Manually Entering Points – Math Aversion Version

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) Open SurvCADD, create and setup a new drawing. Save Drawing.
2) 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.
3) 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.
4) 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
5) 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: **0.0**
        iv. Point Description: "**STA**"
        v. Point Number: "**1**"
    d. Press "**Enter**" or "**Esc**" to clear command after point creation
6) Zoom to the new point with zoom extents: "**z**" then "**e**"

7) Calculate the elevation of the station point based on the backsight elevation: **{COGO – Design} → [COGO] → <Benchmark>**
8) Enter the following data in the Benchmark dialog window
    a. Target Data:
        i. Enter the **Rod Height** from survey notes
        ii. Enter the **TBM/BM Elevation** (typically an assumed value)
    b. Occupy Data:
        i. Enter the **Instrument Height** from survey notes
        ii. Enter the "*Occupied Point #*": **1**
    c. Measurement Data:
        i. Enter the **Zenith Angle** from survey notes
        ii. Enter the **Slope Distance** from survey notes
    d. Make sure the calculation is set to "**Elevation**"
    e. Check "**Store Elev to Occupied Pt**" to update the CRD file
9) Click "**Calculate**" when all the above information is entered. The station elevation should change to the proper elevation.
10) Click "**OK**" when done.
11) Draw the backsight point: [**COGO**] → <**Locate by Bearing-Ang**> → <**by Azimuth**>
12) Type in the occupied point in the command line: "**1**"
13) 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**"
14) Zoom to show both points with zoom extents: "**z**" then "**e**"
15) 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**"
16) Enter your first side shot: [**COGO**] → <**Side Shots**>
17) 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

18) 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:
19) Clear out of all current commands: "**Esc**"
20) 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
21) Continue entering points starting at step 16

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