

chapter 7



AccuDraw

7. AccuDraw

AccuDraw Basics

AccuDraw is a powerful precision drawing tool that is designed to work together with other drawing and modifying tools. **AccuDraw** maximizes drafting efficiency because it allows basic mouse pointer movements and shortcut key-ins to accurately draw, place, modify, or manipulate elements.

Toggle AccuDraw

The AccuDraw feature can be turned on and off by the **AccuDraw Toggle** icon located in the Primary Tools tool box. By default, AccuDraw is active when MicroStation is opened.



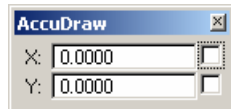
AccuDraw Window

How can you tell if AccuDraw is active or deactivated? A quick way to tell is that when AccuDraw is turned on, the **AccuDraw window** will appear. The **AccuDraw window** is where precision entries are placed. The **AccuDraw window** contains two input entry configurations, the *Rectangular Configuration* and *Polar Configuration*. To toggle between the two configurations, simply press the [Spacebar] on the keyboard when AccuDraw has focus.

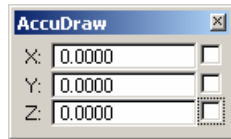
Note: It is not necessary to press the [Enter] or [Tab] key on your keyboard to activate an entry. AccuDraw reads an entry as soon as it is entered in the AccuDraw window.

Rectangular Configuration Mode

The **Rectangular Configuration Mode** accepts X and Y entries for 2D models. For 3D models, X, Y, and Z entries are accepted.



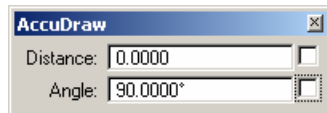
2D AccuDraw window (Rectangular Configuration)



3D AccuDraw window (Rectangular Configuration)

Polar Configuration Mode

The **Polar Configuration Mode** accepts distance and angle entries for both 2D and 3D models.



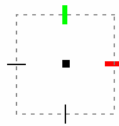
2D and 3D AccuDraw window (Polar Configuration)

AccuDraw Compass

With AccuDraw activated, anytime a drafting tool is used the **AccuDraw compass** is displayed at the starting point in the view window. Similar to the AccuDraw window, the AccuDraw compass contains two different configurations, the *Rectangular Configuration* and *Polar Configuration*.

Rectangular Compass

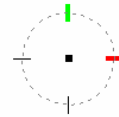
The **Rectangular compass** will appear when X, Y, and Z (3D only) entries are used.



Rectangular AccuDraw compass

Polar Compass

The **Polar compass** will appear when distance and angle entries are used.



Polar AccuDraw compass

Compass Orientation

The four dash marks on the compass at 90° from each other are axis indicators. They allow convenient axis indexing (discussed later in this chapter). By default, the X axis indicator is a red dash mark located at the right side of the compass (0° or 360°) and the Y axis indicator is a green dash mark located at the top of the compass (90°).

Rotating the Compass

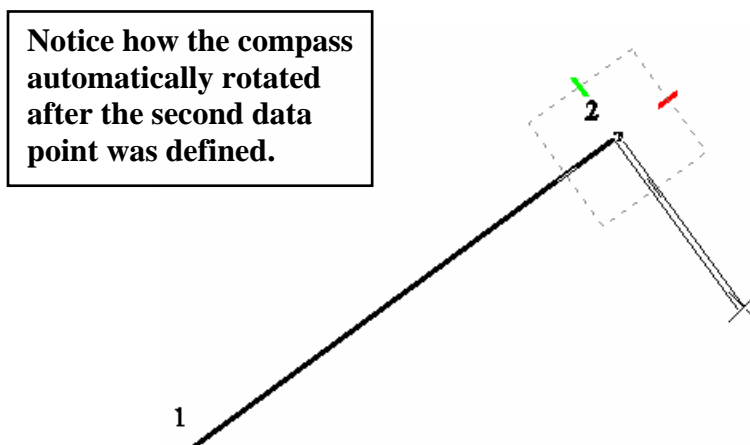
The default compass orientation works well for most drafting operations. However, in some instances it may prove beneficial to define a custom compass orientation by rotating the compass.

The compass can be manually rotated a variety of ways using shortcut key-ins, some of the most common key-ins are as follows:

- [T] (Top rotation) – Aligns compass to top orientation.
- [S] (Side rotation) – Aligns compass to side orientation. (3D Only)
- [F] (Front rotation) – Aligns compass to front orientation. (3D Only)
- [V] (View rotation) – Aligns compass to current view orientation.
- [R][Q] (Rotate Quick) – Rotates compass to a custom orientation defined by the user.

Context Sensitivity

By default, some drawing tools will automatically rotate the compass orientation after an element is placed. This feature is called **context sensitivity**. It is designed to keep the orthogonal relationship (90°) of the axis indicator dash marks after each data point.

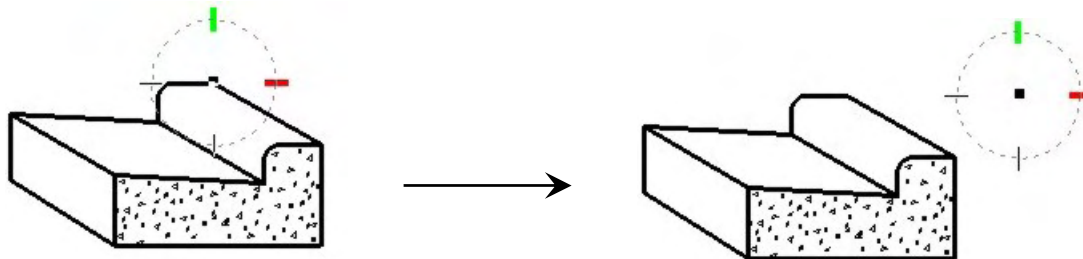


Relocating the Compass Origin

The origin of the AccuDraw compass is always at the location of where a tool or command is started. However, the origin of the AccuDraw compass can be manually relocated prior to initiating the start of a drafting tool or command. Relocating the compass can be accomplished by the use of a shortcut key-in. This is an efficient means of relocating the compass as no construction lines or grid locks need to be used.

To relocate the origin of the AccuDraw compass:

1. <T> at the location the compass is to be relocated from.
2. Enter the [O] (Set Origin) shortcut key-in on your keyboard.
3. Define the offset distance in the direction the compass is to be relocated.
4. <D> to accept the new location.



Relocating the compass origin example.

The compass origin started at the top of the curb and was relocated at a precise offset distance without the use of construction lines.

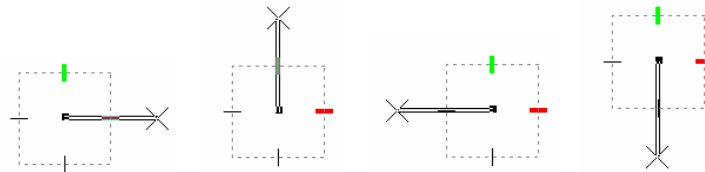
Compass Axes

The AccuDraw compass allows orthogonal axes indexing. All this means is that an element, a line for instance, can be drawn at exact 90° increments without turning on a lock or making a setting change. This can be done in the rectangular or polar mode. The term for this indexing is “**On-the-Fly**” axes indexing.

Without the axes indexed, the AccuDraw compass allows elements to be created at any coordinate value. **Nudging** and **smart lock** are two AccuDraw assisting features that are aide in precision drafting operation.

“On-the-Fly” Axis Indexing

“**On-the-Fly**” axis indexing is when the AccuDraw compass axis is temporarily indexed, or locked, in a horizontal or vertical position. When the mouse pointer is moved close to a horizontal or vertical axis indicator dash mark, it will automatically “index” into that axis. The way to identify if it has been indexed is that when on-the-fly axis indexing occurs, the axis changes color and is bold.



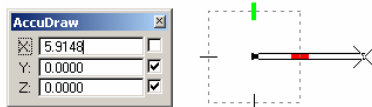
“On-the-Fly” Axis Indexing examples

Axis Indexing using Smart Lock

As mentioned, the “On-the-Fly” axis indexing is a temporary axis indexing method. A more permanent method of indexing is to use a **smart lock**. A smart lock is when one or more axes are locked, thereby restricting the directional movement of the mouse pointer.

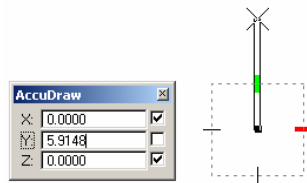
A smart lock can be started by:

- Pressing the **[Enter]** key on your keyboard when the input cursor is present in the AccuDraw window.
- Manually checking on check box(es) in the AccuDraw window.



Smart locking the X axis.

Notice the **Y** and **Z** check boxes are active, or locked, making **X** the only available active axis.



Smart locking the Y axis.

Notice the **X** and **Z** check boxes are active, or locked, making **Y** the only available active axis.

Nudging the Compass Axis

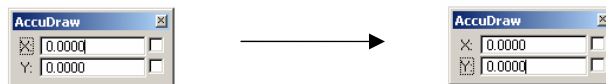
The AccuDraw window works in conjunction with the AccuDraw compass for performing drafting operations. For example, if a 5 unit line was to be drawn in the “X” direction (rectangular mode), “5” would be entered in the AccuDraw window. To type in a value in the AccuDraw window, the input cursor needs to be present in the appropriate field of the dialog.

There are two ways to activate the input cursor in the AccuDraw window:

- Use the [Tab] key to move the input cursor to the correct field.
- “Nudge” the mouse pointer in the correct axis direction.

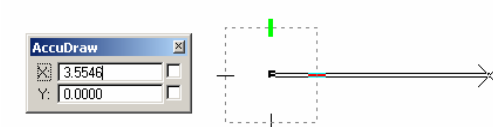
Both methods are effective. However, “Nudging” can drastically increase user efficiency for most drafting operations.

Press the [Tab] key to move the input cursor to a different field.

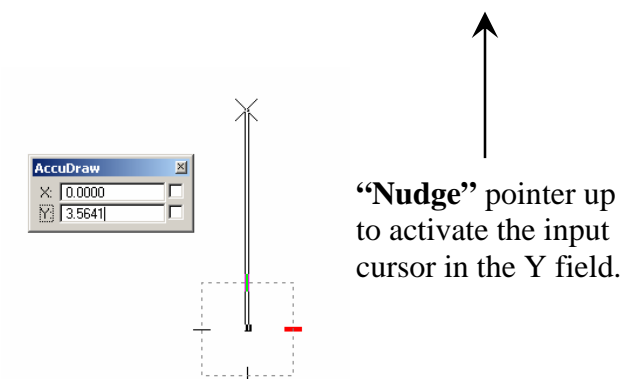


Using the [Tab] key to relocate the input cursor.

“Nudge” pointer to the right to activate the input cursor in the X field.



”Nudging” in the horizontal direction.



”Nudging” in the vertical direction.

AccuDraw Settings

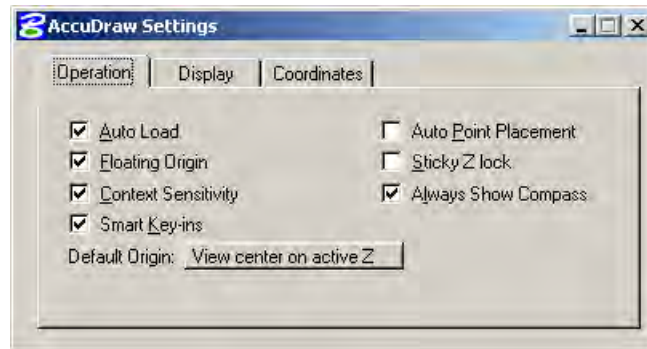
The **AccuDraw Settings** dialog box contains many different settings that are used to control the performance of AccuDraw.

The AccuDraw Settings dialog box can be accessed by:

- Choosing **Settings > AccuDraw**.
- Using the AccuDraw shortcut key-in, **[G][S]** (Go to Settings).
- **<R>** on the **AccuDraw icon** from the Primary Tools tool box and choose *Properties*.

The AccuSnap settings are separated into three categories or tabs. These tabs include the *Operation*, *Display*, and *Coordinates* tabs:

- **Operation tab** – Can turn on and off different AccuDraw features.



- **Display tab** – Controls various AccuDraw display settings, such as AccuDraw highlight color, compass display, and shortcut display settings.
- **Coordinates tab** – Contains settings for the type of coordinate system to use, indexing information, and the rounding of distance and angle units.

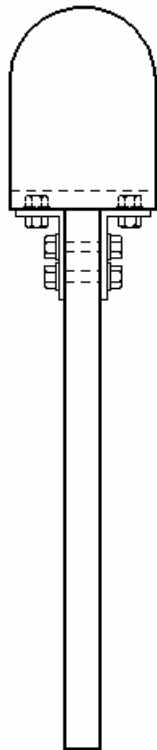
Lab 6 – AccuDraw (Part I)

Objectives

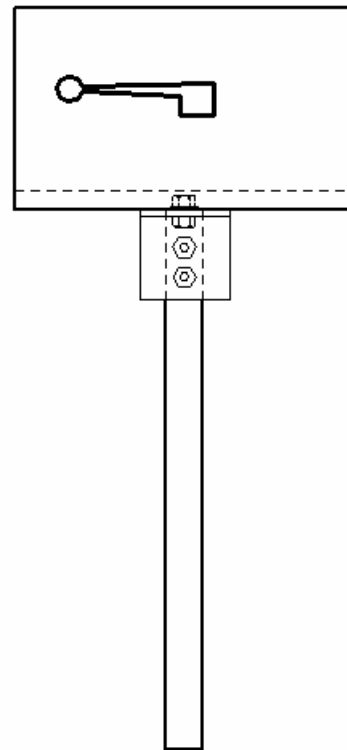
The purpose of this lab will be to:

- Place orthogonal elements with AccuDraw.
- Use drafting tools in conjunction with AccuSnap.
- Practice “nudging” the AccuDraw axis.
- Enter placement values in the AccuDraw window using the rectangular compass mode.
- Practice using the “on-the-fly” axis indexing feature.
- Relocate the AccuDraw compass using the “offset” keyin.

During this lab, you will complete the front and side views of the mailbox detail:



FRONT



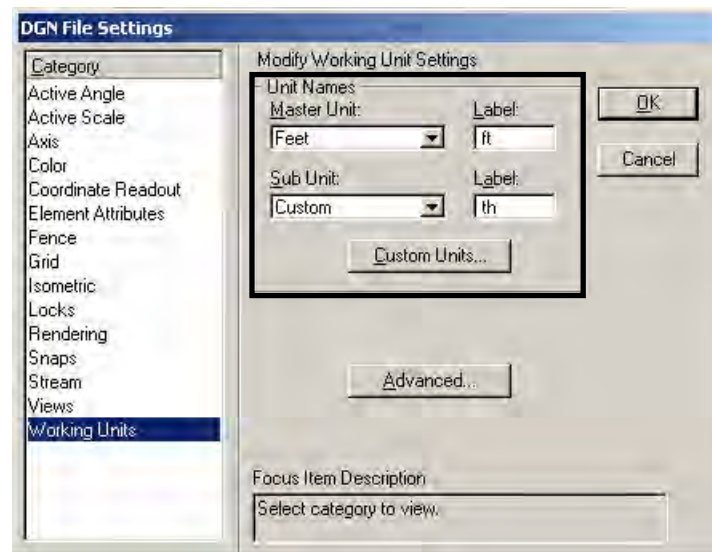
SIDE

Open the Design File

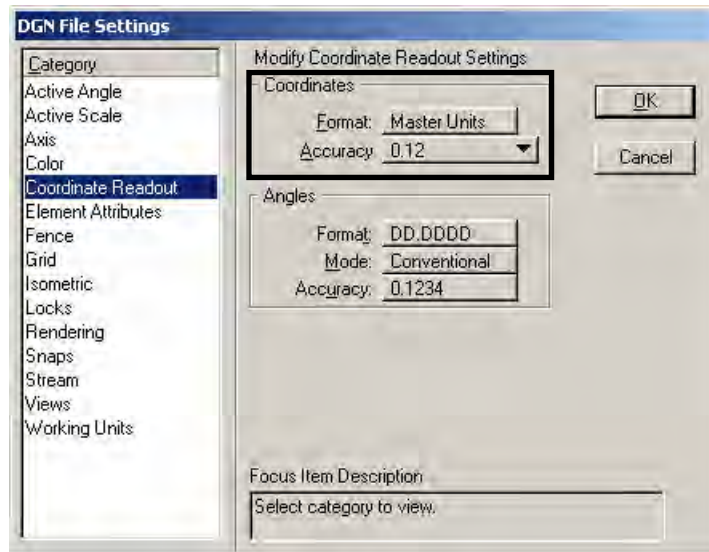
1. Open **MicroStation Manager** or the **Open** dialog box.
2. Set the directory to:
C:\Envision Group_Training\MS V8 Fundamentals\CIVIL
3. Select the file named:
Project_Mailbox.dgn
4. Select **OK**.

Set Design File Settings

1. Choose **Settings > Design File**.
2. In the *DGN File Settings* dialog box, select **Working Units** from the categories list.
3. In the Unit Names section of the dialog box, the *Master Unit* should be set to **Feet** and *Sub Unit* should be set to **Custom**. If not, change it as such.



4. Select **Coordinate Readout** from the categories list. In the Coordinates section of the dialog box, change the *Format* to **Master Units**. Then change the *Accuracy* option to **.12**, which sets the value in the AccuDraw window to be displayed to the nearest hundredths of a foot.

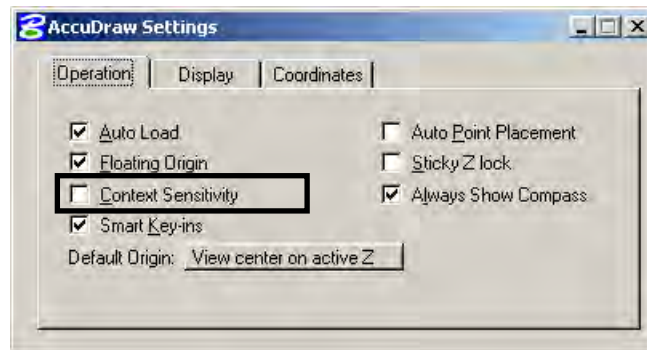


5. Select **OK**.

Note: If file settings are changed and to be recalled after the file is closed, the settings need to be saved before leaving that design file. The settings that was just changed are to be saved for the next editing session, so choose **File > Save Settings**.

In this lab example you will want to do disable the **context sensitivity** option. Since all elements in the lab will be placed at right angles, it is not necessary for the compass to rotate after an element is placed.

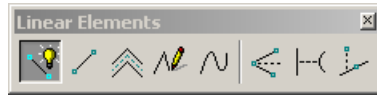
6. Open the *AccuDraw Settings* dialog box. This dialog box can be accessed by choosing **Settings > AccuDraw** or from the AccuDraw shortcut key-in, **[G][S]** (Go to Settings). Under the *Operation* tab, make sure that the **context sensitivity** option is unchecked.



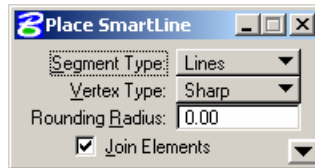
7. **Exit** the *AccuDraw Settings* dialog box.

Create the Mail Box Front View

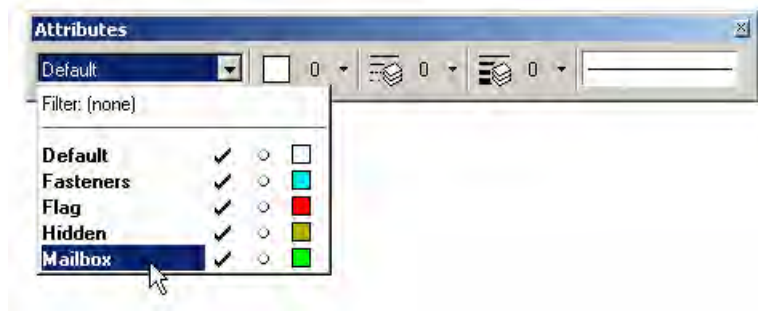
1. Select the **Place SmartLine** tool.



2. Set the *Segment Type* to **Lines** and the *Vertex Type* to **Sharp**.



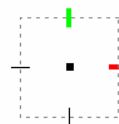
3. Set the *Level* to **Mailbox**. Now the Mailbox level is the active level. So any elements placed in the drawing will go on the Mailbox level.



4. Make sure that the *Color*, *Line Style*, and *Weight* attributes are set to **ByLevel** (symbology that is “ByLevel” is indicated by the paper stack icon). Levels and attribute symbology are discussed in Chapter 11.

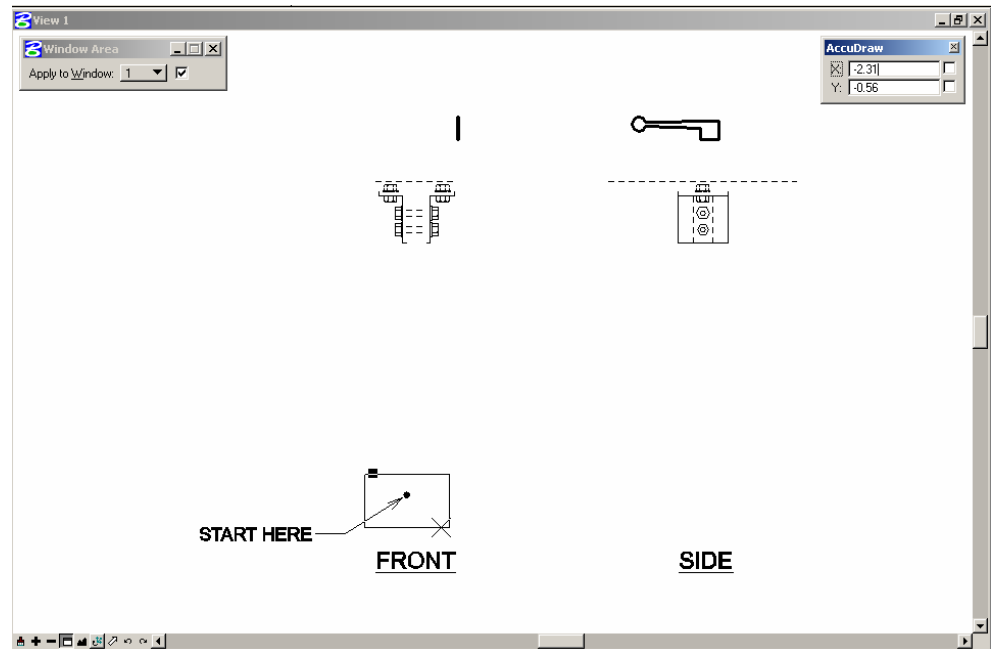


Make sure the AccuDraw mode is set to **Rectangular mode**. In Rectangular mode, the AccuDraw window will display X and Y input values and the AccuDraw compass will be configured as a rectangle.



Note: If the AccuDraw window or compass is not shown, AccuDraw needs to be toggled on.

5. **Window** into the area as shown.

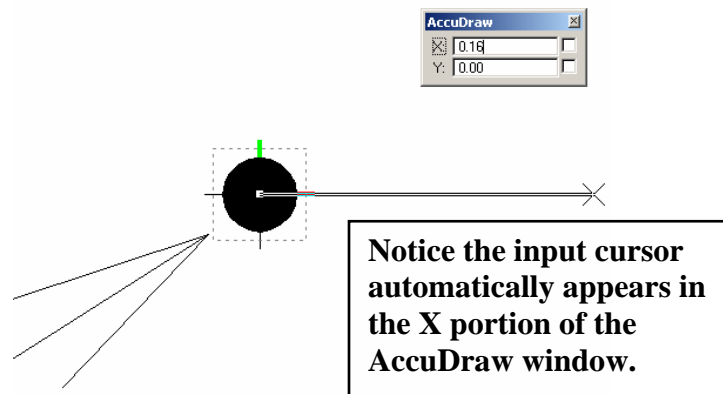


First, you will create the mailbox post in the front view.

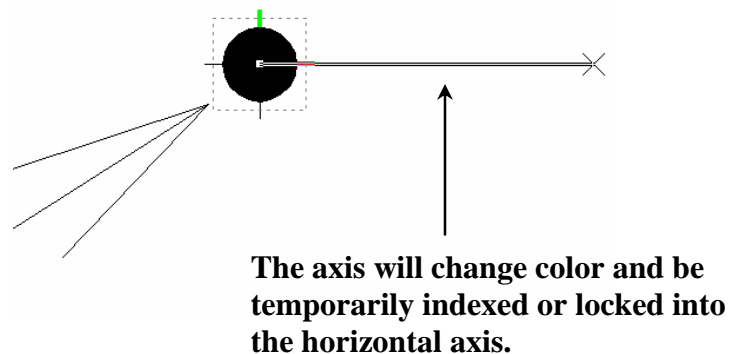
6. <D> at the center of the filled circle to start the Place SmartLine command.

Note: Make sure AccuSnap is toggled on. The *keypoint* or *center* snap can be used when starting the line.

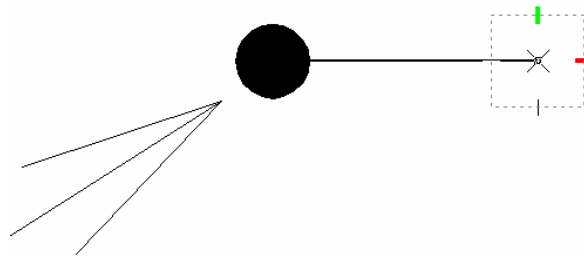
7. **Nudge** the pointer to the right.
This will force the input cursor to populate in the “X” portion of the AccuDraw window.



8. Make sure the **on-the-fly** horizontal axis is indexed.



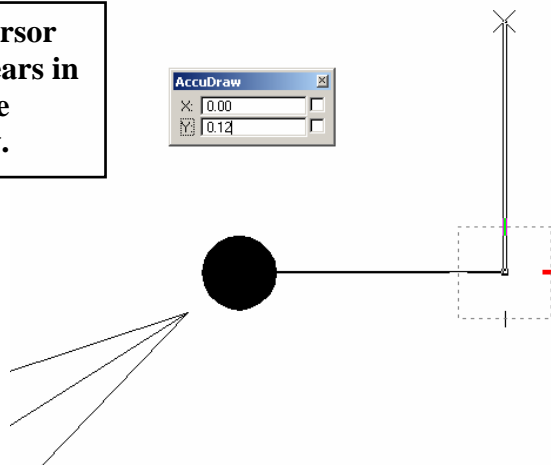
9. Type **.13**.
You do NOT need to press the [Enter] or [Tab] key after typing in this value. The AccuDraw window reads an entry as soon as you type it.
10. <D> to accept the placement. Do NOT reset the command. You just created the first line of the mailbox post and should look like following.



11. **Nudge** the pointer up.

This will force the input cursor to populate in the “Y” portion of the AccuDraw window. The numerical value will change based on the distance from the pointer to the compass.

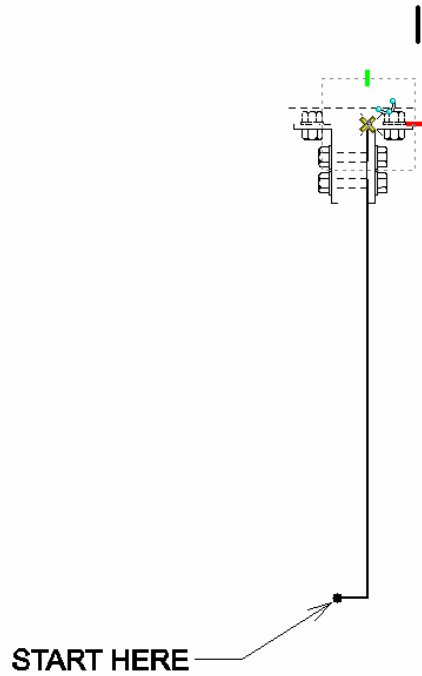
Notice the input cursor automatically appears in the Y portion of the AccuDraw window.



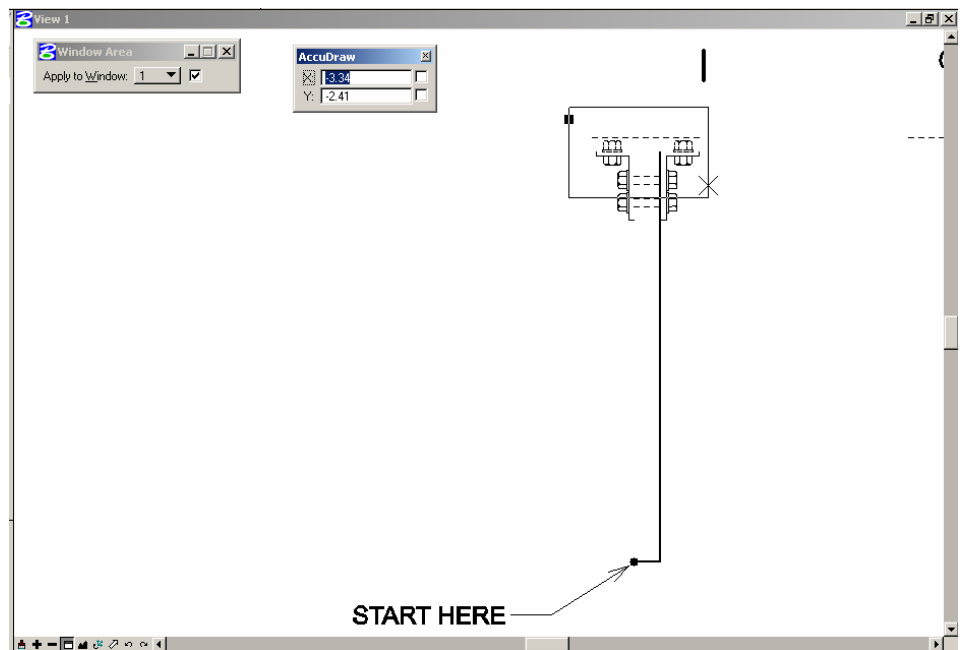
12. Make sure the **on-the-fly** vertical axis is indexed.

13. Type **2**.

14. **<D>** to accept the placement. Do NOT reset the command. Your detail should look like the following.



15. **Window** into the top portion of the detail as shown.



16. **<R>** to exit the zooming tool.
Notice that the active drawing tool remains active. In this case, the Place SmartLine tool is still selected with the compass located at the end of the 2 foot line that was just created.

17. **Nudge** the pointer to the left.