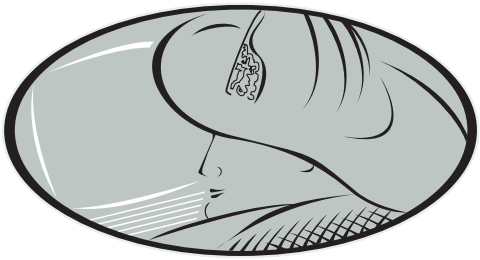
The **CAMEO®** Software System



MARPLOT®

USER'S MANUAL

February 2007

U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Emergency Management
Washington, D.C.

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
Office of Response and Restoration
Emergency Response Division
Seattle, Washington

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Table of Contents

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Welcome to MARPLOT

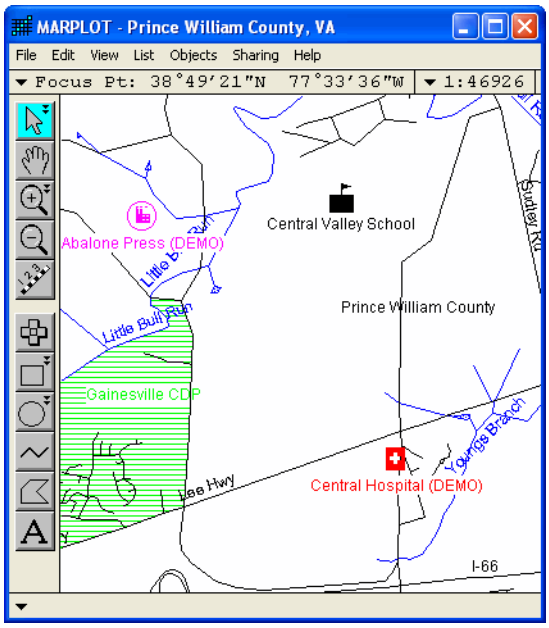
This chapter contains an overview of MARPLOT®, an explanation of how to use this manual and MARPLOT's on-screen help, and a discussion of basic concepts.

About MARPLOT

Key program features

MARPLOT (Mapping Application for Response, Planning, and Local Operational Tasks) is a general-purpose mapping application program with the following features:

- Easy-to-use GIS interface;
- Ability to add objects (such as schools or chemical facilities) to the map and mark them using MARPLOT's set of symbols or an inserted picture;
- Allows you to customize the maps by specifying which layers appear and whether objects in those layers (such as roads) are labeled;
- Simple, all-inclusive search mechanism for map objects;
- Links objects on the maps to data in other programs, such as CAMEO® and LandView®; and
- Easily displays ALOHA® threat zones.



MARPLOT was developed jointly by the National Oceanic and Atmospheric Administration (NOAA) and the Environmental Protection Agency (EPA).

MARPLOT's menu bar

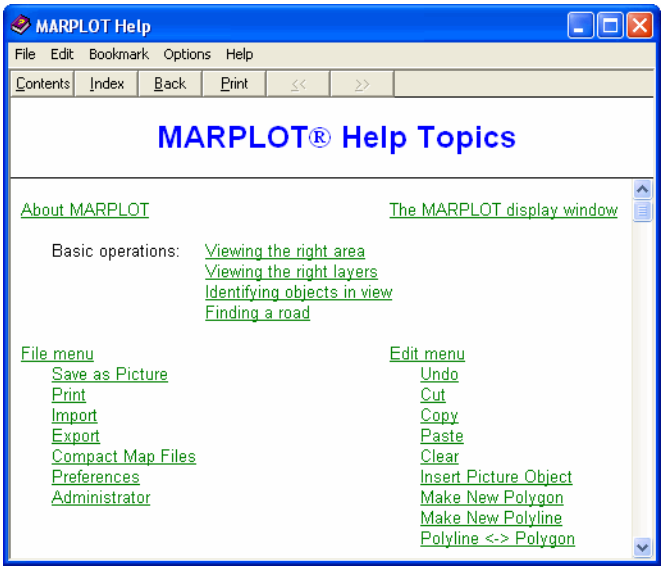
You can perform operations on MARPLOT maps using these menus:

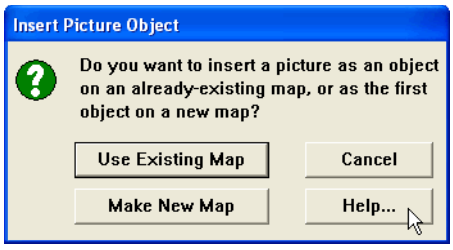
- **File:** Choose items from the File menu to perform basic operations (such as printing and setting preferences) and administrative operations (such as importing/exporting, compacting map files, and setting MARPLOT to multi-user mode). For more information, see "File menu" on page 45.

- **Edit:** Choose items from the Edit menu to (a) undo the last object change you made, (b) delete an object, (c) insert a picture object (such as a logo) onto the map, and (d) create new polygons and polylines. For more information, see "Edit menu" on page 51.
- **View:** Choose items from the View menu to (a) navigate around the map, (b) save and use views, and (c) use the map insets and other map window displays. For more information, see "View menu" on page 54.
- **List:** Choose items from the List menu to (a) perform database searches, (b) work with the list of found objects (called the Search Collection), and (c) access the list of layers and the list of maps. For more information, see "List menu" on page 59.
- **Objects:** Choose items from the Objects menu to (a) get information about objects, (b) adjust vertex settings, (c) move objects to a different layer or map, and (d) modify an object's graphical attributes. For more information, see "Objects menu" on page 73.
- **Sharing:** Choose items from the Sharing menu to share information with other programs, such as ALOHA, and CAMEO, and LandView. For more information, see "Sharing menu" on page 78.
- **Help:** Choose items from the Help menu to see the help topics list and to get information about MARPLOT.

Getting help

On-screen help is available when MARPLOT is running. The list of help topics can be accessed through the Help menu. Also, most screens have Help buttons that take you to a screen-specific help topic.





In Windows. To see the list of help topics, select Topics from the Help menu. When the list appears, click any topic name to view a discussion of that topic. When you've finished reading about that topic, click Contents to return to the list of topics. When you are ready to go back to using MARPLOT, close or minimize the Help window.

On a Macintosh. To see the list of help topics, select Topics from the Help menu. When the list appears, highlight a topic name, then click Select to view a discussion of that topic. When you've finished reading the help topic, click (a) Topics to return to the list, (b) Cancel to close the window, (c) Copy to copy the help text to the clipboard, or (d) Print to print the help text.

How to use this manual

This manual includes seven chapters. Begin here in Chapter 1 by reviewing a discussion of basic concepts. Turn to Chapter 2 for a step-by-step MARPLOT tutorial. Chapter 3 contains explanations of each of MARPLOT's menus, along with information about the map display window and all of the MARPLOT tools. Turn to Chapter 4 for MARPLOT example problems and refer to Chapter 5 for some quick help diagrams. Chapter 6 includes information for MARPLOT administrators (system managers). Review Chapter 7 for trouble-shooting advice. At the back of the manual, you'll find an appendix with MARPLOT symbol information, a glossary, and an index.

Other sources of MARPLOT information

This manual is one of three important sources of information about MARPLOT. The other sources are the on-screen help and the MARPLOT Technical Documentation.

You can access the on-screen help as you use MARPLOT. By using the Help buttons on many of MARPLOT's dialog boxes, you can get immediate information about the function you are currently performing.

The Technical Documentation gives details about the formats of the various files used by MARPLOT, including the MARPLOT Import/Export (MIE) format. It also contains a list of interapplication communication (IAC) messages MARPLOT sends and receives.

Basic MARPLOT concepts

The rest of this chapter is an overview of key MARPLOT concepts.

Objects

Objects are the basic map elements that MARPLOT draws and lets you manipulate. There are seven different types of objects: points (symbols), rectangles, circles, polygons, polylines, text labels, and picture objects. You might use a point object to mark the location of a facility or accident site. Polylines are used to represent things like roads and streams. Polygons are used to represent things like parks or water bodies. MARPLOT provides functions for creating, examining, and modifying each type of object. The objects are organized into layers and maps.

Layers

A layer is a category of objects. For instance, a layer called Roads might contain a large number of polyline objects representing roads. A layer called Facilities might contain point objects representing the locations of facilities. Although a given layer often contains only one type of object, this is not necessarily the case. For instance, a layer called Water might contain some polyline objects representing streams and some polygon objects representing larger water bodies. It is useful to organize objects into layers because then you can operate on the objects in a given layer as a group. For instance, you might choose to hide or show all of the roads. Or you might want to select all or some of the facilities to get information about them. It is possible to move an object from one layer to another, but an object can be on only one layer at a time.

Maps

A map is a folder on your computer—often located in the same folder as the MARPLOT application program—that contains several files. These files contain the objects on the map. Often, a map covers the area of a single U.S. county, but maps can be much smaller or much larger than that. It is possible to expand maps by adding new objects to them, or shrink them by removing objects.

You can have any number of maps in use at a given time. If you use MARPLOT to view an area that intersects with more than one map, all maps in the displayed area are drawn simultaneously on the screen. In fact, it is possible for the geographical areas covered by two or more different maps to overlap. All of the maps that MARPLOT is aware of are always present, and there is no need to close one map before opening another to view it. However, it is possible to put a map out of use, so that it is not drawn on the screen. In most cases, you do not need to be concerned with the fact that the image shown on the screen is actually a composite of two or more MARPLOT maps. For convenience, when the distinction between maps is not important, we often refer to the collection of maps shown on the screen simply as "the map."

Relationship between maps and layers

We have said that layers contain objects, but also that maps contain objects. The truth is that each MARPLOT object is on a particular layer and on a particular map. For instance, you can have a road object on the Roads layer of the LA County map, or you can have a river object on the Water layer of the Orange County map, or you can have a park object on the Miscellaneous layer of the Orange County map.

In most cases, you will think primarily in terms of layers and secondarily in terms of maps. For instance, suppose you are using MARPLOT's search function to find "Park Ave." You know that "Park Ave" will be found on the Roads layer, so you would choose to limit the search to that layer. As for the map(s) to be searched, however, you can generally specify simply the "Map(s) in View." Even if you have more than one map, it is most common to search for an object on the map that you are currently looking at.

The main point to remember is that for the most part when using MARPLOT you can think in terms of layers (in terms of the type of object) and not worry about the fact that there is more than one map. However, for certain operations, such as when searching for a road when several maps are in view, you can greatly increase efficiency by specifying a particular map whenever possible.

Views

MARPLOT provides a number of tools for navigating around your maps. You can zoom in and out, shift the view in any direction, or change the view to show a particular object or group of objects.

You can also save the area you are looking at, along with a miniature image of the map window. The saved view can be used in a number of different ways. You can return to it at a later time. You can use it as a reference view to help with future navigation. You can choose a saved view to be the entry view—that is, the view MARPLOT automatically shows when it starts. Also, if your MARPLOT system is multi-user, you can choose whether a given view that you save is for your use only, or if it is meant to be shared with other system users.

Search Collection and selected objects

MARPLOT provides a flexible mechanism for searching for objects (described more fully in "Search" on page 60). You can search for objects by name or by their position relative to other objects. You can also limit the search to certain layers and/or certain maps. When a search is performed, the objects matching your specified criteria are put into a list called the Search Collection. From the Search Collection, you can choose an object and display it on the map, or look for address ranges and intersections of certain types of objects. This Search Collection list is saved until you explicitly change it. For instance, this allows you to return to the list to show another object. You can also save a Search Collection for use at a later time.

In addition to the objects in the Search Collection, another important set of objects includes those that are currently selected. Every time you click on an object on the screen, MARPLOT selects that object by drawing small red squares around it and displays its name and other information about it at the bottom of the window. It is possible to select more than one object at a time. The functions in the Objects menu apply to the selected object or objects. For instance, when you choose an item from the Color submenu, you change the color of all of the selected objects.

You can copy the objects that are currently selected into the Search Collection. Going the other way, you can select all of the objects in the Search Collection. Between the Search Collection and the selected objects you have a number of mechanisms for dealing with groups of objects.

Linking objects to data in other programs

MARPLOT contains limited information about each object: the color and other graphical attributes, the name, the address ranges of most roads, and a few other pieces of information. Most users are interested in associating MARPLOT objects with data records in other programs, usually databases like CAMEO and LandView. The basic procedure is to establish a link between an object in MARPLOT and a record in the database, either through a manual or an automated procedure. Once links have been established, you can select objects in MARPLOT and choose to go to the associated records in the database. Going the other way, you can select records in the database and choose to view the associated objects on the map.

The specific mechanism for establishing links depends on the particular database application you are using with MARPLOT and the nature of the associated map data. However in most cases creating and using links involves using the Sharing menu in MARPLOT and/or the database application. For more information about links and the Sharing menu, see "Sharing menu" on page 78 or the documentation for your database application.

Object identification

For the most part, you will identify objects on the map by their name, layer, and map. For instance, you may find "Fairfax Ave" on the Roads layer of the LA County map. Internally, MARPLOT has a slightly different mechanism for keeping track of objects: it uses the layer and map name, but—instead of using the object name—MARPLOT assigns each object a unique identification number. For the most part, you need not be aware of this identification number. However, it does come into play when importing and exporting objects (see "Import" on page 46 and "Export" on page 47) and when linking objects to databases.

When MARPLOT imports an object with the same identification number, layer, and map as an existing object, MARPLOT replaces the existing object with the newly imported one by default. MARPLOT's default import behavior is designed for sharing and updating data from a source MARPLOT system to your MARPLOT system—the idea being that the new object with the same identification information is an update of the old object. **Note:** The default settings can be modified using the Options button on the Import dialog box.

When a link is established between a MARPLOT object and a record in a database program, the database program keeps track of the link by storing the layer name, map name, and identification number of the given object.

Administration and user permission

Your MARPLOT system can be set up in either single-user or multi-user mode.

In multi-user mode, there is a system administrator who has the ability to give other users access to the system by giving them a password. The administrator also chooses whether each user will access MARPLOT with browse-level or edit-level permission. Users who have browse-level permission can perform most MARPLOT functions, but cannot access certain functions that have the potential to damage or delete important map data. Users who have edit-level permission can access all MARPLOT functions, including those that are potentially dangerous.

In a multi-user system, each user is given a folder within the USERS folder, which itself is within the MARPLOT folder. The user's folder contains information about the user, the user's MARPLOT preferences and layer order, any views the user has saved, and a special user's map that the user can edit (even if the user does not have edit-level permission).

In single-user mode, there are no passwords and anybody who starts MARPLOT is given edit-level permission.

Some mapping concepts

Scale. Among other obvious differences, computer maps like those in MARPLOT differ from regular maps on paper in that you can zoom in or out—that is, you can view them at different scales. When we talk about the scale of a map, we mean the size of objects on the map relative to the size of those objects in the actual world. For instance, suppose a certain road is one mile long. If the line representing the road on the computer monitor is 1 inch long, we say that the scale is "1 inch = 1 mile." If we zoom out (show more map area on the screen) such that the line on the monitor is now half an inch long, we say that the scale is "0.5 inch = 1 mile" or "1 inch = 2 miles." When we talk about one scale being larger than another scale, we mean that the first scale is "more zoomed in" than the second. For instance, the scale "1 inch = 1 mile" is larger than the scale "1 inch = 2 miles."

Note: You may notice that MARPLOT's interpretation of a screen inch will not agree with a ruler laid against your computer monitor. The discrepancy will depend upon your computer system and monitor settings and you may not notice it unless you actually measure it. Rest assured that the scales on maps printed from MARPLOT will be accurate and will agree with a ruler laid against the printouts.

Consider the scale "1 inch = 1 mile." We can express this scale without reference to units such as inches or miles. To do this we note that 1 mile is equal to 5,280 feet and a foot is 12 inches, so there are 63,360 inches in a mile (5,280 feet/mile x 12 inches/foot). We can write our scale as "1:63360" meaning that one inch (or one centimeter or one whatever) on the map is equal to 63,360 inches (or 63,360 centimeters or 63,360 whatevers) in the actual world.

This gives us two ways to write scales: the "1 inch = 1 mile" format or the "1:63360" format. Another way of indicating scale is to specify how much area is covered by the entire map being viewed. For instance, we can write "7 miles x 6 miles" to indicate that our computer map is displaying 7 miles across by 6 miles up and down.

MARPLOT allows you to display the scale in any of the three formats:

- 1 in = 1 mi,
- 1:63360, or
- 7 x 6 mi.

When to show? When to label? Certain types of map data are appropriate to display only at certain scales. For instance, consider the network of roads in a city. When you are viewing the map at "1 inch = 0.1 mile" or even "1 inch = 3 miles," it may be useful to see the roads—although at the latter scale the roads will probably be drawn very close together. When you change to a scale such as "1 inch = 10 miles," it doesn't make sense to draw the city roads, since they will be so close together on the screen that they will appear as a solid black mass.

On the other hand, if you have a map of the outlines of the 50 U.S. states, it is reasonable to view this data at "1 inch = 100 miles" or a smaller scale. However, a much larger scale such as "1 inch = 1 mile" would not be useful for viewing this data, since—being so far zoomed in—you would only be able to see a tiny section of state boundary on the screen.

In addition to the question of whether to display certain data at all at certain scales, there is the question of when certain data should be labeled on the screen—that is, when should we attempt to draw the names of the roads or the states? Even at scales such as "1 inch = 1 mile," when the roads themselves will be distinguishable, we probably do not want to label the roads, since the names will crowd each other on the screen and will be illegible. We'll generally only want to label roads at scales larger than "1 inch = 0.1 mile." On the other hand, states could be labeled at much smaller scales.

MARPLOT allows you to specify scale ranges within which each layer should display. You can also specify the scale at which labels for each layer appear (see "Layer List" on page 66).

Latitude and Longitude. In everyday conversation, we usually refer to locations by reference to other known locations. For instance, we say "My house is on the corner of 4th and Main." MARPLOT allows you to find locations similarly by specifying street intersections or street addresses. However, a more universal method of specifying locations is to use latitude/longitude coordinates. Latitude is a value in the range of 90 degrees south (the South Pole) to 90 degrees north (the North Pole). The equator is at zero degrees latitude. The line of 40 degrees latitude cuts across the U.S. from Northern California to New Jersey. Longitude is a value in the range of 180 degrees west to 180 degrees east. Zero degrees longitude is the semi-circle that runs from South Pole to the North Pole through Greenwich, England. The 48 contiguous U.S. states are framed roughly between 67 degrees west and 125 degrees west.

Any point on the globe can be specified by giving its latitude (how far north or south) and longitude (how far east or west). For instance, the corner shared by the U.S. states Utah, Colorado, Arizona, and New Mexico is approximately at 37 degrees north, 109 degrees west.

If more precise measurements are needed, we divide each degree (latitude or longitude) into 60 minutes, and each minute into 60 seconds. (One minute latitude is approximately 2,000 yards; one minute longitude varies from about 2,000 yards at the equator to 0 yards at each Pole.)

MARPLOT can display latitude/longitude values in three different ways:

1. As a degree value followed by a decimal degree fraction. For example, 40.250000° represents 40 and 1/4 degrees, which is the same as 40 degrees and 15 minutes.
2. As a degree-minute-second triplet. For example, 40°25'00" represents 40 degrees, 25 minutes and zero seconds. Note that is not the same value as given in the previous example: 25 minutes is almost half a degree, not a quarter.
3. As a degree-minute pair, where the minutes have a decimal fraction. For example 40°25.50' represents 40 degrees and 25.50 (25 and a half) minutes.

TIGER/Line database and LandView

Most MARPLOT users in the U.S. will work with one or more MARPLOT maps that are based on data from the TIGER/Line® geographical database, which is maintained by the U.S. Census Bureau. Each of these maps covers a single U.S. county or territory. For more information about obtaining MARPLOT maps, see "Adding maps to your MARPLOT system" on page 148.

LandView is a database management system that uses MARPLOT as its map viewer. The LandView database includes information from the U.S. Environmental Protection Agency (EPA), U.S. Geological Survey, and the U.S. Census Bureau. LandView's collection of data (such as EPA-regulated sites and demographic and economic information from the 2000 census) is automatically linked with the associated MARPLOT maps and can be queried using MARPLOT's search mechanism.

LandView is distributed on DVDs or custom CDs containing the LandView software, database information, and maps derived from the TIGER/Line database. Because the maps are in the MARPLOT format, MARPLOT users can use the maps on the LandView disks. For more information about LandView, please go to http://landview.census.gov.

Accuracy of the TIGER/Line database

The geographical data in the TIGER/Line files is derived from various sources, which themselves have various degrees of positional accuracy. In general, you should not count on TIGER-derived map features to have better accuracy than the established National Map Accuracy standards for 1:100,000-scale maps from the U.S. Geological Survey (approximately +/- 167 feet). You can, however, count on map features being in the correct location relative to one another (e.g., if a stream appears to run along the north side of a road, it really is to the north of the road).

The accuracy of any geographical database depends on several factors. One of these is the mathematical model of the shape of the earth used when determining the latitude/longitude coordinates of features within the database. The coordinates in the current TIGER/Line database are based on the North American Datum of 1983 (NAD83). A "Datum" includes a mathematical model of the earth along with a set of measured or calculated control points. Until 1995, TIGER/Line coordinates were based on the North American Datum of 1927 (NAD27), which was defined in terms of modeling and surveying techniques used in the 1800s. Coordinates in the NAD83 database can differ from those of the NAD27 database by about 600 meters (656 yards) in certain places. More information about the TIGER/Line database is available at http://www.census.gov/geo/www/tiger/.

For more information on NAD27 and NAD83, see *The North American Datum of 1983, A Collection of Papers Describing the Planning and Implementation of the Readjustment of the North American Horizontal Network*. American Association for Geodetic Surveying, Monograph No. 2. ACSM, Falls Church, VA. 49pp.

2 Guided Tour

This section provides a hands-on guide to the most common MARPLOT functions using the sample map (for Prince William County, Virginia) that is included with the MARPLOT application. Additional examples are given in Chapter 4.

An important note before starting the tour:

As you move through this guided tour, you may notice that your MARPLOT screen does not exactly match the pictures shown in this manual. If your MARPLOT application still has the default preferences and other settings, then your screen will look fairly close to our example screens. (They may vary a bit based on the size of the window you are using or your zoom settings.) Even if you have modified the default MARPLOT settings, you should be able to do most of the exercises in this guided tour.

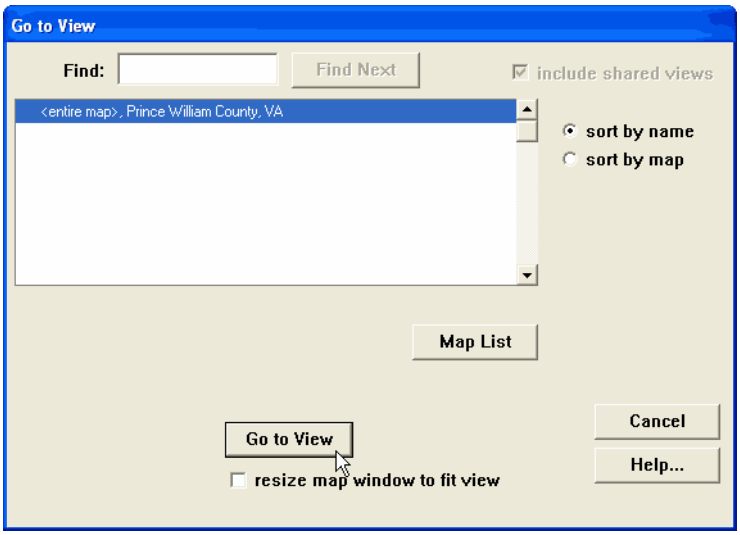
Additionally, this guided tour makes use of sample objects (that is, fictitious facilities and hospitals) on the CAMEO Map. The CAMEO Map is a folder stored in the CAMEO folder of the CAMEO application. (CAMEO is one of the programs that works interactively with MARPLOT. For example, locations stored in the CAMEO database can be linked to a MARPLOT map and displayed automatically.) If you do not have the CAMEO Map, you can still follow along with most steps of the tour. However, there will be differences between your screen and those shown in this manual—namely, there will not be any icons in the northern part of the county. (If you zoom in, you will see that the names of these fictitious facilities and hospitals all include the word DEMO.)

CAMEO users: You must *run MARPLOT and CAMEO simultaneously* on your computer at least one time before going through this tour. To do this, start the MARPLOT program and then the CAMEO program (entering any necessary passwords). Make sure you see the CAMEO Map objects in MARPLOT. Then quit both programs. After having done this, the CAMEO Map objects will continue to appear in MARPLOT, even when CAMEO is not running.

Showing different layers

1. Start MARPLOT. (In Windows®, click the Start button, point to Programs, then choose the MARPLOT item. On a Macintosh®, double-click the MARPLOT program icon located in the MARPLOT folder.) Click OK on the greeting screen.

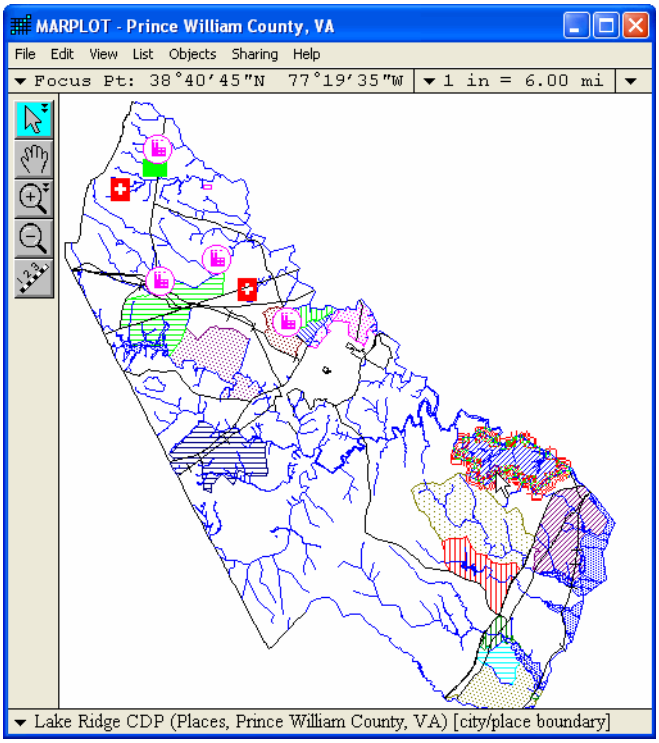
2. MARPLOT opens the map window. The sample map—Prince William County, VA—is shown. (If MARPLOT does not open to this view, use the Go to View item in the View menu, highlight the <entire map> view for Prince William County, and click Go to View.)



3. A number of different layers are shown, including the Places layer (showing various towns), the Water layer, and several CAMEO objects (which are all clustered in the northern part of the county).

   With the arrow tool, click several times on the map. As you select objects, they become highlighted with red dots, and MARPLOT displays their name at the bottom of the map window. Also, the location of your click is marked with a flashing icon called the Focus Point. The latitude/longitude coordinates of the Focus Point are shown in the upper-left corner of the map window.

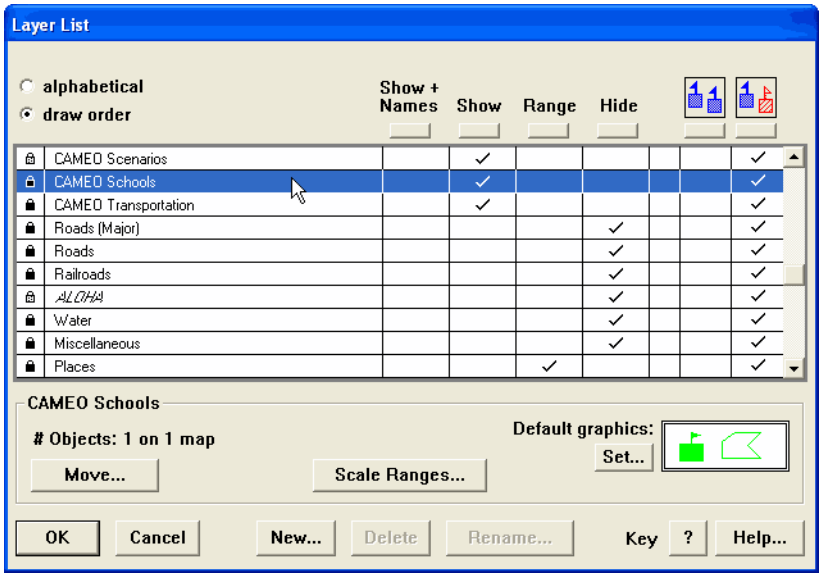
   Note: Your map window may not look exactly the same as the one shown here. The scale value shown at the top of the window will probably be different.



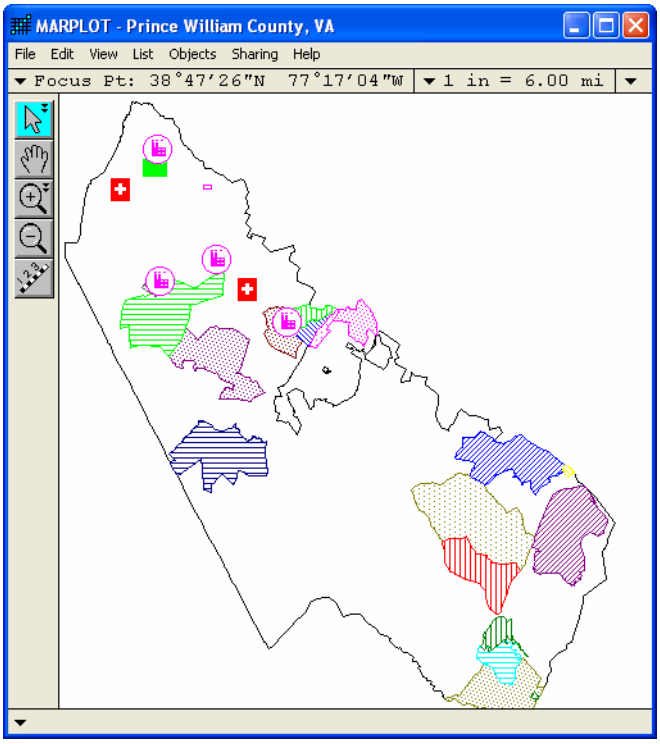
4. From the View menu, select the Redraw item. For the sample map (and other standard MARPLOT maps), the map will redraw itself very quickly. However, for more complex maps (like LandView maps), the redraw function may take awhile to complete. The bottom of the map window shows each layer as MARPLOT draws it. If the map is taking a long time to draw, press the ESC (escape) key. To remind you that all of the layers to be drawn were not drawn, the bottom of the map window will show a message: [DRAW INCOMPLETE]. Even when the drawing is incomplete, however, you can still click on the map with the arrow tool to select any object that would have been drawn.

5. From the List menu, select the Layer List item. This brings up MARPLOT's list of layers. The layers can be sorted alphabetically or from top to bottom according to the order in which they are drawn. Currently the layers are sorted in draw order. Scroll up and down in the list of layers. Notice that the TIGER-derived layers (such as Places and Roads) are lower in the list than the CAMEO layers (such as Facilities and Hospitals). Since the layers are shown according to the draw order, this means that the TIGER-derived objects will draw first (on the bottom), and then the CAMEO objects will draw after (on the top of the lower layers). As you click on the names of different layers, notice that MARPLOT displays—in the bottom part of the window—the number of objects on that layer and also some graphical information about the layer.

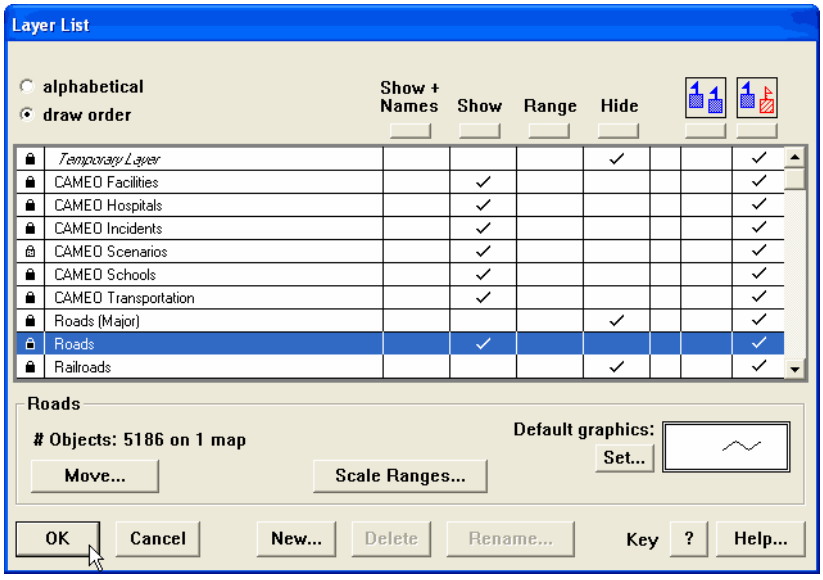
6. As can been seen in the columns in the center of the Layer List dialog box, all of the CAMEO layers are currently in Show mode, and all of the TIGER-derived layers (Roads, Railroads, etc.) are currently in Range mode. When a layer is in Show mode, it displays no matter what the map scale. When a layer is in Hide mode, it does not display. When a layer is in Range mode, it displays only within a certain range of map scales. For now, put all of the non-CAMEO layers except for the Places and Counties layers into Hide mode. To do this, click on each layer's line in the Hide column.



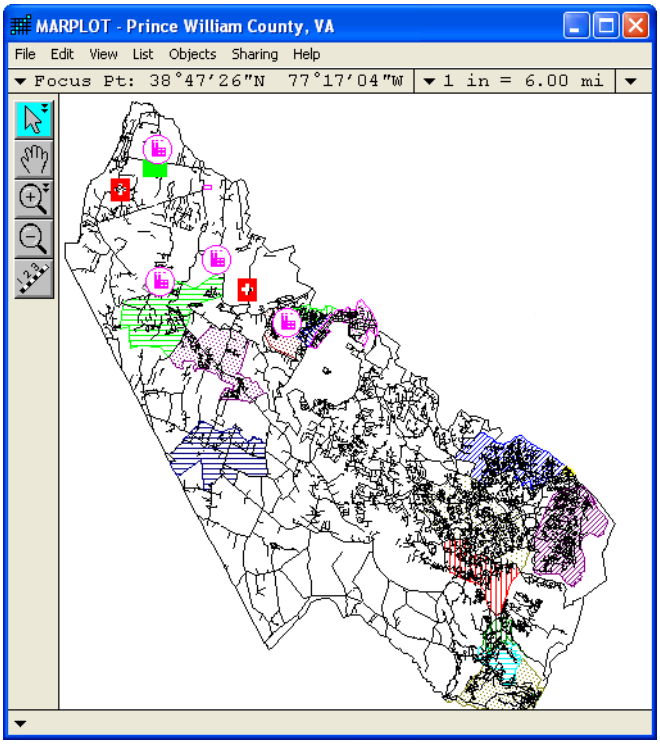
7. Click OK. The map is redrawn with just the Places, Counties, and CAMEO layers shown.



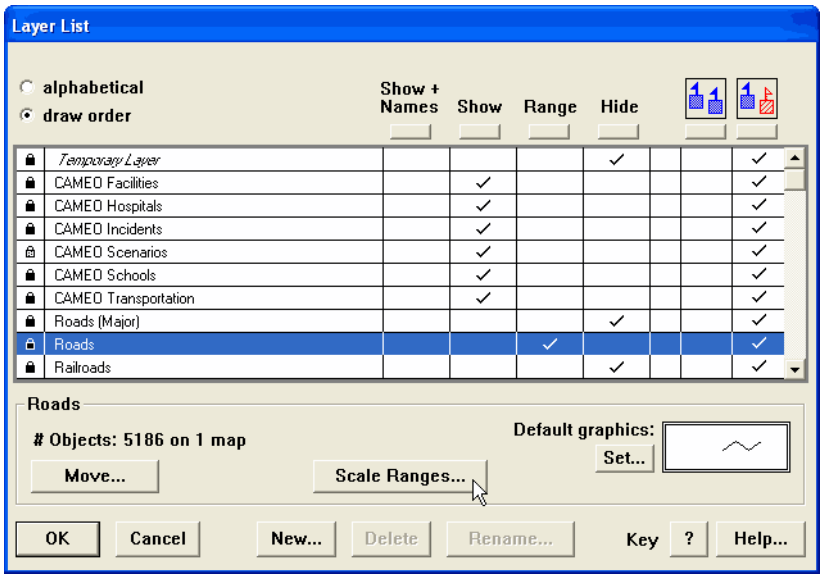
8. Return to the Layer List dialog box using the Layer List menu item again. This time, set the Roads layer to Show mode by clicking in the Show column of the Roads layer's line.



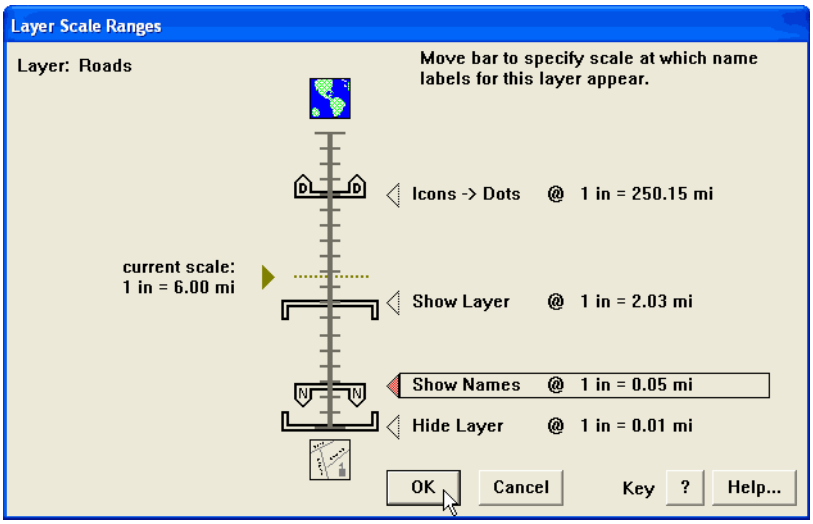
9. Click OK. The map is redrawn with the Roads layer shown.



10. The map view becomes cluttered with all of the roads at this zoomed-out view of the entire county. It would be better to draw the roads only when you are zoomed in closer, so that there are not so many objects shown at one time. This is just what the Range setting in the Layer List dialog box is for. Return to the Layer List and set the Roads layer to Range mode. To see what range of scales the roads will show in, highlight the Roads layer in the list and then click on the Scale Ranges button.



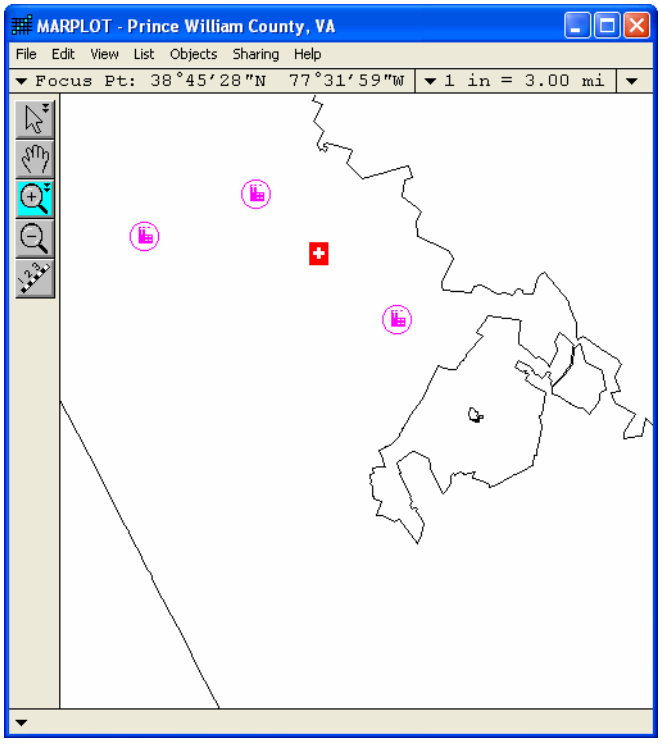
11. The Layer Scale Ranges dialog box appears. You can modify four scale values: the most zoomed out scale the layer will display at, the most zoomed in scale the layer will display at, the scale you have to zoom in to before objects on the layer are displayed with their names, and the scale you have to zoom out to before symbol objects on the layer are displayed as dots instead of icons.



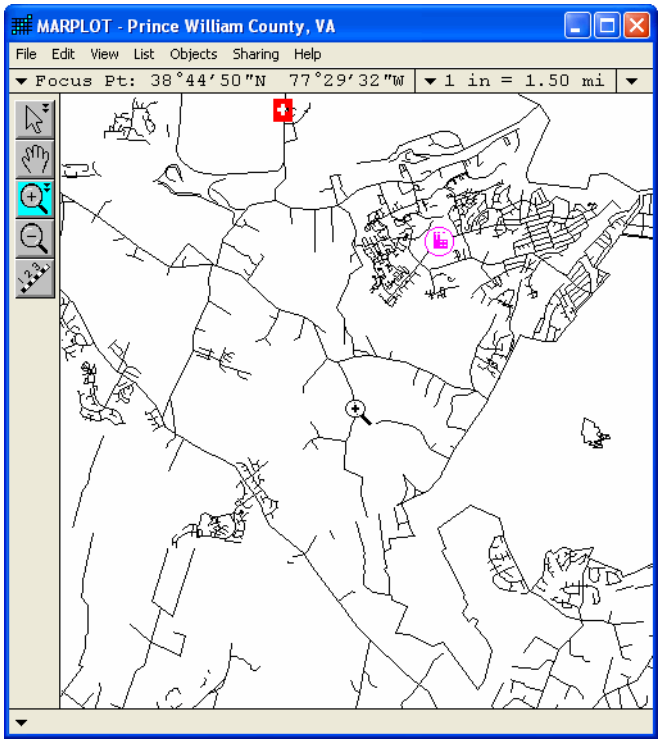
Note that, in the case of the Roads, the layer is set to show when the scale is about 1 inch = 2 miles. Our current scale is more zoomed out than that. If you keep these scale values, and leave the layer in Range mode, you'll have to zoom in for the roads to appear.

12. Click OK to exit the Layer Scale Ranges dialog box, and then click OK to exit the Layer List dialog box. Notice that the roads are no longer displayed. Zoom in closer using the zoom-in tool. 

Click on this tool and then, with the magnifying glass, click in about the center of the county. This causes the view to zoom in by a factor of 2, centered on the point of your click. Note that the number of miles per inch has been cut in half.

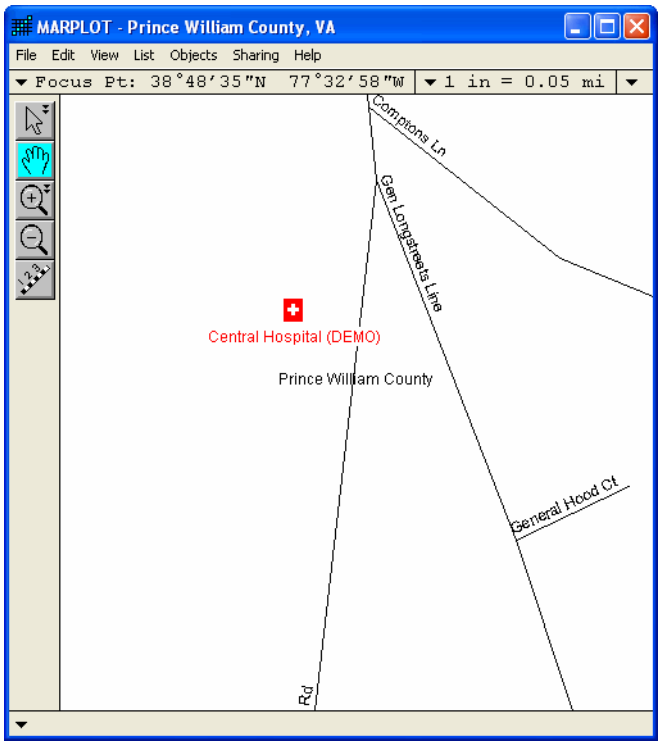


13. The roads still do not display because, as you saw in the Layer Scale Ranges dialog box, they are set to show only when you are zoomed in to at least 1 inch = 2 miles. Click one more time with the magnifying glass, again around the center of the map window. Now the roads appear because you have zoomed in past the threshold scale.

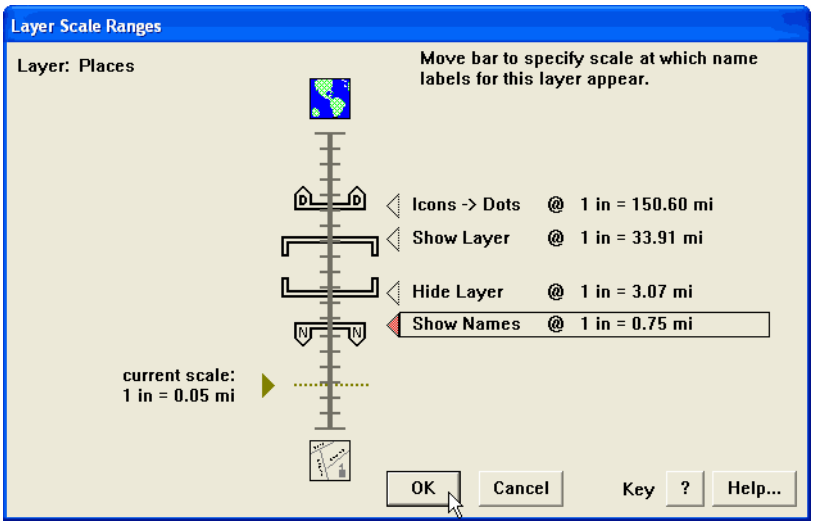


14. Continue clicking with the zoom-in tool until you reach the scale at which the names of the roads appear. **Note:** If your Range Settings are still set to the default, this will be at 1 inch = 0.05 miles.

    For instance, the picture at right might be what you would see if you zoomed in by clicking on the red CAMEO hospital icon. If the names overlap one another, select the hand tool, and click and drag the map until the names no longer overlap.



15. You may have noticed that, as we were zooming in, the cities and towns disappeared. That is because the Places layer, like the Roads layer, is currently in Range mode, and the Places are set to turn off when we zoom in past a certain scale. To see this, return to the Layer List dialog box, highlight the Places layer and click on the Scale Ranges button.



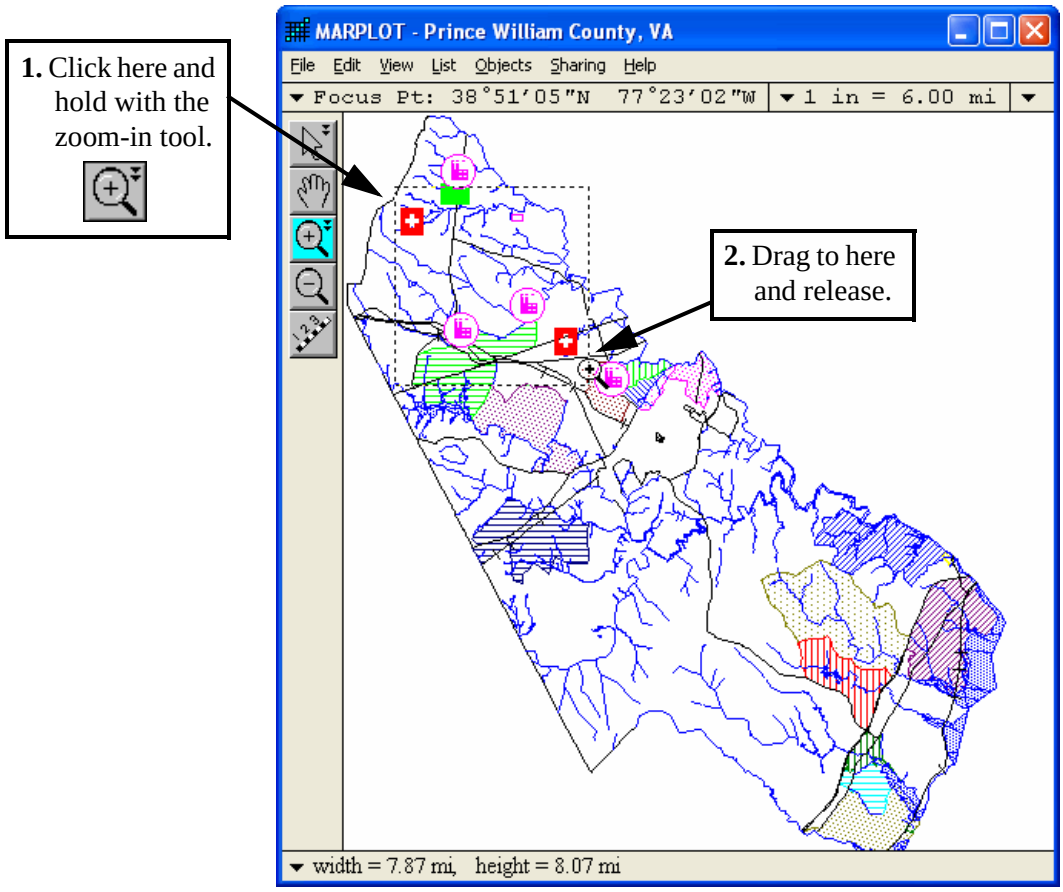
Since it's true for most layers that you'll only want to see them within a certain range of scales, it is common for most of the layers to be set to Range mode. However, there are some exceptions. For instance, there may be relatively few objects on certain layers, such as the CAMEO layers. Since these layers won't clutter the map display, you might want to leave them always in Show mode.

16. For now, set all of the layers except for the CAMEO layers back to Range mode. As you do so, you may want to click on the Scale Ranges button to see the range setting for some of the other layers. Then use the Go to View dialog box to return to the <entire map> view for Prince William County.

Navigation and views

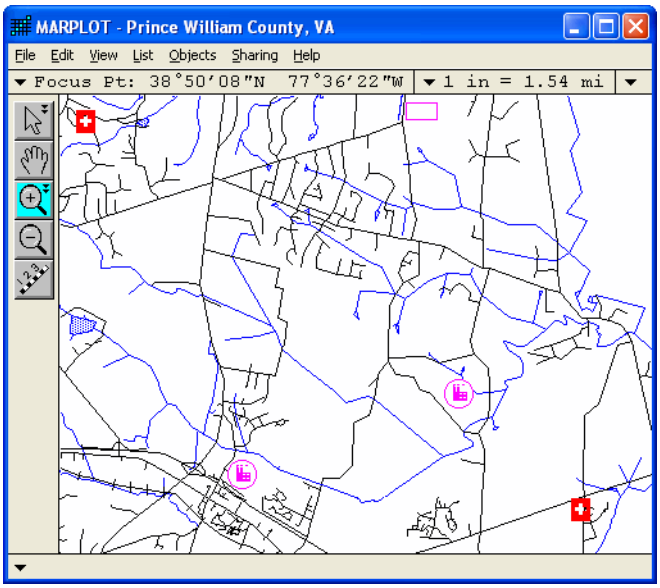
In the previous section, you saw two ways to navigate around the map: the Go to View dialog box, and the plus magnifying glass tool. You may have guessed that the minus magnifying glass tool is used to zoom out, also by a factor of 2. There are two other ways to change the view using the tools along the left edge of the map window. To shift the map view without changing the scale, use the hand tool. The plus magnifying glass tool  can also be used to zoom into a particular rectangular area.

1. Select the plus magnifying glass tool now by clicking on it. With the entire Prince William County map in view, notice the two hospitals objects (red crosses) among the CAMEO objects. Let's zoom into an area just big enough to show both hospitals. Click with the magnifying glass above and to the left of the top hospital. With the mouse button still down, drag below and to the right of the bottom hospital. A gray box defines the region as you drag. When you have just surrounded both hospitals, release the mouse button. MARPLOT changes the view to show the area in the rectangle.

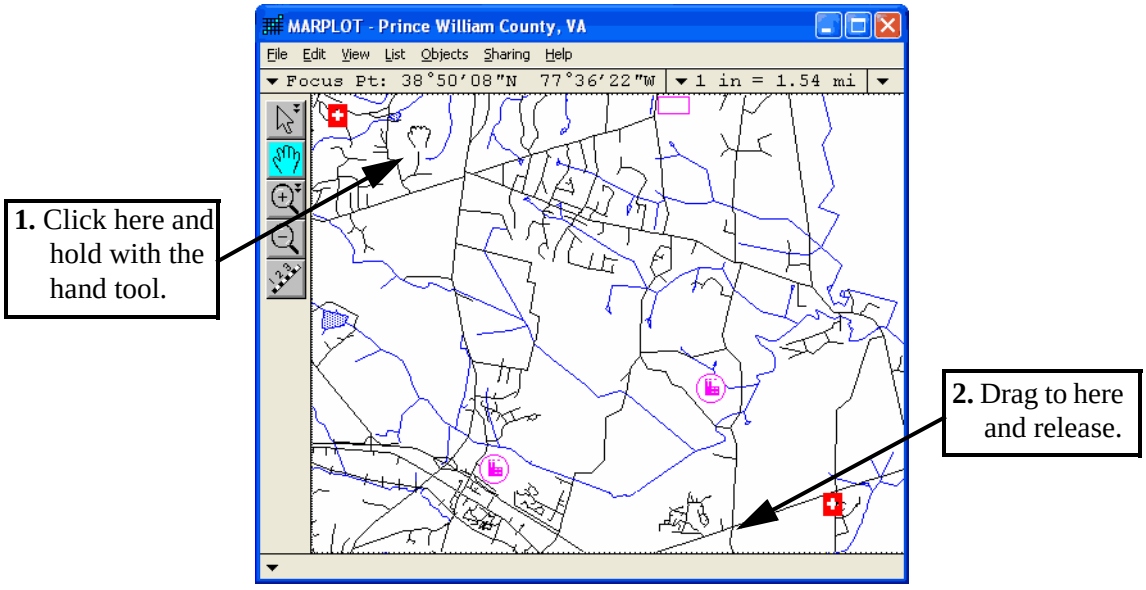


Note: If you make a mistake using the magnifying tool, you can always return to the last view using the Go to Previous View item in the View menu. Also, if you start defining the rectangle and then decide you don't want to zoom after all, you can press the ESC key while the mouse is still down to cancel the zoom.

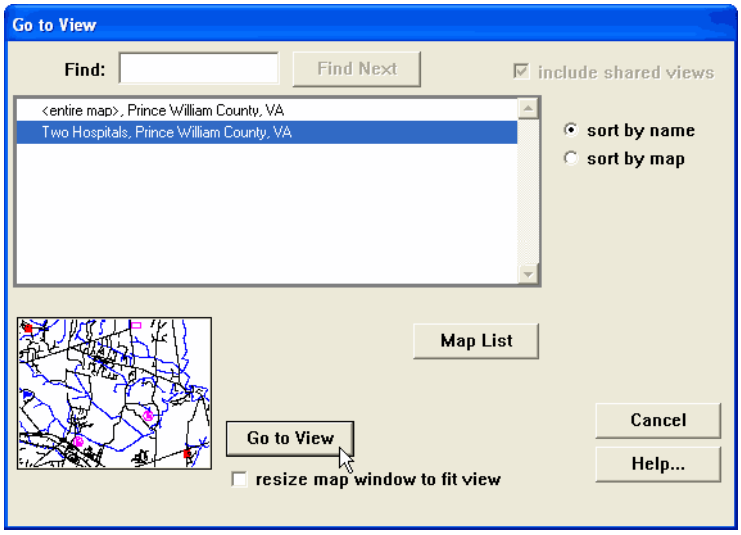
2. The new map window now displays the selected area. Save this view for future reference. Select the Save Current View item from the View menu. The Save Current View dialog box appears. Name the view Two Hospitals and click OK.



3. To show how the view is used, use the hand tool to shift the map view. To do this, click with the hand tool near the top of the view, drag down to the bottom of the window and then release the mouse button. This shifts the view to the north.

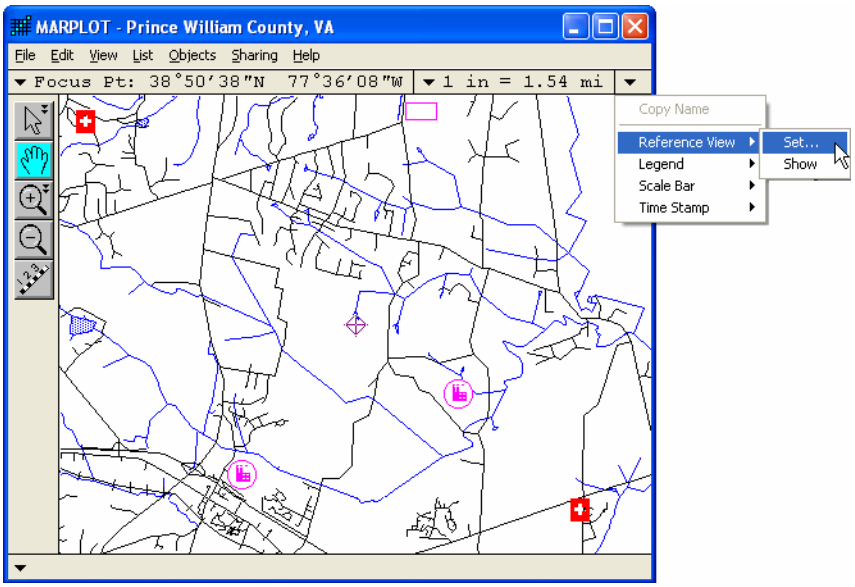


4. Now select the Go to View item in the View menu, highlight the Two Hospitals view, and click Go to View. You are returned to the saved view.

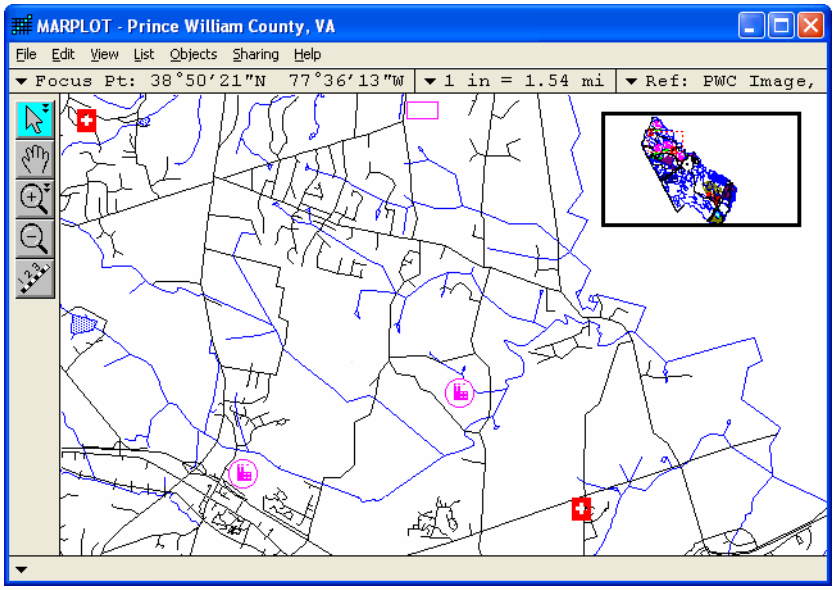


5. Use the Go to View dialog box again to return to the <entire map> view of Prince William County. Save this view also, using Save Current View. Name it PWC Image.

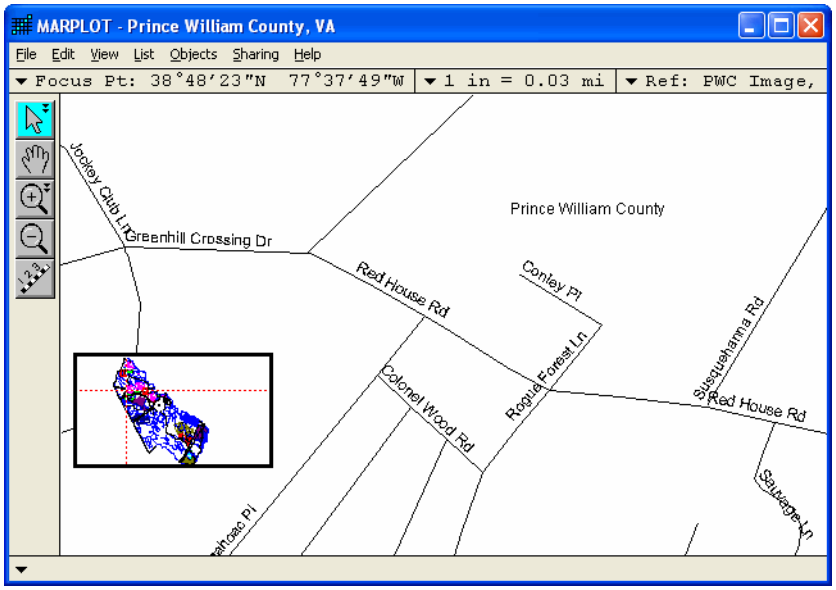
6. Another use for saved views is as a reference view. To see how reference views work, return to the Two Hospitals view again using Go to View. Then click on the triangle in the upper-right corner of the map window, go to the Reference View submenu, and choose Set. Select the PWC Image view, leave the "allow any view in reference" box unchecked, and click Set Reference View.



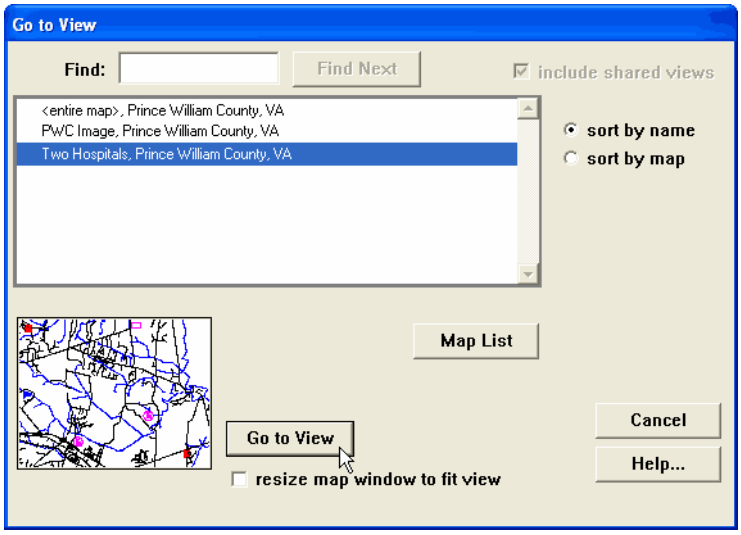
7. The reference view, showing the PWC Image, appears in the upper-right corner of the map window. The reference view shows the location of the current view in the map window relative to some other view. In this case, you see the area of the Two Hospitals view relative to the entire area of Prince William County. The flashing red box indicates the shown area.



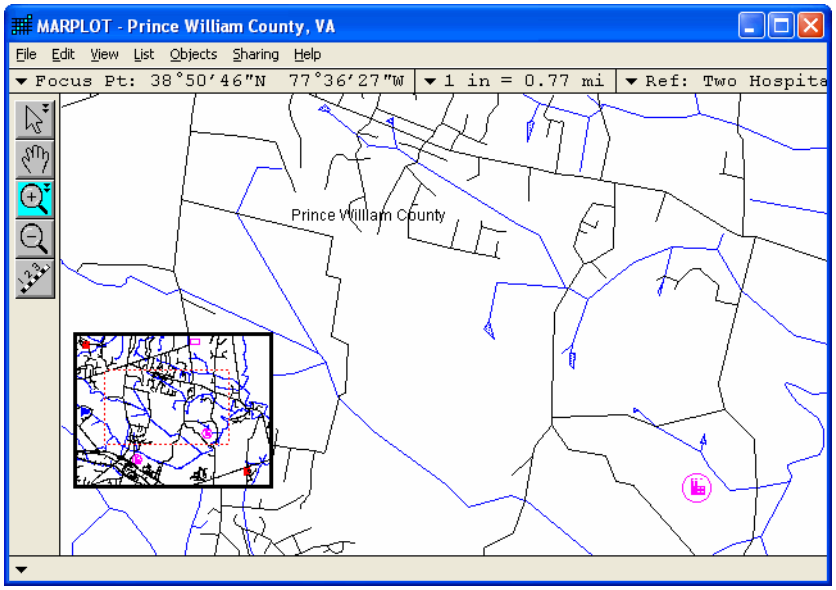
8. Use the hand and magnifying glass tools to move all around the map. Notice how the flashing rectangle in the reference view follows you. Zoom in until the road names appear. Notice that, when the flashing rectangle gets too small, it is replaced by a red crosshairs, pinpointing your location. You can double-click at a point on the reference view to view that area. Try double-clicking a few times on the reference view. Also, by clicking once and dragging on the reference view rectangle, you can reposition it in the map window.



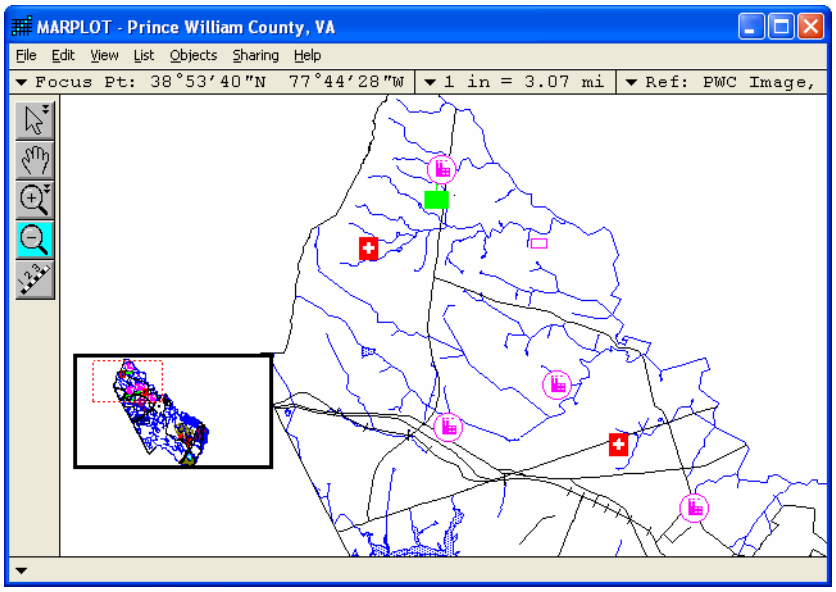
9. Let's try one more experiment with the reference view. Return to the Two Hospitals view using Go to View.



10. Click once with the plus magnifying glass in the center of the map window. Now set the reference view again, this time choose the Two Hospitals view as the reference view (again, leave the "allow any view in reference" box unchecked). As you saw before when using PWC Image as the reference view, here the Two Hospitals view is serving as a reference view and the flashing rectangle shows the area of the current map window relative to it.



11. This time, however, notice what happens when you use the minus magnifying glass to zoom out two times. As soon as the view in the map window no longer fits within the Two Hospitals reference, MARPLOT automatically changes the reference view to the PWC Image. If you then zoom back into an area within the Two Hospitals view, MARPLOT automatically changes the reference view back to the Two Hospitals view. These automatic changes happen because we had the "allow any view in reference" box unchecked when we set the reference view. When this box is checked, MARPLOT allows a view to stay in the reference view, even when the current map view does not fall completely inside of it.



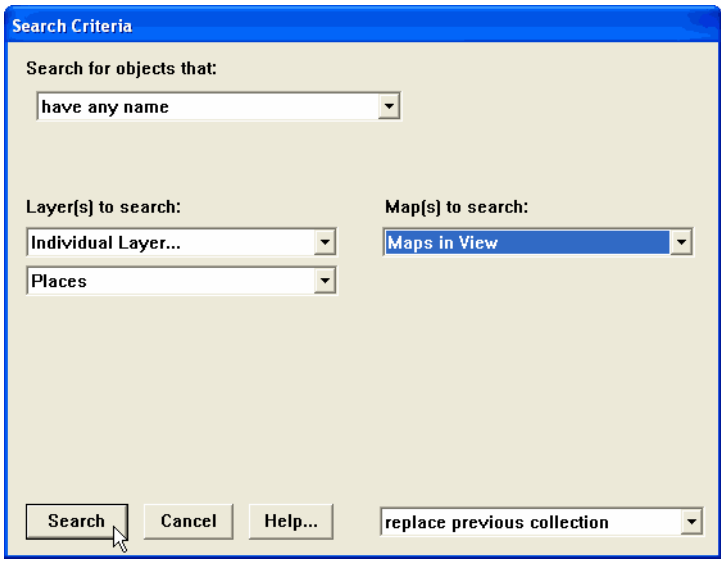
12. When you have saved a view and are sure you no longer want to work with it, you can delete it using the Edit Views item in the View menu. Select Edit Views now and delete both the Two Hospitals view and the PWC Image view. Click OK. Notice that the reference view is closed automatically because you deleted the view it was using.

Searching for cities and roads

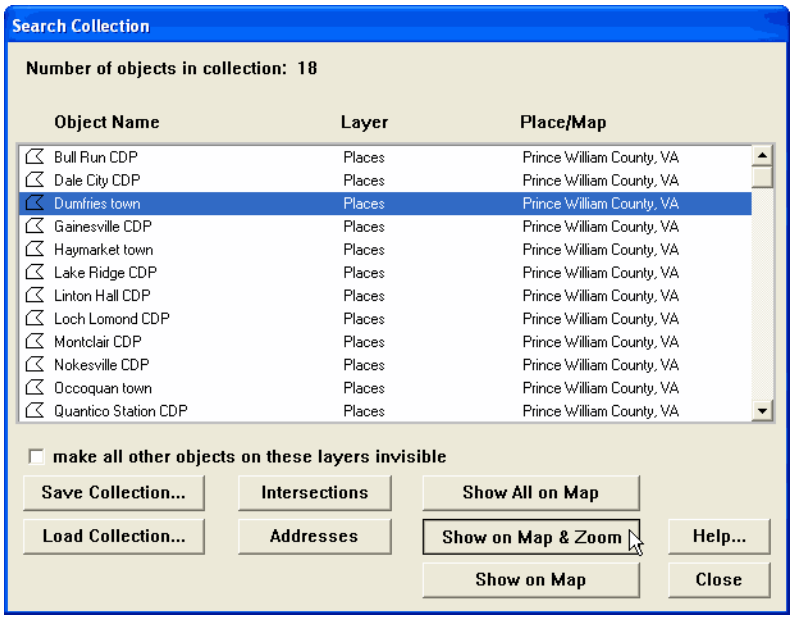
One of the most common operations you will perform in MARPLOT is searching for an object, often for an address range or intersection of a certain road. Another common search, if you are working in a large county, is to find a certain city or town within the county.

1. Let's search for a town within Prince William County. Bring up the Search Criteria dialog box by selecting Search from the List menu.

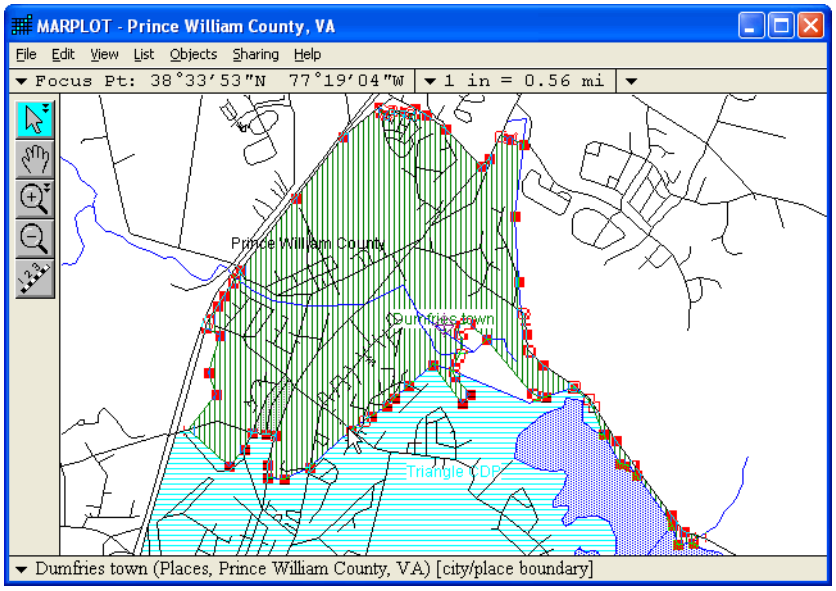
2. Click on the pop-up box below "Search for objects that:" and select "have any name." After "Layer(s) to search:" choose "Individual Layer..." in the first pop-up box and "Places" in the second pop-up box. After "Map(s) to search:" choose "Maps in View" and leave the final pop-up box set to "replace previous collection." Then click the Search button.



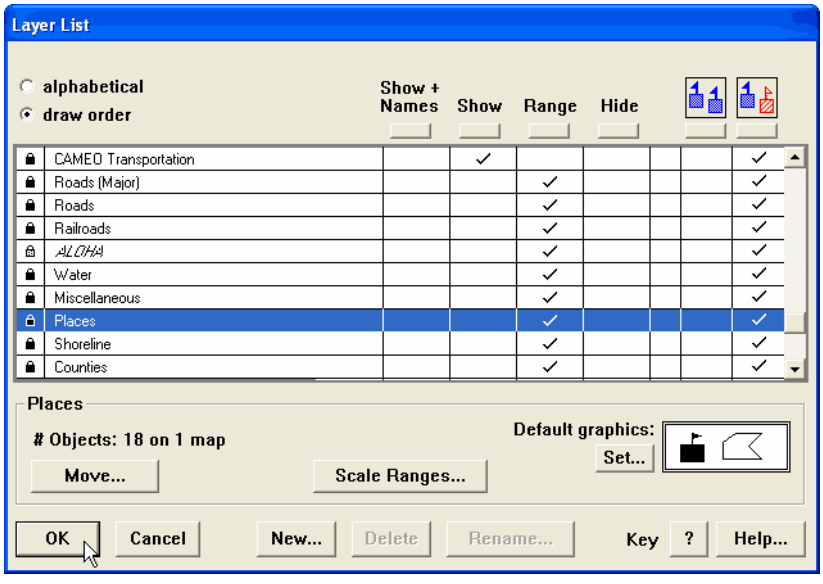
3. MARPLOT performs the search, and puts all of the objects that match the specified criteria into the Search Collection. In this case, you found all of the objects on the Places layer of the Prince William County map. The Places layer contains one polygon object representing each city or town in the county (some of which are Census Designated Places).



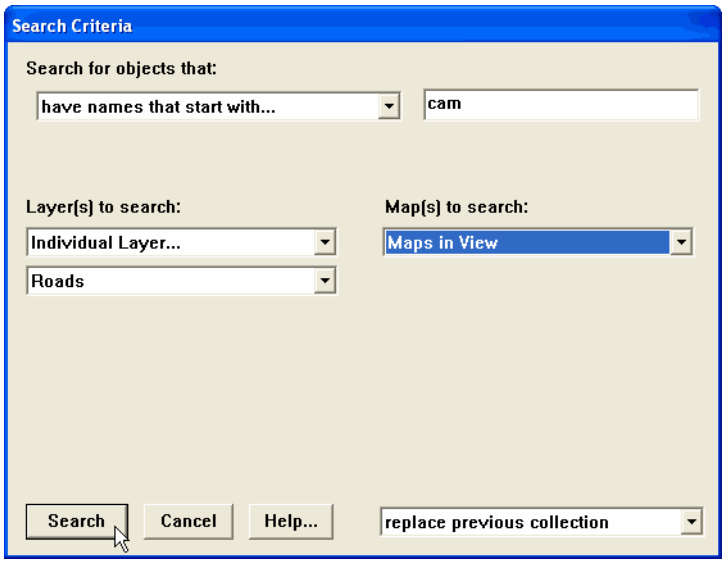
4. Find Dumfries town in the list and click on its name to highlight it. Click the Show on Map & Zoom button. This causes MARPLOT to change the view so that Dumfries town just fits into the map window.



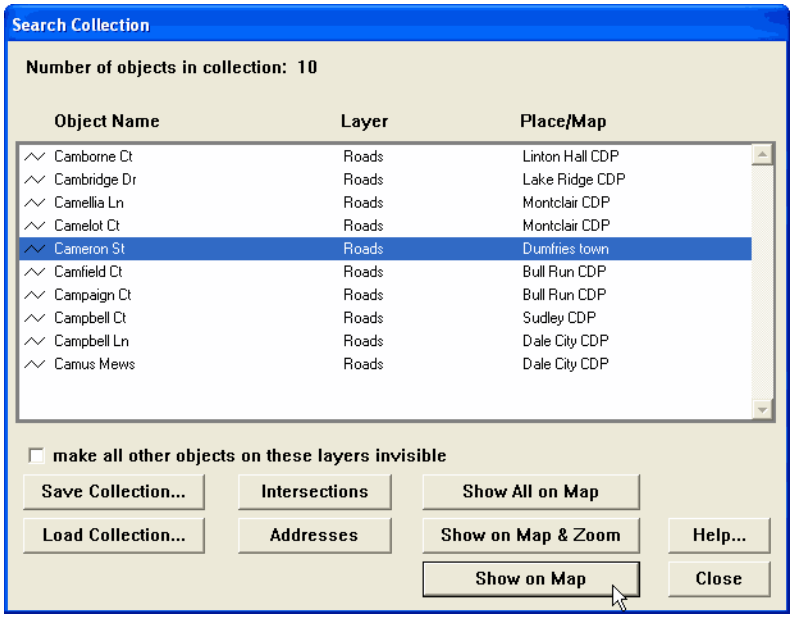
5. Go to the Layer List and set the Places layer back to Range mode. **Note:** MARPLOT automatically changed the Places layer from Range to Show mode because you asked to zoom into an object on the Places layer that would not be shown in Range mode at the chosen scale.



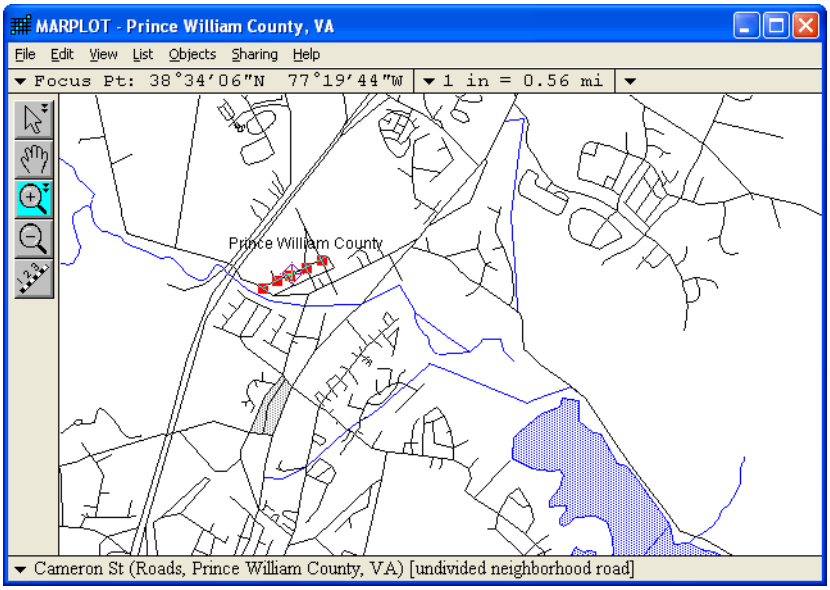
6. Now we see the same area without the Places polygons cluttering the view. There is a street in Dumfries town named Cameron Street. Use the Search function to find this street. In the Search Criteria dialog box, search for objects that "have names that start with." Type the letters "cam" in the box that appears in the upper-right. Search on the "Individual Layer" named "Roads." Again, search on "Maps in View" and choose "replace previous collection." Click Search.



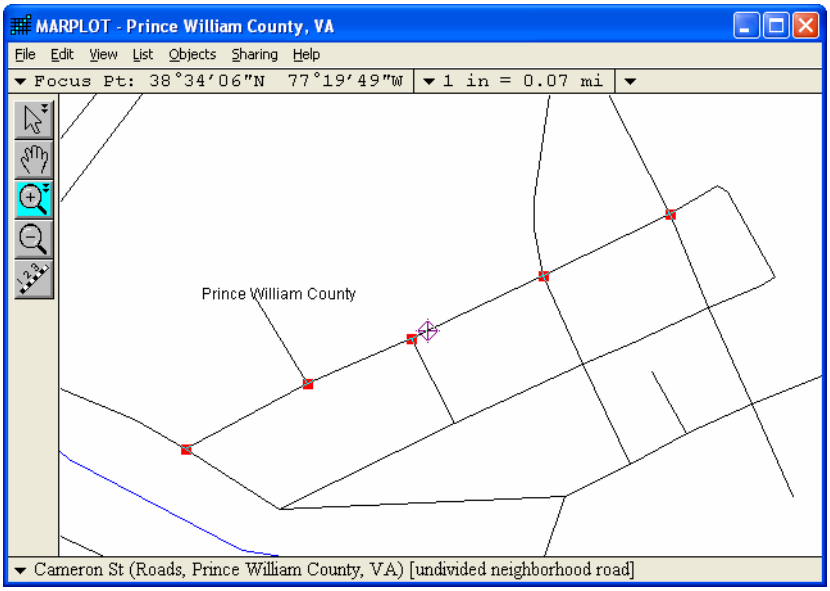
7. Again, the Search Collection dialog box comes up with the results of the search. Highlight "Cameron St" and click Show on Map. **Note:** If you had used Show on Map & Zoom, MARPLOT would have changed the view to show just the area covered by Cameron Street in the map window, but this time you don't want to change the viewing scale.



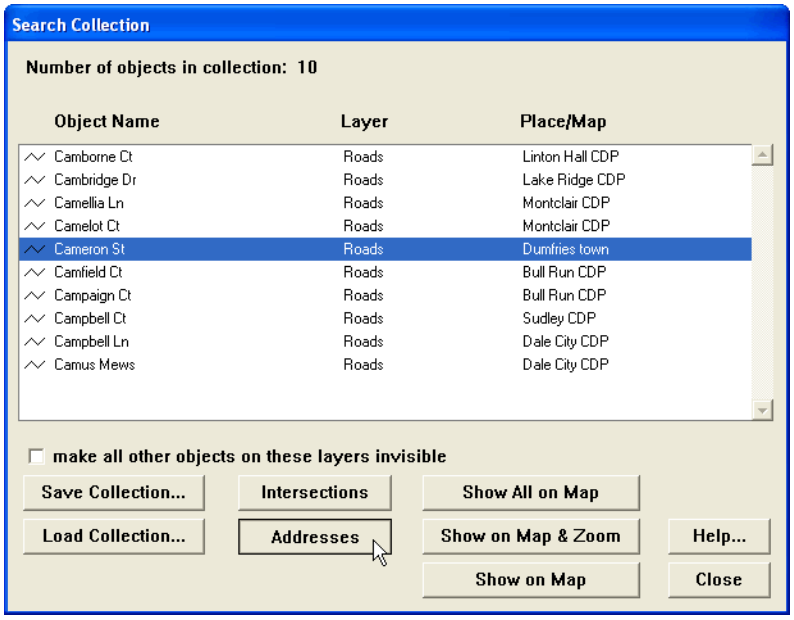
8. MARPLOT highlights "Cameron St" on the map with red dots and shows its name at the bottom of the map window. It also puts the Focus Point at the center of the street.



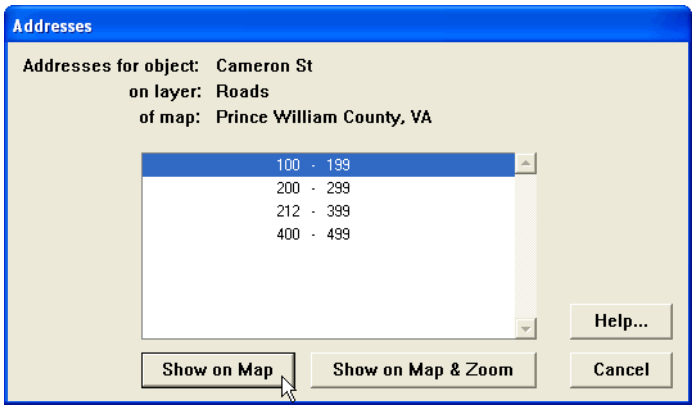
9. Use the plus magnifying glass tool to zoom into an area that shows just Cameron Street, plus a little extra space for borders.



10. Suppose you want to know where the address 150 Cameron Street can be found. Go back to the Search Collection using the Show Search Collection item in the List menu. With "Cameron St" highlighted, click on the Addresses button.



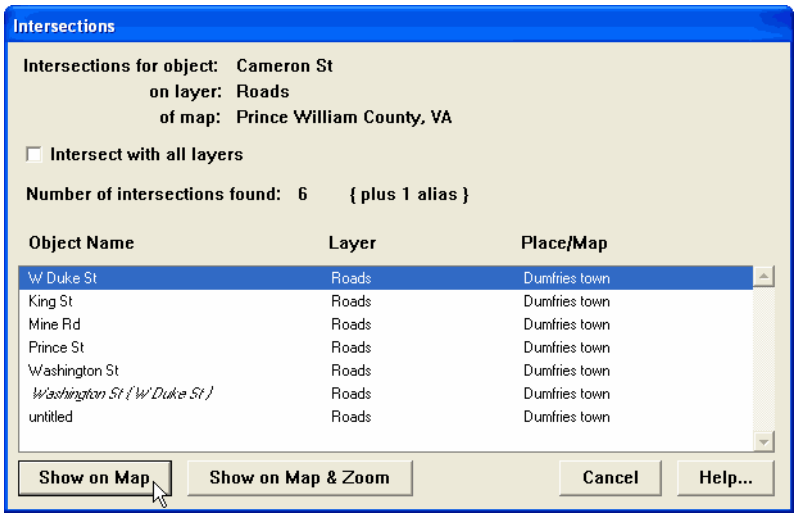
11. MARPLOT displays the list of address ranges for Cameron Street. You are looking for address 150, which falls within the range 100-199. Highlight this range in the list and click Show on Map.



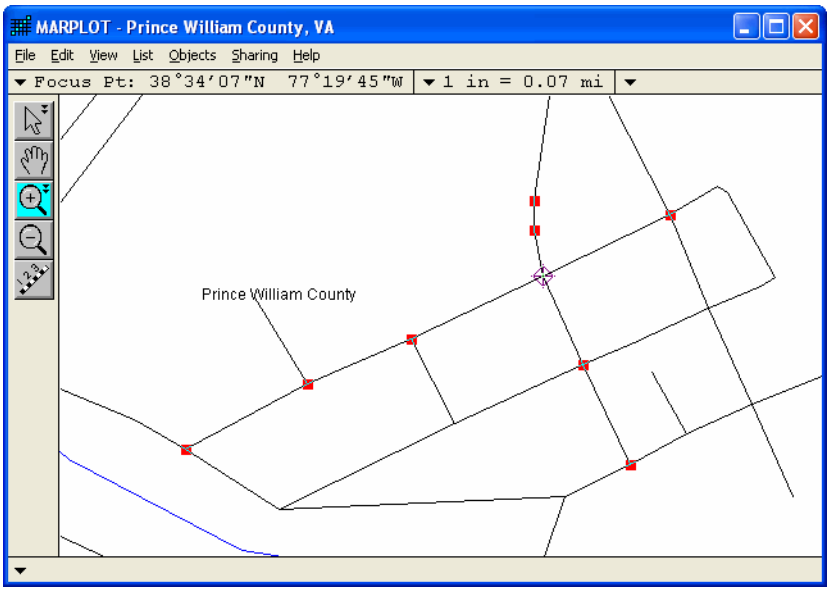
12. MARPLOT shows the location of the address range by positioning the Focus Point at the center of the segment that corresponds to the selected range.

13. Now find the intersection of Cameron Street and West Duke Street. Again, bring up the Search Collection using the Show Search Collection item in the List menu. With "Cameron St" highlighted, click on the Intersections button.

14. MARPLOT lists all of the streets with which Cameron Street intersects. Highlight "W Duke St" in the list and click Show on Map. **Note:** Show on Map & Zoom would change the scale to an appropriate scale for viewing the intersection, but in this case you are already at such a scale.



15. MARPLOT selects both Cameron Street and West Duke Street, and puts the Focus Point at their intersection.



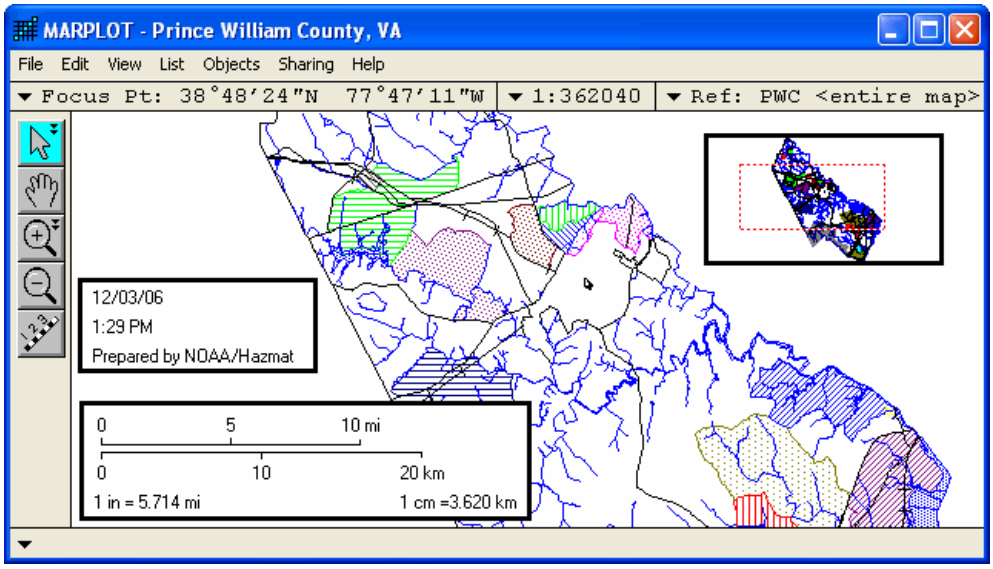
This concludes the MARPLOT guided tour. If other people will be taking this tour using this MARPLOT system, please use the Go to View dialog box now to return to the <entire map> view for Prince William County. Then exit from MARPLOT. You can find more MARPLOT examples in Chapter 4.

3 Reference

Refer to this chapter for detailed explanations of MARPLOT program operations, features, and menu items.

MARPLOT display window

The MARPLOT window contains many components. The title of the window displays the name of the map currently shown in the window, or simply "MARPLOT" if more than one map is shown.



Below the title is a line containing three pieces of information:

1. Latitude/longitude coordinates of the Focus Point. The Focus Point is the flashing target-shaped icon that marks the location of the most recent point of interest. You can change the format of the latitude/longitude values using the Preferences item in the File menu.
2. Current map scale. The scale can be displayed in one of three different formats, as chosen using the Preferences item in the File menu.
3. Name of the reference view, if a one is currently being shown (see "Reference View" on page 57).

The various tools are along the left side of the map window. The currently selected tool is shown highlighted. The function of each tool is described later in this chapter (see "Tools" on page 78). When you have unlocked one or more layers (see "Layer List" on page 66), additional tools for creating new objects appear.

Along the bottom of the map window is a status line that is used to display various messages. Among other things, it gives the name, layer, map, and Census classification of the most recently selected object. If you pressed ESC to cancel a time-consuming map draw (see "Redraw" on page 59) this bottom line will display the words DRAW INCOMPLETE to remind you that you are looking at an incomplete picture.

When you select objects on the map (usually by clicking them with the arrow tool) MARPLOT indicates that they are selected by drawing small, red squares along their borders.

Finally, if you are using the Marked Point (see "Marked Point" on page 58), it appears as a pink, target-shaped icon  .

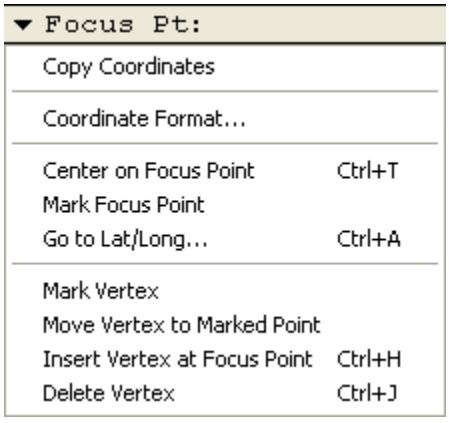
Remember that what you see in the map window depends upon (a) the area you are looking at, (b) the current scale (remember that layers can be set to show only at certain scales), (c) the order of the layers (layers can draw over one another), and (d) the maps that are currently in use. If you are not seeing what you expect, consider each of these factors.

Pop-up menus on the map window

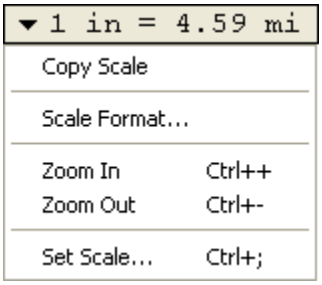
The status lines at the top and bottom of the map window show small black triangles indicating that you can click in the given area to activate a menu that lets you perform functions related to the item displayed. For instance, clicking in the Focus Pt area brings up a menu of functions related to the focus point, while clicking on the map scale area brings up a menu of functions related to map scale. The function of each of these pop-up menu items is explained below.

Clicking in the Focus Pt area at the top of the map window brings up the a Focus Point menu.

- **Copy Coordinates** copies the displayed focus point coordinates to the clipboard.
- **Coordinate Format** brings up the Preferences dialog box so that you can change the format in which coordinates are displayed.
- The remaining items in this menu perform the same function as the identically named items in MARPLOT's View, Marked Point, and Vertex menus.

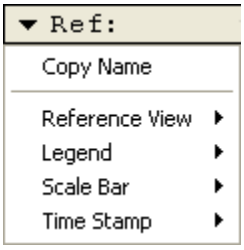


Clicking in the map scale area at the top of the map window brings up a scale menu.



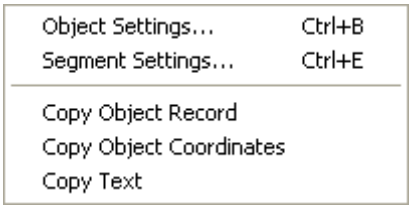
- **Copy Scale** copies the displayed map scale to the clipboard.
- **Scale Format** brings up the Preferences dialog box so that you can change the format in which the map scale is displayed.
- **Zoom In** and **Zoom Out** change the map scale by a factor of two, centered at the Focus Point (note that Zoom In and Zoom Out are not included in the View menu).
- **Set Scale** performs the same function as the identically named item in the View menu.

Clicking in the reference view name area at the top of the map window (the rectangle just to the right of the map scale area) brings up a view menu.



- **Copy Name** copies the displayed reference view name to the clipboard (if a reference view is currently shown).
- **Reference View** allows you to show or hide the reference view, and choose the view to be used as a reference view.
- **Legend** allows you to show or hide the legend, and set legend options.
- **Scale Bar** allows you to show or hide the scale bar, and set scale bar options.
- **Time Stamp** allows you to show or hide the time stamp, and set time stamp options.

Clicking in the message area at the bottom of the map window brings up an object menu.



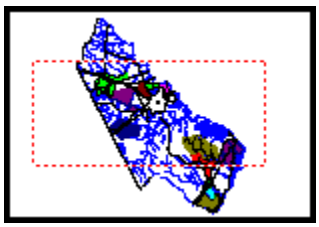
- **Object Settings** and **Segment Settings** perform the same function as the identically named items in the Objects menu.
- **Copy Object Record** copies to the clipboard the MIE (MARPLOT Import/Export) record for the selected object.
- **Copy Object Coordinates** copies to the clipboard the list of latitude/longitude coordinates for the selected object.
- **Copy Text** copies whatever text is in the message area to the clipboard.

Map insets

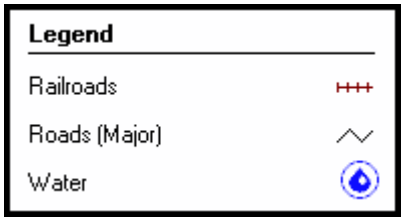
The reference view is just one of four insets that you can display in the map window. Each of the four insets is discussed in this section. **Note:** When you print or save the contents on the map window, any displayed insets are included in the output.

You can show and hide the various insets, and set a number of options related to their display, using the Preferences dialog box (see "File menu" on page 45) and the pop-up menu in the reference view name area of the map window. To position any of the insets, click on them with the mouse and drag to the desired location. MARPLOT remembers this as the position of the inset until you move it again.

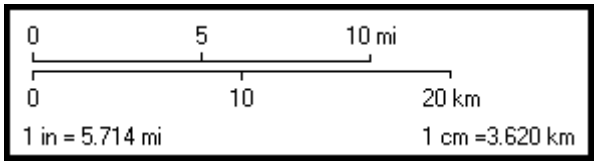
Reference view. The reference view shows the location of the current view in the map window relative to some other view. The flashing red box indicates the shown area. When you zoom in past a certain point, the flashing box is replaced by a red crosshairs, pinpointing your location. Double-click anywhere on the reference view to center the map view on that location.



Legend. The legend displays a map key in one of two formats. The simplest option is to have MARPLOT generate a legend from the list of layers you selected in the Preference dialog box. Alternately, you can create a bitmap in another program and have MARPLOT use it for the legend. Double-click the legend to bring up the Preferences dialog box where you can set options for the display of the legend.

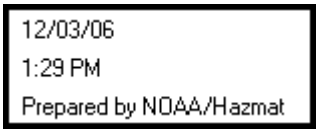


Scale bar. The scale bar inset shows the current map scale in a number of available formats including a number line marked with English units, a number line marked with metric units, an equation with "1 in = ...", and an equation with "1 cm = ...". Double-click the scale bar to bring up the Preferences dialog box where you can set options for the display of the scale bar.



Note: You may notice that MARPLOT's interpretation of a screen inch will not agree with a ruler laid against your computer monitor. The discrepancy will depend upon your computer system and monitor settings and you may not notice it unless you actually measure it. Rest assured that the scales on maps printed from MARPLOT will be accurate and will agree with a ruler laid against the printouts.

Time stamp. The time stamp displays the current date and time in any of a number of available formats. You can also include a one-line comment in the time stamp. Double-click the time stamp to bring up the Preferences dialog box where you can choose date and time formats, and enter the one-line comment.



File menu

The items in the File menu allow you to perform a variety of input/output functions, and to accomplish miscellaneous system-level tasks.

Note that there is no Save item in the File menu. When you make changes to objects on maps, the changes are immediately written to disk. This means that there is no need for you to explicitly save any changes you make. The price of this convenience, however, is that you need to be that much more careful to keep backup copies of any maps you will be editing, so that you can revert to a saved version if you make invalid changes (see "Keeping backups" on page 147).

Save as Picture

The Save as Picture menu item is used to save an image of what is currently drawn in the map window to a picture file. Such a file can be opened with a standard drawing program. The procedure for saving a picture differs slightly between Windows and Macintosh.

Save as Picture in Windows. When you choose Save as Picture, you are presented with a standard file-saving dialog box to specify the file to be saved. You can choose to save a bitmap (.bmp) file or a metafile (.wmf). Metafiles are often smaller than bitmap files, and have the advantage that certain programs will allow you to edit them on an object-by-object basis. However, bitmap files are more common and can be opened with standard drawing programs.

A check box, which only applies when you are saving as a metafile, gives you the option of saving into the picture only the currently selected objects. This is useful if you want to save into the picture a less cluttered view of a certain set of objects.

Save as Picture on a Macintosh. When you choose Save as Picture, you are presented with a dialog box that lets you specify the size of the picture to be saved. By default, the saved picture is the same size as the screen display. If you want to expand or shrink the image when saving, you can specify the desired size either by giving its dimensions (width and height), or by specifying the map scale that you want the picture to have.

A check box gives you the option of saving into the picture only the currently selected objects. This is useful if you want to save into the picture a less cluttered view of a certain set of objects.

When you click OK to confirm the size, you are presented with a standard file-saving dialog box to specify the file to be saved.

Print

The Print menu item is used to print what is currently drawn in the map window to your printer. When you choose the Print item, you are presented with a dialog box that lets you specify the size of the printed output. By default, the output will be fit to the printed page. If you want to specify the image dimensions, you can enter either the desired width and height or the map scale that you want the output to have. If you specify the image dimensions, the Print dialog box displays the size of a printed page as well as the number of pages that will be printed.

A check box gives you the option of printing only the currently selected objects. This is useful if you want to print a less cluttered view of a certain set of objects.

Import

WARNING: Use this menu item with caution. Incorrect use can result in lost data. It is safest to back up your map files before importing (see "Keeping backups" on page 147). Importing data will change the objects on a layer—even if the layer in question is currently locked. The Import menu item is only available to users who have edit-level permission. If your MARPLOT system uses map files shared over a network file server, make sure that no other users are currently using the shared map files before you use Import.

The Import menu item is used to read in a list of objects from a text file. As explained in "Object identification" on page 16, MARPLOT objects are identified by an ID number, layer name, and map name. The most common use of the Import feature is to share data with another MARPLOT system, which may result in situations where MARPLOT has to resolve conflicts between objects with the same ID number, layer name, and map name.

The Options button in the Import dialog box allows you to specify what MARPLOT should do in the case of ID conflicts during import. The default behavior is to overwrite the existing object with the information in the import file. Alternatively, you can choose to keep just the old object, or to both keep the old object and import the new object. (In the latter case, you will have multiple objects with the same ID number on the given layer.)

MARPLOT's default import behavior is designed for sharing and updating data from a source MARPLOT system to your MARPLOT system. A user of that system can export certain objects to a MARPLOT Import/Export (MIE) file. You can then import that MIE file in your system. Any new objects (i.e., objects that were created in the other system but don't yet exist in your system) will be added to your system. By default, any objects that match existing objects in your system (i.e., that have the same ID number, layer name, and map name) will replace those existing objects. The net effect is that your system will be updated to match the objects in the other system. Keep in mind, however, that if you import bad data, you may lose important data that you have entered in your system.

The import file can be in one of four different formats:

- **MARPLOT Import/Export (MIE) format**: Standard format for exchanging MARPLOT information. These files contain complete MARPLOT information about each object.
- **MARPLOT Simple Point format**: In this format, the objects appear one-per-line. Each object is specified as a single point. Besides the coordinates, the following attributes may be included: name, layer, map, symbol, color, and ID.
- **ArcInfo™ GENERATE format**: Allows MARPLOT to exchange data with ArcInfo. Besides the coordinates, the following attributes may be included: name, layer, map, symbol, color, and ID.
- **MARPLOT 1.0.1 (for Macintosh) export format**: Used only to bring objects from MARPLOT 1.0.1 into the current version of MARPLOT.

See the MARPLOT Technical Documentation for more information about import/export formats.

Export

The Export menu item is used to write a list of objects to a text file. The objects to be written can be either those objects currently selected on the map, or those objects currently in the Search Collection. You can export in one of three formats:

- MIE format,
- MARPLOT Simple Point format, or
- ArcInfo GENERATE format.

In the case of the latter two formats, you can output the coordinates along with any subset of the following attributes: name, layer, map, symbol, color, or ID.

See the MARPLOT Technical Documentation for more information about import/export formats.

Compact Map Files

Note: If your MARPLOT system uses map files shared over a network file server, make sure that no other users are currently using the shared map files before you use Compact Map Files.

The Compact Map Files menu item, which is mostly for use by MARPLOT system administrators, performs a number of optimizations on your maps to make them draw more quickly and use less disk space. You will only need to use Compact Map Files after importing or after making a large number of changes to your maps. There is no harm in using Compact Map Files at other times, but you should not expect any improvement in efficiency.

Compacting your map files can take less than a minute if your maps are small and/or are already mostly compacted. However, for large, uncompacted map files, the process can take longer (although you can stop the process at any point if it is taking too long).

Before choosing the Compact Map Files function, you should make sure you have sufficient free disk space. A rule of thumb is to make sure you have free on each disk containing a map folder at least twice the space of the single largest object (.OBJ) layer file on that disk. If MARPLOT is unable to complete the compaction process because of low disk space, it will tell you.

Compact Map Files performs two main functions to improve map file efficiency:

1. Removes the space occupied by deleted objects from the map files, and
2. Sorts the objects in each map file geographically, for improved speed during drawing.

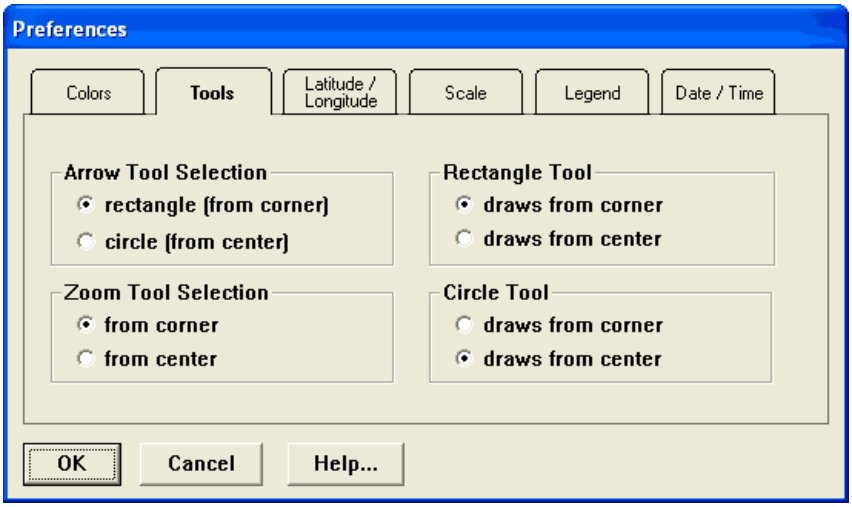
Compact Map Files also does some other cleanup work on your map files. If you think your map files have been corrupted somehow, you might try compacting them to fix the problems.

When you use Compact Map Files, even those files belonging to locked layers are checked and compacted. However, files belonging to maps that are not currently in use will not be touched (use the Map List menu item to see which, if any, of your maps are not in use).

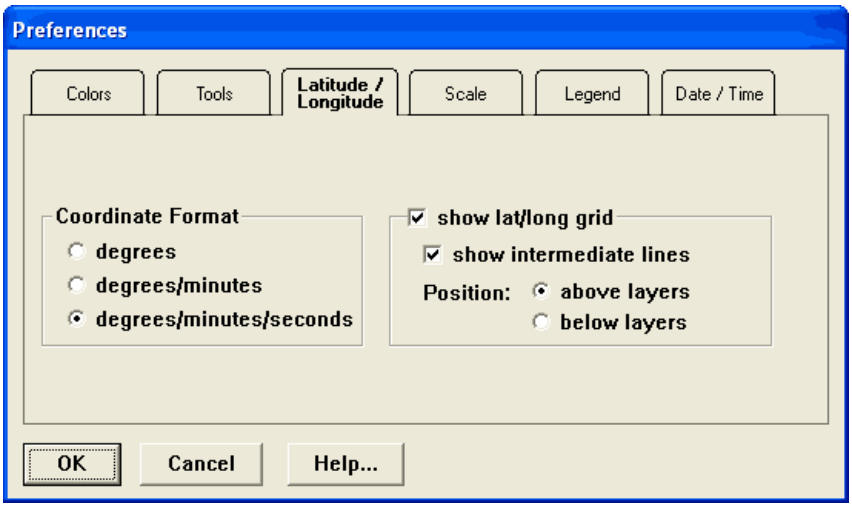
Preferences

Because of the large number of preferences that you can set in MARPLOT, the Preferences dialog box is broken up into six tabbed panels. Move between the panels by clicking the tabs at the top of the window.

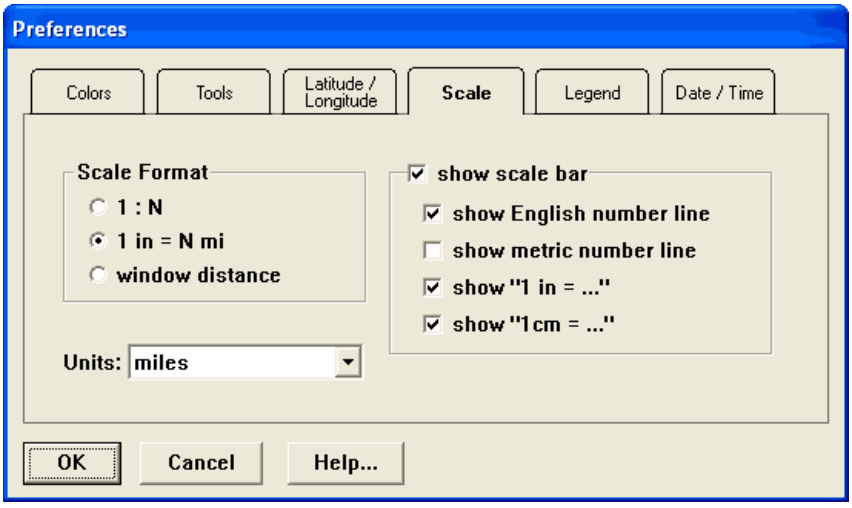
The **Colors** panel lets you set the background color for the map window. The **Tools** panel lets you set preferences for various tools. (These choices are also available by double-clicking the tool icons on the left edge of the map window.)



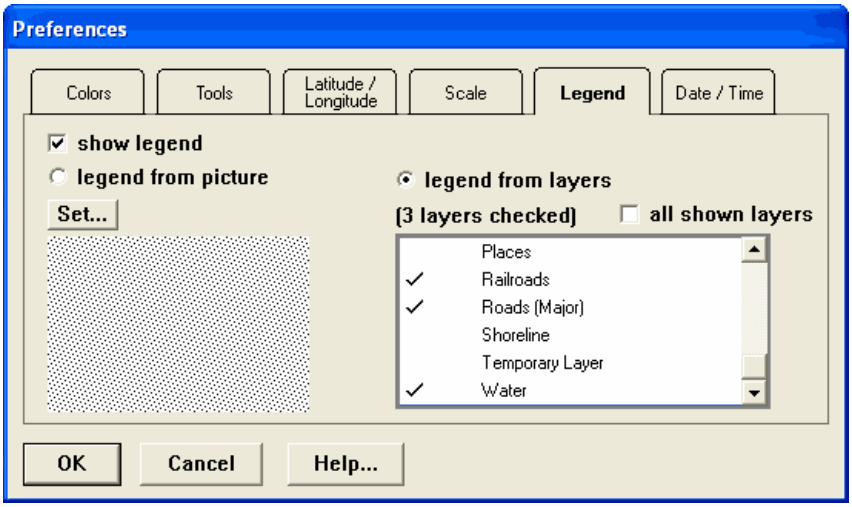
The **Latitude/Longitude** panel lets you choose the format in which coordinates are displayed, and control the lat/long grid in the map window. You can choose whether lat/long values are displayed as degrees with a six-place decimal (e.g., 40.250000°), as degrees followed by minutes (e.g., 40°25.10'), or as a triplet of degrees, minutes, and seconds (e.g., 40°25'00"). Notice that you can display the grid above or below the map, and you have the option of including unlabeled intermediate lines when a dense grid is desired.



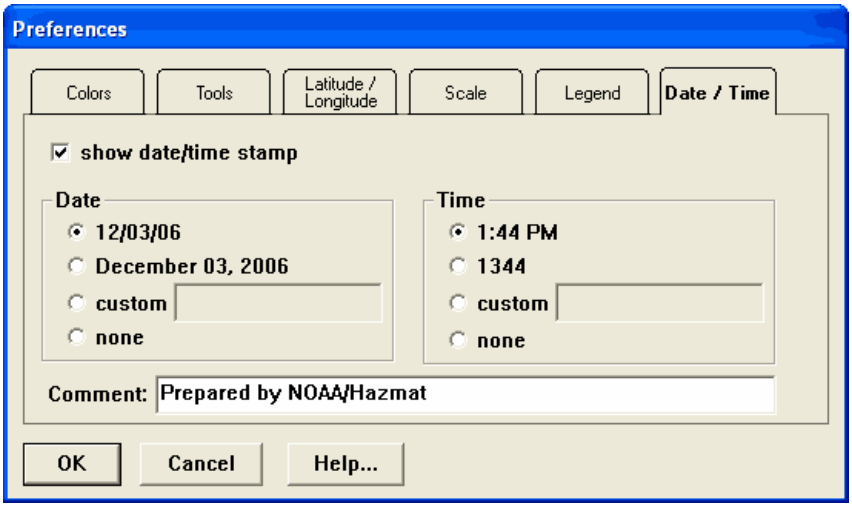
The **Scale** panel lets you choose the scale format for the map window display and the scale bar inset. The scale can be a ratio (e.g., 1:50000), in units (e.g., 1 in = 10 mi), or as window dimensions (e.g., 5 x 3 mi).



The **Legend** panel lets you choose which type of legend to display: a picture or a list of the shown layers. For a picture legend, you can choose any bitmap or PICT picture from your computer using the Set button. For a layers legend, you can choose which layers are shown.



The **Date/Time** panel lets you choose formats in which the date and time are displayed in the time stamp inset. The one-line comment you enter here is included in the time stamp.



Administrator

See Chapter 6 for more information about MARPLOT administration.

The first time this menu item is used, it puts MARPLOT into multi-user mode (as opposed to single-user mode). In multi-user mode, one person (usually the one who first uses the Administrator menu item) is the system administrator. The administrator has the ability to add other users to the system, giving them passwords and user codes.

After the first use of the Administrator menu item, the item is only available to the MARPLOT system administrator. It brings up a dialog box in which the administrator can add new users and modify user settings. For each user, the administrator can set the user's name, password, and permission level (edit or browse). Each user is also assigned a four-character code that is attached to each object the user creates and/or modifies. Using the Object Settings dialog box for a given object, you can see the code of the creator and last modifier of the object.

Note that the administrator can change his or her own password. The administrator should do this as soon as the Administrator menu item is chosen for the first time.

Once MARPLOT is in multi-user mode, it is possible to return to single-user mode. The administrator does this using the Stop Administration button in the MARPLOT Administrator dialog box. This renames the USERS folder as USERSX. If the Administrator menu item is chosen again, USERSX is renamed USERS, and the previously established administration is reinstated.

Edit menu

The Cut, Copy, and Paste items in the Edit menu are not used to cut, copy, and paste MARPLOT objects. While you cannot use the Edit menu to perform these functions, MARPLOT provides a number of mechanisms to accomplish the desired goals. To move objects, select one or more and drag them with the arrow tool. To change an object's layer or map, use the Object Settings dialog box. To change several objects at once, use the Move items in the Objects menu.

Undo

You can undo the last change you made to the objects on the map. For instance, if you accidentally delete an object, you can use Undo to get it back. Similarly, if you accidentally move an object, you can return it to its original position. Some complex operations, such as importing a group of objects, cannot be undone.

Cut, Copy, and Paste

Cut, Copy, and Paste have no function in MARPLOT. They cannot be used to place MARPLOT objects on the clipboard or paste objects from the clipboard into MARPLOT.

Clear

Clear deletes the currently selected map objects. You can get the objects back immediately after the clear using Undo.

Insert Picture Object

The Insert Picture Object menu item is used to create a new picture object.

A picture object is like a rectangle object that is filled with an image, instead of with a standard pattern. Picture objects are like other objects in that they can be named, moved, deleted, etc. You can have as many picture objects as you want, on any layers.

The most common use for a picture objects is as a base map onto which you place other map objects. The idea is to place a picture object, which covers a fairly large geographical area, onto a layer that is near or at the bottom of the layer list. You can then place other objects, such as icons representing facilities, on other layers that are on top of the picture object's layer. While the picture object is technically an object just like those that are placed on top of it, by leaving the picture on a low layer, and by leaving that layer locked, you can achieve the effect of having the picture represent the background (or base map).

However, picture objects may also be used as small objects in their own right. For instance, you might have a logo or other design that you want to place directly on your map. You can do so using a picture object.

Inserting the picture object. When you choose the Insert Picture Object menu item, MARPLOT asks if you want the picture object you are about to add to be the first object on a new map (i.e., the base map for the new map) or an object on an already-existing map. If you choose to make a new map, the name of the map will be the same as the name of the picture file you select.

The image for the picture object can come from either a picture file (i.e., a file—usually made by a drawing program—that contains a picture) or from the clipboard (when you have just copied a picture to the clipboard using the Copy menu item in some other program). If you have copied a picture from another application before choosing the Insert Picture Object menu item, MARPLOT asks if you would like to use that picture, or choose another from a picture file. However, when you are creating a new map, the image must come from a picture file, not the clipboard.

If you choose to insert a picture from a picture file, MARPLOT then lets you locate the picture file on the computer. MARPLOT reads the picture (either from the clipboard or the file) and creates a new picture object. It then brings up the Object Settings dialog box for the new picture object, to allow you to change any of its settings. As with other objects, you should be careful to make sure the picture has been placed on the correct layer and map.

Geo-referencing the picture object. Especially important at the time you create a picture object is the Geo-Reference button in the Object Settings dialog box. The point of the Geo-Reference button is to let you specify exactly where on the earth the new picture object belongs. In some cases, such as when you are using picture objects as small objects instead of as base maps, you will probably not need to geo-reference your picture objects at all; it will be sufficient to drag and stretch them like other objects. But for large base map picture objects that are supposed to represent a precise area, you will usually want to geo-reference them to indicate exactly where they go.

A note to Macintosh users

Some picture files, such as those output by previous versions of MARPLOT, already have lat/long information about the picture they contain stored in a resource. When you insert one of these picture files, MARPLOT will automatically use the provided lat/long values, and no geo-referencing is necessary—unless you want to place the picture object in a different location.

If you do not geo-reference the new picture object as it is being created, it will be placed initially so that it is centered about the Focus Point and scaled to its standard size. No harm is done, since you can always geo-reference the object at a later time. For more about geo-referencing, see "Geo-referencing a picture object" on page 75.

Finishing up. From the Object Settings dialog box, click OK when you are happy with the settings for the new picture object, or Cancel if you decide not to create the object after all. When you click OK, MARPLOT creates a file within the folder of the picture object's map to keep a copy of the picture.

Make New Polygon

This menu item performs different functions depending on which objects are currently selected.

If a single polyline object is selected, it creates a new polygon object that forms an "envelope" around the selected polyline. An envelope is a complex polygon object that is constructed to cover the map area within a given distance from any point on the polyline. You use the Make New Polygon dialog box to specify this distance. For instance, if the polyline represents a road, and you want to see the area that is within 100 yards of any point on the road, you would specify 100 yards in the Make New Polygon dialog box, and the resulting polygon would cover the desired area. Once the envelope is created, you can use it, for instance, to see what other objects fall within it.

If two or more polygon objects are selected, it creates a new polygon object that is the intersection, union, or difference of the selected polygons, depending on your choice in the Make New Polygon dialog box. The intersection is the area that all of the selected polygons have in common. The union is the area that all of the selected polygons cover in total. The difference is the area of the first-selected polygon (the one you clicked first in the map window), excluding the area of the other selected polygon(s).

Note: For the purposes of Make New Polygon, rectangle and circle objects are treated like polygons.

The object created by Make New Polygon (the envelope, the union, the intersection, or the difference) is placed on the Temporary Layer of your User's Map. Objects on the Temporary Layer are deleted when you quit MARPLOT. If you want to save them, move them to another layer before quitting.

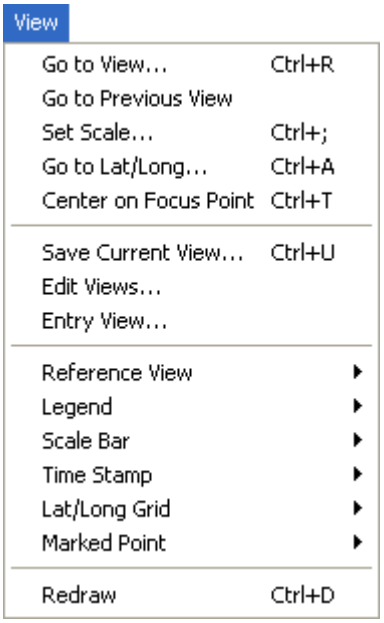
Make New Polyline

Make New Polyline is used after you have selected two or more polyline objects. It creates a new polyline object on the Temporary Layer that contains all of the segments of the selected polyline objects. It can be thought of as a union operation for polylines. Note, however, that attributes of the component polylines, such as street addresses, are not included in the combined polyline.

Polyline <-> Polygon

Polyline <-> Polygon converts the selected object from one type to the other. This is useful, for instance, to "close off" and fill a polyline boundary.

View menu



The items in the View menu are used for navigating around the map, for saving and using views, and for using the map insets and other map window displays.

A view is a rectangular window onto a certain area of the world. When you save a view, MARPLOT records the rectangle, along with a miniature image of what is shown in the map window at the time the view is saved. Depending on the set-up of your MARPLOT system, there may be a number of views available for your use beyond those that you have saved yourself. Also, if your MARPLOT system is multi-user, you can choose whether the saved view is for your use only, or is to be shared with other users.

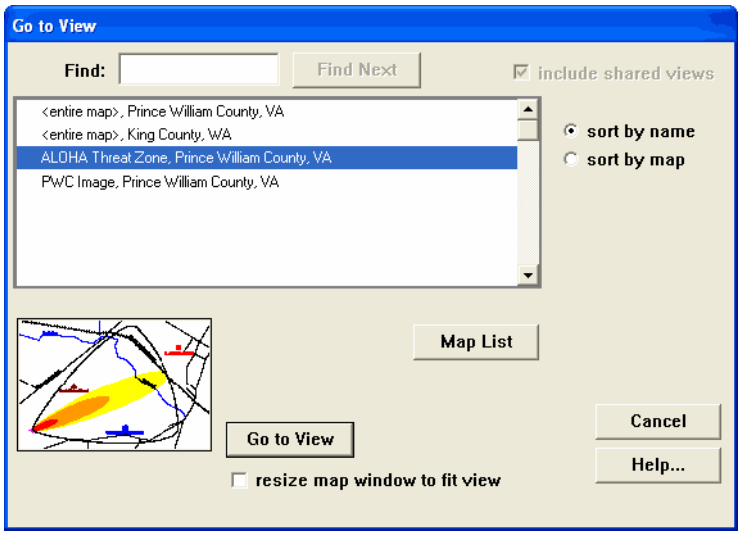
Any saved view can be used as a reference view. When a view is used as a reference view, the miniature image of the view is placed in an inset on the map window. MARPLOT indicates where on the reference view the current map view is situated. For instance, if the reference view shows the entire state of California, and the Los Angeles area is currently shown in the map window, a flashing box appears on the reference view outlining the Los Angeles area within the image of California.

You can designate one of the saved views to be your entry view. When an entry view is set, MARPLOT will go to that view automatically upon starting up.

In the view dialog boxes, you have options as to which views you want to list, and how you want to order them. If your MARPLOT system is multi-user you have the choice of listing only those views saved by you, or including also the views shared among all users of the system. Use the "include shared views" box to make this choice. You can sort the listed views either alphabetically by the name of the view, or alphabetically by the name of the map the view is associated with. Use the "sort by name" and "sort by map" buttons to make this choice. Also, if the list of views is long, you can type the first few letters of a view name in the box at the top of the window and use the Find Next button to locate the desired view in the list.

Go to View

Go to View is used to return to a previously saved view. The Go to View dialog box appears when you the choose the Go to View menu item and also when you start MARPLOT if you have not set an entry view.



The views listed include all the views that have been saved using Save Current View, plus one <entire map> view for each map that has a Places layer (these are usually the county maps derived from TIGER data). Unlike other views, the <entire map> views do not have miniature images associated with them.

Select a view by clicking its name in the list. The miniature image of the view is displayed in the lower-left part of the dialog box. Double-click the view name or click the Go To View button to go to the view.

When the "resize map window to fit view" box is checked, MARPLOT will change the size of the map window on the screen to match the aspect ratio (width to height) of the window at the time the view was saved. This is useful if you want to be sure that what is in the window when you return to the view is exactly what was in the window when you saved the view (actually, such a guarantee is impossible, since the object or layers might have changed since the view was saved). On the other hand, sometimes this extra precision might not be worth the cost of having the map window change size automatically, and you will want to leave this box unchecked.

The Map List button brings you to the Map List dialog box. From the Map List dialog box, you can determine exactly which maps MARPLOT is aware of, and which are in use. From the Map List, you can go to the view of a map—that is, the rectangle that encompasses the map.

Go to Previous View

When you change your view by any means (e.g., zooming in or out, or going to a view with the Go to View menu item) you can return to what you were looking at before by using this menu item.

Set Scale

This menu item and dialog box are used to set the viewing scale by entering the scale value by hand. You can enter the scale in any of the three formats presented. The two other formats change to match the one you modify.

Note: There are other ways to change the viewing scale, without having to type in numbers. For instance, the zoom tools and some of the other items in the View menu change the viewing scale.

Go to Lat/Long

This menu item allows you to enter a latitude/longitude point by hand, and then centers the map about that point. The default lat/long values presented when the dialog box comes up are the coordinates of the Focus Point.

Center on Focus Point

This menu item changes the view, without changing the scale, so that the Focus Point is in the center of the screen.

The Focus Point is the small, flashing target-shaped icon  that marks the location of the most recent point of interest on the map. Every time you click on the map with the arrow tool, the Focus Point moves to the location of your click. The Focus Point also changes in response to other operations, such as when you show an object from the Search Collection on the map.

Save Current View

This menu item is used to add the view that is currently in the map window to the list of saved views. You are asked to name the view, and to pick the map with which the view is associated. You can only associate a view with a map that intersects at least part of that view. It is not crucial that you associate the view with the "correct" map since the map name is used for reference purposes only and can be changed at any time using the Edit Views menu item.

If you have edit-level permission, you have the option of allowing the saved view to be shared with other users of your system. If you want to do so, click the "share view with other users" box.

Edit Views

This menu item and dialog box allow you to make changes to the list of saved views. If you have edit-level permission, you can delete or rename views that you have saved.

Note: Renaming a view also gives you a chance to associate it with a different map.

Entry View

This menu item and dialog box let you pick a saved view as your entry view. There are actually three options regarding the entry view:

1. You can choose to have no entry view (click the No Entry View button), in which case each time MARPLOT starts up it will present you with the Go to View dialog box to choose a starting view.
2. You can choose a particular saved view as the entry view (highlight the desired view and click the Set Entry View button), in which case MARPLOT will go to the designated view when it starts up. The entry view is displayed in the list of views with a small "E" to the left of its name. Note that the list of possible entry views includes those views that have been saved with Save Current View, plus one <entire map> view for each map with a Places layer.
3. You can click the "enter to last view from previous MARPLOT session" box, in which case MARPLOT will always start at the last view you were looking at the last time you were using MARPLOT.

Reference View

Use this menu item to show and hide the reference view inset, and to pick the view to be shown as a reference view. Select the view you want to use as a reference view and click Set Reference View.

In most cases, you will want to restrict your choice of reference views to those views that encompass the current map view. The idea is that a reference view is generally supposed to cover an area that contains the area of the main view, since the point of the reference view is to show you where the main view is in relation to a larger area. It isn't helpful, for instance, if the reference view is showing County A but in the main view you are zoomed in somewhere in County B.

However, there may be times when you want to set a reference view to a view that does not quite encompass the main view. For instance, your main view might be showing the very edge of your map, and you may want to use a reference view that ends at the edge of the map. In this case, you can check the "allow any view in reference" box.

Normally, you will want to keep this box unchecked to avoid the mistake of having a reference view that does not contain the main view. When the box is unchecked, MARPLOT will only allow you to choose a reference view that contains the current main view. Furthermore, as you zoom out, MARPLOT will automatically enlarge the reference view, if possible, to keep the main view enclosed within it.

Legend

Use this menu item to show and hide the legend inset, and to activate the legend panel of the Preferences dialog box to change the legend settings.

Scale Bar

Use this menu item to show and hide the scale bar inset, and to activate the scale bar panel of the Preferences dialog box to change the scale bar settings.

Time Stamp

Use this menu item to show and hide the time stamp inset, and to activate the time stamp panel of the Preferences dialog box to change the time stamp settings.

Lat/Long Grid

Use this menu item to show and hide the latitude/longitude grid on the map window, and to activate the latitude/longitude panel of the Preferences dialog box to change the grid settings.

Marked Point

The Marked Point  serves as a reference location. It is useful for measuring distances when the endpoints of the segment measured are not both visible in the map window. It is also sometimes used when editing polyline objects such as roads.

You can position the Marked Point either by using the Mark Focus Point item in the Marked Point submenu of the View menu, or by using the Mark Vertex item in the Vertex submenu of the Objects menu. You can only mark a vertex after you have selected a polyline or polygon object with the arrow tool.

When the Marked Point is set, its latitude/longitude coordinates appear at the bottom of the window. When you choose Mark Focus Point, the Marked Point is positioned at the current location of the Focus Point. When the Focus Point subsequently moves, the Marked Point retains the position at which it was set and only moves when you explicitly set it to a different location. When you choose Mark Vertex, the Marked Point is positioned at the vertex of the selected polyline or polygon object that is closest to the Focus Point.

Once you have positioned the Marked Point, there are four operations you can perform with it. Three of these operations are in the Marked Point submenu of the View menu:

- **Center on Marked Point** changes the view, without changing the scale, so that the Marked Point is at the center of the map window.
- **Distance to Focus Point** displays the distance from the Marked Point to the Focus Point in the current units (see "Preferences" on page 48).
- **Rescale to Marked & Focus Pts** shifts the map and sets the scale such that the Marked Point and the Focus Point are both just visible at the edges of the window.

The second item in the Vertex submenu, Move Vertex to Marked Point, is used when you want to position a particular vertex point of a given polyline or polygon at an exact latitude/longitude point. This operation, in conjunction with Mark Vertex, is especially important when editing intersecting road segments in MARPLOT, since MARPLOT only considers roads to intersect when they have a common vertex. For example, suppose you have created two roads called A and B. You intend for them to intersect, but as you use the polyline tool to create them in MARPLOT, you do not have the accuracy to ensure that a vertex of A is in the exact same location as a vertex of B. To force the vertices to line up, you can click near the desired vertex of road A and choose Mark Vertex. Then click near the matching vertex of road B and choose Move Vertex to Marked Point. The vertex of B is shifted so that it exactly coincides with the marked vertex of A. Now MARPLOT considers the two roads to intersect. For a step-by-step example of this technique, see "Editing road segments" on page 108.

When you use Clear Marked Point in the Marked Point submenu, the Marked Point disappears from the screen and its latitude/longitude coordinates are no longer displayed.

Redraw

The drawing of a large view can be time-consuming. You can interrupt the drawing by pressing the ESC key or by clicking anywhere on the map with the mouse. This causes the drawing to stop and allows you to perform operations on a partially drawn view. You can then use the Redraw menu item to force the same view to be redrawn completely.

Note: When you cancel the drawing of a view, MARPLOT behaves as if all of the objects are there on the screen. For instance, you can click on the "invisible" objects to select them. Similarly, any objects that were selected before the view was drawn will be remain selected when you cancel the drawing, even if they didn't actually get drawn. If you find you are frequently having to stop the drawing of a map, consider using the Layer List dialog box to set the viewing scale of certain layers to keep them from drawing when you are zoomed out too far.

List menu

This menu contains items for searching and using the resulting Search Collection (that is, the list of found objects).

It is also used to access the list of layers and the list of maps.

Search

The Search Criteria dialog box, which comes up when you select the Search menu item, is used to find objects according to various criteria you specify.

There are three types of criteria that you must specify to do a search:

1. What type of search do you want to do? In the pop-up box following the words "Search for objects that:" there are seven choices for the type of search:
    a. **Have any name –** This choice indicates that you want all objects on the specified maps and layers. Use this option with some caution since you can easily specify several thousand objects—perhaps more than MARPLOT will be able to list on your system.
    b. **Have names that start with...** – In this case, you type the first few letters of the name of the object(s) you are looking for in the box to the right of the pop-up. Do not type a directional prefix in the box. For instance, if you are looking for E Cedar St, just enter Cedar.
    c. **Have names that contain...** – In this case, you type letters that are to be found somewhere within the name of the object(s) you are looking for. This type of search is usually more time-consuming that using the "have names that start with..." option. As with that option, do not type a directional prefix in the box.
    d. **Are within...** – Here you want to find all objects that are within a specified distance from the Focus Point, from the Marked Point (if it is set), or from another set of objects. In this case, you enter the desired distance, including the units, and choose as the reference the Focus Point, the Marked Point, the set of currently selected objects, or the set of objects in the previous Search Collection (i.e., those found in the previous search or the previous Copy to Search Collection operation). This type of search can be time-consuming, so you will want to use it carefully, and be as specific as possible about the layers and maps to be searched.
    e. **Are not within...** – This is similar to the "are within..." option, except it finds objects that are not within the given distance from the given reference.
    f. **Are inside of or touching...** – Here you want to find all objects that are touching the Focus Point, the Marked Point (if it is set), or another set of objects. (**Note:** For polygon, rectangle, or circle objects, touching can mean being completely or partially inside the borders.) For example, finding all objects that "are inside of or touching..." a given polygon object will find objects completely or partially inside the polygon. This search is the same as finding all objects "are within..." 0 miles of the given reference.
    g. **Are outside of and not touching...** – This is similar to the "are inside of or touching..." option, except it finds objects that are not inside of or touching the given reference.

2. Which layers do you want to search? In the pop-up box following the words "Layer(s) to search:" there are three choices:
    a. **All Layers** – This indicates that you want to search all layers. You would use this when you are unsure which layers the desired objects might be found on.
    b. **Multiple Layers... –** Here you want to search on more than one layer, but instead of simply choosing "All Layers," you want to explicitly check each layer to be searched. In this case, a small scrolling box appears in which you can click on the names of the layers you want to search. A check appears to the left of the names of the clicked layers. Clicking a checked layer removes the check. Clicking in the "all layers" box checks or unchecks all layers. Note that you must check at least one layer to perform a search.
    c. **Individual Layer... –** Here you know that the desired object is to be found on a given layer. In this case, a second pop-up box appears in which you can select the layer to be searched.

Note: You may note that in the list of layers presented in the pop-up box, layers with names such as Roads (Major) are not included. Instead, just the Roads layer appears. For the purposes of searching, it is assumed that when you want to search Roads, you also want to search Roads (Major). The same holds true for any layers whose names are the same except for a word in parentheses.

3. Which maps do you want to search? In the pop-up box following the words "Map(s) to search:" you have three choices:
    a. **All Maps –** This indicates that you want to search all maps that are currently available. You would use this when you don't know (or don't want to spend time thinking about) which maps the desired objects are to be found on. In many cases, there is no noticeable loss of efficiency when using this option. However, if you are searching on a layer such as Roads and have a number of maps with many roads, the search is much more efficient if you can specify the map(s) to be searched.
    b. **Maps in View –** This is the most common setting. Here you want to search only the maps that are shown (at least partially) in the current view. The idea is that if you are currently looking at the map, it is likely that you want to search for an object on that map. An important note about this option is that many maps are always considered to be "in view." In fact, only those maps that have a Places layer (which in most cases means those maps derived from Census TIGER files) are ever considered to be not in view. All other maps, such as your User's Map, are always in view, even when no objects on these maps are visible on the screen. Thus, the "Maps in View" option can be thought of as "all maps, except those maps with a Places layer."
    c. **Selected Maps...** – Here you know exactly which map(s) you want to search. In this case, a small scrolling box appears in which you can click on the names of the maps to be searched. A check appears to the left of the names of the clicked maps. Clicking a checked map removes the check. Clicking in the "all maps" box checks or unchecks all maps. Note that you must check at least one map to perform a search.

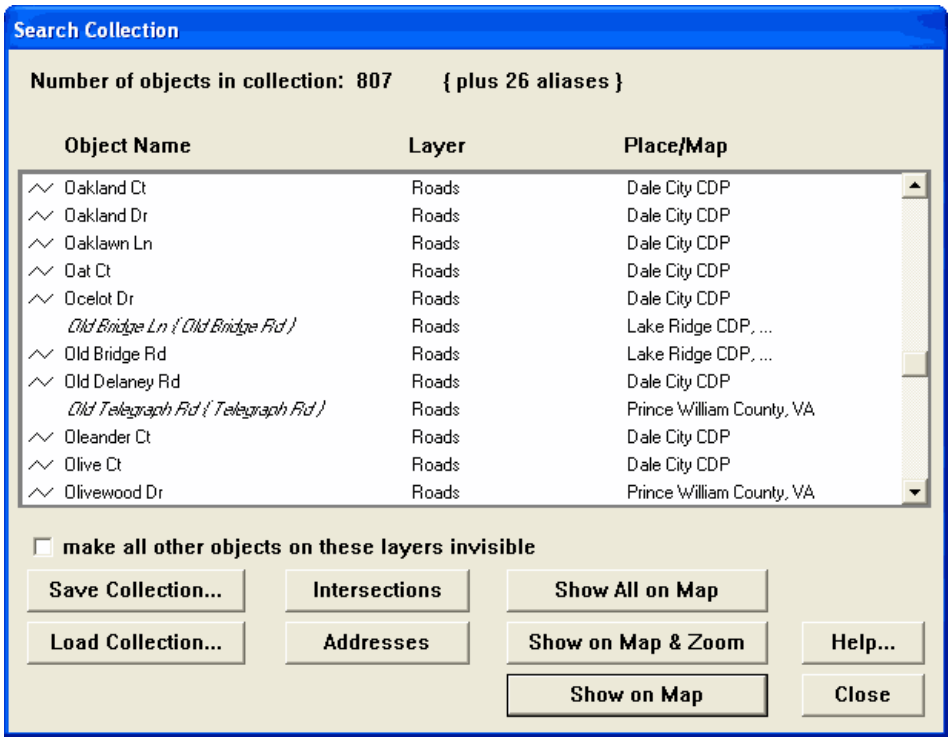
Once you have specified all the necessary criteria, click the Search button to execute the search. While MARPLOT performs the search, it displays messages at the bottom of the map window. If the search is taking too long, you can press the ESC key to stop it, in which case the incomplete results of the search are

displayed. When the search is complete, the objects found to match the specified criteria are put into the Search Collection, and the Search Collection dialog box is shown.

In most cases, you will want to replace any previous contents of the Search Collection (that is, the results of the previous search) with the new list of found objects. This is reflected by the "replace previous collection" choice at the bottom of the Search Criteria dialog box. However, sometimes you may want to keep the contents of the previous Search Collection, but add the newly found objects to the list. In this case you would choose the "add to previous collection" option. Finally, there may be times when you want to search based on the given criteria, but only include objects that were already in the previous search collection (that is, you want to find a subset of the previous search collection). In this case, you would choose the "subsearch of previous collection" option.

Search Collection dialog box

This dialog box displays the list of objects that resulted from the most recent search, or from the most recent use of the Copy to Search Collection menu item.The objects are listed in alphabetical order. You can move quickly to a certain part of the list by typing the first few letters of the name you want.



Each object in the list is displayed with its name, the name of its layer, and its place or map name. If the object is in a particular place that is included on the Places layer of its map, that name will be used. For instance, the place might be "Lake Ridge CDP." If the object is not classified as being in a place on the Places layer, the name of its map will be used. If the object is classified as being in a place, but is also in other places, the name of the place will end with "..." as in "Lake Ridge CDP, ...".

When an object in the list appears in italic type and its name is followed by another name in braces, it means the name is an alternative name for the object whose name is in braces. For instance, if you see *Main St {State Hwy 1}* in italics, it means that the object named State Hwy 1, or at least some section of it, is also called Main St. Thus, the Main St object is not actually an object in its own right, but just a reference to the true object: State Hwy 1. Such references are called aliases in MARPLOT. The Search Collection dialog box shows the total number of aliases, along with the total number of real objects.

A checkbox on this dialog box gives you the option to "make all other objects on these layers invisible." This can be used to hide the other objects temporarily so that you can concentrate on the objects that you placed in the Search Collection. Note that when you are using this option, the words "Search Collection" will appear on the lines of the affected layers in the Layer List dialog to remind you that those layers are being controlled by the Search Collection.

When you have highlighted an object in the list, you can show the object on the map by clicking the Show on Map button. The map is redrawn and shifted, if necessary, to show the selected object. If you click the Show on Map & Zoom button, when the object is shown the scale of the map will change so as just to encompass the object in the map window. This is especially useful when the object to be shown is a boundary-type object, such as a city or county boundary.

Alternatively, you can click the Show All on Map button, in which case all objects in the Search Collection will be selected and shown on the map. The view is rescaled, if necessary, to include all of the objects.

For certain objects, you can also click the Addresses or Intersections buttons to get a list of the address ranges or intersections for the selected object.

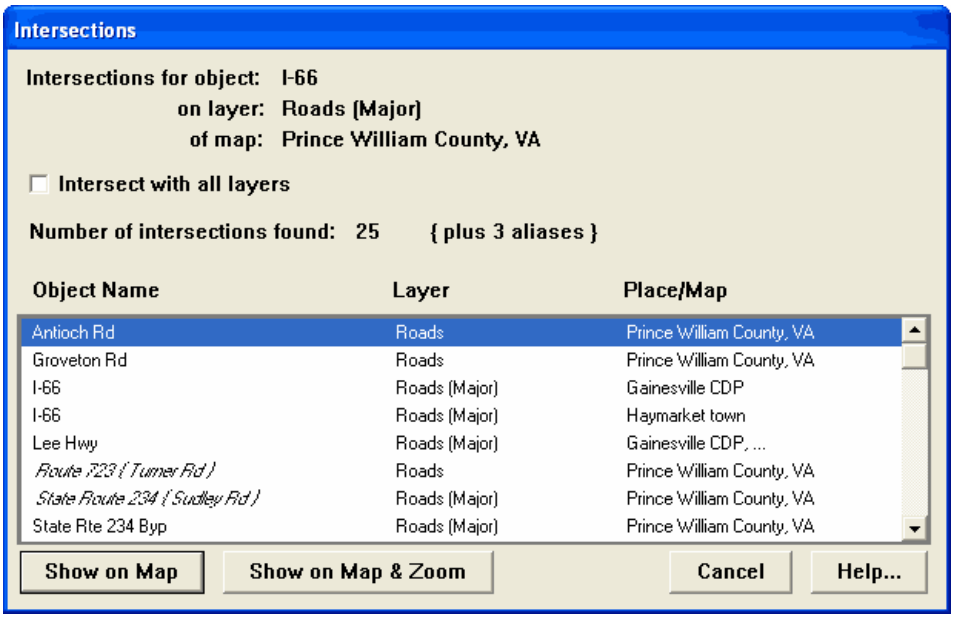
In some cases, you may want to save the list of objects in the Search Collection to your computer, so that you can use them again any time in the future. You can do this using the Save Collection button. You are prompted for a file name to save the Search Collection into. This file has an MSC extension, which stands for MARPLOT Search Collection. Note that MARPLOT provides a folder called SEARCHES as a convenient place to store your saved Search Collections. If your MARPLOT system is multi-user, each user has his or her own SEARCHES folder.

To retrieve a previously saved Search Collection, use the Load Collection button. The loaded collection can replace, be combined with, or serve as a filter on the current Search Collection, depending on your choice at the bottom of that dialog box.

Click Close when you are done working with the Search Collection.

Intersections dialog box

This dialog box lists the objects that intersect the object highlighted in the Search Collection.



Note: For the purposes of this dialog box, MARPLOT only considers two polyline objects to intersect if they share a vertex exactly. Thus, if you simply draw two polylines that cross one another, they will most likely not intersect according to this dialog box, even though they cross each other on the screen. This dialog box is intended for finding intersections in polyline data that has been imported from an external source, such as the TIGER/Line database, where intersecting polylines always share a vertex. If you want to find intersections with arbitrary data, you can do so using MARPLOT's Search function with a "within" or "touching" option. Searching in this way is more flexible, but significantly slower than, this intersection function.

As with objects in the Search Collection dialog box, the intersections are listed with their names, the names of their layers, and the names of their place or map. When you have highlighted an intersecting object in the list, you can show the intersection on the map by clicking the Show on Map button. The map is redrawn and shifted, if necessary, to show the point of intersection. The Show on Map & Zoom button shows the intersection at a scale that is appropriate for viewing typical road intersections.

The check box labeled "Intersect with all layers" is used when you want to find intersections between objects on different layers. For instance, suppose you want to find the places where a road intersects with various rivers. You would select an object on the Roads layer in the Search Collection dialog box and click the Intersections button. By default, only the intersecting objects from the Roads and Roads (Major) layers will be included in the list of intersections. But if you check the "Intersect with all layers" box, intersecting objects from all layers will be included. Thus, any river objects on the Water layer that intersect the road will be in the list.

Note: MARPLOT treats the Roads and Roads (Major) layers as being the same layer as far as intersections are concerned, so you do not have to check the "Intersect with all layers" box to find the intersection between a road and a major road. Whenever two layers have names that differ only by a suffix in parentheses, MARPLOT intersects them with each other automatically.

Addresses dialog box

This dialog box lists the address ranges for a street.

When you have highlighted an address range in the list, you can show the segment of the street that corresponds to that address range by clicking the Show on Map button. The map is redrawn and shifted if necessary to show the chosen segment. The Focus Point is placed on the center of the chosen segment, so that you can identify it.

The Show on Map & Zoom button shows the address range at a scale that is appropriate for viewing typical road segments.

Show Search Collection

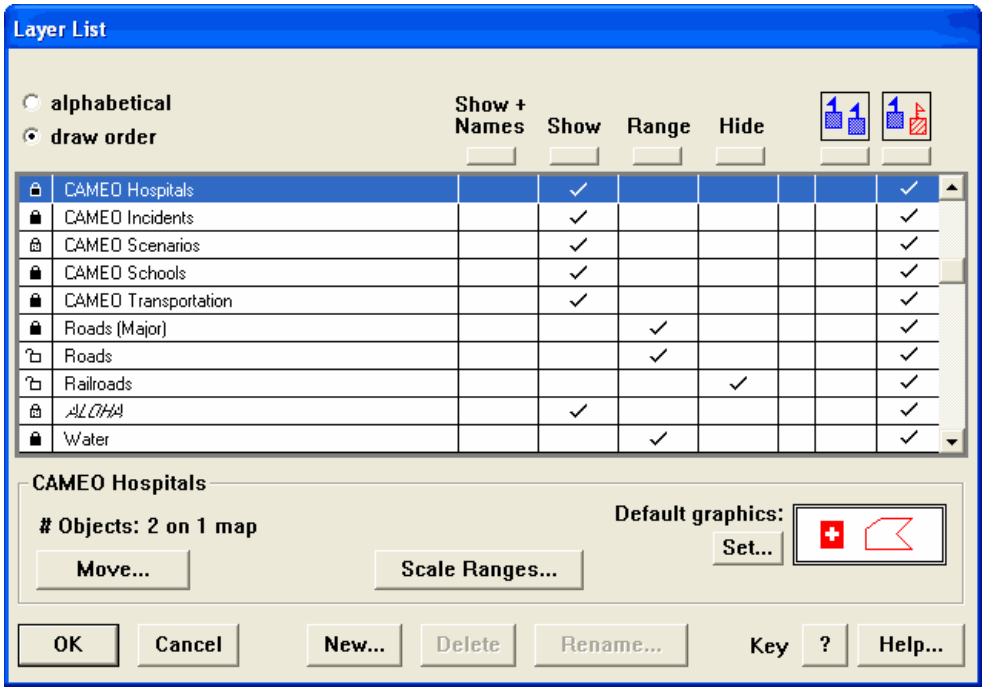
This menu item opens the Search Collection dialog box, which displays the list of objects that resulted from the most recent search, or from the most recent use of the Copy to Search Collection menu item. For more information on the Search Collection dialog box, see "Search Collection dialog box" on page 62.

Copy to Search Collection

Often the set of objects that is currently selected on the map is meaningful to you. For instance, suppose you have selected the 20 objects on your Schools layer that fall within a certain circle. You can easily find the names of the selected objects by copying them to the Search Collection using this menu item. The new Search Collection is then displayed, listing the schools by name. Once the selected objects are in the Search Collection, they will stay there, even after they are no longer selected, until the next time you explicitly modify the Search Collection by doing a search or another Copy to Search Collection.

Layer List

This dialog box presents a list of all the layers. The layers can be listed either in alphabetical order or in their top-to-bottom order, with the top-most layer at the top of the list. The top-to-bottom order of the layers is important because the layers are drawn in order from bottom to top. Thus, objects on higher layers can be drawn over objects on lower layers. Similarly, when you click on the map at a location with objects from more than one layer, the object from the highest layer will be selected.



For each layer, the list gives several columns of information. You can click on any of these columns to change the settings for the given layer. The columns, from left to right, are as follows:

1. **Layer lock status** – At the start of each MARPLOT session, every layer is locked, indicated by a closed padlock icon. When a layer is locked, you cannot make any changes to the objects on that layer, such as moving the objects, renaming them, or changing their color. To unlock a layer, click its lock icon. When you have unlocked one or more layers, the list of tool icons on the left edge of the map window is extended to offer tools for creating new objects. Although all users can unlock layers, users without browse-level permission are restricted to editing those layers on their personal user's map only. You must have edit-level permission to edit other maps. **Note:** When the lock icon for a layer is gray instead of black, it indicates that the given layer has been locked by another application sharing information with MARPLOT. In effect, the layer is "owned" by that application. You can unlock such a layer, but the changes you can make to objects on that layer are restricted to those made by the use of the graphical menu items in the Objects menu.

2. **Layer name –** Clicking on a layer's name simply highlights the layer in the list. If a layer's name appears in italics, it indicates that the layer is temporary, meaning that all objects on the layer will be deleted when the current MARPLOT session is terminated.
3. **Show + Names –** Clicking in this column means that you want to turn the layer on (i.e., show the objects on the layer), regardless of the map scale. Further, you want the objects to be labeled with their names, regardless of the map scale.
4. **Show –** Clicking in this column means that you want to turn the layer on (i.e., show the objects on the layer), regardless of the map scale. The objects will only be labeled with their names at certain scales, as set by the Layer Scale Ranges dialog box.
5. **Range –** Clicking in this column means that you want to turn the layer on (i.e., show the objects on the layer) only within the range of scales set by the Layer Scale Ranges dialog box. Similarly, the objects will only be labeled with their names at certain scales, as set by the Layer Scale Ranges dialog box.
6. **Hide –** Clicking in this column means that you want to turn the layer off (i.e., not show the objects on the layer), regardless of the map scale
7. **Default Graphics –** Clicking in this column  , represented at the top by a pair of identical symbol icons, means that you want all objects on the layer to be drawn using the default graphical settings for the layer, as set using the "Default graphics" control in the boxed area below the list of layers. This gives the objects on the layer a uniform look, and also allows you to change the look of all objects on the layer simply by changing the default graphics for the layer. Note that in this column, instead of a check mark, a small sample of the default graphics for the layer is displayed.
8. **Individual Graphics –** Clicking in this column  , represented at the top by a pair of icons that are not identical, means that you want the objects on the layer to be drawn using their individual graphical attributes, as set by the Object Settings dialog box. In this case, the "Default graphics" for the layer are not used, and the objects on the layer may look very different from one another (although typically most or all of the objects on a layer will have identical individual graphical attributes and will look the same).

There is a small button at the top of each of the last six columns. Clicking this button is the same as clicking in the given column for all layers. For instance, if you wanted to quickly hide all layers except one, you would click the small button at the top of the Hide column to hide all layers, then click in the Show column of the desired layer.

The boxed area just below the list of layers gives information specific to the layer that is currently highlighted in the list. You can use this area to:

- View how many objects are on the layer, and how many maps the layer is represented on.
- Use the Rename button to give the layer a different name. **WARNING:** Renaming a layer can cause trouble when you have previously linked objects on that layer to database programs since the database program's link to the object involves the name of the object's layer. As a rule, you should only rename layers that you have created by hand yourself.
- Use the Move button to move the layer up or down in the list of layers. This option is only available when the layers are listed in top-to-bottom order (that is, when the alphabetical box is not checked).
- Use the Scale Ranges button to set the scale ranges for the layer (see "Layer Scale Ranges dialog box" on page 70).
- Use the Set button to set the default graphical attributes for the layer.

Note: The line style width setting is also used as the setting for the size of the dots, when symbol objects on the layer are shown as dots, according to the Layer Scale Ranges dialog box.

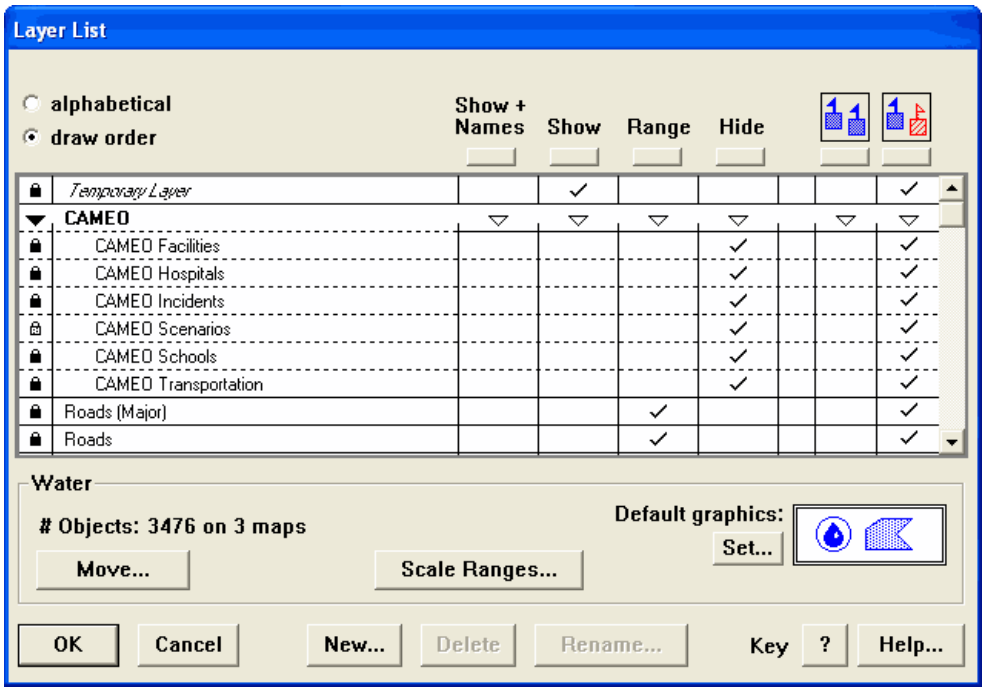
A note on default graphics

By default, in the Default Graphics column of the list of layers, a small symbol icon is displayed to show a sample of the look of objects on that layer. However, some layers contain predominantly objects that are not symbols (points) but polylines or polygons. For instance, a Roads layer would contain only polylines and a Counties layer would contain only polygons. With such a layer, you can choose as the default symbol either the polyline or the polygon symbol that appear near the start of the table of symbols. When one of these is chosen as the default layer symbol, MARPLOT draws a small polyline or polygon instead of a small symbol in the layer's Default Graphics column in the layer list. Similarly, when the default line style pattern is chosen to be the railroad pattern, MARPLOT draws the railroad pattern instead of a symbol in the Default Graphics column.

You can use the New and Delete buttons to create or delete layers. You must unlock a layer before attempting to delete it. Usually, you will only create and delete layers that you intend to use on your personal user's map.

WARNING: Deleting a layer deletes all objects on that layer. This can cause trouble when you have previously linked objects on the layer to database programs, since the database program might consider a linked object to exist even though it has actually been deleted.

Layer List groups. Layer groups give you a way to group layers in the Layer List in order to view and operate on them more conveniently.



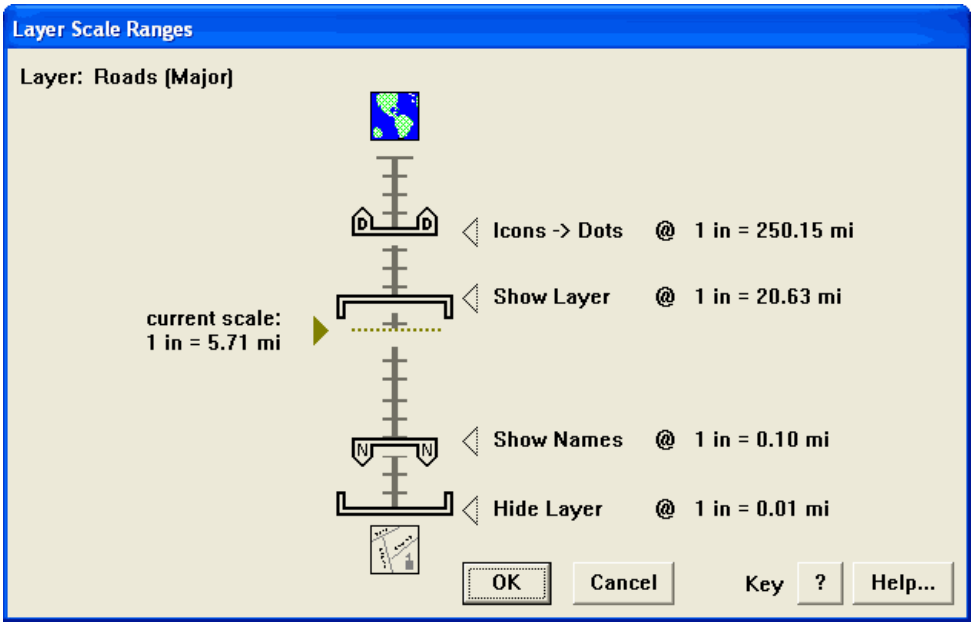
A layer group is just a collection of layers. You create a layer group by clicking the New button in the Layer List dialog box (you are given the choice of creating a new layer or a new group). Move a layer into a group by highlighting the layer and selecting Into Group from the Move pop-up menu. Move a layer out of a group by highlighting the layer and selecting Out of Group from the Move pop-up menu.

A layer group can be opened or closed. Close the group by clicking on the black triangle to the left of its name. Click on the triangle again to re-open the group. The layers in a closed group are treated just like other layers; they are just hidden from view in the Layer List. The downward-pointing triangles at the tops of columns of an open group can be used to set all of the layers in the group with a single action. For instance, clicking in the triangle in the Show column puts all layers in the group into show mode.

To set the scale ranges or default graphics for all layers in a group simultaneously, highlight the group name and use the Scale Ranges button or default graphics pop-up menu.

Deleting a layer group will delete those layers it contains that have no objects. The layers which contain objects are retained in the Layer List.

Layer Scale Ranges dialog box. The purpose of this dialog box is to allow you to set four scale values related to the display of the given layer (or group). The dialog box presents a scale "ruler" that ranges from a largest (most zoomed-in) scale of "1 inch = 0.01 mi" to a smallest (most zoomed-out) scale of "1 inch = 4137 mi". To visualize the scale ruler, you might imagine that you are in a helicopter. At the bottom of the scale ruler, you are very close to the earth and can only see a small amount of land. As you rise higher and higher you see more and more land, until you reach a height, at the top of the scale ruler, where the entire earth is within view.



The four scale values that you can set for the given layer are:

1. The **Show Layer** scale value  . This value applies only when the layer is in Range mode, as set in the Layer List dialog box. It specifies the smallest (most zoomed-out) scale at which the given layer is to be shown (turned on). At all smaller (more zoomed-out) scales, the layer will be hidden (turned off).

2. The **Hide Layer** scale value  . This value applies only when the layer is in Range mode, as set in the Layer List dialog box. It specifies the largest (most zoomed-in) scale at which the given layer is to be shown (turned on). At all larger (more zoomed-in) scales, the layer will be hidden (turned off).

3. The **Show Names** scale value  . The value applies only when the layer is in Show or Range mode, as set in the Layer List dialog box. (When the layer is in Show + Names mode, the names are shown regardless of the scale.) It specifies the scale at which name labels for objects on the layer are to be drawn on the map. The names appear at the given scale and at all larger (more zoomed-in) scales. The purpose of this scale setting is to allow you to show names of objects only at scales where they do not crowd each other on the screen.

4. The **Icons -> Dots** scale value  . This value specifies the scale at which symbol (point) objects on the layer are to be drawn as small dots instead of as their usual symbol icons. Symbols will be drawn as dots at the given scale and at all smaller (more zoomed-out) scales. The purpose of this scale setting is to allow you to show symbols as dots at scales when the symbols icons would crowd each other on the screen.

The four scale values are represented as lines to the right of the scale ruler. Each line has a small arrow pointing at a mark on the scale ruler, the name of the scale value to be set, and the current setting for that scale value.

You can change any of the four layer scale values by clicking on the name of the desired scale value and dragging up or down. The scale value follows the movement of the mouse until you release the button.

The scale of the map's current view in the map window is indicated to the left of the scale ruler. This is a useful reference point when setting scale values. For instance, you might be looking at the map and think, "At this scale, it takes too long to draw all of the objects on my Roads layer." You could then use the Layer Scale Ranges dialog box to change the scale ranges for the Roads layer. You would know to drag the Show Layer scale value somewhere below the current scale marker on the scale ruler.

When you are satisfied with the scale values for the layer, click OK.

Map List

This dialog box lists all of the maps known to MARPLOT. It allows you to modify the status of existing maps, add maps to the system, or remove maps from the system. More information on the management of maps can be found in Chapter 6.

The Map List shows, for each map, the name of the map, the path to the map's folder, the status of the map, and the number of layers the map contains.

Map status can be in one of three states: In Use, Not In Use, or Not Found. Maps that are In Use are drawn on the screen and can be operated on using all of the MARPLOT functions. Maps that are Not In Use are not drawn on the screen. Maps are Not Found when you have renamed or deleted a map folder that MARPLOT had used during a previous session. A map might also be Not Found because it is on a removable disk that is not currently in your computer. **Note:** If a map is Not Found because its disk is not inserted, you must quit MARPLOT, insert the disk, and then restart MARPLOT in order for the map to be found. MARPLOT will not find a map on a disk that is inserted while MARPLOT is running.

You can sort the maps either by name or by path. Sorting by path is useful when you have many maps that are organized hierarchically in folders. Click the small circles to the left of the Name and Path labels to change the sort order.

When there are many maps, you can find a map in the list by typing a few characters of its name into the Find text box and clicking Find Next. Repeatedly clicking on Find Next finds all maps containing the given string of characters.

You can get more specific information about the selected map using the Map Info button, which brings up the Map Info dialog box.

You can use the Go to Map button to change the view in order to encompass the area of the selected map (that is, the area encompassing all objects on the map).

You can rename the selected map using the Rename button.**WARNING:** Renaming a map can cause trouble when you have previously linked objects on that map to database programs since the database program's link to the object involves the name of the object's map. You will rarely want to rename a map.

The Find New Map button is used when you have a map folder that you want to add to the list of maps. You can find a map on one of your hard drives or on any other data storage device. Pick the map by locating the file that ends in .MAP within the map folder you want to add to the map list. Click the Open button to add the map. For information on using CD/DVD maps, see "Adding maps from LandView disks" on page 148.

In a multi-user MARPLOT system, the Find New Map operation is usually performed by the system administrator.

Once you have added a map to the list using Find New Map, MARPLOT will remember it and look for that map each time it starts up. If at some later time you no longer want the map in the list, use the Remove button to remove the map from the list.

MARPLOT automatically looks for maps within its own folder when it starts up. Thus, you can add a map without using Find New Map by putting the map folder into the MARPLOT folder and restarting MARPLOT. You cannot use the Remove button to remove maps in the MARPLOT folder; you must move the map folder outside of the MARPLOT folder in order to remove the map from the list. Also, you cannot remove a map that is "owned" by another application while that application is running.

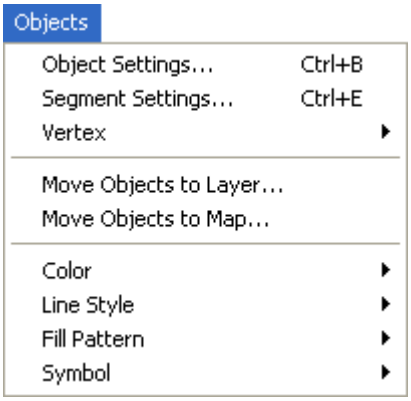
The Remove button does not delete the map's files on the drive, but simply erases MARPLOT's "knowledge" of the map. **Note:** In a multi-user MARPLOT system, any maps added by the system administrator using the Find New Map button are automatically added to the map lists of all users. If the system administrator has added certain maps in this way, only he or she can remove them permanently; other users can remove them for the current MARPLOT session only.

Note: You can toggle a map between In Use and Not In Use by clicking on the map's row in the Status column while holding down the control key (the option key on a Macintosh).

Map Info dialog box. This dialog box shows the name and folder of an individual map, and lets you change certain settings for that map.

- You can click the "use this map" box to put the map In Use or Not In Use.
- Each map has a five-digit default location code. When you create an object on a map, the object inherits its location code from the map.
- The list in the center of the dialog box shows you which layers are included in this map, and how many objects from this map are on those layers.

Objects menu



The items in the Objects menu are used when you have one or more objects selected and want to get MARPLOT information about them or modify them in some way. You can get detailed information about a single object, including information specific to a single segment of a polygon or polygon object. You can modify the selected objects by changing their graphical attributes, or by moving them to a different layer or map.

Note: The Objects menu only affects the objects that are currently selected, and does not apply to other objects, including those created in the future. For instance, if you create an object whose color defaults to red (because red is the default color for its layer) and then change that object to green using the Objects menu, future objects created on that layer will still default to red (until you change the layer's default color).

Object Settings

This dialog box allows you to change the settings of an individual object. It appears automatically to let you check/modify the settings for a newly created object. It also appears when you select a single object on the map and use the Object Settings menu item, or when you double-click on an object on the map. **Note:** In order to modify information about an object, the object's layer must be unlocked. Users with browse-level permission can only modify objects on their personal user's map.

The top portion of the dialog box is the same for all types of objects. The lower portion differs depending on the type of object. The first field lets you view/modify the name of the object.

The next two lines let you change the object's map and layer. Changing an object's map is very rare, and is done only when an object has mistakenly ended up on the wrong map. Changing an object's map does not change its location, but may extend map boundaries. You can change the object's layer if it has been "misclassified" on the wrong layer. Note that to move the object from one layer to another, both layers must be unlocked. **WARNING:** Changing an object's map or layer can cause problems if the object has been linked to a database program.

The next box presents four pieces of information that are used to help track the object:

1. Each object has a four-character owner code. This code is used to keep track of who originally created the object. In a multi-user MARPLOT system, the administrator can assign each user a unique code. Otherwise, objects created by users have the default code: USER. Objects that are derived from Census Bureau TIGER files have the CENS owner code.
2. Each object has a five-digit location code. This is used to keep track of where the object is situated. Generally, this location code matches the default location code of the map the object is on.
3. When an object is modified, the date of the modification is recorded. This date is shown in the Modified field.
4. When an object is modified, the four-character code of the modifier is recorded. This is the code assigned to each user in a multi-user MARPLOT system, or the default value (USER).

Each object is classified according to the Census Bureau's feature classification system. This system uses three-character codes and includes many types of categories ranging from various types of roads to various types of institutions (such as hospitals and schools). In MARPLOT, this classification is used only for display purposes. You can change the classification of the object by using the Set button next to the Class field.

Each object has a place, which is either the name of an object on the Places layer (such as a city), or the name of the map that the object is part of. The place of the object is used by MARPLOT for display purposes only. You can set the object's city or town with the Set button next to the Place field.

The Position/Size button brings up the Position/Size dialog box, which lets you view/modify the latitude/longitude location of the object. The radius measurements of circle objects may also be viewed/modified.

The remaining lower part of the dialog box varies for the different types of objects, as follows.

- **For polygon, polyline, rectangle, and circle objects:** You can view/modify the color, line style, and fill pattern. Filling an object with white means not filling it (i.e., leaving its interior clear). You cannot set the fill pattern of polyline objects, since they have no interior.
- **For symbol (point) objects:** You can view/modify the color, dot width, and symbol. The symbol is the icon used to represent the object on the map. The dot width is the size of the dot to be used for this object when the objects on the given layer are shown as dots, according to the Layer Scale Ranges dialog box.
- **For text objects:** Click the Edit Text button to edit the text of the object. The text does not wrap when displayed on the map, so you should use <enter> (or <return> on a Macintosh) to create multiple lines, if desired. You can also view/modify the color, font, and style of the text. When the "frame" box is checked, the text is drawn surrounded by a frame and against a white background. When the "frame" box is not checked, the text appears unframed, and there is no white background.
- **For picture objects:** A miniature image of the picture is shown on the right. The name of the file in the map folder in which the picture is stored is displayed. When the "frame" box is checked, the picture is drawn surrounded by a frame and against a white background. When the "frame" box is not checked, the picture appears unframed, and there is no white background.

Geo-referencing a picture object. The Geo-Reference button is used to position the picture on the earth by specifying the latitude/longitude coordinates of one or two points on the picture. This is useful when you have a large picture object that serves as a base map upon which other objects are placed. You will usually geo-reference a picture object just once, right after you insert it, but you can correct its location by geo-referencing it any time. Keep in mind, however, that if you have placed objects "on" the picture object, and then shift the picture object, the objects will retain their old position, which will be incorrect in relation to the new location of the picture.

The purpose of this dialog box is for you to specify two latitude/longitude points on the picture object so that MARPLOT knows where it is situated on the earth. You can either specify both points explicitly, or one point explicitly and the other by giving its direction and distance from the first. For a step-by-step example of this technique, see "Adding a picture object with geo-referencing" on page 116.

The four items in the upper-right corner of this dialog box serve as a miniature tool palette. Click on the palette to choose one of these four tools. Use the magnifying glass tools (along with the scroll bars surrounding the picture) to zoom in and out as you search for the two points you want to use. Also, you can click on the miniature copy of your picture on the right side of the dialog box to quickly move to any part of the picture. The moving rectangle in the miniature view shows the area of the picture being displayed in the larger view area.

When you find the location of your first point, choose the "1" tool and click its point on the desired picture point (you might want to zoom in close to increase your accuracy). When you have clicked the point, it will be marked with a "1" on the picture and you will be asked to enter the latitude/longitude values for the point. Do the same for the second point using the "2" tool. With the second point, you have the option of specifying the distance from point 1, instead of giving its latitude/longitude coordinates directly. If you are unhappy with one or both of your points, you can reposition them by using the "1" and "2" tools again, or you can modify only the latitude/longitude values by clicking the Reset buttons. When you are happy with the points and the latitude/longitude values you have entered, click the OK button. MARPLOT will change the position of the picture object to fit the coordinates you have specified.

Note: In some cases, you might not need to geo-reference a picture object. You may be able to achieve the desired accuracy simply by dragging and stretching the object directly in the map window with the arrow tool.

Segment Settings

This menu item and dialog box allow you to view and modify information specific to an individual segment of a polyline or polygon object. To use the dialog box, select a single polyline or polygon object on the map by clicking it with the arrow tool along the desired segment. Then choose the Segment Settings menu item.

The segment's number is given, along with the total number of segments in the object. In objects derived from TIGER/Line data, some segments are "shape" segments of other segments. This means that the segment usually does not have settings of its own but shares settings with some of its neighbors. In most cases, you do not have to be concerned with whether a segment is a shape segment.

For segments that have address information, the address ranges on one or both sides of the segment are displayed. You can modify the segment's address ranges if the selected object's layer is unlocked.

For segments that have ZIP code information, the ZIP codes on one or both sides of the segment are displayed. You can modify the segment's ZIP codes if the selected object's layer is unlocked.

For segments that are derived from TIGER/Line data, the classification code of the segment is displayed. This classification usually matches the classification of the entire object to which the segment belongs, but this is not always the case. You can modify the segment's classification code if the selected object's layer is unlocked.

For segments that are derived from TIGER/Line data, the original TIGER/Line identification number for the segment is displayed, along with the version of the TIGER database the segment was derived from. This information is useful for tracking changes you make to TIGER-derived objects.

When you are finished working with a given segment, you can exit the Segment Settings dialog box with the OK or Cancel buttons, or you can use the Previous and Next buttons as a quick way to browse through other segments of the selected object.

Vertex

The Vertex submenu contains four items that are used to move, insert, and delete vertex points of polyline and polygon objects. All of these items apply only when you have used the arrow tool to select a polyline or polygon object. They all expect the Focus Point to be on or near the desired vertex point of the selected object.

- **Mark Vertex** is used to position the Marked Point at the vertex of the selected polyline or polygon object that is closest to the Focus Point. (For more information, see "Marked Point" on page 58.)
- **Move Vertex to Marked Point** is used when you want to position a particular vertex point of a given polyline or polygon (the one currently closest to the Focus Point) at an exact latitude/longitude point. This operation, in conjunction with Mark Vertex, is especially important when editing intersecting road segments in MARPLOT, since MARPLOT only considers roads to intersect when they have a common vertex. For example, suppose you have created two roads called A and B. You intend for them to intersect, but as you use the polyline tool to create them in MARPLOT, you do not have the accuracy to ensure that a vertex of A is in the exact same location as a vertex of B. To force the vertices to line up, you can click near the desired vertex of road A and choose Mark Vertex. Then click near the matching vertex of road B and choose Move Vertex to Marked Point. That vertex of B is shifted so that it exactly coincides with the marked vertex of A. Now MARPLOT considers the two roads to intersect. For a step-by-step example of this technique, see "Editing road segments" on page 108.
- **Insert Vertex at Focus Point** is used to create a new Vertex in the selected object. You can think of this operation as breaking the given segment into two pieces. Each piece has the settings (address range, ZIP code, etc.) of the original.
- **Delete Vertex** is used to delete the vertex of the selected object that is closest to the Focus Point.

Move Objects to Layer

This menu item moves the selected object(s) from their current layer(s) to the layer you select.

It is most commonly used when you want to change the layer of several objects at once, such as when you are moving all objects from one layer to another layer. (You can also change the layer of an individual object using the Object Settings dialog box.) **Note:** To move an object from one layer to another, both layers must be unlocked. Users with browse-level permission can only move objects between layers on their personal user's map.

WARNING: Changing an object's layer can cause problems if the object has been linked to a database program.

Move Objects to Map

This menu item moves the selected object(s) from their current map(s) to the map you select.

It is most commonly used when you want to change the map of several objects at once, such as when you are moving all objects from one map to another map. (You can also change the map of an individual object using the Object Settings dialog box.) **Note:** To move an object from one map to another, the object's layer must be unlocked. Users with browse-level permission cannot move objects from one map to another.

WARNING: Changing an object's map can cause problems if the object has been linked to a database program.

Color

This menu item changes the color of the selected object(s) to the color you select. **Note:** The layer(s) of the selected object(s) must be unlocked. Users with browse-level permission can only change objects on their personal user's map.

MARPLOT now has enhanced functionality for determining the color of an object. From the Color menu, you may select from 16 pre-determined colors categories or the Other category. The Other category gives you the ability to create a custom color using standardized inputs. **Note:** You can also change the color of an individual object using the Object Settings dialog box.

Line Width/Pattern/Style

These items change the line style of the selected object(s) to the style you select. (You can also change the line style of an individual object using the Object Settings dialog box.) **Note:** The layer(s) of the selected object(s) must be unlocked. Users with browse-level permission can only change objects on their personal user's map.

Note: In Windows, the Line Style menu item is present. On Macintosh systems, there are two menu items relating to line styles: Line Width and Line Pattern. The Line Style items lets you pick from among several thicknesses or patterns. The Line Width and Line Pattern items allow you to combine any chosen thickness with any chosen pattern.

The white or "Ø" line style only applies to polygon edges. If you set the line style of a polyline to white or "Ø", MARPLOT uses a solid pattern instead.

For symbol (point) objects, the width of the chosen line style determines the size of the dot when symbol objects on the given layer are shown as dots, as set by the Layer Scales Ranges dialog box.

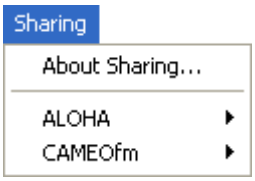
Fill Pattern

This menu item changes the fill pattern of the selected object(s) to the pattern you select. (You can also change the fill pattern of an individual object using the Object Settings dialog box.) **Note:** The layer(s) of the selected object(s) must be unlocked. Users with browse-level permission can only change objects on their personal user's map.

Symbol

This menu item changes the symbol of the selected symbol (point) object(s) to the symbol you select. (You can also change the symbol of an individual symbol object using the Object Settings dialog box.) **Note:** The layer(s) of the selected object(s) must be unlocked. Users with browse-level permission can only change objects on their personal user's map. For more information, see "Appendix: MARPLOT Symbols" on page 157.

Sharing menu



As described in "Linking objects to data in other programs" on page 15, MARPLOT has the capability to share information with other application programs, especially database programs that store information about MARPLOT objects.

The programs work together by means of the Sharing menu. The Sharing menu has a submenu for each application that MARPLOT communicates with directly. For information about the items in the Sharing submenus, see the documentation for the applications that "own" the submenus.

Tools

The MARPLOT tools appear as a list of icons along the left edge of the map window. When you have unlocked one or more layers, the list of tools extends to include tools for creating new objects on the map.

When you click on a tool icon, it becomes highlighted and your mouse cursor changes to the corresponding tool when it is in the map window.

You can double-click on some of the tool icons (those marked with two small arrows) to alter the behavior of the tools. For instance, if you double-click on the arrow tool icon, you can choose whether dragging with the arrow selects using a rectangular or circular area.

Arrow tool 

Whenever you click on the map with the arrow tool, a small, flashing, target-shaped icon called the Focus Point  is placed at that location. The latitude/longitude coordinates of the Focus Point are displayed in the upper-left corner of the map window. The arrow tool is used to select, move, and resize objects on the map. You can also double-click on an object with the arrow tool to get its Object Settings dialog box.

Selecting Objects. You select an object by clicking on it or near it. To select a filled rectangle, circle, polygon, you click on any point inside or near the boundary. To select a non-filled rectangle, circle, polygon, polyline, symbol, or text object you click near the boundary. When an object is selected, it is surrounded by small red markers (handles), and its name, layer, and map are displayed at the bottom of the window. Hold down the shift key when selecting objects to select more than one at a time. If you click on an already-selected object while holding down the shift key, that object will become deselected.

You can select several objects in a given area by clicking with the arrow tool and holding the mouse button down as you drag. The movement of the mouse defines a region with a gray border. When you release the mouse button, you are asked which layer(s) you want to select. All objects in the region and on the chosen layer(s) then become selected.

Moving Objects. When you have selected one or more objects, you can move them simply by clicking on any one and dragging the mouse with the button down. Gray outlines of the objects follow your mouse movements. When you release the button, the objects will move to the indicated location. **Note:** You can only move objects that are on unlocked layers. Users with browse-level permission can only move objects on their personal user's map.

Resizing Objects. When you have one object selected, you can resize it by clicking on one of its handles (the dots that surround the object to indicate that it is selected) and dragging with the mouse. Symbol objects cannot be resized. Picture and Text objects retain their shape as they are resized. **Note:** You can only resize objects that are on unlocked layers. Users with browse-level permission can only resize objects on their personal user's map.

Options. When selecting a group of objects by defining a drag region with the arrow tool, you have the option of using either a rectangular or a circular region. The rectangular region follows the mouse starting at the corner of the rectangle while the circular region follows the mouse from the center of the circle. You can choose which shape will be used by double-clicking on the arrow tool icon. Also, you can toggle between two types of selection regions by holding down the control key (option key on a Macintosh).

If you hold down the control key (option key on a Macintosh) when clicking on the map, MARPLOT will ask you which layers you want to select on and then select all objects on the chosen layers that are touching the point at which you clicked. This allows you to select several objects at the same location, regardless of which ones are "on top" of the others, according to the top-to-bottom order of the layers.

If the right mouse button (control key on a Macintosh) is down at the time MARPLOT displays an object's name at the bottom of the window, the object's ID number is also displayed.

Hand tool 

The hand tool is used to scroll the map in the window. Click and drag with the hand. When you release the button, the map shifts in the direction of your drag.

Zoom-in tool 

The zoom-in tool is used to zoom into the map by a factor of two or to zoom into an area of the map by selecting that area as a rectangular region. When you click with the zoom-in tool, the map is rescaled and centered about the location of the click.

When you drag to select an area and release the mouse button, the view is changed to show just the selected area. Note that, as you drag, the rectangular selection region is constrained to match the dimensions of the map window.

Options: Double-click in the zoom-in tool in the tool palette to choose whether the rectangle is defined by following the mouse from the top-left corner or from the center of the rectangle. Hold down the control key (option key on a Macintosh) when using the tool to toggle between the two behaviors.

Zoom-out tool 

The zoom-out tool is used to zoom out from the map by a factor of two. When you click with the zoom-out tool, the map is rescaled and centered about the location of the click.

Distance tool 

The distance tool is used to measure distances on the map with the mouse. To use this tool, click on the map and drag while holding the button down. The mouse movement defines a circle, with a radius drawn from the mouse to the location of the initial click. The radius of the circle is displayed at the bottom of the map window, in the current units (use the Preferences menu item to change the current units). MARPLOT also displays the angle of the radius line, where 0° is true north, and the angle increases clockwise. **Note:** If you are measuring very large distances with the distance tool, MARPLOT will stop drawing the circle (but continue to draw the length) at the point that the curvature of the earth makes the circle unrealistic.

Symbol tool 

The symbol tool is used for creating symbol objects (also called point objects). **Note:** The symbol tool is only available when one or more layers are unlocked.

As soon as you click to place a symbol, the Object Settings dialog box for the new object pops up to allow you to change any of its settings. You should be especially careful to make sure the object has been placed on the correct layer and map. Click OK when you are happy with the settings for the new object, or Cancel if you decide not to create the object after all.

Rectangle tool 

The rectangle tool is used for creating rectangle objects. **Note:** The rectangle tool is only available when one or more layers are unlocked.

You create a rectangle by clicking with the rectangle tool on the map and dragging. As soon as you release the mouse button, the Object Settings dialog box for the new object pops up to allow you to change any of its settings. You should be especially careful to make sure the object has been placed on the correct layer and map. Click OK when you are happy with the settings for the new object, or Cancel if you decide not to create the object after all. **Note:** A rectangle object is always oriented so that its sides are vertical and horizontal. To create a four-sided object that is rotated, you must use the polygon tool to create a polygon object.

Options: When drawing the rectangle, you can treat the initial mouse click either as the top-left corner or the center. You can use the control key (option key on a Macintosh) to toggle between the two, and you can set one or the other as a default preference by double-clicking on the rectangle tool icon. Also, if you hold down the shift key when drawing the rectangle, it is constrained to a square.

Circle tool 

The circle tool is used for creating circle objects. **Note:** The circle tool is only available when one or more layers are unlocked.

You create a circle by clicking with the circle tool on the map and dragging. As soon as you release the mouse button, the Object Settings dialog box for the new object pops up to allow you to change any of its settings. You should be especially careful to make sure the object has been placed on the correct layer and map. The Position/Size button leads to a dialog box that gives the area, perimeter (circumference), and radius of the selected circle object and lets you view/modify the radius value and the latitude/longitude position of the center of the circle. You can modify the position only when the object's layer is unlocked. **Note:** Unless you need to place the object at an exact latitude/longitude point, it is often easier to move the object by dragging it in the map window with the arrow tool. Click OK when you are happy with the settings for the new object, or Cancel if you decide not to create the object after all.

Options: When drawing the circle, you can treat the initial mouse click either as the top-left corner or the center. You can use the control key (option key on a Macintosh) to toggle between the two, and you can set one or the other as a default preference by double-clicking on the circle icon.

Polyline tool 

The polyline tool is used for creating polyline objects, which are strings of connected line segments used to represent things such as roads or rivers. **Note:** The polyline tool is only available when one or more layers are unlocked.

You define a polyline segment by segment, clicking at the end point of each segment. Double-clicking on the final endpoint finishes creating the polyline. The polyline terminates at the location of your double-click.

As soon as you double-click, the Object Settings dialog box for the new object pops up to allow you to change any of its settings. You should be especially careful to make sure the object has been placed on the correct layer and map. Click OK when you are happy with the settings for the new object, or Cancel if you decide not to create the object after all.

Note: Use the arrow tool, not the polyline tool, to move the vertex points of an existing polyline object.

Hint: If you forget to double-click on the last point of your polyline, you can finish the polyline without defining a new point by clicking once on the polyline tool icon. (You can only do this after you have defined at least two real endpoints.)

Polygon tool 

The polygon tool is used for creating polygon objects (multi-sided, closed figures). **Note:** The polygon tool is only available when one or more layers are unlocked.

You define a polygon segment by segment, clicking at the end point of each segment. Double-clicking on the final endpoint finishes creating the polygon. The final segment connecting the final endpoint to the polygon's starting point is automatically filled in. **Note:** Use the arrow tool, not the polygon tool, to move the vertex points of an existing polygon object.

As soon as you double-click, the Object Settings dialog box for the new object pops up to allow you to change any of its settings. You should be especially careful to make sure the object has been placed on the correct layer and map. Click OK when you are happy with the settings for the new object, or Cancel if you decide not to create the object after all.

Hint: If you forget to double-click on the last point of your polygon, you can finish the polygon without defining a new point by clicking once on the polygon tool icon. (You can only do this after you have defined at least three real endpoints.)

Text tool 

The text tool is used for creating text objects to label your maps. **Note:** The text tool is only available when one or more layers are unlocked.

Click on the map with the text tool to specify the center of a new text object.

As soon as you click, the Object Settings dialog box for the new object pops up to allow you to change any of its settings. For new text objects, MARPLOT brings up the Edit Text dialog box immediately to let you enter the text. You should be especially careful to make sure the object has been placed on the correct layer and map. Click OK when you are happy with the settings for the new object, or Cancel if you decide not to create the object after all.

4

Examples

This chapter contains several MARPLOT examples. If you would like to follow along using your copy of MARPLOT, you will need to download the District of Columbia map by going to http://www.epa.gov/oem/cameo/marmaps/. **Note:** It is not possible to follow along in MARPLOT with the King County, WA, examples, so you do not need that map.

Adding maps

Introduction

A MARPLOT map is a folder containing layer files. Layer files have names that end with .LYR, .SUM, and .OBJ (in some cases there are also files with names ending in .SM2 and .NNX).

MARPLOT automatically adds to its map list any map folder that is inside the MARPLOT folder at the time a MARPLOT session begins.

MARPLOT keeps a list of maps stored in locations other than the MARPLOT folder in the file XTRAMAPS.PLT. When a MARPLOT session begins, MARPLOT adds to its map list any map in this file that is still valid (maps in the XTRAMAPS.PLT file are invalid, for example, if they are on a disk that has been removed, or if you have changed the file name or path).

MARPLOT will automatically add maps from a LandView CD/DVD as soon as it recognizes that such a disk has been inserted.

Thus, you have a number of options for adding MARPLOT maps to your system. This example explores these options in four sections. The first two sections apply to using maps taken from a source other than a disk. Later sections discuss using maps from LandView CDs/DVDs. For more information, see "Adding maps to your MARPLOT system" on page 148.

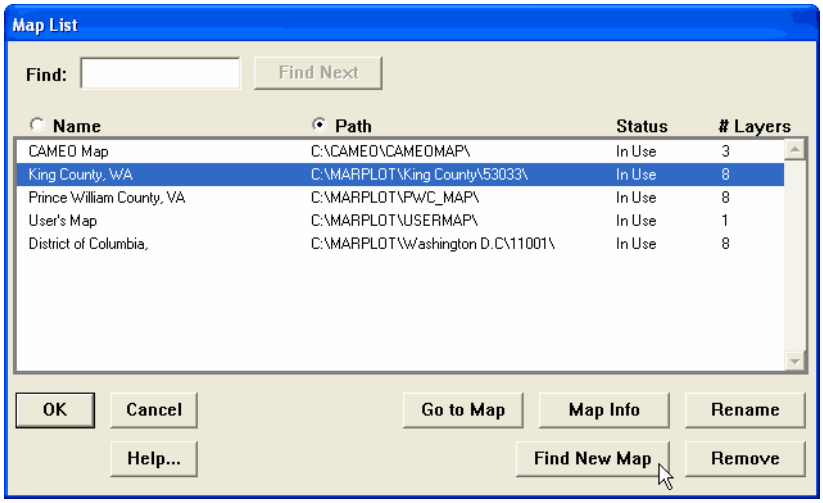
Copying a map into the MARPLOT folder

If you have space where you keep MARPLOT itself, and if the map is one you want to use regularly, it makes sense to keep the map right in the MARPLOT folder. It's a simple matter of copying the map folder into the MARPLOT folder. **Note:** You have to restart MARPLOT for it to see the new map.

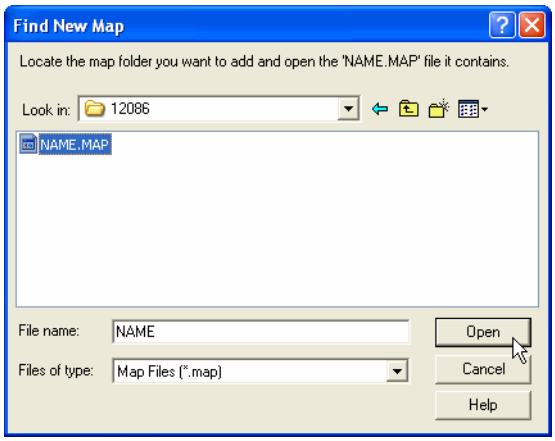
Using Find New Map

If you have a map in a folder that is not in the MARPLOT folder, you need to use MARPLOT's Find New Map function to show MARPLOT where the map is located. **Note:** You will need to use this function to locate maps stored in the XTRAMAPS folder because it is a subfolder within the MARPLOT folder.

1. Start MARPLOT.
2. From the List menu, choose the Map List option. A Map List dialog box appears.

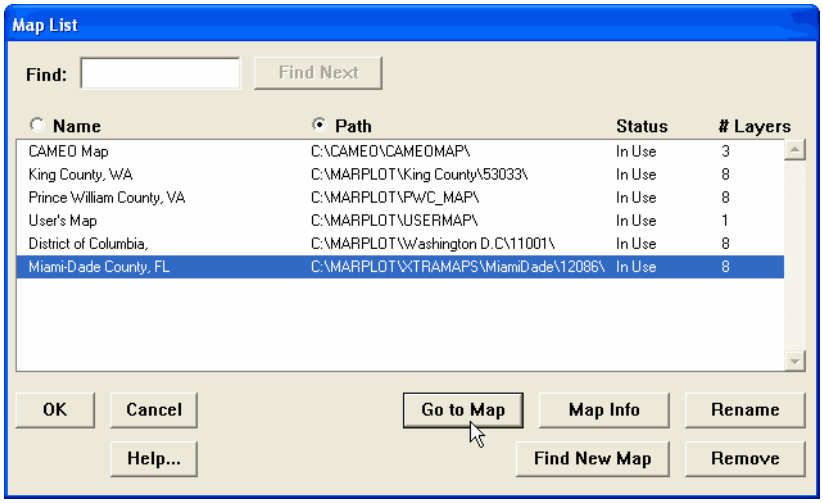


3. Click Find New Map.
4. MARPLOT brings up a standard find file dialog box.



5. Use the Find New Map dialog box to browse to the folder where the desired map is stored. Highlight the NAME.MAP file it contains. Then click Open (or Choose on a Macintosh).

6. Back in the Map List dialog box, the new map has been added to the list. At this point, you can click OK, or click Go to Map to view the added map right away.



Note: MARPLOT keeps the path to the new map in its XTRAMAPS.PLT file. It will remember the map until you use the Remove button in the Map List dialog box to remove it.

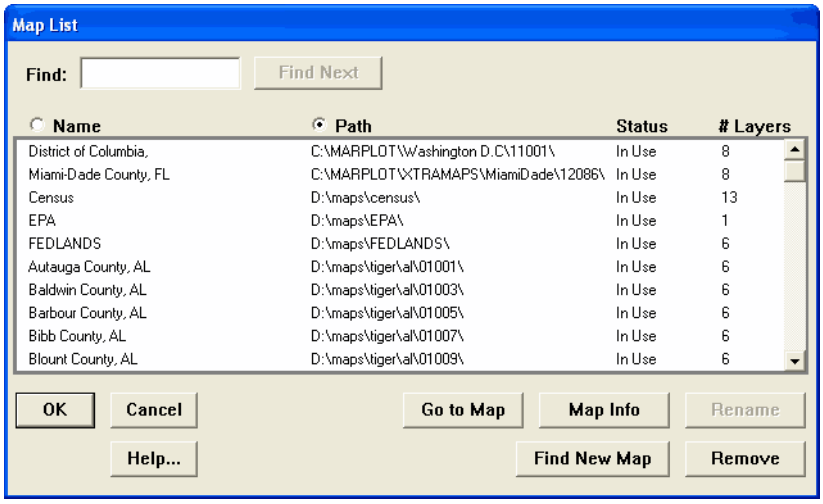
Using maps on a LandView CD/DVD

LandView is a database that uses MARPLOT maps. You can use LandView CDs/DVDs as a source for your MARPLOT maps.

When you insert a LandView CD/DVD into your drive, MARPLOT automatically "loads" all maps on the CD/DVD. (**Note:** If you insert the LandView disk in the middle of a MARPLOT session, you have to go to the Map List dialog box before it will recognize the disk.)

The loaded maps draw directly from the disk. Depending on the speed of your computer and the size of the area you are viewing, the maps may or may not draw at an acceptable speed. If accessing maps directly from the LandView disk is too slow for your purposes, you can download one or more maps to your hard drive to increase performance, as explained in the next section.

When you bring up the Map List dialog box, you can see that all of the maps from the LandView disk are listed, along with the maps in your MARPLOT folder and the maps referenced in XTRAMAPS.PLT.



When the maps from a LandView disk have been loaded, it is often preferable to view the map list sorted by map path instead of by map name. To do this, click the circle next to the "Path" label. You can see the maps in your MARPLOT folder grouped together. Since the LandView disk is organized hierarchically by state, maps from the same state also group together.

Once you have inserted a LandView disk and the maps have been loaded, the maps are ready to use. As you navigate around the map, the various county maps from the disk will draw.

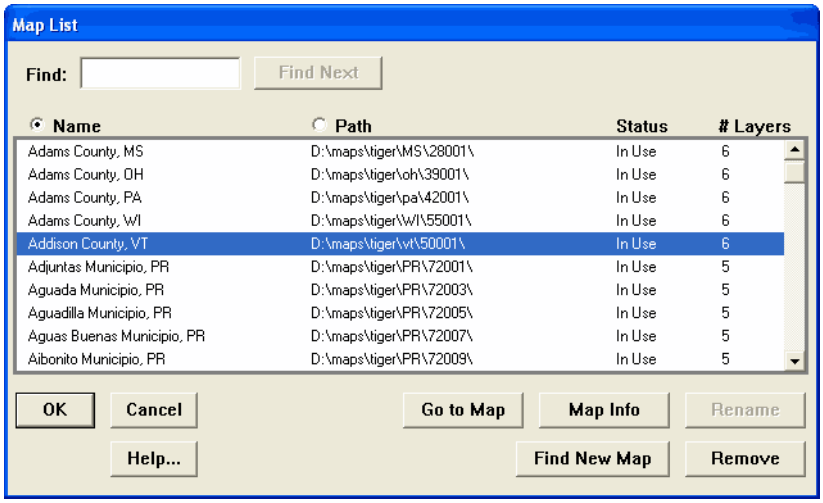
Downloading a map from a LandView CD/DVD

For a number of reasons, you may want to copy maps from a disk onto your hard drive:

- Most map operations such as drawing, clicking, and searching are faster when maps are on your hard drive.
- You want to edit the maps to correct errors or add missing features (**Note:** You cannot edit maps on a LandView disk).
- You only want to use a few maps from the disk, and don't want to bother with the delay when MARPLOT loads the entire LandView disk on startup.
- You have borrowed the LandView disk and want to copy certain maps before returning it.

Suppose you want to download the map for Addison County, VT, from the disk to your hard drive. (Recall that when you insert a LandView disk, MARPLOT automatically loads all maps from the disk into the Map List.)

1. First you need to find the path to the Addison County map from the Map List, since the Map List shows where that county is located on the disk and you want to copy it to the hard drive. Open the Map List dialog box from the List menu.
2. Scroll through the list of maps until you see Addison County, VT.



3. Write down the path that is displayed for the map. (If the path is too long to be displayed on the Map List dialog box, highlight the map name and then click Map Info to see the full path name and additional map details.)
4. Exit out of MARPLOT.
5. Using the path that you just wrote down, locate the map on the LandView disk and copy the map folder to your hard drive. Generally, it is most straightforward to put the map folder in your MARPLOT folder. If you only want to use the map periodically, you may want to put it somewhere other than the MARPLOT folder, such as the XTRAMAPS folder.
6. Exit out of LandView and eject the disk.
7. Start MARPLOT. If you have copied the map into your MARPLOT folder, MARPLOT will find the map automatically. If you have placed the map outside of the MARPLOT folder, you will need to use the Find New Map button and locate the .MAP file inside the map folder.
8. Return to the Map List dialog box. The Addison County map is back in the list, but this time it is located on your hard drive. **Note:** If you reinsert the LandView disk during a future MARPLOT session, the copy of Addison County that you downloaded will be used in preference to the copy of Addison County on the disk.

Searching and the Search Collection

In the guided tour in Chapter 2, you saw how to search for cities, roads, intersections, and address ranges. In those cases, you were finding map objects by name. You can use the same techniques to find other objects by name. For instance, to find the University of Washington in King County, you could search for objects with names starting with "univ" on the Miscellaneous layer of the King County map (or simply the "Maps in View" if you are currently looking at King County).

In this example, instead of searching primarily by name, you will explore the different mechanisms MARPLOT provides for searching by geographical distance. You can ask questions like, "How many objects on layer A are within one mile of this point?" or "Among the objects found in the last search, which ones fall within this threat zone?"

Adding new maps

To follow along with most of the following examples using your copy of MARPLOT, you will need to download the District of Columbia map by going to http://www.epa.gov/oem/cameo/marmaps/. Follow the instructions for downloading and installing the map to you computer. **Note:** It is not possible to follow along in MARPLOT with the King County, WA, examples, so you do not need that map.

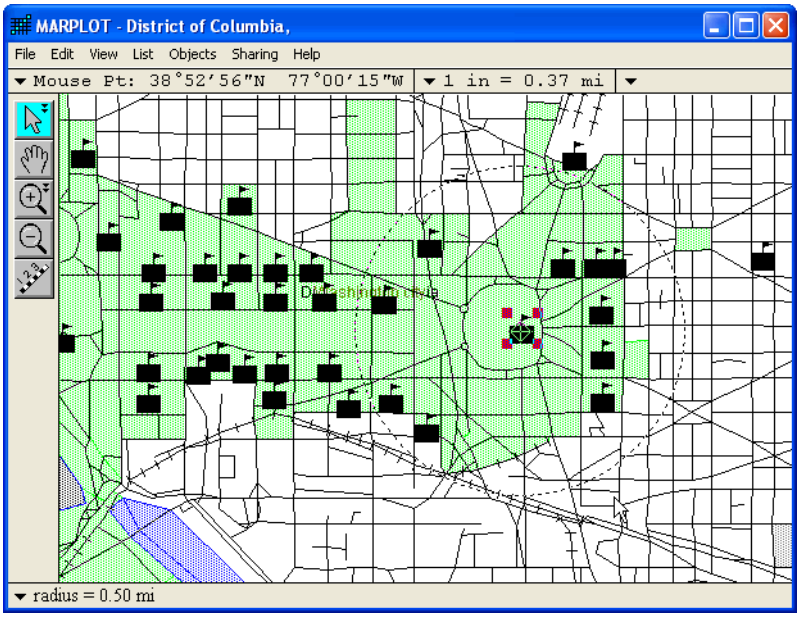
Using the arrow tool to search

The simplest way to search within a certain area or distance in MARPLOT is simply to drag on the map with the arrow tool. As you drag, you define a region, either rectangular or circular (you can choose the shape in the Preferences dialog box). When you release the mouse button, MARPLOT asks which layers you want to select on (only layers that are currently shown are offered). It then selects all of the objects from the chosen layers that fall within the defined region. It includes objects that are partially inside and partially outside of the region.

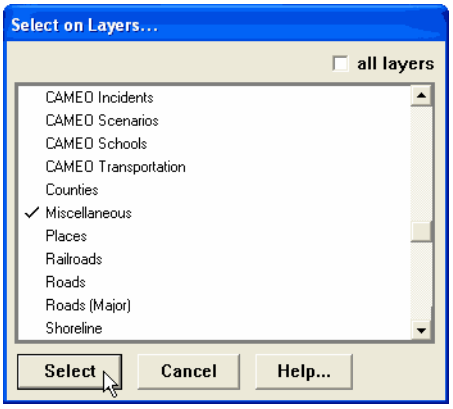
For instance, the Washington, D.C. map includes symbol objects on the Miscellaneous layer representing many of the Federal buildings and national museums in the area. Suppose you want to find which of these buildings and museums are within half a mile of the Capitol.

1. In the File menu, choose Preferences. The Preferences dialog box appears.
2. Select the Tools tab and change the Arrow Tool Selection to the circle option. Click OK.
3. On the Washington, D.C. map, locate the Capitol building. (**Note:** On this map, the Capitol is called the US Capitol Building and it is on the Miscellaneous layer. If you don't see the Capitol, make sure that the Miscellaneous layer is set to Show.)
4. Select the arrow tool. 

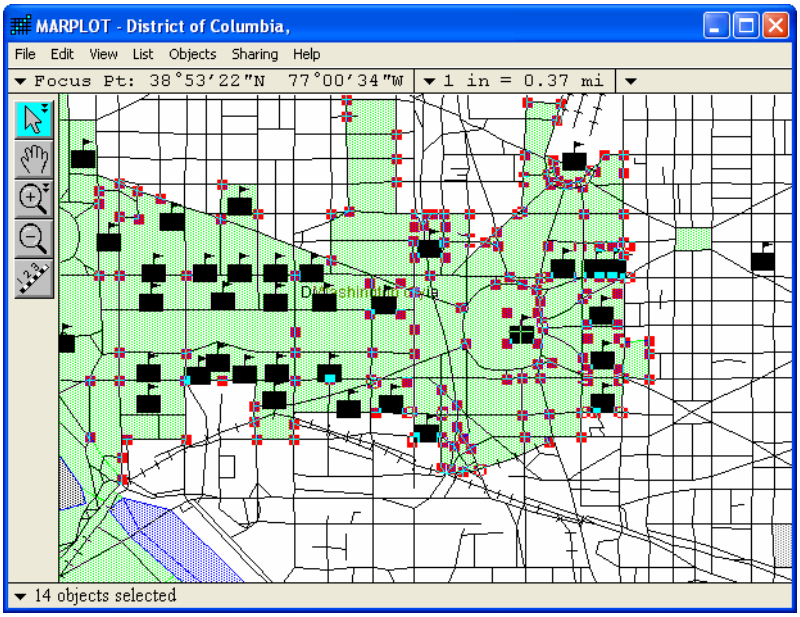
5. Click on the Capitol and drag away until the radius of the circle is 0.50 miles, as indicated in the status line at the bottom of the map window.



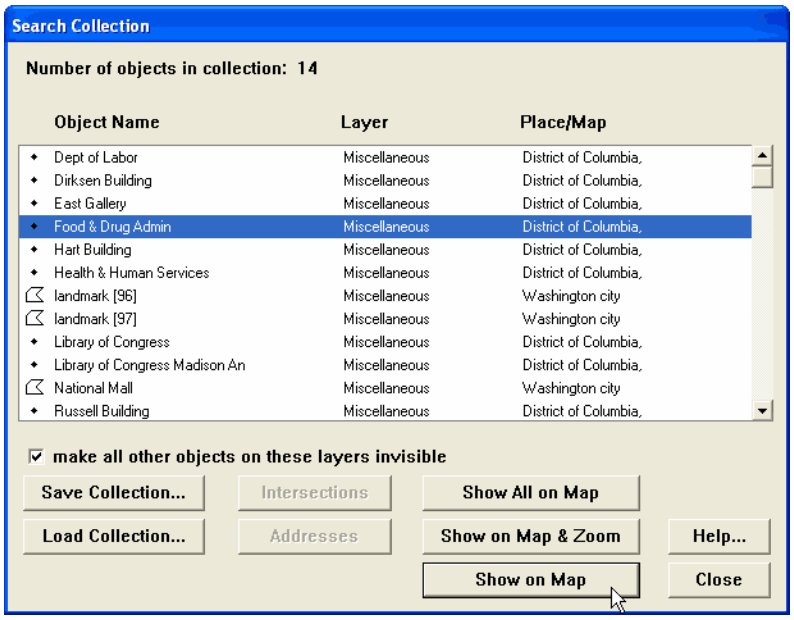
6. When you release the mouse button, MARPLOT asks which of the visible layers you want to select on. Check only Miscellaneous and click Select.



MARPLOT selects all of the Miscellaneous objects that fall within the defined circle, and tells you that 14 objects in all were selected. MARPLOT found not only the point (symbol) objects, but the other objects on the Miscellaneous layer that were within the given radius. In this case, the grounds around the Capitol are represented as many small polygon objects, all named landmark, and one larger polygon object called National Mall.



7. You can see exactly which objects were selected using the Copy to Search Collection function in the List menu. This copies all of the objects that are currently selected on the map into the Search Collection, replacing any previous Search Collection. As soon as the objects are copied, MARPLOT displays the Search Collection dialog box.

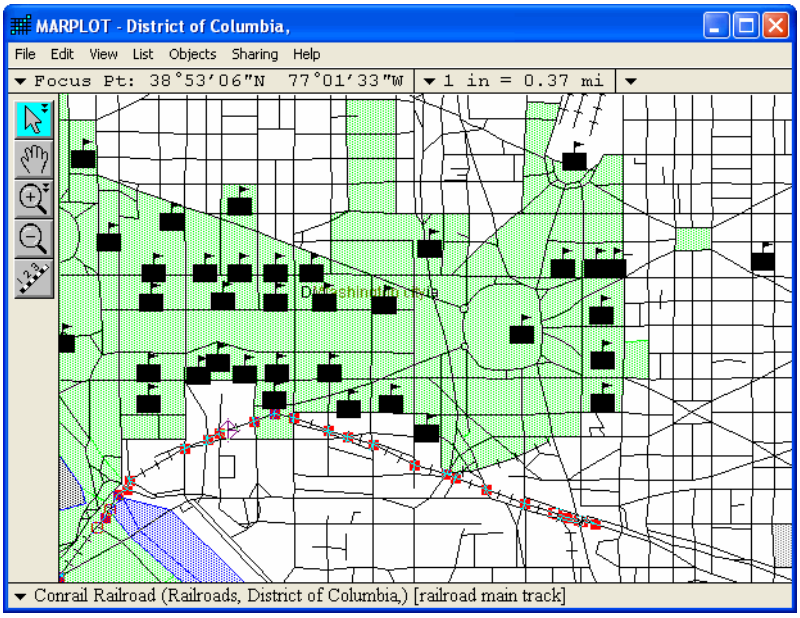


8. To find the location of one of the objects in the Search Collection, highlight it in the list and click Show on Map. MARPLOT displays the map with only that object selected. Although only one object is selected now, the Search Collection is unchanged; it still contains the 14 found objects.

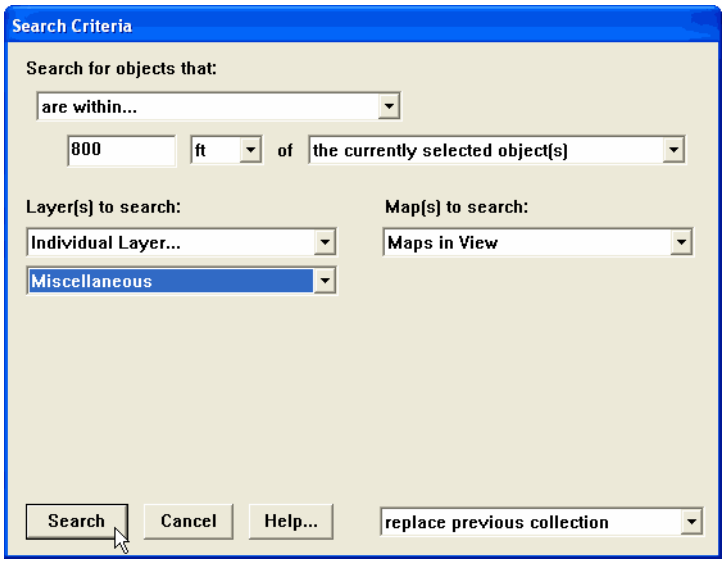
Using the Search Criteria dialog box

Now let's look at some examples of searching by geographic distance using the Search Criteria dialog box. The Conrail Railroad passes along the south edge of the Mall. Suppose you want to identify the government buildings on your map that fall within 800 feet of any point along this stretch of railroad.

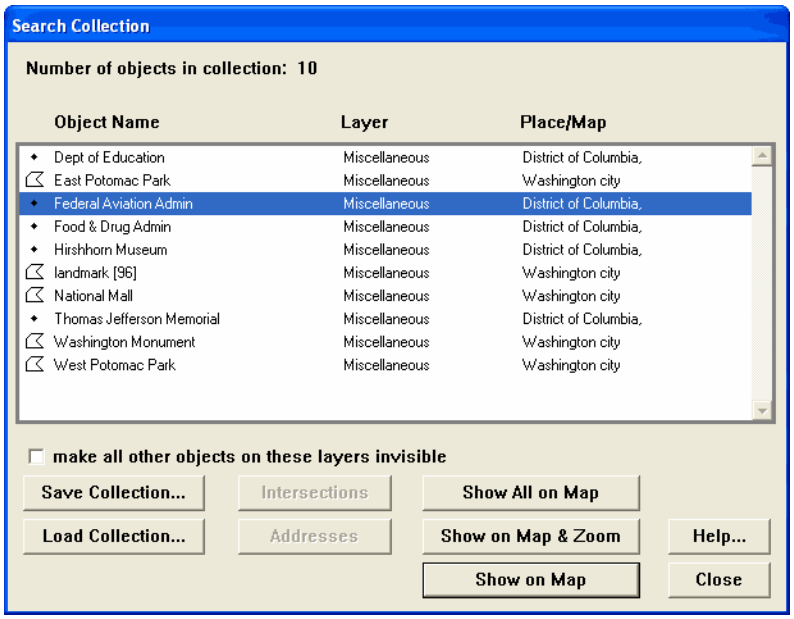
1. Select the Conrail Railroad object using the arrow tool.



2. From the List menu, choose Search. A Search Criteria dialog box appears.
3. Search for objects that "are within" 800 feet of the currently selected object (i.e., the railroad object you just selected on the map). Search on the Miscellaneous layer.

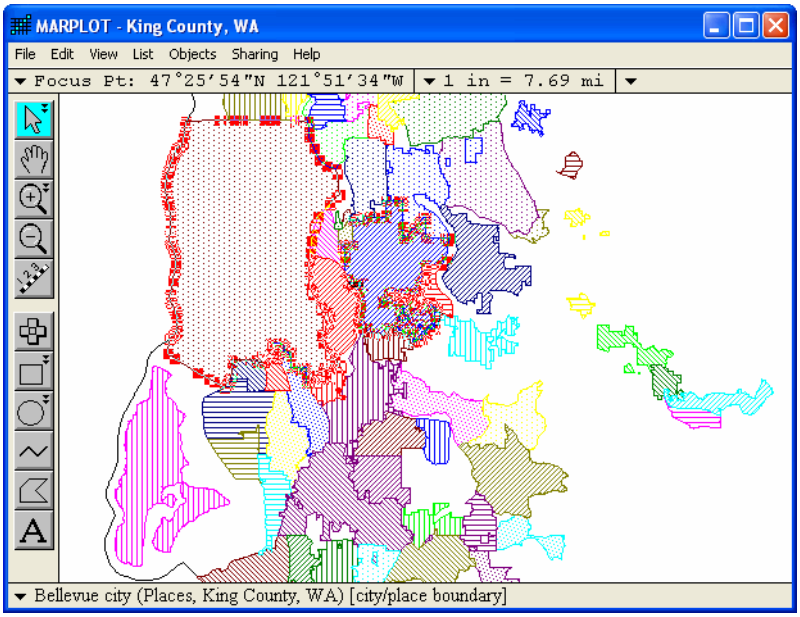


4. MARPLOT displays the results of the search in the Search Collection dialog box. Again, you should see several polygons along with the point objects. Click Close.

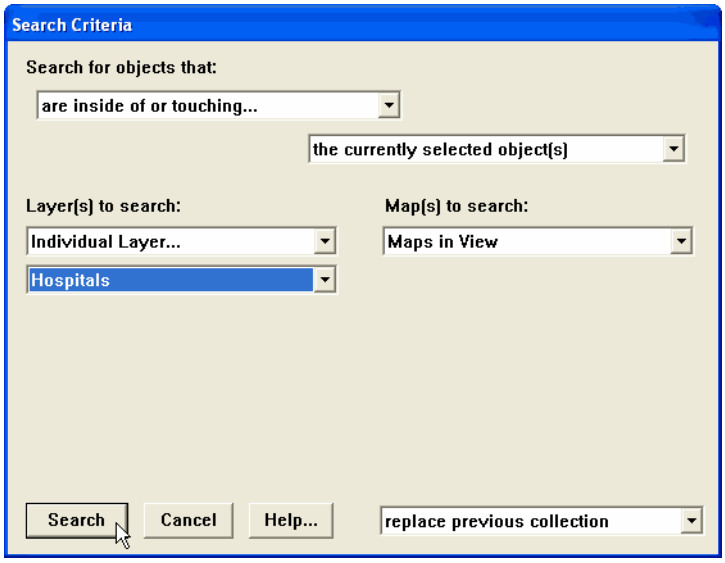


Saving a Search Collection

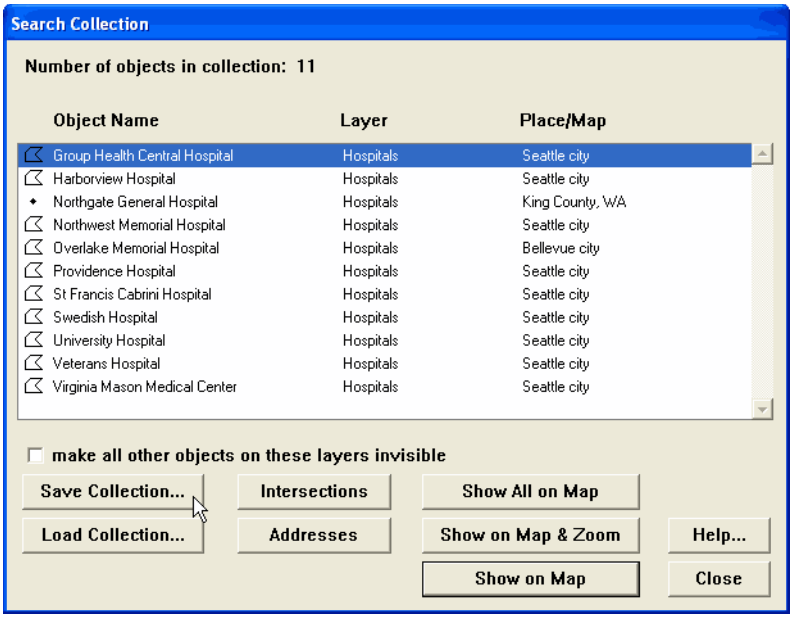
As a final example of searching, suppose you have a database of hospitals in King County, WA. You want a list of the hospitals that are either in the city of Seattle or the city of Bellevue, which is just across Lake Washington from Seattle. To find these hospitals, you can show only the Places layer of the King County map, and then select both Seattle and Bellevue by clicking on them while holding down the shift key.



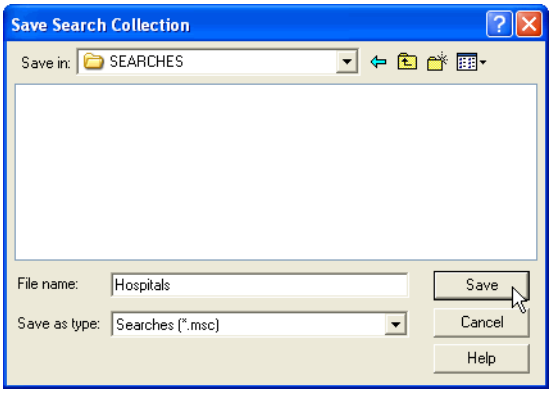
You can then search for all objects (objects with any name) on the Hospitals layer that are inside the objects currently selected on the map (i.e., the two city polygons).



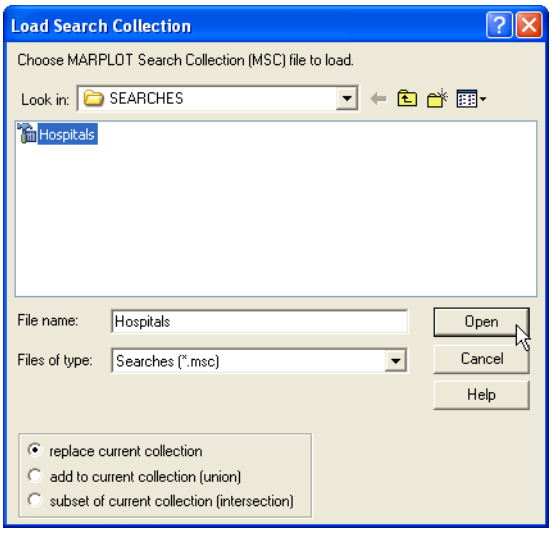
MARPLOT lists the found hospitals in the Search Collection.



If you were planning to use this particular set of hospitals repeatedly, you could avoid having to redo the search by saving the Search Collection. MARPLOT lets you specify the file to save into. It is a good idea to keep your saved Search Collections in the SEARCHES folder that MARPLOT provides explicitly for this purpose (each user in a multi-user MARPLOT system has his or her own SEARCHES folder).



During a future MARPLOT session, you can retrieve the saved Search Collection by selecting Show Search Collection from the List menu, clicking the Load Collection button, and selecting the saved Hospitals file.



Keep in mind that saving a Search Collection does not save the actual objects themselves, but only references to the objects. Thus, if you save an object as part of a Search Collection, and then delete the object from the map, you cannot recreate the object by loading it from the Search Collection. If you load a Search Collection containing references to deleted objects, MARPLOT displays a warning that those references are now invalid.

Adding and modifying objects

While some users of MARPLOT will primarily use their maps as is, other users will want to make modifications and additions. These can range from minor graphical modifications of pre-existing objects to the entry of entire databases of geographical information.

This section gives examples of creating and modifying six of the seven types of MARPLOT objects: points, rectangles, circles, polylines, polygons, and text labels. Working with picture objects is demonstrated later in this chapter (see "Using picture objects" on page 116). For an example of how to perform detailed edits on roads, which are a type of polyline object, see "Editing road segments" on page 108.

Layer locking and user permission

Any time you are going to be modifying or adding objects, you need to unlock the layer or layers you will be editing. MARPLOT starts each session with all layers locked. It is a good practice for you to unlock only one layer at a time, except in certain cases when two or more layers must be unlocked at the same time, such as when you are moving objects from one layer to another. You should relock a layer as soon as you are finished making changes to it. This will reduce the chance of edit mistakes, such as dragging an object when you intended only to click on it to select it.

If your MARPLOT system is multi-user, your system administrator has set you up either with browse-level or edit-level permission. If you have edit-level permission, you can unlock any layer, and modify any object. If you have browse-level permission, you can still unlock any layer, but you can only make modifications and additions to your personal user's map. For example, you can unlock the Roads layer, but you will only be able to add and modify roads on your personal map, not on the TIGER-derived county map(s) that you share with other users of your MARPLOT system.

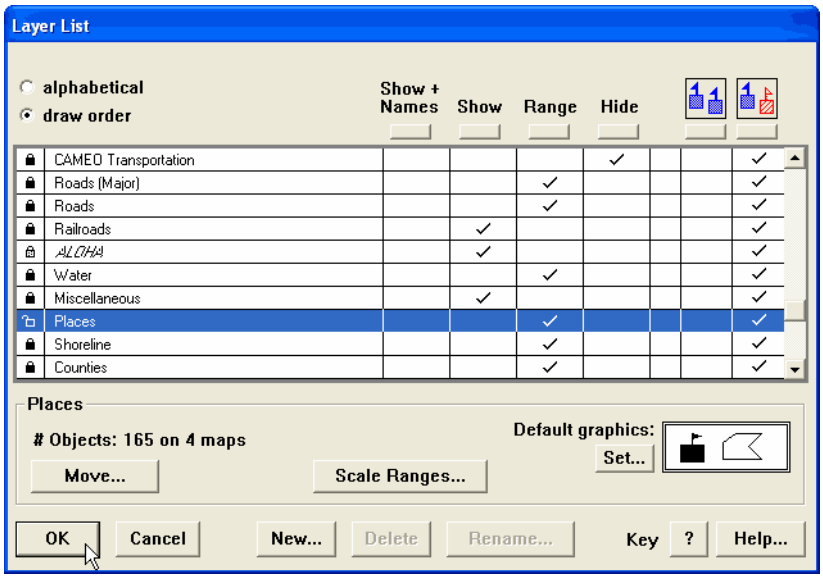
If your MARPLOT system is not multi-user, anyone who uses the system has edit-level permission.

Changing the fill pattern of city polygons

The polygons that make up the cities and towns on the Places layer of the TIGER-derived county maps are automatically filled in with a fill pattern and assigned a random color. You may want to change the default fill pattern or color of these polygons. For instance, if you are printing in black and white, you may want to modify the fill pattern of neighboring cities to make them more distinctive. In this example, you'll modify the fill pattern of one polygon and change the color of another on the Prince William County, Virginia, map.

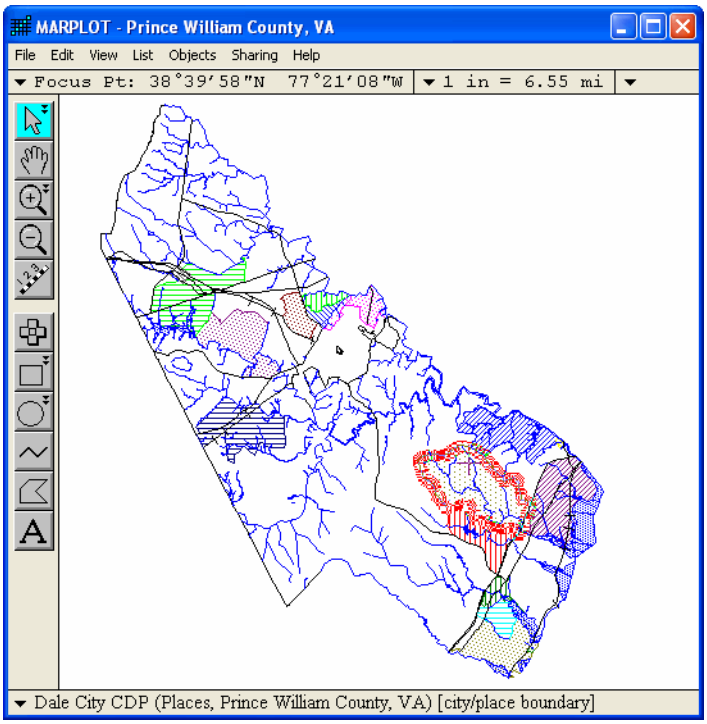
1. Locate Dale City and Montclair on the map. (These are in the south-east part of the map on the Places layer.)
2. Before you can modify any object settings (such as fill pattern or color), you need to unlock the layer the objects are on. In the List menu, select Layer List. The Layer List dialog box appears.

3. Click on the lock icon for the Places layer to unlock it, and then click OK. If you do not have edit-level permission, MARPLOT will still unlock the layer, but will present a note reminding you that you will only be able to make changes on the Places layer of your personal user's map, not shared maps like Prince William County.



4. Back in the map window, the list of tools along the left edge of the window has been extended to offer tools for creating objects. Whenever one or more layer is unlocked, MARPLOT offers these tools. In this case, however, you are interested in modifying existing objects, not creating new ones.

5. Click on the Dale City polygon to select it.

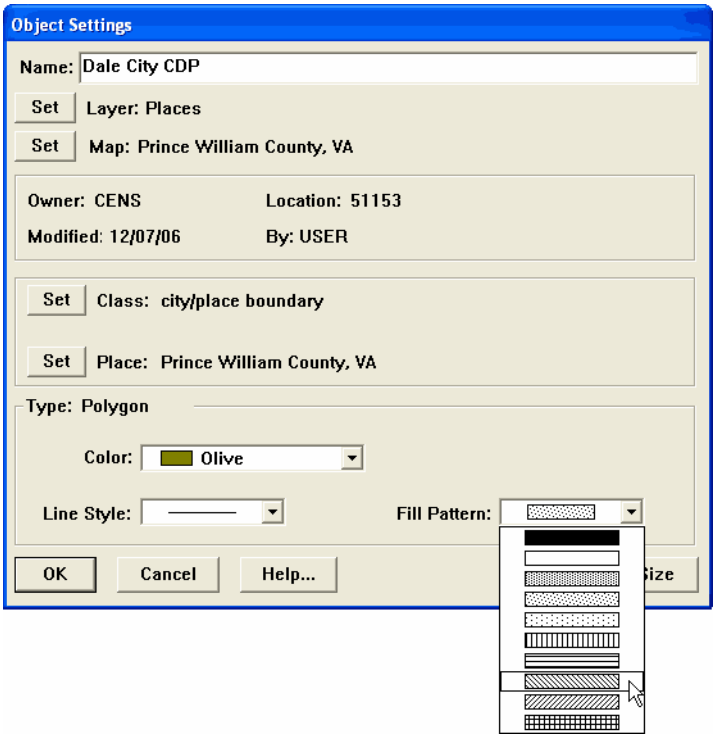


6. In the Objects menu, select Object Settings. The Object Settings dialog box for Dale City appears.

   Because the Places layer is unlocked, all of the items in this dialog box are active, meaning that you can click on them to set the various attributes of the object: name, map, layer, classification, graphical settings, etc. If the Places layer was not unlocked, or if you only had browse-level permission, this dialog box would display the same information, but all of the items would be grayed-out, indicating that you could not change them.

   Note: Double-clicking on the Dale City polygon object would have also brought up the Objects Settings dialog box for Dale City.

7. To change the fill pattern for Dale City, click on the Fill Pattern pop-up, and choose one of the diagonal stripe patterns. Click OK.

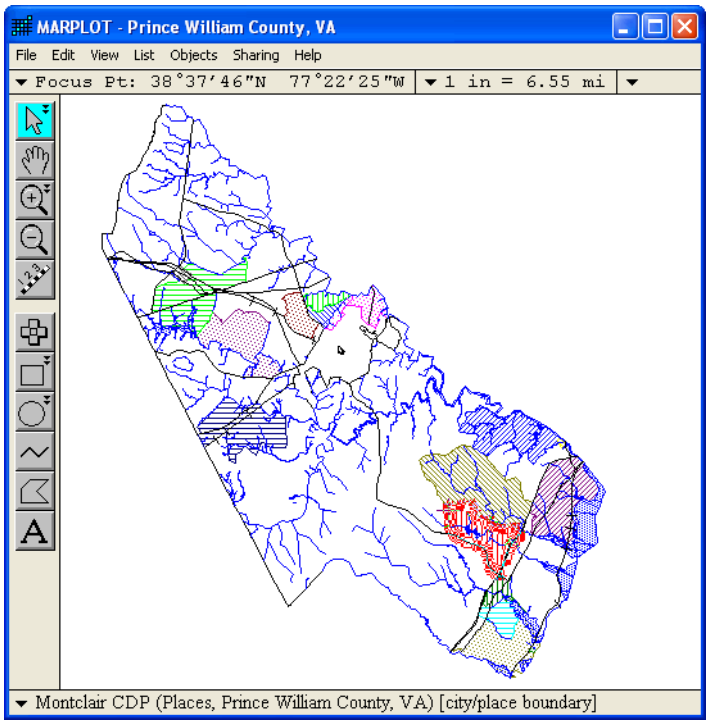


8. The map is redrawn, and Dale City has the new pattern.

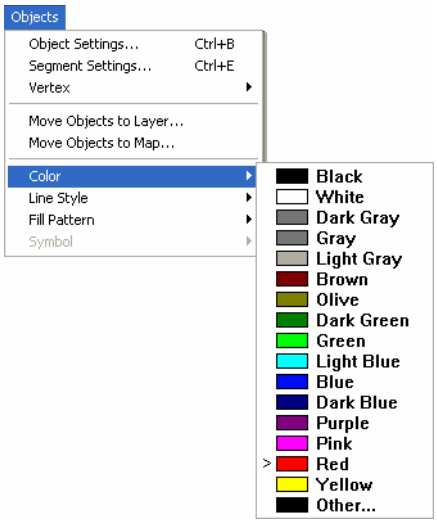
   Note: If you want to remove a polygon's fill pattern, choose the white fill pattern.

Now you want to change the color of the Montclair polygon from red to purple.

9. Using the arrow tool, click on Montclair.



10. You could use the same method as above to change the color of the Montclair polygon. However, a short cut is to use the graphical items in the Objects menu. In the Objects menu, select Color. A list of color options appears. The current color is indicated with a small arrow.



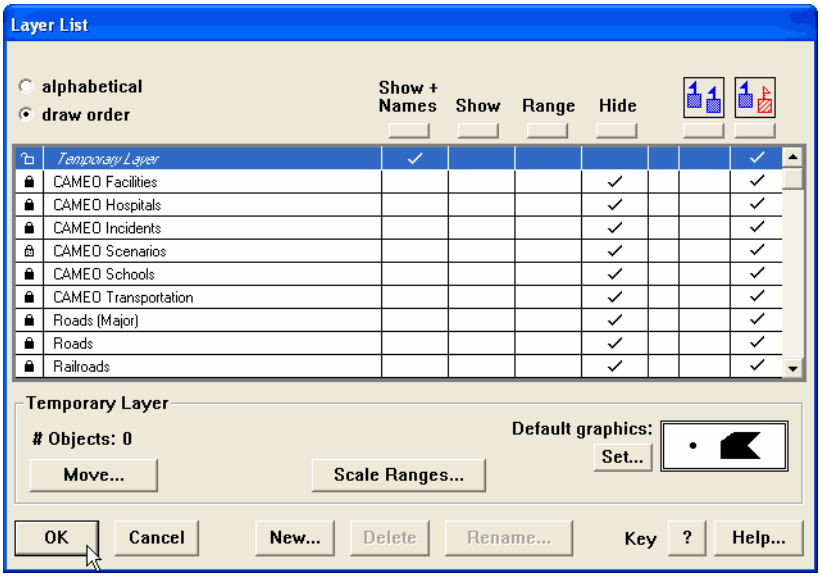
11. Choose purple from the list of colors. The map is redrawn with the new polygon color.

12. When you are done editing the Places layer, you should return to the Layer List dialog box and lock the Places layer.

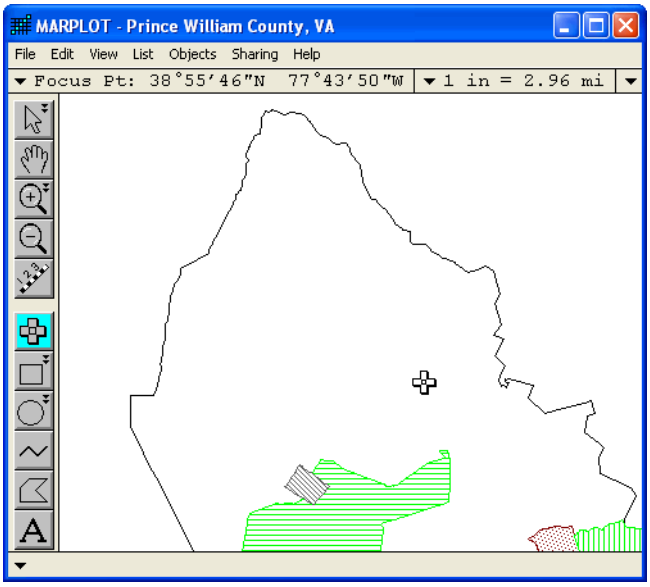
Creating different types of objects

In this example, you will be making some objects just for demonstration purpose, so you'll put them on the Temporary Layer. The Temporary Layer is a good place to put them, since they will be deleted automatically when you quit MARPLOT (you do get a warning and a chance to move the objects to another layer before quitting, in case you want to keep them after all).

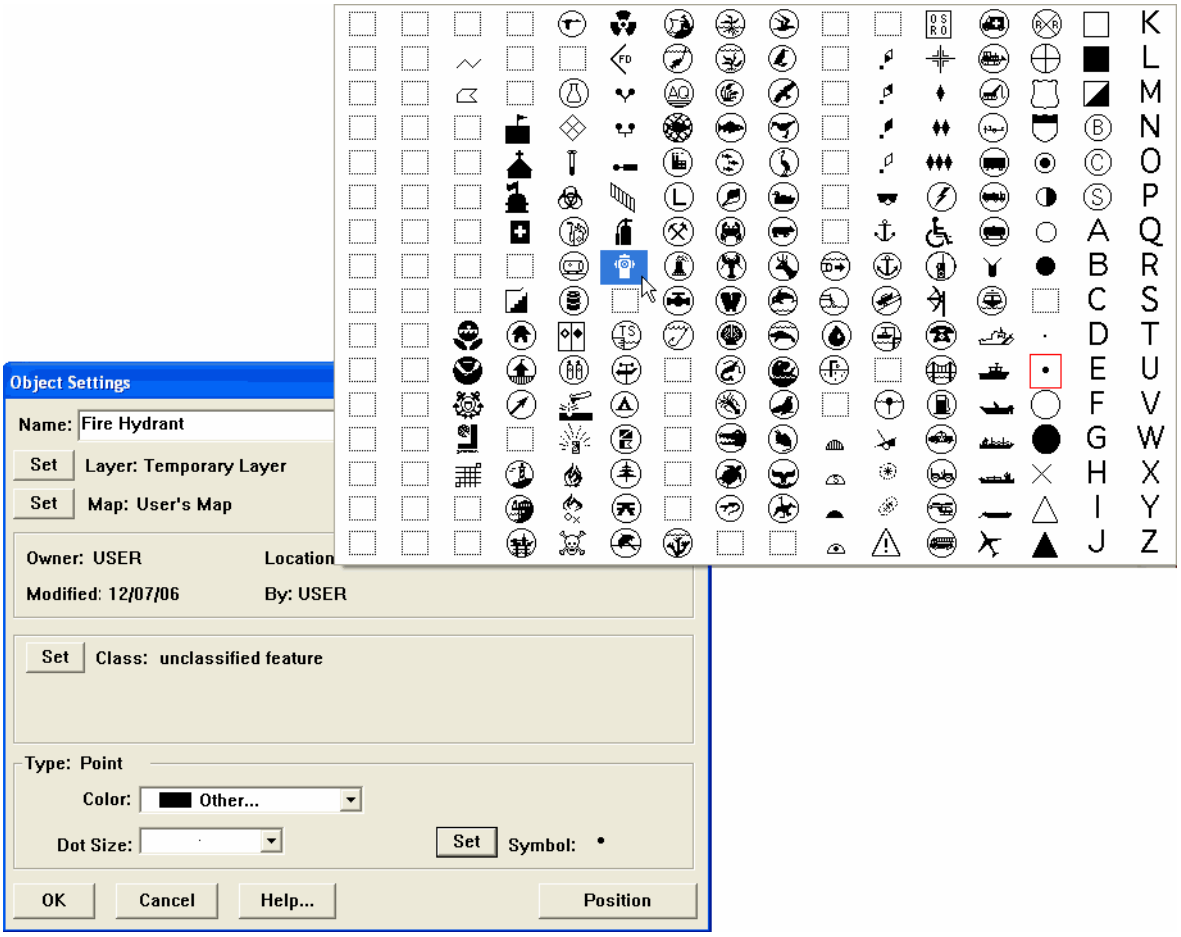
1. In the List menu, choose Layer List. The Layer List dialog box appears.
2. Click on the lock icon for the Temporary Layer to unlock it.
3. Put the Temporary Layer in Show + Names mode by clicking in that column for the Temporary Layer. This will allow you to see the names of the objects you create.
4. Put all of the layers other than Places, Counties, and Temporary Layer into Hide mode. Click OK.



5. Click on the zoom-in tool  , and then click on the map in the northern part of Prince William County. Since only the Places and Counties layers are shown (and there are no objects on the Temporary Layer), you'll have a lot of white space to use as your scratch area. Begin by making a symbol (point) object.
6. Select the symbol tool  by clicking on it. To create a new symbol object, click at the desired location on the map with this tool.



7. MARPLOT immediately brings up the Object Settings dialog box for the new point object. It assigns the point the default name "untitled." It puts the point on the Temporary Layer, since that is the only unlocked layer. Also, it chooses the User's Map as the default map for the object. The default graphical settings for the object are the defaults for the Temporary Layer.
8. Set the name of the object by typing "Fire Hydrant" in the box next to Name.
9. Change the symbol from the default to the fire hydrant symbol by clicking on Set next to the symbol picture. When the Symbol pop-up appears, click on the fire hydrant symbol.

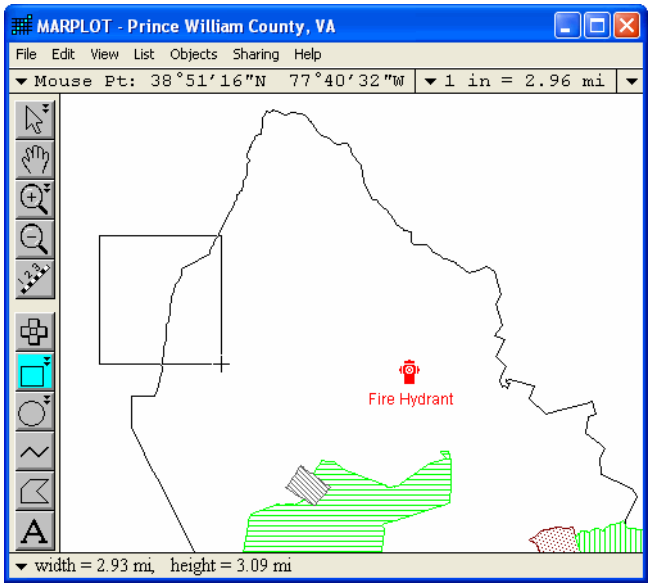


10. Click on the Color option. Select red. Click OK. The new symbol object is added to the map.

    If you decide the object is not in the correct position, you can move it in one of two ways. If you know the exact latitude/longitude position of the object, you can set it using the Position button in the Object Settings dialog box. If you are not concerned with that degree of precision, however, you can move the object simply by dragging it with the arrow tool.

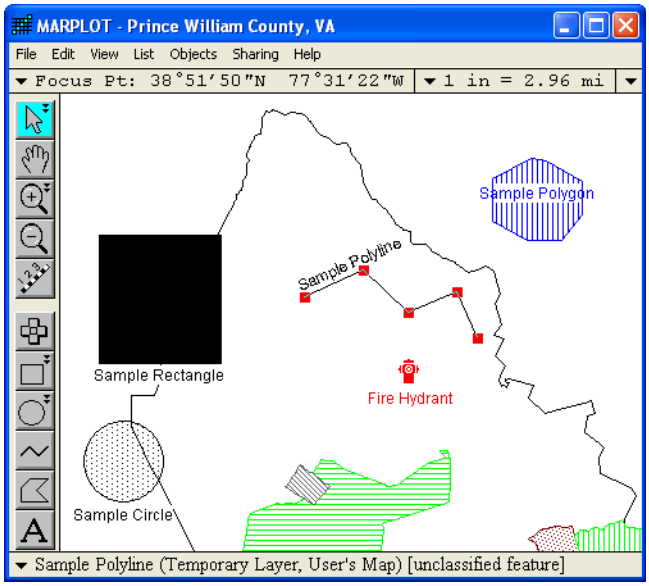
Creating rectangle and circle objects is straightforward. Remember that rectangle objects always have horizontal and vertical edges. If you need a rotated rectangle, you have to use a polygon.

11. Select the rectangle tool  .
12. Click on the map and drag to create the desired rectangle.
13. The Object Settings dialog box pops up to let you set the name, layer, map, and other attributes. Change the name to "Sample Rectangle," but don't change any of the other default settings. Click OK.
14. Select the circle tool  .
15. Click on the map and drag to create the desired circle. When the Object Settings box appears, name it "Sample Circle" and set the fill pattern to one of the dot patterns. Click OK.



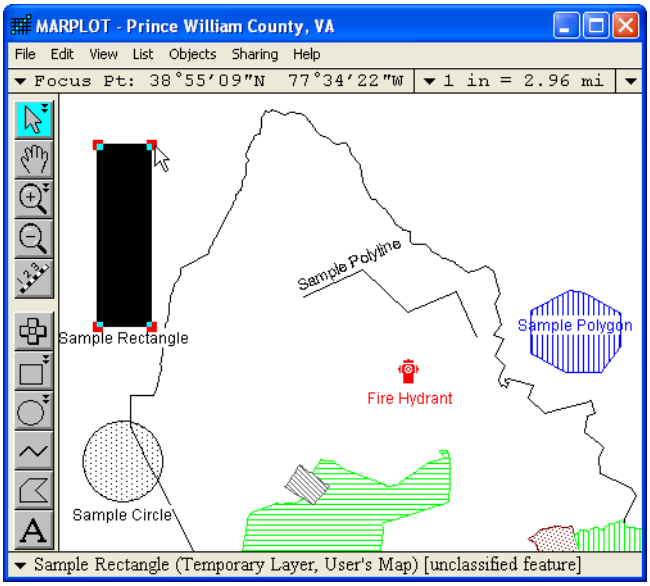
Create polylines and polygons by clicking at each vertex point. Double-click to indicate the final point.

16. Select the polyline tool  .
17. Click on the map to start a polyline.
18. Move the mouse to the next vertex point and click again. Repeat this process until you have added all of the desired segments to your polyline. Double-click to indicate the final point.
19. When the Object Settings box appears, name it "Sample Polyline" and click OK.
20. Select the polygon tool  .
21. Click on the map to start a polygon.
22. Move the mouse to the next vertex point and click again. Repeat this process until you have added all of the desired segments to your polygon. Double-click to indicate the final point.
Note: Your final point does not have to align exactly with your initial point. MARPLOT will automatically connect those points.



23. When the Object Settings box appears, change its name to "Sample Polygon" and set the fill pattern to one of the stripe patterns and set the color to blue. Click OK.

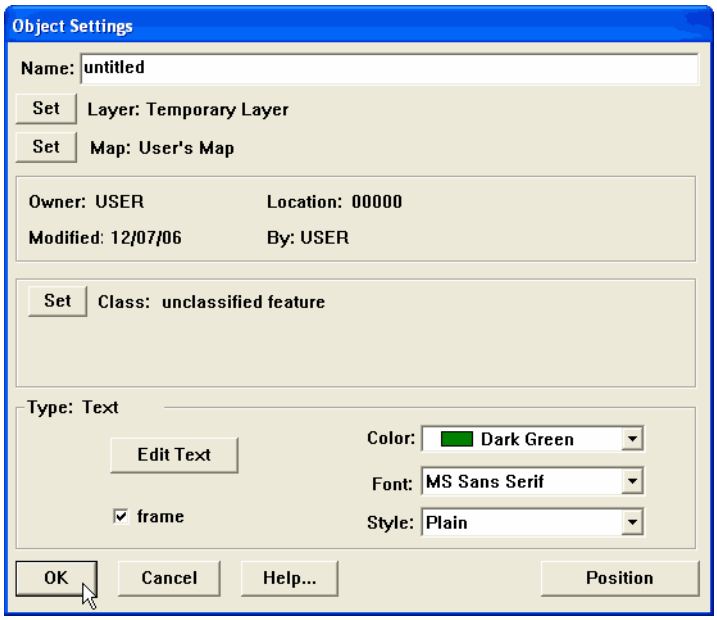
As with the symbol object, any of these new objects can be moved by dragging it with the arrow tool, or by entering latitude/longitude values in the Object Settings dialog box. With non-symbol objects, you can also reshape them using the arrow tool.

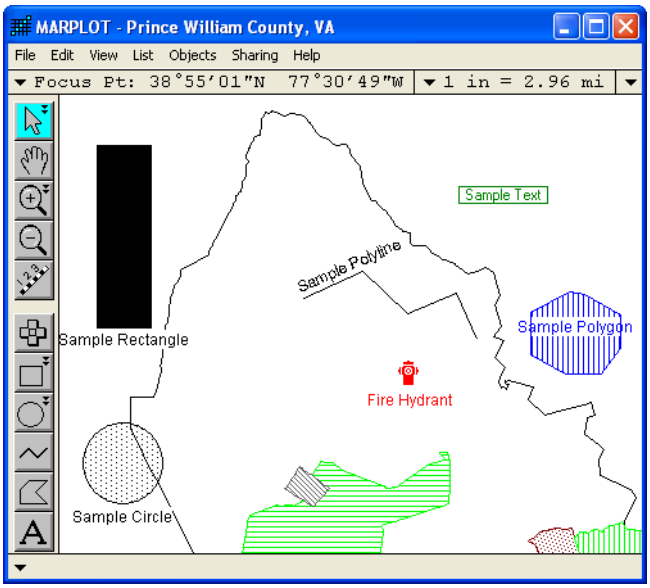


24. Click on the polygon object and drag it to a new location.
25. Click on the rectangle object. When the object is selected, it is surrounded by small red markers (handles). Click on one of these red handles and drag it to resize the rectangle.

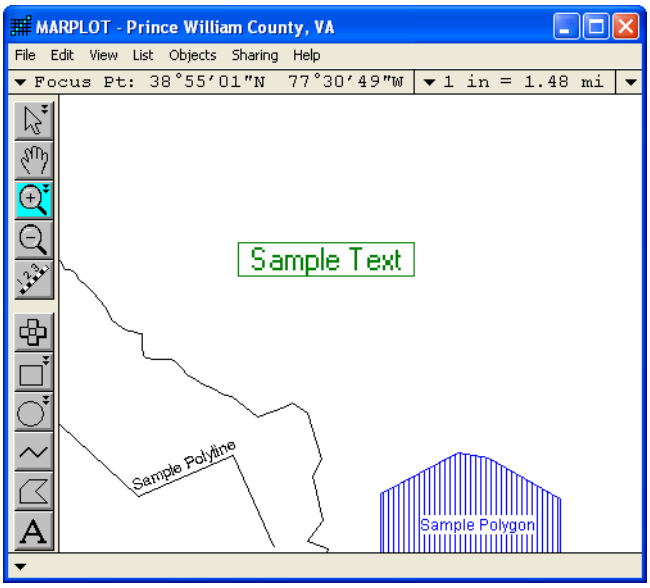
The final item in the list of tools is used to make text label objects. These are for labeling areas on maps, when the shown names of the individual objects do not provide sufficient information.

26. Select the text tool  .
27. Click on the map with the text tool.
28. The Object Settings dialog box appears, as usual, but for text objects you are immediately asked to enter the text. Type "Sample Text" into the Edit Text dialog box that appears. Click OK.
29. In the Object Settings dialog box, do not change the name of the object. If you change the name of the object from the default ("untitled"), that name will appear under your text label. If you leave the name set to the default, only the text in your text label will appear.





30. Place a check in the frame check box so that your text label will have a white background and be surrounded by a thin border.
31. Change the color to dark green. Click OK.
32. Keep in mind that text label objects scale along with the rest of the map as you zoom in and out. Zoom in closer to the sample text object. Notice that the letters in the text label got larger.

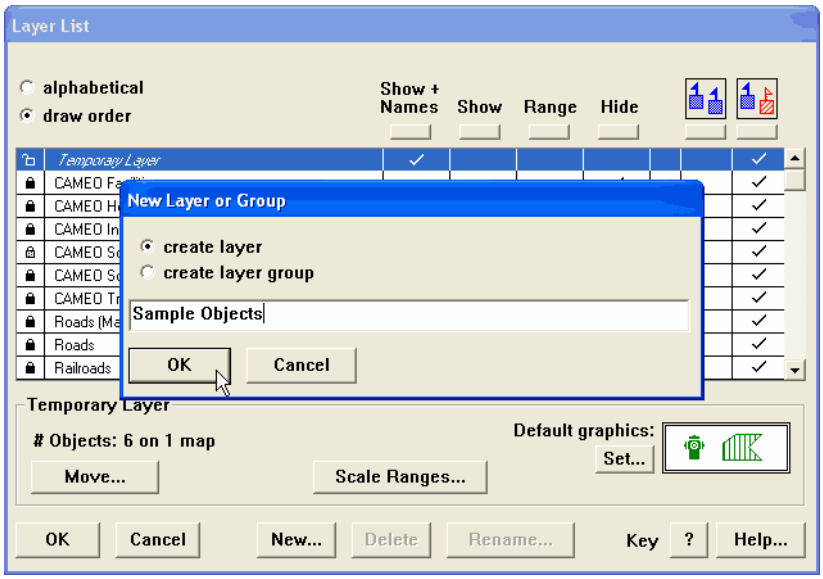


33. Try to exit from MARPLOT. Since you have created objects on the Temporary Layer, you will get a get a warning reminding you that those objects will be deleted when MARPLOT is closed. If you would like to save these objects, click Cancel and read the next two sections (about creating a new layer and moving objects between layers) to learn how to save those objects to a layer.

Creating a new layer

If you wanted to save some of the objects you just created, you need to move them to a different layer because objects on the Temporary Layer will be deleted when MARPLOT is closed. In most cases, you would probably already have an appropriate layer. But in this case, suppose you do not have such a layer and you want to create a new layer for the objects.

1. In the List menu, choose Layer List. The Layer List dialog box appears.
2. Click New. A Name Layer or Group dialog box appears.
3. Enter a name for the new layer (e.g., Sample Objects). Click OK.



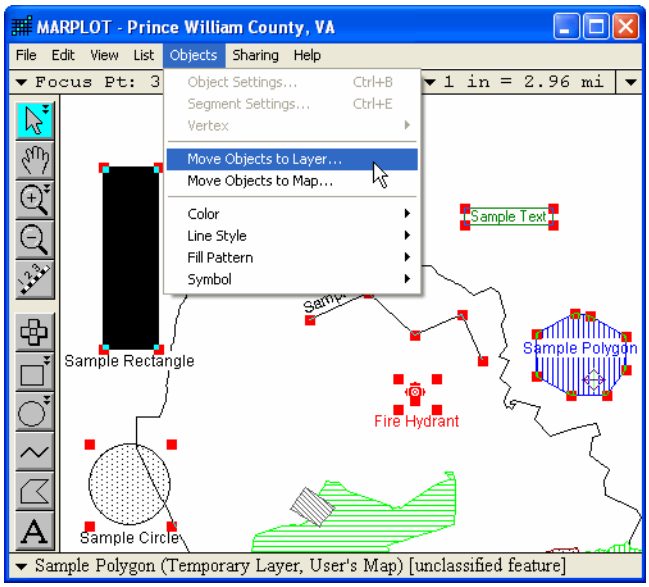
The new layer is added to the top of the Layer List, and is unlocked by default. At this point, you have a new layer, but there are no objects on it on any of our maps. Proceed to the next section for instructions on moving existing objects to this new layer.

Moving objects between layers and maps

An important note:

You should always think twice before moving objects from one layer to another, and especially before moving objects from one map to another. The reason for this is that, when MARPLOT shares information with other programs, objects are referred to using their layer and map names. For example, a database program might have a record linked to a MARPLOT object. The database keeps the link, including the fact that it thinks the linked object is on a certain map and a certain layer. If the object gets moved to a different layer, and especially if it gets moved to a different map, there might be trouble later when the database program refers to the object using its old recorded layer and map. Therefore, before moving objects between layers and maps, make sure the objects are not linked. If they are linked, but you must move them anyway, you may have to reestablish the links after they are moved (the work involved depends on the particular database you are working with).

In this example, you know the objects are not linked, since you just created them. Let's move the objects to the new Sample Objects layer. You could do this one object at a time using the Object Settings dialog box and resetting the layer there. But it is much easier to move them all at the same time using the Move Objects to Layer feature.



1. Begin by selecting all of the new objects by holding down the shift key and clicking on each of the objects with the arrow tool. **Note:** If you mistakenly click on an object while selecting multiple objects using this method, simply click on the object a second time to deselect it (while still holding down the shift key).
2. In the Objects menu, choose Move Objects to Layer. The Move to Layer dialog box appears.
3. The Sample Objects layer is the only layer that is unlocked, so it is the only choice. Select the Sample Objects layer and click Move.
4. You can confirm the objects have been moved to the Sample Objects layer using the Layer List. If you click on the Sample Objects layer in the Layer List dialog box, you will see that there are six objects on this layer and that all of those objects are on a single map.

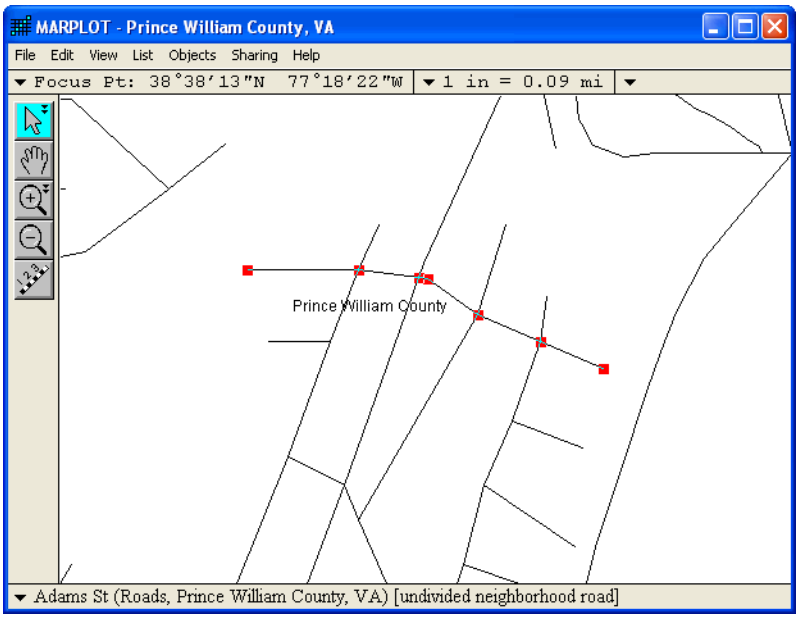
Editing road segments

MARPLOT maps derived from TIGER data may have features that are inaccurate, out of date, or missing. For example, possible problems on the Roads layer might include missing road segments, misnamed roads or pieces of roads, or incorrect address or ZIP code information. Sometimes this is due to an error in the TIGER data, and sometimes the location has been modified since the TIGER data was collected. In this example you will modify a road that has been extended since the map was created. For some MARPLOT users, especially those working regularly within a relatively small region, it is worth the time and effort spent to correct all or some of these errors.

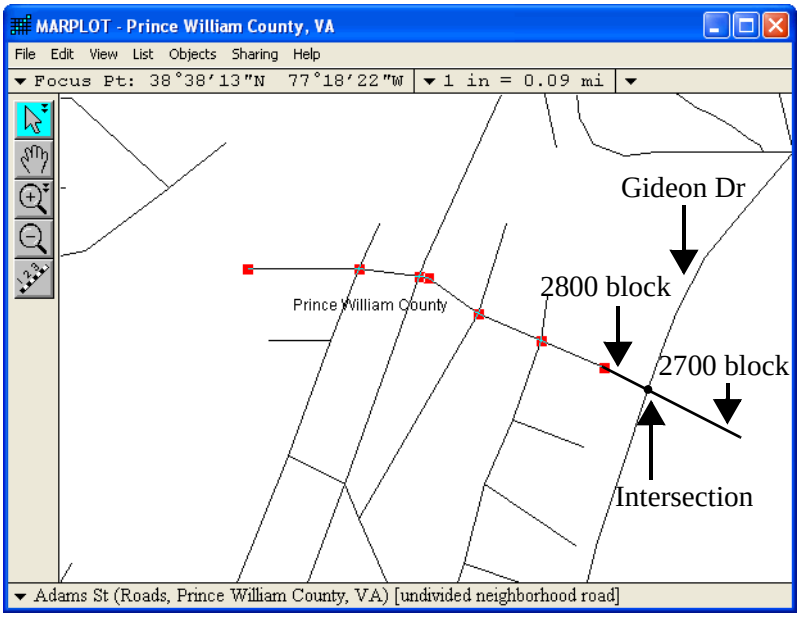
MARPLOT allows you to edit road objects, just like any other objects. Functions are provided for performing many types of edits to roads and other polyline objects: inserting and deleting vertex points, moving vertex points, and setting attributes on a segment-by-segment basis. There are certain types of edits, however, that cannot be performed directly in MARPLOT. Instead, it is necessary to use MARPLOT's Export and Import functions, along with a text editor. An example of this advanced type of editing is given in the MARPLOT Technical Documentation.

Extending a street and making an intersection

Here is Adams St, which can be found in Dale City on the sample map of Prince William County, Virginia.



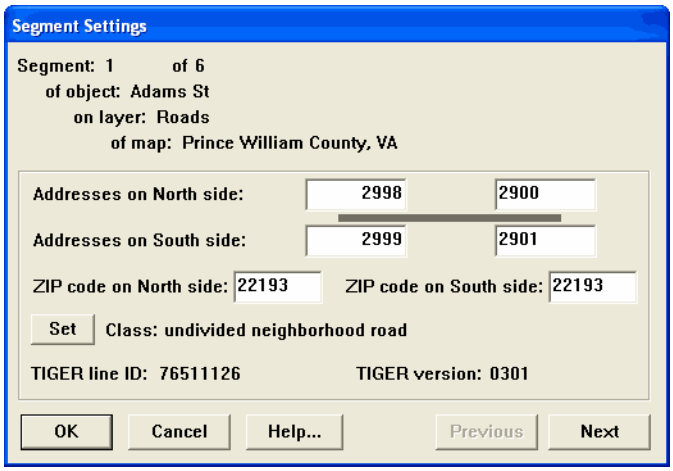
Since the time the TIGER data on which this map is based was recorded, Adams St has been extended to the south-east. It now intersects with Gideon Dr, and continues on to the southeast for 500 feet. You will modify Adams St on the map to show this extension, making sure that the intersection with Gideon Dr works properly. You will also set the correct address ranges for the extension. In particular, the small piece of the extension that is west of Gideon Dr is the new 2800 block of Adams St. The larger piece of the extension that is east of Gideon Dr is the new 2700 block of Adams St.



The work to be done, then, is to add two segments to the Adams St object. The vertex connecting these two segments should coincide with a vertex of Gideon Dr, causing the two streets to intersect.

1. In the List menu, choose Layer List. The Layer List dialog box appears.
2. Unlock the Roads layer by clicking on the padlock symbol on the Roads layer line. Whenever the Roads layer is unlocked, you should be especially careful not to make careless edits. You should lock the Roads layer again as soon as you are finished editing it, as a further safeguard against mistakenly corrupting road data. Click OK.
3. Before you begin making changes, you should take a detailed look at the objects you will be working with. Click along the east-most segment of Adams St.
4. In the Object menu, choose Segment Settings. The Segment Settings dialog box appears.

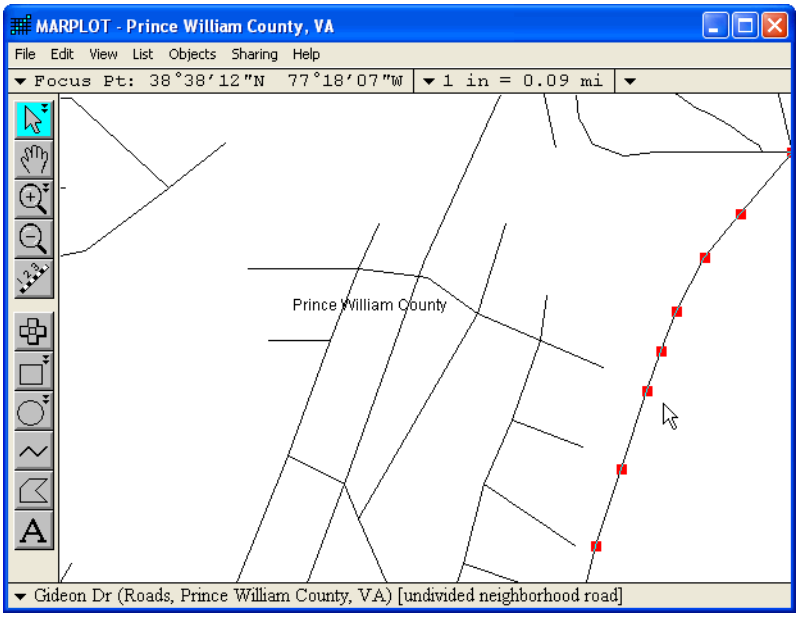
5. These are the settings for the first of the six segments of the street. Thus, in terms of the segment order, this street goes from east to west. You are going to be adding two segments to Adams St, so there will be eight segments in the object when you are done. Since you will be adding segments to the east, our two segments will be segments 1 and 2 of the new Adams St. The six old segments will be segments 3 through 8.



The Segment Settings dialog box also shows that the addresses on the selected segment increase from east to west. This makes sense in terms of your planned extensions, in which addresses decrease as you move farther east.

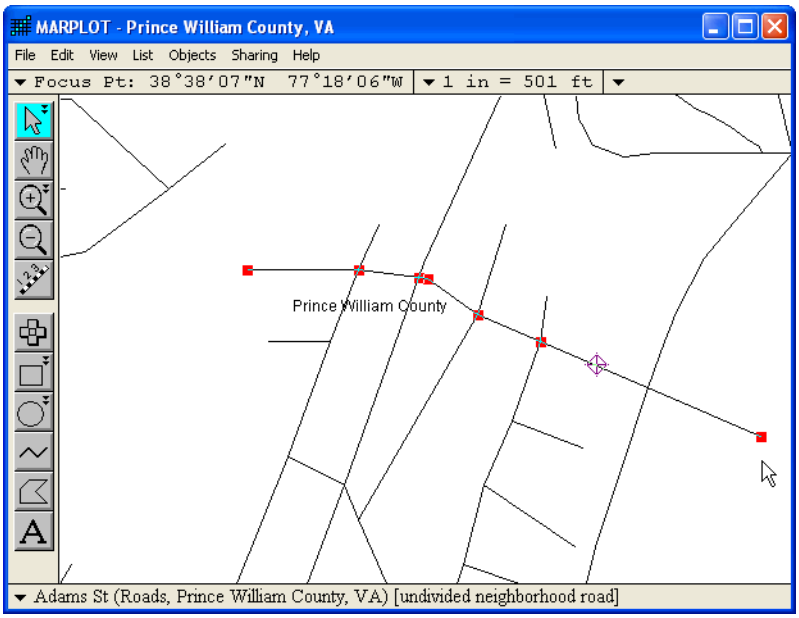
6. As a final preparation step, you should click on Gideon Dr to see where its vertex points lie.

Notice that Gideon Dr has a vertex pretty much right in line with the desired extension of Adams St. (If there wasn't such a vertex, you could either drag a vertex of Gideon Dr to the desired position, or use the Insert Vertex at Focus Point menu item to insert a vertex in Gideon Dr exactly where you want.)



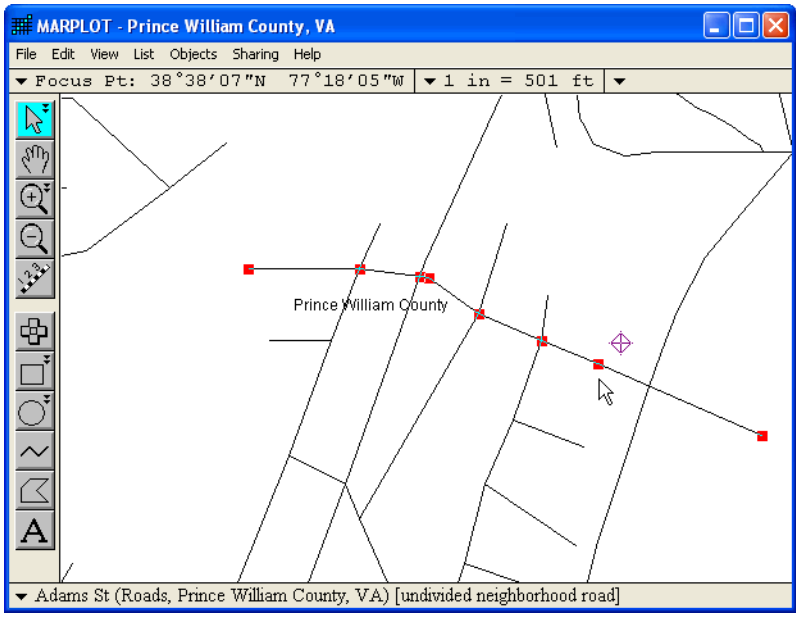
Now you are ready to extend Adams St. The way to create new segments in MARPLOT is to use the Insert Vertex at Focus Point item in the Vertex submenu of the Objects menu. But since you can only insert a vertex in a pre-existing segment, you will need to drag the existing endpoint first.

7. Click on the existing endpoint of Adams St and drag it to the final endpoint of the extension. You have, in effect, just made the 2900 block much longer.

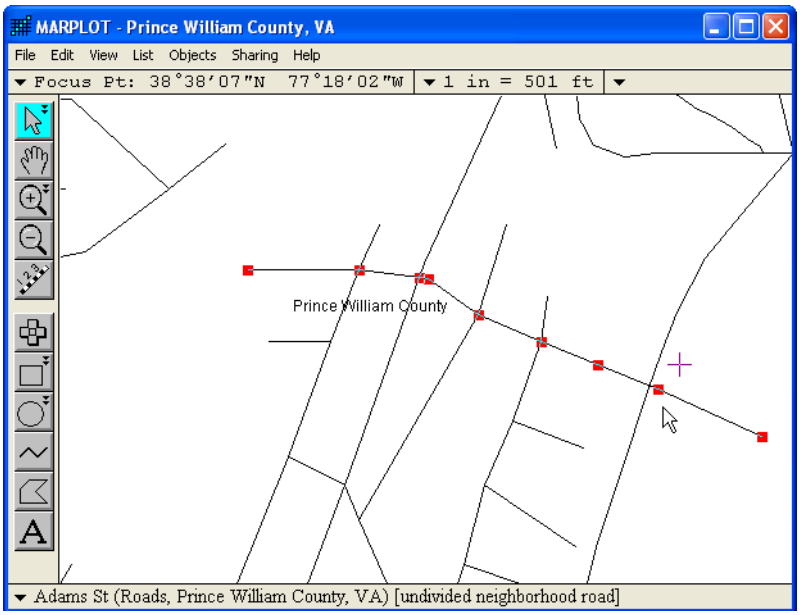


8. Now you can insert two vertex points to make the two new segments. As shown in the picture above, the Focus Point has been left sitting at the old endpoint of Adams St. From the Vertex submenu of the Objects menu, choose Insert Vertex at Focus Point.

   As shown in the picture at right, this inserts a vertex at the location of the old endpoint. (In the picture, the Focus Point has been moved to the side to show the new point more clearly.)

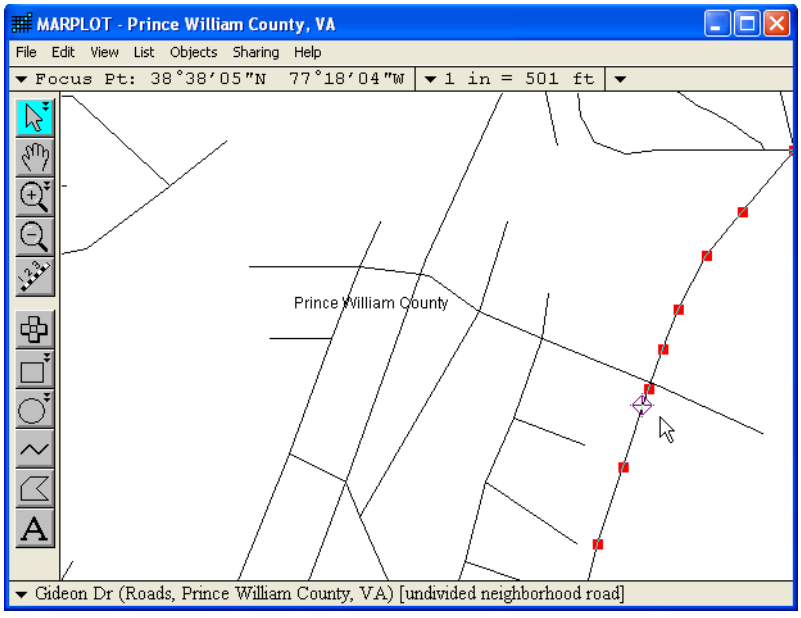


9. Now insert another vertex point, this one very close to where Adams St crosses Gideon Dr. Click at the desired location to place the Focus Point, and then use Insert Vertex at Focus Point (again, the Focus Point has been shifted in the final picture to show the new vertex).

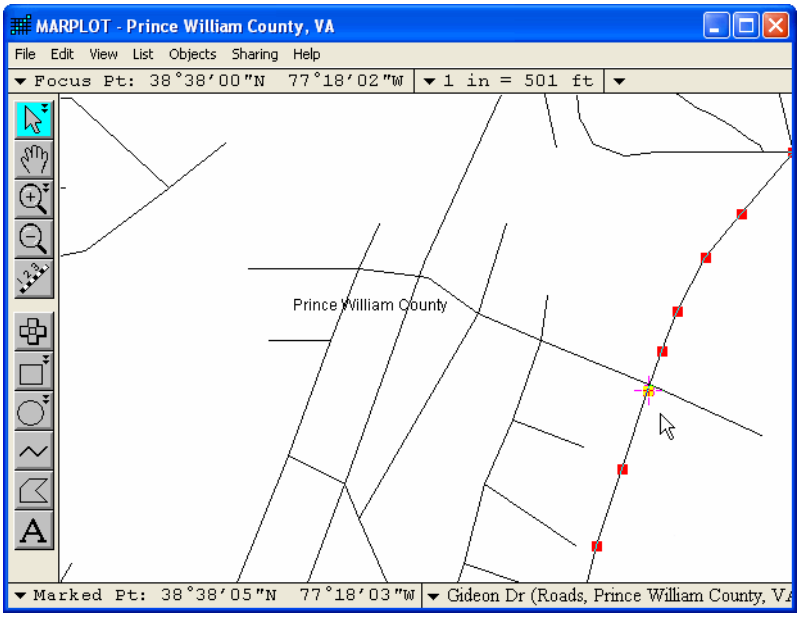


Note: It isn't necessary to put the second vertex right on the intersection with Gideon Dr. The reason for this is that, even if you tried to click exactly at the right location, you don't have the precision at the computer-screen resolution to place the point so that it coincides exactly with a vertex point of Gideon Dr. As explained in "Vertex" on page 76, MARPLOT only considers two roads to intersect if they share a vertex exactly in terms of latitude/longitude coordinates. If you were to search for intersections of Adams St at this point, Gideon Dr would not be found.

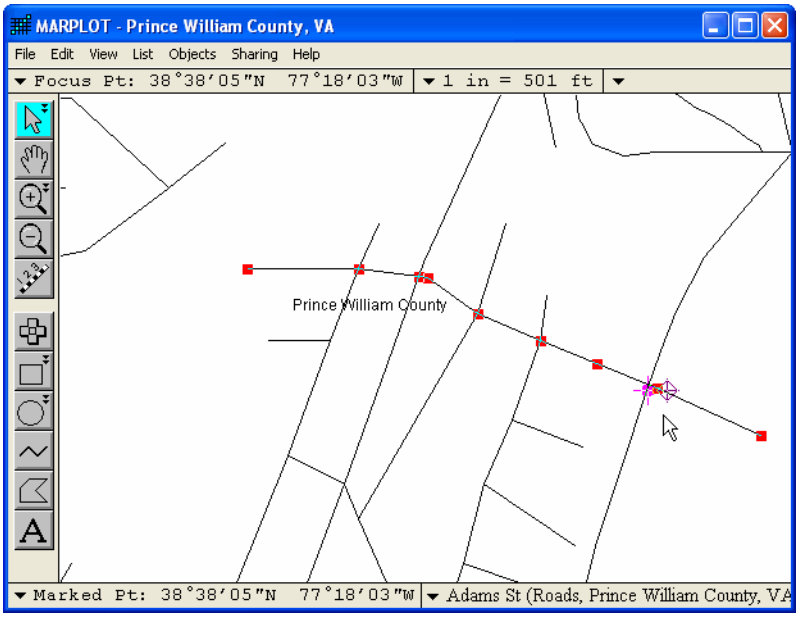
10. You need to use the two other items in the Vertex menu to create a true intersection between Adams St and Gideon Dr. Click on Gideon Dr to select it, placing the Focus Point close to the vertex with which Adams St is to intersect.



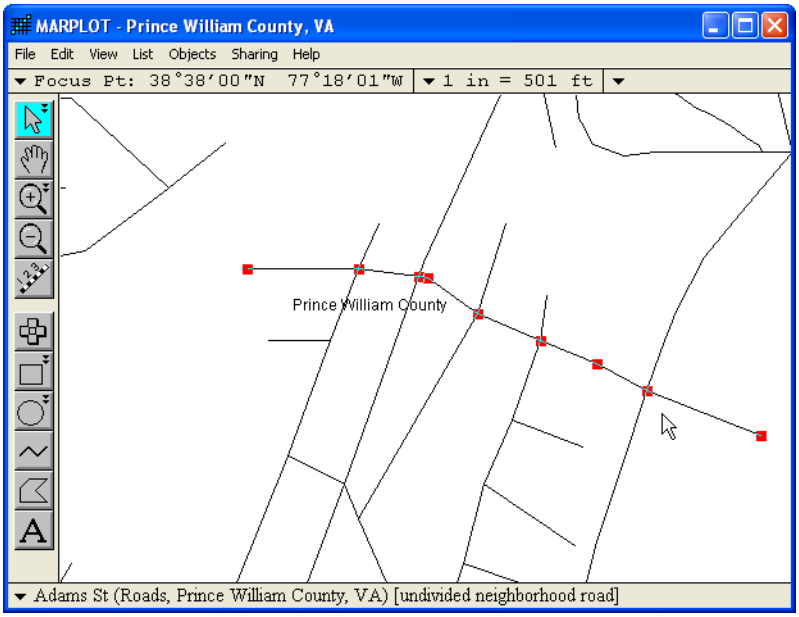
11. From the Vertex menu, choose Mark Vertex. This sets the Marked Point at the vertex of Gideon Dr that was close to the Focus Point (i.e., the point for your intersection).



12. Now that you've marked the desired point, click on Adams St again, placing the Focus Point near the vertex point that is supposed to coincide with the Marked Point.

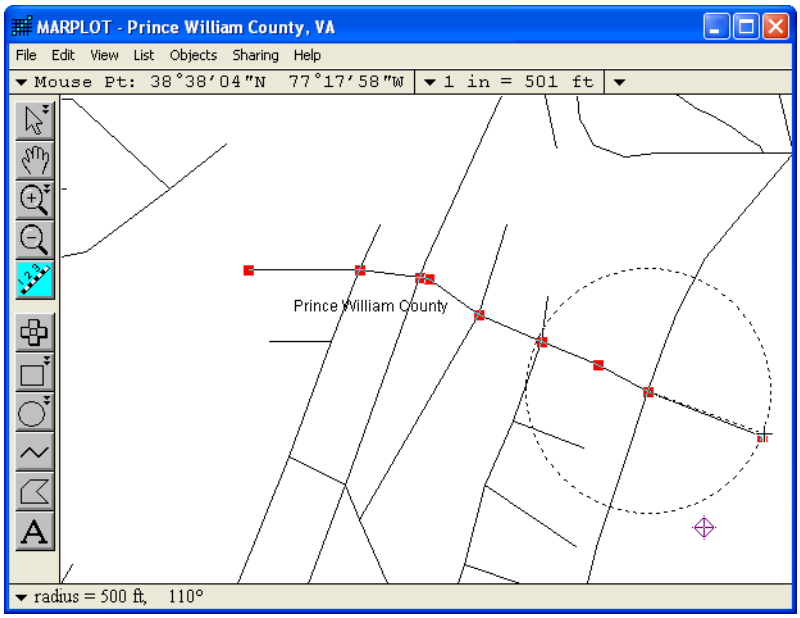


13. From the Vertex menu, choose Move Vertex to Marked Point. This causes the vertex of Adams St that is close to the Focus Point to be shifted so that it coincides exactly with the Marked Point (which has been set to be equal to the desired point on Gideon Dr).
14. Choose Clear Marked Point from the Marked Point submenu in the View menu.



Now the roads intersect. If you search for intersections of Adams St, Gideon Dr is found, and vice versa.

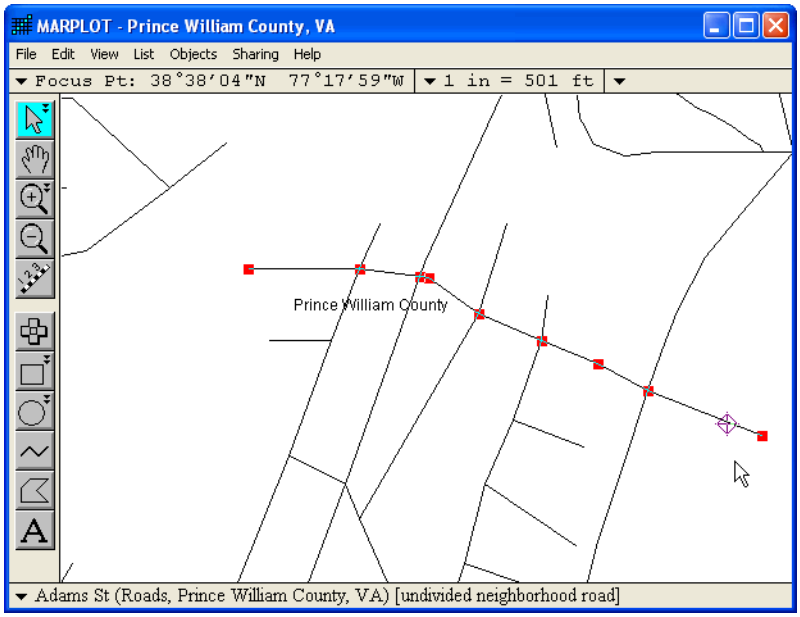
15. It was specified that the extension of Adams St should go 500 feet beyond Gideon Dr. Select MARPLOT's distance tool. Click on the intersection and drag the mouse to the end of the extension. The distance is shown at the bottom of the window. **Note:** If the distance units are not in feet, change them in the Scale tab of the Preferences dialog box (under the File menu).
16. Using the arrow tool, click on the endpoint of the extension and drag it until it is 500 feet beyond Gideon Dr.



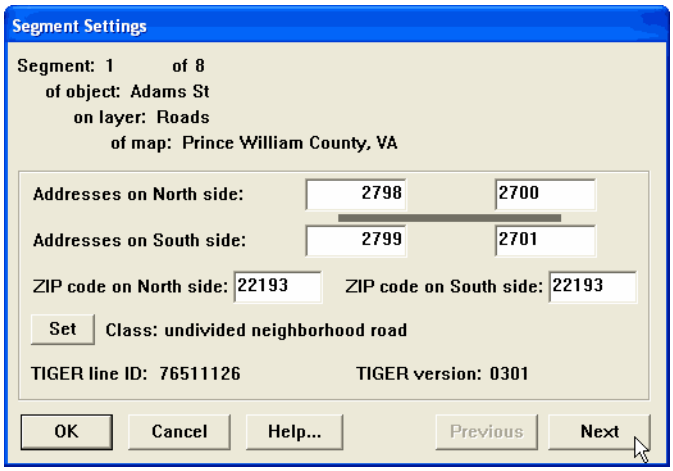
Modifying address ranges

Your segments are now complete, except for the address ranges. Recall that you made these two new segments by inserting points into the (stretched) existing 2900 block of Adams St. By default, MARPLOT assigns the new segments the same address range as the original segment that was split (this is true for the other segment attributes as well, such as ZIP code). So you currently have three segments of Adams St that all have the address range 2900 - 2999.

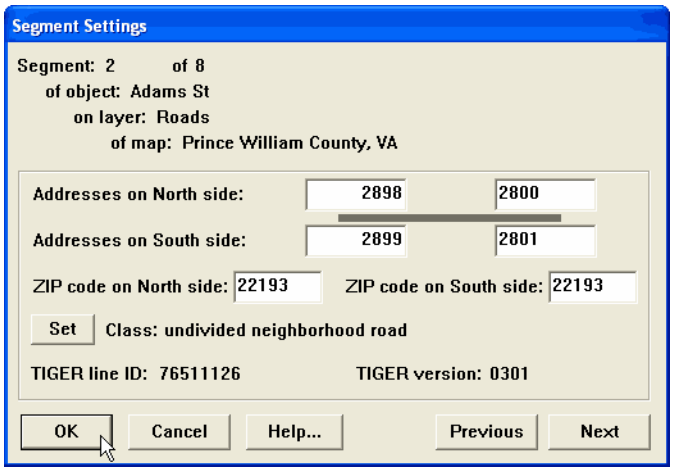
1. To modify the address ranges for the two new segments, click along the first segment.



2. In the Objects menu, choose Segment Settings and set the address values for the 2700 block. Click Next to change the address values for the other new block.



3. Set the address values for the 2800 block. Click OK.



Using picture objects

Picture objects are like rectangle objects except, instead of being filled with a pattern, they are filled with a graphical image. The source for this image is usually a picture file (PICT file on a Macintosh; bitmap or metafile in Windows). The image can also come from the clipboard, after you copy it from another application (usually a drawing application).

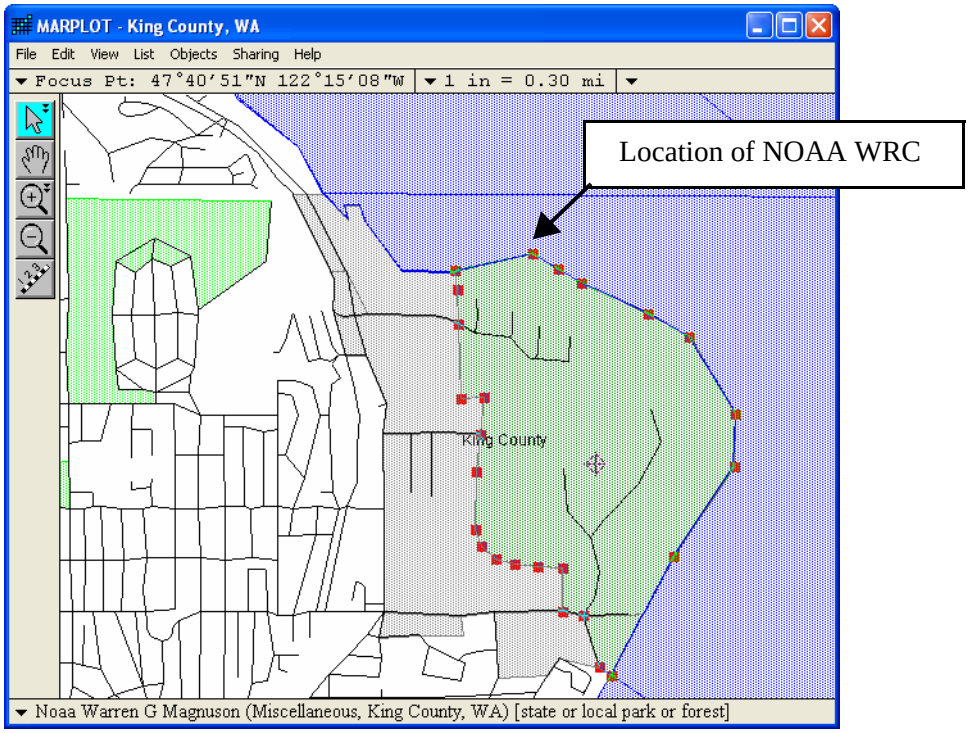
In some cases, you want the picture to be geo-referenced—that is, located in a position meant to be (or to be very close to) its actual position in the real world. For instance, the picture might be a detailed drawing of a university campus or a facility site plan. Here, you want to place the picture object so that points on the drawing correspond as closely as possible to the correct points on the earth. To help you with this, MARPLOT has a special mechanism for geo-referencing picture objects.

In other cases, the exact latitude/longitude placement of the picture object is not as important. For instance, if you want to add a logo or other design to your map, it is sufficient to drag and stretch the object directly on the map in order to position it.

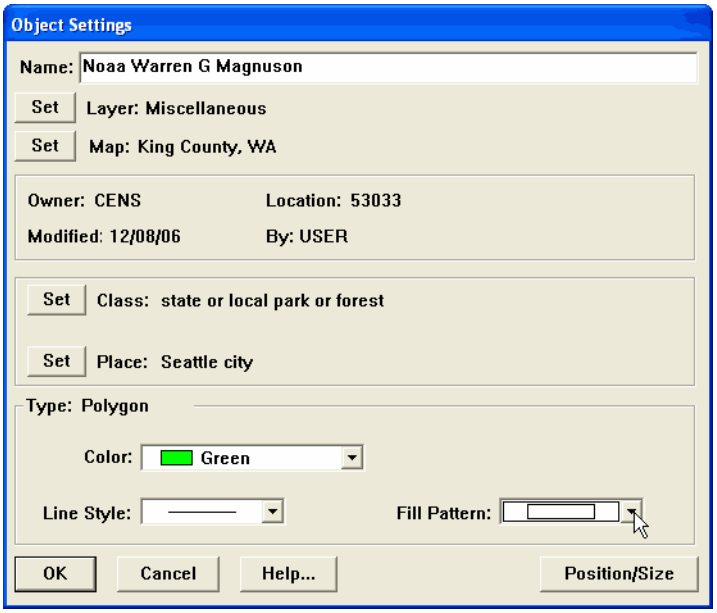
Adding a picture object with geo-referencing

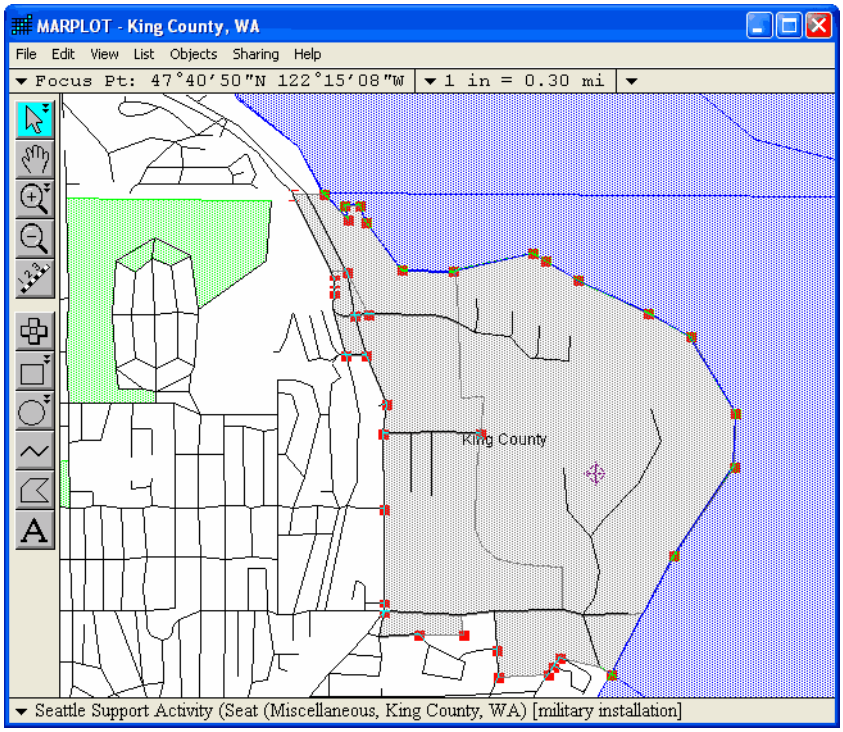
For this example, we will place a detailed picture file of the NOAA Western Regional Center (WRC) onto the King County, Washington, map. We want to use this diagram as a MARPLOT picture object, to add details that are lacking on the given TIGER-derived map.

Looking at the given map, we see that the NOAA WRC is not specifically indicated.



NOAA is shown on the TIGER map as being part of Warren G Magnuson park. As a first step, we can unlock the Miscellaneous layer, and then use the Object Settings dialog box to set the fill pattern of this polygon to white (i.e., no fill). Now the green polygon fill pattern is gone, but the area is gray.





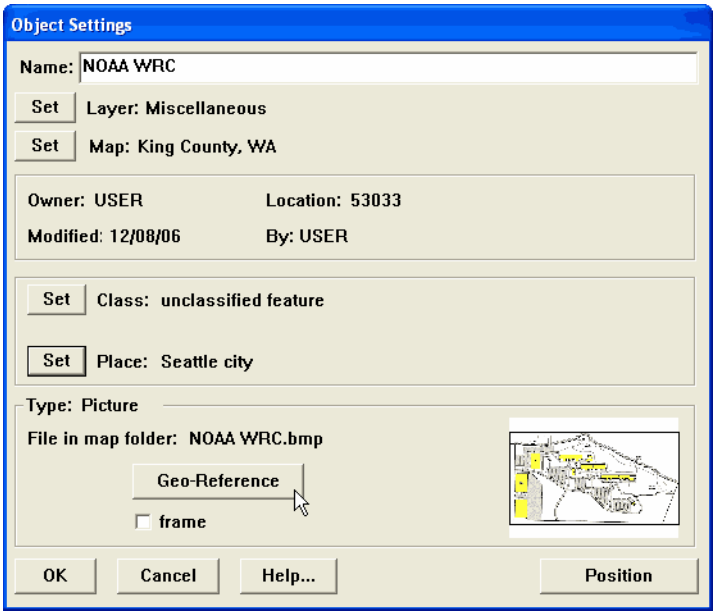
There is another polygon object on the Miscellaneous layer that encompasses the area we are interested in. We repeat the previous steps and change this polygon's fill pattern to white as well. Now we are ready to insert the picture object. **Note:** We could have inserted the picture object over the existing polygons; however, the fill patterns could have made it difficult to see the details of the picture so we decided to remove the fill patterns.

It makes sense to insert the NOAA WRC picture object on the Miscellaneous layer. We've already unlocked that layer to alter the TIGER polygons. So we can immediately choose Insert Picture Object from the Edit menu.

We are asked if we want to use an existing map or make a new map. You will almost always choose Use Existing Map here. Make New Map would be used only if the picture to be inserted couldn't really be called "part" of an already existing map. In our case, the NOAA WRC picture is clearly part of the King County map, so we'll choose Use Existing Map.

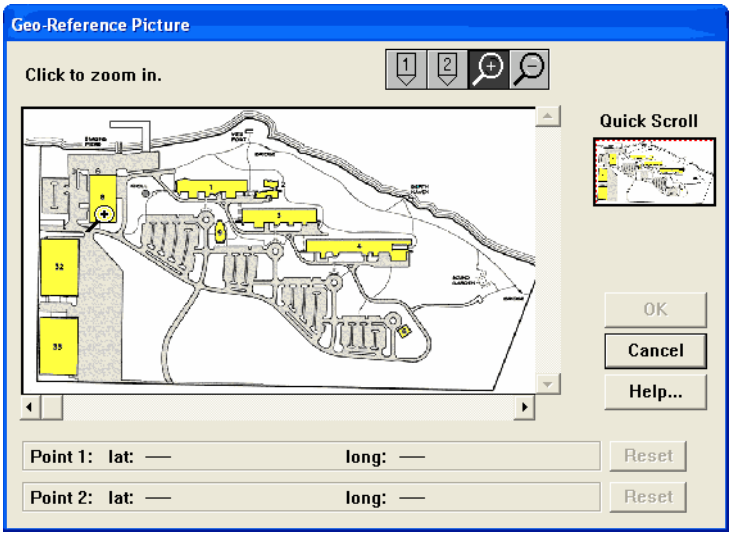
MARPLOT asks us to select the picture file containing the image for the new picture object. We find the picture and click Open (Choose on a Macintosh).

We are immediately presented with the Object Settings dialog box for the new picture object. We see the picture displayed in the lower part of the window. Note that MARPLOT puts the object on the Miscellaneous layer by default, since that is the only unlocked layer. By default, MARPLOT guesses that we want the object on the User's Map. In this case, it probably makes more sense to put the object on the King County map itself (as we have done in the graphic below), although keeping it on the User's Map may also be a reasonable decision.



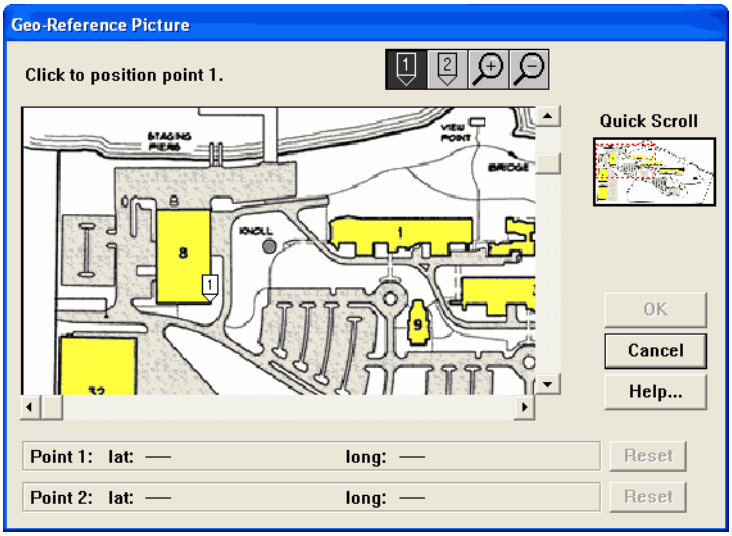
At this point, we have the object on the right layer and map, but its size and position are undefined. If we were to click OK, MARPLOT would guess at the size and position. We could then drag and stretch the object directly on the map to get the right size and position. A more precise method, if we know at least one exact latitude/longitude point on the picture, is to use the Geo-Reference button. (**Note:** Even if you do not use the Geo-Reference button when you first insert the picture, you can use it at any time in the future by simply bringing up the Object Settings for the picture object.)

When we click Geo-Reference, we are presented with a dialog box used for geo-referencing pictures.

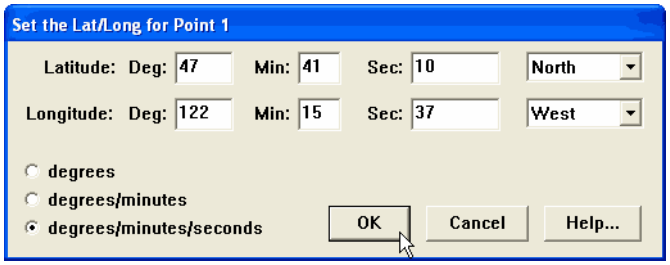


The idea here is to specify the exact size and location of the picture. We do this by marking two points on the picture. We have to give an exact latitude/longitude position for the first point. For the second point, we can give either an exact latitude/longitude position, or the exact distance from the first point.

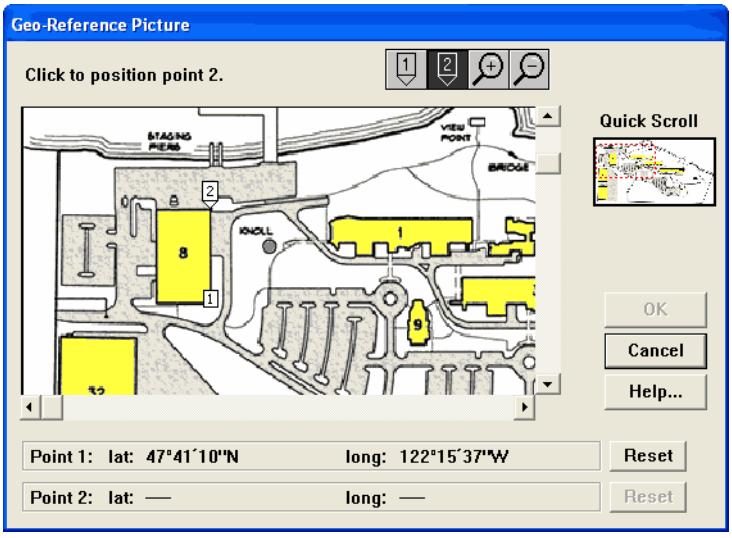
Suppose that in this case, we know that the southeast corner of Building 8 is at latitude 47°41'10" north and longitude 122°15'37" west and that we also know that the building is 363 feet long, from the north end to the south end. First, we zoom in on this point to increase our accuracy. Then, using the number one tool, 
we click on the southeast corner of the Building 8.



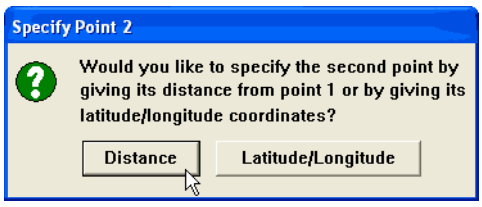
We are asked to enter the lat/long values corresponding to the point we clicked.

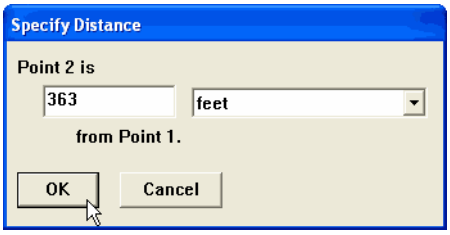


Next, using the number two tool  , we click on the northeast corner of the building.

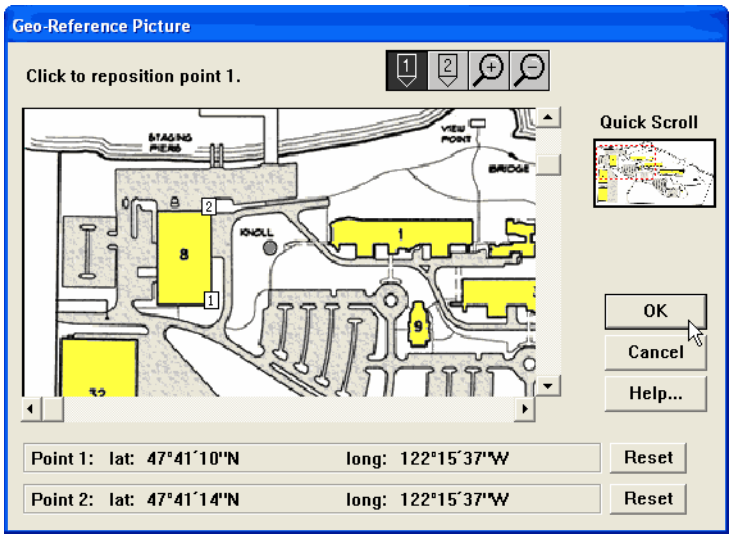


We don't know the lat/long of the second point, but we do know the distance between the two points since we know the length of the building is 363 feet. We click Distance and enter 363 feet.

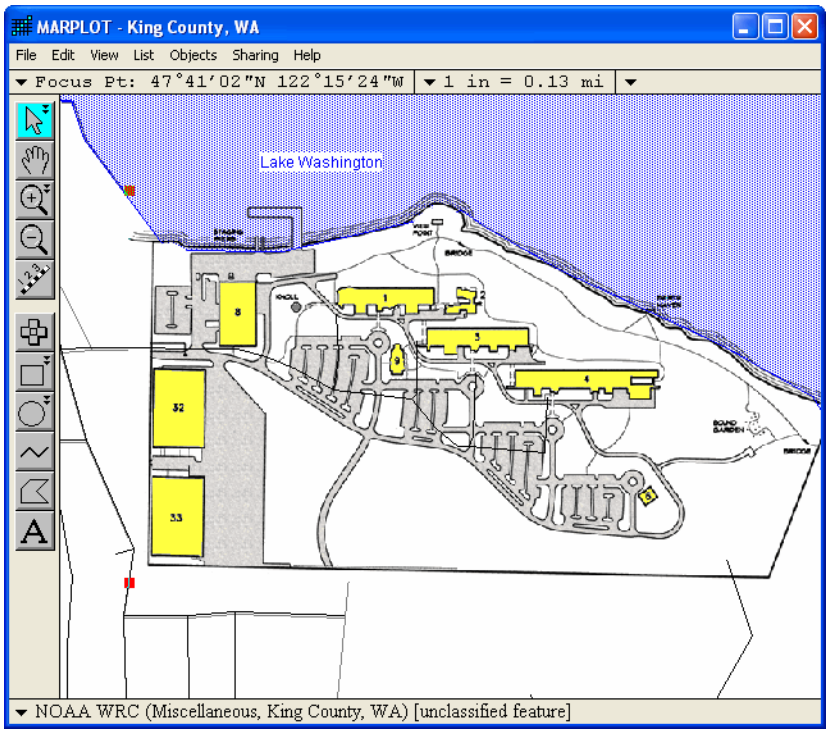




MARPLOT computes the lat/long of the second point based on the distance. Since we have now specified both points, we exit the Geo-Reference Picture and the Object Settings dialog boxes.



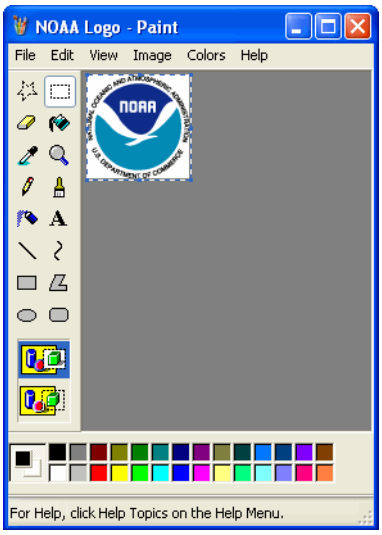
On the map, we see that the picture has been added to the Miscellaneous layer, and is in the correct location. If the picture were not in the correct location, it could be because the lat/long value or distance provided was inaccurate, or because the picture was not drawn properly to scale. It is also possible the lat/long value provided was more accurate than the TIGER lat/long values of the King County map, because it was based on a more accurate model of the shape of the earth (see "Accuracy of the TIGER/Line database" on page 19). In this case, we might try to drag and stretch the object to get it as close as possible to the right size and position.



Now that the picture is in place, we can treat the picture as if it's part of the King County "base map." We can zoom in on it and place other objects on top of it. It's important to keep in mind that any objects we place "on" the NOAA WRC diagram should be on layers that are above the Miscellaneous layer. Otherwise, the diagram will draw over the objects.

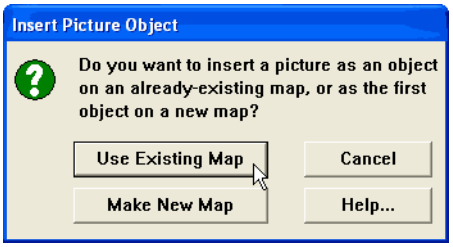
Adding a picture object without geo-referencing

In the previous example, we placed a diagram of the NOAA Western Regional Center (WRC) on the TIGER-derived MARPLOT map for King County, Washington. Now we want to add the NOAA logo to our map as well. We have the NOAA logo in a paint file. We can open the file in our paint/draw application, and copy the image to the clipboard.

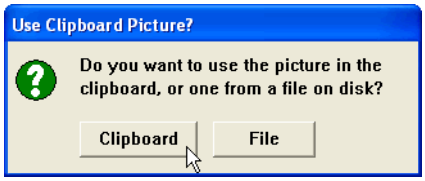


As with the NOAA WRC diagram in the previous example, here we'll place the logo on the Miscellaneous layer of the King County map, although it would be reasonable to put it elsewhere, say on a Logos layer of the User's Map. The Miscellaneous layer is still unlocked from the previous example, so we can begin inserting the picture object.

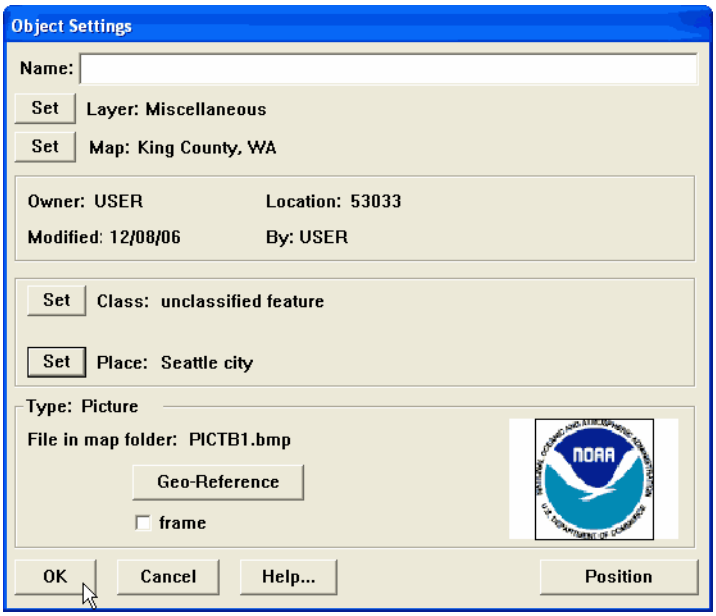
We choose Insert Picture Object from the Edit menu. Again, we add the picture to an existing map.



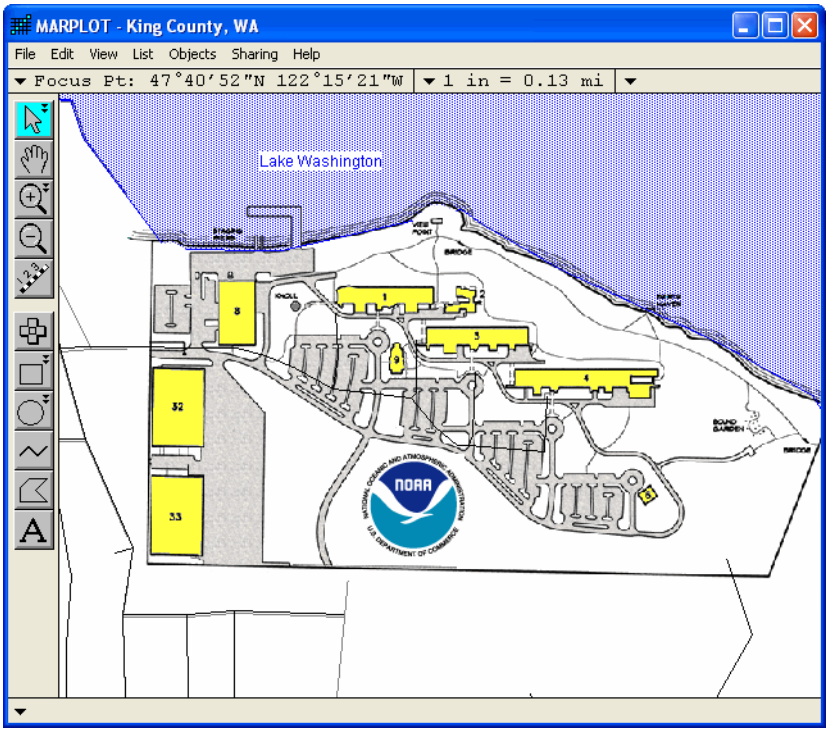
At this point MARPLOT notices the picture on the clipboard and asks if we want to use that one. We click Clipboard to use the copied picture.



MARPLOT takes the image from the clipboard and brings up the Object Settings dialog box for the new picture object. MARPLOT assigns a default name to the object, in this case "PICTB1." We'll clear the name field, so that MARPLOT won't display PICTB1 below the image when it shows names of Miscellaneous objects. Also, we move the object to the King County map from the User's Map, which was MARPLOT's default guess, and assign it to Seattle city. Then we click OK.



MARPLOT adds the picture to the map. We did not geo-reference this picture object, so MARPLOT can only guess at its size and location. By clicking on the picture to select it, then dragging it and stretching it at its corners, we can position and size it as we desire. The NOAA logo is now an annotation to our King County map. We lock the Miscellaneous layer now that we are done editing.



Generating output

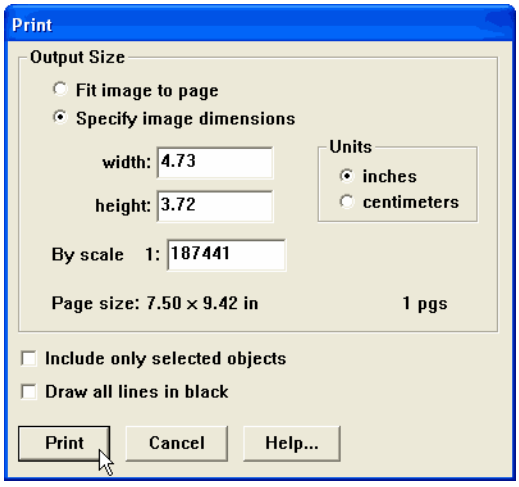
The contents of the map window can be printed to your printer or saved as a standard picture file that can be opened by a drawing application.

Printing

Note: MARPLOT provides its own mechanism for scaling your print output, so you should not use the Print Setup option (Page Setup on a Macintosh) from the File menu to scale your output.

When you have the desired image in the map window (keep in mind that any insets in the map window, such as the reference view or scale bar, will be included in the output), choose Print from the File menu. MARPLOT presents a dialog box where you can specify the size of the printed image.

When you choose the Print item, you are presented with a dialog box that lets you specify the size of the printed output. By default, the output will be fit to the printed page. If you want to specify the image dimensions, you can enter either the desired width and height or the map scale that you want the output to have. If you specify the image dimensions, the Print dialog box displays the size of a printed page as well as the number of pages that will be printed.



Checking the first of the two check boxes causes MARPLOT to print only the objects that are currently selected on the map.

The lower check box is useful if you have a black and white printer and are printing colored lines. In some cases, when the printer attempts to simulate a colored line by drawing it in a gray pattern, it ends up leaving certain segments of the line blank. Choosing to draw all lines in black corrects this problem.

Saving a picture

The Save as Picture item in the File menu is used to save the image in the map window to a file. On the Macintosh, this is a standard PICT file, which can be used by many types of applications. In Windows, you can save the image to a bitmap (.BMP) file or a metafile (.WMF). Metafiles are often smaller than bitmap files, and have the advantage that certain programs will allow you to edit them on an object-by-object basis. However, bitmap files are more common and can be opened with standard drawing programs.

When you have the desired image in the map window (keep in mind that any insets in the map window, such as the reference view or scale bar, will be included in the output), choose Save as Picture from the File menu.

On a Macintosh. MARPLOT gives you the option of changing the size of the saved picture. As with printing, you can choose to save only the selected objects. The lower check box is used to embed within the picture "comments" that cause the lines in the picture to be drawn in a hairline pen width. Also, checking this box draws all filled objects to the picture, followed by all non-filled objects, regardless of their layer order. Together, these two factors cause the saved picture to print as it would if the same area were printed directly by MARPLOT. When you click Save, you are presented with a standard file dialog box asking you for the name and folder location of the saved picture file.

In Windows. You are presented with a standard file dialog box asking you for the name and folder location of the saved picture file. Choose the type of file to be saved from the Save as Type pop-up. For metafiles, you can choose to save only the selected objects.

Transferring map data

Note: "Exchanging data with other MARPLOT systems" on page 149 discusses the two methods that are used to exchange MARPLOT data between two MARPLOT installations: copying maps/map files and using MARPLOT's import/export functions.

Copying maps and map files

Suppose you have been adding symbols representing the locations of fire hydrants in Prince William County onto a map layer called Hydrants that you created on the Prince William County map. If you wanted to share this layer with other MARPLOT users, you could go to the Prince William County map folder and copy all of the layer files that begin with Hydrants. If the users you want to share this fire hydrant data with already have the Prince William County map, you need only give them these layer files. They simply copy the Hydrants layer files into their Prince William County map folder and, when they start MARPLOT, the new layer is automatically added to their system and the fire hydrant objects appear.

Note: If the other MARPLOT user already had a layer called Hydrants on their Prince William County map, this procedure would delete all of the objects on their Hydrants layer and replace them with your Hydrants layer.

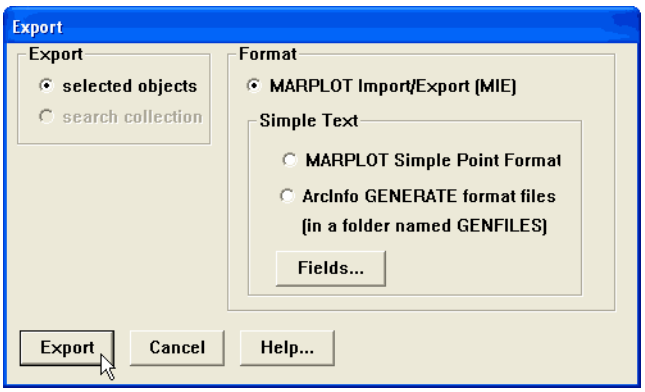
Suppose, on the other hand, that you had not been adding the hydrants to the Prince William County map itself (and it might well be a better idea not to, since you might not like to have your data so closely mixed in with the TIGER-derived map layers). Instead, you have been placing them on a separate map called Fire Information (see "Creating new maps" on page 152 for information about creating maps). In addition to the Hydrants layer, you have also created a Past Fires layer, along with some other fire-related layers. Transferring this data to another MARPLOT installation is very easy. Simply copy the entire Fire Information folder, and give it to the other MARPLOT users. They can put this folder directly in their MARPLOT folder, in which case it's recognized automatically when they start MARPLOT, or in some other folder, in which case they have to use Find New Map in the Map List dialog box to identify the new map. (They would only have to use Find New Map once; they could replace the entire Fire Information folder with future updates without having to use Find New Map again.)

Using Export and Import

As explained in "Exchanging data with other MARPLOT systems" on page 149, there may be cases where you cannot transfer entire maps or groups of map files, but must instead explicitly select the objects to be transferred and export them to an MARPLOT Import/Export (MIE) file. The recipient of the data then imports the MIE file into his or her system.

To do this, first you would select the objects on the map that you want to transfer. There are a number of ways the selection process can take place. If there are only a few objects, you may just shift-click them with the arrow tool. If there are many objects, you might want to select them in some automated way, such as using MARPLOT's Search function, or a search operation in the database to which the objects are linked, if there is such a database.

When the objects are selected, choose Export from the File menu and choose your export and format settings in the Export dialog box that appears. After you click Export, another dialog box appears in which you can specify a name and a destination for the MIE file.



The recipient of the data opens MARPLOT, chooses Import from the File menu, and selects the MIE file you created.

The objects that you exported will be imported to the specified map and layer. If the other MARPLOT user does not have an existing map and layer of the same name, MARPLOT will create them (although they will only contain the objects you exported). If the other MARPLOT user does have the specified map and layer, it will import the objects to them. In this manner new objects from your system can be added to another user's system; these objects will be added to the other user's existing objects. **Note:** If any objects share the same ID number, MARPLOT's default behavior is to replace the existing object with the new import object. To change this default setting, click the Options button on the Import dialog box.

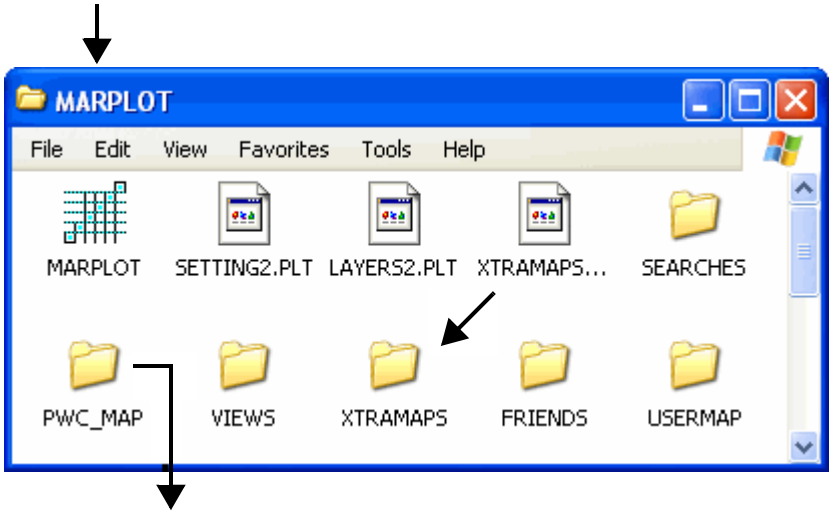
5

Quick Help Diagrams

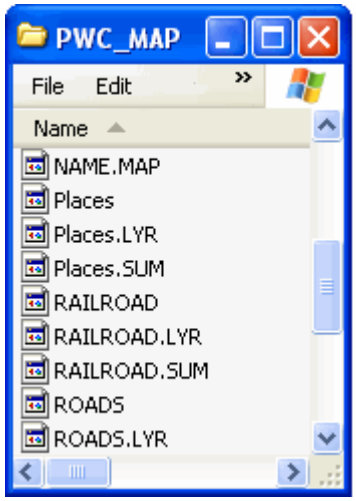
This section contains a number of diagrams that point out the key parts of MARPLOT's main displays and dialog boxes.

MARPLOT folders and files

The MARPLOT folder contains the MARPLOT application, map folders, several .PLT files that MARPLOT accesses, and other miscellaneous files that MARPLOT uses.



Map folders need not be in the MARPLOT folder; they can be in any folder on any of your drives. (The XTRAMAPS folder is a convenient place to store maps that you do not want to keep directly in the MARPLOT folder.) The locations of maps that are not stored in the MARPLOT folder are kept in the XTRAMAPS.PLT file.



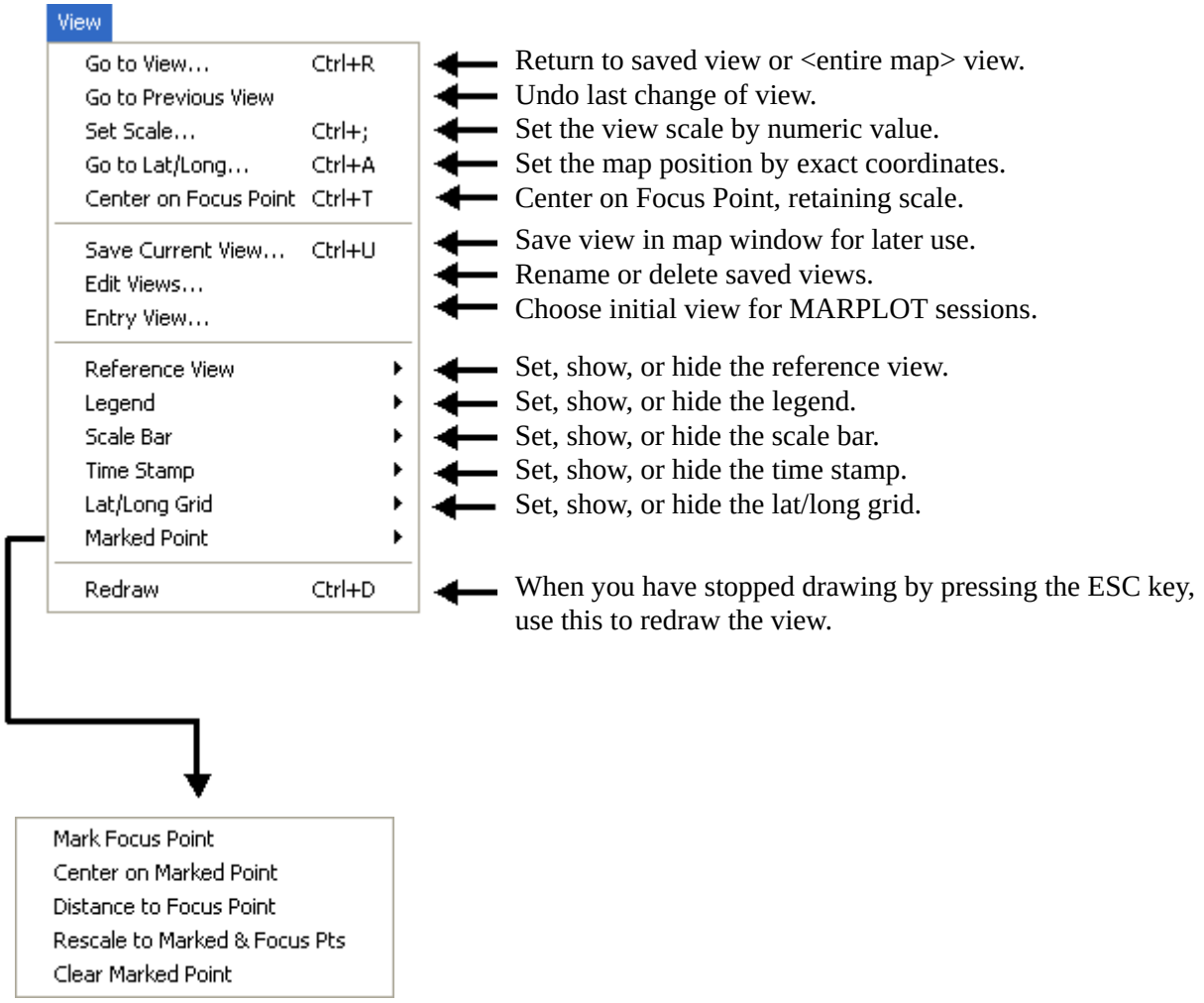
Each map folder contains a NAME.MAP file. This flags the folder as being a map folder. For each layer on a map, there are up to five map files, ending with .LYR, .SUM, .OBJ, .NNX, and .SM2. (**Note:** The last two file types are not always present for a given layer on a given map.) If a map contains picture objects, there will also be a picture file in the map folder for each picture object.

Menus

- Save image in map window to picture file.
- Standard print options (Page Setup on Macintosh).
- Print image in map window.
- Read objects from a MARPLOT Import/Export (MIE) text file.
- Write objects to text file.
- Optimize maps after importing or many edits.
- Choose the way information is displayed.
- The first time this item is used, it gives the option of putting your MARPLOT system into multi-user mode, where there is an administrator and multiple users with passwords and assigned editing permission levels. Once in the multi-user mode, the Administrator item is only available to the administrator.

- Undo last editing operation.
- No function.
- No function
- No function.
- Delete selected objects.
- Create new picture object from picture file or clipboard picture.
- Polygon union, intersection, difference, or envelope.
- Join polylines into a single object.
- Convert one type to the other.

Menus (continued)



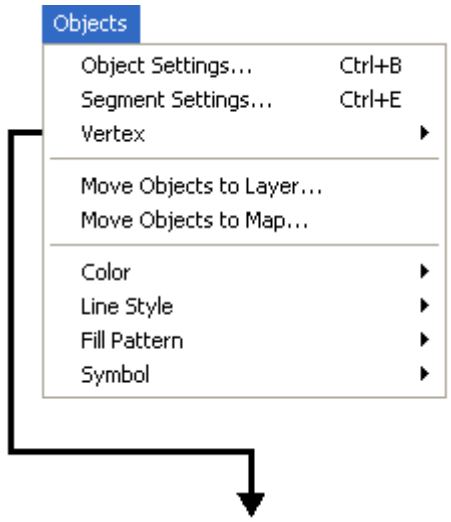
The Marked Point serves as a reference location for the functions in this submenu and also for functions in the Vertex submenu. You set the Marked Point either at the location of the Focus Point (this menu) or the location of the closest vertex (Vertex menu). With this menu, you can:

- Center the view on the Marked Point,
- Find the distance from the Marked Point to the Focus Point,
- Change the view so that the Marked Point and the Focus Point are just visible, or
- Clear the Marked Point.

With the Vertex menu, you can move a vertex to the Marked Point.

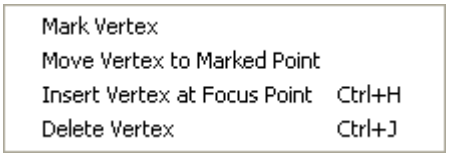
Menus (continued)

Search for objects (various criteria).
Show list of found or copied objects.
Copy selected objects to search collection (replaces collection).
View/modify list of layers.
View/modify list of maps.

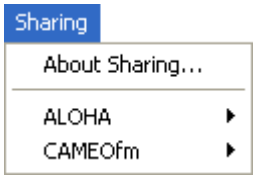


View/modify settings for the selected object.
View/modify settings for the segment of the selected object at the Focus Point.
Move selected object(s) to chosen layer.
Move selected object(s) to chosen map.
Set color of selected object(s).
Set line style width and pattern of selected object(s).
Set fill pattern of selected object(s).
Set symbol (icon) of selected object(s).

Note: On a Macintosh, the Line Style item is separated into two items: Line Width and Line Pattern.

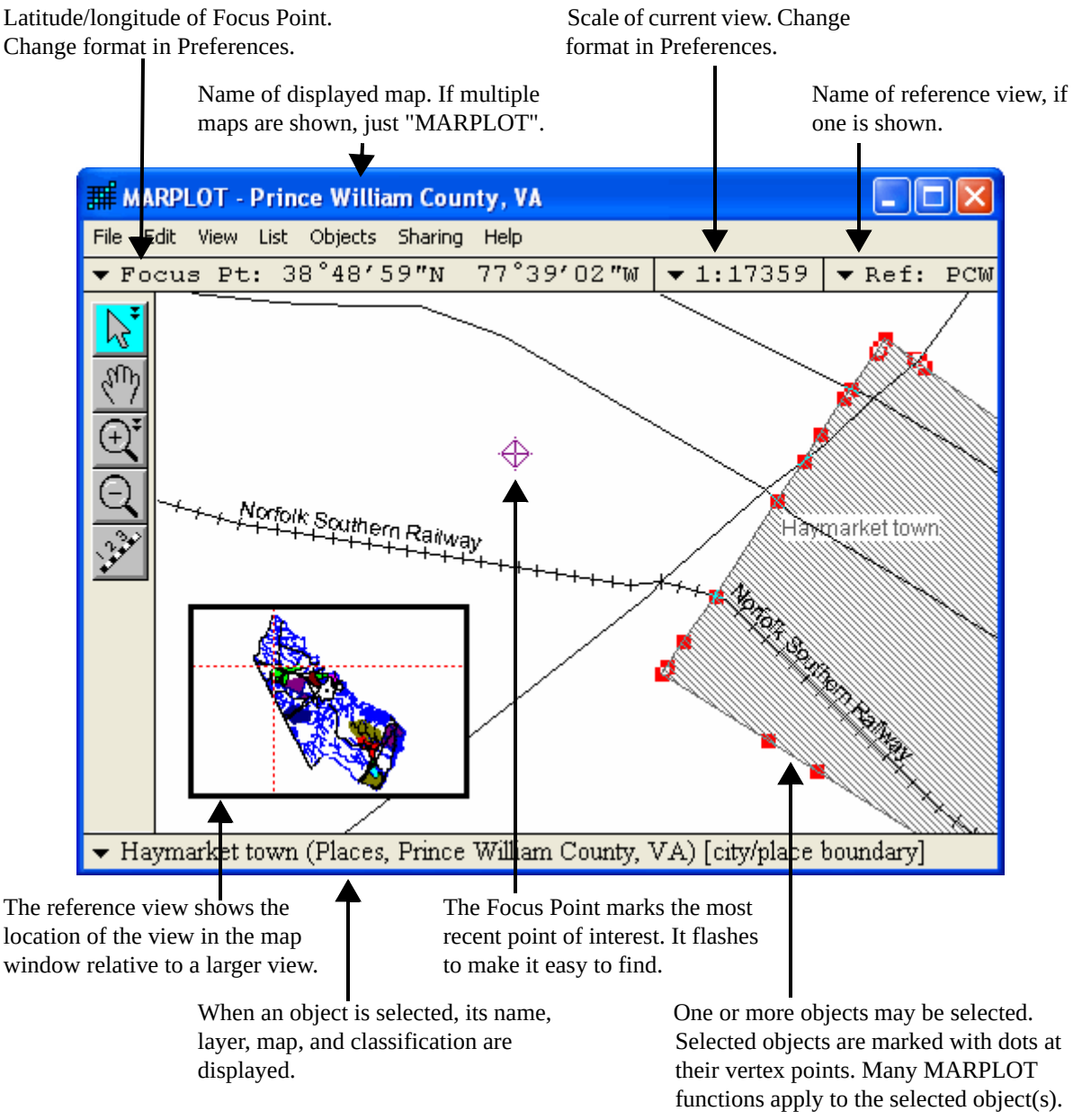


The Vertex submenu allows you to edit polyline and polygon objects at the vertex level. You can insert or delete vertex points, and move vertex points to an exact latitude/longitude location (that is, wherever the Marked Point is set). This latter operation is important when editing road intersections.



The Sharing menu is the connection between MARPLOT and various applications that create objects on MARPLOT maps and/or store database information that is linked to map objects. For more information, see the documentation for the applications that share information with MARPLOT on your system.

Map window



Click to select objects (click and drag to select several). Drag selected objects to edit (e.g., move).

Click to zoom in. Drag to zoom to rectangle.

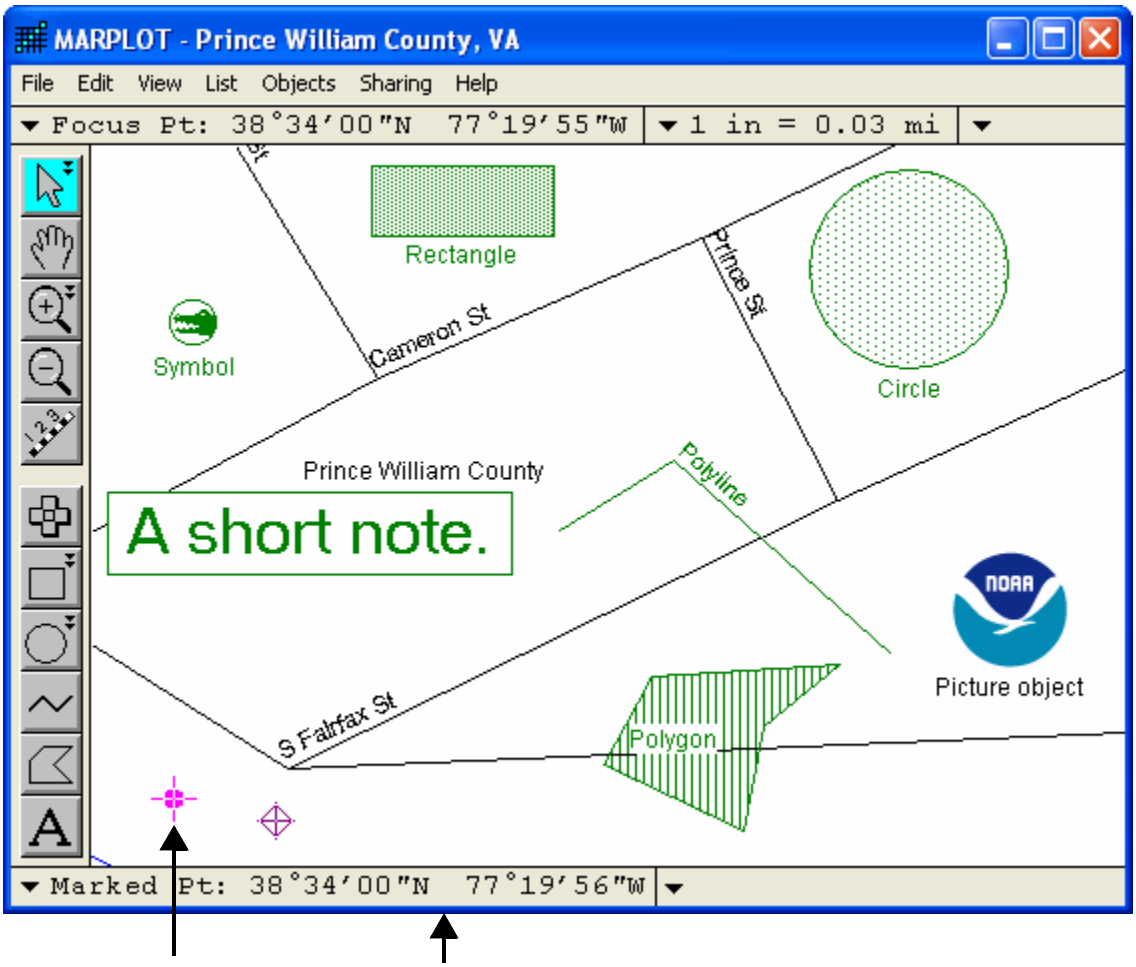
Click to zoom out.

Drag to shift view.

Drag to measure distances.

Map window with an unlocked layer

When one or more layers have been unlocked (using the Layer List dialog box), the list of tools on the left edge of the map window extends to offer tools for creating new objects. This view shows all seven types of MARPLOT objects: a symbol, a rectangle, a circle, polylines, a polygon, a text label ("A short note."), and a picture (the NOAA logo).



When the Marked Point is set, the coordinates are shown here.

 Click to make a symbol (point).

 Drag to make a rectangle.

 Drag to make a circle.

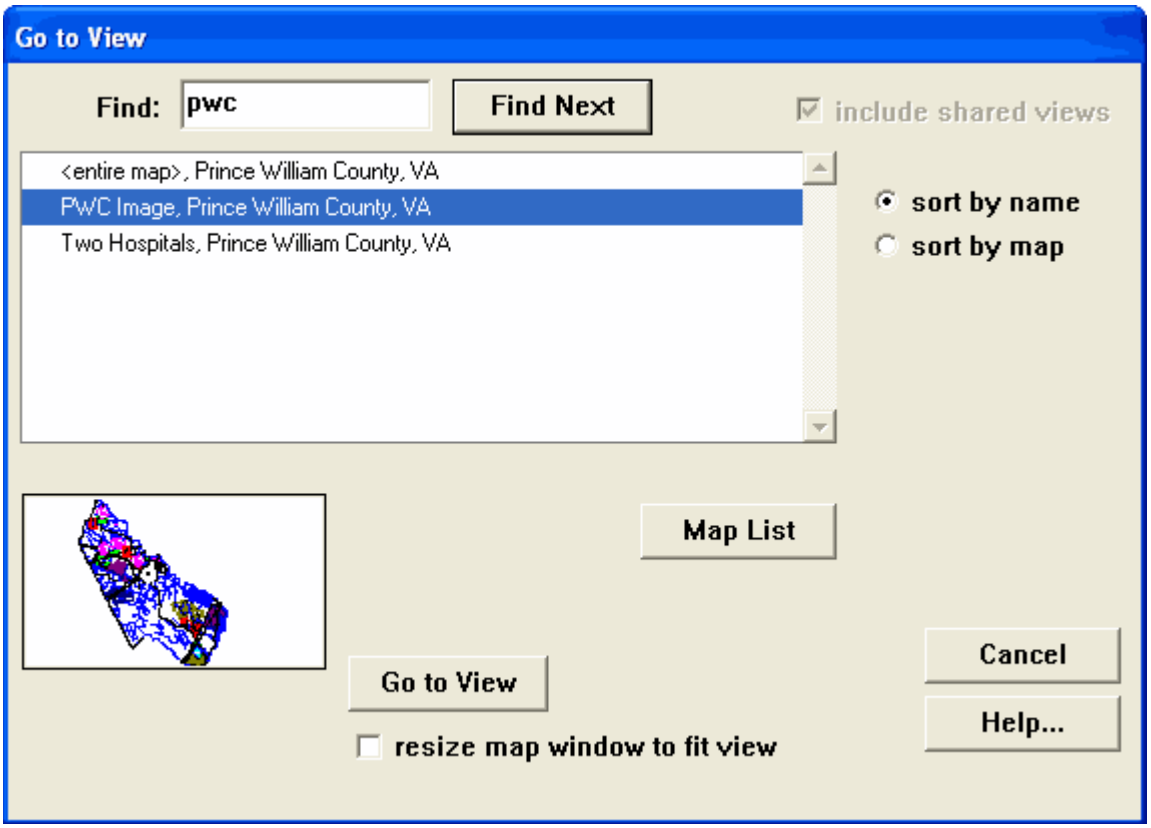
 Click to make a text label.

 Click at each vertex to make a polyline. Double-click to finish.

 Click at each vertex to make a polygon. Double-click to finish.

View dialog boxes

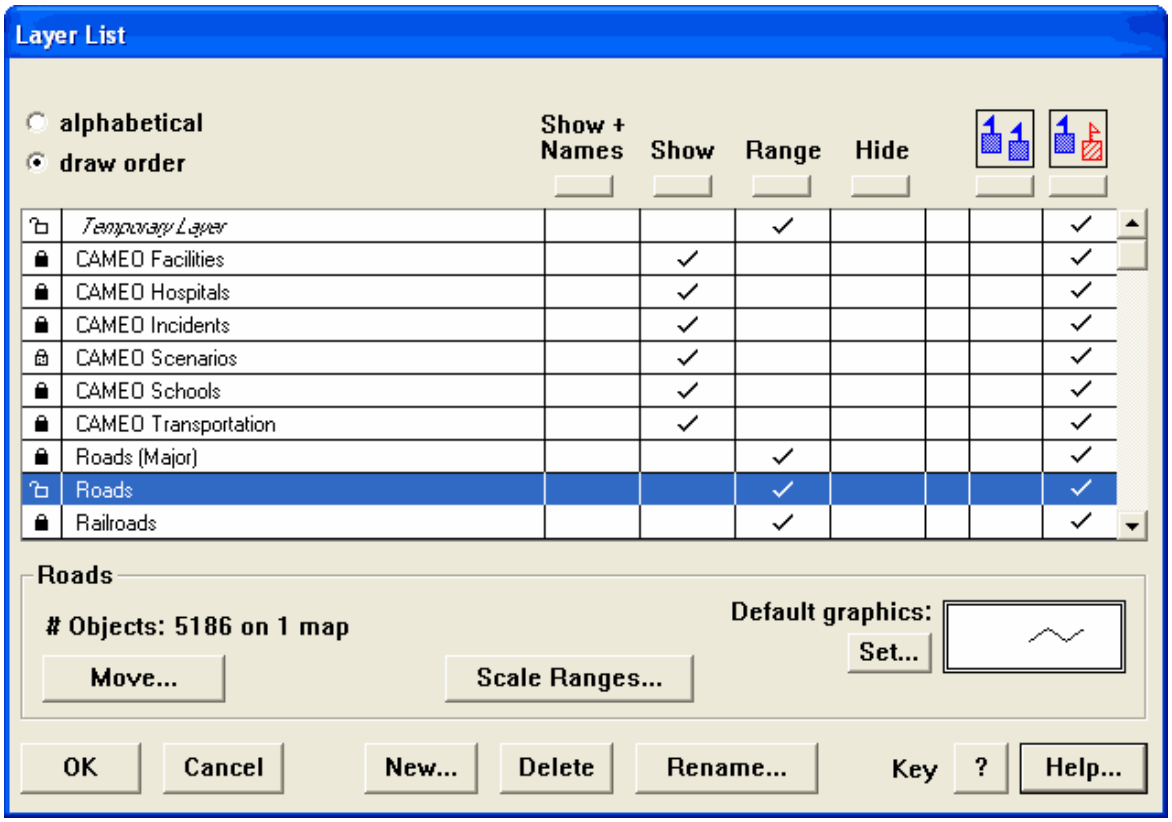
The four dialog boxes—Go to View, Entry View, Set Reference View, and Edit Views—have a similar design. In each case, views can be ordered alphabetically by view name or by map name. You can also type a few characters of the name you are looking for and click Find Next. Except in the case of <entire map> views, the view's miniature image appears in the lower-right. When the "include shared views" box is active, you can specify whether views saved by other users of your MARPLOT system appear in the list.



- In the **Go to View** dialog box, click Go to View to go to the highlighted view. Check the box "resize the map window to fit view" if you want the map window to be automatically resized to match the width/height aspect ratio of the view. Sometimes you may want to see the entire map view of a map that is not listed here. You can click the Map List button to go to the map list, from which you can choose to go the view of any map.
- In the **Entry View** dialog box, you can choose not to have an entry view (in which case the Go to View dialog box comes up at the start of each MARPLOT session), to enter to the last view from the previous MARPLOT session, or to enter to a particular view. In the latter case, the selected view appears with a boxed "E" next to its name in the view list.
- In the **Edit View** dialog box, you can rename or delete saved views.
- In the **Set Reference View** dialog box, you can pick a saved view to serve as the reference view. Check the box "allow any view in reference" if you want to allow a reference view that does not necessarily contain the current area of the map window.

Layer List

The Layer List dialog box shows all of the layers known to your MARPLOT system, sorted either alphabetically or from top-to-bottom layer order (the layer on the bottom is drawn first). Layers can be in one of four show modes (Show + Names, Show, Range, or Hide) and one of two graphics modes (default or individual). They can be locked or unlocked, temporary, permanent, and owned by MARPLOT or another application. Each layer has default graphical settings and settings for four scale values related to when and how the layer is displayed.



Show + Names: Show objects, along with their names.
Show: Show objects; only show their names within the given range.
Range: Show objects when the map scale is within the given range.
Hide: Do not show objects.

Use the default graphical settings (as indicated in the graphics box pop-up).

Use the graphical settings of the individual objects.

Locked. Unlocked. Owned by another application, locked.

Owned by another application, unlocked (Objects menu graphics edits enabled).

Move... Change layer order (when not alphabetical).

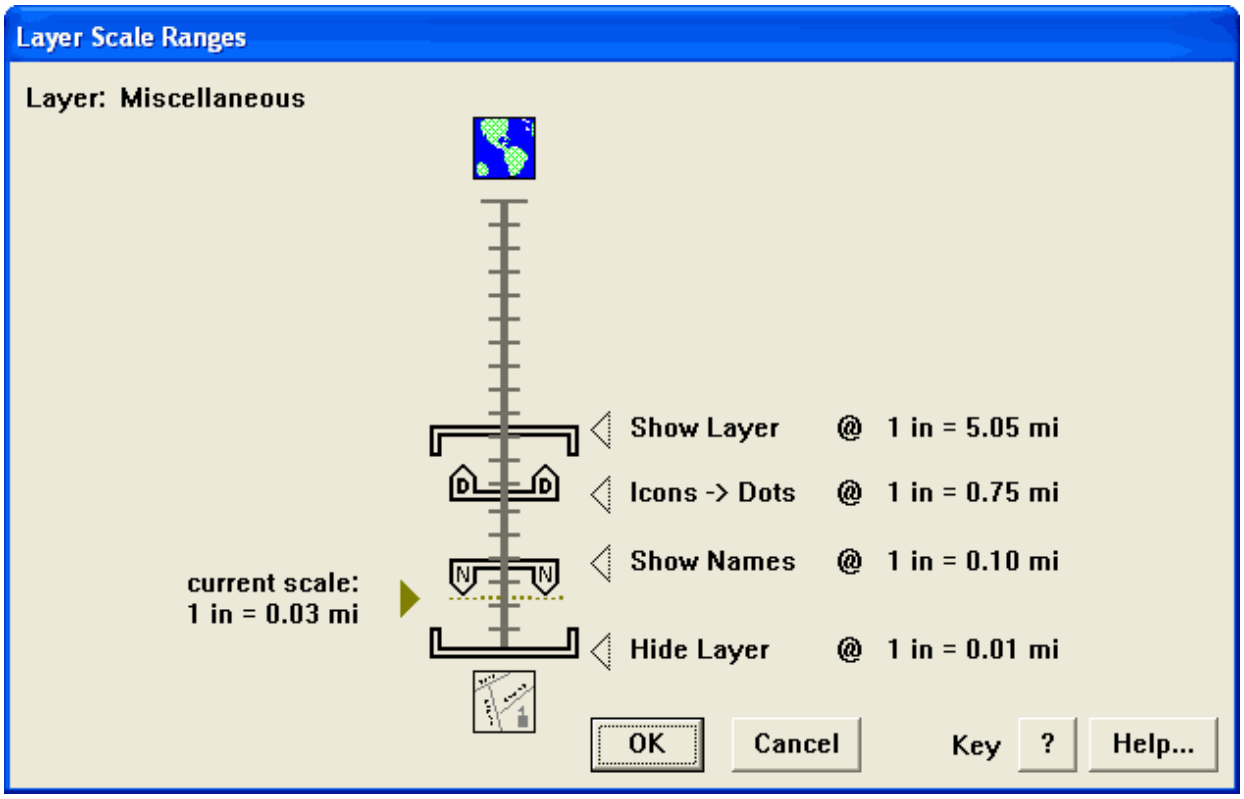
Scale Ranges... View/modify layer scale ranges.

Italics indicates temporary layers whose objects will be deleted at the end of each MARPLOT session.

Layer Scale Ranges

This dialog box lets you set four scale values related to if, when, and how the selected layer displays. It presents a "scale ruler" ranging from a very zoomed in view at the bottom to a view at the top that is so zoomed out it shows the whole earth.

The current map scale is shown on the ruler with a dotted line.



The **Show Layer** and **Hide Layer** pointers, along with the wide brackets, indicate the range of scales at which the given layer is visible when the layer is set to Range mode. The layer is not visible when you zoom out past the Show Layer value, or when you zoom in past the Hide Layer value.

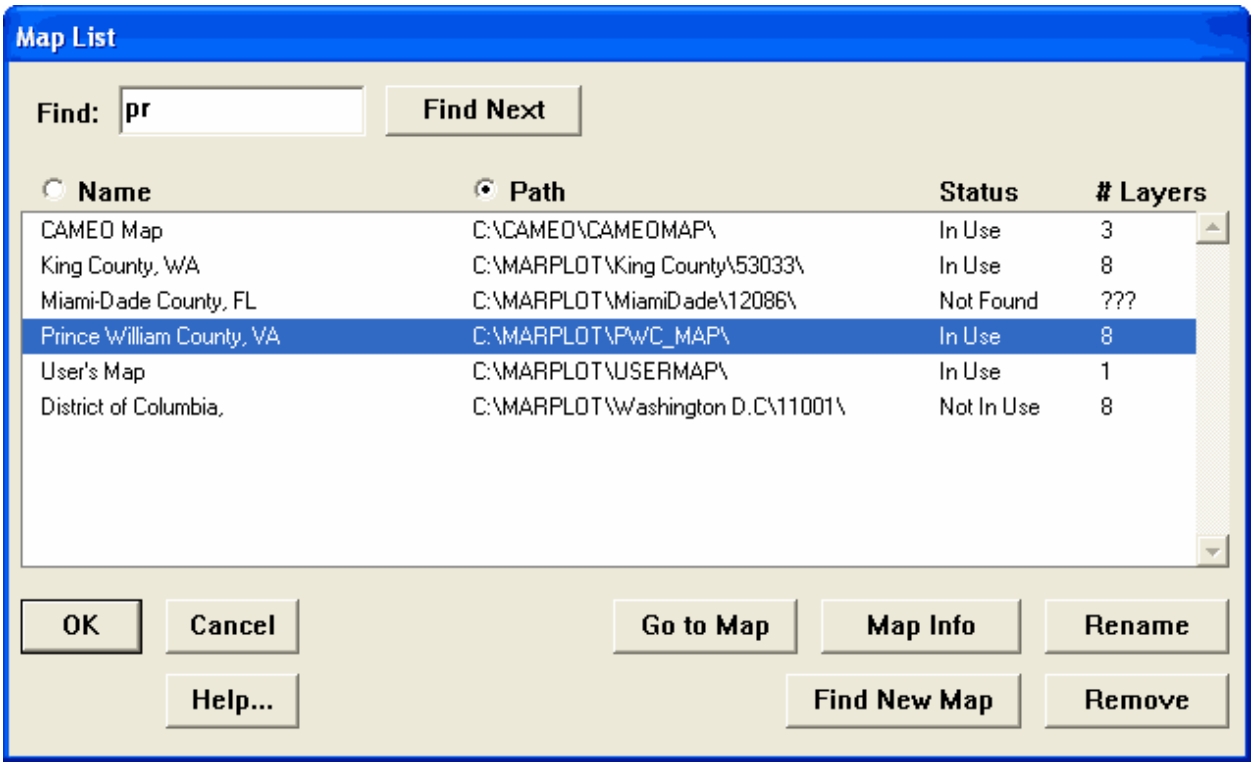
The **Icons -> Dots** pointer, along with the dot bar, indicates the scale at which the objects of the given layer show as small dots, instead of as their usual icons. When you zoom out past this scale, the icons change to dots so that the view is not overcrowded by symbols.

The **Show Names** pointer, along with the "N" bar, indicates the scale at which the names for objects on the given layer appear. When you zoom in past this scale, the names are shown. When you are not zoomed in this far, the names do not show, since they would crowd each other on the screen.

Drag any of these four pointers up or down on the scale ruler to change the setting.

Map List

This dialog box lists all maps known to your MARPLOT system.



The maps in the list are those inside your MARPLOT folder, plus those in locations that are stored in the XTRAMAPS.PLT file. You can determine the location of a map's folder by looking at the Path column. If the path is too long to fit in this column, you can use the Map Info button to see the full path.

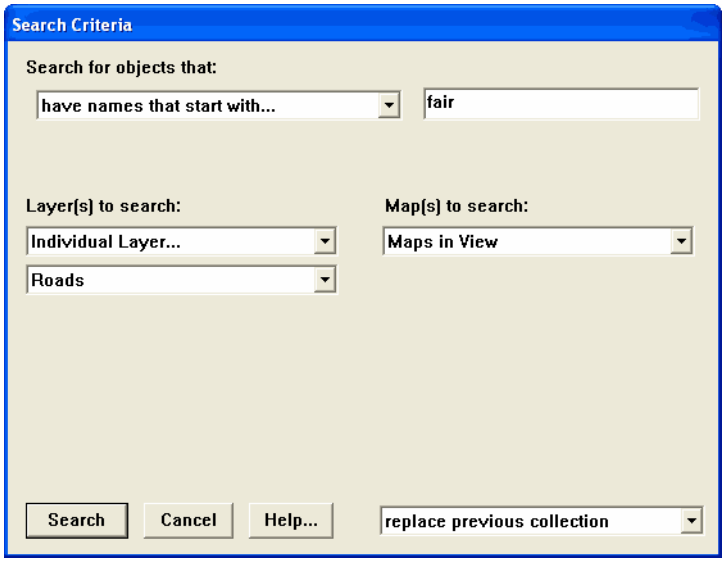
Map status can be in one of three states. Maps that are In Use are active and are drawn to the screen. Maps that are Not In Use are not drawn on the screen. However, they are automatically brought into use when they are needed; for example, when you show an object from such a map using the Search Collection dialog box. Maps are Not Found when the path that MARPLOT has saved for the map is no longer valid. This can happen, for example, when you rename a folder, or if the map is stored on a removable disk.

The # Layers column gives the number of layers that are represented on a given map. The Map Info button gives a more detailed breakdown for a map.

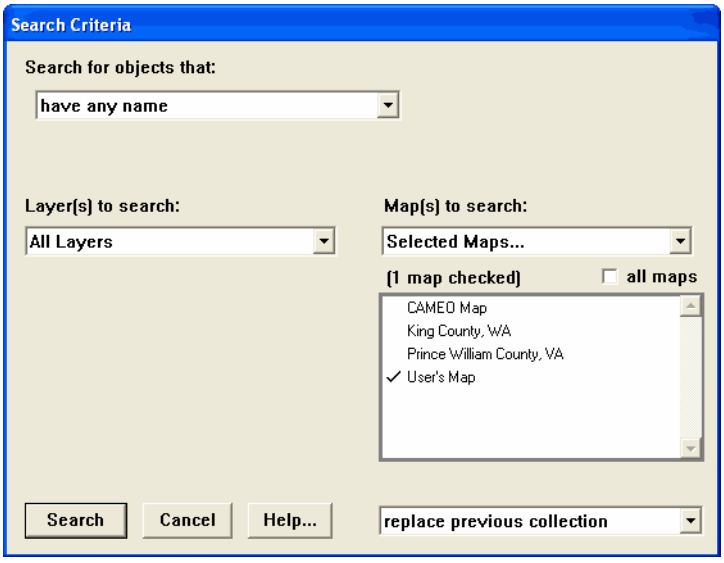
The Find New Map button is used to add a new map to your MARPLOT system.

Search Criteria

This dialog box is used to find objects according to various criteria. You can use the five pop-up boxes to modify how and where MARPLOT looks for objects. Many combinations are possible. Six set-ups are shown here, along with descriptions of what each search will find.

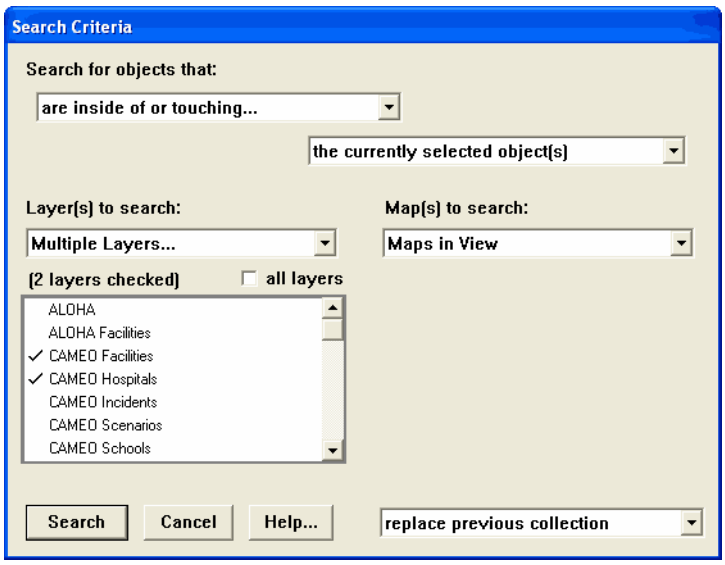


Roads on current map starting with "fair." **Note:** The search results will include roads that start with directional prefixes. For instance, when searching for "fair," the results may include both "N Fairfax St" and "S Fairfax St".



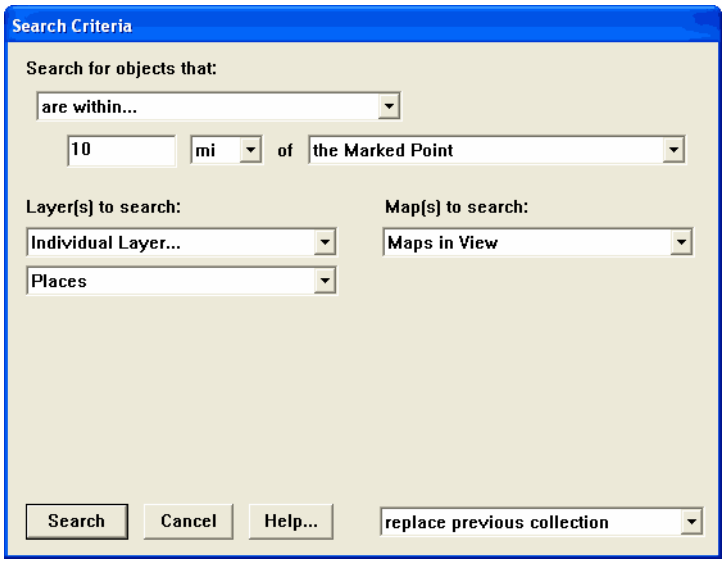
All objects on the User's Map.

Search Criteria (continued)



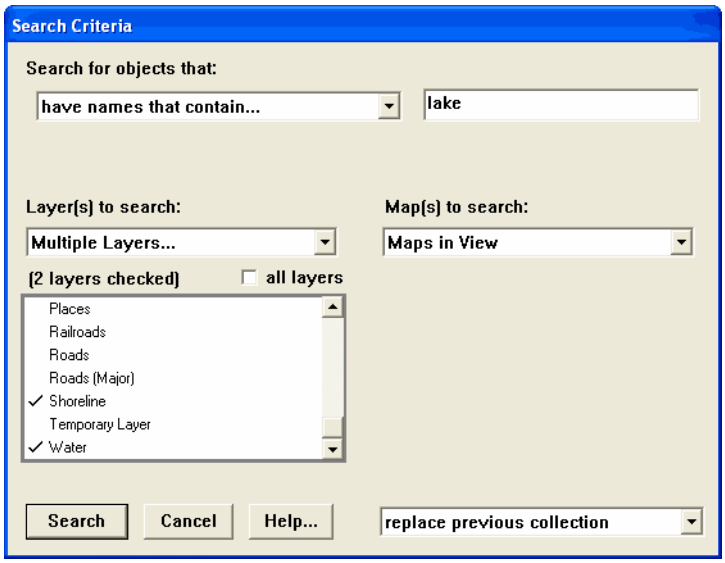
CAMEO hospitals and facilities that are inside of or touching the object(s) currently selected on the map. The selected objects might, for instance, represent ALOHA threat zones.

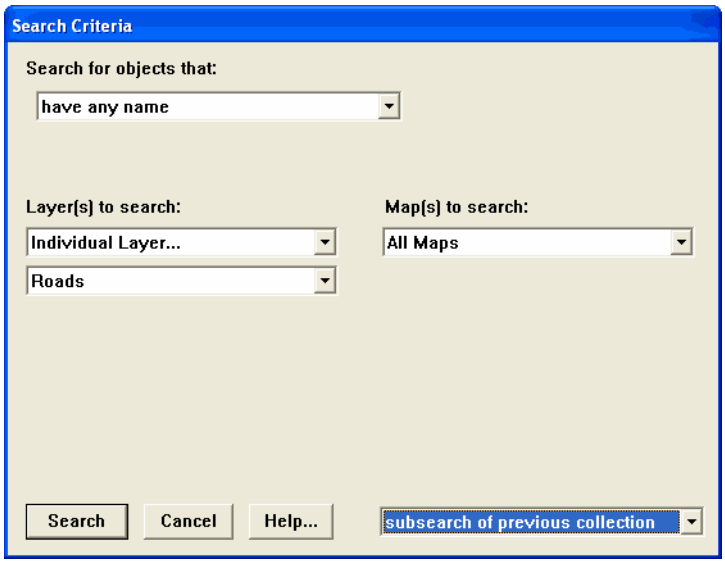
Places (cities and towns) that are within 10 miles of the Marked Point.



Search Criteria (continued)

On the Shoreline or Water layers, any object that has "lake" in its name.

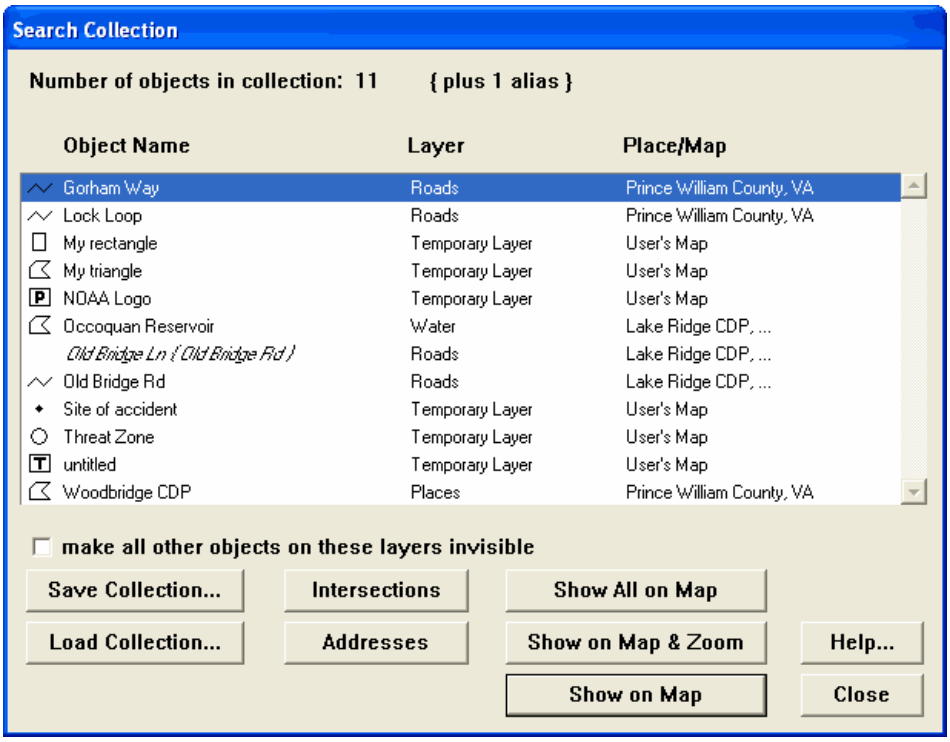




Among the objects found in a previous search, only the roads.

Search Collection

The Search Collection is a list of objects. Each time you do a search, the Search Collection is filled with the objects that match the criteria you have specified. You can also fill the Search Collection with the selected objects using the Copy to Search Collection menu item.



An alias is an alternative name for an object. Aliases in the Search Collection are shown in italics. In the example above, Old Bridge Ln is an alternative name for Old Bridge Rd.

Each object in the Search Collection is preceded by an icon indicating its type:

- polyline
- polygon
- point (symbol)
- rectangle
- circle
- picture
- text label

When the place/map ends with "..." it means the object is primarily in the named place, but crosses into other places as well.

Save Collection... Save Search Collection list to text file.

Load Collection... Load Search Collection list from text file.

Intersections List intersections of select object (usually a road).

Addresses List address ranges of selected object (usually a road).

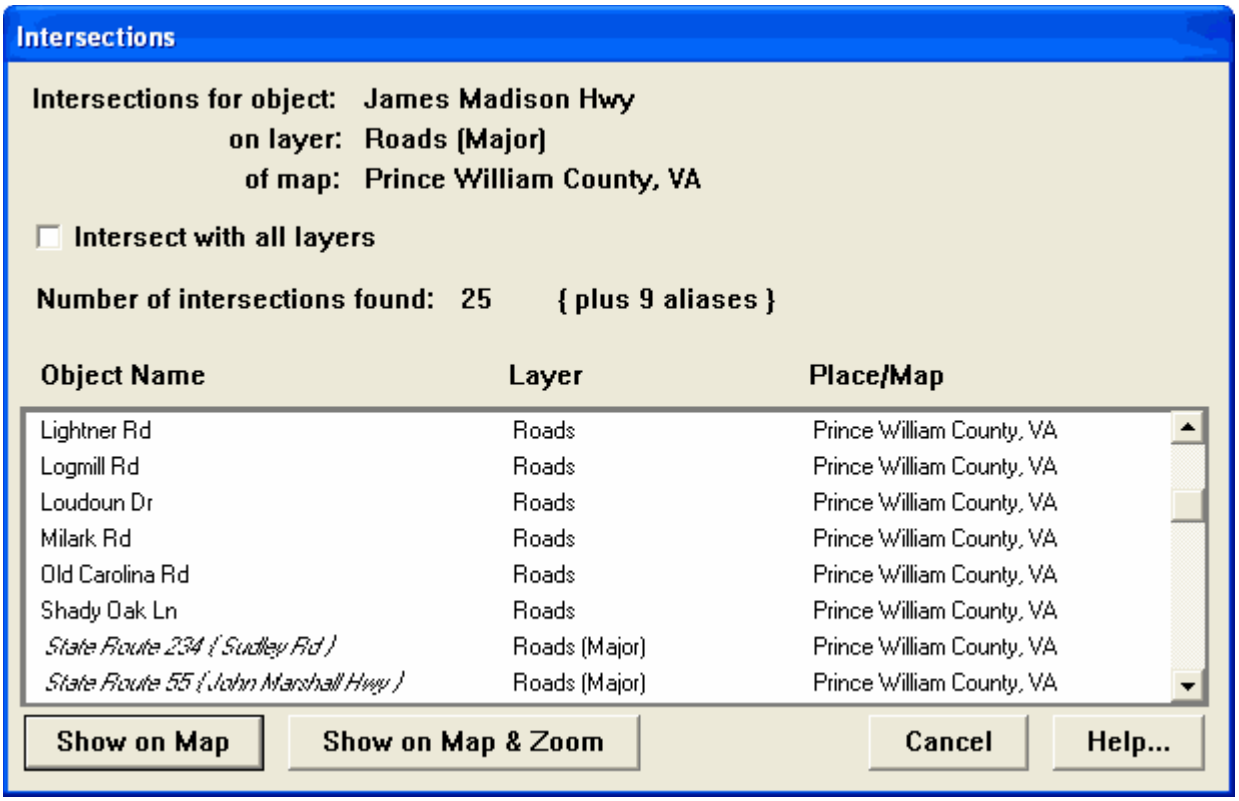
Show All on Map Show and select all listed objects.

Show on Map Show and select highlighted object. Do not change scale.

Show on Map & Zoom Show and select highlighted object. Change scale to show only area of object.

Intersections

This dialog box comes up when you click the Intersections button in the Search Collection.



Show on Map Highlight the two intersecting objects and put the Focus Point at the point of intersection. Do not change scale.

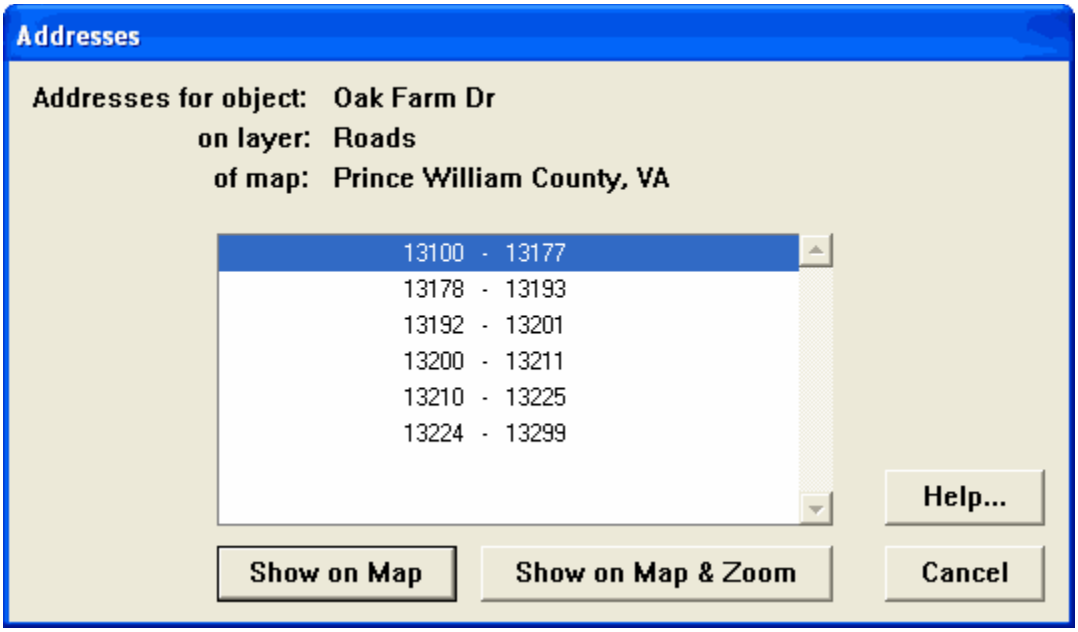
Show on Map & Zoom Highlight the two intersecting objects and put the Focus Point at the point of intersection. Change the scale to a scale appropriate for viewing typical street intersections.

Intersect with all layers Usually, you are interested in finding the intersections of an object with other objects on the same layer—typically to intersect roads with other roads. However, sometimes you may want to intersect with other layers. For instance, you may want to see where a road intersects with rivers on the Water layer. When the "Intersect with all layers" box is checked, the list of intersections is recomputed to include objects from all layers that intersect with the give object.

Note: For the purposes of this dialog box, MAPRLOT only considers two polyline objects to intersect if they share a vertex exactly.

Addresses

This dialog box comes up when you click the Addresses button in the Search Collection.



Show on Map — Highlight the road and put the Focus Point along the segment corresponding to the selected address range. Do not change scale.

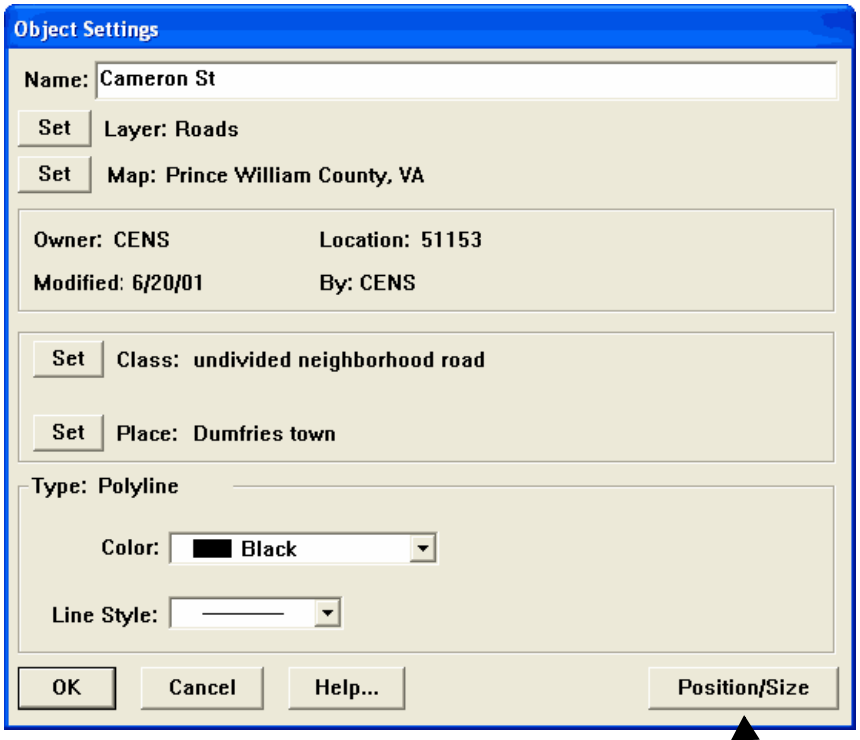
Show on Map & Zoom — Highlight the road and put the Focus Point along the segment corresponding to the selected address range. Change the scale to a scale appropriate for viewing typical street address ranges.

Object Settings

This dialog box comes up when you use the Object Settings menu item with a single object selected, or when you double-click on an object. **Note:** The Object Settings can be modified only if the layer the object is on is unlocked.

Use to move the object from one map to another. Use with caution. Note that this does not change the position of the object, but may extend the map boundaries.

Use to move the object from one layer to another. Use with caution.



Click to view/modify the position of the object by latitude/ longitude coordinates. You can also use this to view the area, perimeter, or radius of an object (if applicable).

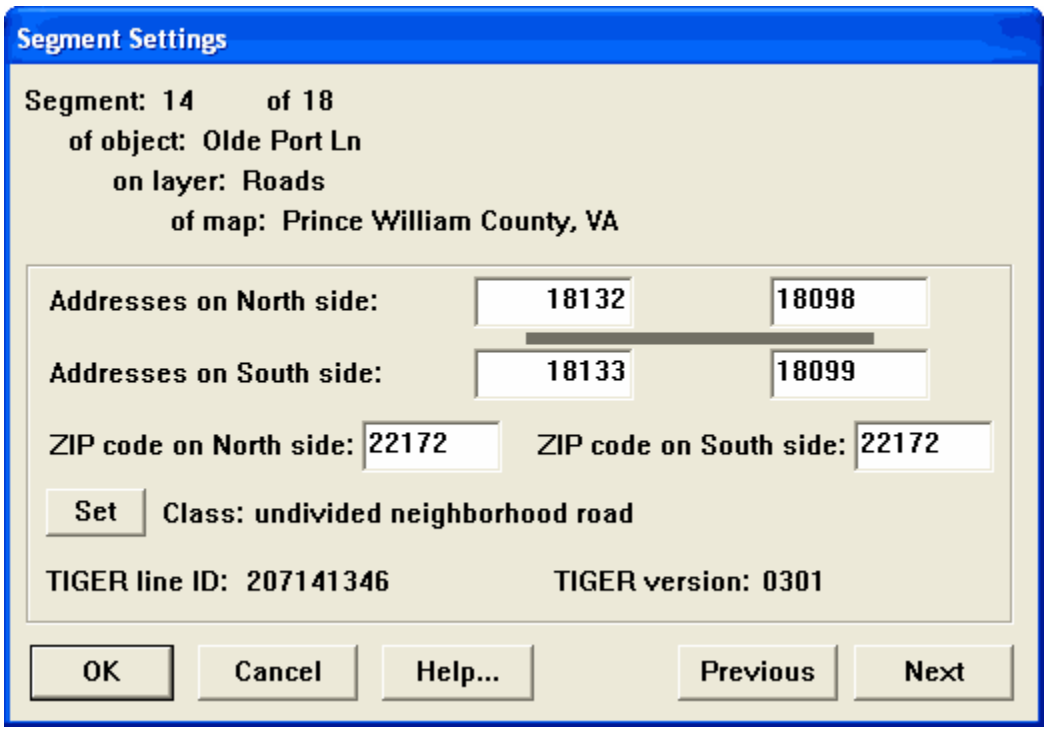
Use items in this box to change type-specific settings for the object. For symbol (point) objects, you can choose the symbol. For polygon objects, you can choose a fill pattern. For text objects you can edit the text. For picture objects, you can geo-reference the picture. **Note:** Line Style is divided into Line Pattern and Line Width on a Macintosh.

Click to change the feature classification or place (city or map name). Both of these settings are used for display purposes only.

This area shows the user code of the original creator of the object, and the user code of its last modifier, along with the last modification date. The location code of the object, if set, indicates the code number of the object's original location.

Segment Settings

This dialog boxes comes up when you select an individual polyline object in the map window and use the Segment Settings menu item. It lets you view/modify information specific to the segment of the selected object that is closest to the Focus Point.



The values are editable if the object is on an unlocked layer. Change the address or ZIP code values by typing in the boxes. Use the Set button to change the classification of just this segment—not of the entire object. (You can set the object's classification in the Object Settings dialog box.)

Use the Previous and Next buttons to scan through the segments of the object.

6 Administration

This chapter describes MARPLOT system management.

Keeping backups

It is important to keep backups of MARPLOT map information, especially for maps that are edited by you or other users of your MARPLOT system. Following is a list of the types of files you will want to back up:

Maps that are edited. It is crucial that you make regular backups of those maps on which you regularly add or modify objects. MARPLOT automatically saves all changes to maps as they are made. Mistakes can easily mean lost or corrupted data if you do not have backups. To make a backup of a map, simply copy the map folder to a backup disk, and change its name to include the backup date. If at some time you need to restore from a backup copy, simply replace the map folder with one from a backup disk (you'll probably want to make an extra backup of the map before restoring it). Sometimes the map to be backed up will be in the MARPLOT folder, but remember that MARPLOT can use maps situated anywhere on any of your disks. Thus, it is important for you to know where all of your maps are in order to back them up. MARPLOT's Map List dialog box provides this information.

Usually, the maps you will want to back up are relatively small compared to other maps, such as those derived from TIGER files. However, some users will want to modify TIGER-derived county maps, and in some cases non-TIGER maps can become quite large. If you are making only periodic edits to these large maps, you should back them up in their entirety, as with other maps. However, if the maps are very large, or if you are making frequent edits, the backup procedure can be cumbersome and consume too much disk space. In this case, you may only want to back up certain layer files from a given map folder. As a simple example, suppose you are making changes only to the Water layer of a certain TIGER-derived map. Instead of backing up the entire map folder, you can back up only those files that start with WATER. These files are WATER.LYR, WATER.SUM, WATER.OBJ, WATER.SM2, and WATER.NNX (the latter two files may not be present). You can copy these WATER files to your backup disk. To restore from a backup, just copy the saved WATER files back into the map folder.

Maps that are not edited. Many users will not make changes to TIGER-derived county maps and there may be other maps on your system that are never modified. You should keep at least one backup of these maps, just in case of disk error.

MARPLOT application file. You should keep your MARPLOT installation file in case the application file itself becomes lost or damaged on your hard drive.

USERS folder. If your MARPLOT system is multi-user, there is a USERS folder inside the MARPLOT folder. The USERS folder contains map files and other data (such as saved views and Search Collections) created by each user. In most cases, the total size of this folder will be fairly small, and you can back it up in its entirety. If a given user needs to be restored from a backup, you can copy just that user's folder from the backup into the MARPLOT USERS folder.

Views and Search Collections. The VIEWS and SEARCHES folders in the MARPLOT folder contain saved views and Search Collections. These folders are usually relatively small, and can be backed up by copying the entire folders to a backup disk. (**Note:** In a multi-user MARPLOT system, the VIEWS and SEARCHES folders in the MARPLOT folder contain collections shared by all system users. Personal views and Search Collections for each user are kept in that user's folder within the USERS folder. These are backed up along with the rest of the USERS folder.)

MARPLOT settings files. In the MARPLOT folder, the files called SETTING2.PLT, USER.PLT, LAYERS2.PLT, GROUPS.PLT should be backed up occasionally. They are all small. (**Note:** In a multi-user MARPLOT system, each user has their own copy of SETTING2.PLT, USER.PLT, LAYERS2.PLT, and GROUPS.PLT. These are backed up along with the rest of the USERS folder.)

Adding maps to your MARPLOT system

For step-by-step examples of adding maps, see "Adding maps" on page 85.

Adding maps from the Internet

A map is a folder containing a number of layer files. To obtain map files, go to http://www.epa.gov/oem/cameo/marmaps/. Find the desired state and county and download the maps. Usually you will copy the new map folder into your MARPLOT folder, in which case the map is automatically recognized the next time you run MARPLOT. If you want to copy the map to some other location, you will need to use the Find New Map button (see "Using Find New Map" on page 86 and "Map List" on page 71) in MARPLOT's Map List dialog box in order to point out the new map to MARPLOT (see the note on the next page on infrequently used maps).

Adding maps from LandView disks

MARPLOT and LandView (a database application discussed in "TIGER/Line database and LandView" on page 19) use the same map file format. Maps for all U.S. counties and territories are available on the LandView DVD. If your computer cannot read DVDs, you can order a custom CD-ROM for a single state or group of states. For more information about LandView or to purchase the latest DVDs, go to http://landview.census.gov.

If a LandView DVD or CD is in your computer, MARPLOT will automatically add all of the maps on the disk to your Map List. This allows you to work with any map on the DVD/CD as you do with any other MARPLOT map, except you cannot make changes, and map operations are significantly slower for DVD/CD maps than for maps on a hard drive.

To speed up mapping operations, you may want to copy some maps from the CD/DVD to your hard drive. Begin by identifying the five-digit FIPS code for the county map you want to copy. With the CD/DVD in the drive, select Map List from the MARPLOT List menu. In the dialog box, all the maps are listed by name and folder; the last item in the folder column is the FIPS code. Write down the code and exit MARPLOT. With the CD/DVD in the drive, browse to the location of the desired map and copy the entire map folder to your hard drive. (The maps are in the Tiger folder inside the maps folder. They are divided by state and then organized into county folders by FIPS code.) If you copy the map to your MARPLOT folder, MARPLOT will find the map automatically when it starts up. If you place the map outside of the MARPLOT folder, use the Find New Map button and locate the .MAP file inside the map folder.

Infrequently used maps

Some users may have some maps that they use infrequently. For example, your county might have a mutual aid agreement with other counties. It would be nice to have maps for these other counties available, but since you use them only rarely, it would also be nice if they did not appear in MARPLOT until they were needed. For infrequently used maps, there is an advantage to keeping them in an alternate location: when maps are not in the MARPLOT folder, you can use the Remove button in the Map List to remove them from the list of maps. When they are removed, MARPLOT will not draw these maps, or refer to them in places such as the Search Criteria dialog box. When you want to use a map again after it has been removed, you can use Find New Map in the Map List dialog box.

If you are trying to conserve space on the disk drive on which MARPLOT is located, you might want to put the maps on an external drive or on a removable disk. However, if you are going to keep them on the same drive as MARPLOT, you should put them in the XTRAMAPS folder (within the MARPLOT folder) that was created for this purpose. (Note that there is also a file in the MARPLOT folder called XTRAMAPS.PLT. This is related to, but different from, the XTRAMAPS folder. You should not try to copy or edit this file. It contains references to all maps in use by MARPLOT that are not in the MARPLOT folder, including the maps in the XTRAMAPS folder.)

Exchanging data with other MARPLOT systems

The two basic methods of exchanging map data are copying maps/map files and using MARPLOT's import/export functions. For a step-by-step demonstration of both of these methods, see "Transferring map data" on page 126.

The simpler method is to copy entire map folders or individual map files from one system to another. In cooperation with the people with whom you are sharing map information, you may be able to set up your MARPLOT system in order to use this simple copy method. For example, suppose a state with twenty counties wants to keep a state-wide map of chemical facilities. Individual MARPLOT installations in each county are responsible for mapping the facilities for their county, and sending the data to the state. This state might design a system where a different map is used to keep the facilities for each county. Each county would plot its facilities and then send to the state the three map files containing the data: FACILITY.OBJ, FACILITY.SUM, and FACILITY.LYR. When the state receives these three files from a county, it copies them into that county's map folder. From the point of view of the state's MARPLOT system, there is still just a single FACILITY layer; it's just distributed among several maps.

In some cases, it may not be possible to transfer data simply by copying files. For example, consider the situation where the state enters data for the facilities in all counties onto a single FACILITY layer of a single map. The state sends this entire map folder to each county. The counties are supposed to correct any errors in the facilities in their area, and send only the corrected objects back to the state. In this case, each county cannot send back the entire map, since the state would have no way to combine the local parts from each county. Instead, each county would select those objects it had modified and use Export from MARPLOT's File menu to export the objects into a text file using the MIE format. Each county would send this text file to the state. The state would import each of these text files as it received them. During the import, each updated object sent from a county would replace the old object on the state's map by default (MARPLOT knows the objects correspond because their MARPLOT ID numbers are the same). In general, this method of updating is slower and more error-prone than simply copying maps or map files.

Administrating a multi-user MARPLOT system

If several people will be accessing the same map files with MARPLOT (either because they use the same computer at different times, or because you're sharing map files among different computers with a network file server), you may want to set up a multi-user system. Advantages of this type of system include:

1. You can restrict certain users from making potentially destructive map edits;
2. You can assign codes to each user to help track who adds and modifies map objects; and
3. You can give each user separate program preferences and a separate space for storing personal views, Search Collections, and map objects.

MARPLOT is installed in single-user mode by default. To change to multi-user mode, the person who is going to be the administrator of the system should choose the Administrator item from MARPLOT's File menu. After a warning, you are asked to enter the administrator password, which initially is set to be **nimda**. After entering this password and clicking OK, the system is converted to a multi-user system and you are presented with the MARPLOT Administrator dialog box.

The MARPLOT Administrator dialog box allows the administrator to add users to the system and set their passwords, permission level (edit or browse), and user codes (four-character codes that are attached to map objects when users add or modify them). The administrator can also modify his or her own password, and should do so as soon as possible. You can read more about the MARPLOT Administrator dialog box in its on-screen help topic.

When your MARPLOT system is in multi-user mode, users must log into MARPLOT with a password each time they start it (an exception is the "guest" user, which is automatically added to the system, and which has browse-level permission and no password). Only the administrator has access to the Administrator menu item, which brings up the MARPLOT Administrator dialog box again.

In multi-user mode, users with browse-level permission can only modify objects on their personal user map, which is stored in their user folder within the USERS folder along with their preferences. Other users, including the administrator, also have a personal user's map, but they can add and modify objects on other maps as well, including TIGER-derived county maps. All users must unlock layers before performing any edits.

The administrator automatically has all the other users' maps added to his or her map list. Among other things, this allows the administrator to check objects that browse-level users have created on their maps before moving them to a shared map. Any maps that the administrator adds to the system using the Find New Map button in the Map List dialog box are automatically added to the map lists of all users of the system.

Any views that are stored in the VIEWS folder within the MARPLOT folder are available for use by all users of the system. Users with edit-level permission can choose to save views into this folder to be shared with other users. Any views saved by the administrator are automatically saved into this folder and are therefore shared.

Note: Once your system has been put into multi-user mode, it can be put back into single user mode with the Stop Administration button in the MARPLOT Administrator dialog box.

Using MARPLOT maps on a network

Since MARPLOT maps can consume a good deal of disk space, installations with several computers connected via a local area network may want to share maps using a network file server. In this way, it is possible for two or more users to be working with the same map at the same time—that is, all users are drawing from the same map files, which are stored on the network file server. This situation presents no problems, so long as no user is attempting to make changes to the shared map files while other users are viewing the shared maps. When a user does make such changes, two problems are possible:

1. Either the user performing the edits or other users of the shared maps may be temporarily unable to access the map files. The editing user may get an error alert saying that the map files could not be accessed to perform the given edits. Other users may get an error alert saying that the map files are temporarily unavailable for reading/drawing because they are being edited.
2. Even if the editing user is able to make the changes without running into error alerts, the other users of the map may not see the new edits immediately. If it is important for those users to stay up to date with the edits as they are made, they can simply quit MARPLOT and restart it. This will cause all new edits to be shown when maps are drawn.

If possible, it is best to wait until you are the only one person using MARPLOT before making edits to shared maps.

Creating new maps

Most MARPLOT users will never need to create a new map. Generally, you will have one or more base maps, such as the U.S. county maps derived from TIGER data. Then you may have one or more maps, each of which is associated with a database program that shares information with MARPLOT. In all of these cases, the map folders are provided for you; you do not need to create them. If you need to add data to these maps (most commonly, you will be adding to the maps associated with database programs), you can add to the existing layers, or create your own layers on the existing maps.

Some users, however, may want to create new maps. If you are creating a map based on a large amount of geographical information from some other data source, you will want to automate the map creation process using MARPLOT Import/Export (MIE) files (see the MARPLOT Technical Documentation). There may be cases, however, when you want to create a new "blank" map, and manually add objects to it in MARPLOT.

Because creating maps in this way is not common, MARPLOT does not provide a special function for it, such as a New button in the Map List dialog box. However, there is a trick you can use to create new "blank" maps. When you insert a picture object (see "Using picture objects" on page 116), you are given the option of using the picture as the first object on a new map. The idea is that the picture might represent a new base map upon which you want to place other objects. The trick for making a "blank" map is to create any picture in a painting or drawing program, insert the picture, choose the option to create a new map, and then delete the picture object from that map, leaving yourself with a new map with no objects on it. You can then rename the map as you like using the Map List dialog box.

Creating custom maps from other sources

MARPLOT maps are created in a two-step procedure. First, the source data (which includes latitude/longitude information) is translated into a text file in the MARPLOT Import/Export (MIE) format. Then this text file is converted into some number of MARPLOT binary map files (files ending with .LYR, .SUM and .OBJ) using the Import item in MARPLOT's File menu.

The two steps of this procedure can be carried out by hand, or can be automated using MARPLOT's IAC messages.

If you want to write your own translator, you will need the MARPLOT Technical Documentation, which describes the MIE format in detail. The complexity of the programming involved in creating such a translator varies depending on the complexity of the source data.

7

Troubleshooting

Often, when you encounter difficulties while running MARPLOT, it will alert you of the problem. At other times, you may encounter a problem and not know how to solve it. Below are some of these cases. For more MARPLOT information, check the MARPLOT Web site at http://response.restoration.noaa.gov/marplot.

MARPLOT is taking too long to draw my map or to perform some other operation.

You can interrupt most MARPLOT operations by pressing the escape (ESC) key. If your layer scale ranges are not set appropriately, you may find that MARPLOT is taking too long to draw because it is drawing too much detail at zoomed-out scales. If you find that you are pressing ESC too often, you should change the layer scale ranges using the Layer List dialog box.

I want to make a change to an object, but MARPLOT won't let me.

To make a change to any object, that object's layer must be unlocked using the Layer List dialog box. Also, if your MARPLOT system is multi-user and your system administrator has set you up with browse-level permission, you will only be able to make changes to objects on your personal user's map.

When I save a view, the small image that MARPLOT uses to represent the view looks like a black rectangle, not like what I saved.

When MARPLOT "shrinks" the image of your saved view, patterns in the image may become more dense than they are in the map window. If you save a view that contains a dotted background pattern, those dots may become magnified in the shrunken image, and can in fact totally obliterate it. Thus, when saving a view you should consider first hiding layers (such as the Places layer) that contain objects that create background patterns in the map window.

MARPLOT does not display the maps/layers I have. I get a blank window or a window that only shows some of my maps/layers.

Remember that what you see in the map window depends upon the area you are looking at, the current scale (layers can be set to show only at certain scales), the order of the layers (layers can draw over one another), and the maps that are currently in use. If you are not seeing what you expect, consider each factor.

Here are some suggestions:

- Choose the correct view using the Go to View item in the View menu. If the desired view is not in the view list, click on the Map List button and then click the Go to Map button to see an entire map.
- Select the Layer List item in the List menu. Check to see if the layers you want are in Hide mode, or if they are in Range mode and their scale settings have them hidden at the current scale.
- In the Layer List, when the alphabetical box is not checked, you can see the layers in their top-to-bottom order. Higher layers can draw over lower layers. Use the Move button to change the order.
- Select the Map List item in the List menu to see a list of the available maps. If the desired map is not listed, use the Find New Map button to locate it (or ask your system administrator to install the map for you). Maps may be unavailable because the disks they are on are not currently in the drive. Finally, a map may be available but not in use, in which case you can simply put it in use using the Map List dialog box.

I'm searching for "E Maple St" in the Search dialog box, but MARPLOT can't find it.

Don't use directional prefixes in the Search dialog box. In this case, you should just type "maple" and click Search.

A while ago I saved a view of a certain area of my map. When I return to the view, it shows the right area, but the contents look different than when I saved it.

When you save a view, MARPLOT remembers the area you were looking at and what it looked like when it was saved. However, if you save a view with certain layers shown and return to the view at a time when different layers are shown, the view may look different. Similarly, it is possible that an object that used to be in the view has since been deleted, or that new objects have been added. If you are bothered by the discrepancy between the small saved image of the view and its current state, you can always delete the old view and save it again with its new look.

Someone used the Administrator menu item and now MARPLOT asks me to login with a password every time I run it. I want to go back to a single-user system without passwords.

There are two ways to return to single-user mode. First, if you know the administrator's password (see "Administrating a multi-user MARPLOT system" on page 150), use that to login to MARPLOT. Then choose the Administrator menu item and click the Stop Administration button in the MARPLOT Administrator dialog box. Another method is to quit MARPLOT, find the USERS folder within the MARPLOT folder, and rename it USERSX. Subsequent uses of MARPLOT will not require passwords.

One or more of my map files seems to be messed up. I can see certain objects on the screen but can't click on them, I don't see objects that I know are supposed to be there, or I get error messages when MARPLOT is drawing the maps.

Under certain unusual circumstances (perhaps after a computer crash), it is possible for MARPLOT's map files to become corrupted. The best way to avoid problems with corrupted files is to keep regular backups of your map files. It is sometimes possible to fix corrupted files by using the Compact Maps item in the File menu. In the process of compacting the maps, this function reorganizes the map data, and this reorganization can correct certain errors. However, corrupted map files are not common, so you should consider other possible reasons for your problem before trying Compact Maps.

A

Appendix: MARPLOT Symbols

Numbers in parentheses represent the symbol's ASCII value in the MARPLOT font.

Places		
 School (51)	 Church (52)	 Federal building (52)
 Hospital (54)	 Fallout shelter (56)	 Village (57)
 Historical site (58)	 Archaeological site (59)	 Lighthouse (61)
 Pier (62)	 Platform (63)	 Wildlife refuge (64)

Chemistry		
 Chemical interest (66)	 Chemical placard (67)	 Chemical sample (68)
 Infectious subst. (69)	 Acetylene torch (70)	 Above-ground tank (71)
 Chemical drum (72)	 Chemical storage (73)	 Gas cylinders (74)
 Corrosive (75)	 Explosive (76)	 Flammable (77)
 Oxidizer (78)	 Poison (79)	 Radioactive hazard (80)

Fire Department		
 Fire dept. access (81)	 Sprinkler connection (82)	 Standpipe conn. (83)
Fire pump (84)	 Fire escape (85)	 Fire extinguisher (86)
 Fire hydrant (87)		

Monitoring Stations		
 Monitoring station (209)	 Tidal station (89)	 Weather station (90)

Recreation Sites		
 Camping (91)	 Diving area (92)	 National park (93)
 Park (94)	 Rec. beach (95)	 Rec. fishing (96)
 Sport fishing (97)		

Industry		
 Aquaculture (98)	 Subsistence fishing (99)	 Factory (100)
 Logging (101)	 Mine/quarry (102)	 Nuclear power (103)
 Pipeline (104)	 Recreational fishing (105)	

Sensitive biological resources		
 Coral/hardbottom reef (111)	 Mangroves (112)	 Submerged veg. (113)
 Rare plant (114)	 Fish (115)	 Nursery area (116)
 Gastropod (117)	 Crab (118)	 Lobster (119)
 Bivalve (120)	 Scallop (121)	 Shrimp (122)
 Squid/octopus (123)	 Alligator/crocodile (124)	 Turtle (125)
 Other reptile/amphibian (126)	 Gull/tern (128)	 Alcid/pelagic bird (129)
 Raptor (130)	 Shorebird (131)	 Wading bird (132)
 Waterfowl (133)	 Bear (134)	 Deer (135)
 Dolphin/porpoise (136)	 Manatee (137)	 Sea otter (138)
 Seal/sea lion (139)	 Small mammal (140)	 Whale (141)
 Diving bird (142)		

Water/marine		
 Underwater outfall (151)	 Surface outfall (152)	 Water intake (153)
 Water supply (154)	 Drain (156)	 Sewer (157)
Storm drain (158)	 Sump (159)	 Channel buoy (161)
Channel buoy (162)	Harbor buoy (163)	Harbor buoy (164)

Water/marine, Continued		
 mooring buoy (165)	 Anchorage (166)	 Marina (167)
 Boat launch/ramp (168)	 Hoist (169)	 Boom (171)
 Exposed wreck (172)	 Rock awash (173)	 Sunken wreck (174)
 Precautionary area (175)		

Communications		
 Radio communication (183)	 Satellite ground station (184)	 Telephone (185)

Transportation, services and vehicles		
 Bridge (186)	 Gas (187)	 Police (188)
 Access (189)	 Helicopter (190)	 Fire truck (191)
 Ambulance (192)	 Heavy equipment (193)	 Crane (194)
 Boat trailer (195)	 Trailer (196)	 Tractor trailer (197)
 Rail tanker (198)	 Skimmer (199)	 Ferry (200)
 USCG boat (201)	 Medium vessel (202)	 Small vessel (203)
 Container ship (204)	 Tanker (205)	Barge (206)
 Airport (207)	 Railroad crossing (208)	 State highway (210)
 Interstate (211)		

Incident Command System (ICS) facilities					
	Incident command post (226)		Incident base (227)		Camp (228)
	Staging area (229)				

CAMEO symbols	
	ALOHA source point (177)
	ALOHA threat at point (209)
	Environmentally sensitive area, lower priority (178)
	Environmentally sensitive area, medium priority (179)
	Environmentally sensitive area, highest priority (180)
	Less than 1 hour breakthrough time (214)
	1 - 3 hours breakthrough time (213)
	More than 3 hours breakthrough time (215)

Miscellaneous					
	Polyline layer (33)		Polygon layer (34)		OSRO (176)
	High voltage (181)		Handicapped (182)		

Logos

 Environmental Protection Agency (41)

 National Oceanic and Atmospheric Administration (42)

 U.S. Coast Guard (43)

 Genwest Systems (44)

 MARPLOT (45)

Shapes

 Place point (212)

 Pixel (217)

 Dot (218)

 Circle (219)

 Filled circle (220)

 Cross (221)

 Triangle (222)

 Filled triangle (223)

 Square (224)

 Filled square (225)

Alphabet

A	(230)	B	(231)	C	(232)	D	(233)
E	(234)	F	(235)	G	(236)	H	(237)
I	(238)	J	(239)	K	(240)	L	(241)
M	(242)	N	(243)	O	(244)	P	(245)
Q	(246)	R	(247)	S	(248)	T	(249)
U	(250)	V	(251)	W	(252)	X	(253)
Y	(254)	Z	(255)				

Glossary

Administrator

MARPLOT can run in either single-user or multi-user mode. In multi-user mode, one person is designated as the administrator. The administrator has the capability to give other users access to the system by assigning each user a password and permission level.

Focus Point

The small, flashing, target-shaped icon that marks the location of the most recent point of interest on the map. Every time you click on the map with the arrow tool, the Focus Point moves to the location of your click. The Focus Point also changes in response to other operations, such as when you show an object from the Search Collection on the map. The latitude/longitude coordinates of the Focus Point are shown in the upper-left corner of the map window.

Layer

A category of objects. Objects are organized into layers so that you can operate on only certain objects at a given time. For instance, you might want to search for an object named Walden Pond only on your Water layer. Or you might want to hide your Roads layer at a scale when the number of roads becomes so great that the map becomes cluttered.

A given layer can contain objects of different types. For instance, you might have both point and polygon objects on a Facilities layer. The layers are drawn in a certain order, allowing you to put certain layers "above" others on the map. You can use the Layer List dialog box to examine and modify the settings of your layers.

Map

A map is a folder that contains the objects for a certain geographical area. A map folder is often located in the same folder as the MARPLOT application program, but can be located anywhere on your computer. A map often covers the area of a single county, but maps can be much smaller or much larger than that. You can have any number of maps. It is common for the geographical areas covered by two different maps to overlap. If you use MARPLOT to view an area that intersects with more than one map, all maps in the displayed area are drawn simultaneously on the screen.

All of the maps that MARPLOT is aware of are always present, and there is no need to close one map before opening another to view it. However, it is possible to put a map out of use so that it is not drawn on the screen. Use the Map List dialog box to examine the list of maps.

A map folder contains a number of layer files. A layer file contains the objects for the given layer on the given map.

Marked Point

The pink, target-shaped icon that marks a location of interest to you. You can set and use the Marked Point with the Marked Point submenu in the View menu, or the Vertex submenu in the Objects menu.

Object

An entity on a map. MARPLOT maps are composed entirely of collections of objects. A typical map contains thousands of objects, distributed among several layers. An object is always on a certain layer and a certain map. Each object has a number of attributes that you can examine and change, such as its name or color. Some attributes, such as fill pattern, are only present in certain types of objects.

There are seven types of objects: point (symbol) objects mark the location of a point with a symbol or dot; rectangle objects and circle objects mark rectangular and circular areas; polyline objects, which are sequences of connected line segments, represent features such as roads and rivers; polygon objects represent bounded features such as water bodies and parks; text label objects are used to label maps with text; and picture objects are like rectangle objects that are filled not with a simple pattern but with the contents of a picture image.

Scale

The ratio of the size of a map to the size of the area it represents. For example, a scale of 1:50000 means one inch on the map is equal to 50,000 inches in the real world. MARPLOT can also display scales in terms of units (e.g., "1 inch = 3.25 miles") or in terms of the distance represented by the width and height of the map window.

Note on scale terminology: As you zoom into the map, the scale becomes larger. As you zoom out, the scale becomes smaller.

Search Collection

The list of objects resulting from the most recent search operation, or from copying the selected objects to the Search Collection.

Segment

Polyline and polygon objects are comprised of connected line segments. Each segment can have a number of attributes, such as the range of addresses contained in a certain segment of a road. When a polyline or polygon object is selected, MARPLOT draws a red dot at each of its vertices. This makes it possible for you to see how the object is broken into segments. If the Focus Point lies along one of the object's segments, you can use the Segment Settings menu item in the Objects menu to see the attributes of that segment. Similarly, when you find an address range from the Search Collection dialog box, and show it on the map, MARPLOT indicates the found segment by centering the Focus Point along it.

In objects derived from TIGER/Line data, some segments are called shape segments. This means that the segment "inherits" its attribute settings from a neighboring segment.

Sharing

The process of MARPLOT communicating with other applications. Usually these applications are databases that store information about MARPLOT objects.

User's Map

Each MARPLOT user has a private map on which he or she can perform any sort of scratch work by creating and editing MARPLOT objects. In a single-user system, the user's map is simply named "User's Map." In a multi-user system, each user has his or her own user's map, with names such as "John's Map" and "Mary's Map." Users who have browse-level permission can only add or modify objects on their user's map.

Vertex

A point defining the shape of a polyline or polygon object. Each vertex of a polyline or polygon is highlighted with a red dot when the object is selected.

View

The area of the world that is displayed in the map window. You can change the view by using one of MARPLOT's several navigation tools. You can save a view to be returned to at a later time by giving it a name. You can pick a view to be the entry view, which MARPLOT will go to automatically when it is started. You can pick a view to be a reference view, which is displayed in an inset on the map window, and which shows the current view in reference to a larger area.

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