The CEDRA Corporation's

COMMAND OF THE MONTH

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Application Description

Those of us who are involved in creating site plan or tax map geometry have often come across the application where it is desired to create a point by moving along a line or curve a specified distance and/or offset.

Take for example the case where we wish to locate a fire hydrant by proceeding along the street centerline 50' (plus) and then perpendicular to the centerline 17' to the right (offset).

Another example involves the processing of cross-section survey data. This example differs from the previous one in that, rather than specifying a plus value, a station value is specified.

A station value differs from a plus value, in that, a station value represents an absolute position while a plus value denotes a relative position from a base point.

The CEDRA Solution

To address the application described above, the Point 4 tool, [icon] *Points along a line or curve with plus and offset* tool (see Figure 1) can be used.

With the [icon] *Points along a line or curve with plus and offset* tool, the user is able to:
a. start from any point, or endpoint of a line, polyline or curve (the base point),
b. progress along any line, direction or arc (the baseline), and

**Figure 1
CEDRA-Point-Tools Toolbar**

c. introduce plus distances (distances ahead or back of the base point in the direction of the baseline) and offset distances (distances normal to the baseline) to establish other points.

Depending on the setting of the CEDRA-AVcad traversing property, the user may continue to create points by traversing, or not along the baseline (see Figure 2). When traversing is active, the last created point becomes the new base point.

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This month's issue discusses how point features can be created by specifying plus and offset values along a predefined baseline.

In addition to the traversing property, this command is also subject to the CEDRA-AVcad snapping tolerance and extended data properties, *which must be set prior to the activation of this tool.*

Regarding the direction of the baseline:
•   If a point feature is selected as the base point, then two other picks will need to be made in order to

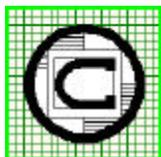establish the baseline direction from the first towards the second pick.

•   If a line, polyline or circular curve feature is selected, the endpoint near the click to select said feature becomes the base point, and the baseline direction is from said endpoint towards the other endpoint.

•   If a point, line or polyline feature is selected, the baseline is a straight line.

•   If a circular curve feature is selected, the baseline is circular and points along the curve are created.

In addition to entering plus and offset distances, the user is able to specify a starting station value, and then enter station values rather than plus distances. In this case, if the numeric progression of the stationing and the direction of the baseline (the blue arrow):
•   Are the same, stations should be entered as positive values.
•   Oppose each other, station values should be entered as negative values.

To establish points with pluses and offsets, and having set CEDRA-AVcad traversing, snapping tolerance and extended data properties, the user should:

➤ 1   **Click** at the [icon] *Points along a line or curve with plus and offset* tool.

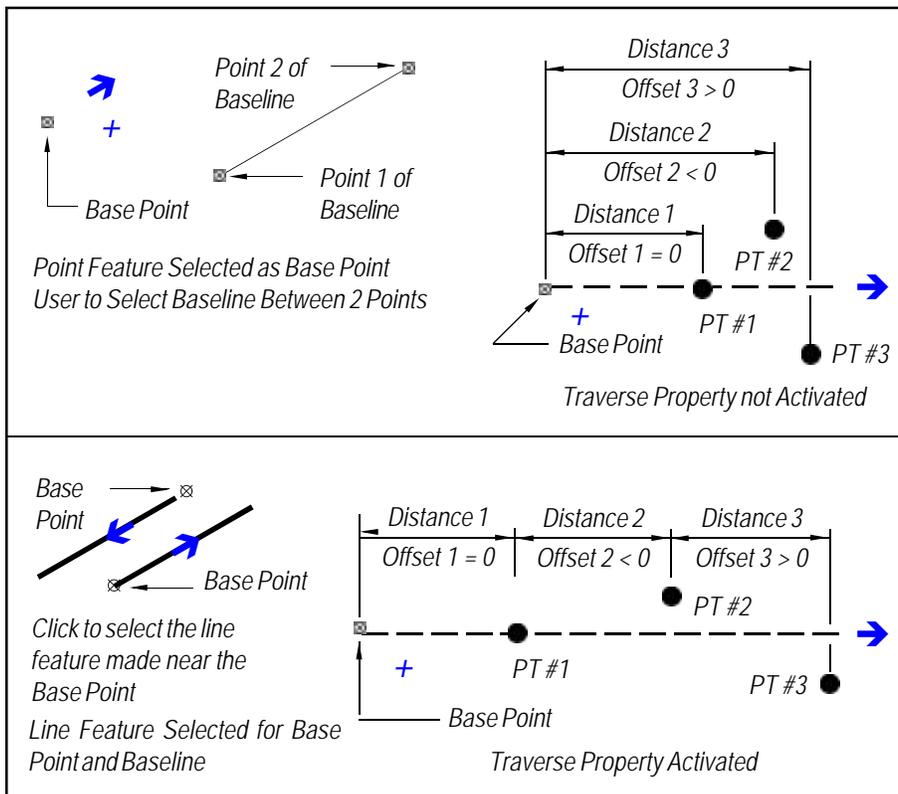➤ 2   **Click** in the ArcMap display at a point, or near the endpoint of a

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Figure 2
Points Created with Plus and Offset Distances

cating the positive plus direction of the baseline, and the positive offset side with respect to the base point and baseline. Refer to Figure 2.

Note that if the extended data property has been activated, the corresponding data fields will be included in the multi-input dialog box.

➤ **6** **Enter** in the *Starting Station:* data field the starting station value, if stations are to be entered,
or
Accept the zero default, if plus distances are to be entered.

➤ **7** **Enter** in the *Plus Distance:* data field the:
• **Plus distance** from the base point and along the baseline to locate the new point,
or
• **Station** value of the point to be created along the baseline.

Note that when entering stations, their values:
• May be higher or lower in value from the starting station.
• Should be negative if the stationing progression opposes the baseline direction.

➤ **8** **Enter** in the *Offset Distance:* data field the offset distances from the baseline to the new point. Note that a positive offset places the new point to the right of the baseline with said direction, and a negative offset to the left.

➤ **9** **Enter** the extended data if so requested.

line, polyline or curve to define the base point and the baseline.

If the click is made where there is no nearby feature, nothing happens, and the command is still active to repeat the above step, else continue. This tool operates on the premise that a feature must be selected.

➤ **3** **Confirm, or not** the selection of the feature found by the tool.

If the confirmed feature is a:
• Point feature, the user should continue with the next step.

• Near an endpoint of a line, polyline or curve feature, the multi-input dialog box of Figure 3 is displayed. The user should now branch to **Step 6**.

➤ **4** **Click** at or near a point feature, or endpoint of a line, polyline or

curve to define the **start point** of the baseline direction.

➤ **5** **Click** at or near a point feature, or endpoint of a line, polyline or curve to define the **end point** of the baseline direction.

Upon clicking at the second point, the multi-input dialog box of Figure 3 is displayed.

In addition to the display of said dialog box in either of the above two conditions, a blue arrow and plus sign are also displayed near the feature selection click indi-

➤ **10** **Click** at the **OK** button to create the new point, and display the dialog box again for the user to introduce another point,
or

Figure 3
Plus and Offset Parameters

click at the **Cancel** button to abort the command.

The above process is repeated until the user clicks at the *Cancel* button.

Note that if an invalid entry is made in any of the three data fields above, a warning message is displayed informing the user of the invalid entry. In this case, click at the OK button to close the warning message, and display the dialog box again. The user may now correct the entry and continue.

Example #1:

The following demonstrates how two points can be created using the 🔲 *Points along a line or curve with plus and offset* tool.

In this example, an existing line feature will be selected, after which, two points will be created by specifying plus and offset values, see Figure 4.

Note that the Traverse Property is set to be active, so that, once the first point is established it will become the base point for the definition of the second point.

Once the tool has been selected:

Identify the existing feature

1. Select the line feature by making a pick on the line. The pick should be made such that it is biased towards the end point of the line that is to act as the base point.

2. Click the Yes button to confirm the selection of the feature.

Enter the plus and offset values to define Point 1

3. Enter in the data fields of Figure 3.
    100
    20.0
    0.0

4. Click the OK button.
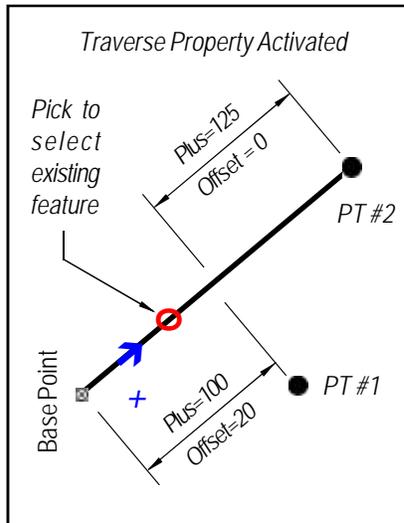
Figure 4
Plus and Offset Parameters

Enter the plus and offset values to define Point 2

5. Enter in the data fields of Figure 3.
    125
    0.0
    0.0

6. Click the OK button.

Terminate the command

7. Click the Cancel button to terminate the command.

Example #2:

This example is similar to the previous example with the exception that station values will be specified, rather than plus values. This example assumes that the station value of the base point is 1000. As such, the following data should be entered to attain the results shown in Figure 4. Note, steps 1 and 2 are identical to that shown in Example #1.

Enter the station and offset values to define Point 1

3. Enter in the data fields of Figure 3.
    1100
    20.0
    1000.0

4. Click the OK button.

Enter the station and offset values to define Point 2

5. Enter in the data fields of Figure 3.
    1225
    0.0
    1000.0

6. Click the OK button.

Terminate the command

7. Click the Cancel button to terminate the command.

Note:

The Point 4 tool is able to process polyline features, in addition to two-point lines. Since most street centerline features are created as polylines (multi-vertex line features), this ability is extremely useful.

Summary

In last month's issue of Command of the Month we discussed the Point 3 tool, which enabled the user to define points by specifying angles and distances. The Point 4 tool, discussed in this month's issue, is an excellent complement to the Point 3 tool. Ideal for positioning utility features, as well as any other features which reference a baseline, the Point 4 tool is extremely easy to use and functional. The ability to accommodate station values makes the Point 4 tool an ideal solution for processing cross-sectional survey data.

As always, should the reader have any suggestions on functionality that should be featured in Command of the Month, please feel free to forward them on to us.

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