Collecting location data with a Garmin Nuvi

Introduction

The Garmin Nuvi line of GPS devices includes a number of inexpensive entry level devices which are more than adequate for the type of data collection we are trying to accomplish. These instructions focus on setting up the Nuvi, using it to collect waypoints and tracks, and getting the data out of the Nuvi so it can be archived and used.

Beware: using the Nuvi as a data logging device can make it less than useful for finding directions. In the section on setup, I will discuss the setup options and their pros and cons.

I provide two methods for getting data out of the GPS. One involves importing the data directly into Google Earth (which is a free download from Google, http://earth.google.com/). The other is more work, but retains copies of the GPX files from the GPS. GPX is the standard interchange format for GPS data and by copying these files directly, you are archiving the actual data from the GPS. It's easy to load the data into Google Earth from GPX files later.

Setting up the Nuvi

When the Nuvi starts up, it ends up in the *Top Menu* Screen. In this screen, you will see a signal strength symbol in the upper right, a battery level & time indicator in the upper right. There are two large icons in the middle. *Where Too?* which can be used to enter addresses, find Places Of Interest (POIs) and so forth. *View Map* allows you to see where the GPS thinks you are on the map.

The bottom two icons are *Volume* (self explanatory) and *Tools*. The tools menu is where many useful settings may be found.

Signal Strength

There is more to the signal strength than just a display of bars. With your GPS is on, place your finger on the bars and hold it there for 8 seconds or so. Most Nuvis will switch to a more detailed signal screen. This screen shows 1) your current latitude and longitude, 2) your current speed, 3) your approximate elevation (Elevation is not a strong point of consumer GPS units), 4) what satellites the GPS can see, 5) their signal strength, 6) and an indication of the circular error (10 feet is best, but not always achievable on overcast days.) When a GPS has just been started up, it may take a little while to acquire satellites and bring the circular error down, so be patient. This screen will give you some visibility into what it's doing. If it's taking a long time, try standing with the GPS outside of your car.

Settings

Select Tools in the main screen, then Settings, then Navigation. Select Route preference and look at the options.

The first three options (Faster, Shorter, Less Fuel) all are associated with the ability of the GPS to provide routes on the road grid.

The fourth option (Off Road) will always provide an as the crow flies route. However, if you don't need navigation, there are good reasons to select Off Road mode.

Garmin GPS units have a "feature" called snap to road. When they see you are near a road on the built in maps, but not quite on it, they will adjust your apparent position to be on the road. This is fine if appearances are all that matter. The problem is that they also adjust the data that is recorded, meaning that you won't get data about where you really were, but only about what roads are close in the Garmin

supplied maps – and they're not always right.

So if you don't need navigation, I recommend setting Off Road here. It's how I use mine. Using Off Road is particularly important if you are participating on any of the online mapping projects such as OpenStreetMap.

Using the Nuvi

GPX tracks

As you drive along, you will see a blue line following your car. This is a graphical represenation of the track you are traveling on. The GPS will record this track in a GPX file which can be gotten off the GPS when you get back to your computer. Instructions on how to do this are later in this document.

Waypoints

You can also record waypoints, specific named points of interest. This could be used in many ways, say in recording the locations of specific POIs. If you press the screen on the car icon, the Location screen will pop up (if you miss slightly, a different screen with a straight down view of the map appears.) The location screen has a "Save Location" button at the bottom. If you select it, you get a small keyboard display and can enter a string of letters & numbers to identify the waypoint later. When you press Done, the waypoint and its name will be saved in the GPX file.

If you do get the screen with the vertical view of the map, you can still select Save, but you won't get the keyboard display. The GPS will generate a name, which may be of little mnemonic value later.

Getting data out of the Nuvi

directly into Google Earth

1. On the back, the Nuvi has a mini-USB port. Use any standard USB-mini cable to connect the Nuvi to your computer
2. The Nuvi will appear in Windows Explorer (PC) or Finder (Mac) as an external disk drive, and will behave pretty much like a flash ("thumb") drive.
3. One or two drives may appear. The "Garmin" drive will be the internal flash memory of the Nuvi, and will be where the GPS coordinate files are to be found. The second drive, if present, is the SD card that optionally can be inserted into the Nuvi. It will have whatever name has been assigned (possibly "NONAME"). It is only of interest if you are using alternate maps; GPS tracks are not normally stored there.
4. Start Google Earth running on your system
5. From the Tools menu, select GPS. The GPS dialog will appear.
6. In the Import tab, select Garmin.
7. Click on Import. Google Earth will grab the tracks and waypoints directly from the GPS
8. Once the import is done, find the Windows Explorer or Finder window and eject all the Garmin drives (one or two). Then disconnect the Garmin. Depending on the Garmin, it may restart automatically. Don't worry about this, go on to "Cleaning data from the Nuvi afterwards"

keeping GPX interchange files on your hard drive

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4. In the Garmin flash drive, navigate to the directory Garmin\GPX
5. if you have been on a relatively short trip, there will be only one file, current.gpx. If the trip is longer, there may be gpx files in the archive directory and files with other names.
6. Copy these files into a directory on your hard drive. I suggest adapting a scheme involving subdirectories with good mnemonic names, locales, dates, or some combination of them.
7. Once the files are copied, find the Windows Explorer or Finder window and eject all the Garmin drives (one or two). Then disconnect the Garmin. Depending on the Garmin, it may restart automatically. Don't worry about this, go on to "Cleaning data from the Nuvi afterwards"

Loading GPX files into Google Earth later

1. Start Google Earth on your computer
2. select GPS from the tools menu
3. select Import From File
4. navigate to the GPX file you wish to load into Google Earth

Cleaning data from the Nuvi afterwards

1. Once you have copied the data off the Garmin, you should remove it so that you will get clean, distinct tracks for your next trip.
2. In the top menu screen, select Tools
3. in the Tools screen, select My Data
4. select Clear Trip Log, then select yes
5. select Delete Favorites, then select "Select All"
6. if you have any you do not wish to delete, then scroll down and uncheck them.
7. Select Delete, then select yes
8. your Garmin is now clean and ready for its next expedition