Diabologic: Get Lost!

by Frank Dolinar

Guys don't need to ask directions…as long as they have a working GPS receiver. Otherwise, they'd better keep a good set of maps in the car and stop every once in a while to determine where they actually are on that map.

The Global Positioning System (GPS) got its start almost 30 years ago, but the basic navigational problems it addresses are much older. The fundamental questions / problems are: "Where am I? [Here, of course, but where is 'here'?]", "How do I get 'there'?", and the ever popular "Are we there yet?"

Throughout human history, as our ancestors wandered further away from home, finding the way back became a progressively bigger problem. Travelers by land find that the familiar landmarks disappear over the horizon although the path may be well trodden. And if the path is well enough known, such as the legendary Silk Road, settlements appear along it. A situation we still have today with the continuing expansion of our major highways.

Sailors, on the other hand, had no landmarks and had to determine their location using other means, identifying their latitude with relatively easy star sightings. The problem of determining longitude, however, was finally solved only after the invention an accurate, portable clock. The key to precise navigation is accurate clocks.

Today, not knowing your location precisely is a situation with potentially fatal consequences, as we all discovered -- to our horror -- in 1983, after the civilian airliner KAL 007 was shot down in restricted Soviet airspace. GPS was initially intended as a military system, but after KAL007, it was made available for civilian use.

The principal and best-known role of the GPS is navigation. According to the Wikipedia, the GPS is: "the only fully-functional satellite navigation system. A constellation of more than two dozen GPS satellites broadcasts precise timing signals by radio to GPS receivers, allowing them to accurately determine their location (longitude, latitude, and altitude) in any weather, day or night, anywhere on Earth." The accuracy is to within about 30 feet -- for civilian applications -- anywhere on or near the Earth's surface.

For example, taxis, buses, trucks, ships, planes, and essentially all long haul transport vessels are being equipped with navigation, is an example of how GPS technology can be applied in routine activities. GPS can also be used for computer control of vehicles such as farm harvesters, mine trucks, and others. Small hand-held GPS receivers are often bundled with PDA devices and/or phones. Getting lost is getting more difficult.

Navigation is part of everything GPS helps us do. But how that capability is used might surprise you. Here's a short list of some of the available applications.

- The military uses GPS for accurate targeting by weapons systems and for improved command and control because forces have a better understanding of their own location as well as the location of their adversaries.
- Precise GPS surveying devices are used to locate boundaries, structures, and survey markers, and for road construction. The accurate placement of pylons for new, very long, bridges is just one example.
- GPS usage by aircraft passengers. Some airlines are integrating GPS tracking of aircraft into the seat-back entertainment system, and making it available to all passengers on planes so equipped.
- Precise time reference for many sistuations where deploying sensors for various monitoring applications requires a source of accurate timekeeping. Communications networks often use this for syncronizing geographically dispersed devices on the network.
- Geologists and geophysicists use GPS to acquire highly precise measurements of crustal strain by finding the relative displacement between GPS sites. Such measurements around a volcano or fault zone can help localize the source of the deformation.
- Cars are now being equipped with 'Location-Based Services' a combination of GPS, wireless internet access, and geographic information system databases to help drivers find goods and services they want, when they want, wherever they travel. (How would you find a good Sushi restaurant in Boise, Idaho?) Run in the other direction, such location-based services help providers, such as the OnStar system from General Motors, quickly find drivers who need assistance.

Location-based applications of GPS technologies may eventually make obsolete the marketing assumptions that cause our highways to be festooned with gigantic billboards. Perhaps we will be allowed to see the trees again.

GPS has become a common, readily available service. The Wikipedia article says, "GPS has become a vital global utility, indispensable for modern navigation on land, sea, and air around the world, as well as an important tool for map-making, and land surveying."

While it is true that "The map is not the territory", having our GPS navigation systems with the interactive maps readily available will help us find our way to the specific patch of territory we choose.

Bon Voyage!