4 Intro to SoloForest

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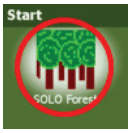
SoloForest is a forestry specific GPS data collection program from Trimble. It runs on any Windows Mobile or Pocket PC device and Windows Desktops/Tablets.

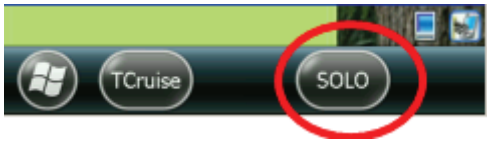
4.1 SoloForest Overview:

- SoloForest allows users to create map projects and record point, line, and polygon features thru a simple preset feature file (sometimes called a data dictionary).
- Solo allows users to have several features in progress at any given time to maximize efficiency.
- Data is collected in a proprietary .UDF format, but can be exported in a variety of vector formats including ESRI shapefile and AutoCAD DXF.
- Solo can utilize several different layer types as basemaps including: TIF, JPEG, JPEG2000, ECW, ESRI shapefile, AutoCAD DXF. (No MrSid support).
- Other features include cruise grid generation, splitting/merging polygons, and laser interface for offsets.
- There is a desktop companion call SoloOffice and an ArcGIS Toolbar called Solo 360 available from Trimble that can aid in project management but these are not necessary to process data.

4.2 Opening SoloForest

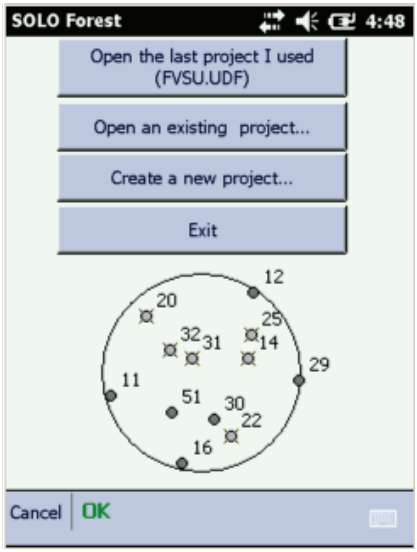
Launch SoloForest using ONE of the following:

- Press Programs button  then click 

- Press Right Hotkey 
- Solo Softkey
- F7 key on Forge 

4.3 Creating a new UDF Project

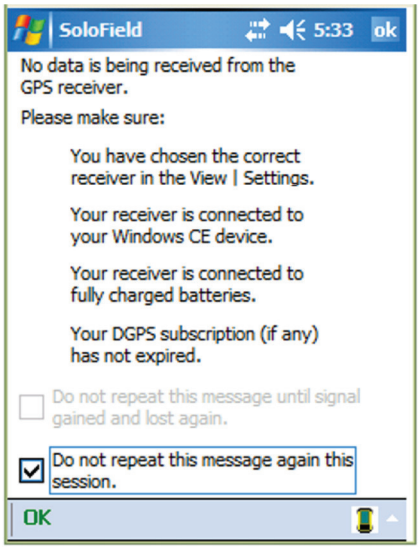
After opening Solo, you will see this screen. **Choose from the following questions:**



- Open the last project that was used?
- Opens a project that has been previously created but was not the last used?
- Create a new SoloForest project?
- Exit out of Solo Forest?

Choose Create a new project….

No GPS Data Screen



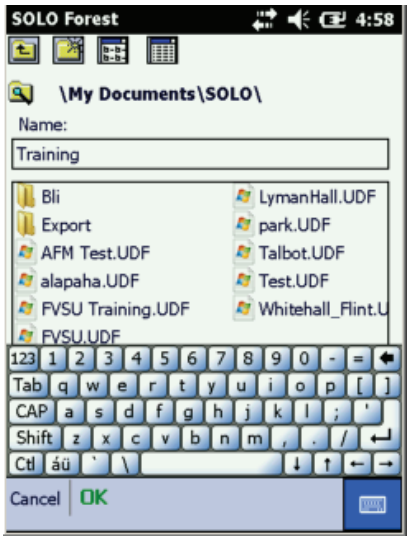
If you do not have GPS going when you open the Solo Forest program, Solo will let you know that it does not see any GPS data by displaying the following screen. It is not an error. It is simply a fact that it is not receiving any GPS data.

When this occurs, simply select the "Do not repeat this message again this session" box and then OK. The message will not harass you again during the current session.

Naming the Project:

When you begin a new project, Solo takes you to default Solo folder location:

My Documents\Solo



To begin a new project, you must first give it a name. Let's use the name Training. The default name is always a number string that represents the year, the month, the day, and the time. Double tap in the name field to highlight the default name and type in

"Training". You'll notice that it will replace the existing name.

Select ***OK*** at the bottom left and you will go to the Settings page. Most often you will not need to modify any settings, but you do need to understand them.

4.4 SoloForest Settings

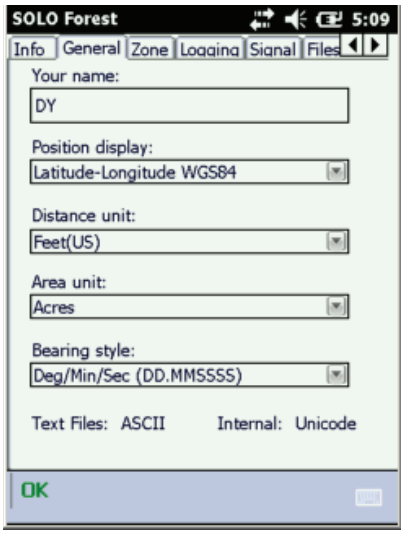
Info Tab

The Info Tab gives the Solo Forest Version Information along with the Project Name and the Directory it is being stored. It also gives the number of features that has been collected. Since this is a new project, there is no feature or point data.

General Tab

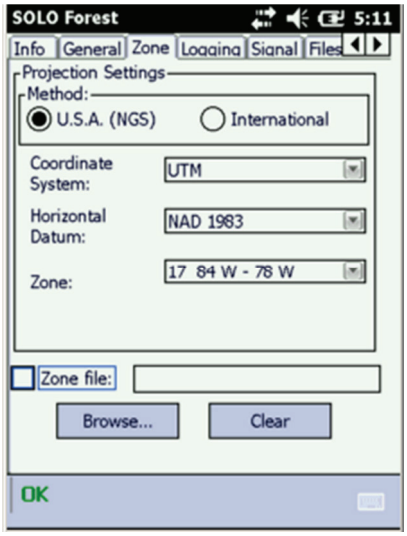
This tab allows you to determine how you want to see your data in the field. Most people like to see Latitude-Longitude and Feet.

After you have finished mapping your features you can export your shapefiles as Lat-Long (i.e.. Geographic), or, if you set the Position display to Northing-Easting and your Distance unit as Meters, then Solo will export your shapefiles in the Coordinate system, Datum, and Zone that are set on the Zone tab (for example UTM, NAD83, Zone 17).

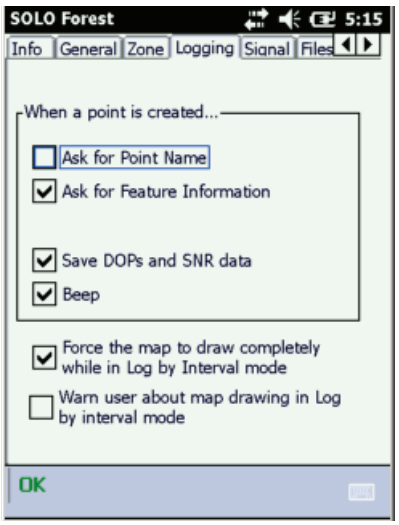


Zone Tab

This tab allows you to configure the Projection Settings which include the Coordinate System, Horizontal Datum, and Zone. If you plan on using Base Maps/Images in the field, you will want to set this to match those.



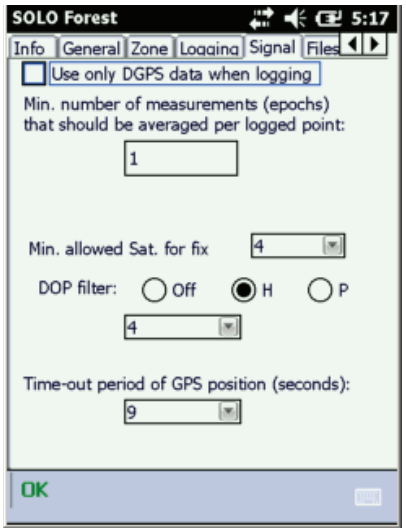
The Logging Tab



This tab allows you to set data collection parameters. This will determine what happens when you begin collecting data by configuring the "When a point is created…" box.

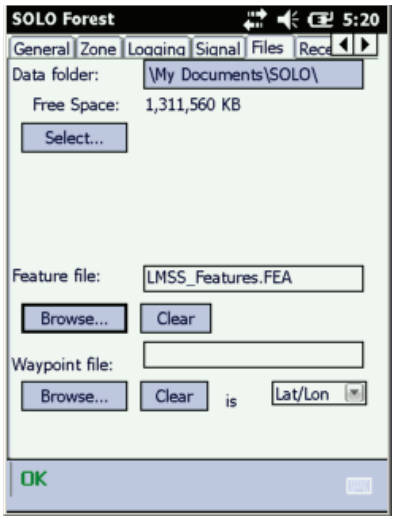
These are the recommended settings.

Signal Tab



This tab is where parameters for maximum allowable DOP is set. You can also select the minimum number of observations to be collected during a static point. You can also choose whether or not to accept data if it is not being differentially corrected. We recommend not checking this box unless you are doing a mapping project that requires DGPS data only. Please read through these options before continuing.

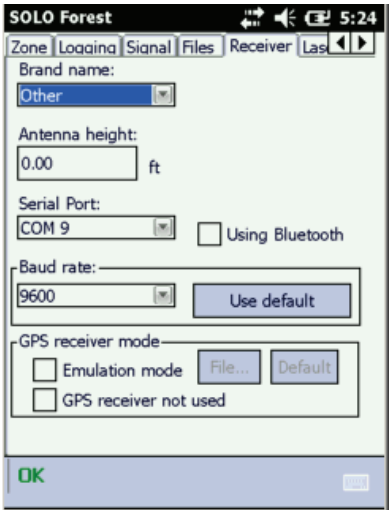
Files Tab



This is where you chose the default data storage location. It is recommended to use the default: \My Documents \Solo

Also, you can select the Feature File and load or clear a waypoint file (cruise grid).

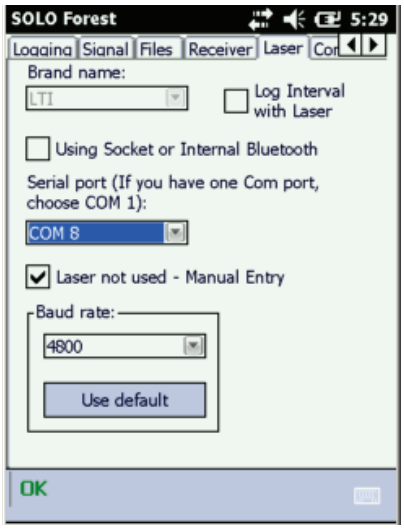
Receiver Tab



This tab allows you to choose the type of GPS receiver with which we will be collecting data. Choose the appropriate one from the pick list. If yours isn't listed, choose Other.

Set the appropriate COM port that applies to your receiver and set the Baud Rate.

Laser Tab



Be sure and check the Laser not used – Manual Entry box on the Laser tab because we will need that set up correctly when we use the Log by Laser technique under the Advanced GPS section.

Don't worry about other settings here unless you use a laser for offsets.

You can skip the COM and RawData tabs.

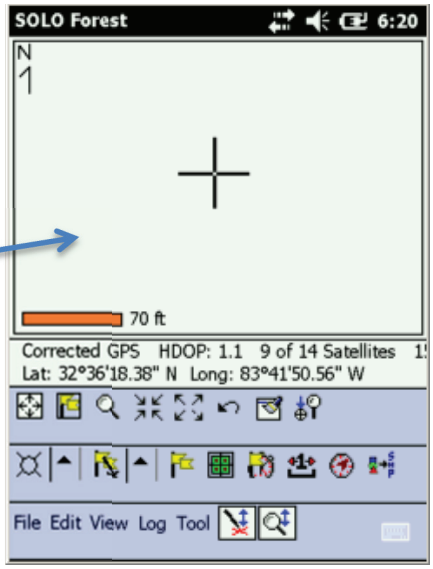
Press ***OK*** to close out of the Settings window.

The selections you have chosen will be the defaults for the next project that is created.

4.5 SoloForest Main Map Screen

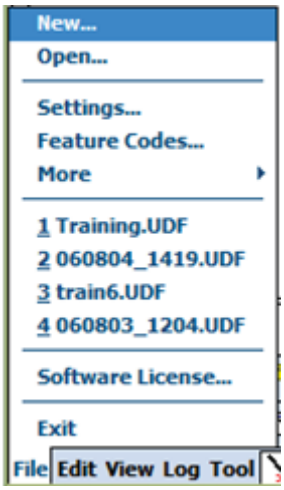
There are five parts to the Solo Map Screen:

- Map Area
- Status Bar
- Zoom Toolbar
- Data Collection Toolbar
- Menu Bar



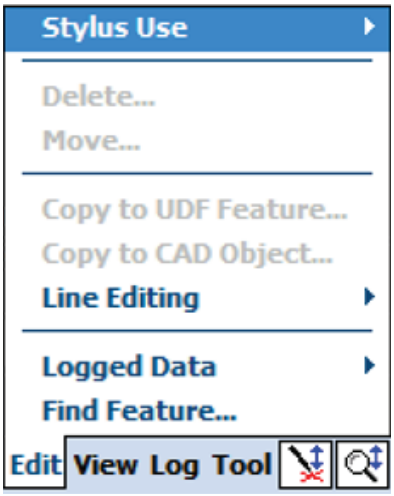
4.6 SoloForest Menus

File Menu:



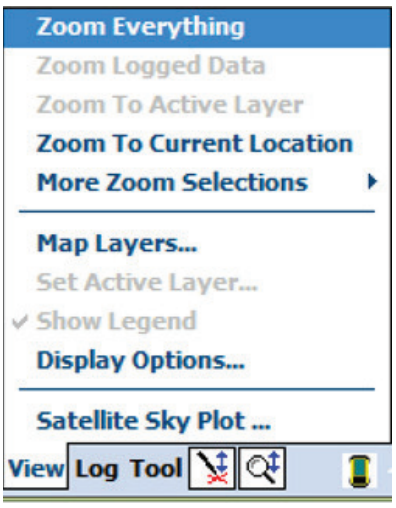
- New = Start a new project
- Open = Open an existing project
- Settings = Settings
- Feature Codes = Edit Feature Codes
- More > Export = Export to shapefiles

Edit Menu:



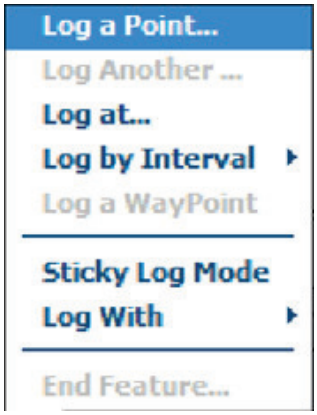
- Delete = Delete a node or feature
- Move = Move a node
- Copy to UDF Feature = used in Freehand Redlining
- Logged Data > Logged Features = a way to see all logged data
- Find Feature = a way to search through shapefile attributes

View Menu:



- Zoom Options = ignore and use the Zoom Toolbar
- Map Layers = Where to go to add a basemap layer.
- Display Options = where to go to change Toolbar icons, etc.
- Satellite Sky Plot = shows satellite status

Log Menu:

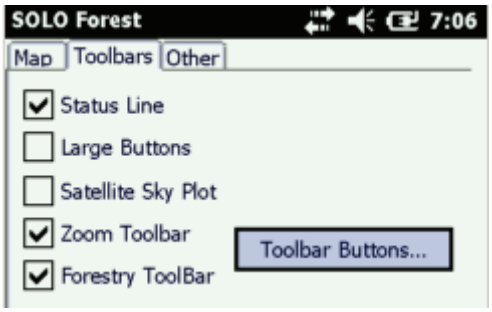


- Log a Point = Log Static
- Log at… = Allows node to node joining of 2 features
- Log by Interval > Log by Interval = Log Dynamic
- Sticky Log = Heads up digitizing

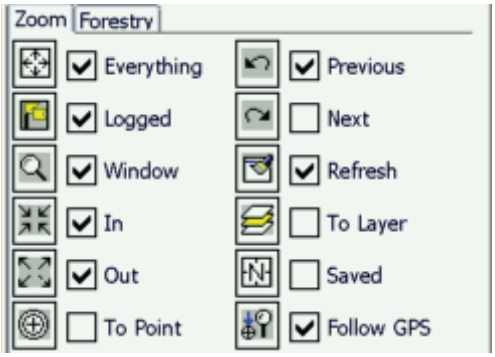
Tool Menu:

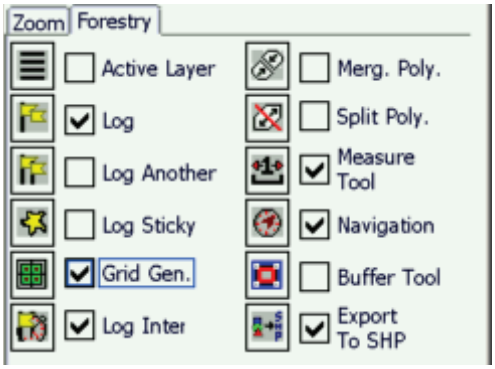
- Navigate = Navigate
- GPS Configure = Way to restart GPS or reconnect to Bluetooth
- Generate Grid = Grid Generator
- Buffer Feature = Create buffers
- Polygons > Split/Merge = Merge or split polygons
- More > RTI = Initialize RTI script

4.7 SoloForest Toolbars



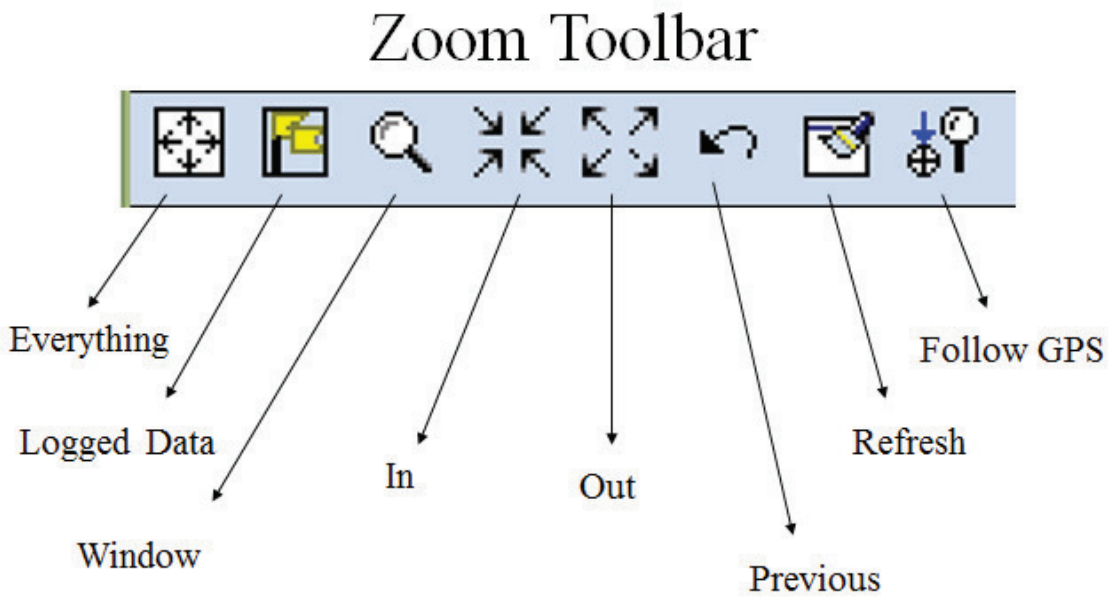
To change the icons on the Toolbars, click ***View > Display Options > Toolbars tab > Toolbar Buttons…***





OK back out when done.

Zoom Toolbar:

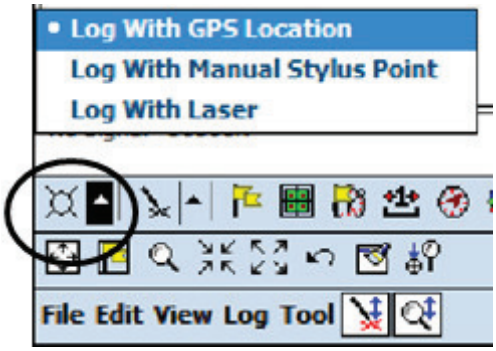


- **Zoom Everything** – Zoom to full extent so all layers, data, and current position are all displayed on the screen.
- **Zoom Logged Data** – Zoom so that logged data is completely displayed on the screen.
- **Zoom Window** – After enabling this tool, the user can click and drag a diagonal box to define the zoom region.
- **Zoom In** – Fixed zoom in.
- **Zoom Out** – Fixed zoom out.
- **Zoom Previous** – Zoom to previous extent. Several previous zoom extents are held in memory.
- **Refresh** – redraws the screen in the event a raster image looks "fuzzy" after panning or zooming.
- **Follow GPS** - If enabled then the screen will automatically pan as you move. If this icon is unselected, the screen will not move as you do and you can walk off the screen as you move around or collect data.

Mode Toolbar:

Two pick lists: 

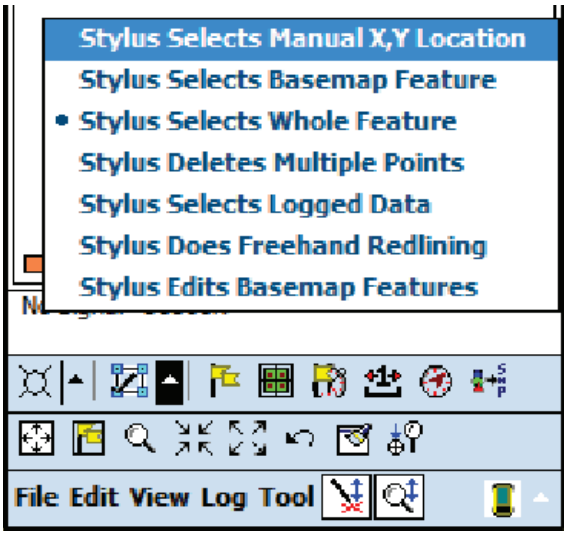
Log With pick list:



Most often you will ***Log with GPS Location***, but sometimes we may want to ***Log manually*** or use ***Log with Laser*** to enter property descriptions (line lengths and azimuths).

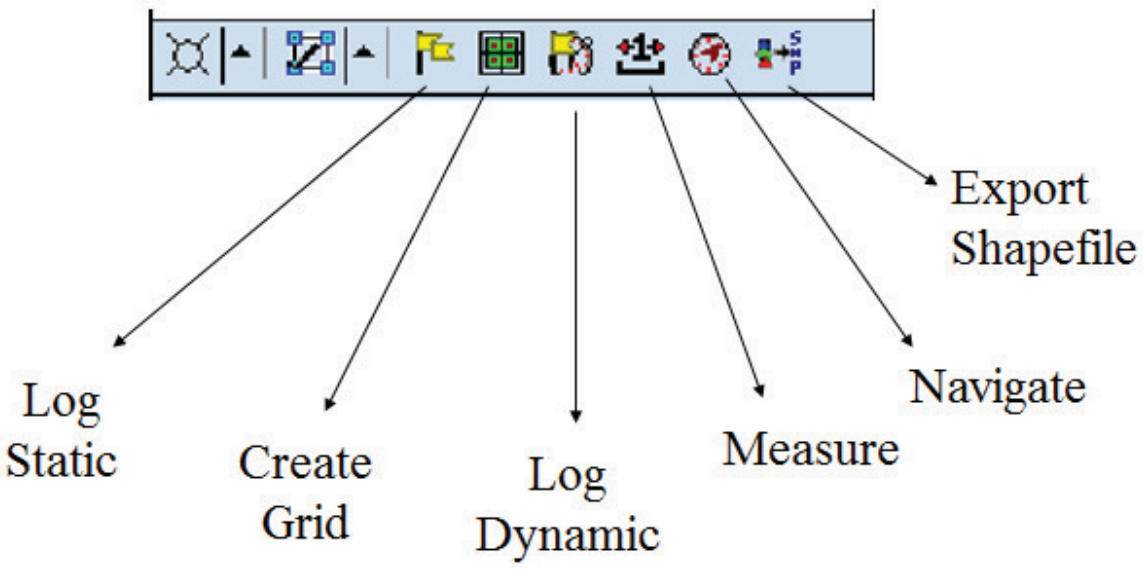
Stylus Use pick list:

Most often you will use select Stylus Selects Whole Feature, but sometimes you may need to select something else:



- **Manual X,Y** will give the coordinates of the point at which the stylus touches the screen. Also handy when logging manually.
- **Basemap Feature** selects the Basemap Layer that has been loaded, if any. Handy for selecting a shapefile polygon to generate a grid on.
- **Whole Feature** will allow you to click anywhere on the feature and select it. Handy for selecting a logged polygon to determine acres or a line to determine length.
- **Deletes Multiple Points** will allow you select individual nodes and delete all of them at once by going to Edit > Delete.
- **Logged Data** selects the feature data that has been collected.
- **Freehand Redlining** allows the user to use the Freehand Redlining sketch tool.
- **Edits Basemap Feature** allows the user to edit vertices on a vector basemap such as a shapefile.

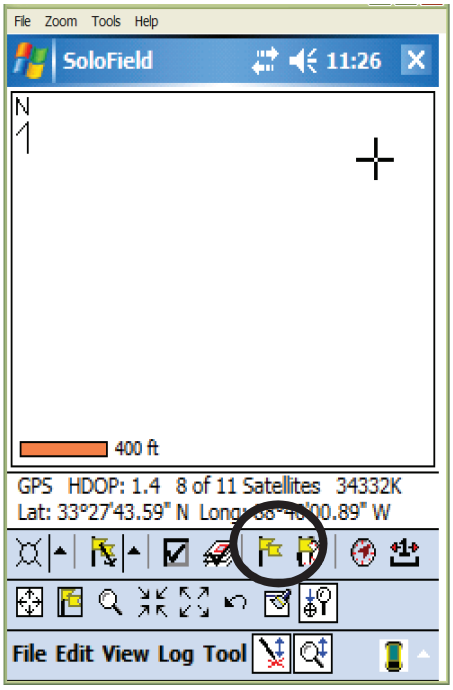
Mode toolbar continued:



4.8 Logging a Static Feature

Step 1 – Press Single Flag

Collect a static position by going to a corner on a timber stand and pressing the Single Flag button.

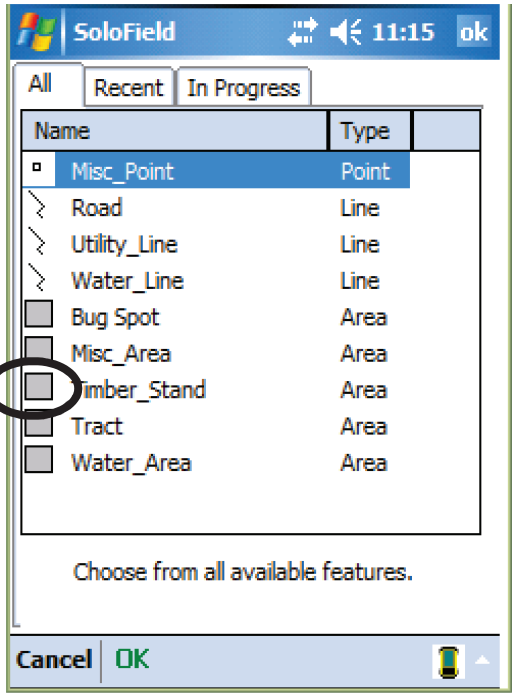


Step # 2 – Select Feature

Select the type of feature you wish to log. For this example, choose a Timber_Stand. We will log a static position, but it will be applied to an area feature.

Note that since this is a new feature, you should select from the ***All Tab***. Be sure and stay out of the ***Recent Tab***. The In ***Progress Tab*** will be discussed later.

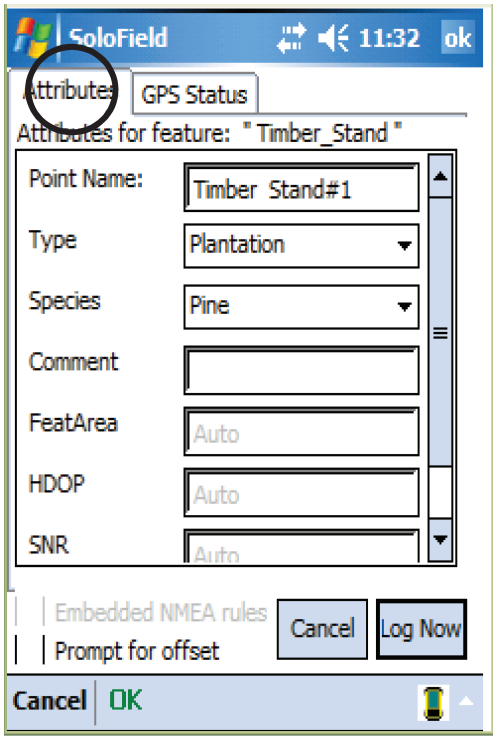
Select the **Timber_Stand** and press ***OK*** or simply Double click the feature to begin logging positions. Be sure the antenna is located over the location where you wish to log before you begin logging.



Step #3 – Enter Attributes

After selecting our feature, the following screen will appear. Click the ***Attributes tab*** and fill in the desired attribute information.

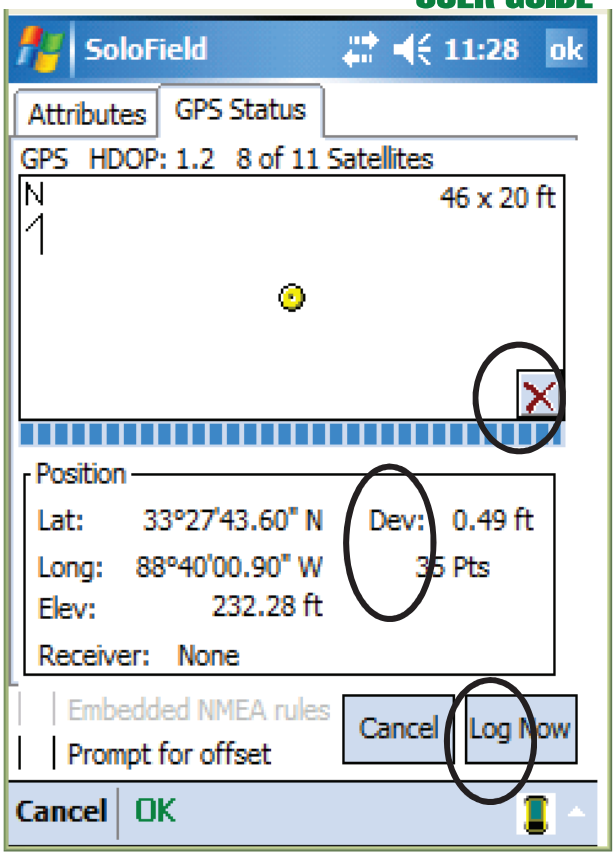
Next tap the GPS Status Tab.



Step #4 – Check Deviation and Log Now

The ***GPS Status Tab*** gives you the ability to view the number of positions and the static spread or deviation of the observations between them at 1 SD. This allows you to judge the integrity of the static position as you collect the data. If you do not like the "spread" and wish to reject the position, press the small X button to "flush" the old positions and collect new ones to average.

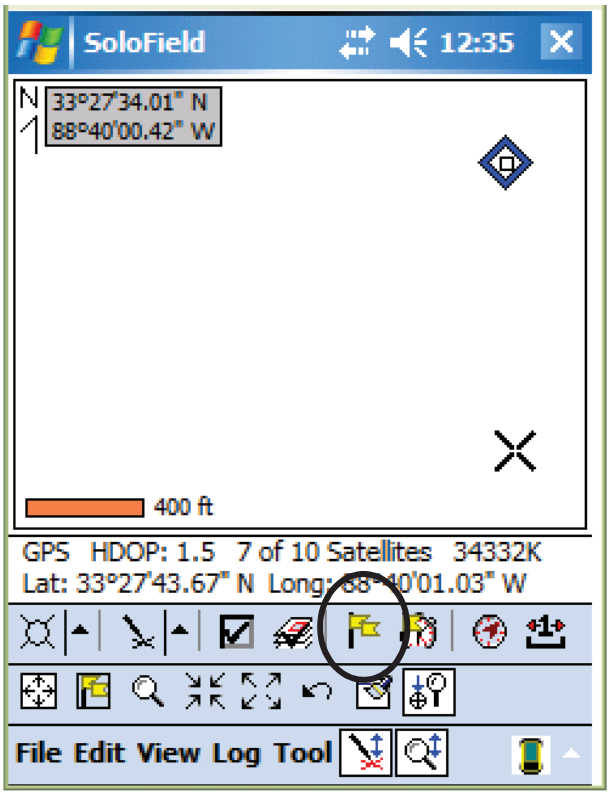
On you have collected 5-20 positions with an acceptable deviation (maybe < 3 feet), press the Log Now button. This will average all of the collected positions together to make one.



Notice the Property Corner is now represented on the screen. Remember, there will always be a blue diamond around the last position logged.

Step # 5 – Single Flag again

To add another corner to this Timber Stand Area Feature, we need to walk to that corner and then select Single Flag again.

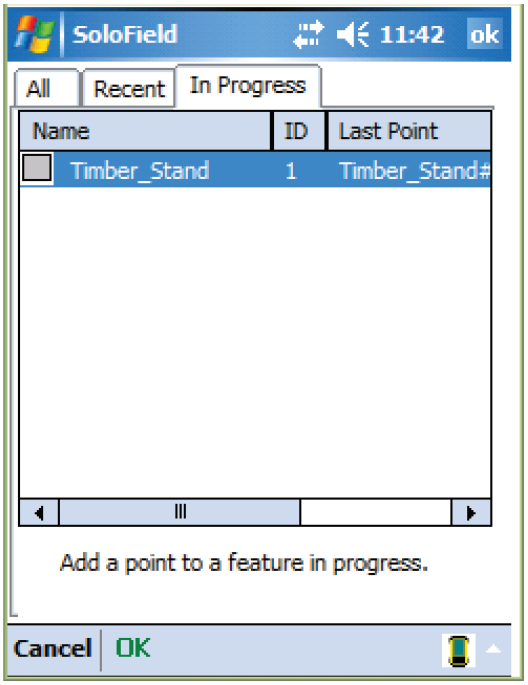


Step #6 – In Progress

The next screen you see is basically asking "What do you want to do?" And the answer is, "Add another Static Position to the Timber Stand in progress!!"

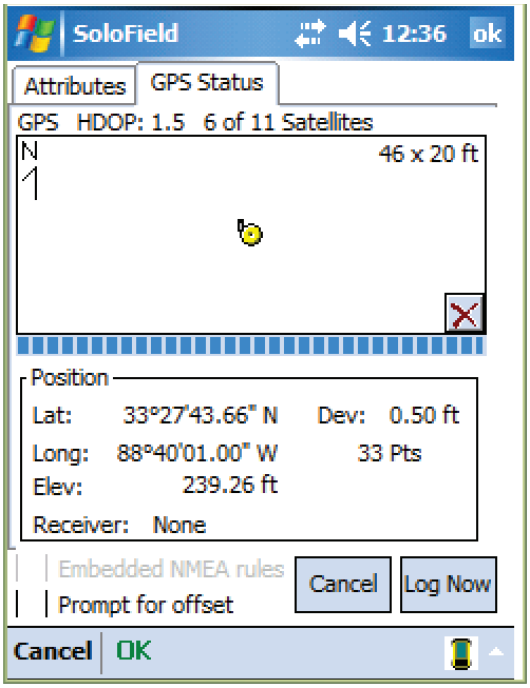
If you wanted to begin a new feature, you would go the ***All tab*** and select a new feature from the Feature List.

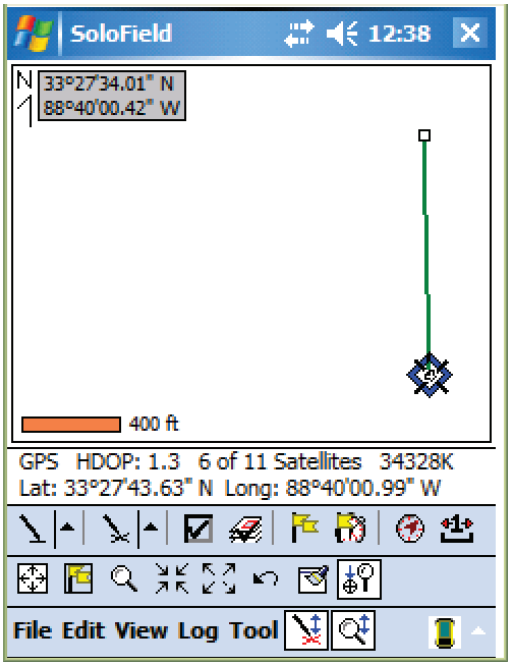
Since the correct Timber_Stand feature is already selected, click ***OK.***



Step # 7 – Check Deviation and *Log Now*

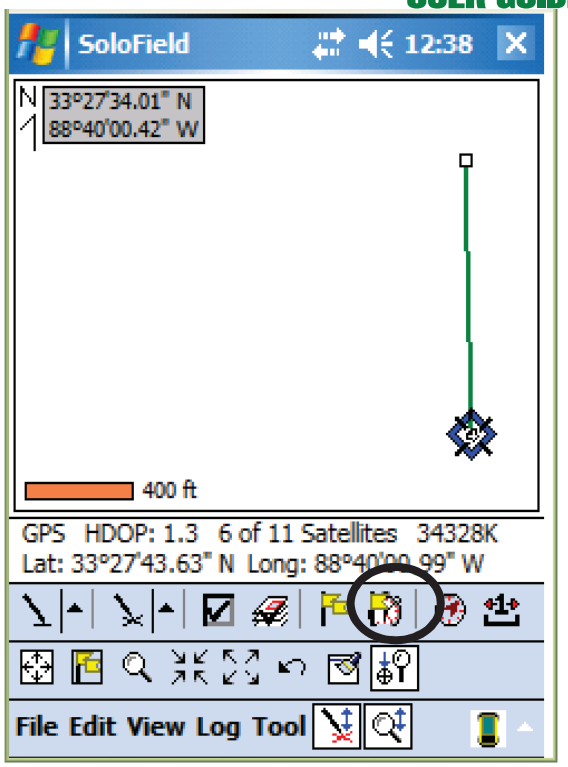
Log 5-20 more seconds of data and check deviation. If it is OK, press ***Log Now***.





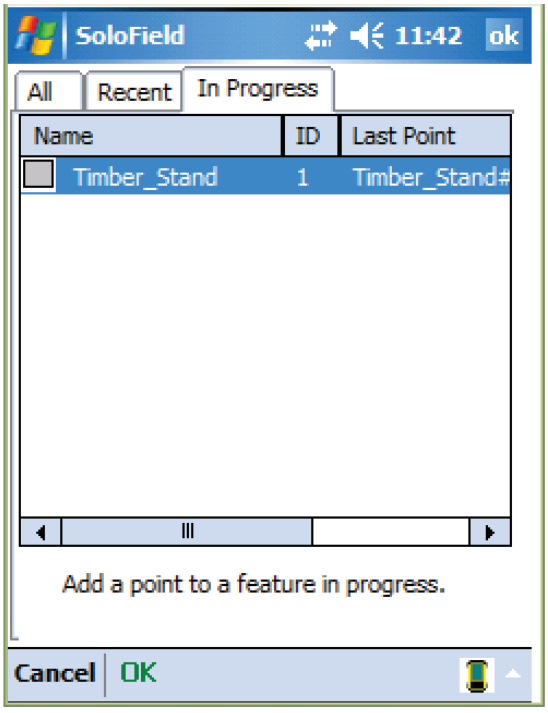
The second Static point has now been added to the Timber Stand area feature.

4.9 Logging a Dynamic Feature



Step #1 – Flag with a Stopwatch

To add a Dynamic segment to the Timber Stand feature already started, or to begin a new Dynamic feature, select the Flag with a Stopwatch icon.



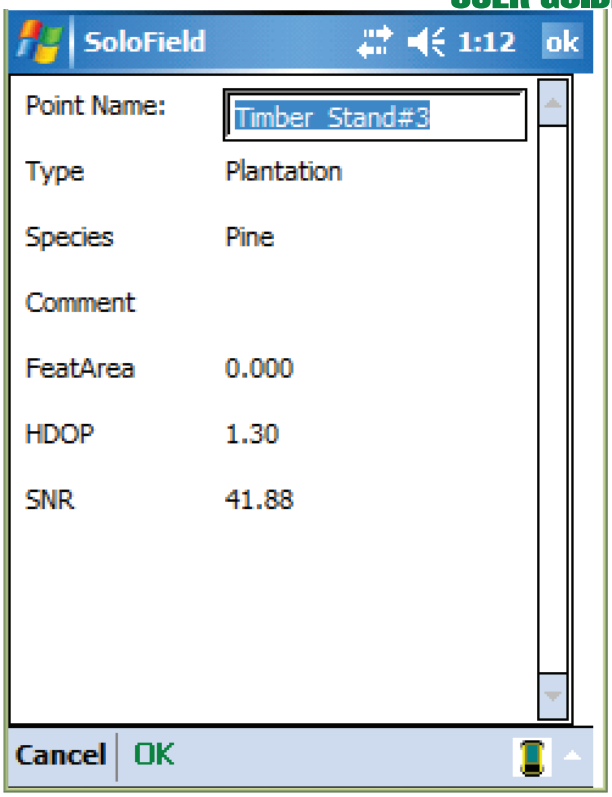
Step #2 – In Progress

The next screen you see is asking, "What do you want to do?" The answer is "Add a Dynamic Segment to the Timber Stand in progress!!"

If you wanted to begin a new feature, you would go the All tab and select a new feature from the Feature List.

Since the correct Timber_Stand feature is already selected, click ***OK***.

Step #4 – Select OK at the Attribute screen to verify the attributes.

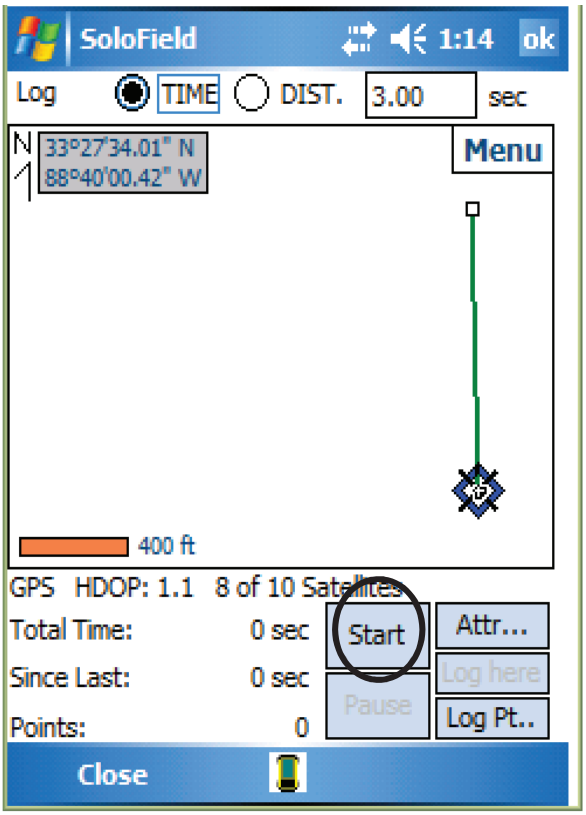


Step #5 – Select Time or Distance and then Start

- In the Log by Interval screen, you can choose to log by Time or Distance.
- If you are walking use an interval of 3-5 seconds depending on how rough the conditions are.
- Use Log by Distance if you are stopping frequently to paint a line or tie flagging.

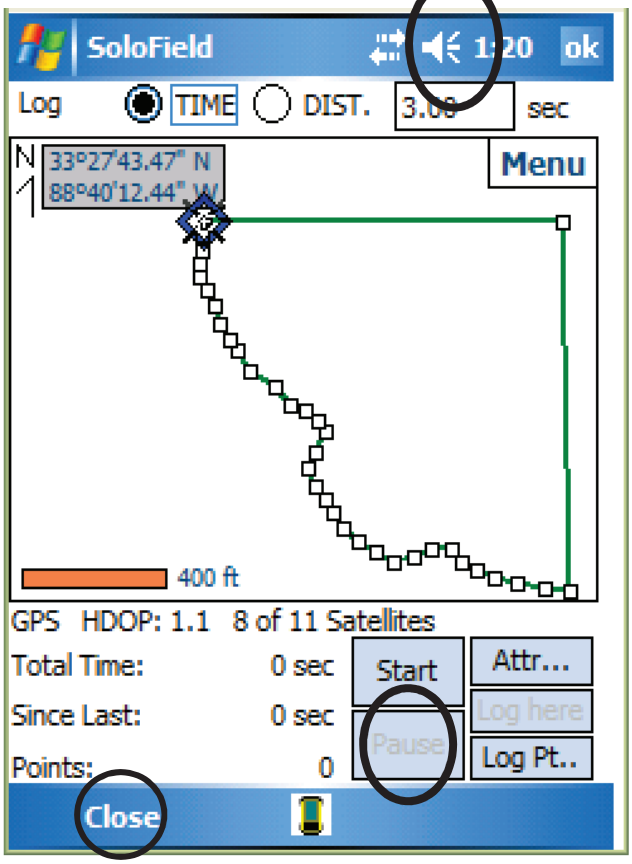
Note the Start and Pause Buttons.

When you are ready to start logging, press ***Start***.



Step #6 – Pause and Close

- Pay attention as you traverse the rest of the area feature. Turn the sound up on the handheld because Solo Forest will beep at you letting you know that positions are being logged.
- Select ***Pause*** when you want to take a break or have finished the dynamic feature.
- Select ***Close*** to return to the Main Screen.



4.10 Deleting Positions in SoloForest

Note that when deleting objects in SoloForest, there is no Undo and there is no Recycle Bin. Once it is it deleted it is GONE.

- **Delete a single position** on a feature set your Stylus Use to ***Stylus Selects Logged Data***. Select the position to delete and press ***Edit Menu > Delete***.

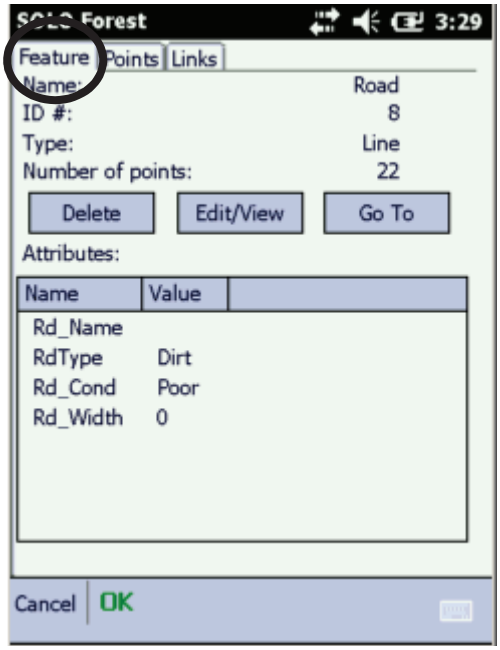
- **To delete multiple positions** on a feature change your Stylus Use to ***Stylus Deletes Multiple Points***. Next, select the positions to be deleted and then choose ***Edit Menu > Delete.***

- **To delete an entire line or area feature**, set your Stylus Use to ***Stylus Selects Whole Feature***. Select the feature to be deleted and ***choose Edit menu > Delete.***

4.11 Editing Data in SoloForest

To edit data in the field, simply double tap on the point/feature with your stylus use set to ***Stylus Selects Logged Data*** or ***Stylus Selects Whole Feature***. This will open the Feature Properties Window. There are three tabs; Features, Points, and Links.

On the ***Feature tab*** you can Delete the Entire Feature, Edit/View the Attributes, or Zoom to the Feature using the ***GoTo*** button.

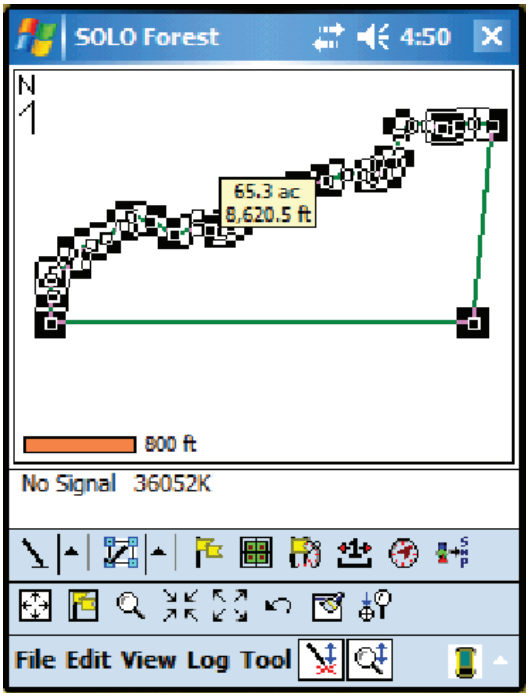


On the ***Points tab*** you can delete a single position, edit position coordinates, or re-order the positions. Press ***Ok*** to exit back to the map screen.

4.12 Viewing Acres in the Field

Setting the Stylus Use to Stylus Selects Whole Feature and selecting an Area feature will allow you to see the Acreage and perimeter.

Selecting a Line feature will show Length and Area as if the last position snapped back to the first.

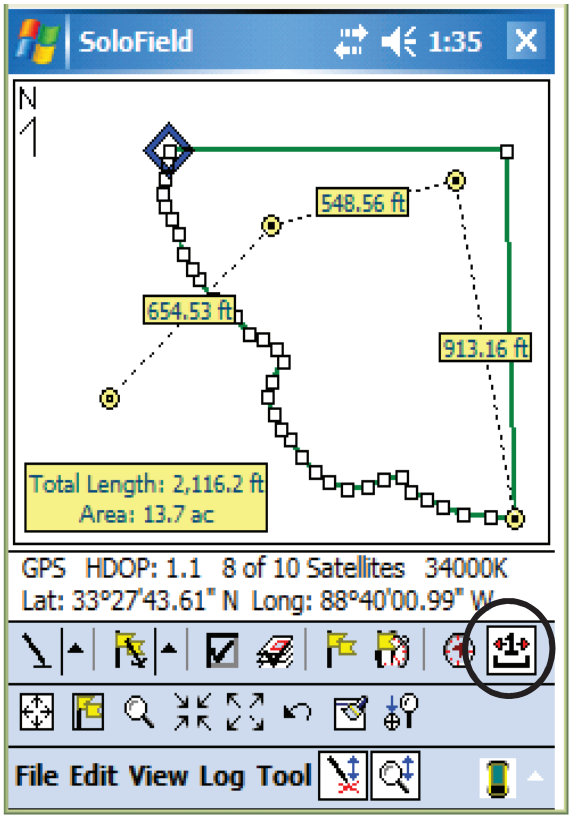


4.13 Measure Tool

To measure distance in the field, simply press the Tape Measure icon and click on the screen. You will see the individual line lengths, the total line length, and the area of the polygon that you created.

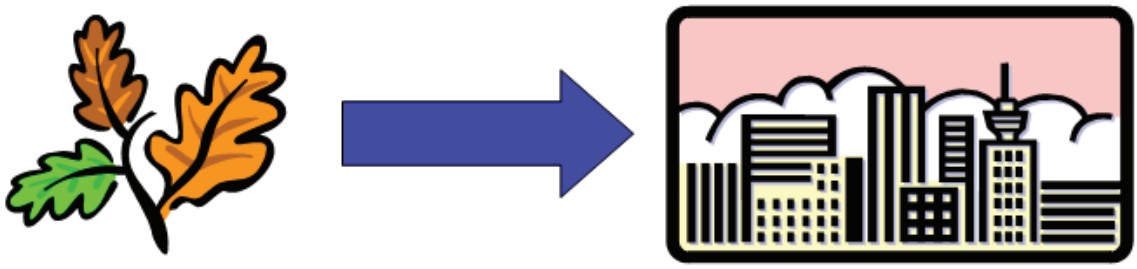
What your Stylus is set to affects how this tool works. Set to ***Manual X,Y*** it can select and position on the screen. On ***Logged Data*** it can snap to Logged positions.

To clear the measurements, simply select the Measure Tool again.



4.14 Office Procedures

The next sections will guide you through the processes of exporting your GPS data into ESRI shapefile format and then transferring the data to the PC. From here you can import the shapefiles into any number of GIS mapping applications that support shapefiles.

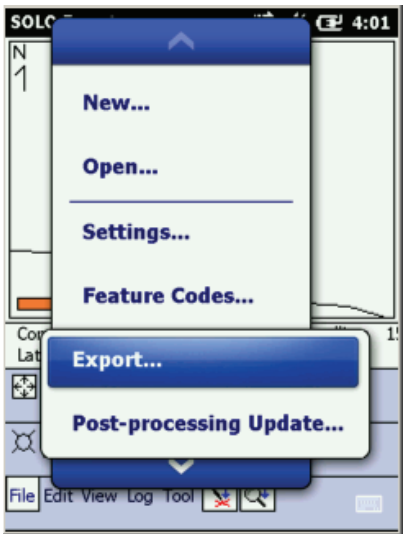


4.15 Exporting Shapefiles

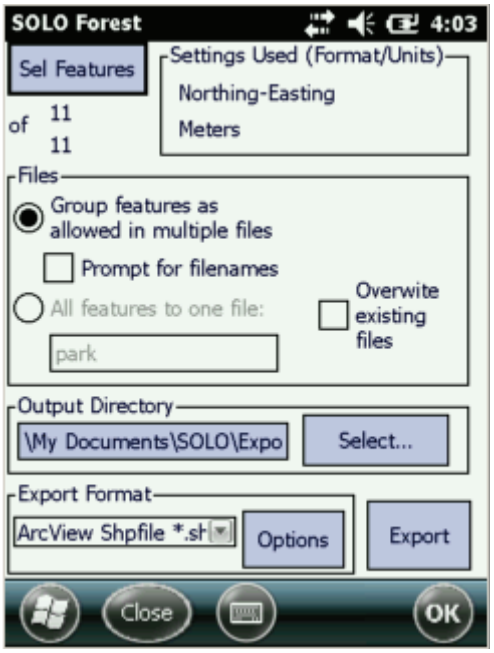
So far you have collected GPS features in a SoloForest UDF file. To get these features in a format that your GIS can use, you need to export them out in Shapefile format. Shapefiles can be exported out in any of the Solo supported coordinate systems. SoloForest 4.0.5 and newer also writes out a projection file (.prj) with the other normal shapefile components to define the coordinate system of the shapefile. It is always best to export out your data in the same coordinate system as the basemaps/imagery that you will be using in your Desktop GIS program.

Step #1 – Go to the Export Dialogue

Select the Shapefile Export Button  on the Mode toolbar or choose ***File menu > More > Export***.



Step #2 – Export Options Screen



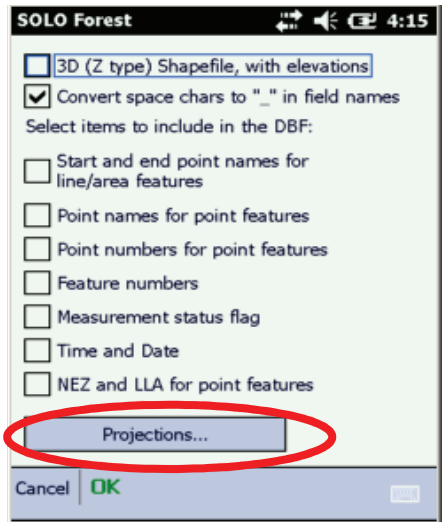
- The ***Sel Features*** button in the upper left allows you to select the features you want to export in the event you don't want to export them all.
- Note the Output Directory is ***My Documents/Solo/Export.***
- Make sure ArcView Shapefile is selected in the ***Export Format pick list***.
- To set the Export Projection select the ***Options button.***

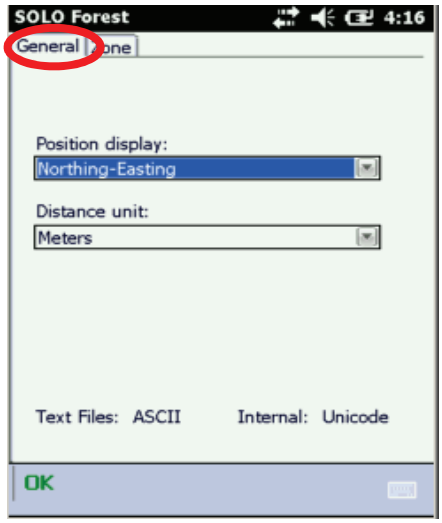
Step #3 – Adjust Project Settings

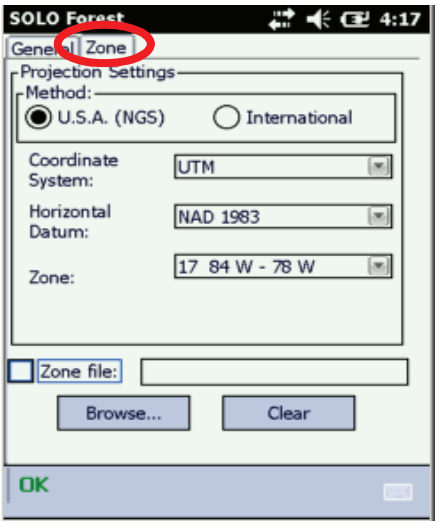
Next, select the ***Projections button*** and then choose the ***General Tab***.

Change the Position Display to Northing Easting and adjust Distance unit to Meters. When you select Northing-Easting, Solo Forest uses the coordinate system defined on the Zone Tab to project the shapefiles. The distance units matter also; UTM uses meters and State Plane usually uses Feet. If you had set Lat Long WGS84 as your Position Display here your shapefiles would get exported in LatLong WGS84.

The example here is: UTM, NAD83, Zone 17, Meters



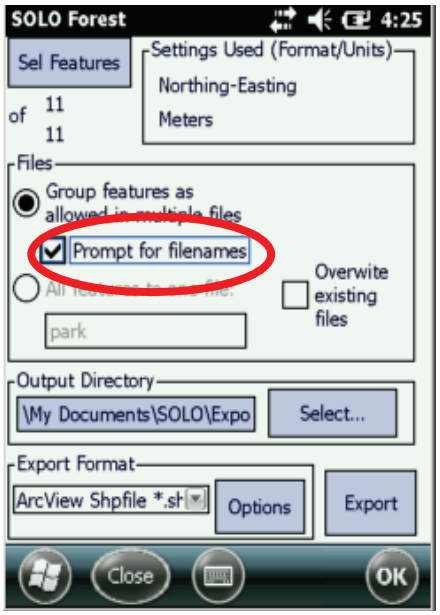




Step #5 – How to Name the Shapefiles?

After you make sure the Project settings are correct, you need to decide if you want to manually name the shapefiles to be exported or simply accept the default Solo shapefile naming convention which is Project Name + Feature name + "000" (ex. Park _Timber_Stand000).

If you want to name them manually as they are created, select the ***Prompt for filenames box***.

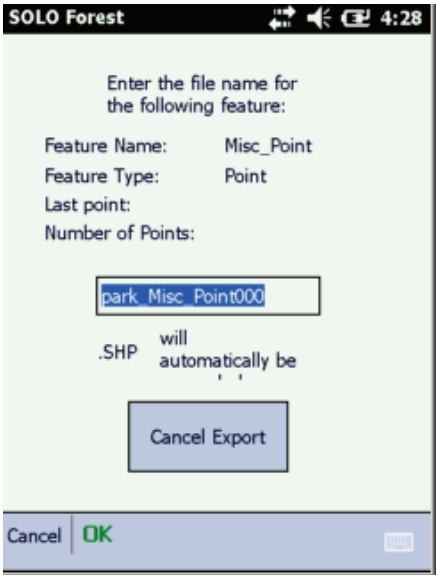


Step #6 - Press *Export* to begin the process.

If you selected ***Prompt for Filenames***, you can then enter the new name here and press ***OK***.

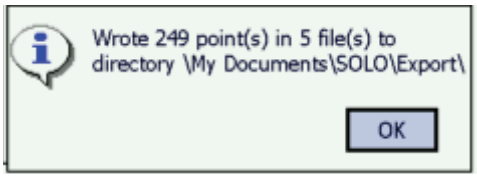
You will have one shapefile for every different feature you chose from your feature list.

After you have named all of the shapefiles, it will tell you that that they have been created in the ***My Documents\Solo\Export folder***.



OK back out of the Export screen.

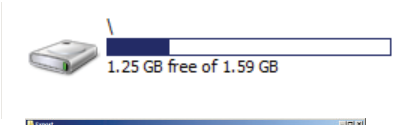
You can also ***File > Exit*** out of SoloForest if you'd like.



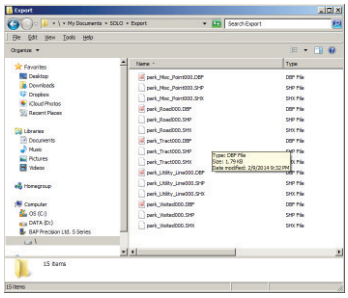
4.16 Transferring Files to the PC

After the shapefile export process is complete you can connect your handheld to the PC and transfer your newly created shapefiles to the PC. Please see the **Section 2.15** of this manual entitled: **Connecting to the PC** for more information on how to connect via MS ActiveSync or Windows Mobile Device Center. You will find connection troubleshooting info there also.

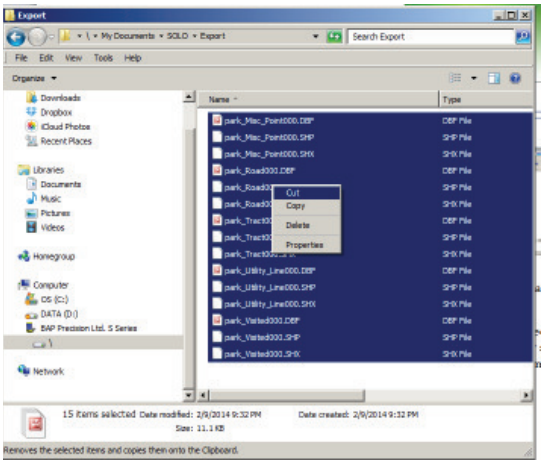
Step 1 – Connect to the PC and Explore the Handheld Files.



Step #2 - Navigate to the location of the exported shapefiles: My Documents\Solo\Export



Step #3 – Cut/Paste the shapefiles



- Select the Shapefiles you want by clicking on the first one and then press the Shift key and click on the Last one. All of the files should be highlighted.

- Cut the files by going to Edit > Cut or by right mouse clicking in the highlighted area and then selecting Cut.

- Note: a shapefile consists of 3 different files (.shp, .shx, .dbf, and .prj) and you need all 4. It is a good idea to use the Cut/Paste method to keep this directory empty so that the next time you export you'll know that all the shapefiles in there are from the current project.

Step #4 – Paste the shapefiles to your PC

- You can choose any folder location on your PC you desire to transfer the shapefiles to. If you aren't sure where to put them, you can create a folder in the ***My Documents*** folder on your PC called ***GPS Projects***. You can create sub-folders here for each mapping project you complete.

- Once your folder on the PC is selected and opened you can right click in it and choose Paste to complete the file transfer.

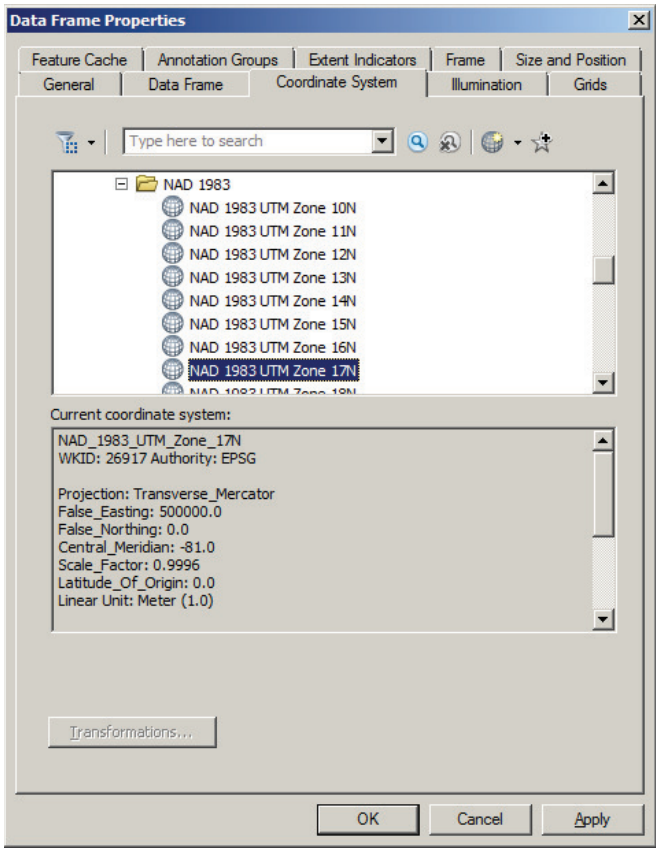
- You are now ready to use the shapefiles in a GIS mapping project on the PC.

4.17 Importing Shapefiles into ArcGIS

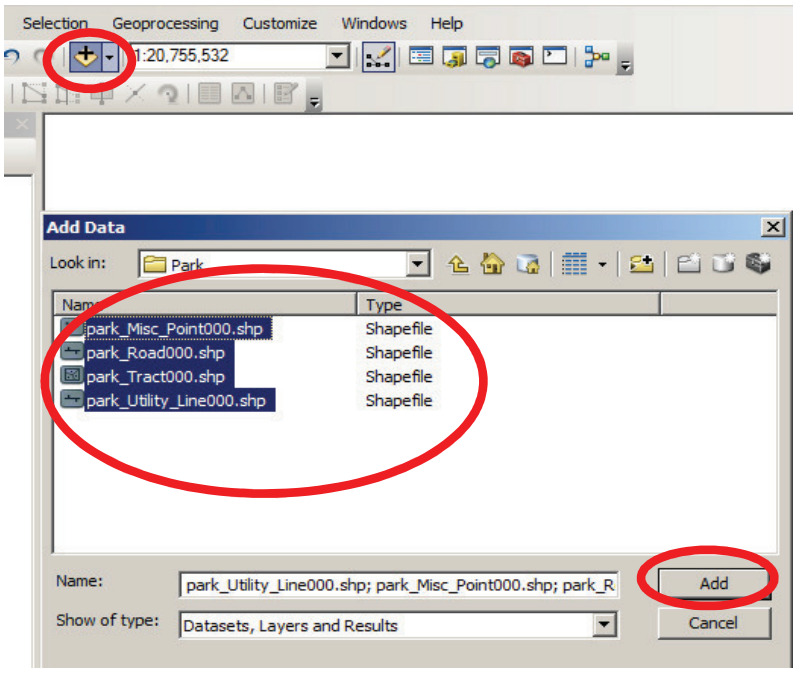
Now that your shapefiles reside on your PC, you can add them in as layers in an ArcMap project. Here are the basic steps:

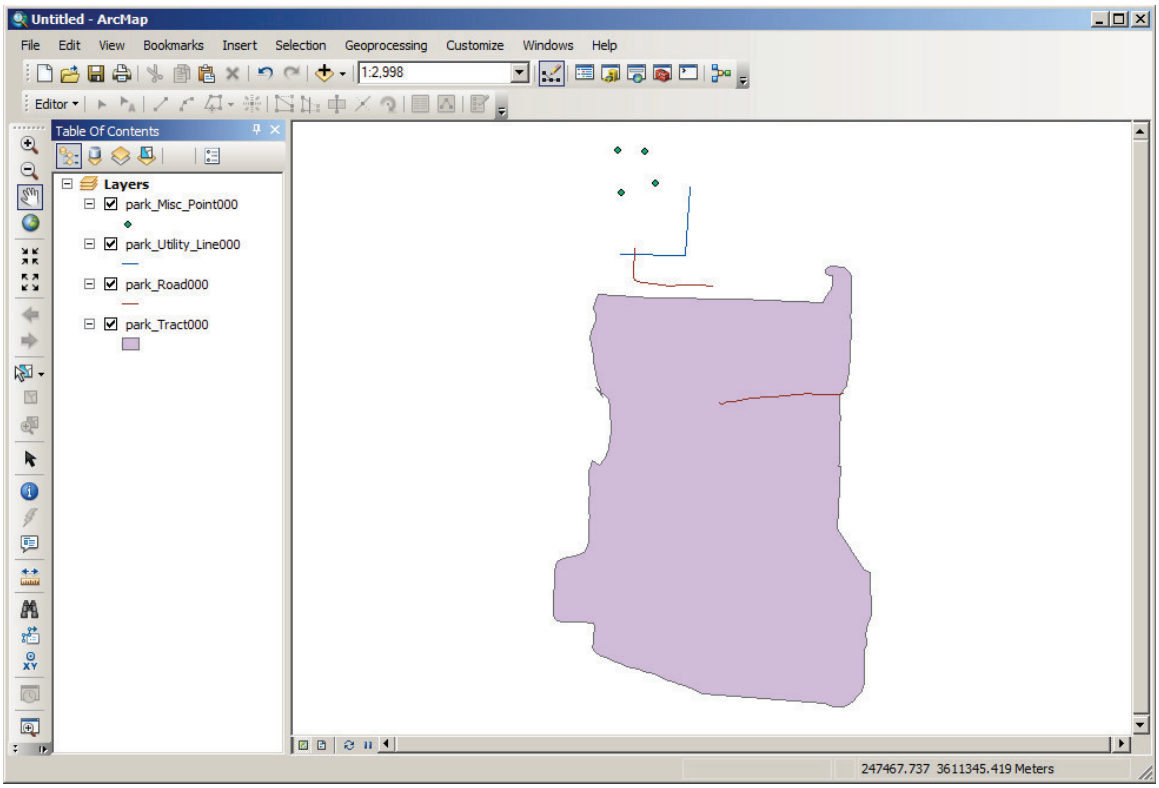
1. **Open an ArcMap project –** open an existing project or create a new one.

2. **Set the Coordinate System of the Data Frame** – click ***View menu > Data Frame Properties > Coordinate System tab*** and choose the appropriate Coordinate System. For this example we'll use UTM NAD 1983 Zone 17. OK out when done.

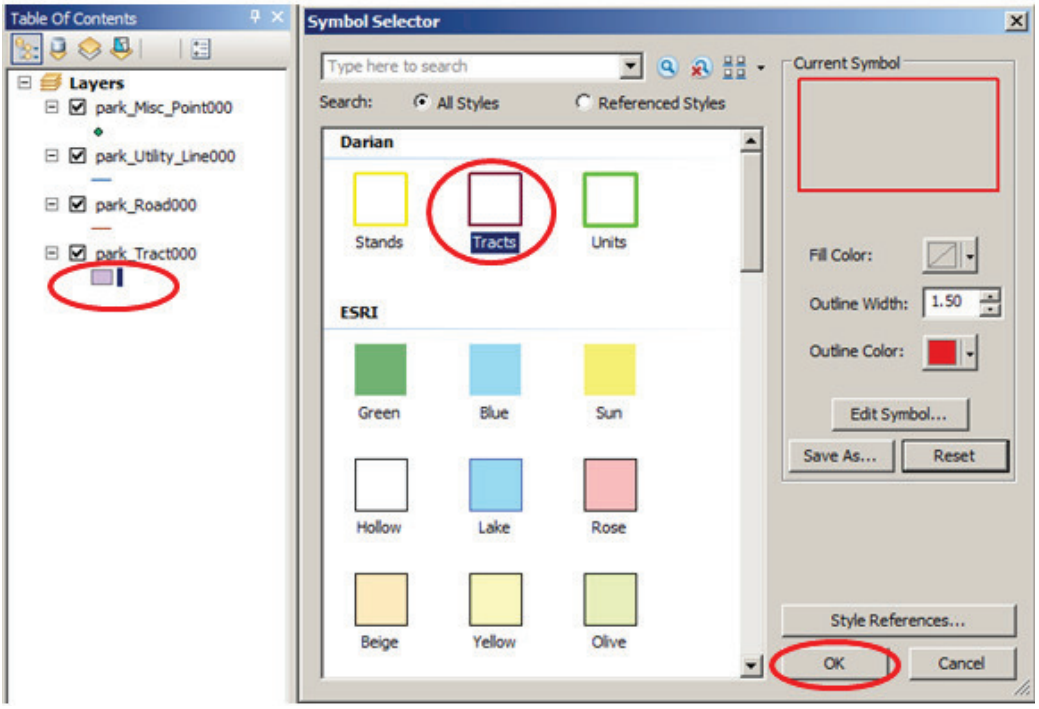


3. **Add Shapefile Layers** – click the Add Data Button on the Standard Toolbar and navigate to the folder where you shapefiles are stored on your PC. Click on the shp's you want to add and press OK.

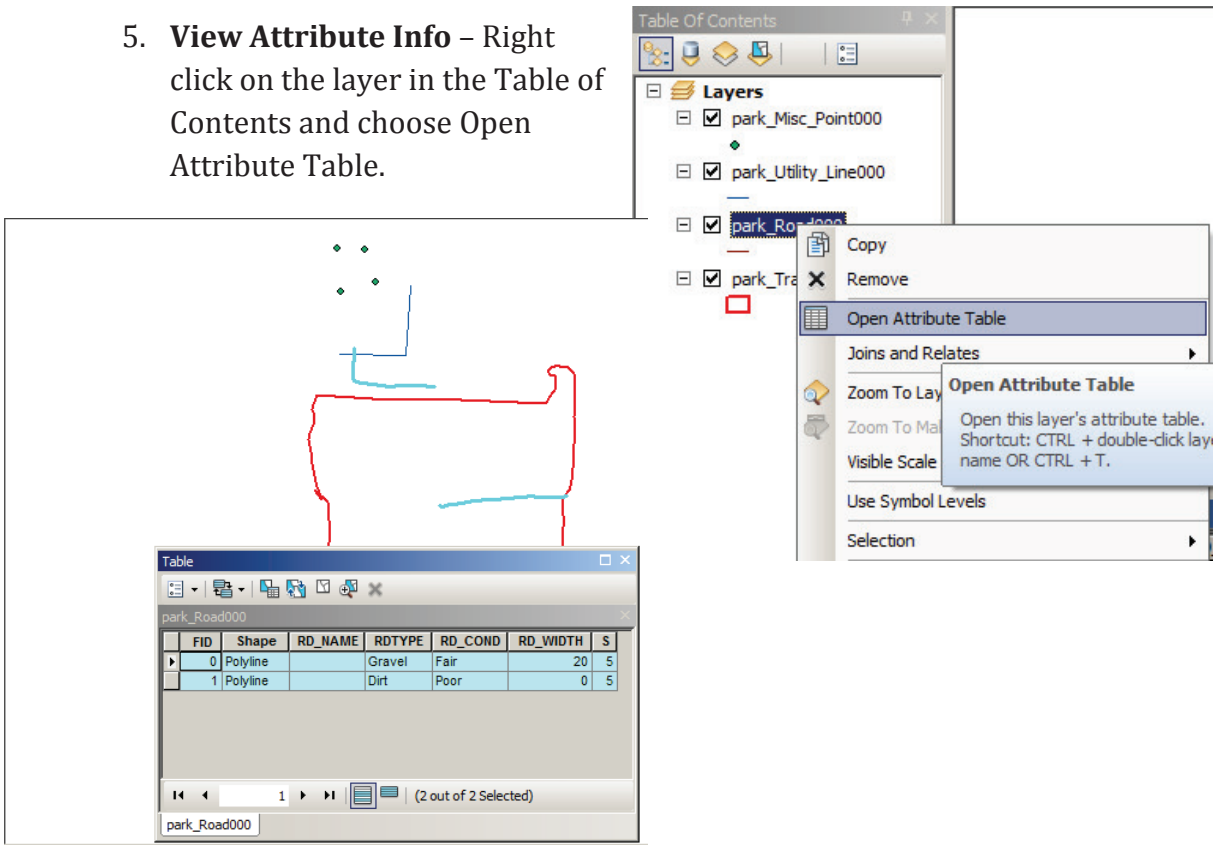




4. **Adjust Symbology of Shapefile Layers** – Click on the color pattern below the layer name in the Table of Contents. Choose from any of the fill patters or symbols and press OK when done to apply the changes. Update symbology for any other layers you'd like.



5. **View Attribute Info** – Right click on the layer in the Table of Contents and choose Open Attribute Table.



6. **Print Map** – Click on the layout View button on the bottom of the Map Window or click ***View menu > Layout View***. From here you can adjust your scale, add map elements such as a Title, North Arrow, Legend, Company Logo. All of these options are under the ***Insert menu.*** When your map is the way you want you can print by clicking ***File menu > Print*** or export the map to pdf or other format under ***File menu > Export map***.