Horizontal Curve Solver

*Using COGO+ Pro by Simple Geospatial Solutions*

The Horizontal Curve Solver program in COGO+ Pro is found in the TOOLS menu. The solver works by providing two known elements and solving for the rest. At least one of the known elements must be the radius or the deflection angle with the standard solver. When the curve is solved it is also possible to calculate coordinates on the curve at any station and offset, and solve the calculated coordinates as points in the job database.

**Example 1**
A curve is given with a known radius of 20m and known deflection angle of 35°. The coordinates and station of the PI are known, and the back tangent azimuth is given as 63°26'06". Solve the coordinates and stations of the BC and EC.
Step 1: Start the Horizontal Curve Solver and enter the known values.

Step 2: The curve solution is presented, press the \( \downarrow \) and \( \uparrow \) cursor keys to switch between the two pages of solutions. Note the softmenu labels.

Step 3: Press \( F2 \) [COORD] to begin solving coordinates for points on the curve. The first input form requires a known station, select the PI as the known station and enter 500 as the value.
Step 4: In the following input form enter the rest of the known curve information.

```
ENTER KNOWN INFORMATION
Known Tangent.. Back 60°
Azimuth.. 63°26'06"
Curve Direc...... Right
Known Coords.... PI
   North...... 1000.000m
   East........ 1000.000m
Choose Known Tangent
CHOOS
```

Step 5: The first solution displayed is for the BC, again note the softmenu.

```
SOLVE COORDINATES
Station..... 6+493.694
Offset....... 0.000m
Northing... 997.1799m
Easting...... 994.3598m
```

Enter Station to Solve
EDIT STORE Sta? CANCEL

Step 6: Press [Sta?] to select a certain key station to solve, for example the EC point.

```
SOLVE COORDINATES
Station..... 6+493.694
Offset....... 0.000m
End of Curve
North... 999.0750m
Easting..... 1006.2378m
```

```
SOLVE COORDINATES
Station..... 6+505.911
Offset....... 0.000m
Point of Intersection
North... 999.0750m
Easting..... 1006.2378m
```

Enter Station to Solve
EDIT STORE EC CANCEL

Optionally you can press [STORE] to store the point in the job.
Also you can enter any station and offset to calculate the coordinates.

<table>
<thead>
<tr>
<th>SOLVE COORDINATES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Station..... 0+500.000</td>
</tr>
<tr>
<td>Offset....... 5,000m</td>
</tr>
<tr>
<td>Northing.... 994.1266m</td>
</tr>
<tr>
<td>Easting..... 1001.0870m</td>
</tr>
</tbody>
</table>

Enter Station to Solve
EDIT STORE Sto? CANCEL

When the station value entered is out of range, no solution is provided.

<table>
<thead>
<tr>
<th>SOLVE COORDINATES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Station..... 0+520.000</td>
</tr>
<tr>
<td>Offset....... 5,000m</td>
</tr>
<tr>
<td>Northing.... ------</td>
</tr>
<tr>
<td>Easting..... ------</td>
</tr>
</tbody>
</table>

Enter Offset From Centerline
EDIT STORE Sto? CANCEL