The Language of GPS Location

By Larry Simmons, VP of Business Development
On-Board Communications

A GREAT DEAL NEEDS TO BE LEARNED ABOUT GPS BEFORE LOCATION INFORMATION BECOMES STANDARD ON EVERY WIRELESS 9-1-1 CALL, AND THAT'S WHY EDUCATION, TRAINING AND PREPARATION ARE TOP PRIORITIES.

Phone calls. They aren't what they used to be. Wireless is permeating our ever-shrinking planet, and phones are going where no call has ever gone before—the highway, the mountains, the beach, the woods, wherever. The world really is your oyster—and now it's your phone booth, too. Toss in the growing popularity of Global Positioning System (GPS), and we can talk, walk and drive just about anywhere without getting impossibly lost. That is, as long as we understand what the GPS data actually means.

Unfortunately, all of this technology can't prevent emergencies from happening, and this raises some questions worth exploring. What happens when an injured motorist uses a wireless phone to call for help after an accident in the middle of nowhere? This is where it gets tricky, because a 9-1-1 operator will likely have no idea where the call is coming from, unless the caller can describe the exact location or unless the necessary technology is in place—at both ends of the phone—to communicate the precise position.

Now consider this—what if the injured motorist does have GPS information (and a growing number do)? If you are the PSAP operator, will you be able to understand it and translate it from numbers and symbols into an exact location? And if you can't, can your existing equipment do it for you? These are all valid questions, because wireless is here to stay. Unfortunately, emergencies don't appear to be going anywhere either, despite advancements such as cell phones and GPS technology.

GPS: Coming to a PSAP Near You

By now, you already know that the FCC will require that wireless carriers provide caller locations to 9-1-1 centers by the end of 2005. In other words, ready or not, here comes GPS. With so much at stake on every call, you can't afford to be unprepared. Fortunately, you don't have to learn everything on your own, because there are resources available to help you prepare, including the following:

The Basics

GPS technology has been around for a long time, but until recently, it hadn't found its way into the hands of mainstream America. The main reason? It simply cost too much. But lower prices have meant rising demand, and consumers have learned how valuable GPS technology can be.

Three Main Groups of Portable GPS Products

1. Personal Digital Assistants
2. Handheld GPS Units
3. Interactive GPS Units

Technology 101

How does GPS technology work? Here is the short answer: A GPS device captures data beamed down from satellites in the sky, and uses this information to pinpoint its precise position. Obviously, if you happen to be holding a GPS device, you can determine your exact location. For the longer version, please see your local scientist.

Unfortunately, not all GPS devices speak the same language. Some might plot your position on a map, while others list your location as a series of numbers and symbols. Either method tells exactly where you are, but neither means much unless it can be easily and quickly translated. This is especially true in an emergency. And if you are a PSAP operator, this is where your training comes into the picture.

Devices

GPS technology has navigated its way into our everyday lives. Golfers use it on the links. Fishermen take advantage of it to find their next catch. Hikers depend on it to locate their campsites. And motorists consult it to find that perfect vacation spot. It's already included on some cell phones, and soon it will be standard issue on every wireless unit. These are just a few of the many GPS applications.

We are starting to depend on GPS to know where we are, and many of us also mistakenly believe that if we call for help from a wireless phone in an emergency, our location will be easily (and immediately) determined by the PSAP. In most cases, this is simply not true—not yet, anyway.

Even though GPS units have been incorporated into many products, you can't carry a boat or a golf cart in your pocket while you're hiking up a mountain! And most cars on the road today don't contain built-in GPS equipment. That's why the growing selection of affordable, portable GPS devices is so exciting (**See Portable GPS Products sidebar**).

The Language of Location

All of these portable devices are capable of determining a precise location and can be used in conjunction with a wireless phone to deliver this information to a PSAP operator. But again, there is no universal location language. In fact, there are a number of acceptable ways to describe a specific location in GPS terms. Below are four of the most popular formats:

1. Degrees Decimal Minutes	example… 35º 54.843'N
2. Degrees Minutes Seconds	example… 35º 54'50" N
3. Decimal Degrees	example… 35.914045º N
4. Universal Transverse Mercator (UTM)	example… 39 74 228 N

It is critical for PSAP operators to understand how to interpret these formats, especially Degrees Decimal Minutes, which is the way most portable GPS units display a specific position. Throw in the different ways latitude and longitude are represented in North America (N, W, +, -) and there is potential for real confusion without thorough training. In fact, if coordinates are misinterpreted, an accident location could conceivably be displayed with the wrong address, the wrong county, or even the wrong country, for that matter.

Obviously, there is still a great deal to learn before location information becomes standard on every wireless 9-1-1 call. That's why education, training, and preparation should be a top priority.

It's a Matter of Time

So what does all of this mean? Consider what we already know:

- The FCC has required all wireless carriers to provide location information when their customers call 9-1-1. The deadline for compliance is the last day of 2005.
- Progress on this matter is slow, due to a variety of reasons including cost and privacy concerns.
- At the same time, portable GPS units are increasing in popularity, thanks to lower prices and innovative designs.
- Most PSAPs aren't equipped to handle wireless calls with verbally transmitted GPS information and most 9-1-1 operators haven't been adequately trained.
- Simply misinterpreting a single number in a GPS coordinate will change the intended location—sometimes dramatically.

Portable GPS Products

Personal Digital Assistants (PDAs)
Some PDAs are equipped with a GPS antenna and special software that allow them to plot location information on their screen. Some even offer turn-by-turn directions for easy navigation. In an emergency, a caller could give a PSAP operator an exact street address. But PDAs have limited memory, and without some careful planning, users may end up with GPS coordinates and no corresponding map. Pharos and Delorme are two of the companies that manufacture this PDA-compatible software.

Handheld GPS Units
These popular products have the ability to display GPS coordinates directly on their screens. In an emergency, a user could call 9-1-1 and read the coordinates directly from the screen. Magellan and Garmin are two popular makers of handheld GPS units.

Interactive GPS Units
So far, there is only one member in this new class of portable GPS units. It is designed to send precise location information directly to the PSAP. It doesn't rely on users to read GPS coordinates to a 9-1-1 operator. Instead, the user holds a wireless phone up to the unit and the unit speaks the GPS coordinates in an easy-to-understand tone. If the PSAP isn't equipped to enter GPS information into its dispatch system, a web-based program is available for dispatchers to plot the GPS coordinates directly onto a map. On-Board Communications has the first portable unit of this type.

Three Reasons to Get to Know GPS

Portable GPS devices are increasing in popularity.

Interactive GPS units are entering the market later this year.

Public awareness is growing. People are learning what a life-saving combination GPS devices and wireless technology can be.

It is critical for PSAP operators to understand how to interpret these formats, especially Degrees Decimal Minutes, which is the way most portable GPS units display a specific position.

Eventually, every PSAP will handle wireless 9-1-1 calls with GPS information—it's just a matter of time. But regardless of how long it takes for the FCC's mandate to become reality, the calls should start pouring in right away. Why? There are (at least) three main reasons:

1. Portable GPS devices are increasing in popularity.
2. Interactive GPS units are entering the market later this year.
3. Public awareness is growing. People are learning what a life-saving combination GPS devices and wireless technology can be.

Learn to Live with GPS

It's clear that training is critical for PSAP operators. Failure to quickly and accurately translate GPS information from a wireless 9-1-1 call can delay life-saving medical treatment for a stranded hiker or an injured motorist. And, in an emergency, every second counts. Fortunately, there are some simple training tools available on the Internet that are free, easy to use and designed to help PSAP operators learn what they need to know about wireless calls and GPS.

Wireless 9-1-1 calls are inevitable, but there doesn't have to be confusion. If you are a PSAP operator, take the time to learn about GPS.

Larry Simmons serves as vice president of business development for On-Board Communications (Dallas, TX). He has more than fourteen years of experience in the wireless industry. He also worked for RESPONSE Services Center, a wholly-owned subsidiary of AAA. His extensive knowledge of wireless and location services gives him unique insight into the challenges facing the deployment of national location services. He can be reached via e-mail at Larry.Simmons@on-boardcommunications.com.