6.2. Introduction

In AutoCAD, block is a general term for one or more objects that are combined to create a single entity. That is, a block is a group of entities saved as a single unit. If an object (or group of objects) is used frequently, then time can be saved if the object is created once and inserted as many time as needed in the same or a different drawing.

A Block can be classified, Figure 6-1, on the basis of its availability or its contents.

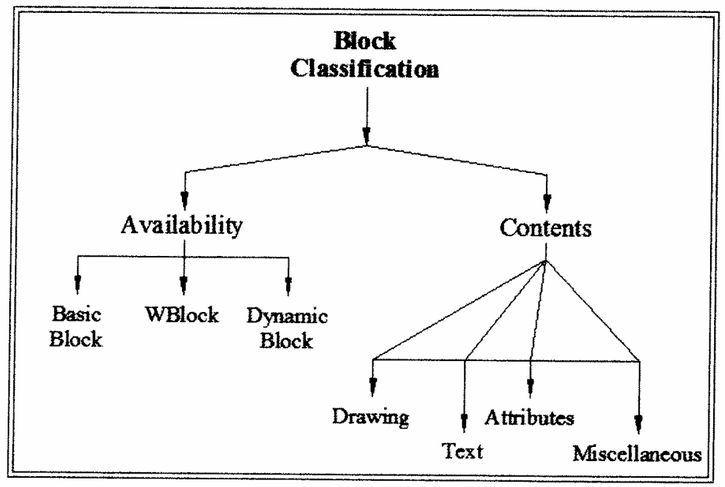

Figure 6-1

Availability: A basic block is available for insertion only in the native file (that is, in the file it is created), the Wblocks (also known as write blocks) can be inserted in any AutoCAD's .dwg file and the dynamic blocks can be updated in real time.

Contents: A drawing block contains only the drawing objects (circle, line, polyline, etc.). A text block is composed of text objects. An attributes block is created using attributes, (attributes are the sections of text added to a block that prompts the user to add information to the drawing). A miscellaneous block can contain any combination.

A drawing, text, attributes, or combination block can be saved as a basic or Wblocks. This chapter discusses in details the creation of basic and Wblock using drawing, text, and attributes.

6.3. Basic block

A basic block is a block that can be inserted only in the native drawing file. That is, it can be inserted only in the drawing file it was created. In order to follow a block creation process, draw the object shown in Figure 6-2a (the drawing units are in inches).

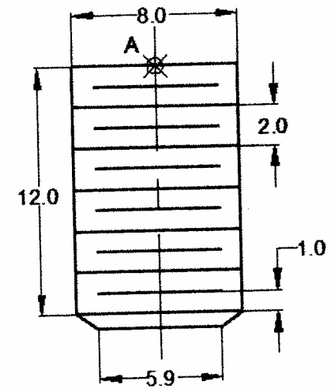

Figure 6-2a

6.3.1. Create a basic block

- The *Make Block* command is activated using one of the following procedures.
  1. Toolbar method: From the *Draw* toolbar select the *Make Block* tool.
  2. Menu method: Select the *Draw* dropdown menu, select the *Block* option, and finally select the *Make* option.
  3. Command line method: Type "block", "Block", or "BLOCK" on the command line and press the *Enter* key.

- The activation of the command will open the *Block Definition* dialog box as shown in Figure 6-2b.

6.3.2. Block definition dialog box

The main features of the *Block Definition* dialog box (Figure 6-2b) are briefly discussed here.

- *Name*: The *Name* field is used to name the block. The name can be 255 characters long and can include letters, numbers, and blank spaces. However, blocks should be given meaningful names. In the current example, the block is named "Thread".
- *Base point*: The *Base point* panel is used to choose an insertion base point (or a reference point) for the block. The selection of a proper base point is an important factor in the block creation process. Its default value is (0,0,0). However, to make the insertion process efficient, select the base point on the object itself. In the current example, point 'A' will be selected to be the base point. The base point is selected using one of the following techniques.
  - ***Specify On-screen***: The selection of this box will make the other two options inactive. The prompts to specify the base point will appear when the *Block Definition* dialog box is closed. In the current example, check this box.
  - ***Pick point***: In order to choose the base point using the pointing device: (i) click on the pointing device button ( ), this will close the dialog box for a moment and allows the user to select a point; (ii) turn on the *object snap* option and click

on the desired point. This will reopen the dialog box. In the current example, point 'A' is selected as the base point using the pointing device.

- ***X, Y, Z***: Specify the coordinates of the base point.

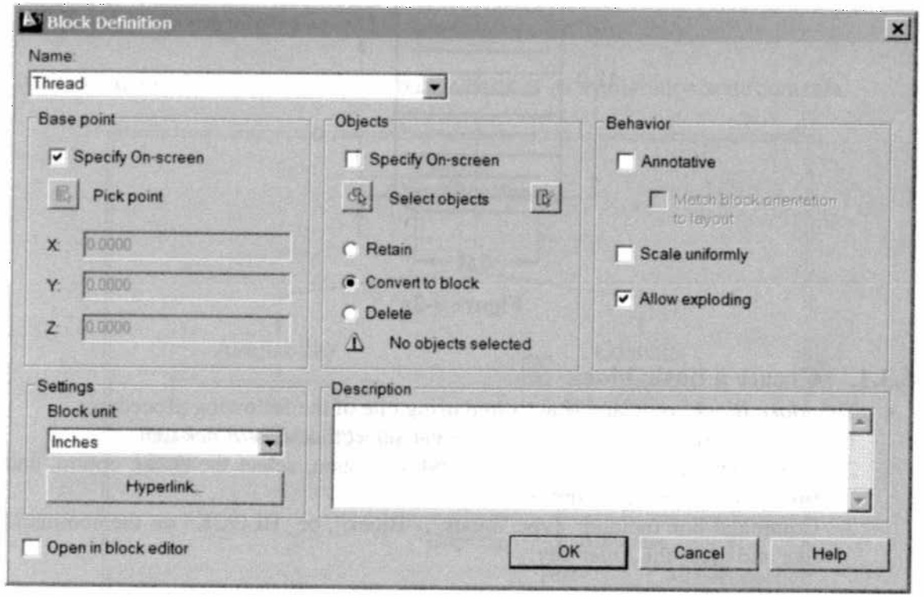

Figure 6-2b

- *Object*: The *Object* panel is used to select the objects to be included in the block.
  - ***Specify On-screen***: The selection of this box will make the other two options inactive. The prompts to select the object will appear when the *Block Definition* dialog box is closed. In the current example, check this box.
  - ***Select objects***: (i) Click on the object selection pointing device button (). This will close the dialog box for a moment and allows the user to select the objects. (ii) Select the objects using one of the object selection methods; this will reopen the dialog box. In this example, the dimensions are excluded from the block.
  - ***Retain***: This option retains the selected objects as distinct objects in the drawing after the block is created.
  - ***Convert to block***: This option converts the selected objects to a block in the drawing after the block is created. In the current example, this option is used.
  - ***Delete***: This option deletes the selected objects from the drawing after the block is created.
- *Behavior*: The behavior panel is used to specify the behavior for a block.
  - ***Scale uniformly***: During the insertion process the user may want to (i) scale the object uniformly (same scale factors in *X*, *Y*, and *Z* direction) or (ii) use different scale factors in *X*, *Y*, and *Z* direction. Since a block can only be scaled uniformly

from the second option, therefore, do not check this box. In the current example, this box is not checked.

  - ***Allow exploding***: This box specifies whether or not a block can be decomposed to the basic object (exploded). Checking of this box will allow the user to modify the block. In the current example, check this box.
- *Setting*: The setting panel is used to specify the settings for a block.
  - ***Block units***: This option specifies the insertion units for the block reference.
- *Open in block editor*: This option will insert the block in the block editing mode. In the current example, this box is not checked.
- *OK*: Click the *OK* button to save the changes and to close the dialog box.
- When the user clicked the *OK* button, the prompt shown in Figure 6-2c will appear.

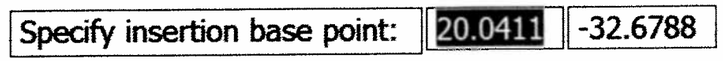

Figure 6-2c

- Turn on the object snap and click at point *A*.
- The object selection prompt will appear, Figure 6-2d.
- In this example, the dimensions and the label *A* are excluded from the block. Select the objects as shown in Figure 6-2d.
- Either press the right button of the mouse or press the *Enter* key.
- This will complete the basic block creation process.
- Click on the block, the block will have only one grip point. The base point is the only grip point, Figure 6-2e.

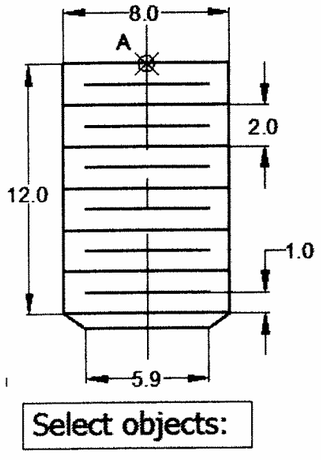

Figure 6-2d

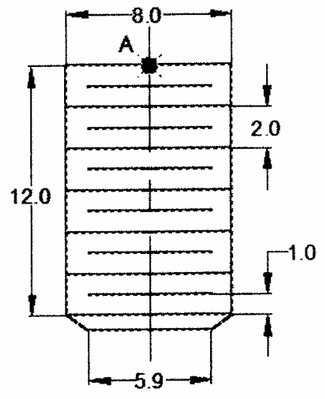

Figure 6-2e

6.4. Wblock

Wblocks (write blocks) are the blocks that can be inserted into any drawing. These blocks are saved as independent drawing files.

6.4.1. Create a Wblock

- Create a basic block. This example will use the 'Thread' block created in the basic block section.
- Activate the *Wblock* command.
  - The *WBlock* command is activated using the command line method. At the command prompt, type *Wblock* and press the *Enter*. The *Write Block* dialog box (Figure 6-3a) will appear.

6.4.2. Write block dialog box

In the *Write Block* dialog box, perform the following actions.

- *Source*: Select the *Block* option. The list of blocks (basic or Wblock) in the current file will be available. Press the down arrow to choose the block. Select the "Thread" block created in the basic block section.
- *Base point*: This option is deactivated if the *Block* option is selected in the *Source* panel.
- *Object*: This option is deactivated if the *Block* option is selected in the *Source* panel.

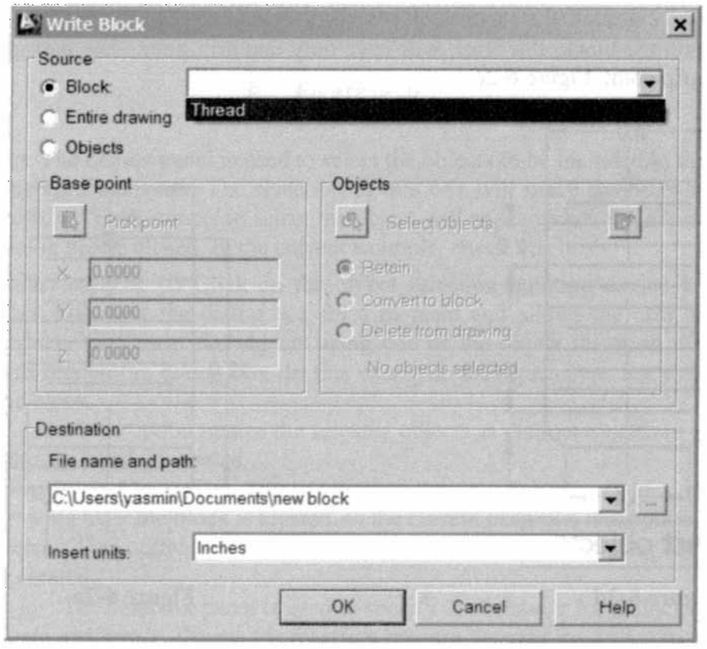

Figure 6-3a

- *Destination*: Select the location to store the Wblock file by clicking (...) destination button. This will open *Browse for Drawing File* dialog box, Figure 6-3b. Specify the location and click the *Save* button.

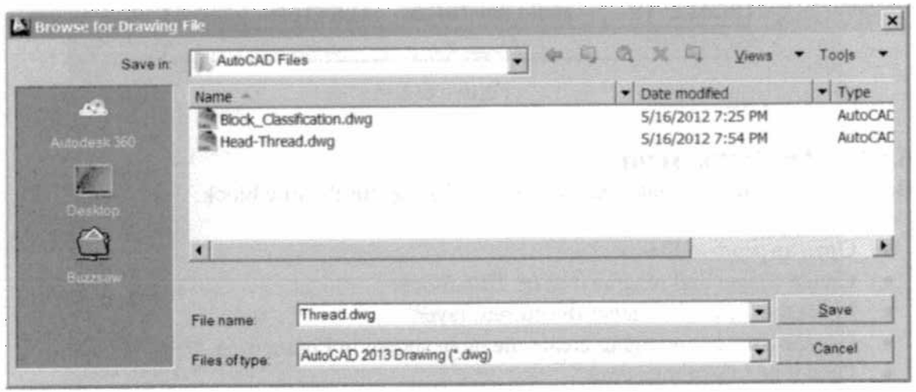

Figure 6-3b

- *OK*: Now, click the *OK* button in the *Write Block* dialog box to save the changes.
- This will close the *Write Block* dialog box, and the *Wblock Preview* window shown in Figure 6-3c will pop up for a very short time. This is the indication that the *Wblock* is created properly.

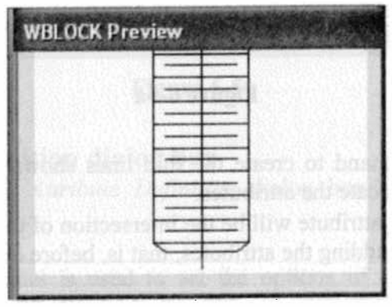

Figure 6-3c

6.5. Block with attributes

Attributes are the sections of text added to a block that prompts the user to add information to the drawing. This section will create a title block with attributes shown in Figure 6-4. The title block includes the information to uniquely identify the drawing. The title block is generally located on the lower right corner of a drawing. A title block entries depend on a company. The block created in this section is typically used in academic institutions.

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05/16/2012	TABLE #0	

Figure 6-4

6.5.1. The initial setup

Before creating the attributes, create the initial setup for the title block.

- Open an acadiso file.
- Create a layer and rename it to be *Title Block*.
- Make the *Title Block* layer the current layer.
- Use the *Line* command to create the table shown in Figure 6-5a.
- Do not add the dimensions.

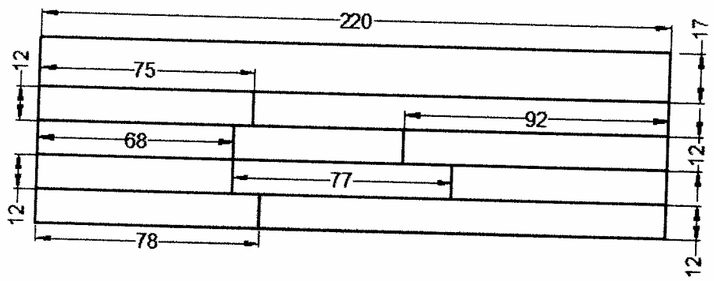

Figure 6-5a

- Use the *Offset* command to create the thin lines shown in Figure 6-5b. The thin lines are created to locate the attributes.
- The start point of an attribute will be the intersection of the thin lines. The thin lines will be deleted after adding the attributes, that is, before creating the block.

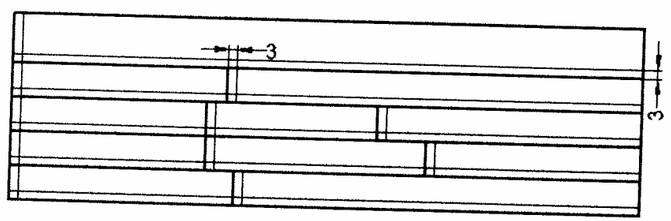

Figure 6-5b

An attribute is defined through the *Attribute Definition* dialog box, Figure 6-5c, and the dialog box is open using one of the following procedures.

1. Menu method: Select the *Draw* dropdown menu and then select the *Block → Define Attributes* option.
2. Command line method: Type "attdef", "Attdef", or "ATTDEF" on the command line and press the *Enter* key.

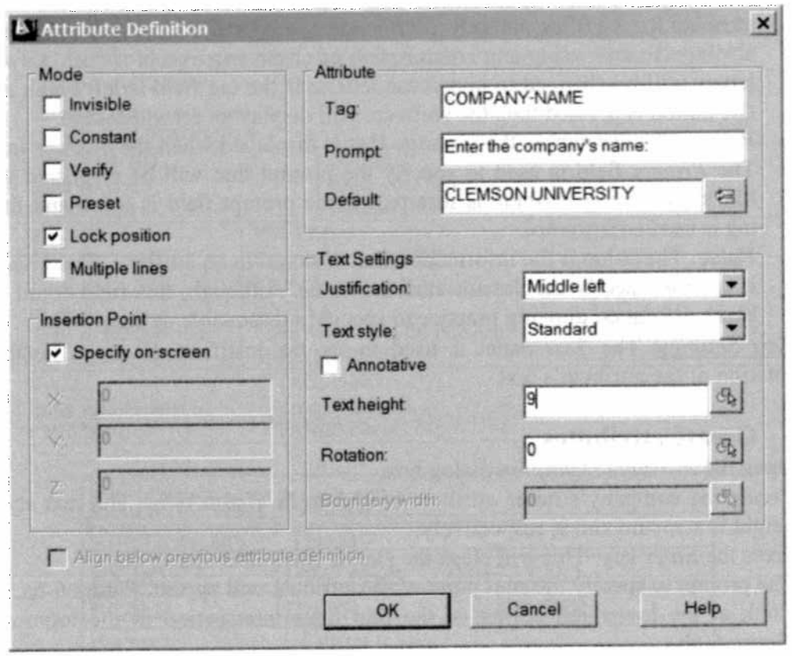

Figure 6-5c

6.5.2. Attribute definition dialog box

The main features of the *Attribute Definition* dialog box (Figure 6-5c) are briefly discussed here.

- *Mode*: The *Mode* panel is used to set the options of attribute for inserting the attributes in the drawing.
  - *Lock position*: This option allows for the locking of the position of the attribute within the block reference. In the current example, this box is checked.
- *Insertion Point*: The *Insertion Point* panel is used to set the location of an attribute in the drawing. The user can specify either the coordinates or pick the location in the drawing area. In the current example, the *Specify on-screen* box is checked, because the drafter has defined the location of the attributes, the intersection of the thin lines.
- *Align below previous attribute definition*: If this box is checked then the second and subsequent attribute tags are placed directly below the previously defined attribute. This option is not available for the first attribute. In the current example, this option

is not checked, because the drafter has defined the location of the attributes, the intersection of the thin lines.

- *Attribute*: The *Attribute* panel is used to set attribute data. An attribute has three characteristics.
  - *Tag*: Tag is the name (one word with no space) of the attribute that identifies an attribute for the filing and referencing purpose. The *Tag* field is used to enter the attribute's name using any combination of characters except spaces. Lowercase letters will be changed to uppercase letters. If the tag field is left blank and the *OK* button is pressed then the software will display an error message.
  - *Prompt*: The prompt is the message that is displayed when the block is inserted. The *Prompt* field is used to specify the prompt that will be displayed when a block containing attribute is inserted. If the prompt field is left blank then the tag is used as a prompt.
  - *Value*: The value is the information that is stored in an attribute. The *Value* field is used to specify the default attribute value. Although, this field could be left blank, it is good drawing practice to specify a reasonable default value.
- *Text Settings*: The *Text* panel is used to set the justification, style, height, and rotation of the attribute's text.

6.5.3. Create attributes

1. Open the *Attribute Definition* dialog box.
2. Create the company's name attribute as shown in Figure 6-5c. The text style and height is standard and 9, respectively.
3. Press the *Enter* key. This will close the *Define Attributes* dialog box.
4. The prompt to specify the start point of the attribute will appear, Figure 6-6a.
5. Click at the lower left corner of the thin lines intersection in the topmost cell, Figure 6-6b.

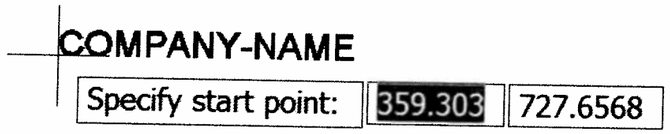

Figure 6-6a

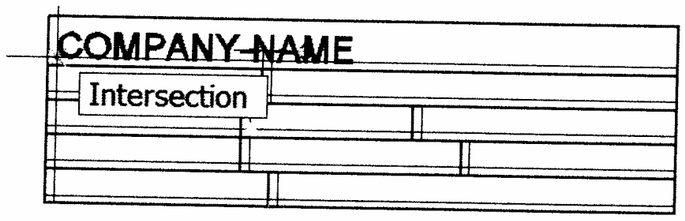

Figure 6-6b

6. Repeat steps #2 to #5 to create the remaining attributes. Set the text height to 6, Figure 6-6b.

7. The tag, prompt, and values of the attributes used in the title block are shown in Table #1. The first entry in each cell is the tag, the second entry is the prompt, and the third entry is the default value of the attribute.
8. The resulting title block is shown in Figure 6-6c.
9. Delete the thin lines, and the final version of the title block is shown in Figure 6-6d.

Table #1: Tag, prompt, and default values for attributes

COMPANY-NAME Enter the company's name: CLEMSON UNIVERSITY		
SECTION_NO Enter section #: EG210 - 024	NAME Enter your name: NIGHAT YASMIN	
EX-NO Enter the exercise #: EX 6_4	HW-LAB-# Enter HW # or LAB #: LAB #8	SHEET-NO Enter sheet #: SHT 1 OF 2
SCALE Scale of the drawing: SCALE: 1:1	UNITS Enter the units of the drawing: MILLIMETERS	PAPER Enter the paper type: LETTER
DATE Enter today's date: 05/16/2012	TABLE-NO Your table #: TABLE #0	

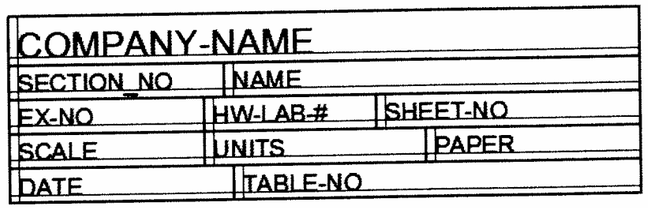

Figure 6-6c

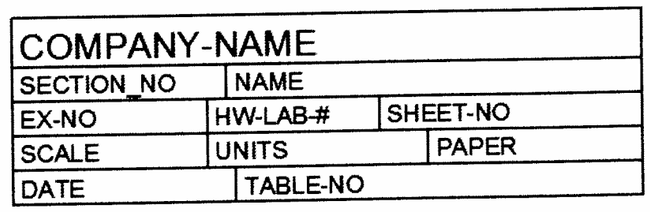

Figure 6-6d

6.5.4. Create block with attributes

1. Activate the *Make Block* command to open the *Block Definition* dialog box.
2. Set the *Name* of the block to be Title_Block; choose the lower right corner of the block as the base point. Press the *OK* button.
3. This will close the *Block Definition* dialog box and open the *Edit Attributes* dialog box, Figure 6-7a. This box can display at most eight attributes; therefore, use the *Next* button to see the remaining attributes.

4. Make any changes (if necessary) and press the *OK* button.
5. This will close the *Edit Attributes* dialog box. The block will display the default values of the various attributes, Figure 6-7b.

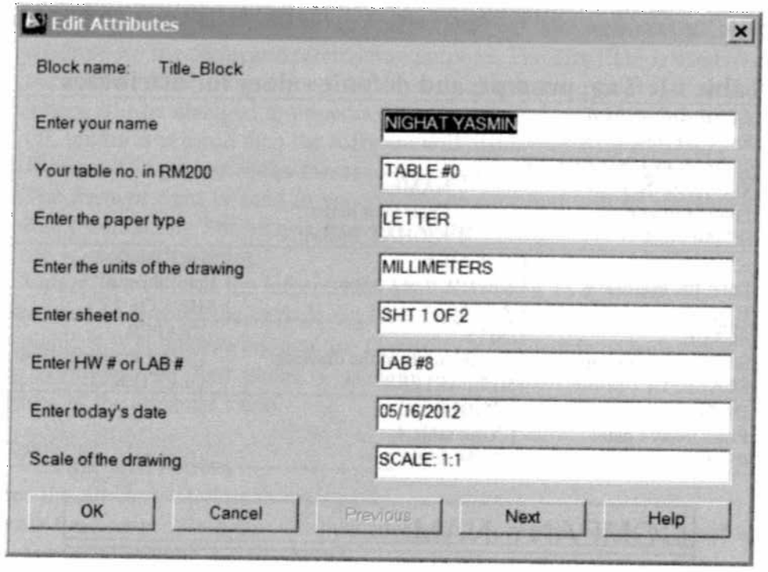

Figure 6-7a

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Figure 6-7b

6.5.5. Convert to Wblock

The process to convert a block with attributes into a Wblock is identical to converting a basic block into a Wblock.

6.6. Block with text boxes

This section will create a block that contains several text boxes. This example will create a release block. A release block contains a list of approval signatures or initials required before the drawing is released for the production. Create a release block as follow.

- Open an acadiso file.
- Create a layer and rename it to be *Release Block*.

- Make the *Release Block* layer the current layer.
- Use the *Line* command to create a table shown in Figure 6-8a.
- Do not add the dimensions.
- Use the *Offset* command to create the thin lines shown in Figure 6-8a.
- Use the *Text* command to create the text shown in Figure 6-8b. Select the font type as Arial and the text height as 9 for the team manager and 6 for the others.
- Remove the thin lines, Figure 6-8c.
- Create a basic block, set the *Name* of the block to be Release_Block, and choose the lower right corner of the block as the base point.
- Convert it to a Wblock.

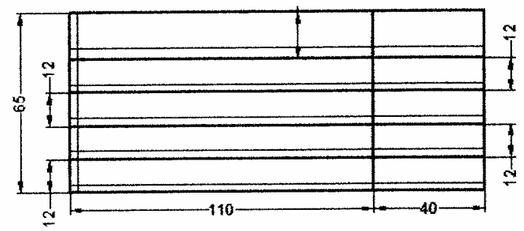

Figure 6-8a

TEAM MANAGER	
DRAWN BY	
DESIGNED BY	
CHECKED BY	
CUSTOMER	

Figure 6-8b

TEAM MANAGER	
DRAWN BY	
DESIGNED BY	
CHECKED BY	
CUSTOMER	

Figure 6-8c

6.7. Basic Block Insertion

The *Thread* basic block created earlier will be used to demonstrate the block insertion process.

- The *Insert Block* command is activated using one of the following procedures.
  1. Toolbar method: From the *Draw* toolbar select the *Insert Block* tool.
  2. Menu method: Select the *Insert* dropdown menu and then select the *Block* option.
  3. Command line method: Type "insert", "Insert", or "INSERT" on the command line and press the *Enter* key.

- The activation of the command will open the *Insert* dialog box, Figure 6-9.

6.7.1. Insert dialog box

The main features of the *Insert* dialog box (Figure 6-9) are briefly discussed here.

- *Name*: The *Name* field is used to choose a named block. By default, it will display the block just created. The down arrow or *Browse* button can be used to choose any other block.

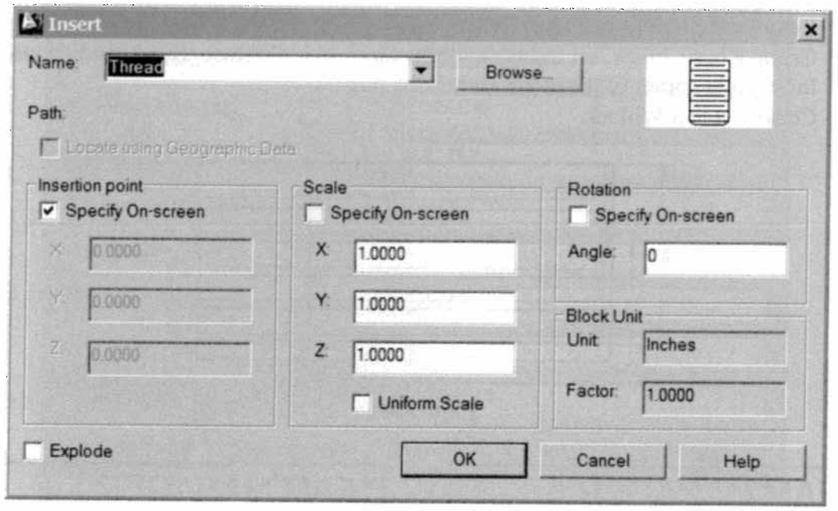

Figure 6-9

- *Path*: The *Path* option displays the location of the block. If the selected block is a basic block then *Path* will be empty and the block preview is shown in upper right corner of the block. However, if the block is saved as a wblock then the *Path* will display the location of the selected block and the preview area will be blank.
- *Insertion point*: This panel is used to specify the insertion point for the block.
  - *Specify On-screen*: Check this box to choose the insertion point using the pointing device.
  - *X, Y, Z*: These boxes are used to set the coordinate values. If the *Specify On-screen* option is selected, then these boxes are not available.
- *Scale*: This panel is used to specify the scale for the inserted block. The negative value for the X, Y, and Z scale factors inserts a mirror image of the block.
  - *Specify On-screen*: Check this box to specify scale factors during the insertion process using the pointing device.
  - *X, Y, Z*: These boxes are used to set the scale factors in the respective directions. If the *Specify On-screen* option is selected then these boxes are not available.
  - *Uniform Scale*: This box is checked to specify a single scale value for the *X, Y,* and *Z* coordinates. In this case, the *Y* and *Z* fields are deactivated by the software and the value specified for X is displayed in the *Y* and *Z* fields, too.
- *Rotation*: This panel is used to specify the rotation angle for the inserted block.

  - *Specify On-screen*: Check this box to specify the angle during the insertion process using the pointing device.
  - *Angle*: Specify the value of the rotation in the dialog box. In the current example the rotation angle is set to zero.
- *Block Unit*: This panel is used to display the information regarding the inserted block. The user cannot control the content of this panel.
  - *Unit*: Displays the unit's value for the inserted block.
  - *Factors*: Displays the unit scale factor, which is calculated based on the units used in the block creation and the drawing units.
- *Explode*: If this box is checked, then the block is exploded and its parts are inserted as the individual objects. Generally, this box is not checked.
- *OK*: Click the *OK* button to insert the block and to close the dialog box.

6.7.2. Insert a block with default values

The default scale factor is 1.00 in X, Y, and Z direction and the angle of rotation is zero. In order to insert a block with default values perform the following operation. The default options are shown in Figure 6-9.

- *Name*: Select the name of the block to be inserted. In the current example, the "Thread" block is selected.
- *Insertion point*: Check on the *Specify On-screen* box to choose the insertion point using the pointing device.
- *Scale*: Keep the *Specify On-Screen* box unchecked, and make sure that the *X, Y,* and *Z* values are 1.
- *Rotation*: Keep the *Specify On-Screen* box unchecked, and make sure that the angle of rotation values is 0.
- *Explode*: Do not check this box.
- *OK*: Click the *OK* button to insert the block. The dialog box will be closed and the block insertion process will start.
  - The prompt shown in Figure 6-10a will appear on the screen. The block will appear on the screen with its insertion (base point in the block creation process) point aligned with the cursor. The block will move with the cursor.
  - Specify the insertion point using one of the two methods. (i) Move the cursor to the desired location and press the left button of the mouse. (ii) Type the values of the x and y coordinated of the insertion point and press the *Enter* key.
  - The block shown in Figure 6-10b will appear on the screen. Recall that the dimensions were not selected as a part of the block.

6.7.3. Change the scale of the block at the insertion

Figure 6-11c shows the effect of changes in the scale factors.

- *Name*: Select the name of the block to be inserted. In the current example, the "Thread" block is selected.
- *Insertion point*: Check the *Specify On-screen* box to choose the insertion point using the pointing device.
- *Scale*: Check the *Specify On-Screen* box.

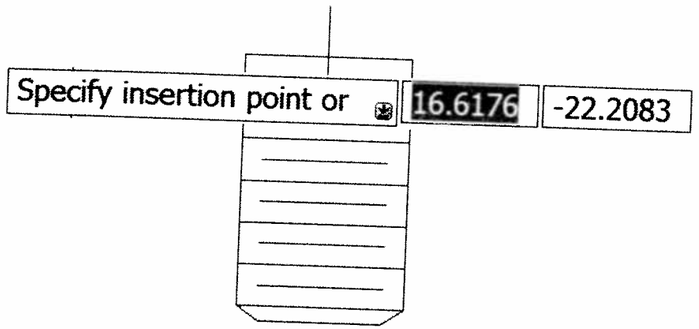

Figure 6-10a

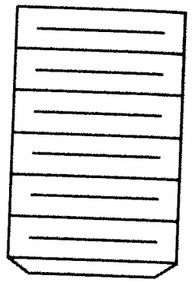

Figure 6-10b

- *Rotation*: Keep the *Specify On-Screen* box unchecked, and make sure that the angle of rotation values is 0.
- *Explode*: Do not check this box.
- *OK*: Click the *OK* button to insert the block. The dialog box will be closed and the block insertion process will start.
  - The prompt to specify the insertion point will appear on the screen.
  - Specify the insertion point.
  - The prompt to specify the scale factor will appear on the screen, Figure 6-11a. Specify the *X* scale factor and press the *Enter* key.
  - The prompt to specify the *Y* scale factor will appear on the screen, Figure 6-11b. Specify the Y scale factor and press the *Enter* key.
  - The block will be inserted at the specified insertion point and at the specified scale factor, Figure 6-11c.
- Repeat the process with the following changes: (i) in the *Scale* panel, do not check the *Specify On-Screen* box (ii) type 0.5, 2.0 and 1.0 in the *X*, *Y* and *Z* fields, respectively, Figure 6-11c.

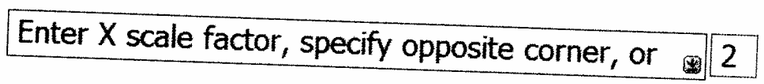

Figure 6-11a

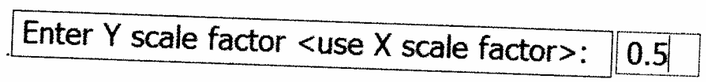

Figure 6-11b

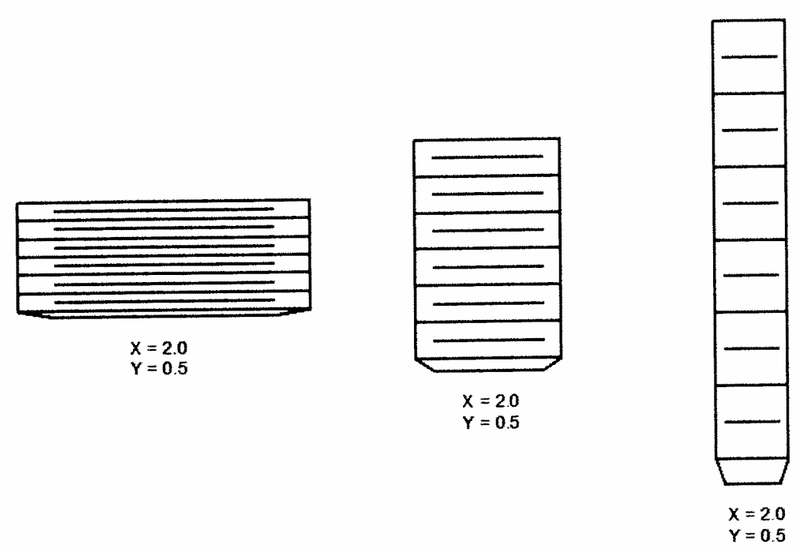

Figure 6-11c

6.7.4. Rotate the block at the insertion

Figure 6-12a shows the effect of changes in the rotation angle.

- *Name*: Select the name of the block to be inserted. In the current example, the "Thread" block is selected.
- *Insertion point*: Check the *Specify On-screen* box to choose the insertion point using the pointing device.
- *Scale*: Keep the *Specify On-Screen* box unchecked, and make sure that the scale factors value is 1.
- *Rotation*: Do not check the *Specify On-Screen* box.
- *Explode*: Do not check this box.
- *OK*: Click the *OK* button to insert the block. The dialog box will be closed and the block insertion process will start.
  - The prompt to specify the insertion point will appear on the screen and specify the insertion point.
  - The prompt to specify the rotation angle will appear on the screen and specify the angle and press the *Enter* key Figure 6-12a.
  - The block will be inserted at the specified insertion point and rotated at the specified angle, Figure 6-12b.
- Repeat the process with the following changes: (i) in the *Scale* panel, do not check the *Specify On-Screen* box and keep the default scale; (ii) in the *Rotation* panel, do not check the *Specify On-Screen* box and type 75 in the *Angle* field, Figure 6-12b.

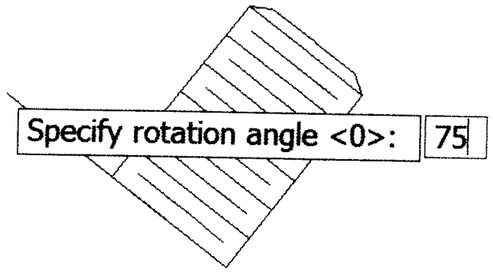

Figure 6-12a

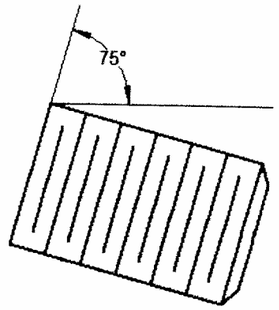

Figure 6-12b

6.7.5. Insert a Wblock

The insertion process of a Wblock is similar to the insertion process of a basic block. In the *Name* field of the *Insert* dialog box, use the browse button to load the Wblock created and saved earlier. Furthermore, the Wblocks can be combined or exploded in a manner similar to a basic block.

6.7.6. Insert a block with attributes

1. Activate the *Insert* command to open the *Insert* dialog box.
2. Choose the Title_Block, Set various options as discussed earlier. Press the *OK* button.
3. Specify the insertion point.
4. The prompt to set the user name, Figure 6-13a will appear. Just press the *Enter* key assuming that the name is correct.

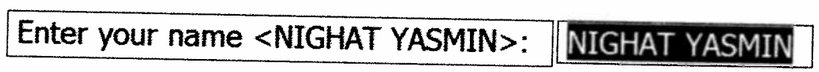

Figure 6-13a

5. If necessary, change the value of the data field; and press the *Enter* key to move to the next prompt. At the prompt to enter the units of the drawing, Figure 6-13b, the user decided to change the units, change the units to INCHES and press the *Enter* key.
6. Repeat step #4 until the block is inserted.

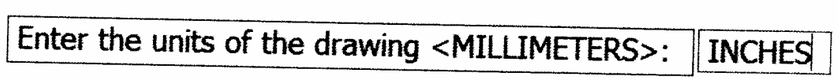

Figure 6-13b

6.7.7. Insert a block with text boxes

The insertion process of a block with the text boxes is similar to the insertion process of a basic block. In the *Name* field of the *Insert* dialog box, use the browse button to load the

respective block created and saved earlier. Furthermore, block with the text boxes can be combined or exploded in a manner similar to a basic block.

6.8. Combine blocks

Complicated shape objects can be created by inserting different blocks at the desired locations. Figure 6-14c shows a bolt created by combining a thread and a head block. Simply, insert a thread block follow by inserting a head block.

Blocks can be combined as follow.

- Create the thread block with point A selected as the base point, Figure 6-14a.
- Create the head block with point B selected as the base point, Figure 6-14b.
- Insert the thread block.
- Insert the head block on top of the thread block, Figure 6-14c.
- Repeat the process with different scale factors to create different size bolts.

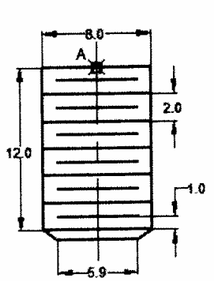

Figure 6-14a

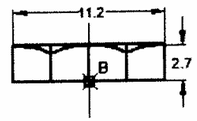

Figure 6-14b

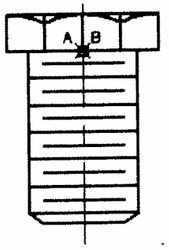

Figure 6-14c

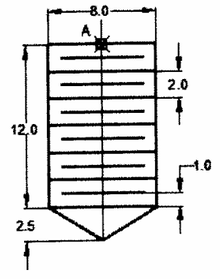

Figure 6-15

6.9. Modify block

In some situations, a user of the block is required to modify the block. Figure 6-15 shows the modification of bolt threads into screw thread. The process is given as:

- Insert the bolt threads block and the block will become part of the drawing.
- From the *Modify* toolbar use the *Explode* command to explode the block.
- Edit the block as desired; that is, create the pointed tip for the screw thread.
- If the new shape will be used frequently then save it as *Screw Thread* (a new block).

6.10. Design center

AutoCAD provides a *Design Center*. The *Design Center* is the collection of blocks. The block can be inserted in both ANSI and ISO file.

- The *Design Center* can be opened using one of the following procedures.
  a. Menu method: Select *Tools* dropdown menu and then select *Palettes* → *Design Center*.

b. Toolbar method: Select *Design Center* tool from the *Standard* toolbar.
c. Command line method: Type "adcenter", "Adcenter", or "ADCENTER" on the command line and press the *Enter* key.
d. Hold the *Ctrl* key and press the '2' key.

- The activation of the command will open the *Design Center* palette, Figure 6-16a.
- Expand the *Design Center* option by expanding *Program File*, *Autodesk*, *AutoCAD 2013 – English*, *Sample*, and finally, the *Design Center*, Figure 6-16a.

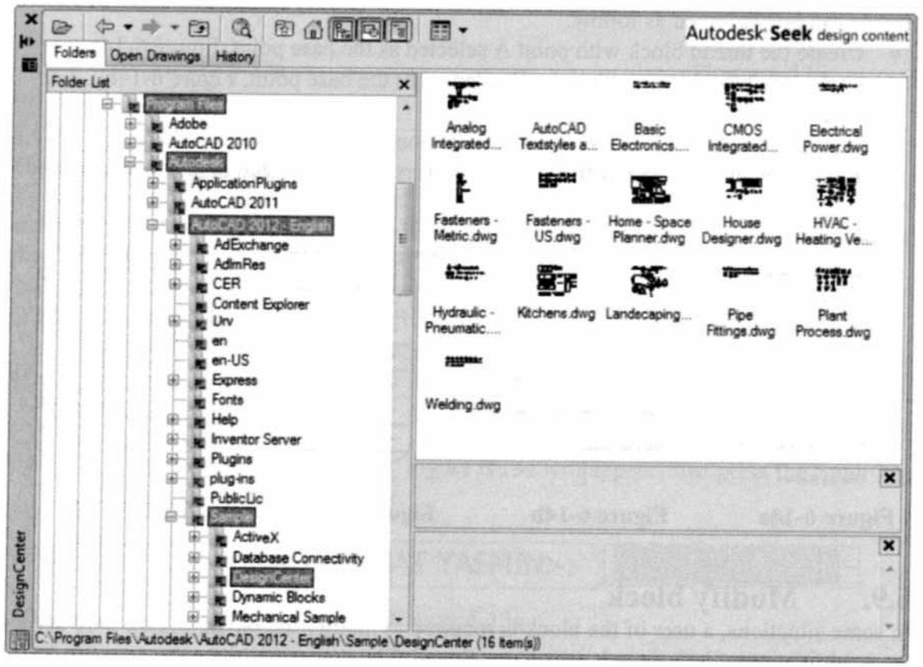

Figure 6-16a

- This section will explain how to insert a block from the *Design Center* by explaining the insertion process of the "*Wall Cabinet 18 X 36 in front*" block.
- Click once on the *Kitchens.dwg* icon, the content of the drawing will appear in the preview window, Figure 6-16b.

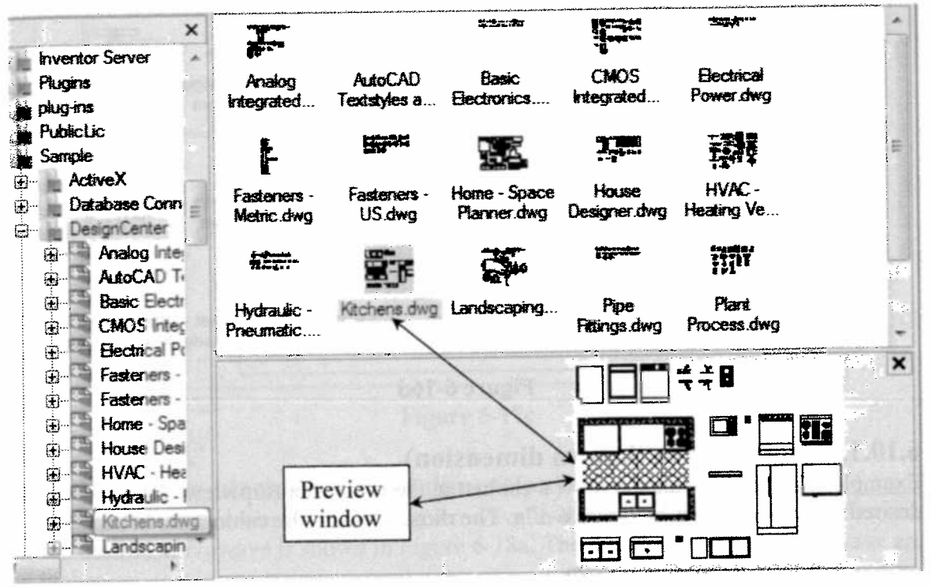

Figure 6-16b

- Choose the *Kitchens.dwg* option, Figure 6-16b, either double click on the *Kitchens.dwg* icon in the upper right panel of the palette or double click on *Kitchens.dwg* file in the left panel of the palette. The various options are shown in Figure 6-16c.
- Choose the *Blocks* option by double clicking on it. Figure 6-16d displays the available blocks under the *Kitchen.dwg* file.

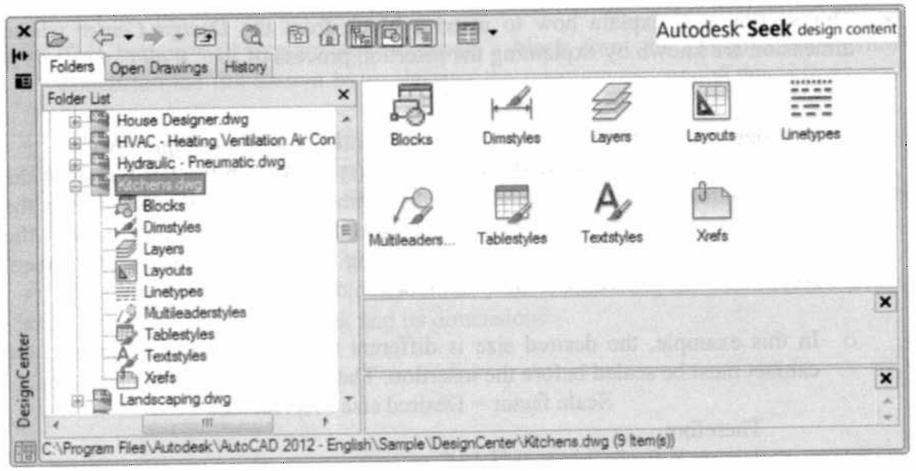

Figure 6-16c

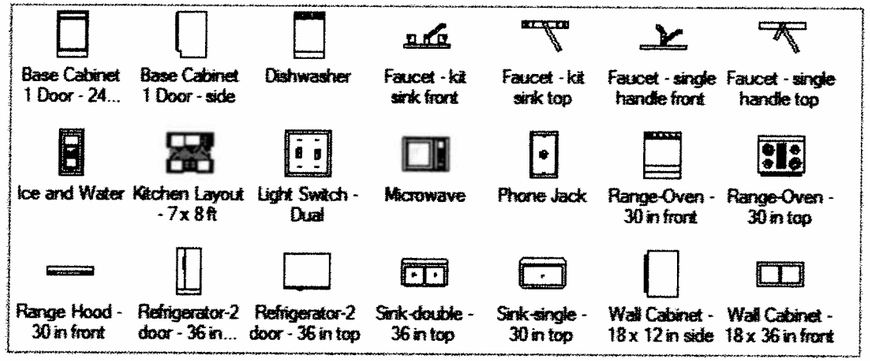

Figure 6-16d

6.10.1. Insert a block (known dimension)

Example: The drafter wants to draw a cabinet in the floor plan (top view). The size of the desired cabinet is shown in Figure 6-17a. The dimensions of the cabinet are in inches.

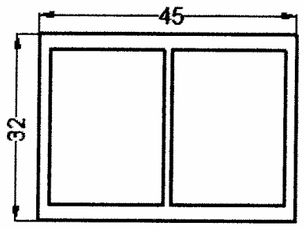

Figure 6-17a

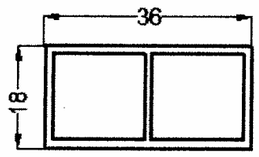

Figure 6-17b

- This section will explain how to insert a block from the *Design Center* whose dimension are known by explaining the insertion process of the "*Wall Cabinet 18 X 36 in front*" block.

  - The size of the cabinet block in the design center is shown in Figure 6-17b.
  - Insert the cabinet as follow (Figure 6-17c). (i) Click with the left button of the mouse on cabinet; this will highlight the cabinet icon and will display it in the preview window. (ii) Press the right button of the mouse. (iii) Click on the *Insert Block* option. The Insert block dialog box will appear on the screen. (iv) Follow the procedure to insert a block.

  - In this example, the desired size is different than the actual size. Hence, the cabinet must be scaled before the insertion. The scale factor is calculated as:

    Scale factor = Desired size / Actual size

    Therefore,

    X-Scale factor = 45 / 36

    Y-Scale factor = 32 / 18 and Z-Scale factor = 1

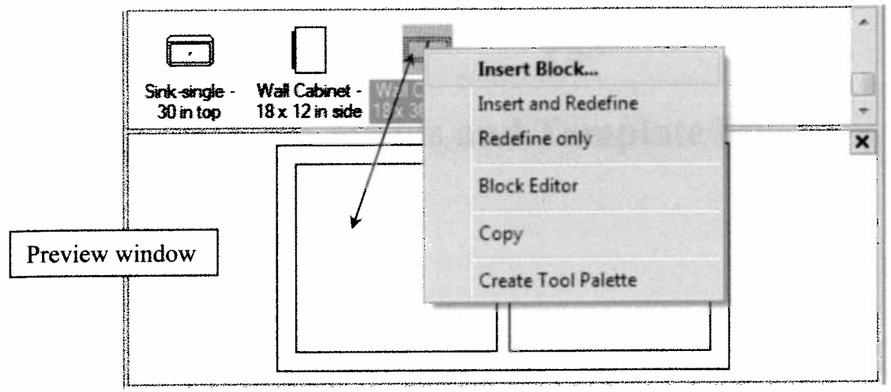

Figure 6-17c

6.10.2. Insert a block (unknown dimension)

Example: The drafter wants to draw a microwave in the elevation (front view). The size of the desired microwave is shown in Figure 6-18a. The dimensions of the microwave are in inches.

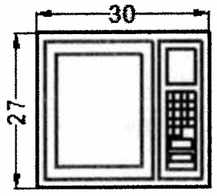

Figure 6-18a

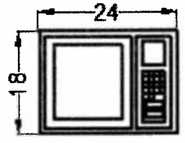

Figure 6-18b

- This section will explain how to insert a block from the *Design Center* whose dimension are not known by explaining the insertion process of the "*Microwave*" block.
- The microwave's block of Figure 6-16d does not contain any dimension. Therefore, the first step is to find out the block dimension.
- To find the dimension of a block, (i) insert the block in question at the scale factor of 1.0 in X, Y, and Z-direction and Angle = 0. (ii) Add the dimensions to the block. Figure 6-18b show the trial block.
- Now insert the microwave block at the desired location and the desired scale factor.
- Finally, delete the trial block and its dimensions.