

## Beginner Tips for Documenting Trails

*by Doug Adomatis*

If you are new to using GPS while hiking, here are some tips that will help you create clean tracklogs of your favorite hiking trails.

Now that you have taken the time to work through the instruction manual that came with your GPS, you should be knowledgeable of *\*how\** to perform various functions, but without some experience you might not know *\*when\** to do such things as average your position, disable tracking, and activate backtracking.

A GPS can be employed for different navigational tasks, many of which require unique operational procedures. And because features vary between the different models of GPS receivers, the following check list items are general instructions for the specific task of collecting and editing data on an existing hiking trail.

### Before you leave the house...

- ❑ Pack a spare set of batteries.
- ❑ Fashion a means of carrying your GPS without holding it in your hands. Keep in mind that you need to have immediate access to your GPS at all times and the antenna should have a full view of the sky. An external antenna Velcroed to the top of a pack will optimize signal reception while allowing you to pocket the receiver anywhere, but you will have to hassle with the connecting cable. Alternatively, armband holders work equally well.
- ❑ Back-up the data on your GPS.
- ❑ Download any waypoints and tracks you have stored on your GPS to your personal computer and clear any unrelated data to free up memory on your GPS.
- ❑ Upload predetermined waypoints.
- ❑ Enter a few waypoints into your GPS for the trail from a map or other existing data source. Waypoint coordinates may be obtained from several sources (see “Navigating Under the Canopy” [1] in the newsletter archives for more about determining coordinates for features shown on topo maps). If you are using PanTerra [2] or ExpertGPS [3], you can download the coordinates of many features found on USGS maps directly from the TopoGrafix web sites.
  - Include significant features. Upload waypoints such as trailheads, trail intersections, sources of water, highpoints, ranger station, etc.
  - Use meaningful names and descriptions. It is easy to forget the significance of numbered waypoints.

### At the trailhead...

- ❑ Power-up your GPS receiver.  
Before you take off on your trek, it's usually easier to get a lock on the satellite signal in the parking area than it is to acquire a signal from the confines of the trail.
- ❑ Disable the power-save feature.  
If your receiver has a power save feature, it probably interrupts signal reception for short periods to save battery consumption. It is practically impossible to get tracklogs that represent your actual meanderings if your signal reception is intermittent.
- ❑ Set tracklog options to fill with the most points without wrapping.  
For most hikes, it is unlikely that you will exceed the maximum number of trackpoints, but just in case, you don't want to lose any data without being warned.
- ❑ Mark a waypoint where you parked your vehicle.  
This is an obvious to-do item that is easy to forget.
- ❑ Reset trip time and distance counters.
- ❑ Start hiking and enable tracking.  
It is best to be moving in the direction of travel when you start tracking. Otherwise, the beginning of your tracklog may start on a different bearing.

### On the trail...

- ❑ Stop frequently to mark waypoints.  
Record significant trail features such as intersections, abrupt changes in direction, water and road crossings. These feature waypoints will be helpful when referencing other maps and provide an alternate "bread crumb trail" to your tracklog. Also, frequent stops help your receiver "catch up" and acquire better signal lock. It is important when you stop to stand still and not wander off the trail while recording waypoints with tracking enabled.
- ❑ Always use signal averaging when recording waypoints.
- ❑ Stop only long enough to accurately record the waypoint.
- ❑ Disable tracking for longer stops and if you need to leave the trail.
- ❑ Keeps notes on you estimated error.  
Knowing the positional accuracy of your waypoints will help when it comes time to "massage" your data.

- ❑ Use a handheld micro-tape recorder

All this stopping and waiting can annoy your hiking companions. By using a tape recorder to make comments while you walk, you'll have a better chance of keeping harmony in the group.

#### When the going gets rough...

Marking feature waypoints is especially important when estimated error is high. Poor satellite geometry, obstructed view of the sky, and bad weather may make the recording of a decent tracklog nearly impossible.

- ❑ Disable tracking if you lose satellite signal lock.  
Retrace your steps to where you first lost signal and mark a waypoint. Then proceed through the area of signal loss and mark a waypoint where you regain signal lock.
- ❑ Mark switchbacks.  
The side of mountain is typically an area of poor signal coverage. If you mark a waypoint at every switchback you will be able to "connect the dots" when you get back home.

#### Backtracking...

If your trail is out-and-back hike and its time to turn around, or if for any other reason you need to double-back, you should take the opportunity to do a few things that will help you double check and clarify the data you've already collected.

- ❑ Note the "split" time and distance.  
You will want to compare the time it took you to go out to the time it takes to go back.
- ❑ Activate the backtrack feature.  
If your GPS receiver has this feature and you've never used it, this is a good time to see how it works. When this feature is activated, some receivers will add special backtrack waypoints to your data at locations where it determines significant turns have been made. Save these waypoints as they will supplement the data you manually acquired.
- ❑ Disable tracking prior to backtracking.  
Rather than adding cluttering, it is better to disable tracking when your indicated position overlays your tracklog.
- ❑ Enable tracking when there are discrepancies.  
If your indicated position does not lie reasonably near your tracks, you need to collect more data.

#### Back at your vehicle...

- ❑ Disable tracking as you approach your vehicle.
- ❑ Note the readings of your trip time and distance.

## Back at home...

- ❑ Backup your work.  
Download your GPS data to your PC, making a copy of the data before making any changes.
- ❑ Type your dictation.  
You may find it easier to cut and paste text from your word processor, rather than type waypoint comments directly from your tape recording. If some time has passed since your trek, you might also find the exercise helpful to the recollection of the journey's events.
- ❑ Use a GPS data management program that allows you to edit your tracklog.  
When you settle down to sort out all the data you've collected, you will have a mix of waypoints and trackpoints to work with. One of your first tasks will be to isolate "chunks" of your tracklog, separating sections of trail and deleting obvious errors. Then, you will likely need to append and insert waypoints and trackpoints to create a contiguous track that accurately represents your trail.

One of the best programs for tracklog editing is ExpertGPS by TopoGrafix. With ExpertGPS routes and tracks are treated the same, allowing you to append waypoints to your tracklog with easy drag and drop action. More powerful tools are provided in the map window of the program, which overlays your data on standard USGS topographic maps or aerial photographs, allowing you to visually see how all your data is spatially related. In the map window, trackpoints are shown with interconnecting lines, forming continuous tracks. Use the scissors tool to snip your track into pieces. Use the pointer to select and delete unwanted pieces of track. Add turns using the insertion tool. Then, back in the main window, you append sections of track by using the "Join Route..." command.

Properly documenting a trail, like many tasks in cartography, is an art as much as it is a science. Today's technology simplifies the task of representing the location of trail features, but only the artist in us can effectively communicate the experience through words and pictures. No GPS can capture the image of a mountain vista or the sound of falling water. So on your next hike, consider taking along a sketchpad and a friend. Documenting the entire experience will bring your data to life.

## Footnotes

Please use these links to help support our free services (no purchase necessary).

[1] Newsletter Article, "Navigating Under the Canopy"  
<http://www.travelbygps.com/articles/archives.htm> - NavUnderCanopy

[2] PanTerra by TopoGrafix  
<http://www.topografix.com/default.asp?rc=454L3>

[3] ExpertGPS by Topo Grafix  
<http://www.expertgps.com/download.asp?rc=454L3>