An introduction to GPS

What is GPS?

The Global Positioning System (GPS – official name NAVSTAR) is a satellite-based navigation system made up of a network of 24 satellites placed into orbit by the U.S. Department of Defence. GPS was originally intended for military applications, but in the 1980s, the government made the system available for civilian use.

GPS works in any weather conditions, anywhere in the world, 24 hours a day. There are no subscription fees or setup charges to use GPS. In 2012 the Russian Government opened up their satellite system (GLONASS - Global Navigation Satellite System), consisting of 24 satellites in orbit, for civilian use.

What is a Handheld GPS unit?

All GPS units do exactly the same thing – they fix their position on the Earth's surface by triangulating from satellites.

The only real differences between the units available are:

- How the unit relays the data to you. More basic units use a black & white screen showing facts and figures. More sophisticated units use colour screens & detailed OS Maps.
- The sensitivity of the receiver i.e. how well it will get a fix in marginal locations. This is influenced by whether it receives just the standard GPS signals or the Russian GLONASS signals as well. The sensitivity affects how well it will cope with environmental issues (e.g. heavy tree canopy or steep sided valleys)
- How fast the unit processes the data i.e. speed of attaining satellite lock and rendering on screen – they are after all, hand held computers.

How robust are they?

Dedicated GPS devices are ruggedized. Most units are rated to Standard IPX7 - tested for 30 minutes immersion at a depth of 1 meter. This is plenty good enough to put up with Welsh weather !!). They will also put up with the knocks and bangs that life in the mountains tends to bring.

Depending on the model of GPS unit they may have button based interfaces, or on many modern devices “Touch Screen” interfaces, much like modern smart phones with the associated “Pinch” and “Swipe” motions. There is no RIGHT or WRONG when it comes to which interface you prefer – some people are more button orientated, whilst some find the touch screen interface more intuitive. A common misconception is that “Touch Screen” cannot be used with gloves on. This is not necessarily the case, as a stylus can be used, making it easier to use with very thick gloves on, than a unit with buttons.

Power

Modern GPS units are very power hungry – constant communication with satellites drains batteries quickly. Most units will give the user at least 15 hours continuous use on one set of batteries. Most GPS units designed for the hills can be powered by AA batteries. Some may be able to take dedicated rechargeable battery packs as well. AA batteries are generally to be preferred; as they are easily replaced (you can always have a spare set in your pocket). The best thing to run modern GPS units on is NMIH Batteries with a high milliamp capacity (2000 mA or more). These can be recharged quickly, sometimes up to 1000 times.

Country Compatibility

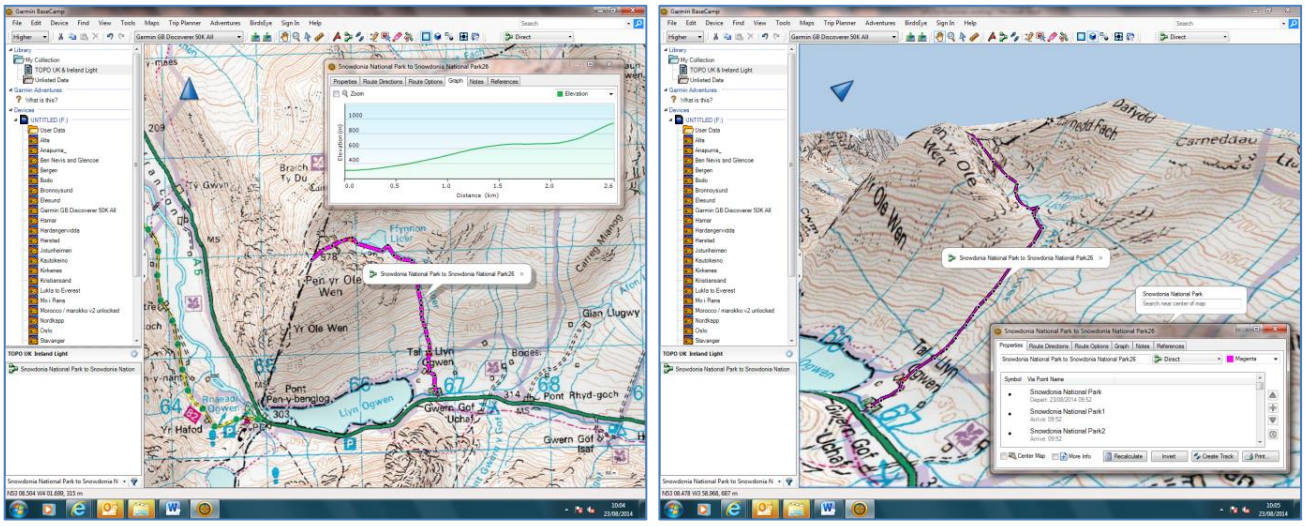
Most units available will provide a very accurate location to the user, with accuracies of 3 metres on the ground now not uncommon. (For use in the UK it is essential that the unit can provide a location in British National Grid – this will normally be a 12 figure reference. Units can normally provide references in formats suitable all over the world (Longitude & Latitude, or more obscure systems like Borneo National Grid).

Units often have the ability to create “Track Logs” or “Tracks”. These can be interrogated to provide data on Distance, Height Gain, Speed, Time and much more. A useful feature can be the ability to “Back Track” a track log (reverse it and follow it back).

Route Planning

Waypoints are pinpoint locations that can be navigated to. These can be added into a unit – either on the ground via the units interface, or before you set off, using desktop computer software. Most GPS manufacturers have developed software to help plan routes and transfer waypoints to GPS units.

Single waypoints can be very useful for specific features or locations you may want to find, but when added together they can be used to form a “Route”.



Garmin's "Base Camp" software.

One of the limitations of using a GPS (or for that matter a map and compass) is that when navigating to a point they will always take you in a straight line. One advantage that a GPS has over a compass is when you deviate from a bearing the GPS will just recalculate and bring you back into the specific Waypoint.

A full days route can be loaded into a GPS before you set out. This can be followed with the GPS alerting you when you approach each waypoint along the way. Of course the GPS can also tell you in advance how far the route will be, and what sort of height gain or loss there will be.

Escape routes can be pre loaded onto a unit for poor visibility navigation.

Maps

More modern units available will be able to display 'Routes' on the screen of the GPS, overlaid on to a map. These can be Ordnance Survey maps, or simpler Topographic maps. Most common (and most popular) are Ordnance Survey 1:50,000 scale maps (although 1:25,000 scale maps can be displayed on a unit, the detail level is too high to use within the confines of a units screen easily).

Mapping, although a nice feature is not essential. When navigating in earnest, the map screens that can be displayed on a unit would not be the first choice, with the 'Compass' screen or 'Trip Computer' screen being more useful.

If Ordnance Survey mapping is needed, it is best to buy a unit with them pre-loaded, as the cost of buying them separately can be expensive.

COTSWOLD outdoor

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