



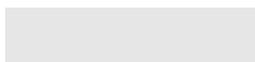
AutoCAD 2004: One Step at a Time, Part II
 by Timothy Sean Sykes ISBN:0972814264
 Forager Publications © 2003 (598 pages)
 With Part II of this resource, you will add Hatching and Section lines to your AutoCAD drawing, create and manipulate Groups, plot a drawing, learn Model and Paper space, reference one drawing to another, and much more.

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AutoCAD 2004 - One Step at a Time, Part II

Timothy Sean Sykes

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The Forager
2043 Cherry Laurel
Spring, TX 77386
www.wildforager.com

AUTHOR'S NOTES

Where are Chapters 1 to 16?

This text continues *AutoCAD 2004: One Step at a Time - Part I*. Please look for those chapters in that text.

Where to Find the Required Files (and Review Questions) for Using This Text:

All of the files required to complete the lessons in this text can be downloaded free of charge from this site:

<http://www.uneedcad.com/2004/Files/>

Select on the file called *OneStepAtATime.zip* and save it to your computer. (You'll need a zip utility to open the file. If you need one, I suggest the free WinZip download at: <http://www.winzip.com/>. The evaluation version will do to get your files.)

Once you've downloaded the zip file (and the WinZip utility, if necessary), follow these instructions.

1. Double-click on the file. The WinZip program will begin and display a window with the files listed.
2. Select the first file in the list, scroll to the bottom of the list and, holding down the Shift key, select the last file. The entire list will highlight.
3. Right-click anywhere in the highlighted area, and select **Extract...** from the menu.
4. WinZip will display an Extract dialog box. Be sure the desired path for your files appears in the **Extract to** text box. I strongly recommend showing only a **C:** in this box. This way, WinZip will extract the files into their own folders within a C:\Steps\ folder.

5. Pick the **Extract** button. WinZip does the rest.
6. Exit the WinZip program and you're ready to begin!

To get the review questions, simply pick on the jump at the end of the appropriate chapter. The text will open a PDF file in your Internet browser. These files are fully printable, or you can save them to your disk if you wish. The last page of each file contains the answers to the questions in that file.

Appendices

I realize that graphics and tables in this document are either unprintable or would not make very good prints. In the case of the graphics, they've been optimized to look best on a computer screen rather than paper. But the appendices might make nice tools for your notebooks, so I've provided print-formatted documents for each. Simply pick on the title, and you'll be taken to a printable pdf at our website.

Graphics & The Best Resolution for Reading This Text:

A tremendous amount of effort went into creating the nearly 3,000 graphics associated with this text (both Book 1 and Book 2). We worked hard to make the right compromises between image quality and file size (we had to limit the final product to under 8Mb to satisfy Lightning Source's instructions). Hopefully, we achieved our goal.

You may notice that I took some occasional liberties in terms of cropping graphics to get them to fit better on the page. I ask your indulgence for these rare indiscretions - I believe I managed to avoid obscuring the purpose of the dialog boxes in question.

On my laptop (a Dell Inspiron), I find it best to view the final file at a page size of 100% in Adobe Reader 6.0. This proves adequate for both text and image viewing. If I'm just viewing the text, I can opt for a *page width* viewing size without sacrificing anything.

On my 17" desktop monitor (as well the 15" monitor on the family computer), I can view the file at anywhere from 100% to 150% and the quality of both text and graphics is quite pleasing.

Regardless of the monitor, however, I still need my "readers" to see anything clearly. Ah, the trials of hitting 50 before my time! (Can you do that?)

Contacting the Author/Publisher:

Although we tried awfully hard to avoid errors, typos, and the occasional boo boos, I admit to complete fallibility. Should you find it necessary to let me know of my blunders, or to ask just about anything about the text - or even to make suggestions as to how to better the next edition, please feel free to contact me at: comments@unecad.com. I can't promise a fast response (although I'm usually pretty good about answering my email), but I can promise to read (almost) everything that comes my way.

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Section IV: Razzle Dazzle

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Chapter 17: Hatching and Section Lines

Overview

Following this lesson, you will:

- *Know how to add Hatching and Section Lines to your AutoCAD drawing through:*
 - ◆ *The **Hatch** command*
 - ◆ *The **BHatch** command and dialog box*
 - ◆ *The Tool Palettes*
- *Know how to edit hatch patterns using the **Hatchedit** command*
- *Know how to use the Sketch command*

Remember all those templates I mentioned in AutoCAD 2004: One Step at a Time - Part I - the ones I needed to draw ellipses? Remember how much simpler (and more accurate) it was to draw ellipses with AutoCAD?

Here's another drawing tool that puts those pieces of plastic to shame. No longer will the drafter need to spend hours drawing each line or symbol to show section lines, a brick façade, concrete, and so forth.

With AutoCAD's hatch commands, you can fill a large area with lines or symbols in a matter of seconds!

This fourth section of our text will cover some razzle- dazzle tools. These are the tools that pushed CAD systems ahead of the drawing board as the preferred tool in design work. We'll begin with hatching in this lesson; then, in subsequent lessons, we'll learn to create blocks of objects and of information.

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17.1 The *Hatch* Command

There are actually a few ways to draw hatch patterns. (Section lines are created as a style of hatch pattern. Therefore, I'll refer to both as hatch patterns.) There's a dialog box approach called Boundary Hatching, a simple drag-n-drop approach that utilizes the Tool Palettes, and, of course, a command line approach. We'll begin with the command line as it presents some opportunity you won't find in the dialog box. The sequence is:

Command: *hatch* (or *-h*)

Enter a pattern name or [?/Solid/User defined] <ANSI31>: *[enter the name of the pattern you wish to use]*

Specify a scale for the pattern <1.0000>: *[enter the scale for your hatch pattern]*

Specify an angle for the pattern <0>: *[enter the desired angle of the pattern]*

Select objects to define hatch boundary or <direct hatch>,

Select objects: *[select closed objects that will form the closed boundaries of the hatching]*

Select objects: *[enter to complete the command]*

- There are four options presented at the initial hatch prompt.
 - ◆ The default option (the one within the angled brackets) is **ANSI31**. This is the standard hatch pattern most people use to show section lines.
 - ◆ If you enter a question mark at the end of the first prompt, AutoCAD will prompt as follows:

Enter pattern(s) to list <*>:

Hit *enter* to view a list of the available hatch patterns.

- ◆ The **Solid** hatch pattern will produce the same results - but faster - as the *Solid* and *Donut* commands you learned in Lesson 10.
- ◆ The **User Defined** option allows you to create a hatch pattern by defining the angle and spacing of hatch lines. If selected, AutoCAD presents these prompts:

Specify angle for crosshatch lines <0>: *[enter the angle for the hatch lines]*

Specify spacing between the lines <1.0000>: *[enter the spacing between the hatch lines]*

Double hatch area? [Yes/No] <N>: *[double hatching means that AutoCAD will draw the lines first according to the angle defined at the first prompt here; then it'll draw a second set of hatch lines perpendicular to the first]*

- The next prompt asks you to enter a **Scale**. This may already be set if you created the drawing using a wizard. But if it defaults to **1** and you wish to plot the final drawing to scale, enter the drawing scale factor here. (Refer to the Drawing Scales chart in [Appendix A](#).)
- The **Angle** of the hatch pattern defaults to zero. This doesn't mean that the lines of the hatch pattern will be horizontal. It means that AutoCAD will draw the lines of the selected hatch pattern as they appear in the pattern's definition. Changing the angle here will cause AutoCAD to rotate the pattern (which may have defined the lines at an angle already) by the angle specified.
- Next, AutoCAD requires that you identify the boundaries of the hatch pattern. Accomplish this by simply selecting the objects to use as boundaries.

Alternately, you can hit *enter* to use the **direct hatch option**. This option allows you to draw the boundaries (polylines) on the fly. The command sequence for the **direct hatch option** looks like this:

Retain polyline boundary? [Yes/No] <N>: *[you'll define the boundary in much the same way you would draw a polyline; tell AutoCAD if you wish to keep the*

boundary once you've defined it]

Specify start point: *[pick the start point of the boundary line]*

Specify next point or [Arc/Length/Undo]: *[continue picking points on the boundary - this option repeats]*

Specify next point or [Arc/Close/Length/Undo]: *c [close the boundary]*

Specify start point for new boundary or <apply hatch>: *[you can hit enter to complete the command or hatch more than one area at a time]*

- ◆ The first option here - **Retain polyline boundary?** - allows you to keep the polyline you'll create to define the hatched area. The default is to delete it.
- ◆ The rest of the options are standard *Pline* options.

Okay; let's take a look at the *Hatch* command in action.

Do This: 17.1.1 Command Line Hatching

I. Open the *demo-hatch.dwg* file the C:\Steps\Lesson17 folder. The drawing looks like [Figure 17.1.1a](#).

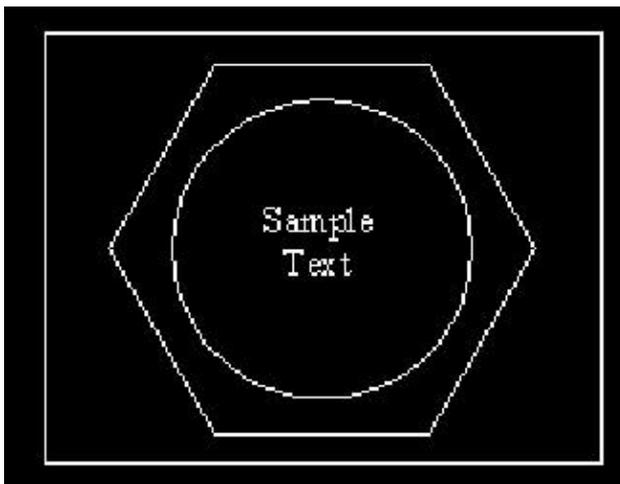
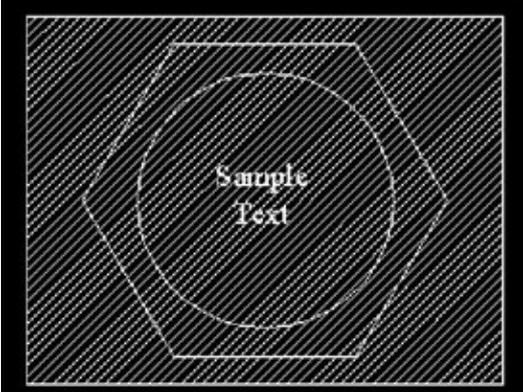
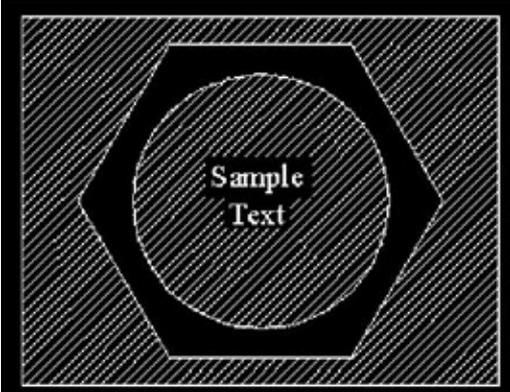
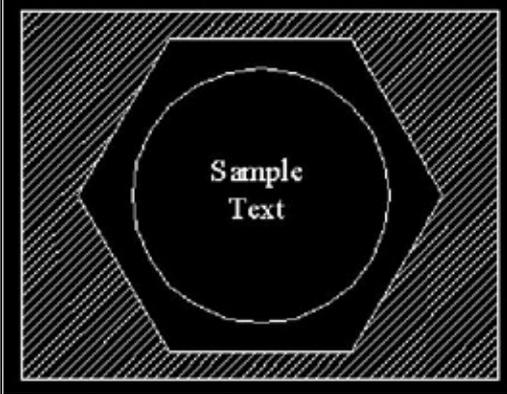


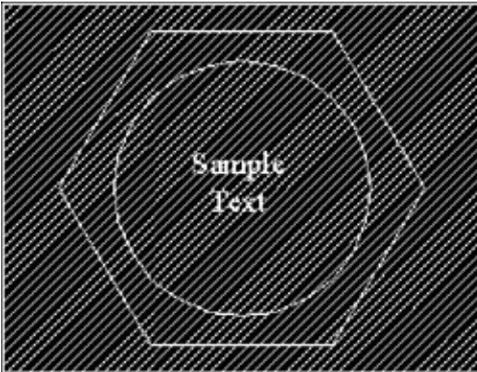
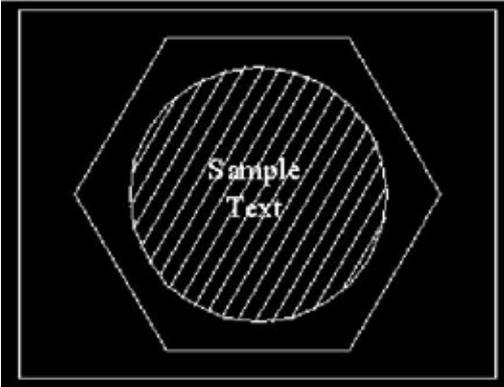
Figure 17.1.1a

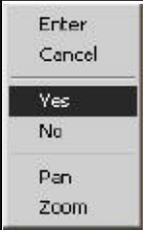
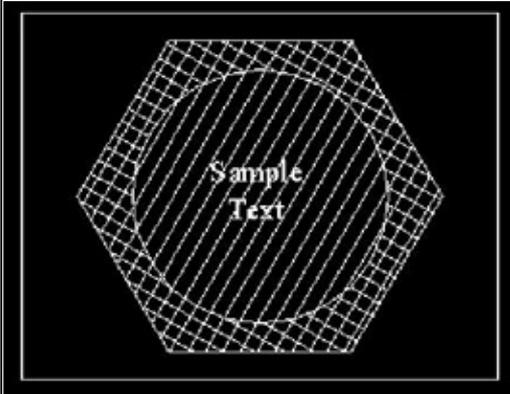
II. Follow these steps.

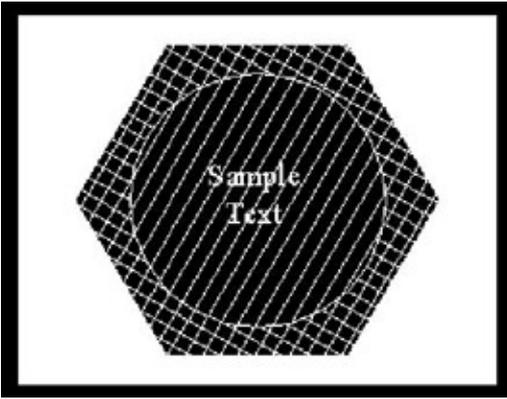
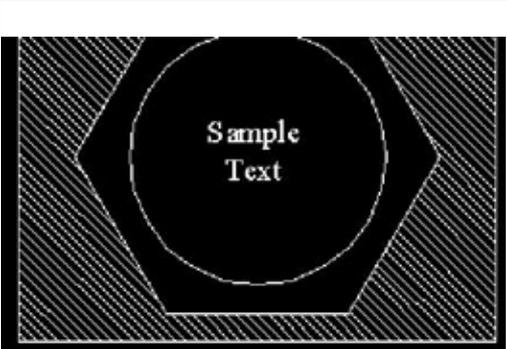
TOOLS	COMMAND SEQUENCE	STEPS
No Button Available (Note: The button on the Draw toolbar calls the <i>BHatch</i> command.)	Command: <i>-h</i>	1. Enter the <i>Hatch</i> command by typing <i>hatch</i> or <i>-h</i> at the command prompt.
	Enter a pattern name or [?/Solid/User defined] <i><ANSI31>; [enter]</i> Specify a scale for the pattern <i><1.0000>; [enter]</i> Specify an angle for the pattern <i><0>; [enter]</i>	2. Accept the defaults for pattern, scale, and angle.

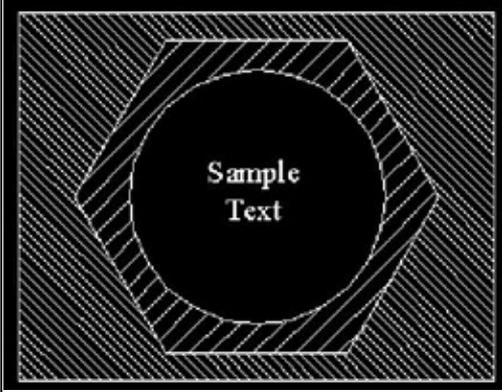
	<p>Select objects to define hatch boundary or <direct hatch>, Select objects: Select objects: [enter]</p>	<p>3. Select the outer rectangle, and then hit <i>enter</i> to complete the command. Your drawing looks like Figure 17.1.1.3a.</p>
		
	<p>Command: <i>u</i></p>	<p>4. Undo the last modification.</p>
	<p>Command: <i>-h</i></p>	<p>5. Repeat Steps 1 and 2.</p>
	<p>Select objects to define hatch boundary or <direct hatch>, Select objects: Select objects: [enter]</p>	<p>6. This time, select all of the objects before completing the command. Your drawing looks like Figure 17.1.1.6a. Notice the results of this hatching. AutoCAD has recognized multiple objects in the selection set and hatched so that you can tell them apart. It has even recognized the text in the middle. This is AutoCAD's Normal style of hatching.</p>
		
	<p>Command: <i>u</i></p>	<p>7. There are three styles altogether. By default, AutoCAD uses the Normal style shown here. Now let's look at the other two - Outer and</p>

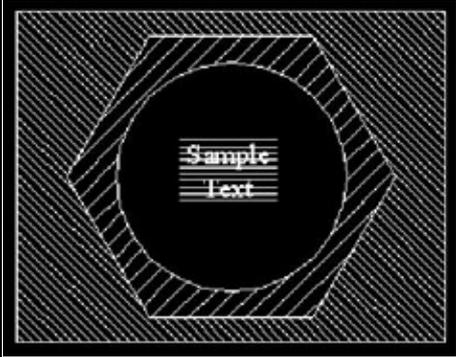
		Ignore. Undo the last modification.
	Command: -h	8. Repeat the Hatch command.
	Enter a pattern name or [?/Solid/User defined] <ANSI31>: <i>ansi31,o</i>	9. When prompted for the pattern, type ANSI31,O . (the "O" tells AutoCAD to hatch only between the two <i>outermost</i> boundaries.)
	Specify a scale for the pattern <1.0000>: <i>[enter]</i> Specify an angle for the pattern <0>: <i>[enter]</i>	10. Accept the defaults for scale and angle.
	Select objects to define hatch boundary or <direct hatch>, Select objects: Select objects: [enter]	11. Select all of the objects; complete the command. Your drawing looks like Figure 17.1.1.11a . (Only the area inside the outer boundary has been hatched.)
		
	Figure 17.1.1.11a: Outer Hatching	
	Command: u	12. Undo the last modification.
	Command: -h	13. Repeat the Hatch command.
	Enter a pattern name or [?/Solid/User defined] <ANSI31>: <i>ansi31,i</i>	14. When prompted for the pattern, type ANSI31,I . (The "I" tells AutoCAD to <i>ignore</i> any internal boundaries.)
	Specify a scale for the pattern <1.0000>: <i>[enter]</i> Specify an angle for the pattern <0>: <i>[enter]</i>	15. Accept the defaults for scale and angle.
	Select objects to define hatch boundary or <direct hatch>, Select objects: Select objects: [enter]	16. Select all of the objects again; complete the command. Your drawing looks like Figure 17.1.1.16a .

		<p>Figure 17.1.1.16a: Ignore Hatching</p>
	<p>Command: <i>u</i></p>	<p>17. Undo the last modification.</p>
	<p>Command: <i>-h</i></p>	<p>18. Let's define our own pattern. Repeat the Hatch command.</p>
	<p>Enter a pattern name or [?/Solid/User defined] <ANSI31>: <i>u</i></p>	<p>19. Tell AutoCAD to use the User defined option.</p>
	<p>Specify angle for crosshatch lines <0>: <i>60</i></p>	<p>20. Draw the lines for your User defined pattern at 60° ...</p>
	<p>Specify spacing between the lines <1.0000>: <i>.25</i></p>	<p>21. ... and space the ¼ unit apart.</p>
	<p>Double hatch area? [Yes/No] <N>:</p>	<p>22. Don't double hatch the area yet.</p>
		<p>23. Select the circle and complete the command. Your drawing looks like Figure 17.1.1.23a.</p>
		<p>Figure 17.1.1.23a: User-Defined Hatching</p>
	<p>Command: <i>-h</i></p>	<p>24. Repeat the Hatch command. (Do <i>not</i> hit enter to repeat the command as that will repeat the Select objects prompt only. AutoCAD will use the Style, Angle, and Spacing you set up last.)</p>

	<p>Enter a pattern name or [?/Solid/User defined] <U>: [enter]</p>	25. Define another style.
	<p>Specify angle for crosshatch lines <60>: [enter]</p> <p>Specify spacing between the lines <0.2500>: [enter]</p>	26. Accept the default angle and spacing.
	<p>Double hatch area? [Yes/No] <N>: y</p>	27. This time, let's Double hatch an area.
	<p>Select objects to define hatch boundary or <direct hatch>,</p> <p>Select objects:</p> <p>Select objects: [enter]</p>	<p>28. Select the polygon and the circle. Then complete the command. Your drawing looks like Figure 17.1.1.28a.</p> <p>Notice that when double hatching is indicated, AutoCAD draws the second set of lines at 90° to the first.</p>
		<p>Figure 17.1.1.28a: Double Hatching</p>
	<p>Command: -h</p>	29. Now let's look at the Solid option. Repeat the Hatch command. (Do <i>not</i> hit enter .)
	<p>Enter a pattern name or [?/Solid/User defined] <U>: s</p>	30. Select the Solid option.
	<p>Select objects to define hatch boundary or <direct hatch>,</p> <p>Select objects:</p> <p>Select objects: [enter]</p>	31. Select the rectangle and the polygon. Then complete the command. Your drawing looks like Figure 17.1.1.31a .

		
	<p>Figure 17.1.1.31a: Solid Hatching</p>	
	<p>Command: <i>e</i></p>	<p>32. Erase all the hatch patterns. Notice that a single pick selects all the lines in a pattern. (You may have to pick several places to find a pickable point in the solid pattern.)</p>
	<p>Command: <i>-h</i></p>	<p>33. Let's change the Angle of the pattern and see what happens. Repeat the Hatch command.</p>
	<p>Enter a pattern name or [?/Solid/User defined] <SOLID>: <i>ansi31</i></p>	<p>34. Use the ANSI31 pattern.</p>
	<p>Specify a scale for the pattern <1.0000>: <i>[enter]</i></p>	<p>35. Accept the scale, but tell AutoCAD to use a 90° angle for the hatching.</p>
	<p>Specify an angle for the pattern <60>: <i>90</i></p> <p>Select objects to define hatch boundary or <direct hatch>, Select objects: Select objects: Select objects: <i>[enter]</i></p>	<p>36. Select the rectangle and the polygon. Complete the command. Your drawing looks like Figure 17.1.1.36a.</p> <p>Notice that AutoCAD hatches between the two selected boundaries, and that the defined 45° hatch lines have been rotated 90° as instructed.</p>
		
	<p>Figure 17.1.1.36a: Angled Hatching</p>	
	<p>Command: <i>-h</i></p>	<p>37. Now let's look at the Scale option. Repeat the Hatch command. (Again, don't hit</p>

		<i>enter</i> .)
	Enter a pattern name or [?/Solid/User defined] <ANSI31>: <i>[enter]</i>	38. Accept the default pattern.
	Specify a scale for the pattern <1.0000>: 2 Specify an angle for the pattern <90>: 0	39. Change the scale to 2, and return the angle to 0.
	Select objects to define hatch boundary or <direct hatch>, Select objects: Select objects: <i>[enter]</i>	40. Select the polygon and the circle, and then complete the command. Your drawing looks like Figure 17.1.1.40a .
		
	Command: <i>-h</i>	41. We've one more thing to explore - the direct hatch option . Here we'll create a hatch pattern within a temporary polyline. Repeat the <i>Hatch</i> command.
	Enter a pattern name or [?/Solid/User defined] <ANSI31>: <i>[enter]</i>	42. Accept the default pattern.
	Specify a scale for the pattern <2.0000>: 1 Specify an angle for the pattern <0>: 135	43. Set the <i>scale</i> to 1 and the angle to 135.
	Select objects to define hatch boundary or <direct hatch>, Select objects: <i>[enter]</i>	44. This time, hit <i>enter</i> to access AutoCAD's direct hatch option .
	Retain polyline boundary? [Yes/No] <N>: <i>[enter]</i>	45. We don't want to retain the polyline boundary .
	Specify start point: Specify next point or [Arc/Length/Undo]:	46. With the Ortho on, draw a four-sided polyline around the text in the center of the circle. Be sure to close the polyline.

	Specify next point or [Arc/Close/Length/ Undo]: Specify next point or [Arc/Close/Length/ Undo]: Specify next point or [Arc/Close/Length/ Undo]: <i>c</i>	
	Specify start point for new boundary or <apply hatch>: <i>[enter]</i>	47. Hit <i>enter</i> to complete the command. Your drawing looks like Figure 17.1.1.47a .
		
	Figure 17.1.1.47a: Direct Hatch	
	Command: <i>e</i>	48. Erase all the hatch patterns.
	Command: <i>qsave</i>	49. Save the drawing but don't exit.

Note An important thing to remember about our exercises thus far is that each of the objects being hatched (circle, polygon, and rectangle) is *closed*. You can hatch lines and arcs as well, but they must also be part of a closed grouping.

It isn't at all unusual to get some fairly bizarre hatching results - particularly patterns that bleed outside of the selected boundaries. There are a number of quirks that can cause this, but the most common is an open boundary. If you're sure the boundary is closed and you still get some freaky result, or if you simply don't want a boundary to show, use the **direct hatch option**.

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17.2 Boundary Hatching

The Boundary Hatch dialog box ([Figure 17.2a](#) - next page), accessed by the **BHatch** command, provides user-friendly access to many of the **Hatch** command options. It also offers some major benefits that the Hatch command doesn't. Let's take a look at the dialog box.

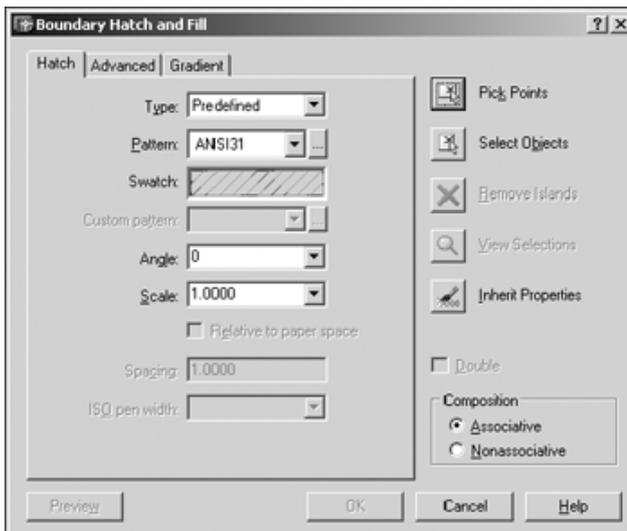


Figure 17.2a

The first tab you see (**Hatch**) allows you to set up the **Type**, **Pattern**, **Scale**, and **Angle** of desired hatching. Simply put, it does most of the things you did on the command line but with an easier interface.

The second tab (**Advanced**) enables you to determine how the hatching will be applied (**Normal**, **Outermost**, **Ignore**, and a few other options).

The third tab (**Gradient**) is new to the 2004 release. It allows you to create some interesting gradient fills - similar to the solid option but with more clout.

Additionally, you'll find a series of buttons down the right side of the dialog box. The first four buttons allow you to identify where the hatch pattern will go. The fifth is sort of a cheater to set the properties on the **Hatch** tab a little faster.

Let's take a more detailed look at the Boundary Hatch dialog box.

- We'll start with the **Hatch** tab.
 - ◆ The **Type** control box allows you to select a **Predefined** pattern, a **User-defined** pattern, or a **Custom** pattern.
 - ◇ The **Predefined** patterns accompany AutoCAD. You can see samples of these in the **Swatch** box or by picking the button next to the **Pattern** control box.
 - ◇ The **User-defined** option allows you to set the **Angle** and **Spacing** of lines (using control boxes), and to decide whether or not to **Double** the pattern as you did in the last exercise. The **Spacing** text box and the **Double** check box are only available when the **User-defined** option has been selected. These correspond to their **Hatch** command counterparts.
 - ◇ Selecting **Custom** in the type control box allows you to select a custom pattern. A custom pattern is also predefined, but the definition is stored in a file other than the *Acad.pat* (the file where AutoCAD keeps hatch pattern definitions by default). The CAD guru will provide custom patterns if needed. If the **Custom** option is selected in the **Pattern** control box, you must enter the name of the desired pattern in the **Custom Pattern** control box.
 - ◆ The **Pattern** control box allows you to scroll through the patterns one at a time; or you can pick the button to the right of the control box to display the Hatch Pattern Palette dialog box, which displays several patterns at a time.
 - ◆ **Scale** and **Angle** control boxes are provided for you to set these options as you did at the **Hatch** command prompt.

- ◆ The **ISO Pen Width** option is only available when an ISO pattern has been selected. This control box allows you to select the width of the ISO lines.
- The **Advanced** tab (Figure 17.2b) offers you some choices in how to apply the hatching.
-

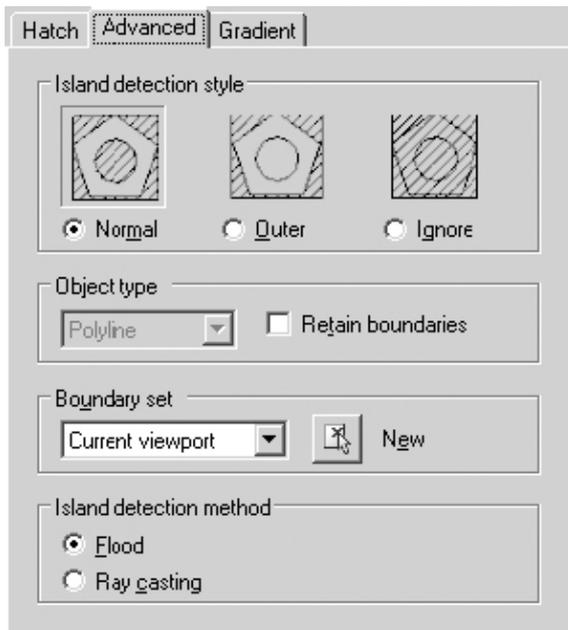


Figure 17.2b

- ◆ In the **Island detection style** frame, you find the same three styles you used on the command line. But thanks to the dialog box format, you can see samples of each.
- ◆ The **Object type** and **Boundary set** frames work together. Let me explain.

You'll notice that, in larger drawings, it may take AutoCAD a while to locate boundaries when using the **Pick Points** method. This is because AutoCAD must search the drawing database for information on all visible objects. Using the **New** button in the **Boundary set** frame can really hasten this process. When picked, AutoCAD will prompt you to **Select objects** on the screen, and then return to the **Advanced** tab of the Boundary Hatch dialog box. AutoCAD will then restrict its search to the objects selected. You can make the new boundary set from the **Current viewport** or from an **Existing Set** by selecting your choice from the control box in the **Boundary set** frame.

When defining a new boundary set, you should use a window or crossing window; other methods will work, but these are faster in a large drawing. In the **Object type** frame, you can tell AutoCAD to retain the defined area as a polyline or a region (an object similar to a 2-dimensional solid). Simply place a check in the **Retain boundaries** box and then make your selection in the control box in the **Object type** frame.

Note The tools available in the **Object type** and **Boundary set** frames can make a tremendous difference in the amount of time required for AutoCAD to hatch objects in larger drawings. However, you must decide if it's necessary to use these tools by considering how long you're willing to wait for the hatching and how long AutoCAD is taking to do the job.

- ◆ The last frame - **Island detection method** - is a bit deceiving. What it boils down to is simply: Do you want AutoCAD to detect islands (boundaries within boundaries) or not? If you do, leave the bullet next to **Flood**; if you don't, move the bullet to the **Ray casting** option.
- The greatest benefit to creating hatch patterns using the **Hatch** command (that isn't available using the **BHatch** dialog box) is the **direct hatch option**. This is an ideal tool for adding partial grating to platforms and walkways, or adding partial façade features (such as *brickface*) to a building elevation. Use this when you just need a sample of the pattern or when fully hatching an area might hinder the

clarity of the drawing.

- The third tab - **Gradient** (Figure 17.2c) - allows you to apply a color or colors with graduated intensity; that is, you can create colors that get more or less intense from one part of the colored area to another.

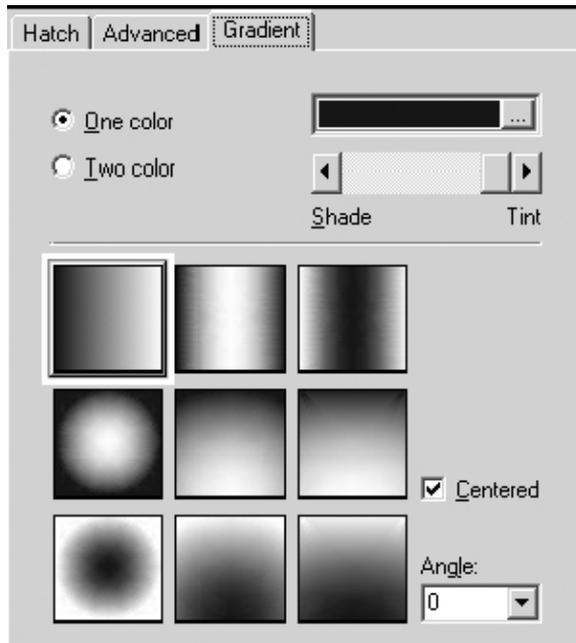


Figure 17.2c

- ◆ You can select between a **One color** or a **Two color** gradient with the radio buttons at the top of the tab. If you opt for one, AutoCAD presents a color selection box (to the right of the radio buttons) and a **Shade/Tint** slider bar to help you control the intensity of the color. If you opt for two colors, AutoCAD replaces the **Shade/Tint** slider bar with a second color selection box to allow you to select the second color.

(You can control the intensity of the colors from the Select Color dialog boxes presented by the color selection box buttons.)
- ◆ In the lower half of the box, AutoCAD presents nine selections for how you'd like your gradient to behave. Select the one you prefer.
- ◆ The **Centered** check box controls how the graduations behave - remove the check and the intensity grows from mild in the upper left corner (appearing something like a light source) to more intense as you move away from the upper left corner.
- ◆ The **Angle** selection box, of course, controls the angle of the gradients.
- Once you've made your selections on the tabs, you must tell AutoCAD what to hatch using one of the buttons on the right side of the dialog box.
 - ◆ You can find one of the greatest enhancements to hatching (and one of my personal favorites) in the **Pick Points** button. With this nifty tool, you simply pick a point where you want hatching. AutoCAD fans outward from that point to find the nearest boundaries. You just can't get any simpler than this. (Again, you must be sure that you select inside a *closed* area.)
 - ◆ The **Select Objects** button allows you to select objects just as you did at the command line in the last exercise.
 - ◆ Remember how the **Normal** style worked? AutoCAD hatched between the outer two boundaries, skipped hatching between the next two boundaries, hatched between the next two, and so forth. AutoCAD recognizes boundaries within the outermost boundary as *islands* and adjusts the hatching for clarity. The same holds true when you select the boundary using the **Pick Points** button. You can use the **Remove Islands** button to tell AutoCAD to ignore the islands and hatch over them. But the **Remove Islands** button give you more control over

which islands to ignore.

- ◆ The **View Selections** button highlights the currently selected boundaries to help you verify the selection.
- ◆ Use the **Inherit Properties** button when you don't know the style of pattern you want to match. That is, when you've used several styles in a drawing and wish to duplicate the settings of one of them, pick this button. AutoCAD will ask you to select the style you want to duplicate. It'll then reset the Boundary Hatch dialog box options to match that style. (How's that for handy?)
- ◆ The **Preview** button (lower left corner of the dialog box) allows you to see the hatched object before completing the command. This way, you can make any necessary adjustments before applying the hatching.
- ◆ The **Composition** frame in the lower right quadrant of the dialog box gives you the chance to use **Associative** hatching. This means that hatch patterns will update automatically when the boundaries change. *This option isn't available at the command line.*

You can also tell AutoCAD to draw hatch lines as individual objects (**Nonassociative** - or pre-exploded). (This option is available at the command line by placing an asterisk (*) in front of the name of the hatch pattern - as in *ANSI31.) But be aware that exploded hatch patterns dramatically increase the size of a drawing and the amount of work involved in modifying the pattern. If you don't create the pattern already exploded, you can always explode the pattern (using the **Explode** command) just as you could explode a polyline.

Let's take a look at hatching using the Boundary Hatch dialog box.

Note In addition to the command line and toolbars, selecting **Hatch** under the Draw pull-down menu will access the **BHatch** command.

Do This: 17.2.1 Hatching with a Dialog Box

- I. Be sure you're still in the *demo-hatch.dwg* file the C:\Steps\Lesson17 folder. If not, please open it now.
- II. Follow these steps.

TOOLS	COMMAND SEQUENCE	STEPS
 Hatch Button	Command: <i>h</i>	1. Open the Boundary Hatch dialog by entering the BHatch command - type bhatch , bh , or h at the command prompt. Alternately, you can pick Hatch button on the Draw toolbar.
		2. On the Hatch tab, pick the Pattern button. The Hatch Pattern Palette dialog box appears (Figure 17.2.1.2a). Here you can select a pattern in one of two ways: <ul style="list-style-type: none"> ◆ double-click on it; ◆ click on the desired pattern and then pick the OK button. Pick the tabs and use the scroll bar to see other patterns.

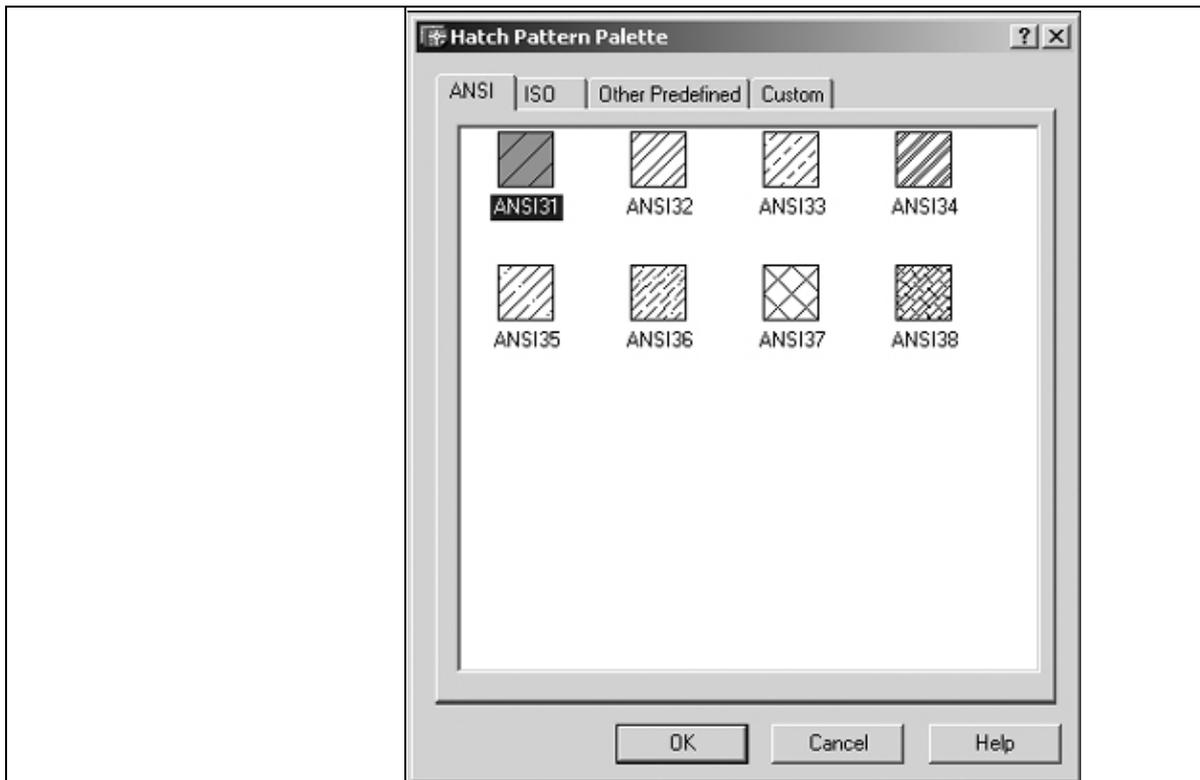
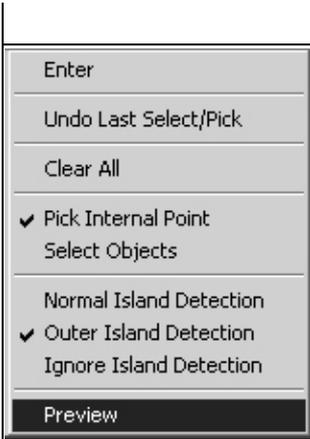
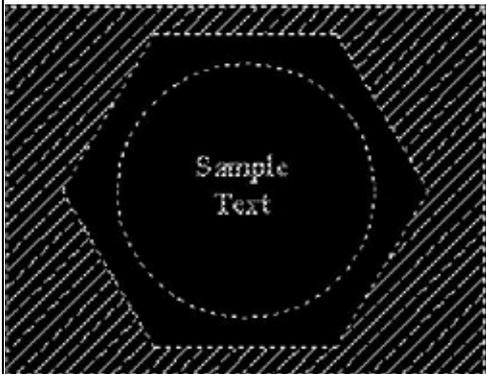
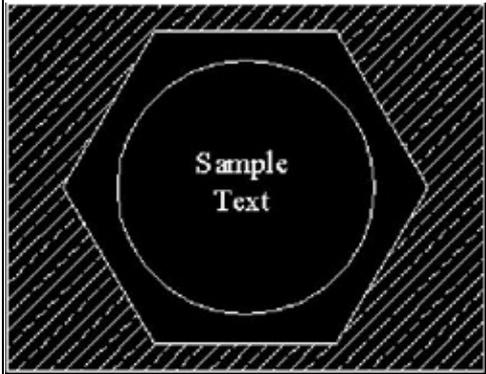


Figure 17.2.1.2a

 <p>ANSI33</p>		<p>3. Double-click on the ANSI33 pattern (first tab, first row, third column). AutoCAD returns to the Boundary Hatch dialog box. The ANSI33 pattern is now shown as current in the Pattern and Swatch control boxes.</p>
<p>Angle: 0</p> <p>Scale: 1.5000</p>		<p>4. Set the Scale to 1.5 and the Angle to 0.</p>
<p>Advanced</p>		<p>5. Pick the Advanced tab.</p>
<p>Island detection style</p> 		<p>6. Set the Style to Outer in the Island detection style frame.</p>
 <p>Pick Points Button</p>		<p>7. Pick the Pick Points button. AutoCAD returns to the graphics screen and prompts to Select internal point.</p>
	<p>Select internal point:</p>	<p>8. Pick any point between the rectangle and the polygon.</p>
	<p>Selecting everything...</p> <p>Selecting everything visible...</p> <p>Analyzing the selected data...</p> <p>Analyzing internal islands...</p>	<p>9. AutoCAD tells you what it's doing, and then repeats the prompt. Right-click to display the cursor menu.</p>

	<p>Select internal point:</p>	<p>10. We could return to the Boundary Hatch dialog box and pick the Preview button to see the hatching before applying it. But let's use the Preview option on the cursor menu.</p> <p>Your drawing looks like Figure 17.2.1.10a.</p>
		<p>Figure 17.2.1.10a: Preview of Hatch</p>
<p>Note Note: The Preview Hatch display isn't always accurate. Most of the ANSI patterns preview fairly well; but many of the other, more complex patterns tend to lose definition or not display at all. If the pattern doesn't display, but you're reasonably sure of your settings, go ahead and apply the pattern. You can always edit or erase the pattern and start again.</p>		
	<p><Previewing the hatch></p> <p>Pick or press Esc to return to dialog or <Right-click to accept hatch>:</p>	<p>11. Hit the Esc button return to the dialog box.</p>
		<p>12. Pick the OK button to complete the command. AutoCAD returns to the graphics screen and the command prompt. Your drawing looks like Figure 17.2.1.12a.</p>
		<p>Figure 17.2.1.12a</p>