

Terramodel[®] Training Guide

Basic Terramodel Concepts

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Introduction

This chapter will introduce you to some basic **Terramodel** concepts, tools and functions needed to get started. When you've learned how to apply these concepts, you can maneuver easily through more advanced **Terramodel** commands and applications.

In this chapter, you will learn how to:

- ✘ Work in multiple view windows.
- ✘ Create and manipulate layers using the **LayerSet** command.
- ✘ Label points and place dynamic text using Smart text.
- ✘ Use point snap modes.
- ✘ Use select options.

All files for the Terramodel Training Guide are located in the TRAINING folder on the TERRAMODEL CD. Although you can open project files directly from the folder on the CD-ROM disk, you will find it easier to work with these files if you first copy them to your hard disk.

To copy the project files:

1. From the Windows Explorer, open the TRIMBLE folder on your hard disk.
2. Create a new folder named **TRAINING**.
3. Copy all of the files listed for this guide from the TRAINING folder on the CD-ROM disk to the \\TRIMBLE\TRAINING folder on your hard disk.

This exercise was written for **Terramodel** version 10.1; later versions may have minor differences.

The Terramodel Screen

After you start **Terramodel** your screen should appear similar to Figure 1 shown below. The view window icons only appear after you have opened or created a project file.

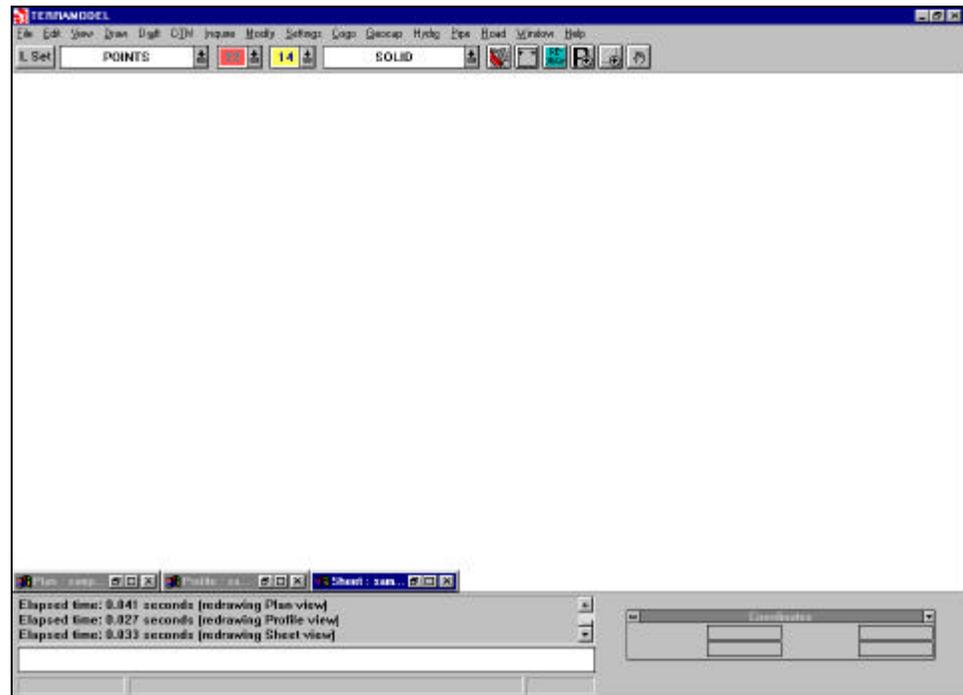


Figure 1 The Terramodel Screen

Windows Basics

The following definitions will help a new user to understand the specific terminology used within **Terramodel** when describing the windows that you see on your display.

Window— A rectangular area on your screen in which you view an application or document.

Application Window— A window that contains a running application. The name of the application appears at the top. An application window may contain multiple document windows. When **Terramodel** is running its application window can be identified by its name at the top of the window.

Document Window— A window within an application window. A document window contains a document you create or modify by using an application. There can be more than one document window within an application window, this is often called a multiple document interface (MDI). In the case of **Terramodel** the document is the project file.

View Window— A special type of document window that displays a portions of the **Terramodel** project file database. Each view window displays a single view mode of the database. Multiple view windows can be displayed within the **Terramodel** application window using the same or different view modes.

View Mode— A **Terramodel** object setting that indicates the type of data that can be displayed within a view window. As each object is created it inherits a specific view mode settings which is used to determine the type of data. The two basic view modes are *plan* and *profile* that directly relate to the traditional coordinate systems used for civil engineering applications.

View— The area that is or will be displayed within a view window.

All of the definitions reduce to the following explanation: When you create objects in **Terramodel** they are created in the plan, profile, sheet or cross section view. **Terramodel** can display objects in multiple windows of the same or different view mode. Windows and view modes are used to properly organize your data making design and drafting functions combine together to make your efforts more efficient.

Working In Multiple View Windows

Terramodel's ability to have multiple view windows open lets you view a detail of a large area at an enlarged scale, move between view windows using DISPLAY commands, move objects between view windows, and look at different perspectives of the same project at the same time. Multiple open views also facilitate creating dynaviews in other view windows. This is a powerful tool because you have control over how and what is displayed.

Terramodel has eight different view modes in which objects can be created. The first four view modes relate to the typical manner in which design and drafting are combined. Plan (view mode 1), profile (view mode 2), sheet (view mode 3) and xsection (view mode 4) are all view modes. For each view mode, you can open multiple view windows.

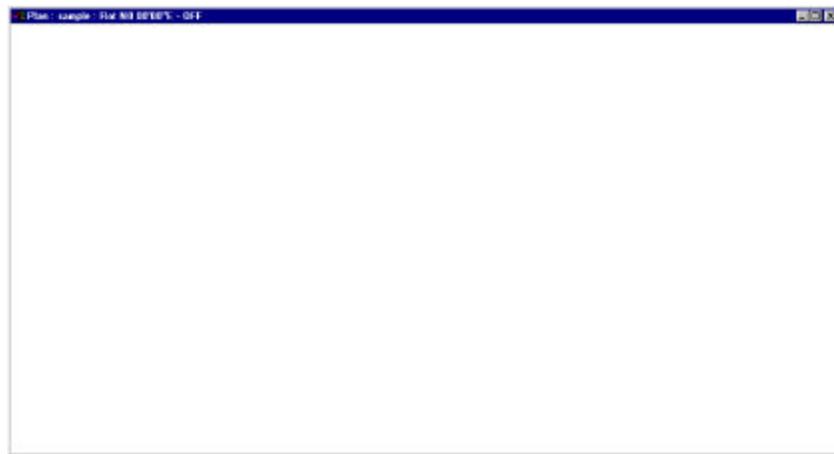


Figure 2 Sample View Window

Opening, Closing and Sizing View Windows

When you first create a project file, the plan view is shown in the middle of the **Terramodel** graphics screen. When you open an existing project file, one view each of the plan, profile and sheet view modes are typically shown as icons at the bottom of the **Terramodel** screen.

To arrange the icons at the bottom of the Terramodel graphics screen:

- From the **WINDOW** menu, choose **Arrange icons**.

To open a view window:

- Double-click the view icon you want to open, or
- Click the view icon you want to open, then choose **Restore** from the menu that opens, or
- Highlight the view icon you want to open, then from the **VIEW** menu, choose **Restore view**, or
- Click the appropriate view name in the **WINDOW** menu to place a check beside it.

To open new or additional view windows:

- From the **VIEW** menu, choose **New** or type **vnew** at the command line.
- At the command line, click the view mode for which you will create another view window.

As each view is opened, it partially obscures other open view windows. You can arrange the open view windows on the **Terramodel** graphics screen to make it easier to work in them.

To arrange the open views side by side on the graphics screen area:

- Open all views in which you will work.
- From the **WINDOW** menu, choose **Tile horizontal**.

To arrange the open views one behind another, where all title bars are visible:

- Open all views in which you will work.
- From the **WINDOW** menu, choose **Cascade**.

To move an open view window on the graphics screen:

- Move the cursor to the title bar, then drag the view window to another location on the graphics screen.

You can change the size of each view window as it appears on the graphics screen. If you move the cursor to an edge or corner of a view window, the cursor will change to a set of arrows. Press and hold the left mouse button while you move the cursor, and you can move the window corners or sides in and out. You can also expand a view window to fill the graphics screen (maximize it), or reduce it to an icon (minimize it):

To maximize an open view window:

- Click the Maximize button in the upper right corner of the view window, or
- Open the control menu in the upper left corner of the view window, then choose **Maximize**, or
- From the **VIEW** menu, choose **Maximize view**, or
- Type **vmax** at the command line.

To minimize an open view window (convert it to an icon):

- Click the Minimize button in the upper right corner of the view window, or
- Open the control menu in the upper left corner of the view window, then choose **Minimize**, or
- From the **VIEW** menu, choose **Minimize view**, or
- Type **vmin** at the command line.

To close an open view window:

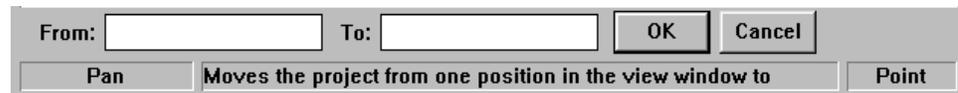
- Click the control menu in the upper left corner of the view window, then choose **Close**, or
- From the **VIEW** menu, choose **Close view**, or
- Type **vclose** at the command line, or
- Press CTRL+f4.

Panning and Zooming Between View Windows

You can specify opposite zoom window corners and pan points from different view windows, as long as the view windows are of the same view mode (plan, profile, sheet, etc.). This is especially useful if you want to specify one window corner or pan point from a view window showing a small-scale area but specify another corner or pan point from a view window that is of a larger scale.

To pan or zoom between view windows:

- From the **VIEW** menu, choose **Pan** or **Zoom**.



- In the *From:* point control, click a location in one view window from which you will shift the screen (pan) or that will be a corner of your zoom window.
- Press **TAB** to move to the *To:* point control, then click a location in the other view window to which you will shift the screen (pan) or that will be the opposite corner of your zoom window.

Copying and Moving Terramodel Objects Between View Windows

You can copy or move any of the **Terramodel** objects between view windows, as long as the view windows are of the same view mode.

To copy or move objects from one view window to another:

- Open the two view windows in which you will be working.
- From the **MODIFY** menu, choose **Move**, or from the **EDIT** menu, choose **Copy**.



- If it is not already highlighted, highlight the *Objs:* select control by clicking it with your mouse pointer, then select the objects you want to move or copy. You can use any of the select options to pick your objects (see the Select Controls section).
- Highlight the *From:* point control by clicking it with your mouse pointer or pressing the **TAB** key on your keyboard, then click a location in one view window from which you will move or copy the objects.
- Press **TAB** to move to the *To:* point control, then click a location in the other view window to which you will move or copy the objects.

Creating and Manipulating Layers

Now that you have been introduced to view windows and view modes the next concept to grasp is that of layers. When an object is created it inherits as a property a layer. The settings of the current layer are used as a quick way of assigning a color and linetype to the object as it is created. The layer can then be used to manipulate objects as a group. In addition to selecting objects by the layer name, layers have some additional settings that are used to make you job easier and **Terramodel** more powerful.

You can turn the visibility of selected layers on and off as well as separately control the visibility of individual objects on the layers. When a layer's visibility is off, **Terramodel** will not display objects on the layer regardless of the objects' visibility status, although the objects can be selected by color, linetype, and other means.

You can change the layer properties of several or all layers in a project file at the same time. This exercise will show you how to use the **LayerSet** command to control your layers.

The Layer Settings Dialog Box

Clicking the **L Set** command button on the Toolbar, as well as typing **layerset** at the command line, opens the *Layer settings* dialog box, where you can set your layer properties. See **Understanding Terramodel CAD**, "Working With Layers" in the *Terramodel User's Guide* for a detailed explanation of each of these controls.

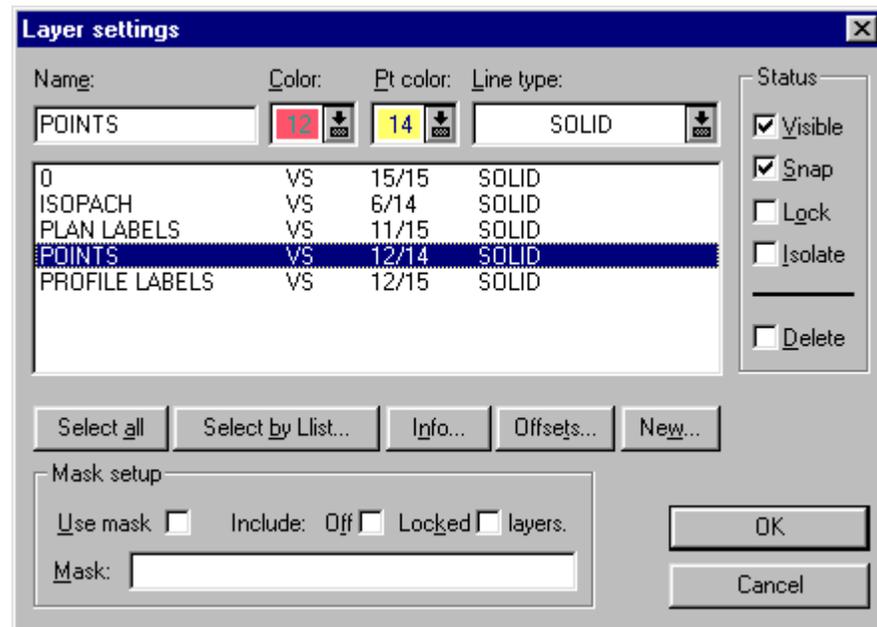


Figure 3 Layer Settings Dialog Box

Creating Layers and Assigning Properties

When you create a new layer, its properties are taken from the layer that is currently highlighted in the layer list box. Thus, you can store a layer that has the same object color and linetype of the highlighted layer, but a different name and point color. This feature lets you shorten the number of properties that you have to define when you create a new layer.

This example will show you how to create new layers in **Terramodel**. After we've created several layers, we will change some of the layer properties.

- new**
1. From the **FILE** menu, select **New project**. In the *New project name* dialog box, enter the name **layers** in the **File Name** text box. Click **Save** to open the project file.
- layerset**
2. Click the **L Set** command button on the Toolbar to open the *Layer settings* dialog box. Unless you have assigned a different prototype file (whose settings are used for each new project file you create), your layer list box should show five layers - 0, ISOPACH, PLAN LABELS, POINTS and PROFILE LABELS (Figure 3). We will create a layer based on the properties of the POINTS layer, so highlight the POINTS layer with your mouse, then click **New** to open the *New layer* dialog box.

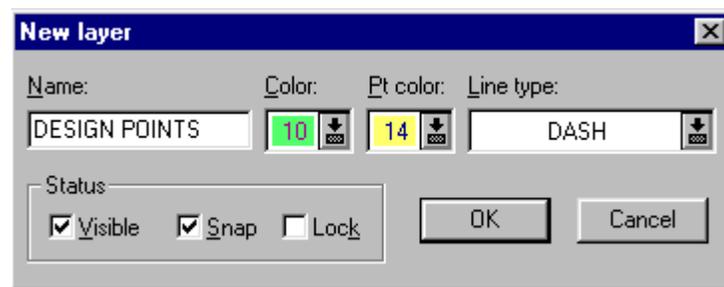


Figure 4 New Layer Dialog Box

3. In the **Name** edit text control, type **DESIGN POINTS**. Your layer name can have up to 16 characters and can include spaces.
4. Click the number shown in the **Color** control, then press the right arrow key on your keyboard until the color advances to 10. You can also change the color by clicking the down arrow next to the color number to open the *Color selection* dialog box, clicking on the color of your choice, then clicking OK.
5. Click the name shown in the **Line type** control, then type the letter D. Your linetype will change to one that begins with the letter D. If you continue to enter D, the control will advance through the linytypes that begin with the letter D. Type D until the linetype returns to DASH. You can also change the linetype by clicking the down arrow next to the linetype to open the *Linetype selection* dialog box, clicking on the linetype of your choice, then clicking OK.
6. Make sure **Visible** is checked, so that you will be able to see the objects that are on the DESIGN POINTS layer.
7. Make sure **Snap** is checked so you can select the objects on the layer for manipulation.
8. Click OK to create the new layer and close the *New layer* dialog box. The DESIGN POINTS layer is now added to the layer list box.

Changing Layer Properties

From the *Layer settings* dialog box, you can turn an entire layer on or off, enable or disable the ability to graphically snap to objects on a layer, or delete a layer. You can also select several or all layers on the project file and change one or more of their properties in a single action. We'll illustrate these features in this section.

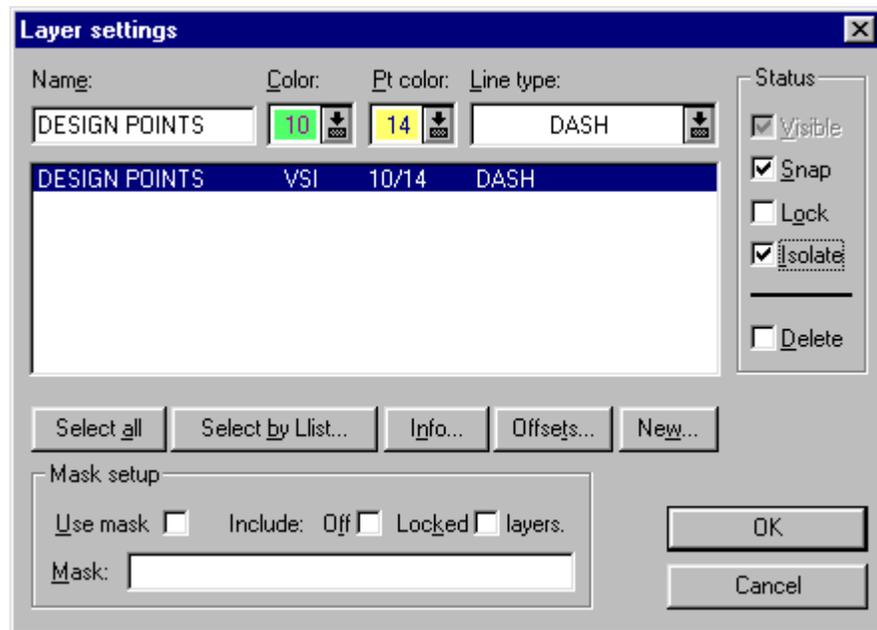
Changing the properties of a single layer

1. With your mouse, highlight the layer POINTS in the layer list box. Once the highlighted bar is on POINTS, you will see the layer information for the POINTS layer in controls on the top line of the dialog box.
 2. Change the object color for the layer by clicking the down arrow next to the color number in the **Color** control. When the *Color selection* dialog box opens, select color 11, then click OK. The object color will also change in the layer list box (the object color is the number in front of the forward slash). All new objects (except points) that you create on the POINTS layer will be created in color 11.
 3. Click OK to save the changes and close the *Layer settings* dialog box.
 4. In the layer selection control on the Toolbar, notice that the current layer is POINTS. We'll draw a new line on layer POINTS.
- pline**
5. From the **DRAW** menu, click **Pline**, then **Line**. In the *Loc:* control, type 1000,1000, press ENTER on your keyboard or click the **Create** command button on the command bar, then type 2000,2000 and click **Create**. A diagonal line from lower left to upper right will be created in color 11. (When typing coordinates, you can separate them with a space or a comma.)
 6. Click **VIEW** on the Menu bar, then **All** to enlarge the display of the line to fill the screen. Notice that most commands can be run while another command is in operation.
 7. Click **Close** on the **Pline** command bar to end the **Pline** command.

Isolating a layer

When you isolate a layer, you can view only the objects on that layer. Objects on other layers will not be visible until you remove the Isolate status from the isolated layer.

- layerset**
1. Click the **L Set** button on the Toolbar to reopen the *Layer settings* dialog box.
 2. Highlight the DESIGN POINTS layer in the layer list box. Check **Isolate** in the **Status** column. Only the DESIGN POINTS layer will be listed in the list box. The letter I is also added to the status letters in the layer list box to indicate that layer DESIGN POINTS is isolated.



3. Click OK to save the changes and close the *Layer setup* dialog box.
4. Your screen will be blank because only the DESIGN POINTS layer is visible in the display, and it contains no objects. If we had created objects on the DESIGN POINTS layer, only those objects would be visible. (Notice that the current layer listed in the layer selection control on the Toolbar is now DESIGN POINTS. Whenever you isolate a layer, it becomes the current layer.)
5. Click the **L Set** button on the Toolbar to reopen the *Layer setup* dialog box.
6. Click the **Isolate** check box in the **Status** column to remove the check. The other layers will appear in the layer list box.

layerset

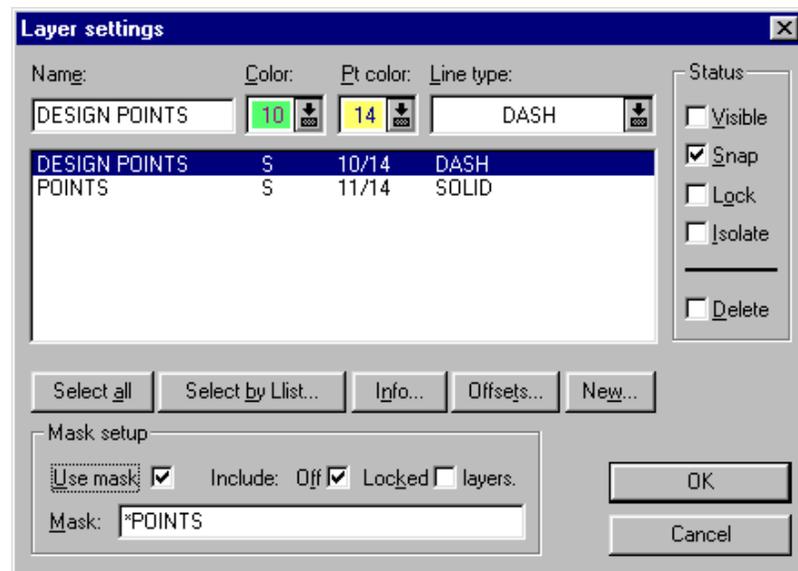
Changing the properties of multiple layers

1. To highlight multiple, consecutive layers in the layer list box, press and hold the **SHIFT** key, then click the first and last layers in the selection. To highlight multiple layers that are not in consecutive order, press and hold the **CTRL** key while clicking your layer selections. Highlight the layers POINTS and DESIGN POINTS in the layer list box by pressing and holding the **CTRL** key while clicking POINTS and DESIGN POINTS. These are standard Windows conventions and can be used throughout **Terramodel**. Notice that when you select more than one layer, the **Isolate** check box dims. You can only isolate one layer at a time.
2. In the **Status** column of the dialog box, remove the check beside **Visible**. The V is now no longer visible in the second column of the POINTS and DESIGN POINTS lines in the layer list box.
3. Click OK to save the changes and close the *Layer settings* dialog box. The line you created on the POINTS layer is still not visible because the visibility status of the layer is off. When an object is not visible, you cannot select it by picking with your cursor. You can, however, select it by layer or by color (see the “Using Select Controls” section of this training exercise beginning on page 31).

Listing layers using a mask

layerset

1. Click the **L Set** button on the Toolbar to reopen the *Layer settings* dialog box.
2. In the *Mask setup* section of the dialog box, enter *points in the **Mask:** edit text control. Check the **Off** check box next to **Include:** to list even those layers whose visibility is turned off.
3. Check the **Use mask** check box. Only the layers POINTS and DESIGN POINTS will be listed in the layer list box even though their visibility is off. The mask capability lets you shorten the list of layers in the layer list box, and is especially useful when you have a large number of layers in a project file.



4. Highlight the POINTS and DESIGN POINTS layers in the layer list box, then place a check in the **Visible** check box.

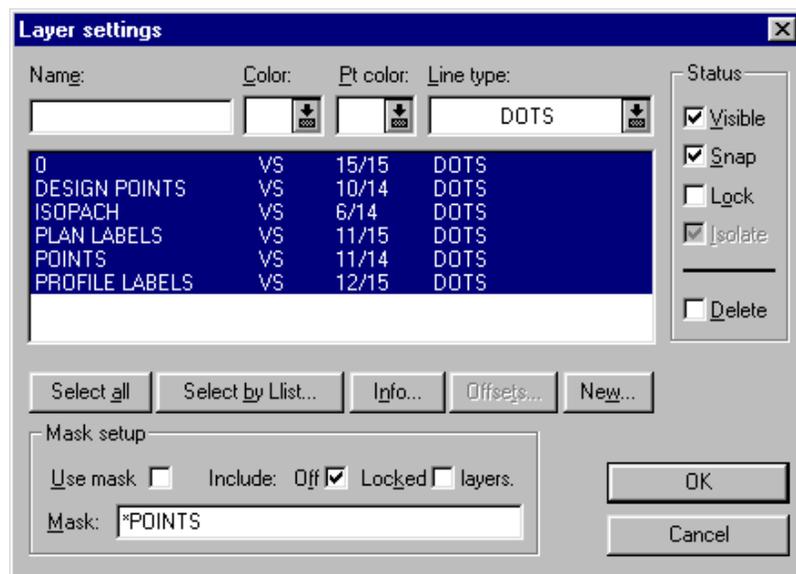
- Remove the check from the **Use mask** check box to show all layers in the layer list box.

Selecting by list

An advanced feature of **Terramodel** is that of the layer list. The user has the ability to create a named list of layers using the **lisset** command. This list of layers can then be used to turn on and off several layers as a group. A layer list can also be assigned to a dynaview so that the dynaview will only display objects that reside on the given list of layers.

Changing the linetype of a layer

- Click the **Select all** command button to highlight all layers in the list box. When you select all layers, the selections in the **Name**, **Color**, **Pt color** and **Line type** controls at the top of the dialog box will disappear because each layer has different object and point colors and a different linetype. You can set the same colors or linetypes for all highlighted layers by clicking the down arrows beside a color or linetype control at the top of the dialog box to open it and selecting a new color or linetype. Since you can't enter the same name for more than one layer, the **Name** edit text control will not accept input.
- Click the down arrow next to the **Line type** control at the top of the dialog box to open the *Linetype* dialog box. Select the DOTS linetype, then click OK. Notice that the linetype in the layer list box changes to DOTS for all layers in the list box.



- Click OK to save the changes and close the *Layer settings* dialog box.
 - In the layer selection control next to the **L Set** button on the Toolbar, change the current layer from DESIGN POINTS to POINTS.
- pline**
- From the **DRAW** menu, click **Pline**, then **Line**. Type 2000, 1000 in the *Loc:* point control on the **Pline** command line, press ENTER, then type 2000, 2000 and press ENTER. Click **Close** to exit the **Pline** command. Your line will be created in the DOTS linetype.

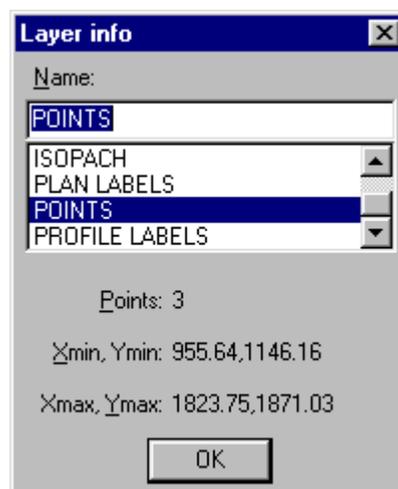
You should note that changing the property of a layer does not change the objects that have been created on the layer. All objects created after changing the settings of the layer will however, inherit the new settings.

Changing the snap capability of a layer

- | | |
|----------|--|
| layerset | <ol style="list-style-type: none"> 1. Click the L Set button on the Toolbar to reopen the <i>Layer settings</i> dialog box. 2. Highlight the POINTS layer in the layer list box. In the <i>Status</i> column, remove the check beside Snap. The S is now no longer visible in the second column of the POINTS layer in the layer list box. 3. Click OK to save the changes and close the <i>Layer setup</i> dialog box. |
| color | <ol style="list-style-type: none"> 4. From the MODIFY menu, choose Color. In the <i>Objs: select control</i>, try to pick the lower left to upper right diagonal line you created on the POINTS layer. You will not be able to select it because you turned off the Snap status for the POINTS layer. 5. Click Cancel on the Color command line to exit the Color command. |
| layerset | <ol style="list-style-type: none"> 6. Click L Set on the Toolbar to reopen the <i>Layer setup</i> dialog box. 7. Highlight the POINTS layer in the layer list box, then replace the check in Snap to enable the snap status. Click OK to save the changes and close the dialog box. |
| color | <ol style="list-style-type: none"> 8. From the MODIFY menu, choose Color. In the <i>Objs: select control</i>, pick the lower left to upper right diagonal line you created on the POINTS layer. Terramodel will find it because you turned on the Snap status for the POINTS layer. 9. Click Cancel to end the Color command. |

Displaying layer information

- | | |
|----------|---|
| layerset | <ol style="list-style-type: none"> 1. Click the L Set button on the Toolbar to reopen the <i>Layer settings</i> dialog box. Click Info to open the <i>Layer info</i> dialog box. This dialog box shows the number of points on the layer contained in the Name display, and the minimum and maximum extents for any point objects contained in the layer. (Note: we added three points to this layer to show you what type of information is displayed in this box.) Click OK to return to the <i>Layer settings</i> dialog box. |
|----------|---|



Deleting a layer

1. Highlight the DESIGN POINTS layer. Check **Delete** in the *Status* column. Notice that the status letters are replaced with ####. Click OK at the bottom of the dialog box to delete layer DESIGN POINTS. Had we attempted to delete the POINTS layer (that contains objects), **Terramodel** would have displayed this warning:



As long as a layer contains objects, you cannot delete it. If you want to delete a layer that contains objects, you must first delete the objects using the **Delete** command in the **EDIT** menu.

Labeling Using Smart Text

Terramodel for Windows has the ability to label objects with smart text. Smart text calculates the indicated information when it is displayed and automatically changes it as the referenced information changes. An example of a good use of smart text is when labeling the northing and easting of a point. When smart text is used the northing and easting values update automatically as the point moves.

Smart text uses Embedded Attribute Text (EAT) codes to define what will be displayed. The following exercise will introduce you to the basic concepts of how smart text can be used.

Creating a Point Label Block Definition

The **LabelPoint** command lets you use pre-defined blocks to label your point information. In addition to such point attribute information as coordinates, elevations, and point names, these blocks can include leader arrows, boxes, and other graphics that you create using **Terramodel** objects. Adding block capability to **Terramodel** lets you customize your point labels. You can create your own point block labels, or use the labels we have included with **Terramodel**.

The point attribute information that you can display in point labels can include X and Y coordinates, elevations, point names, point numbers, and the layer the point occupies. These attributes are dynamically calculated and updated through the use of Embedded Attribute Text (EAT) codes. When you use the **LabelPoint** command to label the point attributes, **Terramodel** places them as attribute text. To illustrate how to create block labels that include one or more of these EAT codes, we will design our own point block label.

- | | |
|-------------------|---|
| new | 1. At the FILE menu, select New . In the File Name edit text control of the <i>New project name</i> dialog box, type <code>Labels</code> . Click Save to create the new project file. An empty plan view window will open in the Terramodel screen. |
| viewset | 2. From the SETTINGS menu, select View Settings . In the <i>View settings</i> dialog box, double-click the Plot scale option, then type <code>1</code> to set our drawing scale for this project to <code>1"=1'</code> . Click OK to save the settings and close the dialog box. |
| displayset | 3. From the SETTINGS menu, select Display Settings . In the Point size section of the <i>Display settings</i> dialog box, click the radio button next to <code>3</code> to have the points in the project file displayed as three pixels. Click OK to save the settings and close the dialog box. |
| text | 4. Notice that the current layer in the layer selection control on the Toolbar is POINTS . We'll create our label definition on this layer. Click the down arrow next to the object color control on the Toolbar to open the <i>Color selection</i> dialog box. Change the object color to <code>14</code> , then click OK to close the dialog box. |
| | 5. From the DRAW menu, select Text , then Single line text to create the coordinate labels. On the command line, enter <code>N \par{y}</code> in the edit text control. <code>N</code> is the abbreviation for North that we'll include with the north coordinate label. The <code>\par{y}</code> EAT code causes Terramodel to derive the north (<code>y</code>) coordinate from the position of the labeled point and display it as a text label. |

6. Press **TAB** to move to the *Loc:* point control on the **SText** command bar and type 2000 , 2000. Click **Style** and select the TMODEL F style from the *Text style selection* dialog box. Click **OK** to close the dialog box.
7. Click **Metrics** on the **SText** command bar to open the *Text metrics* dialog box. Press **TAB** to move the cursor to the **Height** textsize control. Type 3 for the text height, then click **OK** to exit the *Text metrics* dialog box. Click **Text** on the **SText** command bar to place the text codes for the northing. From the **VIEW** menu, select **All** to view the entire label.



8. Still in the **SText** command, enter $E \ \backslash\text{par}\{x\}$ in the edit text control to have **Terramodel** label an E with the east coordinate label. Press **TAB** to advance to the *Loc:* point control, then type 1995.5 , 2000 to place the east coordinate label below the north label. Click **Text** to place the text codes for the easting. Click **Close** to exit the **SText** command. Type **all** at the command line to view the entire label.
- box**
9. From the **DRAW** menu, select **Pline**, then **Box** to create a text box around the coordinate labels. On the command line, type 1988 , 1996 in the *Corner 1:* point control, press **TAB** to move to the *Corner 2:* point control, then type 2008 , 2090 in. Click **OK** to place the box and exit the **Box** command. Type **all** at the command line to view the box and text labels.



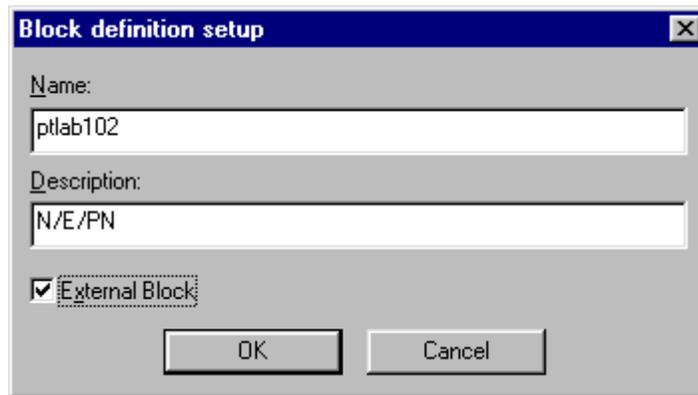
- pline**
10. From the **DRAW** menu, select **Pline** then **Line** to draw a leader line from the labeled point to the coordinate labels. On the command line, enter 1950 , 2125 in the *Loc:* point control to the left and click **Create** to locate one end of the leader line. To locate the other end of the leader line at the bottom right corner of the box around the coordinate labels, with your cursor in the plan view window, press your right mouse button to open the point snap menu and select **End**. Click the bottom right corner of the text box with your left mouse button. Click **Close** to end the leader line and exit the **Pline** command. Type **all** at the command line to view the entire label.

- text**
11. From the **DRAW** menu, select **Text**, then **Single line text** to create the point number label. On the command line, enter $\backslash\text{par}\{p\}$ in the edit text control to cause **Terramodel** to derive the point number from the labeled point(p is the EAT code variable for point number). Press **TAB** to move to the *Loc:* point control, type 1958 , 2125, then click the **Text** command button to place the attribute text for the point number. The point number will appear as ****Bad Rec**** because it is not yet referenced to a point object. Click **Close** to exit the **SText** command. Type **all** at the command line to view the entire label.

- block**
12. From the **DRAW** menu, select **Block**. Open the drop-down list box of block options at the left end of the **Block** command bar by clicking the down arrow. Select the **Create** option. Press **TAB** to move to the **Select:** control, then pick the northing label, easting label, box, leader line, and point number label with your mouse pointer. Press **TAB** to move to the **Origin:** point control, then type 1950 , 2125 for the origin of the block.



13. Click the **Name** command button to open the *Block definition setup* dialog box, and enter `ptlab102` in the **Name** edit text control. Press **TAB** to move down to the **Description** edit text control, then type `N/E/PN` for the description (as shown in the figure on page 22). **Terramodel** recognizes all block names that begin with **ptlab** as point block definitions. The three numbers at the end of the name let you assign a point block definition number between 1 and 255. This point block definition number can then be selected from a list of point block numbers in the *Description* list box in the *Point label settings* dialog box of the **LabelPoint** command (see “Labeling a Point With the Point Label Block” on page 22) when you place a point block label.
14. Check the box beside **External Block** at the bottom of the dialog box. By making this point block definition an external block, **Terramodel** stores it in an external file, letting you import it into any of your **Terramodel** project files. Click **OK** to exit this dialog box.



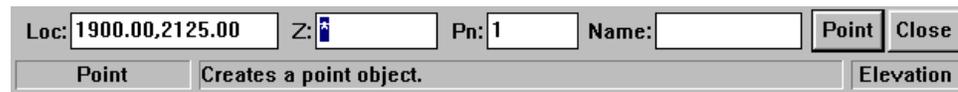
15. Click the **Create** command button on the **Block** command line to create the point label block definition, then **Close** to exit the **Block** command. **Terramodel** will notify you that a block was created with the message “*Defined block ptlab102*” in the Message scroll.

Labeling A Point With the Point Label Block

Next, we’ll place a point in the file and label it with attribute text using the block we just created. Before we create a point, go to **Point Settings** in the **SETTINGS** menu, and make sure *Automatic point numbering* is on, and *Prompt for name* is off.

point

1. From the **DRAW** menu, click **Point**, then **Point**.



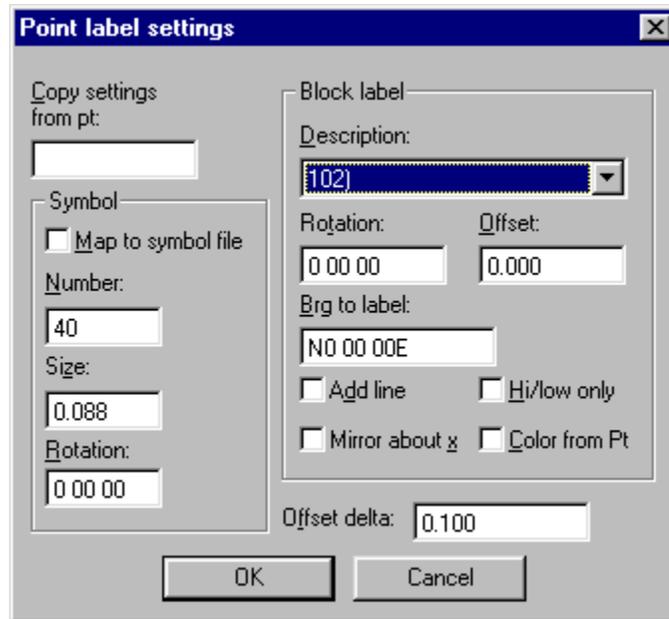
2. At the command line, enter `1900 , 2125` in the *Loc:* point control. Keep the elevation of `*` (signifying a 2-D point object) in the *Z:* elevation control.
3. Click **Point** to place your point, then **Close** to exit the **Point** command. Type **all** at the command line to view the new point you created.

labelpoint

4. From the **Draft** menu, select **Label points with blocks**.



- Click **Settings** to open the *Point label settings* dialog box. Keep the settings as shown in the figure below. In the **Block label Description** list box, click the down arrow to open the list, then scroll down until you see *102*). Click the *102*) block label description to select the point block label we created. Click OK to exit the dialog box.



- On the **LabelPoint** command line, press TAB to move to the **Pts:** locate control, then pick the point we created at coordinates 1900,2125.
- Click **Label** to label the point with the point label block we created, then **Close** to end the **LabelPoint** command. Type **all** at the command line to view the labeled point.

Using the Point Snap Modes

As you build your project file, you will probably want to create new objects by using other objects as points of reference. Point snap modes facilitate line and point construction as you build your project file. The running snap modes let you enable and disable certain point snap modes as you execute your commands. In this section, we will practice using different snap modes to create **Terramodel** objects.

Using Running Snap Modes in Line Construction

When you use the running snaps, you can select from the running point snap modes shown below in Figure 5. As you check a box adjacent to a point snap mode, its name will appear in the *Order* list to the right. You can set the order of precedence for the snap modes that are enabled by dragging them to different positions in the order box. The top position has the highest precedence, the second position the second highest, and so on.



Figure 5 Sample Running Snap Modes Dialog Box

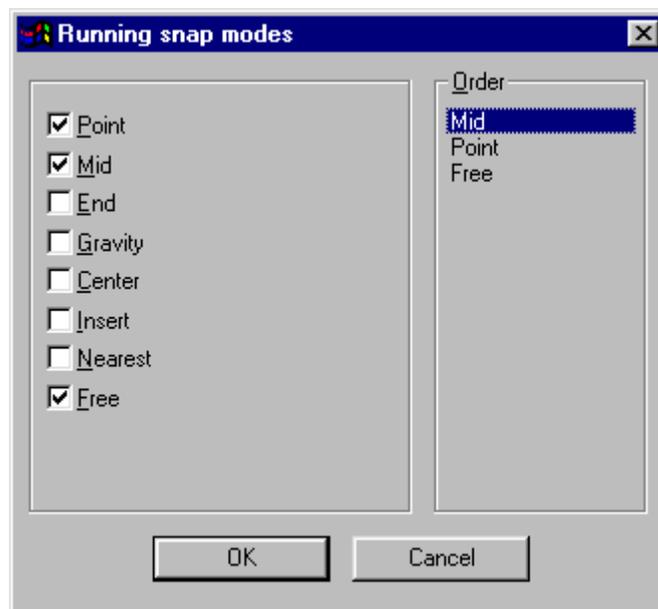
Our first example will illustrate how to use the running snap modes for polyline construction. If you have completed the “Labeling Using Smart Text” section of this chapter, you can begin this exercise at step 7. If you have not tried that exercise, begin this example at step 1.

- | | |
|-------------------|---|
| new | 1. At the FILE menu, select New project . In the File Name edit text control of the <i>New project name</i> dialog box, type Snaps. Click Save to create the new project file. An empty plan view window will open in the Terramodel screen. |
| viewset | 2. From the SETTINGS menu, select View Settings . In the <i>View settings</i> dialog box, double-click the Plot scale control, then type 1 to set our drawing scale for this project to 1”= 1’. Click OK to save the settings and close the dialog box. |
| displayset | 3. From the SETTINGS menu, select Display Settings . In the Point size section of the <i>Display settings</i> dialog box, click the radio button next to 3 to have the points in the project file displayed as three pixels. Click OK to save the settings and close the dialog box. |

4. Notice that the current layer in the layer selection control on the Toolbar is POINTS. We'll create our label definition on this layer. Click the down arrow next to the object color control on the Toolbar to open the *Color selection* dialog box. Change the object color to 14, then click OK to close the dialog box.
- text**
5. From the **DRAW** menu, select **Text**, then **Single line text** to create the north coordinate label. Type `N \par{y}` in the edit text control to the left, press **TAB** to advance to the *Loc:* point control and type `2000,2000`. Click **Style** to open the *Text style selection* dialog box and select the TMODEL style. Click OK to close the dialog box. Click **Metrics** to open the *Text metrics* dialog box, press **TAB** twice to move to the **Height** real number control, and type 3 for the text height. Click OK to close the dialog box. Click **Text** to place the attribute text for the northing and easting. Click **Close** to end the **Text** command.
- box**
6. From the **DRAW** menu, select **Pline**, then **Box** to create a text box around the coordinate labels. On the command line, type `1988,1996` in the *Corner 1:* point control, press **TAB** to move to the *Corner 2:* point control, then type `2008,2090`. Click OK to place the box and exit the **Box** command. Type **all** at the command line to view the box and text labels.
- zoom**
7. From the **VIEW** menu, select **Zoom**. Type `1936 1990` in the *From:* point control, press the **TAB** key on your keyboard, and type `2025 2185` in the *To:* point control. Click OK.
- pline**
8. From the **DRAW** menu, click **Pline**, then **Line**. In the *Loc:* control on the command line, enter `1999,1996`, then click **Create** to place the beginning control point of the polyline.



9. In the *Loc:* control on the command line, enter `1999,2090`, then click **Create** to place the second control point.
10. Press **CTRL+O** to open the *Running snap modes* dialog box. Place a check in the box beside **Mid** to add it to the **Order** list box. In the **Order** list box, drag the word **Mid** to the top of the list by holding down your left mouse button. Click OK to exit.



11. With the focus on the *Loc*: point control in the **Pline** command line, move your cursor to and click on the horizontal line you just drew. The cursor will snap to the middle of the line.
12. Press CTRL+O to open the *Running snap modes* dialog box. Remove the check from the box next to **Mid**, then place a check in the box beside **Gravity**. In the **Order** list box, drag the word **Gravity** to the top of the list. Click OK to exit.
13. With the focus on the *Loc*: point control in the **Pline** command line, move your cursor to and click on the box around the coordinate label. The cursor will snap to the center of gravity of the box.
14. Press CTRL+O to open the *Running snap modes* dialog box. Remove the check from the box next to **Gravity**. In the **Order** list box, drag the word **End** to the top of the list. Click OK to exit.
15. With the focus on the *Loc*: point control in the **Pline** command line, click the upper right corner of the box around the coordinate label by placing the corner inside the aperture box. The cursor will snap to the end of the box. Note that for the end running snap mode to find an end point the point must be within the aperture box.
16. Click **Close** to end the polyline and exit the **Pline** command.

Using Other Point Snap Modes to Build Your Project

This next example teaches you how to use some of the other point snaps modes.

- | | |
|---------------|--|
| delete | <ol style="list-style-type: none"> 1. From the EDIT menu, select Delete. Click the polyline we just created, then click OK on the Delete command bar to erase it. |
| pline | <ol style="list-style-type: none"> 2. From the DRAW menu, select Pline, then Line. 3. With the focus on the <i>Loc</i>: point control in the Pline command bar, click the upper right corner of the box surrounding the coordinate labels to begin the polyline at the corner of the box. |

4. With the focus on the *Loc:* control and the cursor in the plan view window, press your right mouse button to open the point snap menu.
5. Select **DxDy** from the point snap menu with your left mouse button to begin the line at a vertical and horizontal offset distance from a given point.
6. At the **GetPoint/ Delta X/Y snap** command line, you will see the coordinates 2008 , 2090 in the *Loc:* point control, which locates the upper right corner of the box around the coordinate label as the origin of the offset distance. Press TAB to move to the *dX* distance control and enter 50 for the change in distance in the horizontal direction. Press TAB to move to the *dY* distance control and type -25 for the change in distance in the vertical direction. Click OK to place

Loc:	2008.00,2090.00	dX:	50.000	dY:	-25.000	OK	Cancel
GetPoint	Delta-X/Y snap.					Button	

the first polyline segment.

7. With the focus on the *Loc:* control on the **Pline** command line, press your right mouse button to open the point snap menu.
8. Select **BrgDist** from the point snap menu to place a polyline at a given bearing and distance.
9. At the **BrgDist** command line, enter n45e in the *Brg* control, press TAB, then enter 45 in the *Distance* control. The *Loc:* control will display the coordinates of the cursor to which the “rubber band” is attached. Click OK to draw the polyline segment.

Loc:	1983.00,2140.00	Brg:	N45 00 00E	Dist:	45.000	OK	Cancel
GetPoint	Bearing-distance snap.					Button	

10. With the focus on the *Loc:* control on the **Pline** command line, press your right mouse button to open the point snap menu.
11. Select **Offset end** from the point snap menu to place a control point at an offset from a given line segment.
12. At the **Offset** command line and with the focus on the *Line segment:* locate control, select the polyline near coordinates 1985 , 2135. Press TAB, then in

Line segment:	9:1	Dist:	40	Offs:	20.00	OK	Cancel
GetPoint	Type:Pline, Layer:POINTS					Button	

the *Dist:* control, enter 40 as the distance along the polyline segment, measured from the opposite end of the polyline that you picked. Press TAB, then in the *Offs:* control, enter 20 as the offset distance from the polyline segment to where you want to create the control point. Click OK to place the polyline segment.

13. With the focus on the *Loc:* control on the **Pline** command line, press your right mouse button to open the point snap menu.
14. Select **Intersect** from the point snap menu to place a control point at the projected intersection of two selected line segments.

15. At the **Intersect** command line and with the focus on the *Line segment 1*: locate control, select the right side of the text box surrounding the coordinate label with your mouse, near coordinates 1990, 2090. For the *Line segment 2*: locate control, select the polyline segment you just created near coordinates 1975, 2120. A new polyline will be drawn to coordinates 1951.436, 2090.

Line segment 1: 0:0	Line segment 2:	OK	Cancel
GetPoint	Line intersection point snap.	Locate	

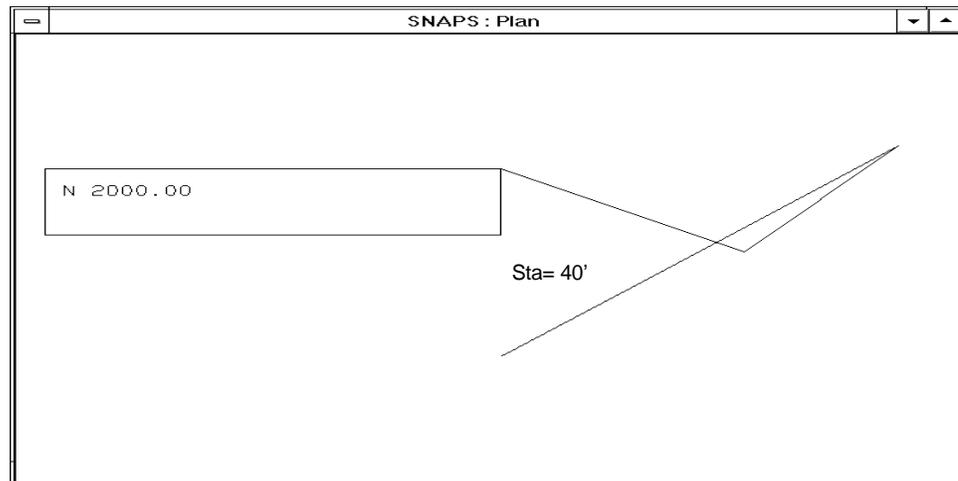


Figure 6 Polyline Created With Various Snap Options

16. With the focus on the *Loc*: control on the **Pline** command line, press your right mouse button to open the point snap menu.
17. Select **Factor** from the point snap menu to place a control point at a factored distance along a selected line segment.
18. From the **Factor** command line and with the focus on the *Line segment*: locate control, select the bottom side of the box surrounding the coordinate labels near coordinates 1988, 2020. Enter .75 in the Factor control to create the control point at .75 of the distance along the box edge. (The factored distance is measured from the opposite end of the line you pick. A factor of 1.0 forces **Terramodel** to snap to the end of the line closest to where you picked it.) Click **OK** to place the polyline segment.

Line segment: 3:4	Factor: 0.75	OK	Cancel
GetPoint	Factor snap.	Real	

19. Click the **Close** command button to end the polyline and exit the **Pline** command.
20. From the **DRAW** menu, select **Arc**, then **Curve**. From the **Curve** command line, select the **Arc** mode, press **TAB** to move to the *Pline:cp* locate control, then pick the polyline vertex located at coordinates 1983, 2140. From the **Curve parameters** command line, select **Radius** as the curve parameter you want to define, press **TAB**, then enter 30 in the adjacent distance control to place a 30'-radius arc at the polyline vertex. Click **OK** to place the arc, then **Close** on the **Arc** command bar to exit the **Arc** command.

pline

21. From the **DRAW** menu, select **Pline**, then **Line**. With the focus on the *Loc:* locate control in the **Pline** command line, press your right mouse button to open the point snap menu. Select **Center** from the menu.

Center of arc:	<input type="text"/>	OK	Cancel
GetPoint	Center-of-arc snap.	Locate	

22. From the **Center** command line and with the focus on the *Center of arc:* locate control, pick the arc we just created with your mouse. The cursor will attach to the radius point of the arc.
23. With the focus on the *Loc:* control on the **Pline** command line, press your right mouse button to open the point snap menu. Select **Perp** from the menu.

Loc:	2019.50,2134.08	Perp. to line segment:	<input type="text"/>	OK	Cancel
GetPoint	Perpendicular to line snap.			Locate	

24. From the **GetPoint/ Perpendicular to line snap** command line and with the focus on the *Perp. to line segment:* locate control, pick the polyline segment that intersects the bottom side of the text box, near coordinates 1954, 2084. A polyline will be drawn from the center of the arc, perpendicular to, and to the projected intersection of the line you selected. Click **Close** to exit the **Pline** command.

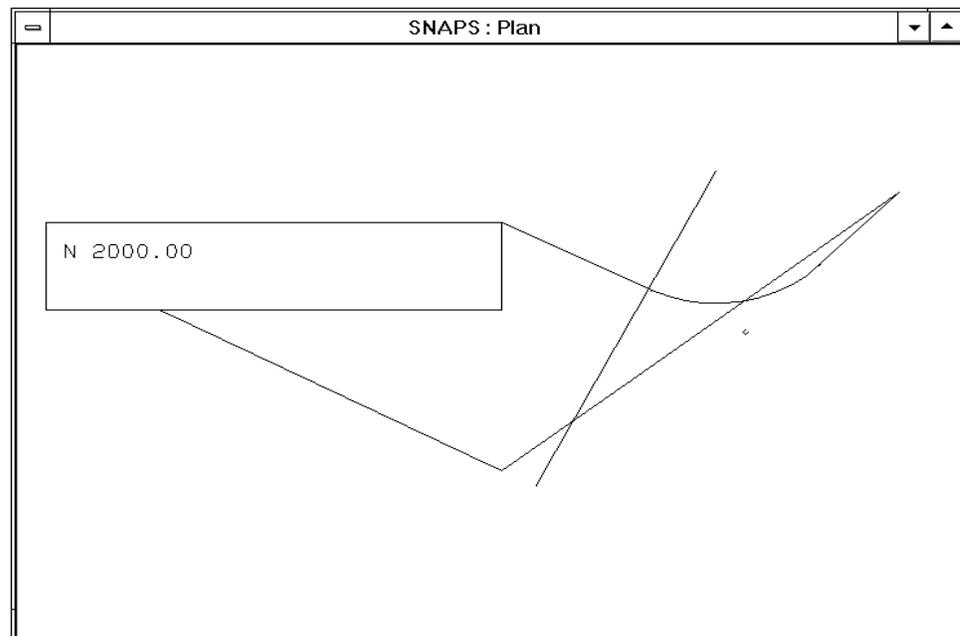


Figure 7 Polylines Drawn With Various Point Snaps

Using Select Controls

Terramodel's select controls give you flexibility and freedom in how you choose objects for modification. Alone and in combination, these controls provide unlimited ways to define a selection set. The examples that follow will illustrate how you can use select controls to build and manipulate your project files. These are only a sample of the many combinations in which the select controls can be used.

First, we'll open a new project file and create objects that we'll use to demonstrate **Terramodel's** selection features.

Creating objects for the sample file

- | | |
|-------------------|---|
| new | 1. At the FILE menu, select New . Click No to discard the changes to the previous file. In the File Name edit text control of the <i>New project name</i> dialog box, type Select . Click Save to create the new project file. An empty plan view window will open in the Terramodel screen. |
| pointset | 2. From the SETTINGS menu, select Point Settings , check the box beside Prompt for name , and click OK to close the dialog box. |
| displayset | 3. From the SETTINGS menu, select Display Settings . In the Point size section of the <i>Display settings</i> dialog box, click the radio button next to 3 to have the points in the project file displayed as three pixels. Click OK to save the settings and close the dialog box. |
| layerset | 4. Click the L Set command button on the Toolbar to open the <i>Layer settings</i> dialog box. Highlight the POINTS layer in the layer list box, then change the object color in the color control to 11. Click the New command button to create a new layer. In the <i>New layer</i> dialog box, enter newpoints for the name of the new layer. In the color selection controls, select color 12 for the object color and color 10 for the point color. Click OK to create the new layer, and OK again to close the <i>Layer settings</i> dialog box. Note that the POINTS layer is still the current layer on which our new objects will be drawn. |
| point | 5. From the DRAW menu, select Point then Point . Enter the following, clicking the |

For point #	Location	Elevation	Name
1	1000,1000	900	sample
2	2000,2000	900	sample
3	1000,3000	900	sample

Click **Close** to exit the **Point** command.

Point command button after entering each set of point data to create the point:

6. From the **DRAW** menu, select **Pline**, then **Line**. In the *Loc:* control, enter 50,600 and click **Create**, then 800,3000, click **Create**, then click **New**. For the second polyline location, enter 800,600, click **Create**, then 50,3000 and click **Create**. Click **Close** to exit the **Pline** command. Type **all** and press ENTER at the command line to view the contents of the file.

- text**
- From the **DRAW** menu, select **Text**, then **Single line text**. In the edit text control on the **SText** command bar, enter `sample` in lowercase letters. Press **TAB** to advance to the *Loc:* point control, and type `1360,1520`. Click the **Metrics** command button or press **TAB** to advance to **Metrics** and press **ENTER** to open the *Text metrics* dialog box. Press **TAB** to move to the **Height** real number control, type `1.5` for the text height, then click **OK** to close the dialog box. Click the **Text** command button to place the text, then **Close** to exit the **SText** command.
 - Click the down arrow next to the Layer selection control on the Toolbar to open the *Layer selection* dialog box. Select **NEWPOINTS**, then click **OK** to close the dialog box and make the current layer **NEWPOINTS**.
- set**
- From the **DRAW** menu, select **Set**, then **Set**. In the *Loc:* control, enter `1600,450` and press **ENTER**, then `1600,3200` and press **ENTER**. Each time the *Creating a point* dialog box opens, enter `newpoint` for the names of the set endpoints, then click **OK** to close the dialog box. Click **Close** to end the **Set** command.
- box**
- From the **DRAW** menu, select **Pline**, then **Box**. Enter `2042,1290` for *Corner 1*, press **TAB**, then type `1323,3397` for *Corner 2*. Click **OK** to place the box and exit the **Box** command. Type `all` at the command line to view all objects.

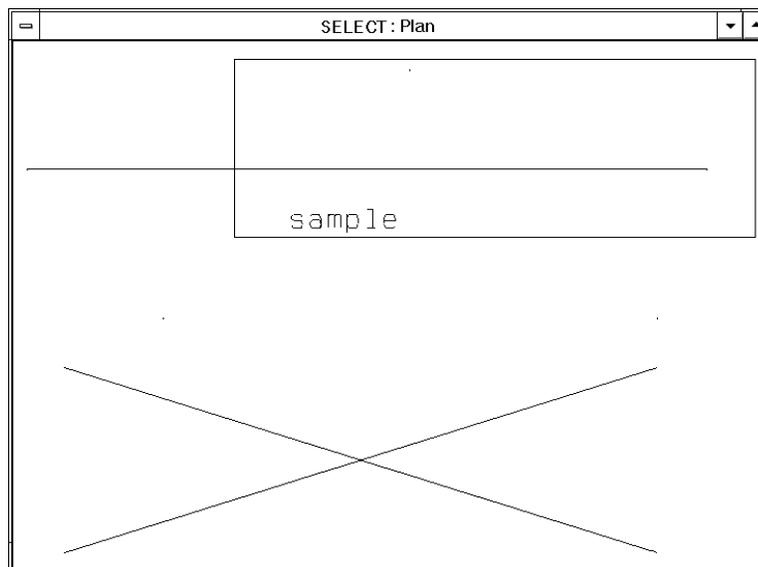


Figure 8 Objects in Select File

move

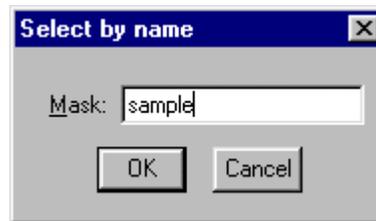
Selecting by Color

- From the **MODIFY** menu, select **Move**. With the focus on the *Objs:* select control and the cursor in the graphics area, press your right mouse button to open the select menu. Select **Color** from the menu. Pick one of the points we created with the **Point** command to select all objects with the same color (color 14). **Terramodel** will select the 3 point objects.
- Press **Tab** to advance to the *From:* locate control on the **Move** command bar, and type `1014,1012` for the coordinates. Press **Tab** again to advance to the *To:* locate control, then type `1025,417` for the coordinates. Click **OK** to move the three point objects and complete the command.

Selecting by Name

relayer

- From the **MODIFY** menu, select **Relayer**. With the focus on the *Objs*: select control, type N to choose the **Name** select option. Click the square button next to the select control to open the *Select by name* dialog box. Type *sample* (in lowercase letters - the Name select option is case-sensitive) in the **Mask** edit text control, then click OK to close the dialog box. **Terramodel** will select the three points we created and the text object (a text object's name is the text itself) for a total of 4 objects.

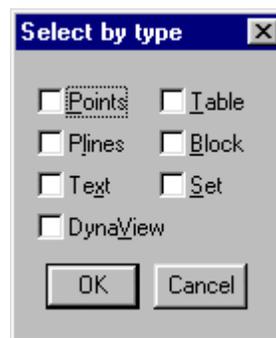


- In the **Relayer** command bar, press TAB to advance to the **New Layer** layer control, then type N to advance to the layers whose names begin with N. Because we have only one layer whose name begins with N, the NEWPOINTS layer name will be shown in the layer control. Click OK to move those objects having the name *sample* to layer NEWPOINTS.

Selecting by Type

linetype

- From the **MODIFY** menu, select **Linetype**. With the focus on the *Objs*: select control, type T to choose the **Type** select option. Click the square button next to the select control to open the *Select by type* dialog box. Place a check in the box beside **Plines**, then click OK to close the dialog box. (Instead of opening



the *Select by type* dialog box, you can also pick a polyline on the screen to designate the polyline object type.) **Terramodel** will select the crossing polylines and the polyline box (3 objects).

- Press TAB to advance to the **New linetype** linetype control on the **Linetype** command bar, then type D to advance to the names of linetypes that begin with D. The Dash linetype name will be shown in the linetype control. Click OK to change the linetype of all polylines in the file. Type **redraw** at the command line to have **Terramodel** refresh the screen.

Selecting by Linetype OR (+) Offline

rotate

17. From the **MODIFY** menu, select **Rotate**. With the focus on the *Objs:* select control, type L to advance to the first select option that begins with an L. If the select option shown in the control is something other than **Linetype**, use the forward arrow key to advance to the **Linetype** select option. Click the square button next to the select control to open the *Select by linetype* dialog box. Pick the Dash linetype from the list box, then click OK to close the dialog box. **Terramodel** will select the crossing polylines and the polyline box (3 objects).
18. With the focus on the *Objs:* select control and the cursor in the graphics area, press your right mouse button to open the select menu. Pick the **OR (+)** select option to specify an additional group of objects for the selection set, then type O to advance to the **Offline** option. Pick the set line we created earlier near coordinates 1600,1445. **Terramodel** will highlight the endpoints of the set line and add them (but not the set line) to the selection set for a total of 5 objects.
19. Press TAB to advance to the *Around:* locate control and enter the coordinates 661,1789. Press TAB to move to the **Angle** control, then type 45. Click OK to rotate the polylines with a Dash linetype and the set endpoints and exit the command.

Objs:	OfLine	Around:	661.00,1789.00	Angle:	45	OK	Cancel
Rotate		Rotates objects around a selected point.				Angle	

20. To view the changes, type **redraw** at the command line. Notice that we rotated the set line not by selecting the set itself, but by selecting its endpoints.
21. Type **undo** at the command line to reverse the affects of the **Rotate** command, then type **redraw** to refresh the screen.

Selecting by Window AND (*) Inside XOR (^) Record

reference

22. From the **MODIFY** menu, select **Reference** to reference selected objects to a parent object. With the focus on the *Objs:* select control, type W to advance to the **Window** option. With the focus still on the *Objs:* control, move your cursor to coordinates 2080,420 and pick with your left mouse button, then move it to coordinates 40,3420 and pick again to place a window around the contents of the screen. **Terramodel** will add the 2 crossing polylines, the polyline box, the text, and the set line to the selection set. (Point objects are not added to the selection set because they can't be referenced to other objects.)
23. With the focus on the *Objs:* control and the cursor in the graphics area, press the right mouse button to open the select menu. Pick the **AND (*)**select option to specify an additional selection set. The objects **Terramodel** will choose must belong to both of these selection sets.
24. With the focus on the *Objs:* control, type I to advance to the **Inside** option. Pick the polyline box near coordinates 1331,1343. **Terramodel** will include only the text in the selection set since it is the only object that fits both selection criteria. (Again, the point object is not added because points can't be referenced to other objects.)
25. With the focus still on the *Objs:* control and the cursor in the graphics area, press your right mouse button to open the select menu. Pick the **(XOR)^** select option to add to the selection set. **Terramodel** will include objects in the

selection set that meet the **Window * Inside** criterion OR the criterion we will establish next but not those objects that match both.

26. With the focus on the *Objs:* control, type R to advance to the **Record** select option. Pick the box surrounding the text near coordinates 1331,1343 to add the box and text to the selection set (a total of two objects).
27. Press TAB to move to the *Parent* locate control and select the set line near coordinates 1600,1100, to reference the text and the polyline box to the set

Selecting by View AND NOT (-) Elevation or Reference

line.

copy

28. From the **EDIT** menu, select **Copy** to copy selected objects to another location. With the focus on the *Objs:* select control, type V to advance to the **View** option. Pick any object on the screen to select all objects in the current (plan) view (10 objects). You can also click the square button next to the select control to open the *Select by view* dialog box and check the boxes of the views you want to select.
29. With the focus still on the *Objs:* select control and the cursor in the graphics area, press your right mouse button to open the select menu. Pick the AND Not (-) select option to remove certain objects from the selection set that meet the criteria below.
30. With the focus in the *Objs:* control, type E to advance to the **Elevation** option. Pick the point we created then moved to coordinates 1011, 2405 to remove from the selection set all objects that have an elevation of 900 (the three points we created). **Terramodel** keeps 7 objects in the selection set.
31. With the focus on the *Objs:* control, type R then press the forward arrow key on your keyboard to advance to the **Reference** select option. Pick the text object to remove from the selection set all objects that have the same reference number as the text object (the text object and the polyline box). **Terramodel** keeps 5 objects in the selection set.



32. Press TAB to advance to the *From:* locate control on the **Copy** command bar, then enter the coordinates 1000 ,1700. Press TAB to move to the *To:* locate control and type the coordinates 1850 ,2650. Click OK to copy only the crossing polylines and the set line to another location.

This concludes this exercise. The following exercises will give you more practice and demonstrate how and when to use these basic concepts of **Terramodel**.

Reader Comment Form

Basic Terramodel Concepts

March 2002
Revision A

We appreciate your comments and suggestions for improving this publication.

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