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Plan to Plot: From Page Setup to Output

Volker Cocco – Autodesk, Inc.

AC6563 Paper space and plotting using AutoCAD software applications can be overwhelming and frustrating. Paper space is often misunderstood and plotting is not necessarily the most intuitive task. This class will work through the process of setting up a drawing for plotter output using paper space layouts. You will learn about viewport scaling and viewport property overrides, as well as how to effectively use Page Setups to easily change plot settings.

Learning Objectives

At the end of this class, you will be able to:

- Learn how to set up a layout with multiple viewports
- Learn how to modify scale factors and properties of individual viewports
- Learn how to add a page setup and plot output device
- Troubleshoot tips and tricks

About the Speaker

Employed at Autodesk, Inc., as a product support specialist, Volker Cocco has been working with AutoCAD software since 1991 (that's R10 in CAD speak). He has been working for various Autodesk Resellers since 1997, and he has had extensive experience troubleshooting and supporting Autodesk products. In addition to having a background in CAD drafting and management, Volker has instructed basic to advanced AutoCAD technical classes, including sessions at AUGI CAD Camp and Autodesk University.
volker.cocco@autodesk.com

Plotting Overview

What is the Difference between Printing and Plotting?

The terms printing and plotting can be used interchangeably for CAD output. Historically, printers would generate text only, and plotters would generate vector graphics. As printers became more powerful and could generate high-quality raster images of vector data, the distinction largely disappeared and the terms are now interchangeable.

Key Features for Plotting in AutoCAD

Unlike other Windows applications, the process of printing in AutoCAD may at first appear a bit daunting as well as confusing. The bottom line is that it is all a matter of understanding the settings, applying the settings and then saving the settings for reuse or modification. One should become familiar with the following:

Plotter Manager

The Plotter Manager is a window that lists plotter configuration (PC3) files for every non-system printer that you install. Plotter configuration files can also be created for Windows ® system printers if you want to use default properties different from those used by Windows. Plotter configuration settings specify port information, raster and vector graphics quality, paper sizes, and custom properties that depend on the plotter type.

The Plotter Manager contains the Add-a-Plotter wizard, which is the primary tool for creating plotter configurations. The Add-a-Plotter wizard prompts you for information about the plotter that you want to set up.

Layouts

A layout represents a drawing sheet, and typically includes

- A drawing border and title block
- One or more layout viewports that display views of model space
- General notes, labels, and possibly dimensions
- Tables and schedules

Usually a drawing file contains only one layout, but you can create as many layouts as you need. The first time you display a layout, it is initialized and a default *page setup* is assigned to it.

Once initialized, layouts can be modified, published, and added to sheet sets as sheets.

Page Setups

When you create a layout, you specify a plotter, and settings such as paper size and orientation. These settings are saved in the drawing as a page setup. Each layout can be associated with a different page setup.

You can control these settings for layouts and for model space using the Page Setup Manager. You can name and save page setups for use with other layouts.

If you do not specify all the settings in the Page Setup dialog box when you create a layout, you can set up the page just before you plot. Or you can override a page setup at plot time. You can use the new page setup temporarily for the current plot, or you can save the new page setup.

Plot Styles

- A *plot style* is an optional method that controls how each object or layer is plotted. Assigning a plot style to an object or a layer *overrides* properties such as color, lineweight, and linetype when plotting. Only the appearance of plotted objects is affected by plot style.
- *Plot style tables* collect groups of plot styles, and save them in a file that you can later apply when plotting.
- The *Plot Style Manager* is a folder that contains all the available plot style tables, along with the Add-A-Plot-Style wizard.
- There are two plot style types: color-dependent and named. A drawing can use only one type of plot style table. You can convert a plot style table from one type to the other. You can also change the type of plot style table a drawing uses once it has been set.
- For *color-dependent plot style tables,* an object's color determines how it is plotted. These plot style table files have *.ctb* extensions. You cannot assign color-dependent plot styles directly to objects. Instead, to control how an object is plotted, you change its color. For example, all objects assigned the color red in a drawing are plotted the same way.
- *Named plot style tables* use plot styles that are assigned directly to objects and layers. These plot style table files have *.stb* extensions. Using them enables each object in a drawing to be plotted differently, independent of its color.

The reality is that you don’t need to use all of these features. In fact, you could easily select the print function and create a hard copy. What these tools allow you to do is to take the guesswork out of plotting drawings by providing an accurate paper-based visual representation of a drawing before it is plotted.

Preparing to Plot

The first item we need to explore is the output device, your physical printer or a software device such as a PDF driver; after all, we need something to plot to, right?

One can easily plot to any output device for which a driver is installed on the system; however, adding and working with a Plotter Configuration (PC3) file gives the user additional flexibility over the output. PC3 files are configured and modified using the Plotter Manager.

About the Plotter Manager:

Use the Plotter Manager to create and manage plotter configurations. From the Plotter Manager, you choose the Add-A-Plotter wizard to step through the process of configuring a plot device, and then create a plotter configuration (PC3) file that stores the plotter settings. One then uses the plotter configuration file to set up the plotter at plot time. The Plotter Configuration editor modifies existing plotter configuration files. From the Plotter Manager, double-click an existing PC3 file to display the Plotter Configuration Editor Dialog box.

The Plotter Manager is basically a shortcut which displays the location where the Add-A-Plotter wizard and the Plotter Configuration Editor are accessed, as well as any PC3 files.

Do one of the following:

- Click Application menu ➤ Print ➤ Manage Plotters.
- Click Application menu ➤ Options. On the Plot and Publish tab, click Add or Configure Plotters.
- Command Line ➤ PLOTTERMANAGER
- Windows Control Panel ➤ Autodesk Plotter Manager

Once invoked a Windows Explorer dialog appears pointing to a folder which by default is, "*C:\Users\<user name>\AppData\Roaming\Autodesk\AutoCAD 2015\R20.0\enu\Plotters*". This path is stored in the Windows Registry and may be modified through the AutoCAD Options dialog ➤ Files tab ➤ Support Files Search Path.

About Setting up Plotters and Printers

Each plotter configuration contains information such as the device driver and model, the output port to which the device is connected, and various device-specific settings.

The program lists the available configured system and HDI non-system printers or plotters. You do not need to configure system devices unless the program defaults differ from those of the operating system.

If a plotter is supported by the program, but not by the operating system, you can use one of the HDI non-system printer or plotter drivers. You can also use a non-system driver to create PostScript, raster image, Design Web format (DWF), or Portable Document Format (PDF) files.

The program stores information about the media and plotting device in configured plot (PC3) files. Plot configurations are portable and can be shared in an office or on a project as long as they are for the same driver and model. Plot configurations for system printers may also be shared, but need to be shared on the same version of an operating system. If you calibrate a plotter, the calibration information is stored in a plot model parameter (PMP) file that you can attach to any PC3 files you create for the calibrated plotter.

Note: If you upgrade a driver, try using your existing PC3 file. If it does not work, then you will need to create a new PC3 file.

PC3 files are added by using the Add-A-Plotter wizard, although fairly straight forward there may be some confusion as to which options to choose. The biggest hurdle is understanding which option to choose for a driver. Three choices are given in *The Add-A-Plotter wizard, Add Plotter-Begin Page:*

- **My Computer.** The program uses an HDI (Heidi® Device Interface) driver to translate drawing geometry to a plot device directly connected to your computer. An HDI driver is an internal or non-system driver specifically developed to handle the unique hardcopy requirements of the program when translating drawing geometry to a variety of defined devices. If you select this option, the plot output will be limited to sending through the communication ports of the local system, to a file, or to AutoSpool.
- **Network Plotter Server.** The program uses an HDI driver, just as above; however, the configuration requires you to select a plot device shared from another computer on the network.
- **System Printer.** The program uses a System Printer driver installed on your computer. Select this option when you already have a Windows system printer driver installed. It is possible to print from the program using a System printer without first configuring with this option. However, if you select this option, the settings made to the device driver for the program will not affect your other Windows applications.

Plotter Configuration Parameter versions

- *PCP file introduced in AutoCAD R12*
- *PC2 file introduced in AutoCAD R14*
- *PC3 file introduced in AutoCAD 2000*

The following is an example for adding a DWG to PDF.PC3 driver. This driver is installed with AutoCAD as a default so you don't necessarily need to install it unless the original becomes corrupt; having said that, it does provide a good example as to how to use the Add-A-Plotter Wizard.

1. In the Windows Control Panel select "Autodesk Plotter Manager"
   (Optional, but recommended) Select the existing "DWG to PDF.PC3" file and rename it.
2. Double-Click the Add-A-Plotter Wizard
3. In the "Add Plotter - Introduction" dialog, Click Next
4. In the "Add Plotter - Begin" dialog, Select "My Computer", Click Next
5. In the "Add Plotter - Plotter Model" dialog, Select "Autodesk ePlot (PDF), Click Next
6. In the "Add Plotter - Import Pcp or PC2" dialog, Click Next
7. In the "Add Plotter - Ports" dialog, Select "Plot to FIle", Click Next
8. In the "Add Plotter - Plotter Name" dialog, Click Next
9. In the "Add Plotter - Finish" dialog, Click Finish

Once a PC3 has been added it can be modified using the Plotter Configuration Editor. The Finish page of the Add-A-Plotter wizard also gave you this option.

There are numerous options available for modifying the PC3. One of the most common tweaks is to add a custom paper size.

When one modifies a PC3 file for a nonsystem printer a Plot Model Parameter file (PMP) is created. The PMP file contains custom plotter calibration and custom paper size information associated with the PC3 file. Creating custom page sizes for a PC3 file will automatically create a PMP file. This file is then referenced by the PC3.

Typically PMP files are stored in "*C:\Users\<user name>\AppData\Roaming\Autodesk\AutoCAD 2015\R20.0\enu\Plotters\PMP Files*". This path is stored in the Windows Registry and may be modified through the AutoCAD Options dialog ➤ Files tab ➤ Support Files Search Path.

The following is an example for modifying custom papers sizes using the Plotter Configuration Editor:

1. Type PLOTTERMANAGER at the command line.
2. In the Plotter Manager, double-click the PC3 file whose configuration you want to change.
3. In the Plotter Configuration Editor, Device and Document Settings tab, under the User Defined Paper Sizes & calibration, select Custom Paper Sizes.
4. Set a new paper size using one of the following methods:
    a. To add a custom paper size, click Add and follow the steps in the Custom Paper Size wizard. You specify the size of the paper, the printable area, and a name for the new paper size.
    b. To edit an existing paper size, under Custom Paper Sizes, select the paper size and click Edit. The Custom Paper Size wizard opens. Change any of the paper size settings.
5. Click OK.

Note that creating a custom paper size for a nonsystem driver attaches a plot model parameter (PMP) file to the plotter configuration (PC3) file. The PMP file contains custom plotter calibration and custom paper size information. By default, PMP files are stored in the PMP Files folder.

Additionally; for a System printer, you will need to set custom page sizes in the Windows printer section. If you try and do this through the AutoCAD plot dialog box as you would for a nonsystem plotter, the options will be grayed out.

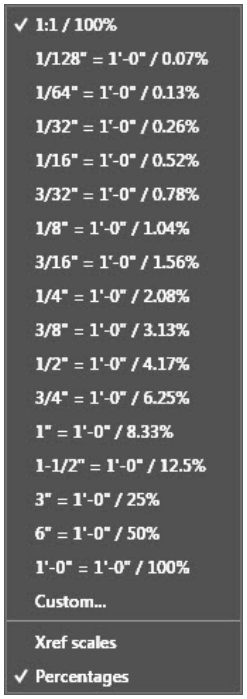
I've provided a link to additional documentation for modifying PC3 files (including the use of custom paper sizes), at the end of this document.

Plotting Your Drawing

With AutoCAD you plot a drawing from either model space or paper space. Model layouts are used to draw objects in real world units. For example, a wall twelve feet long is drawn at that length. Since a twelve foot object doesn't fit easily on a sheet of paper additional scaling must be done in order to plot the objects. One must determine the drawing scale factor before one starts drawing. The drawing scale factor is used to determine the plot scale, text height, dimension scale and linetype scale of the drawing. For example, if your drawing has a scale factor of 1/8"=1'-0", it may require that some or all of the following settings be applied:

- Plot scale factor of 1/8"=1'0"
- Dimension scale of 96 (1' / 1/8" = 96)
- Linetype scale of 96
- Text height of 12" (96 x 1/8" = 12") for a plot text height of 1/8".

Note that using AutoCAD's Scale list and Annotation Scaling simplifies this process. Check out the resource page for additional information.



AutoCAD Scale List

On the other hand, paper space layouts allow us to plot at a scale factor of 1:1. A layout represents a drawing sheet, and typically includes:

- A drawing border and title block
- One or more layout viewports that display views of model space at a desired scale factor
- General notes, labels, and possibly dimensions
- Tables and schedules

Usually a drawing file contains only one layout, but you can create as many layouts as you need. There is a limit of a total of 255 layouts (including model). The first time you display a layout, it is initialized and a default *page setup* is assigned to it.

Once initialized, layouts can be modified, published, and added to sheet sets as sheets.

Plotting a Model Layout

Prior to plotting the model layout, let's take a look at the Plot dialog and its attributes:

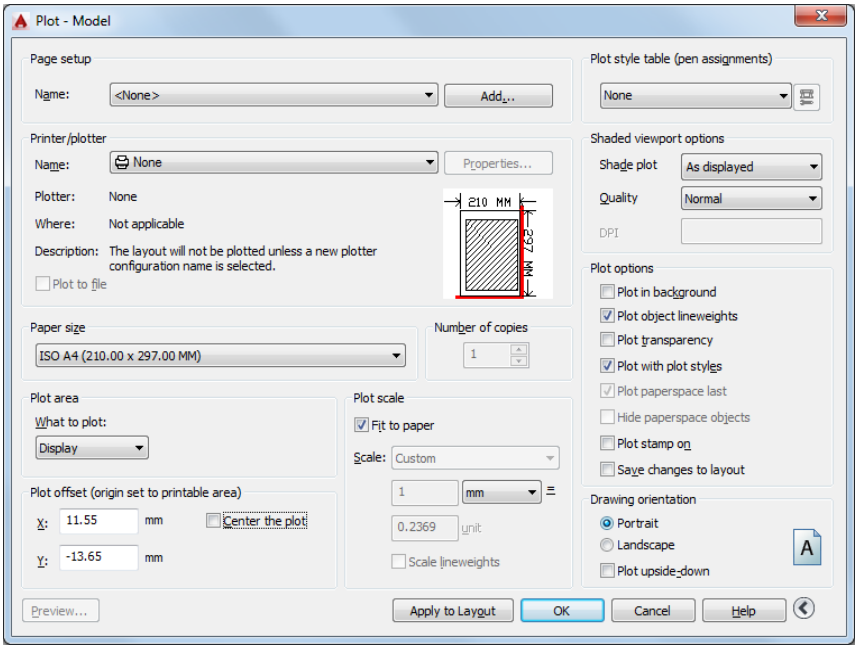
The Plot dialog specifies device and media settings, and plots your drawing.

Do one of the following:

- Click Application menu ➤ Print ➤ Plot.

- Ribbon ➤ Output tab ➤ Plot
- Quick Access Toolbar ➤ Plot
- Command Line ➤ PRINT or PLOT

The Plot dialog will be displayed.



You can display more options by clicking the More Options button.

List of Options

The following options are displayed.

Page Setup - Displays a list of any named and saved page setups in the drawing. You can base the current page setup on a named page setup saved in the drawing, or you can create a new named page setup based on the current settings in the Plot dialog box by clicking Add.

Name - Displays the name of the current page setup.

Add - Displays the Add Page Setup dialog box, in which you can save the current settings in the Plot dialog box to a named page setup. You can modify this page setup through the Page Setup Manager.

Printer/Plotter - Specifies a configured plotting device to use when plotting layouts.

If the selected plotter doesn't support the layout's selected paper size, a warning is displayed and you can select the plotter's default paper size or a custom paper size.

Name - Lists the available PC3 files or system printers from which you can select to plot the current layout. An icon in front of the device name identifies it as a PC3 file or a system printer.

- **PC3 file icon.** Indicates a PC3 file.

- **System printer icon.** Indicates a system printer.

Properties - Displays the Plotter Configuration Editor (PC3 editor), in which you can view or modify the current plotter configuration, ports, device, and media settings.

If you make changes to the PC3 file using the Plotter Configuration Editor, the Changes to a Printer Configuration File dialog box is displayed.

Plotter - Displays the plot device specified in the currently selected page setup.

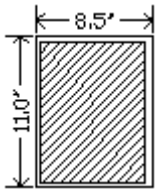
Where - Displays the physical location of the output device specified in the currently selected page setup.

Description - Displays descriptive text about the output device specified in the currently selected page setup. You can edit this text in the Plotter Configuration Editor.

Plot to File - Plots output to a file rather than to a plotter or printer. The default location for plot files is specified in the Options dialog box, Plot and Publish tab, under Default Location for Plot-to-File Operations.

If the Plot to File option is turned on, when you click OK in the Plot dialog box, the Plot to File dialog box (a standard file navigation dialog box) is displayed.

Partial Preview - Shows an accurate representation of the effective plot area relative to the paper size and printable area. The tooltip displays the paper size and printable area.



Paper Size - Displays standard paper sizes that are available for the selected plotting device. If no plotter is selected, the full standard paper size list is displayed and available for selection.

If the selected plotter doesn't support the layout's selected paper size, a warning is displayed, and you can select the plotter's default paper size or a custom paper size.

A default paper size is set for the plotting device when you create a PC3 file with the Add-a-Plotter wizard. The paper size that you select in the Page Setup dialog box is saved with the layout and overrides the PC3 file settings.

The actual printable area of the page, which is determined by the selected plotting device and paper size, is indicated in the layout by a dashed line.

If you are plotting a raster image, such as a BMP or TIFF file, the size of the plot is specified in pixels, not in inches or millimeters.

Number of Copies - Specifies the number of copies to plot. This option is not available when you plot to file.

Plot Area - Specifies the portion of the drawing to be plotted. Under What to Plot, you can select an area of the drawing to be plotted.

Layout/Limits - When plotting a layout, plots everything within the printable area of the specified paper size, with the origin calculated from 0,0 in the layout.

When plotting from the Model tab, plots the entire drawing area that is defined by the grid limits. If the current viewport does not display a plan view, this option has the same effect as the Extents option.

Extents - Plots the portion of the current space of the drawing that contains objects. All geometry in the current space is plotted. The drawing may be regenerated to recalculate the extents before plotting.

Display - Plots the view in the current viewport in the selected Model tab or the current paper space view in the layout.

View - Plots a view that was previously saved with the VIEW command. You can select a named view from the list. If there are no saved views in the drawing, this option is unavailable.

When the View option is selected, a View list is displayed that lists the named views that are saved in the current drawing. You can select a view from this list to plot.

Window - Plots any portion of the drawing that you specify. When you select Window, the Window button becomes available. Click the Window button to use the pointing device to specify the two corners of the area to be plotted, or enter coordinate values.

Plot Offset - Specifies an offset of the plot area relative to the lower-left corner of the printable area or to the edge of the paper, depending on the setting made in the Specify Plot Offset Relative To option (Options dialog box, Plot and Publish tab). The Plot Offset area of the Plot dialog box displays the specified plot offset option in parentheses.

The printable area of a drawing sheet is defined by the selected output device and is represented by a dashed line in a layout. When you change to another output device, the printable area may change.

You can offset the geometry on the paper by entering a positive or negative value in the X and Y offset boxes. The plotter unit values are in inches or millimeters on the paper.

Center the Plot - Automatically calculates the *X* and *Y* offset values to center the plot on the paper. This option is not available when Plot Area is set to Layout.

- **X -** Specifies the plot origin in the *X* direction relative to the setting of the Plot Offset Definition option.
- **Y -** Specifies the plot origin in the *Y* direction relative to the setting of the Plot Offset Definition option.

Plot Scale - Controls the relative size of drawing units to plotted units. The default scale setting is 1:1 when plotting a layout. The default setting is Fit to Paper when plotting from the Model tab.

Fit to Paper - Scales the plot to fit within the selected paper size and displays the custom scale factor in the Scale, Inch =, and Units boxes.

Scale - Defines the exact scale for the plot. *Custom* defines a user-defined scale. You can create a custom scale by entering the number of inches (or millimeters) equal to the number of drawing units.

Inch(es) =/mm =/Pixel(s) = - Specifies the number of inches, millimeters, or pixels equal to the specified number of units.

Inch/mm/pixel - Specifies inches or mm for display of units in the Plot dialog box. The default is based on the paper size and changes each time a new paper size is selected. Pixel is available only when a raster output is selected.

Units - Specifies the number of units equal to the specified number of inches, millimeters, or pixels.

Scale Lineweights - Scales lineweights in proportion to the plot scale. Lineweights normally specify the linewidth of plotted objects and are plotted with the linewidth size regardless of the plot scale.

Note: You can modify the list of scales with SCALELISTEDIT.

Preview - Displays the drawing as it will appear when plotted by starting the PREVIEW command. To exit the preview and return to the Plot dialog box, press ESC, press ENTER, or right-click and then click Exit on the shortcut menu.

Apply to Layout - Saves the current Plot dialog box settings to the current layout.

More Options - Controls display of additional options in the Plot dialog box.

- Plot Style Table (Pen Assignments)
- Shaded Viewport Options
- Plot Options
- Drawing Orientation

Plot Style Table (Pen Assignments) - Sets the plot style table, edits the plot style table, or creates a new plot style table.

Name (Unlabeled) - Displays the plot style table that is assigned to the current Model tab or layout tab and provides a list of the currently available plot style tables.

If you select New, the Add Plot Style Table wizard is displayed, which you can use to create a new plot style table. The wizard that is displayed is determined by whether the current drawing is in color-dependent or named mode.

Edit - Displays the Plot Style Table Editor, in which you can view or modify plot styles for the currently assigned plot style table.

Shaded Viewport Options - Specifies how shaded and rendered viewports are plotted and determines their resolution level and dots per inch (dpi). Rendered viewport options are not available in AutoCAD LT.

Note: When hardware acceleration is disabled or is enabled, but does not support Shadows, it is possible to plot a drawing that contains shaded viewports with unsupported hardware effects by the graphics card through software emulation. To enable the software emulation of hardware effects that are not supported by your graphics card, enter 3DCONFIG and click Manual Tune. In the Manual Performance Tuning dialog box, click Emulate unsupported hardware effects in software when plotting. The unsupported effects will not appear in the viewport in real-time, but will appear in the hardcopy or electronic file that is created during the plot process. (Not applicable to AutoCAD LT)

Shade Plot - Specifies how views are plotted. To specify this setting for a viewport on a layout tab, select the viewport and then, on the Tools menu, click Properties.

From the Model tab, you can select from the following options:

- **As Displayed.** Plots objects the way they are displayed on the screen. (Available in AutoCAD LT)
- **Legacy Wireframe.** Objects in wireframe regardless of the way they are displayed on the screen, using the legacy SHADEMODE command. (Available in AutoCAD LT)
- **Legacy Hidden.** Objects with hidden lines removed regardless of the way the objects are displayed on the screen, using the legacy SHADEMODE command. (Available in AutoCAD LT)
- **Conceptual.** Plots objects with the Conceptual visual style applied regardless of the way the objects are displayed on the screen.
- **Hidden.** Plots objects with hidden lines removed regardless of the way the objects are displayed on the screen.
- **Realistic.** Plots objects with the Realistic visual style applied regardless of the way the objects are displayed on the screen.

- **Shaded.** Plots objects with Shaded visual style applied regardless of the way the objects are displayed on the screen
- **Shaded with Edges.** Plots objects with Shaded with Edges visual style applied regardless of the way the objects are displayed on the screen
- **Shades of Gray.** Plots objects with Shades of Gray visual style applied regardless of the way the objects are displayed on the screen.
- **Sketchy.** Plots objects with Sketchy visual style applied regardless of the way the objects are displayed on the screen.
- **Wireframe.** Plots objects in wireframe regardless of the way they are displayed on the screen.
- **X-ray.** Plots objects with x-ray visual style applied regardless of the way the objects are displayed on the screen
- **Rendered.** Plots objects as rendered regardless of the way they are displayed on the screen.

Quality - Specifies the resolution at which shaded and rendered viewports are plotted.

You can select from the following resolution options:

- **Draft**. Sets rendered and shaded model space views to be plotted as wireframe.
- **Preview**. Sets rendered and shaded model space views to be plotted at one quarter of the current device resolution, to a maximum of 150 dpi.
- **Normal**. Sets rendered and shaded model space views to be plotted at one half of the current device resolution, to a maximum of 300 dpi.
- **Presentation**. Sets rendered and shaded model space views to be plotted at the current device resolution, to a maximum of 600 dpi.
- **Maximum**. Sets rendered and shaded model space views to be plotted at the current device resolution with no maximum.
- **Custom**. Sets rendered and shaded model space views to be plotted at the resolution setting that you specify in the DPI box, up to the current device resolution.

DPI - Specifies the dots per inch for shaded and rendered views, up to the maximum resolution of the current plotting device. This option is available if you select Custom in the Quality box.

Plot Options - Specifies options for lineweights, transparency, plot styles, shaded plots, and the order in which objects are plotted.

Plot in Background - Specifies that the plot is processed in the background. (BACKGROUNDPLOT system variable)

Plot Object Lineweights - Specifies whether lineweights assigned to objects and layers are plotted.

Plot Transparency - Specifies whether object transparency is plotted. This option should only be used when plotting drawings with transparent objects.

Attention: For perfomance reasons, plotting transparency is disabled by default. To plot transparent objects, select the Plot Transparency option. This setting can be overridden by the PLOTTRANSPARENCYOVERRIDE system variable. By default, the system variable honors the setting in the Page Setup and the Plot dialog boxes.

Plot with Plot Styles - Specifies whether plot styles applied to objects and layers are plotted.

Plot Paperspace Last - Plots model space geometry first. Paper space geometry is usually plotted before model space geometry.

Hide Paperspace Objects - Specifies whether the HIDE operation applies to objects in the paper space viewport. This option is available only from a layout tab. The effect of this setting is reflected in the plot preview, but not in the layout.

Plot Stamp On - Turns on plot stamping. Places a plot stamp on a specified corner of each drawing and/or logs it to a file.

Plot stamp settings are specified in the Plot Stamp dialog box, in which you can specify the information that you want applied to the plot stamp, such as drawing name, date and time, plot scale, and so on. To open the Plot Stamp dialog box, select the Plot Stamp On option, and then click the Plot Stamp Settings button that is displayed to the right of the option.

You can also open the Plot Stamp dialog box by clicking the Plot Stamp Settings button on the Plot and Publish tab of the Options dialog box.

Plot Stamp Settings button - Displays the Plot Stamp dialog box when the Plot Stamp On option is selected in the Plot dialog box.

Save Changes to Layout - Saves changes that you make in the Plot dialog box to the layout.

Drawing Orientation - Specifies the orientation of the drawing on the paper for plotters that support landscape or portrait orientation. The paper icon represents the media orientation of the selected paper. The letter icon represents the orientation of the drawing on the page.

- **Portrait -** Orients and plots the drawing so that the short edge of the paper represents the top of the page.
- **Landscape -** Orients and plots the drawing so that the long edge of the paper represents the top of the page.
- **Plot Upside-Down -** Orients and plots the drawing upside down.

Icon - Indicates the media orientation of the selected paper and represents the orientation of the drawing on the page as a letter on the paper.

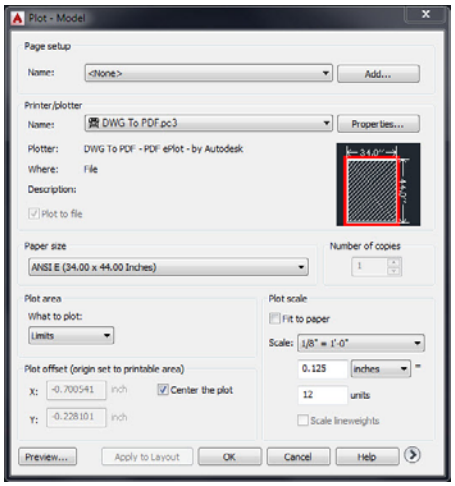
Note: Drawing orientation is also affected by the PLOTROTMODE system variable.

Less Options - Hides the following options in the Plot dialog box:

- Plot Style Table (Pen Assignments)
- Shaded Viewport Options
- Plot Options
- Drawing Orientation

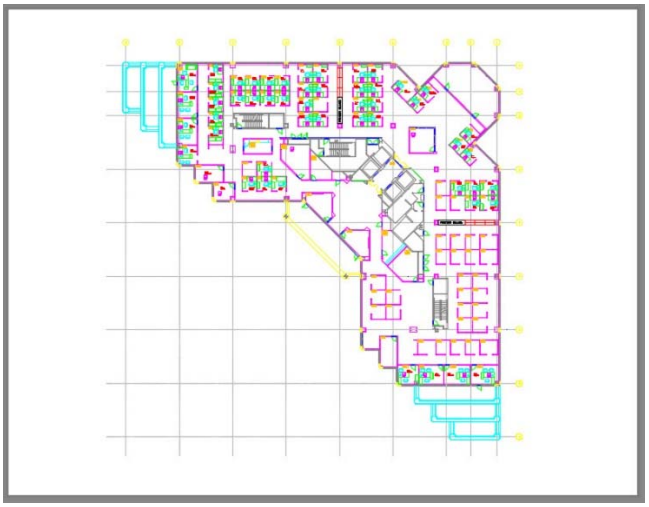
Exercise: Plotting from model space

1. Open "Floor Plan Plot.dwg"
2. Type Plot at the command prompt
3. Printer/Plotter: Select DWG to PDF.PC3
4. Paper size: Select ANSI E (34.00 x 44.00 Inches)
5. Plot area (What to Plot): Limits
6. Plot scale:
7. Uncheck "Fit to paper"
8. Scale: Select 1/8" = 1'0"
9. Plot Offset: Center the plot
10. Select Preview
11. Dismiss the Plot - Plot Scale Confirm dialog, selecting Continue
12. Zoom and Pan in the Preview Window using the wheel on the mouse
13. Right-Mouse click and select Plot



Settings for the Plot dialog

The Plot Preview



FWIW Department:

In the previous example we chose LIMITS for the area to plot. One could have chosen extents which would have plotted to the edge of the physical entities in the drawing. This works best when a title block or some type of border is added conforming to the paper sheet size. Try the model plot example by changing the setting to EXTENTS.

Limits, although still in use, are considered more of a legacy function which set an invisible boundary in the drawing area. Having said that, one can get a visual on limits set in the drawing using the GRID command. Although limits can be set both in the model and paper space environment, they are used primarily in model space. This option is not available in the Plot dialog for paper space layouts, instead the option Layout is used. I've provided a link for more information on Limits in the resource section of this document.

As I mentioned, the GRID command will show a visual of the limits set in a drawing. You may have noticed that the grid, when enabled (default), overlays the entire drawing editor. The following are the changes I made to the grid and limits in order to provide a visual representation of the sheet size being used to plot my model layout.

1. If not already turned on, enable the GRID (F7 function key)
2. Type LIMITS at the command prompt
3. ENTER to accept the default 0,0 lower left corner

Notice that the next prompt, "LIMITS Specify upper right corner" is set to a value of 12,9. This is the default size of an A sized engineering sheet of paper. In this example we are using an ANSI E 34x44, so we need to resize the limits by scaling the sheet by a factor of 96 (1/8"=1'0).
96 x 34 = 3264
96 x 44 = 4224

4. For the Landscape orientation enter: 4224,3264.

The command line should show a history as follows (F2 for text window):

```
Command:
LIMITS
Reset Model space limits:
Specify lower left corner or [ON/OFF] <0.0000,0.0000>:
Specify upper right corner <12.0000,9.0000>: 4224,3264
```

We've set the size of our sheet of paper, but the Grid is still in full display. You can change this as follows:

1. Type GRID at the command prompt
2. Select LIMITS or type L at the command prompt.
3. At the prompt, "GRID Display grid beyond Limits", Select or enter No

If all works as expected, you will now see a visual representation of the limits for an ANSI E 34x44, sheet of paper scale to a factor of 96.

The command line history will display:

```
Command:
GRID
Specify grid spacing(X) or [ON/OFF/Snap/Major/aDaptive/Limits/Follow/Aspect] <0.5000>: L
Display grid beyond Limits [Yes/No] <Yes>: n
```

In my humble opinion, plotting from a paper space layout is a much easier process and allows for greater flexibility.

About Paper Space Layouts

Use paper space layouts to compose or lay out a model space drawing for plotting. A layout can consist of a title bloc, one or more viewports, details and annotations. Layouts use the drawing plot settings and plot style tables to create a visual representation of a paper drawing. The paper representation takes into account the plot device, paper size, paper, orientation, printable area, scale, plotting area, lineweights, color screening, and other visual properties of objects. These are combined to create a WYSIWYG (What You See Is What You Get) representation of your drawing when it is plotted. This takes the guesswork out of plotting. Paper space layouts show you exactly how your drawing will plot prior to plotting.

When paper space was first introduced in AutoCAD Release 11, there was only one paper space environment. No layouts. This changed with the release of AutoCAD 2000 and now an AutoCAD drawing can contain up to 255 layout (including the model layout). Layouts can be renamed, copied, moved, or deleted as necessary. The one caveat is that the model layout, in addition to one paper layout will always be in the drawing, in other words, you cannot delete either.

Each layout can contain multiple viewports, although there is a limit of 64 viewports per layout. This is controlled by the MAXACTVP system variable which is saved in the drawing file.

> Note: Previous versions of AutoCAD had limits as low as 16 viewports in paper space. Since the variable is saved in the drawing file, if you are unable to create less than 64 viewports, change the settings of the MAXACTVP variable. Additionally, each viewport requires additional resources from your graphics card. If you have numerous viewports and the model is not being displayed, try the REGENALL command or select one of the affected viewports. The model should then display. Bear in mind that even if the model does not appear, once you plot the drawing a Regeneration of the drawing database will occur and all objects will plot as expected.

To sum this up, a paper space layout represents the paper on which the drawing will be plotted. AutoCAD layouts give the flexibility to plot the same drawing in different ways. Each layout represents an individual plot output or an individual sheet in a drawing project where viewports and page settings for each layout are specified.

Some Key Terms

Page Setup – This saves the current plot settings with the Model tab and each Layout tab. If you select "Save Changes to Layout" in the Plot dialog box, the plot settings are saves as a page setup after each plot. The page setup information that is saved with each layout or model space is used as the default settings the next time you plot.

Named Page Setup – This names the current plot settings that you save in your drawing. Named page setups can be applied to other layouts you want to plot that require the same settings. Multiple named setups can be created in the same drawing for plotting to different scales and sheet sizes, output devices as well as other plotting preferences. These Named page setups can be imported into other drawing files as well.

Plot area – Layout – Prints all the geometry within the margins of the paper. *Note that this option is only available in a paper space layout.*

Floating Viewport – Displays a rectangular view of the model in paper space.

Nonrectangular Viewport – Displays a non-rectangular view of the model. Can be created using a polyline, circle, region, spline, or ellipse. It can also be created by converting a closed object, such as a circle, into a viewport

Viewport Scale – This represents a ratio between the actual size of the model displayed in the viewports and the sized of layout in paper space. The ratio is determined by dividing the paper space units by the model space units.

Annotation scale – This is used to determine text height or the overall scale of an annotation object. The approach used to calculate an annotation scale depends on whether the object is placed in model space or on a layout.

Display lock (Viewport Locking) – Locks the scale that you set for the selected viewport. Once the scale is locked, you can continue to modify the geometry in the viewport without affecting the viewport scale or model position within the viewport. *Note that if you lock a viewport scale most of the view commands such as VPOINT, DVIEW, 3DORBIT, PLAN, and VIEW, no longer work in that viewport.*

Designing a Layout

The following is typical of the process used to design a layout environment.

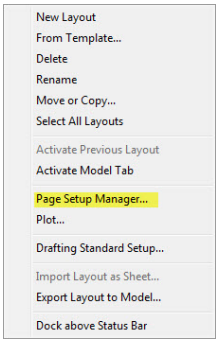
1. Create a model drawing
2. Create a layout
3. Specify layout page settings such as plotting device, paper size, plot area, plot scale and drawing orientation
4. Insert a title block
5. Create floating viewport(s) and position them in the layout
6. Set the scale of the viewport
7. Annotate or create geometry in the layout as needed
8. Plot the layout.

Page Setup

As mentioned previously, Layout settings, or Page setups, control the final plotted output. They affect paper size, plot device, scale, area, origin, and drawing orientation. Understanding how page setups are used ensures that the layout will plot as you expect.

The Page Setup dialog box is similar to the Plot dialog box. When the Page Setup dialog box is used to change plot settings, changes are saved without actually plotting.

To invoke the PAGESETUP command do one of the following:



- Click Application menu ➤ Print ➤ Page Setup.
- Ribbon ➤ Output tab ➤ Page Setup Manager
- Command Line ➤ PAGESETUP
- Shortcut Menu ➤ Right-Mouse click over the Model or Layout tab, select Page Setup Manager…

The Page Setup dialog will be displayed.

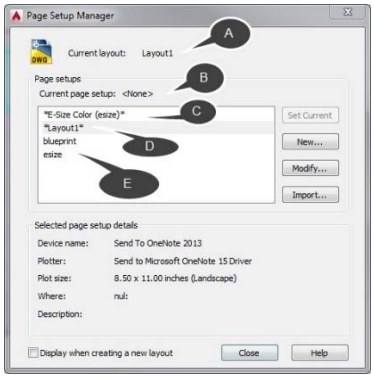
In addition to displaying the current Plot device name, the Plotter, Plot size, Location and description, the Page Setup Manager displays all of the layouts in the current drawing as well as Page setups.

Within the dialog one can create a new page setup, modify an existing page setup or import an existing page setup from a drawing, template or DXF file on a local or network drive.

- Selecting the New option will display a dialog in which the name of the page setup is added. Once OK is selected the Page Setup dialog appears.
- Selecting Modify will launch the Page Setup dialog
- Selecting Import will bring launch Windows Explorer, once a file with page setups is selected all page setups in that drawing are listed allowing one to select and import one or all page setups.

Example of Page Setup Manager in a working drawing file

A. Current Layout name
B. Current Page setup name
C. Layout name and the page setup applied to that layout. The page setup is shown between parenthesis
D. Layouts existing in the drawing. Note the Asterisk (*) enclosing the name
E. Page setups saved within the drawing.



Note that when you activate a layout for the first time the default layout is set as an 8.5 x 11 sheet of paper. When you modify the sheet size in the Page Setup Manager that size will be reflected on the screen once the settings have been applied. Any viewports already existing in a layout will not resize.

Adding a new page setup to a new layout

1. Open *Floor Plan plot.dwg*
2. Right-Mouse click over any Layout tab and select *New Layout* from the shortcut menu. **Note** that AutoCAD 2015 has an additional tab next to the layout tabs labeled with a plus (+) sign. *This allows for quickly adding a layout from scratch.*
3. Select the newly created Layout to make it active. By default a viewport is created showing the extents of the model drawing on an 8.5x11 sheet of paper.
4. Right-Mouse click the Layout tab and select Rename. Rename the Layout *AU 2014 E Size Monochrome*.
5. Right-Mouse click the Layout *AU 2014 E Size Monochrome* and select Page Setup Manager. The Page Setup Manager dialog appears.
6. Select New…
7. In the New Page Setup add the name *ANSI E 34x44 Monochrome* and click OK.

The Page Setup dialog appears. Note that this is identical to the Plot dialog which we discussed earlier in this document. The exception being that under Plot area ➤ What to plot: The option to plot by Layout is available and the option to plot to Limits has been removed. Aside from the new Page Setup name, the settings you see either defaults from a previous plot or defaults which have been assigned in the Options ➤ Plot and Publish tab. More details on these defaults later.

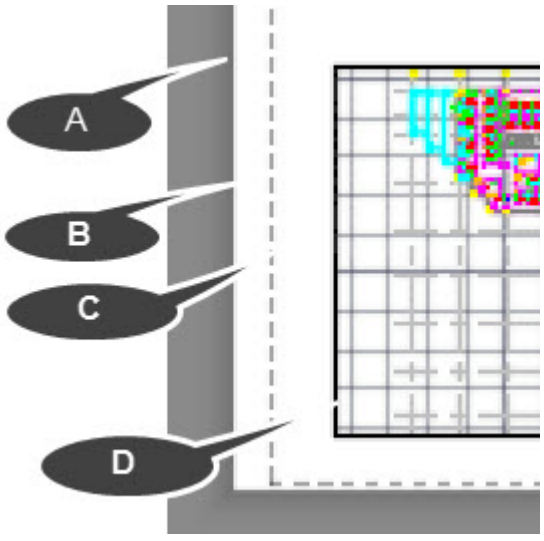
8. In the Page Setup dialog, change or verify the following values:
9. Pinter/Plotter: DWG to PDF.PC3

10. Paper size: ANSI E (34.00 x 44.00 Inches)
11. Plot Area: Layout
12. Plot Scale: 1:1
13. Plot Style table: monochrome.ctb
14. Select Preview…
15. Note that the paper size has changed but the viewport is now a small rectangle in the lower left corner
16. Right-Mouse click and select Exit or use the ESC key to cancel the preview
17. In the Page Setup dialog click OK to close
18. Note the *AU 2014 E Size Monochrome* page setup name now listed in the Page Setup Manager
19. Double-Click the name (or select the name and then click Set Current), this applies the page setup to the current layout. If you then make changes to the page setup, they will be reflected in all layouts which have that page setup assigned.
20. Close the Page Setup Manager and save the drawing.

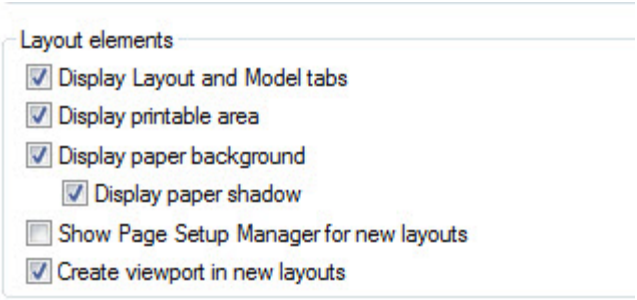
More about Layouts

Taking another glance at the layout in our drawing, one will notice that it does appear to represent a sheet of paper. The following examines the visuals of the Layout.

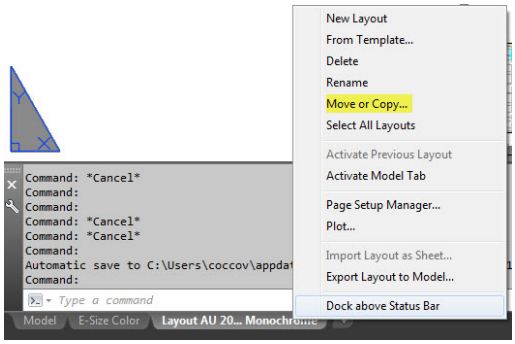
A. Although difficult to tell in AutoCAD 2015, there is a shadow border here. This is to give it a 3D feel.
B. This is what would be the physical edge of the sheet of paper.
C. The dashed line represents the printable area of the sheet of paper. This is dictated by the plot device driver associated with the page setup
D. This is a viewport added to the layout.



The settings for these visuals (A-C) can be enabled or disabled in the Options ➤ Display tab ➤ Layout elements



As mentioned previously, layouts can be copied, moved or deleted. Much of this functionality is available by Right-Mouse clicking over a layout tab. An alternative is to Press, then drag the layout to a new location or hold down the CTRL key while dragging and dropping to copy the layout. *NOTE: In order to Drag, Drop and Copy (with CTRL Key) in 2015 versions you must have Service Pack two installed.*

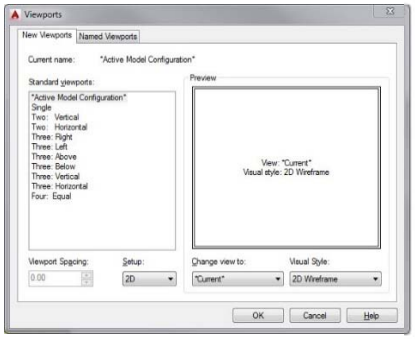


Layouts can also be easily exported for reuse and imported using the “From Template” option of the shortcut menu or through the use of Design Center.

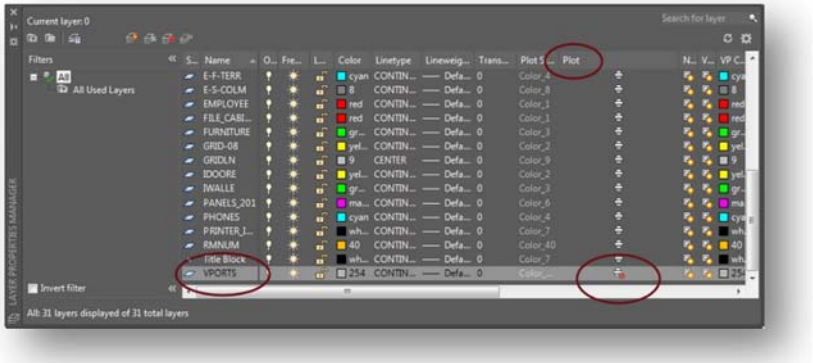
About Viewports

Think of Viewports as a window allowing you to view the model. You can create a single layout viewport that fits the entire layout or create multiple layout viewports in the layout. Each layout viewport contains a view that displays the model at the scale and orientation that you specify. Once you create the viewports, you can change their size, their properties, and also scale and move them as needed. You can also use COPY create multiple layout viewports.

It’s recommended that you create viewports on a specific layer, VPORTS or Viewports are commonly used as layer names. Once you’ve done this you can easily turn off or freeze the layers so that the viewports are not visible. Although turning off or freezing the layers is common, in my opinion it is better to disable plotting of the specific layer in the Layer Manager, this allows you to see the viewport yet not have the frame appear on the hardcopy or electronic output. The choice is yours or determined by your organizations CAD standards, often time’s users prefer to have the frame plot.



The Viewport dialog



No-Plot layer

Once a viewport is created, the appropriate scale factor is assigned to that viewport. For example, the viewport would have a scale factor of 1/8”=1’0” (or 96) assigned to display the model. Then the layout would be plotted at a scale of 1:1. This truly simplifies working with multiple views in a drawing.

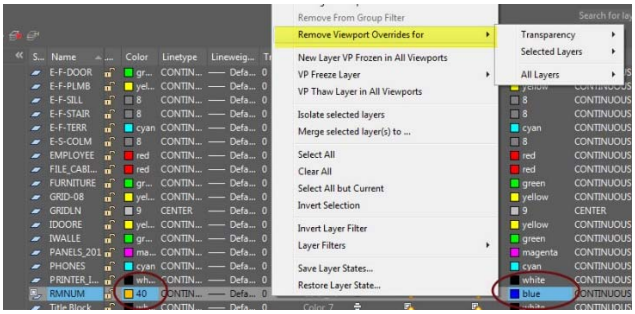
Note that when you use commands such as the Zoom command while in an active viewport, the scale factor is lost. To avoid this issue, once a scale factor is assigned, lock the viewport. This can be done using the Properties Manager or by selecting the viewport and Right-Mouse clicking. From the shortcut menu choose *Display locked* ➤ *Yes*.

Hint: One can also save a view of the model in the viewport, easily restoring it in a current or new viewport. This is done using the VIEW command.

Having multiple viewports and displaying them with different scale factors is only one of the benefits of using viewports. Individual viewports can have property override applied using the layer manager. For example, if you prefer to have new construction layers stand out with a different lineweight, color or other property, viewport overrides can be used. Additionally, you can freeze specific layers per viewport.

1. New VP Freeze – Freezes the layer in any new viewports in the current layout
2. VP Freeze – Freeze the layer in the current viewport only
3. VP Color – Override color property in current viewport
4. VP Linetype – Override linetype property in current viewport
5. VP Lineweight – Override lineweight property in current viewport
6. VP Transparency – Override transparency in current viewport
7. VP Plot Style – Override plot style in current viewport

Layers with overrides applied appear by default with a light blue highlight. One can easily remove overrides by Right-Mouse clicking a specific layer and selecting *Remove Viewport Overrides for,* then select the appropriate option from the submenu.



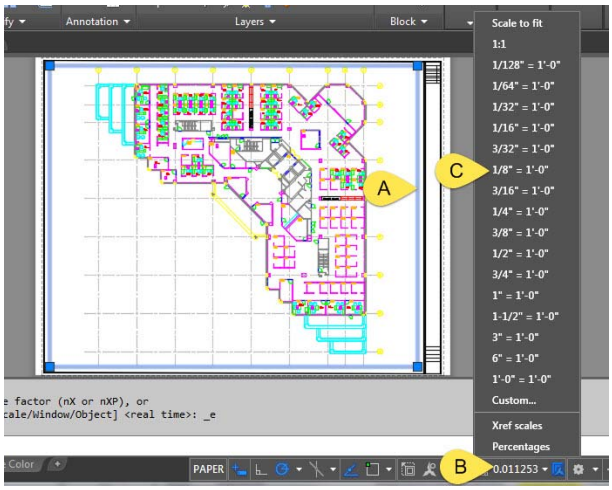
To create viewports

- Ribbon ➤ Layout tab ➤ Layout Viewports ➤ Rectangular or Non-Rectangular (*Note: The Layouts tab is only available once you have switched to a Layout tab*)
- Command Line ➤ VPORTS (opens dialog)
- Command Line ➤ MVIEW or –VPORTS
- Command Line ➤ MVSETUP (not available in AutoCAD LT)

To make a viewport active, double-click within the viewport. When the viewport is active the mouse pointer will appear as the default AutoCAD cross-hair. To make paper space active, double-click in an area outside of the viewport. The paper space icon will reappear. An alternative is to click the Paper/Model icon on the AutoCAD status bar. This will switch between spaces. The TILEMODE (System Variable) also switches between spaces.

Exercise: Working with Viewports and Layouts

1. Continue with, or Open "Floor Plan Plot.dwg"
2. Verify the paper space environment is active (double-click outside of the viewport)
3. Erase the lone viewport
4. Set the layer “Title Block” current
5. Use the INSERT command to insert the block, “Generic ANSI E 34x44 Block”
    a. Insertion Point: 0,0
    b. Scale: 1 (select uniform scale)
    c. Rotation: 0
6. Use the Layer command to open the Layer Property
7. Create a new layer called, “VPORTS”
    a. Color: 254
    b. Set plot to no-plot (select the printer icon in the Plot column)
    c. Set the layer current
8. Close or auto-hide the Layer Palette
9. From the Ribbon ➤ Layout tab ➤ Rectangular, create a viewport using the entire area within the title block. You may want to temporarily disable OSNAPs (F3) so that you don’t draw the viewport over the title block.



10. When a viewport is added, AutoCAD will display the model’s extents in the viewport, thereby applying an arbitrary scale factor.
    a. Selected viewport
    b. Arbitrary scale factor
    c. Desired scale factor
11. Select the Viewport
12. Select the Scale List (B)

13. Select 1/8”=1’0” for the desired scale factor.

14. Select the viewport and Right-Mouse click
15. Select *Display locked* ➤ *Yes*
16. Double-click within the viewport
17. Open the Layer Properties Manager
18. In the VP Freeze column, freeze the layer GRIDLN
19. Close or auto-hide the layer palette
20. Double-click outside of the viewport to activate paper space
21. Type PREVIEW to see a plot preview of the layout
22. Right-Mouse click and select exit or ESC from the keyboard to return to the layout view
23. Save the drawing

The plot preview was displayed in monochrome, yet the drawing is in color. This occurred because in the previous page setup exercise a monochrome plot style (CTB)* was applied to the layout and it is indicated in the layout name, *AU 2014 E Size Monochrome,* that this layout has been setup for monochrome plotting.

*Plot styles will be discussed shortly

Next we’ll make a copy of the layout and modify it for detail views and color plotting.

Exercise: Working with Viewports and Layouts – part two

1. Continue with, or Open "Floor Plan Plot.dwg"
2. Right-Mouse click over the *AU 2014 E Size Monochrome* layout tab and select “Move or Copy”
3. In the Move or Copy dialog select, *(move to end)* and check the box *Create a copy*

Note that you can also Left-Mouse pick while holding down the CTRL key and dragging a copy to a specified location. With AutoCAD 2015 versions you will need Service Pack 2 installed in order for this function to work.

4. Rename the layout *AU 2014 E Size Monochrome(2)* to *AU 2014 E Size Color* by selecting and Right-Mouse clicking, from the shortcut menu select *Rename*. You may also double-click the name to enter the edit mode.
5. Activate the new layout by selecting the layout tab
6. Since this is an exact duplicate, erase the viewport in the layout
7. Right-Mouse click over the layout tab and select Page Setup Manager

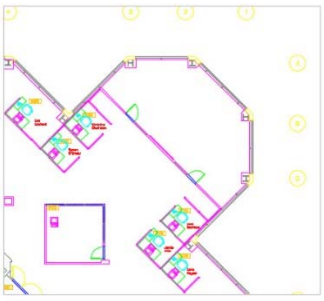
Note that the page setup *ANSI E 34x44 Monochrome* is applied to this layout. Next we’ll create a new page setup based on this one.

8. In the Page Setup Manager select *New…*

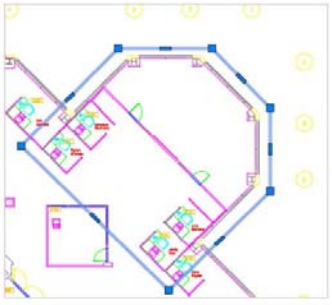
9. Name the page setup, *ANSI E 34x44 Color*
10. Select OK to enter the Page Setup dialog
11. Under *Plot style table (pen assignments),* select *acad.ctb*
12. Select OK to exit the Page Setup dialog
13. Se *ANSI E 34x44 Color* current
14. Select *Close* to exit the Page Setup Manager
15. Save the drawing (A good habit)
16. Verify that the VPORTS layer is current
17. Type **MVIEW** or **MV** at the command prompt
18. Pick a point in the top left corner of the layout (within the title block) and draw a rectangular viewport encompassing about a quarter of the layout.
19. Select the viewport and apply a scale factor of 1/4"=1'-0"
20. Double-click within the viewport to activate it
21. Open the Layer Properties Palette (Type **LAYER** or **LA**), Locate layer GRIDLN and then select the icon in the *VP Freeze* and the *New VP Freeze* columns.

The layer GRIDLN will not appear in the current viewport, nor any new viewports within this layout.

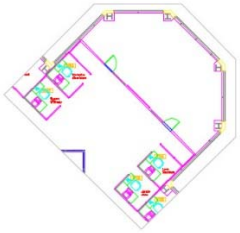
22. Activate paper space by double-clicking outside of the viewport
23. Using the **PLINE** command draw a closed polyline around the nook of the building as shown below.
24. From the Ribbon ➤ Layout tab ➤ Layout Viewports, select **Clip**
25. Following the command prompts, first select the viewport, then select the closed polyline.
26. ENTER to finish the command. The viewport now has a new boundary.
27. Select the viewport and Right-Mouse click to lock the viewport scale



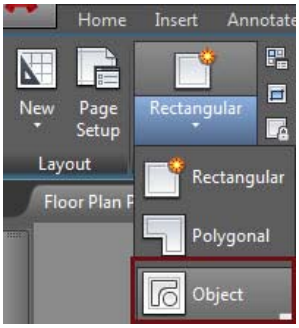
Rectangular Viewport



Closed Polyline



Clipped Viewport

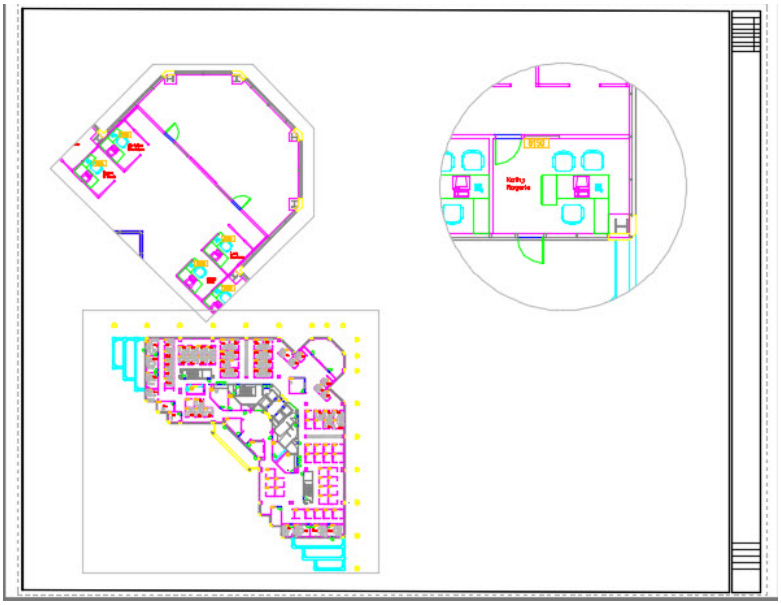


Converting Objects to Viewports

28. Draw a circle to the right of the viewport approximately the same size as the viewport
29. From the Ribbon ➤ Layout tab ➤ Layout Viewports, select Object
30. Select the circle and ENTER
31. The Circle is converted to a viewport
32. Activate the viewport and zoom into the room located in the lower right-hand corner of the drawing.
33. Once the view is centered, double-click outside the viewport to make paper space active
34. Assign a scale factor of 1/2”=1’-0”
35. Lock the Viewport

Using Viewport Overrides

36. Create a Rectangular Viewport at the bottom of the layout
37. Scale the viewport to 1/16”=1’-0”
38. Lock the viewport
39. Make the viewport active
40. Open the Layer Properties Manager
41. Select the following layers:
    a. CPU
    b. Chair
    c. File_Cabinets
    d. Furniture
    e. Phones
    f. Printer_Island
42. In the VP Color column, select one of the color swatches and assign a value of 254
43. Close the Layer Property Palette
44. Zoom to Extents
45. Save the Drawing
46. Plot



Finished Layout

About Plot Style Tables

Plot style tables contain several of the plot settings you use when plotting a drawing. You can use a table to reduce the number of redundant steps you need to perform each time you plot a drawing.

There are two types of plot style tables: color-dependent (CTB files) and named (STB files).

A plot style is similar to a text or dimension style, which determine how text and dimensions look. Plot styles determine how objects appear when plotted.

A plot style table is attached to a layout or to model space in order to apply the plot style parameters to objects in the drawing at plot time.

AutoCAD drawings are either color-dependent or named, they cannot be both.

One can use templates provided with AutoCAD or AutoCAD LT or custom templates to begin a new drawing using a desired plot style type.

If no templates are present or if an AutoCAD R14 or earlier drawing is opened, the PSTYLEPOLICY system variable determines the plot style used.

The Plot Style Manager

The Plot Style Manager displays the Windows location (determined in OPTIONS) of plot styles installed with AutoCAD (LT), as well as the Add-A-Plot Style wizard which is used to create new plot styles. One can modify existing plot styles by double-clicking the plot style or from within the Page Setup Manager using the plot style table *Edit* tool.

Color-dependent plot style tables

Designed to be similar to pen assignments used in AutoCAD release 14 and earlier they are device independent. The same table can be used for more than one plot device

External files that are stored with the file extension *.CTB* (Color Table)

A color-dependent plot style table contains 255 preset plot styles – one for each color in the AutoCAD Color Index. Additionally one can choose from true colors, as well as color books.

When a drawing is plotted, AutoCAD reads the *Color* property of each object. Using a Plot Style table you can specify the color, lineweight, linetype, screening and so on, that objects of a specific color will have when plotted.

Named Plot Style tables

Named plot styles allow for more control over plotting because they are applied independent of object color on an object-by-object or layer-by-layer basis.

Where color-dependent plot styles associate plot parameters based on the color of objects so that all objects of the color plot with the same parameters, named plot styles are assigned to individual objects or to layers, allowing objects of the same color to be plotted differently.

Plot Style Properties

- **Color -** Determines the plot color of objects that use the selected AutoCAD color. Object color uses the color assigned to the object or layer. Color overrides occur when a different color is chosen.
- **Dither -** Approximates a color by making dot patterns with one of the device-supported colors. Use dithering if the plot device does not support the color you want to plot. For example, if you send a color plot to a monochrome device but still want to distinguish between the different colors, turn on dithering so that the plot device creates a dot patterns to distinguish between colors.

I recommend turning this off for monochrome because in most cases the drawing looks pixelated. Note also that dithering automatically turns on if you set a color screening value of 99 or less.

- **Grayscale -** Plots objects using the selected AutoCAD color as a shade of gray. Yellow would plot as light gray, whereas Blue would plot as a darker shade.
- **Pen Number -** For pen plotters only. Determines pen number used to plot objects of the selected AutoCAD color. (Basically Obsolete)

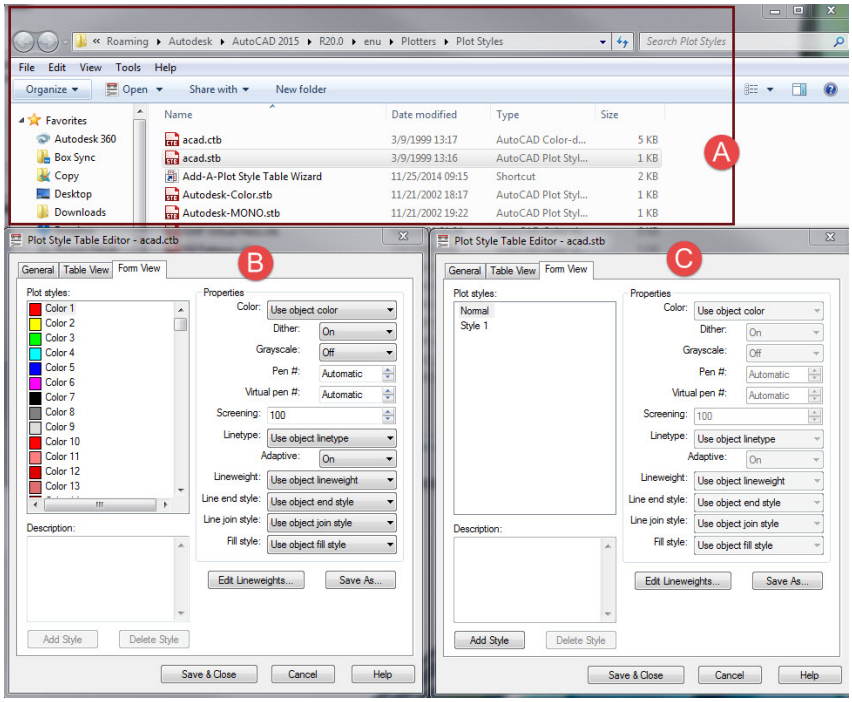
Note: When plotting to a pen plotter, all other plot style table properties are ignored.

- **Virtual Pen -** Reflect back to when you had to use a different physical ink pen for each line weight. Virtual pens are assigned by the hardware.

Note: When plotting to a virtual pens, all other plot style table properties are ignored.

- **Screening -** Determines the color intensity of objects that use the selected AutoCAD color when plotted. Entering (0) reduces the color to white.

- **Linetype -** Determines the plotted linetype of objects that used the Selected AutoCAD color. Selecting a linetype will override the linetype assigned to that color.
- **Adaptive -** Adjusts the size of the linetype pattern so that line objects contain complete patterns. This only affects linetype set in a plot style table.
- **Lineweight -** Determines the plotted lineweight. Selected lineweight overrides assigned lineweight
- **Line End Style -** Determines the line end style of object that use the selected AutoCAD color.



A. Partial view of the Plot Style Manager (Windows Explorer), the Add-A-Plot Style Table Wizard, and sample plot styles for both Color-dependent and Named-plot styles.
B. Color-dependent Plot Style Table
C. Named-Plot Style Table

Exercise: Creating a Color-dependent Plot Style

1. Open Floor Plan - Color Based.dwg.
2. At the command prompt type, **Preview**.

   a. Briefly review the visual display of the geometry.
   b. Exit the Plot Preview
3. Select the Application Menu ➤ Print ➤ Manage Plot Styles or type **STYLESMANAGER** at the command prompt.
4. Double-click Add-A-Plot Style Table Wizard.
5. On the first information page, select *Next*.
6. On the page titled Begin, leave Start from Scratch selected and select *Next*.
7. On the page titled Pick Plot Style Table, leave Color-dependent Plot Style Table selected and select *Next*.
8. On the File Name page, enter *Check Plot - BW* in the file name box. Select *Next*.
9. Select Plot Style Table Editor.
10. In the Plot Style Table Editor, Form View tab, select the first nine colors in the Plot Styles list, but **do not select color 4**. Under Properties:
    a. Set the Color to Black.
    b. Turn Dither to Off.
    c. Select 0.0000 mm for the Lineweight.
11. Select *Save & Close*.
12. Select *Finish*.
13. Right-click on the First Floor layout tab. Select *Page Setup Manager*.
14. In the Page Setup Manager:
    a. Select *Modify*.
    b. Select *Check Plot - BW.ctb* in the Plot Style Table list.
    c. Select *OK*.
    d. Select *Close*.
15. Type **Preview** at the command prompt
16. In reviewing the preview while using this CTB file, you should see that all the geometry that falls in the color range of 1-3 and 5-9 now previews in black.
    a. Zoom into the front porch area to see the difference in the line width for the geometry that was cyan, Color 4.
    b. Exit the Plot Preview.

Exercise: Creating a Named-Plot Style

1. Open *Floor Plan - Named Based.dwg*.
2. At the command prompt type, **Preview**
    a. Briefly review the visual display of the geometry.
    b. Exit the Plot Preview
3. Select the Application Menu ➤ Print ➤ Manage Plot Styles or type **STYLESMANAGER** at the command prompt

4. Double-click the file *acad.stb*
5. Select the Form View tab
6. Select *Save As…*, name the new table, *AU2014.STB*
7. On the Form View Tab:
8. Select *Add Style*.
9. Enter **THICK** in the Add Plot Style dialog box.
10. Select *OK*.
11. With the **THICK** plot style highlighted, change the following properties:
    a. Color: Black
    b. Dither: Off
    c. Lineweight: 0.7000 mm
12. Next, you create a new style by copying the style **THICK**.
13. Right-click the plot style **THICK**. Select *Copy*.
14. Right-click in the Plot Styles list area. Select *Paste*.
15. Enter **MEDIUM** in the Add Plot Style dialog box. Select *OK*.
16. With the **MEDIUM** plot style highlighted, change the *Lineweight property to 0.5000 mm*.
17. Create another new style using the same copy and paste procedures you used to create the style **MEDIUM**.
18. Enter **THIN** for the style name.
19. Select *OK*.
20. With the **THIN** plot style selected, change the *Lineweight property to 0.350 mm*.
21. Create another new style called **SCREEN-40** using copy and paste. Select *OK*.
22. With the **SCREEN-40** plot style selected, change the *Screening property to 40*.
23. Select *Save*.
24. In the Plot Style Table Editor, select *Save & Close*.
25. Type **LAYER**, to launch the Layer Properties Manager.
26. In the Layer Properties Manager, select the Plot Style value for the layer TitleBlock in the Plot Style column.
27. In the Select Plot Style dialog box:
    a. Select *AU2014.STB* for the Active Plot Style Table.
    b. Select **THICK** in the list of Plot Styles.
28. Select *OK*.
29. In the Plot Style column in the Layer Properties Manager, continue making changes for the identified layers by assigning the specified named style. Select *OK* after making the changes. They should appear as shown:
    a. CHAIRS = SCREEN-40
    b. DB - Windows = MEDIUM
    c. Deck = THIN
    d. Furniture = SCREEN-40

e. View Labels = MEDIUM
f. Walls = MEDIUM

30. Close the Layer Properties Manager
31. At the command prompt type, **Preview**

In reviewing the preview image, you will notice that geometry assigned to the identified layers preview in different colors and with different line widths. If you look closely, you can see that the desk and chairs appear in a shade of black because the screening property is only allowing 40% of the color through. Also note that the text in the title block is still displaying in color, while the line geometry is black.

32. Exit the Plot Preview.
33. Save and close all files.

Conclusion

There is much more to plotting and the tools associated with the task. This document should get you started, but I encourage you to take advantage of the resources available in the AutoCAD Help system as well as the Autodesk Knowledge Network and the Autodesk Help Webinars. Explore and Learn!

Additional Resources

- About Controlling PC3 File Device and Document Settings
- About Adjusting the Grid and Grid Snap
- About Annotation Scale
- About Layout Viewports
-

Commands and System Variables associated with Plotting.

Commands

- CONVERTCTB (Command)
- CONVERTPSTYLES (Command)
- PAGESETUP (Command)
- PCINWIZARD (Command)
- PLOT (Command)
- PLOTSTAMP (Command)
- PLOTSTYLE (Command)
- PLOTTERMANAGER (Command)
- PREVIEW (Command)
- PSETUPIN (Command)
- STYLESMANAGER (Command)
- VIEWPLOTDETAILS (Command)
- LIMITS (Command)
- VIEW (Command)
-

System Variables

- CPLOTSTYLE (System Variable)
- PAPERUPDATE (System Variable)
- PLOTOFFSET (System Variable)
- PLOTROTMODE (System Variable)
- PLOTTRANSPARENCYOVERRIDE (System Variable)
- PLQUIET (System Variable)
- PSTYLEMODE (System Variable)
- PSTYLEPOLICY (System Variable)
- RASTERDPI (System Variable)
- RASTERPERCENT (System Variable)
- RASTERTHRESHOLD (System Variable)
- MAXACTVP (System Variable)
- TEXTFILL (System Variable)
- TEXTQLTY (System Variable)
- TILEMODE (System Variable)

Drawing Scale	Scale Factor	Plotted Text Height								
		1/16"	3/32"	1/8"	3/16"	1/4"	5/16"	3/8"	1/2"	5/8"
1/16" = 1" - 0"	192	12"	18"	24"	36"	48"	60"	66"	96"	120"
1/8" = 1' - 0"	96	6"	9"	12"	18"	24"	30"	36"	48"	60"
3/16" = 1' - 0"	64	4"	6"	8"	12"	16"	20"	24"	32"	40"
1/4" = 1' - 0"	48	3"	4.5"	6"	9'	12"	15"	18"	24"	30"
3/8" = 1'- 0"	32	2"	3"	4"	6"	8"	10"	12"	16"	20"
1/2" = 1' - 0"	24	1.5"	2.25"	3"	4.5"	6"	7.5"	9"	12"	15"
3/4 = 1' - 0"	16	1"	1.5"	2"	3"	4"	5"	6"	8"	10"
1" = 1' - 0"	12	0.75"	1.13"	1.5"	2.25"	3"	4"	5"	6"	7.5"
1 1/2 = 1' - 0	8	0.5"	.75"	1"	1.5"	2"	2.5"	3"	4"	5"
3" = 1' - 0"	4	0.25"	.375"	0.5"	0.75"	1"	1.25"	1.5"	2"	2.5"
1" = 10'	120	7.5"	11.25"	15"	22.5"	30"	37.5"	45"	60"	75"
1" = 20'	240	15"	22.5"	30"	45"	60"	75"	90"	120"	150"
1" = 30'	360	22.5"	33.75"	45"	67.5"	90"	112.5"	135"	180"	225"
1" = 40'	480	30"	45"	60"	90"	120"	150"	180"	240"	300"
1" = 50'	600	37.5"	56.25"	75"	112.5"	150"	187.5"	225"	300"	375"
1" = 60'	720	45"	67.5"	90"	135"	180"	225"	270"	360"	450"
1" = 70'	840	52.5"	78.75"	105"	157.5"	210"	262.5"	315"	420"	525"
1" = 80'	960	60"	90"	120"	180"	240"	300"	360"	480"	600"
1" = 90'	1080	67.5"	101.25"	135"	202.5"	270"	337.5"	405"	540"	675"
1" = 100'	1200	75"	101.25"	150"	225"	300"	375"	450"	600"	750"