The CEDRA Corporation's

COMMAND OF THE MONTH

A monthly information bulletin   **October 2007**
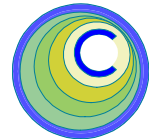
Application Description

A suggestion recently mentioned to us was the ability to create an ASCII based file, following the Traverse File Format, for one or more polygon features.

The Traverse File Format is used by the Traverse Tool, within the Arc/Info® and ArcEditor® software, when "cogo-ing" a polygon or polyline feature. A file which follows this format contains a list of the courses comprising a feature. Depending upon the course type (line or curve), the information appearing in the file will vary.

By creating such a file, the user is able to view, in a text editor or word processor, the course descriptions (bearings, distances, radii, chord lengths, etc.) for each of the courses comprising a feature. In addition, the file can be imported within the Traverse Tool so as to recreate the feature.

The CEDRA Solution

To address the application of exporting data using the Traverse File Format, the [Export Generate] command, within the {CEDRA Commands} combo-box was modified. Note that this functionality is only available for ArcGIS® users. Furthermore, the November 2006 issue of Command of the Month discussed the original implementation of the [Export Generate] command.

To utilize the [Export Generate] command, ArcGIS® users should activate the CEDRA-AVcad-Menus toolbar to display the toolbar shown in Figure 1

Figure 1 - CEDRA-AVcad-Menus Toolbar for ArcGIS Users

Shown in Figure 2 is the {CEDRA Commands} combo-box. The [Export Generate] command appears towards the bottom of the drop-down list.

Export Generate - Overview

The intent of the [Export Generate] command is to provide the user the ability to create an ASCII based file, in a variety of formats, which describes the geometry of a selected group of features. As such, the user, prior to activating the command, must select the feature(s) to be processed.

> ***Command Of The Month bulletin***
>
> *This month's issue discusses the Traverse File Format option within the Export Generate command.*

In addition to exporting geometry, the [Export Generate] command offers file formats which support the exporting of annotation features and attributes.

Note that this command processes all visible selected features. There must be selected features prior to invoking this command. Depending upon the file format that is selected, a file created by the [Export Generate] command can contain point, polyline, polygon, annotation and attribute data. As such, the user
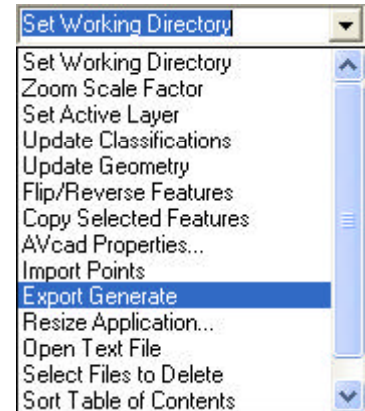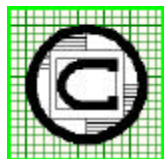

Figure 2
{CEDRA Commands} Combo-Box

will want to ensure that the proper set of selected features is made prior to activating the command.

Export Generate - Operation

Once the command has been activated, the following steps can be performed:

1a. If there are no selected features at the time the command is activated, the error message shown in Figure 3 will be displayed. At this point, click the OK button and select the feature(s) to be processed, at which point the command can be reactivated.

1b. If there are selected features, the multi-input dialog box of Figure 4 will appear.
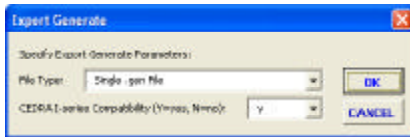
Figure 3
Export Generate Error Message

Figure 4
Export Generate Initial Dialog Box

Upon inspection of the multi-input dialog box, shown in Figure 4, note the following:

● The first data line item enables the user to specify the type of file to be created. Shown in Figure 5 is a list of the available file formats.
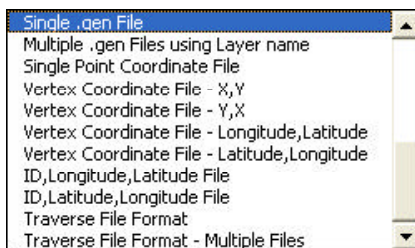

Figure 5
Available File Formats

● The second data line item enables the user to specify whether the file is to be CEDRA I-series software compatible or not. From the choice list which appears to the right of the data line item, the user selects *Y* to indicate that the file is to be imported by CEDRA I-series software or *N* to denote that some other software will post-process the file.

Note that the CEDRA I-series Compatibility parameter is only used when annotation features are being processed. If there are no annotation features selected, the setting of this parameter will have no effect on the exporting process.

2. Once the user has entered the appropriate information in the multi-input dialog box of Figure 4, click at the:
● *Cancel* button to terminate the command, or the
● *OK* button to continue with the processing.

Depending upon the file format that is selected, the operation of the command will vary. As such, there are two possible scenarios.

Scenario A

Multiple .gen Files using Layer name Traverse File Format - Multiple Files

3a. If the file formats *Multiple .gen Files using Layer name* or *Traverse File Format - Multiple Files* **have been** selected, the user will now be asked to specify the working directory where the files to be created are to be stored, see Figure 6
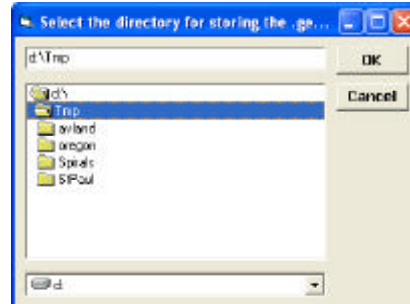

Figure 6
Set Working Directory

4a. Once the user has specified the appropriate directory, click at the:
● *Cancel* button to terminate the command, or the
● *OK* button to begin the processing. Note that the pathname which appears in the topmost data field is the location where the files will be written to.

If the file format *Multiple .gen Files using Layer name* was selected, the command will now begin to develop one file for every layer containing selected features. The name of the file will follow the convention *layer.gen*, where *layer* corresponds to the name of the layer containing the selected features. Once all of the files have been created a message similar to the one shown in Figure 7 will appear in the status bar area. The command now terminates.

Figure 7
Export Generate Completion Message

If the file format *Traverse File Format - Multiple Files* was selected, the command will display the multi-input dialog box shown in Figure 8.

Figure 8
Filename Prefix/Identifier Specification

5a. Enter the filename optional prefix and select the attribute which represents the unique feature identifier, click at the:
● *Cancel* button to terminate the command, or the
● *OK* button to begin the processing.

When using the Traverse File Format - Multiple Files option, a file is created for every selected feature. The name of the file is defined by concatenating an optional prefix and a unique feature identifier. The unique feature identifier is the value of an attribute, which the user selects from a choice list.

So that, from Figure 8, the user can:

a. specify the prefix, entering <none> denotes that no prefix is desired, and

b. select the attribute whose value for a feature will serve as the unique feature identifier. The OID, FID or OBJECTID attributes are good examples of an attribute that can be selected for this parameter.

As an example, assume that the user specifies the prefix to be Polygon and the attribute FID as the unique feature identifier. An example filename would be Polygon27.txt. Note that the *.txt* extension is used in the filename.

Once all of the files have been created a message similar to the one shown in Figure 9 will appear in the status bar area.

Figure 9
Export Generate Completion Message

At this point, the command terminates.

Scenario B

All other File Formats

3b. If the file formats *Multiple .gen Files using Layer name* or *Traverse File Format - Multiple File* **have not** been selected, the user will now be asked to specify the name of the single file to be created. Shown in Figure 10 is the dialog box from which the user can specify the name of the file to be created.
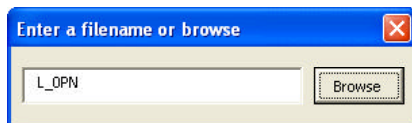
Figure 10
File Specification Dialog Box

Click the **Browse** button to display the conventional file navigation box shown in Figure 11.

Figure 11
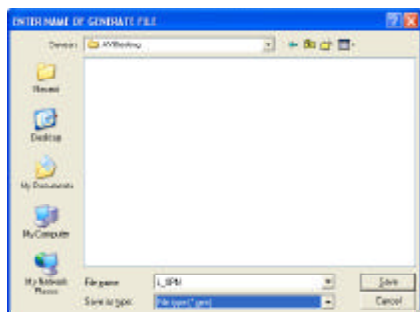**File Navigation Dialog Box**

4b. Specify the name of the file to be created by either: (a) **explicitly typing** the name of the file in the data field to the right of the *File name* label, or (b) by **single-clicking** on the name of the desired file, followed by **clicking** the **Save** button.

If the name of the file specified by the user exists, the user will be queried as to if the file is to be overwritten as shown in Figure 12, at this point, click at the:
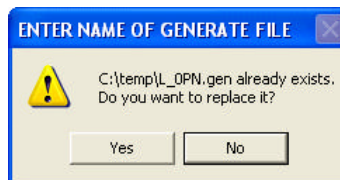
Figure 12
Overwrite Existing File Query

● *No* button to force the re-display of Figure 11, at which point another name can be specified, or the
● *Yes* button to continue with the processing.

5b. If the file formats *Single .gen File* or *Traverse File Format* **have** been selected, the command will now begin to write the data to the specified file.

The file extension *.gen*, will be used to denote a file which follows the Generate File Format. Once the command is finished writing the file a message similar to the one shown in Figure 13 will appear in the status bar area.

Figure 13
Export Generate Completion Message

The file extension *.txt*, will be used to denote a file which follows the Traverse File Format. Once the command is finished writing the file a message similar to the one shown in Figure 14 will appear in the status bar area.

Figure 14
Export Generate Completion Message

At this point, the command terminates.

5c. If the file format *Single Point Coordinate File* **has not** been selected, the multi-input dialog box of Figure 15 will be displayed.

Figure 15
Vertex File Format Dialog Box

Upon inspection of the multi-input dialog box note the following:

● The first data line item enables the user to control the number of digits to the right of the decimal point that are to appear when processing coordinate values.

● The second data line item enables the user to control whether or not attributes for the features are to be exported. From the choice list which appears to the right of the data line item, the user selects *Y* to indicate that attributes are to be exported or *N* to denote that no attribute information is to be exported.

● The third data line item enables the user to indicate the attribute, if any, that contains the ID value to be used in the exporting process.

6c. Once the user has entered the appropriate information in the multi-input dialog box of Figure 15, click at the:
● *Cancel* button to terminate the command, or the
● *OK* button to continue with the processing.

The command will now begin to write the data to the specified file. The extension *.gen*, will be used to denote a file which follows the Generate File Format. Once the command is finished writing the file, a message similar to the one shown in Figure 13 will appear in the status bar area.

At this point, the command terminates.

5d. If the file format *Single Point Coordinate File* **has** been selected, the multi-input dialog box of Figure 16 will be displayed.
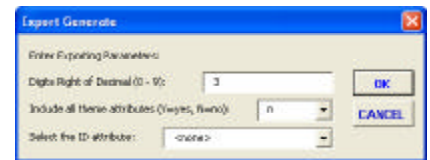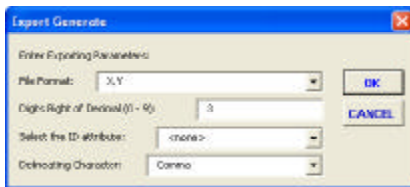

Figure 16
Single Point Coordinate File
Dialog Box

Upon inspection of the multi-input dialog box note the following:

● The first data line item enables the user to specify the type of file to be created. Shown in Figure 17 is a list of the available point file formats. Depending upon the point file format that is selected, the file will contain specific point information in a certain order.
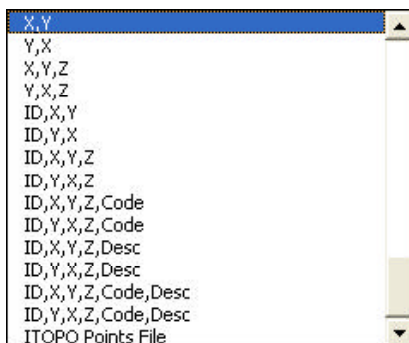

Figure 17
Available Point File Formats

● The second data line item enables the user to control the number of digits to the right of the decimal point that are to appear when processing coordinate values.

● The third data line item enables the user to indicate the attribute, if any, that contains the ID value to be used in the exporting process. For those file formats which export an ID value, this parameter enables the user to control the value that is exported. If no attribute is specified, <none>, the OID of the feature will be used as the ID value.

● The fourth data line item enables the user to control the delineating character (comma or space) separating the values on a data line. The user simply selects the appropriate value from the choice list.

6d. Once the user has entered the appropriate information in the multi-input dialog box of Figure 16, click at the:
● *Cancel* button to terminate the command, or the
● *OK* button to continue with the processing.

The command will now begin to write the point data to the specified file. The extension *.txt*, will be used. Once the command is finished writing the file, a message similar to the one shown in Figure 18 will appear in the status bar area.

Figure 18
Export Generate Completion Message

At this point, the command terminates.

Notes

a. The Single Point Coordinate File option was added following the release of the October 2006 issue of Command of the Month. The Single Point Coordinate File option processes only point and multi-point features. All other feature types are ignored.

b. The Traverse File Format options were added as a direct result of user input. This is a good reminder that if a user or potential user has a request for specific functionality they should feel free to pass it on.

c. When creating a file that is CEDRA I-series software compatible, the command will substitute the | character for the ° character when processing annotation features.

d. If multiple feature types are selected all feature types will be processed. As such, it is possible for a file that is created by this command to contain a mixture of point, polyline, polygon and annotation features. File formats which do no support specific feature types will simply ignore or skip over those selected features. No error message will be displayed.

Summary

The [Export Generate] command provides a mechanism for users to create an intermediate flat file that can be used by other application software for further manipulation. Should readers have comments on any of the formats feel free to pass them on to CEDRA.

File Format Descriptions and Samples

Presented below are descriptions and samples for the available file formats presented in Figure 5. The file format numbering scheme, which is used below, follows the order of the file format options as they appear in Figure 5.

File Formats 1 and 2

Single .gen File and
Multiple .gen Files using Layer name

Tables 1 through 4 pertain to the Single .gen File and Multiple .gen Files using Layer name file formats. Under these formats all coordinates are exported in the source units of the layer being processed. However, if the map units are set to meters, the command prior to exporting the coordinate values will convert the coordinates from meters to whatever units the distance units property is set to. The distance units property is controlled by the {View} [Data Frame Properties...] command.

In addition, note the following when exporting:

Point Features

There are two data lines per feature. The first contains the POINT command, while the second data line is comprised of the following:

1. X coordinate
2. Y coordinate
3. Elevation
4. Angle of Orientation (degrees)
5. Node Type

The semicolon (;) character is used to delineate the various values. All values are formatted for 6 digits to the right of the decimal point, while the Node Type value is formatted as a whole number (integer).

If the feature is a 3D point (ZAware), the elevation associated with the point will be used, otherwise, one of the following attributes will be used, Z, ELV, WW_NODEZ, or RIMELEVATION de-

```
POINT
3506.995506;6250.517279;99999.000000;0.000000;1
POINT
3402.001593;5962.414514;0.000000;0.000000;1
POINT
4247.023396;6094.132541;0.000000;0.000000;1
POINT
3506.995506;5748.519836;99999.000000;0.000000;1
```
Table 1
Single .gen File format for 4 point features

```
3
2857.995373   3758.161787
1992.901583   3753.246481
END
4
1992.901583   3753.246481
1933.917915   4770.714745
END
5
1933.917915   4770.714745
2897.317818   4839.529024
END
6
2897.317818   4839.529024
2857.995373   3758.161787
END
```
Table 2
Single .gen File format
for 4 polyline features

```
16
6215.398469   6325.778021
6195.552508   5856.090290
5831.709900   5882.551571
5795.325639   6335.701001
6215.398469   6325.778021
END
20
6552.779796   6243.086519
6718.162800   6256.317159
6731.393440   5568.323864
6542.856816   5594.785144
6552.779796   6243.086519
END
21
6546.164476   5419.479160
6714.855140   5439.325121
6764.470041   4890.253548
6542.856816   4834.023327
6546.164476   5419.479160
END
```
Table 3
Single .gen File format
for 3 polygon features

pending upon which is found first. If none of these attributes exist, the default value of 0.0 will be used.

The Angle of Orientation will be 0.0 unless the attribute ANGLE is present. If so the value for this attribute will be exported.

The Node Type will be 1 unless the attribute WW_ND_TYPE or WP_ND_TYPE is present. If one of these two attributes is present, the value for the attribute will be exported depending upon which is found first.

Multi-Point Features

Same as a Point feature with the exception that the angle of orientation will always be 0.0 and the node type will be equal to the OID of the feature. Each part in the multi-point feature is processed as a single point feature.

Polyline and Polygon Features

As shown in Tables 2 and 3 each vertex comprising the feature (polyline or polygon) is exported. A feature definition begins with an identification string and is followed by, on a separate data line, the X and Y coordinates of each vertex comprising the feature. The END command is used to terminate the definition of the feature.

For polyline features, the identification string is the OID of the feature unless one of the following attributes is present; ZVALUE, ELEVATION or Z. If one of these attributes is present then the value of the attribute will be used as the identification string.

```
27
1963.871639  2898.656997
1958.118967  3266.828030
END
28
1958.118967  3266.828030
2556.396896  3284.086047
END
29
2556.396896  3284.086047
2567.902241  2881.398980
END
30
2567.902241  2881.398980
1963.871639  2898.656997
END
TEXT;L_0TX;368.22'
1931.953958;3006.492056;90.895174;21.653553
TEXT;L_0TX;598.53'
2180.630378;3303.488272;1.652305;21.653553
TEXT;L_0TX;604.28'
2188.648663;2840.331002;358.363423;21.653553
TEXT;L_0TX;402.85'
2616.175499;3008.467749;91.636577;21.653553
TEXT;L_0TX;Sample
2096.836509;3073.021046;0.000000;52.719054
```
Table 4
Single .gen File format for 4 polyline features and 5 annotation features

File Format 3

Single Point Coordinate File

Tables 5(a) through 5(c) pertain to the Single Point Coordinate File format. Under this format only point and multi-point features are exported. All other selected feature types are ignored.

From Figure 17, there are 15 available point file formats in which point data can be exported. In performing the ex-

port, the coordinate data (X,Y) is extracted from the geometry of the feature. The elevation data (Z) will come from the feature only if the point feature is ZAware. The ID value will be the OID of the feature, provided no attribute is specified in the third data line item of Figure 16, the ID attribute parameter. The point code and description data (Code, Desc) are extracted from the PTCODE and PTDESC attributes, provided they are present. If these attributes are not present then it is assumed that there is no point code or description data for the feature.

When using this format, note the following when exporting:

Point Features

There is a single data line for every feature processed. Depending upon the point file format that is selected, a data line can contain the following:

1. ID value
2. X coordinate

For polygon features, the OID of the feature is always used as the identification string.

Annotation Features

There are two data lines per annotation feature. The first contains the TEXT command followed by the name of the layer which the feature resides in, followed by the text string. The semicolon (;) character is used to delineate the three values.

The second data line is comprised of four values; the X and Y coordinates, the angle of orientation in degrees and the unit character height, which is computed as the overall length or width of the text string divided by the number of characters in the text string, see below:

$$UnitH = TextWidth / NumChrs$$

```
12,3266.828030,1958.118967,1195.450000,MH,Manhole
13,3284.086047,2556.396896,1175.420000,WV,Water Valve
14,2898.656997,1963.871639,1215.740000,CO,Cleanout
15,2881.398980,2567.902241,1184.960000,DI,Drop Inlet
```
Table 5(a)
Single Point Coordinate File
ID,Y,X,Z,Code,Desc point file format option for 4 point features. Six digits to the right of the decimal point was specified in the second data line item, <none> was specified in the third data line item as the ID attribute and the space delineator was selected in the fourth data line item of Figure 16

```
41 3266.828 1958.119 1195.450 MH Manhole
42 3284.086 2556.397 1175.420 WV Water Valve
43 2898.657 1963.872 1215.740 CO Cleanout
44 2881.399 2567.902 1184.960 DI Drop Inlet
```
Table 5(b)
Single Point Coordinate File
ID,Y,X,Z,Code,Desc point file format option for 4 point features. Three digits to the right of the decimal point was specified in the second data line item, PNT was specified in the third data line item as the ID attribute and the space delineator was selected in the fourth data line item of Figure 16

```
  12    3266.828030    1958.118967    1195.450000  *  MH  Manhole
  13    3284.086047    2556.396896    1175.420000  *  WV  Valve
  14    2898.656997    1963.871639    1215.740000  *  CO  Cleanout
  15    2881.398980    2567.902241    1184.960000  *  DI  Inlet
```

Table 5(c)

Single Point Coordinate File

ITOPO Points File point file format option for 4 point features. <none> was specified in the third data line item of Figure 16 as such the OID of the feature is used as the ID attribute. The coordinates and elevation values will always contain six digits to the right of the decimal point

3. Y coordinate
4. Elevation
5. Point Code
6. Point Description

The number of digits to the right of the decimal point is controlled by the value entered in the second data line parameter shown in Figure 16., except for the ITOPO Points File option which always uses 6 digits to the right of the decimal point for the X,Y,Z data items, see Table 5(c) for a sample.

The ID value, which is exported in point file formats 5 and higher, is controlled by the setting of the third data line parameter shown in Figure 16. If <none> is specified, the OID of the feature will be used for the ID value for these point file formats, otherwise, the value of the attribute, as specified for the parameter, will be used. If the attribute value does not exist, the OID of the feature will be used as the ID value.

The space or comma character will be used to delineate the various values on a data line, depending upon the setting of the fourth parameter in Figure 16.

If the feature is a 3D point (ZAware), the elevation associated with the point will be used, otherwise, one of the following attributes will be used, Z, ELV, WW_NODEZ, or RIMELEVATION depending upon which is found first. If none of these attributes exist, the default value of 0.0 will be used.

Multi-Point Features

Same as a Point feature with the exception that each part in the multi-point feature is processed as a single point feature.

File Format 4

Vertex Coordinate File - X,Y

Tables 6 through 9 pertain to the Vertex Coordinate File - X,Y format. Under this format there are no commands which are used but rather each vertex comprising the feature is written to a separate data line. A unique identifier (third data line item in Figure 15) can be used to group vertices together to form a single feature. If no identifier is specified, <none>, there will be one less value on a data line, see Table 6(b).

```
3506.996,6250.517,1,1
3402.002,5962.415,1,2
4247.023,6094.133,1,3
3506.996,5748.520,1,4
```

Table 6(a)

Vertex Coordinate File - X,Y format for 4 point features. The field PNT has been specified as the ID attribute in the third data line item of Figure 15

```
3506.996,6250.517,1
3402.002,5962.415,1
4247.023,6094.133,1
3506.996,5748.520,1
```

Table 6(b)

Vertex Coordinate File - X,Y format for 4 point features without the ID attribute, <none> was specified in the third data line item of Figure 15

As can be seen from Tables 7 and 9, when attribute information is to be included, the attributes appear after the base data for the vertex. Furthermore, since the names of the attributes do not appear in the file, it is assumed that the software which will post-process the file is aware of the order and type of the attributes that appear in the file.

When using this format, note the following when exporting:

Point Features

A single data line will be written for each point that is exported. On this data line the following will appear:

1. X coordinate
2. Y coordinate
3. 1
4. Unique Identifier

The unique identifier will be the OID of the feature or the value of the attribute as specified by the user in the third data line item of Figure 15. If the <none> option is selected, the unique identifier value will not be included in the data line.

Multi-Point Features

A single data line will be written for each point comprising a part within the feature that is exported. On this data line the following will appear:

1. X coordinate
2. Y coordinate
3. Point ID
4. Unique Identifier

The Point ID is the sequential number of the point within the part being processed. The unique identifier will be the OID of the feature or the value of the attribute as specified by the user in the third data line item of Figure 15. If the <none> option is selected, the unique identifier value will not be included in the data line.

```
3506.996,6250.517,1,1,5,0,1,1,11,0,1,1, , ,0,1,3506.995506,0,6250.517279,0,99999
3402.002,5962.415,1,2,5,1,1,1,11,0,1,2, , ,0,1,3402.001593,0,5962.414514,0,0
4247.023,6094.133,1,3,5,2,1,1,11,0,1,3, , ,0,1,4247.023396,0,6094.132541,0,0
3506.996,5748.520,1,4,5,3,1,1,11,0,1,4, , ,0,1,3506.995506,0,5748.519836,0,99999
```

Table 7

Vertex Coordinate File - X,Y

format for 4 point features with all attributes associated with a feature included in the file. The field PNT has been specified as the ID attribute in the third data line item of Figure 15

```
6215.398,6325.778,1,18
6195.553,5856.090,2,18
5831.710,5882.552,3,18
5795.326,6335.701,4,18
6215.398,6325.778,5,18
6552.780,6243.087,1,21
6718.163,6256.317,2,21
6731.393,5568.324,3,21
6542.857,5594.785,4,21
6552.780,6243.087,5,21
6546.164,5419.479,1,22
6714.855,5439.325,2,22
6764.470,4890.254,3,22
6542.857,4834.023,4,22
6546.164,5419.479,5,22
```

Table 8

Vertex Coordinate File - X,Y
format for 3 polygon features. The field CNT has been specified as the ID attribute in the third data line item of Figure 15

Polyline and Polygon Features

A single data line will be written for each vertex comprising a part within the feature that is exported. On this data line the following will appear:

1. X coordinate
2. Y coordinate
3. Vertex ID
4. Unique Identifier

The Vertex ID is the sequential number of the vertex within the part being processed. The unique identifier will be the OID of the feature or the value of the attribute as specified by the user in the third data line item of Figure 15. If the <none> option is selected, the unique identifier value will not be included in the data line.

File Format 5

Vertex Coordinate File - Y,X

Same as File Format 4 with the exception that the order of the coordinates is reversed.

File Format 6

Vertex Coordinate File - Long., Lat.

Same as File Format 4 with the exception that instead of exporting X and Y coordinates, the command exports Longitude and Latitude values.

File Format 7

Vertex Coordinate File - Lat., Long.

Same as File Format 5 with the exception that instead of exporting Y and X coordinates, the command exports Latitude and Longitude values.

```
6215.398,6325.778,1,18,0,0,180706.140687,0, , , ,0,0,0,0,1,18,0,0,99999,16,1709.7082,1,1,1,1, ,0,4.148442
6195.553,5856.090,2,18,0,0,180706.140687,0, , , ,0,0,0,0,1,18,0,0,99999,16,1709.7082,1,1,1,1, ,0,4.148442
5831.710,5882.552,3,18,0,0,180706.140687,0, , , ,0,0,0,0,1,18,0,0,99999,16,1709.7082,1,1,1,1, ,0,4.148442
5795.326,6335.701,4,18,0,0,180706.140687,0, , , ,0,0,0,0,1,18,0,0,99999,16,1709.7082,1,1,1,1, ,0,4.148442
6215.398,6325.778,5,18,0,0,180706.140687,0, , , ,0,0,0,0,1,18,0,0,99999,16,1709.7082,1,1,1,1, ,0,4.148442
6552.780,6243.087,1,21,0,0,118224.287477,0, , , ,0,0,0,0,1,21,0,0,99999,20,1692.7937,1,1,1,1, ,0,2.714056
6718.163,6256.317,2,21,0,0,118224.287477,0, , , ,0,0,0,0,1,21,0,0,99999,20,1692.7937,1,1,1,1, ,0,2.714056
6731.393,5568.324,3,21,0,0,118224.287477,0, , , ,0,0,0,0,1,21,0,0,99999,20,1692.7937,1,1,1,1, ,0,2.714056
6542.857,5594.785,4,21,0,0,118224.287477,0, , , ,0,0,0,0,1,21,0,0,99999,20,1692.7937,1,1,1,1, ,0,2.714056
6552.780,6243.087,5,21,0,0,118224.287477,0, , , ,0,0,0,0,1,21,0,0,99999,20,1692.7937,1,1,1,1, ,0,2.714056
6546.164,5419.479,1,22,0,0,111583.334072,0, , , ,0,0,0,0,1,22,0,0,99999,21,1535.2635,1,1,1,1, ,0,2.561601
6714.855,5439.325,2,22,0,0,111583.334072,0, , , ,0,0,0,0,1,22,0,0,99999,21,1535.2635,1,1,1,1, ,0,2.561601
6764.470,4890.254,3,22,0,0,111583.334072,0, , , ,0,0,0,0,1,22,0,0,99999,21,1535.2635,1,1,1,1, ,0,2.561601
6542.857,4834.023,4,22,0,0,111583.334072,0, , , ,0,0,0,0,1,22,0,0,99999,21,1535.2635,1,1,1,1, ,0,2.561601
6546.164,5419.479,5,22,0,0,111583.334072,0, , , ,0,0,0,0,1,22,0,0,99999,21,1535.2635,1,1,1,1, ,0,2.561601
```

Table 9

Vertex Coordinate File - X,Y

format for 3 polygon features with all attributes associated with a feature included in the file. The field CNT has been specified as the ID attribute in the third data line item of Figure 15

File Format 8

ID, Longitude, Latitude File

Tables 10 and 11 pertain to the ID, Longitude, Latitude File format. Under this format there are no commands which are used but rather each vertex comprising the feature is written to a separate data line. A unique identifier (third data line item in Figure 15) can be used to group vertices together to form a single feature. If no identifier is specified, <none>, there will be one less value on a data line, Tables 10(a) and 11(a) were created using the <none> option, while Tables 10(b) and 11(b) had a specific attribute specified as the ID.

```
-95.866494,86.063295
-95.918053,86.063963
-95.969630,86.064629
-95.877037,86.059771
```
Table 10(a)

```
1151,-95.866494,86.063295
1157,-95.918053,86.063963
1158,-95.969630,86.064629
1161,-95.877037,86.059771
```
Table 10(b)

```
-91.377313,85.993748
-91.377779,85.994640
-91.377779,85.994640
-91.378201,85.994865
-91.378201,85.994865
-91.369157,85.995417
-91.369157,85.995417
-91.356047,85.995356
-91.356047,85.995356
-91.349627,85.995677
```
Table 11(a)

```
2,-91.377313,85.993748
2,-91.377779,85.994640
3,-91.377779,85.994640
3,-91.378201,85.994865
4,-91.378201,85.994865
4,-91.369157,85.995417
5,-91.369157,85.995417
5,-91.356047,85.995356
6,-91.356047,85.995356
6,-91.349627,85.995677
```
Table 11(b)

Tables 10(a) and 10(b) represent 4 point features, while Tables 11(a) and 11(b) represent five line two-point lines. The first item on a data line in Table 11(b) is the unique identifier. All data lines sharing the same unique identifier denote vertices for a single feature. The vertices are written in the same order as they appear in the feature.

If attributes are to be included in the file, the attributes will appear to the right of the base data that is exported.

When using this format, note the following when exporting:

Point Features

A single data line will be written for each point that is exported. On this data line the following will appear:

1. Unique Identifier
2. Longitude
3. Latitude

The unique identifier will be the OID of the feature or the value of the attribute as specified by the user in the third data line item of Figure 15. If the <none> option is selected, the unique identifier value will not be included in the data line.

Multi-Point Features

A single data line will be written for each point comprising a part within the feature that is exported. On this data line the following will appear:

1. Unique Identifier
2. Longitude
3. Latitude

The unique identifier will be the OID of the feature or the value of the attribute as specified by the user in the third data line item of Figure 15. If the <none> option is selected, the unique identifier value will not be included in the data line.

Polyline and Polygon Features

A single data line will be written for each vertex comprising a part within the feature that is exported. On this data line the following will appear:

1. Unique Identifier
2. Longitude
3. Latitude

The unique identifier will be the OID of the feature or the value of the attribute as specified by the user in the third data line item of Figure 15. If the <none> option is selected, the unique identifier value will not be included in the data line.

File Format 9

ID, Latitude, Longitude File

Same as File Format 8 with the exception that instead of exporting Longitude and Latitude values, the command exports Latitude and Longitude values.

File Format 10

Traverse File Format

Tables 12(a) and 12(b) pertain to the Traverse File Format. Under this format only polyline and polygon features are exported. All other selected feature types are ignored.

From Table 12(a) it can be seen that the Traverse File Format defines information by specifying a code followed by one or more values.

The ArcGIS Desktop Help contains a full description of the Traverse File Format. To display the appropriate help description, select the {Help} [ArcGIS Desktop Help] command, click on the Index tab and enter Traverse File Format in the data field below the label *type in the keyword to find:* and depress the Enter key. The description of the Traverse File Format should now appear.

Not all of the codes which appear in the Traverse File Format help description

```
DT QB
DU DMS
SP 3642.659785 6352.554804
EP 3642.659785 6352.554804
DD N90-0-0.0E 427.82064
DD S0-0-0.0E 661.17736
DD S89-7-55.0W 427.86975
DD N0-0-0.0E 667.65949
```
Table 12(a)
Traverse File Format
for a four sided polygon feature comprised of no curves.

```
DT QB
DU DMS
SP 3726.573159 3721.320970
EP 3726.573159 3721.320970
DD N34-3-58.3W 361.58355
NC C 276.083198 D 57-42-32.4 C N5-12-41.3W R
DD N23-38-35.7E 327.89723
DD N74-27-0.7E 371.85736
NC C 213.597474 D 54-57-0.0 C S78-4-28.4E R
DD S50-35-57.6E 250.62777
DD S20-29-13.3E 151.61901
NC C 432.876514 D 58-14-2.4 C S8-37-47.6W R
DD S37-44-48.5W 233.70785
DD S88-8-41.7W 510.09395
```
Table 12(b)
Traverse File Format
for a nine sided polygon feature comprised of six lines and three curves

are used by the [Export Generate] command. The codes which are used include the following:

DT: defines the direction type
DU: defines the direction units
SP: defines the start point coordinates
EP: defines the end point coordinates
DD: defines a direction-distance course
NC: defines a non-tangent curve

The direction type, DT, value will always be set to QB, denoting quadrant bearing.

The direction units, DU value will always be set to DMS, denoting degrees, minutes and seconds.

The start point, SP, and end point, EP, coordinates will always contain six digits to the right of the decimal point.

The direction-distance course, DD, is comprised of two values, that is, the direction (in terms of a bearing since DT is set to QB) and a distance. The distance value will always contain five digits to the right of the decimal point.

A curve, regardless if it is tangent or non-tangent to the previous course, will always be defined in terms of a non-tangent course. The values defining a non-tangent curve, NC, consist of the chord length, central angle, chord direction and curve center location.

The sub-code C is used to denote the chord length, D to denote the central angle, C to indicate the chord direction and L or R to denote that the curve center is either to the left or right of the direction of the chord.

When processing multipart features, only the first part in the feature is processed, all other parts are ignored.

File Format 11

Traverse File Format - Multiple Files

Same as File Format 10 with the exception that a separate file is created for every selected feature that is processed.