

Manually Entering Points in SurvCADD

The following instructions will guide you through manually entering points. SurvCADD modules are displayed as {**COGO-Design**}, main menus are displayed as [**Points**], and submenus and menu commands are displayed as <**Edit Points**>.

- 1) Determine the height of your first instrument station through hand calculation as follows:
 - a. For your backsight, locate the following information:
 - i. **Height of Instrument (HI):**
 - ii. **Slope Distance (SD):**
 - iii. **Zenith/Vertical Angle (VA):**
 - iv. **Rod Height (RH):**
 - v. **Backsight Elevation (BE):**
 - b. Convert vertical angle to decimal degrees
 - c. Calculate vertical difference and horizontal distance:
 - i. $VD = SD \sin (90 - VA)$
 - ii. $HD = SD \cos (90 - VA)$
 - d. Calculate station elevation:
 - i. $Elv_{(sta)} = BE + RH - VD - HI$
- 2) Open SurvCADD, create and setup a new drawing. Save Drawing.
- 3) Create a CRD file: {**any SurvCADD Module**} → [**Points**] → <**Set CoorDinate File**>
 - a. Under the “**NEW**” Tab, save a CRD file in the same location as the drawing files.
- 4) Create a raw file: {**COGO – Design**} → [**COGO**] → <**Raw File On/Off**>
 - a. Click <**New**>
 - b. Save the .rw5 file in the same location as your drawing.
- 5) Inspect Point Defaults: [**Points**] → <**Point Defaults**>
 - a. Check the following features are checked:
 - i. Descriptions
 - ii. Elevations
 - iii. Locate on Real Z Axis
 - iv. Instrument and Rod Height
 - v. SPT10 is the symbol name

- b. Check to make sure Automatic Points Numbers is unchecked
 - c. Click **<OK>** to exit point defaults
- 6) Draw your first station: **[Points] → <Draw-Locate Points>**
- a. Set the decimal places to two (0.00)
 - b. Click **<Enter and Assign>**
 - c. Enter the following as it is asked for on the command line:
 - i. North (y): **"5000"**
 - ii. East (x): **"5000"**
 - iii. Point Elevation: **Elv_(sta)** from hand calculation above
 - iv. Point Description: **"STA"**
 - v. Point Number: **"1"**
 - d. Press **"Enter"** or **"Esc"** to clear command after point creation
- 7) Zoom to the new point with zoom extents: **"z"** then **"e"**
- 8) Draw the backsight point: **[COGO] → <Locate by Bearing-Ang> → <by Azimuth>**
- 9) Type in the occupied point in the command line: **"1"**
- 10) Enter in the following data for your backsight:
- a. Azimuth: (typically **0.0000** or horizontal angle from north, note angles are in the form **ddd.mmss**)
 - b. Slope distance: measurement
 - c. Vertical angle type: **"2"** (1=0 degrees level, 2=90 degrees level, 3=Elev. Difference)
 - d. Zenith (vertical) angle: measurement or Elevation Difference: measurement
 - e. Instrument Height: measurement
 - f. Rod Height: measurement
 - g. Point Description: **"TBM"**
 - h. Point Number: **"100"**
- 11) Zoom to show both points with zoom extents: **"z"** then **"e"**
- 12) Occupy the station point: **[COGO] → <Occupy Point>**
- a. Enter the occupied/station point: **"1"**
 - b. Press **"Enter"** for Point Number Backsight Method
 - c. Enter the backsight point: **"100"**
- 13) Enter your first side shot: **[COGO] → <Side Shots>**
- 14) Enter the following information for the point:
- a. Angle-Bearing Code: **"7"** (7=angle turned to the right, see bottom of next sheet for all angle bearing codes)
 - b. Horizontal Angle: measurement
 - c. Slope Distance: measurement

- d. Zenith/Vertical Angle: measurement or Elevation Difference: measurement
 - e. Instrument Height: press "**Enter**", same as backsight height
 - f. Rod Height: press "**Enter**" if not changed from backsight height
 - g. Point Description:
 - h. Point Number: press "**Enter**" for 101 or type in
- 15) Repeat step 14 until all points are completed. If you find an error before all point information entered (up to point number), hit "**Esc**" and repeat from step 13. If the error is noticed after point is drawn, do the following:
- 16) Clear out of all current commands: "**Esc**"
- 17) Erase the point: **[Points]** → **<Erase Points>**
- a. Type "**S**" to select with mouse or "**N**" to type in point number
 - b. Select points or type in point numbers depending on last step
 - c. Press "**Enter**" when done selecting
 - d. Type "**Y**" then "**Enter**" to delete from coordinate file
 - e. Type "**Y**" then "**Enter**" to delete from confirm delete
- 18) Continue entering points starting at step 13

Angle-Bearing Codes define the angle or bearing type. Codes are as follows:

- 1 is North-East quadrant
- 2 is South-East quadrant
- 3 is South-West quadrant
- 4 is North-West quadrant
- 5 is a north based azimuth
- 6 is an angle turned to the left
- 7 is an angle turned to the right
- 8 is a deflection angle left
- 9 is a deflection angle right