

The CEDRA Corporation's COMMAND OF THE MONTH

A monthly information bulletin

August 2007

FEATURED COMMAND

Aliquot Parcel/Polygon
Definitions



Application Description

Those of you who have done mapping west of the Mississippi have probably heard of the term "Aliquot parcels". For those who have not, Aliquot parcels are mathematical subdivisions of a larger parcel into equally divided smaller parcels. Aliquot parcel descriptions are typically used when bearing and distances are not available.

An example of an Aliquot parcel description is as follows:

SESWSW in Section 1, and SWSES2 in Section 1, and NWNEE2 in Section 12, and NENWNW in Section 12, and NWNENE2 in Section 12.

Parsing through such a description can be confusing, especially when there is no accompanying drawing.

In the above example, five parcels or lots are described using the quadrant identifiers (SE, SW, S2, NW, NE and E2). The identifiers: NE, SE, SW and NW refer to the northeast, southeast, southwest and northwest quadrants of a section, respectively. Likewise, the identifiers: E2 and W2 refer to the east half and west half of a section, respectively.

The basic concept in an Aliquot description is to take a large polygon, which typically represents a section in a grid system, and subdivide it one or more times into a smaller polygon by using various combinations of quadrant identifiers. Note that the result of one quadrant identifier is used as the starting point for the next.



Figure 1
CEDRA-Aliquot-Tools Toolbar

The CEDRA Solution

To facilitate the parsing of an Aliquot description, the user can activate the CEDRA-Aliquot-Tools toolbar, see Figure 1. The tools contained in this toolbar specifically, the [Aliquot Polygon] command, which is the last command in the combo-box choice list, is the command that we will be discussing in this issue of Command of the Month.

Command Of The Month bulletin

This month's issue discusses the process of performing a curve/line intersection, as well as, a curve/curve intersection.

Aliquot Polygon - Overview

Upon activation of the [Aliquot Polygon] command, the command checks for an active polyline or polygon layer in the Table of Contents. If there is no active polyline or polygon layer, or if there is more than one layer active, an appropriate error message is displayed. Figures 2 and 3 illustrate the syntax of the error messages that are displayed depending upon the circumstance.



Figure 2 - No Active Polyline or Polygon Layer Error Message



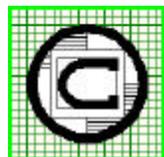
Figure 3 - More than One Active Polyline or Polygon Layer Error Message



Figure 4 - No Selected Feature(s) Error Message

In addition, within the active layer there must be at least one active feature, if not, the error message shown in Figure 4 will be displayed.

In processing an Aliquot description, the [Aliquot Polygon] command determines the corners of the selected feature(s). These corners represent the four corners of a quadrilateral that encompasses the selected feature(s). Shown in Figure 5(a) is an example where the active layer contains one selected feature, while Figure 5(b) illustrates the case of multiple selected features, in this case, 16 features.



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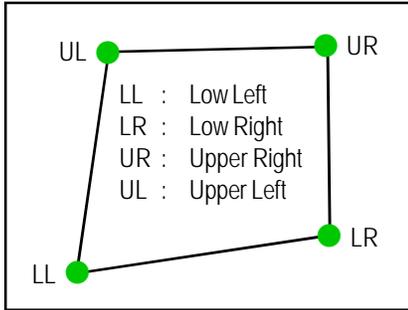


Figure 5(a) - One Selected Feature and the computed 4 corners

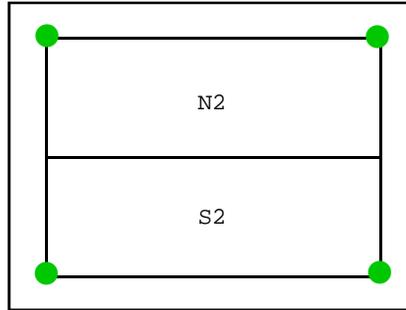


Figure 6(b) - Default N and S halves in a Quadrilateral

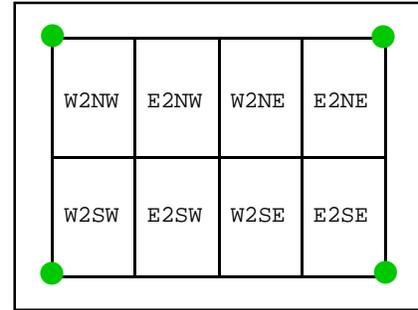


Figure 6(f) - Default E and W Half Quarters in a Quadrilateral

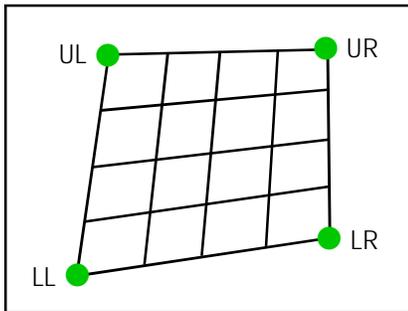


Figure 5(b) - 16 Selected Features and the computed 4 corners

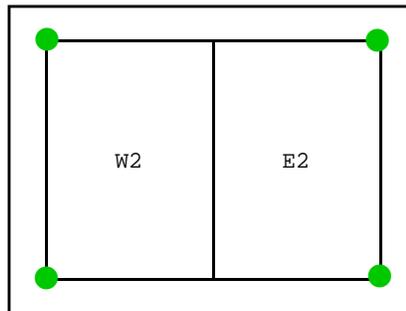


Figure 6(c) - Default E and W halves in a Quadrilateral

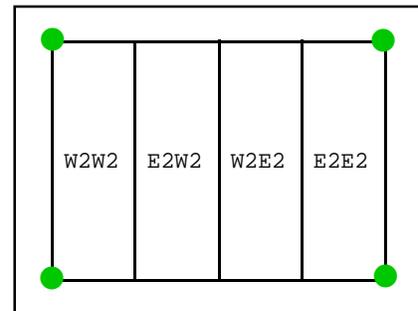


Figure 6(g) - Default E and W Half Sections in a Quadrilateral

From Figure 5(b) it can be seen that the command, when dealing with multiple selected features, will union the selected features and then determine which of the vertices in the selected features represent the four corners of the enclosing quadrilateral.

Once the enclosing quadrilateral has been developed, the command is able to subdivide the quadrilateral into smaller quadrilaterals using standard Aliquot quadrant identifiers. Shown in Figures 6(a) through 6(h) are pictorial representations of the available aliquot identifiers.

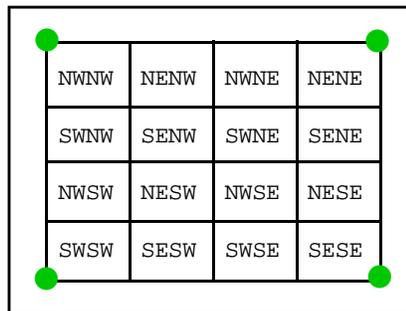


Figure 6(d) - Default 16 Lots in a Quadrilateral

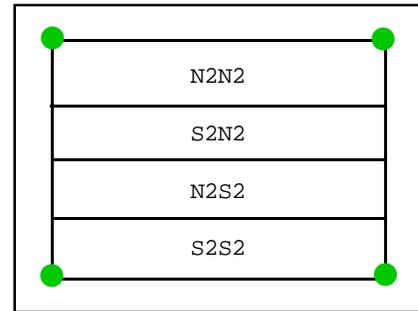


Figure 6(h) - Default N and S Half Sections in a Quadrilateral

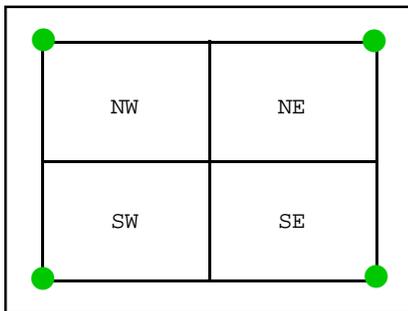


Figure 6(a) - Default 4 Quadrants in a Quadrilateral

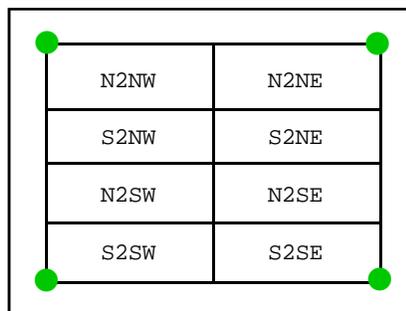


Figure 6(e) - Default N and S Half Quarters in a Quadrilateral

As the user enters a quadrant identifier, such as NE, N2S2, etc., the command divides the current quadrilateral into a smaller quadrilateral using the given quadrant identifier. This smaller quadrilateral then becomes the current quadrilateral that is to be subdivided. This process is repeated until all of the quadrant identifiers are specified.

In addition to the quadrant identifiers shown above, the user is able to enter the North, South, East and West strip identifiers, as shown in Figure 6(i), to indicate that a strip is to be extracted from the quadrilateral.

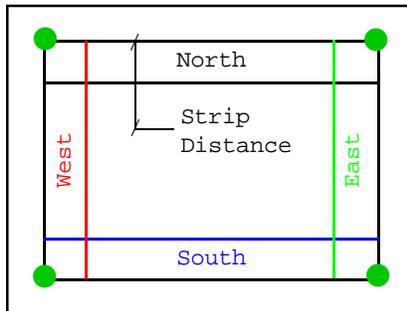


Figure 6(i) - North, South, East, West Strip Identifiers in a Quadrilateral

When using any of the strip identifiers, the user must enter a strip distance value to indicate the width of the strip to be extracted.

Shown in Figure 7 is the initial dialog box displayed by the command upon invocation. The user is able to use the command in one of two modes.

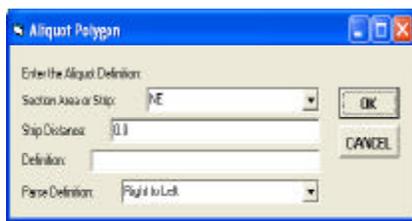


Figure 7 - Initial Dialog Box

The **first** is to build a complete Aliquot definition string by selecting from the choice list, which appears in the first data field, the appropriate quadrant identifier. The user then clicks the OK button to perform the subdivision.

This process is then repeated for all of the quadrant identifiers that are to appear in the Aliquot definition. As the quadrant identifiers are selected, the Aliquot definition is built by adding the individual quadrant identifiers together. The result of this addition is then displayed in the third data field.

Once the initial quadrant identifier has been specified, the command displays the subdivision result in the form of a red polygon graphic element. At this point the dialog box shown in Figure 8 is displayed. Note that two new data fields appear in the dialog box.



Figure 8 - Dialog Box Displayed after Initial Subdivision Performed

The **second** mode of operation is to: (a) select the <Use Definition As Is> option as the quadrant identifier, (b) enter the complete Aliquot definition in the third data field and (c) click the OK button. In so doing, the user does not have to go through the process of building the Aliquot definition one quadrant identifier at a time.

Once the OK button has been selected, the command subdivides the quadrilateral, using the Aliquot definition, and displays the results in the form of a red polygon graphic element. As the Aliquot definition changes, the shape of the polygon graphic element is updated.

Once the desired shape has been computed, the user has the option of: (a) converting the polygon graphic element into a polygon feature, which is stored in the current active layer, or (b) terminating the command. Terminating the command results in the polygon graphic element being deleted.

Aliquot Polygon - Operation

1. Activate or select in the Table of Contents the polyline or polygon layer to be processed.
2. Select the feature(s) which comprise the quadrilateral or section to be subdivided.
- 3a. Once the command has determined the 4 corners of the quadrilateral to be subdivided, as described in the Overview section, the dialog box of Figure 7 appears.

Beginning at the top of the dialog box, the user is able to control the following:

Data Line 1 - Quadrant Identifier

From the choice list, select the quadrant identifier to appear in the Aliquot definition. Note that if one of the strip identifiers (North, South, East, West) is selected, the user must enter a strip distance value in the second data field of this dialog box.

Data Line 2 - Strip Distance

If a strip is to be subdivided, as indicated by selecting the North, South, East or West quadrant identifier in the first data field, the user must enter a value greater than zero in this data field.

Data Line 3 - Overall Aliquot Definition

In this data field, the command displays the Aliquot definition that has been specified to date. When the OK button is selected, the quadrant identifier which appears in the first data field is added to the Aliquot definition, provided that the option <Use Definition As Is> has not been selected.

Data Line 4 - Definition Parsing Order

From the choice list, select the parsing order to be used in parsing the Aliquot definition. The Aliquot definition can be processed left to right or right to left. If the Left to Right option is selected, the command begins at the left side of the string processing the quadrant identifiers in a left to right order. If the Right to Left option is selected, the command begins at the right side of the Aliquot definition and proceeds in a right to left order. Depending upon the order, different results will be achieved.

- 3b. After entering the appropriate value(s), click at the:
 - *Cancel* button to terminate the command, or the
 - *OK* button to process the data that has been specified.

If the OK button is selected, the command performs the subdivision and displays in red a polygon graphic element that represents the result of the subdivision. At this point, the dialog box of Figure 8 appears.

The third data field will contain the Aliquot definition as specified to date. The user can then modify the definition as desired.

The two new data fields that appear in the dialog box enable the user to:

Data Line 5 - Define Additional Part

From the choice list, select the option indicating if an additional part is to be defined. If the No option is selected, the current quadrilateral that is being processed will continue to be processed. If the Yes option is selected, the command will preserve the current polygon graphic element and begin the subdivision process anew using the original 4 corners which were computed when the command was initially invoked. The results of the subdivisions performed at this point are then added to the previous results.

Data Line 6 - Save the Polygon

From the choice list, select the option indicating if the graphic polygon element is to be converted into a polygon feature. If the No option is selected, no polygon feature will be created. If the Yes option is selected, the command will create a polygon feature using the shape of the polygon graphic element and terminate the command. Upon termination of the command the graphic polygon element is deleted. The polygon feature which is created is stored in the current active layer. The [Set Active Layer] command can be used to control the current active layer.

4. Enter the appropriate value(s), click at the:
 - *Cancel* button to terminate the command, or the
 - *OK* button to process the data that has been specified.
5. Repeat Step 4 until the *Cancel* button is selected or the Yes option is selected in Data Line 6.

Example

Shown in Figure 9(a) are the polygons which would have been created using the Aliquot definitions mentioned at the beginning of this article. Note that the Left to Right parsing order is used in performing the Aliquot subdivisions. Shown in Figure 9(b) is the legend for Figure 9(a) indicating the Aliquot description and the resultant polygon shape.

Summary

Users who deal with Aliquot definitions will find this command extremely useful. As stated at the outset, processing Aliquot descriptions can be confusing not to mention that a number of geometric operations are required in order to perform the subdivisions.

Note that the CEDRA-Aliquot-Tools toolbar has recently been added to the software. So that, users wishing this new functionality should inquire about getting an upgrade to their existing software.

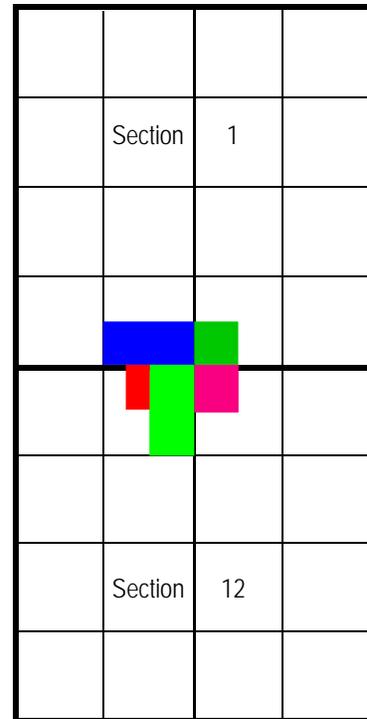


Figure 9(a) - Example of Left to Right Parsing Order

	SESWSW in Section 1
	SWSES2 in Section 1
	NWNEE2 in Section 12
	NENWNW in Section 12
	NWNEE2 in Section 12

Figure 9(b) - Example of Left to Right Parsing Order - Legend

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