

Terrain Navigator

A User Guide for Natural Resource Managers

Prepared by: *The Virginia Geospatial Extension Program*

Overview

Terrain Navigator was developed by MapTech. Terrain Navigator (standard edition) is an easy-to-use mapping software that allows you to manage and manipulate your topographic maps and GPS information.



While there are a number of features included in Terrain Navigator software, some of the functions most applicable to average users include the following:

- ◆ Terrain Navigator can be used to **find** locations quickly and **view and print** topographic maps in 2D and 3D.
- ◆ Map datum and coordinates can be **specified** in a number of formats including UTM and Lat/Long.
- ◆ This software package can **transfer** GPS data (i.e. waypoints, routes, etc.) between a GPS receiver and a PC.
- ◆ Points, labels and routes can be added to topographic maps.
- ◆ Terrain Navigator can be used to for basic measurements such as distances, areas and elevation profiles.

Terrain Navigator has some very good mapping capabilities. This provides you with confidence that the data that you have collected with your GPS “looks correct” on topographic maps. Also it can help in determining imprecise GPS points that were collected. Terrain Navigator works with a variety of GPS receivers. This guide is written to support the Garmin Legend GPS receiver. Most Garmin GPS

receivers will follow the same protocols. If you are using a different GPS receiver, then refer to the Terrain Navigator documentation, or contact the Virginia Geospatial Extension Program.

Before Using Terrain Navigator

The instructions in this handbook assume the following:

1. You have already installed Terrain Navigator software on your computer.
2. You have already collected GPS Data (i.e. waypoints, routes, tracks, etc.), and have stored the GPS data on your GPS receiver (if not, refer to *The Garmin Etrex Legend: An Introductory Handbook for Extension Agents* for additional information and instructions. The Garmin handbook has been prepared by the Virginia Geospatial Extension Program. This customized Garmin handbook is also available on-line:

<http://www.cnr.vt.edu/gep/tools.html>

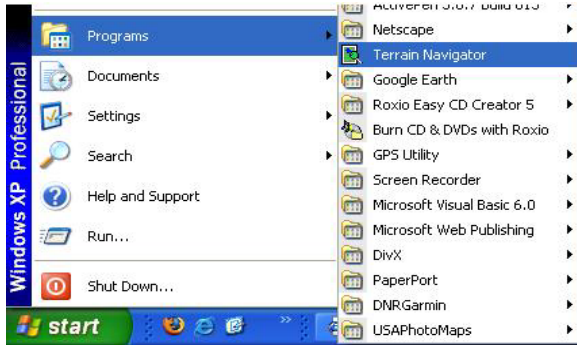
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Let's Get Started -Opening Maps

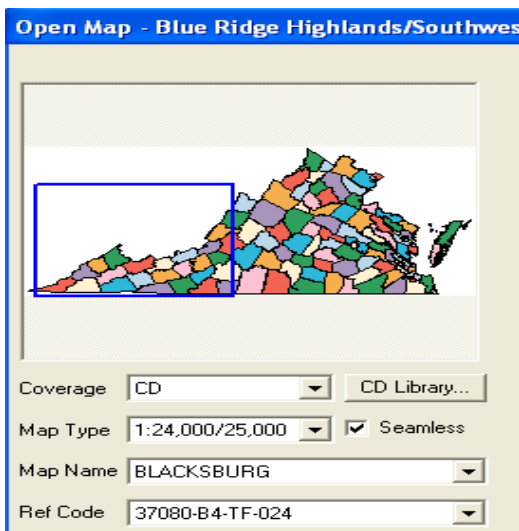
1. Start Terrain Navigator by selecting it from the Program list on your computer (Figure 1)



2. When you open Terrain Navigator, the Map Selector appears. You can also open the Map Selector by clicking File > Open or by selecting the Map Selector button on the tool bar.



The Map Selector will display an overview of the state of Virginia, the grid shows the area covered by each map. Terrain Navigator opens maps from the CDs provided with the package, and does not store maps on your computer. For this reason to you must insert one of the four “USGS Topographic Series” CDs for Virginia. It is important that you insert the correct CD for your county or area. Under the “Coverage” pull down menu select CD, this will show the available maps for the inserted CD.



3. Select a map scale

Under the “Map Type” pull down menu you are given two choices of scale:

- 1:24,000/25,000 - The most commonly used because they provide good detail for hiking, hunting, etc.
- 1:100,000 - These maps don't provide much detail, but they cover large areas and provide a good landscape view.

You can always change your map scale anytime during a project by using the map scale button on the tool bar.

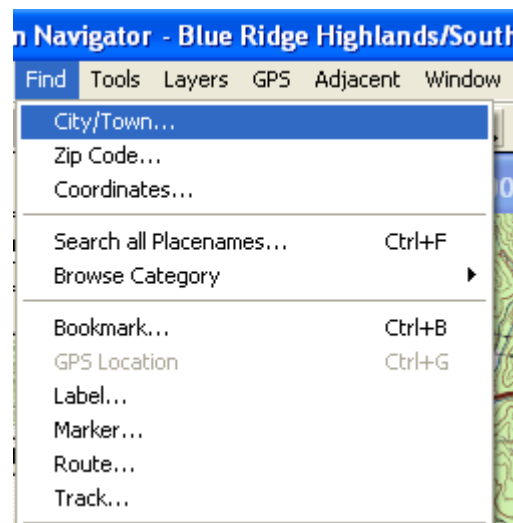
1:24,000 T

4. Opening Maps

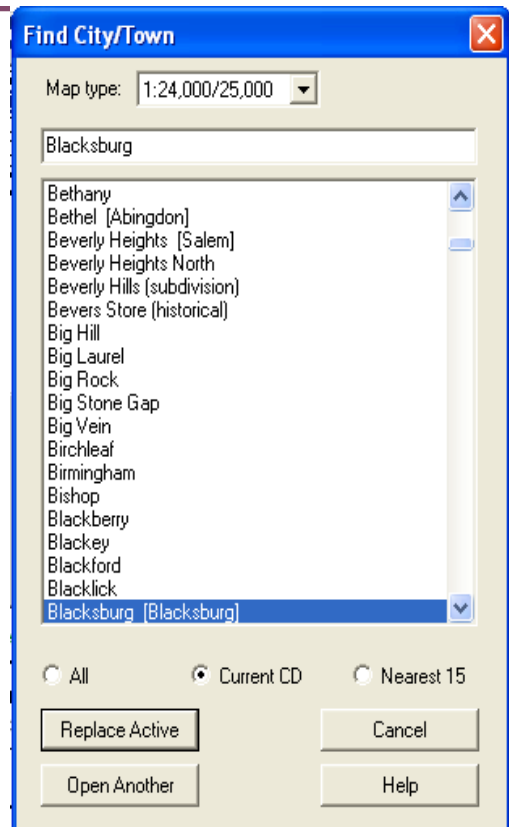
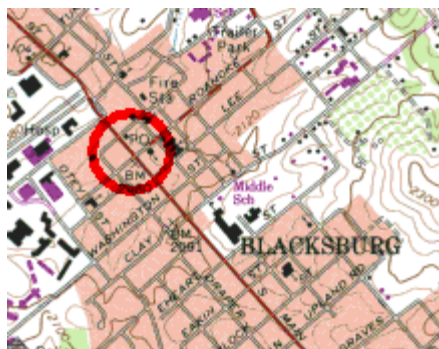
Using the “Map Name” drop down menu you can select maps by name. When you select a name of a map the a square on the grid will become highlighted indicating the location of the map. When you are sure of your map name press “Open.” Another way to open a map is to double click on the map grid.

Searching

Maptech software has a “Find” feature which is an excellent tool to search for and quickly locate a particular area. When you have a map open, click on the “Find” menu and select “City/Town.”



Using the Find City/Town feature is simple, just type in the name of the town you wish to find and select from the available options in the list below. If the city name is common you may select to limit your search to the CD currently in the drive if you know you will be searching in that region. To open a map of this area you can click the bottom “Replace Active” or just double click on the name of the city/town you wish to view this will close whatever map you had been viewing and open the new map. You open the map in a new window by clicking the button “Open Another.” The opened map will have a red circle around the town or city selected.



The Find menu is an excellent tool and can be used to find locations in many other ways. Another great option is the “Zip Code” option on the “Find” pull down menu. This feature works very much like the find City/Town option except you can search using zip codes. The find feature also is great for finding book marks, waypoints, tracks, routes and labels that will be discussed in future sections.

Viewing Maps in 2D

This section will introduce the major tools needed to navigate topographical maps in 2D.



The **drag tool** is the best tool for moving around the topo maps: To use this tool just click (hold) and drag the map on the screen. Another good feature of the drag tool is it changes to a scrolling Arrow when you hold the tool at the edge of the map (this feature works on almost all cursor tools). After the drag tool changes to a scrolling arrow just click and the map will scroll in the direction of the arrow.



Map Overview

The Map Overview feature is located on the side tool bar, it is a thumbnail image of the map that you're viewing. The blue box represents the area of the map you are currently viewing. This feature is much like the drag tool, you can click (hold) on the box and move it to a new location or you can click on an area of the map to re-center the map. By clicking on the black arrow pointing to the map overview it will open up a window with a large version of the map overview.



State Overview

This feature gives the general location of the map you are viewing with the location of the red dot. If you click on the black arrow pointing to the State overview, this will open up the “Open Map” window discussed in previous sections.



Centering Tool

This tool can be found on the tool bar. To use this tool just left click on the map, and the map will be re-center around the point you have just selected. Also with this tool and most others as you use the mouse to move your tool the coordinates and elevation will be displayed on the tool bar.

037° 22' 03.04" N | 080° 44' 33.64" W | 2261 ft



Compass Control

This tool provides yet another way to move the viewing screen. To use this tool just click on the compass direction you wish the map to scroll. For example if you want to view a map section to the north click on the north arrow on the compass.

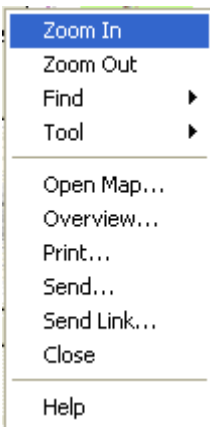
Zoom In / Out

1:1

When Terrain Navigator is first open the scale will 1:1 or the actual scale of the map. This program offers four different zoom levels 1:4, 1:2, 1:1 and 2:1, where 1:4 (25% of actual scale) is the maximum outward view and 2:1 (200% of actual scale) is the maximum inward zoom level. Just use the “Zoom level” on the toolbar to select the zoom level desired.

Don't forget that there are also two different map scales 1:24,000 (detailed view) and 1:100,000. The four zoom levels are available on each of the different scale maps. If you find that you cannot zoom it to the desired level, change the map scale from 1:100,000 to 1:24,000 might solve the problem.

1:24,000 T

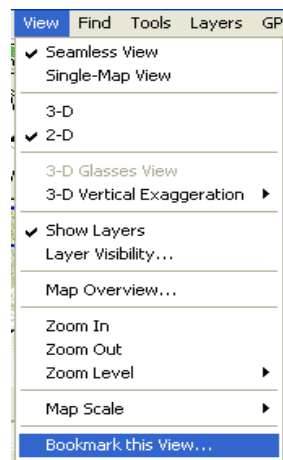


Terrain Navigator provides four zoom levels for viewing maps. To zoom select the Zoom In or Zoom Out tool, then click on the map. The map will center automatically on the point you clicked. Another option is to right click on the map and select Zoom In or Zoom Out from the menu that appears.



Bookmarks

Bookmarks are used to save specific locations so you can return to them later a the same zoom level and map scale. To save a bookmark select “Bookmark this View” on the “View” pull down menu and enter a name for your bookmark. To find your bookmark use the find feature, “Find” menu then select “Bookmark” (mentioned in more detail in a previous section).



Printing Maps

To the map you are viewing select the “File” menu and select “Print.” This will display a map that you are about to print. A blue box (similar to the map overview) will display the area to be printed. This box can be moved (dragged) or centered before you print. If there is no blue box present the whole map as seen will be printed. There are many options provided on the right side of the print window.

The size can be changed, this will essentially change the zoom level of the printed map and the size of the printing area. The size can be adjusted using the scale or percent, “%” is the default. Adjusting the “%” will adjust the percent of the actual scale. Simply a large percent like 200% will zoom in to great detail and a small percent like 10% will display a larger area but in less detail. As the scale is adjusted the size of the blue box will change indicating the area that will be printed. The scale limits are 25% to 1000%.

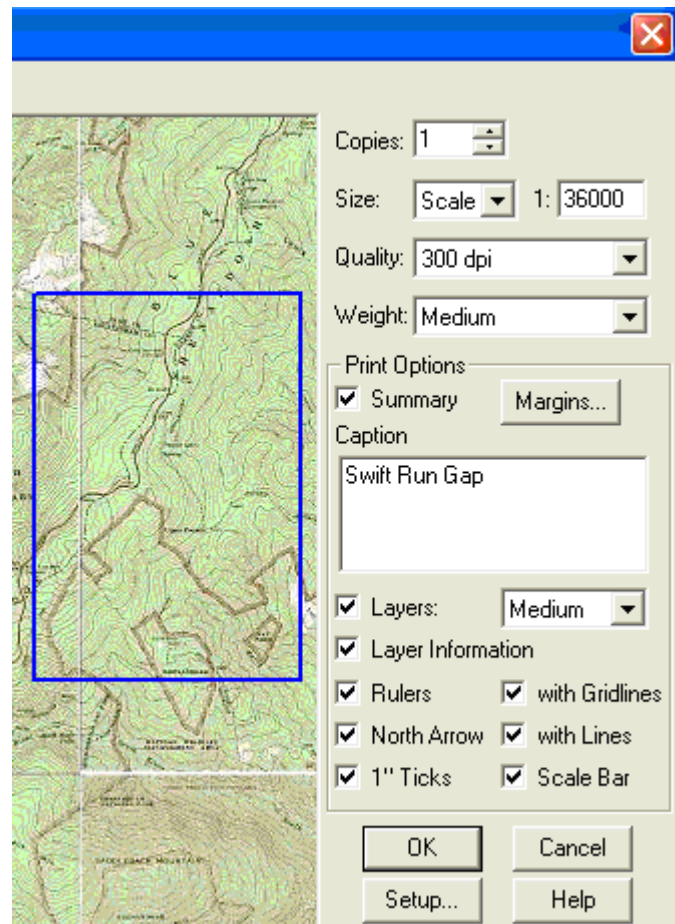
Quality - The quality of the print can be using the “Quality” pull down menu. All options are expressed in dpi (dots per square inch), the higher the dpi the higher quality of the printing. Quality can also be set by clicking the “Setup” button.

Weight – This refers to the amount or density of ink used in printing.


Summary – when this option is checked, a box will be included at the base of the map including the USGS map name, date, scale (1 inch = x feet), coordinates, and caption.

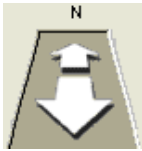
Layers - Layers are markers, routes, tracks and can be included on your printout when this box is checked. The pull down menu to the side is to choose the size (Small, Medium or Large) at which the layers will be displayed. The Layer Information check box will provide sheet printed in addition to your map that includes data about the layers.

Other map options include Gridlines, Scale Bar, North Arrow all good features for reading and interpreting maps. To Add these features just click on the checkbox next to the label.



3-D View

 Terrain Navigator features a 3-D View which provides an additional way to view the shape of the landscape. To use this feature click on the 3-D button on the main tool bar which will display a 3-D view of the terrain.



Zooming In / Out (3-D) - The controls differ from the 2-D view. To zoom in or out, click on the arrows on the side toolbar. The direction listed just above these arrows (in this case “N”) identifies the direction you are looking at the map.



Raising / Lowering the Viewpoint - This feature changes the height at which you are viewing the 3-D map. To adjust the viewpoint click and hold on the lever than drag it up or down. The elevation tool can be found on the side toolbar. The higher you drag the level the farther you will be from the map.



Rotation - The rotation tool lets changes the viewing angle of the map. The right and left arrows will spin the view around your centered point, thus giving the illusion that your rotating around that point. The up and down arrows change the view angle from by raising and lowering the view point, basically the same thing as the Viewpoint feature just above it.

Using the Cursor - The cursor can be used to change the view as well. Just click and hold on the map and drag to change the view. Using the cursor you can rotate and tilt the 3-D map.



Height Exaggeration Buttons - These buttons simply exaggerate the height of the terrain in 3-D display. The up arrow increases the height of mountains and hills and the down arrow shrinks them. These tools are found at the bottom of the side tool bar.



Recording a 3-D Rotation Video Clip - This feature allows you to make a recording of the 3-D rotation around a center point. To use this feature just select the video tool at the bottom of the side tool bar or select “File” menu >”Export” > “Rotation Video Clip.” This feature can also be used to make videos of routes in which case select “Route Video Clip.” Save this clip and click ok. Note the Route Video clip has additional optional settings that can be changed. The clip will only take a few seconds to be produced and can be opened using windows media player.



3-D Glasses View - You can view your 3-D map using the glasses provided with Terrain Navigator. Just click this button and it will take you to the 3-D glasses view. To exit the 3-D glasses view just left click on the mouse again. Note rotation of the map is not possible in 3-D glasses view.

Integrating Terrain Navigator with you Global Positioning System

Terrain Navigator can be used as a software application to download waypoints, tracks and routes from your GPS receiver to the PC. These features can then be integrated with (ontop of) Terrain Navigator’s mapping capabilities.

Configure Your GPS

Terrain Navigator software offers a way to setup your GPS automatically, using GPS Setup Wizard. This feature is offered during the initial software setup. However if you skipped this step or want to add a new

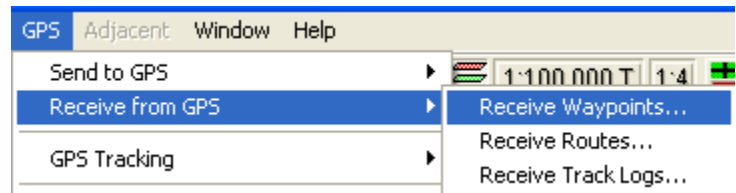
GPS you can run the feature by clicking on the “GPS” pull down menu then selecting “GPS Setup Wizard.”

The GPS Setup Wizard does require that you answer the questions on each screen. When the Wizard is complete, Terrain Navigator will recognize and communicate with your GPS unit.

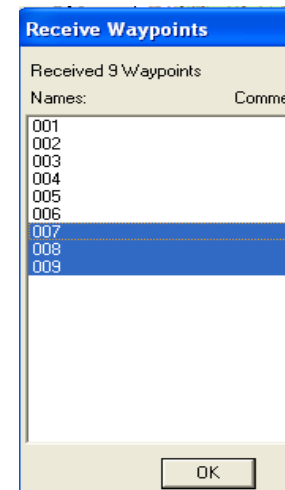
Note if you are unable to configure your GPS using the GPS Setup Wizard your GPS can be configured manually by selecting “Setup” from the “GPS” pull down menu. For more assistance with this feature consult Terrain Navigator’s help section.

Receiving data from your GPS

Using Terrain Navigator waypoints, tracks and routes can be downloaded from your GPS to topographical maps. Before you begin make sure the GPS receiver is connected to the computer and turned on. To receive data from your GPS click on the “GPS” pull down menu then select “Receive from GPS” and choose a type of data by clicking “Receive Waypoints/Track Logs/Routes.”



Terrain Navigator will create a list of all data points that are on your GPS, these points will be displayed in a new window called “Received Waypoints/Track Logs/Routes.” To load points into Terrain Navigator the data must be selected from the list. Note to select more than one data point hold down the control key when using the mouse. When you selected the data you wish to download press the OK button. A message box will appear identifying the number of data points received.



After the data points are received from the GPS they will be displayed on the map. In this program GPS data is know as “Layers” and waypoints are also referred to as “Markers.” Layers can be view by clicking on the “Layers” pull down menu and selecting the type of data you are interested in (markers, tracks, routes). Layers can be turned off and on by clicking on the “View” pull down menu and selecting “Layer Visibility”

Sending data to your GPS

A very valuable feature of Terrain Navigator is that you can transfer data or Layers from your computer to your GPS. This program lets you send all Layers (Markers, Tracks, and Routes) directly to your GPS so you can find these features in the field. Before you start this process make sure you have your GPS unit turned on and connected to your computer. Sending is much like receiving data, just click on the “GPS” pull down menu, select “Send to GPS” then choose what type of layer you wish to send you GPS by clicking “Send Markers/Tracks/Routes” A box will appear with all the possible points that can be sent to the GPS. Select the points you wish send, use the control key to select more than one point. When you have finished your selection click the send button. The data should appear in you GPS as waypoints, tracks, or routes.

GPS Real-Time Tracking

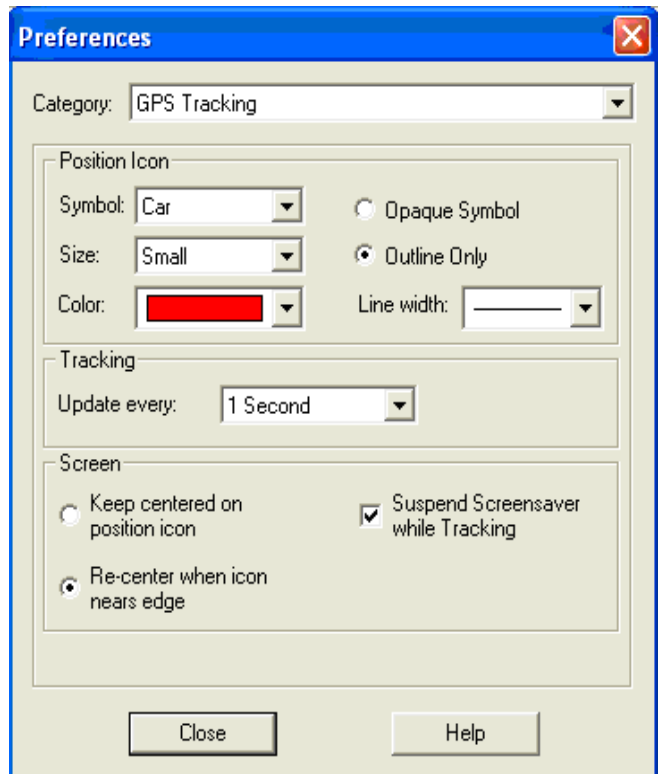
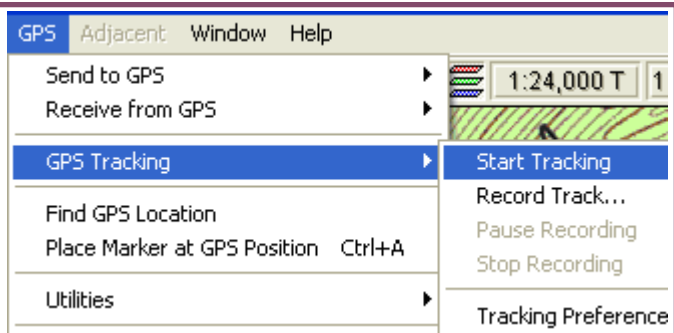
This feature is designed for use in a moving vehicle, as it monitors your movement on the map. Using this feature you can record your movements and save it as a track. To use this feature your GPS unit should be plugged in and turned on. Click on the GPS pull down menu and select “GPS Tracking” then select “Start Tracking” or to record your actions while tracking select “Record Tracking.” When your GPS unit receives enough satellites Terrain Navigator will open a map marking your location on with a tracking

Changing tracking Preferences

Using this feature you can change how Terrain Navigator tracks your position. To use this feature click on the “GPS” pull down menu and select “GPS Tracking” then “Tracking Preferences.” Here you can change the icon displayed size and other visual features. The time interval between tracking points maybe changed, which may be important depending on your speed. Also screen features can be changed.

Creating Layers (Markers/Tracks Routes)

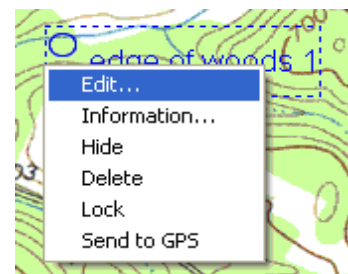
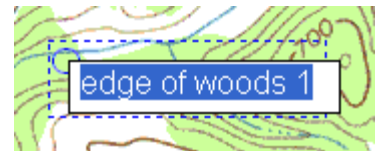
Creating layers is simple and can be invaluable for finding your way in new terrain because you can load these features to your GPS.



Markers

To create new markers you can use the marker tool on the top tool bar or click on the “Tools” pull down menu and select “Markers.” Markers can be used to indicate a place of interest and can be loaded on to your GPS as Waypoints. Because it is much easier to name and label points in Terrain Navigator than on your GPS this is a valuable tool. When the marker tool is selected, markers should be created on the map where you left click.

To change the text of the marker, just left click on the text, this will give you the option to change the marker name. If you wish to change more features or add comments right click on the marker and select edit. Using the right click menu you can also get information, hide the marker, and delete the marker and perform other tasks.






To move Markers you must be using the “Marker tool.” Hold the Cursor over the marker tool until the cursor icon changes to a maker/hand tool. At this point you can hold click and drag the maker to a new location

Tracks and Routes


To add these features you must be using the Track or Route tools with can be found on the top tool bar or on the “Tools” pull down menu. Routes connect a series of waypoints where as tracks are just lines without points in between. Both can be loaded on to your GPS unit. To create these features just click on the map using the Track or Route tool to begin your line. Additional points or clicks should be added to change the direction of the line. When the Track or Route is finished, right click and select “Finish Track/Route” from the cursor menu. Editing and adding text and information can be done in the same way markers are edited. Tracks/Routes can be added to after completed by right clicking (using the track or route tool) and selecting append route/track. They can also be closed or looped by selecting “Toggle Route Loop” from the right click menu.

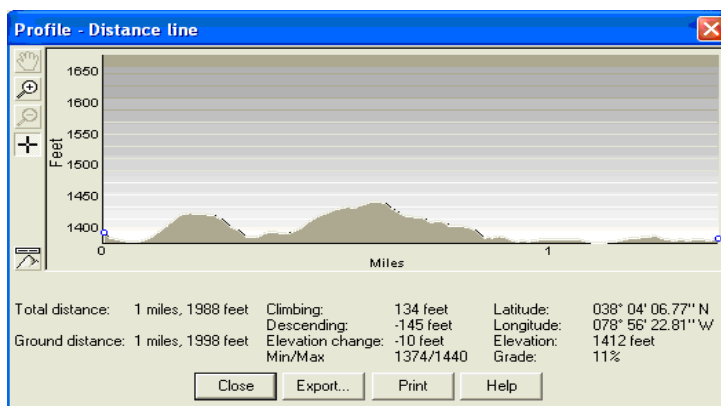


Measuring Tools

Distance can be calculated by using one of two measuring tools. Use the Distance tool  for straight-line measurements, Terrain Navigator will provide the length and bearing, and elevation. The other distance tool  provides information for curved lines and measurements. Select one of the distance tools and choose at least points on the map to calculate distance. To delete the last segment drew use the backspace key one your keyboard. Hold down the control key if you need to drag the map. To create curved lines click and hold the cursor. To get information such as distance about the segment right click on the line and select “Information” from the menu. The right click menu also provides other tools such as option to covert to a track or route. To erase all of the line segments right click on the line and select “Clear” or use the Delete Tool. 

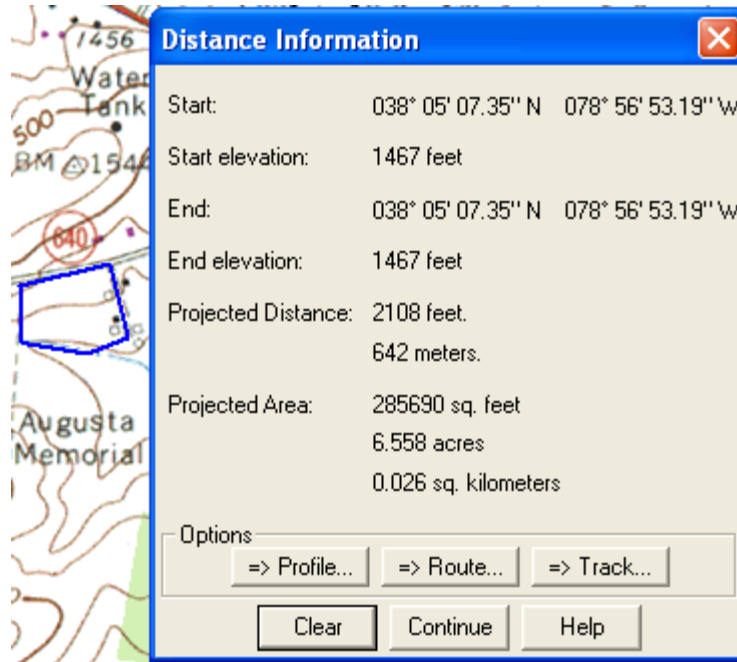
Profile

Another option from the right click cursor menu (using Distance, Tracks or Routes) is the “Profile” feature, which can also be found on the top tool bar. This shows the elevation and terrain crossed by the route or distance line. This feature can also be found in the same way for tracks and routes. This feature is very similar to the “Line of Sight Tool”  which displays the profile with a line of visibility.



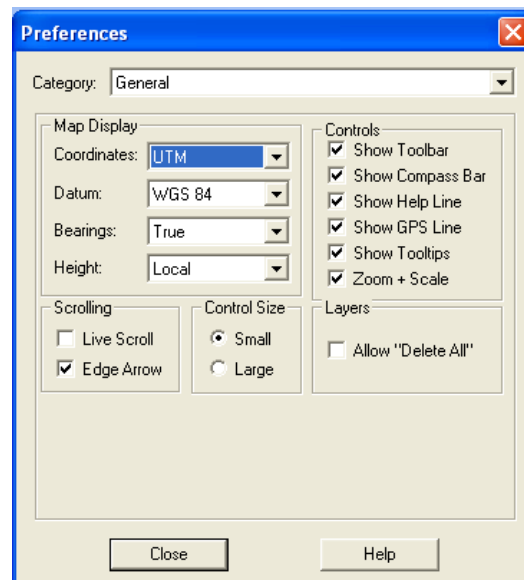
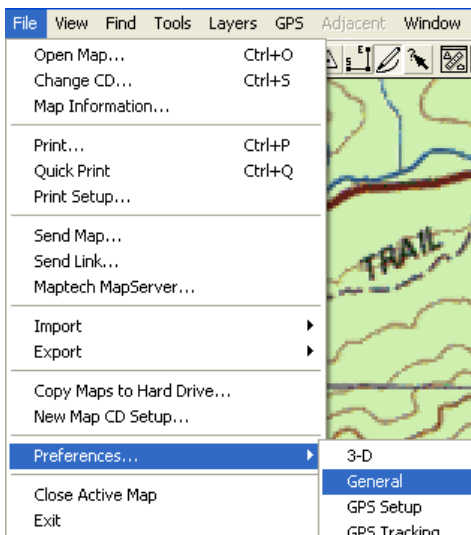
Measuring Area

This feature can be used only if the line is looped or forms an enclosure. To obtain the area information just right click on the line and select “information.” Area information is also collected for toggled routes under the information feature.



Changing Datum

Basically datum is a way of calculating the location of the earth’s center. The earth’s center is used as a point for establishing coordinate locations on the earth’s surface. There are three forms of datum used by Terrain Navigator. This becomes important when transferring points from your GPS because, the datum must match. To change the datum click on the “File” pull down menu select “Preferences” then select “General.”



For additional updates and information about this digital resource, contact the
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