The CEDRA Corporation's COMMAND OF THE MONTH

A monthly information bulletin

December 2009

FEATURED COMMAND Polygon/String **COGO File Format**



Application Description

Some users involved with parcel maintenance have come across the need to create an ASCII based file which contains the metes and bounds of a single parcel. Once created, this file could be used for importing into another application or for other purposes.

The ESRI Traverse File Format is an example of such an ASCII based file. The October 2007 issue of Command of the Month describes the ESRI Traverse File Format. Summarizing, the ASCII based file, under this file format, contains codes such as DD, NC, etc. that describe the courses comprising the parcel.

The question arises what if more than one parcel is to be included in the ASCII file and what if polygons and traverses are to be combined together in the file. That is to say, is it possible to devise a file format that can contain an entire subdivision?

The CEDRA Solution

To address this issue, a new file format called Polygon/String COGO File has been added to the [Import Points] command, within the {CEDRA Commands} combobox, see Figures 1 and 2.

This new file format enables the user to define multiple parcels and/or traverses in a single file. Since the file is ASCII based, any text editor or word processor can be used to establish the file.

The approach at this time, in implementing this new file format, was to create a



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

file format that allowed for the definition of multiple parcels and/or traverses and to provide functionality that allowed for the importation of such a file. That is why the [Import Points] command was modified.

Import Points Overview

Using the [Import Points] command, the user is able to create point, line, curve, polygon and annotation features from a variety of ASCII file formats. The December 2006 issue of Command of the Month discusses the [Import Points] command in detail.

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This month's issue discusses a new file format that enables the user to define multiple parcels and traverses in a single ASCII file.

The addition of the Polygon/String COGO File format to the [Import Points] command enables the user to create multiple parcels and/or traverses in a single operation. The features created during the

Enter a filename or browse	
	Browse

Figure 3 File Specification Dialog Box



Figure 2 {CEDRA Commands} Combo-Box

importing process are stored in the current active layer.

Import Points Operation

- Select the [Import Points] com-≻1 mand ..
- ≻ 2 Select the Browse button, see Figure 3.
- > 3 Using the conventional file navigation dialog box, Figure 4, select the file to be imported and click the **Open** button.
- > 4 Select the desired file format from the drop-down list shown to the right of the File Format parameter, see Figure 5. Shown in Figure 6 is a complete list of the supported file formats.



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Figure 4 File Navigation Dialog Box

a Import Points			
Specify the Points File Format and Options:			
File Forniat RY		*	OK
Create Layers from Codes (Mayor, Name)	1	*	CANCEL
Create Lines from Codes (V-yes, N-no)	n		CALANCE

Figure 5 Import Points Parameters

 Click at the OK button to begin the processing, or
 click at the Cancel button to abort the command.

> If the OK button is selected, the command begins the process of reading the specified file and the creation of the appropriate features.

During the importing process, under the Polygon/String COGO File format, a progress bar is displayed, see Figure 7.

Upon completion of the importing, a message in the status bar area will be displayed stating that the file has been processed and an information message box similar to that shown in Figure 8 will be displayed.

➤ 6 Click at the OK button to dismiss the information message box,

At this point, the user can use native ArcMap functionality to view the features that have been created.

Х,Ү	•
X,Y	
Y,X	
X,Y,Z	-
Y,X,Z	
ID,X,Y	
ID,Y,X	
ID,X,Y,Z	
ID,Y,X,Z	
ID,X,Y,Z,Code	
ID,Y,X,Z,Code	
ID,X,Y,Z,Desc	
ID,Y,X,Z,Desc	
ID,X,Y,Z,Code,Desc	
ID,Y,X,Z,Code,Desc	
ITOPO Points File	
EPANET Map File	
LINK05 Survey File	
Line Connectivity File	
Line Coordinate File - 1	
Line Coordinate File - 2	
Line Coordinate File - 3	
Polygon 1 (lat,long in Quad 1)	
Polygon 2 (lat, long in Quad 2)	
Polygon 3 (lat, long in Quad 3)	
Polygon 4 (lat, long in Quad 4)	
Polygon 5 (lat,long in all Quads)	
Polygon 6 (x,y w/ Bearing & TieLine)	
Polygon / (x,y w/ Bearing)	
Polygon 8 (x,y w/ Azimuth)	
Polygon 9 (x,y w/ Cartesian)	
Polygon IU (V,X W) Bearing)	
Polygon 11 (V,X W/ Azimuth)	
Polygon 12 (Y,X W/ Cartesian)	-
Polygon/String COGO File	

Figure 6 Available ASCII File Formats

Polygon/String COGO File Format

Presented below is a description of the Polygon/String COGO File format. Shown in Table 1 is a listing of the commands supported by the Polygon/String COGO File format.

In defining a parcel or a traverse the user will need to:

- 1. Identify whether a parcel or traverse is to be defined. The LOT and STRING commands can be used to accomplish this task.
- 2. Specify the starting point of the parcel or traverse by using the SP or SP_POC command.
- 3. Define the line/curve courses comprising the parcel or traverse by using any of the other commands listed in Table 1.



The above steps are then repeated for every parcel and/or traverse to appear in the file. There is no limit to the number of parcels and/or traverses that can appear in the file.



Figure 8(a) - Sample ASCII file utilizing the Polygon/String COGO File format



Figure 8(b) - Sample ASCII file utilizing the Polygon/String COGO File format







Figure 8(d) - Sample ASCII file utilizing the Polygon/String COGO File format







Figure 8(f) - Sample ASCII file utilizing the Polygon/String COGO File format



Polygon features created utilizing the LOT Command within the Polygon/String COGO File format

LOT A01 Course String BND 2 String BND 3 0.0 Course String BND 3 String BND 4 0.0 Course String BND 4 String BND 5 0.0 Course String BND 5 String BND 2 0.0 LOT A02 Course String BND 22 String BND 1 0.0 Course String BND 1 String 2 2 0.0 Course String 2 2 String 2 14 0.0 Course String 2 14 String 2 15 376.07 Course String 2 15 String BND 22 -421.17 LOT A03 Course String 2 2 String 2 3 0.0 Course String 2 3 String 2 12 0.0 Course String 2 12 String 2 13 0.0 Course String 2 13 String 2 14 376.07 Course String 2 14 String 2 2 0.0 LOT A04 Course String 2 3 String 2 4 0.0 Course String 2 4 String 2 9 0.0 Course String 2 9 String 2 10 163.115 Course String 2 10 String 2 11 -163.115 Course String 2 11 String 2 12 0.0 Course String 2 12 String 2 3 0.0

LOT A05 Course String 2 4 String 2 5 0.0 Course String 2 5 String 2 6 0.0 Course String 2 6 String 2 7 0.0 Course String 2 7 String 2 8 0.0 Course String 2 8 String 2 9 0.0 Course String 2 9 String 2 4 0.0 LOT A06 Course String 13 8 String 13 7 371.17 Course String 13 7 String 13 6 -426.17 Course String 13 6 String 12 1 0.0 Course String 12 1 String 11 1 0.0 Course String 11 1 String 13 8 0.0 LOT A07 Course String 13 6 String 13 5 -426.17 Course String 13 5 String 13 4 0.0 Course String 13 4 String 13 3 0.0 Course String 13 3 String 13 2 260.28 Course String 13 2 String 13 1 0.0 Course String 13 1 String 11 2 0.0 Course String 11 2 String 13 6 0.0

Command Of The Month

LOT A08 LOT A15 Course String 11 1 String 11 2 0.0 Course String BND 10 String BND 11 -1343.69 Course String 11 2 String 11 3 0.0 Course String BND 11 String BND 12 0.0 Course String 11 3 String 14 2 0.0 Course String BND 12 String 16 2 1353.69 Course String 14 2 String 14 3 -50.0 Course String 16 2 String 5 2 1353.69 Course String 14 3 String 10 1 0.0 Course String 5 2 String BND 10 0.0 Course String 10 1 String 11 1 0.0 LOT A16 LOT A09 Course String BND 2 String BND 5 0.0 Course String 10 1 String 10 2 0.0 Course String BND 5 String BND 6 0.0 Course String 10 2 String 14 4 -50.0 Course String BND 6 String BND 7 0.0 Course String 14 4 String BND 16 0.0 Course String BND 7 String BND 8 0.0 Course String BND 16 String BND 17 0.0 Course String BND 8 String BND 9 -1343.69 Course String BND 17 String 10 1 0.0 Course String BND 9 String BND 10 -1343.69 Course String BND 10 String 5 2 0.0 LOT A10 Course String 5 2 String 5 3 0.0 Course String 14 4 String 14 5 -50.0 Course String 5 3 String 5 4 0.0 Course String 5 4 String 5 5 0.0 Course String 14 5 String BND 15 0.0 Course String BND 15 String BND 16 0.0 Course String 5 5 String 14 13 310.28 Course String BND 16 String 14 4 0.0 Course String 14 13 String 14 12 0.0 Course String 14 12 String 14 11 0.0 LOT A11 Course String 14 11 String 14 10 0.0 Course String 14 10 String 14 9 50.0 Course String 14 5 String 14 6 -50.0 Course String 14 6 String 14 7 0.0 Course String 14 9 String 16 1 50.0 Course String 14 7 String 14 8 -50.0 Course String 16 1 String 14 8 50.0 Course String 14 8 String BND 13 0.0 Course String 14 8 String 14 7 50.0 Course String 14 7 String 14 6 0.0 Course String BND 13 String BND 14 0.0 Course String BND 14 String BND 15 0.0 Course String 14 6 String 14 5 50.0 Course String BND 15 String 14 5 0.0 Course String 14 5 String 14 4 50.0 Course String 14 4 String 14 3 50.0 LOT A12 Course String 14 3 String 14 2 50.0 Course String 14 2 String 14 1 0.0 Course String 14 1 String 13 2 0.0 Course String 14 8 String 16 1 -50.0 Course String 16 1 String 16 2 0.0 Course String 16 2 String BND 12 -1353.69 Course String 13 2 String 13 3 -260.28 Course String BND 12 String BND 13 0.0 Course String 13 3 String 13 4 0.0 Course String BND 13 String 14 8 0.0 Course String 13 4 String 13 5 0.0 Course String 13 5 String 13 6 426.17 LOT A13 Course String 13 6 String 13 7 426.17 Course String 16 1 String 14 9 -50.0 Course String 13 7 String 13 8 -371.17 Course String 14 9 String 5 3 0.0 Course String 13 8 String BND 21 0.0 Course String BND 21 String BND 22 0.0 Course String 5 3 String 5 2 0.0 Course String 5 2 String 16 2 -1353.69 Course String BND 22 String 2 15 421.17 Course String 16 2 String 16 1 0.0 Course String 2 15 String 2 14 -376.07 Course String 2 14 String 2 13 -376.07

 Course String 14 10 -50.0
 Course String 2 13 String 2 12 0

 Course String 14 10 String 14 11 0.0
 Course String 2 12 String 2 11 0

 Course String 14 11 String 14 12 0.0
 Course String 2 11 String 2 10 1

 Course String 14 12 String 14 13 0.0
 Course String 2 9 -1

 Course String 14 13 String 14 14 -310.28
 Course String 2 8 String 2 7 0.0

 Course String 5 4 String 5 3 0.0
 Course String 2 7 String 2 6 0 0

 Course String 5 3 String 5 3 String 5 3
 Course String 2 7 String 2 6 0 0

 Course String 2 13 String 2 12 0.0 Course String 2 12 String 2 11 0.0 Course String 2 11 String 2 10 163.115 Course String 2 10 String 2 9 -163.115 Course String 2 4 String 2 3 0.0 Course String 2 3 String 2 2 0.0 Course String 2 2 String 2 1 0.0 Course String 2 1 String BND 2 0.0

Shown in Figures 8(a) through 8(f) are samples of how the commands can be used and the results they will produce. Shown in Figure 9 are polygon features which have been created using the vertices of the predefined traverses with the LOT and COURSE commands. Note that the commands can appear in lowercase, uppercase or a mix of lower and uppercase characters.

It should also be pointed out that in Figures 8(a) through 8(f) the traverses that are created, by the commands shown in the figures, are identified by the text in the color red. For example, in Figure 8(a), the boundary traverse is identified by the text BND, while in Figure 8(b), the traverse 2 is indicated by the text 2, both displayed in the color red. When a parcel is defined with the LOT command, the result will be a polygon feature. When a traverse is defined with the STRING command, the result will be point, line and curve features. The features that are created are stored in the current active layer. Additionally, there will be no duplicate point features.

When a parcel or traverse is defined, the command keeps track of the vertices comprising the parcel or traverse. In so doing, the user is able to reference a vertex in a parcel or traverse. So that, rather than specifying coordinates, the user references the vertices in a parcel or traverse.

In using the commands, some commands will require the specification of a bearing, such as the DD command. A bearing can be specified in a variety of formats. Shown in Table 2 are the available formats in which a bearing may be specified.

For commands that require the entry of a radius value, the user should note that the sign of the radius value will control the location of the curve center. A positive radius value will place the curve center to the right of the chord direction, while a negative value places the curve center on the left.

To improve the readability of the file, the user can introduce blank lines or a comment line. A comment line is denoted by the /* characters in columns 1 and 2 of a data line. There is no limit to the number of blank lines or comment lines that can appear in the file.

When entering data for a command, at least one space or blank character must separate the parameters that a command requires. As an alternative to the space character, the comma or tab character can be substituted.

Shown in Table 3 is a summary of the available commands with a description of the command and its syntax. Supplementing this information is the following:

Table 2 Available Bearing Specification Formats

Key entry of bearings with lettered quadrants

- The angle portion of a bearing is entered in a manner identical to that of an angle (discussed above), while the quadrant indicator:
 - May be NE, SE, SW, NW, ne, se, sw or nw, and may precede or follow the angle, such as NE 35 34 4.4 or 35 34 4.4 NE.
 - May span the angle, such as N 35 34 4.4 E, or n 35 34 4.4 e.
 - May be numeric, 1 through 4, corresponding to NE, SE, SW and NW respectively. If so,
 - (a) the indicator must precede the angle, and
 - (b) the angle must be entered in d/m/s format, with all three angle components present, such as 1 35 0 0.
 - Must be separated by at least one space from the angle components.

Key entry of bearings with numeric quadrants

Bearings with a numeric quadrant indicator may be entered as one word, without any spaces, and with decimal points separating the degrees, minutes and seconds, such as:

110.45	denoting a bearing of N 10 45 00 E
110	denoting a bearing of N 10 00 00 E
210.456.7	denoting a bearing of S 10 45 06.7 E
39.056.7	denoting a bearing of S 09 05 06.7 W
40.000.25	denoting a bearing of N 0 00 00.25 W

Parcel/String Identification Commands

LOT

Denotes the definition of a parcel which will result in the creation of a polygon feature, which will be stored in the current active layer. This must be the first command in a lot or parcel definition.

Following the command is the lot identification. At least one blank space must separate the LOT command and the lot identification string. The lot identification string is an alphanumeric string. Note that there is no limit to the number of characters that can comprise the identification.

STRING

Denotes the definition of a traverse which will result in the creation of point, line and/or curve features, which will be stored in the current active layer. This must be the first command in a traverse definition.

Following the command is the traverse identification. At least one blank space must separate the STRING command and the traverse identification string. The traverse identification string is an alphanumeric string. Note that there is no limit to the number of characters that can comprise the identification.

Define a line course by specifying two vertices. The coordinates associated

with the vertices are then used for the

Define a tangent curve, whose PC is

the current position, by specifying a

Chord

Tangent Line

CHORD Command

Define a tangent curve, whose PC is

the current position, by specifying a

central angle and a radius. The central

angle is defined in terms of degrees,

minutes and seconds. Note, all three

components of the central angle must

Angle

Tangent Line

ANGLE Command

PT

Radius

PT

Radius

chord length and a radius.

PC

ANGLE

be specified.

PC

start and end points of the line.

Tangent Curve Course Commands

LINE

CHORD

Parcel/String Start Point Commands

SP

Denotes the start point of a parcel or traverse. The start point can be defined explicitly in the form of X (easting), Y (northing) coordinates, such as: SP 5000.0 5000.0 or by referencing a vertex in a predefined parcel or traverse such as: SP String BND 4

SP_POC

Denotes that the start point of a parcel or traverse is to be defined by a plus and offset along an existing course. A positive plus value proceeds in a direction from the PC to the PT, while a negative plus value opposes this direction.



Line Course Commands

DD

Define a line course by specifying a distance and a bearing. The start point of the course is the current position, while the end point is computed using the specified distance and bearing values from the current position. See Table 2 for a listing of the formats in which a bearing may be entered.

ARC

Define a tangent curve, whose PC is the current position, by specifying an arc length and a radius.



CURVE

Define a curve course by specifying two vertices and a radius. The coordinates associated with the vertices are then used for the start and end points of the curve.

Non-Tangent Curve Course Commands

NTC1

Define a non-tangent curve, whose PC is the current position, by specifying radius, chord length and chord direction. The chord direction is specified in the form of a bearing. See Table 2 for a listing of the formats in which a bearing may be entered.



NTC2

Define a non-tangent curve, whose PC is the current position, by specifying radius, chord length, central angle and chord direction. The central angle is specified in terms of degrees, minutes



Table 3 Polygon/String COGO File Command Description and Syntax				
LOT	: Polygon to be defined.			
	LOT lot_id			
STRING	: Points/lines/curves to be defined in the form of a string of lines and curves.			
	STRING string_id			
SP	: Define the start point of polygon/string by coordinates or by referencing a vertex in an existing polygon/string.			
	SP xcord ycord			
	or			
	SP STRING string_id vertex_id			
SP_POC	Define the start point of a polygon/string given a plus and offset along an existing course that is defined by specifying two vertices in a polygon/string and a radius value			
	SP_POC STRING string_id vertex_id STRING string_id vertex_id Radius Plus Off			
DD	: Define a course (line) from the current position with distance and bearing (see Table 2 for the available Bearing formats).			
	DD Dist Bearing			
LINE	: Define a course (line) given two vertices in a polygon/string.			
	LINE STRING string_id vertex_id STRING string_id vertex_id			
CHORD	: Define a course (tangent curve) from the current position given Chord Length and Radius.			
	CHORD Chord_Length Radius			
ANGLE	Define a course (tangent curve) from the current position given Central Angle (degrees, minutes and seconds) and Radius.			
	ANGLE Central_Angle Radius			
ARC	: Define a course (tangent curve) from the current position given Arc Length and Radius.			
	ARC Arc_Length Radius			
CURVE	Define a course (curve) given PC, PT and a Radius, the PC and PT locations are defined by specifying two vertices in a polygon/string.			
	CURVE STRING string_id vertex_id STRING string_id vertex_id Radius			

Table 3 (continued) Polygon/String COGO File Command Description and Syntax

NTC1 : Define a course (non-tangent curve) from the current position given Radius, Chord Length and Chord Direction, which is specified in the form of a bearing (see Table 2 for the available Bearing formats)

NTC1 Radius Chord_Length Chord_Direction

NTC2 : Define a course (non-tangent curve) from the current position given Radius, Chord Length, Central Angle, which is defined in the form of degrees, minutes and seconds, and a Chord Direction, which is specified in the form of a bearing (see Table 2 for the available Bearing formats)

NTC2 Radius Chord_Length Deg Min Sec Chord_Direction

OFFCURVE : Define a course (curve) given a start point (SP) that is concentric to an existing course and an Offset value. The existing course is defined by specifying two vertices and a Radius. The new course's radius value is equal to the sum of the existing course's radius plus the offset value.

OFFCURVE STRING string_id vertex_id STRING string_id vertex_id STRING string_id vertex_id Radius Off

POC : Define a course from the current position to a point on an existing course
 (line or curve) given a Radius and Plus value along the existing course and
 the Radius of the new course.

POC STRING string_id vertex_id STRING string_id vertex_id Radius Plus Course_Radius

COURSE : Define a course using two existing vertices, a Radius and an optional Central Angle, which is defined in the form of degrees, minutes and seconds.

COURSE STRING string_id vertex_id STRING string_id vertex_id Radius Central_Angle



and seconds. All three components of the central angle must be specified. The chord direction is specified in the form a bearing. See Table 2 for a listing of the formats in which a bearing may be entered.

Concentric Curve Command

OFFCURVE

Define a curve course that is concentric to an existing or base curve course. The user specifies the start point of the new course by referencing a vertex in an existing parcel or traverse, along with the existing course definition and an offset value. The existing course is



defined by referencing two vertices (PC and PT) in an existing parcel or traverse and a radius value. The offset value is the radial distance from the existing course to the new course. As such, the radius of the new course is equal to the existing course's radius plus the offset value.

Point on a Course Command

POC

Define a course whose start point (SP) is the current position and whose end point (EP) is computed by a plus value along an existing course. The existing course is defined by referencing two vertices (PC and PT) in an existing parcel or traverse and a radius value. Following the specification of the plus value, the user enters the radius of the new course (course radius). If a line course is desired, the course radius value should be zero, while a nonzero value will result in a curve course be-



ing created.

Course Definition Command

COURSE

Define a course by specifying two vertices (PC and PT), a radius and an optional central angle. The coordinates associated with the vertices are then used for the start and end points of the course. The central angle is defined in terms of degrees, minutes and seconds. Note, all three components of the central angle must be specified. Since the specification of the central angle is optional, the user can exclude the central angle from the data line, if appropriate. The central angle must be specified if the course is to be a curve and its central angle is greater than 180 degrees.

Notes

- **a.** If the start point of a parcel or traverse is a point that has been previously defined, the LINE, CURVE, OFFCURVE or COURSE commands can be used in lieu of the SP or SP_POC commands, see Figure 8(f).
- **b.** The identification string that is entered for the LOT and STRING commands must be unique. That is to say, all of the lot and string IDs must be different, they can not be the same.

Summary

The [Import Points] command is a useful tool for creating features in mass from an ASCII based text file. Users who do not have ArcMap installed on a PC can use this format, in conjunction with a text editor or word processor, to create a file that can then be imported with the [Import Points] command to create the appropriate features.

Although a number of file formats are presently supported, should a user desire an additional file format or a modification to an existing file format, they should feel free to contact The CEDRA Corporation and make a request.

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 file format.

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.