Application Description

Recently we were asked if it was possible to create a profile from contour strings, which in actuality are nothing more than polyline features with an elevation value assigned to them. Those familiar with the CEDRA-AVland software know that the [Sections from Contours] command will not only extract a profile but will also extract cross-sections.

In this application, however, the [Sections from Contours] command did not quite do the job. For this particular case, the only points that were desired in the profile were the intersections of the profile alignment with the contour strings.

The [Sections from Contours] command would not only extract these points but would also extract profile points at the keynodes along the horizontal alignment. The [Sections from Contours] command operates on a horizontal alignment, which is a polyline with additional information assigned to it. Whenever a horizontal alignment is processed, the keynodes of the alignment are always included in the processing.

For this application we needed a command that would process a simple polyline feature, intersecting it with polylines in another layer.

The CEDRA Solution

To address the application described above, the [Profile from Contours] command was added to the CEDRA-AVland-CrossSections Toolbar, see Figure 1.

This new command was recently developed to address the application described above and appears at the bottom of the drop-down list.

Profile from Contours Overview

The [Profile from Contours] command operates on the basis that there is a layer containing the profile alignment and another layer containing the contour strings. The profile alignment is a polyline feature that is intersected with polylines in another layer.

Prior to activating the command, the user must select the polyline feature that represents the profile alignment.

> ### Command Of The Month bulletin
>
> *This month's issue discusses how to extract a profile from contour strings (polylines) to create a profile data table or point features.*

Once this has been accomplished, the command can be selected at which point a multi-input dialog box will appear.

In the dialog box, the user will specify the following information:

a. The name of the layer containing the profile alignment.

b. The name of the layer containing the contour strings.
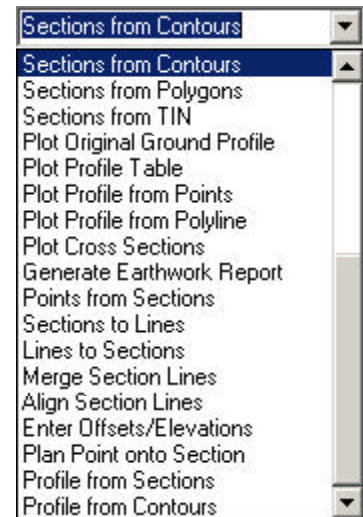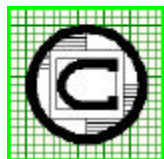
c. The starting station value of the profile alignment.

Figure 1
CEDRA-AVland-CrossSections Toolbar

d. The profile identifier name.

e. Specify whether a profile data table or point features are to be created.

Once the above information has been specified, the command verifies that the requisite information has been properly specified and if so begins its computations. If not, an appropriate error message is displayed. The user then has the option to correct the error and continue with the processing or to abort the command.

Upon completion of the processing, the command will create either a profile data table, which can be processed by other CEDRA-AVland commands, or point features that are stored in the current active layer.
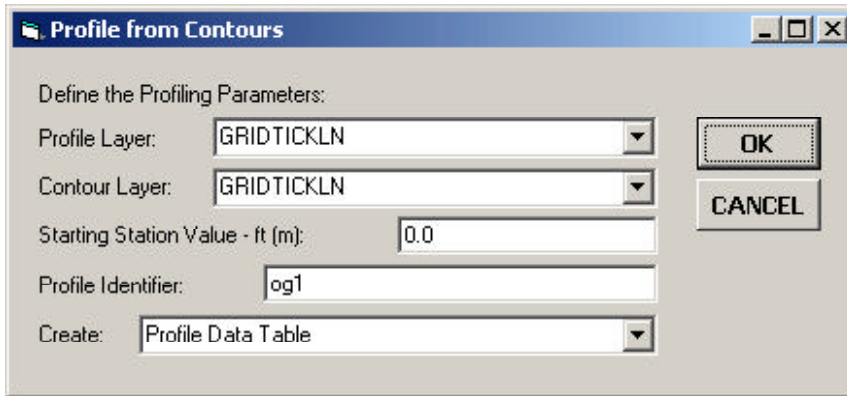
Figure 2
Profile from Contours Dialog Box Parameters

Figure 3
Profile and Contour Names the Same
Error Message

Figure 4
No Profile Alignment Selected
Error Message

Profile from Contours Operation

➤ **1** **Activate** in the Table of Contents the line layer that contains the polyline feature which represents the profile alignment to be processed.

➤ **2** **Select** the polyline feature with the *Select Features from Active Layers* tool, which represents the profile alignment.

➤ **3** **Scroll** down in the {CEDRA-AVland-CrossSections} menu combo box, and **select** the [Profile from Contours] command. At this point the multi-input dialog box shown in Figure 2 will be displayed.

➤ **4** **Scroll** down in the *Profile Layer:* data field, and **select** the layer containing the selected polyline feature which represents the profile alignment.

➤ **5** **Scroll** down in the *Contour Layer:* data field, and **select** the layer with which the profile alignment will be intersected with.

➤ **6** **Enter** in the *Starting Station Value:* data field the desired starting station value. For example, if the starting station value is 10+00, the user should enter 1000. That is to say, omit the + character from the station value.

➤ **7** **Enter** in the *Profile Identifier:* data field name of the profile data table to be created, if any.

➤ **8** **Scroll** down in the *Create:* data field, and **select** the appropriate of the following options:
• **Profile Data Table**, to denote that a profile data table is to be created.
• **Point Features**, to denote that points are to be created.

➤ **9** **Click** at the **OK** button to continue,
or
click at the **Cancel** button to abort the command.

Having clicked at the *OK* button, the command begins to verify the input specified by the user. If an error is detected, a warning message such as that shown in Figures 3 or 4 will be displayed.

At this point, click the OK button after which the multi-input dialog box shown in Figure 2 will reappear. The user can then correct the error or click the Cancel button to abort the command.

Once the command has determined that the data has been properly specified, the command selects all of the features in the Contour Layer which intersect the selected feature in the Profile Layer. The command then begins the process of intersecting each of the selected features in the Contour Layer with the selected feature in the Profile Layer.
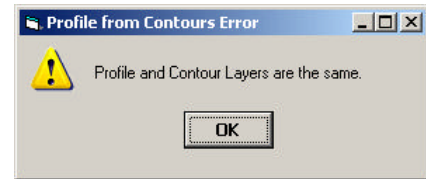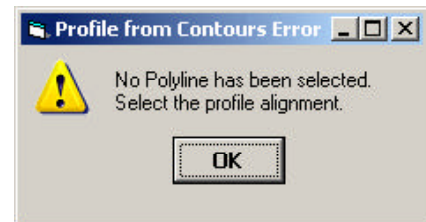
As an intersection is computed, the command determines a station value by computing the distance along the selected polyline feature in the Profile Layer to the intersection point. The starting station value is then added to this distance value.

The elevation value is extracted from a field or attribute in the Contour Layer. The following attributes or fields are examined for the elevation value: ELEVATION, Z, ELV, ELS, ELE, ELV, and CONTOUR. The first of these fields that is found is used.

Once all of the intersections have been found and their corresponding station and elevation values computed, the command sorts the intersections in a station ascending order. Then depending upon the setting of the *Create:* parameter, a profile data table or point features is/are created. If point features are to be created, they will be stored in the current active layer. If a profile data table is to be created, it is stored in the current working directory.

Shown in Figure 5 is an illustration of the intersection points that are computed using the [Profile from Contours] command. Note that the profile alignment as well as the contour strings can be polyline
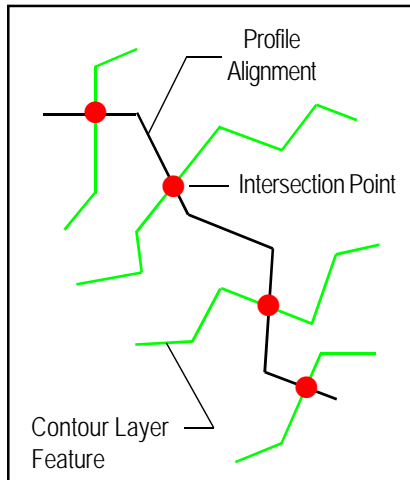
Figure 5
Intersection Points
that are computed using the
Profile from Contours Command

Figure 6
Sample Profile Data Table created with the Profile from Contours Command

or two-point line features. There is no limit to the number of intersections that can be computed.

Shown in Figure 6 is an example of a Profile Data Table. Note the STATION and ELEVATION fields in the table.

Notes

a. The names of the Profile Layer and Contour Layer can not be the same.

b. There can only be one selected feature in the Profile Layer.

c. If the Contour Layer has a selection set, it is disregarded.

d. In order to ensure that the intersections are properly computed, the Profile Layer and Contour Layer should share the same projection. That is to say, their data sources should be in the same coordinate system.

e. When point features are to be created, the command will store the station value in a field called STATION and the elevation value in the field called Z.

f. The suffix _pro is added to the name of the Profile Identifier parameter value. For example, if the user enters TEST for the Profile Identifier parameter, the name of the table that is actually created is called TEST_PRO and the disk filename for the table will be TEST_PRO.dbf.

Summary

As mentioned at the beginning of this article, requests for this functionality spurred the development of this new command. As such, we try to be as responsive as possible to implementing functionality requested not only from our users but from potential users as well.

The implementation of the [Profile from Contours] menu command is a very recent enhancement.

Users with a software support agreement should check with The CEDRA Corporation on how to obtain a software update so as to be able to utilize this new functionality.

As always, users who have a need for functionality that is not presently available in CEDRA software should feel free

to forward these requests to CEDRA, as well as, any other comments or suggestion you may have.

If you have a request for Command Of The Month, feel free to phone, fax or e-mail your request to The CEDRA Corporation.