

## Advice on Buying and Using GPSs

### Buying

1. Even the basic models do more than most users will ever need – and I recommend a basic model like the yellow Garmin eTrex 10. The only drawback of this model is that the writing is small and 3 and 8s are easily confused<sup>1</sup>. Cheapest sources are generally on-line but Argos, Maplin, PC World, Cotswold, Ellis Brigham and other outdoor activities shops all stock them.
2. Buying GPSs which can display maps: These can display a position on a map, but the size of the screen and the scale of the maps reduce usefulness. Also these GPSs are at least twice as expensive and the maps usually have to be bought separately and are also expensive.
3. The Garmin Foretrex is a lightweight, wrist-mounted GPS with built-in rechargeables and most of the features of larger models. It is great for using hands-free and being readily viewable.
4. Smartphones can give very accurate grid references. Use an app like “GB Grid Ref Compass” which allows you to text, email or tweet your location along with a message – handy if you are caught short in the field without a notepad and pen! The iPhone use the Russian Satellite network as well as the American GPS network and so the readout is pretty accurate. However, IT IS ESSENTIAL to wait a few moments before taking a reading on a smartphone to allow it to reach full accuracy. Also if you have Memory-Map on your PC then your maps can be viewed for free using the Memory-Map app which will superimpose your position on the map.

### Using

1. Make sure that your GPS is set-up correctly! For Garmins, Set-up > Position Format is set to 'British Grid'. Or Set-up > Position Format 'Irish Grid' and set the Map Datum to 'Ireland 1965'.
2. All new Garmin GPSs use the Russian Satellite GLONASS network, as well as the American GPS network. Using both enhances time to lock-up and improves accuracy, *but you must enable it*. In the Garmin eTrex 10 go to Setup>System>Satellite System and select “GPS+GLONASS”.
3. WAAS (Wide Area Augmentation System) - Nearly all new GPSs have WAAS which improves the positioning accuracy, *but it must be switched on*. To do this on Garmin eTrex 10 go to Setup > System > WAAS/EGNOS and select Yes. If a GPS is receiving the WAAS correction signals a small 'D' will appear on the satellite strength bars on the Satellite page. It sometimes takes the GPS some time to lock-up to these additional signals and often only after being stationary for several minutes.
4. When using the GPS do not obstruct satellite signals by crowding it or holding your hand over the antenna – usually in the upper part of the device. Satellite signals do not go through heads or hands very well! The GPS's satellite view page gives accuracy - wait until it gets down to 3 or 4 metres.

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<sup>1</sup> The eTrex 10 series can be adjusted so that the Trip Computer page displays the grid reference in twice the normal font.

5. Leave GPSs on all day for improved accuracy, especially using them intensively. There is also no delay while the GPS locks-on. Keep the GPS at the very top of rucksacks or attached to rucksack shoulder straps or waist belts so that it can readily pick up satellite signals.
6. Use Rechargeable Batteries. Nearly all GPSs will work for two full field days with a new set of alkaline batteries. But this is expensive and not very environmentally friendly – a much better idea is to use high capacity re-chargeable batteries e.g. AA batteries with 2,500mAh or greater capacity.
7. Make sure you tell your eTrex 10 which type of battery you are using. Setup>System>Battery Type.
8. Always take a spare set of batteries – regardless of type. They always go flat when needed most!
9. Buy a padded bag to protect the GPS in case of drops and scratches. Some GPS screens score easily.
10. Your GPS's accuracy or Estimated Position Error (EPE) figure has a statistical confidence of 50%. So an EPE of 3m means that there is a 50% probability the true position is within a radius of 3 metres of the readout. But also that there is a 50% probability that it is more than 3 metres from the readout. For 98.9% confidence of accuracy you have to multiply the EPE figure by about 2.5.
11. Given that EPEs are typically 3m at best it is debatable whether it is worth quoting grid references to 10 figures (1m resolution) and the long string of digits may only increase the chance of a transcription error. I prefer 8 digits (10m resolution) – but note if converting **do not** round up or down – merely truncate the fifth easting and northing digits, respectively.
12. Before digitising records, it is worth plotting GPS grid references on maps using the [Grid Reference Lookup tool](#) on the [BSBI DataBase](#) – especially when near VC boundaries and rivers to ensure the reference is on the correct side.
13. GPS altitude readings are never as accurate as horizontal positions. Typically accuracies are up to 2x poorer. It may be better to plot the position on a 1:25,000 map and interpolate between contours.
14. Learn to use the GOTO function! This is extremely useful when trying to refind population sites with reasonably detailed grid references. The GPS will give the bearing and distance to the target. Check on a map that your destination is not on the other side of an abyss, or some other navigational obstacle, before following the GPS's instructions!
15. Locate Photographs. Mark Waypoints when taking photographs and that will give the precise time and place which can be matched with the time in the photograph's properties.
16. Using GPSs with digital maps. All GPSs can be connected to PCs but this requires the correct interface cable. It is then possible to download tracks along with any waypoints into software such as [Memory-Map](#), which will display it superimposed on an OS map background. This is useful as it shows precisely the route taken, with timings. (This is another way to match up with photographs.) Tracks can also be imported and displayed on Google Earth.