

Tristan Darwin Project



GPS Training

A Guide to Using the Garmin Etrex GPS





Introduction

What is GPS and how does it work?

GPS stands for Global Positioning System. A GPS device receives radio signals from orbiting satellites which are owned and controlled by the US military. Each satellite 'knows' its position to a very high degree of accuracy and the receiver calculates its position on the ground by measuring the time difference it takes to receive the signal from each satellite. It follows from this that in order to work the receiver's aerial needs a clear view of the sky. With a handheld device such as the Garmin Etrex the position can't be determined if its view of the sky is obscured by obstacles such as cliffs or dense tree cover, although clouds appear to make little difference and it will usually work on a car dashboard or inside the wheel-house of a boat.

Using the Garmin Etrex GPS Receiver.

The Garmin Etrex is a 12 channel receiver which means it can receive signals from 12 satellites at once. It runs on two AA batteries which are said to last 22 hours; rechargeable batteries are more economical but don't last as long, though you should get 10 to 12 hours from a newly charged set. The device keeps all its data (waypoints and track logs) even if it is switched off or the batteries are removed. This unit is waterproof and has a data connection port which greatly extends its usefulness when used with a PC.

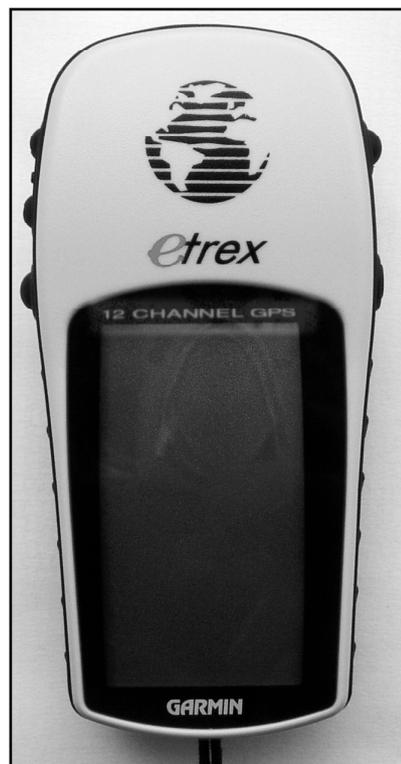
Button Layout

UP/DOWN

Press these buttons to move up and down a menu or to zoom in and out

ENTER

Press this button when you want to choose an option or to say 'YES'
Pressing and holding it down will tell the unit to mark a waypoint at your present position.



PAGE button.

Press to go back or move to the next screen, or press when you want to say 'NO'

POWER button
ON/OFF
LIGHT ON/OFF



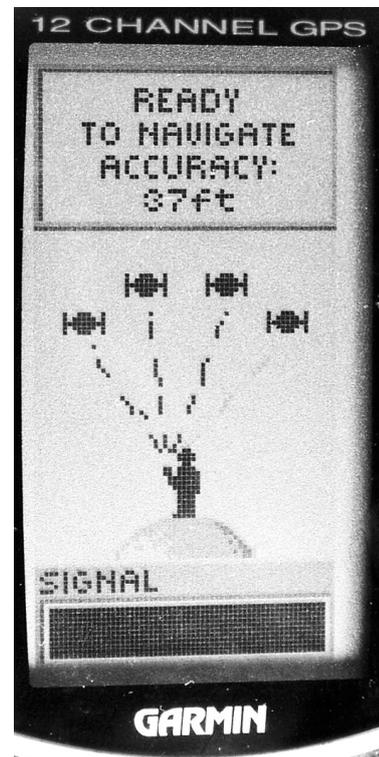
SCREEN DISPLAYS

This GPS receiver has 4 different screens which can be changed by using the PAGE button.

1. SIGNAL STRENGTH SCREEN

This appears when you first switch the device on. It takes a while to get a 'fix' on each satellite. As more satellites are locked on, the accuracy improves. (An 'Advanced

Skyview' can be seen as an alternative view by pressing the ENTER button and choosing this option - the display will show you exactly where the satellites are in the sky.)



This is the screen you will see when you first switch on. The GPS is ready to use when the signal display bar is full and the satellites stop flashing and a link is shown to each of them.



2. MAP SCREEN

While the Garmin Etrex GPS cannot display maps of terrain or roads it does have a useful map screen which shows the position of waypoints and tracks you have made or saved. The scale of the map is shown at the bottom left; this can be changed using the UP/DOWN buttons.

There are 2 different modes for this screen - North Up or Head Up.

In North Up mode your position is shown as an arrow head which points in the direction you are going. This screen is most useful when you are making a new track. North is towards the top of the screen (whether this is True or Magnetic depends on how you've set it up - details of this are given later).

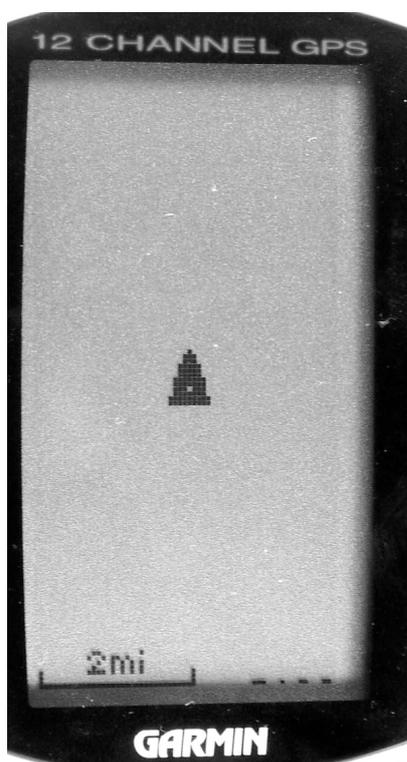
In Head Up mode your position is shown as a little man who walks as you move. Your position is where his head is and the map always shows what's ahead of you; An arrow shows where North is.. This screen is

most useful when you are retracing your steps, following a recorded track or aiming for a waypoint.

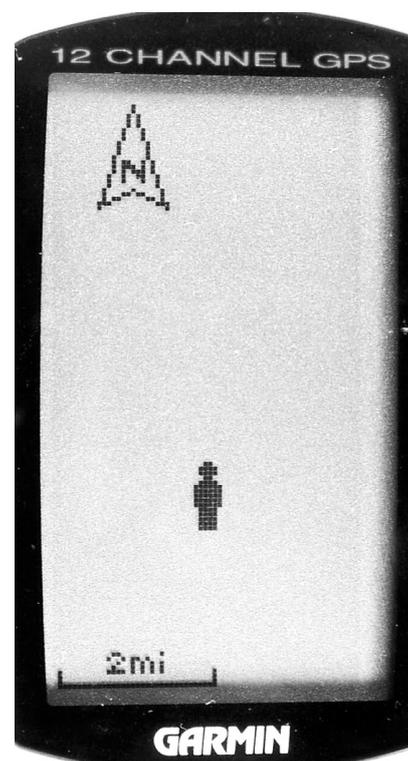
If there aren't enough satellites in view and the unit isn't 'ready to navigate' your position marker is replaced by a flashing question mark.

Waypoints in range are displayed on the screen with their name. As you move along, the position marker leaves a trail behind it on the screen (a bit like a snail leaving a silvery trail) and this can be very useful for retracing your steps or following a route or track you've recorded before.

NOTE - This GPS unit can only tell which way is North when it is moving, once you stop it can't determine which direction you're facing. More sophisticated units have a built-in compass which works even when stationary.



Map Screen - North Up



Map Screen - Head Up

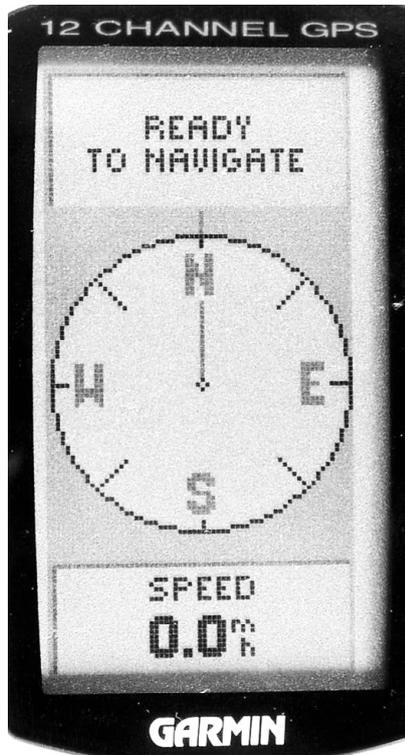
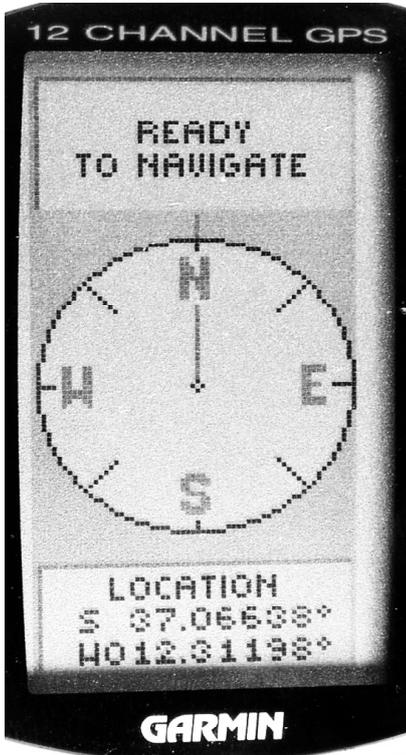


3. COMPASS SCREEN

The main part of this screen shows a representation of a compass. In normal use this will act like a compass showing your direction of travel (see note on previous page about its limitations). When used to navigate to a particular waypoint or to follow a route or track, an arrow will show you which way you should be going. When used like this it will also tell you how far it is to go and how

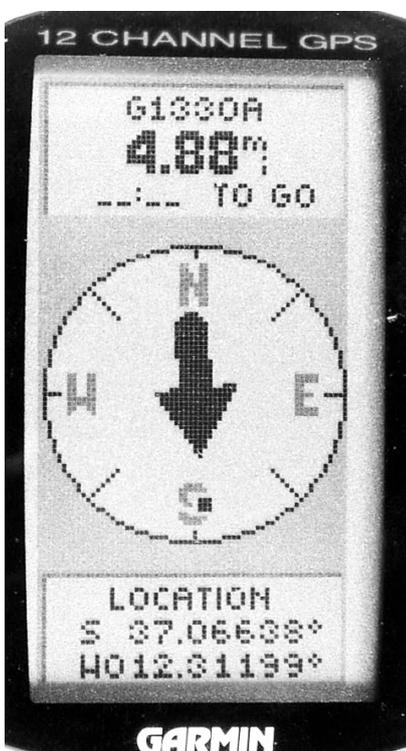
long it will take to get there at your current speed.

There is a lot of additional information available at the foot of this screen. This includes: Location, Current Speed, Max Speed, Heading, Trip Time, Distance Covered, Sunrise, Sunset etc. You can cycle through these using the UP/DOWN buttons.



The ENTER button shows a menu where you can reset the trip time and max speed as well as stop navigating to a waypoint or route (STOP NAVIGATION).

Pressing the UP/DOWN buttons will change which information is shown at the foot of the screen eg Location and Speed as shown here



Here the arrow shows that you need to travel South to get to waypoint 'G1330A' which is currently 4.88 miles away as the crow flies.

No time is shown for how long it will take to get there ('-- TO GO') because the unit isn't moving, ie our current speed is 0 mph.



Press the ENTER button to reset max speed or to stop navigating to Waypoint 'G1330A'.



4. MENU SCREEN

This is where you can edit or delete the stored data.
The options are as follows:

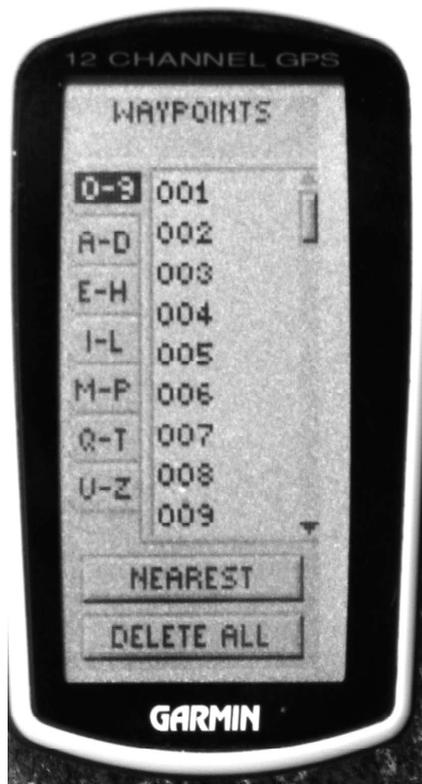


MARK

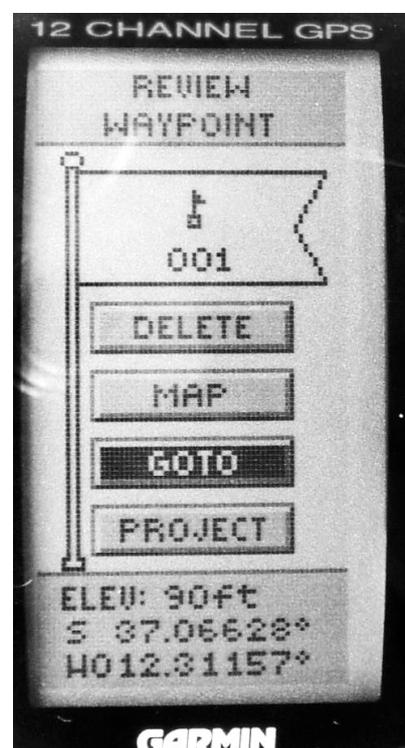
Use to mark a waypoint. You'll probably use this when you want to mark a point you want to go to - if you're already there its much easier just to press and hold down the ENTER button.

WAYPOINTS

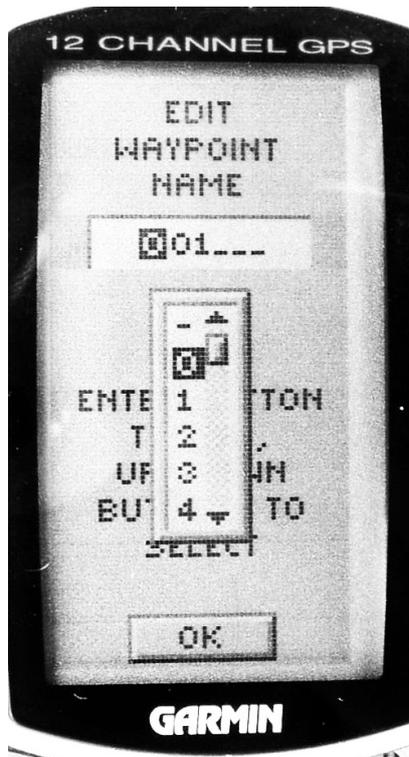
Here you will find all the stored waypoints listed in alphabetical order. This unit will store up to 500 waypoints. Here you can view or delete them, or edit their name, position or symbol. To put in the position of a waypoint that you've determined from a map or chart, use the UP/DOWN buttons to highlight the position shown at the bottom of the screen and press ENTER to change it (this sort of thing is much easier to do on a computer). Note that while it does show altitude this is not always accurate - there is no altimeter built into this model.



Screen showing list of stored waypoints



If you select a waypoint from the list you get this screen where you can see details of the waypoint and edit it.



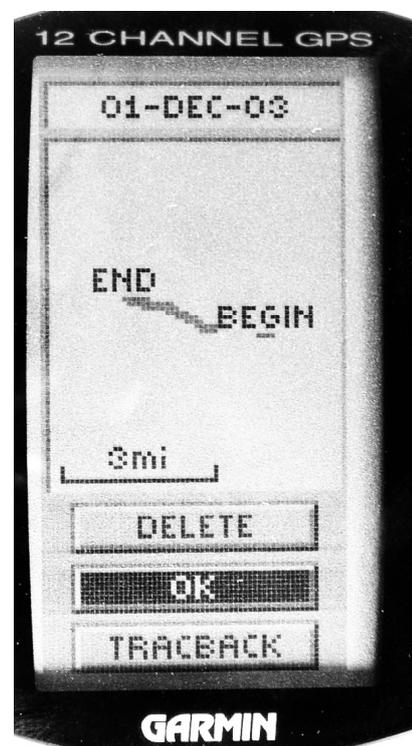
Select the waypoint name and you get the option to edit its name using the UP/DOWN keys. Confirm with the ENTER key. (you can't use the same name for two different waypoints)

ROUTE This unit will store one route which is simply a list of waypoints in the order in which you want to visit them. This is where you choose which waypoints to include in your route.

TRACKS This is where you can see details of the track you have recorded as

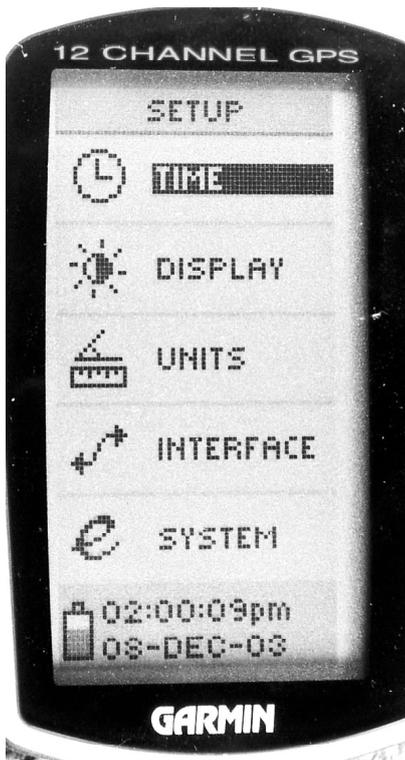
you move along, called a Track Log. The track currently being made will slowly fill up the unit's memory; once the memory is full it will continue to record the track but will begin to delete the track recorded right at the start. You can check how full the memory is at the top of the screen.

You can save up to 10 track logs you have made. The unit will ask what time you want the track record to start; if you cleared the active track at the start of the trip you can just tell it to save the entire log. It will save it with a name using today's date, but you can edit this at any time. A saved track can be used to TRACBACK ie follow your track back to the start.





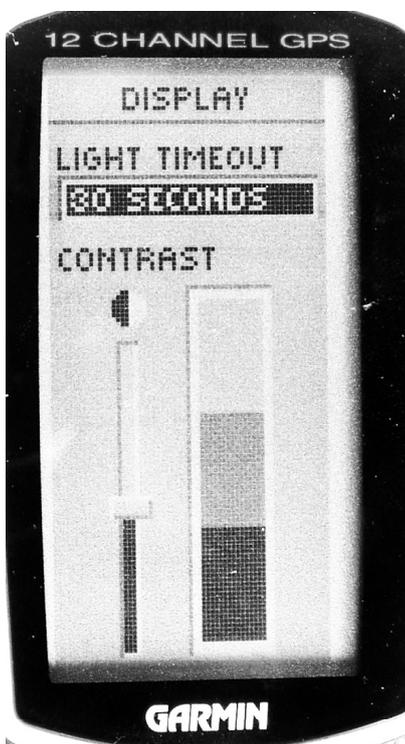
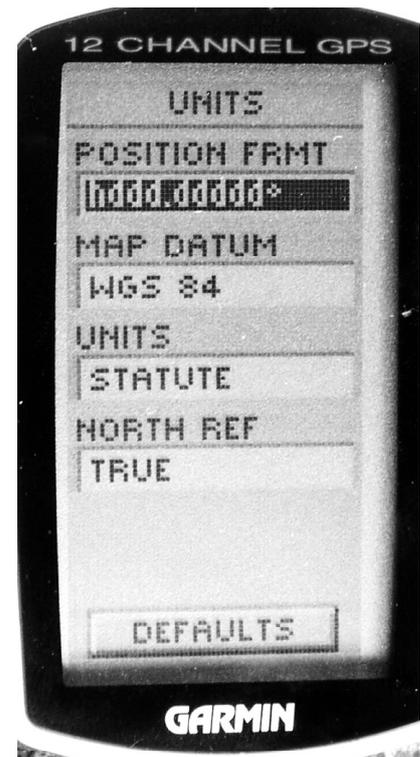
SETUP



This is also where you can check the battery status

This is where you set up the unit. Here you can choose which position format to use eg degrees.decimal degrees or degrees minutes seconds etc.; the units to use eg statute miles / nautical miles / metric; local timezone; display contrast; interface and system. You can easily swap between settings eg a waypoint recorded in ddd.ddddd can also be shown in ddd.mm.ss,etc.

The Darwin Project in Tristan uses GMT timezone, WGS84 map projection, ddd.ddddd position format (not really the most convenient but its required for a software package we use called MAPINFO) and True North. The 'Interface' is set to 'GARMIN' (required for computer connection) and the 'System' setting is set to 'Battery Save' which seems to put the unit on hold when its not moving thus saving the batteries. Whether you use miles or Km is a matter of personal preference.



The DISPLAY screen lets you adjust the screen contrast and set how long the light will stay on after the POWER button is pressed