# Downloading and managing GPS data with the Trimble GeoXM/XT

This document discusses the method for transferring GPS data collected with ArcPad onto your office computer and managing that data. This process is significantly different than with previous Trimble GPS units like the GeoExplorer I/II/3 or ProXR.

## Connecting the GPS unit to your computer

Plug the cradle into an electrical socket using the two-part power cable. Use the USB cable to connect the cradle to a USB port on your computer. Turn the GPS unit on and place it in the cradle by setting the top end (the end with the Trimble logo) into the top of the cradle, and then firmly pressing the bottom end (the end with the power button) into the cradle until it clicks.

This should automatically launch Microsoft ActiveSync on your office computer. [You need to have this software installed – the current version as of the writing of this document is at http://www.microsoft.com/windowsmobile/downloads/activesync38.mspx - ask your IT person to install it]. A window will pop up asking what type of partnership you want to set up. Choose Guest Partnership (or "No" if the options are Yes or No) and click Next. Now you are connected. If you have a problem connecting, try removing the unit from the cradle, waiting a bit (say, 20 seconds or more), and then reconnect. In some cases you may need to restart your computer to get it to work.

## Transferring the data

ArcPad saves your GPS data into an existing shapefile, and, if you are simultaneously running GPScorrect, it will save additional GPS information into an .SSF file. The .SSF file will allow you to differentially correct the shapefile data. You will need to transfer all the files associated with the shapefile including the .SSF file.

On the ActiveSync window click the Explore button. This will launch a Windows Explorer-type window showing the contents of the GPS unit. [you can also see the contents in a regular Windows Explorer or My Computer window if you prefer—the GPS unit will show up as a "drive" called Mobile Device]. Double-click My Pocket PC, then Disk, then My Documents. This is where we store our GPS shapefiles. Your data may be stored in another folder within \Disk\My Documents\, for instance \ArcPad_Fells\ or \catchbasins\.

Once you have found your shapefile, you'll need to copy it to your hard drive. Select all the files associated with the shapefile—ALL files that start with the same name, for instance:

catchbasin.apl

catchbasin.dbf
catchbasin.prj
catchbasin.shp
catchbasin.shx
catchbasin.ssf
catchbasin.vbs

Right click on the selected set of files and click Copy. Then open Windows Explorer or My Computer and navigate to the place where you want to store your GPS data. Create a new folder, name it something relevant (for instance \XM3_20050612\ (for the name of the GPS unit and the date downloaded)), and paste the files into that folder by right-clicking on the folder and clicking Paste. The reason you need the files to be in their own folder is that all the files (for instance all catchbasin GPS files) will have the same name, so if you have multiple days of data from multiple GPS units, you will end up overwriting the files unless you have each set in its own folder. If you have more than one shapefile to download, for instance *trails.shp* and *trailpoints.shp*, then you can put them both in the same folder. An alternative to storing each day's work in a separate folder is to rename each shapefile and keep them all in the same folder.

**Emailing the files to GIS staff**

At this point, you can either send the files to GIS staff or you can differentially correct the files yourself. When you email the files to GIS staff ( nathanael.lloyd@state.ma.us or david.kimball@state.ma.us or chandreyee.lahiri@state.ma.us ) make sure you include ALL the files that start with the same name, as mentioned above. If any of the files are missing, the data may be unusable. Once you have emailed the files, skip to the step titled *Looking at the files in ArcView/ArcMap*.

**Differentially correcting the shapefile(s).**

If you have an .SSF file along with your shapefile, you can use it to differentially correct your shapefile, which will improve the locational accuracy of the shapes.

To complete this step, you must have GPS Pathfinder Office version 2.90 or higher installed on your computer. If you have version 3 or higher, you are ready to go. If you have version 2.90 you may need to update your Pathfinder Office software (free over the internet) so that you can use the ShapeCorrect utility. You can check whether you have ShapeCorrect installed by clicking Start—Programs—GPS Pathfinder Office 2.90—ShapeCorrect. If ShapeCorrect is there, you're all set. If not you'll need to download the updates by clicking Start—Programs—GPS Pathfinder Office 2.90—GPS Pathfinder Office Updater and downloading and installing all applicable updates (not including foreign language updates).

Open GPS Pathfinder Office. You can use the Default project or you can use or create a special project. Open the .SSF file(s) you just downloaded by clicking the Open button and browsing to them. You will see a bunch of little black dots on the screen, which are your GPS positions. Choose Differential Correction from the Utilities menu.

The Rover Files section should show your .SSF files. In the Base Files section, click Internet Search and choose your Base Data Provider. We generally use the URI base station, which is called "COOP_CORS, Environmental Data Center, Univ. of Rhode Island," but you can use another if you prefer. If you are far away from Rhode Island you may want to find a base station that is closer. The reason we like the Rhode Island site is that the base station files are posted hourly, so you can differentially correct as soon as you return to the office. If you don't see the one you want in the drop-down list, click New… and choose it from the list (get the newest list from Trimble's internet site). Click OK on the Internet Search window, and tell it to download all required files (if asked). If the Confirm Internet Setup window appears, click Yes. The base station files should start downloading. You may get an error, but as long as it indicates that you have 100% coverage (or close to it) you are OK. Once your base station file download is complete, click OK on the Differential Correction window to perform the correction. When it is done, you'll get a message telling you if it was successful.

You'll now need to copy the .COR file(s) (which is a differentially corrected version of the .SSF file) to the folder where your shapefile and .SSF file are located. Pathfinder Office usually puts .COR files into C:\Pfdata\DEFAULT\ (if you are using the default project – it might be a different folder if you are using another project). Cut and paste this file into the folder where your shapefile and .SSF file are. You should do this immediately; if you wait, the .COR file might get overwritten with a .COR file from another GPS unit or another day's data.

Now you are ready to run the ShapeCorrect utility. Click Start—Programs—GPS Pathfinder Office X.XX—ShapeCorrect. Click Browse and browse to your shapefile(s). Make sure that "Corrected and Uncorrected" is the selected option under Output GPS Positions. Click OK. This utility will save your existing <filename>.shp file as <filename>.bkp, and it will substitute a new <filename>.shp file with the corrected positions.

**Looking at the files in ArcView/ArcMap**

Now you can add the shapefiles to ArcView or ArcMap to see how they look. If you are personally managing the data you are collecting (as opposed to having the GIS staff manage it for you) you should at some point merge your shapefiles together (only merge the ones that have the same name; for instance, merge all your trailpoints shapefiles together into one, but don't merge trailpoints with trails or catchbasins. Contact GIS staff for instructions on how to merge shapefiles.

**Email files to GIS staff**

Even if you are managing your data yourself, we'd like a copy. See above for how to email the data to us.

**Replacing the files on the GPS unit**

Before you go back out into the field, you'll want to replace the files on the GPS unit (or at least delete the .SSF file). Once you're SURE that you have downloaded the data correctly onto your office computer, you can delete all the files on the GPS unit that make up the shapefile (they all start with the same name, i.e. catchbasin.* ). Then you can replace them with the files in the \Disk\My Documents\projectname\empties folder (if it exists). Alternately, you can keep adding GPS data to the original shapefile(s), but you should delete the .SSF file so you don't get errors. You can't keep appending to the .SSF file indefinitely. You can do this deletion and copying using My Computer or Windows Explorer. Browse to the folder where your data is ( \Disk\My Documents\projectname\ ) and select the files you want to delete, right-click, and choose Delete. Then (if you deleted all the files, not just the .SSF file) go into the \empties\ folder and select all the files and right-click and choose Copy. Go back to the folder where you deleted the files, right click in a blank area, and click Paste. The next time you go out in the field with the GPS unit, you'll edit this new, empty shapefile.

In addition, if you have created a merged file of previously collected data, you can load it onto the unit for use as a background layer (this merged shapefile needs to have a different name than the shapefile you are editing). This can be useful for visualizing where you have already been. Simply select all the files that make up the merged layer, Copy, and Paste it into the \Disk\My Documents\projectname\ folder on the GPS unit. When you launch ArcPad and load your project, tap the Load Data button (black + on yellow background) and add that layer. Tap the Layers button (looks like 3 yellow sheets of paper) and move the layer down in the drawing order so it is below your edit layer. You might also want to make it a different color.

Now you should be ready to go back out in the field and collect more data. Make sure you leave the GPS unit on the cradle for long enough to charge its internal battery. You can check the battery level by tapping Start—Settings, choose the System tab, and tap Power. On the older units, this is Start—Settings—Control Panel, then double-tap Power. If you modified any of your settings (for instance the GPS quality slider in GPScorrect) make sure you set them back to the default setting.