

The CEDRA Corporation's COMMAND OF THE MONTH

A monthly information bulletin

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FEATURED COMMAND

Exporting using the
Generate File Format



Application Description

Most folks have heard the word DXF, which really isn't a word but an abbreviation for Drawing Exchange File. DXF usually comes up in the conversation when people want to "exchange" drawing information between various CAD and GIS software.

For those of you who have not actually looked at a DXF file, a DXF file is an ASCII based file that uses a series of numeric codes to describe the contents of a drawing. As one can imagine, there are a lot of codes which are used to describe a drawing and to look at a DXF file to see what is in the drawing is almost impossible.

This month, we discuss the Generate File Format which is an alternative to the DXF format. The DXF format, as mentioned above, uses a series of numeric codes to describe the drawing contents. The Generate File Format utilizes a very simple structure to define point, polyline and polygon shapes. An identification string is used to identify a feature while the keyword END is used to terminate the feature definition.

For those users who have the need to manipulate data by writing customized applications, the Generate File Format is a format that should be considered because of its simplistic structure. Trying to manipulate data stored in a DXF file is a much more involved task. However, data stored in a Generate File Format is much easier to access and manipulate.



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

The CEDRA Solution

To address the application of exporting data using the Generate File Format, the [Export Generate] command, within the {CEDRA Commands} combo-box can be employed. Note that this functionality is only available for ArcGIS® users.

ArcGIS® users should activate the CEDRA-AVcad-Menus toolbar to display the toolbar shown in Figure 1. Shown in Figure 2 is the {CEDRA Commands} combo-box. The [Export Generate] command appears towards the bottom of the drop-down list.

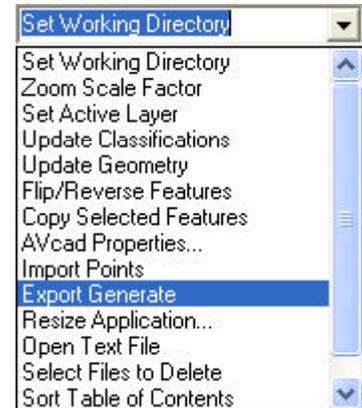


Figure 2
{CEDRA Commands} Combo-Box

Command Of The Month bulletin

This month's issue discusses the Generate File Format, an alternative method of exchanging information.

Export Generate - Overview

The intent of the [Export Generate] command is to provide the user the ability to create an ASCII based file, following the Generate File Format, 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.

In addition to supporting the Generate File Format, the [Export Generate] com-

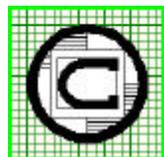
mand offers a few additional variations of the Generate File Format enabling the exporting of annotations and attributes.

Note that the command will process all of the visible selected features. As such, a file created by the [Export Generate] command can contain point, polyline, polygon, annotation and attribute data, if so desired. Depending upon how the file is to be processed, the user will want to ensure that the proper set of selected features is made prior to invoking the command.

Annotate Point Data - 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,



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the error message shown in Figure 3 will be displayed. At this point, click the OK button and select the point(s) to be processed, at which point the command can be reactivated.



Figure 3
Export Generate Error Message

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

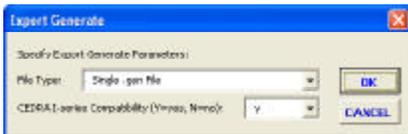


Figure 4
Export Generate Dialog Box

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 5 is a list of the available file formats.

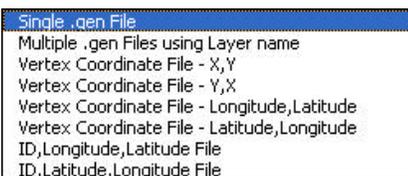


Figure 5
Available File Formats

- 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.

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

Multiple .gen Files using Layer name

- 3a. If file format *Multiple .gen Files using Layer name* has 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

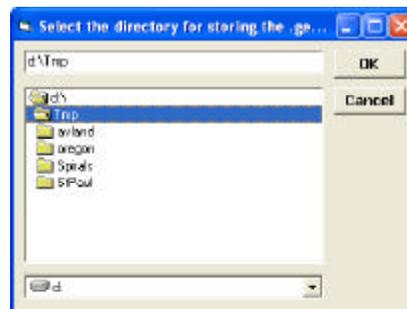


Figure 6
Set Working Directory

- 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.

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.

3 .gen files created in d:\Tmp

Figure 7
Export Generate Completion Message

All other File Formats

- 3b. If file format *Multiple .gen Files using Layer name* has not been selected, the user will now be asked to specify the name of the file to be created. Shown in Figure 8 is the dialog box from which the user can specify the name of the file to be created. Click the **Browse** button to display the conventional file navigation box shown in Figure 9.

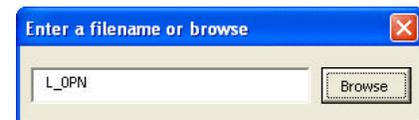


Figure 8
File Specification Dialog Box

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

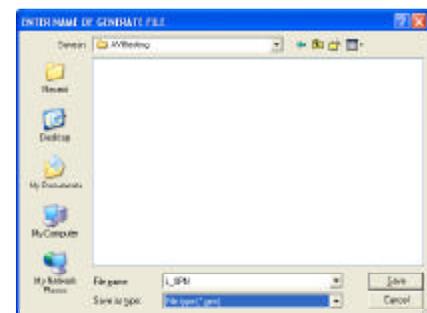


Figure 9
File Navigation Dialog Box

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 10, at this point, click at the:

- *No* button to force the re-display of Figure 9, at which point another name can be specified, or the
- *OK* button to continue with the processing.

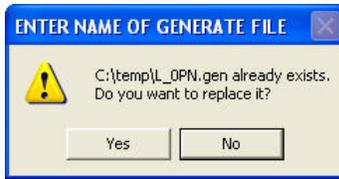


Figure 10
Overwrite Existing File Query

- 5b. If file format *Single .gen File* has been selected, 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 11 will appear in the status bar area.

C:\temp\L_OPN.gen created...

Figure 11
Export Generate Completion Message

At this point, the command terminates.

- 6b. If file format *Single .gen File* has not been selected, the multi-input dialog box of Figure 12 will be displayed.



Figure 12
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.
- 7b. Once the user has entered the appropriate information in the multi-input dialog box, 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 11 will appear in the status bar area.

At this point, the command terminates.

Notes

- a. When creating a file that is CEDRA I-series software compatible, the command will substitute the | character for the ° character when processing annotation features.
- b. 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.
- c. Shown in Table 1 is a file following the *Single .gen File* format for 4 point features.
- d. Shown in Table 2 is a file following the *Single .gen File* format for 4 polyline features.
- e. Shown in Table 3 is a file following the *Single .gen File* format for 3 polygon features.

- f. Shown in Table 4 is a file following the *Single .gen File* format for 4 polyline features and 5 annotation features.
- g. Shown in Table 5 is a file following the *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.
- h. Shown in Table 6 is a file following the *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.
- i. Shown in Table 7 is a file following the *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.
- j. Shown in Table 8 is a file following the *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.

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. This is an excellent alternative to trying to manipulate a DXF formatted file.

The tables presented in the subsequent pages illustrate the various file formats available with the [Export Generate] command. Should readers have comments on any of the formats feel free to pass them on to CEDRA.

```
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

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:

```
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

```
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

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 depending upon which is found first. If none of these attributes exist, the default value of 9999 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

```
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_OTX;368.22'
1931.953958;3006.492056;90.895174;21.653553
TEXT;L_OTX;598.53'
2180.630378;3303.488272;1.652305;21.653553
TEXT;L_OTX;604.28'
2188.648663;2840.331002;358.363423;21.653553
TEXT;L_OTX;402.85'
2616.175499;3008.467749;91.636577;21.653553
TEXT;L_OTX;Sample
2096.836509;3073.021046;0.000000;52.719054
```

Table 4

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 formats. Under these formats all coordinates are exported in the source units of the layer being processed. However,

type will be equal to the OID of the feature. Each part in the multi-point feature is processed as a single point feature.

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 5(a)

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

Table 5(a)

Polyline and Polygon Features

As shown in Tables 2 and 3 each

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 6

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.

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 7

nates, 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:

$$\text{UnitH} = \text{TextWidth} / \text{NumChrs}$$

File Format 3 - Vertex Coordinate File - X,Y

Tables 5 through 8 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

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.

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 8

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

TEXT command followed by the name of the layer which the feature resides in, followed by the text string. The semi-colon (;) character is used to delineate the three values.

unique identifier (third data line item in Figure 12) 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 5(b).

Annotation Features

There are two data lines per annotation feature. The first contains the

The second data line is comprised of four values; the X and Y coordi-

As can be seen from Tables 6 and 8, 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 12. 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 12. 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. 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 12. If the <none> option is selected, the unique identifier value will not be included in the data line.

File Format 4 - Vertex Coordinate File - Y,X

Same as File Format 3 with the exception that the order of the coordinates is reversed.

File Format 5 - Vertex Coordinate File - Longitude, Latitude

Same as File Format 2 with the exception that instead of exporting X and Y coordinates, the command exports Longitude and Latitude values.

File Format 6 - Vertex Coordinate File - Latitude, Longitude

Same as File Format 3 with the exception that instead of exporting Y and X coordinates, the command exports Latitude and Longitude values.

File Format 7 - ID, Longitude, Latitude File

Tables 9 and 10 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 12) 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 9(a) and 10(a) were created using the <none> option, while Tables 9(b) and 10(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 9(a)

```
1151,-95.866494,86.063295
1157,-95.918053,86.063963
1158,-95.969630,86.064629
1161,-95.877037,86.059771
```

Table 9(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 10(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 10(b)

Tables 9(a) and 9(b) represent 4 point features, while Tables 10(a) and 10(b) represent five line two-point lines. The first item on a data line in Table 10(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 12. 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 12. 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 12. If the <none> option is selected, the unique identifier value will not be included in the data line.

File Format 8 - ID, Latitude, Longitude File

Same as File Format 7 with the exception that instead of exporting Longitude and Latitude values, the command exports Latitude and Longitude values.

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