

Introductory *GeoXT* User's Guide

The Trimble *GeoXT* GPS device gives both first time, novice mappers and experienced GIS/GPS users the ability to accurately map field data with customized attribute information. Depending on your familiarity with GIS and to use basemap layers for your project, will determine the sections of this user's guide that will apply to you. Use the guide below to determine what parts of this guide will be necessary for you:

Users with little or no GIS experience who just want to map data with the *GeoXT*:
Sections C through H.

Users with GIS data (either basemap data to display while mapping or shapefiles into which features will be mapped): Sections A, B, C, and E through H.

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Section A: Creating data on your computer for use in *ArcPad* on the *GeoXT*

In order to save time while mapping in the field, we recommended first using ArcCatalog on your computer to create empty data layers with attributes into which field data will be mapped. Be sure you have created as many attribute fields as required to sufficiently describe the data you are mapping.

For users that have defined attribute value domains for features to be mapped, using a **geodatabase** is recommended. This will allow for the use of drop down lists of attribute information to choose from while mapping, saving time and ensuring data integrity. To create a new geodatabase with attribute value domains for use while mapping, follow the directions below. For users familiar with **shapefile** format who do not want the drop down list capability or added setup time that geodatabase requires, skip to the **Creating a shapefile** topic on page 3.

*If you have a geodatabase or shapefile already created that you want to map data into, skip to section B

**Whether using geodatabase or shapefile, first create a "project folder" on your computer to put all of your GPS related data into.

Creating a geodatabase and attribute domains:

To create a geodatabase and its feature class open ArcCatalog, and follow these steps:

1. Right click on the project folder, and then from the pull-down menu choose (New → File Geodatabase). Rename the new gdb file, and then choose "Properties" from the pull-down menu.

2. Inside the "Database Properties" go to the "Domains" tab, and create as many domains as you need. A domain is a declaration of acceptable attribute values. Attribute domains are used to constrain the values allowed in any particular attribute for a table or feature class. First set up the "Domain Name", and then enter the "Code" that describes the domain values.

The screenshot shows the ArcCatalog interface with a context menu open over the 'project' folder. The 'New' option is selected, leading to 'File Geodatabase'. The 'Database Properties' dialog box is open, showing the 'Domains' tab with a table for defining domains.

Domain Name	Description
Tree Kind	Tree Name

Below the table, the 'Domain Properties' section shows 'Field Type' set to 'Text' and 'Coded Values' checked. The 'Coded Values' table is also visible:

Code	Description
Fru	Fruits
On	Onions

1. Right click on the geodatabase file, and then from the pull-down menu choose (New → Feature Class).

2. From the "New Feature Class" window choose the "Name", and the right "Type" for your data collection purpose. Click "Next".

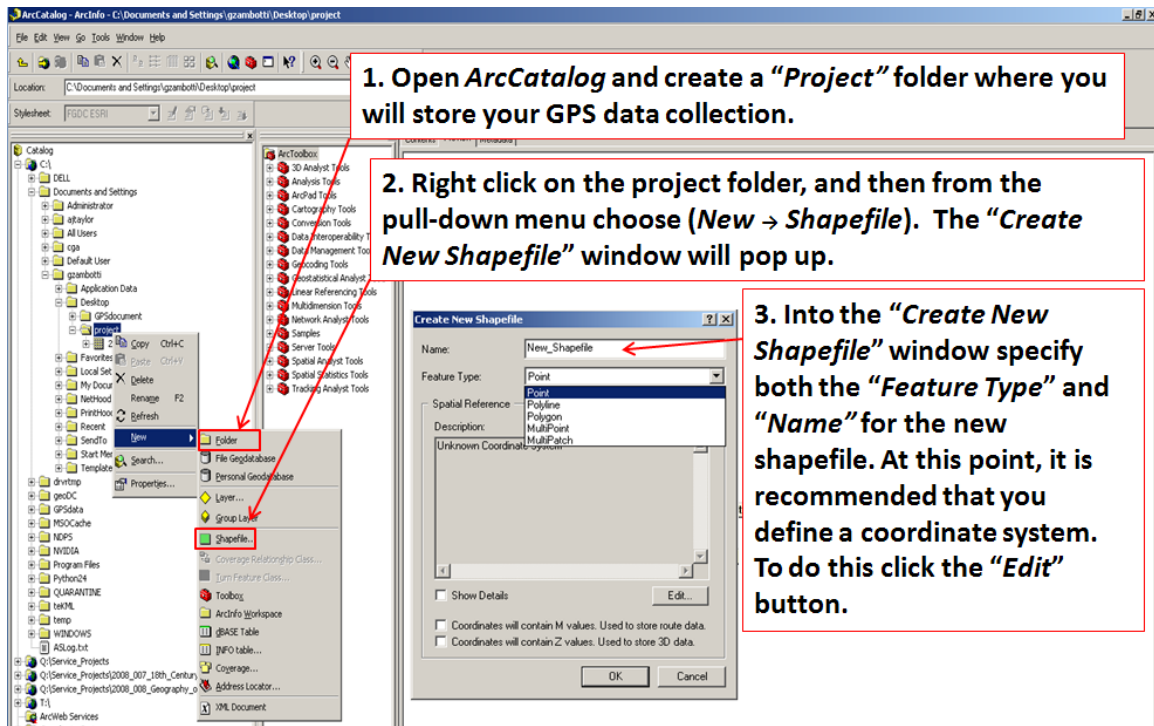
3. Choose a "Geographic Coordinate System" for your project, if you know it. Otherwise, select "WGS 1984" (World → WGS 1984).

4. Add as many fields as you need, and for each of them choose the right "Data Type". In the "Field Properties" section assign the right "Domain" previously created. Click "Finish".

The screenshot shows the ArcCatalog interface with a context menu open over the 'mydb.gdb' file. The 'New' option is selected, leading to 'Feature Class...'. The 'New Feature Class' dialog box is open, showing the 'Name' and 'Type' fields. The 'Geographic Coordinate System' dialog box is also visible, showing 'WGS 1984' selected. The 'Field Properties' dialog box is open, showing the 'Field Name' and 'Data Type' fields.

Creating a shapefile:

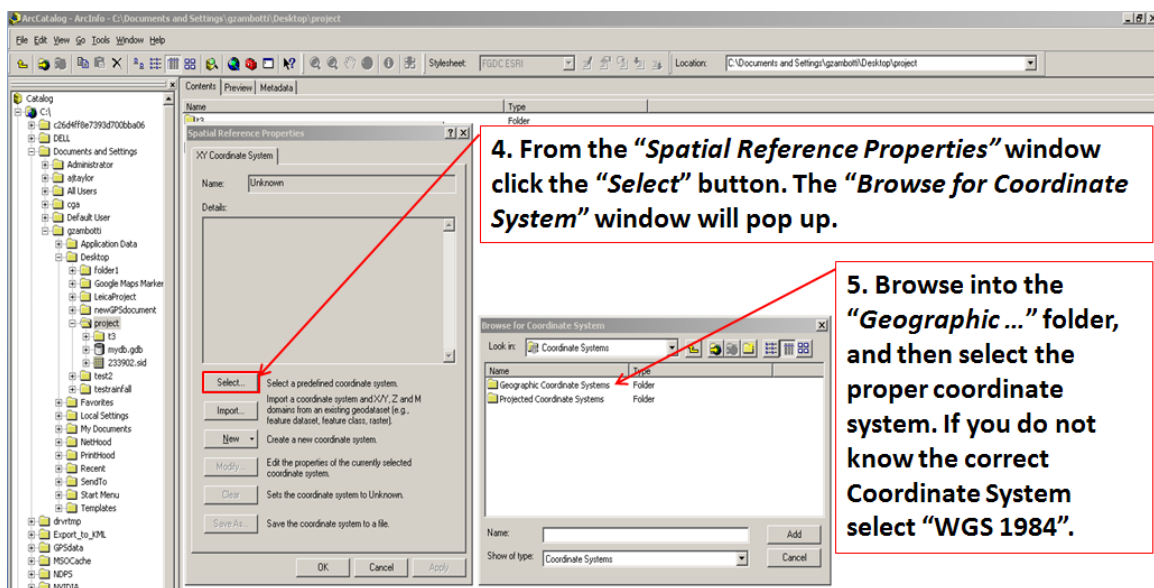
To create a shapefile open ArcCatalog, and following the next four steps:



1. Open ArcCatalog and create a "Project" folder where you will store your GPS data collection.

2. Right click on the project folder, and then from the pull-down menu choose (New → Shapefile). The "Create New Shapefile" window will pop up.

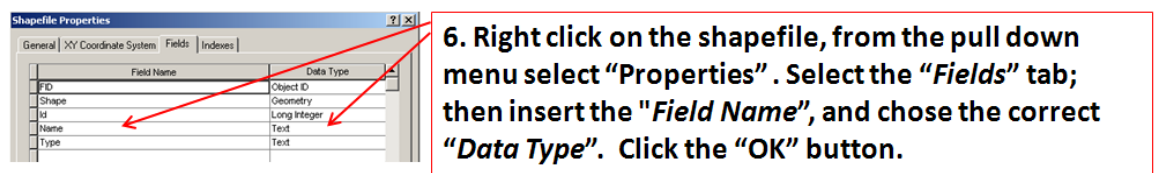
3. Into the "Create New Shapefile" window specify both the "Feature Type" and "Name" for the new shapefile. At this point, it is recommended that you define a coordinate system. To do this click the "Edit" button.



4. From the "Spatial Reference Properties" window click the "Select" button. The "Browse for Coordinate System" window will pop up.

5. Browse into the "Geographic ..." folder, and then select the proper coordinate system. If you do not know the correct Coordinate System select "WGS 1984".

To add new attribute fields into the shapefile, do the following step:



6. Right click on the shapefile, from the pull down menu select "Properties". Select the "Fields" tab; then insert the "Field Name", and chose the correct "Data Type". Click the "OK" button.

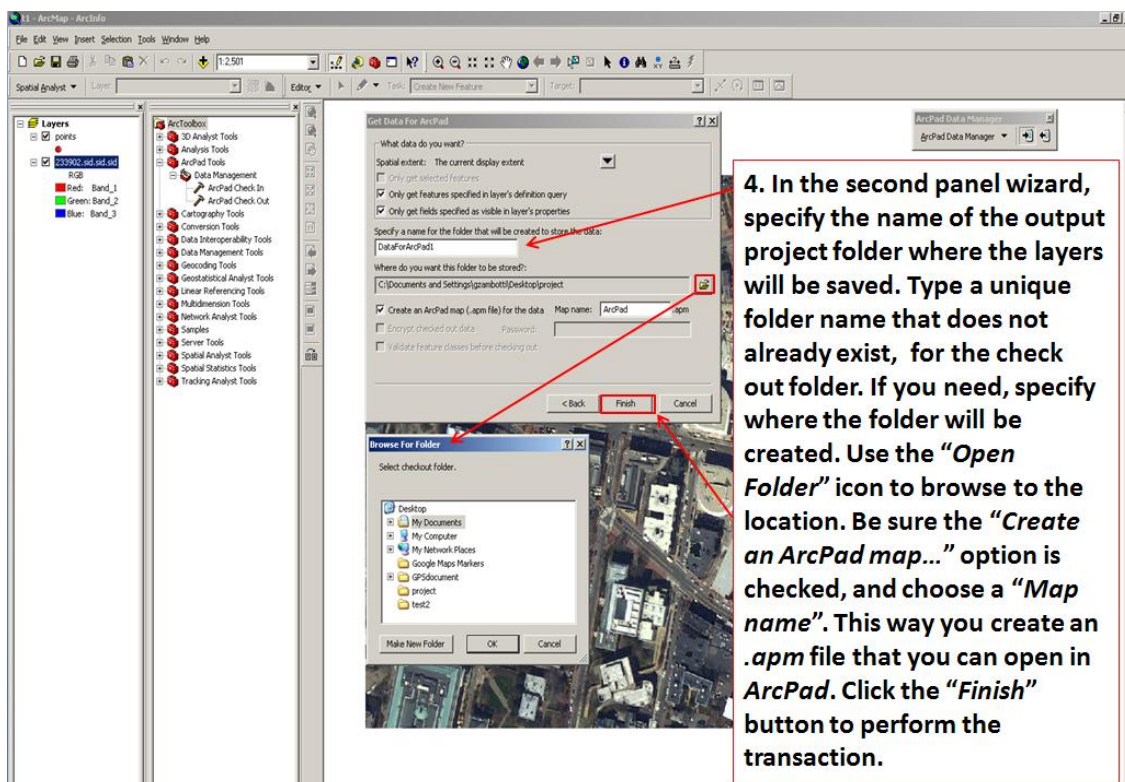
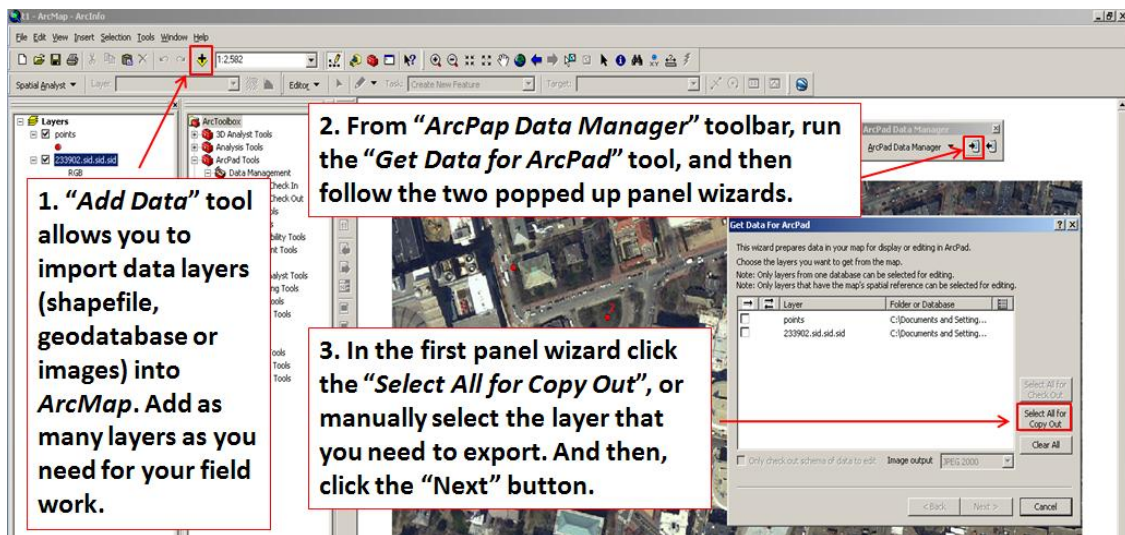
Section B: Exporting Data from ArcMap to use on the GeoXT

To export your data to the *GeoXT* you will need to install *ArcPad* software. Download it after logging in to CGA's website here:

<http://www.gis.harvard.edu/icb/icb.do?keyword=k235&pageid=icb.page105428>

Then enter this registration code to activate: *ArcPad*, registration code: 107800B77943

Open up *ArcMap*, and create a basic *ArcMap* document and add your base-map layers, if you have these; using the geodatabase or shapefile you created for the data input. Add the "*ArcPad Manager*" extension toolbar to *ArcMap* (*Main menu* → *View* → *Toolbars* → *ArcPad Manager*). To export any data layers to the *GeoXT* following the three steps below:



Section C: Connecting the *GeoXT* to your PC or Laptop and copying data to it

Microsoft ActiveSync is free software necessary for communication between your computer and the *GeoXT*. To download it, go to the link below:

<http://www.microsoft.com/windowsmobile/activesync/registration.msp>

and click the “Download ActiveSync 4.5 without Newsletter Registration” link.

Before connecting the *GeoXT* to your PC or laptop, be sure that the battery is fully charged; this required at least 8-10 hours of charging. Put the *GeoXT* in its cradle, with the power connected, and plug in the USB connector to your PC. To load the map onto the *GeoXT*, do the following three steps:

1. Open ActiveSync, it should find the GPS. Use ActiveSync's "Explore" button to browse the *GeoXT* device.

2. Browse into the "Mobile Device" until the "SD Card" folder is reached.

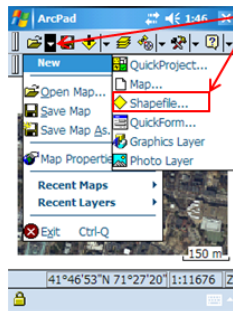
3. Copy or drag the project folder previously created, into the *GeoXT* onto the SD Card/data folder.

The screenshot shows the following details:

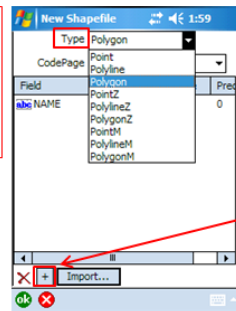
- Microsoft ActiveSync window:** The 'Explore' button is highlighted with a red box. The device name is 'Geo4714438452' and the status is 'Connected'.
- Mobile Device window:** The 'Mobile Device' folder is selected in the 'Other Places' pane. The main pane shows a list of folders including 'My Windows Mobile-Based Device' and 'Dictionaries'.
- SD Card window:** The 'SD Card' folder is selected in the 'Other Places' pane. The main pane shows a list of folders including 'Data', 'FilesToBeDeleted', 'My Documents', 'Program Files', 'Rhode Island', 'Windows', and 'EA'. A file named 'EA' is listed with a size of 96,0KB and a modification date of 8/20/2007 1:35:54...
- Desktop:** A folder named 'project' is highlighted with a red box.

Section D: How to create a shapefile on the *GeoXT* in *ArcPad*.

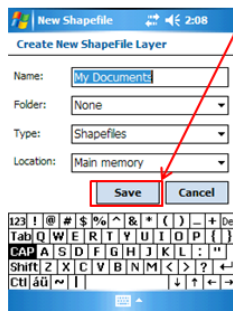
In order to create a new shapefile using *ArcPad*, on the *GeoXT*, follow the five steps as described below:



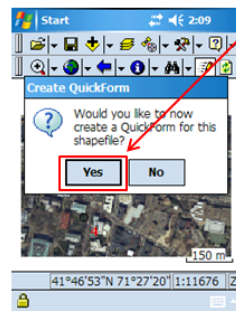
1. Tap the "Open Folder" button, and chose *New* → *Shapefile*.



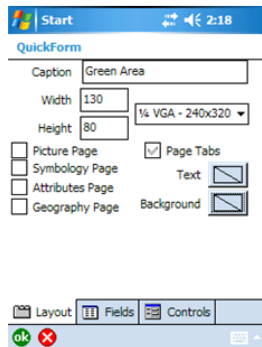
2. Choose the shapefile "Type", and then tap on the "plus" button. From the "Field" dialog box choose the shapefile name, length, and kind. Tap the green "OK" button.



3. Choose the *Name*, *Folder*, *Type* and *Location* for storage. Use the keyboard to type in the entries. Tap the "Save" button.



4. Tap the "Yes" button to create a "QuickForm" data entry for this shapefile. Generally the "QuickForm" facilitates data capture during field work.



5. In the "QuickForm" settings it is possible to assign "Caption", "Width", "Height", and "Picture Page". Tap on the bottom tabs to set up the "Fields" and "Controls" pages. In the "Fields" page choose the table fields that will appear on the form. While on the "Controls" page you can set other properties. Tap the green "OK" bottom at the end of your settings.

Section E: Setting up the *GeoXT* device for mapping

Turn on the *GeoXT* by pressing the green button for 3 seconds (on the bottom of the *GeoXT* keypad), and then use the stylus pen to do these four steps:

1. On the taskbar tap the “Start” button (top-left) and from the pull-down menu choose “ArcPad 7.1”.

2. Before collecting information make sure that “Log data SSF file” is on. Tap the arrow beside the “GPS Position Window” button. From the drop-down list choose “Trimble GPScorrect”. The “GPS correct” dialog appears.

3. In the “GPS correct” dialog, tap either on the “Setup” button or on the arrow beside. From the pull down menu choose “Setup”, and then tap on the “Logging Settings”.

4. Set the “Log data to SSF file” to ON, and tap OK. You can now tap the ArcPad icon on the top-right to return to the “ArcPad 7.1”.

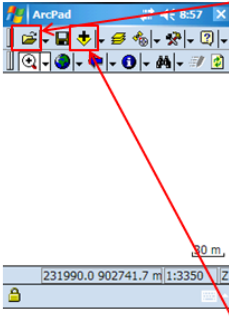
To adjust the position collection interval, maximum *PDOP* settings, set the *Datum*, or toggle *Alerts* on and off, do the following steps:

1. Tap the arrow to the right of the “GPS Position Window” button. Tap the “GPS Preferences” button.

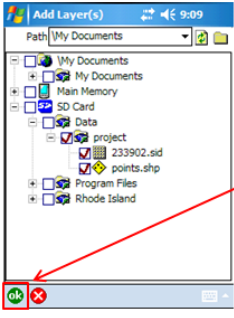
2. Be sure that from the “Protocol” drop-down list the “Trimble GPScorrect” is selected. The bottom of the “GPS Preferences” displays the tab settings list (*GPS*, *Capture*, *Quality*,...). Use these tabs to configure other settings. For further explanation see *ArcPad* and *GeoXT* user guides.

The *GeoXT* allows setting up only a Geographic Coordinate System; any Projected Coordinate System is denied. Choose the “*D_WSG_1984*” GPS Datum from the “*Datum*” section, if you do not have any specific one for your project. **Section F: Displaying your data in *ArcPad* on the *GeoXT***

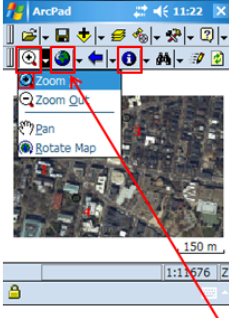
Once the settings on the *GeoXT* are complete, you can display your data in *ArcPad*. To do that following the four steps below:



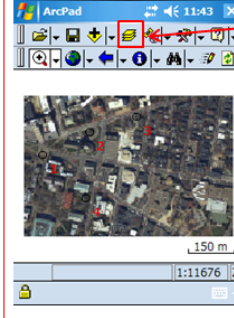
1. Tap on the “Open map” button and browse to the .apm map file. Otherwise, tap the “Add Layer” button on the main tool bar. The Add Layers(s) dialog box opens.



2. Browse through the data tree and select layers that you need to import. A red check indicates that a layer has been selected. Then tap the green “OK” button . The layers will be loaded and displayed into the ArcPad main window.



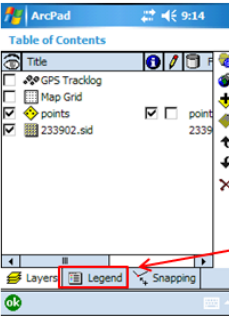
3. Using the “Zoom in”, “Zoom Out”, and “Pan” tools to explore the map. Using “Identify” tool to view attribute information. You can find other tools under the “Zoom to full extent” button.



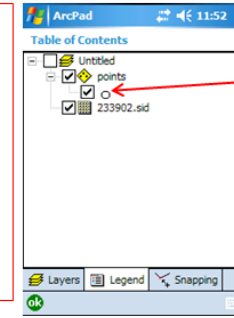
4. Tap the “Table of Contents” button to see a list of all the layers in the current ArcPad map.

Change the layer style in *ArcPad*.

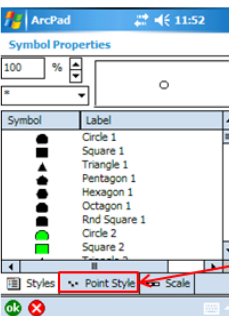
In order to change the style of the layer, follow the steps below:



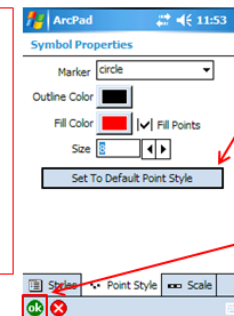
1. With the layers list displayed on the GeoXT screen, turn on or off layers as you need. To change any symbol properties tap on the “Legend” tab.



2. Tap on the layer symbol to open the “Symbol Properties” dialog box.



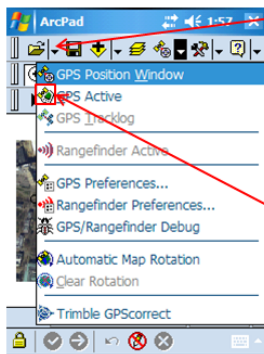
3. Choose the style symbol from the list, or tap on the bottom tab “Point Style” to customize the symbol size and color.



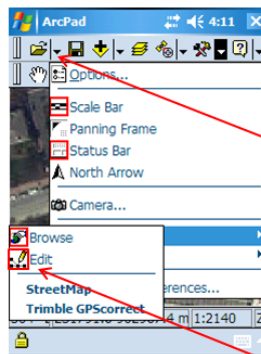
4. Tap the “Set To Default Point Style” button to customize the symbol. Then tap the green “OK” button.

Section G: Collecting and editing data in ArcPad on the GeoXT

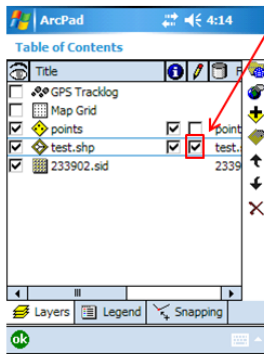
In order to collect point, polyline, or polygon layer you should both activate the GPS and edit the layer. Do the following six steps to collect a polygon layer:



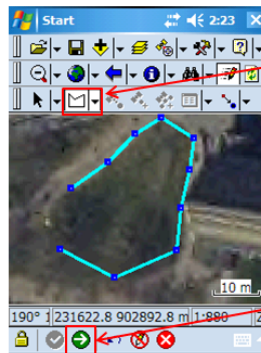
1. Tap the arrow beside the "GPS Position Window" button. From the drop-down list tap on "GPS Active" to start a connection. The GPS cursor is displayed on the view.



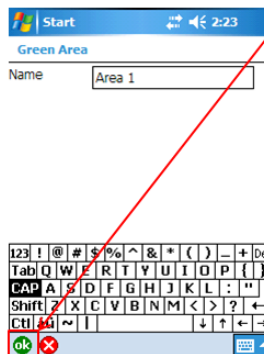
2. Enable the "Edit" tool bar. Tap the drop-down arrow to the right of the "ArcPad Options" button to display the drop-down list. Tap "Toolbars" to display the list of available, check the "Edit" tool.



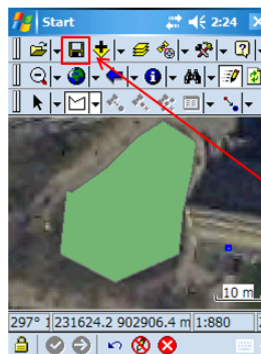
3. Open the "Table of Contents" dialog window, and select the edit check box for the layers that you need to edit. Then, tap the green "OK" button.



4. Tap on the arrow beside the "Select feature type for editing", and then tap on the corresponding type feature. At the end of the editing section tap on the arrow green button.



5. The "QuickForm" will open, enter the name of the feature, and then, tap the green "OK" button.



6. The result will be displayed on the screen. Save the map by tapping on the "Save Map" button.

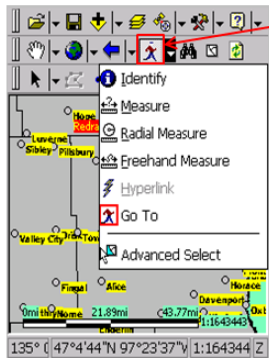
Section H: Uploading data from the GeoXT to your computer

To upload data from the GeoXT to your computer you should follow steps 1 and 2 explained in Section B (page 4) and then copy or drag the project folder from the GeoXT into your computer. This is a reverse operation explained in section B.

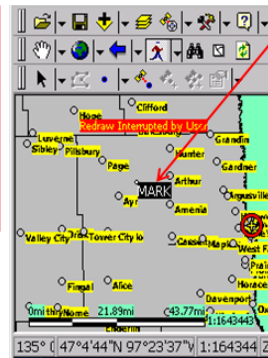
When the project folder is in your computer you can view your data in ArcMap.

Section I: How to use the “GoTo” Function in ArcPad.

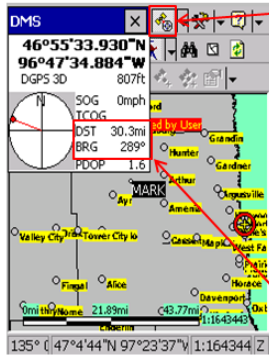
The “Go To” tool can be used to select a navigation destination. Open an existing or new *ArcPad* map, and add a background layers to the map; then following the next three steps:



1. Tap the arrow to the right of the “Identify” button. From the pull-down menu select the “Go To” button.



2. With the “Go To” button on, tap the map to select a navigation destination. The destination is displayed with a black “Mark” label.



3. Tap the “GPS Position Window” button to view the distance (DST) and bearing (BRG) from your current GPS position to your selected destination.

Section J: Recommendations and Troubleshooting tips:

Recommendations before starting to use the *GeoXT*:

- Charge the unit overnight – this will get you 8 – 10 hours of use
- Reboot the unit (hold power key for 10 -15sec.) each morning after taking it out of the cradle – increases performance.

For further study and to answer questions not covered in this document:

- Refer to the [GeoXT_Full_Users_Guide.pdf](#) or [ArcPad_UserGuide_dec2007.pdf](#)
- Do the ArcPad tutorial (.pdf file installed with ArcPad)

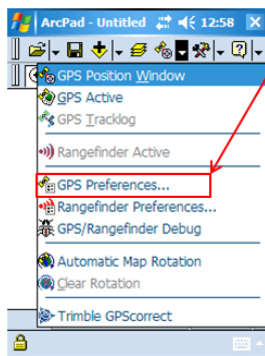
Troubleshooting Tips:

If the *GeoXT* locks up or slows to a crawl:

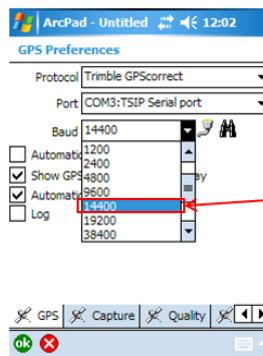
Reboot (hold down power key for 10 sec.).

If it still doesn't respond, or you get a black screen at any time, hold the power button down for a full minute to reboot ALL the non-OS related components.

If the GPS becomes **Disconnected** (NO FIX despite clear view of the sky, “GPS disconnected” will display when clicking GPSCorrect dropdown arrow and choosing Trimble GPSCorrect) do the following two steps:



1. Tap the arrow to the right of the "GPS Position Window" button. Tap the "GPS Preferences" button .



2. Be sure to select the "Protocol" as "Trimble GPScorrect" , "Port" as "COM3: TSIP Serial Port" and "Baund" as "14400". Then tap on the green "OK" button.

Some helpful notes from previous users:

- ❖ It appeared at first that when capture the GPS stream to vertices of a line, that zooming or performing any operation lost the last segment. It did not; it just stops capture and inactivates the PolyLine button, which you need to re-press to get your segment back. Check out: when the data set gets big, check out just the schema and not the data will save a lot of time, and speed up the performance. But you will need to check out in two steps - one for the schema only layers, the other for the data layers.
- ❖ Always backup your GPS data on a SD card before you sync with your PC.

Technical support:

Email contact@cga.harvard.edu or phone 617-496-6063 with any difficulties.

We also have tech support available through Maine Technical Source Trimble dealership, phone: 1-800-322-5003, tell them you are using the Harvard CGA's GeoXT, and ask for technical support.