
























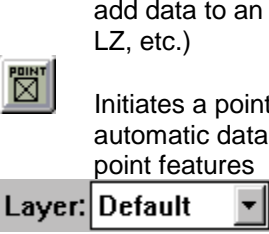







Comprehensive PenMap configuration for training and general GIS field data collection.

This document describes a general use configuration for PenMap. The configuration is described in terms of button configuration, settings and general GIS mapping functions using GPS and a laser range finder.



	Starts a new session or saves file		Adjust data extents to include all new data
	Undo function		Set code description to appear next to node
	Edit database for mapped feature		Set text size for point coding system
	Polyline graphic function		Set point numbering system (use USA commented only)
	Point Numbering system		Access GPS setup window
	Snap mode		Access Total Station setup window
	Free Node mode		Access display configuration window
	Total Station mode		Initiates a polyline graphic for mapping linear features
	GPS Method		Initiates a database entry function to add data to a line (trail, route, etc.)
	Redraw		Initiates a polyline graphic for mapping area features
	Pan function		Initiates a database entry function to add data to an area (danger zone, LZ, etc.)
	Zoom in by a factor of 2 (x2)		Initiates a point (symbol) with an automatic database entry form for point features
	Zoom out by a factor of 2 (x1/2)		Displays current layer
	Zoom out to limits of survey		
	Zoom to window		
	GIS setup		
	Access background map selection		
	Access layers toolbox		

Settings for PenMap

GPS settings

- ❖ Select Misc-GPS Setup. The screen will display as shown at the right.
- ❖ Select the proper instrument.
- ❖ Select the proper com port (usually com 1)
- ❖ Select the proper projection type (check with existing reference maps)
- ❖ Select the proper Reference Ellipsoid
- ❖ Select the proper units
- ❖ Exit this screen when settings are set. Settings are retained for future sessions. Check settings prior to a change in geographic location.



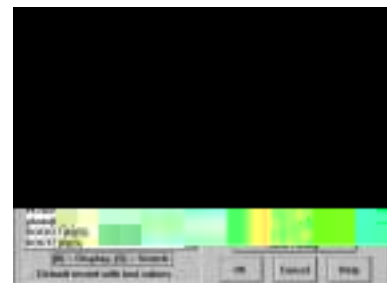
Instrument settings

- ❖ Select Misc-Instrument setup.
- ❖ Verify that the proper com port is set.
- ❖ Verify that the proper Total Station is selected.
- ❖ The bearing correction and Theodolite position are required to operate the Total Station
- ❖ Select the Theo height.
- ❖ Select the staff height for the height of target staff, if used.
- ❖ Select Close before proceeding.



Setting GIS (data) attributes

- ❖ Select GIS-Setup from the pull down menu and view the screen as shown at the right.
- ❖ Note the display status at the upper left hand corner of the window. The settings can be for all, none or selected values. This will turn on and off graphic text for the databases.
- ❖ Note the Text Ht and Wd. settings at the lower right hand part of the window. Changing these settings will alter the size of the text as it is displayed on the screen. When changes are made to the GIS settings, the screen must be refreshed in order for the changes to take. Experiment with the text height settings required for your mapping scale. Start with a text height of approximately 2 units.
- ❖ Select OK when done.



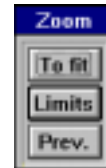
Layer color and configuration

- ❖ Select Misc-Layers Toolbox to see configuration screen as shown at the right.
- ❖ Note that the color of individual layers can be altered.
- ❖ The displayed thickness of lines are fixed by the settings made available after selecting the "Solid" button as shown in the window.
- ❖ Different line styles are selected by activating the Style button and making changes to the settings in the ensuing window.
- ❖ The screen will need to be refreshed when changes are made to the layers.



Symbol adjustment on/off

- ❖ Select Options-Display Configuration to view the screen shown at the right.
- ❖ The setting for Action on Create is important. Selecting the "Adjust symbol" box, will allow the symbols to be sized and adjusted when placed or mapped on the screen. It is recommended, however that this setting be left un-checked.
- ❖ If the user chooses to have the adjustment active, be sure to understand how this function works. Review and practice this particular feature of PenMap prior to field applications.
- ❖ If a symbol is mapped off the view of the screen, while the symbol adjustment mode is active, it will be necessary to select the "To Fit" button on the screen shown at the right. This screen will automatically appear when a symbol is placed on the screen. This action will zoom the user to the symbol so that the symbol can be chosen by selecting the checkmark at the lower left hand corner of the symbol.
- ❖ After the symbol is checked, select View-Last to zoom to the previous zoom level.
- ❖ Select the Data Extents window to encompass the new point and zoom to your new level.



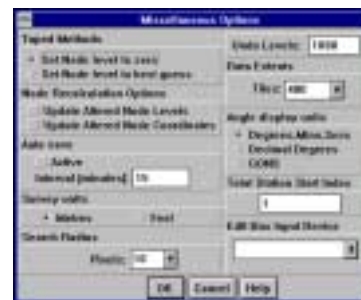
Symbol Size

- ❖ The size of the symbol can be set before it is ever placed on the screen.
- ❖ Select Misc.-Symbols Toolbox to display the screen as shown at the right.
- ❖ Select Placement and select a height and width appropriate for the size for the scale of the zoom or print out.
- ❖ Close the screen when finished.
- ❖ The symbol will appear with at the new scale when placed in the file.



Feet or Meters

Select Misc-Miscellaneous options and select between Feet or meters from the window as shown at the right.



Data Collection Process:

GPS

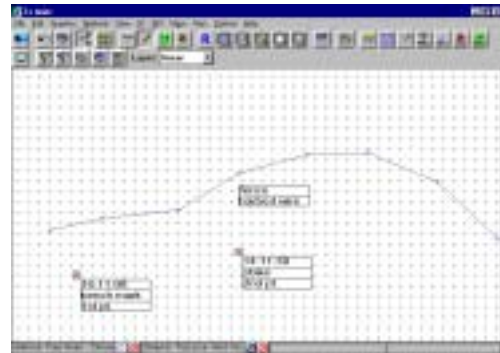
- Start the GPS by selecting the GPS button from the main screen. A window will display as shown at the right.
- The Setup button will display further information about the GPS settings. (screen is shown in expanded format) Setup done button will shrink the GPS window.
- Select the Status Box to monitor the satellite tracking information for performance and accuracy of position.
- The Accept button records the position of the GPS into PenMap.
- Recommended GPS collection modes:
 - ♣ Static Last Reading – Accepts only the last reading from the GPS unit.
 - ♣ Minimum Distance – Records a point every time the GPS unit moves a pre-established distance from the last point. This distance is input into the Min. Dist. Field box.
- The first time that a point is accepted into PenMap session, a data extents window will appear. Accept the default. Later, you may wish to select the Data Extents-Adjust to Max. Min. button so PenMap can place all data into a data extents window. This is required to view all the collected data.



Mapping with GPS

The fundamental operation of PenMap is that a Graphic and Method are used simultaneously to record data.

- To map a road or fence, select the line button as the **graphic**, then, select the GPS button as the **method**. Travel along the trail or road with the GPS unit and accept points along the route. This will map a continuous line. Once the line is complete, end the GPS and polyline functions. Monitor accuracy of GPS position before recording.
- To map a point position, select Point as the **graphic** and use GPS as the **method**. Select the Accept button when on position. This will record a point for that GPS position which is accepted.



Adding data to points

- ♣ To add data about a point such as a monument or way-point, select the point macro button and use in combination with your GPS or Vector method. The database entry screen for that point will automatically appear after the point is recorded as shown.
- ♣ Select OK when complete and continue.

Adding Data to Lines or Areas

Once a line or polygon has been mapped, data can be attached by using the data to line or area buttons.

- ♣ Select the data to line or area button, Select Autoadd and select a node on the line. PenMap will trace the connecting line segments and associate the information from the form with the line.



Using a Laser Range Finder to target and record features

The LRF measures distance and Azimuth and Tilt angle from one point to another. In order for PenMap to record the positions which are targeted, PenMap will first need a position to assign to the instrument location or starting point. The best way is with a GPS position. Make sure the GPS is connected and select the GPS as a method and record a point. The GPS position is automatically assigned as the LRF starting point. *The starting point can also be selected manually from the screen while in the Instrument setup window.*

- When using the GPS for your position, select the Accept button on the GPS control panel after a reasonable fix has been obtained.
- Make sure the binoculars are plugged in and select the Total Station button.
- Select the Expand button to expand the screen to view more settings for this window.
- Select the Remote Trigger setting from the expanded format.
- When viewing through the LRF, a red reticle will appear on your target when you depress either of both buttons on the LRF binoculars.
- To record a position, depress and release the two buttons simultaneously and the LRF measurements will be sent to the computer. The graphic feature should appear on the screen. It may be that the point is plotted off the screen view, use data extents and zoom out to see the point.
- Experiment by selecting Polyline as the graphic and using the Vectors to target to the perimeter of an area or to create a line along a road or fence.
- Also select the Database button and target to objects such as a simple map feature like a power pole or vehicle. Note that the symbol adjustments will appear on the screen (if the setting is set as such), select the check mark on the symbol adjustments and fill out the appropriate data and select OK. See notes on symbol settings.

