

View and Layer

Objectives:

- To define view and layer.
- To recognise the importance and use of views and layers in drawing and editing.
- To change the display of a drawing using the zoom and pan commands.
- To recognise the properties of a layer.
- To create and name layers with different colours and line types for a drawing.
- To filter layers based on layer properties.
- To change the properties of drawing objects.

Subject Matters:

View

It is a specific magnification, position and orientation of a portion of a drawing. AutoCAD provides commands to control the drawing display to move quickly to different areas of the drawing while tracking the overall effect of the changes. **Zoom** and **Pan** are the most common tools to change a view.

Zoom

The most common way to change a view is to use the **Zoom** command, which increases or decreases the size of the image displayed in the drawing window. Zooming does not change the absolute size of the drawing. It changes the size of the view within the drawing window.

Calling the **Zoom** command and its options into action by:




View menu: Zoom

Shortcut menu: With no objects selected, right-click in the drawing area and choose Zoom to zoom in real time.

Command line: zoom (or 'zoom for transparent use)

Options: **All/Center/Dynamic/Extents/Previous/Scale/Window**

Action: Pressing **Enter**  to specify **real time** zoom or choose an option.

Zoom toolbar

The **Zoom** toolbar can be called for use in the same way as other toolbars discussed in “**Drawing Basics**”:

1. From the **View** menu: **View** ⇒ **Toolbars...**
2. Right-click the displayed toolbar to invoke the toolbar shortcut menu.
3. Enter **toolbar** at the command line to invoke the **Toolbars** tab of the **Customize** dialogue box.



This toolbar shows the zoom options including:

- | | |
|-------------|--------------|
| Zoom Window | Zoom Dynamic |
| Zoom Scale | Zoom Center |
| Zoom In | Zoom Out |
| Zoom All | Zoom Extents |

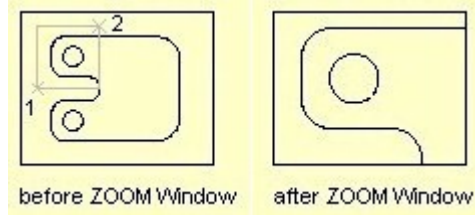
Zoom options

Zoom Window



Function: To display a portion of the drawing specified by two opposite corners of a rectangular window.

Action: Specify first corner and opposite corner.

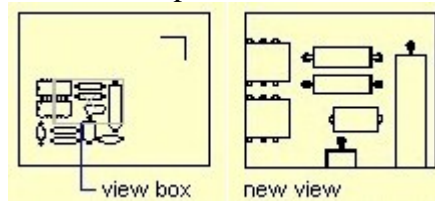


Zoom Dynamic



Function: To display a portion of the drawing using a dynamic view box. The view box can be shrunk or enlarged and moved around the drawing window.

Action: When the panning view box is displayed, left-click and resize it. Then left-click again to display the zooming view box. Drag the view box to the location and press **Enter** \leftarrow to zoom.

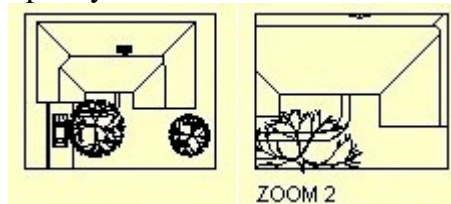


Zoom Scale



Function: To display the drawing at a specified scale factor. The scale factor is relative to the limits of the drawing. If the factor is followed by **x**, it is relative to the current view. If the factor is followed by **xp**, it is relative to paper space units.

Action: Specify a value for the scale factor.

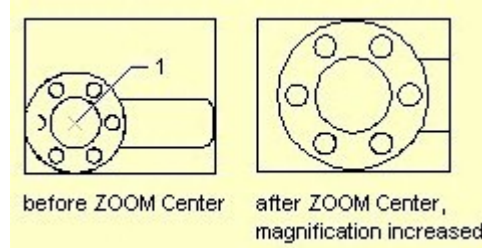


Zoom Center



Function: To display the drawing defined by a centre point and a magnification value or height. A value smaller than the default increases the magnification and a larger value decreases the magnification.

Action: Specify a centre point (Point 1 in the example) on the drawing window and enter a value for the magnification or height.

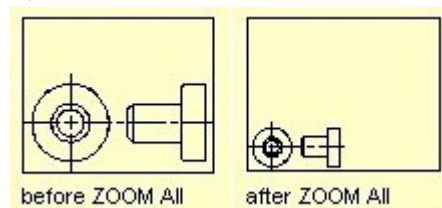


Zoom All



Function: To display the entire drawing in the drawing window, i.e. it zooms to the drawing limits or current extent.

Action: Nil

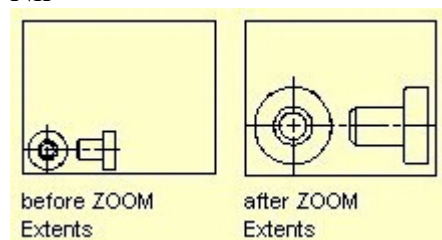


Zoom Extents



Function: To display the drawing extents, i.e. it zooms and displays all drawing objects to the entire drawing window regardless of the drawing limits.

Action: Nil



Zoom In



Function: To display the drawing or a portion of the drawing with a magnification factor of 2. This is equivalent to **Zoom Scale** with a factor of **2x**.

Action: Nil

Zoom Out



Function: To display the drawing or a portion of the drawing with a magnification factor of 0.5. This is equivalent to **Zoom Scale** with a factor of **0.5x**.

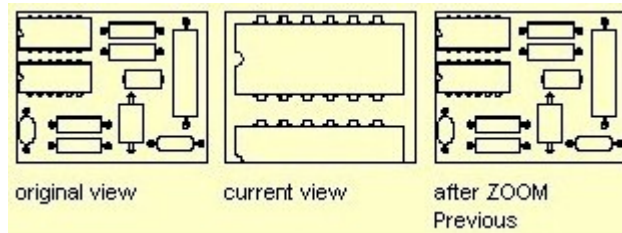
Action: Nil

Zoom Previous



Function: To display the previous view. AutoCAD allows restoring up to 10 previous views.

Action: Nil




Zoom Realtime




Function: To display the drawing or a portion of the drawing interactively to a logical extent. When this option is selected, the cursor changes to a magnifying glass with (+) and (-) signs.



Action: Pressing the left mouse button and dragging the mouse controls the drawing display. To exit, press **ESC** or **Enter**  or right-click to display the shortcut menu and select **Exit**.

Pan (Pan Realtime)

Pan (or **Pan Realtime**) is a tool that is used to move the drawing in any direction. When the command is selected, the cross hair cursor changes to a hand cursor .

Calling the **Pan** command into action by:




View menu: Pan  Realtime

Shortcut menu: With no objects selected, right-click in the drawing area and choose Pan.

Command line: pan (or 'pan for transparent use)

Options: Nil

Action: Pressing the left mouse button and dragging the mouse controls the positioning of the drawing on the window. To exit, press **ESC** or **Enter**  or right-click to display the shortcut menu and select **Exit**.

Aerial view

It is used to display a view of the drawing in a separate window, which can be enlarged or reduced in size and can be moved around the drawing window. This tool allows the CAD user to locate any specific drawing area quickly.

Calling the **Aerial view** command into action by:

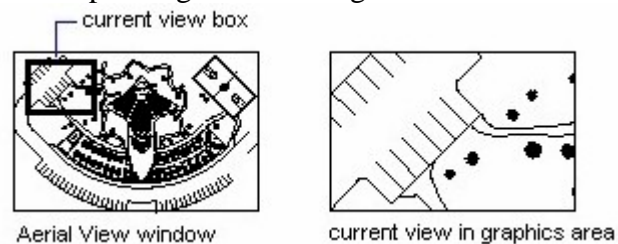
 **View menu:** Aerial View

 **Command line:** `dsvviewer`

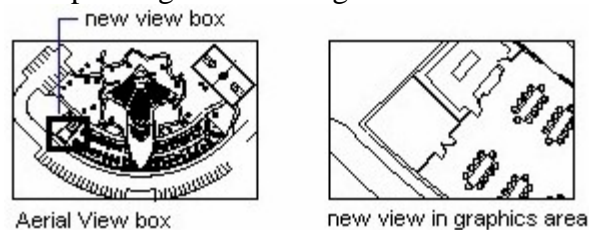
Options: Nil

Action: Within the Aerial View window is a view box, a heavy rectangle that displays the boundary of the view in the current viewport. To change the view in the drawing by changing the view box in the Aerial View window. To zoom in to the drawing, make the view box smaller. To zoom out of the drawing, make the view box larger. All pan and zoom operations are performed by left-clicking. Right-click to end a pan or zoom operation.

The Aerial view window and drawing window before panning and zooming:



The Aerial view window and drawing window after panning and zooming:



Layers

Layers are like transparent overlays on which different kinds of drawing information can be organised and grouped. The layers of a drawing can be viewed individually or in combination.

Layer properties

1. Name – identifies the layer to work with, either default or created
2. Colour – helps distinguishing similar elements in drawings
3. Line type – differentiates line type between different drafting elements, e.g. centre lines, hidden lines, etc.
4. Line weight – differentiates thickness between different drafting elements, e.g. thick line (0.6 mm) for outlines, thin line (0.3 mm) for short dashes, etc.

5. Visibility – controls the display of the layers, e.g. freeze or thaw, turn on or off
6. Protection – allows drawing objects to be visible but cannot be edited, e.g. locked or unlocked
7. Plotting – controls whether the selected layers are plotted. Layers that are turned off for plotting are still displayed.

Working with layers

Objects are drawn on a layer or layers. It may be a default layer (Layer named 0), a named layer or a created layer. Each layer has its own properties. Using layers is one of the major advantages of creating electronic drawings: convenience in drafting with different line types on different layers, avoiding the setting up of line type every time; turning off or freezing a particular layer making the unwanted lines invisible, etc.

Creating a layer



A layer can be created and named for a group of drawing objects. Upon start-up, AutoCAD creates a special layer named **0** and assigns white colour (black if the background is white) and continuous line. This layer cannot be deleted. New layers can be created and different properties can be assigned to. Calling the **Layer** command into action by:



Format menu: Layer

Command line: **layer** (or **'layer** for transparent use)

Procedure:

- (i) When the layer command is called, the **Layer Properties Manager** dialogue box appears.
- (ii) Click **New** to add a new layer in the box.
- (iii) Name the layer.
- (iv) Click the under **Color** to display the **Select Color** dialogue box, select a colour and click **OK**.
- (v) Click **Continuous** under this layer to display the **Select Linetype** dialogue box.
- (vi) Click **Load...** to display the **Load or Reload Linetypes** dialogue box, select one of the line types and click **OK**.
- (vii) The **Select Linetype** dialogue box re-appears. Select the desired line type and click **OK**.
- (viii) Click **Default** under Lineweight to display the **Lineweight** dialogue box.
- (ix) Select an appropriate lineweight and click **OK**.
- (x) Click  to change it to  if it is a “**Don't Plot**” layer.
- (xi) Click **OK** to close the **Layer Properties Manager** dialogue box.

If the created layer is used as the current layer, click **Current** before closing the **Layer Properties Manager** dialogue box.

Making a layer current

Objects are created or edited on the current layer. Before any object is being created or edited, make the desired layer current.


Calling the **Layer** command into action by:



Format menu: Layer

Command line: **layer** (or **'layer** for transparent use)

Procedure:

- (i) On the **Layers** toolbar, click  to call the **Layer Properties Manager** dialogue box on screen.
- (ii) Select the desired layer and click **Current**.
- (iii) Choose **OK** to close the box.

Making an object's layer current


To make the layer of a selected object as the current layer, a simpler method can be used.

Calling the command:



Command line: **ai_molc**

Procedure:

- (i) On the **Layers** toolbar, click .
- (ii) Select an object from the drawing window. The layer of the selected object becomes the current layer.

Restoring previous layer


To undo changes that have been made to layer settings, **Layer Previous** command can be used.



Command line: **layerp**

The command undoes the most recent change or set of changes made using either the **Layer** control or the **Layer Properties Manager**.

Procedure:

- (i) On the **Layers** toolbar, click .
- (ii) AutoCAD displays the message "Restored previous layer states."

Layer Previous does not undo the following changes:

1. Renamed layers
2. Deleted layers
3. Added layers

Filtering layers




Drawing objects can be made invisible or locked by filtering layers.

Name	On	Freeze in all VP	Lock
0			
CENTRELINE			

1. Turning layers on or off

When a layer is turned off, it is not displayed or plotted. However the objects in the layer will be regenerated with the drawing. This avoids regenerating the drawing every time when thawing a layer.




Procedure:

- (i) On the **Layers** toolbar, click  to call the **Layer Properties Manager** dialogue box on screen and select the desired layer.
- (ii) Click the “light bulb” icon  or .
- (iii) Choose **OK** to close the dialogue box.

2. Freezing or thawing layers

When a layer is frozen, it is not displayed, plotted or regenerated. Thawing regenerates the drawing objects and restores the layer’s visibility. It should be noted that current layer cannot be frozen




Procedure:

- (i) On the **Layers** toolbar, click  to call the **Layer Properties Manager** dialogue box on screen and select the desired layer.
- (ii) Click the “sun” icon  or .
- (iii) Choose **OK** to close the dialogue box.

3. Locking and unlocking layers

Objects in a locked layer are visible but they cannot be edited. New objects can be created on a locked layer.

Procedure:

- (i) On the **Layers** toolbar, click  to call the **Layer Properties Manager** dialogue box on screen and select the desired layer.
- (ii) Click the “padlock” icon  or .
- (iii) Choose **OK** to close the dialogue box.

Moving objects to a different layer

Because every object in a drawing is associated with a layer, it's likely that moving an object from a wrong layer to another layer in the course of drafting is necessary.

Procedure:

- (i) Select the desired objects when no command is running, **grips** appear at strategic points on the objects.
- (ii) Click to display the drop-down list of layers on the **Layers** toolbar.
- (iii) Select the desired layer to move the objects to.
- (iv) Press <Esc> to clear the selected objects and grips.

Object properties

Every object in a drawing has a set of inherent properties including layer, linetype, linewidth, and plot style. The properties assigned to objects are easily verified, and these properties can be copied from one object to other objects.

Properties palette

Calling the **Properties palette** on screen by:




Tools menu: Properties

Shortcut menu: Select the objects whose properties you want to view or modify, right-click in the drawing area, and choose Properties. Alternatively, you can double-click most objects to display the Properties palette.

Command line: properties

AutoCAD displays the **Properties palette**. The **Properties palette** is the main method for viewing and modifying properties of AutoCAD objects. There are eight general properties common to all objects: color, layer, linetype, linetype scale, plot style, lineweight, hyperlink, and thickness. When an object in the drawing area is selected, the **Properties palette** displays the properties of that object. If multiple objects are selected, the **Properties palette** displays all the properties they have in common. Follow the procedures to change AutoCAD object properties.

Procedure:

- (i) Select objects when no command is running.
- (ii) Invoke the **Properties palette**.
- (iii) Use one of the following methods to change the object properties:
 - Enter a new value.
 - Select a value from a list
 - Change the property value in a dialog box
 - Use the Pick Point button to change a coordinate value
- (iv) Click  to close the **Properties palette**.
- (v) Press <Esc> to clear the selected objects and grips.

Hands on practice

1. Open the “**hands on practice**” drawing in “**Creating 2D objects**”, practise the display/magnification of views using **Zoom** and **Pan**.
2. Using the **Aerial View** command, display each figure in turn in the drawing window.
3. Using the same drawing, create the following layers:

<u>Name</u>	<u>Line type</u>	<u>Colour</u>	<u>Lineweight</u>
0	continuous	white	0.6 mm
hiddenline	dashed2	green	0.3 mm
centerline	center2	yellow	0.3 mm
dimension	continuous	cyan	0.3 mm
4. Move any 2 figures to each of the created layers and observe the changes.
5. Click **LWT** (Show/Hide Lineweight) on the **Status** bar and observe the change of lines in the drawing window.
6. Practise filtering layers by turning layers on and off, freezing or thawing and locking and unlocking. Observe the changes.

7. Select some of the drawing objects, change their linetype and lineweight using the **Properties palette**. Observe the changes.
8. Open a new drawing, create layers for different types of lines and draw the following figure. It is required that lines of the same type should be drawn in separate layers. Do not include dimensions in your drawing.

