hours, minutes, and seconds, and press ENTER.

Fig. 69a

Fig. 69b

69
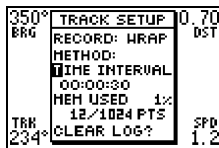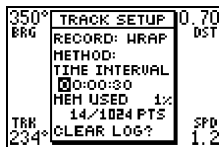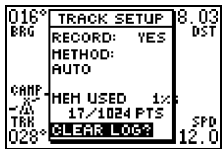
Fig. 70a

Fig. 70b

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 1024 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.

Managing and Clearing the Track Log

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

To clear the track log:

1. Highlight 'CLEAR LOG?' (Fig. 70a), and press ENTER.

2. Highlight 'Yes?' (Fig. 70b), and press ENTER.

Note: 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 TracBack feature.

70

Find City Page

The Find City page lets you search the built-in city database for a city.

To search for a city by name:

1. Highlight 'FIND CITY' (Fig. 71a), and press ENTER.

2. Enter the city name, and press ENTER.

Note: If the city name includes a space, you will need to select a blank in the appropriate place while spelling the name.

The latitiude and longitude of the city location will be displayed along with a bearing and distance from either the current GPS position or a reference waypoint.

To view the city location on the map:

1. Highlight 'SHOW MAP' (71b), and press ENTER.

The Map Page will display the city you selected at the crosshair on the map.

Note: The city location may not be visible if the map is zoomed to a large scale. To view the city location, lower the map zoom scale.

To return the map to the current GPS location:

1. Press the QUIT key.

Fig. 71a

Fig. 71b

71

Find City Page (cont.)

To GOTO the city location from the map:

1. Press GOTO, and then press the ENTER key to activate the GOTO.

To GOTO the city location from the find city page:

1. Highlight 'GOTO' at the bottom of the find city page (72a), and press ENTER twice to confirm.

If you GOTO a city location from the map or find city page, a user waypoint will be created and added to the user waypoint list.

City Setup Page

The city setup page lets you select the zoom range visible on the map. Cities are divided into three categories: small, medium, and large. Note: Small cities may not be visible on the map at high zoom settings.

To set the visible range:

1. Highlight 'CITY SETUP', and press ENTER (72b).

2. Select the city size, and press ENTER.

3. Change to the desired range, and press ENTER.

FIND CITY	
KANSAS CITY	REF:
KANSAS	------
USA	BRG
	016°
N 39°06.417'	DST
W094°40.970'	18.4%
SHOW MAP?	**GOTO?**

Fig. 72a

```
176°              0.02
BRG               DST
    ┌─────────────┐
    │ MAP SETUP   │
    │ TRACK SETUP │
    │ FIND CITY   │
    │ CITY SETUP  │
    └─────────────┘
         +
TRK               SPD
356°              0.0
```

Fig. 72b

72

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 (Fig. 73a). These seven pages are divided into categories by function. We've already gone over the waypoint and route management pages in their respective sections. Let's review the rest of these pages in the order they appear on the Menu Page.

```
       MAIN MENU
  NEAREST WPTS
  WAYPOINT LIST
  WAYPOINT
  ROUTES
  DIST AND SUN
  SYSTEM MENU
  FIND CITY
```

Fig. 73a

```
     MAIN MENU
  NEAREST WPTS
  WAYPOINT LIST
  WAYPOINT
  ROUTES
  DIST AND SUN
  SYSTEM MENU
  FIND CITY
```

Fig. 73b

```
      DIST AND SUN
 FROM: _____  BRG 000°
 TO:   _____  DST 0.00%
  DATE:     04 FEB 98
  SUNRISE   13:23:19
  SUNSET    23:42:46
    AT DESTINATION
```

Fig. 73c

To select a submenu page from the Menu Page:

1. Highlight the page name (Fig. 73b), and press ENTER (Fig. 73c).

2. To return to the Menu Page, press QUIT.

73

Fig. 74a

Fig. 74b

Distance and Sun Calculations

The distance and sun calculation 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. 74a), and press ENTER.

2. Highlight the 'to' field, enter the destination waypoint, and press ENTER.

3. The 'date' field will become highlighted (Fig. 74b). 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, the sunrise and sunset at your present position will be shown.

System Menu

The setup menu page allows the user to access the unit's system, navigation, alarm, and interface submenu pages.

System Submenu

The system submenu page (Fig. 75a) is used to select the operating mode, time offset, and screen preferences. The GPS II⁺ has two operating modes:

- **Normal Mode** operates the unit at maximum performance, and provides battery life of up to 24 hours on alkaline batteries.

- **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 (Fig. 75b), and press ENTER.
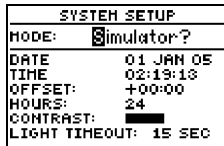
```
   SETUP MENU
  SYSTEM
  NAVIGATION
  ALARMS
  INTERFACE
```

Fig. 75a

```
      SYSTEM SETUP
 MODE:   Simulator?
 DATE      01 JAN 05
 TIME      02:19:13
 OFFSET:   +00:00
 HOURS:    24
 CONTRAST: ▉
 LIGHT TIMEOUT: 15 SEC
```

Fig. 75b

75

Fig. 76a

Fig 76b

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. 76a), and press ENTER.

2. Enter the time offset, and press ENTER.

Note: Move the cursor to the left to change the plus or minus sign.

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. 76b), 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 Page (see p. 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 Satellite Page.

To set the backlight timer:

1. Highlight the 'light timeout' field, and press ENTER (Fig. 77).

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         10 MAR 97
TIME          00:41:48
OFFSET:         +00:00
HOURS:              24
CONTRAST:      ▮
LIGHT TIMEOUT: 15 SEC
```

Fig. 77

Note: 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.

77

SETUP MENU
SYSTEM
NAVIGATION
ALARMS
INTERFACE

Fig. 78a

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

Fig 78b

Navigation Submenu

The navigation setup submenu page (Fig. 78a) 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. 78b). Select the desired setting, and press ENTER.

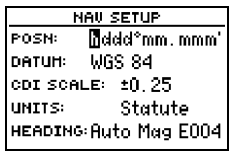**User Grid Option**

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 'datum' field is located just below the 'position' field and comes with a WGS 84 default setting. Although 106 total map datums are available for use (see Appendix E 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 (Fig. 79), 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
POSN:   hddd°mm.mmm'
DATUM:  User
CDI SCALE: ±0.25
UNITS:     Statute
HEADING:Auto Mag E004
```

Fig 79

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

CDIScale Settings

The course deviation indicator (CDI) definition field lets you select the +/- range of the CDI bar scale on the Highway Page. Three scales are available: +/- 0.25 (default), 1.25, and 5.0 miles or kilometers. Note: This CDI value represents the full deflection of scale to either side.

To enter a CDI scale setting:

1. Highlight the 'cdiscale' field (Fig. 80a), and press ENTER.

2. Select the desired setting, and press ENTER.

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

Fig. 80a

Units of Measure

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

To change the unit of measure:

1. Highlight the 'units' field (Fig. 80b), and press ENTER.

2. Select the desired unit of measure, and press ENTER.

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

Fig 80b

Magnetic Heading Reference

The GPS II⁺'s heading information can be displayed referencing magnetic north (automatic 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. 81a), 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. 81b).

2. Enter the degrees and direction of magnetic variation, and press ENTER.

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

Fig. 81a

```
           NAV SETUP
POSN:    hddd°mm.mmm'
DATUM:   WGS 84
CDI SCALE: ±0.25
UNITS:     Statute
HEADING: User Mag: W000
```

Fig. 81b

ALARMS SETUP

Arrival:
Auto

CDI Alarm:
Off   0.0⁜

Fig. 82a

ALARMS SETUP

Arrival:
Auto

CDI Alarm:
Off   **0**.0⁜

Fig. 82b
Note: The arrival and CDI alarms may be set from 0.0 to 9.9 units.

82

Alarms Submenu

The alarms setup page is used to set the two alarms available: arrival and CDI. The arrival alarm will alert you when you are approaching a waypoint and have reached the user-defined distance. The CDI alarm will alert you when your track varies from the shortest distance to a waypoint by the defined range.

Setting the alarm to off, on, or auto:

1. Highlight 'ALARMS', and press ENTER.

2. Highlight the 'off/on/auto' field (82a) for the desired alarm, and press ENTER.

3. Change to the desired setting, and press ENTER.

Off— No alarm will occur.

On— The alarm will occur at the user-specified distance from the destination waypoint.

Auto— The alarm will occur at one minute away (based on current speed, distance, and track) from each waypoint in a route or GOTO destination.

To set the alarms:

1. Repeat step 1 above, select the desired alarm distance field, and press ENTER (82b).

2. Enter the distance for the alarm, and press ENTER.

Interface Submenu

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 units 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' (Fig. 83), 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 data without any differential input capability, select 'None/NMEA.'

```
         INTERFACE
 GRMN/GRMN
 HOST
  WAITING...

      ____ of ____
       PACKETS
```

Fig. 83

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

Fig. 84a

Fig. 84b

DGPS Interface
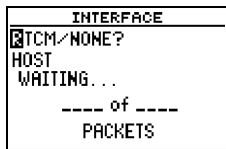
The last two format settings allow the differential-ready GPS II+ to accept RTCM DGPS corrections in RTCM 104 version 2.0 format. Using DGPS corrections will improve receiver accuracy to 1-5 meters, regardless of errors induced by the government's Selective Availability (SA) program. Two RTCM options are available: RTCM/NONE (84a), which allows connection to a beacon receiver with no output capability; and RTCM/NMEA (84b), which allows DGPS input and NMEA output.

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, and press ENTER.

2. Enter the desired frequency, and press ENTER.

3. Highlight the 'rate' field, and press ENTER.

4. Select the desired transmission rate, and press ENTER.

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 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 page. The GPSII+ will display one of three alert messages concerning DGPS operation:

No DGPS Position— there is not enough data 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.

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

Fig. 86a

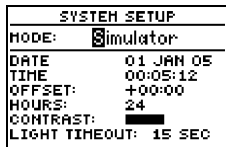| SYSTEM SETUP	
MODE:	**S**imulator
DATE	01 JAN 05
TIME	00:05:12
OFFSET:	+00:00
HOURS:	24
CONTRAST:	∎
LIGHT TIMEOUT:	15 SEC

Fig. 86b

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.

To activate the simulator:

1. From the Menu Page, highlight 'SYSTEMSETUP' (Fig. 86a), and press ENTER.

2. Highlight the 'mode' field, and press ENTER.

3. Select 'Simulator?' (Fig. 86b), and press ENTER.desire (from the Position Page).

Once the simulator mode has been activated, use the Position, Compass, or Highway Page to set your speed and track by highlighting the appropriate field, entering the desired value, and pressing ENTER. You may also enter a new position if you desire (from the Position Page).

⚠️ *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.*

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.
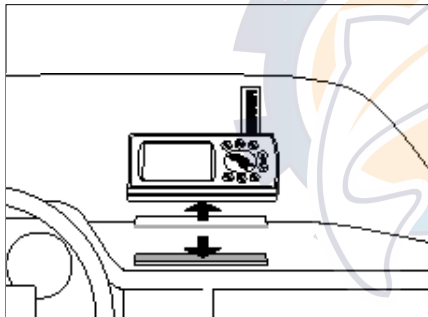
To mount the GPS II+ using the Velcro strips:

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: Fully-gasketed, high-impact plastic alloy, waterproof to IPX7 standards

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 158ºF (-15º to 70ºC)

Memory Back Up: Internal Lithium Battery

PERFORMANCE

Receiver: Differential-ready PhaseTrac12™

Acquisition Time: Approx. 15 seconds (warm start)

Approx. 45 seconds (EZ*init*/cold start)

Approx. 5 minutes (AutoLocate™)

Update Rate: 1/second, continuous

Specifications (cont.)

Position Accuracy: 1-5 meters (3-15 ft.) with DGPS corrections*

15 meters (49 ft.) RMS**

Velocity Accuracy: 0.1 knot RMSsteady state

Dynamics: Performs to specification to 6g's

Interfaces: NMEA 183, and RS-232 DGPS correction

Antenna: Detachable with standard BNC connector

POWER

Input: Four 1.5-volt AA batteries or 10-32v DC

Power Consumption: 0.75 watts max.

Battery Life†: Up to 24 hours

†Note: Alkaline batteries lose a significant amount of their capacity as temperature decreases. Use lithium batteries when operating the GPS II+ in below-freezing conditions. Extensive use of screen backlighting will significantly reduce battery life.

Specifications subject to change without notice.

* With optional GARMINGBR 21 Beacon Receiver Input.

** Subject to accuracy degradation to 100m 2DRMS under the U.S. DoD-imposed Selective Availability Program.

Specifications and Wiring (cont.)

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

- Power/Data Cable—
  Allows connection to DC power source and Input/Output devices.

- 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.

R Receive Data In

T Transmit Data Out

+ 10-32vDC In

− Ground Connection
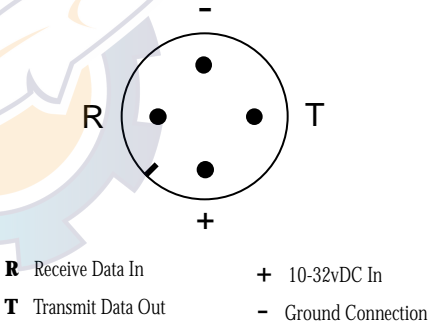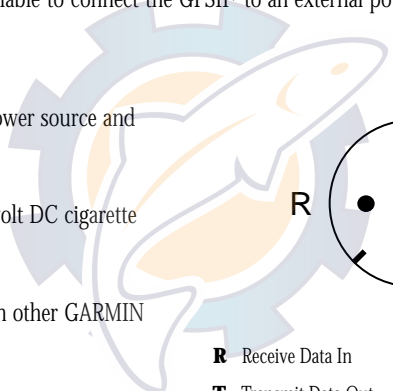
Specifications and Wiring (cont.)

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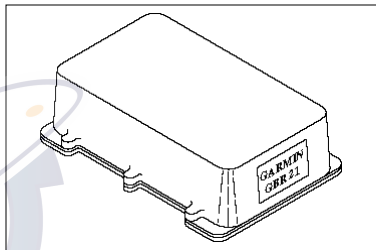
NMEA 0183 version 2.0

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.

Remote Antenna Installation

The GPS II+'s antenna may be removed to allow attachment of an optional remote-mount GPS antenna for certain applications.

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.
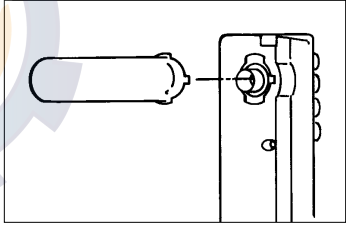
Messages

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 can be cleared from the message page, while condition alerts remain until the condition has been resolved. For your safety, pay careful attention to all messages.

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 unit's accuracy has been degraded beyond 500 meters due to poor satellite geometry or data quality. 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.

Arrival at—You have reached your destination waypoint.

Battery Power is Low—The batteries should be replaced.

CDI Alarm—You are left or right of course beyond the limits set on the alarms submenu.

Leg not Smoothed—The upcoming route leg is too short for smooth waypoint transitions.

Memory Battery is Low—The battery that sustains user memory is low and should be replaced by an authorized service center as soon as possible. Failure to do so may result in loss of stored data, including all user waypoints and routes.

Need 2D Altitude—The unit needs altitude input in order to start and/or continue 2D navigation.

Need to Select Init Method—You must select an initialization method so the unit can locate satellites and obtain a fix.

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

Messages (cont.)

No Position—The unit has not obtained a position fix and cannot mark a position.

No RTCM Input—Beacon receiver is improperly connected or baud rates do not match.

Poor GPS Coverage—The unit cannot acquire the necessary number of satellites to compute a position. Try another location with a clearer view of the sky.

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 Failed—The unit'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.

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.

RTCM Input 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.

Track Memory is Full—You have used all 1024 track log points in the GPS II⁺. Delete unwanted track points to make room for new entries.

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

WPT Memory is Full—You have used all 500 waypoints in the GPS II⁺. Delete unwanted waypoints to make room for new entries.
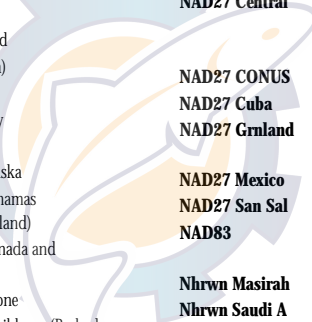
Map Datums

The following are 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
Afgooye	Afgooye- Somalia
AINELABD '70	AIN ELANBD 1970- Bahrain Island, Saudi Arabia
Anna 1 Ast '65	Anna 1 Astro '65- Cocos Isl.
ARC 1950	ARC 1950- Botswana, Lesotho, Malawi, Swaziland, Zaire, Zambia, Zimbabwe
ARC 1960	ARC 1960- Kenya, Tanzania
Ascnsn Isld '58	Ascension Island '58- Ascension Island
Astro B4 Sorol	Astro B4 Sorol Atoll- Tern Island
Astro Bcn "E"	Astro Beacon "E"- Iwo Jima
Astro Dos 71/4	Astro Dos 71/4- St. Helena
Astr Stn '52	Astronomic Stn '52- Marcus Island

Astrln Geod '66	Australian Geod '66- Australia, Tasmania Island
Astrln Geod '84	Australian Geod '84- Australia, Tasmania Island
Bellevue (IGN)	Efate and Erromango Islands
Bermuda 1957	Bermuda 1957- Bermuda Islands
Bogata Observ	Bogata Obsrvatry- Colombia
Campo Inchspe	Campo Inchauspe- Argentina
Canton Ast '66	Canton Astro 1966- Phoenix Islands
Cape	Cape- South Africa
Cape Canavrl	Cape Canaveral- Florida, Bahama Islands
Carthage	Carthage- Tunisia
CH-1903	CH 1903- Switzerland
Chatham 1971	Chatham 1971- Chatham Island (New Zealand)
Chua Astro	Chua Astro- Paraguay

Map Datums (cont.)

Corrego Alegr	Corrego Algre-Brazil
Djakarta	Djakarta (Batavia)- Sumatra Island (Indonesia)
Dos 1968	Dos 1968- Gizo Island (New Georgia Islands)
Easter Isld 67	Easter Island 1967
European 1950	European 1950- Austria, Belgium, Denmark, Finland, France, Germany, Gibraltar, Greece, Italy, Luxembourg, Netherlands, Norway Portugal, Spain, Sweden, Switzerland
European 1979	European 1979- Austria, Finland, Netherlands, Norway, Spain, Sweden, Switzerland
Finland Hayfrd	Finland Hayford- Finland
Gandajika Base	Gandajika Base- Republic of Maldives
Geod Datm '49	Geodetic Datum '49- New Zealand
Guam 1963	Guam 1963- Guam Island
Gux 1 Astro	Gux 1 Astro- Guadalcanal Island

Hjorsey 1955	Hjorsey 1955- Iceland
Hong Kong '63	Hong Kong '63- Hong Kong
Hu-Tzu-Shan	Hu-Tzu-Shan- Taiwan
Indian Bngldsh	Indian- Bangladesh, India, Nepal
Indian Thailand	Indian- Thailand, Vietnam
Indonesia '74	Indonesia 1974- Indonesia
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
Marco Astro	Marco Astro- Salvage Island
Massawa	Massawa- Eritrea (Ethiopia)
Merchich	Merchich- Morocco
Midway Ast '61	Midway Astro '61- Midway
Minna	Minna- Nigeria
NAD27 Alaska	North American 1927- Alaska
NAD27 Bahamas	North American 1927- Bahamas (excluding San Salvador Island)
NAD27 Canada	North American 1927- Canada and Newfoundland
NAD27 Canal Zone	North Am. 1927- Canal Zone
NAD27 Caribbn	North American 1927- Caribbean (Barbados, Caicos Islands, Cuba, Dom. Rep., Grand Cayman, Jamaica, Leeward and Turks Islands)
NAD27 Central	North American 1927- Central America (Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua)
NAD27 CONUS	North Am. 1927- Mean Value
NAD27 Cuba	North American 1927- Cuba
NAD27 Grnland	North American 1927- Greenland (Hayes Peninsula)
NAD27 Mexico	N. American 1927- Mexico
NAD27 San Sal	North American 1927- San Salvador Island
NAD83	North American 1983- Alaska, Canada, Central America, CONUS, Mexico
Nhrwn Masirah	Nahrwn- Masirah Island (Oman)
Nhrwn Saudi A	Nahrwn- Saudi Arabia
Nhrwn United A	Nahrwn- United Arab Emirates
Naparima BWI	Naparima BWI- Trinidad and Tobago
Obsrvtorio '66	Observatorio 1966- Corvo and Flores Islands (Azores)

Map Datums (cont.)

Old Egyptian	Old Egyptian- Egypt
Old Hawaii+an	Old Hawaii+an- Mean Value
Oman	Oman- Oman
Ord Srvy GB	Old Survey Grt Britn- England, Isle of Man, Scotland, Shetland Isl., Wales
Pico De Las Nv	Canary Islands
Ptcairn Ast '67	Pitcairn Astro '67- Pitcairn Isl.
Prov S Am '56	Prov So Amricn '56- Bolivia, Chile,Colombia, Ecuador, Guyana, Peru, Venezuela
Prov S Chln '63	Prov So Chilean '63- S. Chile
Puerto Rico	Puerto Rico & Virgin Islands
Qatar National	Qatar National- Qatar
Qornoq	Qornoq- South Greenland
Reunion	Reunion- Mascarene Island
Rome 1940	Rome 1940- Sardinia Island
RT 90	Sweden
Santo (Dos)	Santo (Dos)- Espirito Santo Island
Sao Braz	Sao Braz- Sao Miguel, Santa Maria Islands (Azores)

Sapper Hill '43	Sapper Hill 1943- East Falkland Island
Schwarzeck	Schwarzeck- Namibia
Sth Amrcn '69	South American '69- Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Guyana, Paraguay, Peru, Venezuela, Trinidad and Tobago
South Asia	South Asia- Singapore
SE Base	Southeast Base- Porto Santo and Madiera Islands
SW Base	Southwest Base- Faial, Graciosa, Pico, Sao Jorge and Terceira Islands (Azores)
Timbalai 1948	Timbalai 1948- Brunei and E. Malaysia (Sarawak and Sabah)
Tokyo	Tokyo- Japan, Korea, Okinawa
Tristan Ast '68	Tristan Astro 1968- Tristan da Cunha
Viti Levu 1916	Viti Levu 1916- Viti Levu/ Fiji Islands
Wake-Eniwetok	Wake-Eniwetok- Marshall Isl.
WGS 72	World Geodetic System 1972
WGS 84	World Geodetic System 1984
Zanderij	Zanderij-Surinam

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

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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 (913-397-8200) for a returned merchandise tracking number. The unit should be securely packaged with the tracking number clearly marked on the outside of the package and sent freight prepaid and insured to a GARMIN warranty service station. A copy of the original sales receipt is required as the proof of purchase for warranty repairs. GARMIN retains the exclusive right to repair or replace the unit or software at its sole discretion.

Notes:

GARMIN

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Part Number 190-00130-10 Rev. A