


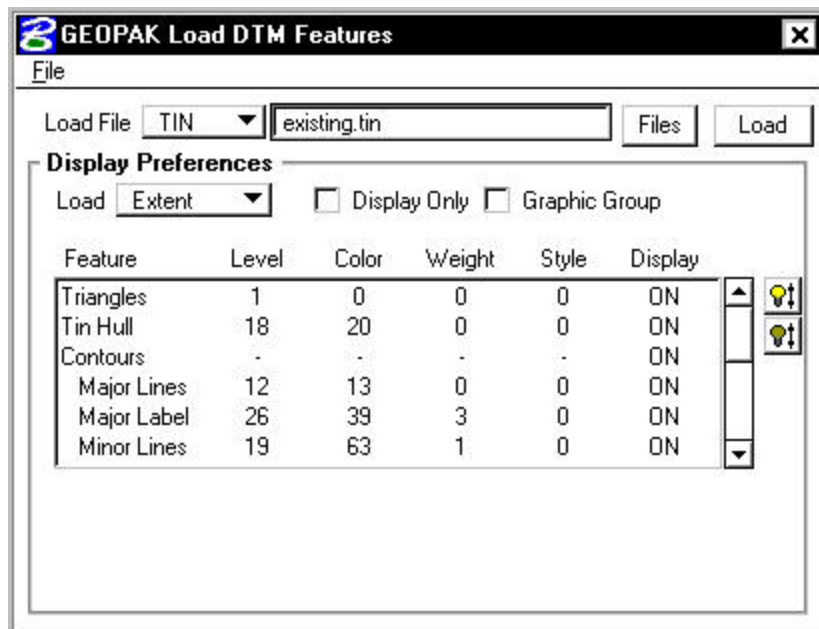
Display and Draw Features

7.1 Overview

Feature / Function	Display or draw DTM features, such as contours, triangles, lattices, voids, islands, etc.
Tool	
DTM Menu Bar	Load > DTM Features

GEOPAK supports a wide variety of options to provide the user with maximum flexibility when drawing and displaying DTM Features, all within a single dialog. The source data can be the DAT file, TIN file or Lattice file. Features can be display only or drawn into the MicroStation file. Features for part of a model can be displayed or drawn by the placement of a MicroStation fence prior to processing.

The default dialog is depicted below.

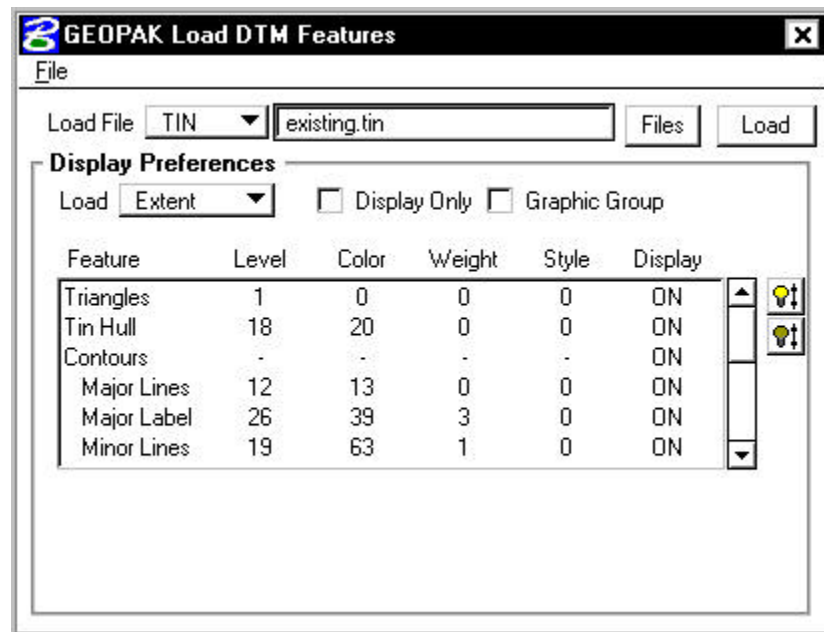


Different DTM Features can be loaded, depending on the type of source file. As the file is selected, the DTM Features automatically change to reflect the selection. The table below illustrates which DTM Features are supported for each file type.

DTM Feature	DATA	TIN	LAT
Spots	X	X	X
Break Lines	X	X	
Extd. Contour Lines (inplace contours if extracted)	X	X	
Voids	X	X	
Islands	X	X	
Holes	X	X	
Boundary	X		
Triangles		X	
Hull (outer border of the triangulated model)		X	
Vertical Edges		X	X
Contours (based on model, not extracted data)		X	X
Lattice			X
Lattice X Lines			X
Lattice Y Lines			X

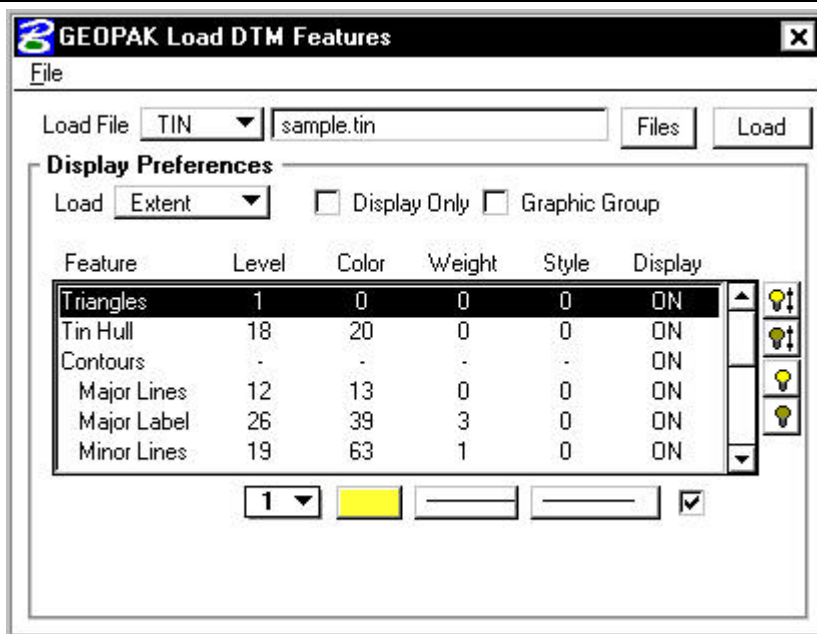
7.4 Load DTM Features Dialog

The Load DTM Feature dialog is depicted below.

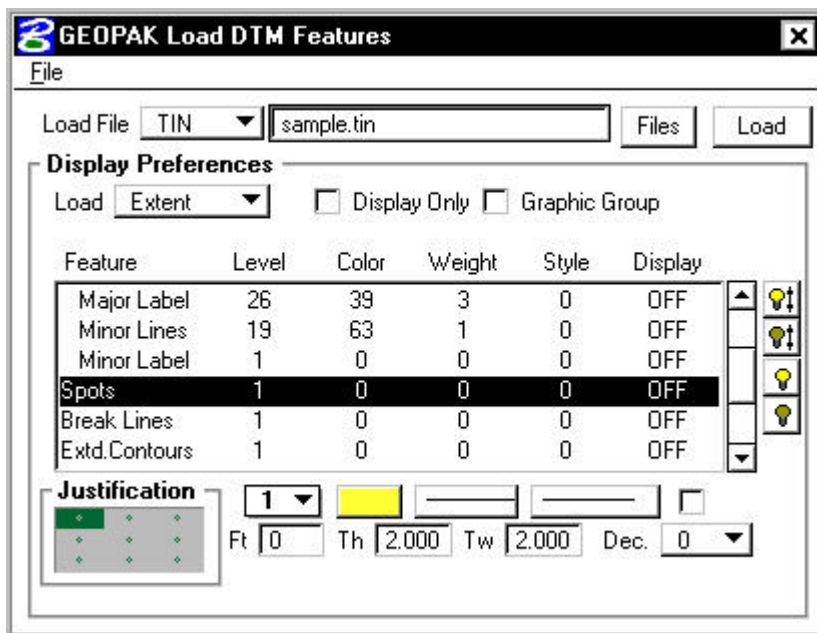


The table below discusses the general aspects of the dialog.


<p>Load File: Data TIN Lattice</p>	<p>Various types of DTM Features can be displayed or drawn, dependent on the type of source file. As this is changed, both the DTM Feature options and the File Name option are dynamically changed to reflect the current selection.</p>
<p>Data File Name TIN File Name Lattice File Name</p>	<p>This setting is determined by the selected Load From option. If the Load From option is set to Data, then Data File Name is displayed. If the Load From option is set to TIN, then TIN File Name is displayed. This file is used as the source for the data to be drawn or displayed. In lieu of typing in the File Name, pressing the Files button invokes the Files dialog, wherein the desired (optional) path and file name may be selected.</p>
<p>Load: Extend For Fence For View</p>	<p>Features for an entire model can be drawn utilizing the Extent option, while partial model features can be accomplished by the Fence option. Regardless of the MicroStation Fence option selected, the overlap method will be utilized. When utilizing the Fence option, the MicroStation fence must be placed prior to pressing the Load button. The View option draws only features within the current view.</p>
<p>Display Only</p>	<p>When this toggle is activated, elements are not drawn into the MicroStation file and disappear when an update or view control command is issued. When not activated, elements are drawn into the file at the specified element symbology.</p>
<p>Graphic Group</p>	<p>When activated, all elements placed within a single processing (each pressing of the Load button) are placed into a graphic group for easy manipulation and / or deletion.</p>
<p>DTM Feature Symbology List Box</p>	<p>As each File type is selected, the Feature list box changes dynamically to display supported features. With each feature is element symbology options (Level, Color, Weight, and Style) and display mode (on/off). As each feature is highlighted, its element symbology is displayed directly below the list box. Note the toggle to the right of the element symbology indicates whether the display is on (toggle is on) or off (not toggled.) For example, when Triangles is selected, the dialog is displayed as depicted below.</p>



The symbology can be changed by editing the fields below the list box. If the feature requires text (i.e., spots) the dialog dynamically changes as depicted below when the feature is highlighted.

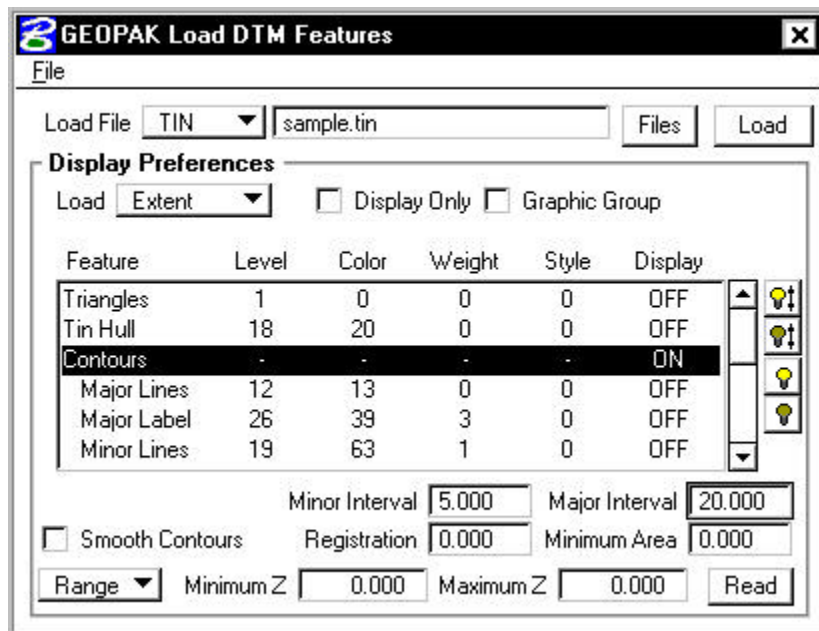


Text parameters (Font, Text Height, Text Width, Number of Decimal Places and Justification) may be defined or modified. Contours require additional parameters and are discussed in the following section.

	<p>The bright light bulb (top) activates the display for all features, regardless of their current status. The darkened bulb (second one down) deactivates the display for all features, regardless of their current status. The bottom two light bulbs activate and de-activate the highlighted feature. Note clicking on any feature places the associated data directly below the list box AND changes the display parameters from its current status. Note the toggle to the right of the element symbology indicates whether the display is on (toggle is on) or off (not toggled.)</p>
<p>Load</p>	<p>Commences the drawing or displaying of DTM Features.</p>

7.4.1 Defining Contour Symbology

Contours can be drawn from either the triangulation or lattice models. From either the model, you may differentiate between major and minor contour intervals. In addition, contours may be drawn with or without elevation labels. Other optional features include contour registration, the ability to define a minimum and maximum elevation range about which contours are to be drawn, the option of drawing contours within a user-defined area via the MicroStation Fence commands, and drawing contours as a MicroStation graphic group. The Contour Symbology is invoked when **Contours** are highlighted in the Feature list box as depicted below.

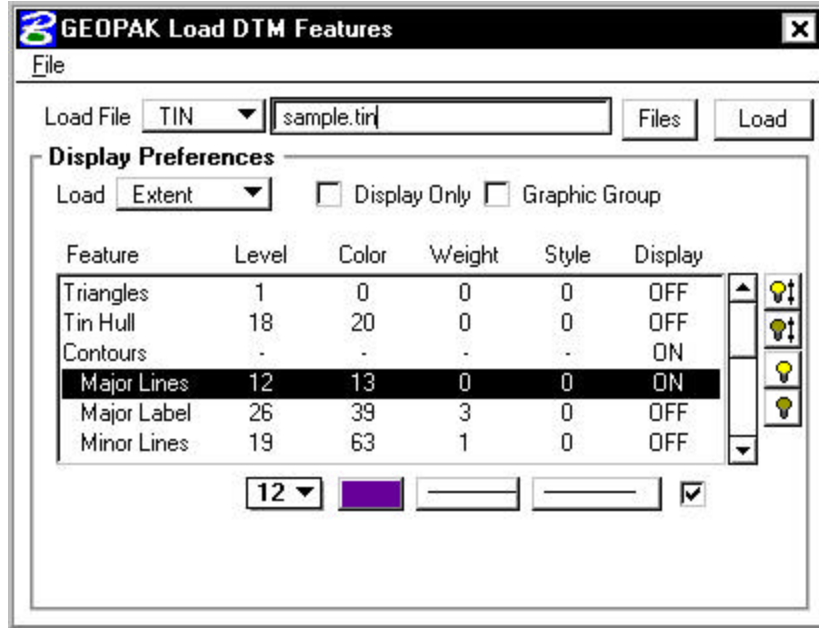


<p>Major Interval Minor Interval</p>	<p>Major contour intervals should be even increments of minor contour intervals. For example, a minor contour interval of 2 and a major contour interval of 10 would be reasonable. Every fifth contour element would reflect the level, symbology and text attributes defined for major contours. Conversely, a minor contour interval of 2 and a major contour interval of 5 would not be reasonable since 5 is not an even increment of 2.</p>
<p>Registration</p>	<p>Contour placements are dictated by the major and minor intervals. These placements can be offset by the value typed into the Registration keyin field. The elevations at which contours are drawn equals the Minor Interval plus the Registration value. For example, a Minor Contour Interval of 10 and a Registration value of 0.0 will result in contours drawn at elevations 10, 20, 30, etc. However, a Minor Contour Interval of 10 and a Registration value of 0.5 will result in contours drawn at elevations 10.5, 20.5, 30.5, etc.</p>
<p>Range or Single Min Z and Max Z Read</p>	<p>Contours may be constrained to a single elevation, or specific elevation ranges via the Minimum Z and Maximum Z keyin fields. For example, if the elevations in the DTM model ranges from 45.0 to 135.0 meters and the Minimum Z is set to 70 and the Maximum Z is set to 100, then only contours between 70 and 100 meters will be drawn. However, by pressing the Read push button to the right of the Max Z keyin field, GEOPAK will scan the specified Lattice or TIN file, determine the minimum and maximum elevation and fill in the keyin fields.</p> <p>Another option is a single elevation. When selected, a keyin field is visible to key in the desired elevation. Only contours of the specified elevation are drawn.</p>
<p>Smooth Contours</p>	<p>When activated, the contours are smoothed, particularly effective if the polynomial mode within latticing was utilized.</p>

Note that no element symbology has been defined. That is accomplished within the Lines symbology.

7.4.2 Defining Contour Lines Symbology

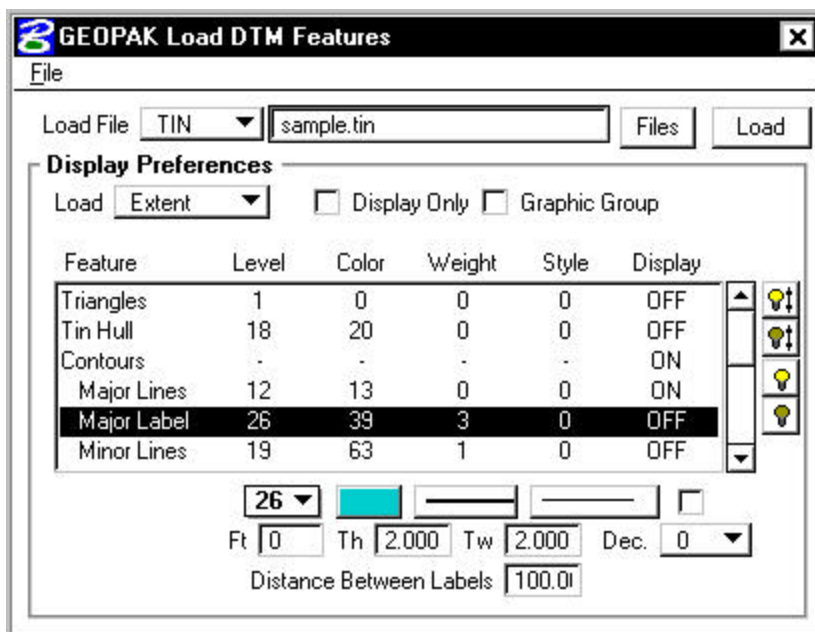
When Major Lines or Minor Lines are highlighted, the dialog changes to reflect the selection as depicted below.



Only the symbology for the actual contour is identified within this dialog. The label is a separate sub-feature.

7.4.3 Defining Contour Label Symbology

When the Major or Minor Label sub-features are selected, the dialog changes as depicted below. Note that drawing of labels is independent of the contour lines. In addition, the user can specify major labels, minor labels, or both.



Element Symbology: Level, Color, Weight, Style	Utilized to draw textual labels.
Text Parameters: Font, Text Height, Text Width	Utilized to determine text size of labels.
Decimal Points	Care should be given to the selection of decimal places in terms of the major and minor intervals. For example, if the minor Interval is set to 0.5, yet the decimal places is set to 0, the software will round off the contour labels. Conversely, if the Major Interval is 5, while the Minor Interval is 1, utilization of decimal points greater than zero (e.g. one) would produce labels such as 5.0, 10.0, etc. making the label longer than necessary.
Distance Between Labels	Defines the distance between contour elevation labels measured along the longitudinal length of the contour.

7.4.4 File Options

the upper right corner of the dialog has the standard File options including:

- **Open** - select a previously stored set of DTM feature settings.
- **Save** - saves the current DTM features as default, however, no file is created. They are displayed in subsequent sessions, but cannot be retrieved with the Open command.

- **Save As** - saves the current DTM feature settings to an LDF file (default) for retrieval in a subsequent session or by other users. To select the file in future sessions, utilize the File > Open option.

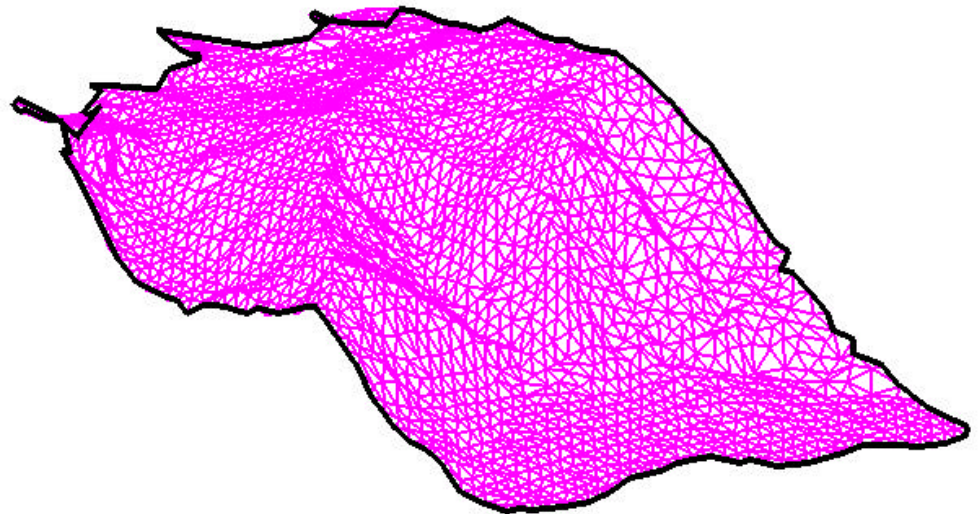
Once a file is saved, it is added to the bottom of the File pulldown menu.

7.5 DTM Feature Examples

The following are examples of the wide variety of DTM Features in various views. Note that the examples are not all inclusive.

7.5.1 Hull and Triangles

The image below depicts the triangulated model (in isometric view) as well as the corresponding hull. The hull is displayed bold for clarification.



7.5.2 Contours

Contours can be derived from the TIN or lattice grid mesh. The resulting contours are shown below.

