

LEARNING OBJECTIVES

After completing this lesson, you will be able to:

1. Understand Blocks
2. Create a Block
3. Insert a Block
4. Re-define and Purge unused Blocks
5. Create Multileaders with blocks attached
6. Use the Collect multileader tool.

LESSON 29

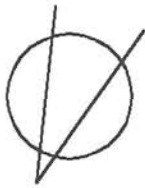
BLOCKS

A **BLOCK** is a group of objects that have been converted into ONE object. A Symbol, such as a transistor, bathroom fixture, window, screw or tree, is a typical application for the block command. First a BLOCK must be created. Then it can be INSERTED into the drawing. An inserted Block uses less file space than a set of objects copied.

CREATING A BLOCK

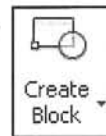
1. First draw the objects that will be converted into a Block.

For this example a circle and 2 lines are drawn.

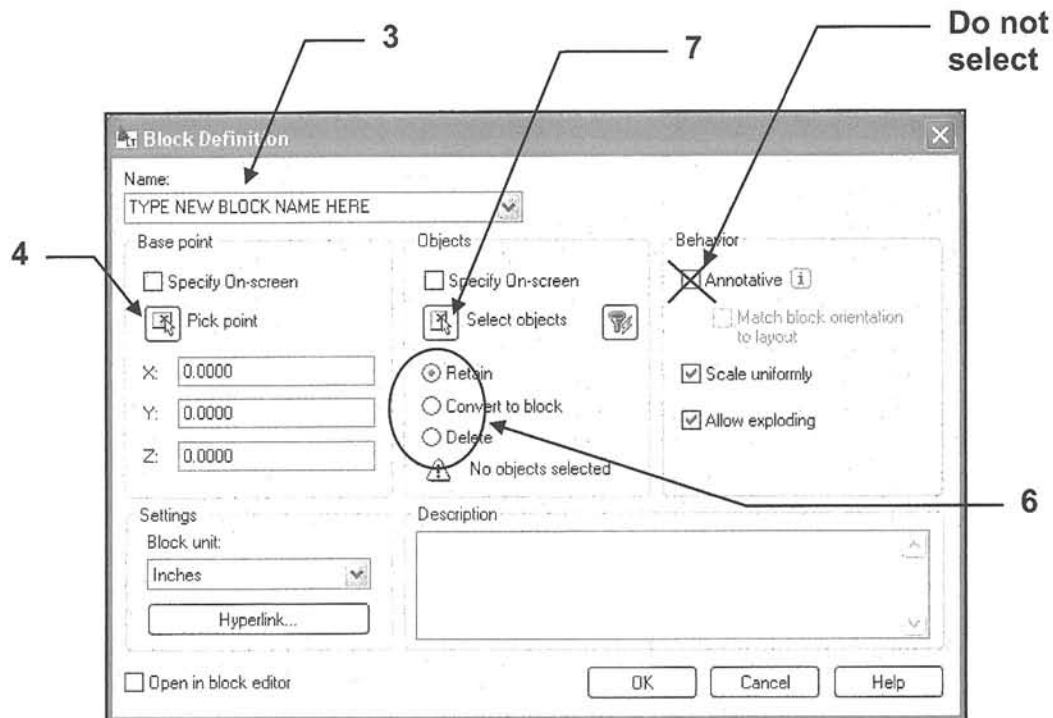


2. Select the **CREATE BLOCK** command using one of the following:

Ribbon = Insert tab / Block Definition panel /
or
Keyboard = B <enter>



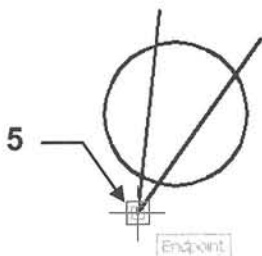
3. Enter the New Block name in the **Name** box.



Continued on the next page...

BLOCKS....continued

4. Select the **Pick Point** button. (Or you may type the X, Y and Z coordinates.)
The Block Definition box will disappear and you will return temporarily to the drawing.
5. Select the location where you would like the insertion point for the Block.
Later when you insert this block, the block will appear on the screen attached to the cursor at this insertion point. Usually this point is the CENTER, MIDPOINT or ENDPOINT of an object.



Notice the coordinates for the base point are now displayed. (Don't worry about this. Use Pick Point and you will be fine)



6. Select one of the options described below.

It is important that you select one and understand the options below.

Retain

If this option is selected, the original objects will stay visible on the screen after the block has been created.

Convert to block

If this option is selected, the original objects will disappear after the block has been created, but will immediately reappear as a block. It happens so fast you won't even notice the original objects disappeared.

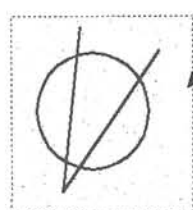
Delete

If this option is selected, the original objects will disappear from the screen after the block has been created. (This is the one I use most of the time)

7. Select the **Select Objects** button.

The Block Definition box will disappear and you will return temporarily to the drawing.

8. Select the objects you want in the block, then press <enter>.

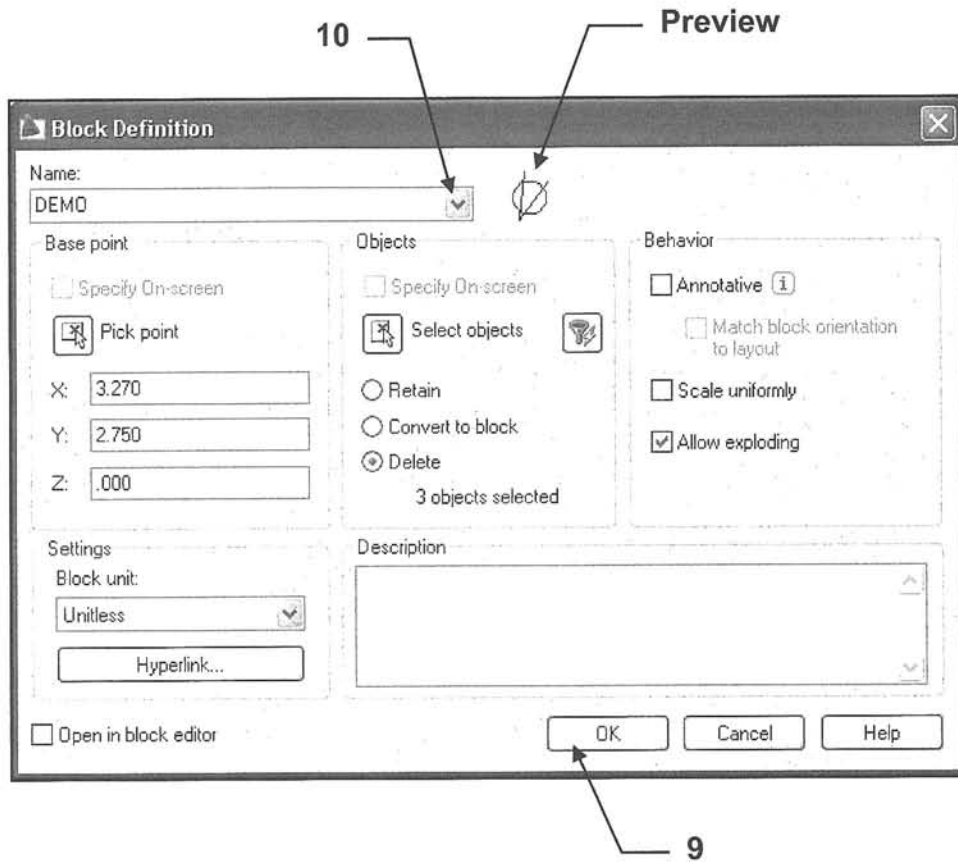


Selection Window

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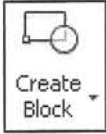
BLOCKS....continued

The Block Definition box will reappear and the objects you selected should be displayed in the Preview Icon area.



9. Select the **OK** button.

The new block is now stored in the drawing's block definition table.

10. To verify the creation of this Block, select  **Create** again, and select the

Name (▼). A list of all the blocks, in this drawing, will appear.
(Refer to page 29-6 for inserting instructions)

Continued on the next page...

BLOCKS....continued

ADDITIONAL DEFINITIONS OF OPTIONS

Block Units

You may define the units of measurement for the block. This option is used with the "Design Center" to drag and drop with Autoscaling. The Design Center is an advanced option and is not discussed in this book.

Hyperlink

Opens the **insert Hyperlink dialog box** which you can use to associate a hyperlink with the block.

Description

You may enter a text description of the block.

Scale Uniformly

Specifies whether or not the block is prevented from being scaled non-uniformly during insertion.

Allow Exploding

Specifies whether or not the block can be exploded after insertion.

HOW LAYERS AFFECT BLOCKS

If a block is created on Layer 0:

1. When the block is inserted, it will take on the properties of the current layer.
2. The inserted block will reside on the layer that was current at the time of insertion.
3. If you Freeze or turn Off the layer the block was inserted onto, the block will disappear.
4. If the Block is **Exploded**, the objects included in the block will revert to their original properties of layer 0.

If a block is created on Specific layers:

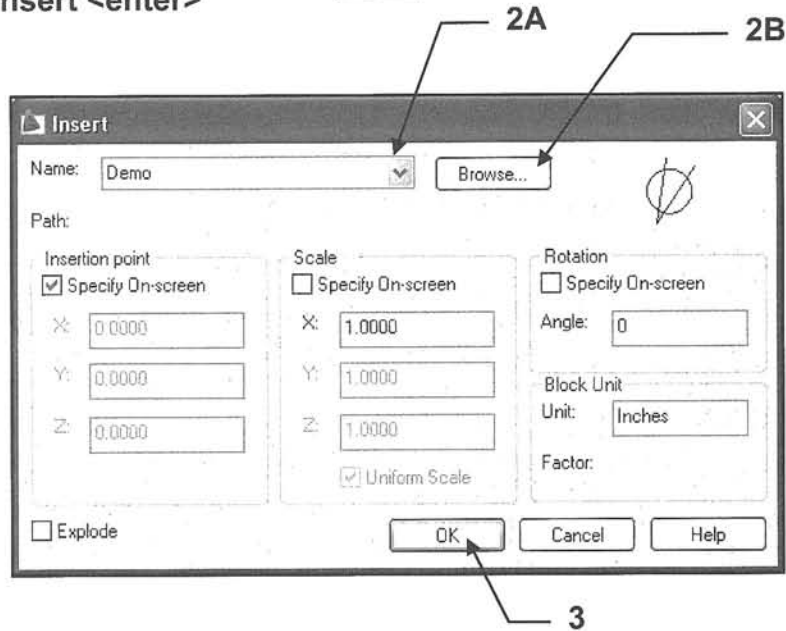
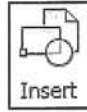
1. When the block is inserted, it will retain its own properties. It **will not** take on the properties of the current layer.
2. The inserted block **will reside** on the current layer at the time of insertion.
3. If you **freeze** the layer that was current at the time of insertion the block will disappear.
4. If you turn **off** the layer that was current at the time of insertion the block will not disappear.
5. If you **freeze** or turn **off** the blocks original layers the block will disappear.
6. If the Block is **Exploded**, the objects included in the block will go back to their original layer.

INSERTING BLOCKS

A **BLOCK** can be inserted at any location within the drawing. When inserting a Block you can **SCALE** or **ROTATE** it.

1. Select the **INSERT** command using one of the following:

Ribbon = Insert tab / Block panel /
or
Keyboard = Insert <enter>



2. Select the **BLOCK** name.
 - a. If the block is already in the drawing that is open on the screen, you may select the block from the drop down list shown above
 - b. If you want to insert an entire drawing, select the Browse button to locate the drawing file.
3. Select the **OK** button.

This returns you to the drawing and the selected block should be attached to the cursor.

4. Select the insertion location for the block by moving the cursor and pressing the left mouse button or typing coordinates.

Command: `_insert`

Specify insertion point or **[Basepoint/Scale/Rotate]:**

NOTE: If you want to change the **basepoint**, **scale** or **rotate** the block before you actually place the block, press the right hand mouse button and you may select an option from the menu or select an option from the command line menu shown above.

You may also **“preset”** the insertion point, scale or rotation. This is discussed on the next page.

Continued on the next page...

INSERTING BLOCKS....continued

PRESETTING THE INSERTION POINT, SCALE or ROTATION

You may preset the **Insertion point**, **Scale** or **Rotation** in the INSERT box instead of at the command line.

1. Remove the check mark from any of the “**Specify On-screen**” boxes.
2. Fill in the appropriate information describe below:

Insertion point

Type the X and Y coordinates from the Origin. The Z is for 3D only.

The example below indicates the block's insertion location will be 5 inches in the X direction and 3 inches in the Y direction, from the Origin.

Scale

You may scale the block proportionately by typing the scale factor in the X box and then check the Uniform Scale box. If you selected “Scale uniformly” box when creating the block this option is unnecessary and not available.

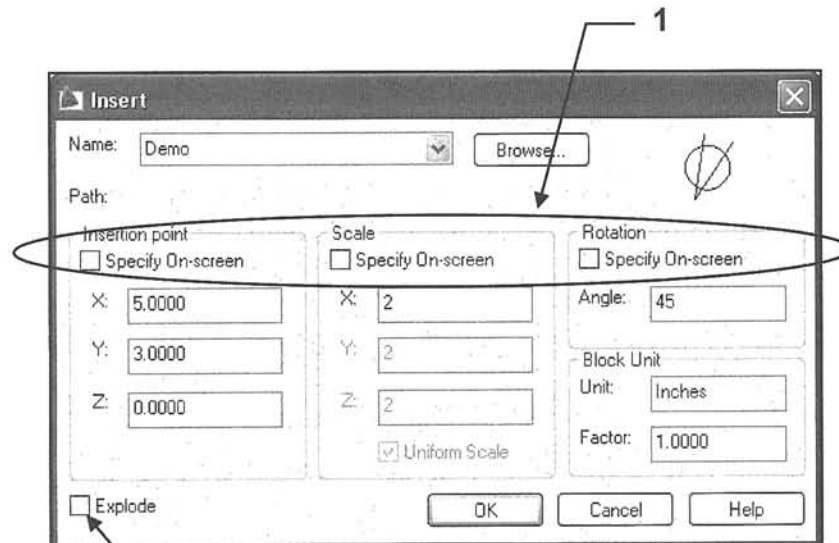
If the block is to be scaled non-proportionately, type the different scale factors in both X and Y boxes.

The example below indicates that the block will be scale proportionate at a factor of 2.

Rotation

Type the desired rotation angle relative to its current rotation angle.

The example below indicates the block will be rotated 45 degrees from its originally created angle orientation.



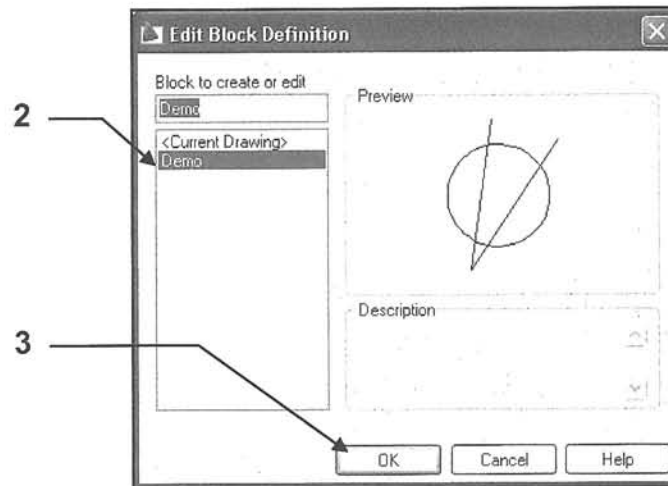
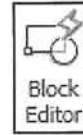
Check this box if you want the block to be inserted already exploded

RE-DEFINING A BLOCK

How to change the design of a block previously inserted.

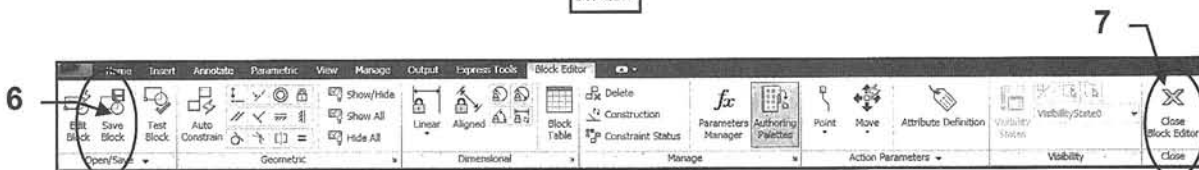
1. Select **Block Editor** using one of the following:

Ribbon = Insert tab / Block Definition panel /
or
Keyboard = bedit



The "**Edit Block Definition**" dialog box will appear.

2. Select the name of the Block that you wish to change.
3. Select the **OK** button.
4. The Block that you selected should appear large on the screen. You may now make any additions or changes to the block. You can change tabs and use other panels such as Draw and Modify. But you must return to the **Block Editor** tab to complete the process.
5. Return to the **Block Editor** button if you selected any other tab while editing.
6. Select the **Save block** tool from the **Open/Save** panel.
7. Select the **Close Block Editor** tool.



You will be returned to the drawing and **all previously inserted** blocks with the **same name** will be updated with the changes that you made.

PURGE UNWANTED and UNUSED BLOCKS

You can remove a block reference from your drawing by erasing it; however, the block definition remains in the drawing's block definition table. To remove any **unused** blocks, dimension styles, text styles, layers and linetypes you may use the **Purge** command.

How to delete unwanted and unused blocks from the current drawing.

1. Select the **Purge** command using one of the following:

Ribbon = None

or

Application Menu = Drawing Utilities / Purge

or

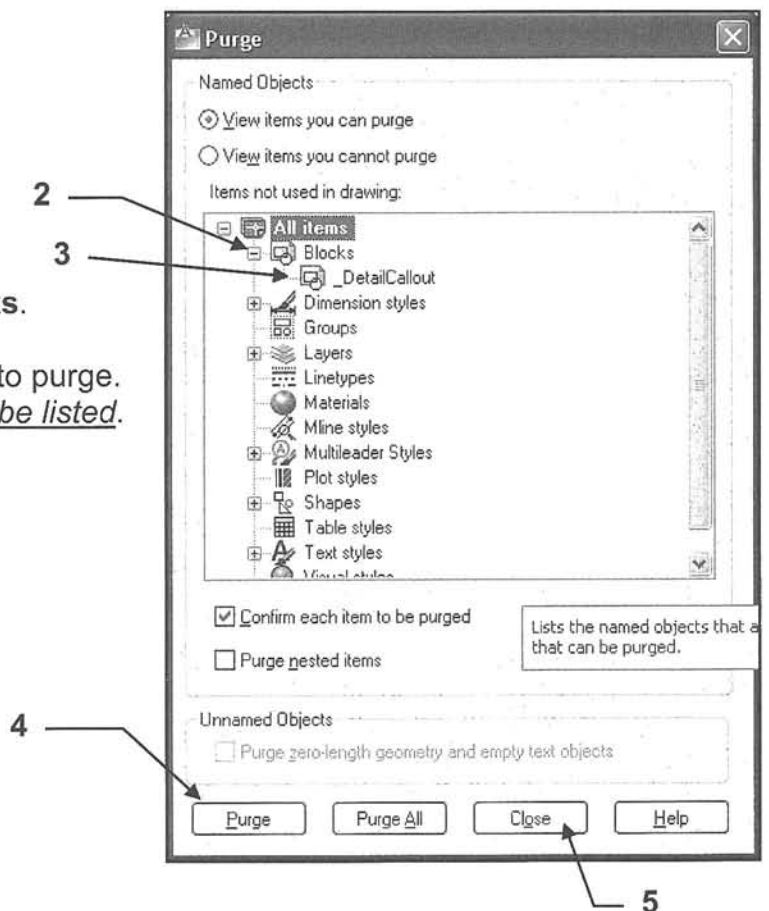
Keyboard = Purge <enter>

2. Select the + sign beside **Blocks**.

3. Select the block that you wish to purge.
*Note: only **unused** blocks will be listed.*

4. Select the **Purge** button.

5. Select the **Close** button.



WHERE ARE BLOCKS SAVED?

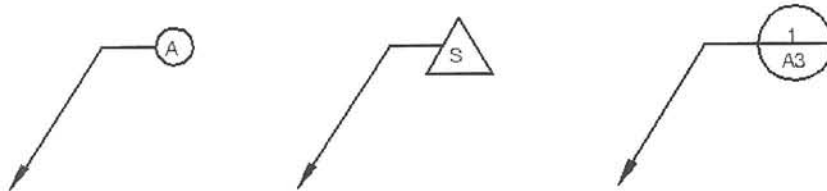
When you create a Block it is saved **within the drawing you created it in.**

(If you open another drawing you will not find that block.)

MULTILEADER and BLOCKS

In Lesson 19 you learned about Multileaders and how easy and helpful they are to use. (I saved this command for this lesson because it works best with Blocks attached to the Leader.) In this lesson you will learn another user option within the Multileader Style Manager that allows you to attach a pre-designed Block to the landing end of the Leader. To accomplish this, you must first create the style and then you may use it.

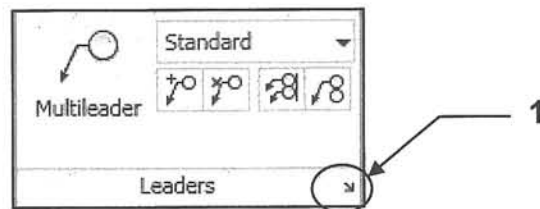
Here are a few examples of multileaders with pre-designed blocks attached:



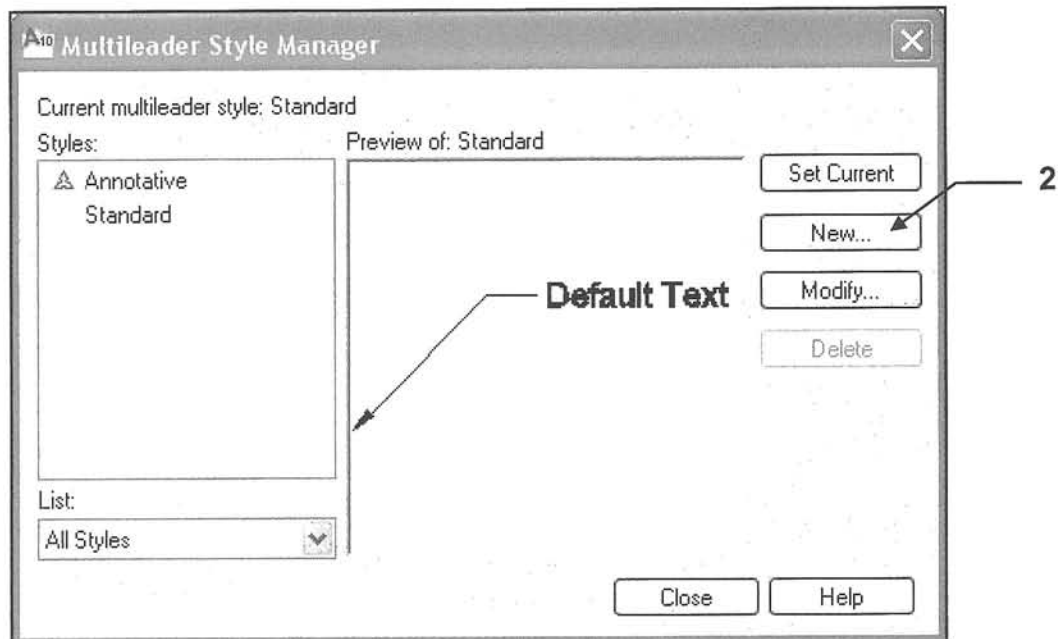
STEP 1. CREATE A NEW MULTILEADER STYLE

1. Select the **Multileader Style Manager** tool using

Ribbon = Annotate tab / Leaders panel / ↘



2. Select the **New** button.



MULTILEADER and BLOCKS....continued

3. Enter **New Style Name**

4. Select a style to **Start with**:

5. Select **Annotative** box

6. Select **Continue** button.



7. Select the **Content** tab.

8. **Multileader Type**: Select **Block** from drop down menu.

9. **Source Block**: Select **Circle** from the drop down menu.

Note: you have many choices here. These are AutoCAD pre-designed blocks with Attributes.

10. **Attachment**: Select **Center Extents**.

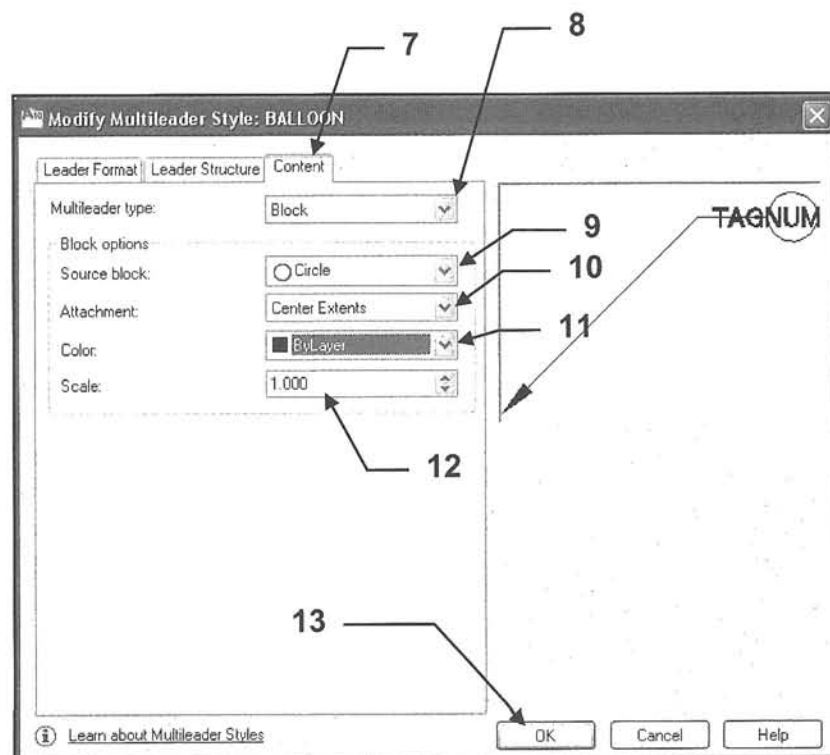
Note: this selection works best with Circle but you will be given different choices depending on which Source block you select.

11. **Color**: Select **Bylayer**

Bylayer works best. It means, it acquires the color of the current layer setting.

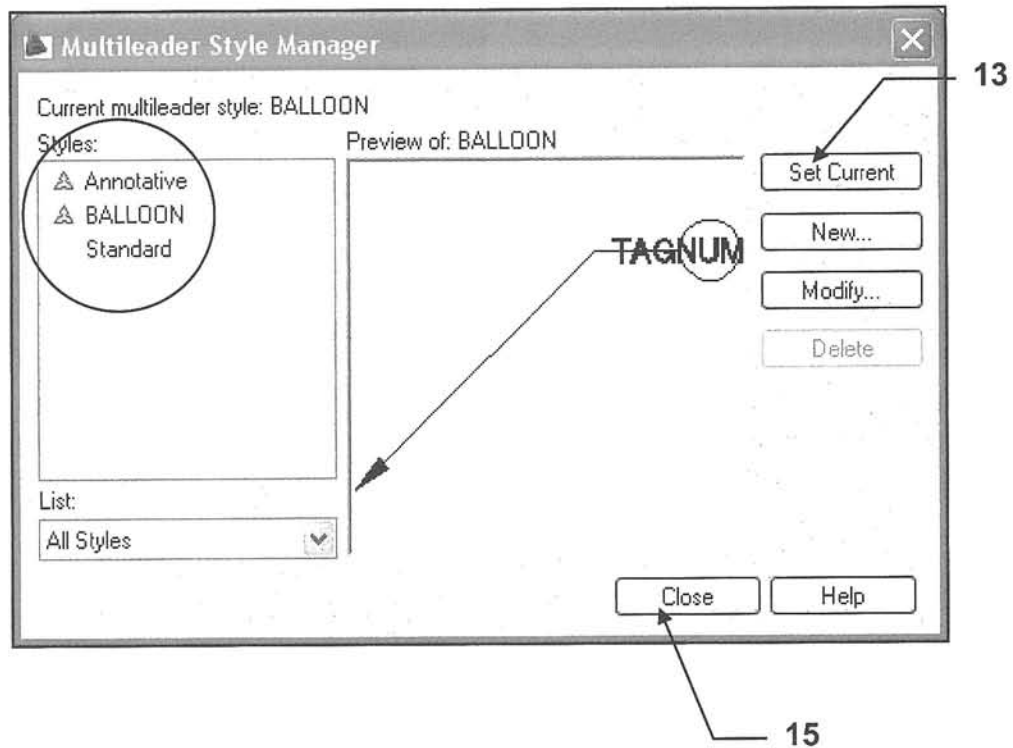
12. **Scale**: Select 1.000

13. Select **OK** button.



MULTILEADER and BLOCKS....continued

Your new multileader style should be displayed in the Styles list.



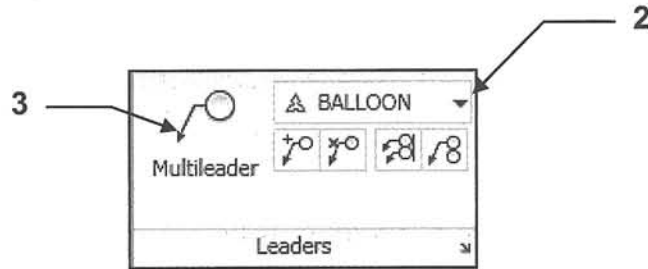
14. Select **Set Current**

15. Select **Close** button.

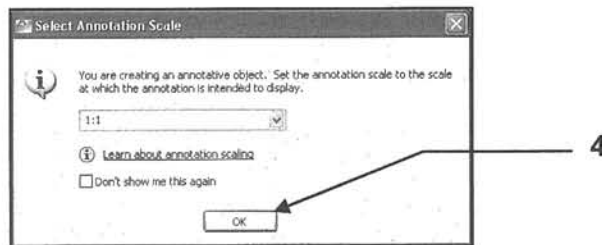
MULTILEADER and BLOCKS....continued

STEP 2. USING THE MULTILEADER WITH A BLOCK STYLE

1. Select the **Annotate** tab / **Leaders** panel
2. Select the **Style** from the Multileader drop down list



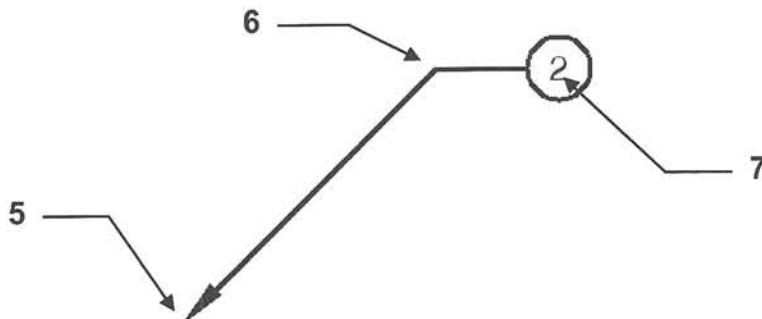
3. Select the **Multileader** tool.
4. The **Select Annotation Scale** box may appear. Select **OK** for now.



5. Specify leader arrowhead location or [leader Landing first/Content first/Options] <Options>: **place the desired location of the arrowhead**
6. Specify leader landing location: **place the desired location of the landing**

***The next step is where the pre-assigned "Attributes" activate.
Refer to the Advanced Workbook for Attributes.***

7. Enter attribute values
Enter tag number <TAGNUMBER>: **type number or letter <enter>**

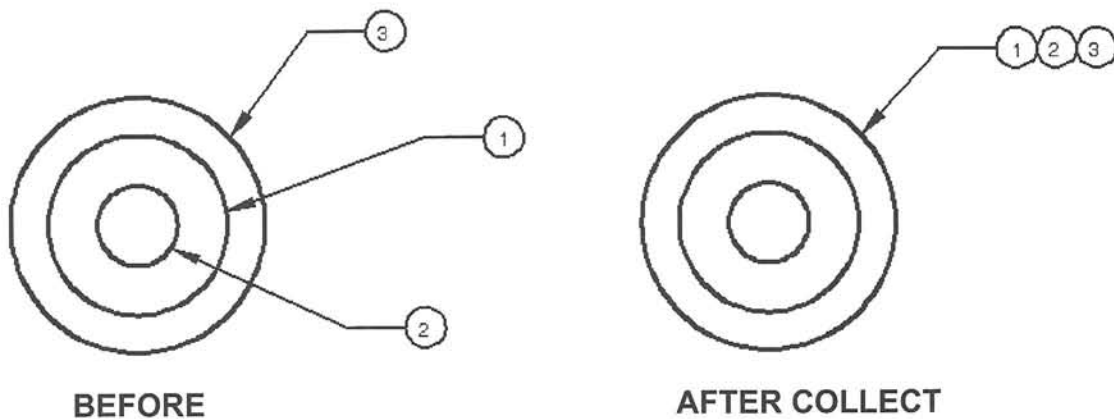


COLLECT MULTILEADER

In lesson 19 you learned how to ADD, REMOVE and ALIGN multileaders. Now you will learn how to use the **COLLECT** multileader tool.

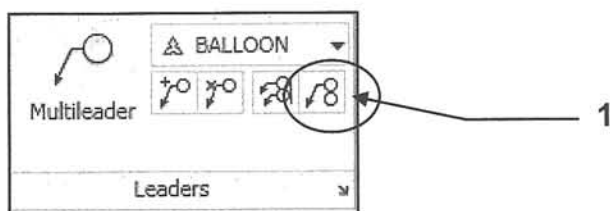
If you have multiple Leaders pointing to the same location or object you may wish to COLLECT them into one Leader.

Example:



HOW TO USE COLLECT MULTILEADER


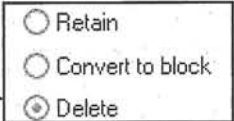
1. Select the Collect Multileader tool

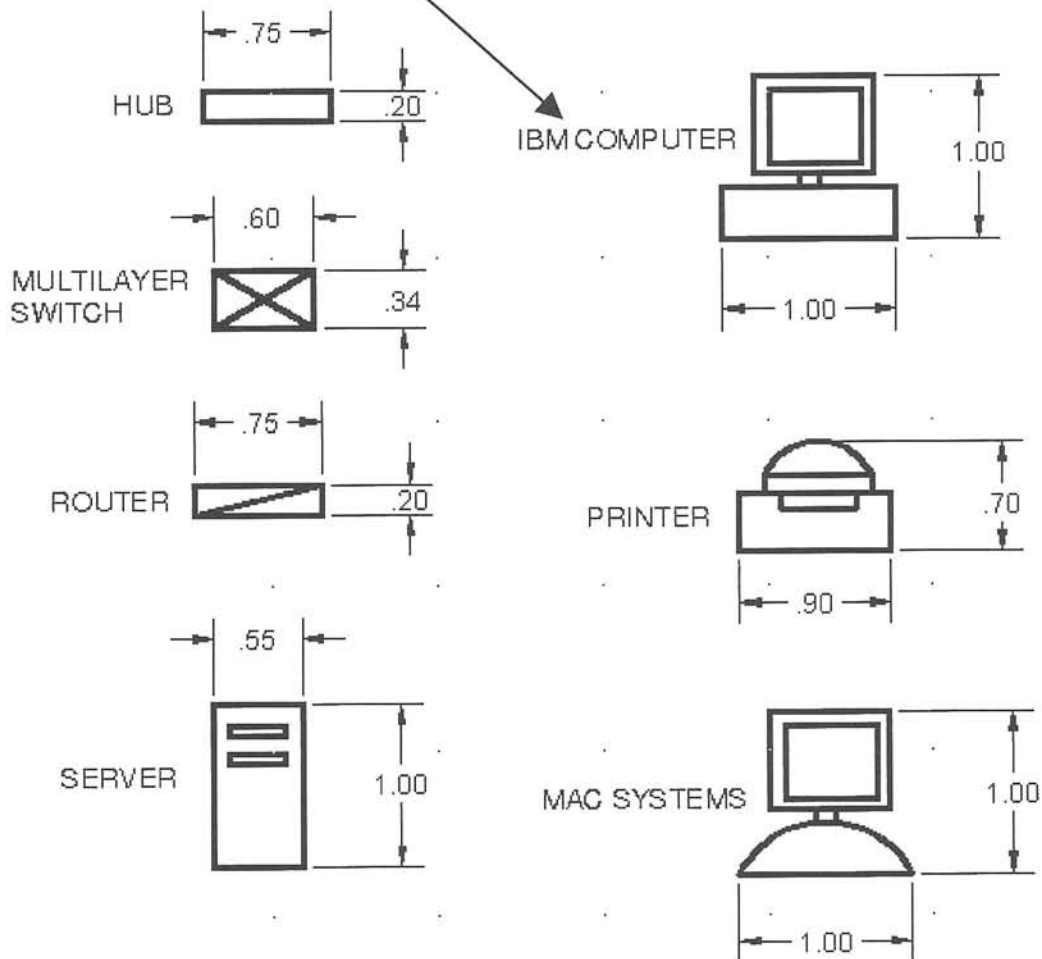


2. Select the Multileaders that you wish to combine then press <enter>.
Note: Select them one at a time in the order you wish them to display.
Such as (1, 2, 3, A, B, C, etc)
3. Place the combined Leader location. (**Ortho** should be **OFF**)

EXERCISE 29A


STEP 1

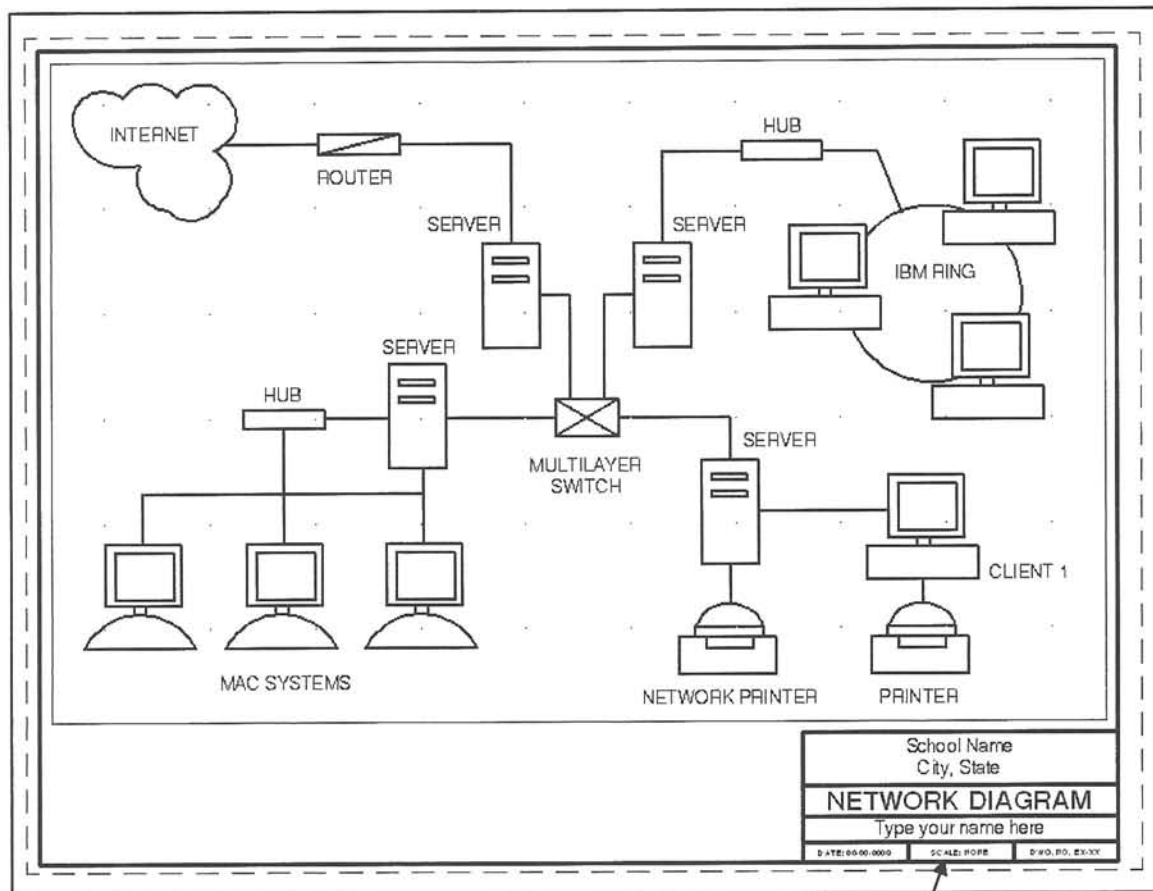
1. Start a **NEW** file using **My Decimal Setup.dwt**.
2. Select the **Model** tab 
3. Draw the objects shown below approximately as shown. Use Layer Symbol.
4. Do not dimension
5. Create a block of each.
 - A. **Important:** Don't forget to select a "**Base Point**" somewhere on each object.
 - B. Select "**Delete**" so they disappear as they are made. 
 - C. Do not include the name when selecting the objects for each block.
6. Save as **EX-29A**



EXERCISE 29A continued

STEP 2

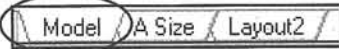
1. Open **EX-29A** (If not already open)
2. Select the **A Size** tab and confirm **Model** is displayed. 
3. Draw the Network Diagram approximately as shown within Model space.
4. Insert the Blocks you previously created in Step 1.
5. Add the Labels use: Text Style: Text-Classic Height: .125
6. Edit the Title Block
7. **Save** the drawing as: **EX-29A** again
8. **Plot** using page setup **Plot Setup A**



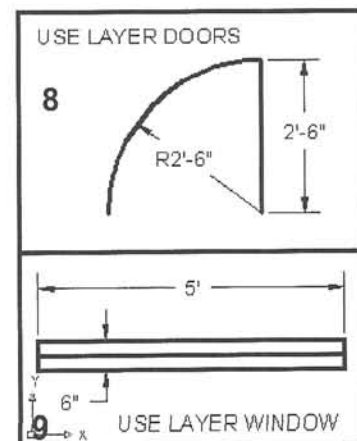
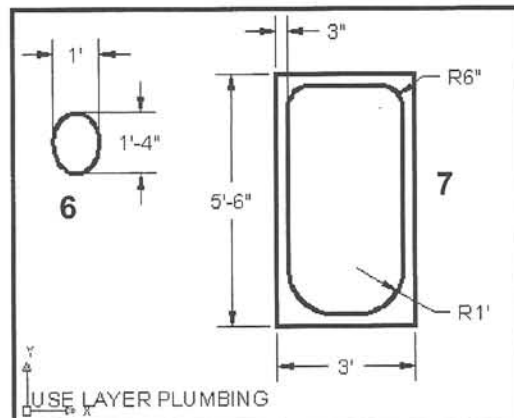
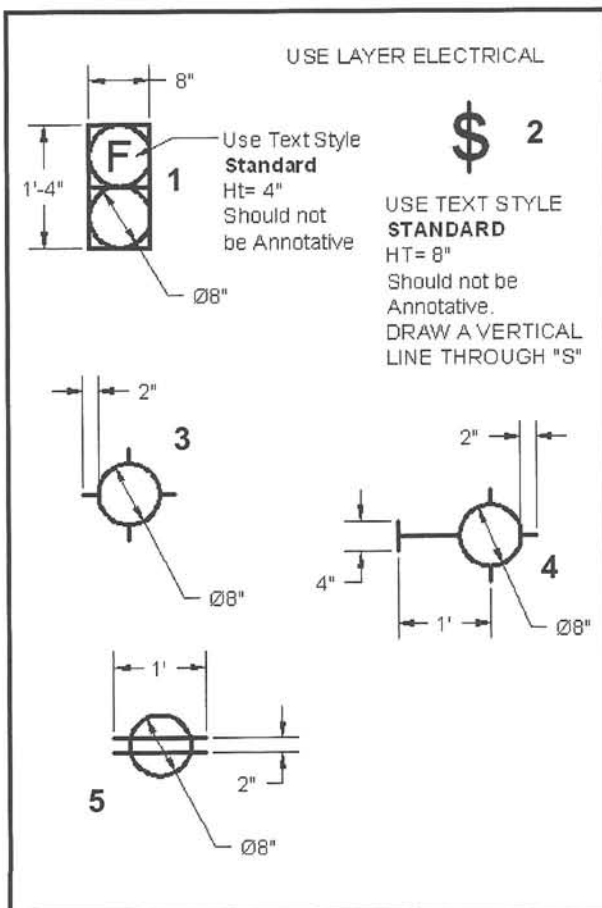
SCALE: NONE

EXERCISE 29B

STEP 1

1. Start a **NEW** file using **My Feet-Inches Setup.dwt**.
2. Select the **Model** tab 
3. Draw the objects shown below approximately as shown. **Use Layers specified.**
4. Do not dimension
5. Create a block for each.
 - A. **Important:** Don't forget to select a "**Base Point**" on each object.
 - B. Select "**Delete**" so they disappear as they are made.
 - C. Use the Numbers for name. Do not include the number when selecting the objects for the block.
6. Save as **EX-29B**

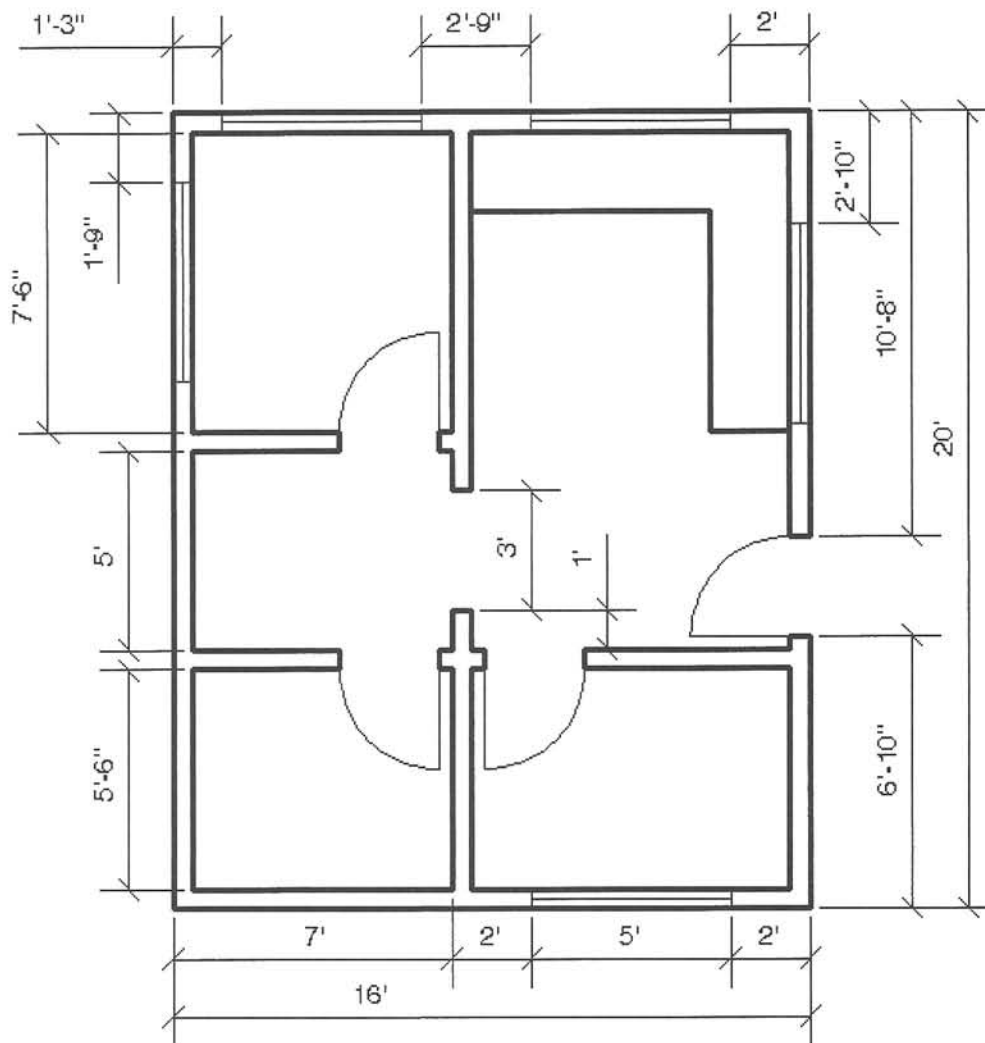
Note: Your blocks will appear much smaller and thinner than the blocks shown below. These have been enlarged for clarity.



EXERCISE 29B continued

STEP 2

1. Open **EX-29B** (If not already open)
2. Select the **A Size** tab
3. Draw the Floor plan approximately as shown below inside the viewport.
(Note: the viewport scale should already be adjusted to $1/4" = 1'$)
 - A. The walls are 6" wide.
 - B. The space behind the door is 4" and counter depth is 24".
4. Insert the (8) DOOR Blocks on Layer Door
5. Insert the (9) WINDOW Blocks on Layer Window.
6. Dimension as shown using Dimension Style **Dim-Arch** (Your dimension text will appear different. I used text style Text-Classic because it is easier for you to read)
7. **Save** the drawing as: **EX-29B** again

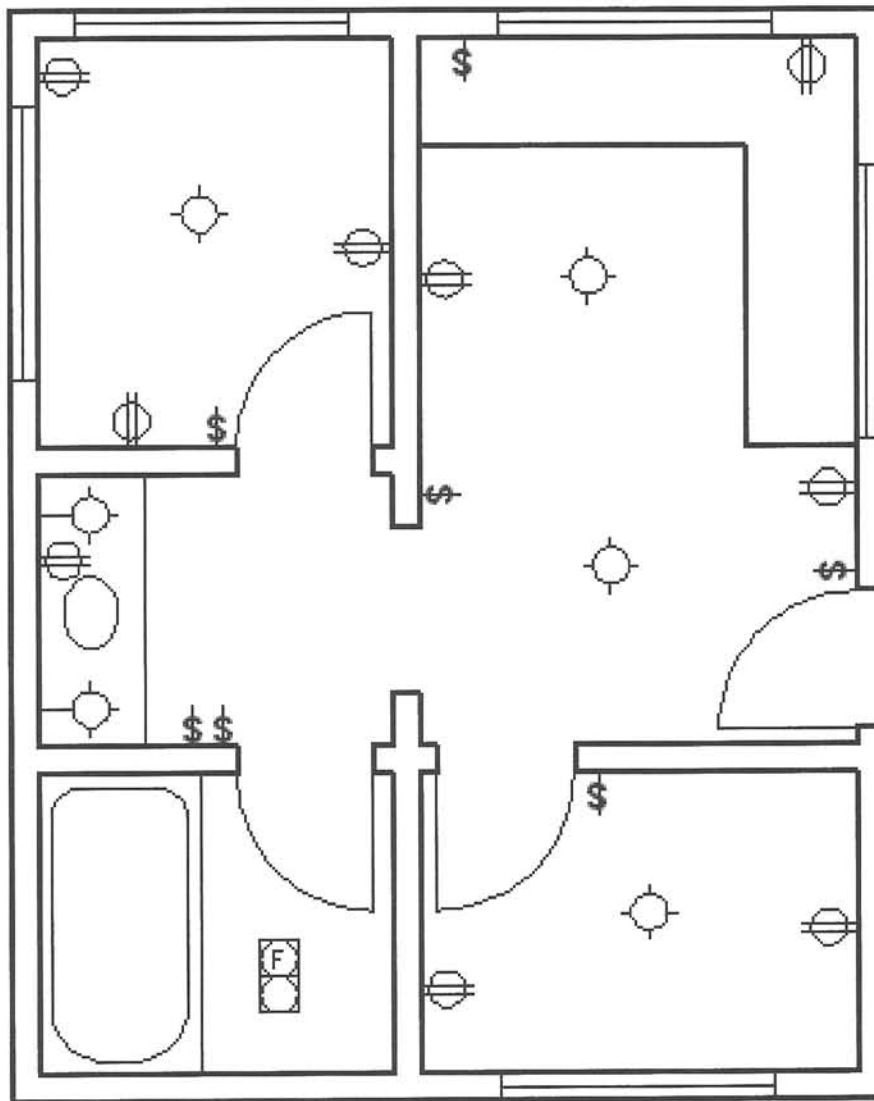


EXERCISE 29B continued

STEP 3

1. Open **EX-29B** (If not already open)
2. Add the Electrical Blocks (1, 2, 3, 4 and 5) on Layer Electrical.
3. Add the Plumbing Blocks (6 and 7) on Layer Plumbing.
4. **Save** the drawing as: **EX-29B** again

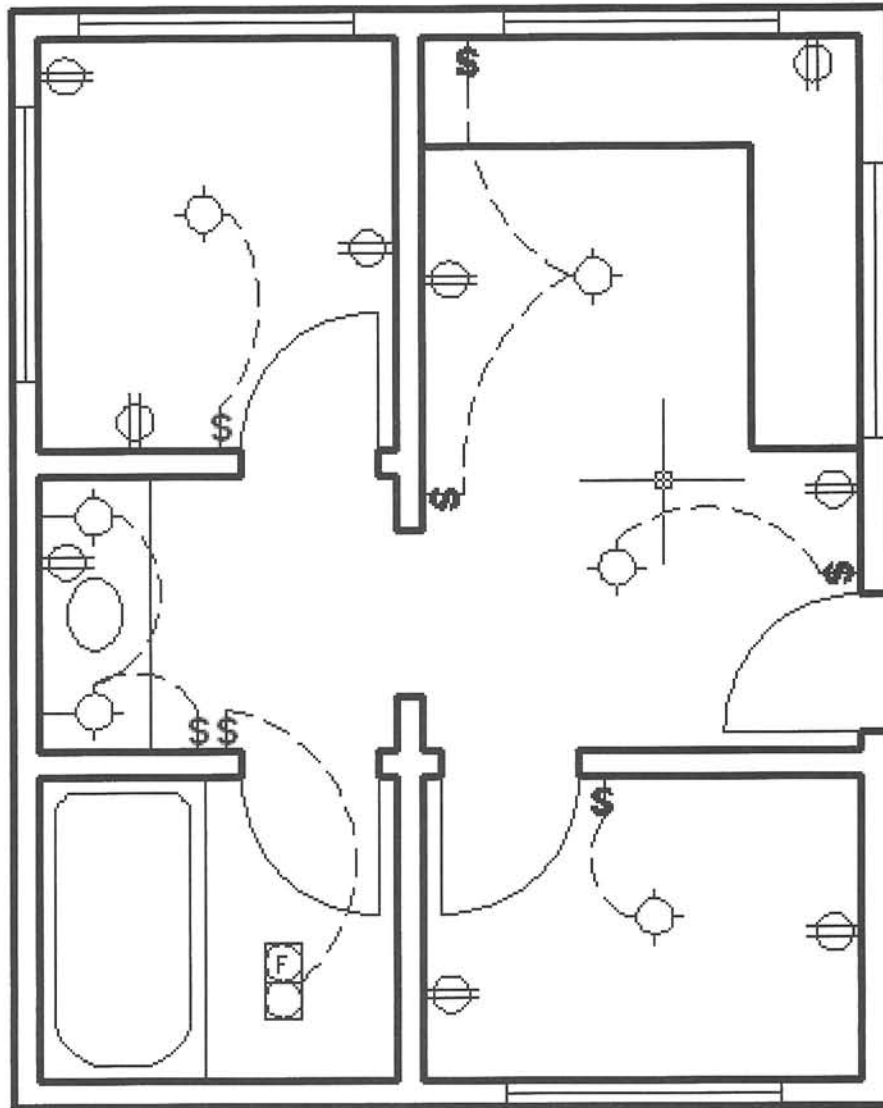
Note: The dimension layer has been temporarily turned off so you can see the electrical and plumbing blocks easier.



EXERCISE 29B continued

STEP 4

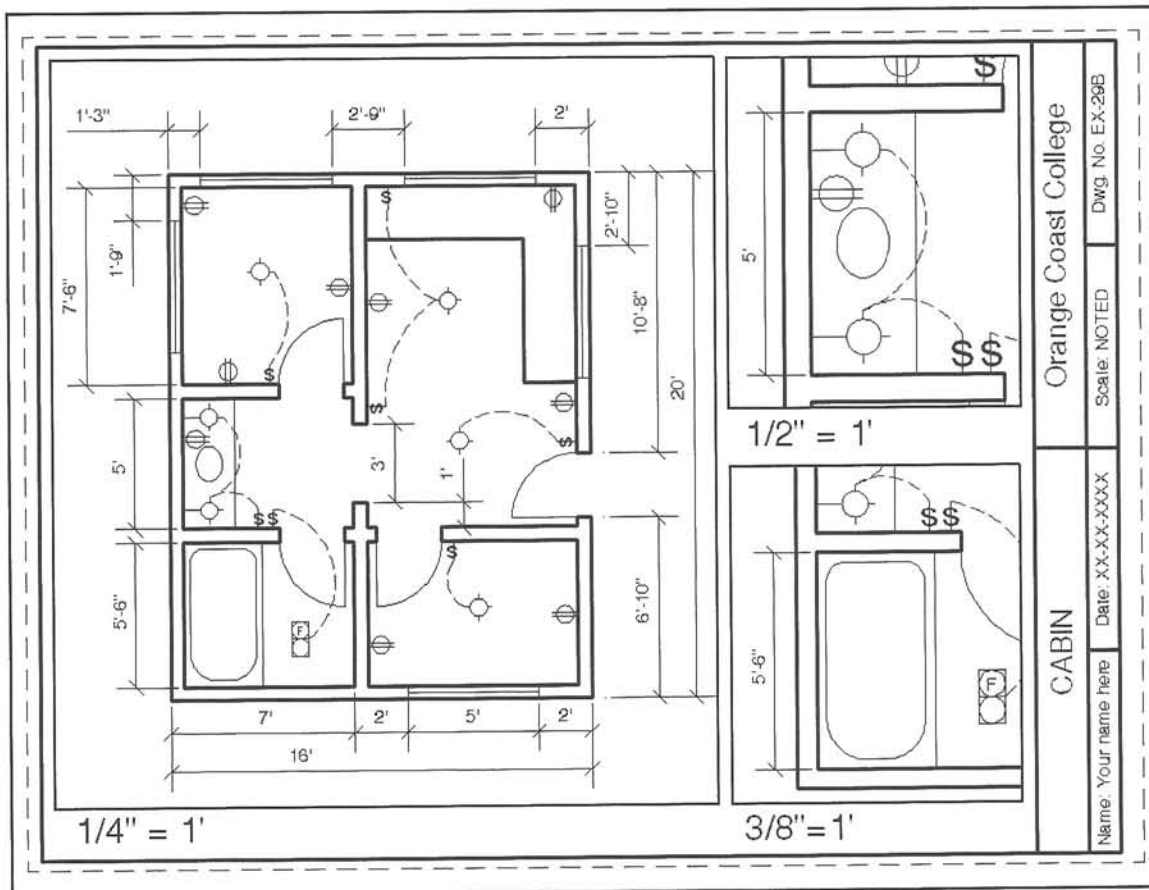
1. Open **EX-29B** (if not already open)
2. Add the Wiring.
 - A. Use Layer Wiring
 - B. Use Arc, (Start, End, Direction)
3. Notice that your dashed lines do not appear like the example below.
 - A. Type **LTS** (this is Linetype Scale setting)
 - B. Type **.25** (This scales all linetypes)
4. **Save** the drawing as: **EX-29B** again



EXERCISE 29B continued

STEP 5

1. Open **EX-29B** (If not already open)
2. Erase the existing Viewport Frame. (The Floor plan will disappear)
3. Select Viewport as Current layer and create **3 NEW** Viewports approx. as shown.
4. Adjust the scale of each Viewport.
5. Use **PAN** to find the area to view as shown below.
6. **Lock** each Viewport.
7. **Add** the dimensions in the 2 Viewports on the right by adding the current object scale. (Refer to page 28-3 and 28-4)
8. **Add** the Viewport Scale labels (1/8" ht) in Paperspace (Not Model space)
9. Make Viewport Frames plottable. (page 3-11)
10. **Save as EX-29B** **Edit** Title Block **Plot** using Plot Page Setup **Plot Setup A**

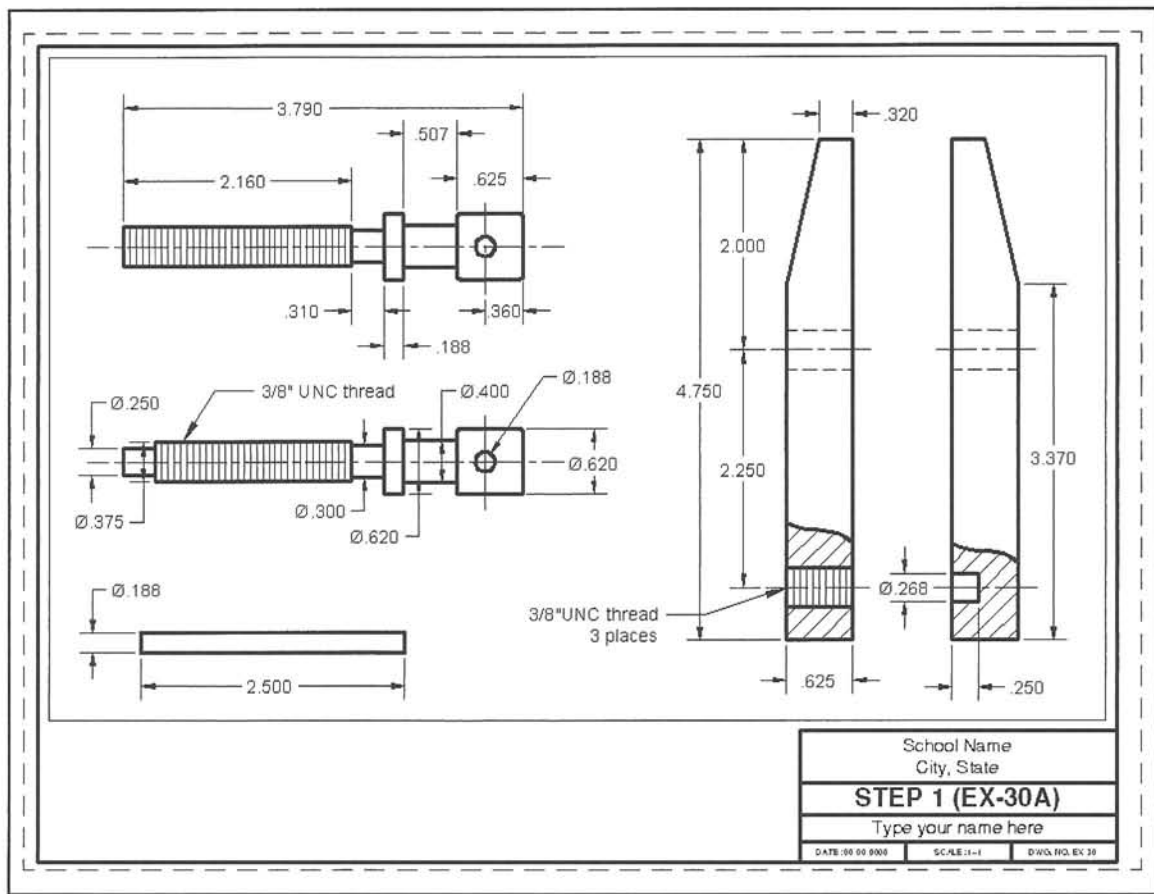


EXERCISE 29C

INSTRUCTIONS:

STEP 1

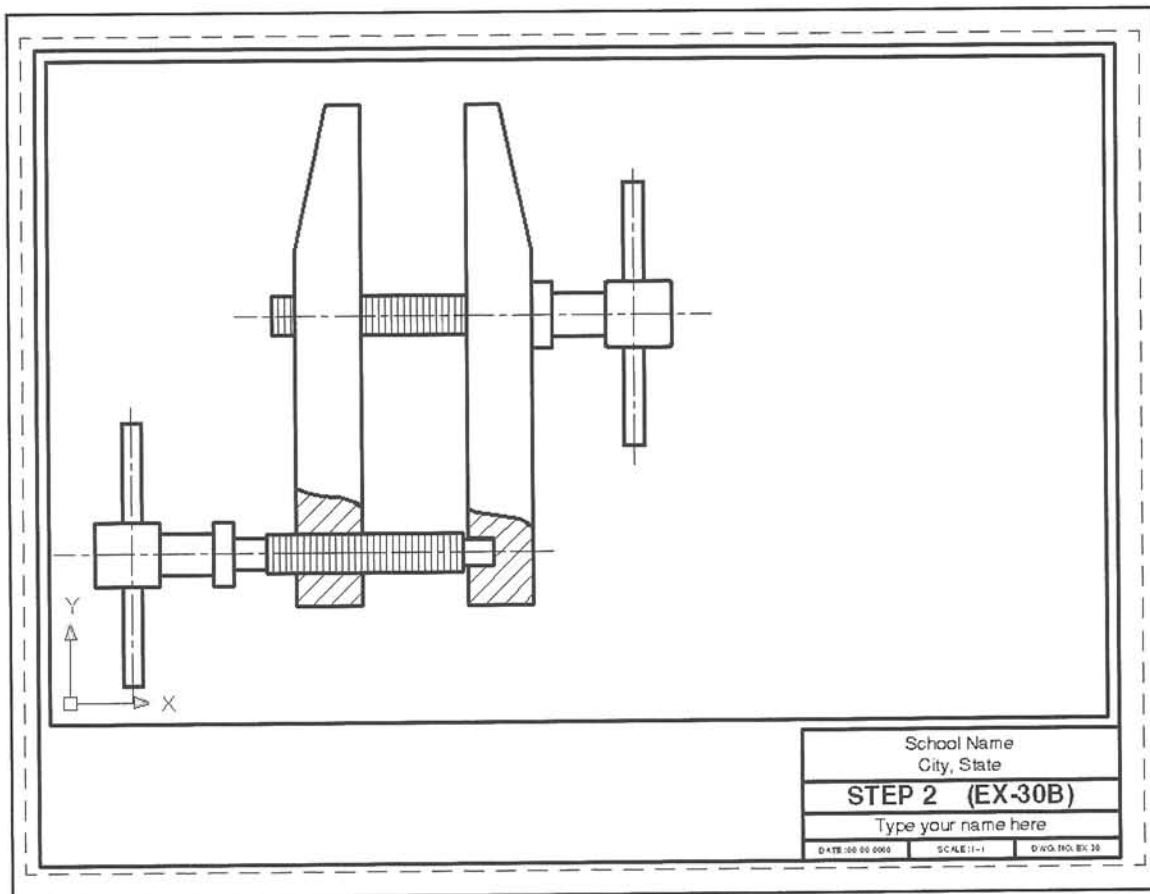
1. Start a **NEW** file using **My Decimal Setup.dwt**.
2. The Viewport should already be scaled to 1 : 1 and locked.
3. **Draw** the objects shown below.
4. Draw the **Break** line using Polyline with the Spline option (page 24-3)
5. Draw the Hatch using Pattern Ansi 31 and Layer Hatch.
6. Draw the Threads:
 - A. Use Layer Threads
 - B. Thread lines are .0625 distance apart.
7. Dimension as shown using Layer Dimension and Dimension Style = Dim-Decimal.
8. Save as **EX-29C**



EXERCISE 29C

STEP 2

1. **Freeze** the Dimension Layer.
2. **Assemble** the parts as shown below.
3. Use Move, Mirror, Rotate, Trim, Erase and any other command that you need.
4. The distance between the Jaws should be 1"
5. Save as **EX-29C**



EXERCISE 29C

STEP 3

1. Draw the List of parts in **Paper space** above the title block as shown.
2. Use Multiline Text to enter text. **Justify** = Middle Center **Text ht** = .125 and .062
3. Add Ballooned Leaders as shown in **Model Space**. Use Collect and Align.
4. Save as **EX-29C** and **plot** using plot page setup **Plot Setup A**

5	PIN	2	CRS
4	PILOT SCREW	1	CRS
3	SCREW	1	CRS
2	JAW-RIGHT	1	CRS
1	JAW-LEFT	1	CRS
ITEM	PART NAME	QTY	MATERIAL
School Name			
City, State			

List of Parts (enlarged)

