Satellite navigation

Okay! Let’s first of all clear up what we call it, and why. Hooks is the name of a company, it’s now become synonymous with the vacuum cleaner. Similarly, GPS is the name of the American Government’s satellite system used for navigation, yet it has incorrectly become synonymous with similar systems developed by other countries. The European Union has a system called Galileo; this will be fully operational in 2014 and all hand-held satnavs are already using data from this system. China has Compass, Russia has GLONASS. The correct term given to all of these systems, including the American GPS, is Global Navigation Satellite Systems (GNSS), and the devices we use to receive the signals from GNSS to navigate with are called satnavs. Therefore, for full-fartiness we shall call them satnavs, as that’s what they are.

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They’re too complicated NO!
All hand-held satnavs receive signals, just like a radio, from satellites orbiting the Earth. The satellites transmit low-powered microwave signals, which travel by line of sight and will pass through all weather systems and materials such as glass or plastic but not through thin solid objects like buildings, mountains or water... or indeed you!

From these signals your satnav can calculate where each satellite is, and then simply triangulates your location from the known positions of these satellites (in much the same way you do when using a compass to triangulate) and displays this as a grid reference, a mark on its electronic map, or both.

It’s expensive to get started NO!
We are going to show you how for about £50 you can access this multi-billion-dollar system and use all of the essential navigational features to find your way.

It’s difficult to use properly NO!
Whether you have spent £600 on a high-end satnav and full Ordnance Survey mapping or £30 on a second-hand basic unit they all provide the same level of accuracy and the necessary directional data.

It replaces a map and compass NO!
That is, like saying the Kindle has replaced books; it hasn’t. It’s simply another way of performing the same task in a more convenient way. But because batteries can fail and software crashes, we must always carry a map and compass as backup.

The most basic handheld satnav will work:
• anywhere in the world (there are some limitations at the Earth’s poles)
• on any terrain – from magnetised rock, to the water and in the air
• in any weather, with no loss of accuracy
And they provide you with:
• a very accurate position, displayed as a grid reference, of your exact location
• your height above sea-level (elevation)
• the direction you are heading (your bearing)
• time and date
• a record of how long and how far you have been travelling (travelling time and distance) and even your walking speed

With every unit you can:
• mark and store a current location (called a waypoint) and even store up to 250 of these devices
• navigate directly to it from anywhere in the world
• plot a route (a series of waypoints) and then follow it

When you first receive your satnav, attach a lanyard so you don’t lose it; and make it long enough so that when it is secured to your vehicle you can hold it out at arm’s length.

ONCE YOU HAVE YOUR SATNAV...

1. When you receive your satnav, attach a lanyard so you don’t lose it, and make it long enough so that when it’s secured to your vehicle you can hold it out at arm’s length. See a video of how to do this at www.rto.com/navigation

2. Insert fully charged batteries (use pre-charged rechargeable batteries to save money) and go to Garmin’s website and install its free application WebUpdater. This lets you update your unit without using your Internet web browser and check every couple of months for new updates.

3. When you have your satnav, you will also need to buy the leads to connect to your computer, so you can update to the current firmware, then download and share your waypoints, routes and routes on Google Earth or one of the free Ordnance Survey-based web mapping programs. These cables (£9.99 on eBay) require a serial port on your computer. If you don’t have one you will also need to buy a £30 to £50 USB 2.0 to RS232 adapter cable (£2.28 on eBay). A serial port has four pins: brown and blue to signal the port exists and is not to be confused with the external monitor connector, which has holes for 15 pins.
NAVIGATING USING YOUR SATNAV

If this is the first time you’ve tried satellite navigation outdoors, choose an area that is safe and where you won’t get lost. A park is ideal.

**TECHNIQUE 1 Creating a waypoint**

This is the single most important satnav technique. Satnavs can only receive the signals from the satellites if they have an unobstructed view of the sky, and we ourselves are a big obstruction. In addition, there are different types of antenna (aerials) that work best in different positions.

The good news is that there is a simple fix for both of these obstacles.

1. Stand directly over the spot or object you want to create a waypoint for.
2. Hold the satnav at arm’s length and head height, and tilted at 45°.
3. Look at the satellite screen and check the stated accuracy – if this is improving (the numbers are getting smaller) then wait until it settles.
4. On the same screen look at the satellite geometry, which in simple terms is how well they are spread around you. If they are all clustered above you, or to one side, the accuracy will be low. If you can see a satellite on your screen which would change this and your receiver is not obtaining a good signal from it (the strength bar is low or empty) it may be obscured by a tree or other obstacle, so move your position slightly. Sometimes rotating the position you are facing by 180° has an effect. See a video explaining this at www.lfto.com/navigation
5. Press and hold the ENTER button for 3 seconds.
6. Name your waypoint by scrolling to the number in the first box and press ENTER. Pressing ENTER again you can choose A-Z or 0-9 to name your waypoint. Simply call this one A1. Scroll to the speech bubble with OK in it and press ENTER.

You have now created a waypoint that you can navigate back to at any time from anywhere in the world!

**TECHNIQUE 2 Navigating to a waypoint**

A satnav will only take you in a straight line back to a waypoint and takes no account of mountains, canyons, rivers, oceans or any other obstacles whatsoever! This is why you must use either a printed map or a digital one installed onto your satnav for practical purposes. At its barest, think of your unit as a fishing rod: the object you’ve hooked is the waypoint, and wherever you are as you walk around it, the fishing line always goes straight to it.

1. Scroll down to A-D and you will see your waypoint A1.
2. Press ENTER to highlight your waypoint.
3. Press ENTER again and select GOTO.
4. The compass screen appears with an arrow. Start walking in the direction of the arrow. It may initially point you in the wrong direction, but this is because the eTrex needs to be moving for its compass to work. It will soon correct itself after a couple of metres travel.
5. When you are just under 2m from your waypoint your satnav will prompt you saying ARRIVING. Press STOP NAVIGATION to stop looking at your satnav screen and now look for the spot/object you marked your waypoint.
6. Press ENTER and select STOP NAVIGATION when you have actually arrived.
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TECHNIQUE 3 Creating a route

By joining together waypoints that you have created, you create a route that you or other people can follow.

To practise this technique, move around a large area and create a set of waypoints, for instance at a gate, a bridge, a bench and at a café (GT1, BR1, BN1 & CA1).

1. On the main menu page select ROUTES.
2. Scroll down to NEW ROUTE.
3. By pressing ENTER twice you will be prompted to choose a waypoint from a list of the ones you have created. Select them in a logical order.
4. When you have entered all of them scroll to FOLLOW.
5. You will now be prompted to indicate which way you want to follow them (so when you are at the end you can come back).

If you now go to the main menu screen and check your ROUTES, you will see that your satnav has automatically saved this route for you to use at any time in the future.

You can store 10 such routes on your eTrex H.

Expert tip!

By default all satellites give waypoints numbers but after a short while it is easy to forget which number relates to what, so it’s much better to name them using abbreviations such as GT = gate, ST = stream, RD = road etc, then you can have GT1, GT2 and so forth.

TECHNIQUE 4 Creating a track

This feature records a tracklog while you are moving that, at any time, you can follow back along the same path. It is one of the most useful features, especially in poor visibility.

1. On the main menu page select TRACKS.
2. Scroll to CLEAR and delete the current track.
3. Scroll down to SETUP and switch the recording Interval to DISTANCE with a value of 10m (shown as 0010m on the screen).
4. When you leave the truck, you will then see on your satnav a tracklog that is the same as you are travelling.
5. In the eTrex H stores 10,000 track nodes, so at a recording interval of 10m it will record your path for 10km. If travelling further, simply set your recording interval to a greater distance.

TECHNIQUE 5 Using your satnav to find your position on the map

You have already set the last field on the Data screen to LOCATION. This displays your location in the local grid reference system, and on the Main menu you set this to Ordnance Survey GB.

You need to be able to take a grid reference for this; check out last month’s Trail to see how.

The letters BNG in the bottom left of this box tell you that you are using the British National Grid.

Above this the two letters describe the 100km x 100km box you are in and must always match to those on your map.

The five numbers on top are your existing (this runs left to right on your map).

The bottom five numbers are the northings (this runs bottom to top on your map).

Therefore your satnav gives you a 10 figure grid reference, which describes an area of 1m².

Always remember to clear your track log at the beginning of your journey.

TECHNIQUE 6 Using Google Earth

Viewing your waypoints, tracks and routes on Google Earth and sharing them with other people is such good fun. It’s a really valuable way of storing all of your data, also it could not be easier.

1. Connect your satnav to your computer and turn it on.
2. Open Google Earth and select from its menu bar TOOLS/CFS.
3. On the tab Import check these boxes: Garmin Waypoints, Tracks, Reroute KML Tracks.
4. Adjust altitudes to ground height – click the Import button and – hey presto! – all of your information is loaded onto Google Earth.
5. If you right click on any of your data displayed on Google Earth you are given a choice of actions from saving it to a personal folder to emailing it to friends.

Expert tip!

As you become proficient at transferring data from your satnav to Google Earth and vice versa, try one of the free mapping programs that use Ordnance Survey maps, such as www.maptogo.co.uk.

Lyle’s off now, but... Trail’s navigation expert Lyle will be back soon, but for more of his expert insight, check out his superb Ultimate Navigation Manual by Collings, which is setting the standard for instructional texts worldwide.

EXCLUSIVE VIDEO LESSONS ONLINE!

Join Lyle Brotherton for some special video tutorials onwww.freelifeoutdoors.com/navigation

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