

Starting to Draw

Learning AutoCAD is a bit like trying to decide which came first — the chicken or the egg. On one hand, you need to know many basics before you can start drawing. On the other hand, it can be very difficult to understand those basics if you haven't had the experience of drawing something. In this chapter, you resolve this problem by drawing a simple rectangle in AutoCAD. The next few chapters then fill you in on basic information you need to move on to more complex drawings. By experiencing the drawing process first, the initial learning curve will be easier and smoother.

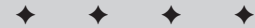
Getting Acquainted with AutoCAD

AutoCAD, created by Autodesk, is the most widely used technical drawing program anywhere, with more than 3 million registered users. According to Autodesk, CAD stands for *computer-aided design*, but can also stand for computer-aided drafting or drawing.

The first version of AutoCAD, running under DOS, came out in 1982. AutoCAD was the first significant CAD program to run on a desktop computer. At the time, most other technical drawing programs ran on high-end workstations or even mainframes. AutoCAD's success has been attributed to its famous open architecture — many source code files in plain text (ASCII) files that you can easily customize and programming languages (such as AutoLISP and Visual Basic for Applications) designed especially so that the end user can program AutoCAD.

As a result, AutoCAD is the most flexible drafting program available, applicable to all fields. AutoCAD's support for languages other than English, including those using other alphabets, is unparalleled, making AutoCAD without serious competition abroad. As a result, AutoCAD is used in all disciplines and in more than 150 countries.

CHAPTER



In This Chapter

Getting acquainted with AutoCAD

Starting AutoCAD

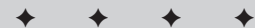
Creating a new drawing

Using the AutoCAD interface

Creating your first drawing

Saving your drawing

Closing a drawing and exiting AutoCAD



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Through a high level of technical innovation and expertise, Autodesk has created a program with unequalled features and capabilities, including 3D surface and solid modeling and visualization, access to external databases, intelligent dimensioning, importing and exporting of other file formats, Internet support, and much more.

The major disciplines that use AutoCAD are:

- ♦ Architectural, Engineering, and Construction (AEC)
- ♦ Mechanical
- ♦ Geographic Information Systems (GIS),
- ♦ Surveying and Civil Engineering
- ♦ Facilities management
- ♦ Electrical/electronic
- ♦ Multimedia

However, AutoCAD has many other lesser-known uses, such as pattern making in the garment industry, sign making, and so on.

In this book, I try to provide examples from many fields. The world of AutoCAD is very broad, and it is worthwhile to see the many approaches that AutoCAD makes possible.

Starting AutoCAD

This section starts the quick tour of AutoCAD, designed to make AutoCAD look easy and simple. The first step is to start AutoCAD.



The CD-ROM contains a 30-day trial version of AutoCAD 2004. Look in \Software\AutoCAD 2004.

This book covers AutoCAD 2004 running on Windows 2000, Windows NT 4.0, or Windows XP/XP Professional. Every computer is set up somewhat differently, so you may need to adjust the following steps slightly. If you didn't install AutoCAD yourself and are unfamiliar with the folders (once called directories) on your computer, you should get help from someone who is familiar with your computer system.



If you need help installing AutoCAD, see Appendix A on the CD-ROM.

By default, installing AutoCAD places a shortcut on your desktop, as shown in Figure 1-1. You can double-click this shortcut to launch AutoCAD. Of course, you can also choose Start ⇨ Programs ⇨ Autodesk ⇨ AutoCAD 2004 ⇨ AutoCAD 2004.



Figure 1-1: An AutoCAD shortcut on the desktop provides a quick way to open AutoCAD.

Creating a New Drawing

After you launch AutoCAD, you are automatically in a new drawing named `Drawing1.dwg`. You can see the drawing name on the title bar as shown in Figure 1-2. You can start drawing immediately. In Chapter 2, I explain how to start a drawing based on a template and how to open an existing drawing.

Step-by-Step: Starting AutoCAD

1. Click Start on the task bar at the bottom of your screen.
2. Choose Programs ⇨ Autodesk ⇨ AutoCAD 2004 ⇨ AutoCAD 2004.

You see a blank drawing named `Drawing1.dwg`.

If you are continuing on with this chapter, keep this drawing open. Exiting from AutoCAD is covered later in this chapter.

Using the AutoCAD Interface

You are probably impatient to start drawing. First, though, it helps to get the lay of the land.

Figure 1-2 shows the screen when you first open AutoCAD. Your screen may look somewhat different — remember that AutoCAD can be customized in many ways — but the general features will be the same.



You may see the Tool Palettes window with some sample office furniture and hatches. The palette is a way to access content that you insert into your drawing. I cover the Tools Palette in Chapter 26. For now, you can click the palette's close button to get it out of the way. (If you want it back, choose Tools ⇨ Tool Palettes Window.)

The AutoCAD screen consists of four important areas. These are discussed in the next sections.

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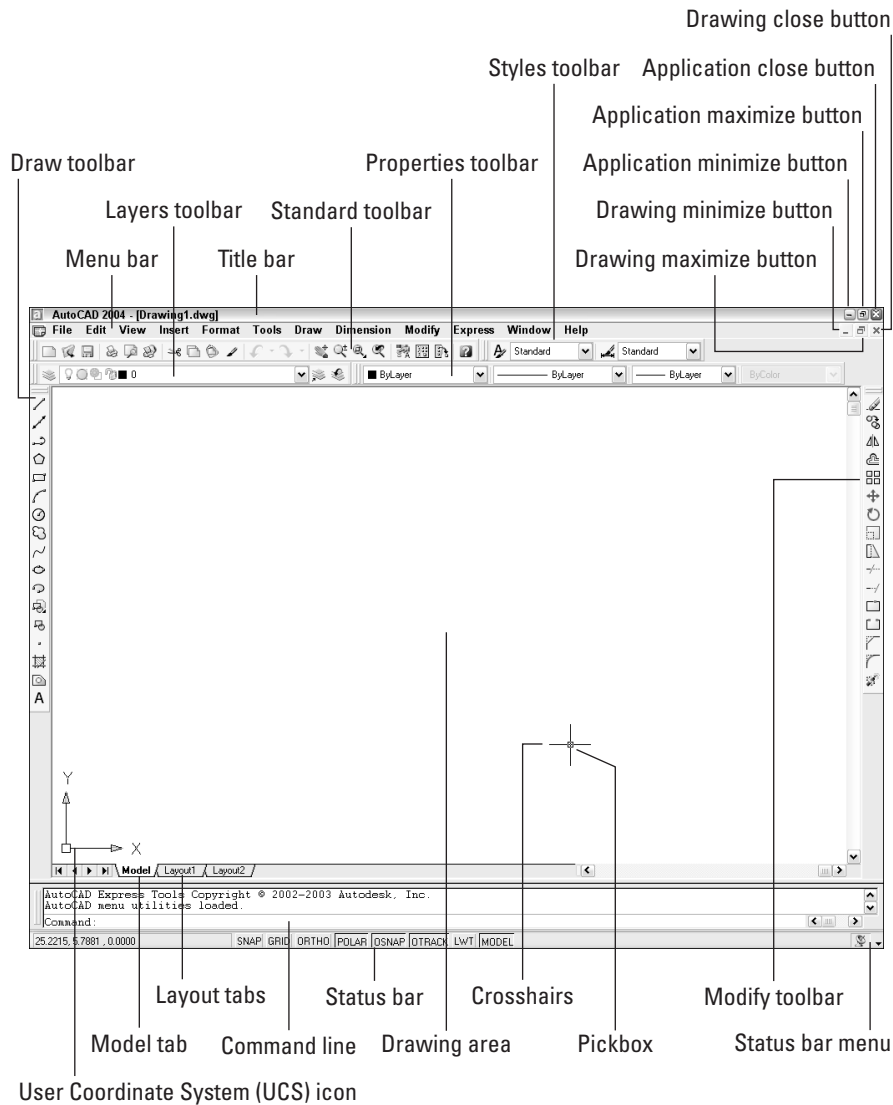


Figure 1-2: The AutoCAD screen

The drawing area

The blank area in the middle of the screen, the *graphics window*, is where you draw. You can think of this as a sheet of drafting paper, except that this piece of paper can be any size—even the size of a huge factory!

At the bottom of the drawing area is a tab labeled Model. You draw on this tab. You use the layout tabs to lay out your drawing for plotting.

When you start to draw, you need to specify where to start drawing. One way is to use coordinates. To specify a coordinate, the universally accepted convention is to put the X coordinate first, then a comma, and then the Y coordinate. Figure 1-3 shows some coordinates on X and Y axes.

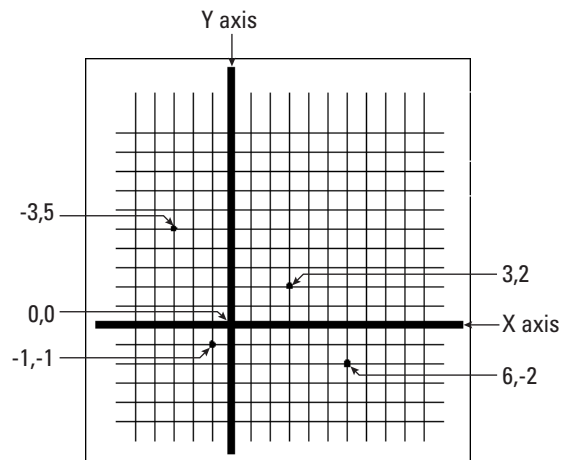


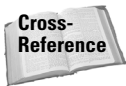
Figure 1-3: Some X,Y coordinates



Chapter 4 is devoted to explaining how to specify coordinates. To create three-dimensional models, you need to add a Z coordinate when specifying a point. Chapter 21 discusses three-dimensional coordinates.

The UCS icon

Notice the symbol with two arrows at the bottom-left corner of the drawing area in Figure 1-2. This symbol is called the User Coordinate System (UCS) icon. The arrows point to the positive directions of the X and Y axes to help you keep your bearings.



You can change the look of this icon. (See Chapter 8.)

The crosshairs

In the drawing area of Figure 1-2, notice the two intersecting lines with a small box at their intersection. The small box is called the *pickbox* because it helps you to pick objects. The lines are called *crosshairs*. They show you the location of the mouse cursor in relation to other objects in your drawing.

As you move your mouse around, the pickbox and crosshairs move with your mouse. At the bottom of your screen, at the left end of the status bar (described later), you can see the X,Y coordinates changing as you move the mouse.

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The menus and toolbars

At the top of your screen is the title bar, and directly beneath the title bar is a menu bar. Below that are two rows of toolbars. In addition, your screen has two more toolbars, the Draw and Modify toolbars, which are probably docked at the left and right sides of the screen, as shown in Figure 1-2. Use the menus and toolbars together to give AutoCAD commands to draw, edit, get information, and so on.

Because you can customize the menus and toolbars to suit your needs, your screen may appear somewhat different. AutoCAD provides many more toolbars that you can display when you need them. Some examples of the toolbars are Dimension, Solids, Render, and Zoom. You learn about these and more in this book.

The command line

At the bottom of the screen, you see a separate window showing approximately three lines of text. (You can change it to show as many lines as you like by dragging the top edge of the window up or down.) Notice the word `Command:`. This is the *command line*. All commands can be executed by typing them on the command line.

Even if you use a menu item or toolbar button to execute a command, you may need to look at the command line to see how AutoCAD responds. Often, AutoCAD provides options that must be typed in from the keyboard. Also, text that you type appears on the command line. For example, when you type in coordinates specifying a point, they appear on the command line. To see more of the command line, press F2 to open the AutoCAD Text window. You can scroll back through previous commands. Press F2 again to close the window.

The status bar

At the very bottom of the screen is the status bar, as shown in Figure 1-2. At the left are the X,Y coordinates. As you move your mouse around, these coordinates change. (If they don't change, click them and move your mouse again.) The status bar also sports several buttons that you read about later.



At the right side of the status bar is a small down arrow. Click it to open the Status bar menu. This menu determines which buttons appear on the status bar. If you don't use a certain button, choose it to remove its checkmark and make it disappear. You can always go back and choose it again to redisplay the button. Also at the right side of the status bar is the new Communication Center icon. See Chapter 26 for details.

Also, you can use the Express Tools `FULLSCREEN` command to hide the Title bar, menu, and status bar, leaving more room for the drawing area. To return to the regular display, type **fullscreen** on the command line and press Enter. See Appendix A on the CD-ROM for information about installing the Express Tools.

Creating Your First Drawing

You are now almost ready to draw your first lines. It is worthwhile first to take a minute to get accustomed to using the toolbars to give AutoCAD a command.

Toolbars

On the Draw toolbar, move the mouse cursor over the first button. You see a Tooltip that says Line, as shown in Figure 1-4. Also notice the status bar, which tells you that this button creates straight-line segments.

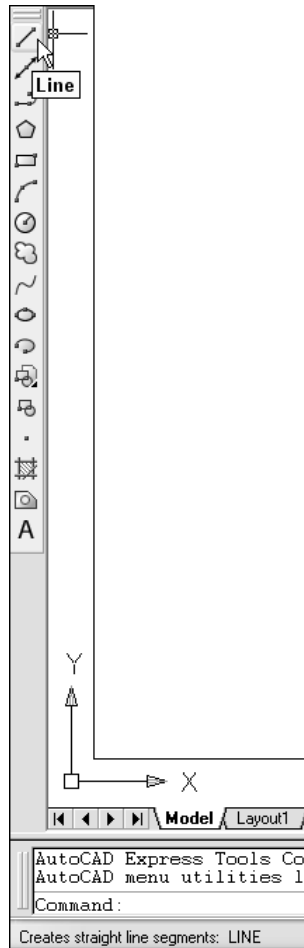


Figure 1-4: Moving the cursor over the Line button displays a Tooltip.

**Tip**

If you inadvertently start a command that you don't want, press Esc. The command-line prompt (Command:) returns.

Drawing a rectangle


For this exercise, simply follow the instructions exactly. When you type the X and Y coordinates (shown in bold), type the first number, a comma, and then the second number, with no spaces between them. If you haven't read the Preface, now is a good time to go back and read the part that explains how to follow the exercises. Don't worry if you don't understand everything you are doing. It all becomes clear as you progress through this book.

Follow the prompts shown next. As explained in the Preface, you type what appears in **bold**. Instructions to you in command sections appear in *italics*.

Step-by-Step: Drawing a Rectangle

1. Start AutoCAD.

AutoCAD displays the new drawing. (If you are prompted for a template, type or choose **acad.dwt**.)

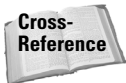
2.  With your left mouse button (also called the *pick button*), choose Line from the Draw toolbar. Notice that the command name is repeated on the command line.

```
Command: _line Specify first point: 0,0 ↵ (This arrow means to press Enter)
Specify next point or [Undo]: 10,0 ↵
Specify next point or [Undo]: 10,7 ↵
Specify next point or [Close/Undo]: 0,7 ↵
Specify next point or [Close/Undo]: 0,0 ↵
Specify next point or [Close/Undo]: ↵
```

The command-line prompt appears again, ready for a new command.

3. To make the rectangle fill up the screen, type the following, shown in bold:

```
Command: zoom ↵
Specify corner of window, enter a scale factor (nX or nXP),
or
[All/Center/Dynamic/Extents/Previous/Scale/Window] <real
time>: e ↵
```

**Cross-Reference**

The rectangle is centered and fills most of the screen, leaving a small space at the edges of the drawing area. The ZOOM command with the Extents (e) option brings the outer extents of the drawing to the edges of your screen. You read more about the ZOOM command in Chapter 8.

4. Keep your drawing open. You save it later in this chapter. It should look like the image shown in Figure 1-5.

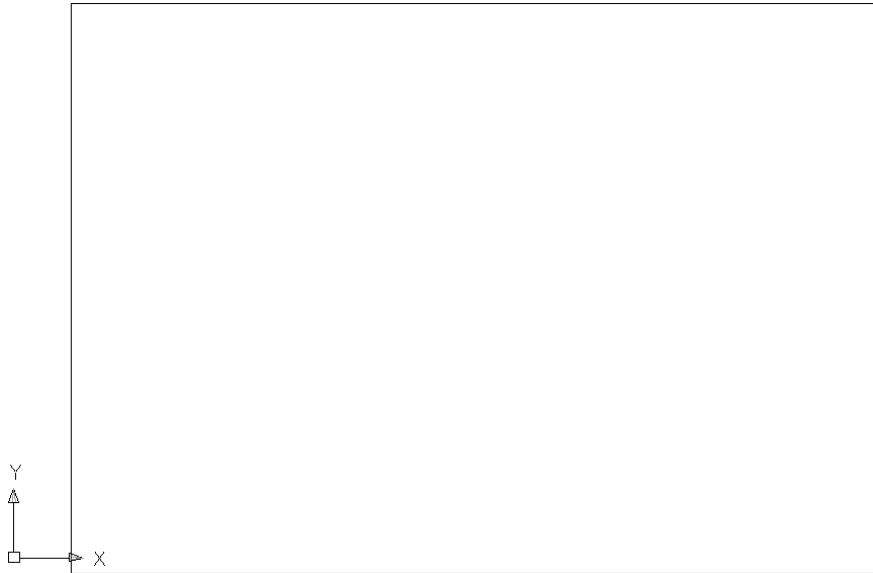


Figure 1-5: Your first drawing

You may be wondering what units the coordinates you typed refer to. For now, you can think of them as inches, although they can actually be whatever you want. As a result, you could print out your drawing as a rectangle of 10 inches by 7 inches.

Help! My drawing doesn't look like the figure

If your drawing doesn't look like the image shown in Figure 1-5, there could be several reasons. To fix the problem, try one of the following options:

- ♦ You may have made a mistake. If you think that's the case, choose **File** ⇨ **New** to start a second new drawing, choose the `acad.dwt` template and click **Open**. Then follow the prompts again.
- ♦ If your drawing still seems wrong, put the CD-ROM that accompanies this book in your CD-ROM drive. Choose **File** ⇨ **Open** and use the Open dialog box to find `ab-acad.dwg` on the CD-ROM. Choose `ab-acad.dwg` and click **Open**. Then follow the prompts again.

One of the preceding options should solve your problem. If you began more than one new drawing, you probably have more than one drawing currently open. You can switch from one open drawing to another by choosing any open drawing from the **Window** menu.

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You have learned several things — how to start a command by using the toolbar (the **LINE** command), how to type in X,Y coordinates on the command line, and how to end the **LINE** command (by pressing **Enter** without typing any coordinates). You also used the **ZOOM** command by typing it on the command line. Most of AutoCAD builds on these basic skills.

Saving a Drawing

Saving a drawing is similar to saving any other file in Windows. You should get in the habit of saving your work every 10 to 15 minutes to avoid losing your work in case your computer system crashes.

For your work with this book, you should create a new folder so that you can save your exercise drawings where they won't get mixed up with other drawings. Although saving is a standard Windows function, I review the steps here because they are so important.

The following directions leave it up to you where to create this new folder. Each computer system is organized differently. If you are unsure what to do, choose the drive (not the folder) where AutoCAD is installed and create a new folder there. I do not recommend creating a subfolder in AutoCAD's folder (which by default is called *AutoCAD 2004*) because it is too easy to make a mistake and delete necessary AutoCAD files.

Step-by-Step: Creating a New Folder

1. Move the mouse cursor down to the task bar at the bottom of your screen and right-click **Start**. (That means, click the **Start** button with your right mouse button.)
2. Choose **Explore**.
3. On the left pane of Windows Explorer, click the drive where you want to create the new folder. If you don't know where to create the folder, choose the drive where AutoCAD is installed. If you are on a network, choose the drive that represents your computer.
4. If you want to make a subfolder (a folder within a folder), choose the folder where you want to create the subfolder.
5. From the Explorer menu, choose **File** ⇨ **New** ⇨ **Folder**.
A new, highlighted folder, named **New Folder**, appears in the right pane. You may have to scroll down to see it.
6. Type **AutoCAD Bible** for the folder name and press **Enter**. (If you did the exercises from a previous edition of this book, such as *AutoCAD 2002 Bible*, and already have a folder named **AutoCAD Bible**, first rename the original folder to something such as **ACAD2002Bible**.)

Now you are ready to save your drawing. Saving a drawing for the first time is different from saving it subsequently because you have to name the drawing the first time you save it. The important point is to save the drawing in the right drive and folder. You should save this drawing (and all drawings you create by using this book) in the special folder you created in the exercise just completed.



Caution Creating a folder for your drawings as described in the previous steps is essential before you go on to exercises in the rest of this book.

 To save a drawing, click Save on the Standard toolbar. If you are saving a drawing for the first time, the Save Drawing As dialog box appears, as shown in Figure 1-6.

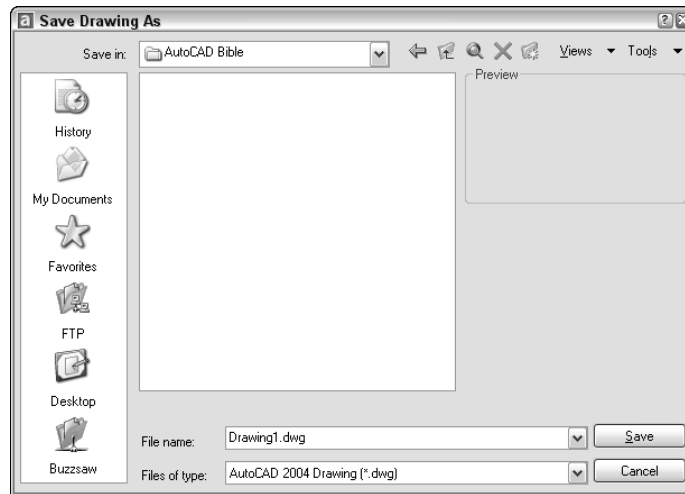


Figure 1-6: The Save Drawing As dialog box

Down the left side of the dialog box are several buttons to help you find a location to save drawings more quickly. Together, these buttons are called the *Places list*. Use the Places list as follows:

- ♦ **History** lists shortcuts to recently used drawings.
- ♦ **My Documents** lists drawings and folders in the My Documents folder. Some people store files in this folder. (Your system may call this the Personal folder.)
- ♦ **Favorites** lists files and folders in the C:\Documents and Settings\[login name]\Favorites folder. (This is the location in Windows XP; it may be different on your computer.) You may have an AutoCAD subfolder; if so, double-click the AutoCAD subfolder to save a drawing there. Usually, this folder

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contains only shortcuts to files saved elsewhere. To put a shortcut to an already saved drawing in Favorites, choose File ⇨ Save As and click the Tools drop-down list; then click Add to Favorites. Then you can later open the file from the Favorites folder.

- ♦ **FTP** sites are locations on the Internet for transferring files. When you choose FTP, you see FTP sites that you added to the list. To add FTP locations, choose Tools ⇨ Add/Modify FTP Locations from the menu of the Save Drawing As dialog box. You need to list the name of the FTP site, choose a logon type (Anonymous or User), and specify your user name and password if you are logging on as a User. You can then save drawings (called uploading) to FTP locations. This feature makes an intranet or any server with FTP capability as accessible as your own computer system.
- ♦ **Desktop** shows drawings on your desktop. Some of the Windows icons also appear on this list.
- ♦ **Buzzsaw** sends you to www.buzzsaw.com, the Autodesk business-to-business portal for the building design and construction industry. You can set up a new account or access existing projects.



Tip

In a nice touch, you can reorder the buttons in the Places list. Just drag any button to a new location.

Of course, you can also choose a location from the Save In drop-down list to save the file to. To save a file, type a file name in the File Name text box and click Save to save the file.


Use the Views drop-down list of the dialog box to specify how you want to display files in this dialog box. List just displays the name; Details adds the file size, type, and date modified; and Preview adds a preview of the drawing.



New Feature

The SAVEALL command of the Express Tools saves all open drawings, without closing them. If a drawing hasn't been saved, you are prompted for a file name. Choose Express ⇨ File tools ⇨ Save All Drawings. For information on installing Express Tools, see Appendix A on the CD-ROM.

Step-by-Step: Saving a Drawing for the First Time

1.  The rectangle you created earlier in this chapter should still be on your screen. Click Save on the Standard toolbar.
The Save Drawing As dialog box opens.
2. Click the Save In drop-down list box. If necessary, choose the drive where you created your AutoCAD Bible folder.
3. Double-click the AutoCAD Bible folder you created for this book.
You may need to scroll down to display the folder name.
4. In the File Name box, select the file name. Type **ab01-01** and press Enter (or click Save).

AutoCAD saves your drawing under the name `ab01-01.dwg`. You can use a different name if you like, but this will help you organize your drawings from this book. It just means that this is the first drawing from Chapter 1 of the *AutoCAD 2004 Bible*.



The CD-ROM includes a small program, `savea.lsp`, that automatically backs up your drawing to the floppy drive after you have saved it on your hard drive. If you like to back up to a diskette regularly for safety, this program can be useful. Look in `\Software\Chap01\Savea`.

Closing a Drawing and Exiting from AutoCAD

You can close your drawing and keep AutoCAD open. The simplest way is to use the drawing Close button just under the application Close button. You can also choose `File ⇨ Close`.



You can choose `Window ⇨ Close All` to close all open drawings. If any have unsaved changes, AutoCAD prompts you to save the changes. If you installed the Express Tools (see Appendix A on the CD-ROM for details), you can choose `Express ⇨ File tools ⇨ Quick Exit`, which closes all open drawings (prompting you to save if necessary) and then exits AutoCAD. You can also choose `Express ⇨ File tools ⇨ Close All Drawings` to close all drawings without exiting AutoCAD. You are prompted to save any unsaved changes.

To exit AutoCAD, click the Close (X) box at the top-right corner of your screen. You can also exit out of AutoCAD by typing **quit** on the command line and pressing Enter. Another method is to choose `File ⇨ Exit`.



If you are in the middle of a command, you can now close a drawing without ending the command.

If you have made any changes to your drawing since last saving it, AutoCAD asks you if you want to save your changes. Choose Yes or No as your situation requires. Choosing Cancel returns you to your drawing. If you have more than one drawing open to which you have made changes, AutoCAD asks you about each drawing in turn so that you will not exit AutoCAD without saving all the changes you have made in your open drawings.

Step-by-Step: Closing Your Drawing and Exiting AutoCAD

1. The rectangle of `ab01-01.dwg` should still be on your screen. Choose `File ⇨ Close`. You now see a gray screen with no drawing. (Repeat this process if you have other drawings open. Save or cancel the changes to these extra open drawings as you like.)
2. Click the Close button in the upper-right corner to exit AutoCAD. AutoCAD closes immediately.

Summary

Chapter 1 explained how to start AutoCAD and a new drawing. I gave you a tour of the AutoCAD screen and explained how save a drawing. This chapter provides the basis for all your work in AutoCAD.

In this chapter, you learned the following:

- ♦ A brief history of AutoCAD
- ♦ Some of the different disciplines that use AutoCAD
- ♦ How to start AutoCAD
- ♦ How to start a new drawing
- ♦ The AutoCAD interface and its various sections, including the drawing area, the UCS icon, the crosshairs, the menus and toolbars, the command line, and the status bar
- ♦ How to start the LINE command from a toolbar
- ♦ How to end the LINE command
- ♦ How to draw a rectangle by specifying X,Y coordinates
- ♦ How to start the ZOOM command by typing it on the command line
- ♦ How to save a drawing for the first time
- ♦ How to close a drawing
- ♦ How to exit AutoCAD

You may have several questions at this point, but “well begun is half done.” The next chapter explains all the ways to start a new drawing as well as how to open an existing drawing.

