

# The CEDRA Corporation's COMMAND OF THE MONTH

A monthly information bulletin

October 2006

FEATURED COMMAND

Updating and Annotating Point Coordinates



## Application Description

Have you ever had the need to identify a point feature and examine its coordinates? Well if you have, you're not alone. Many a time it is useful to echo or display a point feature's coordinate values.

Additionally, it is also very convenient to be able to display the coordinates in not just state plane units but also in terms of latitudes and longitudes. Furthermore, when viewing latitudes and longitudes, it is extremely useful to be able to control the format of the values.

## The CEDRA Solution

To address the application described above, the [Annotate Point Data] command, within the {CEDRA Annotation Commands} combo-box can be employed. Note that this functionality is only available for ArcGIS® users.

Shown in Figure 1 is the {CEDRA Annotation Commands} combo-box. The [Annotate Point Data] command appears at the bottom of the drop-down list.

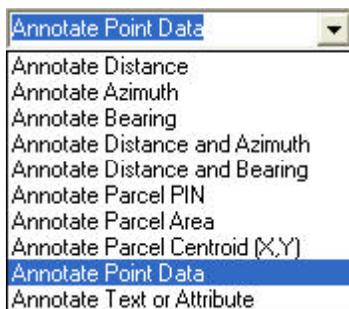


Figure 1  
{CEDRA Annotation Commands}

## Annotate Point Data - Overview

The intent of the [Annotate Point Data] command is to provide the user the ability to *annotate* and/or *update* information associated with a selected group of point features. As such, the user, prior to activating the command, must select the point(s) to be processed.

The annotation which is generated by this command is stored in a Personal GeoDatabase (PGD) using the name of the current active layer as the root name of the PGD.

### Command Of The Month bulletin

*This month's issue discusses the process of updating the coordinate values of one or more point features.*

The type of point data that can be *annotated* and the attribute or field which contains the point data value is shown below:

| Point Data        | Attribute |
|-------------------|-----------|
| Point Number      | PNT       |
| X Coordinate      | X         |
| Y Coordinate      | Y         |
| Elevation         | Z         |
| Point Code        | PTCODE    |
| Point Description | PTDESC    |

Table 1

The type of point data that can be *updated* with this command is the coordinates of the point feature. In updating the coordinates of a point feature, the command uses the current geometry of

the point to ascertain its present location and stores this data in certain pre-defined field names. Depending upon the units of measure, specified by the user, the field names will vary. Shown in Table 2 are the available units of measure and the field names in which the coordinate values are stored in.

| Coordinate Units    | Field Names           |
|---------------------|-----------------------|
| Map                 | X,Y                   |
| Distance            | X,Y                   |
| Decimal Degrees     | X_Long<br>Y_Lat       |
| Longitude, Latitude | Longitude<br>Latitude |

Table 2

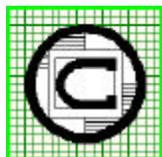
Note that there are 8 different formats which are available under the Longitude, Latitude coordinate units setting. These formats are described latter on in this bulletin.

If the field names shown above do not exist in the point feature's attribute table, the command will add these fields automatically. All of the fields, with the exception of the Longitude and Latitude fields, that are added will be numeric with a *Precision* (field width) of 18 and a *Scale* of 8, digits to the right of the decimal point. The Longitude and Latitude fields are of Text or String type with a *Length* (field width) of 25.

## Annotate Point Data - Operation

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

- 1a. If there are no selected point features at the time the command is



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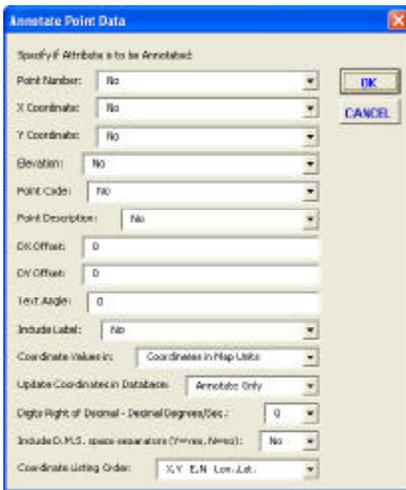
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activated, the error message shown in Figure 2 will be displayed. At this point, click the OK button and select the point(s) to be processed, at which point the command can be reactivated.



**Figure 2**  
Annotate Point Data Error Message

**1b.** If there are selected point features, the multi-input dialog box of Figure 3 will appear.



**Figure 3**  
Annotate Point Data Dialog Box

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

- The first six data line items correspond to the attributes (fields) which the user can select for processing. From the choice list, which appears to the right of the attribute, the user selects *Yes* or *No* to denote if the attribute is to be processed.
- Data line items 7, 8 and 9 enable the user to control the DX and DY offset and the angle of orientation of the annotation. A positive DX values positions the annotation to the right of the point feature, while

a positive DY value places the annotation above the point feature. The DX and DY values should be in world or distance units and can be negative.

- Data line item 10 enables the user to specify whether a label describing the attribute is to appear in the annotation that is generated or not. From the choice list which appears to the right of the data line item, the user selects *Yes* to include a label or *No* to denote that only the value of the attribute is to appear. Shown below are a list of the attributes which can be annotated and the label which will appear if so desired.

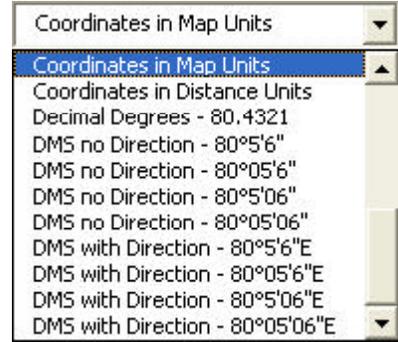
| Point Data        | Label      |
|-------------------|------------|
| Point Number      | Pt. #      |
| X Coordinate      | X, E, Lon. |
| Y Coordinate      | Y, N, Lat. |
| Elevation         | Z          |
| Point Code        | Code=      |
| Point Description | Desc=      |

**Table 3**

Depending upon the setting of the property Direction Orientation, the labels for the X and Y coordinates will be X and Y or E and N. If the property is set to *Cartesian* then the labels will be X and Y, otherwise, they will be E and N. If the units of measure, data line item 11, is set to Decimal Degrees - 80.4321 or any of the DMS options, the labels Lon. and Lat. will be used.

- Data line item 11 enables the user to control the units of measure when processing coordinate values. Shown in Figure 4 is a list of the available units of measure.

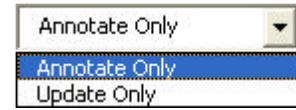
As can be seen, the user can chose from 11 different formats for controlling how the coordinate values are to be presented. Depending upon the option that is selected, the command will format the coordinate value accordingly and store the value in the appropriate field identified in Table 2. The various DMS options enable the user to



**Figure 4**  
Coordinate Units Choice List

control whether the direction labels (N, S, E and W) are to appear in the coordinate string that is generated, as well as, if leading zeros are to be included.

- Data line item 12 enables the user to control the type of operation to be performed by the command.



**Figure 5**  
Type of Operation Choice List

As shown in Figure 5, the user can select the option Annotate Only to indicate that only annotation is to be created, or the option Update Only to indicate that no annotation is desired, but rather, the coordinates in the point feature's attribute table are to be updated.

- Data line item 13 enables the user to control the number of digits to the right of the decimal point which are to appear in the seconds component, see Figure 6, when annotating or updating coordinates using the Decimal Degrees option or any of the DMS options as shown in Figure 4. If the ALL option is selected then the command will display as many digits to the right of the decimal point as possible. Note, if the Map Units or Distance Units options are selected (see Figure 4), then the Digits Right of Decimal - Distance property under the [Change

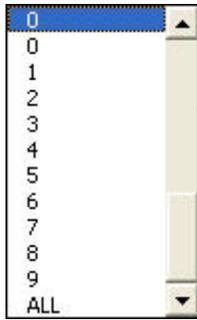


Figure 6  
Digits Right of Decimal - Seconds

Text Properties] command will control how many digits to the right of the decimal point will appear in the coordinate value.

- Data line item 14 enables the user to control whether or not a blank character (space) is to be inserted to separate the various components comprising a coordinate value when any of the DMS options has been selected under data line item 13. From the choice list appearing to the right of the data line item, the user selects *Yes* to include the blank character or *No* to not include the blank character.

- Data line item 15 enables the user to control the coordinate listing order when creating annotation. Shown in Figure 7 are the two choices the user can select from. The default order is X,Y E,N Lon.,Lat. The alternative is the reverse so that rather than having the X coordinate on top of the Y coordinate, the Y,X N,E Lat.,Lon. option results in the Y coordinate appearing above the X coordinate.



Figure 7  
Coordinate Listing Order Choice List

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 begin the processing.

- 3a. If all of the first six data line items have a response of *No* entered, the error message of Figure 8 will appear.



Figure 8  
Annotate Point Data Error Message

At this point, click the OK button to re-display the multi-input dialog box of Figure 3. The user can now select the attribute(s) to be processed or abort the command by selecting the Cancel button.

- 3b. If one or more attributes have been specified for processing, a query similar to that shown in Figure 9 or 10 will be presented. The response given in Data line item 12 will control which type of query is presented. If the option *Annotate Only* is selected a query similar to that shown in Figure 9 will be presented, while if the option *Update Only* is selected a query similar to that shown in Figure 10 will be displayed. At this point the user should click at the:
  - *No* button to terminate the command, or the
  - *Yes* button to begin the processing.

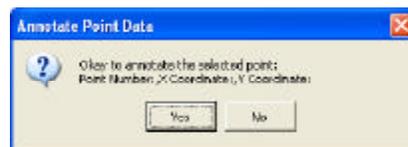


Figure 9  
Annotate Features Confirmation Query



Figure 10  
Update Features Confirmation Query

**Sample Annotation**

Shown below are annotations or text strings which were created using various [Annotate Point Data] settings.

All of the examples below assume that the X Coordinate and Y Coordinate attributes (data line items 2 and 3) have been set to *Yes* and that the type of operation (data line item 12) has been set to *Annotate Only*. Furthermore, the coordinate listing order has been set to the X,Y E,N Lon.,Lat. option.

- a. Coordinate Units (data line item 11) set to Coordinates in Map Units and the Digits Right of Decimal - Distance property under the [Change Text Properties] command set to 2. Note that the map units for the data frame has been set to meters.

1512679 . 73  
911735 . 30

- b. Same as a with attribute label (data line item 10) included. Note that the Direction Orientation property under the [AVcad Properties...] command is set to *Bearing*, which explains the labels E= and N= being used.

E=1512679 . 73  
N=911735 . 30

- c. Coordinate Units (data line item 11) set to Coordinates in Distance Units and the Digits Right of Decimal - Distance property under the [Change Text Properties] command set to 2. Note that the distance units for the data frame has been set to feet.

4963115 . 84  
2989926 . 65

- d. Same as c with attribute label (data line item 10) included. Note that the Direction Orientation property under the [AVcad Properties...] command is set to *Bearing*, which explains the labels E= and N= being used.

E=4963115 . 84  
N=2989926 . 65

- e. Coordinate Units (data line item 11) set to Decimal Degrees - 80.4321 and the number of digits to the right of

the decimal point (data line item 13) set to 7.

```
-92.7276957
46.8576983
```

**f.** Same as **e** with attribute label (data line item 10) included.

```
Lon.=-92.7276957
Lat.=46.8576983
```

**g.** Coordinate Units (data line item 11) set to DMS no direction - 80°5'6" and the number of digits to the right of the decimal point (data line item 13) set to 4.

```
-92°42'5.5343"
46°51'6.3966"
```

**h.** Same as **g** with attribute label (data line item 10) included.

```
Lon.=-92°42'5.5343"
Lat.=46°51'6.3966"
```

**i.** Coordinate Units (data line item 11) set to DMS no direction - 80°05'06" and the number of digits to the right of the decimal point (data line item 13) set to 1. Note that under this coordinate unit setting there will be a leading zero inserted in the minutes and seconds components, if appropriate.

```
-92°42'05.5"
46°51'06.3"
```

**j.** Same as **i** with attribute label (data line item 10) included.

```
Lon.=-92°42'05.5"
Lat.=46°51'06.3"
```

**k.** Coordinate Units (data line item 11) set to DMS with direction - 80°05'06" and the number of digits to the right of the decimal point (data line item 13) set to 1. Note that under this coordinate unit setting there will be a leading zero inserted in the minutes and seconds components, if appropriate.

```
-92°09'05.4"W
46°50'40.1"N
```

**l.** Same as **k** with attribute label (data line item 10) included.

```
Lon.=-92°09'05.4"W
Lat.=46°50'40.1"N
```

**m.** Coordinate Units (data line item 11) set to DMS with direction - 80°5'6", the number of digits to the right of the decimal point (data line item 13) set to 1 and the DMS space character (data line item 14) included. Note that each component in the coordinate is separated by a single blank character.

```
-92° 43' 2.3" W
46° 50' 26.5" N
```

**n.** Same as **m** with attribute label (data line item 10) included.

```
Lon.=-92° 43' 2.3" W
Lat.=46° 50' 26.5" N
```

### Notes

**a.** When generating annotation, the user should first verify that the current working directory is set as desired with the [Set Working Directory] command. Secondly, the user should verify that the current active layer is appropriately set, as well as, the False X, False Y and False XY units values by using the [Set Active Layer] command. This will ensure that the annotation is placed in the appropriate location under the appropriate layer name and that the *Coordinate Out of Bounds...* error message does not appear.

**b.** In order to compute latitude and longitude values, the layer(s) in which the selected point feature(s) reside in must be assigned a spatial reference (coordinate system).

**c.** The command remembers the settings specified by the user so that the next time the command is invoked, the previous settings will appear as the default values.

**d.** If the coordinate values are to be updated, the user should select the *Yes* option for data line items 2 and 3, corresponding to the X Coordinate and Y Coordinate attributes.

**e.** If the type of operation (data line item 12) has been set to Update Only

the samples shown in items **g** through **n** would also appear in the point feature's attribute table. That is to say, since the Latitude and Longitude fields are of type string, the annotation that would appear on the map would also appear in the point feature's attribute table under the Update Only type of operation.

### Summary

The [Annotate Point Data] command provides both annotation and updating functionality for selected point features from one or more layers. Readers should feel free to forward any comments they may have regarding the use or operation of this command.

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