

Choosing the Right Type of GPS

In order to be in a position to choose from the various GPS solutions that are present in the consumer marketplace, it is necessary to have a reasonable understanding of what they can offer, as well as what the user is expecting from the solution.

There are several components that need to be looked at. There is the GPS receiver (or antenna) itself, which plays an important part. Then there is the portion of the system which uses the received information to estimate where the device is located on an internal map.

Then there are the various capabilities for route planning and recording, which vary from unit to unit. Finally, the display portion of each solution type can vary considerably, from limited location information to full color three dimensional maps of the immediate surroundings and advised route.

How it Works

All GPS solutions are based on the same premise, and it is a good idea to at least be aware of the underlying technology so that an informed decision can be made as to which application of the GPS technology is appropriate for the user in question.

GPS receivers use signals from satellites which orbit the Earth at known positions. Each satellite has a unique identification code and sends a signal which the GPS receiver software can use to calculate the distance from the device to that satellite.

Much like regular orienteering triangulation, this allows the software to estimate its own position from several (at least 3, preferably 4 or more) signals, by finding the point in space at which the spheres representing the distance from each satellite intersect.

From this location information, the software can then pinpoint the device's location on a map and use the information for a variety of operations, from simply displaying the location, to adjusting a proposed route based on the actual position of the device compared to the desired position.

Applications

There are three broad classes of application - road, hiking and maritime - and each is further subdivided into other types which offer different features depending on the exact use to which they will be put and the environment that they will be operating in.

One important thing to remember is that this technology does not allow the transmission of actual mapping data via the satellites. It is purely concerned with the location of the device.

The first application we shall look at is the in-car (or in-vehicle) GPS. These units need to be reasonably accurate, reliable, and contain details of all the roads, and important addresses (petrol stations, railroads etc.) and points of interest for the region in which the device will be operating.

These devices may be part of the in-vehicle entertainment system, which ties them to a single vehicle. Or installed under the dashboard. Obviously the drawback is that they are not able to be removed from the vehicle.

Portable devices suitable for in-vehicle use exist, and offer a great alternative to those which are integrated within a particular vehicle. However, they will not be able to override the in-vehicle entertainment device (CD player, etc.) and so the voice commands might be drowned out by the music!

Then there are portable devices which are designed for general use, which have a limited road database, and reasonable terrain information. They are small enough to be carried in the palm of your hand.

However, a recent trend has seen PDA manufacturers attaching a GPS antenna, and providing sophisticated software and maps which use the power of the PDA to give an excellent solution. They might not be rugged, but they do provide a very good base for both in-vehicle and general navigation.

Rather than having a direct connection, many PDA-based GPS solutions use Bluetooth as a means to communicate with the GPS receiver. This makes them more easily installed in, and transported from, vehicles.

Finally, maritime units need very specific features, not least being that they should be waterproof, and containing information that can be plotted on nautical charts. Their maps are also very specific, giving undersea elevations as well as navigable channel information.

This includes devices such as fishfinders, which build other fishing related features into the basic GPS unit. A fishfinder is very useful for positioning, tracking and helping the fishing enthusiast to locate schools of fish at sea.

Associated technologies such as GPS Tracking have also evolved, where the user wears a watch which relays their position via radio to a central control centre. This tracking information is then used in conjunction with an alert system to track anything from vehicles to people.

Updates & Mapping

When choosing a GPS, it is important to bear in mind that each type will be updated in a different way. For example, dedicated in-vehicle units tend to be updated via a CD, which has to be purchased from the road map data supplier.

Those which are attached to a PDA, as well as most handheld dedicated GPS devices, are usually updated via a PC. They also need maps, but said maps can usually be acquired at a much lower price than the dedicated branded ones needed for other systems.

Being able to update the device easily and at a reasonable cost is a very important part of the decision process; unlike other consumer devices that you purchase, the cost of ownership of a GPS unit is proportional to its usefulness.

The less you spend on maintaining it, the less useful it becomes since the road networks are always changing. This is perhaps less important for devices aimed at hiking and orienteering, but could be a factor in deciding whether a multi-function device is better than one dedicated to a specific use.

Specific software vendors have solutions for preparing maps which can be uploaded into the GPS unit. For example, many are based around the mapsource system which permits users to define their own maps, perhaps scanned from a real one, in order to get the most out of their GPS.

Accuracy & Portability

If accuracy is paramount, then it is also important to choose a unit that is equipped with a WAAS (Wide Area Augmentation System) capability (assuming it is available in the region the unit is being used). This is a satellite service which provides additional correction information to the GPS receiver in order to increase its accuracy.

WAAS equipped devices might be especially useful for road users and those involved in either door-to-door selling, or providing a service which requires them to be able to pinpoint their position right down to a metre or so.

On the other hand, it is useless to purchase a WAAS capable system if the service is not available in the area in which the device is to be used.

If portability is a key part of the decision process, then it will usually be a trade-off against accuracy, whether that accuracy stems from poor GPS signal acquisition, or less powerful software coupled with a less detailed map.

The Choice

In the end, the choice is reasonably straightforward - buy the most expensive GPS that fits your needs; if price is a deciding factor, then buy the most expensive one you can afford which fits your needs.

Try to think about the following:

Portability

Features

Mapping and Updating

Environmental Features

Portability is affected by weight and size, as well as the antenna. This could have an effect on the features that the device offers - clearly if the screen is tiny, and the whole unit is about the size of a mobilephone, then some advanced features will not be fitted.

The mapping and updating capabilities are also important. Should it be able to accept any old map from a PC, or is it enough that the unit is replaced after 5 years? Technology moves almost as fast as the roads are updated, so this could be an option.

Finally, are there any specific environmental options that are needed, such as waterproofing, rugged shock-proof design, or other features that make one device more attractive than another?

Answering these questions will help determine what type of GPS receiver that is right for you, and at the right price.

About the Author: Guy Lecky Thompson is a successful freelance writer offering guidance and suggestions for consumers regarding [GPS tracking](#), [GPS](#), [GPS maps](#) and [tracking devices](#) (<http://www.1st-at-gps-tracking.com/>). His many articles give information and tips to help people save money and make smarter decisions.