GPS In Emergencies – N1JOY

Seeing the events unfold in Japan with the recent earthquake and tsunami are a perfect example of how entire communities can be completely destroyed in moments. Hurricanes Katrina and Andrew had the same kind of destruction, and even wildfires, tornadoes, and flooding will obliterate large areas.

One function Amateur Radio Operators serve after these types of disasters is to do damage assessment to identify levels of destruction in various neighborhoods. When an entire community has been leveled and you may not be familiar with the area you are serving in, how will you accurately identify where you are, or where you need to go to next?

In recent years GPS, Global Positioning System, has been a wildly popular consumer gadget and navigation aid. Hams have been using them long before they were so popular and incorporating them into our radio systems. The first Ham application that comes to mind is APRS, Automatic Packet Reporting System. More recently D-Star has come on the scene and has incorporated APRS features into this new combination digital voice and data system. Not only can you see where you are, so can everybody else. This can be very helpful for a Net Control Operator to guide you to your next location.

What if you don't use APRS in your local emergency plan? A GPS can help you find your destination, or route around areas that are impassable. One readily available program is Microsoft Streets & Trips, which can be purchased for around $39. It can be loaded onto a laptop computer, will interface to various GPS devices via RS-232 or USB connection, and has a long list of capabilities. You can easily program in waypoints, set up a route, get driving directions, or even turn by turn voice prompts over the computer speakers. Many landmarks are included in the database, and what is displayed on the screen is very customizable. Map files can be easily created and shared with your team to make sure everybody has exactly the same information.

With a laptop and a digital camera, you can quickly survey an area, set a pushpin on the map to remember you location, write your comments into a text file, mark areas of interest on the map, and move on to your next position. You may be identifying victims, danger zones, or downed live power lines in need of repair. In a devastating event, many or all of your visual landmarks may be destroyed, so a GPS will be your only reliable way of knowing exactly where you are located.

In a search and rescue situation, it is also useful for knowing where you are currently, tracking where you have been, and keeping Net Control abreast of your situation so you don't get lost yourself. Different GPS maps show varied amounts of detail in the roads. Your average automobile GPS will not show anything that is not paved and maintained street. The Garmin Map Source programs have different map databases for applications such as Roads and Recreation that will show details such as hiking and snowmobile trails, and they also have a Terrain database, which would be helpful for a remote search and rescue operation. Know the limitations of your GPS maps before you go charging into a dangerous area.

One problem with portable GPS's is they can eat up batteries pretty quickly, so if you are not powering your GPS off a power supply, be prepared with spare batteries. You can greatly extend your battery life by dimming your display backlight, or only turning the GPS on when it is needed. Just remember they can take several minutes to reacquire the satellite signal and get a reliable position lock.

There are several sources for inexpensive PC interface-able GPS's. N1JOY recently purchased a lot of 5 used hockey puck magnetic mount units for $5 each on E-Bay. Microsoft makes an affordable USB GPS that can be placed on your dashboard with an extension cable, and there are plenty more if you look around. Many of the older GPS units had RS-232 data outputs in the NMEA-0183 format, which is a

serial data string of GPS position data that can be used to drive computer based map software. Newer automobile units typically do not have an external data output, so they cannot be used with your computer.

One more source for getting GPS data is in your cell phone. The cell phone GPS is normally used for navigation applications that usually require you to pay a subscription to your cellular provider, but cell phones carry a very powerful GPS in them. Try learning how to access that info from your phone and you'll be amazed at how dead accurate they are and how fast they can acquire the satellite position. The cell phone GPS is able to be queried by E-911 systems so they can locate you quickly in an emergency.

One thing you must remember is GPS only works when your receiver can hear the weak signals from the array of satellites orbiting nearly 13,000 miles in space! This means they will not work indoors, but can sometimes acquire a signal when placed right at a window. When a GPS has been turned off for a long period of time it may take a very long time to acquire an accurate position. This is because the GPS receiver downloads an almanac to help it calculate its position. If the GPS does not know what time it is, or have some idea of where it is located when it was turned on, it must go through a search sequence to hunt for satellite signals and then start to build the almanac, and once 4 satellites have been acquired, the GPS is able to determine your exact location within a few feet.