Enhancements in PC-GIS 05

An Introduction to PC-GIS 05 and Supplement to the PC-GIS Reference Guide

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

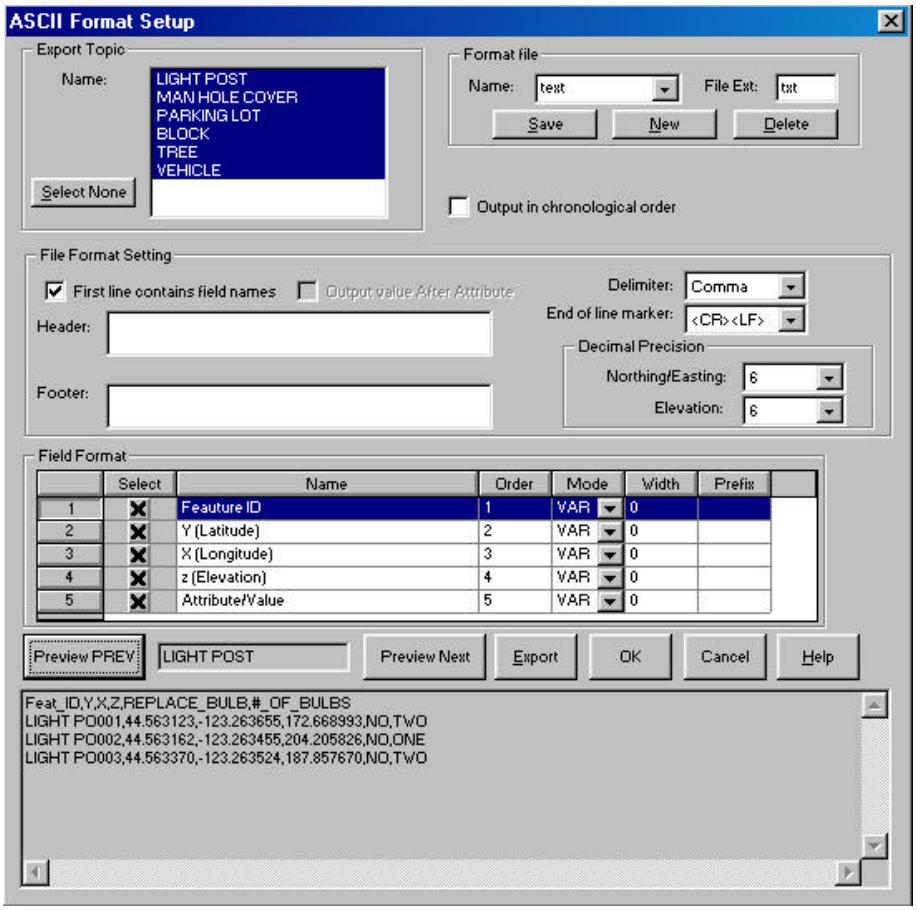
TABLE OF CONTENTS

Section I - Modifications under the File Menu

1.1 ASCII Export of Multiple Topics

The PC-GIS ASCII export has been enhanced to export multiple topics as well as export of Line/Area topics. Please refer to the PC-GIS 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.

Section 2 - Modifications under the Map Menu

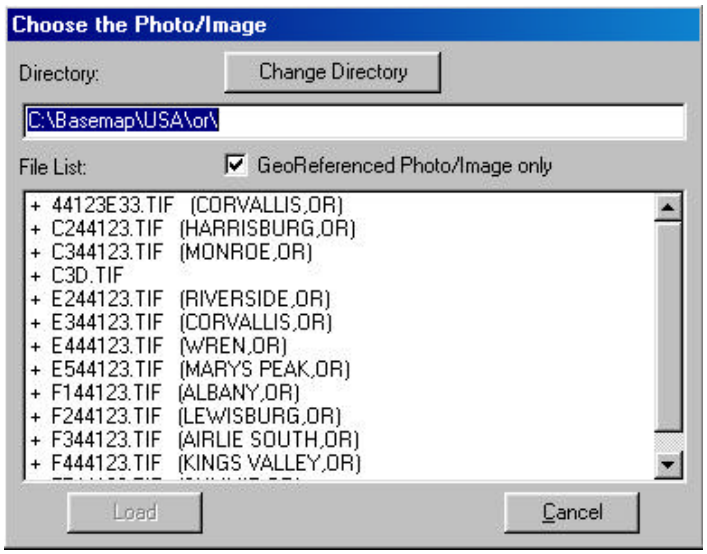
2.1 Load Image - Added option to work with PIM format

PC-GIS now lets you load georeferenced imagery in the native CMT Windows CE format: PIM format. The PIM format is recommended for use in PC-GIS 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).

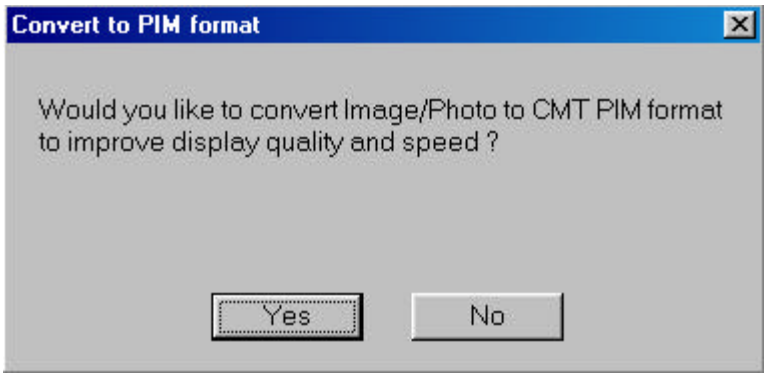
Working with the PIM format will reduce time spent by the software on redrawing the image after a change in scale (by zooming in or zooming out) as well as when panning the image.

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:



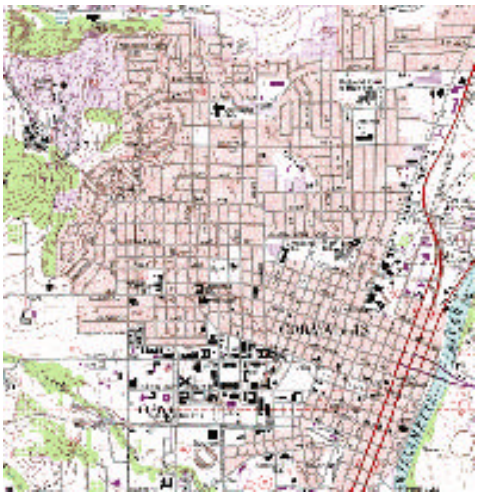
Select the image you want to load and click on the **Load** button. The following dialog is displayed:



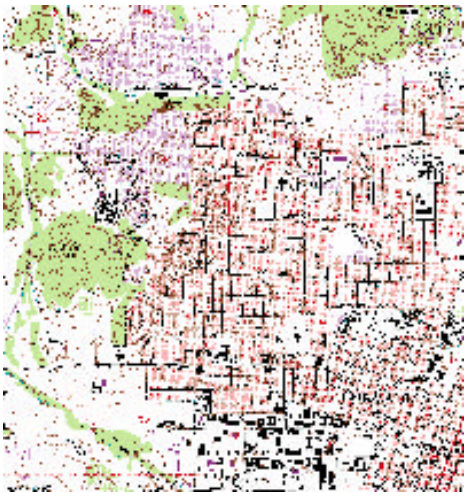
Select **YES** if you want to convert your image to the PIM format and have it loaded in your Map. Choose **NO** if you wish to load your image in its native format in your Map without conversion. After choosing **YES** or **NO**, you will be prompted for the coordinate system information of the image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

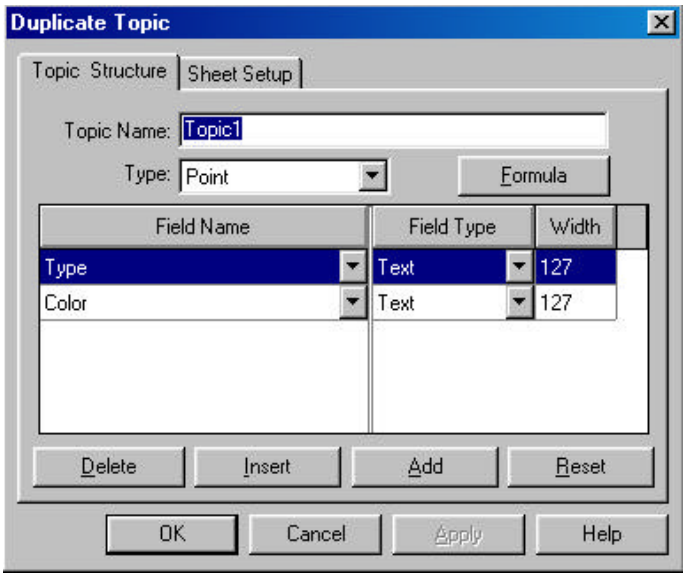
As described in steps for loading a Geotiff format file, an accompanying ASCII text file called a “world file” is also required when loading GeoJPEG imagery. In the case of the Geotiff format the world file carries the extension *.TFW. For GeoJPEG images, the world file has the extension *.JGW.

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

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.

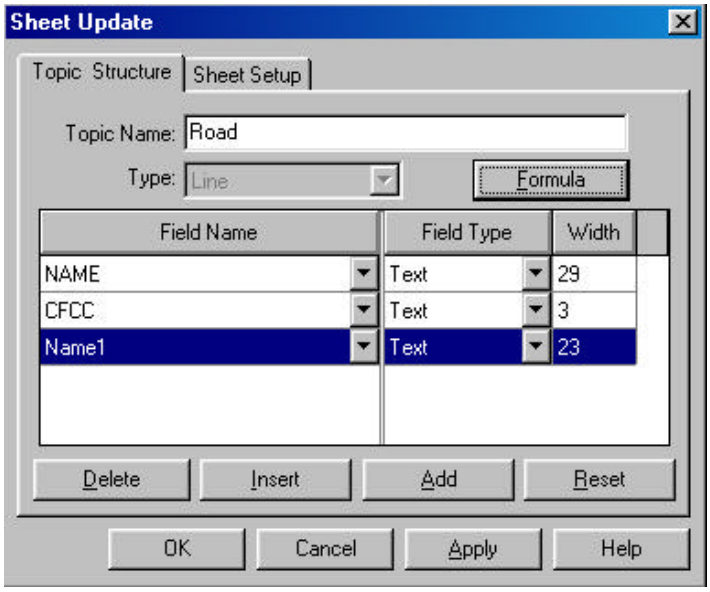
Section 4 - Modifications under the Sheet Menu

4.1 Formulae for user-defined attributes

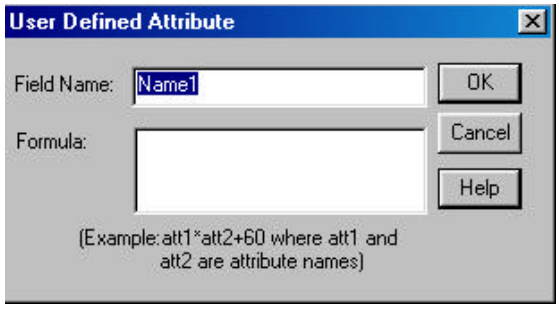
The Sheet Setup function has been enhanced to allow for greater flexibility in defining formulas in the user-defined attributes.

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-GIS 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"

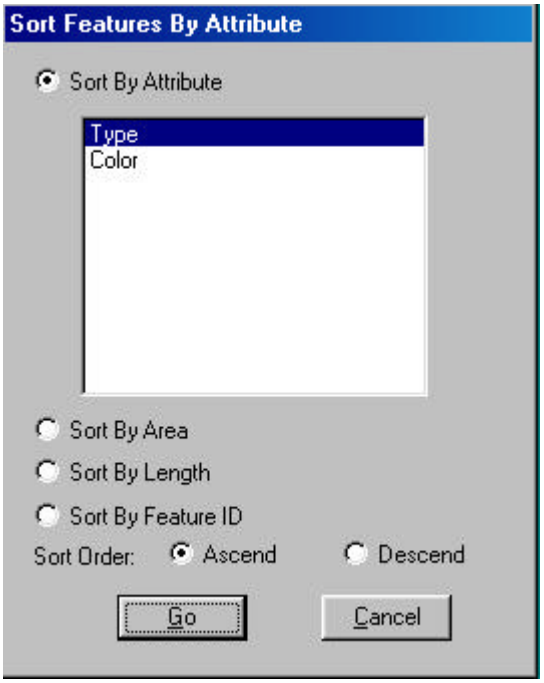
to double the height value. If you enter "2HEIGHT" the program will try to search for the attribute named "2HEIGHT".

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:

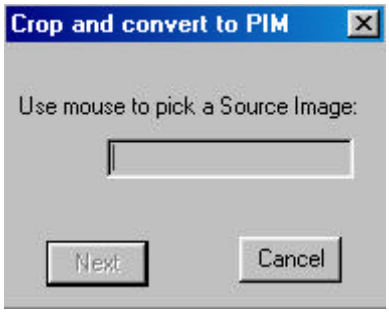
1. Select the Topic you want to sort.
2. Select **Sheet/Sort Features**.
3. In the dialog window, choose the desired **Sort By…** option.
4. Choose the **Sort Order** (either Ascending or Descending order).
5. Click on the **Go** button to sort the features by the specified parameters or select **Cancel**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

Section 5 - Modifications under the Utilities Menu

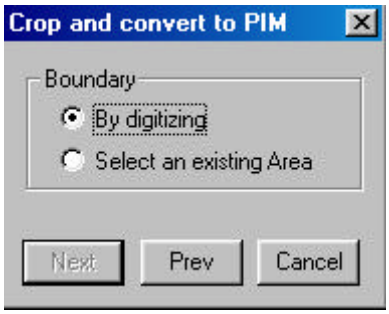
5.1 Converting and Cropping Georeferenced Images to PIM Format

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-GIS as well. After selecting this function, the following dialog is displayed:



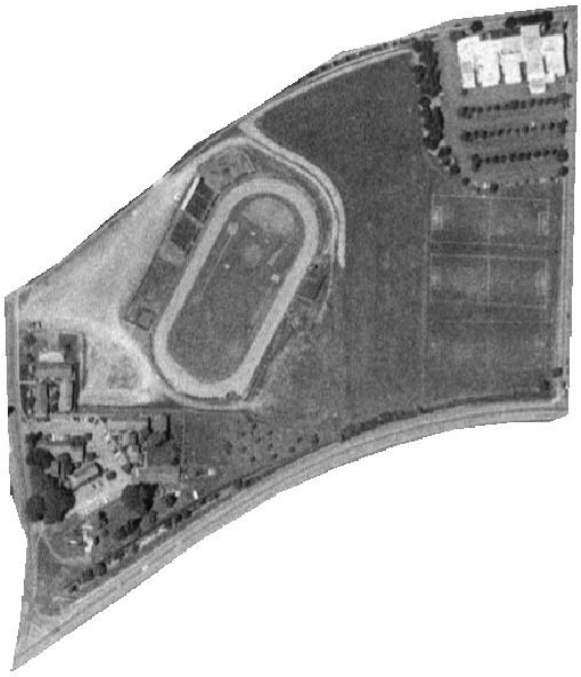
At this point, your mouse will turn into a crosshairs to allow you to select the target image. After selecting the image, the following dialog is displayed:



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:



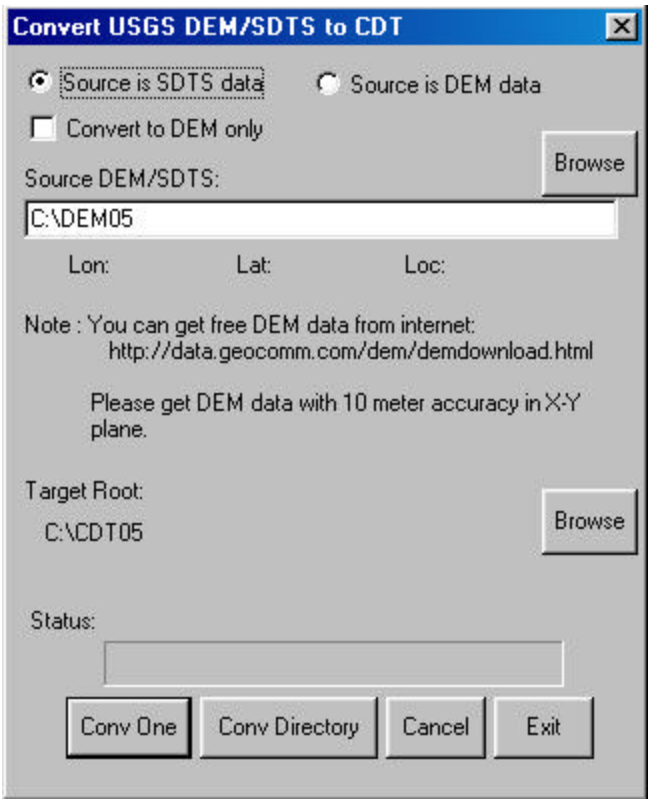
5.2 Convert DEM to CDT

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-GIS. 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-GIS 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-GIS will create a folder called ‘DEM05’ on your local drive. We recommend using this folder to store any downloaded DEM data. PC-GIS 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-GIS will create a folder called ‘CDT05’ on your local drive that will act as the target folder. With this naming convention, PC-GIS 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-GIS 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.

5.3 Convert CDT to CDM

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

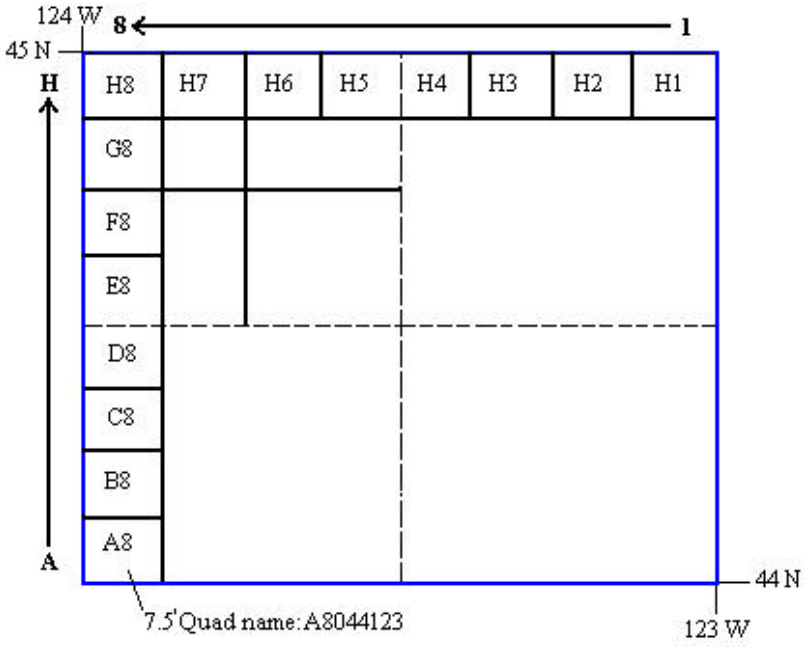
The resultant .cdm files contain data in the LLA coordinate system. Each .cdm file corresponds to a "2.5 minute by 2.5 minute" range. The .cdm files are automatically placed into pre-defined folders.

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-GIS 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

5.4 The Geoid 2003 Model (g03u*.g1)

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

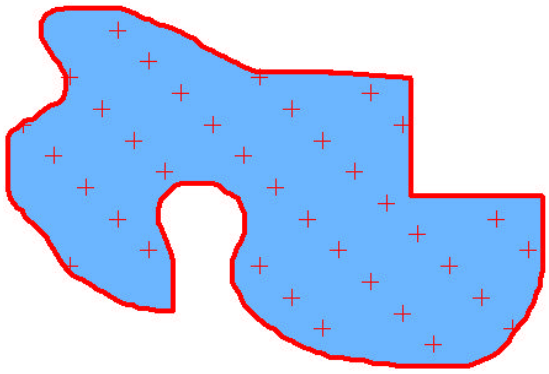
PC-Mapper and CMT-Survey allow specific Geoid 2003 files to be transferred to Field CE Survey for increased accuracy in elevation readings/conversions.

5.5 Utilities/Create 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.

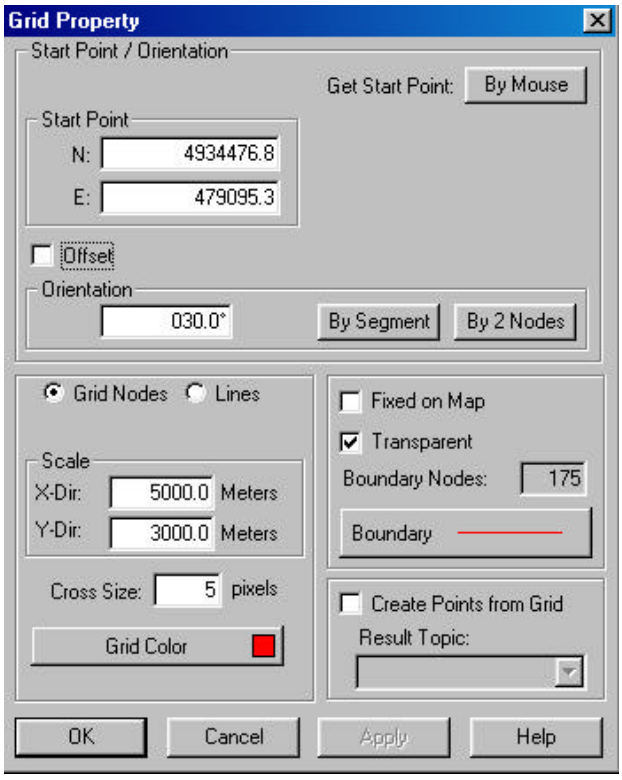
This powerful and friendly tool lets you select single or multiple area features to create your own user-defined grid at specified interval spacing for either timber cruising or other grid sampling applications. Adjust the size and color of the grid points as well as the angle of orientation for the 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.



5.5.1 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 a 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.

5.6 Mobile Device Interface

5.6.1 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.

5.6.2 System

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

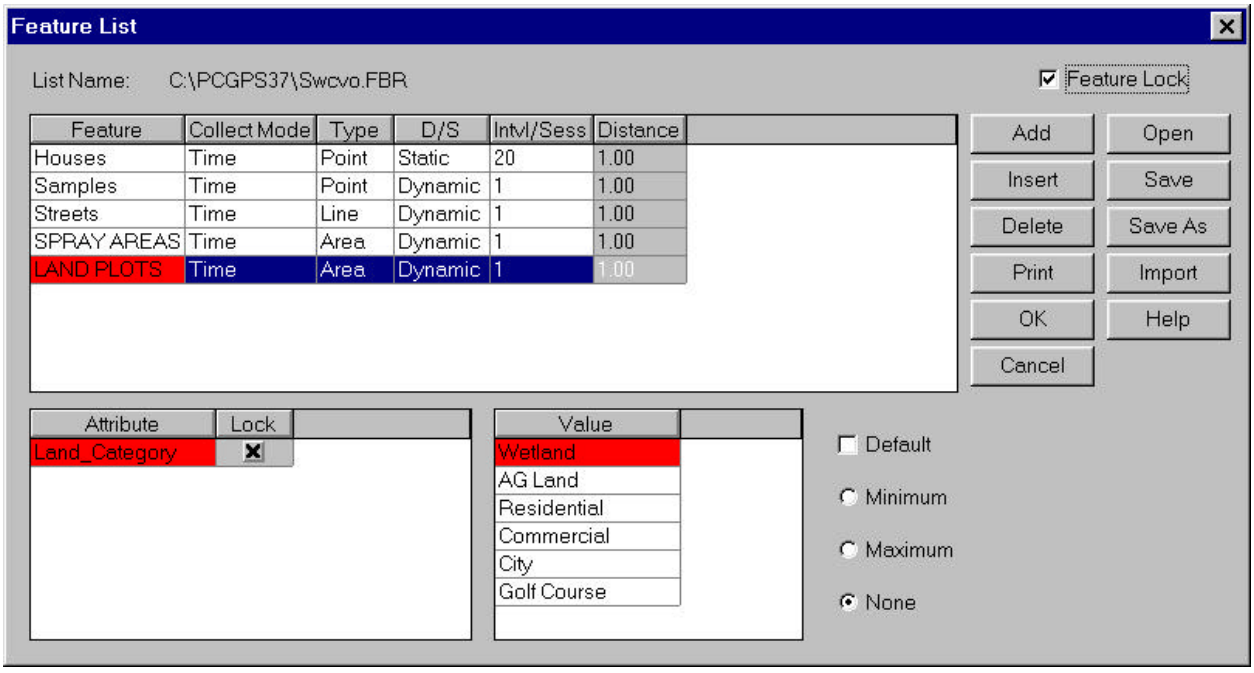
a) User-defined coordinate systems
b) Symbol/Pattern libraries

Section 6 - Modifications under the GPS Menu

6.1 GPS Feature Lists

The **GPS/Feature List** function allows you to set up a "point and shoot" database structure for your Features, Attributes and Values. Use of a Feature List simplifies field data collection and promotes sound data organization. The Feature List can be easily downloaded to the CMT Field unit. The file created by the Feature List function has the file extension .FBR.

When you click on the **GPS/Feature List/Open** menu option, the Open dialog box will be displayed. To edit a Feature List, double-click on the file name in the Open dialog box. To create a new Feature List, click on the **GPS/Feature List/New** menu option. If you choose to create a new Feature List, a blank Feature List screen will be presented. The Feature List screen for the file SWCVO.FBR is shown on the following page:



There are eight major columns labeled Feature, Collect Mode (Version dependent), Type, D/S, Intvl/Sess, Distance (Version dependent), Attribute and Value in the Feature List dialog box. A complete Feature entry will include Feature name, Type, D/S, and Interval. Attributes and Values for the Feature are optional. **Note**: The Feature name is used as the Topic name when the Feature file is opened in PC-GIS.

The **Feature**, **Attribute** and **Value** have a hierarchical relationship. Each Feature may have several associated Attributes. Similarly, for each Attribute, there may be several Values.

In the Feature List screen above, the “Land Plots” **Feature** has one **Attribute** called “Land Category”. The Land Category Attribute has six **Values** listed: Wetland, AG Land, Residential, Commercial, City and Golf Course.

Feature Type:

Features may be Points, Lines or Areas.

Collect Mode (Version dependent):

Point Features may be collected by Time or by Distance mode. If Time mode is selected, the **Invl/Sess** field will be active to allow you to enter the session time for the Point Feature. If Distance mode is selected, the **Distance** field will be active to allow you to enter the distance interval for collecting Point Features.

- For additional information on Distance collection mode, please refer to the CMT-Z33 Operator’s Manual.

D/S:

Features may be collected in Static or Dynamic mode. Point Features are always Static. Line Features and Area Features may be collected in either mode. In Dynamic mode, GPS fixes for the Feature are taken while the GPS receiver is moving. In Static mode, GPS fixes for the Feature are taken while the GPS receiver is stationary.

Interval for Dynamic mode or Session for Static mode:

The **Interval** is the number of seconds between GPS fixes in Dynamic mode. For example, an Interval of 5 would mean that a GPS position fix would be stored once every 5 seconds for the Line or Area you collect. The **Session** time is the number of fixes that will be stored for Static Features. A GPS position fix will be stored each second.

6.1.1 Adding a Feature entry to the Feature List

To add a Feature entry to a new Feature List, click in the first row in the Feature column, and type in a Feature name. After you enter the Feature name press the keyboard, ENTER key. Select the Feature type (Point, Line or Area), Mode, and input the Interval or Session time in seconds. Click in the first blank field of the Attribute column for the Feature. Enter the Attribute name and then press the keyboard ENTER key. You may press the down-arrow to move to a second Attribute field. To enter Values for your Attribute, highlight the Attribute and then click on the Value field.

To append a Feature, **Attribute**, **or Value**, simply place the cursor in the last entry of the respective column and press the down arrow key. A blank row will be appended.

To delete a Feature, **Attribute** or **Value**, click on the record you wish to delete, and then click on the Delete button.

To exit the Feature List, click on the OK button. The Feature List will automatically be saved.

6.1.2 Feature List Error Checking

There are three options for error checking: Feature Lock, Attribute Lock, and Value Check.

The Feature Lock box is located in the top right corner of the dialog box. When the Feature Lock is toggled ON, users will not be able to store Features that are **not on the Feature List**.

The Attribute Lock box is located to the right of each Attribute. When the Attribute Lock is toggled ON, users will not be able to store Values which are **not listed** in the Feature List for the corresponding Attribute.

The Value Checking options allow you to specify a default Value or a range of Values for your Attributes. To assign a default Value, highlight one of the Values and then click on the Default mark box. Alternatively, you may establish a range of acceptable numerical Values by designating one Value as the minimum Value and another Value as the maximum Value in a similar fashion.

6.1.3 Importing Feature records to your Feature List

The Import button in the Feature List screen allows you to import Features, Attributes, and Values into the Feature List. The data can be in either an ASCII format (*.FAS file) or a DBF format. The imported file may contain one Feature record with multiple Attributes and Values.

- For further information, use Help/Online Manual and search on “Feature List”.

Please note: You may create a Feature List using the Feature data in your Map file. For information, use Help/Online Manual and search for “Feature List Export”.

6.1.4 Saving your Feature List

After you have entered the Feature, Attribute, Value records into your Feature List, you may save the Feature List by clicking on the OK button, the Save button, or the Save As button. The Save As function allows you to save the Feature List under a different file name.

6.1.5 Downloading the Feature List to the CMT Field Unit

Once you have established a Feature List, the list can be downloaded to your GPS unit to facilitate field data collection. The Feature List can be attached to a Feature file via the GPS/Job Setup option and downloaded automatically with the Feature file. Feature Lists can also be downloaded to the GPS unit separately.

6.2 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-GIS does not allow duplicate feature names, so the newly duplicated feature must be renamed before saving the updated feature list.

Section 7 - Modifications under the View Menu

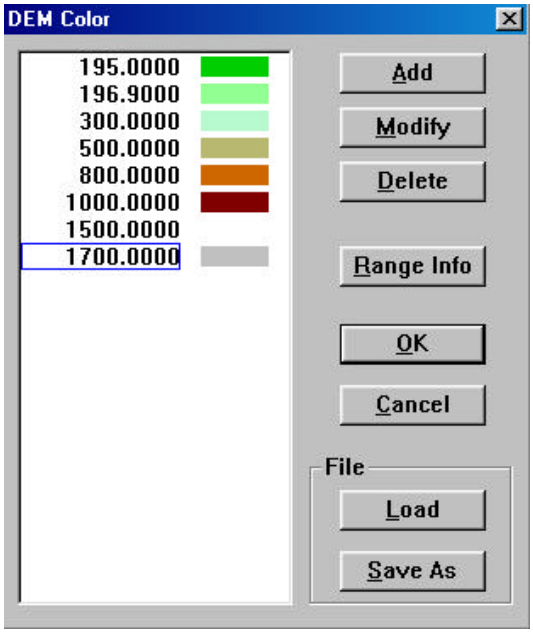
7.1 View/Basemap/CDM Directory

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).

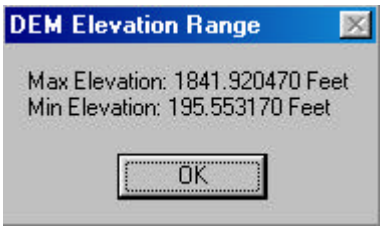
Standard DEM/SDTS files must be converted to the CMT CDM format before they may be used by PC-GIS. This conversion involves two steps because the standard DEM/SDTS files use the UTM coordinate system while PC-GIS requires the CDM files to be in the LLA system.

7.2 View/Basemap/DEM Color Setup

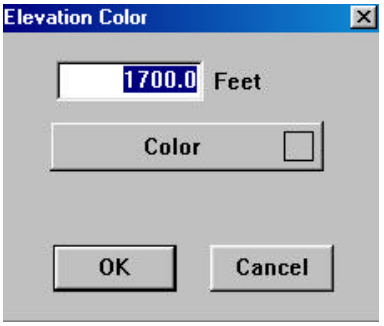
The DEM Color Setup option is used to manually define your own color gradient from lowest to highest elevations displayed in the CMT CDM data. When this option is selected, the following dialog window appears:



Click on the **Range Info** button to let PC-GIS 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:



7.3 View/Basemap/DEM Ramp Setup

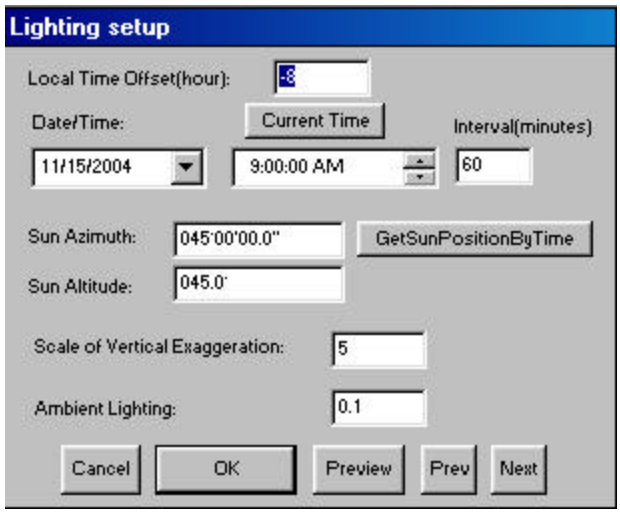
This option is to define the color “ramp” for DEM data displayed in PC-GIS. When using the color ramp mode, the minimum and maximum elevations are calculated by PC-GIS using the CDM data for your Map and presented to you.

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

7.4 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).

7.5 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.

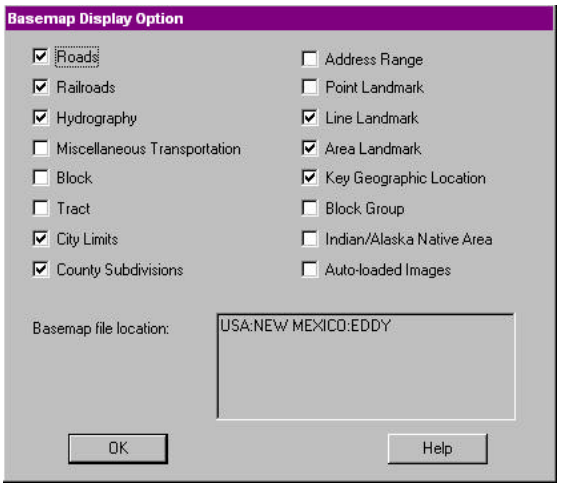
c) **By DEM Color Setup**: This choice indicates that the color scheme to be used for the different elevations on the current CDM data will be dictated by the "DEM Color Setup" option.

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).

7.5.1 BaseMap Options

The **View/BaseMap/BaseMap Option** command is available only when the BaseMap display is active. To turn on the BaseMap display, simply click on View\BaseMap\Display BaseMap.



The View\BaseMap\BaseMap Option command provides check boxes for the various categories of items (shapes) available in a basemap. To turn off a particular category of basemap items, simply unmark the associated box. Turning off the items that you don't really need will help speed up the BaseMap loading process. Please note that selecting Block, Block Group and Tract will obscure the City Limits, County Subdivisions and Indian/Alaska Native Area layers.

When **Roads** and **Address Range** are selected, placing your mouse pointer near any road will display the address ranges associated with that road. You can use Utilities\Search Basemap and Utilities\Search Address (see Section 8.2.1) to locate a specific address on the displayed basemap.

The option for **Auto-loaded Images** can be used for automatic loading of USGS topographic quad maps (DRG's) along with your BaseMap data.

In order to use this BaseMap option, you must first load the desired image and then choose the **Utilities/Encode Image for Auto-Loading** option to create a *.img file and place it with your BaseMap data.

For auto-loading of multiple images, you will need to manually create the *.img file. You will also need to put all of the DRG files for the BaseMap county of interest into the correct folder.

Example: Washington County, Oregon

1) Copy all DRG files for Washington County, Oregon to the \basemap\usa\or folder.

Please note: Since the DRG file size is very large for each county, it is recommended that you put the BaseMap files and the DRG files on your local hard drive. Additionally, it is a good idea to put the DRG files to your local hard drive because a rotation file (*.ROT) may need to be created to properly display the DRG files. A CD-ROM or remote disk may have limitations to create these rotation files.

2) Prepare the *.img file.

a) Open a blank .map file (or .fmp file for Forester's Toolkit).

b) Set the Coordinate System, Datum, Zone and Units of the blank map file to match that of the DRG files (typically UTM, NAD 27 CONUS).

c) Import each of the DRG files for Washington County into that map file.

d) Make sure the control points are not being displayed in the Map View. If they are on, they will appear as red crosses in each corner of the DRG.

e) Save the file as a .map file with the following naming convention: **Mapxxyyy.map** where **xx** is the state index and **yyy** is the county index (see below). For Washington County, Oregon the file name would be: map41067.map (or map41067.fmp for file used in the Forester's Toolkit version of PC-GIS).

f) Rename the file in Windows Explorer to have the extension: *.img. For Washington county, Oregon the file name would be: map41067.img

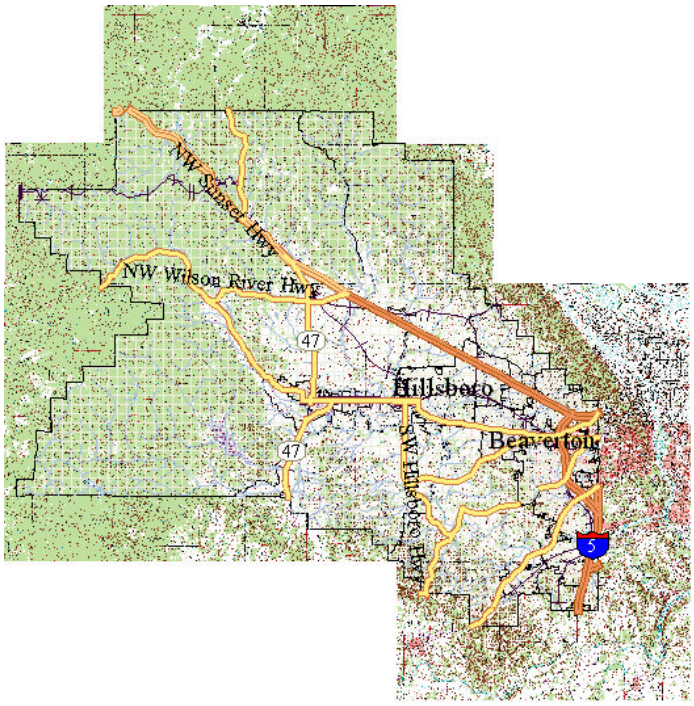
g) Make sure that the *.img file that you just created is in the basemap/usa/or folder.

You can use the following method to get the **xx** and **yyy** values if you do not know them:

a) Copy the file bnd??.bm from the basemap/usa folder to a temporary folder and rename it to: bnd??.map (or bnd??.fmp) where ?? is the state abbreviation.

b) Use PC-GIS to open the bnd??.map file. Look in the Sheet View to find the specific county you are working with. Under the column "map_name" you can find the correct index to be used for naming the *.img file.

3) With the BaseMap displayed and the **Auto-loaded Images** box checked, the DRG files will be displayed along with the BaseMap. Following is a *sample Map View of Washington County, Oregon*.



Please note: Any polygons in the BaseMap will be automatically converted to a transparent fill pattern for easy viewing of the DRG data in the background.

7.6 Default Coordinate System for Importing DXF Files and Georeferenced Images

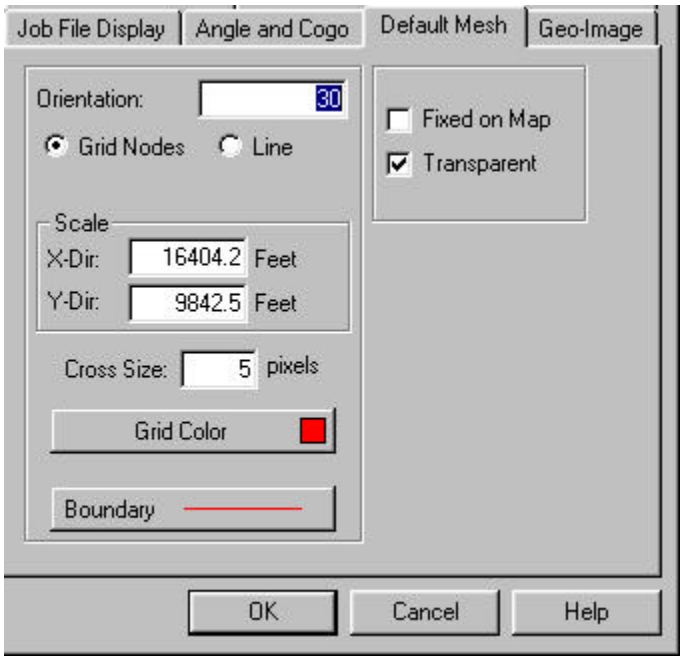
Use the View/Configure menu option and select the **Default Coordinate System** tab to select a coordinate system of your choice. This coordinate system will be used for creating new map files and also when importing DXF files and georeferenced images.

7.7 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.

7.8 Default Mesh Settings

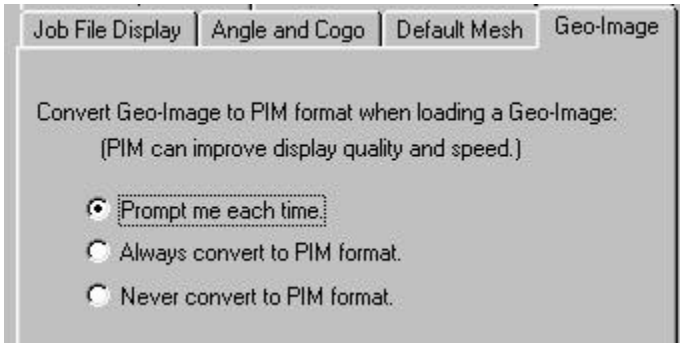
Set the defaults for the “Grid” or “Mesh” under the View/Configure menu option and then clicking on the **Default Mesh** tab. The following menu is displayed:



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

7.9 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-GIS 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-GIS will not display the prompt for conversion to .PIM format.

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

INDEX