GPS Level 1

The GPS receiver provides its user with four main things: location, distance and directional information, tracking and route creation. With this information, hikers and travelers learn where they are and, more importantly, how to reach where they want to go. The information provided by the GPS system is constantly updated, which helps you to stay on track.

Between 24 and 32 satellites orbit the Earth, and these satellites provide the answer to the GPS receiver's aching question, "Where am I?" The satellites calculate this through a process called **trilateration**. Receivers lock signals with several different satellites orbiting the Earth, and based on the time it took those signals to reach the different satellites, a calculation is made about the receiver's location on Earth. Long story short, you look down at your receiver and see exactly where you are on a digital map.

It wasn't that long ago that GPS technology was used only by the military. But in recent years, that has changed dramatically. Receivers are now very affordable. For less than the cost of a quality tent and not much more than a pair of sturdy hiking books, outdoor enthusiasts can find a functional GPS that floats, is waterproof and is durable enough to withstand the rigors of a rough trail.

Although GPS receivers are affordable, many consumers still wonder if they have the skill to use one. When you consider that the GPS must send a signal to satellites orbiting the Earth, wait to receive a signal back, and then convert that signal to not only your location but the speed at which you're traveling and how long it will take you to reach a particular destination, the gadget can seem pretty fantastical and intimidating. But the truth is, the receiver does the bulk of the work itself. If you can navigate by map and compass, reading a GPS will be an easy skill for you to learn. Let's get started

If you have never used a Global Positioning System before, you may find that it is somewhat daunting to set everything up. Not to fear, though - following these basic tips will have your GPS up and running in no time at all.

1. Turn it on. You will be surprised to find how many people actually forget to follow this basic step.
2. Thoroughly read the instruction manual before leaving the house. The instruction manual is included with the device for a reason. Reading it will help you better understand your GPS system and cut back on complications you may have while using it.
3. Use it in a familiar location in order to both accustomed to the device. Before you go stumbling out into the woods with only your GPS system to guide you, try taking it on a couple of test runs around your town.
4. Be specific. Know where it is you are wanting to go before you program it into your GPS system. The more precise you are in your desired destination, the more precise the GPS will be in issuing you directions.
5. Save places you may visit again. Is there a particular location that you want to return to at a later time? Saving the location will make it easier to find that place again, no matter where you may be.

6. Use memorable names. To make it easier to navigate through your GPS's saved locations, mark each one with a distinct, memorable name.
7. Find alternative routes. Sometimes, if you are trying to get to a place for an important meeting, a GPS is handy. However, it will often times give you the most direct route, which may lead you directly into rush hour traffic. Using your GPS to help you find alternatives to driving through the heart of town at rush hour is always a wise decision.
8. Check the manufacturer for downloadable features. Many GPS manufacturers are always working on improving their products through software updates and feature upgrades. Check their website often to keep up to date with any new software releases.
9. Carry extra batteries. The last thing you need is to be out in the country, away from civilization, and have your GPS system go dead on you. Carrying an extra set of batteries or a car charger is an essential step to take for any long-distance trips.
10. Ask for the trackback route and save this information so that you can find your way back from wherever you may be traveling. After all, what's the point of going to your destination of choice if you can't find your way back?

GPS Waypoint and Go-to

To accurately determine your location, a GPS receiver needs to lock onto four different satellites. The signal it receives from these satellites must be strong. If the signal is weak or the GPS receiver cannot lock onto four satellites, the information you receive may not be accurate.

To get a signal, turn the GPS receiver on and push the satellite button. It may take a few minutes, but you'll be able to see the number, location and strength of the satellites that the GPS receiver is locked onto. If the signal is weak, or there are less than four satellites on the screen, you should navigate using a map and compass.

Sometimes the area where you're standing can have an effect on your signal strength. If the signal is spotty or weak, try moving to a location without any overhead obstructions. Both trees and canyon walls can interfere with the GPS's ability to communicate with satellites. Move into a meadow or a parking lot while the GPS system locks onto the satellites. Once it has locked on, the receiver usually can maintain a connection when you enter the woods.

Two important functions of a GPS receiver are the waypoint and the go-to functions. **Waypoints** are points that you can enter into the memory of your GPS for a particular journey. They may be the spot you plan to camp, where you parked your car or other interesting places along the trail. You can enter more than one waypoint for each trip. While you're hiking, you can see the waypoints and your relationship to them on the GPS screen.

The **go-to** function guides you exactly where you want to go. When you're ready to head to camp or home, simply press the go-to button, and a selection of waypoints will appear on your screen. Select the waypoint you want, and the GPS receiver will immediately let you know how far away it is and what direction you need to travel to get there. It will continually update as you hike, so you'll know if you're drifting off course and how much farther you need to travel.

GPS technology has greatly improved in the past several years, but receivers still get confused. While hiking, attach the GPS receiver to your shoulder or the top of your backpack. You need easy access to it, but carrying it in your hand or clipping it to your waistband can create problems. The motion of swinging your hand while hiking can be enough to confuse it and it may not hold a connection with the satellites.

Initializing Your GPS

Sometimes, despite your best efforts, your GPS has trouble picking up signals from satellites. When this happens, you can use a process known as initializing to improve your reception. Most GPS systems are manufactured in Asia, so if you're in the Western Hemisphere, the last version of the sky in the GPS's memory is that from the other side of the world.

Initializing helps your new GPS quickly locate the satellites in the area where you live. Initializing only needs to be done one time, and the GPS will hold this information in its memory. Each GPS model has a different method for initializing, so check your owner's manual.

Laying a Track with GPS

Laying a track is another important GPS receiver skill. You can use your GPS to leave a virtual trail, which allows you to follow your trail out if you become lost. Your GPS will have a button that's responsible for dropping track points. You can drop the track points as close together or as far apart as you like. The closer together you place your track points, the more accurate this trail will be if you have to follow it out. When you use the tracking feature, you don't need to manually enter the track points, the GPS will automatically mark them for you at the distance you specify before your trip.

All of the features available on GPS receivers are nice to have, but these features come with a drawback. GPS receivers can be hard on batteries. Lithium batteries have the longest battery life, but may cause distracting lines across the GPS screen when they're new. To eliminate this problem, many people use lithium batteries in another piece of equipment for a few minutes before putting them in their receiver.

You can prolong the life of your batteries, no matter what type they are, by turning off nonessential functions. Backlighting, compass mode and other auxiliary functions can be switched off. Also, if your GPS loses its satellite lock, turn it off to conserve battery power until you find an open area to lock in on the satellites again.

It's No Map and Compass

A GPS receiver is many things, but it's not a replacement for a map and compass. Batteries can die, satellite lock can be lost, and many other things can happen that render the GPS receiver ineffective.

Loading Maps onto GPS

GPS receivers are only as good as the maps they're used with. If you're proficient with a map and compass, then you're probably familiar with the various types of topography maps. The U.S. Geological Survey is one source of high-quality maps for all areas in the United States. Regardless of where you plan to backpack, it's important you have accurate and easy-to-read maps.

Your receiver will come loaded with a variety of maps. If the maps you want aren't preloaded onto your GPS, you can probably purchase them in CD-ROM format and load them onto your receiver. Some companies also provide microSD memory cards that are preloaded with maps that can easily be added to your GPS. Finally, the Internet has a wealth of downloadable maps available for receivers.

GPS receivers are bound to become a more intimate part of our lives as more people become comfortable with the technology. Some people first learn to use them through their jobs. More and more workplaces are using GPS to track company vehicles or employees who work outside the office.

Once you become proficient with a GPS receiver, you may find you're interested in adding one to your vehicle. Whether you're using a GPS receiver while hiking or driving, the drawback is the same. GPS receivers are not capable of recognizing obstacles in their paths, so both a road detour or a rushing river will require you to reconsider your route. For this reason, it's unlikely that maps will become obsolete any time soon.

Letterboxing Turned Geocaching

Before GPS usage became widespread, there was a sport known as letterboxing. In letterboxing, people would interpret compass readings and follow them. If they were correct, they would find a small box with a token inside. They'd take that token and leave another one behind. There was also a logbook at the site to record what was found or to simply sign and date. Geocaching is the modern equivalent. Instead of using a compass, participants follow their GPS coordinates to locate the "cache."