Enhancements in PC-MAPPER 05

An Introduction to PC-MAPPER 05 and Supplement to the PC-GPS Reference Guide

Corvallis Microtechnology, Inc.
413 SW Jefferson Ave.
Corvallis, OR 97333
www.cmtinc.com

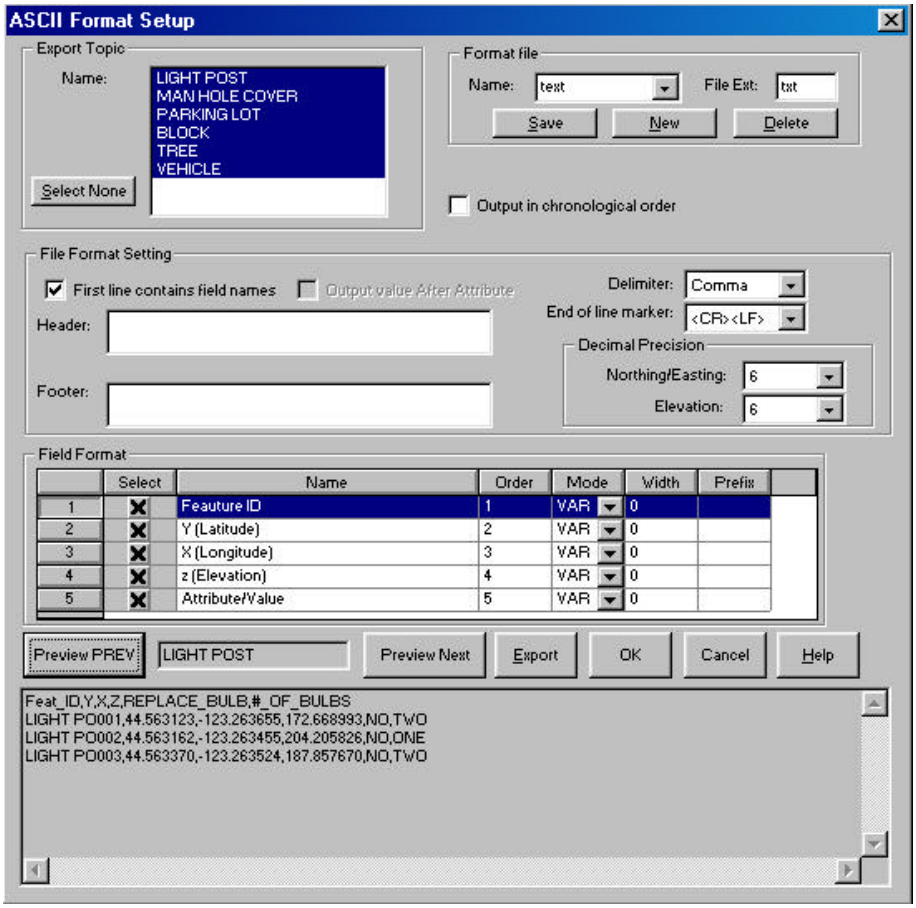
TABLE OF CONTENTS

Section I - Modifications under the File Menu

1.1 ASCII Export of Multiple Topics

The PC-MAPPER ASCII export has been enhanced to export multiple topics as well as export of Line/Area topics. Please refer to the PC-GPS Reference Guide or online manual for general information on configuring the ASCII export dialog window.

To export ASCII data for multiple topics, open the desired file and then choose the ASCII format under the Data Source Box and choose File/Export. The ASCII export dialog window is displayed:



All spatial data topics are displayed in the upper left corner of the screen and are available for selection. Use the **Select All** button to quickly select all listed topics. Alternatively, use your mouse to select individual topics for export.

Use the **Export Preview** button to see a preview of what the ASCII file will look like when exported. Only one topic at a time is displayed in the preview area. The first topic in the list will be used for the export preview and the topic name is listed in the gray box above the

preview area. Use the **Preview PREV** and the **Preview NEXT** buttons to view the export preview for all other topics.

A new option is available under the File Format Setting frame. You can now export your data with the Attribute and Value contained in each row. This option is listed as: **Output Attribute Names also**. This option is only available when the option **First line contains field names** is not checked. In previous versions, the only option was to export with or without a “header” row that describes each column.

The following examples illustrate the different options.

A) Sample output with option: **“First line contains field names”:**

```
Feat_ID,Y,X,Z,REPLACE_BULB,#_OF_BULBS
LIGHT PO001,4934452.236361,479068.110049,70.939624,NO,TWO
LIGHT PO002,4934457.847605,479090.340236,67.831227,NO,ONE
LIGHT PO003,4934475.261013,479075.833786,72.141497,NO,TWO
```

B) Sample output with option: **“Output Attribute Names Also”:**

```
LIGHT PO001,4934452.236361,479068.110049,70.939624,REPLACE_BULB,NO,#_OF_BULBS,TWO
LIGHT PO002,4934457.847605,479090.340236,67.831227,REPLACE_BULB,NO,#_OF_BULBS,ONE
LIGHT PO003,4934475.261013,479075.833786,72.141497,REPLACE_BULB,NO,#_OF_BULBS,TWO
```

C) Sample output with no selected options:

```
LIGHT PO001,4934452.236361,479068.110049,70.939624,NO,TWO
LIGHT PO002,4934457.847605,479090.340236,67.831227,NO,ONE
LIGHT PO003,4934475.261013,479075.833786,72.141497,NO,TWO
```

Line and area topics may also be exported. The ASCII output file will contain a record for each node found in the line or area feature.

There is also a general option in the ASCII export dialog for **Output in Chronological Order**. This function is useful if features in a topic have been re-ordered for layering and display purposes using the **Move Feature** option. When the box **Output in Chronological Order** is checked, all features in the specified topic will be listed in the output ASCII file in the correct chronological order (order in which they were collected) regardless of the order of features in the Sheet View. Please note that this option will only affect the output ASCII file and will not change the order of features in your Map View.

1.2 Load Background Map

PC-MAPPER 05 comes with the ability to display background maps (in .MAP or .FMP format). The background map can be used as a backdrop for your current job to help identify locations of features to be mapped and to easily see which features have been mapped in previous jobs.

The background map to be loaded must be in .FMP or .MAP format and, once loaded, will be treated as an image or a “picture” of the map in the background. Features contained in the background map may not be selected to obtain feature properties. However, you may specify the layering order and turn on/off specific topics for viewing that are contained in the background map.

Steps for loading a background map:

2. Load the background map by choosing **File/Background Map/Load Background Map**. After choosing this option, the **Open File** dialog is displayed.
2. Select the .MAP or .FMP file of interest in select it by double-clicking on it or choosing the **Open** button.
2. The Job will be loaded and displayed in the background along with your current map. After the background map is loaded, it may be toggled ON and OFF using the **File/Background Map/Background Map OFF** option (the word OFF will change to ON automatically if the Background Map has already been toggled off.

Topics listed in the background maps may be viewed, reordered and turned ON/OFF under the **View/Background Map Option** menu. When this option is selected a floating Topic View panel will be displayed on top of the original Topic View. This floating panel is titled **Background Map Topics** and may be moved, resized or closed. Only one background map at a time may be loaded and used with your current PC-MAPPER Map.

Section 2 - Modifications under the Map Menu

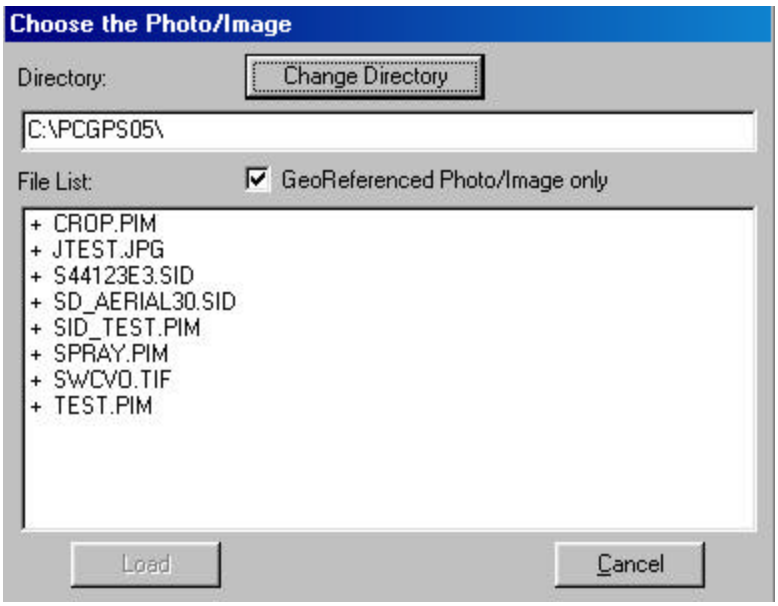
2.1 Load Image - Added option to work with PIM format

PC-MAPPER now lets you load georeferenced imagery in the native CMT Windows CE format: PIM format. The PIM format is recommended for use in PC-MAPPER also, because it is a compressed image format and the image resolution at lower scales is also improved (the image will appear sharper and more resolute when zoomed out).

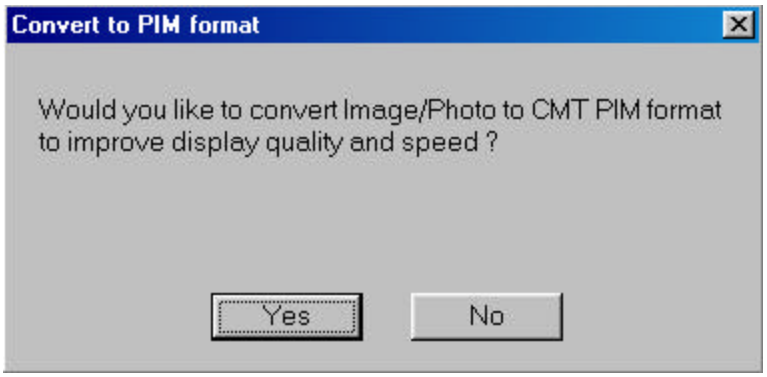
Working with the PIM format will reduce time spent by the software on redrawing the image after a change in scale (by zooming in or zooming out) as well as when panning the image.

The PIM format is also the format used by the CMT Windows CE software products (such as Field CE GIS). Clipping of this image may be done later to reduce the size of the image to be sent to the Windows CE mobile device. See information on Utilities/Geo-Image/Crop and Convert to PIM.

To convert your georeferenced image into the CMT PIM format, select the **Load Registered Photo/Image** button. The following dialog is displayed:



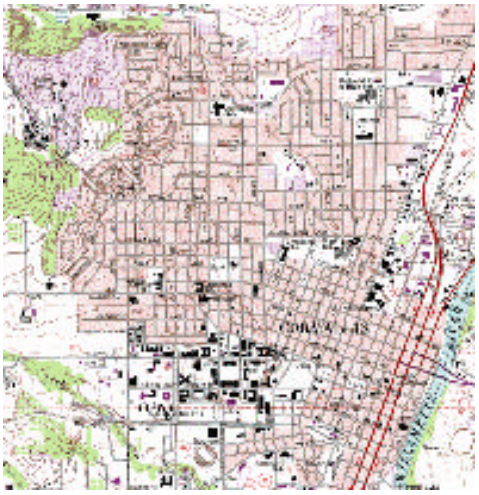
Select the image you want to load and click on the **Load** button. The following dialog is displayed:



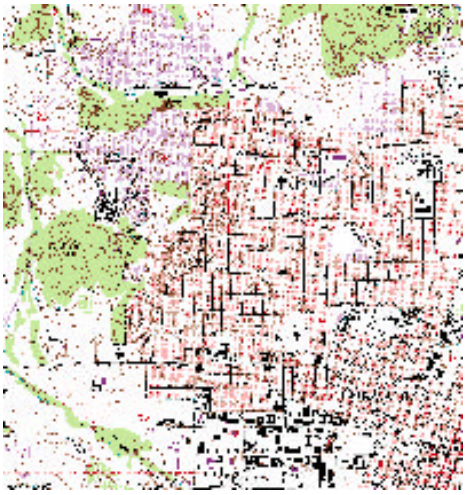
Select **YES** if you want to convert your image to the PIM format and have it loaded in your Map. Choose **NO** if you wish to load your image in its native format in your Map without conversion. After choosing **YES** or **NO**, you will be prompted for the coordinate system information of the image to be loaded.

More information about the different options for this dialog prompt can be found under the View/Configure/Geo-Image option.

The following example illustrates the difference in resolution between PIM converted images and non-converted images:



PIM FORMAT



NON PIM FORMAT

2.2 Load Image – GeoJPEG Support

In addition to supporting the **CMT PIM format**, **Geotiff format** and also **MRSID® format** imagery, PC-MAPPER now also supports the **GeoJPEG format** imagery.

To load a GeoJPEG into the Map View, follow the steps for loading a normal Geotiff image using the **Map/Load Photo/Image** menu option or use the button found on the toolbar.

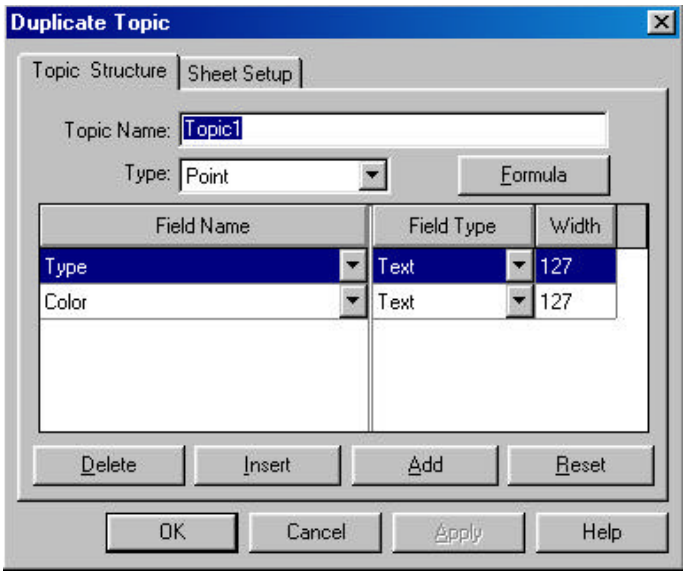
As described in steps for loading a Geotiff format file, an accompanying ASCII text file called a “world file” is also required when loading GeoJPEG imagery. In the case of the Geotiff format the world file carries the extension *.TFW. For GeoJPEG images, the world file has the extension *.JGW.

Any world files must be located in the same folder as the image for proper loading of this georeferenced imagery into PC-MAPPER.

Section 3 – Modifications under the Topic Menu

3.1 Duplicating Topics

Use the Topic/Duplicate Topic function to duplicate the active topic and its attribute structure. The duplicate topic menu is presented:



This dialog window is the same as the Topic/New Topic function. Rename “Topic1” to the desired topic name then click **OK** to save this new topic. For more information, search the Online Manual for Topic/New Topic.

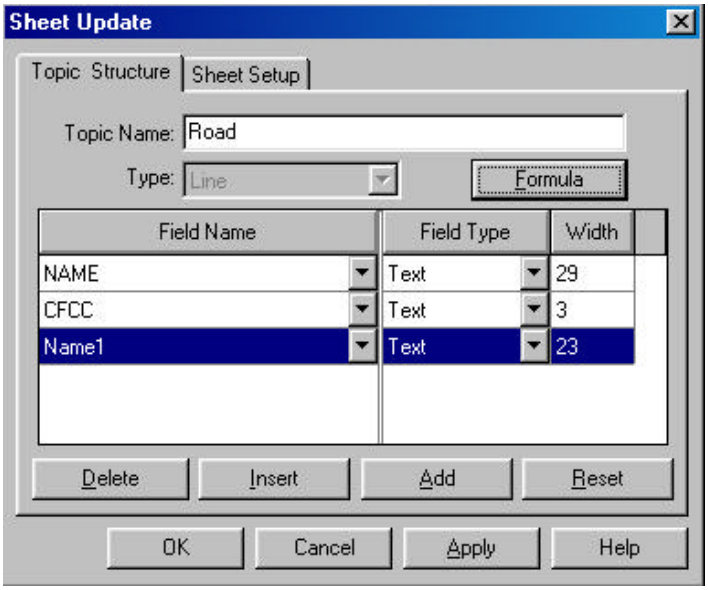
Section 4 - Modifications under the Sheet Menu

4.1 Formulae for user-defined attributes

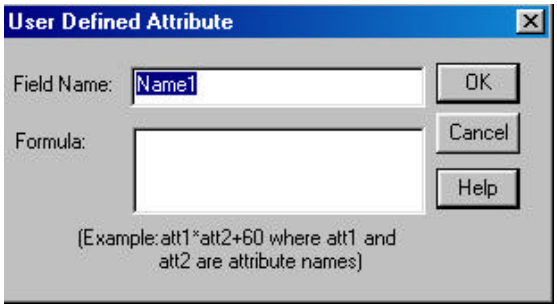
The Sheet Setup function has been enhanced to allow for greater flexibility in defining formulas in the user-defined attributes.

You may define an attribute in terms of one or more of the other attributes for the same Feature Topic by using a formula. For example, suppose you have "Area (Acres)" and "Yield per Acre" in the Attribute list and added a new Attribute "Total Yield" defined by "Area Acres x Yield per Acre". In the Sheet View, each record in the "Total Yield" column will show the product of the corresponding acreage and yield per acre values.

To access this function, select the topic of interest and then choose Sheet/Setup. The following dialog is displayed:



Click on the **Add** button to add your own Field Name (attribute). The Name1 attribute appears by default. Click on the **Formula** button to create a formula for this attribute. The following dialog is displayed:



Rename the Field Name to a meaningful name. Use the following terminology and operands to define your formula for this user-defined attribute (in terms of the other attributes for the same Topic). There is no limitation on the number of attributes and operands you can use to define the formula.

Information for user-defined formulae:

a. The valid arithmetic operators are: +, -, /, * . For the exponent operand, use ^. For example, "DIAMTER^2" represents the square of the value of the attribute named DIAMETER. To obtain the square-root of the value of the attribute named AREA, enter "AREA^(1/2)".

b. Constants are allowed in the expression, such as "DIAMETER+20" where DIAMETER is an existing attribute.

c. Use parentheses to specify the order of operations. For example, (LENGTH1+LENGTH2)^2 means add the value of LENGTH1 to the value of LENGTH2 then square the sum.

d. Conditional operators may be used such as: **>, >=, =, <, <=, < >, AND, OR, NOT**.

e. For conditional expressions use '?' to indicate IF and use ':' to indicate ELSE.

For example: LENGTH > WIDTH ? COSTA + 10 : COSTB -20

This formula can be read as: If LENGTH is greater than WIDTH, then add 10 to the value of the attribute COSTA and show it as the value of the new attribute. Otherwise, show the value of COSTB less 20.

Similarly, you may use the following formula to define an attribute that displays the text "KEEP" or "CULL" based on the value of the attribute named DIAMETER:

DIAMETER > = 6 ? "KEEP" : "CULL"

f. Formulas can be saved for later recalculation or reference.

g. PC-MAPPER allows flexibility in the field “type” and in “type” conversion between results and operands.

For example:

If the attribute containing the formula is defined to be of "TEXT" type, the numeric result computed from another "INTEGER" type attribute will be stored as "TEXT" type.

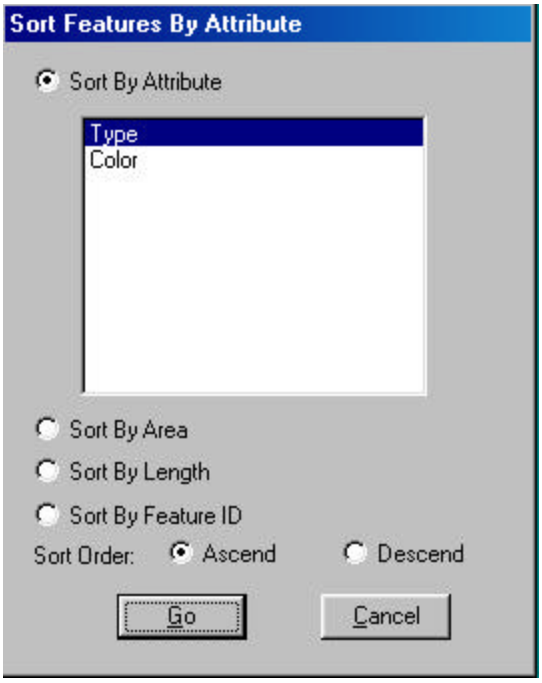
Please Note: If you have an attribute named HEIGHT and you want to multiply it by a constant, please enter "*" explicitly. For example, enter "2*HEIGHT" to double the height value. If you enter "2HEIGHT" the program will try to search for the attribute named "2HEIGHT".

4.2 Sorting Features in a Topic

The Sheet/Sort Features function works to allow you to sort your data presented in the Sheet View in ascending or descending order alphabetically or numerically.

There are also options for sorting by some of the key pre-defined attributes such as: Area, Length or Feature ID.

Select the Sheet/Sort Features function to be presented with the following dialog window:



Steps:

1. Select the Topic you want to sort.
2. Select **Sheet/Sort Features**.
3. In the dialog window, choose the desired **Sort By…** option.
4. Choose the **Sort Order** (either Ascending or Descending order).
5. Click on the **Go** button to sort the features by the specified parameters or select **Cancel** to abort the sorting session.

Section 5 - Modifications under the CoGo Menu

5.1 CoGo Menu

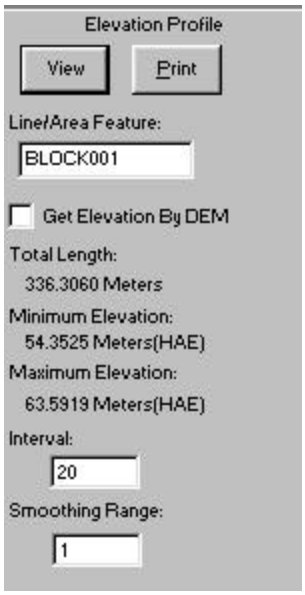
Refer to PC-GPS Reference Guide for information on each CoGo function.

Section 6 - Modifications under the Utilities Menu

6.1 Elevation Profiling

In the Utilities menu, select DEM/CDM/Profile/Contour then select **Elevation Profile.** Select an existing line or area feature for a cross-sectional view of the changes in elevation over the line feature or perimeter of the area boundary.

After selecting Elevation Profile, the following dialog panel is displayed at the right of the screen:



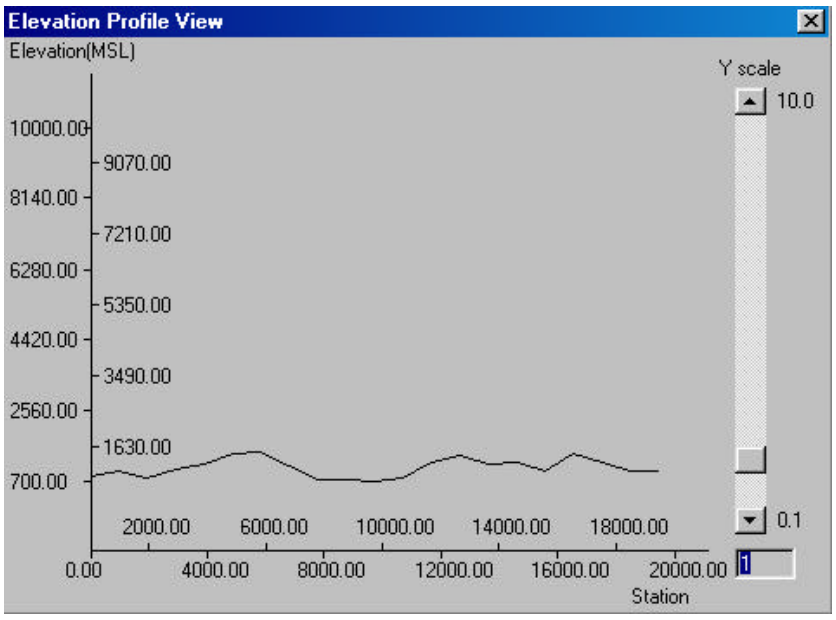
Steps:

1. Select the line or area feature in your Map View by clicking on it. The FeatureID of the line or area boundary is displayed in the Line/Area Feature box.
2. Place a checkmark in the **Get Elevation By DEM** option if you want to use the CMT CDM (DEM) data to create your elevation profile. If this option is selected, then the minimum and maximum elevations along the line or area boundary will be obtained from the CMT CDM (DEM) data.

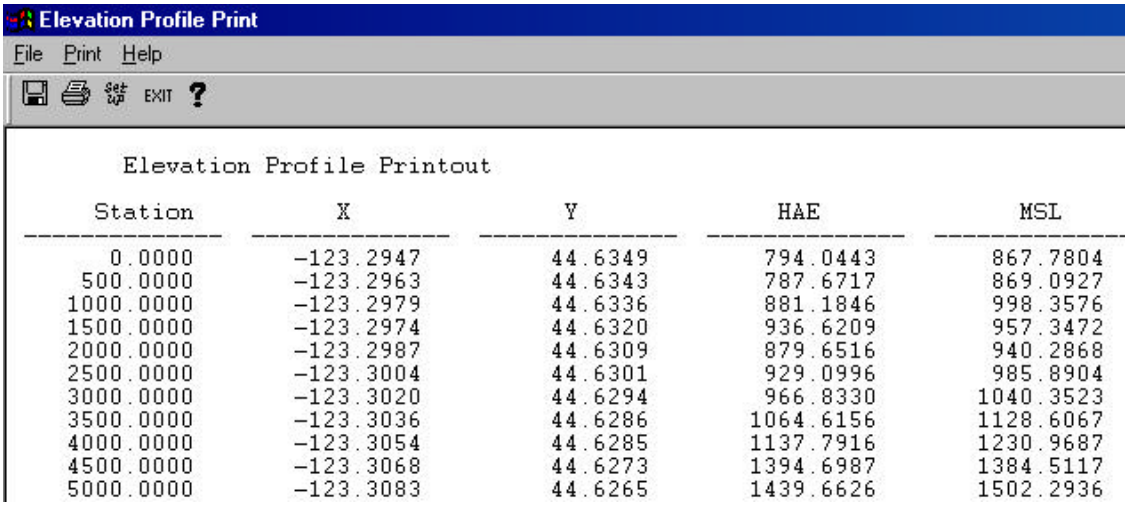
   Alternatively, if the line or area feature was created by GPS data, then you can uncheck this option to use the elevation data captured by the GPS.
3. Specify a desired **interval** and **smoothing range**. The interval specifies how often an elevation reading is taken over the course of the line or area boundary (x-axis). Larger intervals will result in fewer listings in the Elevation Profile Printout. The Smoothing Range option lets you specify a range over which the elevation values will be averaged

before being displayed at each interval. In general, using a smoothing range results in a smoother elevation profile.

4. Click on the **View** button to view a visual cross-section of the elevation change over the course of the selected feature. An example is presented:



5. Alternatively, click on the **Print** button to get a textual listing of the interval, x, y and z data (in both HAE and MSL). A sample text printout for the previous example is displayed:



Elevation Profile Printout

Station	X	Y	HAE	MSL
0.0000	-123.2947	44.6349	794.0443	867.7804
500.0000	-123.2963	44.6343	787.6717	869.0927
1000.0000	-123.2979	44.6336	881.1846	998.3576
1500.0000	-123.2974	44.6320	936.6209	957.3472
2000.0000	-123.2987	44.6309	879.6516	940.2868
2500.0000	-123.3004	44.6301	929.0996	985.8904
3000.0000	-123.3020	44.6294	966.8330	1040.3523
3500.0000	-123.3036	44.6286	1064.6156	1128.6067
4000.0000	-123.3054	44.6285	1137.7916	1230.9687
4500.0000	-123.3068	44.6273	1394.6987	1384.5117
5000.0000	-123.3083	44.6265	1439.6626	1502.2936

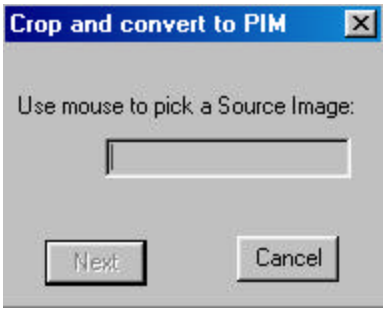
You may send the printout to a printer or print directly to a file.

Use the  button to close the Elevation Profile panel.

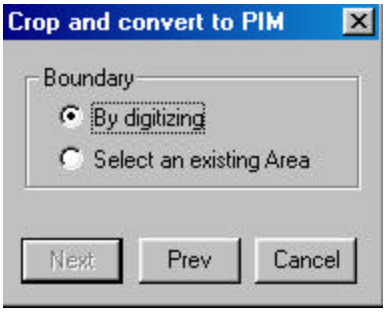
6.2 Converting and Cropping Georeferenced Images to PIM Format

Use the **Utilities/Geo-Image/Convert to PIM** function to convert your georeferenced image into the CMT PIM format. The PIM format is advantageous because it is a compressed image format and therefore requires less memory. As a result, the PIM images will take up less memory on your computer and will also provide faster update rates when zooming and panning. Also, this format uses bi-linear sampling to improve image resolution at large scales (when zoomed out).

The **Utilities/Geo-Image/ Crop and convert to PIM** function allows you to crop portions of your georeferenced image to be used in your Map. This function was previously only available to crop images to be sent to the mobile device, but now you can define the image boundary for use in PC-MAPPER as well. After selecting this function, the following dialog is displayed:



At this point, your mouse will turn into a crosshairs to allow you to select the target image. After selecting the image, the following dialog is displayed:

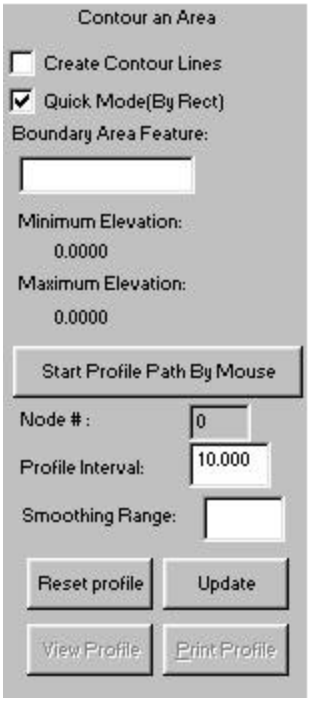


Select the method for defining the boundary: either by digitizing the area or by selecting an existing area to use as the border. Once the selection is made, proceed to either digitize or click on an existing area. Then, hit **NEXT**.

The final step is to name and save the newly cropped image. Choose a name for the image and choose **Save**. The image is then ready to be loaded into a map using the normal procedure for loading an image in .PIM format. Following is an example of a cropped image with an unusual boundary:

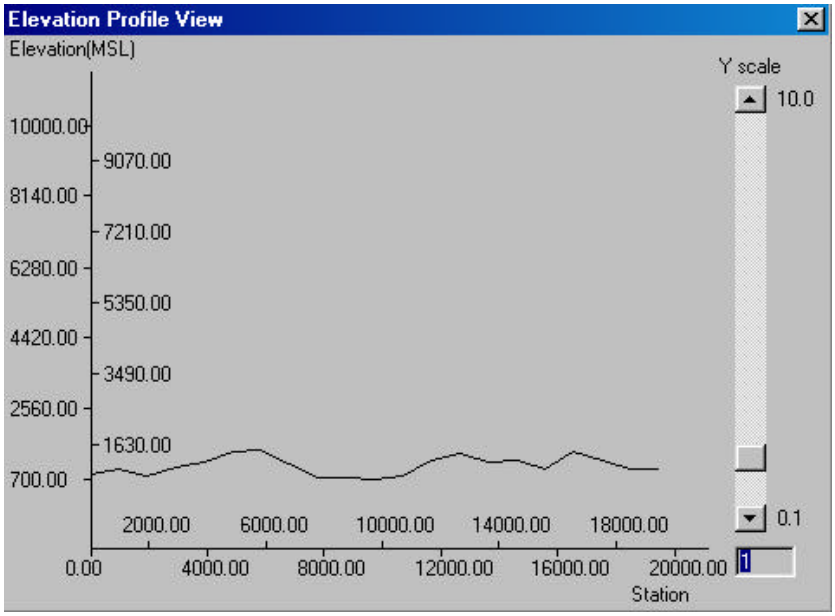
6.3 Creating Contour Lines for Area Features

PC-MAPPER will allow you to create contour lines for selected area features by using any point, line or area data found within the selected area. In the Utilities menu, select DEM/CDM/Profile/Contour then select the **Utilities/ Contour Area** option. The following dialog panel is displayed:

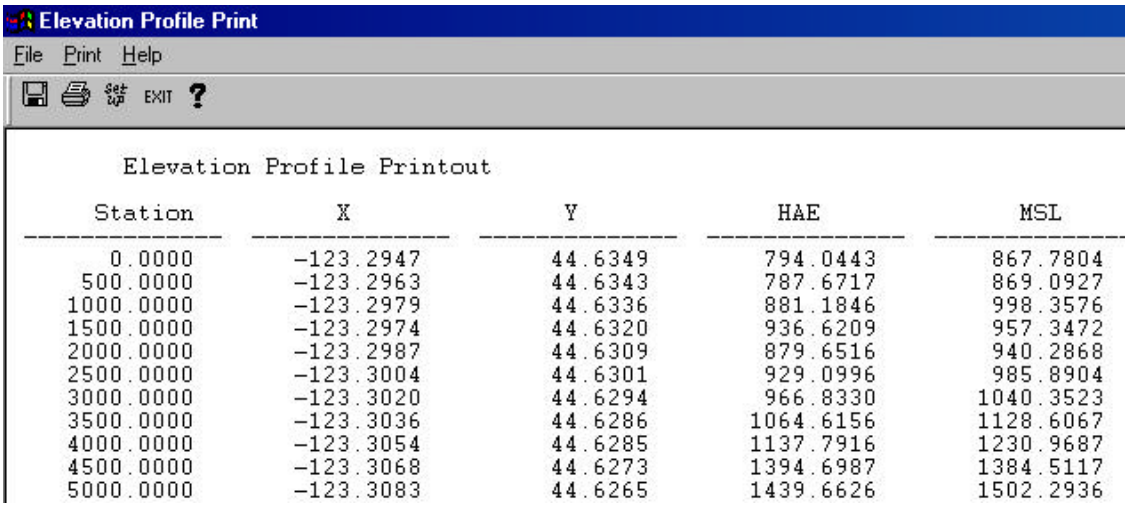


Steps:

1. Select the area feature in your Map View by clicking on it. The FeatureID of the area is displayed in the **Boundary Area Feature** box.
2. The selected area feature is highlighted to indicate the extent of the area to be contoured; the elevations of its boundary are not used for contouring. Any enclosed point, line or area features will participate in generating the contour lines in the next step. The minimum and maximum elevations are calculated and displayed for your reference. By default, the **Quick Mode (By Rect)** checkbox is marked and the contour lines will be generated for a rectangular area covering the selected area. Uncheck this box if you do not wish to have the contour lines extend outside the selected area. With this option unchecked, it will take longer to generate the contour lines.
3. Check the box for **Create Contour Lines** to create the contour lines for the area feature. The contour lines are shown in the Map View and a new line topic called: Contour_Line is generated which contains the newly created contour lines. Alternatively, you may check the box for **Create Contour Lines** prior to selecting the area feature to be contoured. You may add or remove data to be used for contour line generation by turning on/off topics that fall within the specified area. Use the **Update** button to regenerate the contour lines.
4. An elevation profile can be created by using your mouse to draw a transect line across the area feature. Click on the **Start Profile Path By Mouse** button to activate this feature. As soon as this feature is activated, your mouse pointer will turn into a crosshairs. Digitize a transect line across the contoured area feature. Right-click to end the transect or click on the **Stop the Profile** button. Click on the "Reset Profile" button to erase the transect and start over.
5. To see the Elevation Profile, click on the **View Profile** button. A sample is shown:



6. Alternatively, click on the **Print Profile** button to get a textual listing of the interval, x, y and z data (in both HAE and MSL). A sample text printout for the previous example is displayed:



Elevation Profile Printout

Station	X	Y	HAE	MSL
0.0000	-123.2947	44.6349	794.0443	867.7804
500.0000	-123.2963	44.6343	787.6717	869.0927
1000.0000	-123.2979	44.6336	881.1846	998.3576
1500.0000	-123.2974	44.6320	936.6209	957.3472
2000.0000	-123.2987	44.6309	879.6516	940.2868
2500.0000	-123.3004	44.6301	929.0996	985.8904
3000.0000	-123.3020	44.6294	966.8330	1040.3523
3500.0000	-123.3036	44.6286	1064.6156	1128.6067
4000.0000	-123.3054	44.6285	1137.7916	1230.9687
4500.0000	-123.3068	44.6273	1394.6987	1384.5117
5000.0000	-123.3083	44.6265	1439.6626	1502.2936

You may send the printout to a printer or print directly to a file.

Use the  button to close the Contour Area panel.

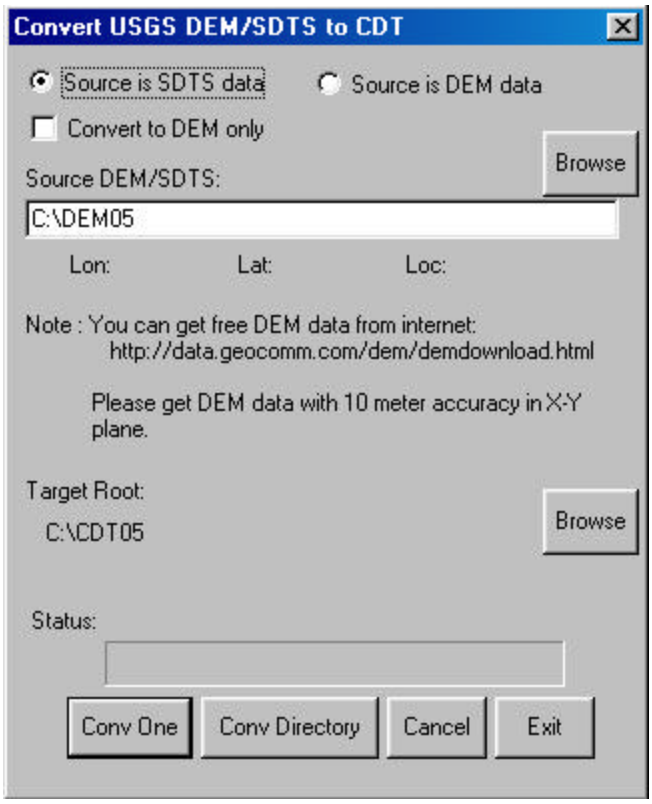
6.4 Convert DEM to CDT

You may obtain 10-meter accuracy (in x-y plane) DEM data free from the Internet in SDTS format or DEM format (just search for DEM data in your state).

This data must be converted to CMT CDT format for use in PC-MAPPER. The first step is to convert to the intermediary CDT format. The ultimate goal of this process is to convert the CDT format (in another step) to the CMT CDM format. These files are to be used by PC-MAPPER for elevation profiles and to show three-dimensional shaded relief on your maps. They are also used for generation of contour lines in your maps.

Upon installation, PC-MAPPER will create a folder called ‘DEM05’ on your local drive. We recommend using this folder to store any downloaded DEM data. PC-MAPPER can convert all DEM files found in this folder and correctly name and place them in the correct CDT folder or subdirectory.

In the **Utilities** menu, select **DEM/CDM/Profile/Contour** and then select **Convert DEM/SDTS to CDT**. The following dialog is displayed:



This function will convert the DEM and SDTS ASCII files to the CMT .cdt format. The DEM and SDTS ASCII files must be for the UTM coordinate system. The resultant CMT .cdt binary files are still in the UTM coordinate system. They will be automatically placed into the proper pre-defined folders. For example, the DEM file for the first quad (A1) of N44 W123 would be converted to: CDT05\W123\N44\A1.CDT.

Steps:

1. Upon installation, PC-MAPPER will create a folder called 'CDT05' on your local drive that will act as the target folder. With this naming convention, PC-MAPPER will automatically create subfolders in the target directory, which help to break up the DEM data into their respective locations.
2. Select the data source. Choose **DEM data** if the files you are working with have the extension *.DEM. Select the **SDTS data** option if you have DEM data in the SDTS format. The DEM data should be of 10-meter accuracy in the x-y plane and should be in the UTM coordinate system. PC-MAPPER will notify you if your DEM data is not in the UTM coordinate system.
3. Click on the **Browse** button to locate the sources of the DEM/SDTS data files. We recommend using a source directory named: 'dem05' for your original unconverted DEM files. Alternatively, you may skip browsing for individual files if all of the DEM files you wish to convert are in the same directory. If this is the case, you can click on the **Conv**

Directory button to begin conversion of all found DEM files in the source directory to the CDT format. Make sure you have specified the ‘cdt05’ folder as the target directory.

4. To convert one file, locate the file you want to convert and click **Open**. The filename will appear in the “Source DEM/SDTS” line. Click on the **Conv One** button to convert this single file DEM file to the source directory in the CDT format
5. After all files have been converted to the CDT format, click on the **Exit** button to end the conversion session.

6.5 Convert CDT to CDM

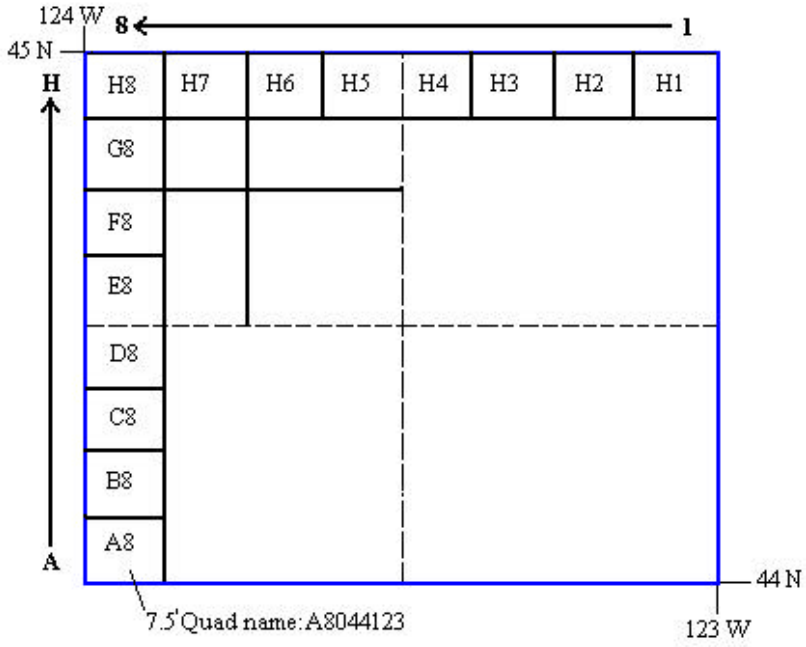
In the Utilities menu, select DEM/CDM/Profile/Contour, and then select **Convert CDT to CDM**. This will convert the CMT .cdt files to the CMT .cdm files.

The resultant .cdm files contain data in the LLA coordinate system. Each .cdm file corresponds to a "2.5 minute by 2.5 minute" range. The .cdm files are automatically placed into pre-defined folders.

For example, the .cdm files for latitude N44-N435 and Longitude W123-W124 are placed in the folder: cdm05\W123\N44. With the required .cdm files placed in the appropriate folders, you will be able to see the DEM shading on the displayed basemap when you select **View/Basemap/Basemap Options** then mark the checkbox for **Contour Regions**.

Steps:

1. Upon installation, a folder called ‘CDM05’ will be created on your local drive as the target folder. A sample .CDM file is included in this folder for use with the CMT tutorial files: cmttut.ftr or swcvo.fmp. With this naming convention, PC-MAPPER will automatically create subfolders in the target directory, which help to break up the DEM data into their respective locations.
2. Specify the range from the lower-left corner to the upper-right corner in LAT-LON.
   Mark the **Only One CDM file** box and specify the quad designation in the **Loc** field if you just need the one specified CDM file. Each CDM file covers one 7.5 minutes by 7.5 minutes quad, represented by A1, A2,..., H8. A sample grid is displayed that shows the naming convention:



For example, if you select the latitude range (44,45) and longitude range (-124,-123), and select the quad (Loc) E3, then you would get C:\CDM05\W123\N44\B44123E3.CDM. The program would get all the CDT files for this quad. Because of the coordinate conversion from UTM to LLA, more than one quad of CDT files may need to be converted to obtain B44123E3.CDM. (The main .cdt file is \CDT05\W123\N44\E3.CDT, while some of the neighboring files may also be used for the peripheral areas.)

3. Specify the CDT Root directory (default: CDT05) and CDM root directory (default: CDM05).
4. Click on the **Convert** button to begin conversion of all the .cdt files that are needed for the specified range.
5. After the conversion, click on the **Exit** button to end the conversion session.

Naming Convention for the CDM Files

The 64 *.cdm files for the 1x1 degree range "latitude N44-N45 and Longitude W123-W124" are named as follows:

B44123A1.CDM
B44123A2.CDM
...
B44123A8.CDM

B44123B1.CDM
B44123B2.CDM

...
B44123B8.CDM
...
...
...
B44123H1.CDM
...
B44123H8.CDM

Naming convention for the first character:
A: north latitude, East Longitude
B: north latitude, West Longitude
C: south latitude, West Longitude
D: south latitude, East Longitude

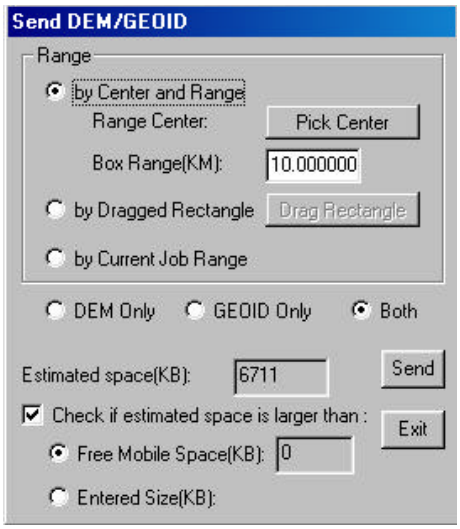
Naming convention for the last two characters:
A1 : Lat : 44-44.125
Lon : 123-123.125
A2 : Lat : 44-44.125
Lon : 123.125-123.250
...
B1 : Lat : 44.125-44.250
Lon : 123-123.125
B2 : Lat : 44.125-44.250
Lon : 123.125-123.250

6.6 Utilities/Mobile Device Interface/Conversion/CE DEM

Use this function to search the DEMs (CDM's in fact) and the GEOID files in the specified range and transfer them to your mobile device. Since the DEM files are in a pre-defined folder, they may be difficult to find. This function is designed to help you locate and transfer the proper DEM files to your mobile device.

Please note: The Geoid files are for use with Field CE Survey and the option to transfer the Geoid files is only available in PC-MAPPER and CMT Survey.

The following dialog is presented when this option is selected:

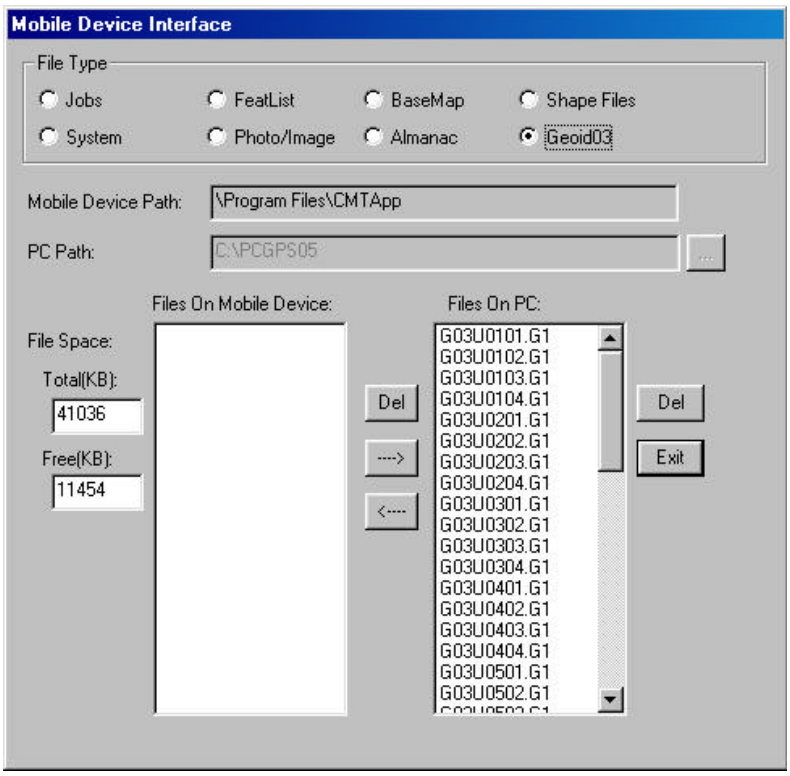


6.7 The Geoid 2003 Model (g03u*.g1)

PC-MAPPER now contains the Geoid 2003 data for accurate elevation conversion from HAE to MSL.

PC-MAPPER and CMT-Survey allow specific Geoid 2003 files to be transferred to Field CE Survey for increased accuracy in elevation readings/conversions.

Select Utilities/Mobile Device Interface and then click on the Geoid 2003 option for individual selection of the Geoid 2003 files to be sent to your Mobile Device. The following dialog is shown:



6.8 Utilities/DEM/CDM/Profile/Contour/Contour Topic

Please refer to the PC-MAPPER Reference Guide for information on how to use this function to send data in a specific topic to the Contour/Volume module.

6.9 Utilities/Create Deed Call

Use the Utilities/Create Deed Call function to input calls from a legal metes and bounds description, title deed or other text description of a parcel of land to map out the boundary and create an area feature in your map.

This function has two purposes:

a) create the text description of bearings and distances for a specified boundary or
b) create an area feature in your map by entering in the description of bearings and distances into the Calls menu.

6.9.1 Creating calls from an existing area feature

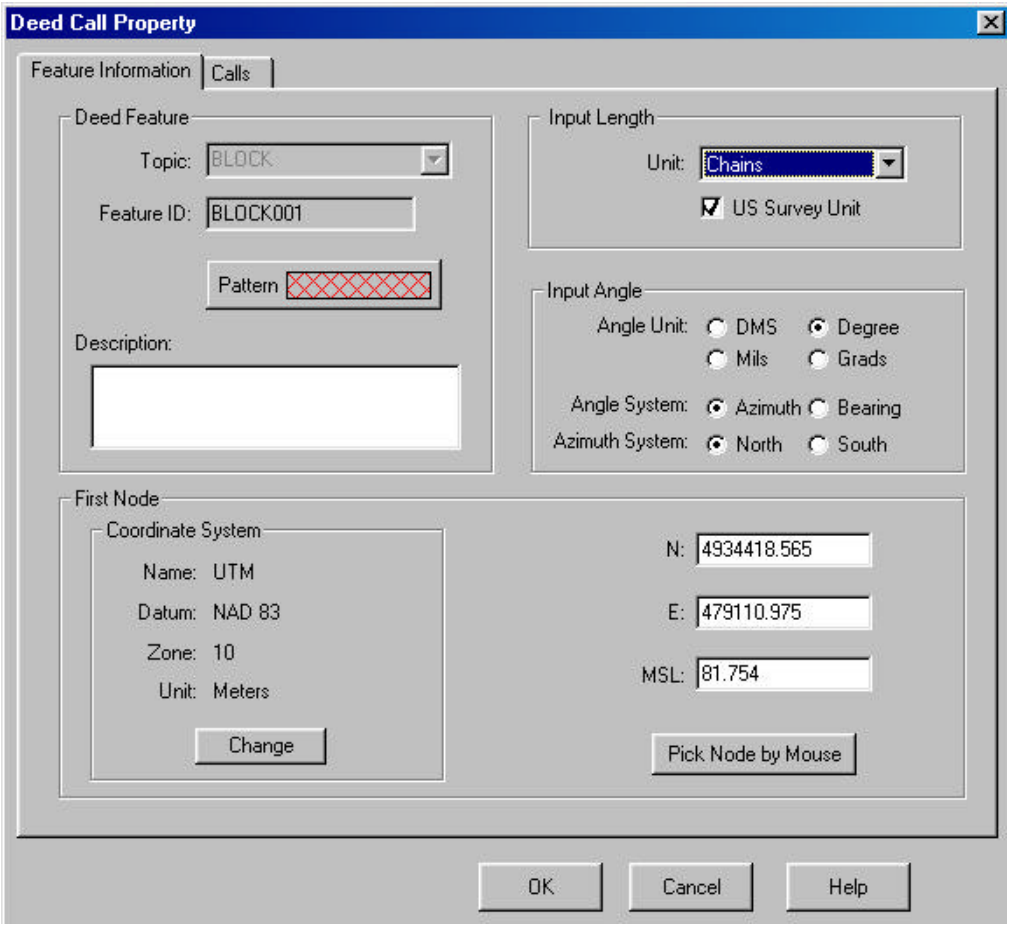
This section describes the procedure for selecting an existing area feature in your map and creating the bearing and distance calls for each segment of the area.

Please Note: This function only works for area features.

The following example illustrates creating the text description of bearings and distances for the “Block001” feature found in the CMT tutorial file: cmttut.ftr.

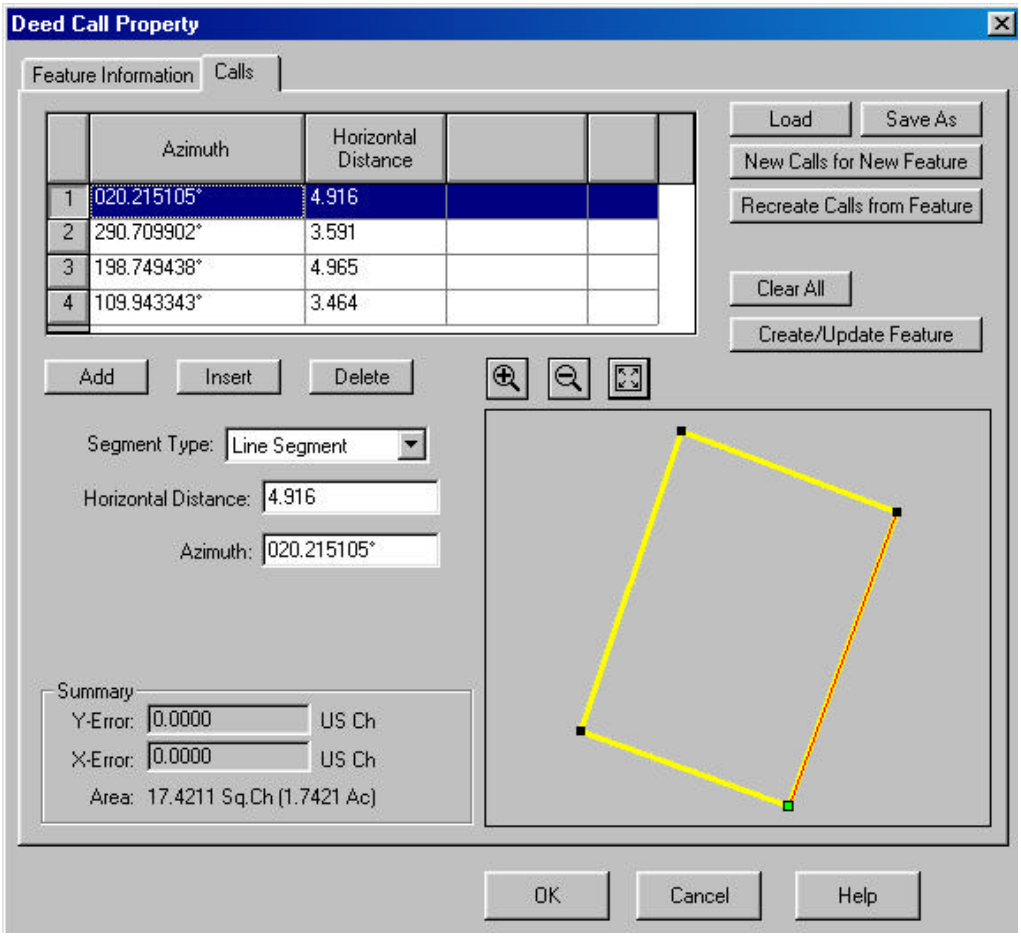
Steps:

1. In the map view, click on the area feature you wish to create calls for (i.e. the Block001 area feature) so it is highlighted.
2. Select Utilities/Create Deed Call. The following dialog window is displayed:

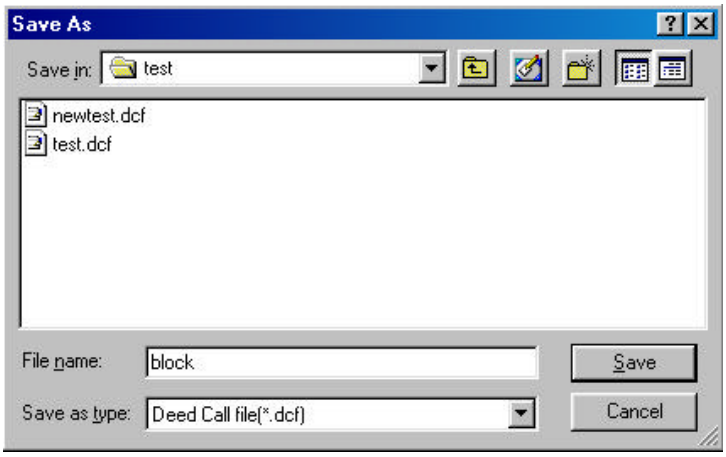


3. The Feature Information screen is presented. The topic, FeatureID and the area pattern are displayed for your reference.
4. A text description may be entered in the **Description** box (up to 64 characters) to help describe the deed call feature.
5. The coordinate system may be changed to view the coordinates of the first node of the selected feature for confirmation. This is an optional step.
6. Specify the units of measurement for the length information using the pull-down menu. If using U.S. units of measurement, be sure to check the box **US Survey Unit**. This option is selected for you by default.

7. Specify the desired Angle method for the calls. Available choices for **Angle System** include: Azimuth or Bearing. If Azimuth is chosen, also specify the Azimuth System: North or South. Also specify the **Angle Unit** with choices of: DMS, Decimal Degrees (Degree), Mils or Grads.
8. Next, click on the **Calls** tab to see the call descriptions. The following dialog is shown:



9. The calls are displayed in the upper left corner table for your reference. A graphical representation of the calls is displayed in the lower right corner. A brief summary of the total area and any **errors** (i.e. differences between the starting and ending points) in the X and Y directions are shown for your reference. Edits may be made to the calls by clicking on the row number of the line segment and then editing the data in the **Horizontal Distance** and **Azimuth/Bearing** fields. Additionally, segment type may be changed from a straight line (line segment) to a curve by using the pull-down menu. The currently selected segment is highlighted in red in the graphical view. Zoom tools are available for your convenience to zoom in or zoom out to portions of the graphical view.
10. If no further changes are desired, then click on the **Save As** button to call up the following dialog:



11. Specify the folder and the file name in which to save the deed calls. The file extension will be ***.DCF (Deed call file)**. This is an ASCII text file, which may be opened and viewed with any text editor. Click on the **Save** button to save the file. The following is a sample output of the DCF file for the above 'Block' example:

```
[Location]
File: Cmttut.ftr
Topic: BLOCK
Feature_ID: BLOCK001
Desciption: This is a block.

[Coordinate_System]
// Coordinate System and the First Node
Coordinate_System: UTM
Datum: NAD_83
Zone: 10
First_Node_Unit: Meters
First_Node_Loc: 479110.975 4934418.565 81.754

[Record_Unit]
Length_Unit: US_Chains
Angle_Unit: Deg
Angle_System: Azimuth
Azimuth_System: North

[Records]
020.240608° 4.879
290.133602° 3.523
199.646803° 4.842
110.736373° 3.473

[Summary]
X-Error: 0.0000 US Chains
Y-Error: 0.0000 US Chains
Area: 17.0026 Sq.Ch (1.7003 Ac)
```

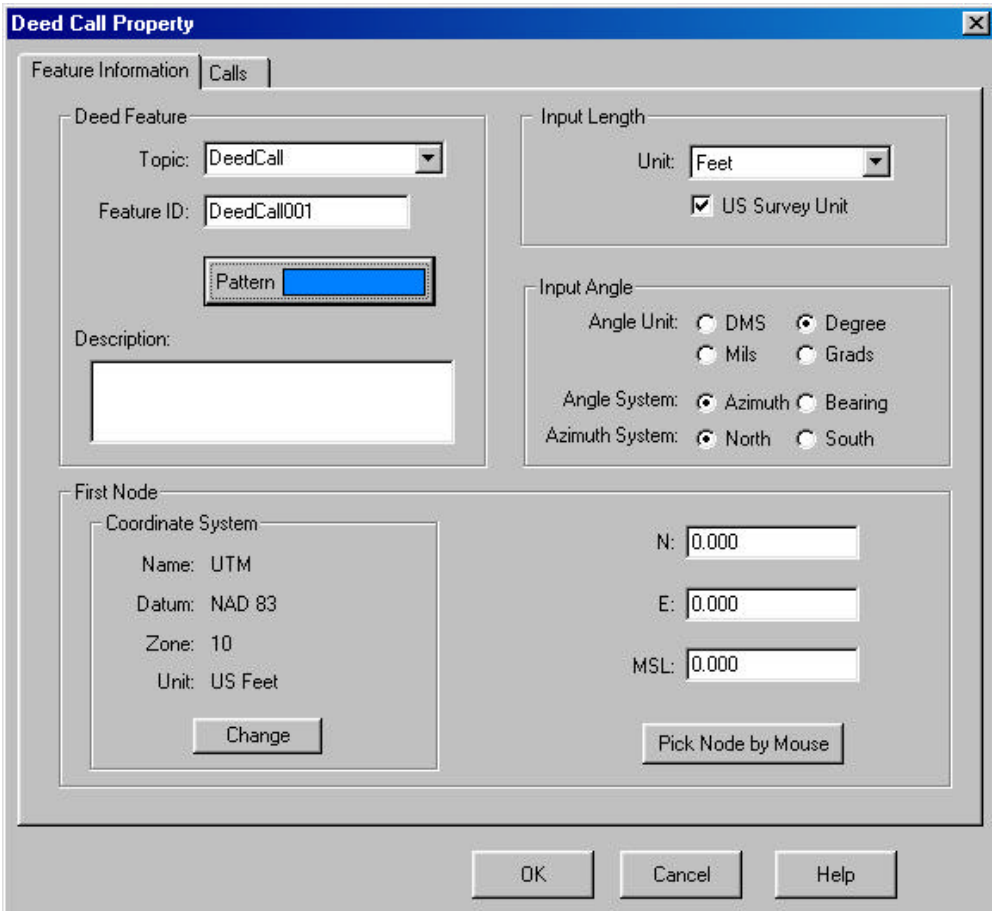
12. The Records section of the text may be further edited to complete the deed call description.

6.9.2 Creating an area feature from a set of deed calls

This section describes the procedure for inputting bearing and distance calls for each segment of an area feature to create the area feature in your map view.

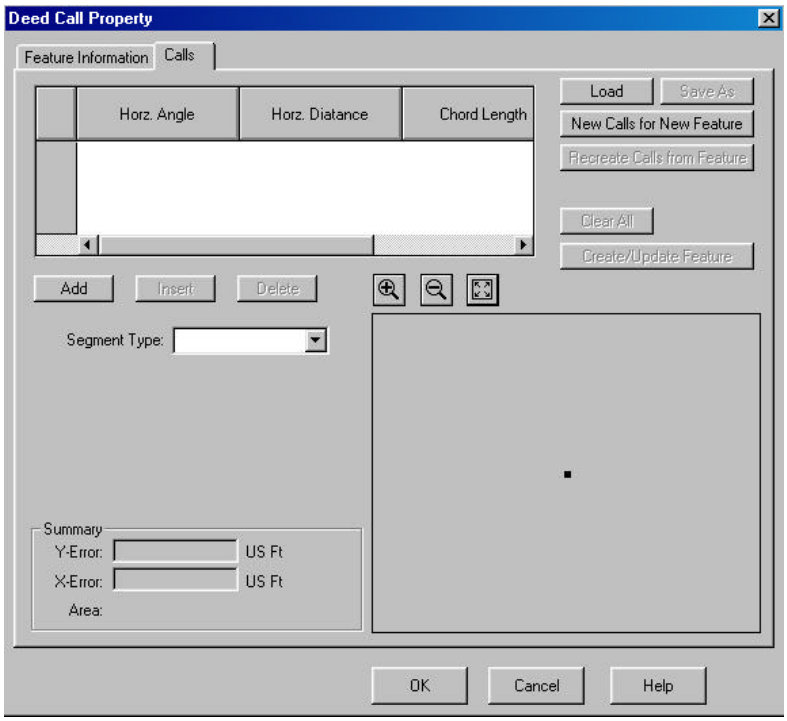
Steps:

1. In a blank or existing map file, select **Utilities/Create Deed Call**. The following dialog window is displayed:

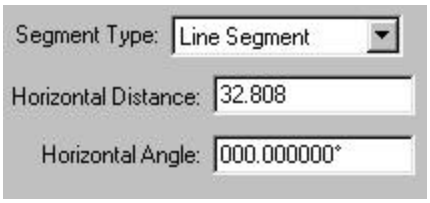


2. If you are using an existing file, select the topic that you want to create the new area feature in. If you are not using an existing file, then it is recommended to choose the 'DeedCall' topic. The FeatureID and topic will automatically be created for you upon creation of the feature.
3. Enter an optional text description (up to 64 characters) to help describe the deed call feature.

4. Choose the Coordinate System, datum and units of measurement for the first node of the call.
5. Specify the units of measurement for the input length. US Survey feet is the default selection.
6. Specify the Input Angle method: either Azimuth or Bearing and also choose between DMS, Decimal Degrees (Degree), Mils or Grads.
7. Type in the coordinates for the first node or select the location by clicking on a location in the map with your mouse. To pick a location on the map with your mouse, click on the **Pick Node by Mouse** button. After selecting this button, you will be taken to the Map View and your mouse pointer will turn into a crosshairs. Click on an existing node or point feature to select those coordinates. An existing node or point feature must be selected with your mouse (you cannot select a floating location) to establish the starting point. After selecting the point, you will be returned to the Feature Information dialog and the coordinates of the selected point will be displayed for you.
8. Once the beginning point has been established, click on the **Calls** tab to begin inputting the call information. The following screen is shown:

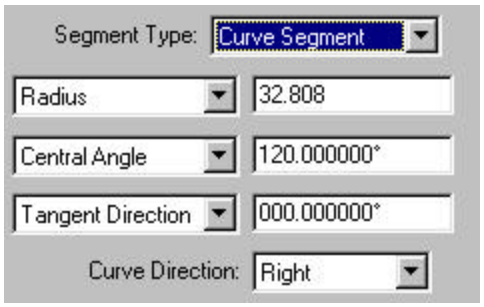


9. Click on the **Add** button to enter a new call record into the fields shown:

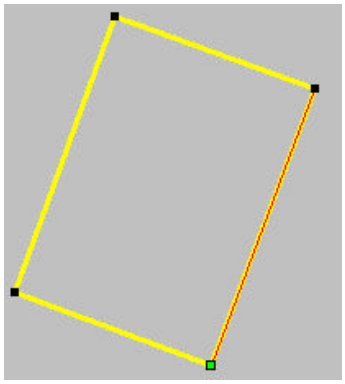


For segment type, choose between options of **line segment** for straight lines, or **curve segment** to define a curve. Type in the horizontal distance from the starting point and also specify the horizontal angle using the angle system specified (from Step 6).

For curves, specify the size and length of the curve by inputting a combination of: radius, arc length, chord length, and/or central angle. The tangent direction of the curve (right or left) should also be specified at this time along with the direction angle of the curve from the last node. Select the **continuous** option if the new section is to continue in the direction of the last defined curve or line segment.



A preview of the calls is shown in the lower right corner of the Calls dialog window:



10. After all calls have been entered, you may choose to create the deed call feature in the existing map, or you can save it for addition to a different map at a later time.

    To create the deed call feature in the existing map, click on the **Create/Update Feature** button. If the feature does not exist in the current map, it will automatically be created for you and placed in the topic specified in Step 2. Also use the **Create/Update Feature** button if any changes have been made to the deed calls. Upon clicking on this button, you will be prompted if you want to "Recreate the Area Feature?" Choose **Yes** to update and overwrite the existing feature or **No** to abort the update.

    To save the deed call feature, click on the **Save As** button. Specify the folder and the file name to save the deed calls. The file extension will be ***.DCF (Deed call file)**. This

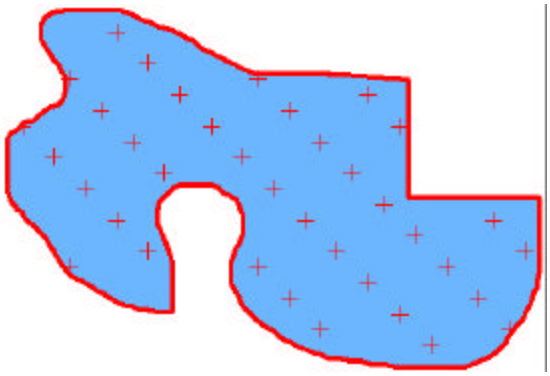
is an ASCII text file which may be opened and viewed with any text editor. Click on the **Save** button to save the file. The saved deed call feature may be accessed from different maps and loaded by clicking on the **Load** button and then selecting the desired *.DCF file.

Click on the **Clear All** button to clear all existing deed calls from the list and start a new deed call feature. Alternatively, click on the **New Calls for New Feature** button to accept changes and update/create the deed call feature and start the next deed call entry using the same specified topic (the FeatureID will automatically be incremented). If changes have been made or the deed call feature has not yet been saved or created in the map, you will be prompted to update/create the area feature or to save changes before proceeding.

6.10 Utilities/Create Cruising Grid

The **Utilities/Create Grid** function is a valuable tool for timber cruising applications or any other grid sampling application where a grid needs to be created and overlaid within a specified area feature.

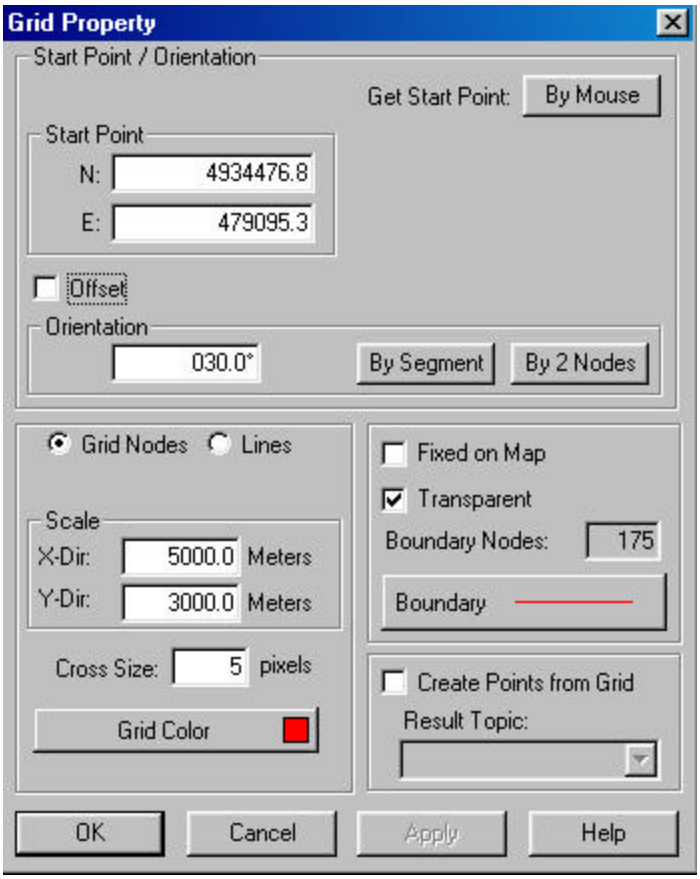
This powerful and friendly tool lets you select single or multiple area features to create your own user-defined grid at specified interval spacing for either timber cruising or other grid sampling applications. Adjust the size and color of the grid points as well as the angle of orientation for the grid. Built-in coordinate geometry lets you get the angle of orientation by clicking on any two points in the map. Now you can align your grid to roads or streams very easily. As a final step in the grid creation process, you can create point or line features on the grid for further coordinate information or to load this information to your GPS unit for navigation and guidance to the plot center points in the field.



6.10.1 Steps for creating a grid

1. Select the area feature in your map that you will be used for the grid creation so it is highlighted. Choose **Utilities/Create Grid** or click on the **Create Cruising Grid** icon found in the Forester's Toolbar . A default grid will be displayed over the selected Area. The grid is automatically created and stored in the Non-Spatial Data Topic. The

properties of the grid can be modified in the Grid Property dialog box. The Grid Property dialog is automatically displayed at the time of grid creation. The **Grid Property** dialog is shown:



2. Use the **Grid Property** dialog box to edit the parameters of your sampling grid. The Start Point box lets you view and edit the coordinates of the origin of the grid. You may specify the starting point of the grid by one of the following methods:

a) Type the correct coordinates into the Lat and Lon (or N: and E:) fields.

b) Click the **Get Start Point by Mouse** button to select the coordinate origin of the grid with your mouse in the Map View. When this option is selected, your mouse pointer will turn into a crosshairs to enable you to select the location in your map.

The starting point will be shown in the Map View as a small red triangle . Place a check mark in the **Offset** box to specify an X and Y-Offset from the starting point. The X-Offset and Y-Offset fields are used to specify the offset distance along the grid directions when the grid is to be offset from the known Start Point. For example, if you selected a known control point as the Start Point but really want the grid 30 ft to its right, then you would specify an X-Offset of 30 ft.

3. Specify the angle of orientation for the grid in the **Orientation** field. This setting controls the angle at which the grid will be displayed. Type the desired orientation directly into this field.

   Alternatively, if the orientation is not known, you may specify the grid orientation by selecting an existing line segment (such as a road or creek) by clicking on the **By Segment** button and then selecting the correct line segment in the Map View.

   Orientation may also be specified using point features or nodes when no line segment is available. To do so, select the **By 2 Nodes** button to select two point features or nodes of an area feature in your Map View. The horizontal angle between the two selected points will automatically be calculated and input for you into the Orientation field.
4. Select the **Grid Nodes** option if you wish to have the grid represented by the grid nodes (points). Select the Lines option if you wish to have the grid represented by **Grid Lines**.
5. The **Scale** field lets you set the distance between grid nodes. Type the desired distance directly into this field. Scale fields are provided for the x and y directions so you may create rectangular instead of square grids. The unit of measure can be changed using the Unit option under Map/Coordinate System.
6. Specify the **Cross Size** (in terms of pixels) by typing the desired cross size directly into this field.
7. The **Boundary Nodes** field is displayed for your reference only and displays the number of nodes that define the boundary of the grid. The **Fixed on Map** option lets you prohibit the movement of the grid shape with the mouse in the Map View. If this option is checked off, you can drag the grid in the Map View. The **Transparent** option lets you specify that the grid will have a transparent background. In this case, Features behind the grid shape will still show through. If this option is checked off, the grid background will be white and other Features will not show through.
8. Click the **Grid Color** button is used to change the pattern and color of the crosses. If Lines mode is selected, you will have the option of selecting the color for lines in both the X and Y directions.
9. You may check the **"Create points from grid"** box if you wish to have Point Features created from the grid nodes. If you have the Line mode selected, you may click the **"Create lines from grid"** check box to have Line Features created from the grid lines. Specify the Topic in which to put the point or line features.

Click the **Apply** button to apply the changes you have made or click the **OK** button to exit this dialog box.

6.11 Mobile Device Interface

6.11.1 Photo/Image

The Photo/Image option under the Mobile Device interface has been improved in PC-Mapper to provide support for the image formats *.PIM and *.SID to be easily selected and sent over to your Mobile Device from the PC and vice versa.

6.11.2 System

Previously listed as “Coordinate System” in the Mobile Device Interface dialog, the System option now includes support for the following formats:

a) User-defined coordinate systems
b) Symbol/Pattern libraries

Section 7 - Modifications under the GPS Menu

7.1 Duplicating Features in a Feature List

Features contained in a new or existing feature list may be quickly duplicated to save time. There is now a **Duplicate** button found on the Feature List editor dialog window. This function is very helpful for creation or updating feature lists for features which contain many attributes and values. The duplicate function will create an exact copy of the selected feature including the attribute and value structure.

Click on the desired feature to be duplicated and then click on the **Duplicate** button. The duplicated feature will be created underneath the existing feature and will be automatically selected for editing. All attributes and values for that feature will also be duplicated (eliminating the need to re-type them each time you add a new feature). Simply click on the feature, attributes or values to edit them and change the names, add or delete records. PC-MAPPER does not allow duplicate feature names, so the newly duplicated feature must be renamed before saving the updated feature list.

7.2 Navigation

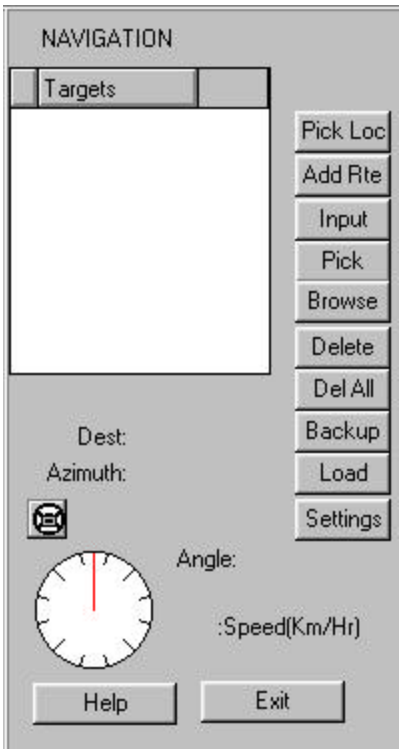
In addition to various Stakeout options, PC-MAPPER is designed for the following navigation methods:

1) Type in a set of target coordinates for navigation.
2) Select the target coordinates by clicking on a location in the Map View.
3) Select an existing feature for navigation.
4) Navigation along a route or autoroute.

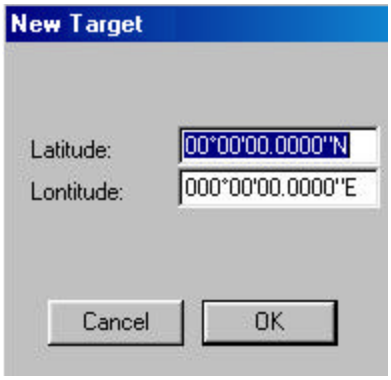
Once you have populated the Target/Route list with the desired target points or routes, simply select the desired target and let the program guide you to the specified point or along the specified route.

7.2.1 Typing in a Set of Target Coordinates for Navigation

1. From the GPS pull-down menu, select **Navigation**. The following Navigation panel is displayed:

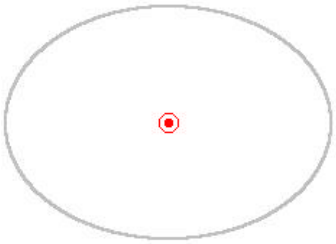


2. Click on the **Input** button and the following panel is displayed:



3. Type in the Latitude and Longitude of the target coordinates. Choose **OK** to accept the coordinates and return to the Navigation panel. The target will be displayed in the Map View along with the specified target tolerance. Use the **Setup** tool to change navigation settings (e.g. target color, marker color, trail color/length, target and path tolerance, etc.).

   You will see the target and tolerance displayed in the Map View similar to the following:

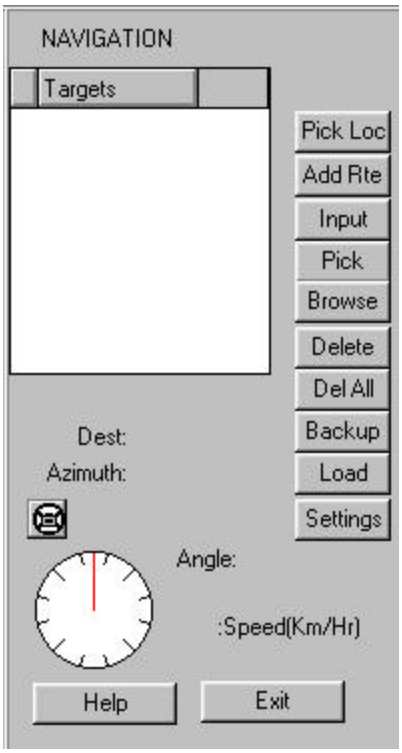


4. You may edit the target name listed under the Targets section by double-clicking on the name and then typing in the new name.
5. Begin navigating to the target.

Please note: The coordinate system shown will reflect the coordinate system chosen under the **Menu/Coordinate System** menu. For example, to navigate to a set of UTM coordinates in meters using the NAD 83 datum, set the Coordinate System to UTM, NAD 83, meters in the Coordinate System screen and then enter the UTM coordinates in Step 3 above.

7.2.2 Selecting a Target by Clicking on a Location in the Map View

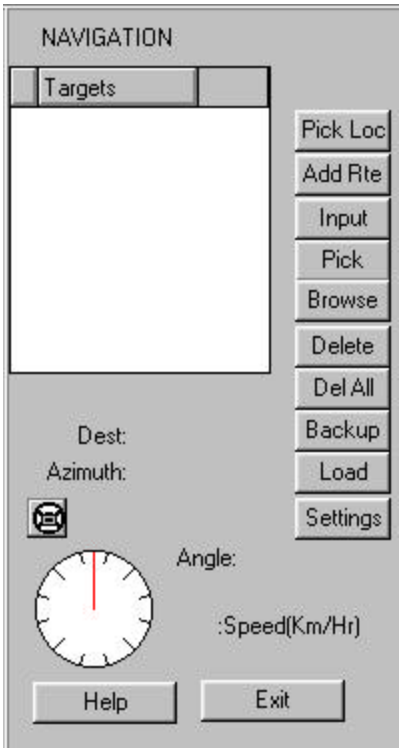
1. From the GPS pull-down menu, select **Navigation**. The following Navigation panel is displayed:



2. Click on the **Pick Loc** button. Your mouse pointer will turn into a crosshairs to allow you to click on a location in the Map View.
3. Upon clicking once in the Map View, your target location will automatically be listed under the Targets menu of the Navigation panel. The navigation target is listed as: **PickLoc**. If you are not satisfied with the target shown, the location may be chosen again by repeating step #2 until the desired target location is displayed.
4. The next location picked will overwrite the coordinates of **PickLoc**. If you wish to save the location you just picked, double-click the current name under the Target menu and enter a new name. Type in the new name and press **Enter** to accept the name. PC-MAPPER will not allow a blank name.
5. Begin navigating to the target.

7.2.3 Selecting an Existing Feature for Navigation

1. Open the file containing the desired feature for navigation. From the GPS pull-down menu, select **Navigation**. The following Navigation panel is displayed:



2. Use the **Pick** button or the **Browse** button in the Navigation panel to select the desired feature for navigation. Following are definitions for each of these buttons.

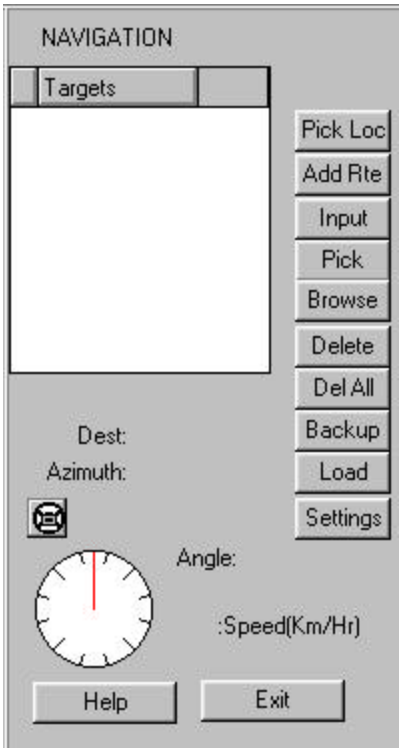
Pick: Uses the mouse pointer to select the feature in the Map View. Click on the feature once to select it as a target for navigation. Any feature may be selected regardless of the active Topic.

Browse: Uses the currently active Topic, to display a list of features found in the Topic for selection. Click on the desired FeatureID from the list and click **OK** to select it as a target. Other Topics found in the job may be selected by using the pull-down menu titled: **Select a Topic**.

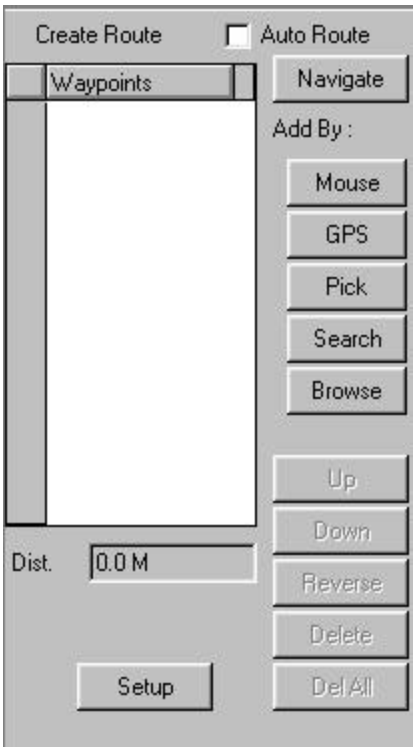
3. The selected target FeatureID will be displayed under the Targets menu of the Navigation panel. Begin navigating to the target.

7.2.4 Creating a Route for Navigation

1. From the GPS pull-down menu, select **Navigation**. The following Navigation panel is displayed:



2. Click on the **Add Rte** button to view the **Create Route** panel. The following screen is displayed:



3. Make sure the Auto Route option is not checked. Please see Section 7.2.5 for information on creating an Auto Route. Under the **Add By:** list of buttons use the **Mouse, GPS**, **Pick, Search, or Browse** buttons to add waypoints to the list under the **Waypoints** menu. These waypoints will be automatically joined together to form a route for navigation. The buttons used to add waypoints to the route are defined below:

   Mouse: Clicking on this button will turn your mouse pointer into a crosshairs to allow you to click on locations in the Map View to be added to the list as waypoints which form the route. Continue clicking locations with your mouse to add multiple points for the route. Also, when this button is selected, the option for Auto Route will change to **Snap to Node**.

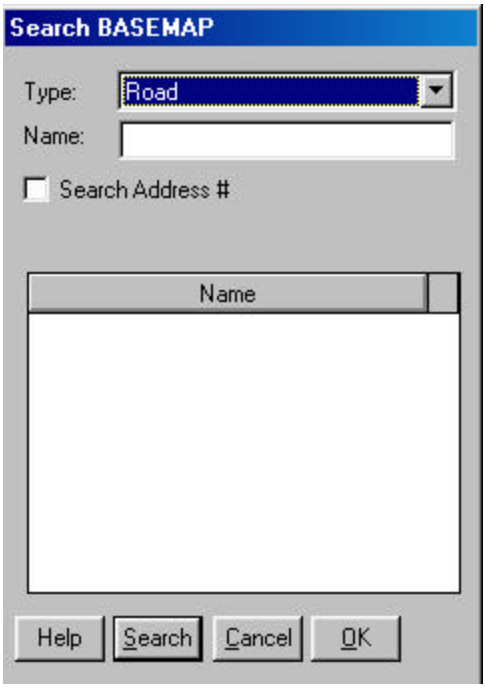
   Use the **Snap to Node** function to select locations that are part of existing features. This function can be toggled ON/OFF using the Snap to Node check box in the upper right corner of the Create Route panel. When checked (ON), the selected waypoint location will be “snapped” to the nearest node (of an existing feature). When unchecked (OFF), no “snapping” to existing nodes will occur. Therefore, you are free to click on any location in the map to select that location as a waypoint.

   When finished adding waypoints, right-click with your mouse to end the session.

GPS: Clicking on the GPS button will add a waypoint to the list using the coordinates of the current GPS position.

Pick: Uses the mouse pointer to select the desired feature in the Map View. Click on the feature once to select it as a target for navigation. For creating Routes, only point features may be selected.

Search: This function requires a CMT BaseMap to be loaded in the background of the Map View. Use the Search button to search the BaseMap for a specific feature to be added to the route as a waypoint. When this option is selected, the following panel is displayed:



Specify the type of BaseMap feature using the Type pull-down menu. Type in the name of the desired BaseMap feature in the Name box. For roads, you can type in an address # by checking the Search Address # box.

Once the search parameters have been defined, click on the **Search** button to locate the BaseMap feature. If no features are found, then no features will be listed under the Name column. If features are found, then they will be listed under the Name column. Highlight the desired feature to be used as a waypoint and click **OK** to add it to the list of waypoints in the Create Route panel. If a line or area feature is selected, then the center point of that feature will be used as the included Waypoint.

Browse: Uses the currently active Topic, to display a list of features found in the Topic for selection. Click on the desired FeatureID from the list and click **OK** to select it as a target. Other Topics found in the job may be selected

by using the pull-down menu titled: **Select a Topic**. Please note, only point features may be selected to create a route.

4. Please note that duplicate waypoint names **are** permitted. However, it is advisable not to rename a waypoint with the same name as another waypoint.

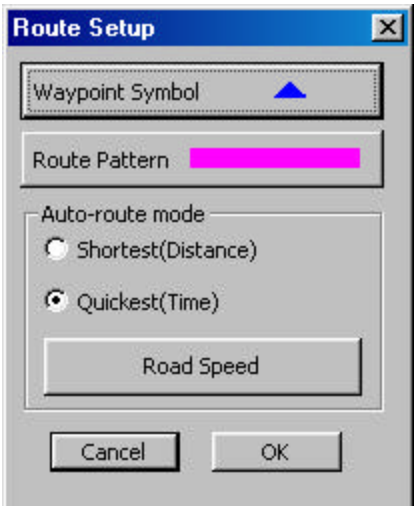
   Use the Zoom tools to zoom in or zoom out, pan and zoom fit as needed to view and select the desired waypoint locations.

   Use the **Up** and **Down** buttons to change the order of the waypoints in the list. The first waypoint listed will be the first target on the route.

   Click on the **Reverse** button to completely reverse the order of the listed waypoints.

   Use the **Delete** button to delete the highlighted waypoint. Use the **Delete All** button to delete all of the listed waypoints.

   Use the **Setup** button to call up the following dialog:



   This screen is used to define the symbols and patterns for waypoints and routes, respectively. Click on the appropriate button to change the symbol/pattern.

   Also on the Route Setup screen, there is an option for Auto Routes (see Section 7.2.5). Choose from one of the available modes: **Shortest** (route will be calculated based on distance) or **Quickest** (route will be calculated based on time). Choose OK to save your settings.

   Once you are back to the Create Route screen, the waypoints selected in the previous step will be automatically joined together to form a route. Therefore, it is important to select the waypoints in the correct navigation order. The first waypoint in the list will be the first target of the route; the second waypoint in the list will be the second target, and so forth.

   Click the **Auto Route** checkbox if the route is to follow the roads on the basemap, rather than connecting one waypoint directly to the next. If you add, delete or change the order of the waypoints on an Auto Route, you will need to first unmark

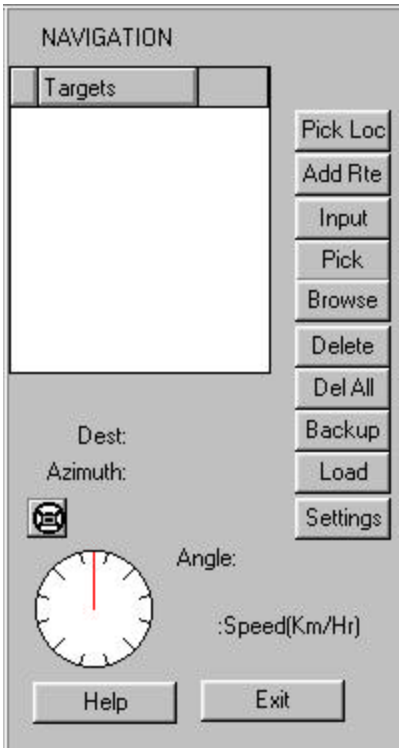
the Auto Route checkbox then mark it again to update the Auto Route (see Section 7.2.5).

Click on the **Navigate** button when done selecting waypoints to return to the Navigation Panel. Begin navigating along the Route.

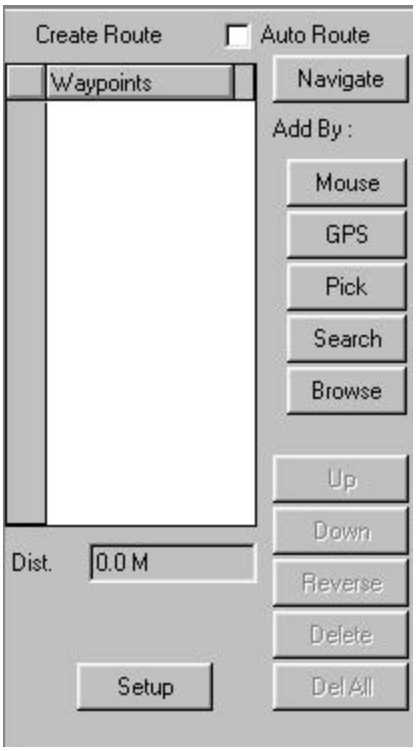
7.2.5 Creating an Auto Route for Navigation

PC-MAPPER uses the Basemap roadways to route you to your destination. In order to use the Auto Route function, you need to load a CMT BaseMap for the desired route. The CMT BaseMap will automatically be loaded into your current Map View when you place a check mark in the Auto Route box found on the **Create Route** screen.

1. From the GPS pull-down menu, select **Navigation**. The following Navigation panel is displayed:



2. Click on the **Add Rte** button to view the **Create Route** panel. The following screen is displayed:



3. Make sure the Auto Route option is checked. Under the **Add By:** list of buttons use the **Mouse, GPS**, **Pick, Search, or Browse** buttons to add waypoints to the list under the **Waypoints** menu. The buttons used to add waypoints to the route are defined in Section 7.2.4.

4. Placing a checkmark in the **Auto Route** box tells PC-MAPPER that the route being created will be an Auto Route. When Auto Route is selected, PC-MAPPER uses the Basemap roadways to route you to your destination. Therefore, as you add waypoints to be included in your Auto Route, they will automatically "snap" to the nearest road. Use the various buttons listed under the **Add By:** section to add waypoints to the list under the **Waypoints** box.

   Multiple waypoints may be selected from this screen by continuing to click on the map with your stylus. The waypoints will be automatically joined together to form an Auto Route.

5. Click on the **Setup** button to go to the Route Setup screen, where you can adjust options for Auto Routes. Choose from one of the available modes: **Shortest** (route will be calculated based on distance) or **Quickest** (route will be calculated based on time). Click on the **Road Speed** button to specify default road speeds for different road types (e.g. Interstate = 70 mph, US Highway = 65 mph, etc.). Click on the **OK** button to save your settings.

   Click on the **Navigate** button when done selecting waypoints to return to the Navigation screen.

6. Once you are back to the Navigation screen. View the newly created Auto Route in the Map View. To begin navigating along the route, select the desired route in the Select Target window. The default name for the first created route is: "Nav_Rout001". Once the desired route is highlighted, turn on the GPS receiver to begin navigation along the route in the Navigation View (see Section 7.4).

7.3 Navigation Waypoint/Route Management

In the Navigation panel, use the **Delete** or **Delete All** buttons to remove unwanted waypoints/routes listed under the Targets section.

For easier identification of the Targets, the following notation appears next to the target name in the Target list:

"P" = **Point** target.

"L" = **Line** target. Both line and area features will be shown as this type.

"C" = **Connected route** – a route formed by direct connection of the waypoints.

"R" = **Road route** formed by using the **Auto Route** method.

Waypoints and routes are stored independently of the current job and are available for access from any job selected.

Use the **Backup** button to create a backup file of your existing list of waypoints/routes. The backup file will be stored with the extension *.NAV. Therefore, you will have an opportunity to name the backup file when the **Backup** function is accessed. Name the file in the "Save File As" screen and then click on the **Save** button to save it.

Use the **Load** button to access and load the backup file or any other .NAV file created by using the Backup button.

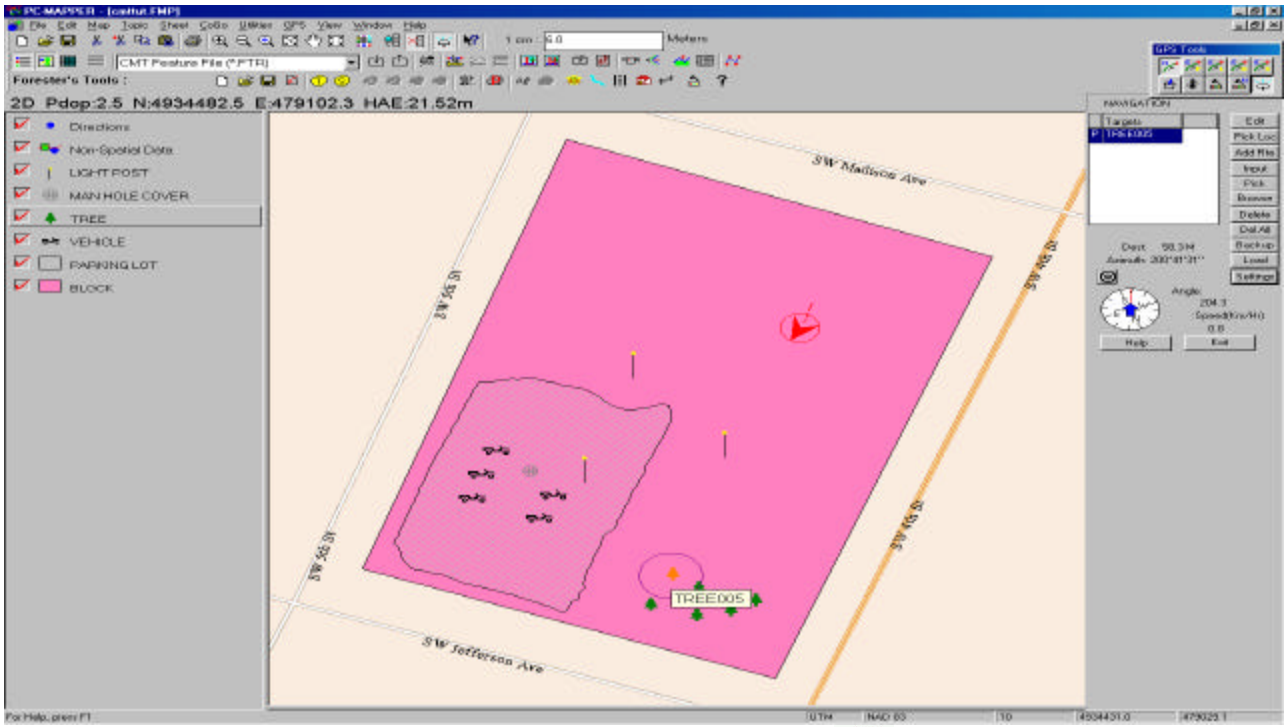
Use the **Edit** button to view and edit the currently selected Target/Route. The Target/Route name may also be edited by double-clicking on the Target name and then typing in the new name. Press Enter on your keyboard to accept the name change.

7.4 Navigation in the Map View

Once the target and method of navigation has been selected, you are ready to call up the Navigation View, so you can see your target for navigation.

7.4.1 Navigating to Point Targets

When navigating to point targets, you will see a screen that looks similar to the following:



Your current position will be marked by the following symbol: . The large arrow indicating your current position will turn to the following symbol when your speed is very slow (e.g. less than 1 m/s). This will change back to an arrow when your speed is above 1 m/s. The direction of the arrow indicates your current direction. An indicator showing the direction to reach the target is overlaid on top of your current position and is shown as a triangle . To reach the target, start moving in the direction of the target so the arrow indicating your current position aligns with the triangle that points toward the target.

Your target will be marked by the following symbol: . The target color and shape can be changed along with the navigation marker and trail color by clicking on the **Settings** button.

A tolerance “ring” is drawn around the target coordinates creating a target area. You will be notified that you have reached the target when your current position is within the tolerance ring. To reach the target, start moving in the direction of the target so the arrow indicating your current position points toward the target.

If you have the **Target Voice** toggled on under the Settings menu, then you will hear an audible voice notify you when your current position is within the specified tolerance of the target marker as well as the remaining distance to reach the target.

The Map View is always North-oriented unless you have chosen the option for “Moving Map” in the Navigation Settings menu by clicking on the **Settings** button.

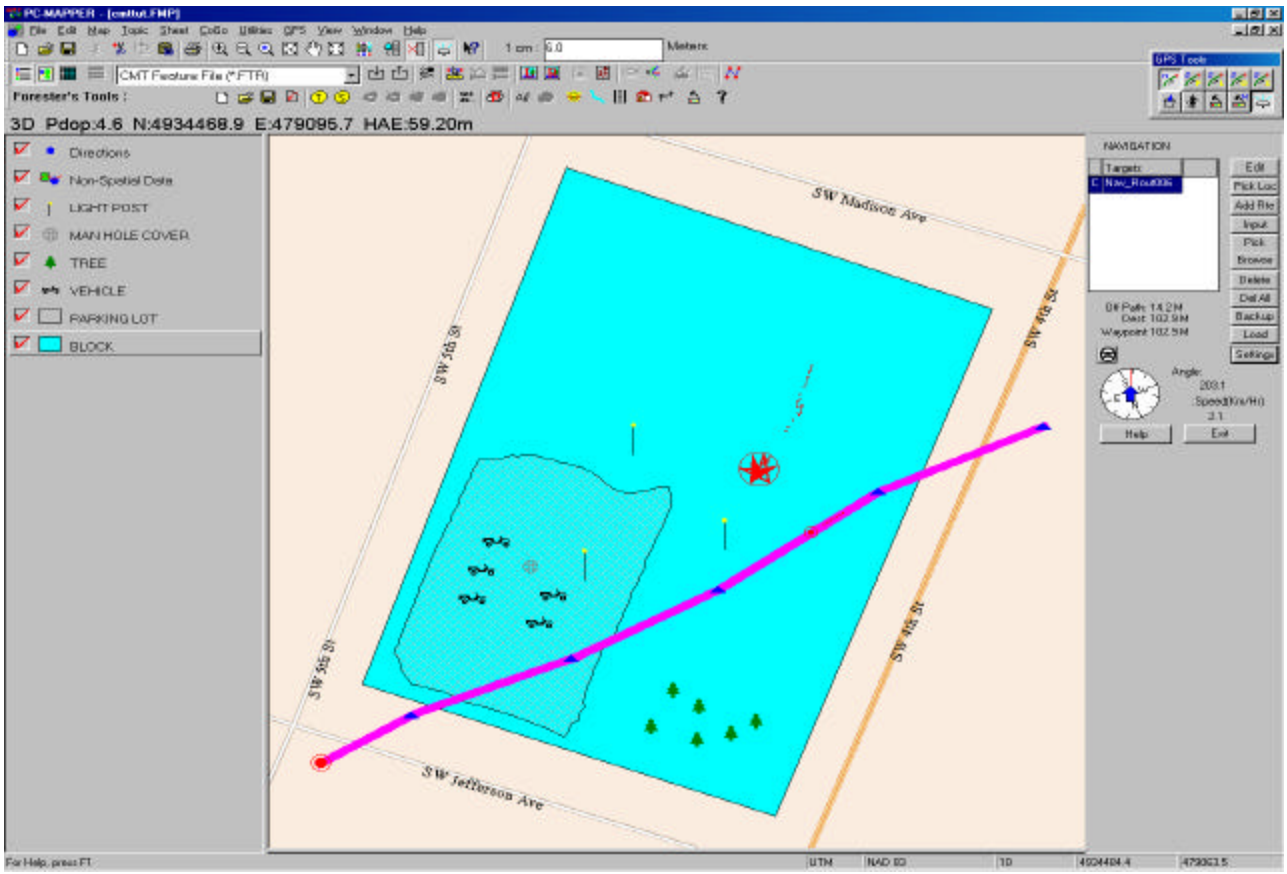
Distance information from your current position to the target marker is dynamically displayed and updated each second. The **Azimuth** is the direction from your GPS receiver to your target waypoint (in degrees from north). The difference between your direction of motion and the direction to your target is displayed in the **Angle** field. You may switch between the **Compass** mode and the **Steering Wheel** mode by clicking on the corresponding icon (the steering wheel is always point in the direction of your target). These values and the speed of your motion will be updated continually as your position changes relative to the waypoint. This information is found in the Navigation Panel at the side of the screen.

Use the various zoom tools to **Zoom In/Out**, **Pan** or use the **Zoom Fit** button to fit all items in the current file into the Map View.

Please note: The units of measurement displayed and used for the dynamic distance display reflect those settings chosen under the **Map/Coordinate System** menu.

7.4.2 Navigating Along a Route

When navigating along a route, you will see a screen similar to the following:



The red arrow marks your current position and direction  . Your position will be marked as a  while you are not moving or while you are moving at a speed less than 1 m/s. Information is displayed at the bottom of the screen for: direction and distance to the current waypoint/destination as well as your current distance from the route (path). The **Azimuth** is the direction from your GPS receiver to your target waypoint (in degrees from north). The difference between your direction of motion and the direction to your target is displayed in the **Angle** field. You may switch between the **Compass** mode and the **Steering Wheel** mode by clicking on the corresponding icon (the steering wheel is always point in the direction of your target). These values and the speed of your motion will be updated continually as your position changes relative to the waypoint.

An indicator showing the direction to reach the route is overlaid on top of your current position and is shown as a triangle  . To reach the route, start moving in the direction of the target so the arrow indicating your current position aligns with the triangle that points toward the target.

Your current projection on the route will be marked by the following symbol  . Waypoints on the route will be shown as blue triangles connected by a solid pink line (symbology for waypoints and routes may be adjusted in the Route Setup screen). The current waypoint target is displayed in the written description at the bottom of the screen. Proceed in navigating toward the waypoint target until you are within the "Target Range" specified in the Navigation Settings screen (using the **Settings** button).

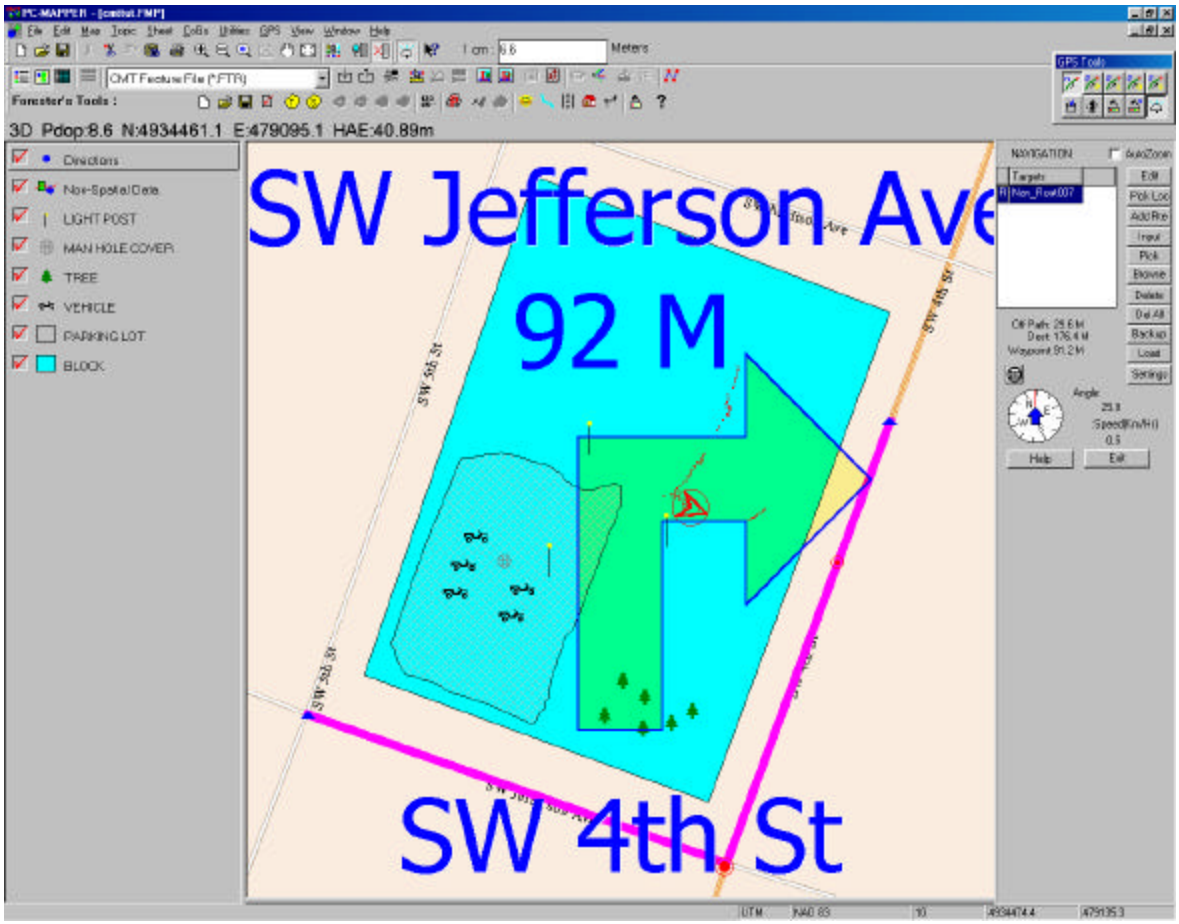
To proceed to the next waypoint, continue along the highlighted route and PC-MAPPER will automatically change the current target to the next waypoint on the route when you have moved out of the tolerance range of the current target.

Use the various zoom tools to **Zoom In/Out**, **Pan** or use the **Zoom Fit** button to fit all items in the current file into the Map View.

7.4.3 Navigating Along an Auto Route

Once you have created the Auto Route and selected it under the Navigation Panel, you are ready to begin navigation along the Auto Route.

In the Navigation View, the Auto Route will be highlighted and displayed on the screen.



The on-screen graphics displays distance information and turning directions from your current position and direction to the current target. There is also a visual reminder for the direction of the next turn. The street name is also provided. The **Azimuth** is the direction from your GPS receiver to your target waypoint (in degrees from north). The difference between your direction of motion and the direction to your target is displayed in the **Angle** field. You may switch between the **Compass** mode and the **Steering Wheel** mode by clicking on the corresponding icon (the steering wheel is always point in the direction of your target). These values and the speed of your motion will be updated continually as your position changes relative to the waypoint

For a complete navigation experience, toggle ON the audible voice directions to help you reach your destination. The **Target Voice** option is controlled in the Navigation Settings screen accessed by the **Settings** button.

In the **Target Tolerance** field, enter the radius of the target territory. When you enter that region, you will be considered to have arrived at the target. When you are traveling along a path, your position will be projected on the path unless you are within the range of the target tolerance.

The **Snap to Road/Path** option is useful when you are navigating along a road or path. Your position may not be right-on due to GPS receiver accuracy or because you are not

walking straight. Check the "Snap to Road/Path" box if you wish to have your position displayed on the path as long as you are within a given distance from the path.
When the "Snap to Path" option is active, you will be able to enter the permitted deviation into the **Snap Distance** field.

Use the various zoom tools to **Zoom In/Out**, **Pan** or use the **Zoom Fit** button to fit all items in the current file into the Map View.

In the navigation panel, place a check in the box titled: **AutoZoom** and PC-MAPPER will automatically keep you zoomed in to the nearest road/intersection to facilitate navigation along the Auto Route.

The current waypoint target along the Auto Route will be marked by the red target symbol  . Your corresponding position on the Auto Route will be marked by the smaller target symbol  and will slide along the Auto Route path as your position moves. Your actual current position will be marked with the standard arrow marker  . Other waypoints will be shown on the route as blue triangles connected by a solid pink line (symbology for waypoints and routes may be adjusted in the Route Setup screen).

Verbal reminders are available to help remind you to turn as you travel along the route. By default, the verbal messages are toggled ON.

Please note: With the verbal directions toggled OFF, you can still click on a waypoint or on the route once to get a single voice prompt telling you how far you are away from your current target.

Proceed in navigating toward the waypoint target until you are within the “Target Range” specified in the Navigation Setup screen. You will receive an audible notification when you are at the target if you have the audible voice activated.

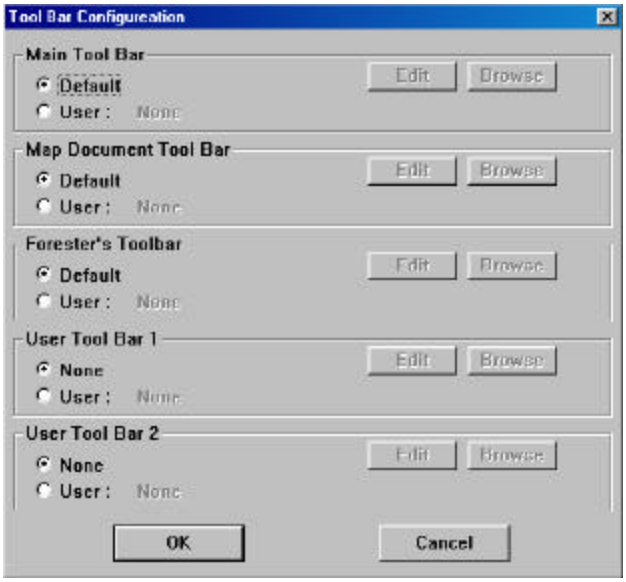
To proceed to the next waypoint, continue along the highlighted route and PC-MAPPER will automatically change the current target to the next waypoint on the route when you have moved out of the tolerance range of the current target.

Section 8 - Modifications under the View Menu

8.1 Customizing the PC-MAPPER tool bars

PC-MAPPER now lets you create your own custom toolbars and also customize existing toolbars to fit your application. This function is very useful because you can get rid of unused icons on specific toolbars and create your own specific version of PC-MAPPER based on the functions you use.

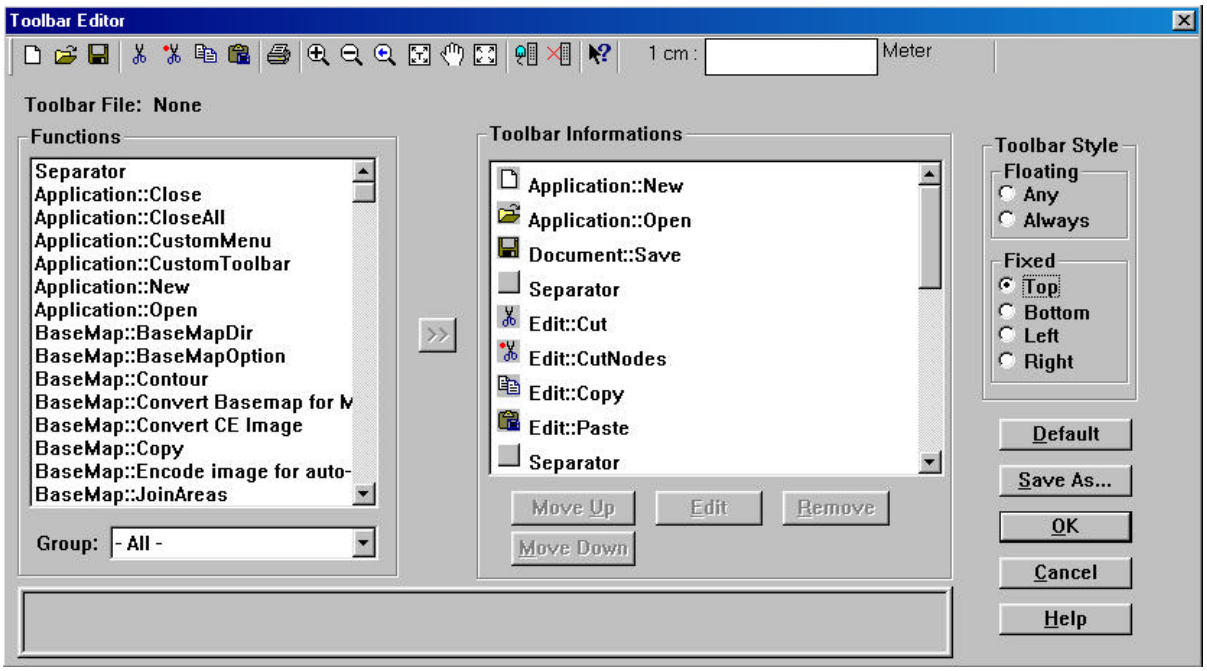
When you select View/Customize Toolbar, the following dialog is presented:



The three main toolbars in PC-MAPPER are listed along with two user-defined toolbars. The current display status of each toolbar is listed below the toolbar name. When **Default** is selected, the original specified PC-MAPPER toolbar would be used by the program. Select **User** to modify the existing toolbar and create your own. When the **"User"** option is selected, the **Edit** and **Browse** buttons become active for that toolbar.

Newly created toolbar files carry the file extension *.CGT (PC-MAPPER User Tool File). Use the **Browse** button to find any previously defined .CGT files for the specified toolbar. This allows you to have an unlimited amount of toolbar configurations for each toolbar.

Click on the **Edit** button to call up the tool bar editor screen:



A view of the existing toolbar is displayed at the top of the dialog window. All PC-MAPPER functions are listed to the left of the window. The current functions on the toolbar are displayed on the right side of the window. Use the **>>** button to move functions into the list of current functions. Those functions that are not currently assigned an icon will appear with a gray box next to them. Use the edit button to choose bitmap images to assign to the icon toolbar.

Any newly defined toolbars may be saved using the **Save As** button.

Using the **Move Up** or **Move Down** buttons can change the order of the icon arrangement. Remove unwanted functions with the **Remove** button.

Use the **Group** pull-down menu to quickly view and select groups of functions that are listed under the same function grouping.

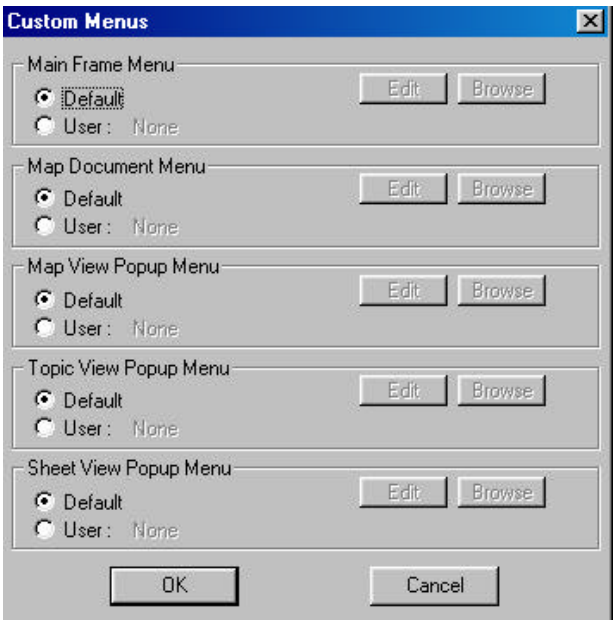
8.1.1 Toolbar Styles

Floating:
Any - Sets the current toolbar to be floating, but it can also be mounted.
Always - Sets the current toolbar to be always floating. It cannot be mounted.

Fixed:
A fixed toolbar may be placed along the top, bottom, right or left edge of the PC-MAPPER software.

8.2 Customizing the PC-MAPPER Menus

PC-MAPPER also lets you customize the menu items to fit the needs of your application. When you select View/Customize Menu, the following dialog is presented:

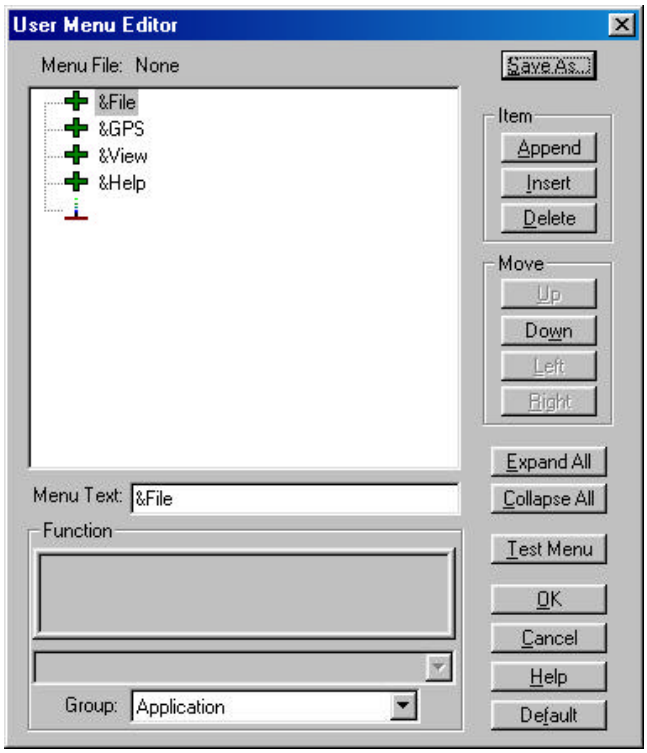


The menu items available for editing are the main menus for overall customization, the Map menu, the Map View menu (normally accessed by right-clicking on the Map View), the Topic menu and the Sheet menu.

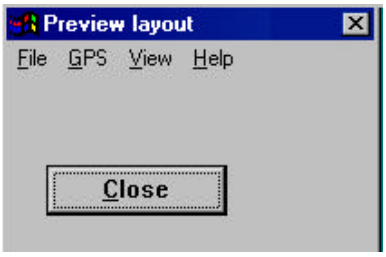
The current display status of each menu is listed below the toolbar name. When **Default** is selected, the original default PC-MAPPER menu is used by the program. Select **User** to modify the existing menu and customize it. When the **User** option is selected, the **Edit** and **Browse** buttons become active for that menu.

Newly created menu files carry the file extension *.CGM (PC-MAPPER User Menu File). Use the **Browse** button to find any previously defined *.CGM files for the specified menu. This allows you to have an unlimited amount of menu configurations for each menu.

Click on the **Edit** button to call up the menu editor screen:

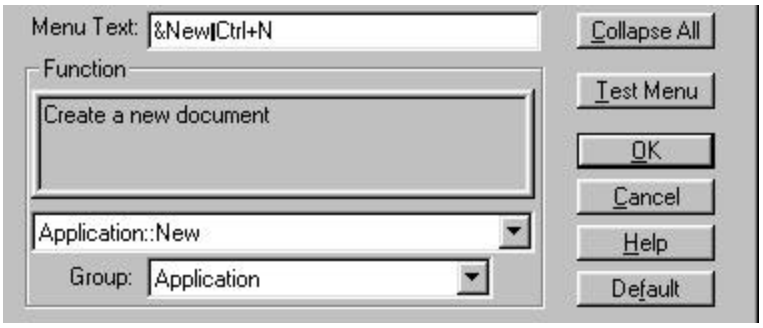


A sample view of the existing menu configuration can be displayed by clicking on the **Test Menu** button. A sample menu is shown:



Use the **Expand All** button to display all menu functions listed under the menu headings. Use the **Collapse All** button to minimize all menu functions and only display menu headings.

Click on a menu function to begin editing. The current menu text and a description of the function is displayed at the bottom of the editor screen to help identify the function:



The menu text may be edited. Take extra care when choosing the text because the menu text entered here will be used as the text in the pull-down menu. Place the "&" symbol in front of the character that will serve as the shortcut key for the function. The control character sequence such as "Ctrl+N" are hardwired and may not be changed by you. For example, the menu text "&New|Ctrl+N" will display as "New". The function will be activated when you press "N" in the File menu or when you hold down the Ctrl key and press "N" in the Map View.

Again, use the **Test Menu** button to see a sample of what the menu and text will look like.

8.2.1 Moving Menu items

Use the **Up**, **Down**, **Left** and **Right** buttons to change the order and also the hierarchy structure of the current menu item.

Items listed next to the **+** or **–** are considered menu headings. These items are at the top of the hierarchy structure and may not be moved further left.

Menu headings may be moved up or down. This will affect the location of the items on the menu bar. Menu headings listed first will be shown at the far left of the actual menu. Menu headings may also be moved to the right which reduces their status to a menu item/function rather than a menu heading. Moving the menu headings further right will continue to reduce their status to sub-menu and finally sub-sub-menu. It is not recommended to move menu heading items to a sub-menu status because all functions listed under the menu heading are only accessible by first accessing the sub-menu which can be time consuming.

Menu functions may also be moved up or down to change their respective position in the list of functions on the pull-down menu. Menu functions may also be moved left and right to change their hierarchy.

New functions can be added using the **Insert** or **Append** buttons. The **Insert** button will insert a new menu item above the location of the current selection. The **Append** button will add a new menu item at the end of the list. Be sure to note at what level you are adding the new menu item: menu heading or menu function or sub-menu, etc. Remove unwanted functions with the **Delete** button.

When adding a new menu function or changing the existing menu function, you can use the pull-down list of existing functions to select a new one. Use the pull-down menu for the **Group** to simplify this process. Selecting a specific group will minimize the time spent searching for the desired function. For example, to add a “copy” function, first choose the Group item: “Edit”. Then, choose from the list of available functions to find the entry: “Edit::Cut”. Notice that the only available functions listed for selection originate from the Edit menu. However, you are not limited to only using “Edit” functions for the “Edit” menu item.

Any newly defined menus may be saved using the **Save As** button. Saved files will carry the file extension *.CGM (PC-MAPPER User Menu File).

Choose **OK** to return to the Menu dialog window. If changes were not saved, you will be prompted to save changes in a new file. Click **Cancel** to abort any changes and return to the user Menu dialog window.

Click on the **Default** button to abort any changes and reset the menus back to their original default configuration.

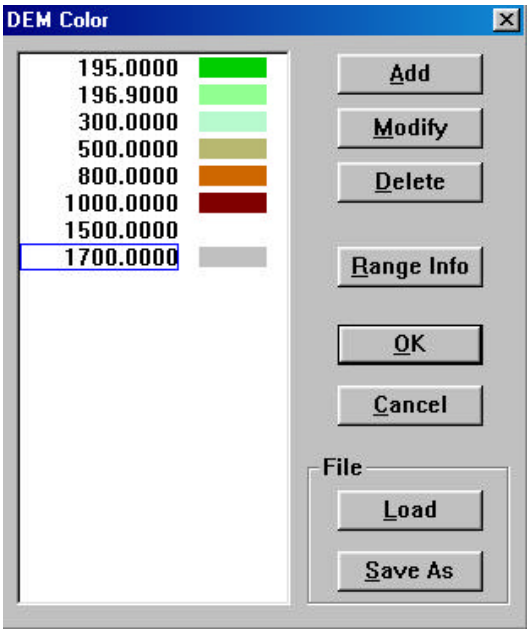
8.3 View/Basemap/CDM Directory

In the **Show/Change CDM Directory** window, specify the directory from which the CMT CDM data will be automatically loaded for the displayed BaseMap (when contour region or contour line is selected under BaseMap Options).

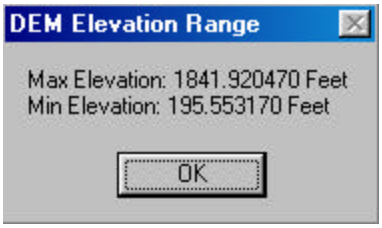
Standard DEM/SDTS files must be converted to the CMT CDM format before they may be used by PC-MAPPER. This conversion involves two steps because the standard DEM/SDTS files use the UTM coordinate system while PC-MAPPER requires the CDM files to be in the LLA system.

8.4 View/Basemap/DEM Color Setup

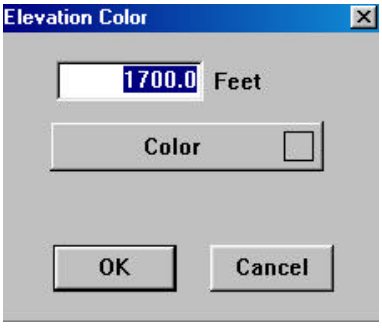
The DEM Color Setup option is used to manually define your own color gradient from lowest to highest elevations displayed in the CMT CDM data. When this option is selected, the following dialog window appears:



Click on the **Range Info** button to let PC-MAPPER calculate the minimum and maximum elevations and display them for you:



Use the **Add** button to add elevations and specify colors. Click on the **Modify** button to change any existing elevations and colors. An example is presented for the modify button:



8.5 View/Basemap/DEM Ramp Setup

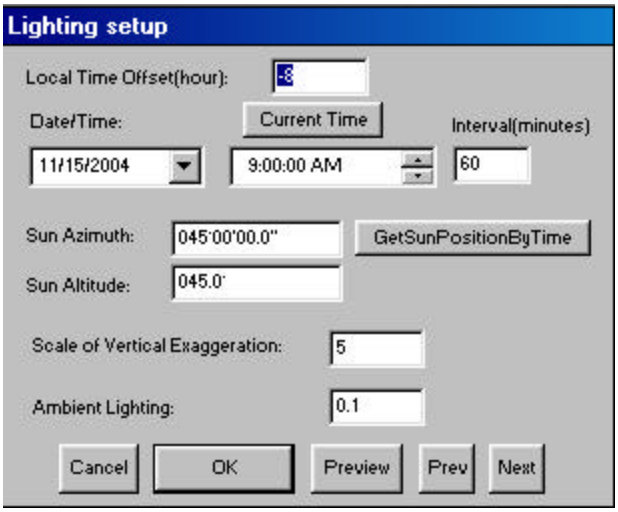
This option is to define the color “ramp” for DEM data displayed in PC-MAPPER. When using the color ramp mode, the minimum and maximum elevations are calculated by PC-MAPPER using the CDM data for your Map and presented to you.

Use the ramp setting to select a color for the minimum elevation and the maximum elevation. PC-MAPPER will automatically create a color gradient from the lowest to highest elevation points.

8.6 View/Basemap/DEM Light Setup

Use the DEM Light Setup option to view your DEM data and the shading in different levels of lighting based on the time of day and ambient lighting. There are specific settings for sun azimuth and sun altitude. However, these are automatically calculated for you based on your input for the time of day and date settings.

The following dialog is displayed:



When using this function, it is important to make sure you have the correct time, date and UTC time offset entered. The UTC time offset is the difference between your local time and the time at Greenwich, England. For example, in the Pacific Time Zone, the offset between standard time (not daylight savings time) and UTC time is –8. After determining the correct time offset, enter this information in the box at the top.

The Date/Time may be entered in manually or use the **Current Time** button to get this information automatically from your PC.

The fields for Sun Azimuth and Sun Altitude may also be entered in manually. Automatic entry for this information may be achieved by using the **Get Sun Position By Time** button. This function uses the current time/date settings and a table of sun angles to determine the correct sun altitude and azimuth.

Change the **Scale of Vertical Exaggeration** (between 0.01 and 100) to exaggerate the vertical scale of the DEM data.

Use the **Ambient Lighting** setting to change the brightness of ambient light in the area. Acceptable values range between 0 and 1.

Use the **Preview** button to see a preview of how these settings will look in your map.

Observe changes over the course of a day or over a specific time interval by setting the Interval in minutes. Then, use the **Prev** and **Next** buttons to increment the time based on the specified interval (acceptable intervals range from 1 to 9999).

8.7 View/Basemap/DEM Color Options

Select the color scheme of your choice for the displayed CDM data by choosing from one of three options:

a) **None**: This choice indicates that no color scheme is to be used for different elevations in the current CDM data.

b) **By Ramp**: This choice indicates that the color scheme to be used for the different elevations on the current CDM data will be dictated by the settings specified in the "DEM Ramp Setup" option.

c) **By DEM Color Setup**: This choice indicates that the color scheme to be used for the different elevations on the current CDM data will be dictated by the "DEM Color Setup" option.

Please note: CDM data must be loaded and displayed for these menu items to be active.

Also note: The lighting setup (especially ambient lighting) will affect the display of you CDM data (even when the **None** option is selected).

8.8 Default Coordinate System for Importing DXF Files and Georeferenced Images

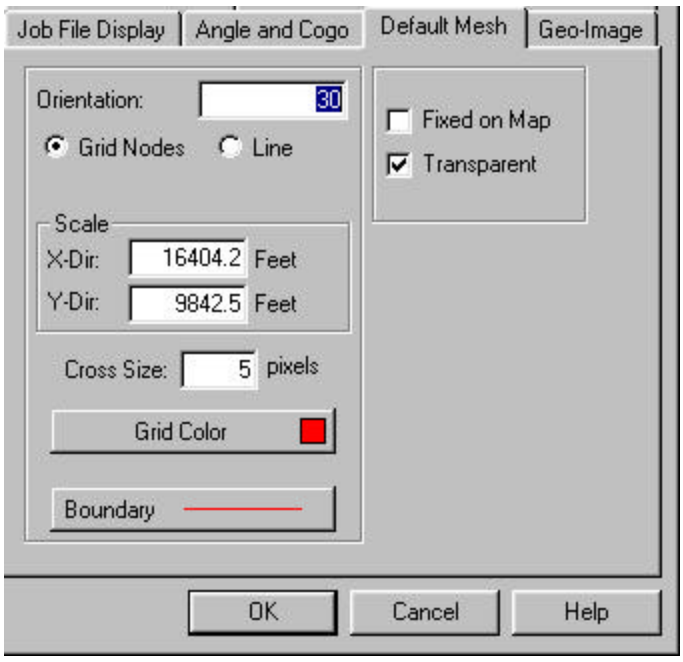
Use the View/Configure menu option and select the **Default Coordinate System** tab to select a coordinate system of your choice. This coordinate system will be used for creating new map files and also when importing DXF files and georeferenced images.

8.9 Show BEARING Instead of Azimuth in the Status Bar

Use the View/Configure menu option and select the **Angle/Cogo** tab to select an Angle System of your choice (either Bearing or Azimuth). The functions **Add Line By Mouse** and **Add Area By Mouse** will now show the BEARING in the status bar when BEARING mode is selected.

8.10 Default Mesh Settings

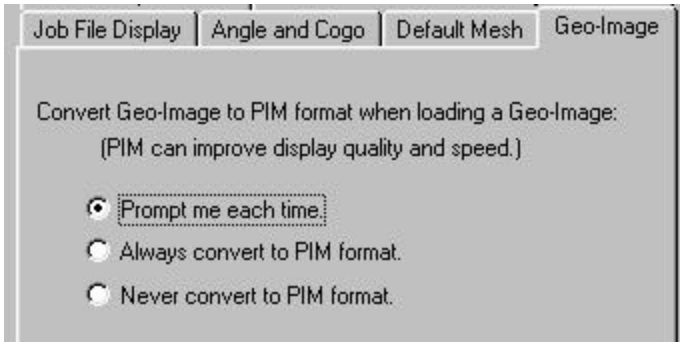
Set the defaults for the “Grid” or “Mesh” under the View/Configure menu option and then clicking on the **Default Mesh** tab. The following menu is displayed:



These settings will be used by default and displayed when using the Utilities/Create Grid function.

8.11 Geo-Image Settings

Set the defaults for georeferenced image conversion to .PIM format using the View/Configure menu option and then clicking on the **Geo-Image** tab. The following menu is displayed:



This dialog is used to control the defaults for conversion of your georeferenced images to the .PIM format. It is recommended to convert your images to the .PIM format to improve image display quality and speed of loading. The options are explained as follows:

Prompt me each time: PC-MAPPER will prompt you each time you load a georeferenced image and ask you whether or not you would like to convert the image to .PIM format. If the image has already been converted to .PIM format, then PC-MAPPER will not display the prompt for conversion to .PIM format.

Always convert to PIM format: PC-MAPPER will not prompt you when loading a georeferenced image and will always convert the image to .PIM format. The conversion to .PIM format will be skipped if the selected image is already a .PIM image or if the image has already been converted to .PIM format.

Never convert to PIM format: PC-MAPPER will not prompt you when loading a georeferenced image and will never convert the image to .PIM format.

INDEX