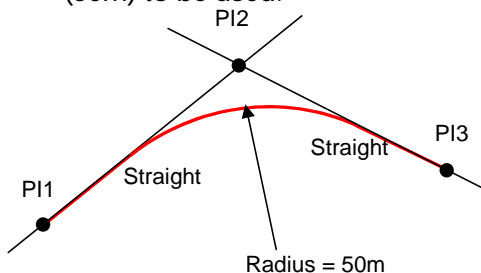


COGO – How Can it Help Me?

System 500 supports various COGO routines – read chapter 11.6 in the Technical Reference Manual for full details. But when could COGO functionality be of practical use in the field?

The Problem

You are on site with an oil-pipe laying contractor. The pipeline consists of only straight sections and curves of fixed radius. In the field he gives you the co-ordinates of the intersection points of the straight lines (PI1, PI2 and PI3) and the radius of the pipes (50m) to be used.



He now wants you to stake out the start and the end of the curve and points at 10m intervals along the curve. How can COGO help here?

When entering the COGO application first choose the **Job** in which the points are stored. If you wish, you can also create a **log file**. For this exercise, ensure to set **Use Offset** to **YES**.

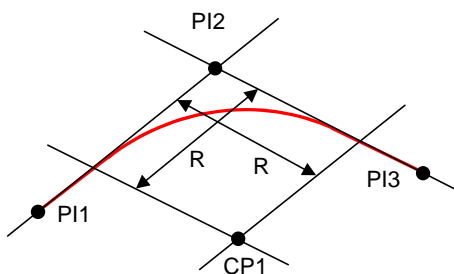


The Solution – Step 1

The first step is to compute the centre of the curve. Select the **Bearing- Bearing** option from the **Intersection...** menu.

Select **PI1** as the **Point Id 1** and then compute the **Bearing** from **PI1** to **PI2** by pressing **F2(INV)** when the **Bearing** field is highlighted. Set the **Parallel Offset** to be radius of the curve.

Then select **PI3** as the **Point Id 2** and again, compute the **Bearing** from **PI3** to **PI2** by pressing **F2(INV)** when the **Bearing** line is highlighted. Set the **Parallel Offset** to be radius of the curve (remember to the left is negative).

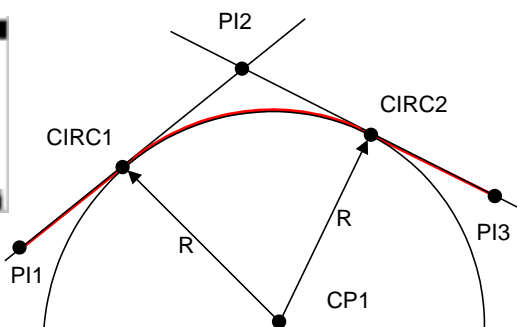


Press **F1(COMP)** to compute the co-ordinates and name this point **CP1**.

The Solution – Step 2

We can now compute the start and end points of the curve. Select the **Bearing- Distance** option from the **Intersection...** menu.

As before, select **PI1** as the **Point Id 1** and compute the **Bearing** from **PI1** to **PI2**. This time the **Parallel Offset** should be zero. Select **CP1** as **Point Id 2** and enter the radius of the curve as the **Distance** value.



This will compute the co-ordinates of **CIRC1** at the start of the curve. This point can now be staked out.

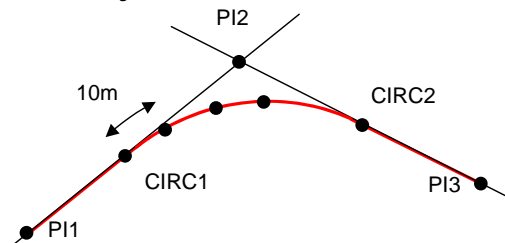
To compute **CIRC2** at the end of the curve, select **PI3** as the **Point Id 1** and compute the **Bearing** from **PI3** to **PI2**. Again, set the **Parallel Offset** to zero and then select **CP1** as **Point Id 2** and enter the radius of the curve as the **Distance** value. **CIRC2** can now be staked out.

The Solution – Step 3

We have now found **CIRC1** and **CIRC2** and need to compute any third point on the circle. Select **Traverse** from the COGO main menu. Select **CP1** as **Point Id 1**, enter any value as the bearing and then enter the radius of the curve to be the **Horizontal Distance**. Name this point **CIRC3**.

Stake out the Curve

Choose **Distance on Arc** from the **Arcs...** menu. Select **CIRC1**, **CIRC2** and **CIRC3** as **Arc Points 1**, **2** and **3** respectively.



Now enter **10m** for the distance along the arc at which you wish to stake out the curve. Press **F1(COMP)** to compute these co-ordinates and then **F5(STAKE)** to stake out the point directly. Stake out the next point by increasing the distance along the curve.

Remember

- COGO functionality can be a useful tool to solve setting out or computation problems on site.
- Use **F2(INV)** to compute unknown bearings and distances within a COGO computation.