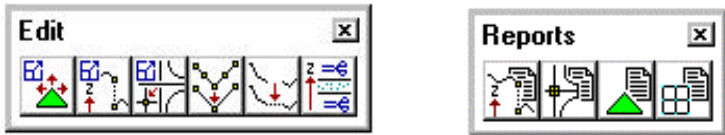# DAT File Editing Tools

5.1   Overview

Feature / Function	Generate reports and / or edit the DAT File prior to generating the triangulation model.
Tools	

A wide variety of DAT file editing tools are supported within GEOPAK. It is preferable to edit prior to creating the TIN model. If the TIN model needs to be regenerated, all TIN editing changes are lost. However, if changes are made to the DAT file are made, and the Tin model is regenerated, the changes are utilized within the TIN generation.

Two reports can be generated:

- Report Duplicate Points - reports duplicate points, i.e., those with coincident x, y coordinates.
- Report Crossing Features - reports intersecting break lines or contours.

Both reports utilize the extracted data file (*.dat), however, they do not make changes to the file. Hence, they are simply reporting functions.

The Join Linear Feature is useful when the source break line or contour line consists of several elements containing numerous vertices. In these cases, the end of one break line is the beginning of the next break line, so the software utilizes this as two separate break lines. During the Joining process, GEOPAK changes these from the beginning and end of individual elements to the beginning and subsequent shots of one element.

The Filter Data File features tool removes vertices from break or contours lines when located within the specified tolerances of another vertex.

The Data Z Clip filters the data file to include (or exclude) data based on elevations.

The Break Line editor locates intersecting break lines, dynamically displays both graphic and coordinate data, then prompts the user for corrective action.

Another useful editing tool is the Edit Duplicate Points. Duplicate points are defined as two or more points with identical X, Y values. Their corresponding Z values may or may not be identical. In contrast to the Report Duplicate Points, which only provides a report, the Edit Duplicate Points provides interactive editing.

5.2 Report Duplicate Points

Feature / Function	Create a report of duplicate points. Note this feature has no editing capabilities.
Tool	
DTM Menu Bar	Reports > Duplicate Points

The Report Duplicate Points dialog produces an ASCII file report listing duplicate points. Two types of messages are supported. If the x, y, and z coordinates of the point are coincident, the report simply lists the point and its coordinates. However, if the x and y coordinates are coincident, but the z values are different, an ERROR message is given. Once again, the point coordinates are listed. When the Report Duplicate Points is accessed, the following dialog is displayed:
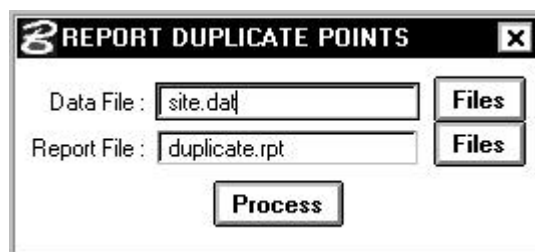
The user specifies the name of the data file, or optionally can select the **Files** button, which activates the MicroStation File Manager to select the desired file name. The name of the ASCII file which the software will utilize to write the report must also be specified or selected from the File Manager dialog. When the **Process** button is pressed, the process commences. A sample fragment of the report is shown below.

```
**********************************************************
**
**   GEOPAK Duplicate Data Point Report
**
```

```
**********************************************************
**
**   Fri Jul  1 12:05:39 1994
**
**   Data File : site.dat
**   Number of Data Points =  37543
**       Minimum       Maximum       Range
**     ============ ============ ============
**   X   530167.733   532606.100     2438.367
**   Y  1331889.312  1333649.266     1759.954
**   Z      113.880      141.800       27.920
**
**   Number Of Duplicates =  32927
**
**   Errors Detected In Duplicate Data
**
**          Point  36634 :   1   530473.921  1332213.537     125.400
**   ERROR  Point  36635 :   1   530473.921  1332213.537     124.600
**          Point  37087 :   1   530473.921  1332213.537     125.400
**   ERROR  Point  37088 :   1   530473.921  1332213.537     124.600
**          Point  37540 :   1   530473.921  1332213.537     125.400
**   ERROR  Point  37541 :   1   530473.921  1332213.537     124.600
**

**********************************************************
```
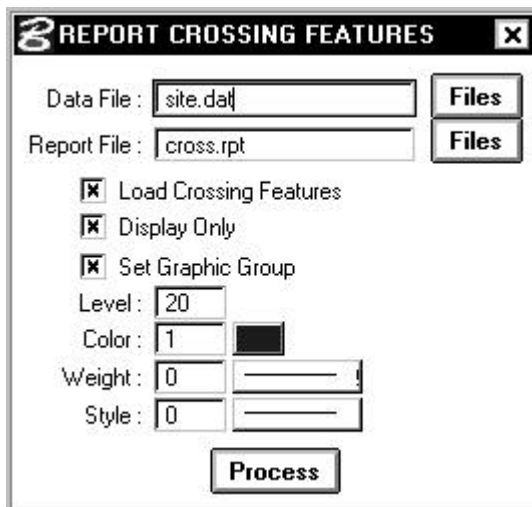
5.3 Report Crossing Features

Feature / Function	Create a report of intersecting features. Note this tool has no editing capabilities.
Tool	
DTM Menu Bar	Reports > Crossing Break Lines

The Report Crossing Features tool scans the DAT file and generates a list of intersecting break lines or intersecting contours. The report lists the number of intersections, the vertices of each crossing element, and the interpolated x, y, z coordinates of the intersection, even though it may not be a vertex on either feature. When the Report Crossing Break Lines is accessed, the following dialog is displayed.

REPORT CROSSING FEATURES

Data File : site.dat   [Files]

Report File : cross.rpt   [Files]

[X] Load Crossing Features

[X] Display Only

[X] Set Graphic Group

Level : 20

Color : 1

Weight : 0

Style : 0

[Process]

The user specifies the name of the data file, or optionally can select the **Files** button, which activates the MicroStation File Manager to select the desired file name. The name of the ASCII file which the software will utilize to write the report must also be specified or selected from the File Manager dialog. When the **Process** button is pressed, the procedure commences. A sample fragment of the report is shown below:

```
*******************************************************
**
  GEOPAK Crossing Features Report
**
*******************************************************
**
**   Fri Jul  1 11:52:50 1994
**
**   Data File : site.dat
**
**   Number of Data Points =  36184
**      Minimum        Maximum          Range
**     ============ ============ ============
**   X   530167.733   532606.100     2438.367
**   Y  1331889.312  1333649.266     1759.954
**   Z      113.880      141.800       27.920
**
**   Number Of Duplicates =  31571
**
**   Number Of Break Lines   =    9046
**   Number Of Contour Lines =       0
**
**   Intersecting Lines
==   Point No =    27319   3   531329.645  1332508.978      120.000
==   Point No =    27320   3   531343.225  1332498.505      120.000
##   Point No =    35166   3   531335.256  1332494.760      120.000
##   Point No =    35167   3   531346.645  1332500.629      120.000
**   Intersection =    531342.944  1332498.722
**
**   Intersecting Lines
```
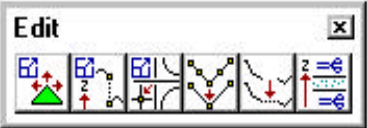
```
==  Point No =    27314   3   531329.645  1332508.978      120.000
==  Point No =    27315   3   531343.225  1332498.505      120.000
##  Point No =    35166   3   531335.256  1332494.760      120.000
##  Point No =    35167   3   531346.645  1332500.629      120.000
**  Intersection =    531342.944  1332498.722
```

In addition, the crossing features are displayed visually on the screen for the user to review.

5.4   Joining Linear Features

Feature / Function	Utilizing the DAT file, join linear data.
Tool	
DTM Menu Bar	Edit > Join Linear Features

The Join Linear Feature is useful when the source break line or contour line consists of several elements containing numerous vertices. In these cases, the end of one break line is the beginning of the next break line, so the software utilizes this as two separate break lines. During the Joining process, GEOPAK changes these from the beginning and end of individual elements to the beginning and subsequent shots of one element.

The dialog for Join Linear Features is depicted below:
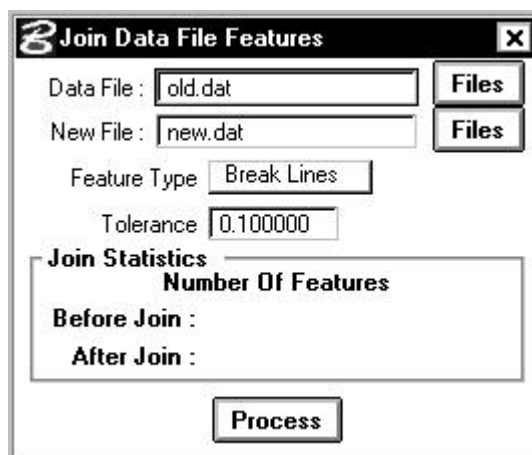
The user must specify the data file to be utilized for Joining as well as the name of the new data file to be created. Two **Feature Types** are supported as depicted in the exploded view below.
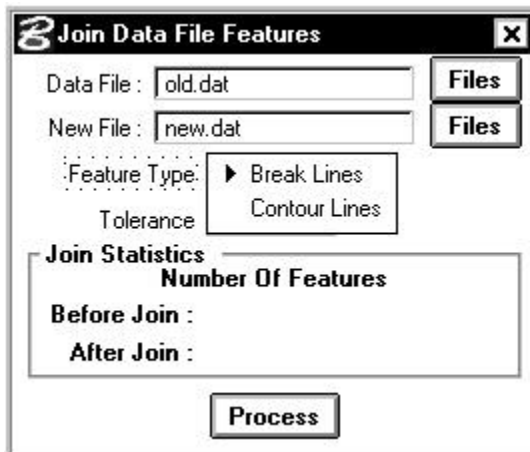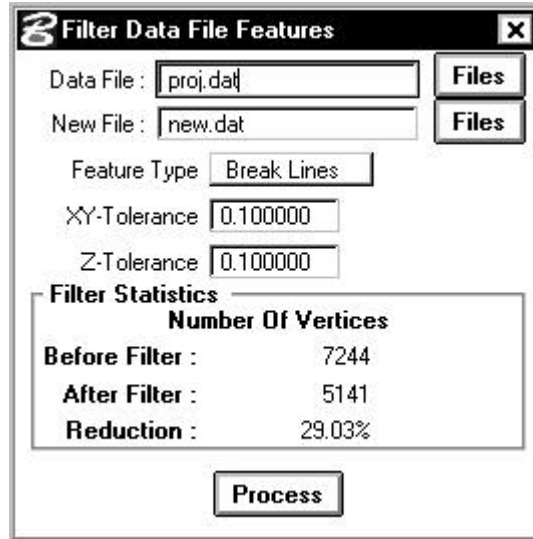
GEOPAK® _____

If the distance between the vertices of two elements is less than the specified **Tolerance**, GEOPAK creates a single element. If the distand is greater than the Tolerance, the two elements are not joined.

Pressing the **Apply** button commences the procedure. When complete, the Join Statistics are displayed in the dialog.

5.5 Filtering Vertices

Feature / Function	Utilizing the DAT file, filter vertices within linear data.
Tool	
DTM Menu Bar	Edit > Filter Linear Features

The Filter Vertices tool removes vertices from break or contours lines when located within the specified Tolerance of another vertex. The dialog is depicted below.

In order to maintain the integrity of the original data file, two fields are supported. The **Data File** indentifies the original GEOPAK .dat file, while the filtered file is specified in the **New File** field. In lieu of typing existing file names, pressing either **Files** button invokes the Files dialog, wherein the desired file may be selected.

Two Feature Types are supported: **Break Lines** and **Contour Lines**. Two tolerances, (specified in terms of master units, i.e., feet or meters) are supported: **XY-Tolerance** and **Z-Tolerance**. GEOPAK compares three consecutive points on the linear feature as depicted in the graphic below.
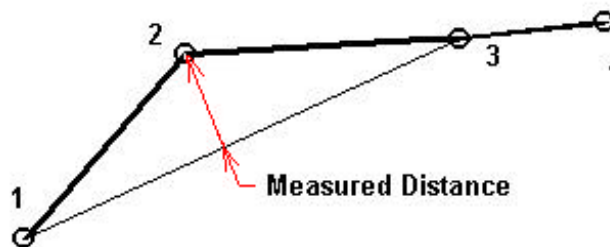
The heavier weighted line depicts a break line with three vertices. GEOPAK connects the first and third vertices, then measures the distance in a horizontal plane as depicted above. If the distance is greater than the **XY Tolerance**, then the point is NOT filtered out. If the distance is less than the **XY Tolerance**, then the **Z Tolerance** is considered. The vertex is removed only if the following conditions are all satisfied:
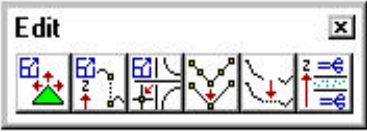
- Measured Distance (measured horizontally) < **XY Tolerance**

- Absolute Value (elevation of 1 - elevation of 2) < **Z Tolerance**
- Absolute value (elevation of 2 - elevation of 3) < **Z Tolerance**

When the testing on the three vertices (1,2,3) is complete, GEOPAK repeats the process for vertices 2, 3, and 4.

Pressing the **Apply** button commences the procedure. When complete, the Filter Statistics are displayed in the dialog.

5.6 Data Z Clip

Feature / Function	Utilizing the DAT file, remove extraneous or erroneous data based on elevation ranges.
Tool	
DTM Menu Bar	Edit > Z Range Clip

Another editing feature is Data Z Clip and utilizes the data (*.dat) file. Its function is the filtering of a data file to include (or exclude) data based on elevations. The dialog is depicted below.
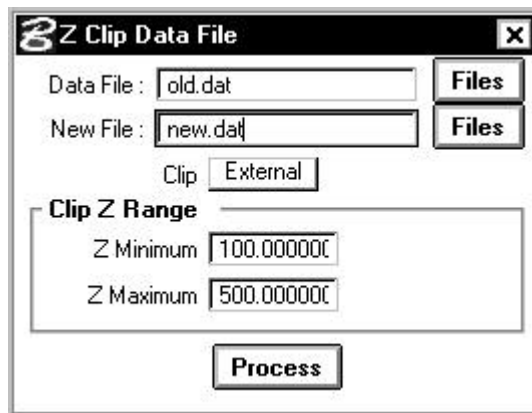
The **Data File** is the original DAT file, either binary or ASCII format, while the **New File** is the name of the clipped DAT file, which is in binary format. A New File is created in order to maintain the integrity of the original DAT file. In lieu of typing in the file, pressing the **Files** button invokes the Files dialog, wherein the desired file may be selected. The Clip Z Range group box contains the **Z Minimum** and **Z**

Maximum fields which identify the elevation range (in master units) of the clipping.

Two Clip options are supported: **External** and **Internal**. When the **External** option is utilized, all data external or outside of the specified range is excluded from the **New File**. For example, in the dialog above, any spot elevation or vertex on a break line not in the 100 - 500 master unit range would be eliminated. Therefore, a spot elevation of 99.5 or a vertex of a break line at 501.00 would not be included. Note if some vertices of a break line are in the range and some are outside, the entire break line is not eliminated, only the particular vertices which are outside the range. When the **Internal** option is selected, all data within the specified elevation range is eliminated from the new file, leaving only the data outside the range within the **New File**.

5.7 Edit Break Lines

Feature / Function	Utilizing the DAT file, edit crossing linear features.
Tool	
DTM Menu Bar	Edit > Crossing Break Lines

Break lines have been utilized in other editing tools, namely, Report Crossing Features and Insert Break Lines. However, another useful tools is the Break Line Editor. The Break Line editor locates intersecting break lines, dynamically displays both graphic and coordinate data, then prompts the user for corrective action. The dialog is depicted below.

_____
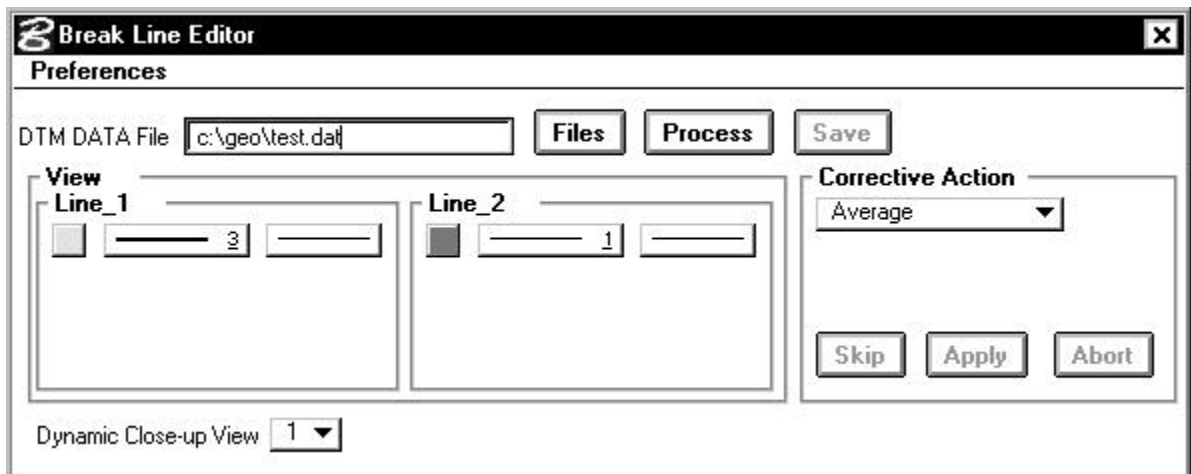
Before any processing occurs, select **Preferences > Tolerances** to invoke the dialog depicted below.


Activate the toggle and key in the value of the desired tolerance.

The Break Line Editor dialog has a keyin field for the DAT (not TIN) file name. In lieu of typing, pressing the **Files** button invokes the Files dialog, wherein the desired file may be selected. In the lower left corner, the user specifies the view where errors are displayed in close up view. If the specified view is not active when the first error is encountered, GEOPAK will open the view. In the center of the dialog, a group box for Line 1 and Line 2 are displayed. Separate element symbology fields are supported. As corrective action and error display is based on color, unique colors should be selected for each line. Display fields for coordinates, and type of feature (i.e., contour or break line) are provided. The Corrective Action group box is located on the far right side of the dialog.

Upon pressing the **Process** buton in the Break Line Editor dialog, GEOPAK will scan the DAT file and locate intersecting break lines and / or contours. At the intersection, the elevations of the two elements is computed and compared. If the elevation difference at the intersection of the two elements is less than the specified tolerance, the two are averaged, and the average is utilized for the model. If the elevation difference is greater than the tolerance, it flags the intersection as an error and the processing stops, waiting for user input for corrective action. If errors are encountered, the coordinates of the intersection are displayed in the dialog, while the graphic intersection is displayed in the Dynamic Close Up View. The graphics below depict both the dialog and corresponding view of a problem area.
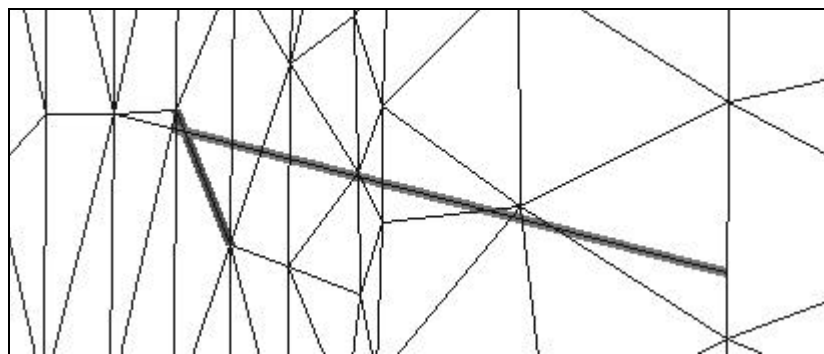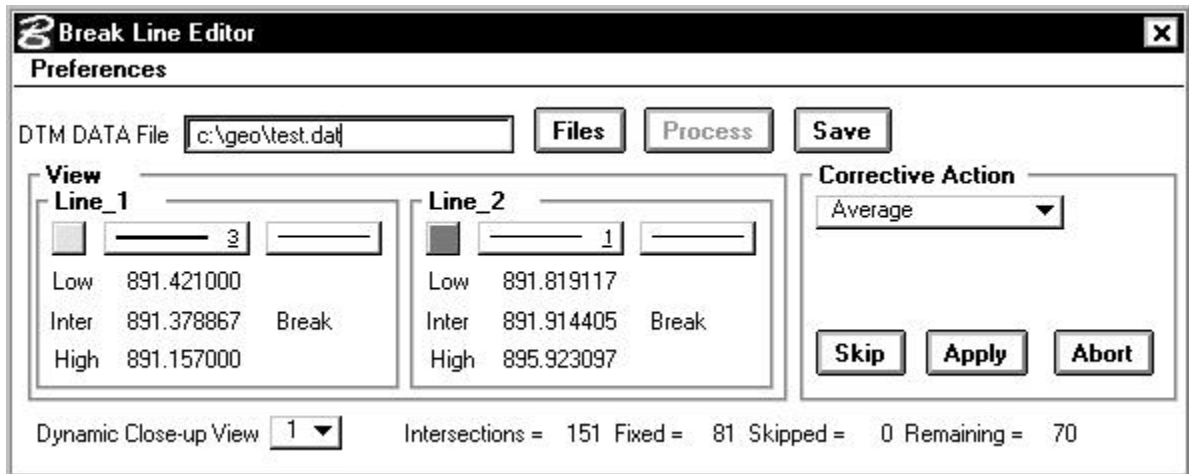
Note the information displayed at the bottom of the dialog. It includes the number of **Intersections** in the DAT file, how many GEOPAK **Fixed** (i.e., either by averaging if the elevation difference was less than the tolerance or user corrective action), how many have been **Skipped** and the number **Remaining**. The option to **Skip** (ignore a particular intersection with no corrective action being taken) is located in the bottom of the Corrective Action group box. **Abort** will discontinue the processing, while **Apply** commences the corrective action selected. These options are depicted in the exploded view below.
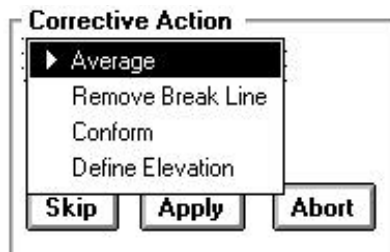

The first option, **Average**, requires no additional user input. The elevations of the two elements at the point of intersection are averaged, then both elements are changed to the computed elevation when the **Apply** button is pressed. A sample dialog is depicted below.

GEOPAK
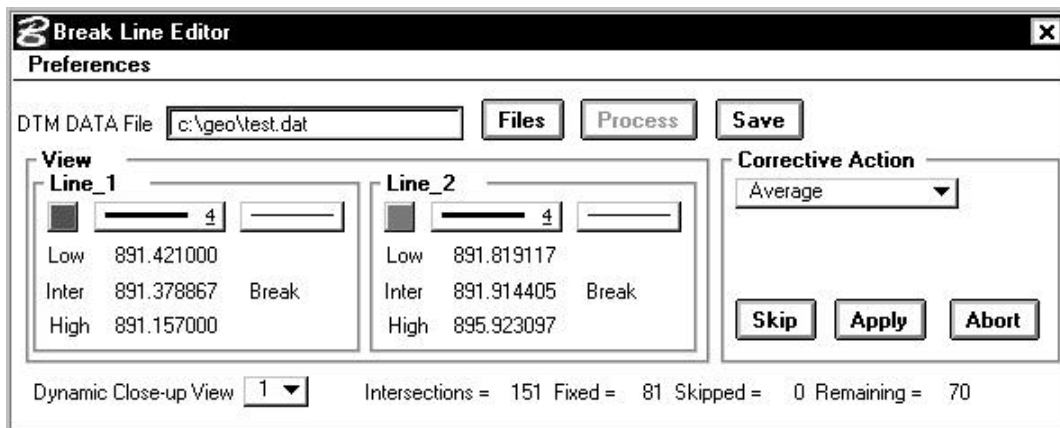
The second option, **Remove Break Line**, requires the identification of which line is to be removed. The Corrective Action group box presents the two options based on color. Activate the toggle to the left of the desired color of the break line to be removed, then press the **Apply** button. A sample dialog is depicted below.
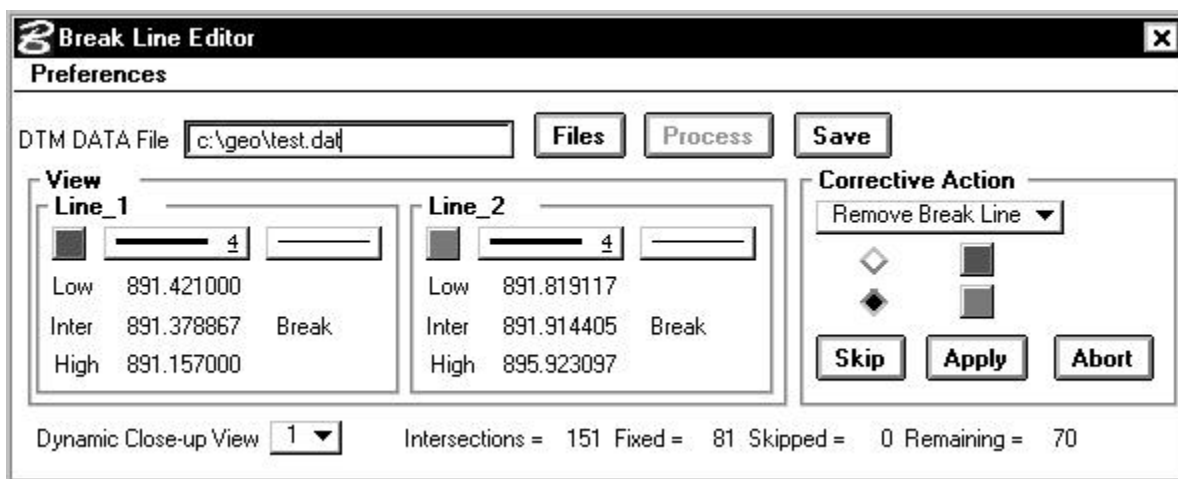
The third option, **Conform**, requires the identification of which line is to be changed to conform to the other. The Corrective Action group box presents the two options based on color. Activate the toggle to the left of the desired conformity, then press the **Apply** button. A sample dialog is depicted below.
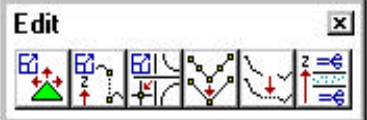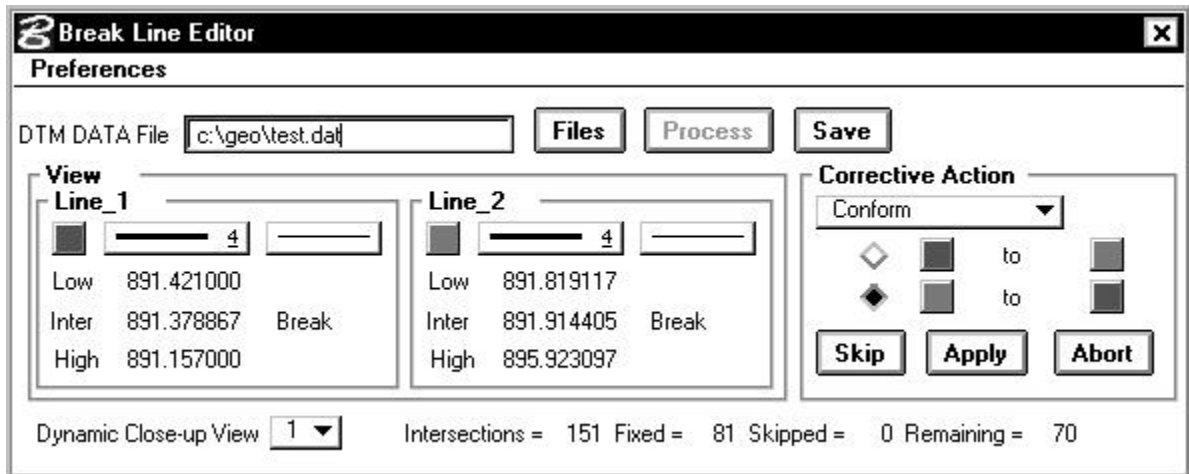
The last option, **Define Elevation**, requires the user to input the desired elevation of the intersection point as depicted in the graphic below. Key in the **Elevation at Inter**, then press the **Apply** button.
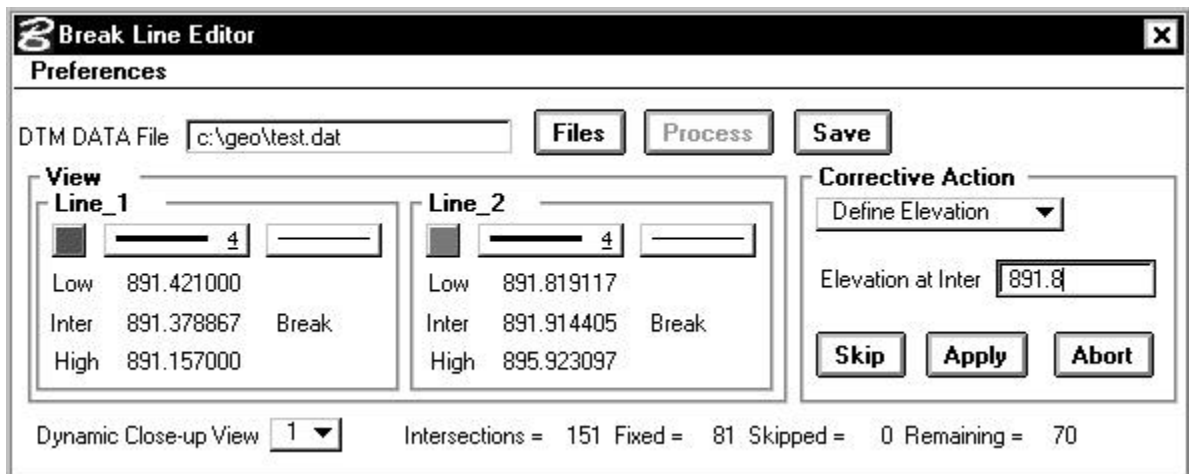

The **Save** button to the right of the **Process** button may be utilized at any time after processing commences and saves the corrective action to the DTM Data file. If the **Abort** button is selected or the dialog is closed prior to activating the **Save** button, all changes made via corrective action are lost.

5.8 Edit Duplicate Points

Feature / Function	Utilizing the DAT file, edit duplicate points.
Tool	

DTM Menu Bar	Edit > Duplicate Points

Another useful editing tool is Edit Duplicate Points. Duplicate points are defined as two or more points with identical X, Y values. Their corresponding Z values may or may not be identical. In contrast to the Report Duplicate Points, which only provides a report, the Edit Duplicate Points provides interactive editing. The dialog is depicted below.
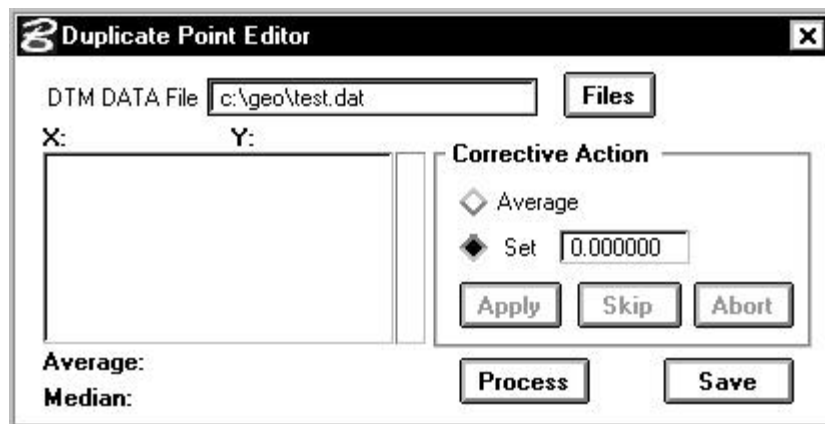
Similar to the Break Line Editor, the Duplicate Point Editor utilizes the **DTM Data File**, whose name may be typed in. In lieu of typing, pressing the **Files** button invokes the File Manager, wherein the desired file may be selected. To begin the procedure, press the **Process** button. GEOPAK will scan the file, stopping at duplicate points as depicted in the graphic below.
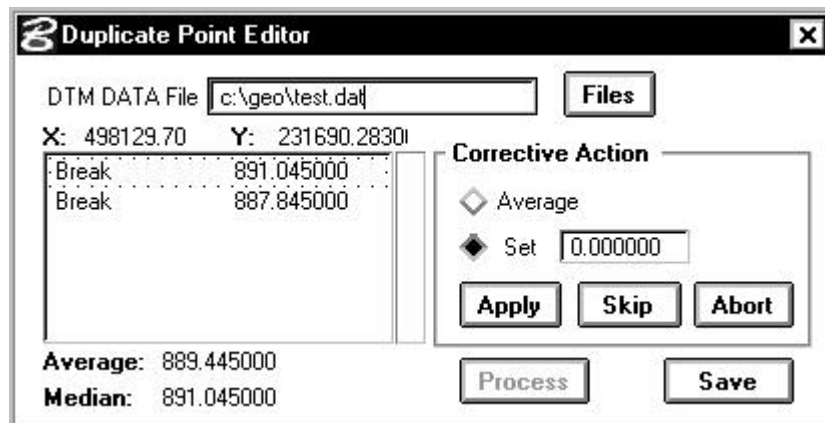
The list box on the left side of the dialog lists the type of feature (i.e., break, spot elevation, etc.) and the two elevations. The **X** and **Y** coordinates are displayed directly above the list box, while the Average and the Median are displayed directly below. The right side of the dialog has Corrective Action options: **Average** or **Set**. Activate the

desired toggle, key in the desired elevation if the **Set** option is utilized, then press the **Apply** button to commence corrective action. The **Skip** button ignores the current duplication, and continues scanning with no corrective action taken. The **Abort** button discontinues all processing and closes the dialog. The **Save** button in the lower right corner may be utilized at any time after processing commences and saves the corrective action to the DTM Data file.

If the **Abort** button is selected or the dialog is closed prior to activating the **Save** button, all changes made via corrective action are lost.