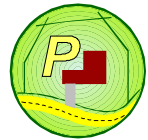


The CEDRA Corporation's COMMAND OF THE MONTH

A monthly information bulletin

April 2005


FEATURED COMMAND
Create a Parcel



Application Description

Users who deal with land record information often come across deed data which has to be converted from paper to digital format. The result of this conversion can be: (a) line and curve features, (b) polygon features and/or (c) all three types of features. When transcribing a deed that results in a closed figure (polygon), most times the information on the deed results in a non-closed figure, thereby requiring some sort of adjustment to close the figure.

The CEDRA Solution

The Create a Parcel tool,  offers the user the ability to transcribe a deed, as well as, the ability to perform an adjustment if the deed does not form a closed figure. ArcGIS® users can employ the CEDRA-AVparcel-Tools toolbar, while ArcView® GIS users can activate the CEDRA-AVparcel or the CEDRA-Deed extension, whichever is available. Figure 1 illustrates the CEDRA-AVparcel-Tools toolbar for ArcGIS users.

For ArcView® GIS users, the Create a Parcel tool can be displayed by: (a) selecting the {AVparcel Tools} [Tools on Toolbar (Hide/Show)] command, the result of which is shown in Figure 2 or (b) activating the CEDRA-Deed extension.

Create a Parcel Tool - Overview

In transcribing a deed, the Create a Parcel tool operates on the premise that there is a starting point. As such, there must be an existing point or line feature. In the case of the line feature, one of the

end points will serve as the starting point of the parcel. Note that the word parcel is arbitrary since this command can be used for the creation of zoning polygons, wetland delineations and many other types of boundaries.

Command Of The Month bulletin

This month's issue addresses how to transcribe a deed.

Given a starting point, the command will display a dialog box from which the user can create both line and curve features. In addition, the user is able to alter the display of the map by panning or zooming in or out of the view. This is very handy because the Create a Parcel command is not terminated when the view is altered.

Create a Parcel Tool - Operation

When the tool is selected, the user will be prompted to pick the start of the parcel of land, at which point, the user should pick the appropriate point or line feature. In the case of a line feature, the

pick, which is made to select the line, should be towards the end point of the line that is to act as the starting point.

Once the pick has been made, the user is asked to select the method of parcel definition, as shown in Figure 3.

When transcribing a deed, the user will most likely select the third option, Pick POB & Transcribe Deed. The last option is similar to the third, with the exception that the user first defines a tie-line, after which, the parcel is defined. A tie-line is one or more courses that lead from the start point that is initially selected to the start point of the parcel that is to be defined.

The first two options in Figure 3 presume that there are existing line and curves features from which a polygon feature is to be created. Since this

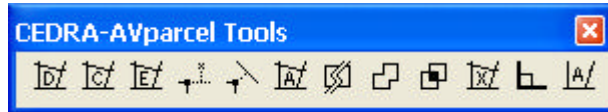


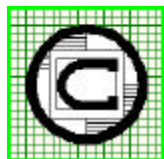
Figure 1
CEDRA-AVparcel-Tools Toolbar for ArcGIS Users



Figure 2
CEDRA-AVparcel Tools on Toolbar (Hide/Show) for ArcView GIS Users



Figure 3
Method of Parcel Definition Query



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month's issue of Command of the Month deals with transcribing deed data we will forego a discussion of these options.

If the third or fourth option in Figure 3 is selected, the command will query the user for confirmation of the selected feature, as shown in Figure 4.



Figure 4
Feature Confirmation Query

PIN Assignment

Once the selected feature has been confirmed, the tool prompts the user for a parcel identification number, PIN. Every parcel that is defined is assigned a PIN. The PIN value is used to uniquely identify the parcel. If the user is not interested in assigning a PIN to the parcel, a “dummy” PIN may be entered. Note that a PIN must be entered regardless if it is to be used or not.

Shown in Figure 5 is the dialog box that is displayed when the New York State O.R.P.S. PIN format is desired. Figure 6 shows the dialog box when the alphanumeric PIN format is desired. Depending upon the current PIN format that is active, the PIN dialog box will vary in appearance.

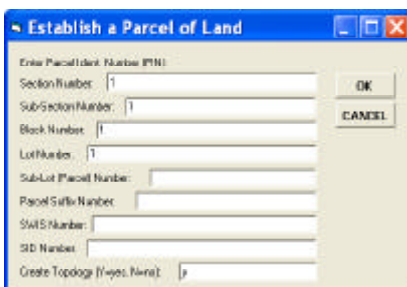


Figure 5
N.Y.S. O.R.P.S. PIN Dialog Box

The PIN format can be controlled by modifying the *pin.txt* file, which is located in the CEDRA distribution directory. For PC users this is typically,

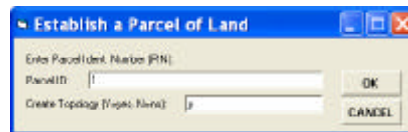


Figure 6
Alphanumeric PIN Dialog Box

c:\cedra\avprjs. The first line in the *pin.txt* file controls the PIN format. A value of 0 denotes that the alphanumeric PIN format is desired. A value of 1 indicates that the N.Y.S. O.R.P.S. format is desired.

Additional information describing the format of the *pin.txt* can be found within the *pin.txt* file, as well as, the AVparcel on-line help.

Parcel Course Definition

Once the PIN has been entered, the parcel course data entry dialog box will appear. Shown in Figure 7 is a sample parcel course data entry dialog box.

The first seven data fields enable the user to define a line or curve feature. Specifically, the first two result in the creation of a line feature, while the remaining five are used to create curve features in a variety of different modes.

The eighth data field, the one with the *to the point of beginning* label, is used to terminate the definition of the parcel, while the bottom three data fields can be used to alter the display of the view.

In reviewing the first seven data fields, notice the letters, A, B, C, D, E, F and G appearing in a vertical fashion. These letters are used to denote the items which need to be entered in order to create a specific type of feature.

Specifically, code A indicates that a line feature is to be created by specifying a direction and a distance, the first and second data fields in the parcel course data entry dialog box.

Codes B, F and G indicate that a non-tangent curve is to be created, while codes C, D and E denote a tangent curve is to be established. Each code establishes a curve using different curve data.

Code B enables the user to create a non-tangent curve by specifying the chord direction, chord distance and radius.

Code C enables the user to create a tangent curve by entering a radius and an arc length.

Code D enables the user to create a tangent curve by entering a radius and a chord length.

Code E enables the user to create a tangent curve by entering a radius and central angle.

Code F enables the user to create a non-tangent curve by entering a chord direction, radius and arc length.

Code G enables the user to create a non-tangent curve by entering a chord direction, radius and central angle.

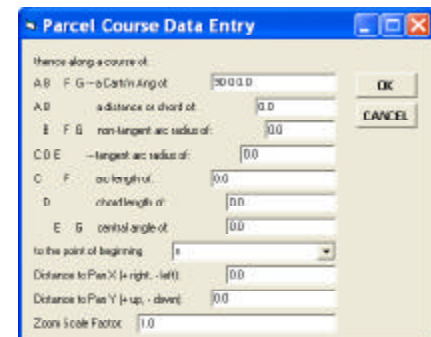


Figure 7
Update Matching Attributes Query

When entering radius values, a positive value will place the center of the curve to the right of the direction, while a negative value places the center on the left side of the direction.

Depending upon the type of feature to be created (line or curve) and the data that is available, the user enters the data in the appropriate data fields, after which, the OK button is selected. Once the OK button has been selected, the command displays the result. This process is repeated for each course comprising the parcel.

As the courses are entered, the user will see the results on the screen. The line

and curve features that are displayed are graphic elements, not features. That is, none of the courses defined are stored to disk. All of the courses are stored in memory and are not written to disk until the parcel is terminated.

Note, when defining curves the direction shown in the first data field will be either: (a) the direction which the curve will be tangent to or (b) the direction of a non-tangent curve's chord. Furthermore, when defining curves the value that should be entered in the second data field should be 0.0, the exception to this rule is when Code B is to be used in the curve definition.

Parcel Termination

A parcel can be terminated in one of two ways. The *first* is when the parcel closes upon itself. That is, the end point of the last course entered matches the start point of the first course in the parcel. When this occurs, the query shown in Figure 8 is displayed.



Figure 8
Parcel Confirmation Query

The user then responds accordingly to accept or reject the parcel. If the parcel is accepted, a polygon feature is created and stored in the current active layer. If the parcel is rejected, the command remains active so that another parcel can be defined.

The *second* way a parcel can be terminated is by entering *y* in the eighth data field. In so doing, the user has indicated to the command that it is desired to return to the point of beginning of the parcel.

At this point, the parcel review choice box, as shown in Figure 9, will appear, as

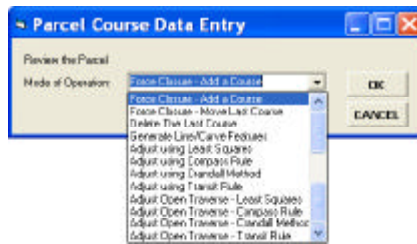


Figure 9
Parcel Review Choice Box

will, the data shown in Figure 10. The information contained in Figure 10 is displayed in the status bar area (low left corner of the application window) and reflects the parcel closure error. That is, the difference between the start and end points of the parcel. Specifically, the direction and distance between the two points is displayed, as well as, the differential distances (DX and DY).

From Figure 9, it can be seen that the user has a variety of choices in determining how to terminate the parcel definition.

The first option *Force Closure - Add a Course* terminates the parcel definition by adding a course whose end point will match the start point of the first course in the parcel. This saves the user from having to enter the final course in the parcel definition. It also ensures that the parcel is closed, thereby, eliminating any need to perform a parcel adjustment.

The second option *Force Closure - Move Last Course* closes the parcel by moving the end point of the last course entered to the start point of the first course in the parcel. This option can be used when the deed data does not close and it is not desired to perform a parcel adjustment.

The third option *Delete The Last Course* enables the user to remove the last course from the parcel definition. This option can be used when an invalid entry has been made and the user simply wants to delete the last course without having to start completely over.

So that, if this option is selected the last course which was entered will be deleted, after which, the parcel course data entry dialog box reappears and the parcel definition process continues.

The fourth option *Generate Line/Curve Features* enables the user to create line and/or curve features for the courses that have been specified. This option can be used when an open figure (string) is being defined or when the user simply wants to create line and curves features and not a polygon.

Options 5, 6, 7 and 8 enable the user to perform an adjustment on the parcel using the Least Square, Compass Rule, Crandall or Transit Rule methods.

The last four options in Figure 9 enable the user to perform an adjustment on an open figure. That is, a figure whose end point does not match its start point. These options should not be used on a closed figure. They should only be used on open figures.

Altering the Map Display

During the course of parcel course entry it may be necessary to change the map display by: (a) panning or (b) zooming in or out of the current view. The bottom three fields of the parcel course data entry dialog box, see Figure 7, can be used to accomplish either of these tasks. Once the view has been altered, the dialog box will reappear and the parcel course data entry process can continue.

Note that if any values, other than the default values for the bottom three data fields, appear in these fields, the map display will be altered accordingly. That is to say, the panning and zooming parameters take precedence over the parcel course parameters.

Example

As an example let us consider the parcel shown in Figure 11. As can be seen, the parcel is comprised of both line and

Length= 71.74389 Azimuth=215 15 51.8 SW 35 15 51.8 Cartesian=234 44 8.2 (234.735610) DX=41.42136 DY=58.57864

Figure 10 Parcel Closure Error Data

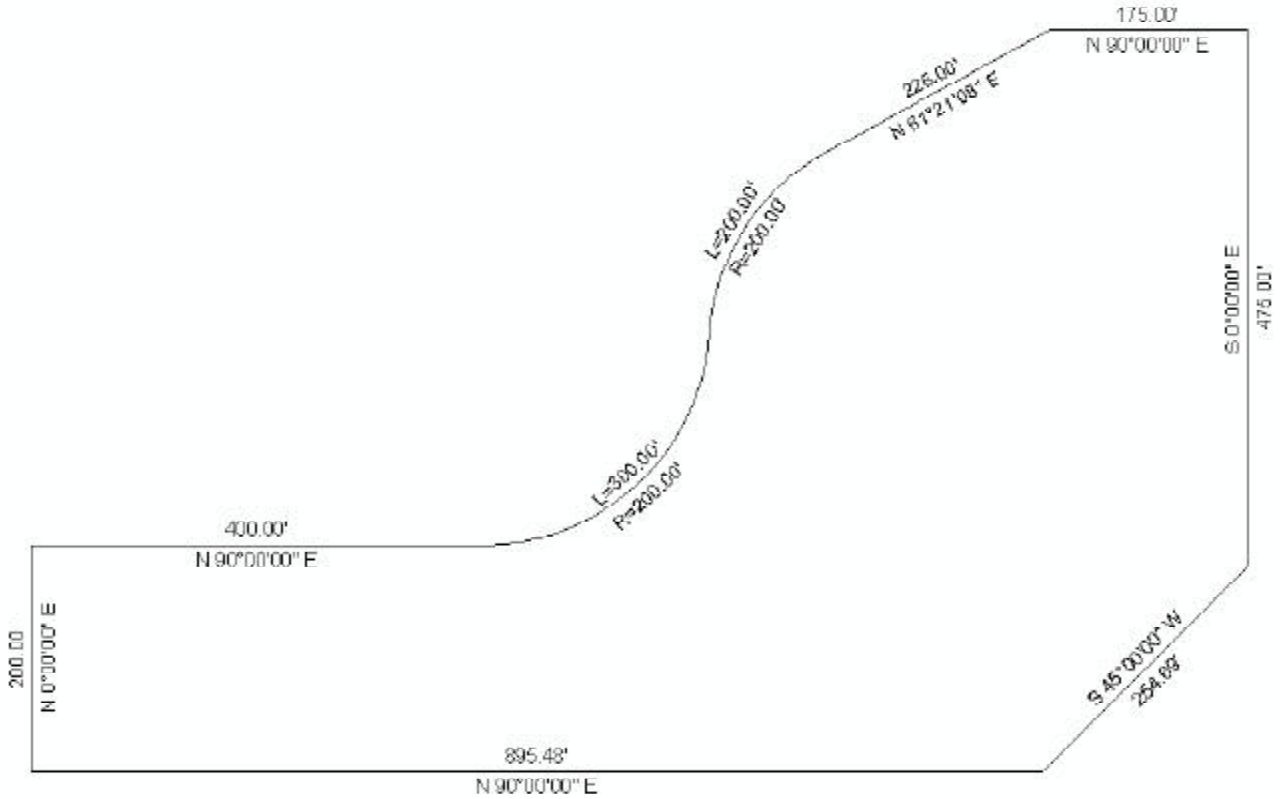


Figure 11 Sample Parcel

curve features. Using typical COGO functionality, the user could use two or three different commands to establish the features shown in Figure 11. Using the Create a Parcel tool, however, we will use a single tool to create all of the features shown in the sample parcel.

In getting started, we will assume that the user has an established point somewhere in the map. As such, invoke ArcMap or ArcView and either load an existing point theme or create a new point theme at some arbitrary location.

Once this is done, display the Create a Parcel tool by either (a) activating the CEDRA-AVparcel-Tools toolbar (ArcGIS users) or (b) activating the CEDRA-AVparcel extension (ArcView GIS users).

At this point we are ready to begin the deed transcribing process. We assume that the low left corner of the sample parcel shown in Figure 11 is the starting point, so that:

1. Select the Create a Parcel tool.

2. Make a pick at the existing point feature.

At this point, the choice list message box of Figure 3 will appear.

3. Select the Pick POB & Transcribe Deed option, then pick the OK button.

At this point, the command will query the user for confirmation of the feature selection.

4. Pick the Yes button to confirm the selection of the feature.

The command will now prompt for the parcel PIN. Depending upon the parcel PIN format that is active the user will see either Figure 5 or 6 or some variation of Figure 5.

5. Enter any desired PIN and then pick the OK button.

At this point, the parcel course data entry dialog box of Figure 7 will appear.

We will now begin to enter the various parcel course data using the A and C codes. Code A will establish the lines, while code C will establish the tangent curves. In defining the curves, as per code C, we will enter the radius and arc length of the curves.

6. Enter:
NE 0 in data field 1 - Direction,
200 in data field 2 - Distance, then
Pick the OK button.
7. Enter:
NE 90 in data field 1 - Direction,
400 in data field 2 - Distance, then
Pick the OK button.
8. Enter:
0 in data field 2 - Distance, then,
-200 in data field 4 - Arc Radius,
300 in data field 5 - Arc Length, then
Pick the OK button.
9. Enter:
200 in data field 4 - Arc Radius,
200 in data field 5 - Arc Length, then
Pick the OK button.

10. Enter:
NE 61 21 8 in data field 1 - Direction,
225 in data field 2 - Distance, then
Pick the OK button.
11. Enter:
NE 90 in data field 1 - Direction,
175 in data field 2 - Distance, then
Pick the OK button.
12. Enter:
SE 0 in data field 1 - Direction,
475 in data field 2 - Distance, then
Pick the OK button.
13. Enter:
SW 45 in data field 1 - Direction,
254.69 in data field 2 - Distance, then
Pick the OK button.

At this point we have one last course to enter to terminate the parcel. One possibility is to use the command's capability to force close the parcel by adding a course. As such we could:

14. Enter:
y in data field 8 - Point of Beginning,
Pick the OK button.

At this point, the parcel termination choice list of Figure 9 will appear.

15. Select the option:
Force Closure - Add a Course,
Pick the OK button.

At this point, the parcel confirmation query box of Figure 8 will appear.

16. Select the Yes button to confirm the parcel definition. At this point a polygon feature or an AVparcel parcel feature will be created. Depending upon how the user responded to the Create Topology parameter in Figures 5 or 6, the user can control which type of feature is created. A response of NO for this parameter will result in the creation of a polygon feature, while a response of YES will create an AVparcel parcel feature.

As an alternative to Steps 14 through 16, described above, let us enter the last course explicitly. However, we will enter

a course that results in the parcel not closing. Graphically, the parcel will look closed but the end point of the last course and the start point of the first course will not be the same. So that, rather than performing Steps 14 through 16 above, we could:

14. Enter:
NE 90 in data field 1 - Direction,
-896 in data field 2 - Distance, then
Pick the OK button.

At this point, the parcel course data entry dialog box will reappear. Graphically, the parcel looks closed. However, the distance we entered, 896, is larger than the true distance of 895.48.

What we want to do now at this point is to close the parcel using a Least Squares adjustment. As such:

15. Enter:
y in data field 8 - Point of Beginning,
Pick the OK button.

At this point, the parcel termination choice list of Figure 9 will appear.

16. Select the option:
Adjust using Least Squares,
Pick the OK button.

At this point, the parcel adjustment dialog box of Figure 12 will appear.

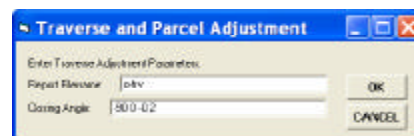


Figure 12
Parcel Adjustment Dialog Box

17. Select the OK button to confirm the name of the report file and closing angle.

The command will then begin the adjustment, after which, a polygon or AVparcel parcel feature will be created, the reader is referred to the explanation given in Step 16.

Note, in order to perform an adjustment within ArcMap, it is required that the document file be assigned a name. An adjustment can not be performed in an 'Untitled' document file.

When a parcel is adjusted, within the polygon theme (layer), the command will introduce six fields called: CLOSED, CLOSE_DIST, CLOSE_DX, CLOSE_DY, CLOSE_AZ and CLOSE_BEAR which contain information pertaining to the error of closure. The value for the CLOSED attribute will be either YES or NO. A value of YES indicates that when the parcel was defined the result of all of the courses was a closed figure. A value of NO, on the other hand, indicates that the parcel did not close and that an adjustment had to be performed in order to close the parcel. The other attributes identified above contain information pertaining to the error of closure between the start and end points of the parcel.

Summary

For those users who are involved in transcribing deed data, the Create a Parcel tool provides a single user-interface for creating line, curve or polygon features, representing parcels or open traverses. An excellent alternative to using multiple individual COGO tools.

As always should there be any questions in how to use the Create a Parcel tool or recommendations in additional functionality that would be desirable, please let us know.

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