Application Description

For those who are involved in any sort of geometric creation/editing operations, the task of performing a curve/line or a curve/curve intersection will have undoubtedly arisen.

At first glance, this does not seem to be a tremendously difficult operation to perform. However, there are a couple of nuances that a user should be aware of.

The first is when performing an intersection with a curve, there most likely will be two solutions. The question then becomes which of the two, if not both, are actually desired. The second is what if the user does not have an existing curve feature, but yet, knows the radius of the curve to be intersected.

The CEDRA Solution

To address the application of intersecting curve and line features, the user can activate the CEDRA-Intersection-Tools toolbar, see Figure 1. The tools contained in this toolbar are available for both ArcGIS® and ArcView® GIS users. Specifically, the [ICV/LIN] tool, which is the second tool from the left within this toolbar, and the [I 2CV] tool, which is the third tool from the left within this toolbar, are the commands which we will be discussing.

Curve/Line Intersection

Upon activation of the [I CV/LIN] command, the user is prompted to select the curve feature in which line fea-
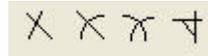

Figure 1
CEDRA-Intersection-Tools Toolbar

tures are to be intersected with. The prompt shown below will appear in the status bar area.

Pick circular curve to be intersected

> ***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.*

As such:

1. Make a pick in the map area to select the appropriate curve.

2. Once a feature has been found, a confirmation query message box similar to that shown in Figure 2 will be displayed, click at the:

Figure 2 - Curve Confirmation Query Message Box

● *Cancel* button to terminate the command, the
● *No* button to search for another feature within proximity of the pick made in Step 1, or the

● *Yes* button to continue with the processing.

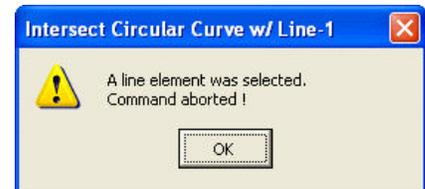2a. If a curve feature was not selected, see Figure 3, click at the:

Figure 3 - Curve Feature not selected Error Message

● *OK* button to continue with the processing. At this point, repeat Step 1 or select another command.

2b. If a curve feature was selected, the user is now prompted to select the line feature to be intersected with the curve feature, as shown below.

Pick the line to be intersected

2c. If a point feature was selected, see Figure 4, the user is able to explicitly enter the radius of the curve. After entering the value, click at the:
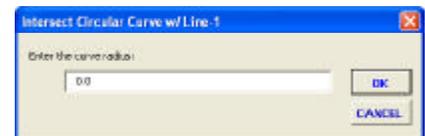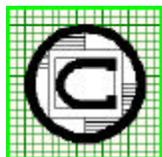

Figure 4 - Curve Radius Message Box

● *Cancel* button to terminate the command, or the
● *OK* button to confirm the entry and continue with the processing.

The user is now prompted to select the line feature to be intersected with the curve feature, as shown below.

Pick the line to be intersected

3. Make a pick in the map area to select the line feature that will be intersected with the curve.

4. Once a feature has been found, a confirmation query message box similar to that shown in Figure 5 will be displayed, click at the:

Figure 5 - Line Confirmation Query Message Box

● *Cancel* button to terminate the command, the
● *No* button to search for another feature within proximity of the pick made in Step 3, or the
● *Yes* button to continue with the processing.

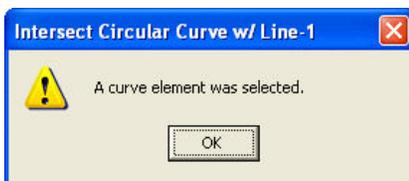4a. If a line feature was not selected, see Figure 6, click at the:

Figure 6 - Line Feature not selected Error Message

● *OK* button to continue with the processing. At which point, repeat Step 3 or select another command.

4b. If a line feature was selected, the command begins its computations to determine the points of intersection.

Once the line has been confirmed, the command performs the appropriate computations and displays the points of intersection. The point features
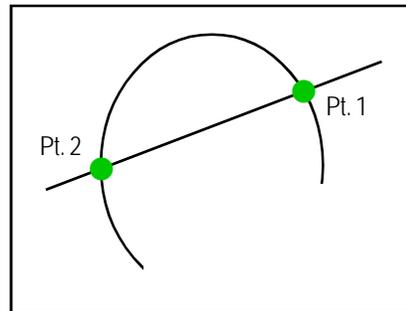
Figure 7 - Curve/Line Intersection Results

which are created are stored in the current active layer. Figure 7 contains a sample curve/line intersection and the points which would be displayed.

ArcView GIS users will be prompted to select another line to be intersected with the curve.

Pick the line to be intersected

5. Repeat Steps 3 and 4 or select another command.

ArcGIS users have the option of either: (a) selecting another line to be intersected with the curve, or (b) selecting one of the two points which were just created, which will result in the other point being deleted. As such, the prompt below will appear in the status bar area.

Pick the point to be kept, the other will be deleted, or pick another line to be intersected

To select anther line for intersecting:

5. Repeat Steps 3 and 4 or select another command.

To keep one of the two point features just created and delete the other:

5. Make a pick in the map area to select the point feature to be kept.

6a. If a point feature was not selected, both point features are kept and the user can repeat Steps 3 and 4 or select another command.

6b. If a point feature was selected, see Figure 8, click at the:

Figure 8 - Point Confirmation Query

● *Cancel* button to terminate the command, the
● *No* button to search for another feature within proximity of the pick made in Step 5, or the
● *Yes* button to keep the selected point and delete the other one.

7. Repeat Steps 3 and 4 or select another command.

Curve/Curve Intersection

Upon activation of the [I 2CV] command, , the user is prompted to select the curve feature in which other curve features are to be intersected with. The prompt shown below should appear in the status bar area.

Pick circular curve 1 to be intersected

As such:

1. Make a pick in the map area to select the appropriate curve.

2. Once a feature has been found, a confirmation query message box similar to that shown in Figure 9 will be displayed, click at the:

Figure 9 - Curve Confirmation Query Message Box

● *Cancel* button to terminate the command, the
● *No* button to search for another feature within proximity of the pick made in Step 1, or the
● *Yes* button to continue with the processing.

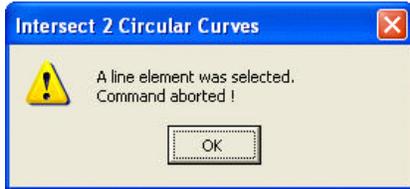**2a.** If a curve feature was not selected, see Figure 10, click at the:

Figure 10 - Curve Feature not selected Error Message

● *OK* button to continue with the processing. At this point, repeat Step 1 or select another command.

2b. If a curve feature was selected, the user is now prompted to select the other curve feature to be intersected with the curve feature, as shown below.

Pick circular curve 2 to be intersected

2c. If a point feature was selected, see Figure 11, the user is able to explicitly enter the radius of the curve. After entering the value, click at the:
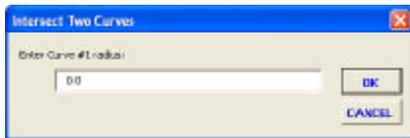

Figure 11 - Curve Radius Message Box

● *Cancel* button to terminate the command, or the
● *OK* button to confirm the entry and continue with the processing.

The user is now prompted to select the other curve feature to be intersected with the curve feature, as shown below.

Pick circular curve 2 to be intersected

3. Make a pick in the map area to select the curve feature that will be intersected with the curve.

4. Once a feature has been found, a confirmation query message box similar to that shown in Figure 12 will be displayed, click at the:
● *Cancel* button to terminate the command, the

Figure 12 - Curve Confirmation Query Message Box

● *No* button to search for another feature within proximity of the pick made in Step 3, or the
● *Yes* button to continue with the processing.

4a. If a curve feature was not selected, see Figure 13, click at the:
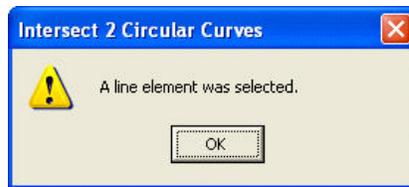

Figure 13 - Curve Feature not selected Error Message

● *OK* button to continue with the processing. At which point, repeat Step 3 or select another command.

4b. If a curve feature was selected, the command begins its computations to determine the points of intersection.

4c. If a point feature was selected, see Figure 14, the user is able to explicitly enter the radius of the curve. After entering the value, click at the:
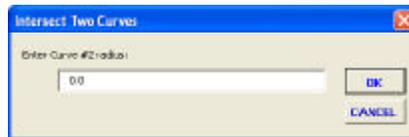

Figure 14 - Curve Radius Message Box

● *Cancel* button to terminate the command, or the
● *OK* button to confirm the entry and continue with the processing.

Once the second curve has been confirmed, the command performs the appropriate computations and displays the points of intersection. The point features which are created are stored in the current active layer. Figure 15 contains a sample curve/curve intersection and the points which would be displayed.
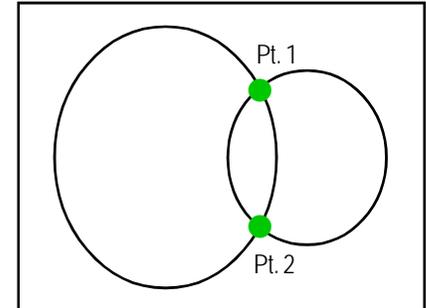

Figure 15 - Curve/Curve Intersection Results

ArcView GIS users will be prompted to select another curve to be intersected with the curve.

Pick circular curve 2 to be intersected

5. Repeat Steps 3 and 4 or select another command.

ArcGIS users have the option of either: (a) selecting another curve to be intersected with the curve, or (b) selecting one of the two points which were just created, which will result in the other point being deleted. As such, the prompt below will appear in the status bar area.

Pick the point to be kept, the other will be deleted, or pick another line to be intersected

To select anther curve for intersecting:

5. Repeat Steps 3 and 4 or select another command.

To keep one of the two point features just created and delete the other:

5. Make a pick in the map area to select the point feature to be kept.

6a. If a point feature was not selected, both point features are kept and the user can repeat Steps 3 and 4 or select another command.

6b. If a point feature was selected, see Figure 16, click at the:

Figure 16 - Point Confirmation Query

● *Cancel* button to terminate the command, the
● *No* button to search for another feature within proximity of the pick made in Step 5, or the
● *Yes* button to keep the selected point and delete the other one.

7. Repeat Steps 3 and 4 or select another command.

Note

The user is able to perform a curve/line or curve/curve intersection without having a curve feature present. This is accomplished by creating a point feature at the center of the implied curve and then picking the point feature when prompted to select the curve. When the point feature is confirmed, the user is prompted for the radius of the curve. In so doing, the intersection commands are able to perform these types of intersections without the user having to construct the curve features.

Summary

The intersection commands within the CEDRA-Intersection-Tools toolbar are straightforward and easy to use. The ability to select the desired point to be kept has recently been added. So that, users wishing this new functionality should inquire about getting an upgrade to their existing software.

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